

5.12.10 PERSPECTIVES
ARCHITECTURAL CONCEPT DESIGN > THREE-STAR HOTEL



Environmental Impact Assessment Report

International Hotel Project

Pwint Phyo Thit Co., Ltd

5.15.13 PERSPECTIVES
ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



February 2024



Phwint Phyto Thit

COMMITMENT LETTER

Letter No: 1 / 2 - 2 / (011 / 2024)

Date: 22 February 2024

To
Director General
Ministry of Natural Resources and Environmental Conservation
Office No. (53), Ottrathiri Township,
Nay Pyi Taw, Myanmar.
Commitment - Phwint Phyto Thit Company Limited

We refer to the captioned EIA, which was prepared and finalized by (third party, Resource and Environment Myanmar Company Limited (REM Co., Ltd.) in accordance with the Environmental Conservation Law, Rules and Procedures under the instructions of Ministry of Natural Resources and Environmental Conservation and formally submitted by Environmental Conservation Department to Ministry of Natural Resources and Environmental Conservation.

We hereby submit our Environmental Impact Assessment (EIA) Report with the Summary in both Myanmar and English languages for the approval of the report, **‘International Hotel Project’** confirming that by EIA procedure (2015):

- a) the accuracy and completeness of the EIA;
- b) that the EIA has been reared in strict compliance with applicable laws including this Procedure and with the Mitigation measures and management plan for the EIA; and
- c) That the Project will at all times comply fully with the commitments, mitigation measures and plans in the EIA Report.

And we do commit that we shall;

- i) arrange of appropriate public consultation through all phases of the EIA process as required by EIA procedure
- ii) Disclose to the public in a timely manner all relevant project-related information in accordance with this procedure except that which may relate to National Security concerns as informed by the Ministry.

The issuance of this confirmation and undertaking has been authorized by all necessary corporate actions and a copy of the resolution of the Project Management Institution authorizing it and the power of attorney explicitly granting signing authorization to the individual who has signed below are attached ass schedules hereto.

Sincerely

Thein Lwin Shwe
Deputy CEO
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DECLARATIONS

Resource & Environment Myanmar Co., Ltd. (REM); a local environmental consultant firm, conducted environmental impact assessment and prepared ESIA report for Phwint Phyo Thit Company Limited. In compliance with EIA Procedure and other relevant laws/rules and formally submitted to the Environmental Conservation Department (ECD) for final approval.

We do state, to the best of our knowledge at the time of report preparation, that

- To our knowledge, all information contained in this report is accurate and a truthful representation of all findings as relating to the project, and ;
- The EIA Report has been prepared in strict compliance with all applicable laws, rules regulations and procedure in force.

We also consulted to Phwint Phyo Thit Company Limited to undertake that;

Phwint Phyo Thit Company Limited in respect of the “International Hotel Project” will at all times comply fully with (1) any and all commitments and obligations as set forth in the EIA Report which has been reviewed by Review Team, and (2) any and all plans and the various components thereof, including without limitation, impact avoidance, mitigation, and remediation measures, and with respect to such commitments, obligations, plans and measures related to the development, construction, commissioning, operation and maintenance of the project, and any circumstance in which work done or to be done, or services performed or to be performed, in connection with the project’s development.

Signed: Min Thant Tun (Director)

Date: 28.2.2024

For: Resource & Environment Myanmar Co., Ltd. (REM)



ABBREVIATION

AOI	=	Area of Influence
CDI	=	Community Development Initiatives
CO	=	Carbon monoxide
EIA	=	Environmental Impact Assessment
ECL	=	Myanmar Environmental Conservation Law
ECR	=	Myanmar Environmental Conservation Rules
ECD	=	Environmental Conservation Department
ECC	=	Environmental Compliance Certificate
EPAS	=	Environmental Perimeter Air Station
EHS	=	Environmental Health and Safety
FGD	=	Focused group discussions
GAD	=	General Administration Department
GIS	=	Geographic Information System
IEE	=	Initial Environmental Examination
IFC	=	International Finance Corporation
ISO	=	International Organization for Standardization
IUCN	=	International Union for Conservation of Nature
LAeq dB	=	Sound Pressure Level
Lv dB	=	Vibration level
MONREC	=	Ministry of Natural Resources and Environmental Conservation
MOECAF	=	<u>Ministry of Environmental Conservation and Forestry</u>
MCDC	=	Mandalay City Development Committee
NWCD	=	Nature and Wildlife Conservation Division
NEQG	=	National Environmental Quality (Emission) Guidelines
NO ₂	=	Nitrogen dioxide
NO _x	=	Nitrogen Oxide
NO	=	Nitrogen monoxide

PM	=	Particulate matter
PPE	=	Personal Protective Equipment
PCM	=	Public Consultation Meeting
Q/A	=	Question and Answer
SO ₂	=	Sulfur dioxide
STP	=	Sewage Treatment Plant
TOR	=	Terms of References
TGC	=	Township Grievance Committee
UNFCCC	=	United Nations Framework Convention on Climate Change
U.S. EPA	=	United States Environmental Protection Agency
USD	=	United State Dollar
VGC	=	Village Grievance Committee
WHO	=	World Health Organization

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အကျဉ်းချုပ် အစီရင်ခံစာ

ဤ ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ် လေ့လာခြင်း အစီရင်ခံစာသည် အဆိုပြုထားသော လုပ်ဆောင်ချက်များနှင့် စီမံကိန်းများ၏ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ အကျိုးသက်ရောက်မှုများကို ခွဲခြားသတ်မှတ်ခြင်း၊ ခန့်မှန်းခြင်းနှင့် အကဲဖြတ်ခြင်း၏ စနစ်တကျ လုပ်ငန်းစဉ်တစ်ခုဖြစ်ကြောင်း သိရှိနားလည်ထားပါသည်။ အဆိုပြုထားသော ဆောင်ရွက်ချက်များ၏ ဆိုးကျိုးများကို ကာကွယ်ရန်၊ လျော့ပါးရေးနှင့် နှိမ်နင်းရေး အလေ့အကျင့်အတွက် ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ် လေ့လာခြင်း တွင် အထူးအလေးပေးထားကြောင်းလည်း မှတ်သားရပါသည်။ ထို့ကြောင့်၊ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ် လေ့လာခြင်း ၏ ရည်ရွယ်ချက်မှာ အဆိုပြုထားသော လုပ်ဆောင်ချက်များ၏ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ အကျိုးဆက်များအပေါ် ဆုံးဖြတ်ချက်ချရန်အတွက် သတင်းအချက်အလက်ပေးရန်ဖြစ်သည်။ သဘာဝပတ်ဝန်းကျင်နှင့် ညီညွတ်သော၊ ရေရှည်တည်တံ့သော ဖွံ့ဖြိုးတိုးတက်မှုနှင့် လျော့ပါးသက်သာစေရေး အစီအမံများကို မြှင့်တင်ရန်။ သို့သော်လည်း ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ် လေ့လာခြင်း ၏ ရည်ရွယ်ချက်မှာ အဆိုပြုချက်၏ သဘာဝပတ်ဝန်းကျင် ကို မြှင့်တင်ရန်ဖြစ်သည်။ အရင်းအမြစ်များကို သင့်လျော်စွာနှင့် ထိထိရောက်ရောက်အသုံးပြုကြောင်း သေချာစေရန်၊ အဆိုပြုချက်၏ ဖြစ်နိုင်ချေရှိသော သက်ရောက်မှုများ လျော့ပါးစေရန်အတွက် သင့်လျော်သော အစီအမံများကို ဖော်ထုတ်ရန်၊ အဆိုပြုချက်ကို အကောင်အထည်ဖော်ရန်အတွက် ပတ်ဝန်းကျင်ဆိုင်ရာ စည်းကမ်းသတ်မှတ်ချက်များ သတ်မှတ်ခြင်း အပါအဝင် အသိပေးဆုံးဖြတ်ချက်များ ချမှတ်ရာတွင် အဆင်ပြေချောမွေ့စေရန် တို့ဖြစ်ပါသည်။

၁.၁ စီမံကိန်း ခြုံငုံသုံးသပ်ချက်

စီမံကိန်းအဆိုပြုသူအဖြစ် ဖွင့်ဖြိုးသစ်ကုမ္ပဏီလီမိတက် သည် ရင်းမြစ်နှင့်ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး မြန်မာကုမ္ပဏီလီမိတက်အား စဉ်ဆက်မပြတ်ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးမြန်မာနှင့် အတူတတ်ယပါတီ ပတ်ဝန်းကျင် အကဲဖြတ်မှုလေ့ကျင့်ရေးမှူး (EAP) အဖြစ် EIA အဆိုပြုဖွံ့ဖြိုးတိုးတက်မှု ဆောင်ရွက်ရန်အတွက်လည်းကောင်း၊ ဆက်စပ်အခြေခံအဆောက်အအုံများ ဆောက်လုပ်ခြင်းနှင့် မန္တလေးမြို့တော် စည်ပင်သာယာရေး ကော်မတီနှင့် Phwint Phyo Thit Co., Ltd. တို့သည် International Standardized Ye Dagon Taung Golf Course, Club House, Refreshment Sports Garden, Commercial and Urban Residential Complex ဆောက်လုပ်ရေးနှင့် ငှားရမ်းခြင်း လုပ်ငန်းကို ၂၀၁၆ ခုနှစ် ဖေဖော်ဝါရီလတွင် တည်ဆောက်ရန် လက်မှတ်ရေးထိုးခဲ့သည်။ ဤ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်လေ့လာခြင်း အစီရင်ခံစာသည် နိုင်ငံတကာအဆင့်မီ ဟိုတယ်ဝန်ဆောင်မှုများ ဖော်ဆောင်ရေးစီမံကိန်း ၊ ဖွင့်ဖြိုးသစ် မြို့ပြဖွံ့ဖြိုးရေးအစီအစဉ်၏ အစိတ်အပိုင်းတစ်ခုဖြစ်သည်။ စီမံကိန်း အသေးစိတ်အား အောက်တွင်

စီးပွားရေးဖွံ့ဖြိုးတိုးတက်မှုကို ဖန်တီးရန်ဖြစ်သည်။

အဆိုပါ ရည်မှန်းချက်နှင့် အညီ စီမံကိန်းကို အဓိကထား လုပ်ဆောင်ပါသည်

- လက်ရှိသဘာဝ ပတ်ဝန်းကျင် အရင်းအမြစ်များ ရုပ်ပိုင်းဆိုင်ရာ ဇီဝဗေဒနှင့် လူမှုစီးပွားကို လေ့လာခြင်းဖြင့် စီမံကိန်းနှင့်ပတ်သက်သည့် ဥပဒေမူဘောင်များကို ပြန်လည်သုံးသပ်ဆွေးနွေးခြင်း၊
- ပြည်သူများ၊ ဒေသဆိုင်ရာအာဏာပိုင်များနှင့် သက်ဆိုင်ရာ အုပ်ချုပ်ရေးအဖွဲ့များ၏ မှတ်ချက်များ၊
- စီမံကိန်း၏လုပ်ဆောင်မှုများကြောင့်ဖြစ်ပေါ်လာနိုင်သော သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများကို ခွဲခြားသတ်မှတ်ပြီး ရှောင်ရှားရန်၊ လျော့ချရန်၊ ပြန်လည်ထူထောင်ရန် သို့မဟုတ် လျော်ကြေးပေးရန် သင့်လျော်သောလျော့ပါးရေးအစီအမံများကို ထည့်သွင်းစဉ်းစားပြီးနောက် စီမံကိန်းပိုင်ရှင်အတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် ကို အကောင်အထည်ဖော်ရန်နှင့် သက်ဆိုင်ရာအုပ်ချုပ်ရေးအဖွဲ့များကို စောင့်ကြည့်ရန်၊

နောက်ဆုံးတွင် စီမံကိန်းအပေါ် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများအကြောင်း ပူးတွဲ ကောက်ချက်ချပြီး လိုအပ်သော အကြံပြုချက်များကို မြှင့်တင်ရန်။

၁.၄ စီမံကိန်း အကောင်အထည်ဖော်ဆောင်ရွက်သူ ၏ အမည်နှင့် လိပ်စာ Phwint Phyo Thit Co., Ltd. ၏ ဆက်သွယ်ရန် အသေးစိတ်အချက်အလက်များကို အောက်ပါအတိုင်းဖော်ပြထားပါသည်။

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ဖွင့်ဖြိုးသစ်ကုမ္ပဏီသည် ၂၀၀၆ ခုနှစ်တွင် မြန်မာနိုင်ငံကုမ္ပဏီများဥပဒေနှင့်အညီ ရင်းနှီးမြှုပ်နှံမှုနှင့် ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန (DICA Myanmar) တွင် မှတ်ပုံတင်ခဲ့သည်။ ကုမ္ပဏီသည်

နှစ်များတစ်လျှောက် ကိုယ်တိုင်ပုံသွင်းခဲ့ပြီး အမျိုးမျိုးသော စက်မှု လုပ်ငန်း၊ အထူးသဖြင့် အိမ်ခြံမြေနယ်ပယ်အသီးသီး စသည်များ စွားလုပ်ကိုင်ခဲ့သည်။ ထိုအချိန်မှစ၍ ကုမ္ပဏီသည် အောင်မြင်မှုများကို ရှေ့ဆောင်ခဲ့ပြီး ၎င်း၏လုပ်ငန်းကို ချဲ့ထွင်ကာ နိုင်ငံ၏ ဖွံ့ဖြိုးတိုးတက်မှုအဆင့်တိုင်းတွင် ရှေ့တန်းမှနေခဲ့သည်။

၁.၅ ပတ်ဝန်းကျင် ဆိုင်ရာ အကြံပေး ကုမ္ပဏီအချက်အလက်

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၂ မူဝါဒ၊ ဥပဒေရေးရာနှင့် အဖွဲ့အစည်းဆိုင်ရာမူဘောင်များ

အဆိုပြုထားသော နိုင်ငံတကာအဆင့်မြင့် ဟိုတယ်စီမံကိန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ကို မြန်မာနိုင်ငံပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ ECU (2012နှင့် Myanmar Environmental Conservation Rules (ECR, (2014တို့နှင့်အညီ ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ ECR သည် သက်ဆိုင်ရာဝန်ကြီးဌာန ဆိုလိုသည်မှာ)MONREC) မှ သတ်မှတ်သည့်အတိုင်း အစိုးရနှင့် ပြည်သူ့ ဖွံ့ဖြိုးတိုးတက်ရေး စီမံကိန်းအားလုံး ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ၏ လိုအပ်သော လုပ်ထုံးလုပ်နည်းများကို ဆောင်ရွက်ရမည့် ECL ကို အကောင်အထည်ဖော်ရန် စည်းမျဉ်းလမ်းညွှန်မှုကို ပံ့ပိုးပေးပါသည်။ ၂၀၁၅ ခုနှစ်တွင် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ဆောင်ရွက်ရာတွင် ခိုင်မာသော လုပ်ထုံးလုပ်နည်း လိုအပ်ချက်များနှင့်အတူ Myanmar EIA Procedure အသစ်ကို ချမှတ်ခဲ့ပါသည်။

မြန်မာနိုင်ငံ စည်းကမ်းထိန်းသိမ်းရေးမူဘောင်

- စိုက်ပျိုးမွေးမြူရေးနှင့် ဆည်မြောင်းဦးစီးဌာန
- အမျိုးသား သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ကော်မတီ
- အမျိုးသား သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေးနှင့် ရာသီဥတု ပြောင်းလဲမှု ဗဟိုကော်မတီ
- သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
- ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာန

မြန်မာနိုင်ငံ စည်းမျဉ်း၊ ဥပဒေ မူဘောင်များ

- ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်ဖွဲ့စည်းပုံအခြေခံဥပဒေ (၂၀၀၈)
- မြန်မာနိုင်ငံ၏ လုပ်ငန်းစဉ် ၂၁ ရပ် (၁၉၉၇)
- မြန်မာနိုင်ငံအမျိုးသားပတ်ဝန်းကျင်ရေးရာမူဝါဒ (၁၉၉၄)
- အမျိုးသားရေရှည်ဖွံ့ဖြိုးတိုးတက်ရေး မဟာဗျူဟာ (၂၀၀၉)
- မြန်မာနိုင်ငံတံကြီးများဆိုင်ရာ အမျိုးသားကော်မတီဥပဒေ (၂၀၁၅)
- မြန်မာနိုင်ငံအင်ဂျင်နီယာကောင်စီဥပဒေ (၂၀၁၃)

ပတ်ဝန်းကျင်ဆိုင်ရာမူဝါဒ၊ ဥပဒေနှင့် စည်းမျဉ်းများ

- အမျိုးသားမြေအသုံးချမှု မူဝါဒ (၂၀၁၆)
- ပြည်ထောင်စု သမ္မတမြန်မာနိုင်ငံတော် အမျိုးသားအဆင့် ရေမူဝါဒ (၂၀၁၅)
- အမျိုးသား စွမ်းအင်မူဝါဒ (၂၀၁၄)
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေများ (၂၀၁၄)
- ပတ်ဝန်းကျင်ဆိုင်ရာထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်းများ (၂၀၁၅)
- မြန်မာနိုင်ငံရာသီဥတုပြောင်းလဲမှုဆိုင်ရာ မူဝါဒ (၂၀၁၉)
- မြန်မာနိုင်ငံရာသီဥတုပြောင်းလဲမှုဆိုင်ရာ မဟာဗျူဟာ (၂၀၁၉)
- မြန်မာနိုင်ငံရာသီဥတုပြောင်းလဲမှုဆိုင်ရာ ပင်မ လုပ်ငန်းအစီအစဉ် ၂၀၁၈-၂၀၃၀ (၂၀၁၉)
- မြန်မာနိုင်ငံအမျိုးသားအဆင့် စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု မဟာဗျူဟာ နှင့် ပင်မ လုပ်ငန်းအစီအစဉ်(၂၀၁၈-၂၀၃၀)-(၂၀၂၀)

ကဏ္ဍအလိုက် အကျုံးဝင်နိုင်ခြေရှိသောဥပဒေများနှင့် စည်းမျဉ်းများ

- မြေသိမ်းဥပဒေ (၁၉၈၄)
- လယ်ယာမြေဥပဒေ (၂၀၁၂)
- မြေလွတ်၊ မြေလပ်နှင့် မြေရိုင်းများ စီမံခန့်ခွဲရေး ဥပဒေ (၂၀၁၂)
ပတ်ဝန်းကျင်ဆိုင်ရာထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်းများ (၂၀၁၅)
- သစ်တောဥပဒေ (၁၉၉၂, ၂၀၁၈)

- သစ်တောနည်းဥပဒေ (၁၉၉၅)
- တောရိုင်းတိရစ္ဆာန်နှင့်သဘာဝအပင်များ ကာကွယ်ရေးနှင့် သဘာဝနယ်မြေများ ထိန်းသိမ်းရေး ဥပဒေ (၁၉၉၄)
- ဇီဝမျိုးစုံမျိုးကွဲနှင့် သဘာဝထိန်းသိမ်းရေးနယ်မြေများကာကွယ်ရေးဥပဒေ (၂၀၁၈)
- တောရိုင်းတိရစ္ဆာန်နှင့် သဘာဝအပင်များကာကွယ်ရေးနှင့် သဘာဝဧရိယာများ ထိန်းသိမ်းရေးနည်း ဥပဒေများ (၂၀၀၂)
- ရေအရင်းအမြစ်နှင့်မြစ်ချောင်းများထိန်းသိမ်းရေးဥပဒေ (၂၀၀၆)
- ရေချိုငါးလုပ်ငန်းဥပဒေ (၁၉၉၁)
- ယဉ်ကျေးမှုအမွေအနှစ်ဒေသများ ကာကွယ်ထိန်းသိမ်းစောင့်ရှောက်ရေးဥပဒေ (၁၉၉၈)
- ရှေးဟောင်းပစ္စည်းများ ကာကွယ်ထိန်းသိမ်းစောင့်ရှောက်ရေးဥပဒေ (၂၀၁၅)
- ရှေးဟောင်းအထိမ်းအမှတ်များ ကာကွယ်ထိန်းသိမ်းစောင့်ရှောက်ရေးဥပဒေ (၂၀၁၅)
- ပြည်သူ့ကျန်းမာရေးဥပဒေ (၁၉၇၂)
- ကူးစက်ရောဂါများ ကာကွယ်ထိန်းချုပ်ရေးဥပဒေ (၂၀၁၅)
- ဆေးလိပ်နှင့် ဆေးရွက်ကြီးထွက်ပစ္စည်းသောက်သုံးမှု ထိန်းချုပ်ရေး ဥပဒေ (၂၀၀၆)
- လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးကင်းရေးဥပဒေ (၂၀၁၉)
- သဘာဝဘေးအန္တရာယ်ဆိုင်ရာစီမံခန့်ခွဲမှုဥပဒေ (၂၀၁၃)
- မြန်မာနိုင်ငံမီးသတ်ဦးစီးဌာနဥပဒေ (၂၀၁၅)
- မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ဥပဒေ (၂၀၁၆)
- မော်တော်ယာဉ်ဥပဒေ (၂၀၁၅)နှင့် နည်းဥပဒေ (၁၉၈၇)
- ယာဉ်အန္တရာယ်ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ် စီမံခန့်ခွဲမှုဥပဒေ (၂၀၂၀)
- ရေနံနှင့် ရေနံထွက်ပစ္စည်းဥပဒေ (၂၀၁၇)
- အလုပ်သမားအဖွဲ့အစည်းဥပဒေ (၂၀၁၁)
- အလုပ်အကိုင်နှင့် ကျွမ်းကျင်မှုဖွံ့ဖြိုးတိုးတက်ရေးဥပဒေ (၂၀၁၃)
- အလုပ်သမားရေးရာအငြင်းပွားမှု ဖြေရှင်းရေးဥပဒေ (၂၀၁၂)
- အနည်းဆုံးအခကြေးငွေဥပဒေ (၂၀၁၃)
- အခကြေးငွေပေးချေရေးဥပဒေ (၂၀၁၆)
- ခွင့်ရက်နှင့် အလုပ်ပိတ်ရက် အပ်ဥပဒေ (၁၉၅၁)

- ခွင့်ရက်နှင့် အလုပ်ပိတ်ရက် ဥပဒေ (၂၀၁၈)
- အလုပ်သမားများ၏ လျော်ကြေးငွေအက်ဥပဒေ (၁၉၂၃)
- လူမှုဖူလုံရေးဥပဒေ (၂၀၁၂)
- မြန်မာ့အာမခံဥပဒေ (၂၀၁၅)
- တိုင်းရင်းသားလူမျိုးများ၏အခွင့်အရေးကာကွယ်စောင့်ရှောက်သည့် ဥပဒေ (၂၀၁၅)
- တိုင်းရင်းသားလူမျိုးများ၏အခွင့်အရေးကာကွယ်စောင့်ရှောက်သည့် နည်းဥပဒေ (၂၀၁၉)

ပတ်ဝန်းကျင်ထိန်းသိမ်းမှုဆိုင်ရာစံချိန်စံညွှန်းများ

- အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေးထုတ်လွှတ်မှု(လမ်းညွှန်ချက်များ) ၂၀၁၅
- အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး ထုတ်လွှတ်မှု(လမ်းညွှန်ချက်များ) လေနှင့်ဆူညံသံ
- ရေဆိုး၊ မိုးရေစီးဆင်းမှု၊ စွန့်ထုတ်အရည်နှင့် မိလ္လာစွန့်ထုတ်မှုဆိုင်ရာ ကန့်သတ်ချက် တန်ဖိုးများ
- သောက်သုံးရေ အရည်အသွေး စံနှုန်းများ

နိုင်ငံတကာစံနှုန်းများ၊ လမ်းညွှန်ချက်များ နှင့် နိုင်ငံတကာသဘောတူညီချက်များနှင့်

- ကမ္ဘာ့ဘဏ်၏သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာမူဘောင် (၂၀၁၇)
- အီကွေတာအခြေခံမူများ (EPFI 2013)
- သဘာဝပတ်ဝန်းကျင်နှင့် ရေရှည်တည်တံ့မှုဆိုင်ရာ IFC စွမ်းဆောင်ရည်စံနှုန်းများ (၂၀၁၂)
- သဘာဝပတ်ဝန်းကျင်၊ ကျန်းမာရေးနှင့် ဘေးကင်းရေးဆိုင်ရာအထွေထွေလမ်းညွှန်ချက်များ (၂၀၀၇)
- ပြန်လည်နေရာချထားရေးလုပ်ဆောင်မှုအစီအစဉ်ပြင်ဆင်ရေးဆိုင်ရာ IFC လက်စွဲစာအုပ် (၂၀၀၂)
- အပြည်ပြည်ဆိုင်ရာ အလုပ်သမားအဖွဲ့အစည်း စံနှုန်းများ
- နိုင်ငံတကာစံချိန်စံညွှန်းသတ်မှတ်ရေးအဖွဲ့ (IOS)

စီမံကိန်းနှင့် သက်ဆိုင်သည့်နိုင်ငံတကာ ကွန်ဗင်းရှင်းနှင့် သဘောတူညီချက်များ

မြန်မာနိုင်ငံနှင့် အပြည်ပြည်ဆိုင်ရာ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ သဘောတူညီချက်၊ ကွန်ဗင်းရှင်းများ၊ အစည်းအဝေးများတွင် ပါဝင်လက်မှတ်ရေးထိုးထားသော သဘောတူညီချက် များ

၂.၁ မြန်မာနိုင်ငံ၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း လုပ်ထုံးလုပ်နည်း ၂၀၁၅အရ စီမံကိန်းအတွက် လိုအပ်ချက်များ

၂.၁.၁ စီမံကိန်း အမျိုးအစားခွဲခြားခြင်း။

ပြင်ဆင်ထားသော EIA လုပ်ထုံးလုပ်နည်းများ၏ နောက်ဆက်တွဲ၊ ၂၀၁၅ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း လုပ်ထုံးလုပ်နည်း စီးပွားရေးဆိုင်ရာ အကဲဖြတ်ခြင်းရည်ရွယ်ချက်များအတွက်" ၏ (269/264) အမျိုးအစားခွဲခြားခြင်း၊ ဤ"စီမံကိန်းအမျိုးအစားအား စီးပွားရေးလုပ်ဆောင်ချက်အမျိုးအစားအောက်တွင် ခွဲခြားထားပါသည်။အဖြစ် အမျိုးအစား "ဟိုတယ်နှင့် ခရီးသွားလာရေးဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်း"

၂.၁.၂ စီမံကိန်း နယ်ပယ်

အဆိုပြုစီမံကိန်း၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ကို ဖွင့်ဖြူးသစ်ကုမ္ပဏီလီမိတက်မှ အတိုင်ပင်ခံပုဂ္ဂိုလ်ဖြင့် ဆောင်ရွက်ပါသည်။ REM (MONREC မှတ်ပုံတင်ထားသော အရည်အချင်းပြည့်မီသော EIA ကုမ္ပဏီ ။(ဤအတိုင်းအတာ အစီရင်ခံစာကို EIA လုပ်ထုံးလုပ်နည်း၊ ၏ လိုအပ်ချက်အဖြစ် 2015 တင်ပြပါသည်။

၂.၁.၃ စီမံကိန်းအတွက် လိုအပ်ချက်များ

ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း လုပ်ထုံးလုပ်နည်း) ၂၀၁၅ နှင့် (စီမံကိန်း အစိတ်အပိုင်းများနှင့်အညီ စီမံကိန်းသည် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း လေ့လာမှု၏ ဘာသာရပ်ဖြစ်ပြီး MONREC တွင် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဌာန ထံမှ ECC ရယူရန် လိုအပ်ကြောင်း အသိအမှတ်ပြုရန်ဖြစ်ပါသည်။ စီမံကိန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း လုပ်ထုံးလုပ်နည်း အတွက် အဆိုပြုသူမှာ ဖွင့်ဖြူးသစ် ကုမ္ပဏီ လီမိတက်ဖြစ်ပြီး အများပိုင်ကုမ္ပဏီ နှစ်ကြိမ်၊ သက်ဆိုင်သူများနှင့် ဆွေးနွေးတိုင်ပင်မှုများ Stakeholder Meetings ကိုလည်း စတင်လုပ်ဆောင်ရန်နှင့် အကောင်အထည်ဖော်ရန် လိုအပ်ပါသည်။

၃ စီမံကိန်းအကြောင်းအရာဖော်ပြချက်နှင့် အခြားရွေးချယ်စရာများ

ရေတံခွန်တောင် အဆင့်မြင့် စီမံကိန်းနေရာသည် ရေကြီးအရှေ့ခြမ်း၊ ကွင်အမှတ် ၅၄၈၊ ရေကြီးကျေးရွာအုပ်စု၊ ပုသိမ်ကြီးမြို့နယ်၊ မန္တလေးခရိုင်နှင့် မန္တလေးတိုင်း ဒေသကြီးတို့၌ တည်ရှိသည်။ စုစုပေါင်း မြေဧရိယာ အကျယ်အဝန်းမှာ ၇.၅ ဧက ဖြစ်သည်။

စီမံကိန်းအမျိုးအစား၏ ပင်မစီမံကိန်းတွင် ပက်ကော့ချ် ၄ ခုပါဝင်သည်;

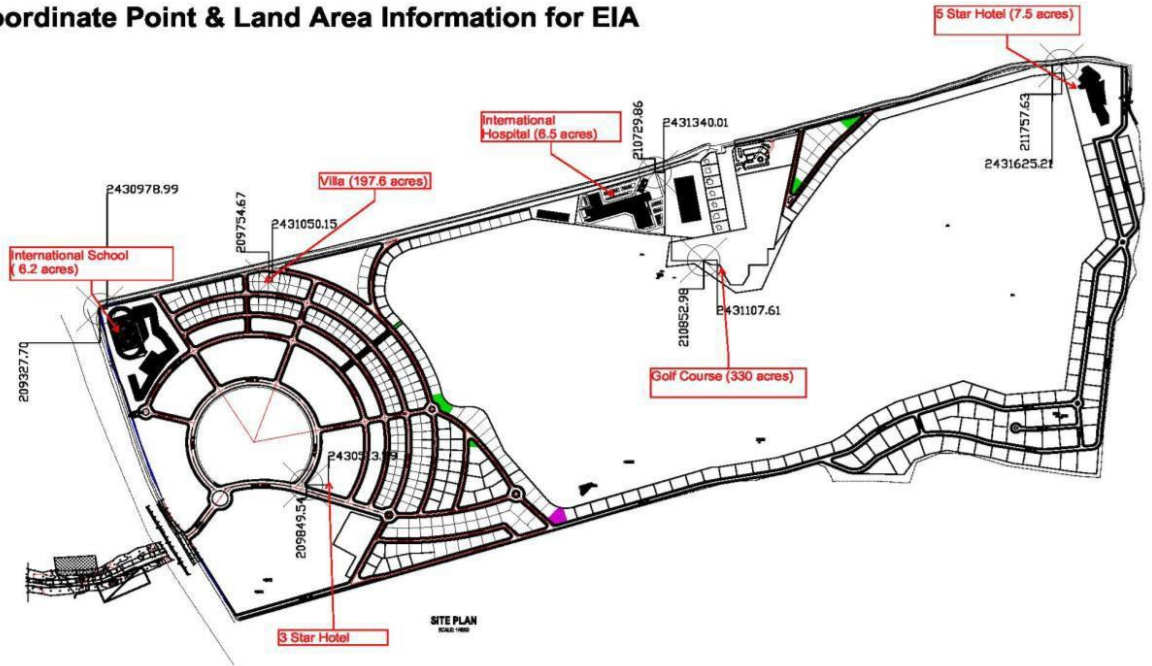
Package- -1International Hotel (ကြယ်ငါးပွင့်) စီမံကိန်း၊

Package- -2International Hospital၊

Package- -3International Standardized Yedagun Taung Golf Course၊ Club House၊ Amusement

Park နှင့် Package- -4Business and Residential Complex Buildings အရောင်းဆိုင်များ အိမ်နှင့်

Coordinate Point & Land Area Information for EIA



ပုံ ၃-၂ International Hotel ၏ Coordinates တည်နေရာ

၃.၁ နိုင်ငံတကာဆင့်မှီဟိုတယ်စီမံကိန်း

နိုင်ငံတကာအဆင့်မှီ ဟိုတယ်စီမံကိန်းသည် ဖွင့်ဖြိုးသစ်မြို့ပြဖွံ့ဖြိုးတိုးတက်ရေးအစီအစဉ်များ၏ တစ်စိတ်တစ်ပိုင်းဖြစ်သည်။ အမျိုးအစားအလိုက် အုပ်စုဖွဲ့ထားပါသည်။

1. 3Star ဟိုတယ်
2. 5Star ဟိုတယ်

၃.၂ Site Layout Map သို့မဟုတ် Schematic Diagram

၂၀၁၆ ခုနှစ် နိုဝင်ဘာလမှစတင်၍ ဖွင့်ဖြိုးသစ်ကုမ္ပဏီလီမိတက်နှင့် မြန်မာနိုင်ငံ ရင်းနှီးမြုပ်နှံမှုကော်မရှင် (MIC) တို့အကြား မြေပါမစ်စာချုပ်ကို ချုပ်ဆိုခဲ့ပါသည်။ Package တွင် အပြည်ပြည်ဆိုင်ရာ 1 ဖွင့်ဟိုတယ်တို့ ပါဝင်ပါသည်။ ၂ ဖွင့်ဟိုတယ်နှင့် ကြယ်၅ကြယ်

၃.၃ IBIS 3Star ဟိုတယ်

IBIS Mandalay သည် ဆန်းသစ်သောကုမ္ပဏီ ဗိသုကာဒီဇိုင်းဖြင့် ကြယ် ၅ ဖွင့်ဟိုတယ်တစ်ခုဖြစ်သည်။ 3 အခန်းပေါင်း ၁၈၈ ခန်းအထိ ထားရှိနိုင်သော အထပ် ၅ ထပ် အဆောက်အအုံဖြစ်ပြီး ၂ ဧကနီးပါးကျယ်ဝန်းသော မြေဧရိယာပေါ်တွင် တည်ဆောက်ထားသည်။ စီမံကိန်းအတွက် မြေယာအသုံးပြုမှု

စုစုပေါင်းဧရိယာနှင့် စီမံကိန်း အစိတ်အပိုင်းများအတွက် မြေအသုံးချမှုဧရိယာ စုစုပေါင်းကို အောက်ပါအတိုင်း ဖော်ပြထားသည်။

Name	IBIS Mandalay
Land Area	1.74 Acres
Ground Floor Area (GFA)	150,296 SQFT
No. of Storey	5
No. of Rooms	188

၃.၄ ကြယ် ၅ ပွင့် ဟိုတယ်

Novotel Mandalay သည် ၁၁ ထပ်ရှိသော ကြယ် ၅ ပွင့် ဟိုတယ်ဖြစ်ပြီး ခေတ်မီဆန်းသစ်သော ဗိသုကာလက်ရာပုံစံဖြင့် တည်ဆောက်ထားသည်။ ၅ ဧကကျော် ကျယ်ဝန်းသော မြေဧရိယာပေါ်တွင် တည်ဆောက်ထားပြီး အခန်းပေါင်း ၃၁၁ ခန်း ပါဝင်သည်။ ကြယ် 5 ပွင့်ဟိုတယ်၏အသေးစိတ်အချက်အလက်များမှာ အောက်ပါအတိုင်းဖြစ်သည်။

Name	Novotel Mandalay
Land Area	5.27 Acres
Ground Floor Area (GFA)	97301.5 SQFT
No. of Storey	11
No. of Rooms	311

၃.၅ စီမံကိန်း ဖွံ့ဖြိုးတိုးတက်ရေးနှင့် အကောင်အထည်ဖော်ရေး အစီအစဉ်

၃.၅.၁ Site Access Road

၂၀၂၀ ခုနှစ် ဇူလိုင်လတွင် မန္တလေးမြို့ ပြင်ဦးလွင်လမ်းနှင့် သိဒ္ဓိလမ်းဆုံမှ ရေတံခွန်တောင် မဟာစီမံကိန်းသို့ သွားမည့် အဓိကဝင်ပေါက်လမ်းကို ဖောက်လုပ်ခဲ့ပါသည်။ ဝင်ပေါက်လမ်းသည် အနံ 3.8 ပေ ရှိပြီး 106 မိုင်ရှည်လျားသော မြေသားလမ်းသည် Phwint Phyothit Company Ltd.

၃.၅.၂ ဆောက်လုပ်ရေးလုပ်ငန်းများ

20th May 2021 တွင် LIU Co., Ltd.၊ Shwe Yi Lin Co., Ltd. နှင့် Rapid Ativex Corporation Co., Ltd. တို့သည် လမ်း၊ ဓာတ်အားခွဲ စက်ရုံနှင့် လျှပ်စစ်မီး၊ ရေဖြန့်ဖြူးရေးစနစ်နှင့် ရေသန့်စက်၊ ဆောက်လုပ်ရန် တင်ဒါ အောင်မြင်ခဲ့ပါသည်။ အောက်ပါဇယားသည် ဟိုတယ် စီမံကိန်း အတွက် ဆောက်လုပ်ရေး အချိန်ဇယားကို ပြသထားပါသည်။

ဇယား ၃.၅-၁ Yaytagon Hill City Development Project ၏ ဆောက်လုပ်ရေးအချိန်ဇယား

Construction Period			
Project	Start Date	Finish Date	
International School	1-Nov-22	31-Mar-25	
International Hospital	2-Jan-23	31-Oct-28	
Hotel	1-Jul-24	28-Sep-29	
Golf Course	West Course	1-May-23	30-Oct-26
	East Course	2-Nov-26	1-May-29
Club House	21-Oct-25	3-Jun-27	

၃.၅.၃ လည်ပတ်လှုပ်ရှားမှုများ

ဧည့်သည်များ ညစာစားခြင်း၊ အဝတ်လျှော်ခြင်း၊ မီးအလင်းရောင်နှင့် အခြားဝန်ဆောင်မှုများ အပါအဝင် သုံးစွဲသူများအတွက် ဝန်ဆောင်မှုများကို ပုံမှန်အတိုင်း လုပ်ဆောင်ပေးမည်ဟု မျှော်လင့်ပါသည်။ လုပ်ငန်းဆောင်ရွက်မှုကာလအတွင်း စွန့်ပစ်ရေနှင့် အိမ်တွင်းရေဆိုးများကို ထွက်ရှိမည်ဟု မျှော်မှန်းထားသည်။

၃.၅.၄ ရေသုံးစွဲမှုနှင့် အရင်းအမြစ်များ

လုပ်ငန်းဆောင်ရွက်မှုကာလအတွင်း အဆင့် ၁ အတွက် စုစုပေါင်းရေလိုအပ်ချက်မှာ တစ်ရက်လျှင် 32, 200 gal/day နှင့် အဆင့် ၂ အတွက် 19, 000gal/day ဖြစ်သည်။ အဆင့် ၁ ဖွံ့ဖြိုးတိုးတက်မှုအတွက် စုစုပေါင်းစွန့်ပစ်ရေ သည် အဆင့် (%90)၂ အတွက် တစ်ရက်လျှင် 29, 800gal/day နှင့် 17, 100gall လိုအပ်ပါမည်။ စီမံကိန်းရည်ရွယ်ချက်အတွက် အသုံးပြုသောရေကို ဆည်တော် ဆည်မှ စုပ်ယူပါသည်။

၃.၅.၅ စွမ်းအင်အရင်းအမြစ်များ

လျှပ်စစ်ဓာတ်အား အဓိကအရင်းအမြစ်ကို ကိုယ်ပိုင်လျှပ်စစ်ဓာတ်အားခွဲရုံ (40MVA) မှ အသုံးပြုမည်ဖြစ်သည်။ အဆိုပါ ဓာတ်အားခွဲရုံ၏ လျှပ်စစ်ဓာတ်အားကို ပုသိမ်ကြီးမြို့နယ် ပင်မဓာတ်အားခွဲရုံမှ ထောက်ပံ့ပေးမည်ဖြစ်ပြီး အလယ်တန်းခွဲရုံကို စီမံကိန်းဝင်းအတွင်း ၂ ဧကကျယ်ဝန်းသော မြေနေရာတွင် တည်ဆောက်မည်ဖြစ်သည်။ လက်ရှိတွင် အောင်ပင်လဲမှ သိဒ္ဓိမြို့ပတ်လမ်းအထိ ဖောက်လုပ်ထားပြီး ကုန်းလမ်းပေါ်ရှိ အောင်ပင်မြို့ပတ်လမ်းမှ ရဲတံခွန်တောင် စီမံကိန်းအထိ ဖောက်လုပ်မည်ဖြစ်သည်။

၃.၆ အခြားရွေးချယ်စရာများ

အစားထိုး ခွဲခြမ်းစိတ်ဖြာခြင်းသည် စီမံကိန်း၏ အခိုင်မာဆုံး၊ ထိရောက်ပြီး ကုန်ကျစရိတ်သက်သာသော နည်းလမ်းဖြင့် စီမံကိန်း၏ရည်ရွယ်ချက်များကို အချိန်နှင့်တစ်ပြေးညီ ပြီးမြောက်အောင်မြင်ရန် နည်းလမ်းများကို အချိန်နှင့်တစ်ပြေးညီ သိရှိနိုင်စေရန် လမ်းညွှန်ပေးသောကြောင့် အစားထိုး ခွဲခြမ်းစိတ်ဖြာခြင်းသည် အရေးကြီးပါသည်။ EIA ရှုထောင့်မှနေ၍ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများကို ရှောင်ရှားရန် သို့မဟုတ် လျှော့ချရန် အခြားနည်းလမ်းများကို ရှာဖွေကြသည်။

၄ အနီးပတ်ဝန်းကျင်၏ ဖော်ပြချက်

ဤအပိုင်းတွင် စီမံကိန်းပတ်ဝန်းကျင် ဧရိယာကို ဖော်ပြထားပါသည်။ ဖော်ပြထားသော အချက်အလက်သည် ထုတ်ဝေထားသော အချက်အလက်များ၏ သုံးသပ်ချက်အပြင် Phwint Phyo Thit Co., Ltd. နှင့် REM ၏ မှ ရရှိနိုင်သော စာပေများ ပြန်လည်သုံးသပ်ချက်အပေါ် အခြေခံထားသည်။ အခြေခံအခြေအနေများကို ပြန်လည်သုံးသပ်ခြင်း၏ ရည်ရွယ်ချက်မှာ လေ့လာမှုဧရိယာ၏ အလားအလာရှိသော ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ အာရုံခံစားနိုင်စွမ်းများကို နားလည်သဘောပေါက်စေရန် တင်ပြခြင်းဖြစ်ပါသည်။ အခြေခံအခြေအနေများကို ပြန်လည်သုံးသပ်ခြင်းသည် စီမံကိန်းအတွက် သင့်လျော်သော အကျိုးသက်ရောက်မှုအကဲဖြတ်မှုအဆင့်အပေါ် အသိဉာဏ်ဖြင့် စီရင်ဆုံးဖြတ်နိုင်စေပါသည်။ စီမံကိန်း အတွက် ကောက်ယူခဲ့သော အခြေခံအခြေချစစ်တမ်း၏ ရလဒ်များအပါအဝင် လေ့လာမှုနယ်မြေရှိ အခြေခံပတ်ဝန်းကျင်နှင့် လူမှုရေးအခြေအနေဆိုင်ရာ အသေးစိတ်အချက်အလက်များကို အစီရင်ခံစာတွင် ဖော်ပြမည်ဖြစ်ပါသည်။ International Hotel Project သည် Ye Dung Taung Master Plan Project ၏ ဆက်စပ်အဆောက်အအုံများဖြစ်သောကြောင့် ပတ်ဝန်းကျင်နှင့် လူမှုရေးအခြေခံလေ့လာခြင်း၏ ရလဒ်အပါအဝင် ပတ်ဝန်းကျင်ဖော်ပြချက်အား စီမံကိန်းပက်ကေ့ချ်အားလုံးအတွက် လုပ်ဆောင်မည်ဖြစ်ပါသည်။

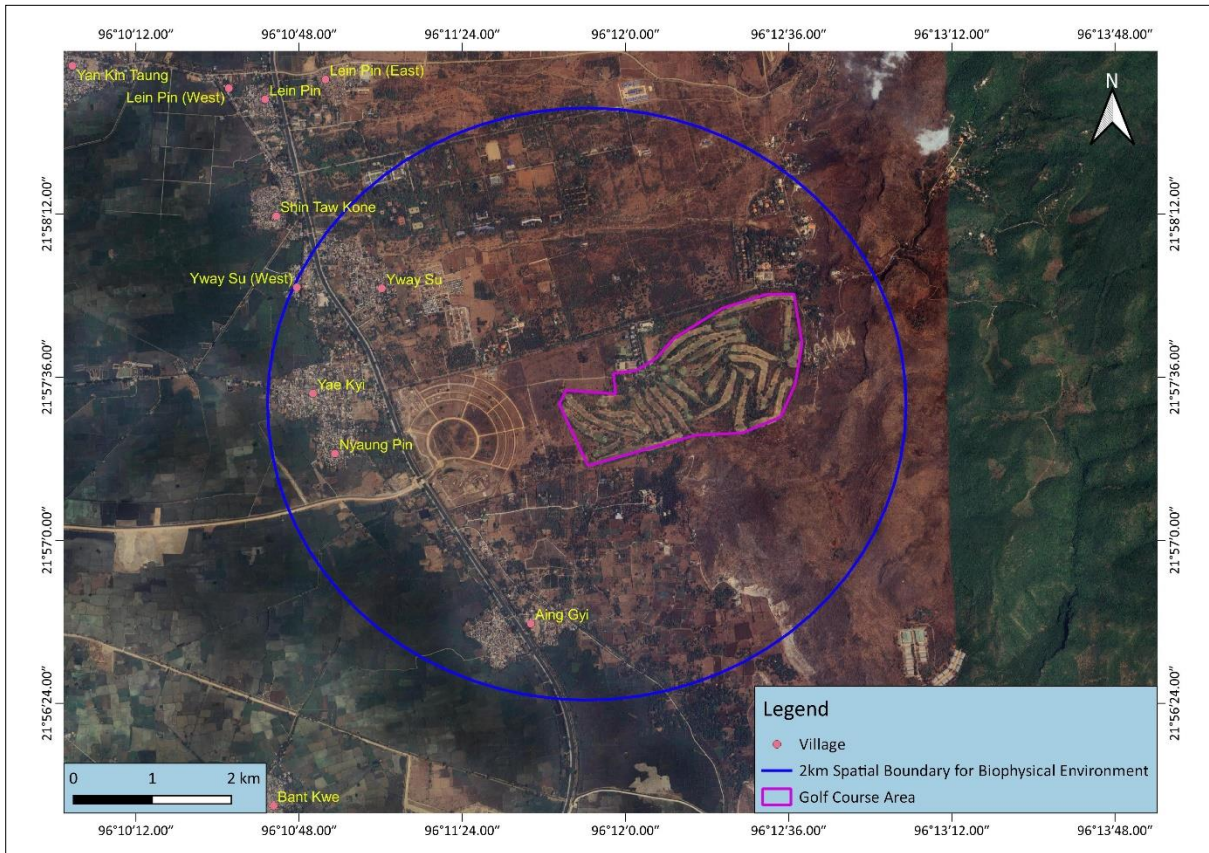
၄.၁ လေ့လာမှုဧရိယာနှင့် လွှမ်းခြုံမှု ဧရိယာကို သတ်မှတ်ခြင်း။

၄.၁.၁ လေ့လာမှုဧရိယာများ သတ်မှတ်ခြင်း။

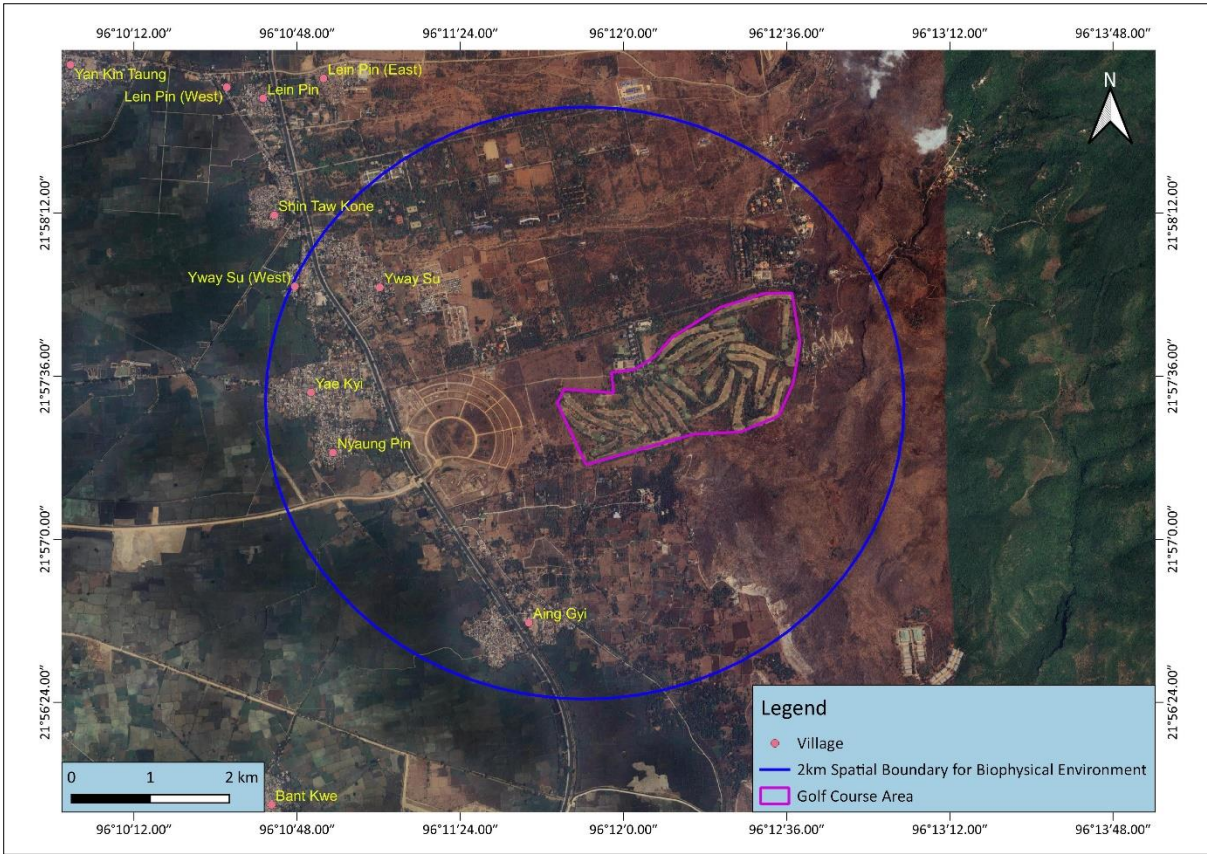
ဤစီမံကိန်းအတွက် လွှမ်းခြုံမှု တွင် အောက်ပါအချက်များ ပါဝင်ပါသည်။

- နိုင်ငံတကာဟိုတယ်နှင့်ဆက်စပ်အခြေခံအဆောက်အအုံများတည်ဆောက်ခြင်း၊ နှင့်
 - နိုင်ငံတကာဟိုတယ်လုပ်ငန်းဆောင်ရွက်မှုနှင့် ၎င်းတို့၏ဆက်စပ်အခြေခံအဆောက်အအုံ။
- စီမံကိန်းလေ့လာရေးဧရိယာအတွင်း ပတ်ဝန်းကျင်အခြေအနေများကို ပဏာမပြန်လည်သုံးသပ်ခြင်း

ဆောင်ရွက်ခဲ့ပါသည်။ ဤလေ့လာမှု၏ရည်ရွယ်ချက်များအတွက် ရှိပြီးသားဒေတာကိုအခြေခံသည်။



ပုံ ၄.၁-၁ ဇီဝရုပ်ပိုင်းဆိုင်ရာပတ်ဝန်းကျင်အတွက်စီမံကိန်း လွှမ်းခြုံမှု ဧရိယာ



ပုံ ၄.၁-၂ လူမှုဝန်းကျင်အတွက် စီမံကိန်း လွှမ်းခြုံမှု ဧရိယာ

၄.၁.၂ ရုပ်ပိုင်းဆိုင်ရာလက္ခဏာများ

မြေမျက်နှာသွင်ပြင် အခြေအနေ

စီမံကိန်းနေရာသည် မန္တလေးတိုင်း ဒေသကြီးအတွင်း ပုသိမ်ကြီးမြို့နယ်တွင် တည်ရှိသည်။ စီမံကိန်းဧရိယာ၏ မြေမျက်နှာသွင်ပြင်သည် မြေနိမ့်ပိုင်း ကုန်းမြင့်ထုံးကျောက် ခွဲခြားထားသော တောင်ကုန်းဖြစ်ပြီး ရှမ်းကုန်း ပြင်မြင့် အနောက်ဘက်ခြမ်းတွင်လည်း ရှိသည်။

ဘူမိဗေဒ

ယေဘုယျအားဖြင့်၊ စီမံကိန်းနေရာအား Quaternary age ၏ ထူထပ်သော Alluvium သိုက်များဖြင့် ဖုံးအုပ်ထားသည်။ Alluvium သည် ရွှံ့စေးနှင့် သဲအချို့ဖြင့် Clayey Silt ဖြင့် ဖွဲ့စည်းထားသည်။ ခန့်မှန်းခြေအားဖြင့် ကျောက်စရစ်ခင်းသည် အနက် ၁၈ မီတာနှင့် ကျောက်စရစ်ခင်းလျှင် အထူ ၁၂ မီတာခန့်ရှိသည်။

၄.၁.၃ ရာသီဥတုနှင့် မိုးလေဝသအခြေအနေ

မြန်မာနိုင်ငံတွင် အပူပိုင်းမုတ်သုံရာသီဥတုရှိသည်။ မုတ်သုံလေ အားကောင်းပြီး မိုးရွာသွန်းမှုနှုန်း

မြင့်မားသည်။ မြန်မာနိုင်ငံတွင် ရာသီသုံးမျိုးရှိပြီး ဆောင်းရာသီမှာ နိုဝင်ဘာလမှ ဖေဖော်ဝါရီလအထိဖြစ်ပြီး လစဉ် ပျမ်းမျှအပူချိန်မှာ 20°C (68°F) နှင့် 24°C (75°F) ကြားရှိသည်။ နွေရာသီ သို့မဟုတ် ပူပြင်းသောရာသီသည် မတ်လမှ မေလလယ်အထိဖြစ်ပြီး လစဉ်ပျမ်းမျှအပူချိန်မှာ 30°C (86°F) နှင့် 35°C (95°F) ကြားဖြစ်သည်။ မိုးရာသီသည် မေလလယ်မှ အောက်တိုဘာလအတွင်း ပျမ်းမျှအပူချိန် 25°C (77°F) နှင့် 30°C (86°F) ကြားရှိပါသည်။ မြစ်ဝကျွန်းပေါ်ဒေသတွင် နှစ်စဉ်မိုးရေချိန် ၂၅၀၀ မီလီမီတာ (လက်မ ၄.၉၈) ခန့်ရှိပြီး အပူပိုင်းဇုန်တွင် နှစ်စဉ်ပျမ်းမျှမိုးရေချိန် ၁၀၀၀ မီလီမီတာ (လက်မ ၃.၉၄)ထက်နည်းသော်လည်း ကမ်းရိုးတန်းဒေသသည် နှစ်စဉ် မိုးရေချိန် ၅၀၀၀ မီလီမီတာ (လက်မ ၈.၁၉၆)ကျော်ရှိသည်။ မန္တလေးတိုင်းဒေသကြီး၏ နှစ်စဉ်မိုးရွာသွန်းမှု၊ အပူချိန်နှင့် နှိုင်းရစိုထိုင်းဆကို ဇယား ၄-၅-၅ နှင့် ပုံ ၃-၄၊ ၂-တွင် ဖော်ပြထားသည်။

၄.၁.၄ သဘာဝဘေးအန္တရာယ်

စစ်ကိုင်းပြတ်ရွှေ့ ဟူ၍ တည်ရှိနေသော အဓိက (ညာခြမ်း) နှင့် ကျောက်ကြန်းပြတ်ရွှေ့ (ဘယ်ဘက်ခြမ်း) ပြတ်ရွှေ့နှစ်ခုကို စီမံကိန်းဧရိယာနှင့် ဝေးကွာစွာ တွေ့ရှိရပေသည်။ စီမံကိန်းဧရိယာတွင် သမိုင်းဝင်လျှင် မရှိပါ။ စီမံကိန်းနေရာသည် အပူပိုင်းဇုန်၏ အရှေ့ဘက်တွင် တည်ရှိပြီး မြေမျက်နှာသွင်ပြင်မှာ ပြန့်ကျဲနေသည်။ မြို့နယ်ကိုယ်ရေးအကျဉ်းအချက်အလက်ပေါ်အခြေခံ၍ မုန်တိုင်းနှင့် ရေကြီးခြင်းကဲ့သို့သော သဘာဝဘေးအန္တရာယ်များနှင့်ပတ်သက်၍ စီမံကိန်းနေရာသည် အတွေ့အကြုံမရှိပေ။

၄.၁.၅ ရုပ်ပိုင်းဆိုင်ရာပတ်ဝန်းကျင်

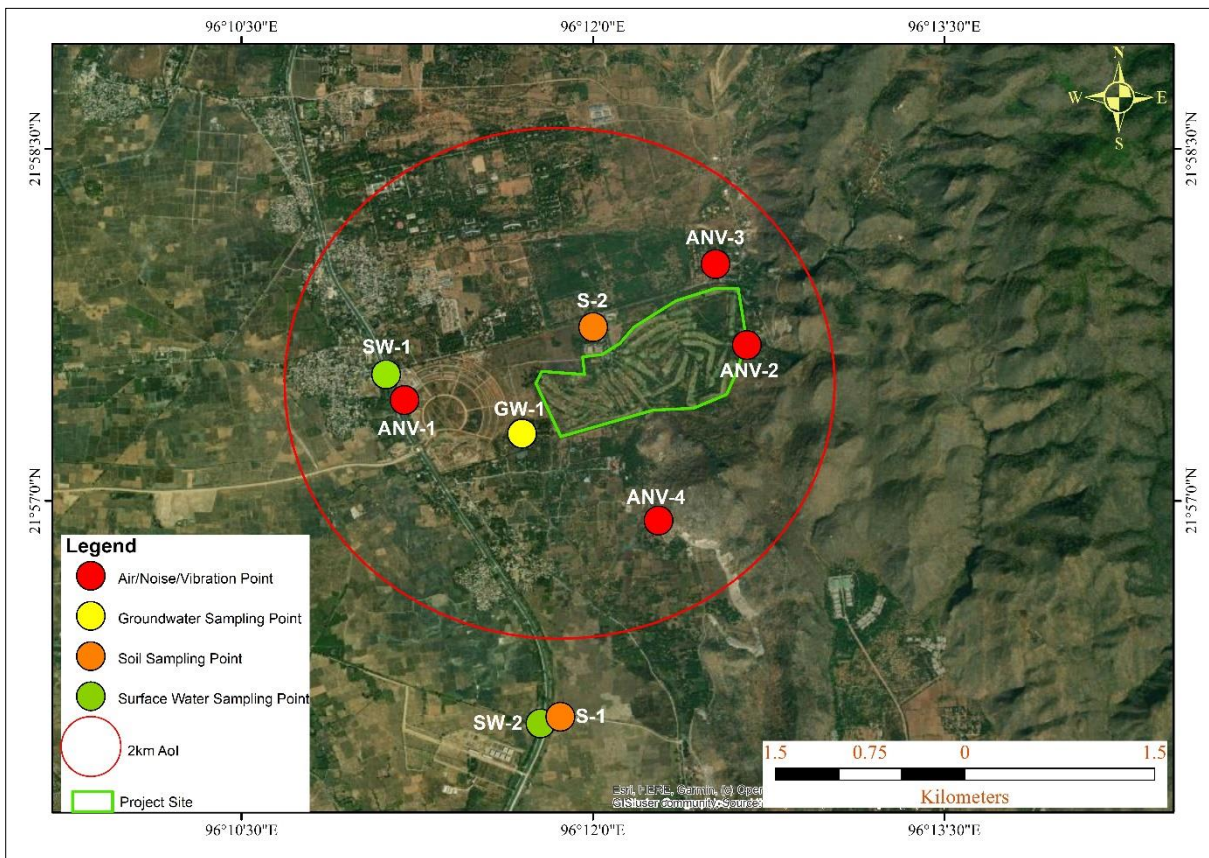
သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာစစ်တမ်း၏အကျဉ်းချုပ်ကို ဇယား တွင်ပြသထားပြီး သဘာဝပတ်ဝန်းကျင် အခြေခံစစ်တမ်းအတွက်နမူနာအချက်များကိုပုံ တွင်ပြသထားသည်။

ဇယား ၄.၁-၁ ဇီဝပတ်ဝန်းကျင်ဆိုင်ရာ စစ်တမ်း အကျဉ်းချုပ်

Air Quality	Parameter	(1) Sulphur Dioxide (SO ₂), (2) Nitrogen Dioxide (NO ₂), (3) Carbon Monoxide (CO), (4) Ozone (O ₃), (5) Total Suspended Particles (TSP), (6) Particulate Matter (PM ₁₀ & PM _{2.5}), (7) Air Pressure and (8) Wind Speed & Wind Direction
	Period	2 points for one time within survey period (24 hours)
	Location	Residential and construction areas.
Vibration Level	Parameter	L _{veq}
	Period	Three hours continuously in each location (2 points)

	Location	Residential and construction areas.
Noise Level	Parameter	L _{Aeq} (A-weighted loudness equivalent)
	Period	One time at 2 locations for 24 hours duration
	Location	Residential and construction areas.
Flora & Fauna	Item	Interview, field observation and secondary data collection
	Area	Project site
	Period	Whole survey period

Source: Survey Team



ပုံ ၄.၁-၃ ရုပ်ပိုင်းဆိုင်ရာအခြေခံစာရင်းစစ်တမ်း၏တည်နေရာမြေပုံ

လေအရည်အသွေး

ပတ်ဝန်းကျင်လေထုအရည်အသွေး စောင့်ကြည့်လေ့လာခြင်းကို စီမံကိန်းဧရိယာတစ်ဝိုက်၊ မန္တလေးတိုင်းဒေသကြီး၊ ပုသိမ်ကြီးမြို့နယ်၊ ရေကြည်ကျေးရွာတွင် တိုင်းတာခဲ့ပါသည်။ တိုင်းတာသော တည်နေရာအသေးစိတ်ကို ဇယား တွင်ဖော်ပြထားသည်

ဇယား ၄.၁-၂ တိုင်းတာသည့်တည်နေရာ

Monitoring ID	Coordinates	Type of Monitoring	Description of Monitoring point
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ANV-1	21°57'25.48"N 96°11'11.58"E	စီမံကိန်းအတွင်း	စီမံကိန်းအတွင်း
ANV-2	21°57'39.66"N 96°12'39.64"E	လူနေရပ်ကွက်	စီမံကိန်းနေရာ)သစ္စာအောင်မြေကျောင်းတိုက် အရှေ့ခြမ်း၊(
ANV-3	21°57'59.8"N 96°12'32.0"E	လူနေရပ်ကွက်	စီမံကိန်းနေရာ အရှေ့မြောက်ဘက်)Thitsawaidagu ကျောင်းတိုက်၊(
ANV-4	21°56'55.5"N 96°12'16.2"E	လူနေရပ်ကွက်	စီမံကိန်းဧရိယာ၏ အရှေ့တောင်ဘက် .ဝစီမံကိန်းနေရာမှ)၉၅ ကီလိုမီတာအကွာ၊(

လေအရည်အသွေး ရလဒ် (ဓာတ်ငွေ့နှင့် အမှုန်အမွှား)

လေ့လာမှုအတွက် ထည့်သွင်းစဉ်းစားထားသော ယူနစ်များတွင်ရှိသော ပတ်ဝန်းကျင်အခြေအနေများကို နားလည်နိုင်စေရန် လေ့လာတွေ့ရှိချက်များကို ဇယားများဖြင့် ခွဲခြမ်းစိတ်ဖြာထားပါသည်။ SO₂၊ O₃ နှင့် NO₂ ပါဝင်မှုအဆင့်နှင့် လေထုအရည်အသွေး PM နှင့် 10PMအဆင့်တို့သည် အမျိုးသားပတ်ဝန်းကျင် 2.5 နည်းကို သတိပြုမိသည်။လမ်းညွှန်ချက်တွင် ရှိ (ထုတ်လွှတ်မှု) အရည်အသွေး

ဇယား ၄.၁-၃ ဝန်းကျင်လေထုအရည်အသွေးရလဒ်

Monitoring Date	Parameter	Average Period	Result µg/m3/pp	WHO Guideline	NEQG Guideli
30-31 October, 2021	Total Suspended Particles (TSP)	-	30.09	NG*	NG*
	Particulate Matter (PM10)	24-hours	23.66	50	50
	Particulate Matter (PM2.5)	24-hours	17.56	25	25
	Sulphur Dioxide (SO2)	10-mins	328.35	500	500
	Nitrogen Dioxide (NO2)	1-hour	15.16	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.86	100	100
	Carbon Dioxide (CO2)	-	1 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*
1-2 November, 2021	Total Suspended Particles (TSP)	-	20.52	NG*	NG*
	Particulate Matter (PM10)	24-hours	16.09	50	50

	Particulate Matter (PM2.5)	24-hours	11.42	25	25
	Sulphur Dioxide (SO2)	10-mins	299.19	500	500
	Nitrogen Dioxide (NO2)	1-hour	11.26	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.25	100	100
	Carbon Dioxide (CO2)	-	1 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*
2-3 November, 2021	Total Suspended Particles (TSP)	-	25.68	NG*	NG*
	Particulate Matter (PM10)	24-hours	19.7	50	50
	Particulate Matter (PM2.5)	24-hours	16.14	25	25
	Sulphur Dioxide (SO2)	10-mins	345.46	500	500
	Nitrogen Dioxide (NO2)	1-hour	11.7	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.64	100	100
	Carbon Dioxide (CO2)	-	1.71 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.23	NG*	NG*
3-4 November, 2021	Total Suspended Particles (TSP)	-	30.32	NG*	NG*
	Particulate Matter (PM10)	24-hours	23.13	50	50
	Particulate Matter (PM2.5)	24-hours	19.24	25	25
	Sulphur Dioxide (SO2)	10-mins	327.01	500	500
	Nitrogen Dioxide (NO2)	1-hour	11.91	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.21	100	100
	Carbon Dioxide (CO2)	-	17.24 ppm	NG*	NG*

	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*
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NEQG = National Environmental Quality (Emission) Guideline 2015
 WHO = World Health Organization * NG = No Guideline

ဆူညံသံအဆင့်

တိုင်းတာသည့် တည်နေရာ

ဆူညံသံအဆင့် အမှတ်များ၏ တည်နေရာများသည် လေထုအရည်အသွေး စောင့်ကြည့်သည့် တည်နေရာနှင့် တူညီသည်။

ခ စစ်တမ်းရလဒ်

ဆူညံသံအဆင့် LAeq) ကို ဇယား တွင် တင်ပြထားပါသည်။ 4.5.11 တွက်ချက်ထားသော ဆူညံသံအဆင့်အရ နေရာ နှစ်ခုရှိ ဆူညံသံ decibels အများစုသည် အသုံးချစံနှုန်းအတွင်းတွင် ရှိနေသည်။ စောင့်ကြည့်နေရာ တစ်ခုစီ၏ အဓိကဆူညံသံအရင်းအမြစ်မှာ

N-1	နေ့အချိန်နှင့် ညအချိန်	ရွာသားများထံမှ စကားသံ၊ ယာဉ်သွားလမ်းလာ၊ မော်တော်ဆိုင်ကယ်၊ စေတီတော်မှ ခေါင်းလောင်းသံ၊ ဘုန်းကြီးကျောင်းမှ အသံချဲ့စက်၊ မိုးရွာနေစဉ် လေပြင်း၊
N-2	နေ့အချိန်နှင့် ညအချိန်	နေ့ခင်းဘက်နေထိုင်ရာကနေ အသံချဲ့စက် မိုးသည်းထန်စွာရွာခြင်း၊ ခွေးဟောင်သံ၊ မြူခိုးသံများ ညအချိန်စောင့်ကြည့်ရေးစခန်းအနီး၊ တိုင်းတာသည့်ကာလတွင် မိုးသည်းထန်စွာရွာသွန်းခဲ့သည်။
N-3	နေ့အချိန်နှင့် ညအချိန်	ယာဉ်အသွားအလာ၊ မော်တော်ဆိုင်ကယ်၊ မော်တော်ဆိုင်ကယ်၊ စေတီတော်မှ ခေါင်းလောင်းသံသေးသေးလေးများ၊ ဘူတာရုံအနီးတစ်ဝိုက်တွင် ကလေးငယ်များ စာဖတ်ခြင်းနှင့် ဆော့ကစားခြင်း၊ တိုင်းတာသည့် အတွင်း မိုးသည်း ထန်စွာရွာသွန်းခဲ့သည်။
N-4	နေ့အချိန်နှင့် ညအချိန်	ခွေးဟောင်သံ၊ ရွာသူရွာသားများနှင့် မော်တော်ဆိုင်ကယ်များ သွားလာနေသည့် ခြေလျင်လမ်းတစ်လျှောက်တွင် စောင့်ကြည့်နေချိန်အတွင်း မိုးသည်းထန်စွာ ရွာသွန်းခဲ့သည်။

တုန်ခါမှုအဆင့်

တိုင်းတာသည့် တည်နေရာ

တုန်ခါမှုအဆင့် အမှတ်များ၏ တည်နေရာများသည် လေထုအရည်အသွေး စောင့်ကြည့်သည့် တည်နေရာနှင့် တူညီသည်။

တုန်ခါမှုအဆင့် စစ်တမ်းရလဒ်

တိုင်းတာသည့်နေရာအားလုံး၏ ပျမ်းမျှ ၂၄ နာရီကြာ တိုင်းတာမှု တုန်ခါမှုအဆင့် ရလဒ်ကို ဖော်ပြထားပါသည်။

တိုင်းတာသည့်နေရာအားလုံးရှိ ပျမ်းမျှ ၂၄ နာရီ တုန်ခါမှုအဆင့်သည် နှိုင်းယှဉ်ထား သောစံနှုန်းအတွင်း ကျရောက်ပါသည်။

ဇယား ၄.၁-၄ တိုင်းတာသည့် နေရာများ၏ ပျမ်းမျှ တုန်ခါမှု အဆင့်ရလဒ်

Parameter		Result				Target Value (Japan Standard)
		V-1	V-2	V-3	V-4	
X-axis	Lveq	13	13	14	17	55
X-axis	Lvmax	20	19	20	24	55
X-axis	Lvmin	8	8	8	9	55
X-axis	Lv5	17	16	17	21	55
X-axis	Lv10	16	15	16	19	55
X-axis	Lv50	13	12	13	15	55
X-axis	Lv90	10	10	10	12	55
X-axis	Lv95	10	9	10	11	55
Y-axis	Lveq	18	19	15	19	55
Y-axis	Lvmax	25	28	21	25	55
Y-axis	Lvmin	10	9	10	11	55
Y-axis	Lv5	22	24	18	22	55
Y-axis	Lv10	21	21	18	21	55
Y-axis	Lv50	16	14	15	17	55
Y-axis	Lv90	13	11	12	14	55
Y-axis	Lv95	12	11	12	13	55
Z-axis	Lveq	17	16	16	19	55
Z-axis	Lvmax	18	18	19	23	55
Z-axis	Lvmin	16	16	14	16	55
Z-axis	Lv5	17	17	17	20	55
Z-axis	Lv10	17	17	17	19	55
Z-axis	Lv50	17	16	16	18	55
Z-axis	Lv90	17	16	15	17	55
Z-axis	Lv95	16	16	15	17	55

ရေအရည်အသွေး

တိုင်းတာသောတည်နေရာ

ရေမူနာစစ်တမ်းအမှတ်များ၏တည်နေရာများကို ဇယားတွင် ဖော်ပြထားပါသည်။

Category	Sampling Point	Coordinates	Description of Sampling Point
Surface Water	SW-1	21°57'32.31"N 96°11'7.08"E	ဆောက်လုပ်ရေးအဆင့်အတွက် ရေပေးဝေရေး ဧရိယာ ဆောက်လုပ်ရန် ရည်ရွယ်ထားသည့် နေရာဖြစ်သည့် ဝင်ပေါက်အပိုင်းတွင် ကောက်ယူ ထားသည်။

Surface Water	SW-2	21°56'3.03"N 96°11'46.58"E	မိလ္လာသန့်စင်စက်ရုံတည်ဆောက်ရန် ရည်ရွယ်ထားသည့် နေရာသည် ထွက်ပေါက်အပိုင်းတွင် ကောက်ယူထားသည်။
Ground water	GW-1	21°57'17.15"N 96°11'41.87"E	သရက်တော ရွာ

ရေအရည်အသွေးရလဒ်

ရေအရည်အသွေး ခွဲခြမ်းစိတ်ဖြာမှု ကန့်သတ်ချက်များကို အမျိုးသားထုတ်လွှတ်မှု အရည်အသွေး လမ်းညွှန်ချက်နှင့် မြန်မာ့သောက်သုံးရေ အရည်အသွေး စံနှုန်းများဖြင့် နှိုင်းယှဉ်ခဲ့ပါသည်။ ခွဲခြမ်းစိတ်ဖြာမှုရလဒ်များအရ မျက်နှာပြင်ရေရှိ စုစုပေါင်း coliform ရလဒ်များသည် အသုံးပြုထားသော စံနှုန်းများထက်ပိုမိုမြင့်မားသည်။ ရေမျက်နှာပြင် အရည်အသွေး စုစုပေါင်း coliform တန်ဖိုးများ တိုးလာခြင်း အကြောင်းရင်းမှာ အနီးနားကျေးရွာများ တည်ရှိသော ဆည်တော်ဆည်တွင် ရေအရည်အသွေးနမူနာကို ကောက်ယူခဲ့ပြီး ယင်းတူးမြောင်းကို စိုက်ပျိုးရေးအတွက် အဓိကထားသည့် အပြင် လျှော်ဖွပ်အသုံးပြုခြင်း ဖြစ်သည်။ ရွာသားများထံမှ အမှိုက်များကို တူးမြောင်းအနီးတွင် စွန့်ပစ်သည်။ ထို့ကြောင့်၊ ဤလုပ်ဆောင်ချက်များသည် coliform တန်ဖိုးပိုမိုမြင့်မားနိုင်သည်။

မြေဆီလွှာအရည်အသွေး

တိုင်းတာသောတည်နေရာ

မြေဆီလွှာနမူနာများနှင့် စစ်တမ်းများ၏တည်နေရာများကို ဇယားတွင် ဖော်ပြထားပါသည်။

နမူနာအချက်များ၏အသေးစိတ်အား အောက်ပါအတိုင်းဖော်ပြထားပါသည်။

ဇယား ၄.၁-၅ မြေဆီလွှာအရည်အသွေးစစ်တမ်း၏ နမူနာနှင့် စစ်တမ်းအမှတ်များ

Category	Sampling Point	Coordinates	Description of Sampling Point
Soil	S-1	21°56'4.74"N 96°11'51.69"E	မိလ္လာသန့်စင်စက်ရုံ ဆောက်လုပ်ရန် ရည်ရွယ်ထားသည့် နေရာ၌ ကောက်ယူထားသည်။
Soil	S-2	21°57'44.38"N 96°12'0.11"E	အလုပ်ရုံ ဆောက်လုပ်ရန် ရည်ရွယ်ထားသည့် နေရာ၌ ကောက်ယူထားသည်။

မြေဆီလွှာအရည်အသွေးရလဒ်များ

မြေဆီလွှာနမူနာများကို ရန်ကုန်တိုင်း ဒေသကြီး မြေအသုံးချမှု ဦးစီးဌာနတွင် လေ့လာဆန်းစစ်ခဲ့သည်။

နေရာတစ်ခုစီရှိ မြေဆီလွှာအရည်အသွေးရလဒ်ကို ဇယား ၄-၈ တွင် ဖော်ပြထားပါသည်။

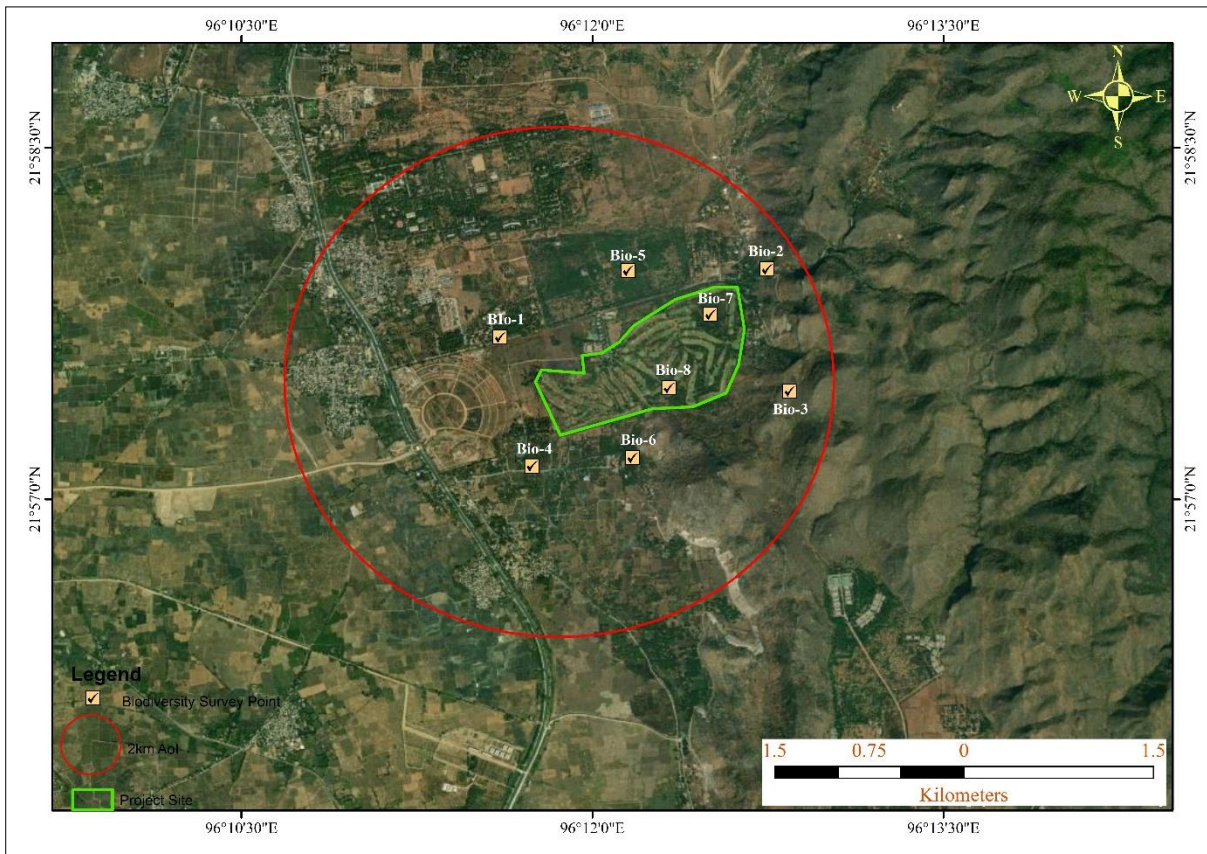
ဇယား ၄.၁-၆ မြေဆီလွှာအရည်အသွေး ဓာတ်ခွဲခန်းရလဒ်

Parameter	unit	S-1	S-2
pH		7.61	7.86
Moisture content		7.44	3.09
Lead		5.06	Not detected
Cadmium		Not detected	Not detected
Copper		1.992	0.534
Arsenic		18.54	91.9
Zinc		Not detected	Not detected
Iron		4.1	0.352

ဇီဝအစိတ်အပိုင်းများ

ဇီဝမျိုးစုံမျိုးကွဲ စစ်တမ်း ဧရိယာ

စစ်တမ်းဧရိယာ၏တည်နေရာကို ပုံ တွင်ဖော်ပြထားပါသည်။



ပုံ စီမံကိန်းနေရာတစ်ဝိုက်ရှိ ဇီဝမျိုးစုံမျိုးကွဲများ စစ်တမ်းကောက်ယူသည့် တည်နေရာ

အပင်စစ်တမ်းရလဒ်

အပင်စစ်တမ်းသည် သစ်ပင်ပန်းမန်အဖွဲ့၏ ကွဲပြားမှုကို နားလည်သဘောပေါက်ရန် ကောက်ယူခဲ့ခြင်းဖြစ်သည်။ စစ်တမ်းကောက်ယူမှုအတွင်း စုစုပေါင်း သစ်ပင်ပန်းမန်မျိုးစိတ် ၈၈ မျိုး တွေ့ရှိခဲ့သည်။ မျိုးစိတ်မျိုးသည် မျိုးသုဉ်းလုနီးပါးမျိုးစိတ်များကို ခွဲခြားသတ်မှတ်ထားပြီး စိုးရိမ်(၁)စရာ

အနည်းဆုံးမျိုးစိတ် ဒေတာချို့တဲ့မှုနှင့် (၂) မျိုးရှိသည်။(၃၁)Iucn Red List တွင် အကဲဖြတ်မရသေးသည့် မျိုးစိတ် ၅၄ မျိုး တွေ့ရှိခဲ့ပြီး ဤဧရိယာတွင် အစုလိုက်မျိုးစိတ်မရှိပေ။

Fauna စစ်တမ်းရလဒ်

နို့တိုက်သတ္တဝါများ၊ ငှက်များ၊ တွားသွားသတ္တဝါများ၊ လိပ်ပြာများ အပါအဝင် တိရစ္ဆာန်မျိုးစိတ်များကို လွှမ်းခြုံထားသည့် ဇီဝမျိုးစုံမျိုးကွဲစစ်တမ်းကို ကောက်ယူခဲ့သည်။ တိရစ္ဆာန်စစ်တမ်းကို ၎င်းတို့၏ သဘာဝနေထိုင်ရာများတွင် ခြေရာခံခြင်းနှင့် အစာကျွေးခြင်းဆိုင်ရာ လက္ခဏာများကဲ့သို့သော ခြေရာခံ အမှတ်အသား များကို ကွင်းဆင်းကြည့်ရှုခြင်းနှင့် လူတွေ့စစ်ဆေးခြင်း စစ်တမ်းကို ဒေသခံအသိုင်းအဝိုင်းများထံ တိုက်ရိုက်ကြည့်ရှုလေ့လာခြင်းမှတစ်ဆင့် မေးမြန်းကောက်ယူခဲ့ခြင်းဖြစ်သည်။ တိရစ္ဆာန်မျိုးစိတ်များတွင် စိုးရိမ်စရာအနည်းဆုံးနှင့် အကဲဖြတ်ခြင်းမရှိသော တွားသွားသတ္တဝါများကို တွေ့ရှိရပြီး ထိခိုက်လွယ်သောမျိုးစိတ်များနှင့် ငှက်မျိုးစိတ်နှစ်မျိုးကို IUCN အနီရောင်စာရင်းအရ တွေ့ရှိရသည်။ စစ်တမ်းကောက်ယူသည့် ဧရိယာတွင် အစုလိုက်ငှက်မျိုးစိတ် လေးမျိုး တွေ့ရှိခဲ့သည်။

ဇယား ၄.၁-၇ စစ်တမ်းကောက်ယူ ရရှိသည့် မျိုးစိတ်မှတ်တမ်းများ

Fauna Group	Total Number of Species
Mammal	7
Bird	45
Butterflies	22
Reptiles	10
Fish	6
Total	90

နို့တိုက်သတ္တဝါ

နို့တိုက်သတ္တဝါများကို တိုက်ရိုက်လေ့လာခြင်းနှင့် အင်တာဗျူး စစ်တမ်းမှ ဖော်ထုတ်တွေ့ရှိခဲ့သည်။ နို့တိုက်သတ္တဝါမျိုးစိတ် နှစ်ခုကို မှတ်တမ်းတင်ခဲ့ပါသည်။ မျိုးစိတ်ငါးမျိုးအား စစ်တမ်းကောက်ယူသည့် ဧရိယာရှိ ဒေသခံပြည်သူများမှ တွေ့ဆုံမေးမြန်းခဲ့ပါသည်။ IUCN Red List အရ ခြိမ်းခြောက်ခံရသောမျိုးစိတ်များ အားလုံးသည် စိုးရိမ်စရာအနည်းဆုံး၊ ခြိမ်းခြောက်မှုခံရသော မျိုးစိတ်မရှိပေ။

Herpetology

စစ်တမ်းကောက်ယူမှုအတွင်း စုစုပေါင်းတွားသွားသတ္တဝါမျိုးစိတ် ၉ မျိုးကို ရှာဖွေတွေ့ရှိခဲ့သည်။ မျိုးစိတ်ကိုးမျိုးအား မှတ်တမ်းတင်ထားပြီး တစ်မျိုးမှာ စစ်တမ်းဧရိယာရှိ ဒေသခံပြည်သူများထံမှ တွေ့ဆုံမေးမြန်းမှုမှ ရရှိခဲ့ပါသည်။ IUCN Red List အရ ခြိမ်းခြောက်ခံရသောမျိုးစိတ်များ ဤဧရိယာသည် ခြိမ်းခြောက်နိုင်သောမျိုးစိတ်မဟုတ်ပေ။ ဤဧရိယာတွင် အစုလိုက်မျိုးစိတ်များ မတွေ့ရှိရပါ။ မျိုးစိတ် ၃ မျိုးအဖြစ် ခွဲခြားသတ်မှတ်ထားသော မျိုးစိတ်အားလုံးကို အကဲဖြတ်ခြင်းမပြုဘဲ မျိုးစိတ် ခြောက် ခု သည် စိုးရိမ်မှုအနည်းဆုံးဖြစ်သည်။

လိပ်ပြာ

စုစုပေါင်း မျိုးစိတ် ၂၃ မျိုးအား မှတ်တမ်းတင်ခဲ့သည်။ မိသားစု Nymphalidae နှင့် Pieridae တို့ကို လွှမ်းမိုးထားသည်ကို တွေ့ရသည်။ IUCN Red List of (3-2021အရ မျိုးစိတ်အားလုံးကို ကြီးကြီးမားမား ခြိမ်းခြောက်မှုအောက်တွင် အကဲဖြတ်ခြင်း မခံခဲ့ရပါ။

ငှက်

စစ်တမ်းကာလအတွင်း ငှက်မျိုးစိတ် စုစုပေါင်း ၄၃ မျိုးကို မှတ်တမ်းတင်ခဲ့သည်။ IUCN Red List အရ ဤဧရိယာသည် ခြိမ်းခြောက်နိုင်သောမျိုးစိတ်များမဟုတ်ပေ။

ငါး

လေ့လာမှုဧရိယာအနီးတွင် နေထိုင်ကြသော ဒေသခံပြည်သူများအား ကွင်းဆင်းစစ်တမ်းများနှင့် အင်တာဗျူးများကို နမူနာများ ကောက်ယူစဉ်တွင် ပြုလုပ်ခဲ့ပါသည်။ ငါးဖမ်းခြင်းလုပ်ငန်းသည် အများအားဖြင့် ရိုးရာနည်းလမ်းဖြစ်သည်။ ငါးဖမ်းလုပ်ငန်းနဲ့ ပတ်သက်ပြီး ရေလုပ်သားတွေကို တွေ့ဆုံမေးမြန်းခဲ့ပါတယ်။ ရေကြည်တူးမြောင်းမှ မျိုးစိတ် ၅ မျိုး စုစုပေါင်း မျိုးစိတ် ၆ မျိုးအား ရှာဖွေတွေ့ရှိခဲ့ပြီး မှတ်တမ်းတင်ခဲ့သည်။ IUCN ၏ ခြိမ်းခြောက်ခံရသော မျိုးစိတ်များ၏ အနီရောင်စာရင်းအရ အဆိုပါဧရိယာသည် ခြိမ်းခြောက်နိုင်သောမျိုးစိတ်များမဟုတ်ပေ။

လူမှုပတ်ဝန်းကျင်

နယ်နိမိတ်နှင့် လူဦးရေ မြို့နယ်ပုသိမ်ကြီး

ပုသိမ်ကြီးမြို့နယ်သည် မြန်မာနိုင်ငံ မန္တလေးတိုင်းအတွင်းရှိ မြို့နယ်တစ်ခုဖြစ်သည်။ ပုသိမ်ကြီးမြို့နယ်သည် မန္တလေး မြို့နှင့် ၅ မိုင်ဝေးသည်။ ပုသိမ်ကြီးမြို့နယ်သည် မြောက်လတ္တီကျု ၂၁ ဒီဂရီ ၅၁” မှ ၂၂ ဒီဂရီ ၀၉” အကြားနှင့် အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ ၀၁” နှင့် ၉၆ ဒီဂရီ ၂၂” ကြား ရှိသည်။ စုစုပေါင်း ဧရိယာသည် ၂၃၁ စတုရန်းမိုင် ကျယ်ဝန်းသည်။ ၅၅.ကျေးရွာအုပ်စု ၅၈ ခုနှင့် မြို့ပြရပ်ကွက် ၁ ခု ရှိသည့် ကျေးရွာ ၁၄၀ ရှိသည်။

ကျား၊မ အခြေအနေ

ယေဘုယျအားဖြင့် မြန်မာနိုင်ငံတွင် အမျိုးသားနှင့် အမျိုးသမီး တန်းတူဖြစ်သည်။ ထို့ကြောင့် လေ့လာမှုဧရိယာအတွင်း ကျား၊မ ပြဿနာမရှိပါ။ ရာထူး၊ အလုပ်ခွဲဝေမှုနှင့် ဆုံးဖြတ်ချက်ချခြင်းတို့ကို အမျိုးသားနှင့် အမျိုးသမီးကြားတွင် ရုပ်ပိုင်းဆိုင်ရာ အခြေအနေ၊ လူမှုဖွဲ့စည်းပုံနှင့် စံနှုန်းများဖြင့် ဆုံးဖြတ်သည်။ အချို့သော ကဏ္ဍများတွင် ဆုံးဖြတ်ချက်ချခြင်းသည် အမျိုးသားနှင့် အမျိုးသမီး နှစ်ဦးစလုံး၏ ပူးပေါင်းဆောင်ရွက်ခြင်း သို့မဟုတ် မျှဝေခြင်းသာ ဖြစ်သည်။

စီးပွားရေးအခြေအနေ

ပုသိမ်ကြီးမြို့နယ်သည် မန္တလေးတိုင်းဒေသကြီးတွင် တည်ရှိပြီး စီးပွားရေးအရ ဖွံ့ဖြိုးတိုးတက်သော မြို့နယ်တစ်ခုဖြစ်သည်။ မြို့နယ်အတွင်းရှိ ဒေသခံပြည်သူများသည် စိုက်ပျိုးရေးလုပ်ငန်းကို အဓိကလုပ်ကိုင်ကြသည်။ ပုသိမ်ကြီးမြို့နယ်သည် အခြားမြို့နယ်များသို့ ကုန်းလမ်း ရေလမ်းဖြင့် သွားလာနိုင်ပြီး လမ်းပန်းဆက်သွယ်ရေး ကောင်းမွန်ပါသည်။ မြို့နယ်၏ အဓိကထွက်ကုန်များမှာ ဆန်နှင့် အခြားဒေသများသို့ တင်ပို့ရောင်းချသည်။

ပညာရေး

မြန်မာနိုင်ငံတွင် ကျောင်းအမျိုးအစား လေးမျိုးရှိသည်(၂) အဓိကကျောင်းများ၊/ခွင့်ပြုထားသော (၁) - ဌာနခွဲကျောင်းများ၊(၃) တွဲဖက်ကျောင်းများနှင့် ကိုယ်ထူကိုယ်ထကျောင်းများ။ (၄)၎င်းတို့အနက် တွဲဖက်ကျောင်းများနှင့် ပင်မကျောင်းတစ်ခုစီတွင် စီမံခန့်ခွဲရေး ချိတ်ဆက်ထားသော ကျောင်းများသည် ကျောင်းအသုံးအဆောင်များနှင့် ဆရာအစီအစဉ်အားလုံးကို ကိုယ်တိုင်ပြင်ဆင် စီမံရမည်ဖြစ်ပြီး အဆိုပါ တွဲဖက်ကျောင်းများရှိ ကျောင်းသားများကို ကျောင်းသားများအနေဖြင့် အစီရင်ခံတင်ပြထားသည်။

ဆရာမများ၏ လစာစရိတ်များအပါအဝင် ကုန်ကျစရိတ်အများစုကို ကျောင်းတည်ထောင်သည့်အဖွဲ့မှ ကျခံသည် (အများအားဖြင့် ရပ်ရွာ၊ ဘုန်းကြီးကျောင်းများနှင့် အခြားဝန်ကြီးဌာနများမှ ကုန်ကျစရိတ်များ) ဆက်စပ်ကျောင်းတွင် စာမေးပွဲများကို အများအပြားဆောင်ရွက်ခွင့်မပြုသောကြောင့် ကျောင်းသားများသည် ပင်မကျောင်းတွင် စာမေးပွဲများဖြေဆိုရမည်ဖြစ်သည်။

အများပြည်သူသယ်ယူပို့ဆောင်ရေး

ပုသိမ်ကြီးမြို့နယ်သည် မန္တလေး အလွန်နီးသော မြို့ဖြစ်သည်။ ဒေသခံအများစုသည် ကားနှင့်ဆိုင်ကယ်ဖြင့် သွားလာရန် လမ်းများကို အဓိကအသုံးပြုကြသည်။ ကားလမ်းဖြင့် မန္တလေးသည် ၁၉ ကီလိုမီတာ ဝေးသည်။ မကြာသေးမီက မြို့နယ်လမ်းကွန်ရက်ကို ယခင်က လမ်းပန်းဆက်သွယ်ရေးကွန်ရက်ဖြင့်သာ ချိတ်ဆက်ခဲ့သည် ။(အချို့သော ဆက်သွယ်မှုအချို့သည် မြေကြီးလမ်းများသာ ဖြစ်သည်)

လူမှုရေးနှင့် ကျန်းမာရေး ထိခိုက်မှု အကဲဖြတ် နမူနာကောက်ယူသည့် ဧရိယာ လွှမ်းခြုံမှု

စီမံကိန်းဧရိယာအတွင်း လူမှုရေးအခြေအနေများကို အကဲဖြတ်ရန်အတွက် မန္တလေးတိုင်းဒေသကြီး ပုသိမ်ကြီးမြို့နယ်တွင် လူမှုရေးနှင့် ကျန်းမာရေးထိခိုက်မှု အကဲဖြတ်ခြင်းကို ဆောင်ရွက်ခဲ့ပါသည်။ ယင်းအကဲဖြတ်မှုတွင် မြို့နယ်အတွင်းရှိ စုစုပေါင်းကျေးရွာ လေးရွာဖြစ်သည့် ရေကြည်ကျေးရွာ၊ အိုင်ကြီးကျေးရွာ၊ သရက်တောကျေးရွာနှင့် ရွာစုကျေးရွာတို့ ပါဝင်သည်။ အဆိုပါကျေးရွာများတွင် အိမ်ထောင်စုနမူနာများ ဖြန့်ဝေခြင်းမှာ အောက်ပါအတိုင်းဖြစ်သည်။ ရေကြည် - ဝ်ကျေးရွာတွင် အိမ်ထောင်စု ၁၆၈ စု၊ အိုင်ကြီးကျေးရွာတွင် အိမ်ထောင်စု ၇၀၊ သရက်တောကျေးရွာတွင် အိမ်ထောင်စု ၁၅၂ စုနှင့် ရွာစုကျေးရွာတွင် အိမ်ထောင်စု ၁၁၇ စု၊ စုစုပေါင်း အိမ်ထောင်စု စုကို အကဲဖြတ်ခဲ့ပါသည်။ (၅၀၇) အိမ်ထောင်စုအကဲဖြတ်မှု၏ဖွဲ့စည်းပုံနှင့်ပတ်သက်၍၊ ကျေးရွာတစ်ခုစီမှနမူနာကိုအောက်ပါဇယား တွင်ဖော်ပြထားသည်။

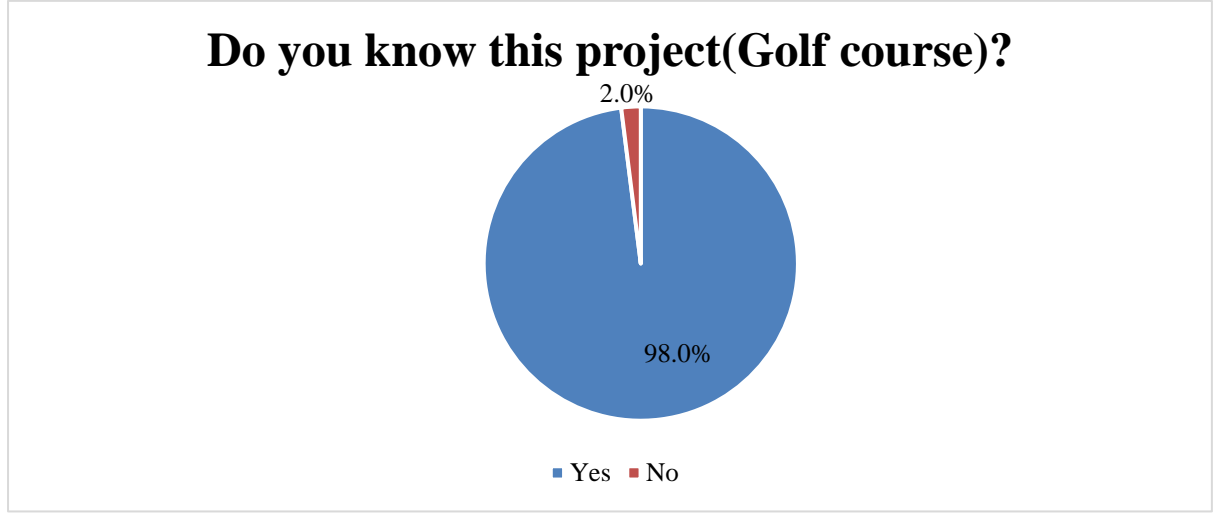
ဇယား သက်ဆိုင်ရာရွာမှ နမူနာ ကောက်ယူသည့် အိမ်ထောင်စု

မြို့နယ်	ရွာအမည်	Sample HH
ပုသိမ်ကြီးမြို့နယ်	ရေကြည်ကျေးရွာ	၁၆၈
	အိုင်ကြီးကျေးရွာ	၇၀
	သရက်တောကျေးရွာ	၁၅၂

ရွာစုကျေးရွာ	၁၁၇
စုစုပေါင်း	၅၀၇

စီမံကိန်းအပေါ်အမြင်များ

လေ့လာမှုအဖွဲ့သည် စီမံကိန်းနှင့်ပတ်သက်သည့် အသိပညာပေးမှုများအပြင် တည်ဆောက်ဆဲကာလတွင် စီမံကိန်းနှင့်ပတ်သက်သော စိုးရိမ်မှုများကို မေးမြန်းခဲ့ပါသည်။ ဖြေဆိုသူ ၉၈ရာခိုင်နှုန်းသည် ၀. ရာခိုင်နှုန်းကသာ ၀.၂ဂေါက်ကွင်းစီမံကိန်းကို သိရှိကြပြီး စီမံကိန်းကို သတိမပြုမိကြောင်း တွေ့ရှိရသည်။



စစ်တမ်းရလဒ်များအရ ဖြေဆိုသူ ၉၄ ရာခိုင်နှုန်းသည် စီမံကိန်းတည်ဆောက်မှု၏ လူမှုရေးဆိုင်ရာ ၅.၅.၅ရိမ်ပူပန်မှုမရှိကြောင်း ဖော်ပြကြပြီး အကျိုးသက်ရောက်မှုနှင့် ပတ်သက်၍ သိသာထင်ရှားသော စိုးရိမ်မှုများကသာ ရပ်ရွာအပေါ် ၎င်း၏လူမှုရေးဆိုင်ရာ သက်ရောက်မှုအပေါ် စိုးရိမ်မှုအဆင့်အချို့ကို ဖော်ပြခဲ့သည်။ ဤအချက်အလက်များသည် စီမံကိန်း တည်ဆောက်မှုကြောင့် လူမှုအသိုက်အဝန်း အများစုသည် အနုတ်လက္ခဏာဆောင်သောလူမှုရေးဆိုင်ရာ သက်ရောက်မှုများကို မမျှော်လင့်ထားကြောင်း အကြံပြုထားသည်။ သို့သော်လည်း စီမံကိန်း အကောင်အထည်ဖော် ဆောင်ရွက်သူသည် စီမံကိန်း၏ လူမှုရေးဆိုင်ရာအကျိုးသက်ရောက်မှုများကို ထိရောက်စွာစီမံခန့်ခွဲပြီး ရပ်ရွာသာယာရေးနှင့် မျှော်လင့်ချက်များနှင့်အညီ လိုက်လျောညီထွေဖြစ်စေရန်အတွက် ဖြေဆိုသူများ၏ ၅.၅ မှတင်ပြသော % စိုးရိမ်မှုများကို လျော့ပါးသက်သာစေရန် လိုအပ်ပါသည်။

Response	Percent
ဒီကုမ္ပဏီမှာ အလုပ်ဝင်ချင်လား။	29.4
ဤစီမံကိန်းကို အလုပ်အကိုင်အခွင့်အလမ်းများ ဖန်တီးနိုင်သို့မဟုတ် ရရှိစေနိုင်သောကြောင့် / ဤစီမံကိန်းကို နှစ်သက်သည်။	43.8

ရွာကို ဖွံ့ဖြိုးတိုးတက်အောင်စေချင်	2.1
ကျန်းမာရေးနဲ့ ပညာရေးကို ပံ့ပိုးပေးဖို့ လိုတယ်	13.9
လျှပ်စစ်နဲ့ ရေလိုအပ်	1.0
နေရာအတိအကျနဲ့ နေချင်တယ်	5.7
ကလေးရဲ့ အနာဂတ်အတွက် ကောင်းပါတယ်။	3.1
လမ်းပန်းဆက်သွယ်ရေးကောင်းဖို့ လိုတယ်	.5
လယ်သမားတွေ လယ်တွေဆုံးရှုံးလို့ မကြိုက်ဘူး	.5
စုစုပေါင်း	100.0

ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ထိခိုက်မှု အကဲဖြတ်ခြင်းနှင့် လျော့ပါးရေး ဆောင်ရွက်မှုများ

ဤအခန်းသည် အဆိုပြုထားသော လုပ်ဆောင်ချက်၏ အမှန်တကယ်နှင့် ဖြစ်နိုင်ခြေရှိသော သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ အကျိုးဆက်များကို ခွဲခြားသတ်မှတ်ပြီး အကဲဖြတ်မည် ဖြစ်ပါသည်။ ထို့အပြင် အပျက်သဘောဆောင်သော သက်ရောက်မှုများ လျော့ပါးစေရန်နှင့် အပြုသဘောဆောင်သော သက်ရောက်မှုများ တိုးမြှင့်ခြင်းအတွက် အလားအလာများကို ဖော်ပြထားပါသည်။ စီမံကိန်းတည်ဆောက်မှု၊ လည်ပတ်မှုနှင့် ဖျက်သိမ်းခြင်း၏ အဓိကသော့ချက်ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများကို အကဲဖြတ်ခြင်းသည် စီမံကိန်း၏ သဘောသဘာဝနှင့် နယ်ပယ်နှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များအပေါ် အခြေခံသည်။ ဤအခန်းတွင် စီမံကိန်းလှုပ်ရှားမှုများနှင့် ဆက်နွယ်မည့် အလားအလာရှိသော အပြုသဘောနှင့် အနုတ်လက္ခဏာသက်ရောက်မှုများကို အကြမ်းဖျင်းဖော်ပြထားသည်။ ဆောက်လုပ်ရေး၊ လည်ပတ်မှုနှင့် ဖျက်သိမ်းရေးအဆင့်များအတွင်း ဆောင်ရွက်ရမည့် လုပ်ငန်းများ အမျိုးအစားခွဲခြားဖြင့် သက်ရောက်မှုများကို ခန့်မှန်းတွက်ချက်ပါသည်။

သက်ရောက်မှု အကဲဖြတ်မှု နည်းစနစ်

သက်ရောက်မှု ခွဲခြားသတ်မှတ်ခြင်းနှင့် အကဲဖြတ်ခြင်းမှာ အတိုင်းအတာဖြင့် စတင်ပြီး ကျန်ရှိသော အကျိုးသက်ရောက်မှု အကဲဖြတ်ခြင်းလုပ်ငန်းစဉ်ကို ဆက်လက်လုပ်ဆောင်သည်။ အဓိကအကျိုးသက်ရောက်မှု အကဲဖြတ်ခြင်းအဆင့်များကို ပုံ ၅တွင် အကျဉ်းချုပ်ဖော်ပြထားပြီး ၁-၂ ပါဝင်သည်။

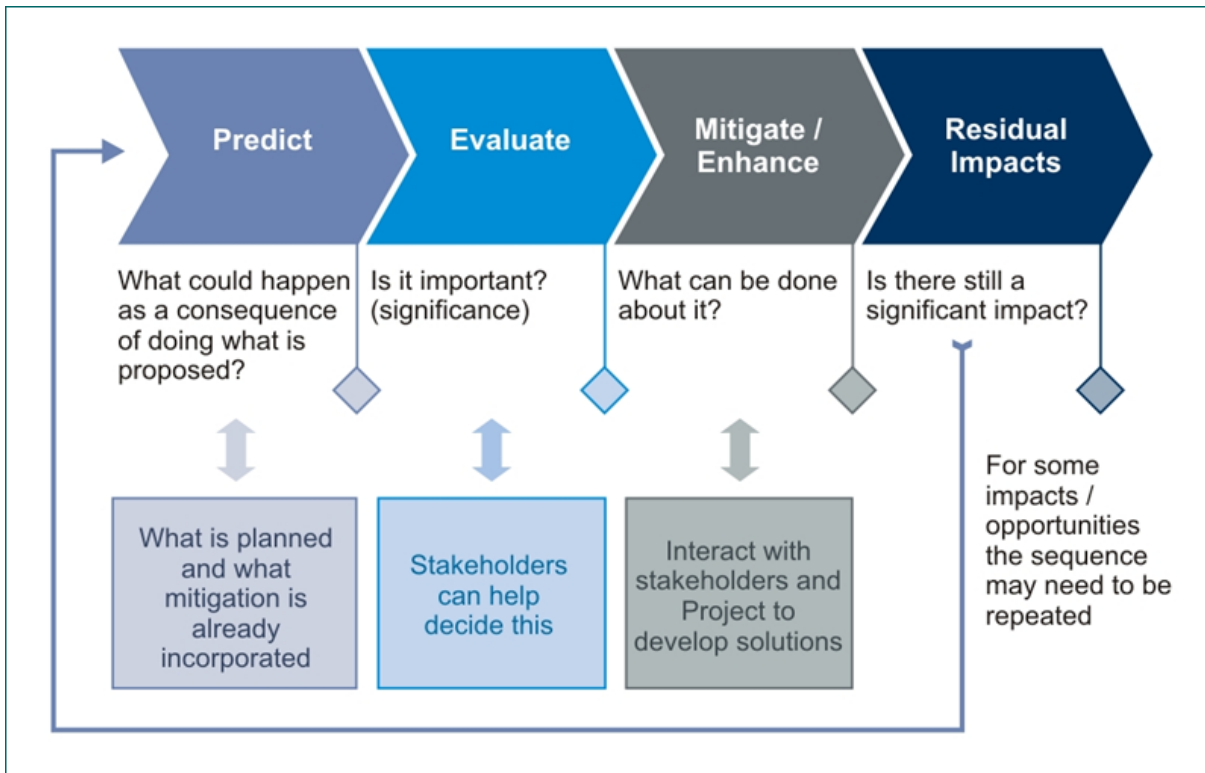
သက်ရောက်မှုကြိုတင်ခန့်မှန်းခြင်း- စီမံကိန်း နှင့် ၎င်း၏ဆက်စပ်လုပ်ဆောင်မှုများကြောင့် အရင်းအမြစ်များလက်ခံသူများတွင် မည်သို့ဖြစ်နိုင်သည်ကို ဆုံးဖြတ်/ရန်။

ထိခိုက်မှုအကဲဖြတ်ခြင်း- ၎င်းတို့၏ ပြင်းအားနှင့် ဖြစ်ပေါ်လာနိုင်ခြေနှင့် ထိခိုက်ခံရသော အရင်းအမြစ် လက်ခံရရှိမှု၏ အရေးပါမှုတို့ကို ထည့်သွင်းစဉ်းစားခြင်းဖြင့် ခန့်မှန်းထားသော/

သက်ရောက်မှုများ၏ အရေးပါမှုကို အကဲဖြတ်ရန်။

❑ လျော့ပါးသက်သာရေးနှင့် မြှင့်တင်ရေး- အနုတ်လက္ခဏာသက်ရောက်မှုများ လျော့ပါးစေရန်နှင့် အပြုသဘောဆောင်သော သက်ရောက်မှုများကို မြှင့်တင်ရန် သင့်လျော်ပြီး တရားမျှတသော အစီအမံများကို ဖော်ထုတ်ရန်။

❑ ကျန်ရှိသော သက်ရောက်မှု အကဲဖြတ်ခြင်း- ထိရောက်သော လျော့ပါးသက်သာရေးနှင့် မြှင့်တင်ရေး အစီအမံများကို ထိရောက်စွာ အကောင်အထည်ဖော်မည်ဟု ယူဆရသည့် သက်ရောက်မှုများ၏ အရေးပါမှုကို အကဲဖြတ်ရန်။



ပုံ ၅.၁-၁ သက်ရောက်မှု အကဲဖြတ်ခြင်း လုပ်ငန်းစဉ်

ဇယား တွင်ပြသထားသည့် matrix ကို အသုံးပြု၍ ထိခိုက်မှုအရေးပါမှုကို သတ်မှတ်ထားသည်။

		Sensitivity/Vulnerability/ Importance of Resource/Receptor		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

ပတ်ဝန်းကျင် အရင်းအမြစ်များနှင့် တန်ဖိုးကို ထိခိုက်စေမှု	ထိခိုက်မှုများ/အရင်းအမြစ်များ	Recommended Feasible Protection/ Mitigation Measures	Impact Significance			
			Insignificant	Significant Effect		
				Small	Moderat	Major
မြေအရည်အသွေး	<ul style="list-style-type: none"> - သစ်ပင်များ ခုတ်ထွင်ရှင်းလင်းခြင်းသည် မြေဆီလွှာတိုက်စားမှုကို ထိခိုက်စေနိုင်သည်။ - ဆောက်လုပ်ရေးလုပ်ငန်းသုံးပစ္စည်းများ သယ်ယူရာတွင် အသုံးပြုသည့် မော်တော်ယာဉ်များမှ ဆီများ မတော်တဆ ယိုဖိတ်ခြင်းနှင့် ဆောက်လုပ်ရေး ရည်ရွယ်ချက်အတွက် အသုံးပြုသည့် ဆောက်လုပ်ရေးပစ္စည်းများမှ မတော်တဆ ယိုဖိတ်ခြင်းတို့ကို မြေဆီလွှာ ညစ်ညမ်းစေသည့် အရင်းအမြစ်အဖြစ် သတ်မှတ်သည်။ 	<ul style="list-style-type: none"> - ဆီ သို့မဟုတ် ဆီများယိုဖိတ်မှု၊ ယိုစိမ့်မှု သို့မဟုတ် စွန့်ထုတ်မှုများကြောင့် မြေဆီလွှာညစ်ညမ်းမှုကို တားဆီးရန်၊ ဆောက်လုပ်ရေးနှင့် စက်များသို့ လောင်စာဆီပေးဆောင်ခြင်း လုပ်ငန်းစဉ်များတွင် ဖြစ်ပေါ်လာသည့် ဆီများအားလုံးကို ဂရုတစိုက်ဖြင့် လုပ်ဆောင်သင့်သည်။ - ဆီ/ဆီများ သိုလှောင်ခြင်းနှင့် သယ်ယူပို့ဆောင်ရာတွင် ယိုစိမ့်သော ဒဏ်ခံကွန်တိန်နာများကို အသုံးပြုသင့်ပြီး ဆီ/ဆီ ကိုင်တွယ်သည့်နေရာကို ဆေးကြောပြီး စွန့်ပစ်ခြင်းမပြုမီ စနစ်တကျ လုပ်ဆောင်ရမည်။ - ဆောက်လုပ်ရေးလုပ်ငန်းသုံး အမှိုက်များနှင့် အပျက်အစီးများကို အမှိုးဖြင့်ဖုံးအုပ်ကာ ပုံမှန်အမှိုက်ပုံးများတွင် စွန့်ပစ်ခြင်း၊ - သတ်မှတ်ထားသော အလုပ်နေရာများနှင့် လမ်းများပြင်ပတွင် စက်ကိရိယာနှင့် ယာဉ်များဖြင့် လည်ပတ်ခြင်းအား တားမြစ်ခြင်း၊ 	Insignificant	X		
လေအရည်အသွေး	<ul style="list-style-type: none"> - ဖောင်ဒေးရှင်းလုပ်ငန်း၊ ဆိုက်တူးခြင်း၊ 	<ul style="list-style-type: none"> - သက်ဆိုင်ရာ အစိုးရခွင့်ပြုချက်ရရှိမှုနှင့် သဘာဝပတ်ဝန်းကျင် 				

	<p>ယာဉ်များနှင့် ထရပ်ကားများနှင့် အကြီးစား ဆောက်လုပ်ရေးစက်ကိရိယာများ လည်ပတ်ခြင်းမှ ထွက်ပြေးလာသော ဖုန်မှုန့်များကြောင့် ဖြစ်ပေါ်လာသော လေထုညစ်ညမ်းမှုတိုးလာနိုင်ပါသည်။</p> <p>- ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း ပိတ်မိနေသော ဆောက်လုပ်ရေးလုပ်သားများနှင့် ရပ်ရွာကျန်းမာရေးအတွက် လုပ်ငန်းခွင်ကျန်းမာရေးကို အလေးထားဆောင်ရွက်သွားရန် မျှော်လင့်ပါသည်။</p>	<p>စီမံခန့်ခွဲမှုဆိုင်ရာ လိုက်နာမှုတို့အတွက် လိုင်စင်ကန်ထရိုက်တာများနှင့် စာချုပ်ချုပ်ဆိုခြင်း၊</p> <p>- ဖုန်မှုန့်ထုတ်သည့်နေရာများတွင် ရေဖြန်းခြင်း၊</p> <p>- မခင်းထားသောလမ်းများပေါ်တွင် သွားလာနေစဉ်အတွင်း ယာဉ်များ၏ အမြန်နှုန်းကန့်သတ်ချက်၊</p> <p>- မြေဆီလွှာ/ ဆောက်လုပ်ရေးပစ္စည်းများ တင်ဆောင်လာသော ယာဉ်များကို အဖုံးဖုံးထားခြင်း</p> <p>- ကြိုတင်ကာကွယ်ထိန်းသိမ်းမှုစနစ်ကို ကျင့်သုံးခြင်း၊</p> <p>- မော်တော်ယာဉ်နှင့် စက်ကိရိယာများကို နေ့စဉ်စစ်ဆေးခြင်း၊</p> <p>- လေပြင်းများတွင် ဖုန်မှုန့်များထုတ်ပေးသည့် လှုပ်ရှားမှုများကို ရပ်တန့်ခြင်း၊</p>				
<p>အသံဆူညံမှု နှင့် တုန်ခါမှု</p>	<p>- ဆောက်လုပ်ရေးလုပ်ငန်းခွင်တွင် ပတ်ဝန်းကျင်ဆူညံသံကို တိုးမြှင့်စေကာ၊ အထူးသဖြင့် တုန်ခါမှုကြောင့် ပျက်စီးသွားနိုင်သည့် ညံ့ဖျင်းသော အဆောက်အအုံများကို ပစ္စည်းများ သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်းများအနီးရှိ လူမှုအသိုင်းအဝိုင်းများ၊ - ဆူညံသံကို ကြာရှည်စွာ ထိတွေ့ခြင်းက အကြားအာရုံနှင့်</p>	<p>- လုံလောက်သော စက်ပစ္စည်းကို ရွေးချယ်ပါ (ဆူညံသံနှင့် အံကိုက်)။</p> <p>- လည်နေသောအင်ဂျင်များဖြင့် စက်ယန္တရားများနှင့် အသုံးမပြုသောအခြေအနေများကို လျှော့ချပါ။</p> <p>- စက်ယန္တရားများကို ကောင်းမွန်သောအခြေအနေတွင် ထိန်းသိမ်းပါ။</p> <p>- ဖြစ်ပေါ်လာနိုင်သည့် ဆူညံသံတိုင်ကြားမှုများကို ဖြေရှင်းရာတွင် အထောက်အကူဖြစ်စေမည့် တက်ကြွသော ရပ်ရွာလူထုနှင့်</p>			<p>X</p>	

	<p>လုပ်သားထုတ်လုပ်မှုစွမ်းရည်ကို လျော့ကျစေပြီး ပင်ပန်းနွမ်းနယ်ခြင်း၊ စိတ်ဖိစီးမှုနှင့် အိပ်မပျော်ခြင်းတို့ကို ဖြစ်စေသည်။</p>	<p>အပြုသဘောဆောင်သော ဆက်ဆံရေးကို ထိန်းသိမ်းပါ။</p>				
<p>ရေ အရည်အရင်းအမြစ် နှင့် အရည်အသွေး</p>	<p>ဆောက်လုပ်ရေးစွန့်ပစ်ပစ္စည်းများနှင့် စတု အတွင်းရှိ အိမ်တွင်းစွန့်ပစ်ပစ္စည်းများကို မသင့်လျော်စွာ စီမံခန့်ခွဲခြင်းကြောင့် ရေ အရည်အသွေး ကျဆင်းခြင်း။ - မြေအောက်ရေအရည်အသွေးကို နက်ရှိုင်းသော အုတ်မြစ်ချခြင်းနှင့် ထုလုပ်ခြင်း နှင့် စွန့်ပစ်ခြင်းစသည့် ဆောက်လုပ်ရေး လုပ်ငန်းများကြောင့် မြေအောက်ရေ အရည်အသွေး ထိခိုက်မှု။</p>	<p>- လောင်စာဆီနှင့် ချောဆီ/ဆီအတွက် သိုလှောင်မှု မရှိပါ။ - လောင်စာဆီ သို့မဟုတ် ချောဆီယိုစိမ့်မှုအန္တရာယ်ကို လျှော့ချရန်အတွက် မော်တော်ယာဉ်နှင့် စက်ယန္တရားအားလုံးကို ပုံမှန်ထိန်းသိမ်းခြင်းနှင့် စစ်ဆေးခြင်း၊ - ပုံမှန်အားဖြင့် ဆောက်လုပ်ရေးလုပ်ငန်းများသည် အနှောင့်အယှက်ဖြစ်နေသော မြေဆီလွှာများ၊ ကွန်ကရစ်များ၊ ဆီများနှင့် အခြားစွန့်ပစ်ပစ္စည်းများကို ထုတ်ပေးသောကြောင့်၊ စက်ရုံတွင် စုဆောင်းခြင်းနှင့် ညစ်ညမ်းရေများကို ဖြေရှင်းခြင်း၊ စက်ကိရိယာများ ဆေးကြောခြင်းကို တားမြစ်ခြင်း၊ ဆောက်လုပ်ရေး လုပ်ငန်းခွင်မှ မြေဆီလွှာဆုံးရှုံးမှုနှင့် အဆိပ်အတောက်များ ထွက်လာခြင်းတို့ကို ကာကွယ်ရန် လိုအပ်ပါသည်။</p>	<p>X</p>			
<p>အစိုင်အခဲ</p>	<p>- ဆောက်လုပ်ရေးအကြိုကာလတွင် သစ်ပင်များ ခုတ်ထွင်ရှင်းလင်းခြင်းမှ စွန့်ပစ် အမှိုက်များ နှင့် အပင်စွန့်ပစ်ပစ္စည်း များကို</p>	<p>- စွန့်ပစ်ပစ္စည်းအားလုံးကို ခွဲထုတ်ခြင်း၊ ကိုင်တွယ်ခြင်းနှင့် စွန့်ပစ်ခြင်းဆိုင်ရာ လိုအပ်ချက်များ အပါအဝင် အမှိုက်စီမံခန့်ခွဲမှု အစီအစဉ်ကို ရေးဆွဲရမည်။</p>		<p>X</p>		

	<p>ဖယ်ရှားရှင်းလင်းခြင်း ပြုလုပ်ရန် မျှော်လင့်ပါသည်။</p> <p>- စီမံကိန်းတည်ဆောက်မှု အကောင်အထည်ဖော်သည့်အဆင့်တွင် ဆောက်လုပ်ရေး လုပ်ငန်းသုံး အမှိုက်အမျိုးအစား အမျိုးမျိုး ဖြစ်ပေါ်လာနိုင်ဖွယ်ရှိသည်။</p>	<p>- အန္တရာယ်ရှိသော ပစ္စည်းများအားလုံးကို ရှင်းလင်းစွာ တံဆိပ်တပ်ထားသော ပုံးများတွင် သိမ်းဆည်းရမည်။</p> <p>- အန္တရာယ်ရှိသော ပစ္စည်းများ သိုလှောင်ခြင်းနှင့် ကိုင်တွယ်ခြင်းများသည် ၎င်းတို့၏ အန္တရာယ်လက္ခဏာများနှင့် သင့်လျော်သော နိုင်ငံတော်နှင့် ဒေသဆိုင်ရာ စည်းမျဉ်းများနှင့်အညီ ဖြစ်သင့်သည်။</p>				
<p>သဘာဝပေါက်ပင် ကုန်းနေ သတ္တဝါများ</p>	<p>- ဆောက်လုပ်ရေးလုပ်ငန်းခွင်ရှိ သစ်ပင်နှင့် ချုံပုတ်များကို ဖယ်ရှားရှင်းလင်းခြင်း ပြုလုပ်မည်ဖြစ်၍ သစ်ပင်များအပေါ် သက်ရောက်မှုရှိနိုင်မည်ဟု မျှော်လင့်ပါသည်။</p> <p>- ဒေသအလိုက် တိရစ္ဆာန်မျိုးစိတ်များသည် သစ်ပင်များ ရှင်းလင်းမှုကြောင့် ၎င်းတို့၏ နေထိုင်ရာနေရာများ ဆုံးရှုံးရဖွယ်ရှိသည်။</p>	<p>- ကတုတ်ကျင်းများကို ပုံမှန်စစ်ဆေးခြင်း (ရှိလျှင်) နှင့် မကာကွယ်နိုင်လျှင် အကောင်များကို ချုပ်နှောင်မှုနည်းပါးစေရန်၊</p> <p>- အမဲလိုက်ငှက်များ၊ မြွေများနှင့် ရောင်းဝယ်ဖောက်ကားခြင်းဆိုင်ရာ ချိုးဖောက်မှုတစ်ခုခုကို အစီရင်ခံခြင်း။</p> <p>- မြေပြင်တွင် ကောင်းမွန်သော အိမ်သန့်ရှင်းရေး အလေ့အကျင့်များ ကို အကောင်အထည်ဖော်ပြီး ဇာတိတိရစ္ဆာန်များ အန္တရာယ် ဖြစ်စေနိုင်သော အရင်းအမြစ်မှန်သမျှကို မပျောက်စေရန်အတွက် ကောင်းမွန်သော စွန့်ပစ်အမှိုက်စီမံခန့်ခွဲမှု အစီအစဉ်ကို အကောင်အထည်ဖော်ခြင်း၊</p> <p>- စီမံကိန်းနေရာရှိ ရှင်းလင်းရေး နယ်နိမိတ်မျဉ်းများ သတ်မှတ်ခြင်းဖြင့် အသီးအရွက်များ ခုတ်ထွင်ရှင်းလင်းရေးနှင့်</p>	<p>X</p>			

		နေအိမ်များ အနှောင့်အယှက်ဖြစ်မှု အနည်းဆုံးဖြစ်အောင် လုပ်ဆောင်ခြင်း				
ယာဉ်ကြောပိတ်ဆို့မှုများ	- ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း ပြင်းထန်သောယာဉ်များ ရွေ့လျားမှုသည် ဆောက်လုပ်ရေးလုပ်ငန်းသုံး စက်ယန္တရားများကို သယ်ယူရန် မျှော်မှန်းထားသည်။	- အမြန်နှုန်းကန့်သတ်ချက်၏အဓိပ္ပာယ်ဖွင့်ဆိုချက်နှင့်၎င်းတို့ကို (ကန်ထရိုက်တာများအပါအဝင်) မှလိုက်နာကြောင်းသေချာပါစေ။ - ယာဉ်အန္တရာယ်ကင်းရှင်းစေရန်အတွက် ယာဉ်ကြောအန္တရာယ်ကင်းရှင်းစေရန်အတွက် ယာဉ်မောင်းသင်တန်းများ၊ ယာဉ်မောင်းများ အတွက် ပုံမှန်အရက်နှင့် မူးယစ်ဆေးဝါးစစ်ဆေးမှုများနှင့် မောင်းနှင်မှုကန့်သတ်ချက်များ (အထူးသဖြင့် ကျောင်းများအနီး) တွင် ဘေးအန္တရာယ်ကင်းရှင်းစွာမောင်းနှင်ရန် ကြိုမြင်ထားသင့်သည်။	X			
အမြင်ပဒရ	- တည်ဆောက်ဆဲကာလတွင် ရပ်ရွာသည် အကျွမ်းတဝင်မရှိနိုင်ဘဲ ပတ်ဝန်းကျင် ကို ရှုမြင်မှု ပြောင်းလဲနိုင်သည်။	- ဒေသအသီးသီးမှ ကြီးကြပ်နိုင်သည့် ဒေါင်လိုက်ဖွဲ့စည်းပုံများအား မိတ်ဆက်ခြင်းမပြုရ။ - စီမံကိန်း၏အသေးစိတ်ဒီဇိုင်းဖြစ်သည့် အဆောက်အဦဒီဇိုင်းနှင့် စိုက်ပျိုးပင်များ စသည်တို့ကဲ့သို့သော စီမံကိန်း၏အသေးစိတ်ပုံစံများ အတွင်း ထိန်းချုပ်မှုအစီအမံများကို ချမှတ်ပါ။	X			
လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် အန္တရာယ်	- ဆောက်လုပ်ရေးလုပ်ငန်းခွင်မှ ဖုန်မှုန့်များနှင့် ဆူညံသံများ ထုတ်လွှတ်မှုသည် ဆောက်လုပ် ရေး	ဓာတုပစ္စည်းများ ကိုင်တွယ်အသုံးပြုရာတွင် (ကန်ထရိုက်တာလုပ်သားများ အပါအဝင်) ဝန်ထမ်းများအားလုံးကို - Personal Protective Equipment (PPE) နှင့်	X			

	<p>လုပ်သားများကို ထိခိုက်စေမည် ဖြစ်သည်။</p>	<p>လေ့ကျင့်သင်ကြားပေးခြင်း၊</p> <ul style="list-style-type: none"> - အန္တရာယ်သင်တန်းများ အသိအမှတ်ပြုသင်တန်း၊ - မြန်မာဘာသာဖြင့် အလုပ်ဆိုင် အန္တရာယ် ဆိုင်းဘုတ်များ ထားရှိခြင်း၊ - ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာ ဝန်ထမ်းများအားလုံးကို လေ့ကျင့်ပေးခြင်း။ - site ၏အမြင့်ဆုံးအဆင့်များကိုကျော်လွန်ကြောင်း သေချာစေရန်ပုံမှန်ဆူညံသံစစ်တမ်းများ။ - စက်ယန္တရားနှင့် စက်ကိရိယာများအတွက် စစ်ဆေးခြင်း၊ စမ်းသပ်ခြင်းနှင့် ပြုပြင်ထိန်းသိမ်းခြင်း အစီအစဉ်များ ဖော်ဆောင်ခြင်း။ 				
<p>ရပ်ရွာကျန်းမာရေး</p>	<p>- ဆောက်လုပ်ရေးလုပ်ငန်းခွင်တွင် ဖုန်မှုန့်များနှင့် ဆူညံသံများ ထုတ်လွှတ်ခြင်း နှင့် လေးလံသော သယ်ယူပို့ဆောင်ရေး များကြောင့် ဆောက်လုပ်ရေး လုပ်သားများ ထိခိုက်မှု ရှိလာမည်။</p>	<ul style="list-style-type: none"> - ဆူညံသံနှင့် ယာဉ်မတော်တဆမှုများ လျော့ပါးစေရန် သင့်လျော်သော မော်တော်ယာဉ် ထိန်းသိမ်းမှု အာမခံချက်၊ - အမြင်အကွာအဝေးနှင့် မြင်နိုင်စွမ်းတိုးတက်စေရန် သစ်ပင်ရှင်းလင်းခြင်းအပါအဝင် ယာဉ်မတော်တဆမှုဖြစ်နိုင်ချေများကို လျှော့ချရန် စီမံကိန်းလမ်းများကို ထိန်းသိမ်းပါ။ . 	<p>X</p>			
<p>လူမှုအသိုင်းအဝိုင်း</p>	<p>ညှိနှိုင်းဆွေးနွေးခြင်းနှင့် လျော်ကြေးပေးခြင်း လုပ်ငန်းစဉ်များမှတစ်ဆင့် စီမံကိန်းနေရာ</p>	<p>- ဒေသအတွင်း စီမံကိန်း ဖွံ့ဖြိုးတိုးတက်မှုလုပ်ငန်းများအတွက် ဒေသခံလူထုနှင့် ကောင်းစွာ ညှိနှိုင်းဆွေးနွေးပါ။</p>	<p>X</p>			

	<p>အတွက် ဆုံးရှုံးသွားသောမြေယာပိုင်ဆိုင်မှု အချို့ရှိနိုင်သည်။ ဤလုပ်ငန်းစဉ်ကို ကောင်းစွာမအကောင်အထည်ဖော်ပါက စီမံကိန်း ဖွံ့ဖြိုးတိုးတက်ရေးနှင့်ပတ်သက်၍ ဒေသခံ လူထု၏ သဘောတူညီချက် အားနည်းခြင်းကြောင့် စီမံကိန်းသည် မြေဧရိယာအတွင်းသို့ ဝင်ရောက်ရာတွင် ကြန့်ကြာမှုများ ကြုံတွေ့ရနိုင်သည်။</p>	<p>- မြေပိုင်ရှင်၊ အိမ်ငှား၊ ပုဂ္ဂလိက လုပ်ငန်းလုပ်ကိုင်သူများအပြင် အစုရှယ်ယာလုပ်ကိုင်သူများ အပါအဝင် စီမံကိန်းမှ တိုက်ရိုက် ထိခိုက်သည့် မြေယာနှင့် ပိုင်ဆိုင်မှုအားလုံးကို ကျယ်ကျယ်ပြန့်ပြန့် စာရင်းပြုစုထားသည့် ရပိုင်ခွင့်မက်ထရစ်ကို တည်ထောင်ကာ သက်ဆိုင်ရာဥပဒေနှင့် စည်းမျဉ်းများနှင့်အညီ လျော်ကြေးပေးဆောင် ရမည်ဖြစ်ကြောင်း။</p>				
<p>ရုပ်ပိုင်းဆိုင်ရာအန္တရာယ်</p>	<p>ဆောက်လုပ်ရေးအဆင့် လုပ်ဆောင်ချက် အများအပြားသည် မတော်တဆထိခိုက်မှု များနှင့် ခြိမ်းခြောက်မှုများစွာကို ဖြစ်ပေါ်စေနိုင်သည်။ ဆောက်လုပ်ရေး ဝန်ထမ်းတွေနဲ့ ပြည်သူတွေ ထိခိုက်ဒဏ်ရာရရှိနိုင်သည်။ အထက်မှ ပြုတ်ကျလာသော ဆောက်လုပ်ရေး ပစ္စည်းများသည် အောက်ဖော်ပြပါ သူများကို ထိခိုက်ဒဏ်ရာရစေပြီး မတော်တဆ ထိခိုက်မှု များ ဖြစ်စေနိုင်သော်လည်း စက်ပစ္စည်းများကို ယေဘုယျ ကိုင်တွယ်ခြင်း သည် ကိုင်တွယ်</p>	<ul style="list-style-type: none"> • ရှေးဦးသူနာပြုစုရန် အလုပ်သမားအားလုံးကို လေ့ကျင့်ပေးပါ။ • အလွန်အကျွံ အမှိုက်အညစ်အကြေးများနှင့် အရည်များ ယိုဖိတ်မှုကို ပုံမှန်သန့်ရှင်းပါ။ • စလစ်မကပ်သော ဖိနပ်ကိုသုံးပါ။ • ထိန်းချုပ်စနစ်များနှင့် ဘေးကင်းရေး စောင့်ကြည့်ရေး စနစ်များ ကို အသုံးပြုပါ။ • သတ်မှတ်ထားသော ကန့်သတ်အမှိုက်စွန့်ပစ်ဧရိယာကို အသုံးပြုပါ။ • စစ်ဆေးပြီး ကောင်းမွန်စွာ ထိန်းသိမ်းထားသော စက်များကို အသုံးပြုပါ။ 	<p>X</p>			

	သူအား ထိခိုက်ဒဏ်ရာရစေမည့် အန္တရာယ် ရှိသည်။					
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၆. လူထု တွေ့ဆုံ ဆွေးနွေးခြင်း

၆.၁ နည်းစနစ်နှင့် ရည်ရွယ်ချက်

စီမံကိန်းအကောင်အထည်ဖော်သူ သည် သက်ဆိုင်ရာအဖွဲ့များ၏ ခြုံငုံသုံးသပ်ချက်နှင့် ထိတွေ့ဆက်ဆံမှုဆိုင်ရာ လှုပ်ရှားမှုများအတွက် ခန့်မှန်းအချိန်ဇယားပါရှိသော ပဏာမ Stakeholder Engagement Plan (SEP) ကို ရေးဆွဲခဲ့ပါသည်။ အချက်အလက်များကို သက်ဆိုင်သူအသီးသီးသို့ ထုတ်ဖော်ခဲ့ပြီး၊ ယင်းတို့ပါဝင်သည့်၊

- စီမံကိန်းအကြောင်းအရာ အသေးစိတ်အကျဉ်းချုပ်၊
- ကနဦး ပတ်ဝန်းကျင် ဆန်းစစ်ခြင်း လုပ်ငန်းစဉ်၊ လေ့လာမှုနှင့် တိုင်းတာမှုများ၊
- ညှိနှိုင်းဆွေးနွေးခြင်း၏ ရည်ရွယ်ချက်၊
- တိုင်ပင်ဆွေးနွေးခြင်း စသည်တို့နှင့် စပ်လျဉ်း၍ ဒေသခံ သက်ဆိုင်သူများထံမှ မျှော်လင့်ချက်များ၊ နှင့်
- အများသူငှာနှင့်သို့မဟုတ် ပတ်ဝန်းကျင်အတွက် ဖြစ်နိုင်ခြေရှိသော ဆိုးကျိုးများ။/

တိုင်းဒေသကြီးအဆင့် အစည်းအဝေးကို အောက်ပါအတိုင်း ကျင်းပ ခဲ့ပါသည်။

- စီမံကိန်းအကြောင်းတင်ပြခြင်း နှင့်စီမံကိန်း အကောင်အထည်ဖော်သူမှ ရှင်းလင်း တင်ပြခြင်း င်း၊တင်ပြခြင်း (မြန်မာဘာသာဖြင့်)
- အဆိုပြုထားသော EIA လေ့လာမှုနှင့် အစီအမံများကို တင်ပြခြင်း၊ နှင့်
- အမေးအဖြေကဏ္ဍ။

နေရာ	အစည်းအဝေး ခန်း၊ ရေတံခွန်တောင် မြို့ပြခန်းမ
တက်ရောက်သူများ	အုပ်ချုပ်ရေးမှူး၊ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန- -MCDC မှ အရာရှိများ -REM အတိုင်ပင်ခံများ မိမိတို့ အထွေထွေမန်နေဂျာ၊ရေတံခွန်တောင် စီ - -AGM, PPT ရေတံခွန်တောင် စီမံကိန်း ၏ မန်နေဂျာများ - ရေတံခွန်တောင်စီမံကိန်း အင်ဂျင်နီယာဌာန - ရေတံခွန်တောင် စီမံကိန်း ၏ -HR ဌာန၊ ရေတံခွန်တောင် စီမံကိန်း ၏ -Sale & Marketing Department ၊

	ရေကြည်ရွာသားများ -
ရည်ရွယ်ချက်	ရေတံခွန် တောင်မြို့ စီမံကိန်း၏ ဖော်ပြချက်နှင့် သဘာဝပတ်ဝန်းကျင် ထိခိုက်မှု အကဲဖြတ်လေ့လာမှု၏ ရည်ရွယ်ချက်များ
အမေးအဖြေများ	
ဦးမြင့်ဦး ပုသိမ်ကြီးမြို့နယ်အုပ်ချုပ်ရေးမှူး၊ မြို့နယ်၊ မန္တလေးတိုင်း ဒေသကြီး	မေး: ရေအရည်အသွေးအခြေအနေကို ဘယ်လိုတိုင်းတာမလဲ။ ရာသီအလိုက် လား မဟုတ်ဘူးလား ဆောက်လုပ်ရေးလုပ်ငန်းခွင်က ရေမြောင်းတွေကို ဘယ်လိုတိုင်းတာမလဲ။
ဒေါ်ခင်ဥမ္မာထွေး ဒါရိုက်တာ REM	ဖြေမိုးရာသီနှင့် နွေရာသီ နှစ်ခုစလုံးအတွက် ရေအရည်အသွေးကို : နမူနာအမှတ်များဖြင့် တိုင်းတာမည်ဖြစ်သည်။ မြေပြင်ရေအရည်အသွေးကို ရာသီနှစ်လုံးတွင် တိုင်းတာမည်ဖြစ်သည်။ စီမံကိန်းနေရာအနီးရှိ ကြီး တူးမြောင်း မှ ရေအရည်အသွေးကိုလည်း ဆည်တော် စမ်းသပ်စစ်ဆေးမည်ဖြစ်သည်။
ဦးမြင့်ဦး ပုသိမ်ကြီးမြို့နယ်အုပ်ချုပ်ရေးမှူး၊ မြို့နယ်၊ မန္တလေးတိုင်း ဒေသကြီး	မေး: Villa Project တွင် အိမ်ရာယူနစ်မည်မျှ ဒီအိမ်ကြီးအတွက် ရေပေးဝေမှု အရင်းအမြစ်က ဘာလဲ။ စီမံကိန်းတွေက ဆည်တော်ကြီးတူးမြောင်းကို အသုံးပြုမယ်ဆိုရင် ရေရည်အတွက် ရေပေးဝေမှုကို ဘယ်လိုစီမံမလဲ။
မန်နေဂျာ ဦးအောင်ကျော် အုပ်ချုပ်ရေးဌာန၊ ရေတံခွန်တောင်မြို့ စီမံကိန်း	ဖြေ: အဲဒီမှာ အိမ်ရာယူနစ် ၅၀၀၀ ရှိမယ်။ ဆည်ကြီးကြီးတူးမြောင်း၊ မြစ်ဆုံနှင့် မြေအောက်ရေတို့မှ ရေအရင်းအမြစ်များကို အသုံးပြုမည်ဖြစ်သည်။
ဦးမြင့်ဦး ပုသိမ်ကြီးမြို့နယ်အုပ်ချုပ်ရေးမှူး၊ မြို့နယ်၊ မန္တလေးတိုင်း ဒေသကြီး	မေး: မျောက် အစရှိတဲ့ ဇာတိ တိရစ္ဆာန်တွေကို ဘယ်လို ထိန်းသိမ်းမလဲ။ စီမံကိန်းသည် SIA ကို အလေးထားသင့်ပြီး လူထု၏အသံကို နားထောင်သင့်သည်။ မြို့နယ်အုပ်ချုပ်ရေးဦးစီးဌာနမှ တရားဝင်အချက်အလက်များရရှိရန်နှင့် လုံခြုံရေး ဆိုင်ရာကိစ္စရပ်များကို စီမံခန့်ခွဲရန် ပူးပေါင်းဆောင်ရွက်သွားမည်ဖြစ်ကြောင်း သိရသည်။ ထို့နောက် မြို့နယ်အုပ်ချုပ်ရေး ဦးစီးဌာနအနေဖြင့် လမ်းဖွံ့ဖြိုး ရေးကဏ္ဍနှင့် ဆက်သွယ်ရေး အထောက်အကူပြု ပစ္စည်းများ ပါဝင်ဆောင်ရွက်ရန် MCDC ကို အကြံပြုလိုပါသည်။
ဒေါ်ခင်ဥမ္မာထွေး ဒါရိုက်တာ REM	

	<p>. ဖြေ ဟုတ်ပါတယ်။ ကွင်းဆင်းလေ့လာခြင်းနှင့် အချက်အလက်များ စုဆောင်းခြင်းမပြုမီ REM မှ GAD သို့ အကြောင်းကြားပါမည်။ စီမံကိန်းနှင့် ပတ်သက်သည့် ကုမ္ပဏီ၏ တရားဝင်ဝတ်စာမျက်နှာတွင်လည်း စီမံကိန်း ၏ထုတ်ဖော်မှုအစီအစဉ်ကို စတင်မည်ဖြစ်သည်။</p>
<p>MCDC မှ ဦးစီးအရာရှိ ဒေါ်ခင်ပြုံးလွင်၊</p>	<p>ဤအစည်းအဝေးတွင် MCDC ကိုယ်စား ပန်းဥယျာဉ်ရွာမှ တက်ရောက်ခဲ့သည်။ MCDC မှ ရေနှင့်သန့်ရှင်းရေးရွာမှ ကိုယ်စား လှယ်များ လာမည့်အစည်းအဝေး တွင် တက်ရောက်မည်ဖြစ်သည်။</p>
<p>ဦးအောင်လင်းက AGMI ရေတံခွန်တောင်မြို့စီမံကိန်း</p>	<p>ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း CSR အစီအစဉ်များအကြောင်း ဦးအောင်လင်းက ရှင်းပြသည်။ ယင်းတို့ ပါဝင်သည်။</p> <p>ဒေသခံပြည်သူများအတွက် -CSR အစီအစဉ်အတွက် ကျပ်ငွေ ၂၀၀၀၀၀၀၀ ၂ သုံးစွဲခဲ့သည်။</p> <p>မှ ၂၀၁၉-၂၀၁၈) င်ပင်လယ်လမ်းဆုံအထိစီမံကိန်းနေရာမှ အော -၂၀၂၀ (၂၀၂၁- (လမ်း ၆) ခုနှစ်အထိ လမ်းပိုင်းအတွက် ကျပ် ၃၀၀၀၀၀၀ အကုန်အကျခံ ၅. ဖောက်လုပ်ခဲ့ခြင်း၊</p> <p>-CSR အစီအစဉ်အားလုံးသည် ငွေကျပ် ၅၀၀၀၀၀၀၀ ဖြစ်သည်။ ၇.</p>
<p>ဦးသန့်ဇင်ဦး GM၊ ရေတံခွန်တောင်မြို့စီမံကိန်း</p>	<p>စီမံကိန်းဧရိယာအနီးရှိ ရေအရင်းအမြစ်များအကြောင်းကို ဦးသန့်ဇင်ဦးက ရှင်းပြသည်။</p> <p>-စီမံကိန်းဧရိယာအနီးတွင် ရေကျလေ့ရှိသော်လည်း ပြင်ဦးလွင်ဒေသတွင် မိုးသည်း ထန်စွာရွာပါက ၂ နှစ် သို့မဟုတ် ၃ နှစ်အတွင်း တစ်ကြိမ်သာ မြင်တွေ့ရသည်။</p> <p>.၃စီမံကိန်းနေရာနှင့် အောင်ပင်လယ်လမ်းဆုံမှ -၄၇ မိုင် အကွာတွင် ဖောက်လုပ်ထား ပြီးဖြစ်ကြောင်း သိရသည်။</p> <p>တံတား၊ -လမ်းနှင့် စက်ရုံတည်ဆောက်ရေးလုပ်ငန်းများ စတင်ဆောင်ရွက် နေပါသည်။</p>
<p>ပုသိမ်ကြီးမြို့နယ် အုပ်ချုပ်ရေးမှူး ဦးမြင့်ဦးက အောက်ပါအတိုင်း နိဂုံးချုပ်အမှာစကား ပြောကြားသည်။</p> <p>စည်းအဝေးကို ဆက်လက်ဆောင်ရွက်ရန် ရေရှည်တည်တံ့ခိုင်မြဲသော ဖွံ့ဖြိုးတိုးတက်ရေးအတွက် ညှိနှိုင်းအ - လိုအပ်ပါသည်။</p> <p>ပုသိမ်ကြီးမြို့နယ် ဖွံ့ဖြိုးတိုးတက်ရေး အတွက် အားပေးမှု တစ်ခုဖြစ်သည်။ ထို့ကြောင့် ရေရှည်တည်တံ့မှုကို - ထည့်သွင်းစဉ်းစားရန် လိုအပ်ပါသည်။</p>	

က်မည်ဖြစ်သည်။ ထို့ကြောင့် စီမံကိန်းသည် မန္တလေးမြို့၏ အဓိက ဖွံ့ဖြိုးတိုးတက်ရေး နယ်မြေအဖြစ်လည်း ဆောင်ရွက် - စီမံကိန်း၏ ရေရှည်တည်တံ့မှုကို ထည့်သွင်းစဉ်းစားရန်နှင့် CSR အစီအစဉ်များ၏ ဗျူဟာမြောက် ရှုထောင့်ကို ထည့်သွင်းစဉ်းစားရန် ပိုမိုကောင်းမွန်ပါသည်။

အစည်းအဝေး အောင်မြင်စွာ ပြီးမြောက်ခဲ့ပါသည်။

ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်း အဆင့် လူထုတွေ့ဆုံဆွေးနွေးချက်မှ မှတ်ချက်များ အကျဉ်းချုပ် အစည်းအဝေးများအတွင်း အောက်ပါအကြောင်းအရာများနှင့် စိုးရိမ်ပူပန်မှုများကို ဆွေးနွေးပြီး စုစည်းထားပါသည်။

- ကိုယ်ပိုင် မီးသတ် တည်ထောင်ပါ။
- အလုပ်သမားများအား စည်းကမ်းရှိရှိနေထိုင်ရန် ထိန်းချုပ်ပါ။
- ပတ်ဝန်းကျင်ရှိ အမှိုက်များနှင့်ပတ်သက်ပြီး စိုးရိမ်မှုများ။

အစည်းအဝေးမှတ်တမ်းများနှင့် ပါဝါပွင့်တင်ပြချက်အသေးစိတ်များကို အောက်ဖော်ပြပါနှင့် နောက်ဆက်တွဲတွင် တင်ပြထားပါသည်။

ဇယား ၆.၂ ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်း အဆင့် PCM များ၏ရလဒ်များအကျဉ်းချုပ်

Date:	30-1-2024
Time:	10:00 pm – 12:00 pm
Venue:	Meeting Room, Ye Dagon Taung City Show Room
ဦးသက်လွင်ရွှေ Deputy (CEO) Ye Da Gyun Taung Project	အဖွင့်အမှာစကားနှင့် ရေတံခွန်တောင် စီမံကိန်း၏ အကြောင်းအရာများ ရှင်းလင်းချက်
အမေးအဖြေ	
ရေကြည်ကျေးရွာ အုပ်ချုပ်ရေးမှူး	မေး- စီမံကိန်းတွေ ဆောင်ရွက်နေပြီး အလုပ်အကိုင် အခွင့်အလမ်းတွေ ရလာတဲ့အခါ အနီးပတ်ဝန်းကျင်က မိသားစုတွေကို အရင်ဆုံး စဉ်းစားစေချင်တယ်။ ဆောက်လုပ်ရေးကာလတွင် ဤနေရာတွင် လုပ်ကိုင်နေကြသော အလုပ်သမားများအား စည်းကမ်းရှိရန်နှင့် လုံခြုံရေးအရ နေထိုင်သင့်သည်ဟု အကြံပြုလိုပါသည်။ သူတို့ဟာ အရပ်ရပ်က နေပြီး ဒီနေရာက မဟုတ်ဘူး။ ဒါကြောင့် သူတို့ကို စီမံခန့်ခွဲရတာ အရမ်းခက်ခဲတဲ့အတွက် သူတို့ကို စနစ်တကျ လုပ်စေချင်တယ်။ ပတ်ဝန်းကျင်ကိစ္စတွေကို နားမလည်ဘူး။ ဒါပေမယ့်

တာဝန်ရှိသူတွေရဲ့ ညွှန်ကြားချက်နဲ့အညီ စနစ်တကျ ဆောင်ရွက်ပေးဖို့ လိုပါတယ်။
အဖြေ၊ အကြံပြုချက်အတိုင်း လိုက်နာပါမည်။

၇.၂. သတင်းအချက်အလက်ထုတ်ဖော်ခြင်းအစီအစဉ်

အကြံပြုလွှာတောင်းခံခြင်း

မန္တလေးတိုင်းဒေသကြီး၊ ပုသိမ်ကြီးမြို့နယ်တွင် မန္တလေးမြို့တော်စည်ပင်သာယာရေးကော်မတီနှင့် ဖွံ့ဖြိုးသစ်ကုမ္ပဏီတို့ ပူးပေါင်း အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိသည့်

ရေတံခွန်တောင်စီးတီးစီမံကိန်း (YE DAGUN TAUNG CITY PROJECT)အား ပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်းအစီရင်ခံစာ ကို မြန်မာနိုင်ငံမှ Resource and Environment Myanmar Co., Ltd. (REM)နှင့် တွဲဖက်ဆောင်ရွက်မည်ဖြစ်ပြီး ပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်းအစီရင်ခံစာအတွက် သက်ဆိုင်သူများနှင့်တွေ့ဆုံခြင်းအစည်းအဝေးကို (၁.၁၀.၂၀၂၁) ရက်နေ့တွင် ဆောင်ရွက်ခဲ့ပါသည်။

သို့ဖြစ်ပါ၍ ရေတံခွန်တောင်စီးတီးစီမံကိန်း (YE DAGUN TAUNG CITY PROJECT)နှင့် ပတ်သက်သော အကြံဉာဏ်များပေးပို့လိုပါက ဖွံ့ဖြိုးသစ်ကုမ္ပဏီ၏ phwintphyothit.com website ၏ chat box တွင်လည်းကောင်း၊ info@phwintphyothit.com သို့လည်းကောင်း အကြံပြုစာများ ရေးသားပေးပို့နိုင်ပါသည်။

Contact Send us message

အစည်းအဝေးများအားလုံးကို ဂရုတစိုက်မှတ်တမ်းတင်ပြီး မှတ်တမ်းတင်ထားမည်ဖြစ်ပြီး၊ မှတ်တမ်းများ ယူမည်ဖြစ်ပြီး နောက်ဆက်တွဲလုပ်ဆောင်မှုများကို မှတ်တမ်းတင်မည်ဖြစ်သည်။ အဓိကသက်ဆိုင်သူများနှင့် ထိတွေ့ဆက်ဆံမှု အမျိုးအစား လေးမျိုးရှိသည်အဓိကသက်ဆိုင်သူများ၏ ခွဲခြမ်းစိတ်ဖြာမှုအပေါ် အခြေခံ၍ - သက်ဆိုင်ရာ သက်ဆိုင်သူ တစ်ဦးစီအတွက် သင့်လျော်သော ချဉ်းကပ်မှုများနှင့် လုပ်ဆောင်မှု အစီအစဉ်ကို ချမှတ်ရန် လိုအပ်ပါသည်။ စီမံကိန်း အချက်အလက်ကို ရဲဒွန်တောင်ကုမ္ပဏီ၏ Website နှင့် Facebook စာမျက်နှာတွင် အများသူငှာ ကြည့်ရှုနိုင်ပါသည်။

၇ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် (EMP) ကို လျော့ပါးစေရေး အစီအမံများ သဘာဝပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်)ကို လျော့ပါးစေရေး အစီအမံများ အကောင်အထည်ဖော်ရန်နှင့် စောင့်ကြည့်ရန် လိုအပ်ချက်များကို လမ်းညွှန်ရန် ပြင်ဆင်ထားပါသည်။ ၎င်းတွင် အင်စတီကျူးရှင်းများနှင့် ၎င်းတို့၏ အခန်းကဏ္ဍများ၊ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု လှုပ်ရှားမှုများ၊ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အဖွဲ့အစည်း ဖွဲ့စည်းပုံနှင့် လျော့ပါးသက်သာစေရေး ဆောင်ရွက်မှုများအတွက်

ဘတ်ဂျက်တို့ ပါဝင်သည်။ သဘာဝပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုယူနစ်သည် လျော့ပါးသက်သာစေရေး အစီအမံများ အကောင်အထည်ဖော်ရန်နှင့် စောင့်ကြည့်ရေးစီမံချက်အတွက် တာဝန်ရှိမည်ဖြစ်သည်။ EMP ကို အလုံးစုံ အကောင်အထည်ဖော်ခြင်းသည် စီမံကိန်း အကောင်အထည်ဖော်ဆောင်သူ ၏ တာဝန်ဖြစ်သည်။

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
ဆောက်လုပ်ရေးအဆင့်ဤအဆင့်တွင် အဆောက်အဦ - ဆောက်လုပ်ခြင်းလုပ်ငန်းများမှာ ဥပမာအားဖြင့် ဧည့်ခန်းများ၊ ရုံးခန်းများ၊ ဝန်ထမ်းများနှင့် အလုပ်သမားများအတွက် နေရာများ၊ ဂိတများ၊ ရေထိန်းနံရံနှင့် ကြည်လင်သောရေတိုင်ကီ စသည်တို့ဖြစ်သည်။						
တိုက်ရိုက်သက်ရောက်မှု						
ရေအရည်အသွေး	ဆောက်လုပ်ရေး နေရာအားလုံး	<ul style="list-style-type: none"> ✓ အောက်ဖော်ပြပါ လျော့ပါးရေးအစီအမံများကို ဆောင်ရွက်သင့်သည် - ✓ မိုးရာသီတွင် မြေလုပ်ငန်းများ ရှောင်ကြဉ်ခြင်း ဖြင့် ညစ်ညမ်းရေများ လျော့နည်းစေကာ သင့်လျော်သော ရေဆိုးထုတ်မြောင်းစနစ် ဆောင်ရွက်ပေးရမည်။ ✓ အလုပ်သမားများအတွက် ယာယီအိမ်သာ ထားရှိပေးရမည်။ ✓ ဆီနှင့်ဆီများကို သိုလှောင်ခြင်းနှင့် သယ်ယူပို့ဆောင်ရာ တွင် ယိုစိမ့်မှုဒဏ်ခံနိုင်သော ကွန်တိန်နာများကို အသုံးပြုကာ ဆီနှင့် အဆီကို တွယ်ရာနေရာများ၏ မစိမ့် ဝင်နိုင်သော ကြမ်းပြင်များကို ပြုလုပ်ထား သင့်သည်။ 	ဆောက်လုပ်ရေး ကာလ တစ်လျှောက်	သိန်း ၃၀	ဆောက်လုပ်ရေးကု မ္ပဏီ ကြီးကြပ်ရေးမှူး	HSE Coordinat or
မြေဆီလွှာတိုက်စားမှု နှင့် မြေပြိုမှု	ဆောက်လုပ်ရေးနေရာ အားလုံး	✓ ဆီ သို့မဟုတ် ဆီများယိုဖိတ်မှု၊ ယိုစိမ့်မှု သို့မဟုတ် စွန့်ထုတ်မှုများ ကြောင့် မြေဆီလွှာညစ်ညမ်းမှုကို	ဆောက်လုပ်ရေး ကာလ	သိန်း ၂၀	ဆောက်လုပ်ရေးကု မ္ပဏီ	HSE Coordinat

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
		<p>တားဆီးရန်၊ ဆောက်လုပ်ရေးနှင့် စက်များသို့ လောင်စာဆီ ပေးဆောင် ခြင်း လုပ်ငန်းစဉ်များတွင် ဖြစ်ပေါ်လာ သည့် ဆီများအားလုံးကို အမြင့်ဆုံး သတိထား ဤ လုပ်ဆောင်သင့်သည်။</p> <p>✓ သတ်မှတ်ထားသော အလုပ်နေရာ များ နှင့် လမ်းများအပြင်တွင် စက်ကိရိယာ နှင့် ယာဉ်များဖြင့် သွားလာခြင်းကို တားမြစ်ရမည်။</p>	တစ်လျှောက်		ကြီးကြပ်ရေးမှူး	or
လေအရည်အသွေး	ဆောက်လုပ်ရေးနေရာ အားလုံး	<p>✓ ပစ္စည်းကိုင်တွယ်ခြင်းလုပ်ငန်းစဉ်တွင် ရေဖြန်းခြင်း၊ အိတ်ကဲ့သို့သော အဖုံး သို့မဟုတ် ထိန်းချုပ်ကိရိယာများကို အသုံးပြုသင့်သည်။</p> <p>✓ ခွင့်ပြုထားသည့် ကန့်သတ်ချက် အတွင်း အိတ်စောထုတ်လွှတ်မှုကို ထိန်းသိမ်းရန်အတွက် စက်ယန္တရားများ အားလုံးတွင် ထိရောက်သော အင်ဂျင် နှင့် အိတ်စောစနစ်များ ရှိရမည်။</p> <p>✓ စွန့်ပစ်ပစ္စည်းများကို မီးရှို့ဖျက်ဆီးခြင်း မပြုရ။</p>	ဆောက်လုပ်ရေး ကာလ တစ်လျှောက်	သိန်း ၅၀	ဆောက်လုပ်ရေး ကုမ္ပဏီ ကြီးကြပ်ရေးမှူး	HSE Coordinator or
ဆူညံမှု	ဆောက်လုပ်ရေးနေရာ အားလုံး	<p>✓ အရည်အချင်းပြည့်မီသော အင်ဂျင်နီယာများ နှင့် ကြီးကြပ်ရေးမှူးများကို ခန့်ထားခြင်းဖြင့်</p>	ဆောက်လုပ်ရေး ကာလ	သိန်း ၁၀	ဆောက်လုပ်ရေး ကုမ္ပဏီ	HSE Coordinator

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
		<p>ဆောက်လုပ်ရေးလုပ်ငန်းကို အချိန်တိုအတွင်း ပြီးမြောက်စေရမည်။</p> <ul style="list-style-type: none"> ✓ ဆောက်လုပ်ရေးလုပ်ငန်းများကိုလည်း နေ့ခင်းဘက်တွင် လုပ်ဆောင်ရန် ကန့်သတ်ထားရမည်။ ✓ ဆူညံသံထိန်းချုပ်သည့်ကိရိယာများဖြစ်သည့် ထိခိုက်မှုပေါက်ကွဲခြင်းဆိုင်ရာလှုပ်ရှားမှုများအတွက် ယာယီဆူညံသံအတားအဆီးများနှင့် deflectors များ၊ လောင်ကျွမ်းအင်ဂျင်များ အတွက် အိတ်စောထုတ်စက်များကို အသုံးပြုသင့်သည်။ ✓ ဂျင်နရေတာအတွက် ဆူညံသံအကာအရံများ ဆောက်ထားသင့်သည်။ 	တစ်လျှောက်		ကြီးကြပ်ရေးမှူး	or
အမှိုက်	ဆောက်လုပ်ရေးနေရာ အားလုံး	<ul style="list-style-type: none"> ✓ အဆိုပါ အမှိုက်စွန့်ပစ်မှုကို လျော့ချရန်နှင့် ထိန်းချုပ်ရန်၊ ✓ စည်းကမ်းသတ်မှတ်ချက်များနှင့်အညီ သင့်လျော်သော ကျန်းမာရေးနှင့် ဘေးကင်းရေးဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများကို အသုံးပြု၍ 	ဆောက်လုပ်ရေး ကာလ တစ်လျှောက်	သိန်း ၃၀	ဆောက်လုပ်ရေး ကုမ္ပဏီ ကြီးကြပ်ရေးမှူး	HSE Coordinator or

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
		<p>ဆောက်လုပ်ရေးလုပ်ငန်းများကို ဆောင်ရွက်သင့်သည်။</p> <p>✓ အချို့သော အမှိုက်အမျိုးအစားများသည် မြေဖြည့်ခြင်း၊ အချို့ကို ပြန်လည်အသုံးပြုသင့်ပါသည်။</p>				
ပန်းမန် သစ်ပင်	ဆောက်လုပ်ရေးနေရာ အားလုံး	<p>✓ ဖြစ်နိုင်လျှင် ဒီဇိုင်းနှင့် ဆောက်လုပ်ရေး အဖွဲ့သည် အမြင်ပဒေသ ထိခိုက်မှုကို တတ်နိုင်သမျှလျော့ချကာ သစ်ပင်များကို ထိန်းသိမ်းထားရန် ရှာဖွေသင့်သည်။</p> <p>✓ သဘာဝပတ်ဝန်းကျင်နှင့် ပတ်ဝန်းကျင် အသိုင်းအဝိုင်းအပေါ် ဖြစ်ပေါ်လာနိုင်သော ဆိုးကျိုးများကို လျော့ချရန် စီမံကိန်း ချိန်ညှိမှုကို ဂရုတစိုက်ရွေးချယ်သင့်သည်။</p>	ဆောက်လုပ်ရေး ကာလ တစ်လျှောက်	သိန်း ၅၀	ဆောက်လုပ်ရေး ကုမ္ပဏီ ကြီးကြပ်ရေးမှူး	HSE Coordinator
လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးကင်းလုံခြုံရေး	ဆောက်လုပ်ရေးနေရာ အားလုံး	<p>✓ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးကင်းရေး စီမံခန့်ခွဲမှု အတွက်၊</p> <p>✓ စီမံကိန်းအဆိုပြုသူ၏ကိုယ်စားလှယ်သည် EMP ကိုအခြေခံ၍ ဆောက်လုပ်ရေးလုပ်သား များအတွက် ကျန်းမာရေးနှင့်ဘေးကင်းရေး စီမံခန့်ခွဲမှုအစီအစဉ်</p>	ဆောက်လုပ်ရေး ကာလ တစ်လျှောက်	သိန်း ၃၀	ဆောက်လုပ်ရေး ကုမ္ပဏီ ကြီးကြပ်ရေးမှူး	HSE Coordinator

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
		<p>ရှိသင့်သည်။</p> <ul style="list-style-type: none"> ✓ သက်ဆိုင်ရာ ကျန်းမာရေး စည်းမျဉ်းများကို အလေးထားသော ကန်ထရိုက်တာများ အတွက် သင့်လျော်သော အခြားဘာသာ စကား ဖြင့် ပြသထားသော ပိုစတာများကို သင့်လျော်သော အရင်းအမြစ်များမှ ရယူပြီး ဆိုဒ်တွင် ထင်ရှားစွာ ပြသသင့်ပါသည်။ ✓ ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း လုံခြုံရေး လက်အိတ်များ၊ ဦးထုပ်ဆောင်းခြင်း၊ မျက်မှန်များ၊ နားကြပ်များ အစရှိသည့် တစ်ကိုယ်ရေ အကာအကွယ်ပစ္စည်းများကို ပေးဆောင်ရမည်။ ✓ ဆောက်လုပ်ရေး ဝန်ထမ်းများ၏ ဘေးကင်း စေရန် အတွက် ရှေးဦးသူနာပြု အဆောက်အဦများ ရရှိနိုင်မှု အပါအဝင် လုံလောက်သော ဘေးကင်းရေး အစီအမံများ ကို စီမံကိန်းဆိုက်တွင် အကောင်အထည်ဖော် ဆောင်ရွက်ရမည်။ 				
<p>လည်ပတ်မှု ဧည့်သည်များ၊ ဟိုတယ်ဝန်ဆောင်မှုနှင့် ပြုပြင်ထိန်းသိမ်းမှု၏ အဓိကလုပ်ငန်းများမှာ -ဟိုတယ်ဝန်ဆောင်မှုအဆင့်/စားသောက်ဆိုင်များ၊ ဘားများ၊ အစည်းအဝေး၊</p>						

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
ခရီးသွားလာမှုနှင့် ဆက်သွယ်မှုများအတွက် ဝန်ဆောင်မှုများဖြစ်သည်။						
တိုက်ရိုက်သက်ရောက်မှု						
ရေထိန်းသိမ်းမှု	ရေချိုးခန်း၊ မီးဖိုချောင်နှင့် ဧည့်ခန်း	<ul style="list-style-type: none"> ✓ ဟိုတယ်သည် သင့်လျော်သော ရေဆိုးထုတ်မြောင်းများကို အသုံးပြုရန် စီစဉ်သင့်ပြီး အဝတ်လျှော် နှင့် မီးဖိုချောင်တွင် ထိရောက်သော စက်များကို အသုံးပြုသင့်သည်။ ✓ အလွန်နိမ့်သော ရေဆေးအိမ်သာများ၊ ဖြန်းဆေး Nozzles၊ ဆီများ၊ faucet aerators နှင့် low-flow shower head၊ infrared နှင့် ultrasonic sensor water spigots နှင့် pressure-control valves ကဲ့သို့သော ရေကိုချွေတာသည့်ကိရိယာများ ၊ ✓ 	လည်ပတ် ကာလတစ် လျှောက်လုံး	သိန်း ၃၀	အထွေထွေမန်နေဂျာ နှင့် အဆိုပြုသူ	HSE Coordinator
စွမ်းအင်ချွေတာမှု	ရည်ရွယ်ထားသော ဟိုတယ်နေရာ	<ul style="list-style-type: none"> ✓ စွမ်းအင်သုံးစွဲမှုကို လျှော့ချရန်အတွက် မီးသီးများ၊ အလိုအလျှောက်တံခါးသော့နှင့် စွမ်းအင်ချွေတာသည့် ခလုတ်ကတ်ကဲ့သို့သော စွမ်းအင်ချွေတာရေးကိရိယာများကို အသုံးပြုပါမည်။ 	လည်ပတ် ကာလတစ် လျှောက်လုံး	သိန်း ၁၀	အထွေထွေမန်နေဂျာ နှင့် အဆိုပြုသူ	HSE Coordinator
မြေဆီလွှာအရည်	ရည်ရွယ်ထားသော	<ul style="list-style-type: none"> ✓ မီးခိုးရောင်ရေသန့်စက်ကို တပ်ဆင်ပါ။ မြောင်းထဲသို့ 	လည်ပတ်	သိန်း ၁၀	အထွေထွေမန်နေဂျာ	HSE

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
အသွေးနှင့်ဖွဲ့စည်းပုံ	ဟိုတယ်နေရာ	မထွက်မီ မှန်ကန်သော နည်းလမ်းများ ဖြင့် လုပ်ဆောင်သင့်သည်။ အလင်းရောင်ကောင်းစွာ ရှိပြီး ကောင်းမွန်စွာ ထိန်းသိမ်းထားသော ပုံမှန် မိလ္လာအမျိုးအစား အိမ်သာများကို အသုံးပြုပါမည်။	ကာလတစ် လျှောက်လုံး		ဂျာ နှင့် အဆိုပြုသူ	Coordinat or
လေအရည်အသွေး	ရည်ရွယ်ထားသော ဟိုတယ်နေရာ	<ul style="list-style-type: none"> ✓ မီးရှို့ဖျက်ဆီးရာတွင် ရော်ဘာနှင့် ပလတ်စတစ်များကို မီးရှို့ခြင်းကို ခွင့်မပြုဘဲ အကောင်းဆုံး လောင်ကျွမ်းသည့် အလေ့အကျင့်ကို ကျင့်သုံးရမည်။ ✓ အသုံးမပြုချိန်တွင် အင်ဂျင်ကိုပိတ်ပါ။ ✓ လေထုညစ်ညမ်းမှု နည်းပါးစေရန်အတွက် ကြိုတင်စက် များ၊ စက်ကိရိယာများနှင့် နည်းလမ်းများကို အသုံးပြု၍ စက်ဖုံးအုပ်ခြင်း၊ လမ်းများကို ရေလောင်းပေးခြင်းစသည့် လေထုညစ်ညမ်းမှုကို လျှော့ချရန်။ 	လည်ပတ် ကာလတစ် လျှောက်လုံး	သိန်း ၅၀	အထွေထွေမန်နေဂျာ နှင့် အဆိုပြုသူ	HSE Coordinat or
အသံဆူညံမှု	ဧည့်ခန်း၊ မီးဖိုချောင်နှင့် ရှုခင်းများ	<ul style="list-style-type: none"> ✓ အသံလျှော့ချရေးပစ္စည်းများပါရှိသော တံခါးပေါက်ကို တပ်ဆင်သင့်သည်။ ✓ အဆိုပြုထားသည့် ဟိုတယ်၏ ဆူညံသံ သက်ရောက်မှုကို ဇီဝဗေဒထိန်းချုပ်မှုအနေဖြင့် ရင်းနှီးမြှုပ်နှံသူသည် နယ်နိမိတ်များ၏ ပတ်ပတ် 	လည်ပတ် ကာလတစ် လျှောက်လုံး	သိန်း ၁၀	ဟိုတယ် အထွေထွေမန်နေဂျာ နှင့် အဆိုပြုသူ	HSE Coordinat or

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
		လည်တွင် သစ်ပင်များ စိုက်ပျိုးခြင်း အပါအဝင် စိမ်းလန်းစိုပြည်ရေးနှင့် ရှုခင်းပြင်ဆင်ခြင်းအစီအစဉ် ရှိပါသည်။				
အမှိုက်	မီးဖိုချောင် အမှိုက် မီးရှို့ရာ နေရာ	<ul style="list-style-type: none"> ✓ ဧည့်သည်များအား မျက်နှာသုတ်ပုဝါနှင့် အိပ်ယာများကို ပြန်လည်အသုံးပြုရန် တောင်းဆိုခြင်းဖြင့် အဝတ်လျှော်အသုံးပြုမှုကို လျှော့ချသင့်သည်။ ✓ ဟိုတယ်တွင် အမှိုက်အမျိုးအစားများနှင့် စိုစွတ်သောအခြောက်အခြာအနေအပေါ် မူတည်၍ သီးခြားစီထားရှိပေးရမည်။ ✓ ဆပ်ပြာများ သုံးစွဲမှုကို ထိန်းချုပ်သင့်သည်။ 	လည်ပတ် ကာလတစ် လျှောက်လုံး	သိန်း ၃၀	ဟိုတယ် အထွေထွေမန်နေဂျာ နှင့် အဆိုပြုသူ	HSE Coordinat or
လူသား	ရည်ရွယ်ထားသော ဟိုတယ်နေရာ	<ul style="list-style-type: none"> ✓ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်း ရေး တားဆီးလျှော့ချရေး၊ ✓ ချော်လဲခြင်းမှ ကင်းဝေးစေရန် လှေကားထစ်အစွန်း တစ်လျှောက်တွင် တိပ်ပြားများကို တပ်ဆင်ထားသင့်သည်။ ✓ အလုပ်သမားများအား မီးဖိုချောင်အဝတ်အစား မပါဘဲ မီးဖိုချောင်ထဲသို့ ဝင်ခွင့်မပြုသင့်ပါ။ 	လည်ပတ် ကာလတစ် လျှောက်လုံး	သိန်း ၅၀	ဟိုတယ် အထွေထွေမန်နေဂျာ နှင့် အဆိုပြုသူ	HSE Coordinat or

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
		<ul style="list-style-type: none"> ✓ ဧည့်ခန်းတွင် Site Plan ထားရှိရမည်။ အရည်အချင်းပြည့်မီသော ရှေးဦးသူနာပြုကို အချိန်တိုင်း ပံ့ပိုးပေးရမည်။ ✓ သင့်လျော် သော အထပ်တွင် လေဝင်လေထွက် ကောင်း သော အနားယူခန်းထားရှိရမည်။ 				
<p>ဖျက်သိမ်းခြင်းအဆင့် နှစ် -၅၀ ကြာပြီးနောက်၊ ဤသည်စီမံကိန်း၏နောက်ဆုံးအဆင့်ဖြစ်ပြီး၊ ၎င်းသည် ရင်းနှီးမြှုပ်နှံမှုစာချုပ်တွင်ဖော်ပြထားသည့်အခြေအနေနှင့်ဆက်စပ်နေမည်ဖြစ်သည်။ ဖြိုဖျက်ရာတွင် ဖြိုဖျက်သည့် စက်ကိရိယာများကို အသုံးပြုရန် လိုအပ်သည်။ လိုအပ်ပါက ယင်းတို့ကို ဖြိုဖျက်ရာတွင် အသုံးပြုသည့် လက်ရှိ အန္တရာယ်ရှိသော ပစ္စည်းမှန်သမျှကို အုပ်ချုပ်ရေး အာဏာပိုင်များ၏ သတ်မှတ်ချက်များနှင့်အညီ စနစ်တကျ ကိုင်တွယ်စွန့်ပစ်ခြင်း ခံရမည်ဖြစ်သည်။</p>						
<p>တိုက်ရိုက်သက်ရောက်မှု</p>						
ရေ အရည်အသွေး	ဖျက်သိမ်းနေရာအားလုံး	<ul style="list-style-type: none"> ✓ လျော့ပါးရေးအစီအမံသည် ဆောက်လုပ်ရေး အဆင့်နှင့် ဆင်တူသည်။ ✓ ရေဆိုးများကို စနစ်တကျစွန့်ထုတ်ခြင်းဖြင့် ညစ်ညမ်း သောရေကို လျှော့ချရမည်။ ✓ အလုပ်သမားနှင့် ယိုစိမ့်မှုဒဏ်ခံနိုင်သော ကွန်တိန်နာ များ အတွက် ယာယီအိမ်သာကို ဆီနှင့်ဆီများ သယ်ယူရာတွင် သိုလှောင်ရန်နှင့် ဆီနှင့်ဆီနှင့် အဆီကိုင်တွယ်ရာနေရာများ၏ မစိမ့်ဝင်သော 	အဆင့်တစ် လျှောက်လုံး	သိန်း ၂၀	ဖြိုချသည့် ကုမ္ပဏီ	HSE Coordinat or

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
ဆူညံသံ	ဖျက်သိမ်းနေရာအားလုံး	<ul style="list-style-type: none"> ✓ ကြမ်းပြင် များ ကို ပြုလုပ် ထားရန် လိုအပ် ပါသည်။ ✓ ဆူညံသံညစ်ညမ်းမှု လျှော့ချရန်၊ ✓ ဆူညံသော ဆောက်လုပ်ရေးလုပ်ငန်းများကို နေ့ခင်း ဘက်ဖြစ်ရန် စီစဉ်သင့်သည်။ ✓ ဖြိုဖျက်သည့်စက်များ၊ မီးစက်များနှင့် အခြားစက် ကိရိယာများကို ကောင်းမွန်သောအခြေအနေတွင် အသုံးပြုသင့်ပြီး လျှပ်ကာများဖြင့် ပြုလုပ်ထား သင့်သည်။ 	အဆင့်တစ် လျှောက်လုံး	သိန်း ၁၀	ဖြိုချသည့် ကုမ္ပဏီ	HSE Coordinat or
အမှိုက်	ဖျက်သိမ်းနေရာအားလုံး	<ul style="list-style-type: none"> ✓ စွန့်ပစ်ပစ္စည်းများကို ထိန်းချုပ်ရန်၊ ✓ ထိရောက်သော အမှိုက်စီမံခန့်ခွဲမှုစနစ် ထားရှိသင့် သည်။ ✓ ပြန်လည်အသုံးပြုခြင်းပြန်လည်အသုံးပြုရန် / သို့ မဖြစ်နိုင်ပါက စွန့်ပစ်ပစ္စည်းကို စွန့်ပစ်သည့်နေရာ သယ်ဆောင်သွားသင့်ပါသည်။ 	အဆင့်တစ် လျှောက်လုံး	သိန်း ၂၀	ဖြိုချသည့် ကုမ္ပဏီ	HSE Coordinat or
လုပ်ငန်းခွင်ကျန်းမာရေး နှင့်ဘေးကင်းလုံခြုံရေး	ဖျက်သိမ်းနေရာအားလုံး	<ul style="list-style-type: none"> ✓ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးကို ထိန်းချုပ်နိုင်ရန်၊ ✓ ဘေးကင်းရေးလုပ်ထုံးလုပ်နည်းများကို လိုက်နာ 	အဆင့်တစ် လျှောက်လုံး	သိန်း ၃၀	ဖြိုချသည့် ကုမ္ပဏီ	HSE Coordinat or

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
		<p>ကျင့်သုံးကာ မတော်တဆမှုတုံ့ပြန်မှုအတွက် အရေးပေါ်စီမံချက်များ ပြင်ဆင်ခြင်းဖြင့် ဖြိုဖျက်လုပ်သားများ ၏ မတော်တဆထိခိုက်မှုများကို လျော့ပါးစေခြင်း။</p> <ul style="list-style-type: none"> ✓ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာ စည်းမျဉ်းစည်းကမ်းများကို လိုက်နာဆောင်ရွက်ရမည်။ ✓ ဖြိုခွင်းလုပ်သားများအတွက် သင့်လျော်သော တစ်ကိုယ်ရေ အကာအကွယ်ပစ္စည်းများကို ပံ့ပိုးပေးသင့်ပြီး ဖြိုခွင်းသည့်ဝန်ထမ်းများအတွက် ဘေးကင်းပြီး ကျန်းမာသောပတ်ဝန်းကျင်ကို အာမခံချက်ပေးရမည်။ 				
အများသူငှာ နှင့် ရုပ်ရွာဝန်ဆောင်မှုများ	ဖျက်သိမ်းနေရာအားလုံး	<ul style="list-style-type: none"> ✓ လျော့ပါးရေးအစီအမံများ ပါဝင်သည် - ✓ ယာဉ်မောင်းများကြားတွင် ဘေးကင်းရေးကဏ္ဍများကို အလေးထားဆောင်ရွက်သင့်သည်။ ✓ ယာဉ်မောင်းကျွမ်းကျင်မှုနှင့် ယာဉ်မောင်းလိုအပ်ချက်ကို မြှင့်တင်ပေးရမည်။ 	အဆင့်တစ်လျှောက်လုံး	သိန်း ၁၀	ဖြိုချသည့် ကုမ္ပဏီ	HSE Coordinator

Issue	နေရာ	လျော့ပါးရေး အစီအစဉ်များ	အချိန်ကာလ	ခန့်မှန်းကုန်ကျစရိတ် (MMK in thousands)	အကောင်အထည်ဖော် ဆောင်ရွက်သူ	ကြီးကြပ်/ ခွင့်ပြုသူ
တောရိုင်းတိရစ္ဆာန် ဘေးမဲ့တော	စီမံကိန်း တစ်ခုလုံး	<ul style="list-style-type: none"> ✓ တောရိုင်းတိရစ္ဆာန် ဘေးမဲ့တော ဖျက်သိမ်းရေး အဆင့်တွင် ထိခိုက်မှုမှ ကာကွယ်ရန်၊ ✓ ဟိုတယ်စီမံခန့်ခွဲမှုနှင့် ဖွံ့ဖြိုးတိုးတက်ရေး ကော်မတီ အား ဂေဟစနစ်နှင့် ဇီဝမျိုးစုံမျိုးကွဲများ ပေါင်းစပ် ထား သည့် ရေရှည်မျှော်မှန်းချက်ဖြင့် လမ်းညွှန် သင့်သည်။ 	အဆင့်တစ် လျှောက်လုံး	သိန်း ၃၀	ဖြူချသည့် ကုမ္ပဏီ	HSE Coordinat or

၇.၂ လူမှုစီမံခန့်ခွဲမှု

ကုမ္ပဏီသည် နိုင်ငံတကာ အကောင်းဆုံးကျင့်ထုံးများအပြင် မြန်မာ့လေ့ထုံးတမ်းစဉ်းမျဉ်းစဉ်းကမ်းများနှင့်အညီ အလုပ်သမားအခွင့်အရေးများ အထူးသဖြင့် အမျိုးသမီးဝန်ထမ်း၏ အခွင့်အရေးများကို စောင့်ရှောက်ခြင်းဖြင့် အကျိုးသက်ရောက်မှု ထုတ်ပြန်ချက်တွင် ဖော်ပြထားသည့် အလုပ်သမားပြဿနာကို ရှောင်ရှားမည် ဖြစ်ပါသည်။ အသင့်တော်ဆုံး လစာပမာဏကို အကျိုးရှိရှိ အသုံးချသွားမည်ဖြစ်ပြီး အချိန်ကြာလာသည်နှင့်အမျှ လူမှုဘဝအပေါ် သက်ရောက်မှုကြောင့် အခြားလျော်ကြေးငွေများ ကို အသုံးချသွားမည်ဖြစ်ပါသည်။

၇.၃ ဘေးကင်းရေးနှင့် လုံခြုံရေးစီမံချက်

ဤဘေးကင်းရေးနှင့် လုံခြုံရေးစီမံချက်သည် စီမံကိန်း တည်ဆောက်မှုအဆင့်နှင့် လုပ်ငန်းလည်ပတ်မှုအဆင့်အတွင်း အကောင်အထည်ဖော်ရန် ရည်ရွယ်ပါသည်။ ၎င်းသည် အလုပ်သမားများအတွက် အမြင့်ဆုံးသော လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးကင်းရေး (OHS) ကို ဖြည့်ဆည်းပေးရန် ရည်ရွယ်ပါသည်။ ၎င်းသည် ဖြစ်နိုင်ချေရှိသော အရေးပေါ်အခြေအနေများနှင့် ဘေးလွတ်ရာသို့ ရွှေ့ပြောင်းရန်နှင့် အရေးပေါ်အသုံးပြုမှုအတွက် သန့်ရှင်းရေးလုပ်ထုံးလုပ်နည်းများကိုလည်း ထည့်သွင်းစဉ်းစားပါသည်။

၇.၄ အရေးပေါ်တုံ့ပြန်မှုအစီအစဉ်

အရေးပေါ်အစီအစဉ်ရေးဆွဲခြင်း၏ ရည်ရွယ်ချက်မှာ လုပ်ငန်းခွင်တွင် ဖြစ်ပေါ်သည့် အရေးပေါ်အခြေအနေများ၏ သက်ရောက်မှုများကို လျော့ချရန်ဖြစ်သည်။ အရေးပေါ်အခြေအနေတွင် ပေါက်ကွဲမှု၊ မီး၊ အန္တရာယ်ရှိသော တုံ့ပြန်မှု သို့မဟုတ် မီးလောင်လွယ်သော ဆင့်ကဲဖြစ်စဉ်တွင် ပါဝင်နိုင်ပါသည်။

၇.၅ လူမှုရေးတာဝန်ယူမှု (CSR) အစီအစဉ်

အဆိုပြုထားသော စီမံကိန်းကို အကောင်အထည်ဖော်ခြင်းသည် ရပ်ရွာ၏နေ့စဉ်လူနေမှုဘဝအပေါ် အနုတ်လက္ခဏာနှင့် အပြုသဘောဆောင်သော အကျိုးသက်ရောက်မှုများ နှစ်ခုစလုံးကို ဖြစ်ပေါ်စေသည်ဟူသော အမှန်တရားဖြစ်သည်။ ဤအစီအစဉ်၏ ရည်ရွယ်ချက်မှာ ဝန်ထမ်းများနှင့် ၎င်းတို့၏ မိသားစုဝင်များ ပိုမိုကောင်းမွန်သော အသိုက်အဝန်းအတွက် လူမှုဖူလုံရေးရရှိစေရန်ဖြစ်သည်။ စက်ရုံလည်ပတ်သည့်နှစ်မှစတင်၍ နှစ်စဉ်အမြတ်ငွေ၏ %2ကို Corporate Social Responsibility (CSR) အစီအစဉ်အတွက် ခွဲဝေပေးမည်ဖြစ်ကြောင်း MIC သို့ တင်ပြထားသည့် အဆိုပြုသူ၏စာတမ်းတွင် ဖော်ပြထားပါသည်။ သို့သော်လည်း ကုမ္ပဏီသည် စီမံကိန်း၏ ပထမနှစ်တွင် ၎င်းတို့၏ ပထမနှစ်

အသားတင်အမြတ်အပေါ် အခြေခံ၍ CSR အစီအစဉ်ကို အကောင်အထည်ဖော်သင့်သည်။

၈ နိဂုံးနှင့် အကြံပေးချက်

ဆောက်လုပ်ရေးစီမံကိန်းသည် ဒေသခံပတ်ဝန်းကျင်အပေါ် ဆိုးရွားသော သက်ရောက်မှုများရှိသည်။ သို့သော်လည်း ညစ်ညမ်းမှု ထိန်းချုပ်ရေးနှင့် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအမံများကို အကောင်အထည်ဖော်ခြင်းဖြင့် စီမံကိန်း၏ တည်ဆောက်မှုနှင့် လည်ပတ်ဆောင်ရွက်မှုများကြောင့် မျှော်မှန်းထားသည့် အသေးစား အကျိုးသက်ရောက်မှုများကို လျော့ပါးစေပါသည်။

ဤစီမံကိန်းသည် ဒေသခံပြည်သူများအတွက် စီးပွားရေးအခွင့်အလမ်းများ ပေးစွမ်းပြီး ပညာရေး၊ ကျန်းမာရေးစောင့်ရှောက်မှု၊ အခြေခံအဆောက်အအုံဆိုင်ရာ အဆောက်အအုံများနှင့် အမျိုးသမီးများ စွမ်းဆောင်ရည်မြှင့်တင်ရေး စသည့် နယ်ပယ်များတွင် အကျိုးဖြစ်ထွန်းစေပါသည်။ ထို့ကြောင့် ကြီးကြီးမားမား ဆိုးရွားသော သဘာဝပတ်ဝန်းကျင် ထိခိုက်မှုမရှိဘဲ စီမံကိန်း မှ အကျိုးကျေးဇူးများစွာရရှိသောကြောင့် စီမံကိန်းသည် ဒေသတွင်းသာမက နိုင်ငံအတွက်ပါ အကျိုးကျေးဇူးအရှိဆုံးဖြစ်သည်။

Introduction

This study report was cognizant that Environmental Impact Assessment (EIA) is a systematic process of identifying, predicting and evaluating the environmental effects of proposed actions and projects. It also noted that special emphasis in EIA is given to the practice of preventing, mitigating and offsetting adverse effects of proposed undertakings. Therefore, the purpose of environmental impact assessment is to provide information for decision-making on the environmental consequences of proposed actions; to promote environmentally sound, sustainable development and mitigation measures.

However, the immediate objectives of EIA is to improve the environmental design of the proposed proposal; to ensure that resources are used appropriately and efficiently; to identify appropriate measures for mitigating the potential impacts of the proposal; to facilitate informed decision making including setting the environmental terms and conditions for implementing the proposal.

Project Overview

Phwint Phyo Thit Co., Ltd., as the project proponent, has appointed Resource and Environment Myanmar Co., Ltd. together with Sustainable Environment Myanmar as the third-party Environmental Assessment Practitioner (EAP) to undertake the EIA for the proposed development and construction and installation of associated infrastructure.

Mandalay City Development Committee and Phwint Phyo Thit Co., Ltd. signed for the construction Project of International Standardized Ye Dagon Taung Golf Course, Club House, Refreshment Sports Garden, Commercial and Urban Residential Complex Construction and Leasing business in February 2016. This report is for EIA of “Development of International Standard Hotel Services Project”. This is a part of the Phwint Phyo Thit urban development programs. Detailed of the Project are summarized in below:

Project Details

Component	Details
Name of the Project	Construction Project of Ye Dagon Taung Golf Course, Club House, Amusement Park, Commercial and Urban Residential Buildings
Project Owner	Phwint Phyo Thit Company Ltd.
Project Location	Patheingyi Township, Mandalay Region, Myanmar
Project Components	International Standardized Five Star Hotel and Three Star Hotels Project International Standardized School International Standardized Hospital Ye Dagon Taung Golf Course and Club House, Refreshment Sports Garden Business and Business and Residential Complex Construction and Leasing

The total land area of the real estate is about 547.80 acres and it is situated in field No. 548, east of Yae Kyi, field No. 549, north of Chaung Gyi Wa and field No. 550-A, east of Chaung Gyi Wa (Aing Gyi),

Patheingyi Township of Mandalay Region. The project area is currently operated as the training course of golf and the Ye Dagon Taung Golf Course Business and Phwint Phyo Thit Company is responsible for the management on the said land. Phwint Phyo Thit Company is the worthy one to operate the business.

Overall, the present project intends for New City Development with providing high facilities to residents.

The “Development of International Hotel Services Project” is part of the Master Plan project.

Objectives of Environmental Impact Assessment

All development activities have resulted more or less negative or positive impacts. The study was done with the purpose of the following objectives:

The overall objective of the study is *“To create sustainable social and economic development of the project at the local, regional and national level through the effective conservation of the environment”*.

In line with that objective the project is focused on:

- Review and discuss legal frameworks related to the project by studying on existing environmental resources- physical, biological and socio-economics
- Make public dissemination and consultation to gather comments, concerns, and recommendations of the people, local authorities and relevant governing bodies
- Identify potential environmental impacts caused by the project’s activities and consider appropriate mitigation measures to avoid, minimize, restore or compensate, and then to develop an Environmental Management Plan for the project owner to implement and for relevant governing bodies to monitor, and finally make a joint conclusion about environmental impacts on the project and to raise necessary recommendations.

Project Proponent

Contact details for Phwint Phyo Thit Co., Ltd. are provided below:

Contact Person:	U Thet Lwin Shwe, Deputy CEO
Address:	Phwint Phyo Thit (Office 1) Sin Phyu Kan Golf Range, Corner of Theikpan & 78th Streets, Chanmyathazi Township, Mandalay, Myanmar. Phwint Phyo Thit (Office 2) Yé Dagon Taung Golf Club, Patheingyi Township, Mandalay, Myanmar.
Telephone:	+959 778 778 877
Email:	admin@phwintphyothit.com

Web Site:

<https://phwintphyothit.com>

<https://www.facebook.com/phwintphyothitcompany/>

Phwint Phyothit Company registered in Directorate of Investment and Company Administration (DICA Myanmar) in accordance with the Myanmar Companies Law in 2006. The company molded itself through the years and fruitfully ventured into different industries, especially in real estate. Since then, the company has pioneered breakthroughs, broadened its enterprise, and stayed at the forefront in every phase of the country's rise to development.

2 LEGAL AND INSTITUTIONAL FRAMEWORK

EIA for the proposed International Hotel Project will be conducted in compliance with the Myanmar Environmental Conservation Law (ECL, 2012) and the Myanmar Environmental Conservation Rules (ECR, 2014). ECR provides the regulatory guidance to implement the ECL, where all the government and public development project shall undergo the required procedures of the EIA as prescribed by the relevant Ministry (i.e. MONREC).

In 2015 a new Myanmar EIA Procedure has been adopted with strengthened procedural requirements in conducting the EIA.

Overview of Myanmar Regulatory Framework

- National Environmental Conservation Committee (NECC)
- National Environmental Conservation and Climate Change Committee (NECCCC)
- Ministry of Natural Resources and Environmental Conservation (MONREC)
- The Environmental Conservation Department (ECD)

Relevant Legislations Related to EIA and Environmental Management of the Project

- Constitution of the Republic of the Union of Myanmar (2008)
- Myanmar Agenda 21 (1997)
- National Environmental Policy (1994)
- National Sustainable Development Strategy (2009)
- Myanmar Engineering Council Law (2013)

Environmental Policy, Laws and Rules

- National Land Use Policy (2016)
- Myanmar National Water Policy (2015)
- National Energy Policy (2014)
- The Environment Conservation Law (2012)
- Environmental Conservation Rules (2014)
- Environmental Impact Assessment Procedure (2015)
- Myanmar Climate Change Policy (2019)

- Myanmar Climate Change Strategy ((2019
- Myanmar Climate Change Master Plan ((2019) (2030-2018
- National Waste Management Strategy and Action Plan for Myanmar ((2020) (2030-2018

Other Applicable Laws and Rules

- (1) Land Acquisition Act (1984)
- (2) Farmland Law (2012)
- (3) Vacant, Fallow and Virgin Lands Management Laws (2012)
- (4) Environmental Impact Assessment procedure (2015)
- (5) Forest Law (1992, 2018)
- (6) Forest Rule (1995)
- (7) Protection of Wildlife and Conservation of Natural Areas Law (1994)
- (8) The Protection of Biodiversity and Natural Protected Areas Law (May 2018)
- (9) The Protection of Wildlife and Wild plant and Conservation of Natural Area Rule (2002)
- (10) The Conservation of Water Resources and Rivers Law (2006)
- (11) Freshwater Fisheries Law (1991)
- (12) The Protection and Preservation of Cultural Heritage Regions Law (1998)
- (13) The Protection and Preservation of Ancient Monuments Law (2015)
- (14) The Protection and Preservation of Antique Objects Law (2015)
- (15) The Union of Myanmar Public Health Law (1972)
- (16) The Prevention and Control of Communicable Diseases Law (2015)
- (17) The control of Smoking and Consumption of Tobacco Product Law (2006)
- (18) Occupational Health and Safety Law (2019)
- (19) Natural Disaster Management Law (2013)
- (20) The Myanmar Fire Force Law (2015)
- (21) The Myanmar Fire Brigade Law (2016)
- (22) Motor Vehicle Law (2015)

- (23) Motor Vehicle Rules (1987)
- (24) Vehicle Safety and Management of Vehicle Act (2020)
- (25) Petroleum and Petroleum Products Law (2017)
- (26) Labour Organization Law (2011)
- (27) Employment and Skill Development Law (2013)
- (28) Labour Disputes Settlement Law (2012)
- (29) Minimum Wages Law (2013)
- (30) Payment of Wages Law (2016)
- (31) Leaves and Holiday Act (1951)
- (32) Leaves and Holiday Rules (2018)
- (33) Workmen's Compensation Act (1923)
- (34) Social Security Law (2012)
- (35) Myanmar Insurance Law (2015)
- (36) The Ethnic Rights Protection Law (2015)
- (37) The Ethnic Rights Protection Rule (2019)

National Policies and Standards

- National Environmental Quality (Emission) Guidelines (2015)
- Air Emission
- Wastewater, Storm Water Runoff, Effluent and Sanitary Discharges
- National Drinking Water Quality Standards
- Noise Level

International Standards and Guidelines and International Agreements and Conventions

- The World Bank Environmental and Social Framework (The World Bank, 2017)
- The Equator Principles (EPFI, 2013)
- IFC Performance Standards on Environmental and Sustainability (IFC, 2012)
- Environmental, Health, and Safety General Guidelines (IFC, 2007a)
- IFC Handbook for preparing a resettlement action plan (IFC, 2002)
- International Labour Organization standards
- International Organization for Standardization (IOS)

International Conventions and Agreements related to the Project

- International Environmental Agreement with Myanmar, Conventions, and agreements

Requirements for the Project by EIA Notification (2015) of Myanmar

2.1.1 Project Categorization

Based on Annex of amended EIA Procedures, 2015, “Categorization of Economic Activities for Assessment Purposes” of EIA Notification (264/269), this type of project is classified as “Hotel and Tourism Development Project” under Type of Economic Activity.

2.1.2 Project Scope

The EIA of the proposed project is conducted by the Phwint Phyto Thit Co., Ltd. with consultancy of the


REM (qualified EIA company with MONREC registration). This report is submitted as a requirement of the EIA Procedure, 2015.

2.1.3 Requirements for Project

In accordance with EIA Notification (2015) and the project components, it is recognized that the Project is subject to an EIA study and is required to obtain an ECC from ECD at MONREC.

Namely, the proponent for EIA for the Project is Phwint Phyto Thit Co., Ltd. Two rounds of public Consultations with stakeholders (Stakeholder Meetings) are also required to be initiated and implemented by Phwint Phyto Thit Co., Ltd. So far, the first-round public consultation meeting has already done.

Third Party Consultant

Leading Organization	Resource & Environment Myanmar (REM)	
Contact Person	Mr. Min Thant Tun, Director	
Email	service@enviromyanmar.net	
Address	No. 702 B, Delta Plaza, Shwegondaing Road, Bahan, Yangon.	
Contact Number	959-777006373	
Fax	01-552901	
Website	www.enviromyanmar.net.mm	

3 Project Description and Alternatives

YE TAGON HILL MASTER PLAN Project is located Yaykyi East Kwin, Kwin No. (548), Yaykyi village Tract, Patheingyi Township, Mandalay District, Mandalay Region, the total land was 7.5 acres.

The project consists of 4 packages;

Package-1: International Hotel (Five Star Hotel) Project,

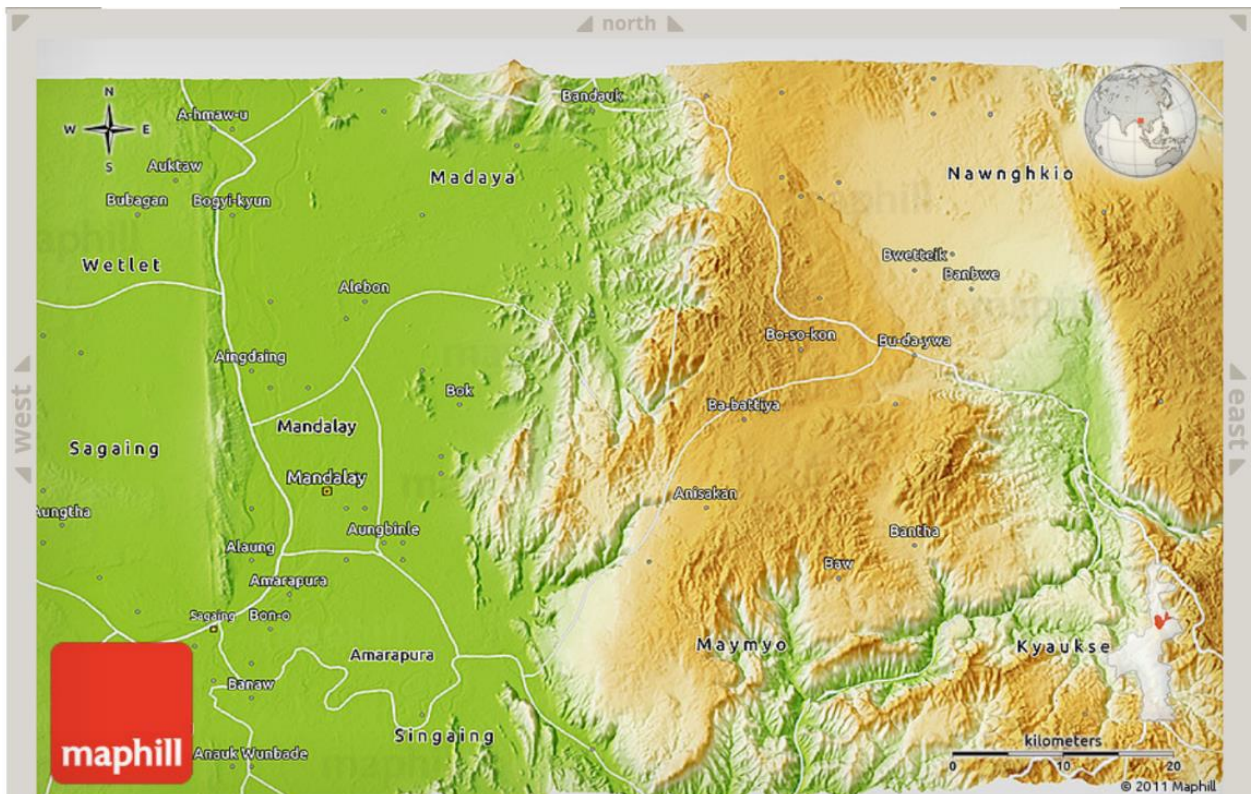
Package-2: International School,

Package-3: International Hospital, and

Package-4: International Standardized Yaytagon Hill Golf Course, Club House, Amusement Park, Commercial and Urban Residential Buildings.

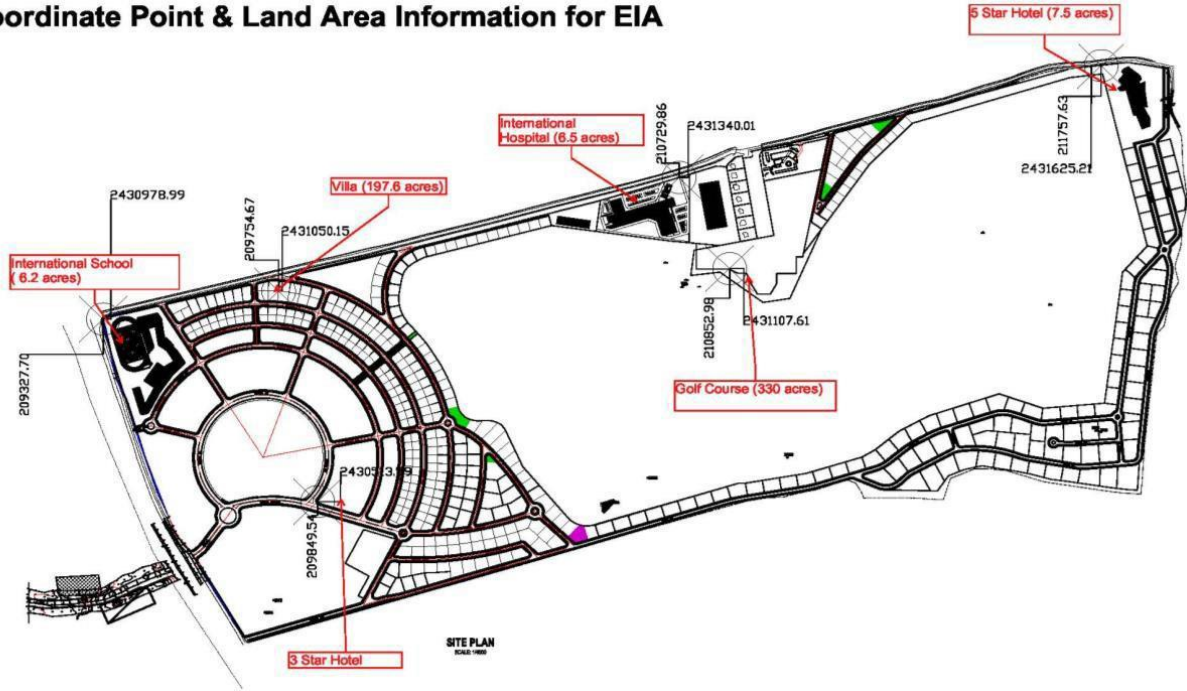
The project area for those four packages is within Patheingyi Township in Mandalay Region. (Figure 3-

3-
1). Figure 2-2 shows the location of project area .



<Figure 3-1> Patheingyi Township in Mandalay Region

Coordinate Point & Land Area Information for EIA



<Figure 3-2> Location of International Hotel with Coordinates

3.1 International Hotel Project

The International hotel projects are part of the Phwint Phyo Thit urban development programs. It could be grouped by type:

- 1.3 Star Hotel
- 2.5 Star Hotel

3.2 Site Layout Map or Schematic Diagram

Land permit agreement was made between Phwint Phyo Thit Co., Ltd. and Myanmar Investment Commission (MIC) since November 2016. Package 1 consists of an International 5 Star Hotel and a 3 Star Hotel.

3.3 IBIS 3 Star Hotel

IBIS Mandalay is a 3-star hotel with an innovative cubic architectural design. It is a 5-storeyed building that can accommodate up to 188 rooms and is built on a large land area of nearly 2 acres. Total areas of land use for project and land use area for project components are provided as follows.

Name	IBIS Mandalay
Land Area	1.74 Acres
Ground Floor Area (GFA)	150,296 SQFT
No. of Storey	5

No. of Rooms	188
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3.4 5-Star Hotel

Novotel Mandalay is an 11-storeyed 5-star hotel which is built in a cutting-edge, state of the art architectural style. It is built on a massive land area which spans over 5 acres and it consists of an overwhelming 311 rooms. A detail of the 5-star hotel is as follow.

Name	Novotel Mandalay
Land Area	5.27 Acres
Ground Floor Area (GFA)	97301.5 SQFT
No. of Storey	11
No. of Rooms	311

3.5 Project Development and Implementation Schedule

3.5.1 Site Access Road

In July 2020, the main entrance road to the Yaytagon Hill Master Plan Project from the Junction of Theik Pan Road and Mandalay Pyin Oo Lwin Road had been constructed. The entrance road is 106 fts Wide and 3.8-mile-long earth road by own cost of Phwint Phyto Thit Company Ltd.

3.5.2 Construction Activities

In the date of 20th May 2021, LIU Co., Ltd., Shwe Yi Lin Co., Ltd, and Rapid Ativex Corporation Co., Ltd. awarded the tender for construction of Ye Dagon Taung's infrastructures such as road, drainage, sub- station and electricity, water distribution system and water treatment plant. The following table shows the construction timeline for Hotel Project.

Table 3.5-1 Construction Schedule of Yaytagon Hill City Development Project

Construction Period			
Project	Start Date		Finish Date
International School	1-Nov-22		31-Mar-25
International Hospital	2-Jan-23		31-Oct-28
Hotel	1-Jul-24		28-Sep-29
Golf Course	West Course	1-May-23	30-Oct-26
	East Course	2-Nov-26	1-May-29
Club House	21-Oct-25		3-Jun-27

3.5.3 Operation Activities

Operation activities are expected the services to customers including dining, washing, lighting and other services as usual. Waste generation and domestic wastewater are expected during the operation period.

3.5.4 Water Consumption and Sources

During operation period, the total water demand for phase 1 will be 32,200 gal/day and 19,000 gal/day for phase 2. Total waste water per day (90% of water) for phase 1

development will be 29,800 gal/day and 17,100 gal/day for phase 2 developments. The water used for project purpose is pumped from Sedawgyi dam.

3.5.5 Energy Sources

The main source of electricity will be used from own Electrical Sub-station (40 MVA). The electricity of this sub-station will be supplied from Patheingyi main sub-station and the secondary sub-station will be constructed in 2 acres wide land within the project compound. At present, the overhead lines had already erected from Aung Pin Le to Theik Pan Circular Road and the underground line will be constructed from the Theik Pan Circular Road to Ye Dagon Taung project.

3.6 Alternatives

Alternative analysis is important as it guides the project to identify ways in a timely manner to accomplish the project's purposes in the most technically robust, efficient and cost-effective manner. From EIA perspective, alternatives are sought to avoid or minimize environmental impacts.

4 Description of the Surrounding Environment

This section describes the environment of the Project surrounding area. The information provided is based on a review of published information, as well as a review of available literature from Phwint Phyto Thit Co., Ltd. and from REM's in-house library.

The purpose of reviewing the baseline conditions is to present an understanding of the potential environmental and social sensitivities of the Study Area. Reviewing the baseline conditions allows Phwint Phyto Thit to make an informed judgment on the appropriate level of impact assessment for the Project. More detailed information on the baseline environmental and social conditions in the Study Area, including the results of primary baseline surveys conducted for the Project will be provided in the EIA Report.

The International Hotel Project is of the associated facilities of Ye Dagon Taung Master Plan Project therefore, the description of the surrounding environment including result of the environmental and social baseline study will be done for all project packages.

4.1 Defining the Study Area and Area of Influence

4.1.1 Setting the Study Limits

The AoI for this Project consists of the following aspects:

- Construction of International Hotel and associated infrastructure; and

- Operation of International Hotel and their associated infrastructure.

A preliminary review of the environmental conditions within the Project study area has been undertaken

based on existing data for the purposes of this Study.

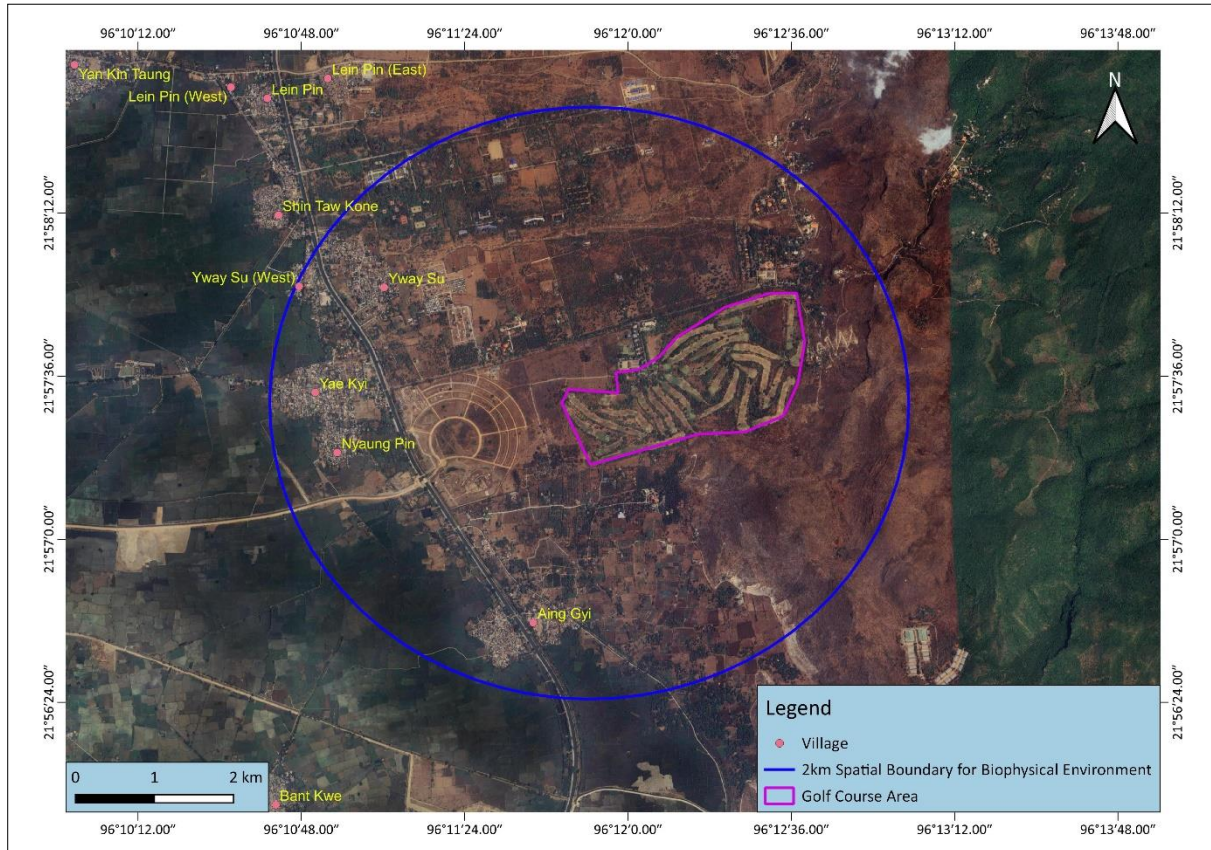


Figure 4.1-1 Project AoI for Biophysical Environment

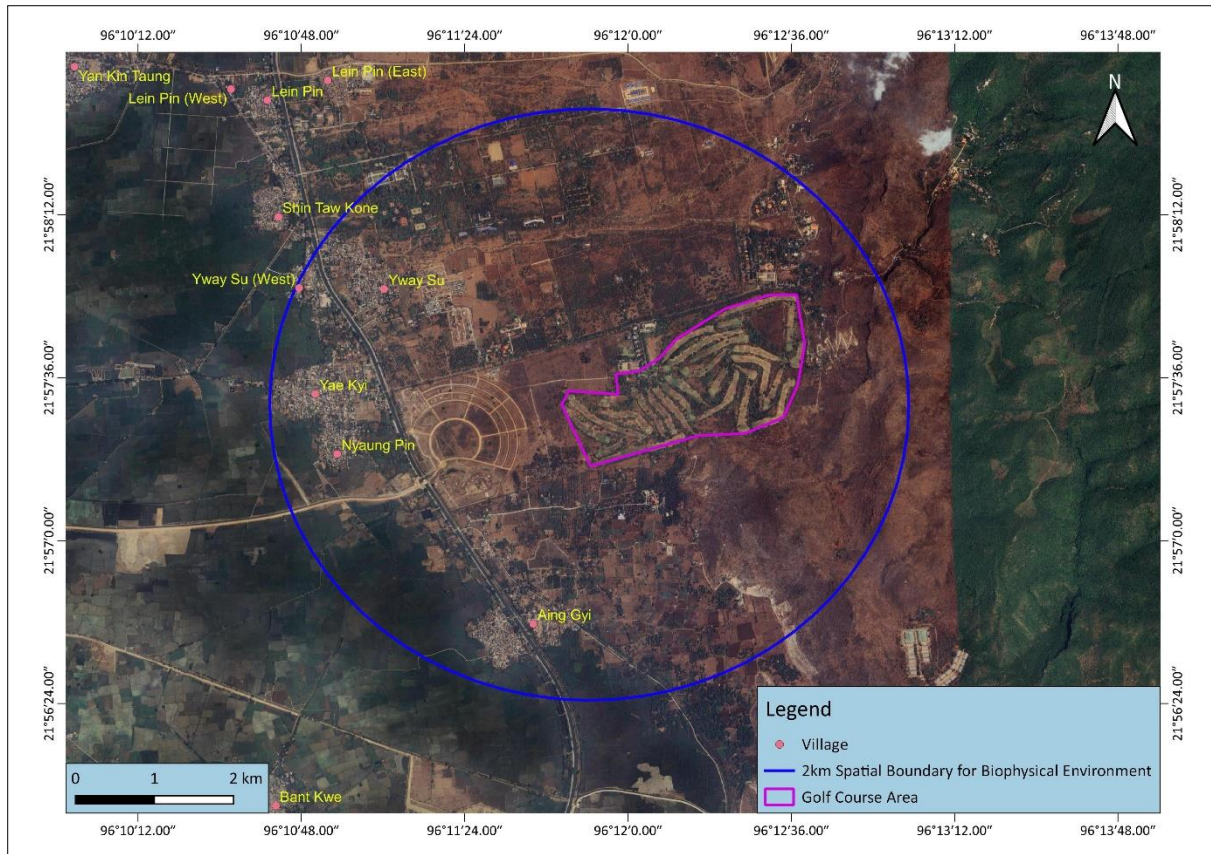


Figure 4.1-2 Project AoI for Social Environment

4.2 Physical Characteristics

4.2.1 Topographic Condition

The Project site is located in the Patheingyi Township within the Mandalay Region. Topography of project area belongs to isolated hill of Plateau limestone on low land terrain of alluvial area and also at western part of the Shan Plateau range.

4.2.2 Geology

Generally, the project site is mainly covered by thick Alluvium deposits of Quaternary age. Alluvium is composed of Clayey Silt with some Clay and Sand. Approximately, gravel bed has been encountered at the depth of 18 m and the thickness if the gravel bed is about 12 m.

4.2.3 Climate and Meteorology

Patheingyi Township is situated in the dry zone of Central Myanmar and the tropical climate of the area.

The nearest meteorology station is located in Mandalay city. The average minimum temperature of throughout the year of Mandalay is 22.5 °C and the average maximum is 34.4 °C. The warmest month, on average, is April with an average temperature of 32.1°C. The coolest month on average is January, with an average temperature 22.5°C. The annual mean relative humidity is about 67 %. The

prevailing wind direction of Mandalay City is south, southeast and southwest direction.

4.2.4 Natural Disaster

There are two major active faults named as Sagaing Fault (left side) and Kyauk Kyan Fault (right side) are observed far away from the project area. There is no historical earthquake in the project area.

The project site is located in the eastern part of dry zone and topography is flat plain. The project site had no experience about the natural disaster such as storm and flooding based on the township profile data.

4.2.5 Physical Environments

The summary of environmental survey is shown in Table 4.2-1 and sampling points for environmental baseline survey are shown in Figure 4.2-1.

Table 4.2-1 Summary of Environmental and Biological Environment Survey

Air Quality	Parameter	(1) Sulphur Dioxide (SO ₂), (2) Nitrogen Dioxide (NO ₂), (3) Carbon Monoxide (CO), (4) Ozone (O ₃), (5) Total Suspended Particles (TSP), (6) Particulate Matter (PM ₁₀ & PM _{2.5}), (7) Air Pressure and (8) Wind Speed & Wind Direction
	Period	2 points for one time within survey period (24 hours)
	Location	Residential and construction areas.
Vibration Level	Parameter	L _{veq}
	Period	Three hours continuously in each location (2 points)
	Location	Residential and construction areas.
Noise Level	Parameter	L _{Aeq} (A-weighted loudness equivalent)
	Period	One time at 2 locations for 24 hours duration
	Location	Residential and construction areas.
Flora & Fauna	Item	Interview, field observation and secondary data collection
	Area	Project site
	Period	Whole survey period

Source: Survey Team

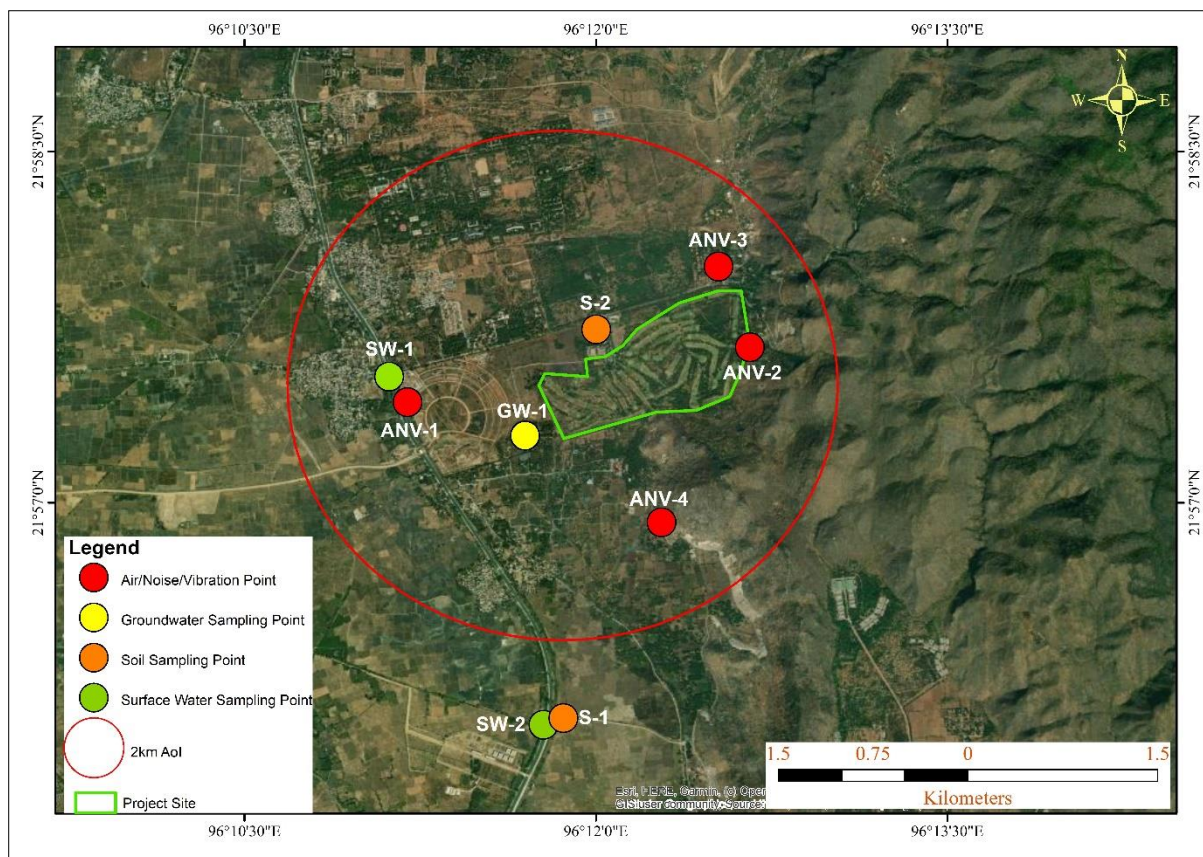


Figure 4.2-1 Location map of the physical baseline survey

Air Quality

a) Survey Location

This environmental monitoring point was located in Yay Kyi Village, Patheingyi Township, and Mandalay Region. The details of the location of survey point are presented in Table 4.2-2 and Figure 4.2-2.

Table 4.2-2 Location of Survey Point

Monitoring ID	Coordinates	Type of Monitoring	Description of Monitoring point
ANV-1	21°57'25.48"N 96°11'11.58"E	Within the project site	Inside of the project site
ANV-2	21°57'39.66"N 96°12'39.64"E	Residential area	Eastern part of the project site (At the Thitsa Aung Myay Monastery)
ANV-3	21°57'59.8"N 96°12'32.0"E	Residential area	Northeast side of the project site (At the Thitsawaidagu Monastery)
ANV-4	21°56'55.5"N 96°12'16.2"E	Residential area	Southeast side of the project area (0.95 km away from the project site)

Result of Air Quality (Gaseous and Particulate Matter)

The observations were tabulated and analyzed section wise to understand the environmental status prevailing in the units considered for the study. It was observed that the air quality of SO₂, O₃ and

NO₂ concentration level and particulate matter PM₁₀ and PM_{2.5} level are within the National Environmental Quality (Emission) Guideline.

Table 4.2-3 Ambient Air Quality Result

Monitoring Date	Parameter	Average Period	Result µg/m ³ /pp	WHO Guideline	NEQG Guideli
30-31 October, 2021	Total Suspended Particles (TSP)	-	30.09	NG*	NG*
	Particulate Matter (PM ₁₀)	24-hours	23.66	50	50
	Particulate Matter (PM _{2.5})	24-hours	17.56	25	25
	Sulphur Dioxide (SO ₂)	10-mins	328.35	500	500
	Nitrogen Dioxide (NO ₂)	1-hour	15.16	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O ₃)	8-hours	3.86	100	100
	Carbon Dioxide (CO ₂)	-	1 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*
1-2 November, 2021	Total Suspended Particles (TSP)	-	20.52	NG*	NG*
	Particulate Matter (PM ₁₀)	24-hours	16.09	50	50
	Particulate Matter (PM _{2.5})	24-hours	11.42	25	25
	Sulphur Dioxide (SO ₂)	10-mins	299.19	500	500
	Nitrogen Dioxide (NO ₂)	1-hour	11.26	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O ₃)	8-hours	3.25	100	100
	Carbon Dioxide (CO ₂)	-	1 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*
2-3 November, 2021	Total Suspended Particles (TSP)	-	25.68	NG*	NG*
	Particulate Matter (PM ₁₀)	24-hours	19.7	50	50

	Particulate Matter (PM2.5)	24-hours	16.14	25	25
	Sulphur Dioxide (SO2)	10-mins	345.46	500	500
	Nitrogen Dioxide (NO2)	1-hour	11.7	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.64	100	100
	Carbon Dioxide (CO2)	-	1.71 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.23	NG*	NG*
3-4 November, 2021	Total Suspended Particles (TSP)	-	30.32	NG*	NG*
	Particulate Matter (PM10)	24-hours	23.13	50	50
	Particulate Matter (PM2.5)	24-hours	19.24	25	25
	Sulphur Dioxide (SO2)	10-mins	327.01	500	500
	Nitrogen Dioxide (NO2)	1-hour	11.91	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.21	100	100
	Carbon Dioxide (CO2)	-	17.24 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*

NEQG = National Environmental Quality (Emission) Guideline 2015

WHO = World Health Organization * NG = No Guideline

Noise Level

a) Survey Location

The locations of noise level points are as same as the location of air quality monitoring.

b) Survey Result

Noise level (LAeq) was presented in Table. According to the calculated noise level, most of noise decibels in two stations are within the applied standard. The main noise source of each monitoring locations

N-1	Day time and Nighttime	Voice from villagers, traffic, vehicle passing, motorbike, tiny bell sound from Pagoda, loudspeaker from monastery, strong wind during the raining
N-2	Day time and nighttime	Loudspeaker from residence during daytime Heavy rain, dog bark, fog voice near monitoring station during nighttime, during the monitoring period, heavy rain was strongly rained.
N-3	Day time and	Traffic, vehicle passing, motorbike, tiny bell sound from Pagoda, children's

	nighttime	reading and playing around the station, during the monitoring period, heavy rain was strongly rained.
N-4	Day time and nighttime	Dogs barking, voice from villagers and motorbikes driving along the foot path near to the monitoring station, during the monitoring period, heavy rain was strongly rained.

Vibration Level

a) Survey Location

The locations of vibration level points are as same as the location of air quality monitoring.

b) Survey Result

Average three-hour vibration level in all monitoring station is presented in Table 4.2-4. Average 24-hours vibration levels in all monitoring stations are within the applied standard.

Table 4.2-4 Average 24-hours vibration level in all monitoring stations

Parameter		Result				Target Value (Japan Standard)
		V-1	V-2	V-3	V-4	
X-axis	Lveq	13	13	14	17	55
X-axis	Lvmax	20	19	20	24	55
X-axis	Lvmin	8	8	8	9	55
X-axis	Lv5	17	16	17	21	55
X-axis	Lv10	16	15	16	19	55
X-axis	Lv50	13	12	13	15	55
X-axis	Lv90	10	10	10	12	55
X-axis	Lv95	10	9	10	11	55
Y-axis	Lveq	18	19	15	19	55
Y-axis	Lvmax	25	28	21	25	55
Y-axis	Lvmin	10	9	10	11	55
Y-axis	Lv5	22	24	18	22	55
Y-axis	Lv10	21	21	18	21	55
Y-axis	Lv50	16	14	15	17	55
Y-axis	Lv90	13	11	12	14	55
Y-axis	Lv95	12	11	12	13	55
Z-axis	Lveq	17	16	16	19	55
Z-axis	Lvmax	18	18	19	23	55
Z-axis	Lvmin	16	16	14	16	55
Z-axis	Lv5	17	17	17	20	55
Z-axis	Lv10	17	17	17	19	55
Z-axis	Lv50	17	16	16	18	55
Z-axis	Lv90	17	16	15	17	55
Z-axis	Lv95	16	16	15	17	55

4.5.5.4 Water Quality

a) Survey Locations

The locations of water sampling survey points are shown in Table. The detail of each sampling points is described as below.

Category	Sampling Point	Coordinates	Description of Sampling Point
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Surface Water	SW-1	21°57'32.31"N 96°11'7.08"E	Collected at the inlet part where is the site intended for the construction of water supply area for construction phase
Surface Water	SW-2	21°56'3.03"N 96°11'46.58"E	collected at the outlet part where is the site intended for the construction of a sewage treatment plant
Ground water	GW-1	21°57'17.15"N 96°11'41.87"E	Theyetdaw Village

b) Water Quality Result

Table 4.5-21 presented the result of water quality for all sampling points. The water quality analysis parameters were compared by national emission quality guideline and Myanmar Drinking water quality standard. According to the analysis results, total coliform results in surface water are higher than the applied standards. The reason for the increase in total coliform values in surface water quality, water quality sample were collected at Sedaw Dam which is situated the nearby villages, and this canal is mainly applied by washing and usage for agriculture. Solid wastes from villagers are dumped near the canal.

a) Survey Locations

The locations of soil samples and surveys are shown in Table 4.2-5. The detail of sampling points is described as below.

Table 4.2-5 Sampling and survey points of surface soil quality survey

Category	Sampling Point	Coordinates	Description of Sampling Point
Soil	S-1	21°56'4.74"N 96°11'51.69"E	Collected at the site intended for the construction of a sewage treatment plant.
Soil	S-2	21°57'44.38"N 96°12'0.11"E	Collected at the site intended for the construction of workshop area

b) Soil Quality Results

Soil samples were analyzed at the Land Use Department of Yangon Region. Soil quality results of soil on each point are shown in table 4.2-6.

Table 4.2-6 Soil quality laboratory result

Parameter	unit	S-1	S-2
pH		7.61	7.86
Moisture content		7.44	3.09
Lead		5.06	Not detected
Cadmium		Not detected	Not detected
Copper		1.992	0.534
Arsenic		18.54	91.9
Zinc		Not detected	Not detected
Iron		4.1	0.352

4.3 Biological Components

Survey Area of Biodiversity

The location of the survey area was shown in figure 4.3-1.

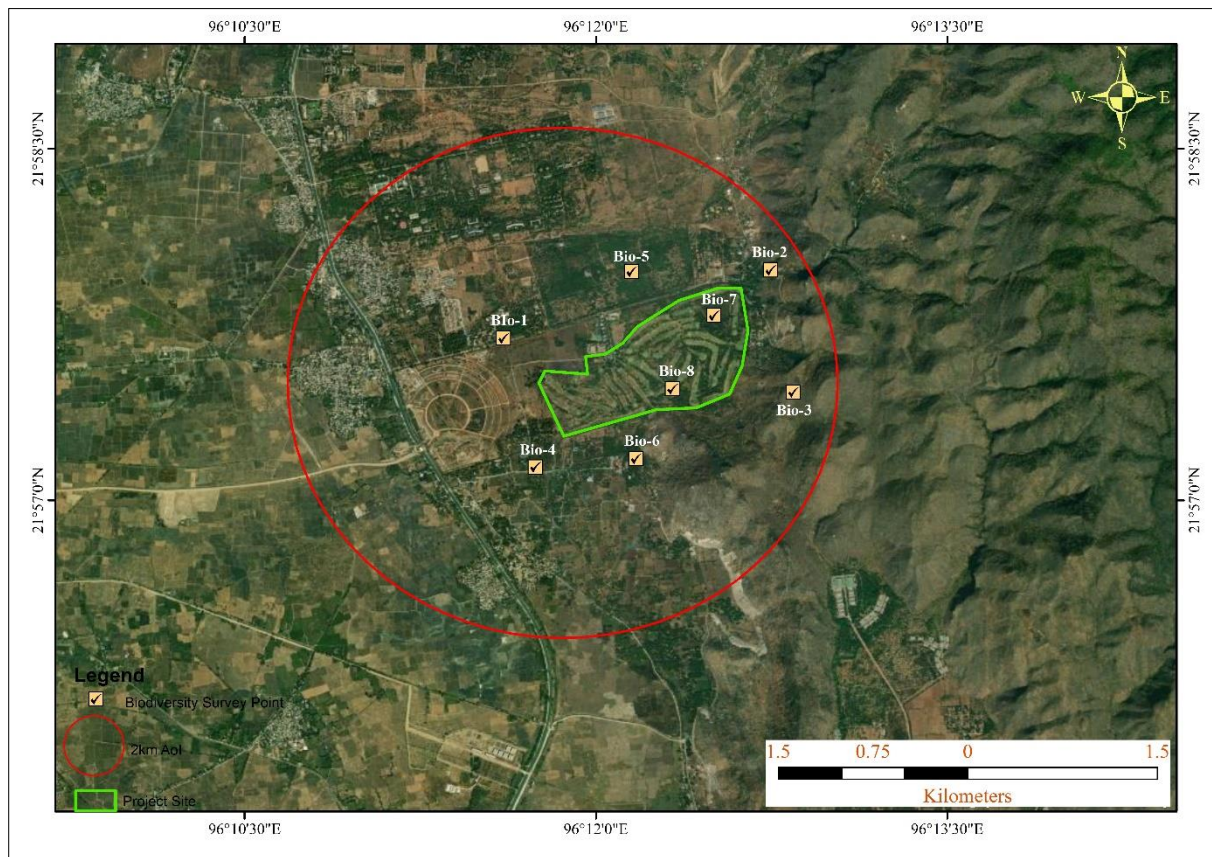


Figure 4.3-1 Location of Biodiversity survey area around the project site

Flora Result

Flora survey was conducted to obtain an understanding of the diversity of flora taxa group. A total of 88 flora species identified during the survey. One (1) species is endangered species were classified and 31 species of least concern. (2) Data Deficient and 54 species of Not Yet Assessed on the Iucn Red List. There was no endemic species in this area.

Fauna Result

A biodiversity survey was conducted that covered a range of fauna species including mammals, birds, reptiles, butterflies. The fauna survey was conducted via direct observation in the field observation of track and sign such as footprint and feeding signs in their natural habitats and interview survey were local communities. Fauna species were found least concern and Not Evaluated, reptile was found one vulnerable species and Bird species were found two species of near threatened according to Iucn red list. Four endemic bird species were found in survey area.

Table 4.3-2 Number of Species Record during Survey

Mammal	8
Bird	45
Butterflies	22
Reptiles	10
Fish	7
Total	92

Mammal

Mammals were identified through direct observation and interview survey. Two mammal species were recorded. Five species was interview from local people in survey area. According to the IUCN Red List of threatened species, all species was least concerned, there was no threatened and no endemic species.

Herpetology

A total of 9 reptile species was identified during the survey. Nine species were recorded and one species were interview from local people in survey area. According to IUCN Red List of threatened species, this area was no threatened species. This area was found no endemic species. All species classified as 3 species were Not Evaluated and Six Species were Least concerned.

Butterflies

A total of 23 species with 20 genera of butterflies under the order Lepidoptera belonging to 5 families were recorded. The family Nymphalidae and Pieridae were found dominant. According to the IUCN Red List of (2021-3), all species were not evaluated under any major threatened.

Bird

A total of 43 birds species were recorded during the survey period. According to the Iucn Red List of threatened species, this area was no threatened species.

Fish

Field surveys and interviews with local people who lived near the study area were conducted during the collection of the specimens. Fishing activities are mostly traditional method. Fishermen were interviewed with regard to fishery process. A total of 6 species distributed 5family were identified and recorded from Yay Kyi Canal. According to the Iucn red list of threatened species, these areas were no threatened species.

4.4 Social Environment

4.4.1 Patheingyi Township Boundary and Population

Patheingyi is one of the townships in the Mandalay Region of Myanmar. Patheingyi Township is 5 miles far from Manadalay City. Patheingyi Township is between North Latitude between 21° 51" and 22° 09" and East Longitude between 96° 01" and 96° 22". The total area is 231.55 square miles. It is 140 villages with 58 village tracts and 1 urban ward. The population and household are shown in the following table.

Gender Situation

In general men and women are equal in Myanmar. Therefore, there are no gender issues within the study area. Roles, work division and decision making between men and women are determined by physical condition, social structure and norms. Decision making on some aspects are on a joint or sharing by both male and female.

Economic Condition

Patheingyi Township located in Mandalay region and is an economically developing township. Township local people tend to operate mainly for agriculture. Patheingyi Township can travel to other township by road and by waterway and good transportation. The main township's main products are rice and exported to other parts.

Education

There are four types of schools in Myanmar: (i) approved/main schools; (ii) branch schools; (iii) affiliated schools and (iv) self-help schools. Among them, affiliated schools, and self-help schools, each of which is administratively attached to a main school, must prepare and manage all school facilities and teacher arrangement by themselves and students in these affiliated and self-help schools are reported as students at the main schools. Most of the expenses including the cost of teachers' salaries should be borne by the entity which established the school (mostly communities, monasteries and other ministries are bearing the cost). Since administering examinations at the affiliated school is not allowed in many cases, students must take examinations at the main school.

Public Transportation

Patheingyi Township is very closed the Mandalay city. Mostly local peoples are mainly used the roadways for transport to go by both car and motorbike. By roadway, Mandalay was 19km away. Recently, township road network was previously connected only by road-transport network (even if some of the connections consist only of earth roads).

4.4.2 Sample coverage in the social and health impact assessment

To assess the social conditions within the project area, the social and health impact assessment was conducted in Patheingyi Township, situated in the Mandalay region. This assessment encompassed a

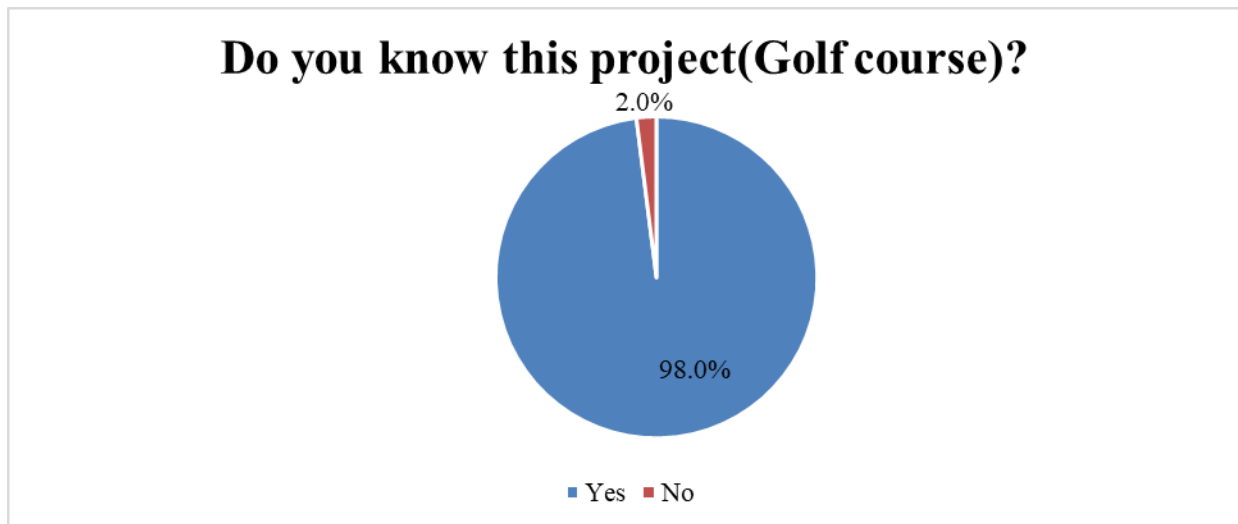
total of four villages within the township: Yay Kyi Village, Aik Gyi Village, Thayattaw Village, and Yway Su Village. The distribution of the household sample across these villages is as follows: 168 families were surveyed in Yay Kyi Village, 70 households in Aik Gyi Village, 152 households in Thayattaw Village, and 117 households in Yway Su Village. In total, the assessment covered 507 households. Regarding the composition of the household assessment, the sample from each village is provided in Table 4.7-2 below.

Table 4.4-1 Sample from each village

Township	Village Name	Sample HH
Patheingyi	Yay Kyi Village	168
	Aik Gyi Village	70
	Thayattaw Village	152
	Yway Su Village	117
Total		507

Opinions on the project

The study team was asked about awareness of the project as well as worries regarding the project during the construction phase. It was found that 98.0% of the respondents are aware of the golf course project, while only 2.0% are not aware of the project.



The survey results show that 94.5% of respondents expressed no significant concern about the social impact of the project's construction, while only 5.5% indicated some level of concern about its social impact on the community.

This data suggests that the majority of the community does not expect negative social effects due to project construction. However, the project developer needs to address and mitigate concerns raised by 5.5% of respondents to ensure that the social impact of the project is managed effectively and aligned

with community well-being and expectations.

Table 4.4-3 Suggestion about the Project

Response	Percent
Want to job this company	29.4
We like this project because it can create and/or get job opportunities	43.8
Develop our village	2.1
Need to support for health and education	13.9
Need electricity and water	1.0
Want to live exactly the place	5.7
Can be good for a child's future	3.1
Need good transportation	.5
Farmer don't like it because they lose their lands	.5
Total	100.0

5 Environmental and Social Impact Assessment and Mitigation Measures

This Chapter identifies and evaluates the actual and potential environmental consequences of the proposed activity. Furthermore, the potential for mitigation of negative impacts and enhancement of positive impacts are described.

Assessment of key environmental impacts of the project construction, operation and decommissioning is based on the nature and scope of the project and information on the environment. This chapter outlines the potential positive and negative impacts that will be associated with the project activities. The impacts are predicted by categorizing the activities to be carried out during construction, operation and decommissioning phases.

5.1 Impact Assessment Methodology

Impact identification and assessment starts with scoping and continues through the remainder of the impact assessment process. The principal impact assessment steps are summarized in Figure 5.2-1 and comprise:

Impact prediction: to determine what could potentially happen to resources/receptors because of the Project and its associated activities.

□ Impact evaluation: to evaluate the significance of the predicted impacts by considering their magnitude and likelihood of occurrence, and the sensitivity, value and/or importance of the affected resource/receptor.

□ Mitigation and enhancement: to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts.

□ Residual impact evaluation: to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.

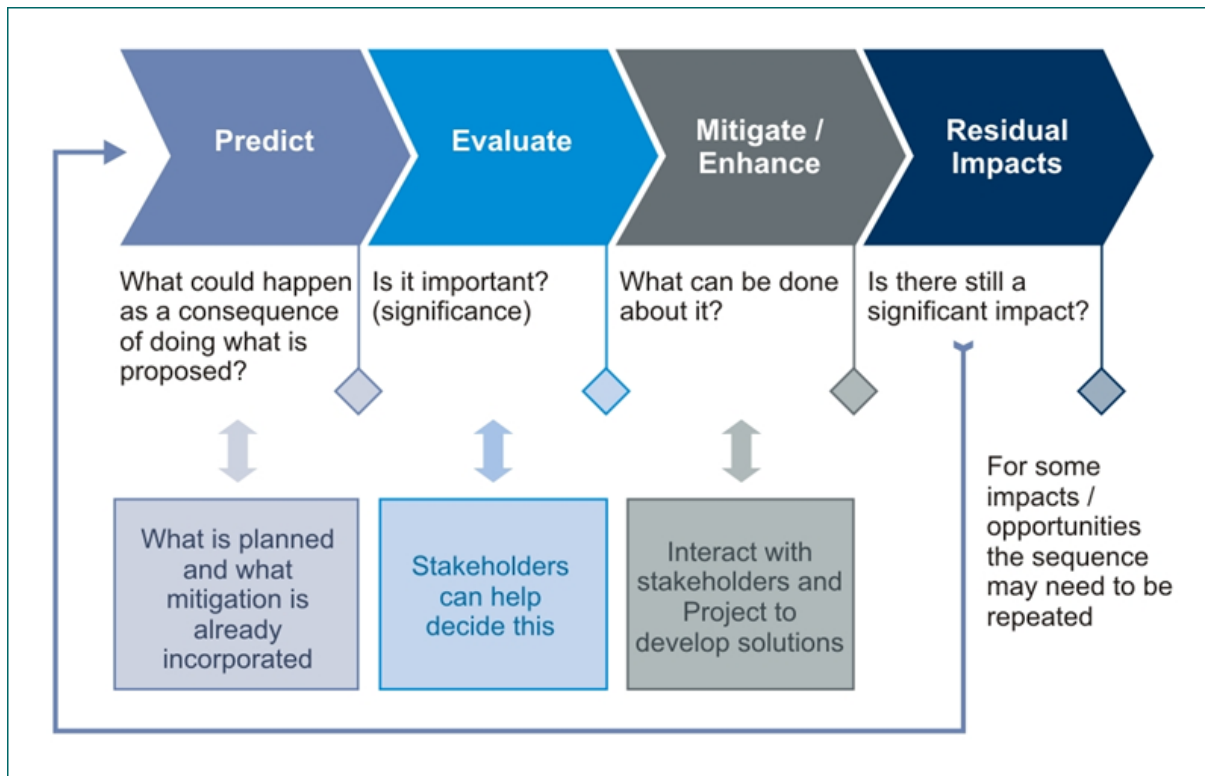


Figure 5.2-1 Impact Assessment Process

Table 5.2-1 Environmental Impact and Significance

		Sensitivity/Vulnerability/ Importance of Resource/Receptor		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

Action Affecting Environmental Resources & Value	Impacts/ Sources	Recommended Feasible Protection/ Mitigation Measures	Impact Significance			
			Insignificant	Significant Effect		
				Small	Moderat	Major
Soil	<p>-Clearance of Trees might affect soil erosion.</p> <p>-The accidental spillage of oil from vehicles used for transportation of construction material and accidental spillage from the building material used for construction purposes are also considered as soil contamination sources.</p>	<p>- Prevent soil contamination by oil or grease spills, leakages or releases, all manipulations of oil derivate in the process of construction and provision of fuel to the machines should be performed with maximum attention;</p> <p>-Leak proof containers should be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through drains and treated properly before disposal;</p> <p>- Construction waste and debris shall be collected on a regular basis, covered by roof and disposed of at designated landfills;</p> <p>- Prohibit to operate with equipment and vehicles outside the designated work areas and roads;</p>		X		
Air Quality	<p>-Increases in air pollutants caused by fugitive dust from foundation work, site excavation, and emissions from operation of vehicles and trucks and heavy construction equipment.</p> <p>-Occupational health concern for construction workers and community health lived in the closed surroundings of the construction site are expected.</p>	<p>- Contract with the license contractors for compliance of environmental management consistence with the concerned government authorized department;</p> <p>- Sprinkling of water on dust generating areas;</p> <p>- Restricting the speed limits of vehicles during movement on unpaved roads;</p> <p>- Covering of vehicles carrying loose soil/construction material;</p> <p>- Applying preventive maintenance system;</p> <p>- Checking vehicle and equipment inspection daily;</p> <p>- Stopping dust generating activities in high wind;</p>				

Noise and Vibration	<ul style="list-style-type: none"> - Increase ambient noise level at the construction site, and communities near the material transport routes, especially, the poor buildings which could be destroyed by vibration. - Long-term noise exposure will reduce hearing and labour productivity, and will cause fatigue, stress, and insomnia. 	<ul style="list-style-type: none"> - Select adequate equipment (fit with noise mufflers); - Minimize machinery and equipment unused conditions with engines in action; - Maintain machinery and equipment in good conditions; - Maintain an active community consultation and positive relations with residents that will assist in alleviating concerns that might arise and resolve any potential noise complaints; 			X	
Water Resources and quality	<p>Degradation of water quality due to inappropriate management of construction wastes and domestic waste from camp site.</p> <p>-Impacts on groundwater quality as a result of construction activities such as deep foundation and piling works, and discharges.</p>	<ul style="list-style-type: none"> -No storage for fuel and lubricants/oil; - regular maintenance and checking of all vehicles and machinery to minimize the risk of fuel or lubricant leakages; - As construction activities typically generate disturbed soil, concrete fines, oils and other waste, on-site collection and settling of storm water, prohibition of equipment washes down, and prevention of soil loss and toxic releases from the construction site are necessary to minimize water pollution; 		X		
Solid wastes	<ul style="list-style-type: none"> -Demolition wastes and plant wastes from clearance of trees are expected at pre- construction phase. -Various types of construction solid wastes are likely to occur during the implementation stage of the project construction. 	<ul style="list-style-type: none"> - A waste management plan shall be developed including requirements for separation, handling and disposal of all waste generated; - All hazardous materials shall be stored in clearly labelled containers; - Storage and handling of hazardous materials should be in accordance with national and local regulations appropriate to their hazard characteristics; 			X	
Vegetation And Terrestrial	<ul style="list-style-type: none"> - A removal of the tree and bushes in the construction area will be done so potential impact on vegetation was 	<ul style="list-style-type: none"> - Routine checking of trenches (if any) and escape routes to minimize, if not prevent, entrapment of fauna; - Reporting of any violation relating to hunting birds, snakes and 		X		

fauna	<p>expected.</p> <ul style="list-style-type: none"> - The regional fauna species are also expected to face loss of their habitats due to clearance of vegetation. 	<p>trading activities;</p> <ul style="list-style-type: none"> - Implementing good housekeeping practices on the field and implementing good Solid Waste Management Plan in order to eliminate any source of hazard to the native fauna; - Minimize vegetation clearance and habitat disturbance by demarcating the clearing boundaries in the project site; 				
Traffic loads	<ul style="list-style-type: none"> -Heavy vehicle movements during construction phase are highly expected to transport construction machinery. 	<ul style="list-style-type: none"> - Definition of speed limits and make sure that they are respected by Project drivers (including contractors); - Adopt a Traffic Management Plan to ensure traffic safety, which should foresee safe drive trainings, regular alcohol and drug tests for drivers and driving restrictions during rush hours (especially close to schools). 		X		
Aesthetic view	<ul style="list-style-type: none"> - During construction phase the community can be unfamiliar and affect loss of aesthetic view to the surrounding community. 	<ul style="list-style-type: none"> - No introduce the vertical structures which can be overseen from various parts of the region; - Adopt the control measures during the detailed design of the project such as building design, and growing vegetation, etc.; 		X		
Occupational Health and Risk	<ul style="list-style-type: none"> - The construction dust and noise emissions will be affected to the construction workers. 	<ul style="list-style-type: none"> - Adopting and training all personnel (including contractor workers) in the use of Personal Protective Equipment (PPE) and chemical handling; - Training in recognition of hazard symbols; -Adoption of work site hazards signage in Myanmar language; - Training of all personnel in health and safety risk prevention and protection; - Regular noise surveys to ensure the on-site maximum levels are not exceeded; - Development of inspection, testing and maintenance programs for 		X		

		machinery and equipment;			
Community Health	- The construction dust and noise emissions and fugitive emission by heavy transportation will be affected to the construction workers.	- Guarantee proper vehicle maintenance to reduce noise and accidents; - Maintain the Project roads to reduce the possibility of accidents, including clearing of vegetation on to improve sight distance and visibility; .		X	
Social Community	Some may have loss land asset for project site through the consultation and compensation process. If this process not properly implemented, the project may face some delay in accessing the land area due to poor agreement of local communities on the project development.	- Engage and well consult with local communities for project development activities within the region. - Establish an entitlement matrix covering a comprehensive list of the direct affected land and any asset by the project, including both landowner, tenants, private business operators as well as sharecroppers and according to compensation measures should be established in accordance with the related laws and regulations in Myanmar.		X	
Physical Hazard	Several of the construction phase activities can pose serious threat of accidents and injuries to the construction crew and general public Construction materials falling from above can cause injuries and accidents to those below while general handling of equipment poses a risk of injuries to the handlers.	<ul style="list-style-type: none"> • Train all the workers for first aid • Clean up excessive waste debris and liquid spills regularly • Use slip retardant footwear • Provide temporary fall arrestors • Use control zones and safety monitoring systems • Use a designated and restricted waste disposal area • Use checked and well-maintained devices 		X	

Table 5.2-1 Environmental Impact and Significance

Action Affecting Environmental Resources & Value	Impacts/ Sources	Recommended Feasible Protection/ Mitigation Measures	Impact Significance			
			Significant	Significant Effect		
				Small	Moderate	Major
Air Quality	Major pollutants envisaged are Particulate Matter, Sulphur dioxide and Oxides of Nitrogen due to traffic activities and emergency operation of DG sets. Being, the operation of DG sets will only be a temporary phenomenon, it will not cause any major adverse impacts on air environment.	<ul style="list-style-type: none"> - Emission standards of the vehicles applying in the complex are of international standards. - Adequate height of stack is provided for the DG sets. 		X		
Noise and Vibration	The noise levels in the project were high due to the traffic movement within the city and further due to the usage of DG set. However, the greenbelt is provided to further attenuate the noise levels.	<ul style="list-style-type: none"> - DG sets are provided with acoustic enclosures. - Noise levels would be reduced by the use of absorbing material on roof walls and floors. - The project area would be thickly vegetated with species of rich canopy. 		X		
Water Resources and quality	<ul style="list-style-type: none"> - In order to reduce the water consumption, suitable measures are taken. For watering the plants and landscaped areas, adequately treated sewage is used, thus conserving water. -Wastewater discharge from activities during operation phase. 	The hotel should be planned to use proper wastewater drainage systems and efficient machines should be used in the laundry department and kitchen. In order to mitigate water pollution, procedures for spill preventive measures will be developed such as due care to be taken to prevent from spillage while filling diesel oil and lubricants and also adequate secondary containment will be provided for the			X	

		diesel and engine oil storage containers.				
	There is generation of surface run-off from the premises during monsoon season. The runoff is of two types i.e. run-off from the previous areas of the site and run-off from the built-up area of the complex.	<p>Run-off from the Built-up area</p> <p>The run-off from the previous surfaces and built up areas of the project site is being routed through a carefully designed storm water drainage network discharging into rainwater harvesting structures provided along the boundary of the project site. Surplus storm water after percolation into ground will flow into the storm water drain and is disposed of by gravity into the existing public storm water drain adjacent to the project site.</p> <p>Run-off from other area</p> <p>The run-off from other area is being routed directly to the rainwater harvesting structures, proposed to be constructed at suitable locations as per the contours.</p>			X	
		<p>For augmenting the ground water resources in the project site, appropriate numbers of rainwater harvesting structures were constructed along the boundary of the blocks. These structures will facilitate percolation of water into the ground and thus augmenting the groundwater sources. This will result in increase in groundwater table. Only the surplus water after possible percolation into the ground is discharged into the municipal storm water drains outside the project site.</p> <p>Water harvesting connotes collection and storage of rainwater and also other activities aims at harvesting surface water and ground water, prevention of losses through evaporation.</p>				
Energy Saving	Electricity is crucial for hotels, powering				X	

	essential services like lighting, heating, cooling, and electronic systems. Its impact is felt in guest comfort, safety, and overall operational efficiency. A power outage can disrupt services, inconvenience guests, and affect revenue.				
Solid wastes	-Domestic solid wastes, office wastes, wastes from guests and other wastes are expected during operation phase.	- In order to prevent water contamination, Hotel has collected all solid waste separately and disposes of based on their types and wet and dry status. All-wet-wastes such as kitchen wastes are disposed in the underground tank measuring (L 10 ft. x W 10 ft. x H 10 ft.) The other used plastic bottles, oil containers and cans are collected-daily and-return to recycle business. .			X
Traffic and Transport	- Increase in traffic volume due to project developments and eventual likelihood of congestion on the road network; - Random parking of vehicles and unplanned loading / unloading areas can lead to confusion.	- Comprehensive traffic and travel survey to be conducted for every 5 years to monitor the characteristics and behaviour of traffic and travel respectively to consequently develop strategies for effective transportation. - Hierarchy in roads is adopted to categorize and segregate the traffic based on its size, frequency and density of traffic.			X
Social Economy and Livelihood	- certain impacts emerged which will affect the local population positively	- With increasing demand for medical care, there is a strong need for enhancement of the existing infrastructure. - The unskilled local population of the adjoining areas will find job opportunities as drivers, security guards, cleaners, housekeeping etc. which will improve their economic condition.			

		Development of infrastructure will also take place with the coming of the project in the area. The project will involve activities like amusement, hotel, and golf club. This will enhance the existing structure and also encourage further development in the surroundings.				
Occupational Health and Risk	- The construction dust and noise emissions will be affected to the construction workers.	About 100 employees will in administration and management department of the Hotel. Hotel buildings will be designed and constructed in careful consideration of physical stability, structural load capacity, proper ventilation, lighting, fire prevention, sanitation and general safety issues, and shall comply with all relevant health and safety requirements, mainly issued by Ministry of Hotels and Tourism.			X	

7 ENVIRONMENTL MANAGEMENT AND MONITORING PLANS

7.1 Environmental Management Plan

The Environmental Management Plan (EMP) is prepared to guide implementation of mitigation measures and monitoring requirements. It includes institutions and their roles, environmental management activities, environmental management organizational structure and budget for mitigation measures.

The Environmental Management Unit will be responsible for the implementation of mitigation measures and of the monitoring plan. Overall implementation of the EMP is an obligation of the project developer.

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
<p>Construction Phase: In this phase, the activities of buildings' construction are, for example, construction of guest rooms, office, quarter for staff and workers, guard post, retaining walls and clear water tank etc.</p>						
<p>Direct Impact</p>						
Water Quality	All construction sites	<p>The following mitigation measures should be taken:</p> <ul style="list-style-type: none"> ✓ Contaminate water shall be reduced by avoiding earthwork in rainy season, and the proper wastewater drainage system shall be provided ✓ Temporary toilet should be provided for labors ✓ Leak proof containers should be used for storage and transportation of oil and grease, and keeping the impervious floors of oil and grease handling areas. 	Throughout Construction period	30lakhs	Construction company supervisor	HSE Coordinator
Soil Erosion and Landslide	All construction site	<ul style="list-style-type: none"> ✓ prevention of soil contamination by oil or grease spills, leakages or releases, all manipulations of oil derivate in the process of construction and provision of fuel to the machines should be performed with maximum attention; ✓ it must be prohibited to operate with equipment and vehicles outside the designated work areas and roads; 	Throughout Construction period	20lakhs	Construction company/ supervisor	HSE Coordinator
Ail quality	All construction site	<ul style="list-style-type: none"> ✓ Cover or control equipment should be used such 	Throughout	50lakhs	Construction	HSE

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		<p>as spraying water, bag house in the material handling process.</p> <ul style="list-style-type: none"> ✓ All machineries and equipment shall have effective engines and exhaust systems so as to maintain exhaust emissions within permissible limit. ✓ Open burning of waste materials shall not be allowed. 	Construction period		company/supervisor	Coordinator
Noise pollution	All construction site	<ul style="list-style-type: none"> ✓ Construction work should be completed in as short a period by assigning qualified engineers and supervisors. ✓ Construction works should also be confined to daytime hours. ✓ Noise control devices should be applied such as temporary noise barriers and deflectors for impact blasting activities, and exhaust muffling devices for combustion engines. ✓ For generator, noise enclosure should be built. 	Throughout Construction period	10lakhs	Construction company/supervisor	HSE Coordinator
Waste	All construction site	<p>To reduce and control of these waste disposal,</p> <ul style="list-style-type: none"> ✓ Construction activities should be conducted with the use of appropriate health and safety procedures in accordance with the regulatory 	Throughout Construction period	30lakhs	Construction company/supervisor	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		<p>requirements.</p> <ul style="list-style-type: none"> ✓ Some types of the waste should be land filling, some be reused and some be recycled. 				
Floral	All construction site	<ul style="list-style-type: none"> ✓ Where possible the design and the site construction team should seek to retain the trees, reducing the visual impact as possible. ✓ The project alignment should be carefully selected to minimize potential adverse impacts on the environment and surrounding communities. 	Throughout Construction period	50lakhs	Construction company/ supervisor	HSE Coordinator
Occupational health and safety	All construction site	<p>For management of occupational health and safety,</p> <ul style="list-style-type: none"> ✓ The representative of project proponent should a health and safety management plan for the construction workers based on the EMP. ✓ Posters shown in Myanmar language and any other language appropriate for the contractors drawing attention to relevant health regulations should be made or obtained from the appropriate sources and be displayed prominently at the site. ✓ Personal Protective Equipment such as safety gloves, helmets, goggles, earmuffs etc., be provided during construction. 	Throughout Construction period	30lakhs	Construction company/ supervisor	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		<ul style="list-style-type: none"> ✓ For the safety of construction staff, adequate safety measures including availability of first-aid facilities are implemented on the project site. 				
<p>Operation/ Hotel Service Phase: The main project activities of hotel services and maintenance are, services for guests, restaurants, bar, meeting, travel and communication.</p>						
<p>Direct Impact</p>						
Water conservation	Laundry, kitchen and guest rooms	<ul style="list-style-type: none"> ✓ The hotel should be planned to use proper wastewater drainage and efficient machines should be used in the laundry department and kitchen. ✓ Procedures for spill preventive measures will be developed such as due care to be taken to prevent from spillage while filling diesel oil and lubricants and also adequate secondary containment will be provided for the diesel and engine oil storage containers. ✓ Water-saving equipment such as ultra-low flush toilets, spray nozzles, urinals, faucet aerators and low-flow shower head, infrared and ultrasonic sensor, water spigots, and pressure-control valves should be installed to reduce wastewater 	Throughout Operation period	30lakhs	General manager and proponent	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		generation.				
Energy conservation	All the proposed hotel site	<ul style="list-style-type: none"> ✓ Energy saving devices such as energy saving bulbs, intelligent door lock and energy saving switch card will be used to reduce energy consumption. ✓ Auto switching off electrical equipment will be installed to control energy conservation. 	Throughout Operation period	10lakhs	General manager and proponent	HSE Coordinator
Soil quality and structure	All the proposed hotel site	<ul style="list-style-type: none"> ✓ Install grey water treatment plant. Proper treatments are given before discharging into channels. Standard septic type toilets of well-lit, well-cleaned and well-maintained will be used. 	Throughout Operation	10lakhs	General manager and proponent	HSE Coordinator
Air quality	All the proposed hotel site	<ul style="list-style-type: none"> ✓ Burning of rubber and plastic shall not be allowed at the incinerator and the best combustion practice shall be applied. ✓ Turn off the engine while not in use ✓ advance machines, equipment and methods are utilized to minimize air pollutions, such as covering machines, watering accessible road ✓ regular inspection and maintenance of generator are carried out to maintain a good operational condition; ✓ sprinkle the road used for material 	Throughout Operation period	0lakhs	General manager and proponent	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		transportation;				
Noise	Visitor rest place, kitchen and landscaping	<ul style="list-style-type: none"> ✓ Windows with sound-reduction materials should be installed. ✓ As biological control of noise impact of the proposed hotel, the investor has greening and landscaping plan including planting trees at the perimeter of the boundary line. 	Throughout Operation period	10lakhs	Hotel general manager and proponent	HSE Coordinator
Waste	kitchen and incinerator	<ul style="list-style-type: none"> ✓ Laundry usage should be minimized by asking guest to reuse towels and bedding. ✓ The hotel has to all solid waste separately and of based on their types and wet and dry status. ✓ Consumption of detergents should be controlled ✓ Disposing of waste only after all waste control and recycling have been explored and minimized. 	Throughout Operation period	30lakhs	Hotel general manager and proponent	HSE Coordinator
Human	All the proposed project site	<p>To prevent and reduce of occupational health and safety,</p> <ul style="list-style-type: none"> ✓ Anti-slip stair tape treads should be equipped along the for highlighting step edge and avoid slipping. ✓ Workers should not be allowed to enter kitchen without kitchen wear. 	Throughout Operation period	50lakhs	Hotel general manager and proponent	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		<ul style="list-style-type: none"> ✓ Site plan should be provided at the lobby. ✓ Qualified first-aider be provided at all times. ✓ A good ventilation rest room for provided at a level appropriate for the purpose of the facility. ✓ Food-handling, preparation and storage areas for dry and wet food adapted to workers and guests' food hygiene. ✓ 24 hours' security in the proposed hotel should be managed for the guest safety 				
<p>Decommissioning Phase: After 50 years later, this is the final phase of the project and it will be in relation to the condition as stated in the investment contract. Decommissioning would require use of the demolishing equipment. Where needed, any existing hazardous material used in demolition of these would be properly handled and disposed of in accordance with governing authority requirements.</p>						
<p>Direct Impact</p>						
Water	All the decommissioning site	<p>The mitigation measure is similar to the construction phase,</p> <ul style="list-style-type: none"> ✓Contaminate water shall be reduced by discharging wastewater properly ✓Temporary toilet for labor and leak proof containers should be used for storage and transportation of oil and grease, and keeping the impervious floors of oil and grease handling 	Throughout the phase	20lakhs	company	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		areas.				
Noise	All the decommissioning site	<p>To reduce noise pollution from demolition,</p> <ul style="list-style-type: none"> ✓ The noisy construction works should be planned to be during the day. ✓ The demolition machineries, generators and other equipment should be used in good condition and insulated. 	Throughout the phase	10lakhs	Demolish company	HSE Coordinator
Waste	All the decommissioning site	<p>To control the waste generation,</p> <ul style="list-style-type: none"> ✓ The effective solid waste management system should be provided. ✓ Where recycling/reuse is not possible, the material should be taken to a waste disposal site. 	Throughout the phase	20lakhs	Demolish company	HSE Coordinator
Occupational health and safety	All the decommissioning site	<p>In order to control occupational health and safety,</p> <ul style="list-style-type: none"> ✓ Mitigate demolition workers' accidents by enforcing adherence to safety procedures and preparing contingency plan for accident response. ✓ Adherence to the Occupational Health and Safety Rules and Regulations should be adopted. ✓ Appropriate personal protective equipment should be provided as well as ensuring a safe and healthy environment for demolition workers. 	Throughout the phase	30lakhs	Demolish company	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
Public and community services	All the decommissioning site	Mitigation measures include: ✓ Safety aspects should be emphasized among drivers ✓ Driving skills and requiring of drivers should be improved	Throughout the phase	10lakhs	Demolish company	HSE Coordinator
Wildlife Sanctuary	All the site	To prevent impact on wildlife sanctuary during decommissioning phase, ✓ Hotel management and development committee should be guided by a long-term vision that incorporates ecosystem and biodiversity. ✓ In this regard, as detailed described in the following Biodiversity Management Plan, the hotel project has carefully planned to implement all necessary precaution measures to avoid any potential negative impact on the wildlife and its ecosystem	Throughout the phase	30lakhs	Demolish company	HSE Coordinator

7.2 Social Management

The company shall avoid the worker's problem specified in impact statement by taking care of the rights of labour, especially of female employee, in accordance with international best practice as well as Myanmar's customary rules and regulations. Best suited pay scale will be utilized and over time cost and other compensation due to impact on social life will be applied.

7.3 Safety and Security Plan

This safety and security plan is intended to implement during the construction phase and operation phase of the project. It aims to provide maximum Occupational Health and Safety (OHS) for workers. It also considers possible emergency situations and evacuation and clean up procedures for emergency uses.

7.4 Emergency Response Plan

The purpose of emergency planning is to minimize the effects of an emergency that occurs at a workplace. An emergency may involve an explosion, fire, harmful reaction or the evolution of flammable, corrosive or toxic gases and vapors or an escape, spillage or leak of a hazardous chemical. And then, the natural hazard likes earthquake and flooding.

7.5 Corporate Social Responsibility (CSR) Plan

It is the truth that the implementation of the proposed project would generate both negative and positive impact on the community's daily life. The objective of this plan is to ensure social well-being of the employees and their family members for better community. It is stated in the document of the proponent, submitted to MIC that 2% of the profit will be allocated for Corporate Social Responsibility (CSR) program every year starting by the year of factory running. However, the company should implement CSR program based on their first-year net profit at the very first year of the project.

8 PUBLIC CONSULTATION

8.1 Methodology and Purpose

The Project Proponent (PPT) developed a preliminary Stakeholder Engagement Plan (SEP) which contained an overview of the relevant stakeholder groups to be consulted and the estimate schedule for engagement activities. Information was disclosed to various stakeholders, which included:

- Brief details about the Project;
- EIA process, study and measures;
- Purpose of the consultations;
- Expectations from the local stakeholders in regards to the consultation etc.; and
- The likely adverse impacts to the public and/or environment.

The meeting was conducted at the regional level and was structured as follows:

- Presentation of Project and Project Proponent (in Myanmar language);
- Presentation of the proposed EIA study and measures; and
- Question and Answer Session.

Venue:	Meeting Room, Ye Dagon Taung City Show Room
Attendees:	<ul style="list-style-type: none"> - Administrator, General Administrative Department - Officers from MCDC - REM Consultants - General Manager, Ye Da Gyun Taung Project - AGM, PPT - Managers of Ye Dagon Taung Project - Engineer Department of Ye Dagon Taung Project - HR Department of Ye Dagon Taung Project - Sale & Marketing Department of Ye Dagon Taung Project - YayKyi Villagers
Objective:	Ye Dagon Taung City Project' Description and Objectives of Environmental Impact Assessment Study
Questions and Answers	
U Myint Oo, Administrator, Patheingyi Township, Mandalay Region	Question: How would you measure water quality conditions? Seasonally or not? How does construction work measure the drainage? Answer : Water quality will be measured by sample points representing for both rainy season and summer season. Ground water quality will be measured in both season. Quality of water from Sedawgyi Canal which is nearby the project site will also be tested.
Daw Khin Ohnmar Htwe Director, REM	
U Myint Oo, Administrator, Patheingyi Township, Mandalay Region	Question: How many housing units in Villa Project? What is the source of water supply for this villa? If the projects use Sedawgyi canal water, how the project will manage water supply for the long term period? Answer : There will be 5000 housing units there. We will use the water resources from Sedawgyi Canal, Myitnge River and ground water.
U Aung Kyaw , Manager Administrative Dept, Ye Dagon Taung City Project	
U Myint Oo, Administrator, Patheingyi Township, Mandalay Region	Question: How would you conserve native fauna such as monkeys? The project should emphasize SIA and should listen to the public voices. Township Administrative Department would cooperate to get official data and to manage security concerns. And then Township Administrative Department would like to suggest MCDC to participate in the road development sector and communication facilities.

Daw Khin Ohnmar Htwe Director, REM	Answer : Of course. REM will inform to GAD before conduction field observation and data collection. Disclosure plan of the project will also be launched in official web page of the project related company.
Daw Khin Pyone Lwin, Officer , MCDC	In this meeting, representative of MCDC only belong to Garden Department. Representative from Water and Sanitary Department of MCDC will attend in the next meeting.
U Aung Linn, AGM, Ye Dagon Taung City Project	U Aung Linn explained about CSR programmes during construction period. These included <ul style="list-style-type: none"> - Spent 2.2 billion kyats for CSR programmes to local people - Spent 3.5 billion kyats for main road (6 lanes) construction from the project site to Junction of Aungpinle (2018-2019 to 2020-2021)and - All CSR programmes are 5.7 billion kyats
U Thant Zin Oo, GM, Ye Dagon Taung City Project	U Thant Zin Oo explained about water resources near the project area. <ul style="list-style-type: none"> - It is observed that there is a water fall near the project area but it appears once in only 2 or 3 years when the rain is heavy in PysinOoLwin area. - Access road to the project is 3.47 miles from the project site and Junction of Aungpinle and it has already constructed. - Bridge, assess road and factory construction are being started.
U Myint Oo, Administrator, Patheingyi Township gave concluding remarks as follows. <ul style="list-style-type: none"> - It is necessary to continue consultation meeting for sustainable development. - It is one of the encouragements for the development of Patheingyi Township. Therefore, it is necessary to consider the sustainability. - The project will also be the main development area of Mandalay City also. Therefore, it is better to consider sustainability of the project and to consider the strategic view point of CSR programmes. Meeting was completed successfully.	

8.3 Public Consultation Meeting (PCM) at the EIA Stage

Public consultations with the three identified categories of stakeholders were held on 30th January 2024. The meeting dates, group of agencies, and number of participants are given in Table 6.2-1. Minutes of meeting and list of participants in each meeting are shown in below.

Table 8.3-1 Meeting with Projects Stakeholders

Meeting Dates	Stakeholders	Number of Participants
30th January 2024	Patheingyi Township	
	1.Government officials	5
	2.Project Proponent's representatives	5
	3.EIA Consultant (TEAM)	4
	4. Local people	16
	Total	30

8.4 Summary of the Outcomes of PCMs at the EIA Stage

Four PCMs were organized on 30th January 2024 a Meeting Room, Ye Dagon Taung City Show Room. In the consultation meeting, after the explanation on the project plan, the expected key environmental and social benefits as well as major positive and negative environmental and social impacts analyzed in the draft EIA report were explained. In addition, findings of the EIA study and further schedule of the EIA were presented to the participants. All the meeting was ended with the question-and-answer session. As a whole, about 4 suggestions were raised from the participants and discussed with the project proponent and representatives from REM.

8.4.1 Summary of Comments from PCMs at the EIA Stage

The following topics and concerns have been discussed and collected during the meetings:

- Establish the own fire station
- Control the workers to stay with discipline
- Concerns about garbage within the surrounding environment.

Summary of Comments from PCMs at the EIA Stage

The following topics and concerns have been discussed and collected during the meetings:

- Establish the own fire station
- Control the workers to stay with discipline
- Concerns about garbage within the surrounding environment.

The detailed of minutes of meeting and power point presentation used in public consultation meeting are presented in below and Annex.

Table 8.4-1 Summary of the Outcomes of PCMs at the EIA Stage

Date:	30-1-2024
Time:	10:00 pm – 12:00 pm
Venue:	Meeting Room, Ye Dagon Taung City Show Room
U Thet Lwin Swe Deputy (CEO) Ye Da Gyun Taung Project	Opening remarks and explanation of the contents of the Ye Da Gyun Taung Project
Question and Answer	
U Thein Lwin Oo Yaykyi village administrator,	Question: I want the families of the surrounding villages to be considered first when projects are being carried out and employment opportunities are available. During the construction period, I would like to suggest that the

worker who are working in this area so that they should stay disciplined and for security reasons. They are from different places and they are not from this place. Therefore, it is very difficult to manage them, so I want them to do it systematically.

I don't understand about environment issues. However, I would like to proceed systematically in accordance with the instructions of the responsible departments.

Answer || **Follow as per suggestion.**

8.5 Grievance Redress Mechanism

Grievance redress mechanism (GRMs) is an integrated system consisting of institutions, instruments, methods, and processes to settle down grievances from diverse stakeholders with regard to the project. Grievances and dissatisfactions about the actual and perceived impacts of development projects are normally raised by project affected people or communities who are adversely influenced by such projects. These grievances usually stem from physical, situational, and social losses and can be imposed on the project developer at different stages of the project cycle.

8.6 Disclosure Plan



မူရင်း: ဖွံ့ဖြိုးသစ်အကြောင်း Phwint Phyto Thit Land သတင်း: အလုပ်အကိုင် ဆက်သွယ်ရန် ဘာသာစကား

အကြံပြုလွှာတောင်းခံခြင်း

မန္တလေးတိုင်းဒေသကြီး၊ ပုသိမ်ကြီးမြို့နယ်တွင် မန္တလေးမြို့တော်စည်ပင်သာယာရေးကော်မတီနှင့် ဖွံ့ဖြိုးသစ်ကုမ္ပဏီတို့ ပူးပေါင်း အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိသည့်

ရေတံခွန်တောင်စီးတီးစီမံကိန်း (YE DAGUN TAUNG CITY PROJECT)အား ပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်းအစီရင်ခံစာ ကို မြန်မာနိုင်ငံမှ Resource and Environment Myanmar Co., Ltd. (REM)နှင့် တွဲဖက်ဆောင်ရွက်မည်ဖြစ်ပြီး ပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်းအစီရင်ခံစာအတွက် သက်ဆိုင်သူများနှင့်တွေ့ဆုံခြင်းအစည်းအဝေးကို (၁.၁၀.၂၀၂၁) ရက်နေ့တွင် ဆောင်ရွက်ခဲ့ပါသည်။

သို့ဖြစ်ပါ၍ ရေတံခွန်တောင်စီးတီးစီမံကိန်း (YE DAGUN TAUNG CITY PROJECT)နှင့် ပတ်သက်သော အကြံဉာဏ်များပေးပို့လိုပါက ဖွံ့ဖြိုးသစ်ကုမ္ပဏီ၏ phwintphyothit.com website ၏ chat box တွင်လည်းကောင်း၊ info@phwintphyothit.com သို့လည်းကောင်း အကြံပြုစာများ ရေးသားပေးပို့နိုင်ပါသည်။

Contact Send us message

All meetings will be carefully documented and logged, minutes will be taken, and follow-up activities will be recorded. There are four different types of engagement activities with key stakeholders: Based on the analysis of the key stakeholders, appropriate approaches and action plan need to be established respective to each of the stakeholders

The project information is available for public in the Website and Facebook page of Ye Dagon Taung Company.

9 Conclusion and Recommendation

The construction project has marginal adverse impacts on the local environment. However, with the implementation of the pollution control and environment management measures, the minor impacts anticipated due to construction and operation of the operation of the project has been mitigated.

This project has provided business opportunities for the local people and they are benefited in the areas such as education, health care, infrastructure facilities and women empowerment. Thus, in view of considerable benefits from the project without any major adverse environmental impact, the project is most advantageous to the region as well as to the nation.

CHAPTER 1 CONTEXT OF THE PROJECT

1 Introduction

The purpose of environmental impact assessment is to seek approval for the proposed project and to provide baseline information upon which subsequent environmental audits shall be based in line with the Environmental Law, Environmental Rules and related guidelines. The report describes the project including project inputs, activities and possible environmental impacts likely to arise from the construction, operation and decommissioning of the project. In addition, the report proposes appropriate mitigation measures where negative impacts are likely to occur and ways to enhance the positive impacts, if any. An environmental management plan has also been developed to help the proponent take care of any impacts that may arise due to the project activities.

1.1 Project Overview

The project is to develop the hotel services on 7.5 Acres of land area located in Yaykyi Kwin, Kwin No (548), Yaykyi Village Tract, Patheingyi Township, Mandalay region. The project is a part of Yaytagon Hill City Development Project and the total amount of capital is about 34801.96 million kyats (USD 15.635 million). The period of investment is 2 years.

1.2 Objectives of Environmental Impact Assessment

Every development activities have resulted more or less negative or positive impacts. The study was done with the purpose of the following objectives:

The overall objective of the study is *“To create sustainable social and economic development of the project at the local, regional and national level through the effective conservation of the environment”*.

In line with that objective the project is focused on:

- Review and discuss legal frameworks related to the project by studying on existing environmental resources- physical, biological and socio-economics
- Make public dissemination and consultation to gather comments, concerns, and recommendations of the people, local authorities and relevant governing bodies
- Identify potential environmental impacts caused by the project’s activities and consider appropriate mitigation measures to avoid, minimize, restore or compensate, and then to develop an Environmental Management Plan for the project owner to implement and for relevant governing bodies to monitor, and finally make a joint conclusion about environmental impacts on the project and to raise necessary recommendations.

1.3 Terms of Reference

The term of reference (TOR) for this beverage factory project is as follows:

- Provide a description of the proposed project activities with a focus on potential adverse impacts of all the activities during construction, operation and decommissioning phases.
- Establish the environmental baseline conditions of the project area and identify areas that are likely to be impacted on the project in accordance with the established environmental regulation and guidelines.
- Produce a comprehensive ESIA report that should contain among other issues, identification of key environmental aspects, recommendations of appropriate mitigation measures to minimize or prevent adverse negative impacts.
- Develop an environmental management plan

The following environmental issues were identified for coverage as per the terms of reference above:

a) Physical resources

- Water Quality (surface water and ground water)
- Soil contamination and land degradation
- Air quality
- Noise
- Occupational Health and Safety

b) Biological resources

- Biodiversity (Flora and Fauna)

c) Socio Economics resources

- Settlement patterns
- Land use
- Public health, safety and general hazards
- Employment opportunities
- Opinion upon the proposed project

1.4 Scope and Content of Project

The project assessment investigated and analyzed the anticipated environmental impacts of the proposed project in line with the Environmental Law (2012), the Environmental Rules (2014) and EIA procedures (2015).

Consequently, the report will provide the following:

- Nature of project
- Investment Plan
- Employment Statement
- Location of the project including the physical area that may be affected by the project activities
- Activities that shall be undertaken during the project construction, operation and design of the project
- The material to be used ,waste to be generated by the project and methods of disposal
- The potential environmental impacts of the project and mitigation measures to be taken during and after the implementation of the project
- An action plan for prevention and management of possible accidents and hazards during the project cycle

The project consists of IBIS Mandalay 3-star hotel and Novotel Mandalay 5-star hotel.

1.5 Project Proponent

Contact details for Phwint Phyo Thit Co., Ltd. are provided below:

Contact Person:	U Thet Lwin Shwe, Deputy CEO
Address:	Phwint Phyo Thit (Office 1) Sin Phyu Kan Golf Range, Corner of Theikpan & 78th Streets, Chanmyathazi Township, Mandalay, Myanmar. Phwint Phyo Thit (Office 2) Yé Dagon Taung Golf Club, Patheingyi Township, Mandalay, Myanmar.
Telephone:	+959 778 778 877
Email:	admin@phwintphyothit.com
Web Site:	https://phwintphyothit.com https://www.facebook.com/phwintphyothitcompany/

Phwint Phyo Thit Company registered in Directorate of Investment and Company Administration (DICA Myanmar) in accordance with the Myanmar Companies Law in 2006. The company molded itself through the years and fruitfully ventured into different industries, especially in real estate. Since then, the company has pioneered breakthroughs, broadened its enterprise, and stayed at the forefront in every phase of the country's rise to development.

Currently, the company is one of the largest and most diversified conglomerates in the country, engaged primarily in businesses that serve a growing population with rising disposable incomes. Phwint Phyo Thit's place in Myanmar business has for its cornerstone a business portfolio of market leaders, a solid financial position, a formidable management team, and a vision of leading the country

to global competitiveness and making life better for every individual.

1.6 Consultant

Leading Organization - Resource & Environment Myanmar Co., Ltd. (REM)

(REM) is located in the city of Yangon, Myanmar, in the country it is a leading resources and environment consulting firm that composed of geoscientists, engineers, biologist, botanist, socio-economic experts, cultural heritage experts, environmental engineers and physical resources management specialist.

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1.6.1 EIA Consultant Team

Members of EIA preparation				
Team Leader of the team				
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1.7 Methods and Scope of the Study

1.7.1 Study on Existing Social and Environmental Resources in the Project Area

The study on existing environmental resources in the project area was focused on three main resources- physical, biological and socio-economic. Data were collected for quantitative and qualitative aspects of physical, biological and socio-economic conditions of the project area by two approaches:

(a) **Secondary data**

Data related to physical, biological and socio-economic resources from the relevant ministries/bodies and research institutions were collected as reference material for the preparation of the ESIA report. Data such as geographical conditions (type of land, topology and slope), weather (temperature, rainfall, wind and humidity), biological resources (types of flora and fauna), and socio-economic situation on demography, land and economic condition of the people living near the project area were collected from different sources.

(b) Primary Data

The primary data collection was carried out to obtain existing information for the preparation of ESIA.

- Physical resources: the primary data relates to quality of air, noise and water inside or near the project area. This data collection was done by direct observation, survey, sample analysis, and discussion with local people and relevant government departments.
- Biological resources: the primary data includes living environment of the project area (i.e., flora and fauna). Species occurrence and abundance of flora and fauna were mainly recorded with special emphasis on rare and endemic species. Field equipment such as GPS, camera, binoculars, pH meter, and conductivity meter were also used.
- Socio-economic resource: the primary data relating to demography/residences, economic status (occupation, revenue/expense), land, water and energy uses, infrastructure, education, health and public welfare and cultural assets were collected. Data collection was made based on direct observation, interview and questionnaire survey with local people and local administrators in the target locations that are likely to be affected by the project impacts. This ESIA has been systematically carried out according to the EIA procedures.

CHAPTER 2 LEGISLATION FRAMEWORK

2.1 Overview

Myanmar's major environmental policies, laws and regulations are as follows:

- ✚ Environmental Policy (1994)
- ✚ Environmental Conservation Law (2012)
- ✚ Environmental Conservation Rules (2014)
- ✚ Environmental Impact Assessment Procedure (2015)
- ✚ Environmental Quality (Emission) Guidelines (2015)
- ✚ Other existing social related laws and regulations

(Source: MONREC-ECD, 2016)

According to Section 7 of the Environmental Conservation Law and Articles 52 and 53 of the Environmental Conservation Rules of the Republic of the Union of Myanmar, all Projects undertaken in Myanmar which have the potential to cause significant environmental and social impacts are required to undertake an Initial Environmental Examination (IEE) or an Environmental Impact Assessment (EIA) and to obtain an Environmental Compliance Certificate (ECC) in accordance with the Environmental Impact Assessment (EIA) Procedure (“the Procedure”).

EIA for the proposed Yedagun Taung Real Estate Development Project (International Hotel Project) will be conducted in compliance with the Myanmar Environmental Conservation Law (ECL, 2012) and the Myanmar Environmental Conservation Rules (ECR, 2014). ECR provides the regulatory guidance to implement the ECL, where all the government and public development project shall undergo the required procedures of the EIA as prescribed by the relevant Ministry (i.e MONREC).

In addition, a number of national and regional environmental (of Mandalay Region) and sector-specific laws and regulations of Myanmar shall be complied with in carrying out the EIA, as illustrated in the sections below:

National Environmental Policy (2019) builds on Myanmar’s 1994 National Environmental Policy, the 1997 Myanmar Agenda 21 and the 2009 National Sustainable Development. The Government of the Republic of the Union of Myanmar recognizes the fundamental links between environmental protection, economic and social development, and poverty alleviation.

2.2 Institutional Framework on Environmental Management

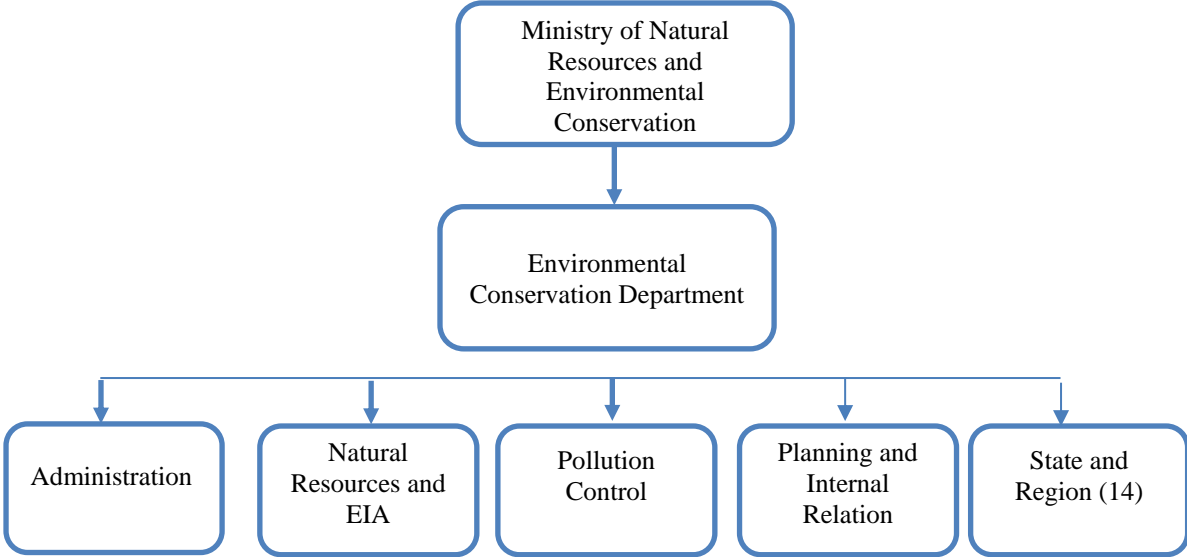
2.2.1 Ministry of Natural Resources and Environmental Conservation (MONREC)

The government body with primary responsibility for ensuring and promoting soundness of the

environment in Myanmar is MONREC although other Related Ministries such as the Ministry of Transportation and Communications also share certain level of responsibility. MONREC was reformed in April 2016 from the Ministry of Environmental Conservation and Forestry to be the focal point and coordinating agency for environmental management. While ECL (2012) and ECR (2014) do not specify the role of MONREC, responsibility of its predecessor (i.e. [Ministry of Environmental Conservation and Forestry](#) (MOECAF)) is stipulated in the Forest Policy (1995) as: forest land management; environmental protection; timber extraction; and forest policy in Myanmar. Since then, there has been only one modification to the structure of the Ministry, which is addition of ECD established in October 2012 based on Environmental Conservation Law. ECD is the department responsible for managing the EIA process in Myanmar. The role of MONREC in environmental conservation can therefore be considered greater than before.

The “Ministry of Natural Resources and Environmental Conservation (MONREC)” which was founded by the merger between former “Ministry of Environmental Conservation and Forest (MOECAF)”, and former “Ministry of Mines (MOM)” when the new Myanmar Government was launched in 2016, is the nodal governmental body of Myanmar for taking on administration of Environmental Management and Environmental Impact Assessment (EIA) procedures in Myanmar.

The Environmental Conservation Department (ECD) of the MONREC is to take responsibility for the environmental conservation and management as well as EIA procedures in Myanmar which consists of five sub-divisions as shown in Figure 2.2-1.



Source: Environmental Conservation Department

Figure 2.2-1 Myanmar National Environmental Conservation organization chart

2.3 Relevant Legislations Related to EIA and Environmental Management of the Project

The Project proponent will follow and comply the following laws and regulation of Myanmar for the development of the present Project.

2.3.1 Environmental Policy (1994)

To achieve harmony and balance between socio-economic, natural resources and environment through the integration of environmental considerations into the development process enhancing the quality of the life of all its citizens

2.3.2 National Land Use Policy (2016)

- a) To promote sustainable land use management and protection of cultural heritage areas, environment, and natural resources for the interest of all people in the country;
- b) To strengthen land tenure security for the livelihood improvement and food security of all people in both urban and rural areas of the country;
- c) To recognize and protect customary land tenure rights and procedures of the ethnic nationalities;
- d) To develop transparent, fair, affordable and independent dispute resolution mechanisms in accordance with rule of law;
- e) To promote people centered development in land resources and accountable land use administration in order to support the equitable economic development of the country;
- f) To develop a National Land Law in order to implement the above objectives of National Land Use Policy.

2.3.3 The Environmental Conservation Law (2012)

The Pyidaungsu Hluttaw (Assembly of Union) enacted this law by Law No. 9 of 2012 on 30 March 2012. The legal mechanism for ESHIA has been addressed in this law. This law was enacted with the objectives of:

- a. To enable to implement the Myanmar National Environmental Policy;
- b. To enable to lay down the basic principles and give guidance for systematic integration of the matters of environmental conservation in the sustainable development process;
- c. To enable to emerge a healthy and clean environment and to enable to conserve natural and cultural heritage for the benefit of present and future generations;

- d. To reclaim ecosystems as may be possible which are starting to degenerate and disappear;
- e. To enable to manage and implement for decrease and loss of natural resources and for enabling the sustainable use beneficially;
- f. To enable to implement for promoting public awareness and cooperation in educational for dissemination of environmental perception;
- g. To enable to promote international, regional and bilateral cooperation in the matters of environmental conservation;
- h. To enable to cooperate with Government Departments, Government Organizations, International Organizations, non-government organizations and individuals in matters of environmental conservation.

The following articles are particularly relevant to ESHIA requirements and this project:

Article 7 of chapter 4 mentions the need for SIA and ESIA for any project operated by the government or organizations or individuals.

The duties and powers relating to the environmental conservation of the Ministry are as follows:

- a) To specify categories and classes of hazardous wastes generated from the production and use of chemicals or other hazardous substances in carrying out industry, agriculture, mineral production, sanitation and other activities;
- b) To prescribe categories of hazardous substances that may affect significantly at present or in the long run on the environment;
- c) To promote and carry out the establishment of necessary factories and stations for the treatment of solid wastes, effluents and emissions which contain toxic and hazardous substances;
- d) To prescribe the terms and conditions relating to effluent treatment in industrial estates and other necessary places and buildings and emissions of machines, vehicles and mechanisms;
- e) To lay down and carry out a system of ESIA and SIA as to whether or not a project or activity to be undertaken by any Government department, organization or person may cause a significant impact on the environment;

To manage to cause the polluter to compensate for environmental impact, cause to contribute fund by the organizations which obtain benefit from the natural environmental service system, cause to contribute a part of the benefit from the businesses which explore, trade and use the natural resources in environmental conservation works.

Also, in this law, Article 14 and Article 15 are related with waste disposal in accordance with environmental standards:

14. A person causing a point source of pollution shall treat, emit drainage and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards.

15. The owner or occupier of any business, material or place which causes a point source of pollution shall install or use an on-site facility or controlling equipment in order to monitor, control manage, reduce or eliminate environmental pollution. If it is impracticable, it shall be arranged to dispose the wastes in accord with environmentally sound methods.

16. A person or organization operating business in the industrial estate or business in the SEZ or category of business stipulated by the Ministry:

- a) is responsible to carry out by contributing the stipulated cash or kind in the relevant combined scheme for the environmental conservation including the management and treatment of waste;
- b) is responsible to carry out by contributing the stipulated cash or kind in the relevant combined scheme for the environmental conservation including the management and treatment of waste;
- c) shall contribute the stipulated users' charges or management fees for the environmental conservation according to the relevant industrial estate, SEZ and business organization
- d) shall comply with the directives issued for environmental conservation according to the relevant industrial estate, SEZ or business."

2.3.4 Environmental Conservation Rules (2014)

The Ministry of Environmental Conservation and Forestry, in exercise of power conferred under sub-section (a) of section 42 of the Environmental Conservation Law, issues this rules by No.50 of 2014 on the date of 5 June 2014.

In the Environmental Conservation Rules, concerning Environmental Impact Assessment, it has been stated as:

- g) **Rule 51:** The Ministry shall assign duty to the Department for enabling to adopt and carry out the environmental impact assessment system.
- h) **Rule 52:** The Ministry shall determine the categories of plan, business or activity which shall carry out environmental impact assessment

- i) **Rule 53:** The Ministry shall to scrutinize whether or not it is necessary to conduct environmental impact assessment, determine the proposed plans, businesses or activities which do not include in stipulation under rule 52
- j) **Rule 56:** The person who carries out any project, business or activity shall arrange and carry out for conducting the environmental impact assessment for any project, business or activity by a qualified third person or organization accepted by the Ministry.
- k) **Rule 58:** The Ministry shall form the Environmental Impact Assessment Report Review Body with the experts from the relevant Government departments, Government organizations.
- l) **Rule 61:** The Ministry may approve and reply on the ESIA report or IEE or EMP with the guidance of the Committee

Rule 69: (i) Any person shall not emit, cause to emit, dispose, and cause to dispose, pile and cause to pile, by any means, the pollutants and the hazardous waste or hazardous material stipulated by notification under the Law and any of these rules at any place which may affect the public directly or indirectly.

(ii) Any person shall not carry out to damage the ecosystem and the natural environment which is changing due to such system, except for carrying out with the permission of the Ministry for the interest of the people.

The following are summaries of the key laws related to the natural and social environment in Myanmar that will likely be relevant to the Project.

2.3.5 The Environmental Impact Assessment Procedure (2015)

The EIA procedure, issued on 29th December 2015, defines the requirements for the EIA and states that:

“An EIA investigation shall consider all biological, physical, social, economic, health, cultural and visual-components of the environment, together with all pertinent legal matters relating to the environment (including land use, resources use, and ownership of and rights to land and other resources) that may be affected by the Project during all project phases including pre-construction, construction, operation, decommissioning, closure, and post-closure; and shall identify and assess all Adverse impacts and risks that potentially could arise from the project.

Article 7 – This Procedure does not address specific matters in relation to resettlement. Projects involving resettlement shall additionally comply with separate procedures issued by responsible ministries, and in the absence of such procedures all such Projects shall adhere to international best practice on Involuntary Resettlement.”

Three different steps are foreseen for the EIA process which are described in the following sections: screening phase; scoping phase; and EIA Investigation and Report Preparation

2.4 Relevant Legislations Related to the Project

The legislative framework applicable to this project is diverse and consists of a number of Acts and Regulations which must be complied with. A summary of the key environmental legislation and relevant policies and/or guidelines is provided in the following sections:

Law, Regulation or Guidelines	Relevance to Environmental Assessment
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Environmental Framework	
National Environmental Policy (2019)	National Environmental Policy (2019) builds on Myanmar's 1994 National Environmental Policy, the 1997 Myanmar Agenda 21 and the 2009 National Sustainable Development. The Government of the Republic of the Union of Myanmar recognizes the fundamental links between environmental protection, economic and social development, and poverty alleviation.
Environmental Conservation Law, 2012 (Section 7 (a), (b), (c), (d), (e), 14, 15,16)	Provision of basic guidance to integrate environmental conservation in sustainable development, ministry's responsibility to develop relevant guideline and regulation, setting up monitoring system, waste management, conservation of natural resource and cultural heritage. The project company commits to comply section 7 (a), (b), (c), (d), (e), 14, 15, 16.
Environmental Conservation Rules, 2014 (Rule 51, 52, 53, 56, 58, 61, 69)	The principle of this rule is to support the execution conducted by ministry as required by environmental conservation law. The project company commits to comply rule 51, 52, 53, 56, 58, 61, 69.
EIA Procedures, 2015 (Article 102 – 110, 113, 115, 117)	Description of categories of project to conduct EIA and IEE requirement, content of EIA, submission and approval principle, environmental certificates, responsibilities of ministry and project proponent. The project company commits to comply article 102 – 110, 113, 115, and 117.

Myanmar Climate Change Strategy and Action Plan 2016-2030 (draft)	The long-term goal by 2030, Myanmar has achieved climate- resilience and pursued a low-carbon growth pathway to support inclusive and sustainable development.
Guidelines	
National Environmental Quality (Emission) Guidelines (2015)	MOECA (MONREC) formulated the National Environmental Quality (Emission) Guidelines (NEQG) in coordination with ADB in December 2015. The NEQG determines the guideline values for general emission such as air emissions, wastewater, noise levels, odor, and those for sector-specific emission such as emission from forestry, agribusiness/food production, chemicals, oil and gas, infrastructure, general manufacturing, mining, and power.
National Ambient Water Quality Guidelines (in preparation)	Sets environmental guidelines for ambient water quality.
Water	
Underground Water Act (1930) (repeal) (underground water law – 2019 (draft))	The underground water act enacted on the date of 21 st June in 1930 whereas it is expedient to conserve and protect underground sources of water supply in the Union of Burma. This act prohibits sinking of a tube for the purpose of obtaining underground water except under and in accordance with the terms of a license granted by the water officer. Township Officer or sub-divisional officer had power to close a license tube after exercising jurisdiction over the local area concerned and the expense of such closure
Public Health and Safety	

Public Health Law (1972)

The Union Revolutionary Council enacted this law by No 1/1972 on the date of the 12th January 1972. It is concerning with protection of people's health by controlling the quality and cleanliness of food, drugs, environmental sanitation, epidemic diseases and regulation of private clinics.

Section-2:

This section covered communicable disease prevention and environmental sanitation to protect public health and to enhance public health not only by prohibiting harmful activities or conditions, but also by providing preventive and rehabilitative services to advance the health of the people. Regarding environmental sanitation, it is included that

- a. limited control of the disposal of human and other wastes
- b. concerns for water purity and the hygiene of housing
- c. limited interest in food and milk sanitation,
- d. Incipient school health controls, and very little else.

The recently enacted rules require ESIA study for large projects according to the rules of the Ministry of Environmental Conservation and Forestry. Although the law does not specifically define legislation for ESIA's, the following investments are prohibited under this law:

- a. Business which can affect the traditional culture Business which can affect the traditional culture and customs of the national races within the Union;

Business which can affect public's environment, causing noise in the residing area;

- b. Business which can affect public health;
- c. Business which can cause damage to the natural environment and ecosystem;
- d. Business which can affect the land and marine animals, trees, flowers, crops, antique heritage, resources;

<p>The Prevention and Control of Communicable Diseases Law, 1995 (Section 3 (a) (b), 4, 9, 11)</p>	<p>To ensure the healthy work environment and prevention the communicable diseases by the project owner with the relevant health department.</p> <p>The project owner commits to comply section 3 (a) (b), 4, 9, and 11.</p> <p>Section 9: The project owner will inform promptly to the nearest health department or hospital if the following are occurred:</p> <ul style="list-style-type: none"> a) Mass death of birds or chicken b) Mass death of mouse c) Suspense of occurring of communicable disease or occurring of communicable disease d) Occurring of communicable disease which must be informed
<p>The control of Smoking and Consumption of Tobacco Product Law, 2006 (Section 9)</p>	<p>The person-in-charge of the project company will:</p> <ul style="list-style-type: none"> • Keep the caption and make non-smoking area • Arrange the specific place for smoking area • Supervise and carry out measures so that no-one will smoke at the non-smoking area.
<p>Transportation</p>	
<p>Motor Vehicles Law, 2015 and Rules, 1987</p>	<p>It aims to drive safely motor vehicles in public area through registration according to official rules and regulations, to provide driving license, to protect the road users from the road risks and vehicles perils, to avoid traffic congestion and to use high technology transportation systems.</p>
<p>Investment Laws</p>	
<p>Myanmar Investment Law (MIL) (2016) and Myanmar Investment Rules (MIRule) (2017)</p>	<p>The Myanmar Investment Law and Rules cover all investments in Myanmar (foreign and domestic) and clearly states that Myanmar is seeking to attract “responsible investment businesses which do not cause harm to the natural environment and the society for the benefit of the Union and its citizens;” and to develop “business and investments that meet international standards.”</p>
<p>Myanmar Insurance Law (1993)</p>	<p>Requires that any business, that may pollute the environment are required to have compulsory general liability insurance</p>

Export and Import Law (2012)	It aims to implement the economic principles of the State successfully, to lay down the policies to export and import that support the development of the State, and that are to
Labor/working Environment	
Minimum Wages Law (2013)	The Minimum Wages Law sets a minimum wage to meet the essential needs of workers, and their families, who are working in commercial, production and service, agricultural and livestock breeding businesses and for the purpose of increasing the capacity of the workers.
The Payment of wages Law, 2016 (Section 3, 4, 5, Chapter 3, Section 3, 7)	<p>Receipt of wages is made regularly. Unlawful deductions are not to be made.</p> <p>The Law sets out:</p> <ul style="list-style-type: none"> • The obligations on employers regarding the payment of employees' wages • The methods and time frames for payment • The permissibility of deducting wages <p>The duties and responsibilities of the Director General and investigating officers of the Factories and General Labor Laws Inspection Department (the "Department") under the Ministry of Labor, Immigration and Population.</p>
Labor Organization Law (2011)	To protect the rights of the workers, to have good relations among the workers or between the employer and the worker, and to enable to form and carry out the labor organizations systematically and independently.
Settlement of Labor Dispute Law (2012) and Amending Law (2014)	For safeguarding the right of workers or having good relationship between employer and workers and making peaceful workplace or obtaining the rights fairly, rightfully and quickly by settling the dispute of employer and worker justly.
Employment and Skills Development Law (2013)	<ul style="list-style-type: none"> - Creation of employment opportunities - Implementing measures to reduce unemployment - Carrying out to enhance discipline and capacity of the workers - Carrying out for the skills development of the workers - Forming and guiding the Employment and Skills Development Agencies
Social Security Law (2012)/ Came into force 1 April 2014	To support the development of the State's economy through the increase of production to enjoy more security in social life and health care of workers who are major productive

	Union by the collective guaranty of the employer, worker and the Union for enabling to fulfill health and social needs of the workers
Workmen’s Compensation Act, 1923	It stipulates that employer is required to make payments to employees who become injured or who die in any accidents arising during and in consequence of their employment. Such compensation also must be made for disease which arises as a direct consequence of employment, such as carpal tunnel syndrome.
The Leave and Holiday Act, 1951; Amendment in 2014 (Section 3, 4, 5, 7 (a))	This act has been used as the basic framework for leaves and holidays for workers with minor amendment in 2006 and 2014. This defines the public holidays that every employee shall be granted with full payment. It also defines the rules of leaves for workers including medical leave, earned leave and maternity leave. The project company commits to comply section 3, 4, 5, and 7(a).
Rights of Persons with Disabilities Law (2015). Rules currently under internal discussion between Ministry of Social Welfare and PWD groups	Applies to companies who are required to provide employment opportunities for PWD.
Occupational Health and Safety	
Occupational Health and Safety Law (2019)	The objectives of this Law are given here under: (a) to implement Occupational Safety and Health matters effectively in the respective Industries/Businesses; (b) to determine the duties of relevant persons applicable under this Law including Employers and Workers to lessen and mitigate occurrence of Occupational Diseases and Occupational Accidents; (c) to cause relevant persons applicable under this Law, Employers and Workers to take precaution and prevention against occupational hazards and Occupational Diseases; (d) to improve the productivity and health of Workers by preventing the occurrence of Occupational Accidents and Occupational Diseases for their safety; (e) to create Workplaces that are safe and good for health by prescribing the Occupational Safety and Health standards relevant to the Union’s status after considering

The Fire Force Law (2015)	<p>To ensure to prevent the fire, to provide the precautionary material and apparatuses, if the fire caused in the project area to be defeated because the project is business in which electricity and any inflammable materials such as petroleum are used. So, the project owner has to institute the specific fire service in line with the law.</p> <p>Sub-section (a) of section 25: The project proponent will institute the specific fire services.</p> <p>Sub-section (b) of section 25: The project owner will</p>
Culture	
The Protection and Preservation of Cultural Heritage Region law, 1998 (Revised in 2009 and supplemented in 2011)	<p>The Ministry of Culture may, with the approval of the Government issue notification for the protection of cultural heritage areas are categorized as following kinds of zones/region:</p> <p>a) ancient monumental zone;</p> <p>b) ancient site zone.</p>
The Law Protecting Antique Objects (2015)	<p>The antique object is non-valuable for national heritage. So, anybody has to inform if he or she has found any antique object.</p> <p>Section 12: The project proponent will inform to the village-tract office antique object is found.</p>
Criminal Matters	
Penal Code (1861) and Amending Law 2016	<p>Prohibits water pollution, air pollution and discharges of poisonous substances that may harm human health or cause injury. Prohibits explosives causing harm. Prohibits public nuisance</p>

2.5 Legal and Regulatory Framework of Development, Planning and Management for Mandalay City

2.5.1 Mandalay City Development Committee

The Mandalay City Development Committee (abbreviated MCDC) is the administrative body of Mandalay, the second largest city in Myanmar. MCDC has wide-ranging responsibilities, including city planning, land administration, tax collection, and urban development. MCDC raises its own revenues through tax collection, fees, licenses and property development. MCDC's chairman acts as Mayor of Mandalay, and sits as the Municipal Minister for the Government of Mandalay Region.

MCDC was established first established by the State Law and Order Restoration Council's 1992 City of Mandalay Development Law. In 2002, the said law was repealed by State Peace and Development Council and replaced with the 2002 City of Mandalay Development Law. Mandalay Region Hluttaw enacted the new MCDC law in 2014 December. MCDC was formed by the Mandalay Regional Government, and legally comprises 13 to 15 members, including a chairman who acts as the Minister (Mayor), and a Vice- Chairman, who acts as the Vice-Mayor.

2.5.2 City of Mandalay Development Law (2014)

In 13 December 2014, the Mandalay City Development Law formally established the present incarnation of MCDC, delegating wide responsibilities to this body, including city planning, land administration, tax collection, and development. The Committee's duties stipulated in this law can be summarized as below:

1. Local and foreign organizations; Contacting individuals to support the city's development is subject to existing laws and regulations. Rules and regulations; In accordance with the rules and regulations; With grants; Working with loans;
2. Leasing of committee-owned buildings and lands; Prosecute and remove tenants who violate any of the terms;
3. Construction of departmental buildings except for buildings related to national defense or classified as classified; Inspection and maintenance in accordance with this Law; Submitting inspection findings;
4. Establish an advisory and advisory body, if necessary, for advice on development projects. Once formed, assign responsibilities and determine their salaries and allowances with the approval of the Cabinet.
5. Obtaining modern technical assistance and support from home and abroad to implement development projects more effectively.
6. The committee has the right to manage the lands under the authority of any person. Organization Maintaining departmental intrusion; Management; Prosecuting and removing aggressors; In particular, designated gardens and parks for housing projects and other areas under the authority of the committee. Taking responsibility for preventing parks and playgrounds from disappearing for various reasons;
7. Any person within the designated road boundary within the city limits; Organization Prohibition, inspection and supervision to prevent any departmental intrusion. Action and removal; Maintenance;
8. In the reserve lands, any person; Organizations; Maintenance of departmental intrusion;

9. According to the management method under this law, if the prescribed fine is paid, the action may be suspended or allowed to be settled.
10. To increase committee funds, either locally or internationally. In collaboration with foreign investors. Conducting business decided by the committee that it is guaranteed to make a profit with 100% investment by the committee;
11. Exchanging knowledge with friendly cities in foreign countries; Obtaining support; Establishing Sister Cities to provide mutual assistance; Signing memorandums of understanding and concluding agreements;
12. Dissemination of knowledge to the public; Reporting Establishing and operating the media necessary for entertainment activities.
13. Exercising the powers conferred by the government from time to time.

2.5.3 Law Amending Mandalay City Development Law (2021)

In 10 February 2021, the Mandalay City Development Law has been amended according to State Administration Council Law No (2/2021).

1. The State Administration Council has issued this law in accordance with Section 419 under the State Constitution of the Republic of the Union of Myanmar.
2. This law shall be called the Law Amending Mandalay City Development Law.
3. The Law shall take effect until the formation of Union Government and Region/State governments resulted from the elections organized by the State Administration Council after carrying out its tasks in accordance with the provisions during the period with the State of Emergency.
4. Under the prevalence of this amending law, Chapter 3, 4, 5 and 6 of Mandalay City Development Law are deemed to be ineffective.

The law is signed as per Section 419 of State Constitution.

2.6 Environmental Quality Standards

Ministry of Natural Resources and Environmental Conservation, in exercise of the power conferred by sub-section (b) of section 42 of the 2012 Environmental Conservation Law (ECL), the National Environmental Quality (Emission) Guidelines were issued on December, 2015.

These Guidelines have been excerpted from the International Finance Corporation (IFC) Environmental Health and Safety (EHS) Guidelines, which provide technical guidance on good

international industry pollution prevention practice for application in developing countries. The Guidelines are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of these Guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them.

Emissions Guidelines shall apply to any project subject to EIA Procedure, as adopted by the Ministry, in order to protect the environment and to control pollution in the Republic of the Union of Myanmar. These Guidelines specifically apply to all project types listed in the EIA Procedure under ‘Categorization of Economic Activities for Assessment Purposes’ which sets out projects that are subject to EIA, IEE, or EMP.

Air Emission

Projects with significant sources of air emissions, and potential for significant impacts to ambient air quality, should prevent or minimize impacts by ensuring that: (i) emissions do not result in pollutant concentrations that reach or exceed ambient quality guidelines and standards, or in their absence the current World Health Organization (WHO) Air Quality Guidelines; and (ii) emissions do not contribute a significant portion to the attainment of relevant ambient air quality guidelines or standards (i.e. not exceeding 25 percent of the applicable air quality standards) to allow additional, future sustainable development in the same air shed.

(Source: National Environmental Quality (Emission) Guidelines, 2015.

Table 2.6-1 Ambient Quality Guidelines

Parameter	Averaging Period	Guideline Value $\mu\text{g}/\text{m}^3$
Nitrogen dioxide	1-year	40
	1-hour	200
Ozone	8-hour daily maximum	100
Particulate matter PM10^a	1-year	20
	24-hour	50
Particulate matter PM2.5^b	1-year	10
	24-hour	25
Sulfur dioxide	24-hour	20
	10-minute	500

^aParticulate matter 10 micrometers or less in diameter

^bParticulate matter 2.5 micrometers or less in diameter

Source: National Environmental Quality (Emission) Guidelines, 2015

Wastewater

The following guideline values apply during the construction phase of projects, covering storm

water or surface water, and sanitary wastewater discharges from all project sites.

Table 2.6-2 shows the Site Runoff and Wastewater Discharges (Construction Phase) set in NEQG.

Table 2.6-2 Site Runoff and Wastewater Discharges (Construction phase)

Parameter	Unit	Maximum Concentration
5-day Biochemical oxygen demand	mg/l	30
Chemical oxygen demand	mg/l	125
Oil and grease	mg/l	10
pH	S.U. ^a	6-9
Total Nitrogen	mg/l	10
Total coliform bacteria^b	100 ml	400
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50

^a Standard unit

^b Coliforms refer to a group of bacteria which are found in the intestines of warm-blooded animals and therefore are present in sewage, and on / in soils, surface waters and vegetation. Total coliforms are used as an indicator organism which, although by it is not considered to cause diseases in man or animals, usually indicates the presence of pathogenic or disease-causing organisms. By measuring the number of total coliforms present in a sample a judgment can be made as to the water's utility for a given purpose.

This following guideline applies to tourism and hospitality facilities, including hotels, resorts and other accommodation and catering facilities. Wastewater discharges should be managed through conventional treatment to achieve the indicated guideline values for discharge of sanitary water.

Table 2.6-3 Effluent Water (Tourism and Hospitality Development)

No	Parameter	Unit	Guideline Value
1	5-day Biochemical oxygen demand	mg/l	50
2	Chemical oxygen demand	mg/l	250
3	Oil and grease	mg/l	10
4	pH	S.U. ^a	6-9
5	Total coliform bacteria	100 ml	400
6	Total nitrogen	mg/l	10
7	Total phosphorus	mg/l	2
8	Total suspended solids	mg/l	50

Table 2.6-4 Drinking Water Quality (WHO Drinking Water Guideline, Geneva-1993)

No	Parameter	Unit	WHO Drinking Water Guideline
1	pH		6.5-8.5
2	Colour (True)	TCU	15 TCU
3	Turbidity	NTU	5 NTU
4	Conductivity	Micro S/cm	
5	Total Hardness	mg/l as CaCO ₃	500 mg/l as CaCO₃
6	Calcium Hardness	mg/l as CaCO ₃	-
7	Magnesium Hardness	mg/l as CaCO ₃	-
8	Total Alkalinity	mg/l as CaCO ₃	-
9	Phenolphthalein Alkalinity	mg/l as CaCO ₃	-
10	Carbonate (CaCO ₃)	mg/l as CaCO ₃	-
11	Bicarbonate (HCO ₃)	mg/l as CaCO ₃	-
12	Iron	mg/l	0.3 mg/l
13	Chloride (as CL)	mg/l	250 mg/l
14	Sodium Chloride (as NaCL)	mg/l	
15	Sulphate (as SO ₄)	mg/l	500 mg/l
16	Total Solids	mg/l	1500 mg/l
17	Total Suspended Solids	mg/l	
18	Total Dissolved Solids	mg/l	1000 mg/l
19	Manganese	mg/l	0.05 mg/l
20	Phosphate	mg/l	-
21	Phenolphthalein Acidity	mg/l	-
22	Methyl Orange Acidity	mg/l	-
23	Salinity	ppt	-

Noise Level

Noise prevention and mitigation measures should be applied where predicted or measured noise impacts from a project facility or operations exceed the applicable noise level guideline at the most sensitive point of reception. Noise impacts should not exceed the levels presented below, or result in a maximum increase in background levels of three decibels at the nearest receptor location off-site.

Table 3-5 shows the Site Runoff and Wastewater Discharges (Construction Phase) set in NEQG.

Table 2.6-5 Target Noise Level

Receptor	One Hour LAeq (dBA)	
	Daytime 07:00 – 22:00	Nighttime 22:00 – 07:00
Residential, institutional, educational	55	40
Industrial, commercial	70	70

Source: National Environmental Quality (Emission) Guidelines, 2015

Solid Wastes

The solid wastes generation will be comprised of household's wastes such as papers, plastics and kitchen wastes including organic matters, and gardening wastes from the project activities. Typically, the wastes will be collected in temporary waste camp at the project site and then collected by the Mandalay Municipals truck and the final disposal area is Aung Pin Lal Landfill.

Solid wastes will be collected in separation at least two types, wet wastes and dry wastes. Then the project will follow National Waste Management Strategy and Master Plan for Myanmar (2018-2030), following the waste management hierarchy, 1) Reduce 2) Reuse 3) Recycle 4) Recovery and 5) Disposal to meet with the strategic goals A and C.

A: Extending sound waste collection service to all citizens and eliminating uncontrolled disposal and open burning as a first step towards environmentally sound waste management

- a. Achieve sound waste collection service for all citizens
- b. Eliminate the uncontrolled dumping and burning in the cities and mandate the operation of environmentally sound disposal facilities

C: Substantively prevent waste through 3Rs and thereby establish a resource circular society

- (i) Mandate the development of city waste management strategies and action plans with actual waste reduction targets by all CDCs and TDCs
- (ii) Mandate the introduction of targets for diverting the food waste from landfills

Soil Quality

Monitoring parameters for soil quality survey are determined so as to cover the available environmental standards as below. It is not available for national soil quality standards and therefore, the analysis results will be compared by the guidelines of Asian Countries, Japan, Thailand and Vietnam.

No.	Parameter	Unit	Standard
-----	-----------	------	----------

			Japan	Thailand	Vietnam
1.	Arsenic	ppm	150	27	12
2.	Lead	ppm	150	750	300
3.	Zinc	ppm	150	-	300
4.	Iron	ppm	-	-	-
5.	Copper	ppm	125	-	100
6.	pH	ppm	-	-	-
7.	Moisture	ppm	-	-	-

Source: Japan: Ministry of Environment, Government of Japan (2002), “Regulation for Implementing the Law on Soil Contamination Countermeasures”

Thailand: Notification of National Environmental Board No.25, B.E. Thailand (2004), “other purpose” class”

Vietnam: QCVN 03:2008/BTNMT, Applied “industrial land”, Vietnam.

2.6.1 Occupational Health and Safety

The General EHS Guidelines are organized as reported in the following Table.

Table 2.6-6 Summary of Recommended Personal Protective Equipment According to Hazards

Objective	Workplace Hazards	Hazards Suggested PPE
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety glasses with side- shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Plastic helmets with top and side impact protection.
Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs or ear muffs).
Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes or boots for protection against moving & falling objects, liquids and chemicals.
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.

Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors.	Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi-gas personal monitors, if available.
	Oxygen deficiency	Portable or supplied air (fixed lines). On-site rescue equipment.
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

2.7 Myanmar Climate Change Policy (2018-2030)

Myanmar’s vision is to be a climate-resilient, low carbon society that is sustainable, prosperous and inclusive, for the wellbeing of present and future generations. The guiding principles of this policy include the followings:

- (a) Sustainable development
- (b) Precaution
- (c) Prevention
- (e) Shared responsibility and cooperation
- (f) Inclusiveness
- (g) Good governance
- (h) Climate justice and equity
- (i) Gender equality and women’s empowerment

The Government of the Republic of the Union of Myanmar will take sector-relevant measures to implement this Policy and achieve its purpose by taking the following actions primarily in the six sectoral clusters listed below:

- (a) Food and water security
- (b) Healthy ecosystems
- (c) Low-carbon and resilient growth
- (d) Resilient urban and rural settlements
- (e) Human wellbeing
- (f) Knowledge, awareness and research

The Government of the Republic of the Union of Myanmar will take overarching and cross-cutting measures to implement the policy recommendations in this Policy and achieve its purpose by taking the following actions primarily on the eight areas listed below:

- 1) Laws, regulations, strategies, action plans and policies
 - i) Adopt and implement laws and regulations to further enhance the implementation of actions under this policy, as appropriate;
 - ii) Adopt and implement short, medium and long-term strategies and action plans on climate change on a regular basis taking into account national circumstances and international commitments;
 - iii) Amend existing policies and/or adopt new policies in relevant sectors to further enhance the implementation of actions under this policy, as appropriate;
 - iv) Ensure coherence and coordination of existing and future national and sectoral frameworks, policies, legislation, regulations, strategies and action plans;
- 2) Institutions
- 3) Finance, budgets and investment
- 4) Capacity-building
- 5) Research and technology
- 6) Partnerships
- 7) Transparency and accountability
- 8) Monitoring, evaluation, reporting and learning

2.8 Ozone Depleting Substances Act (2014)

The project owner will follow the following sessions whenever necessary to use the products relating to ozone depletion substances.

3. Ozone-depleting substances or A person or organization who wants to import or export a product manufactured to use an ozone-depleting substance must have the necessary certification according to the application form for domestic importation (1) and the application form (2) for exportation must be submitted to the ministry with complete information in accordance with the requirements.

7. Ozone-depleting substances or Any person or organization that wants to do business using ozone-depleting substances, including importing or exporting products manufactured to use ozone-depleting substances, must submit an application to register their business with complete information in form (5) and apply to the Department assigned by the Ministry.

11. Ozone-depleting substances or A person who imports or exports products manufactured to use ozone- depleting substances must report the status of actual domestic import or actual export to the Ministry no later than January 31st of each year, along with relevant statistics.

15. Ozone Depleting Substances Operators -

- (a) In relation to their work, they must undergo the inspection of the Ministry or the department or organization assigned by the Ministry.
- (b) The information related to their business has been properly compiled with the necessary annual statistics and will be shown and inspected if requested by the relevant department.
- (c) importing products manufactured to use ozone-depleting substances; If you are an exporter or a manufacturer, you must display the registration certificate number issued for your business on the boxes containing ozone-depleting substances.
- (d) shall comply with the terms of the registration certificate issued under this order.
- (e) Must comply with orders and instructions issued by the Ministry from time to time.

2.9 Relevant International Regulations and Guidelines

This section shows the International Agreements and Conventions which will have relevance to the Project and the Good International Industry Practice Guidelines that Myanmar Phwint Phyto Thit Co., Ltd. will consider in the process of the EIA preparation.

2.9.1 International Agreements and Conventions

Myanmar is a signatory to the international conventions listed in Table 3.7-1, which will have relevance to the proposed Project. A full list of international conventions, treaties, and agreements of relevance to the Project will be provided in the EIA Report.

Table 2.9-1 International Agreements and Conventions

<i>No</i>	<i>International Convention/Protocol/Agreement</i>	<i>Environmental Date of Signature</i>	<i>Date of Rectification</i>	<i>of Date of Member</i>	<i>of Cabinet Approval Date</i>
1	Plant Protection Agreement for the South-East Asia and the Pacific Region, Rome, 1956		4-11-1959 (Adherence)	4-11-1959	
2	Treaty Banning Nuclear Weapons Test in the Atmosphere in Outer Space and	14-08-1963	15-11-1963		

	Under Water, Moscow, 1963		(rectification)	
3	Treaty on the Prohibition of the Emplacement of Nuclear Weapons and other Weapons of Mass Destruction on the Sea-Bed and Ocean Floor and in the Subsoil there of, London, Moscow, Washington, 1971	11-02-1971		
4	Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and on their Destruction, London, Moscow, Washington, 1972	10-04-1972		
5	International Convention for the Prevention of Pollution from Ships, London, 1973	(Accession)	undertakes to give effect to this Convention under para 1 & 2 of Article 1 of the Protocol of 1978	
6	Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, London, 1973		04-8-1988 (Accession)	Except for Annexes III, IV and V of the Convention
7	United Nations Convention on the Law of the Sea, Montego Bay, 1982	10-12-1982	21-05-1996 (Ratification)	
8	United Nations Framework Convention on Climate Change, New York, 1992 (UNFCCC)	11-06-1992	25-11-1994 (Ratification)	41/94 (09-11-1994)
9	Convention on Biological Diversity, Rio de Janeiro, 1992	11-06-1992	25-11-1994 (Ratification)	41/94 (09-11-1994)
10	Treaty on the Non-Proliferation of Nuclear Weapons, London, Moscow, Washington, 1968		02-12-1992(Accession)	
11	Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and their Destruction, Paris, 1993	14-1-1993		
12	International Tropical Timber Agreement	06-07-1995	31-1-1996	

	(ITTA), Geneva, 1994		(Rectification)		
13	Vienna Convention for the Protection of the Ozone Layer, Vienna, 1985	24-11-1993	(Rectification)	22-2-1994	46/93
14	Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1987	24-11-1993	(Rectification)	22-2-1994	46/93
15	London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London, 1990	24-11-1993	(Rectification)	22-2-1994	46/93
16	The Convention for the Protection of the World Culture and Natural Heritage, Paris, 1972	29-4-1994	(Acceptance)		6/94
17	ICAO ANNEX 16 Annex to the Convention on International Civil Aviation Environmental Protection Vol. I Aircraft Noise	Accession			
18	ICAO ANNEX 16 Annex to the Convention on International Civil Aviation Environmental Protection Vol. II Aircraft Engine Emission	Accession			
19	Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies (Outer Space Treaty), London, Moscow, Washington, 1967	22-5-1967	(Rectification)	18-3-1970	
20	Agreement on the Networks of Aquaculture Centres in Asia and the Pacific, Bangkok, 1988	22-5-1990	(Accession)		
21	South East Asia Nuclear Weapon Free Zone Treaty, Bangkok, 1995	15-12-1995	(Rectification)	16-7-1996	
22	United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and / or Desertification, Particularly in Africa, Paris, 1994 (UNCCD)	02-01-1997	(Accession)	02-04-1997	40/96 (4-12-96)
23	Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, D.C., 1973; and this convention as amended in Bonn,	13-6-1997	(Accession)	11-09-1997	17/97 (30-4-97)

	Germany,1979 (CITES)			
24	Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, New York, 1994		21-5-1996 (Accession)	
25	Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, Rome, 1973		8-9- 1994(Acceptance)	
26	ASEAN Agreement on the Conservation of Nature and Nature Resources, Kuala Lumpur, 1985	16-10-1997		
27	Catagena Protocol on Biosafety, Cartagena, 2000	11-05-2001		13/2001 (22-03-2001)
28	ASEAN Agreement on Transboundary Haze Pollution	10-06-2002	13-3-2003 (Rectification)	7/2003 (27-02-2003)
29	International Treaty on Plant Genetic Resources for Food and Agriculture, 2001		04-12- 2004(Rectification)	29-6-2004
30	Kyoto Protocol to the Convention on Climate Change, Kyoto, 1997		13-8- 2003(Accession)	26/2003 (16-07-2003)
31	Stockholm Convention on Persistent Organic Pollutants (POPs), 2001		18-4-2004 (Accession)	18-7-2004 14/2004 (01-04-2004)

2.10 Good International Industry Practice Guidelines

Phwint Phyo Thit Co., Ltd. will undertake the impact assessment study and Project activities in a manner guided by Good International Industry Practice (GIIP). Applicable guidelines which Phwint Phyo Thit Co., Ltd. will consider in preparing the EIA include:

- International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012); and
- IFC Environmental, Health and Safety (EHS) guidelines, including:
 - General EHS Guidelines (2007); and
 - EHS Guidelines for Environmental, Health, and Safety Guidelines for Thermal Power Plant (2008).

2.10.1 Environmental Requirements for the Project

The Project shall satisfy EIA Notification (2015) of MONREC as mentioned in Section 3.3.5.

2.10.2 Requirements for the Project by EIA Notification (2015) of Myanmar

(1) Project Categorization

Based on Annex of amended EIA Procedures, 2019 “Categorization of Economic Activities for Assessment Purposes” of EIA Notification (264/269), this type of project is classified as “Housing Development, Urban Development of Resettlement and New Town Construction Project” of Type of Economic Activity.

(2) Project Scope

The EIA of the proposed project is conducted by the Phwint Phyo Thit Co., Ltd. with consultancy of the REM (qualified EIA Company with MONREC registration). This EIA report is submitted as a requirement of the EIA Procedure, 2015.

(3) Requirements for Project

In accordance with EIA Notification (2015) and the project components, it is recognized that the Project is subject to an EIA study and is required to obtain an ECC from ECD at MONREC.

Namely, the proponent for EIA for the Project is Phwint Phyo Thit Co., Ltd. Two rounds of public Consultations with stakeholders (Stakeholder Meetings) are also required to be initiated and implemented by Phwint Phyo Thit Co., Ltd.

2.11 Phwint Phyo Thit’s Commitments

The ESIA report is accurate and complete, and;

The ESIA report has been prepared in strict compliance with applicable laws, rules, regulations and procedures in force. We hereby undertake that; Phwint Phyo Thit in respect of the “**Development of Ye Dagon Taung Master Plan Project for resort and urban development (Hotel Services Sub- project)**” will at all times comply fully with: (i) any and all commitments and obligations as set forth in the ESIA report which has been reviewed by Review Team of MONREC, and (ii) any and all plans and the various components thereof, including without limitation, impacts avoidance, mitigation, and remediation measures, and with respect to both (i) and (ii), including but not limited to such commitments, obligations, plans and measures related to the development, construction, commissioning, operation and maintenance of the project, and any circumstance in which work done or to be done, or services performed or to be performed, in connection with the projects development, construction, commissioning, operation and maintenance is carried out our intended or required to be carried out by any contractor, subcontractor or other party.

When the proposed project will be constructed and operated in Myanmar, Phwint Phyo Thit will comply and follow the Environmental Management Plan that mentioned in the ESIA report that prepared by Resource & Environment Myanmar Co., Ltd.

Besides, Phwint Phyothit will submit the Environmental Monitoring Report during construction and operation of the proposed project to Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation.

CHAPTER 3 PROJECT DESCRIPTION AND ALTERNATIVES

3.1 Project Location

YE TAGON HILL MASTER PLAN Project is located Yaykyi East Kwin, Kwin No. (548), Yaykyi village Tract, Patheingyi Township, Mandalay District, Mandalay Region, the total land was 7.5 acres.

The project consists of 4 packages;

Package-1: International Hotel (Five Star Hotel) Project,

Package-2: International School,

Package-3: International Hospital, and

Package-4: International Standardized Yaytagon Hill Golf Course, Club House, Amusement Park, Commercial and Urban Residential Buildings.

The project area for those four packages is within Patheingyi Township in Mandalay Region., Figure 3.1-1. Figure 3.1-2 shows the location of hotel with coordinates. Figure 3.1-3 shows the plot division of Yaytagon Hill Master Plan Project.



Figure 3.1-1 Patheingyi Township in Mandalay Region

Coordinate Point & Land Area Information for EIA

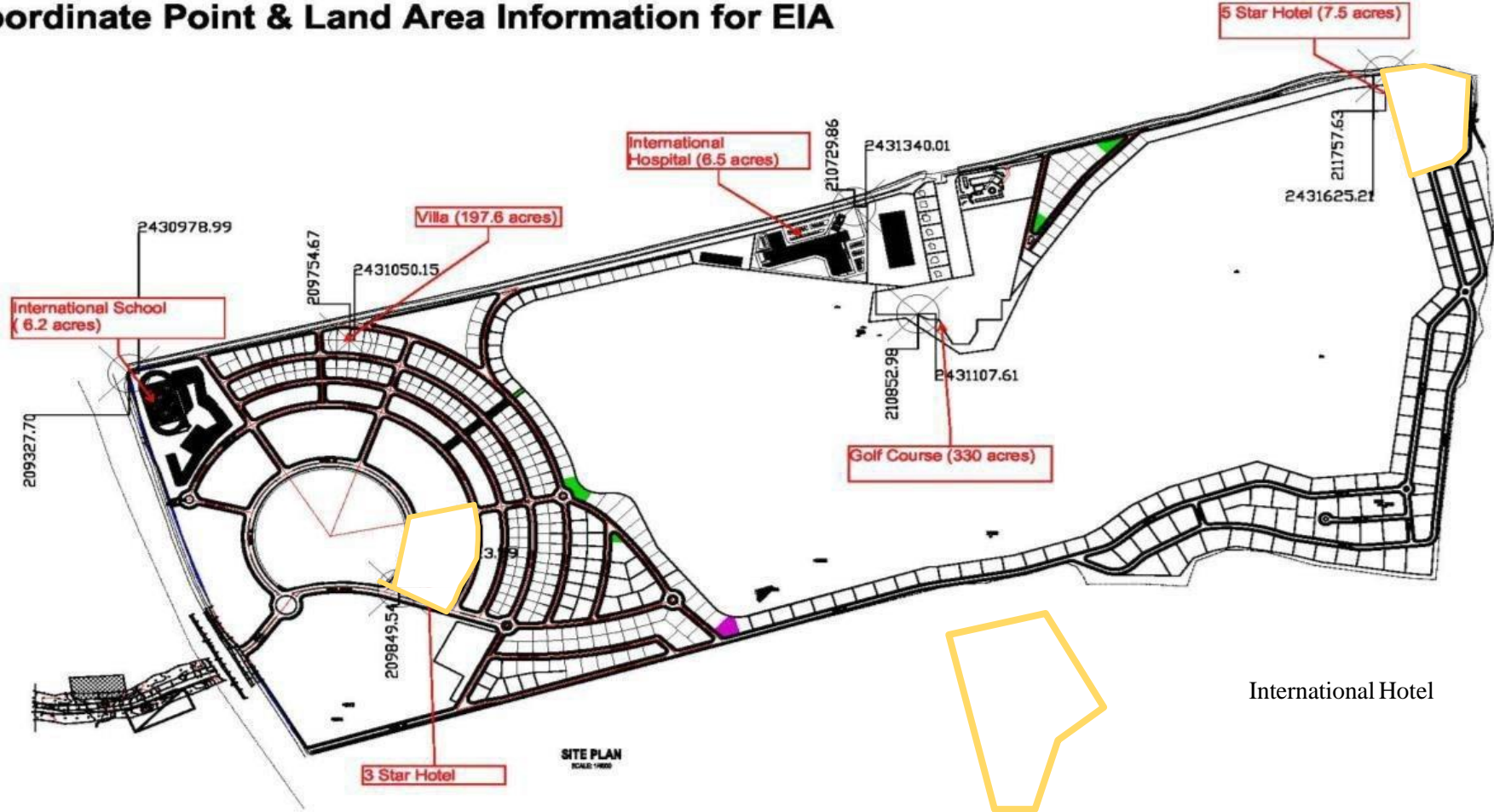


Figure 3.1-2 Location of Hotel with Coordinates

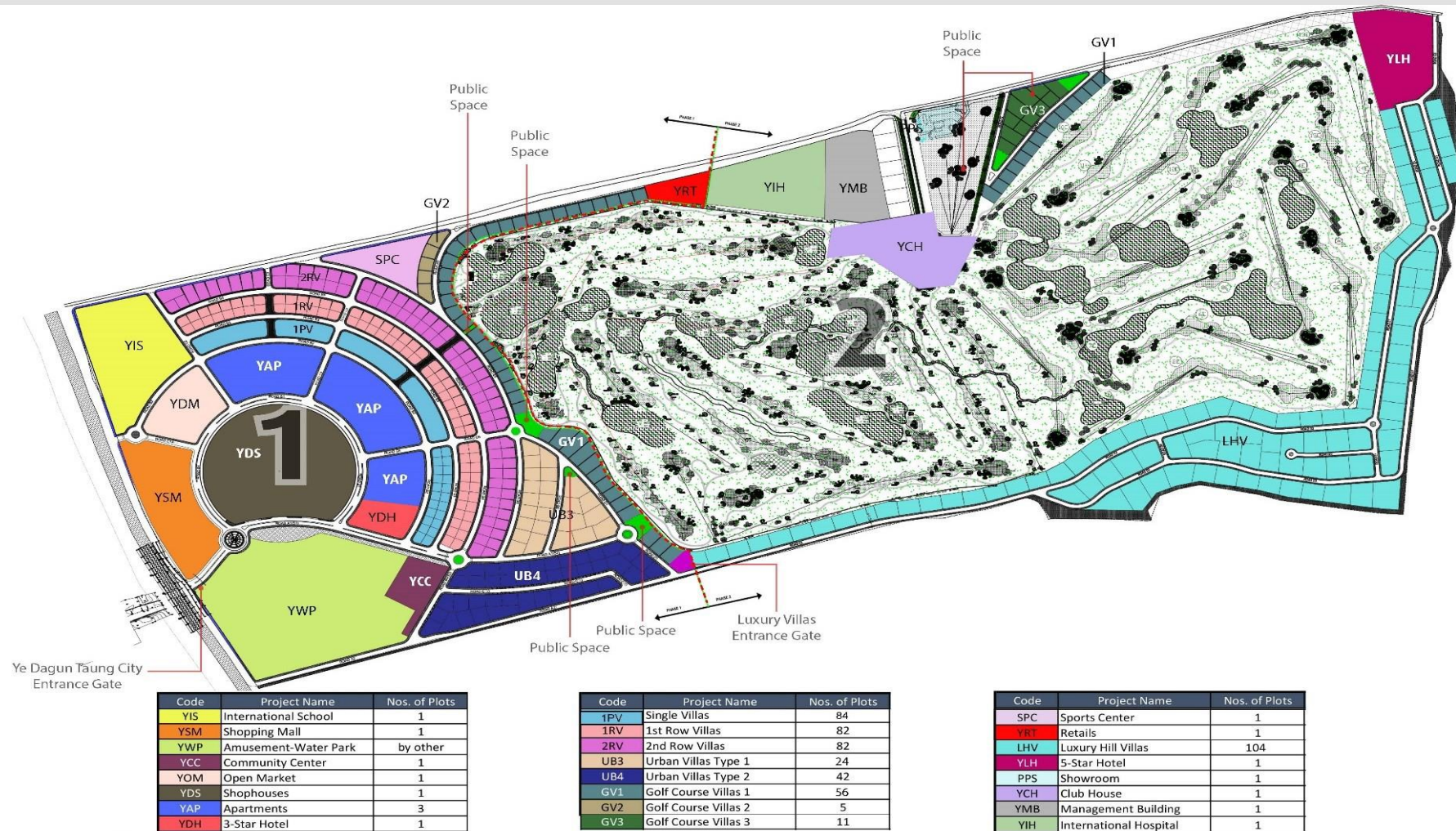


Figure 3.1-3 Plot Division of the Yaytagon Hill Master Plan Project

3.2 Site Layout Map or Schematic Diagram

Land permit agreement was made between Phwint Phyo Thit Co., Ltd. and Myanmar Investment Commission (MIC) since November 2016. Package 1 consists of an International 5 Star Hotel and a 3 Star Hotel.

Total areas of land use for project and land use area for project components are provided as follows.

3.2.1 IBIS 3 Star Hotel

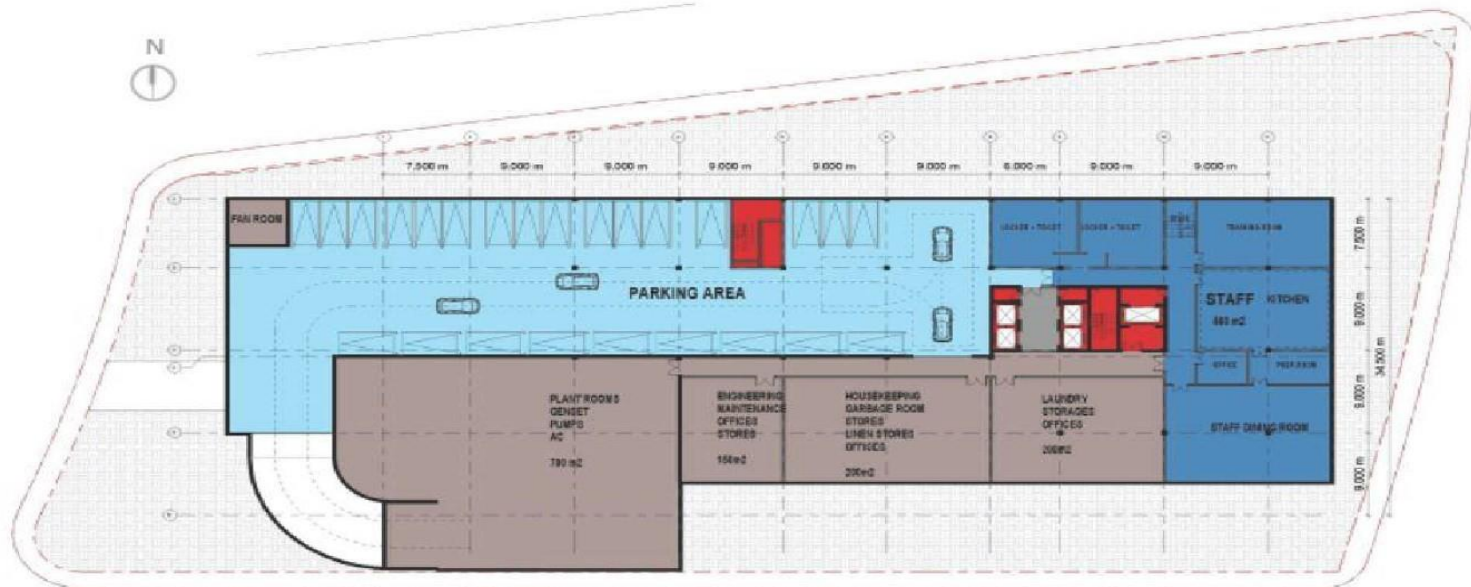
IBIS Mandalay is a 3-star hotel with an innovative cubic architectural design. It is a 5-storey building that can accommodate up to 188 rooms and is built on a large land area of nearly 2 acres.

Name	IBIS Mandalay
Land Area	1.74 Acres
Ground Floor Area (GFA)	150,296 SQFT
No. of Storey	5
No. of Rooms	188

Figures 3.2 (a-f) shows the floor plan, floor and rooms, sections and perspective view of the IBIS 3-star hotel.

5.12.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > THREE-STAR HOTEL



- Legend :
- Parking
 - Circulation
 - Corridor
 - Staff
 - BOH

SCHEDULE - Basement

Parking Area	1136.82m ²
Circulation	21.58m ²
Staff	557.16m ²
BOH	1232.27m ²
TOTAL Basement	3051.39 m²



Figure 3.2-1(a) Basement Plan of 3-Star Hotel

5.12.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > THREE-STAR HOTEL



GROUND FLOOR PLAN

Legend :

■	Circulation
■	Corridor
■	Hotel Lobby
■	Restaurant
■	Kitchen
■	Admin
■	Shop

SCHEDULE - Ground-Floor

Hotel Lobby	396.33m ²
Restaurment	405.46m ²
Kitchen	460.03m ²
Circulation	123.31m ²
Corridor	16.33m ²
Admin	151.50m ²
Shop	11.31m ²
TOTAL Ground-Floor	1664.27m²

archetype
GROUP

(b) Ground Floor Plan of 3-Star Hotel

5.12.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > THREE-STAR HOTEL



Legend :

- Circulation
- Corridor
- Restaurant
- Conference / Meeting Room

SCHEDULE – 1st Floor

Circulation	103.16m ²
Corridor	185.26m ²
Restaurant	196.08m ²
Meeting / Conference Room	767.43m ²
TOTAL First Floor	1252.43m²

archetype
GROUP

(c) 1st Floor Plan of 3-Star Hotel

5.12.6 TYPICAL FLOORS & ROOMS

ARCHITECTURAL CONCEPT DESIGN > THREE-STAR HOTEL

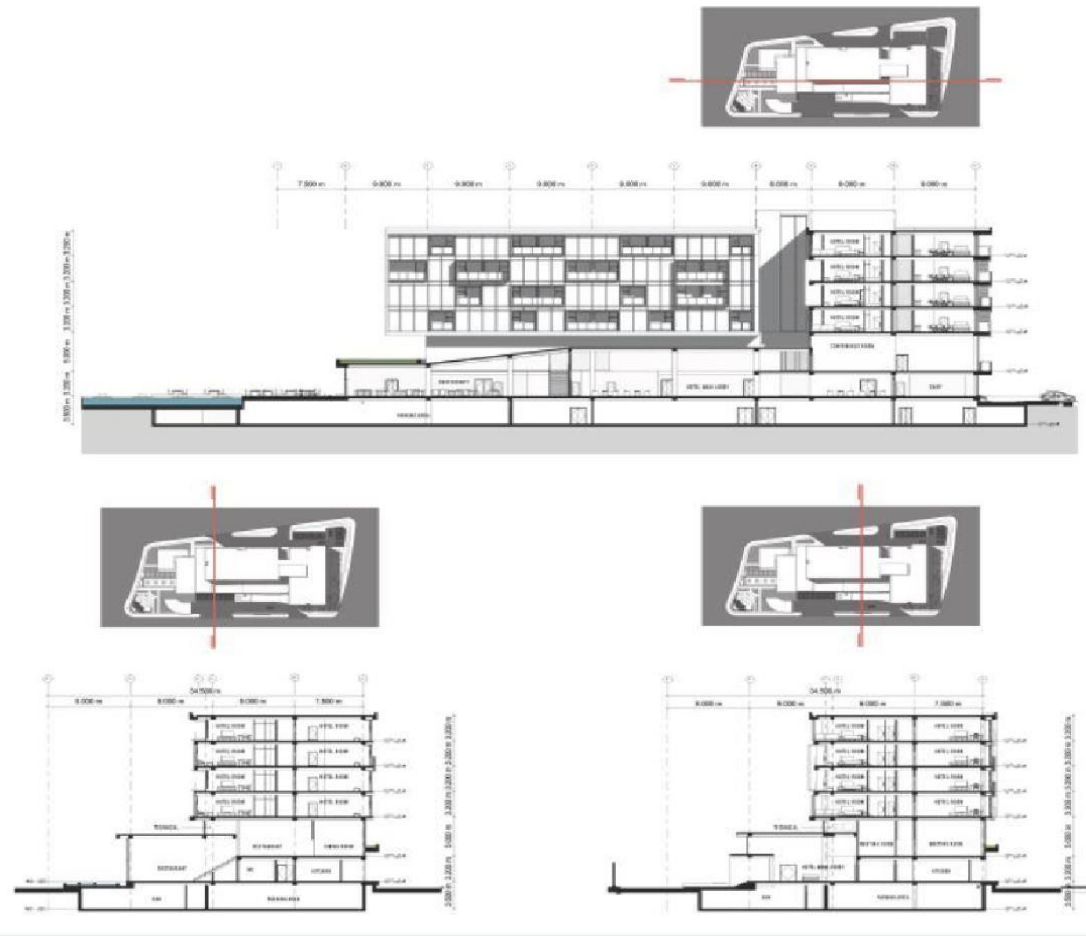


archetype
GROUP

(d) Typical Floors (2nd - 5th) and Rooms Plan

5.12.7 SECTIONS

ARCHITECTURAL CONCEPT DESIGN > THREE-STAR HOTEL



(e) Sections of 3-Star Hotel

5.12.10 PERSPECTIVES

ARCHITECTURAL CONCEPT DESIGN > THREE-STAR HOTEL



<Figure 4-5> Architectural Concept Design of Perspective View for 3-Star Hotel

3.2.2 5-Star Hotel

Novotel Mandalay is an 11-storeyed 5-star hotel which is built in a cutting-edge, state of the art architectural style. It is built on a massive land area which spans over 5 acres and it consists of an overwhelming 311 rooms. A detail of the 5-star hotel is as follow.

Name	Novotel Mandalay
Land Area	5.27 Acres
Ground Floor Area (GFA)	97301.5 SQFT
No. of Storey	11
No. of Rooms	311

5.15 FIVE-STAR HOTEL ARCHITECTURAL CONCEPT DESIGN



PARCEL 15	5 star Hotel	
Designated Land Use	Hotel	300 rooms
Building Land Plot	20,716m ²	222,985 ft ²
Approx. GFA	23,700m ²	255,105 ft ²
Footprint	3,865m ²	41,603 ft ²
FAR	1.14	
BCR	18.7%	
Maximum Building Height	40m	131 ft
Number of Storeys	7	(from 2-10 floors)
Green Space Ratio Min.	35%	
Required Setback	6m	20 ft



Figure 3.2-2 Architectural Concept Design of 5-Star Hotel

Figure 3.2-3 (a-l) show the floor plan, floor and rooms, sections and perspective view of the Novotel Mandalay hotel.

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



GROUND FLOOR & SURROUNDINGS



YEDAGON MASTER PLAN | 264

Figure 3.2-3 (a) Ground Floor and Surroundings of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



GROUND FLOOR

GFA = 5,710.97 SQ-M

NFA = 4,164.00 SQ-M

- | | | |
|---------------------|---------------------|-------------------|
| CONFERENCE ROOM | ITALIAN RESTAURANT | NIGHTDAY BAR |
| ENTRANCE & LOBBY | JAPANESE RESTAURANT | LIFT & STAIR CASE |
| CIRCULATION FOR BOH | ALL DAY DINNING | CIRCULATION |
| BOH | BALLROOM | |



YEDAGON MASTER PLAN | 265

Figure 3.2-3 (b) Ground Floor of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



1st FLOOR & SURROUNDINGS

archetype
GROUP

YEDAGON MASTER PLAN | 266

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



1st FLOOR

GFA = 3,492.02 SQ-M
NFA = 2,099.00 SQ-M

- | | |
|---|--|
| ■ KID'S ROOM | ■ POOL BAR |
| ■ MEETING | ■ LIFT & STAIR CASE |
| ■ GYM , SPA & YOGA | ■ CIRCULATION |
| ■ ITALIAN RESTAURANT | |

N ⊕

archetype
GROUP

YEDAGON MASTER PLAN | 267

Figure 3.2-3 (c-d) 1st Floor and Surroundings of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



2nd FLOOR & SURROUNDINGS



YEDAGON MASTER PLAN | 268

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



2nd FLOOR

GFA = 2,539.31 SQ-M
NFA = 1,730.00 SQ-M

- | | | |
|----------------------|----------------------|-------------------|
| DELUXE ROOM | SUPERIOR ROOM TYPE 5 | SUITE ROOM TYPE 2 |
| SUPERIOR ROOM TYPE 1 | SUPERIOR ROOM TYPE 6 | |
| SUPERIOR ROOM TYPE 2 | SUPERIOR ROOM TYPE 7 | |
| SUPERIOR ROOM TYPE 3 | LIFT & STAIR CASE | |
| SUPERIOR ROOM TYPE 4 | CIRCULATION | |



YEDAGON MASTER PLAN | 269

Figure 3.2-3 (e-f) 2nd Floor and Surroundings of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



Figure 3.2-3 (g) 3rd Floor of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



Figure 3.2-3 (h) 4th – 7th Floors of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



Figure 3.2-3 (i) 8th Floor of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL

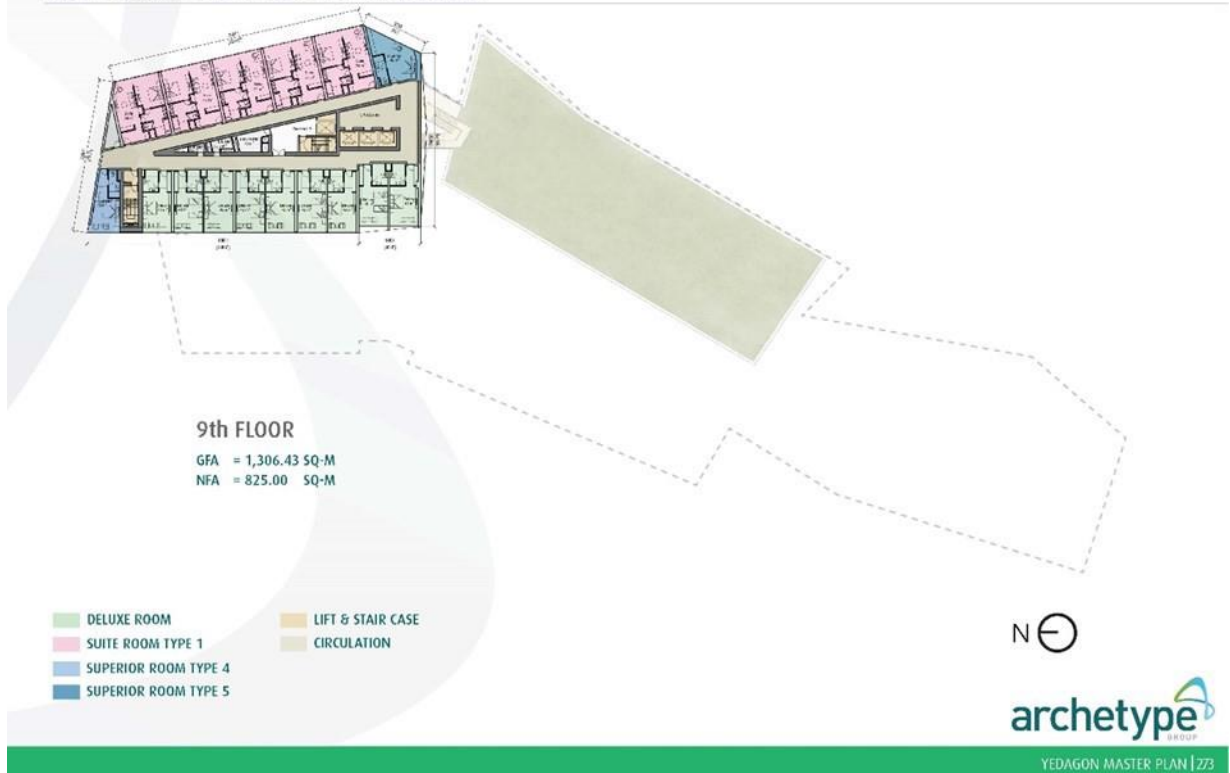


Figure 3.2-3 (j) 9th Floor of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



10th FLOOR

GFA = 1,306.43 SQ-M
NFA = 1,082.00 SQ-M

- | | |
|----------------------|----------------------|
| DELUXE ROOM | PRESIDENT SUITE ROOM |
| SUITE ROOM TYPE 1 | LIFT & STAIR CASE |
| SUPERIOR ROOM TYPE 5 | CIRCULATION |



archetype
GROUP

YEDAGON MASTER PLAN | Z74

Figure 3.2-3 (k) 10th Floor of the 5-Star Hotel

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



ROOFTOP

GFA = 1,322.60 SQ-M
NFA = 298.66 SQ-M

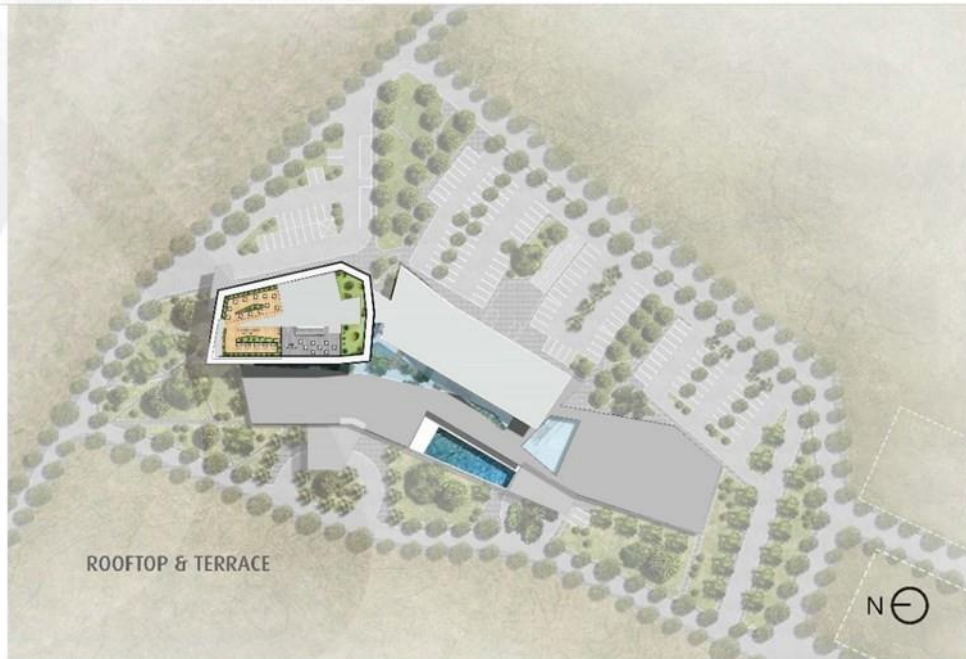


archetype
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YEDAGON MASTER PLAN | Z75

5.15.5 FLOOR PLANS

ARCHITECTURAL CONCEPT DESIGN > FIVE STAR-HOTEL



ROOFTOP & TERRACE

archetype
GROUP

YEDAGON MASTER PLAN | 276

Figure 3.2-3 (1) Rooftop and Terrace of the 5-Star Hotel



Figure 3.2-4 Architectural Concept Design of Perspective View for 5-Star Hotel

3.3 Facilities and Services of the Hotel Project

Hotel project facilities will be comprised of the following components:

- Banquet facilities
- Bar
- Computer facility
- Conference and meeting facilities
- Disabled room
- Fitness room
- Sauna
- Luggage storage
- Non-smoking rooms
- Parking outside the hotel at an extra charge
- Pet friendly, at a surcharge
- Restaurant
- Summer terrace
- Complimentary Wi-Fi internet throughout the entire hotel

Hotel Services include:

- Car rental services
- Catering services
- Concierge services
- Courier services
- Doctor on call
- Dry cleaning
- Excursions and guided tours
- Flower arrangement
- Ironing service
- Laundry and valet service

- Mail services
- Room service (24-hour)
- Shoeshine service
- Ticket service
- Transfer and chauffeur driven limousine services
- Turndown service
- Valet parking

3.4 Project Development and Implementation Schedule

3.4.1 Site Access Road

In July 2020, the main entrance road to the Yaytagon Hill Master Plan Project from the Junction of Theik Pan Road and Mandalay Pyin Oo Lwin Road had been constructed. The entrance road is 106 feet wide and 3.8-mile-long earth road by own cost of Phwint Phyto Thit Company Ltd.



Figure 3.4-1 Road Access to the Project Site

3.4.2 Construction Activities

The development is for (188) guestrooms with 3-star facilities and (311) guestrooms with 5-star facilities together with general support services. The 3-star hotel building is 5-storey high and

5-star hotel building is 11-storey.

Geotechnical site investigation was carried out by Myayarpin Survey Team at Proposed Building Project site area from 7, April, 2019 to 29, April, 2019 and all survey results and report are completed on 3, May, 2019.

In the date of 20th May 2021, LIU Co., Ltd., Shwe Yi Lin Co., Ltd, and Rapid Ativex Corporation Co., Ltd. awarded the tender for construction of Ye Dagon Taung’s infrastructures such as road, drainage, sub- station and electricity, water distribution system and water treatment plant. The following table shows the construction timeline for the Golf course and club house Project.

Table 3.4-1 Construction Schedule of Yaytagon Hill City Development Project

Construction Period			
Project	Start Date		Finish Date
International School	1-Nov-22		31-Mar-25
International Hospital	2-Jan-23		31-Oct-28
Hotel	1-Jul-24		28-Sep-29
Golf Course	West Course	1-May-23	30-Oct-26
	East Course	2-Nov-26	1-May-29
Club House	21-Oct-25		3-Jun-27

The proposed Structural & Civil Concept Design has been developed based on the following design criteria.

3.4.3 Building Codes and Standards

The provisions from the following International Building Codes and Standards have been adopted in the proposed structure design of this project:

Building Code/Standard	Title/Description
ACI 318 – 1999	Building Code Requirements for Reinforced Concrete (American
AISC	AISC Manual of Steel Construction – 13th Edition
UBC97 & ASCE 7-05	Wind Loading Standard for Building Design
UBC97 & ASCE 7-05	Seismic Resistance Building Standard

Building construction will take place on largely flat land but where this is gently sloping the developer intends, as far as possible, to place the buildings on ‘platforms’ or levels created by balanced cut and fill operations. This will serve to reduce the amount of earth material to be wasted. Depending on substrate conditions concrete foundation piles will be inserted where necessary.

3.4.4 Construction Material and Equipment Use

Table 3.4-2 shows the construction material and equipment used in construction phase.

Table 3.4-2 Main Construction Machinery Equipment

Item	Types of Machine	No	Operating Weight	Net Power	Gross Power	Bucket	Travel Speed
1	Mini Hydraulic Excavator (306E2)	2	5.8 Ton	34.7kW (47.2hp)	36.5kW (49.6hp)	0.25m ³	2.8 - 4.8 km/h
2	Hydraulic Excavator (320D2/D2L)	4	22 Ton	106kW (142hp)	112.5kW (151hp)		5.4 km/h
3	Vibratory Soil Compactor (CS533E)	5	10 Ton	93kW (125hp)	97kW (130hp)		
4	Track Type Tractor (D5K2)	2	9 Ton	71.6kW(96hp)			9 - 5.6 km/h
5	Track Type Tractor (D6R2)	1	19 Ton	141kW (189hp)			
6	Wheel Loader(SEM618B)	2	6 Ton		60kW(82hp)	1m ³	
7	Mortar Grader (SEM 919)	1	10 Ton	140kW(188hp)			
Total		17					

1 Mini Hydraulic Excavator 306 E2 x 2 Nos



2 Hydraulic Excavator (320D2/D2L) x 4 Nos



3 Vibratory Soil Compactor (CS533E) x 5 Nos



4 Track Type Tractor (D5K2) x 2 Nos



<p>5 Track Type Tractor (D6R2) x 1 Nos</p> 	<p>6 Wheel Loader(SEM618B) x 2 Nos</p> 
<p>7 Mortar Grader (SEM 919) x 1 Nos</p> 	

Figure 3.4-2 Construction Machinery

3.4.4 Water Supply and Consumption during Construction Period

The plant nursery, construction camp and site works will require a supply of water. This implies that the provision of water to the construction area from the tube wells that located in the site compound will also be an initial construction activity. This will involve vegetation clearance along the route of the water mains and possibly burying of the pipe in a trench. The precise alignment of the route for the water pipes has not yet been determined.

3.4.5 Water Supply Development

The WTP project footprint covers approximately 85,824 square meters (21.208 acres), and it is located nearly 10 kilometers (straight measurement) or 12 kilometers (measure along the road) north of the main project in Patheingyi Township, Mandalay, Myanmar. The project lies in the coordinates of latitude 22°03'01"N, longitude 96°10'19"N and at the immediate vicinity in the South, there is an education facility called Mandalay Technological University and the small villages around.



During operation period, the total water demand for phase 1 will be 32,200 gal/day and 19,000 gal/day for phase 2. Total waste water per day (90% of water) for phase 1 development will be 29,800 gal/day and 17,100 gal/day for phase 2 developments. The water used for project purpose is pumped from Sedawgyi dam.

Water supply, storm water, waste water and sewer drainage will be managed properly during the construction and operation period. Some other requirements and processes are given below.

The nearest water body was Yaykyi Creek is the distance is was shown in figure.



SN	Particulars	Description
1	Water Demand	Substantial amount of water will be required daily for hospital for its regular cleaning and drinking. Adequate provision for tube wells, water reservoirs, piping, distribution systems including valves and manholes and water purification facilities consisting of pumps have been incorporated in the project cost.

2 Electricity demand	The main source of electricity will be used from own Electrical Sub-station (40 MVA). The electricity of this sub-station will be supplied from Aung Tha Pyay main sub-station and the secondary sub-station will be constructed in 2 acres wide land within the project compound. At present, the overhead lines had already erected from Aung Pin Le to Theik Pan Circular Road and the underground line will be constructed from the Theik Pan Circular Road to Ye Dagon Taung project.
Fuel demand	Fuel is required for running diesel generator, laundry machines and vehicles. Fuel is easily available in the local market. Lubricating oil, grease etc. will also be used during construction and operation phase of the project.
Fire Fighting Equipment	Hospital has provision for the firefighting to cope with any kind of eventualities. Fire Extinguishers and Fire Hydrants will be installed as per need.
Storm Water Drains	A combination of open earth and brick drain is constructed. All storm water is to be diverted to the drains provided along the boundary wall. Rainwater harvesting will be performed. Water recharge pits will be developed in different locations.
Sewer and Wastewater Drains	Sewer will be discharged to septic tank and wastewater will be discharged to a soak pit with treatment. Treated water can be used for ground water recharge too.
Pavements and Parking	Majority of the build-up area will be concrete asphalt. Besides, the transportation management will be planned in such a way that it will not obstruct the patient pass on hospital activities.
Pollution and Waste Management	<p>Signage will be placed in order to make the area silence and quiet in possible crowd area, premises and parking area. Pressure horn will be discouraged by placing traffic symbol adequately. Trees of different species (small to medium height) will be planted in the premises to maintain greenery. Besides this, the seasonal plants, lawn and garden are also maintained adequately to have greenery in the premises. The suitable landscape plan will be developed and implemented.</p> <p>Solid waste during construction will be well segregated as degradable and non-degradable and will be supplied to municipal waste system.</p> <p>Waste water during construction will be collected in soak pits. Fecal</p>

	and other related wastes will be collected in safety tanks. During operation, waste will be well segregated. The harmful wastes will be autoclaved before supplying to municipal supply. The needles will be destroyed by needle destroyer. Other sharps material will be supplied to waste system. The waste water will be treated to meet guidelines norms for further use or throwing it to water bodies.
Garden and Greenery Management	Hospital will develop its greenery and garden at front and back open zones. The garden and greenery area will be developed in the surrounding open area, the front and back of proposed hospital.
Grievance Redress Mechanism	Hospital will have its own grievance redress cell for solving and managing raised grievance.
Health, Safety, Security	Adequate number of emergencies exists, and wide passages, provision of ramps for handicap peopled are planned.

3.4.6 Waste Management at Construction Site

A considerable amount of organic refuse (vegetation) would be generated during site clearance activities. To the greatest extent possible the soft material (leaves, shoots, etc.) would be separated and composted on site for later reuse during the landscaping phase. Harder and woody material (tree trunks, branches) would be stockpiled and removed from the site by a clean department of city development committee.

During construction, portable toilets will be provided for use on the site.

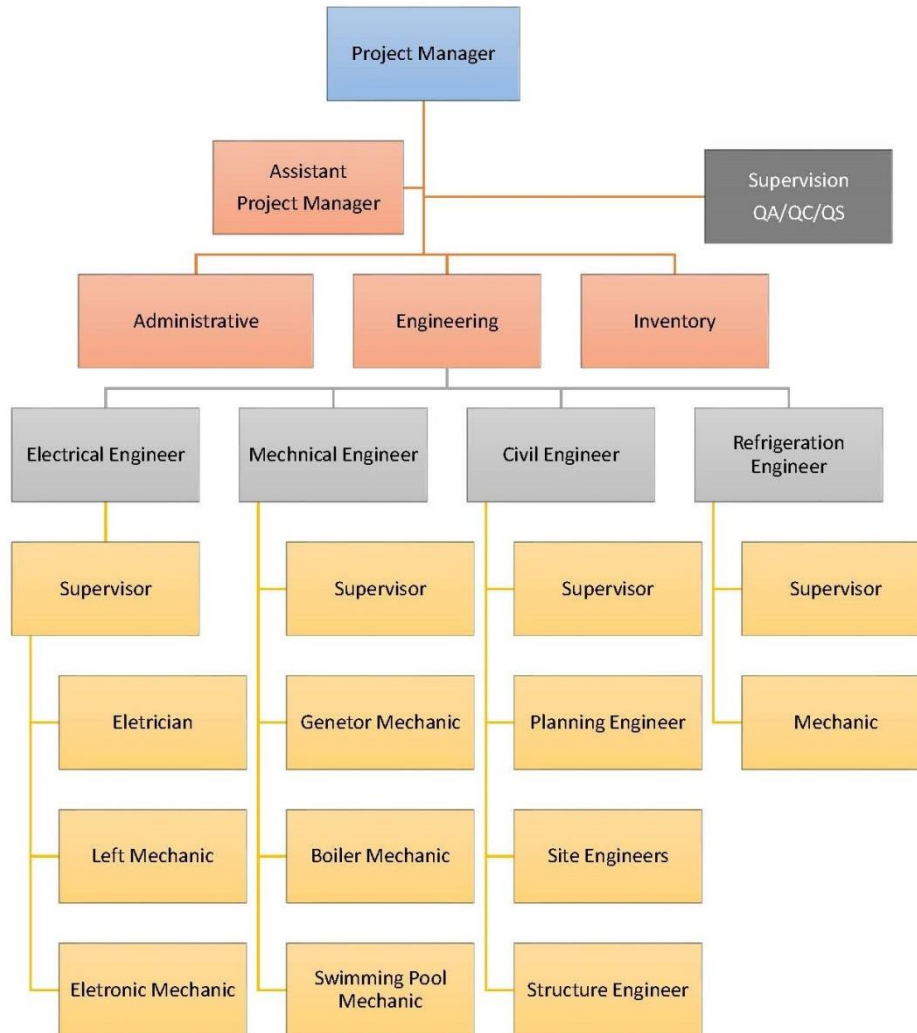
Solid waste management Solid waste generated at the site will primarily be domestic in nature (paper, plastics, packaging, waste food, etc.). This will be collected on a regular basis by a private waste haulage contractor and dumped at the disposal site under the guidance of the Patheingyi Township and Mandalay City Municipals. The hotel operators are willing to institute waste separation and recycling procedures at the resort and the extent to which these can be effectively executed will be examined.

3.4.7 Materials Transportation

Site clearance and construction of the hotel will require transportation of materials to and from the site and this will generate a significant amount of traffic, especially trucks, on the expressway and road. This will exacerbate traffic congestion in towns along the transport routes and potentially cause a deterioration of air quality due to dust and exhaust fumes.

3.4.8 Manpower during Construction Period

The hotel construction organization chart is shown in Figure 4-14. It includes Project Manager, 4 departments, 4 Engineers and 11 supervisors. It is estimated that approximately between 50 to 100 persons (skilled and unskilled) will be employed during construction period.



Note This chart is construction og as for your reference. PPT haven't started yet the construction progress and also the design situaion is the same.(sample)

Organization Chart of Hotel Construction

3.5 Operation Activities

During operation period, hotel gives the services to customers including dining, washing, lighting and other services.

3.5.1 Water Consumption

The following table shows the water consumption during operation of hotel.

No	Description	Area (m ²)			Water Demand	Total water demand	Total waste water	Remark
		Building land plot	Approx. GFA	No. of Bedroom	Gal/person / day	Gal/day	Gal/day	
1.	3 - star hotel	7,530	11,801	104	40	8,320	7,488	2 people per room, no dining and laundry. MNBC part 5
2.	5- star hotel	2	30,886	311	70	87,080	78,372	4 people per room, with laundry and dining.
						95,400	85,860	
	Total average water supply per day (gal)					740,193		
	Average Daily Demand					3,368		
	Maximum daily demand (m ³ /day); Q _{day}			(1.8 x ADD)		6,062		
	Maximum hourly demand			(2.5 x ADD)		351		
3.	Fire water	For residential/commercial			409.15 m ³ /hr	Use 1500gpm – NFPA		
		Required flow			2.00			
	Fire water tank				81,830 m ³		Conversion	
							1 gallon = 4.456 liters	
Leaking backup water;								
From water supply and sewerage, six edition: Terence J. McGheee, McGraw Graw Hull Publishing Company, 1991								
					48,499 m³/day			
Q_{ke}=8% Q_{day}					20.21 m³/hr			

Storage water;	
Storage factor	1.20 (To be confirmed by PTT)
Calculation storage capacity (m³)	8,839
Waste water demand;	Waste water = 646,771 (gal/day)

Standard reference; 2016 Myanmar National Building Code, Part 5D Building Services (Water supply, drainage and sanitation) JWWA – Japan Water Works Association

Note: This water demand calculation only for infrastructure project water demand assumption. It is need to review by Water treatment Designer. Need to review from technical expert view as international reference and also experiences.

3.5.2 Electrical System

The design for the electrical system will comply with the following standards and regulations:

National Fire Protection Association	-	NFPA
International Electro-Technical Commission	-	IEC
Illumination Engineering Society	-	IES
National Electric Code	-	NEC
Local Regulation		

The electrical system will be consisting of the following:

The main source of electricity will be used from own Electrical Sub-station (33/11kV). The electricity of this sub-station will be supplied from Aung Pin Lal sub-station. At present, the overhead lines had already erected from Aung Pin Le to Theik Pan Circular Road and the underground line will be constructed from the Theik Pan Circular Road to Ye Dagun Taung project.

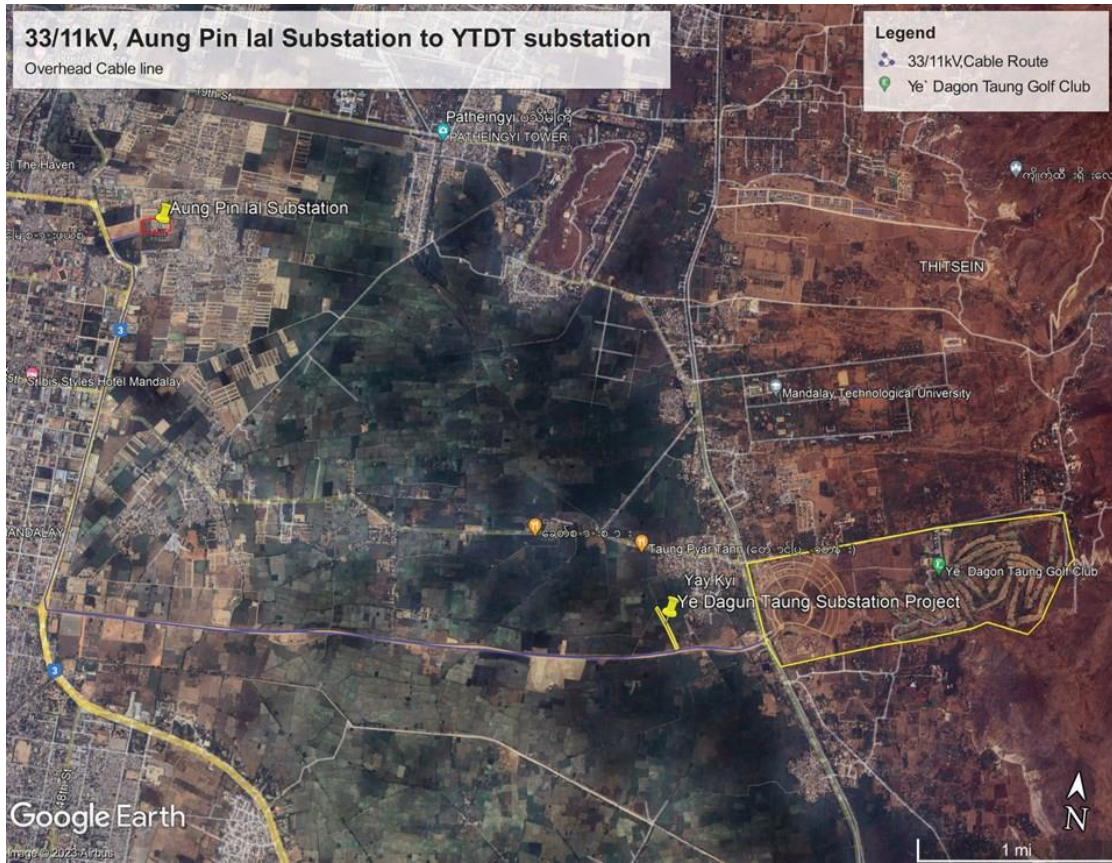


Figure 3.5-1 Single line diagram of Ye Dagon Taung Master Plan Project

The electrical system will be consisting of the following:

The common areas such car parking, lift lobby, etc. will be illuminating by fluorescent lamps.

The guestroom lighting will be energy saving bulbs illuminair or fluorescent lamps.

Level of illumination will be as follow:

(ii)	Guestrooms	200-300	lux-level
(iii)	Public corridor	150-200	lux-level
(iv)	Stairs	150	lux-level
(v)	Car parking	100	lux-level
(vi)	M&E plant room	200	lux-level

a) Standby Power

Standby power will be provided for essential services and will be supplied by a standby generator.

The generator will be arranged to start automatically at pre-determined time after the sensing of mains power failure. The transfer of the power supply between the mains and the standby generator to the essential bus bar section will be via the operation of pairs of electrical and mechanical interlock air circuit breakers. The essential loads supplied by the generator will be as follows:

- a. General lighting for stair and corridor lighting
- b. Exit lighting and directional signage
- c. Lighting, outlet and power supply for essential rooms
- d. Fire service pumps
- e. Fire detection system
- f. Homing of other lifts
- g. Communication system
- h. Selected ventilation and air conditioning system
- i. Domestic water transfer pumps
- j. Security system

A main fuel storage tank will be included to provide 8 hours continuous full load operation.

a. Emergency Light and Fire Exit Light

Emergency lighting linked to general lighting with battery pack in ceiling.

b. Grounding System

The LV earthling system will be designed in accordance with the requirement of local regulations.

c. Lightning Protection System

The lightning protection system will be of a conventional (Faraday Cage) type, complying with the National Fire Protection Association No. 780. This system will effectively protect against lightning occurrences.

3.5.3 Air Conditioning and Ventilation System

The air conditioning and ventilation system will be designed in accordance with ASHARE (American Society of Heating, Refrigerating and Air conditioning Engineering), climatic condition requirements prevailing in location site.

Ventilation system or fresh air will be provided to every air condition area as conformed to the international standards and codes.

For ventilation rate of guest area, machines room, store and rest room shall be:

- | | | |
|---|----|------------------|
| a) Air ventilation rate for guest room | 8 | l/s/person. |
| b) Air ventilation rate for rest room | 10 | air changes/ hr. |
| c) Air ventilation rate for electrical room | 30 | air changes/ hr. |
| d) Air ventilation rate for kitchen room | 30 | air changes/ hr. |
| e) Air ventilation rate for Basement area | 4 | air changes/ hr. |

Air ventilation rate for other specific areas should be further considered achieving amount of required circulation air.

Ventilation system, the exhaust air fan shall be provided in reason of life safety priority from smell, poison or corrosive fume and shall be operated every time while human enter to the room.

Stair pressurization system shall be provided in fireman lift corridor in order to prevent smoke coming into the fireman lift lobby. The pressurized fan system will automatically start working, when fire alarm system is activated by heat or smoke. Whereas the fire staircases will be natural ventilation due to the fire staircases are located against external wall therefore these external wall of fire staircases shall be opened for natural ventilation.

3.5.4 Wastewater Treatment System

A waste water treatment system is adopted to ensure that all waste water is properly treated to an acceptable level before it discharges to the designated place.

For the waste water treatment each buildings or rooms will be set up biotank and the detail information and specification are attached in appendix.

The sewer pipes and kitchen pipes in the building shall be separated and run to underground waste water treatment plant. All sewer pipes from every guestroom toilet will be run down inside its toilet

shaft then transfer to and combine with the main sewer pipe. The combined main sewer pipe will then run down to the underground WWTP for treatment. The treated waste water from WWTP will discharge to city/public main drainage line. In general, the design of waste water treatment systems shall comply with the local authority's requirement.

3.5.5 Drainage System

Provide a retention pond to collect all rain falls and re-use for plant irrigation purpose.

Floor drain shall be installed in the roof deck area. Sizing and quantity shall be sufficient for rain intensity rate. All rain leader riser pipes shall be collected and run down into the shaft then transfer to the retention pond or go directly to city/public drainage line without any water treatment requirement.

The proposed drainage system would be a continuous drainage system that connects all the outlets within the building through a main channel along the perimeter of the site and connected to the plan drainage (later decide it) connecting points which is typically located at the entrance to site.

In this early stage, Phwint Phyo Thit has not yet develop the drainage system layout, however typically will consist of a continuous gutter system under the road surface connected to sewerage pipes with several service man-holes near the entrance towards the site.

The discharge rate will depend on the rainfall intensity (based on rainfall return period) and also to some account of ground water discharge on site. The design of the drainage system will be developed after the Concept Design Stage. Please noted that public drainage data and rainfall intensity are not available at the time this report is prepared.

3.5.6 LPG Gas System

LPG gas will be provided to serve kitchen of the restaurant. It will be located at ground floor on the back side of hotel building and will be provided at least 2 days gas storage. The first step regulating valve is located at the gas station. Pressure regulator will be provided in the kitchen to meet the equipment's requirement.

Gas detection system will be provided at the LPG storage area and the kitchen. It will consist of detectors and link to fire alarm system, control panels and solenoid valves. The system consists of auto/manual function that complete with shut off valve.

3.6 Alternatives

Alternative analysis is important as it guides the project to identify ways in a timely manner to accomplish the project's purposes in the most technically robust, efficient and cost-effective manner. From EIA perspective, alternatives are sought to avoid or minimize environmental impacts.

3.6.1 Analysis of the Alternatives: 'Action' vs. 'No action' Scenarios

Environmental and socio-economic considerations of both the 'Action (of the proposed project)' and 'No Action' Options are put in comparison as below.

Table 3.6-1 Analysis of the Alternatives: 'Action' vs. 'No action' Scenarios

Expected Impacts	'Action' Scenario (of the Proposed Project)	'No action' (Status quo) Scenario	Remarks
Environmental	Temporary negative influences on the environment are expected to occur by execution of a project such as: dust generation, noise pollution, construction drainage, solid waste generation, and damage to the ecosystem of the nearby area are expected to occur. Movement of materials and workers during construction, operation and demolition could impact public safety; and	Short-term environmental changes do not occur if the project is not to take place. Currently, the project area is like rural area and it still remains unchanged if the project is not conducted.	These are temporary effects and expected to be stabilized at the operational stage once the construction is completed. During the construction period, an effective environmental impact management plan (EMP) need to be set in place to minimize the environmental impacts.

<p>Social</p>	<p>Some disturbance during the construction period such as dust, noise, entry of outsiders (international and national) for various technical purposes while project planning, building of access road, infrastructures, transport of construction materials, etc.</p> <p>The project can bring the infrastructure development such as facilitation of road transportation, high living standards, international school, shopping mall, amusement park, hospital together with the opportunities of employment and business development based on the project activities within the region.</p> <p>Influx of workers looking for opportunities and the presence of a construction workforce from outside of the local Project area will result in a change in demographics of the local communities.</p>	<p>No disturbance in livelihood of the community near the project area during construction (e.g., no temporary/permanent loss of land, inconvenience of movements, longer commuting time, etc.).</p> <p>With no timely prevention, the social costs of the lost lives due to safety accidents on road transportation and consequent welfare loss would disproportionately aggravate.</p>	<p>The overall social welfare of the adjacent communities in "No Action" Scenario is expected to be lesser than the "Action" scenario in mid- and long-term.</p> <p>Expected negative social impacts on the affected communities during construction could be minimized or offset through effective impact management and compensation measures. (Detailed impacts and mitigation measures are to be included in Chapter 6.)</p>
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<p>Economic</p>	<p>★ Immediate and direct economic loss may occur due to the land and property losses and damages due to construction to directly affected persons and households.</p> <p>★ Employment opportunities, Enhance in local economic activities, Production of skilled manpower in medical sector and Income form hospital services</p>	<p>Other types of interruptions of business of temporary nature, due to the loss for the project area would not occur.</p> <p>Loss in the production of significant number of qualified and skilled personnel for the health care services, and increase in employment opportunities together with enhancement of economic/ commercial activities</p>	<p>Mid- and long-term economic benefits is estimated to outweigh the short-term costs the project host community would pay during construction.</p> <p>Expected negative economic impacts on the affected communities during construction could be minimized or offset through effective impact management and compensation measures.</p> <p>The discount opportunities will be provided to local people in healthcare services.</p>
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The project has been contracted with MCDC and the project is existing as one, so the location alternative has not been considered.

The followings are the technical alternatives to be considered in EIA stage.

3.6.2 Technical Alternatives

Floor Slab

A number of floor structural systems have been investigated for these building, namely with their advantages and dis-advantages as follows.

Option 1: Post-Tensioned Flat Slab System



Figure 3.6-1 Construction of Post-Tensioned Slab

Advantages:

- Thinner Slab for longer span
- Faster to build due to faster de-mounting of formwork shutter
- Less prone to cracking
- Can build more stories in the same height in comparison to reinforced concrete structure.

Disadvantages:

- Not suitable for Post-Construction coring to accommodate sleeve penetrations through the slab.
- Require specialist contractor to build
- Slightly more expensive construction cost in comparison to reinforced concrete slab.
- Still not available of local contractor in Myanmar.
- Contractor with specific machine shall be imported.
- Lack of skilled labour
- Myanmar building committee still not accepts for post-tensioned flat slab system.

Option 2: Conventional floor system (beam-slab)



Figure 3.6-2 Construction of Conventional Floor System

Advantages

- Suitable for Post-Construction coring to accommodate sleeve penetrations through the slab.
- Does not require specialist contractor to build

Disadvantages:

- Typically slower to build in comparison to the Post-Tensioned floor system.
- Slightly more prone to cracking in comparison to Post-Tensioned floor system.
- Less stories in same height in comparison to other systems

Option 3: Reinforced Concrete Slab System with Band Beam

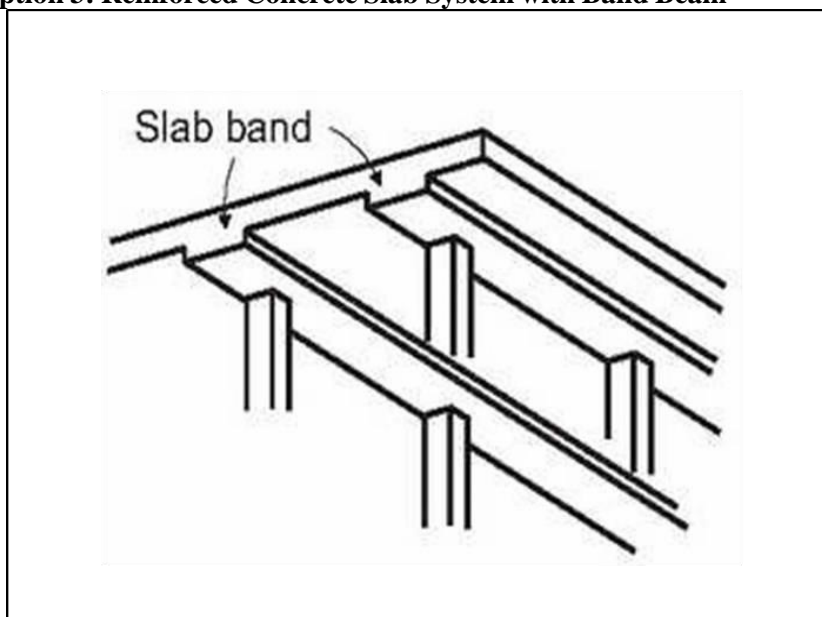


Figure 3.6-3 Reinforced Concrete Slab System with Band Beam

Advantages:

- Thicker Slab for longer span in comparison to Post-Tensioned Slab Option
- Suitable for Post-Construction coring to accommodate sleeve penetrations through the slab.
- Does not require specialist contractor to build.

Disadvantages:

- Typically slower to build in comparison to the Post-Tensioned floor system.
- Slightly more prone to cracking in comparison to Post-Tensioned floor system

3.6.3 Floor System Recommendation

From the above, it is quite clear that the option 3 floor system is suitable for the application of the building. If **Option 3** is adopted as the base scheme, then:

Slab Thickness = 300mm (approx.)

Typical Band Beam Dimension = 1000mm wide x 600mm deep (approx.)

Band beam is required to control “punching shear” and “deflection”.

Approx. Slab Reinforcement Rate = **35kg/sqm.**

Figure 3.6-4 below shows this floor option on the typical floor for the building.

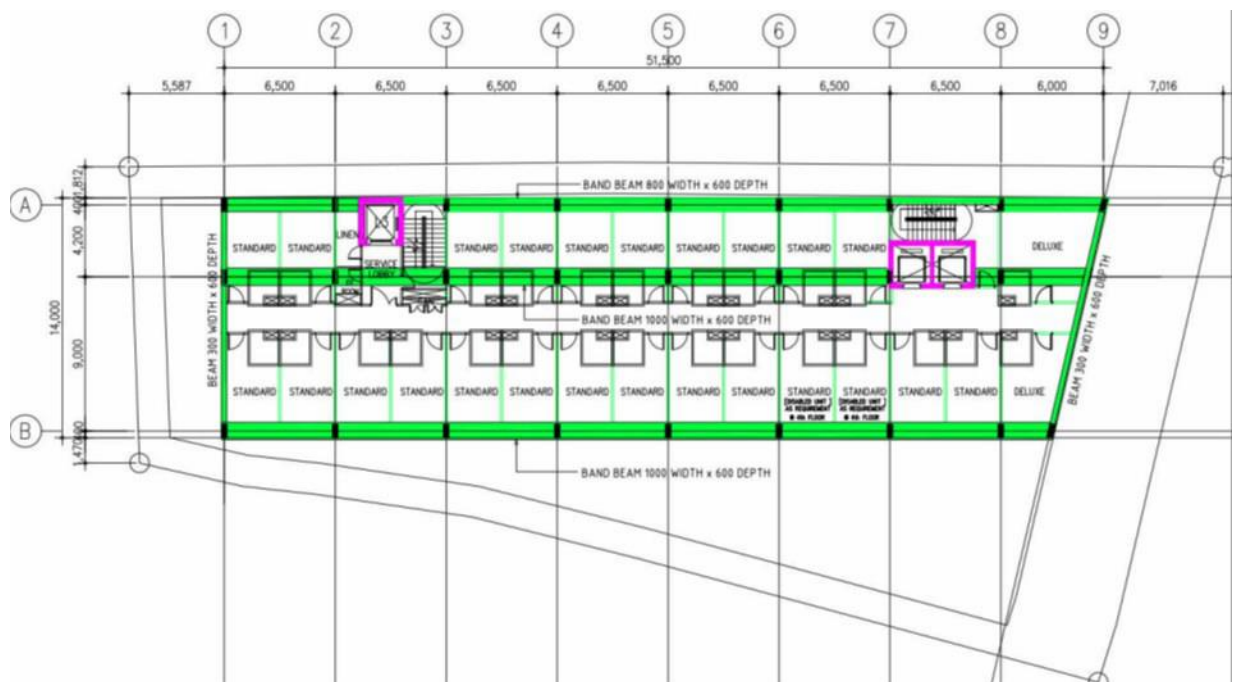


Figure 3.6-4 Structural Concept for Typical Floor of Option 3

3.6.4 Columns and Walls

The typical column sizes and including their typical reinforcements for the building is as follows:

Level	Perimeter Column Size (Typical)	Interior Mid- Column Size (Typical)	Reinforcement Rate(kg/m ³)
L1 to L5	300mm x 1000mm	300mm x 1000mm	200
L6 to L10	300mm x 800mm	300mm x 800mm	160
L11 to L16	300mm x 600mm	300mm x 600mm	140

The typical wall thickness and including their typical reinforcements for the building is as follows;

Level	Wall Thickness (mm)	Reinforcement Rate (kg/m ³)
L1 to L5	300	150
L6 to L10	300	120
L11 to L16	300	100

CHAPTER IV DESCRIPTION OF THE SURROUNDING ENVIRONMENT

4.1 Introduction

This section describes the environment of the Project surrounding area. The information provided is based on a review of published information, as well as a review of available literature from Phwint Phyto Thit Co., Ltd. and from REM's in-house library.

The purpose of reviewing the baseline conditions is to present an understanding of the potential environmental and social sensitivities of the Study Area. Reviewing the baseline conditions allows Phwint Phyto Thit to make an informed judgment on the appropriate level of impact assessment for the Project. More detailed information on the baseline environmental and social conditions in the Study Area, including the results of primary baseline surveys conducted for the Project will be provided in the EIA Report.

4.2 Defining the Study Area and Area of Influence

4.2.1 Setting the Study Limits

A preliminary review of the environmental conditions within the Project study area has been undertaken based on existing data for the purposes of this EIA Study for Construction and Operation of International Hotel. This section describes the environmental and social baseline conditions based on desktop review and initial site visit undertaken during 12 January to 17 January, 2022. The Project site is located in the Patheingyi Township, Mandalay Region.

For the purpose of assessing the impacts, the area influence (AoI) for biophysical environment was defined 2km radius around project site for the EIA procedure. The purposes of defined as the 2km AoI for Biophysical environment of EIA for Hotel project is based on the following condition

- The project site is a little far from sensitive receptor and residence
- No need to use a lot of machinery during construction phase
- Assess road was built avoiding villages to be used for construction

Above the situations, AoI for Biophysical environment is defined as the 2 km.

The **Area of Influence** for social environment is defined as the area expected to be potentially affected by the Project, which is beyond the Project Site and within where direct or indirect impacts are expected to occur. For this Project, the Area of Influence refers to the village tracts, wards and townships located in the buffer area of 3km from the Project Site boundary.

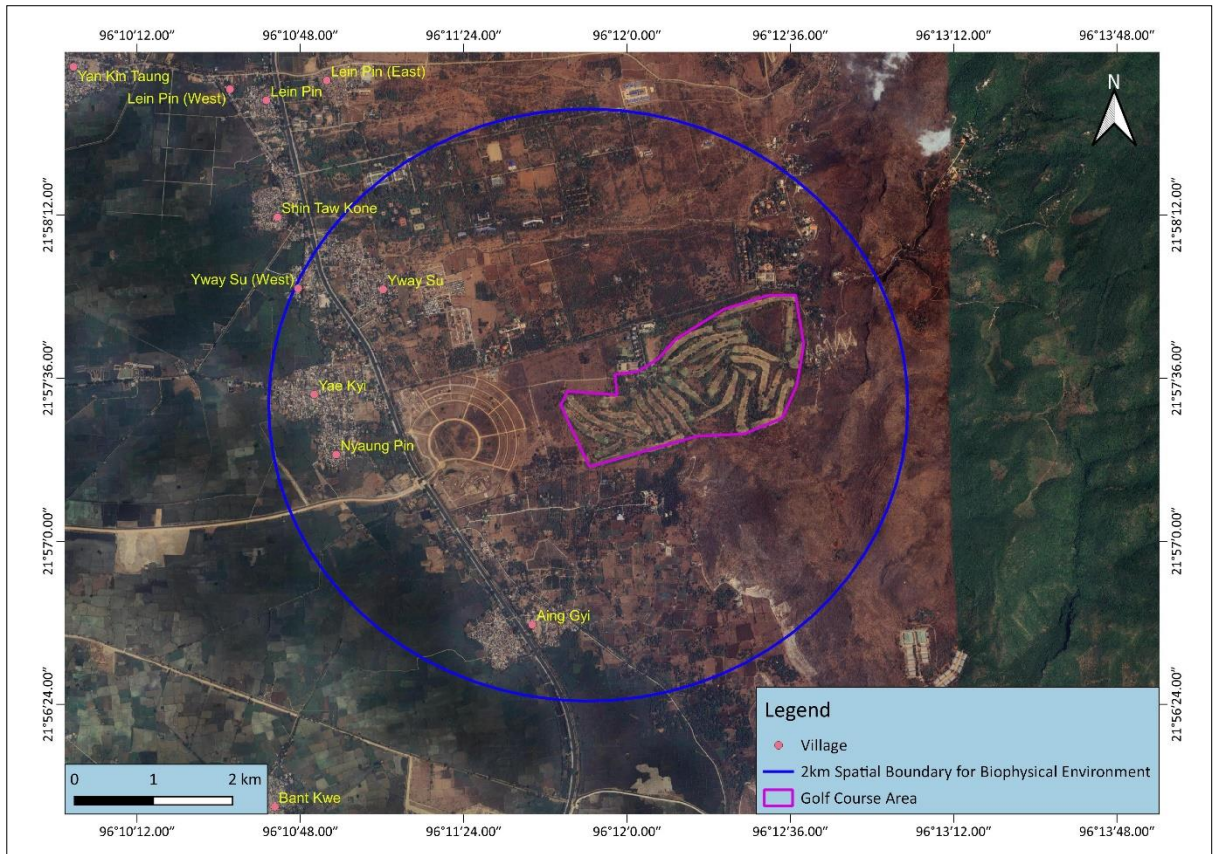


Figure 4.2-1 Project AoI for Biophysical Environment

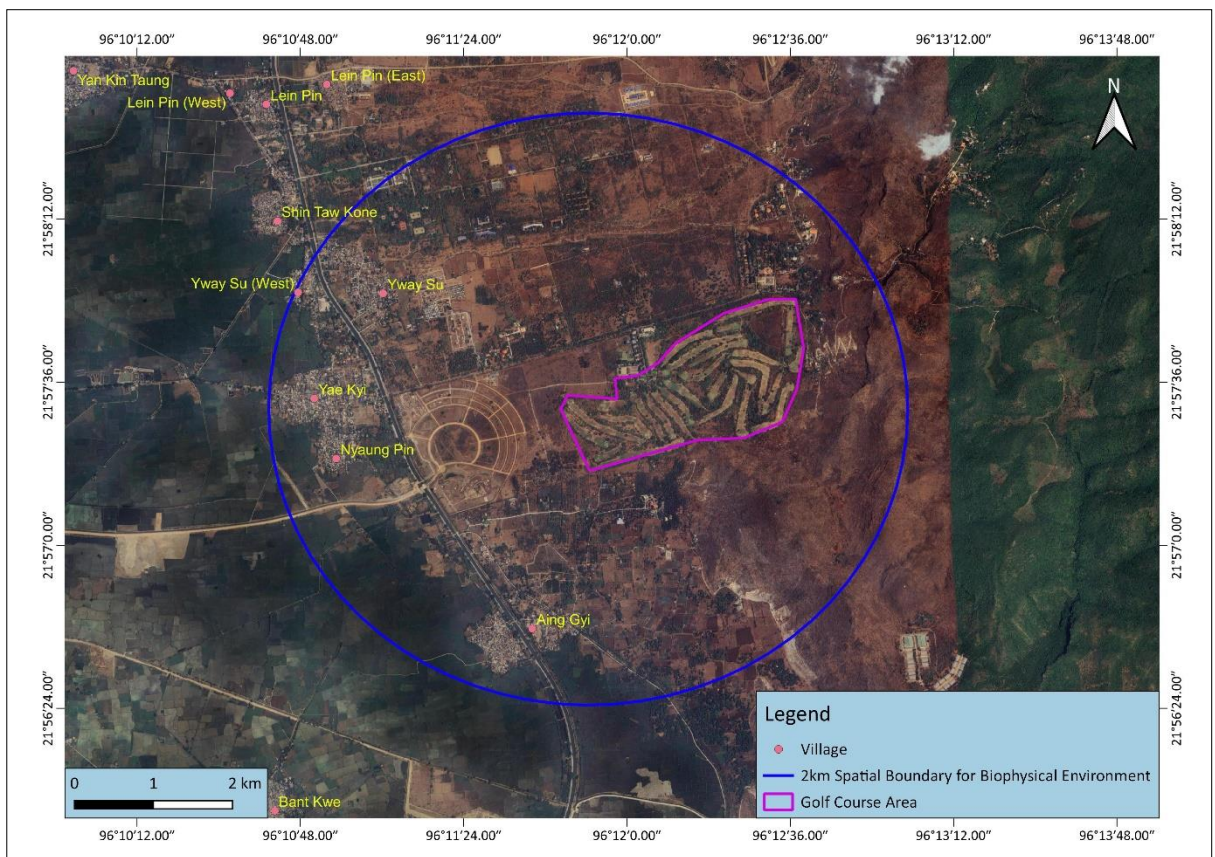


Figure 4.2-2 Project AoI for Social Environment

4.3 Environmental Category of the Project

There are four categories of environmental and social aspects as shown in **Table 4.3-1** that included in the EIA study.

Table 4.3-1 Category of Environmental and Social Aspects

No.	Category	Description
1	Physical Resources	- Climate - Hydrology - Topography and Soil - Water Quality - Geology and Seismology
2	Ecological Resources	- Aquatic biology - Wildlife - Forests
3	Economic Development	- Infrastructure facilities - Transportation - Land Use Pattern - Water Supply and Water Use
4	Social and Cultural Resources	- Demography - Population and Community - Health Facilities - Education Facilities - Communication - Socio-economic Condition

4.4 DETAILED APPROACH AND METHODOLOGY

In conducting the baseline study of above aspects, the detailed IEE approach and methodology were generally followed according to the regional environmental safeguard and the Myanmar Environmental Conservation Rule and others that described in Chapter 2 (Policy and Legal Framework) of this report. Data collection was performed by the IEE study team (Environment Specialists, Engineer, Geologist, Ecologist, Socio-economist, etc.).

4.4.1 Desk Review

The following steps were followed during the desk review:

- *Collection and review of secondary information from various sources*

Secondary information was collected through published and unpublished reports and interpretation of maps and photographs. The sources of information were District Forest Office, other line agencies, and other project offices in the district. Similarly, collection of project details from project proponent

will be also done.

• ***Delineation of geographical boundary of the influence area on the topographic map***

It is necessary to specify area that shall be covered for assessment of environmental impacts so as to avoid future confusion. Depending upon nature and extent of expected impact area the geographical area is categorized into Directly Impact Area and Indirectly Impact Area.

• ***Preparation of project specific checklist***

Study team has prepared the Environmental checklist and Questionnaire Survey in order to conduct the detail field study and to collect baseline environmental information of the project area.

Field Survey

A multi-disciplinary team visited the project area for updating/ verifying the baseline information on physical, biological, socio-economic and cultural environment of the proposed project, the anticipated environmental impacts and practical mitigation measures while implementing the specified activities. Interaction meetings and key informant interviews were undertaken with local people and measurement of infrastructures were also carried out.

Field survey comprised of walk through survey, water quality sampling, and geological investigation, consultation with community, site inspection and observation. The following tools were used for the collection of primary data.

- Field survey on water quality sampling was conducted within project area.
- Focus group discussion - To conduct consultation with the local communities at different settlements, Focus group discussion was organized with key informants and other knowledgeable persons. It was done to collect biological, socio-economic and cultural environment related information using a checklist.
- Household survey - Questionnaire was used to collect socio-economic information of all the households in the project area.
- Household listing survey - Total enumeration was done for the listing of agricultural land, forest, trees, houses and other affected properties.
- Topographical map - It was used to show environmental features on the map during walkthrough survey.
- Photographs - Necessary photographs were taken to show different environmental features.

Within 3km circle of the project area, Aing Gyi, Nyaung Pin, Yay Kyi and Yway Su (West and east) villages and new Pan Kin Housing are settled. The project activities are mainly construction activities and the project affected area may not be too large due to major dust, noise and solid waste generation. Also, the clearance of ecological components such as trees and bushes may not be effect such much in the project region. However, for the social impact, 2km radius circle was recommended to cover

because it might include sharing of land transportation road access and some farmlands are occupied by the project.

4.5 Physical Resources

4.5.1 Topographic Condition

The Project site is located in the Patheingyi Township within the Mandalay Region. Topography of project area belongs to isolated hill of Plateau limestone on low land terrain of alluvial area and also at western part of the Shan Plateau range.

According to the DEM map shown in Figure 4.5-1, topographical condition around the project site is characterized by typical feature of flat landform. The western part of Shan Plateau is located in the east of the project site. The aerial distribution of ground levels elevation is range from 80 m to 130 m above sea level. Generally, the eastern part of the project site is higher than the western part.

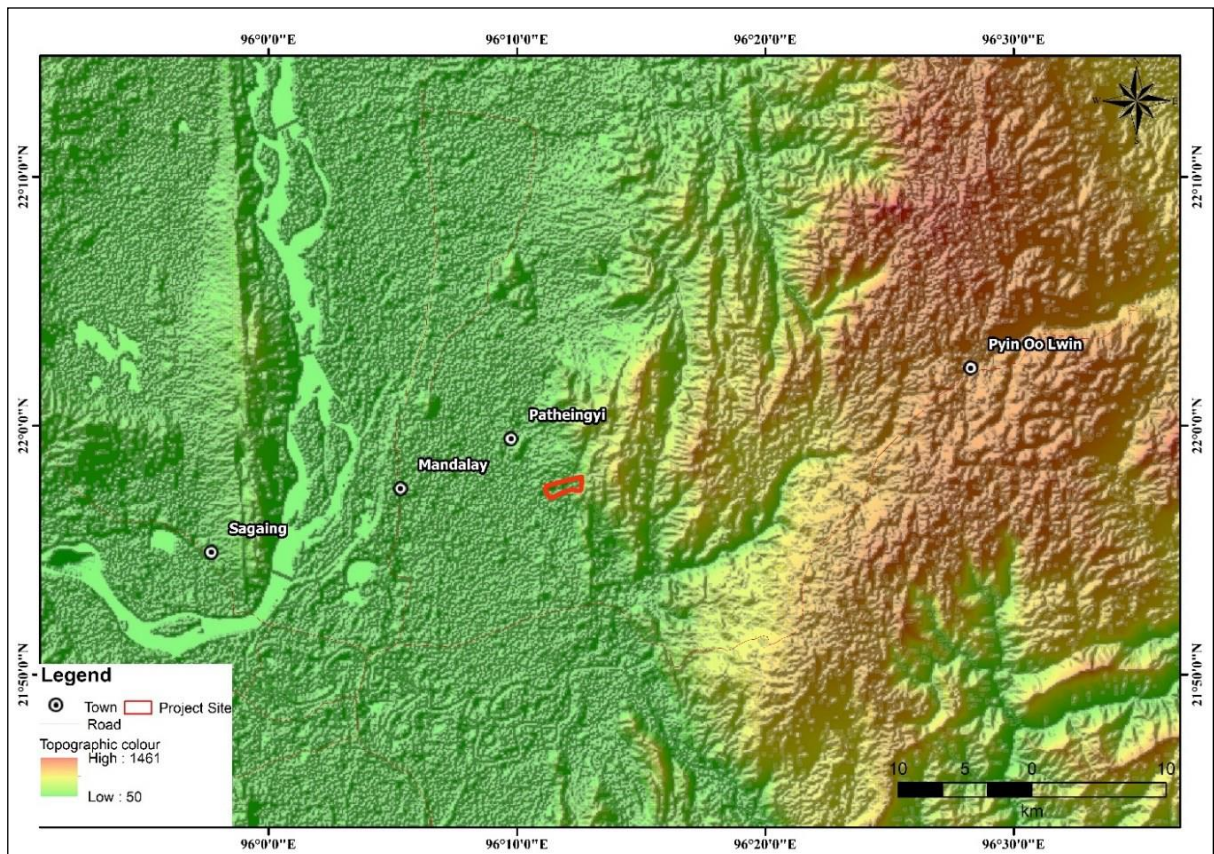
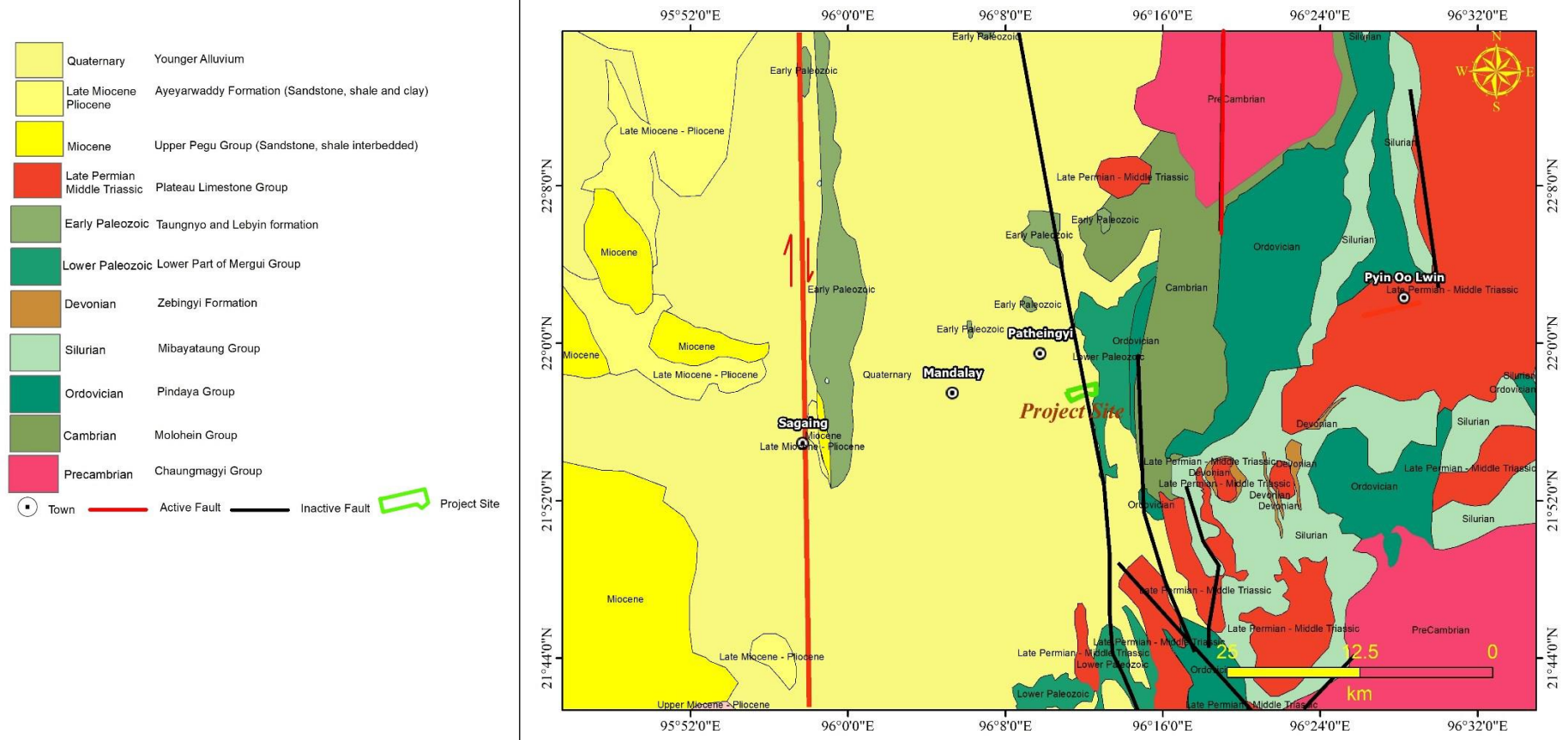


Figure 4.5-1 DEM showing Topographic Characteristics of the Project Area and Surroundings

4.5.2 Geology

Geology of the area is presented mainly based on previous literatures such as Chhibber (1934) and Bender (1983), and technical reports of the geoscientists from the University of Yangon and Department of Geological Survey and Mineral Exploration (DGSE).

Generally, the project site is mainly covered by thick Alluvium deposits of Quaternary age (See in Figure 4.5-2). Alluvium is composed of Clayey Silt with some Clay and Sand. Approximately, gravel bed has been encountered at the depth of 18 m and the thickness of the gravel bed is about 12 m.



Source: Modified after geological map of Myanmar, 2012 (published from Myanmar Geosciences Society)

Figure 4.5-2 Geological Map of the Project Site and Surroundings

4.5.3 Climate and Meteorology

Myanmar has a tropical monsoon climate. It is characterized by strong monsoon influences and it has a high rate of rainfall. There are three distinct seasons in Myanmar: The winter season, from November to February, with average monthly temperatures that range between 20°C (68°F) and 24°C (75°F). The summer or hot season is from March to middle of May with average monthly temperatures between 30°C (86°F) and 35°C (95°F). The rainy season between middle of May and October with average temperature between 25°C (77°F) and 30°C (86°F). Annual rainfall in the delta region is approximately 2,500 millimeters (98.4 inch), while average annual rainfall in the Dry Zone is less than 1,000 millimeters (39.3 inch), the coastal regions receive over 5,000 millimeters (196.8 inch) of rain annually. Annual rainfall, temperature and relative humidity of Mandalay Region is presented in Table 4.5-1, 4.5-2 and Figure 4.5-3.

Table 4.5-1 Annual Rainfall, Temperatures, and Relative Humidity of Mandalay Region (Years 2009 - 2018 (Average))

Station	2009-2018 Average				2018 Actual			
	Temperature (°C)				Temperature (°C)			
	Annual Rainfall in Millimeter	Mean max.	Mean min.	Mean Relative Humidity Percent	Annual Rainfall in Millimeter	Mean max.	Mean min.	Mean Relative Humidity Percent
Mandalay	954	34.4	22.5	67	951	33.5	23	69

Monthly mean temperature and Monthly rainfall (month to month average) of Mandalay Region is shown in Table 5-3.

Table 4.5-2 Monthly Mean Temperature and Rainfall of Mandalay Region (Years 2009 – 2018(Average))

Monthly	Temperature (°C)	Rainfall (mm)
Jan	22.5	7
Feb	25.2	2
Mar	29.1	6
Apr	32.1	39
May	31.9	157
Jun	30.9	76
Jul	30.8	70
Aug	30.2	190
Sep	30.1	166
Oct	28.7	211
Nov	26.8	22
Dec	23	9
Aug	30.2	190

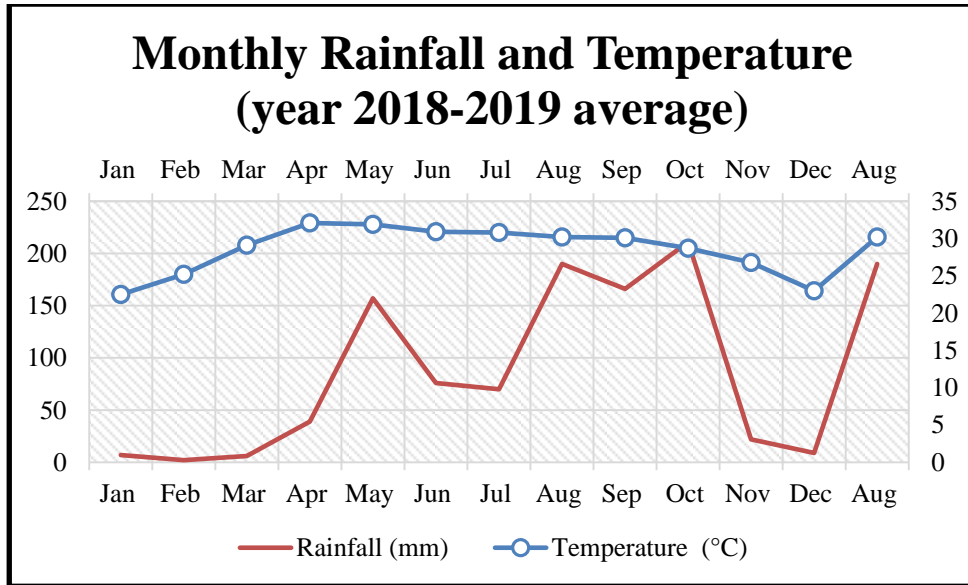
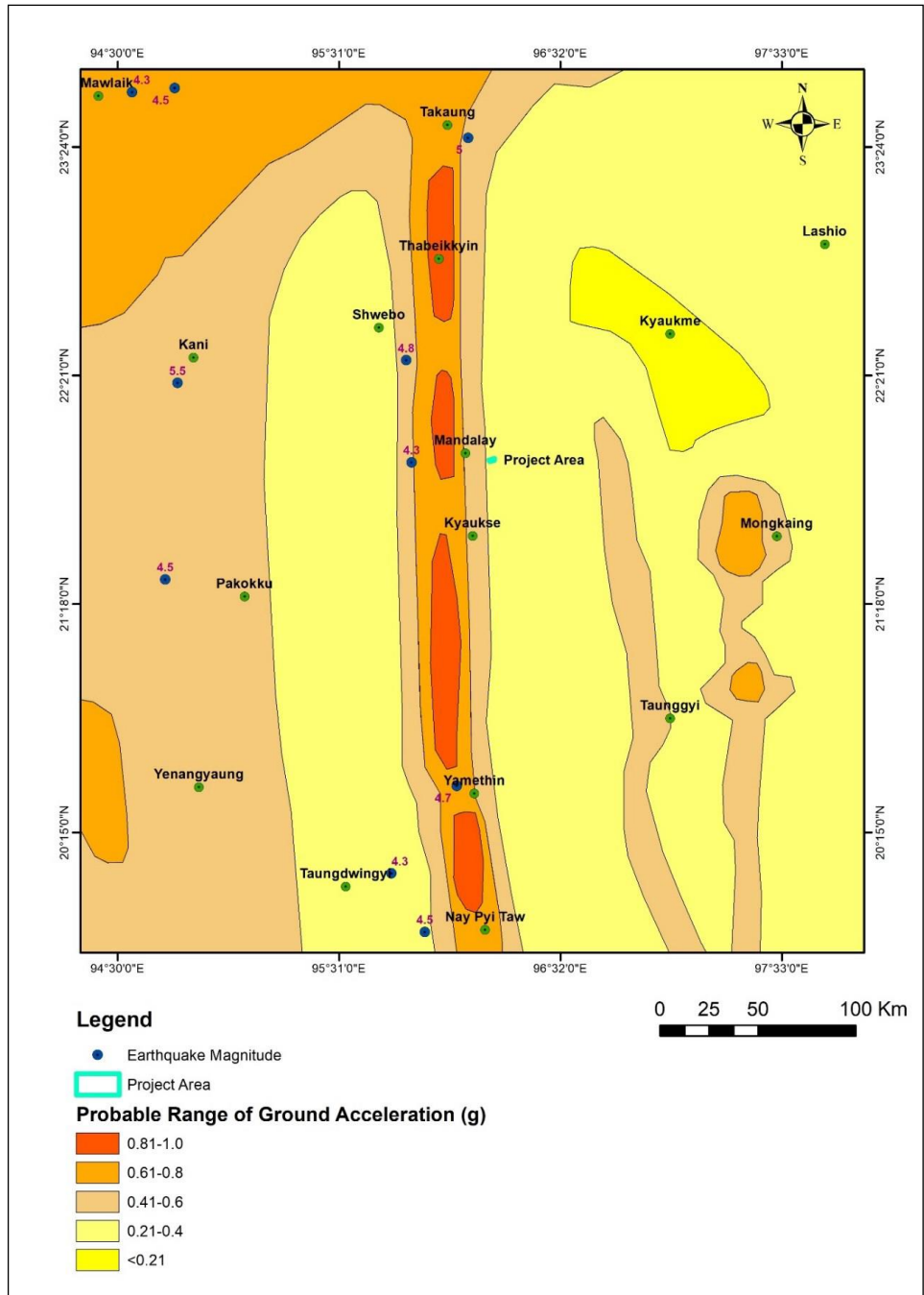


Figure 4.5-3 Annual rainfall and temperature of Mandalay Region

4.5.4 Natural Disaster

There are two major active faults named as Sagaing Fault (left side) and Kyauk Kyan Fault (right side) are observed far away from the project area. There is no historical earthquake in the project area.

According to the probabilistic seismic hazards assessment (PSHA) map 2012, which was presented by Myanmar Earthquake Committee, 0.21 – 0.4 pga (g) values of 100% probability for 500 years will be estimated in the project area (Figure 4.5-4).



Source: Seismic Hazards Assessment for Myanmar, 2012 (Myanmar Earthquake Committee)

Figure 4.5-4 Probabilistic Seismic Hazard Map of Project Area.

A tropical cyclone is a tropical storm with rotating winds at speeds of greater than 74 miles (119 km) per hour. Myanmar is vulnerable to cyclones, which often originate in the Southern Andaman Sea and enter the Bay of Bengal. These cyclones can result in heavy rains, storms, and floods. There are two prominent cyclone seasons for the country, between April to May and October to December. The project site is located in the eastern part of dry zone and topography is flat plain. The project site had no experience about the natural disaster such as storm and flooding based on the township profile data.

5.5.5 Physical Environments

The summary of environmental survey is shown in Table 5.4 and sampling points for environmental baseline survey are shown in Figure 4.5-4.

Table 4.5-3 Summary of Environmental and Biological Environment Survey

Air Quality	Parameter	(1) Sulphur Dioxide (SO ₂), (2) Nitrogen Dioxide (NO ₂), (3) Carbon Monoxide (CO), (4) Ozone (O ₃), (5) Total Suspended Particles (TSP), (6) Particulate Matter (PM ₁₀ & PM _{2.5}), (7) Air Pressure and (8) Wind Speed & Wind Direction
	Period	2 points for one time within survey period (24 hours)
	Location	Residential and construction areas.
Vibration Level	Parameter	L _{veq}
	Period	Three hours continuously in each location (2 points)
	Location	Residential and construction areas.
Noise Level	Parameter	L _{Aeq} (A-weighted loudness equivalent)
	Period	One time at 2 locations for 24 hours duration
	Location	Residential and construction areas.
Flora & Fauna	Item	Interview, field observation and secondary data collection
	Area	Project site
	Period	Whole survey period

Source: Survey Team

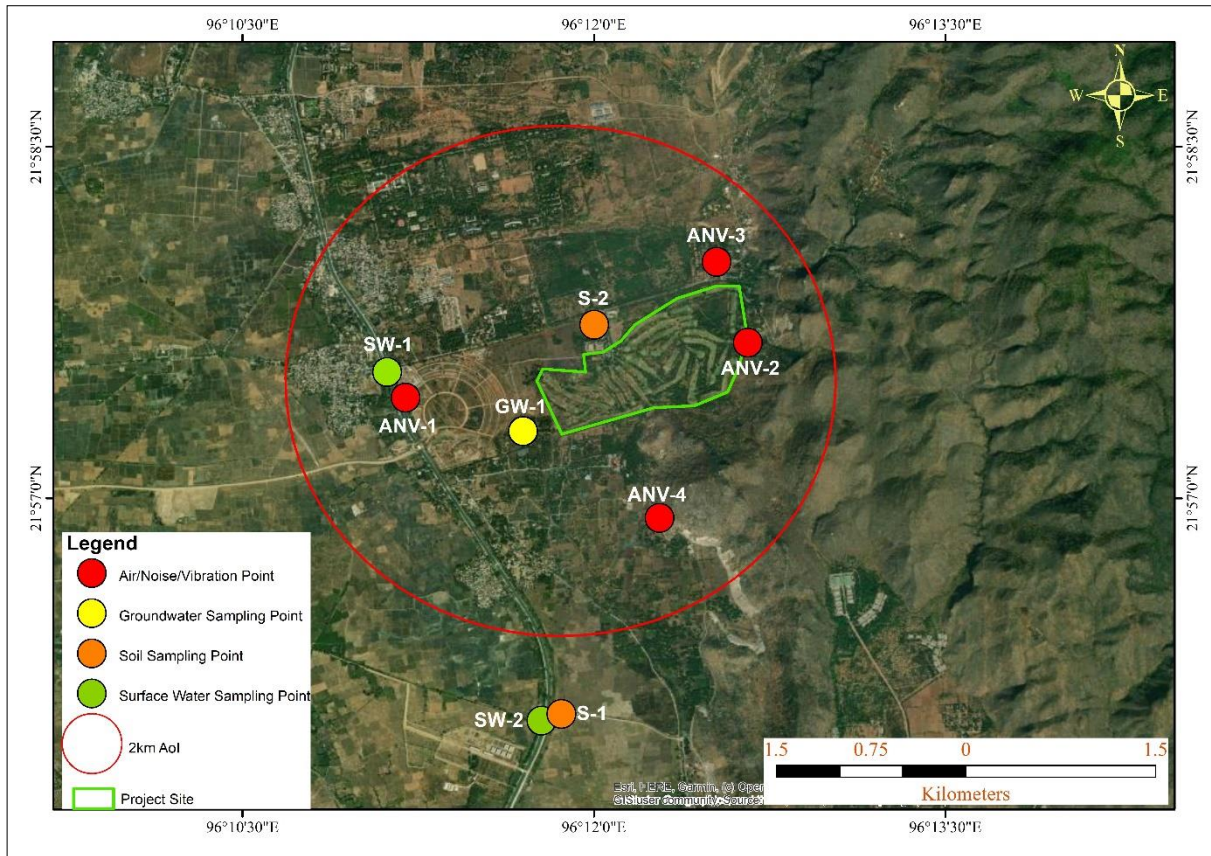


Figure 4.5-5 Location map of the physical baseline survey

4.5.5.1 Air Quality

b) Survey Parameter

The ambient air quality monitoring for environmental impact assessment was surveyed around the project area, Ye Dagon Taung City Development, Patheingyi Township and Mandalay Region by Physical Survey Team on 22nd to 25th on November 2023. The project site is situated in the eastern part of Mandalay City. National Environmental Quality (Emission) Guideline (NEQG) has set the ambient air quality in Myanmar and World Health Organization (WHO) as shown in Table 4.-4.

Table 4.5-4 Ambient Air Quality Standard of NEQG and WHO

Item	Avg period	NEQG	WHO
SO ₂	10 mins	500 µg/m ³	500 µg/m ³
	1 hour	-	-
	24 hours	20 µg/m ³	125 µg/m ³ (Interim target 1)
			50 µg/m ³ (Interim target 2)
	1 year	-	20 µg/m ³ (Guideline)
NO ₂	1 hour	200 µg/m ³	200 µg/m ³
	24 hours	-	-
	1 year	40 µg/m ³	40 µg/m ³
	1 hour	-	-

CO	8 hours	-	-
	24 hours	-	-
PM10	1 hour	-	-
	24 hours	50 µg/m ³	150 µg/m ³ (Interim target 1) 100 µg/m ³ (Interim target 2) 75 µg/m ³ (Interim target 3) 50 µg/m ³ (Guideline)
	1 year	20 µg/m ³	70 µg/m ³ (Interim target 1) 50 µg/m ³ (Interim target 2) 30 µg/m ³ (Interim target 3) 20 µg/m ³ (Guideline)
PM2.5	24 hours	25 µg/m ³	75 µg/m ³ (Interim target 1) 50 µg/m ³ (Interim target 2) 37.5 µg/m ³ (Interim target 3) 25 µg/m ³ (Guideline)
	1 year	10 µg/m ³	35 µg/m ³ (Interim target 1) 25 µg/m ³ (Interim target 2) 15 µg/m ³ (Interim target 3) 10 µg/m ³ (Guideline)
O ₃	1 hour	-	160 µg/m ³ (Interim target 1)
	8 hours	100 µg/m ³	100 µg/m ³ (Guideline)

Source: Myanmar: National Environmental Quality (Emission) Guidelines (December, 2015). WHO: WHO Air Quality Guidelines 2005

c) **Methodology**

The environmental parameters such as ambient air quality, which were measured by using air quality monitoring system (AQM-09). The AQM-09 can measure outdoor air pollutants in real-time, measure data quickly and accurately. To determine the existing baseline ambient air quality status within 2km radius of the project site, 24-hours of continuously air pollutants level, which include particle modules (TSP, PM10 and PM2.5), gases (O₃, CO, SO₂, NO₂) and meteorological parameters (including of Temperature, Humidity, Wind speed, Wind direction, Barometric pressure) were measured at the selected site using the AQM-09. Air quality monitoring measured by Resource and Environment Myanmar Company Limited, environmental consultant organization registered by Ministry of Natural Resources and Environmental Conservation (MONREC). To reveal the existing status of baseline air quality, the average ambient air qualities measured were compared with National Environmental Quality (Emission) Guideline. The points for measurement are near the operation area and segregated section. Based on the results appropriate interventions are suggested.

d) **Survey Item**

The baseline environmental quality at the Project Site and its immediate surroundings was established by ambient air quality samples, temperature and humidity measurements at immediate surrounding areas. The overall conditions of air quality monitoring are quoted from the project. The summary of the field survey for overall conditions is shown in Table 4.5-5.

Table 4.5- 5 Summary of Environmental Survey

Item	Parameter
Air quality	(1) Sulphur Dioxide (SO ₂), (2) Nitrogen Dioxide (NO ₂), (3) Carbon Monoxide (CO), (4) Ozone (O ₃), (5) Total Suspended Particles (TSP), (6) Particulate Matter (PM ₁₀ & PM _{2.5}), (7) Air Pressure and (8) Wind Speed & Wind Direction

e) Survey Location

This environmental monitoring point was located in Yay Kyi Village, Patheingyi Township, and Mandalay Region. The details of the location of survey point are presented in Table 5.7 and Figure 5.8.

Table 4.5-6 Location of Survey Point

Monitoring ID	Coordinates	Type of Monitoring	Description of Monitoring point
ANV-1	21°57'25.48"N 96°11'11.58"E	Within the project site	Inside of the project site
ANV-2	21°57'39.66"N 96°12'39.64"E	Residential area	Eastern part of the project site (At the Thitsa Aung Myay Monastery)
ANV-3	21°57'59.8"N 96°12'32.0"E	Residential area	Northeast side of the project site (At the Thitsawaidagu Monastery)
ANV-4	21°56'55.5"N 96°12'16.2"E	Residential area	Southeast side of the project area (0.95 km away from the project site)

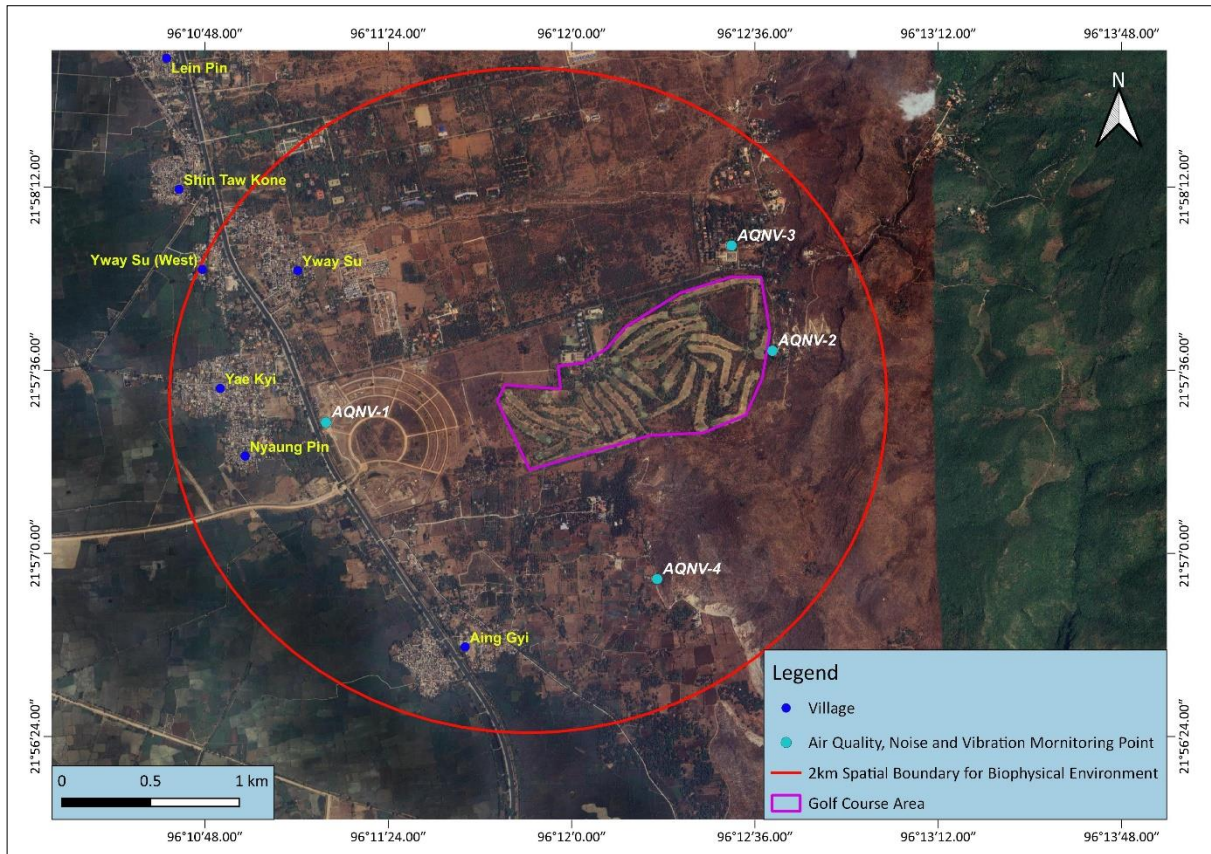


Figure 4.5-6 Location map of Air quality, Noise and Vibration Level monitoring

f) Detail Description Air Quality Monitoring

This station was installed in flat area, located at Yay Kyi Village, Patheingyi Township, Mandalay Region and about 14.35 km away from Irrawaddy River. The Air Quality Monitoring Point-1 is situated at inside of the project area, it is about 0.23 km away from Yay Kyi Village and AQM Point-2 is at the east side of the project area (Thitsa Aung Myay Monastery), it is about 0.13 km away from the project boundary. The AQM Point-3 is located at the northeast side of the project area (Thitsawaidagu Monastery), it is about 0.29 km away from the project boundary. And also, AQM Point-4 is at southeast side, and it is about 0.95 km away from the project boundary. Between project site and Irrawaddy River, its average elevation is about 76 m, maximum is 85 m and minimum are 63 m. And elevation gain/loss are 126.8 m and -104.6 m.



Figure 4.5-7 Monitoring activities for Air Quality, Noise and Vibration Level

**g) Ambient Air Quality Result
Meteorological Information**

The following table describes the wind speed and wind direction of the air quality monitoring stations. AQN-1 and AQN-2 were conducted on 22nd November from 24th November. According to the data results from the monitoring points, the wind is mostly blown from South-Southwest to Southeast direction of the proposed project. The outdoor temperature and humidity condition during the air quality monitoring periods shows the average temperature of 25.79°C while the average humidity is 78.73%.

Table 4.5-7 Meteorological Measurement at Project Site

Monitoring Date	Description	Result value	Environmental parameter air station guideline
30-31 October, 2021	Air Pressure	1002.2 hPa	Present condition
	Wind Speed	0.26 m/s	Present condition
	Wind Direction	186.13°	Present condition
	Relative Humidity, RH %	77.08 (%)	Present condition
	Temperature	29.5 °C	Present condition
1-2 November, 2021	Air Pressure	999.97 hPa	Present condition
	Wind Speed	0.1 m/s	Present condition
	Wind Direction	227.08°	Present condition
	Relative Humidity, RH %	79.37 (%)	Present condition
	Temperature	27.6 °C	Present condition
2-3 November, 2021	Air Pressure	999.51 hPa	Present condition
	Wind Speed	0.2 m/s	Present condition
	Wind Direction	121.6°	Present condition
	Relative Humidity, RH %	75.45 (%)	Present condition
	Temperature	28.51 °C	Present condition
3-4 November, 2021	Air Pressure	1001.54 hPa	Present condition
	Wind Speed	0.1 m/s	Present condition
	Wind Direction	231.57°	Present condition
	Relative Humidity, RH %	74.13 (%)	Present condition
	Temperature	28.18 °C	Present condition

Result of Air Quality (Gaseous and Particulate Matter)

The observations were tabulated and analyzed section wise to understand the environmental status prevailing in the units considered for the study. It was observed that the air quality of SO₂, O₃ and NO₂ concentration level and particulate matter PM₁₀ and PM_{2.5} level are within the National Environmental Quality (Emission) Guideline.

Table 5.9 Ambient Air Quality Result

Monitoring Date	Parameter	Average Period	Result µg/m ³ /pp	WHO Guideline	NEQG Guideli
30-31 October, 2021	Total Suspended Particles (TSP)	-	30.09	NG*	NG*
	Particulate Matter (PM ₁₀)	24-hours	23.66	50	50

	Particulate Matter (PM2.5)	24-hours	17.56	25	25
	Sulphur Dioxide (SO2)	10-mins	328.35	500	500
	Nitrogen Dioxide (NO2)	1-hour	15.16	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.86	100	100
	Carbon Dioxide (CO2)	-	1 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*
1-2 November, 2021	Total Suspended Particles (TSP)	-	20.52	NG*	NG*
	Particulate Matter (PM10)	24-hours	16.09	50	50
	Particulate Matter (PM2.5)	24-hours	11.42	25	25
	Sulphur Dioxide (SO2)	10-mins	299.19	500	500
	Nitrogen Dioxide (NO2)	1-hour	11.26	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.25	100	100
	Carbon Dioxide (CO2)	-	1 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*
2-3 November, 2021	Total Suspended Particles (TSP)	-	25.68	NG*	NG*
	Particulate Matter (PM10)	24-hours	19.7	50	50
	Particulate Matter (PM2.5)	24-hours	16.14	25	25
	Sulphur Dioxide (SO2)	10-mins	345.46	500	500
	Nitrogen Dioxide (NO2)	1-hour	11.7	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.64	100	100
	Carbon Dioxide (CO2)	-	1.71 ppm	NG*	NG*

	Volatile Organic Compound (VOC)	-	0.23	NG*	NG*
3-4 November, 2021	Total Suspended Particles (TSP)	-	30.32	NG*	NG*
	Particulate Matter (PM10)	24-hours	23.13	50	50
	Particulate Matter (PM2.5)	24-hours	19.24	25	25
	Sulphur Dioxide (SO2)	10-mins	327.01	500	500
	Nitrogen Dioxide (NO2)	1-hour	11.91	200	200
	Carbon Monoxide (CO)	-	0.3	NG*	NG*
	Ozone (O3)	8-hours	3.21	100	100
	Carbon Dioxide (CO2)	-	17.24 ppm	NG*	NG*
	Volatile Organic Compound (VOC)	-	0.01	NG*	NG*

NEQ = National Environmental Quality (Emission) Guideline 2015
WHO = World Health Organization * NG = No Guideline

AQI and Health Implications

AQI Value	Health Implication	Recommended Precautions
54.5 – 73.25	Some pollutants may slightly affect very few hypersensitive individuals.	Only very few hypersensitive people should reduce outdoor activities.

Environmental Monitoring Analysis Report has been prepared for Ye Dagon Taung Master Plan Project according to the analysis report dust particles and other related gas parameters which are immanent in the National Environmental Quality (Emission) Guideline.

According to the observations, the survey results indicated that the air quality of the proposed project site is normal condition. The results are good because monitoring is performed during rainy season and the operation is not start yet. If the operations start up and during dry season, the impacts of air quality be possible to higher than the Guidelines. Mitigation measures ought to perform to protect the ambient air quality. Medical records and interactions with the employees indicate that the workers are exposed to health-related illness such as heat stress, heat stroke, eyestrain, headache, dizziness, etc. Hence, appropriate measures were suggested to improve the environmental parameters, which can lead to enhanced occupational health and safety. Further studies can be carried-out to analyze other environmental related issues and their influence on the occupational health and safety of the employees.

4.5.5.2 Noise Level

c) Survey Item

Parameter for noise level was determined by referring the environmental quality standards as shown in Table 4.5.8.

As there have been the environmental standards for noise level in Republic of Myanmar, the survey result was evaluated by comparing with the National Emission Quality Guideline for residential, institutional environment.

Table 4.5-8 Guideline of Noise Level

Receptor	One Hour LAeq ^a		Unit
	Daytime 07:00 – 22:00 (10:00 – 22:00 for Public holidays)	Nighttime 22:00 – 07:00 (22:00 – 10:00 for Public holidays)	
Residential, Institutional, Educational	55	45	dBA

Remark: LAeq = Equivalent continuous sound level in decibels

d) Survey Location

The locations of noise level points are as same as the location of air quality monitoring.

e) Survey Period

Noise level survey was conducted on 24 hours consecutive day. The measurement duration was as shown in Table 4.5-9.

Table 4.5-9 Sampling Duration for Noise Level Survey

Point	Period
N-1	November 3 rd – 4 th , 2021
N-2	November 3 rd – 4 th , 2021
N-3	November 3 rd – 4 th , 2021
N-4	November 3 rd – 4 th , 2021

f) Survey Method

Measurement of environmental sound level was conducted by referring to the recommendation of International Organization for Standardization (ISO), ISO 1996-1:2003 and ISO 1996-2:2007.

The instrumentation used for noise quality is shown in Table 4.5.10.

Table 4.5-10 Instrumentation for Noise Level Survey

Instrumentation	Description
Sound Level Meter	Sound Level Meter with SD Card, Model SL-4023SD

g) Survey Result

Noise level (LAeq) was presented in Table 4.5.11. According to the calculated noise level, most of noise decibel in two stations are within the applied standard. The main noise source of each monitoring locations

N-1	Day time and Nighttime	Voice from villagers, traffic, vehicle passing, motorbike, tiny bell sound from Pagoda, loudspeaker from monastery, strong wind during the raining
N-2	Day time and nighttime	Loudspeaker from residence during daytime Heavy rain, dog bark, fog voice near monitoring station during nighttime, during the monitoring period, heavy rain was strongly rained.
N-3	Day time and nighttime	Traffic, vehicle passing, motorbike, tiny bell sound from Pagoda, children's reading and playing around the station, during the monitoring period, heavy rain was strongly rained.
N-4	Day time and nighttime	Dogs barking, voice from villagers and motorbikes driving along the foot path near to the monitoring station, during the monitoring period, heavy rain was strongly rained.

Table 4.5-11 A-weighted loudness Equivalent (LAeq) Level

Unit: dB(A)

	N-1 (3 rd - 4 th Nov, 2021)		N-2 (3 rd - 4 th Nov, 2021)		N-3 (3 rd - 4 th Nov, 2021)		N-4 (3 rd - 4 th Nov, 2021)	
	Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time
	54	54	49	44	59	55	51	52
Env. Standard	55	45	55	45	55	45	55	45

Remark: Shaded area is higher than the standard.

Table 4.5-12 Hourly LAeq value in noise monitoring stations (Unit: dBA)

Time	N-1 (3 rd - 4 th Nov, 2021)	N-2 (3 rd - 4 th Nov, 2021)	N-3 (3 rd - 4 th Nov, 2021)	N-4 (3 rd - 4 th Nov, 2021)
	7:00-8:00	55	49	56
8:00-9:00	54	48	76	46
9:00-10:00	56	54	59	51
10:00-11:00	56	56	58	46
11:00-12:00	57	54	66	68
12:00-13:00	54	45	51	48
13:00-14:00	44	49	59	56
14:00-15:00	44	50	70	52
15:00-16:00	66	46	63	62
16:00-17:00	54	44	64	44
17:00-18:00	48	44	64	42
18:00-19:00	56	45	47	42
19:00-20:00	46	56	50	57
20:00-21:00	49	51	51	50

21:00-22:00	66	45	48	44
22:00-23:00	59	44	49	49
23:00-00:00	45	42	61	53
00:00-1:00	56	45	55	51
1:00-2:00	43	41	49	52
2:00-3:00	56	41	52	56
3:00-4:00	57	43	49	53
4:00-5:00	53	45	55	54
5:00-6:00	55	44	62	53
6:00-7:00	59	47	65	52

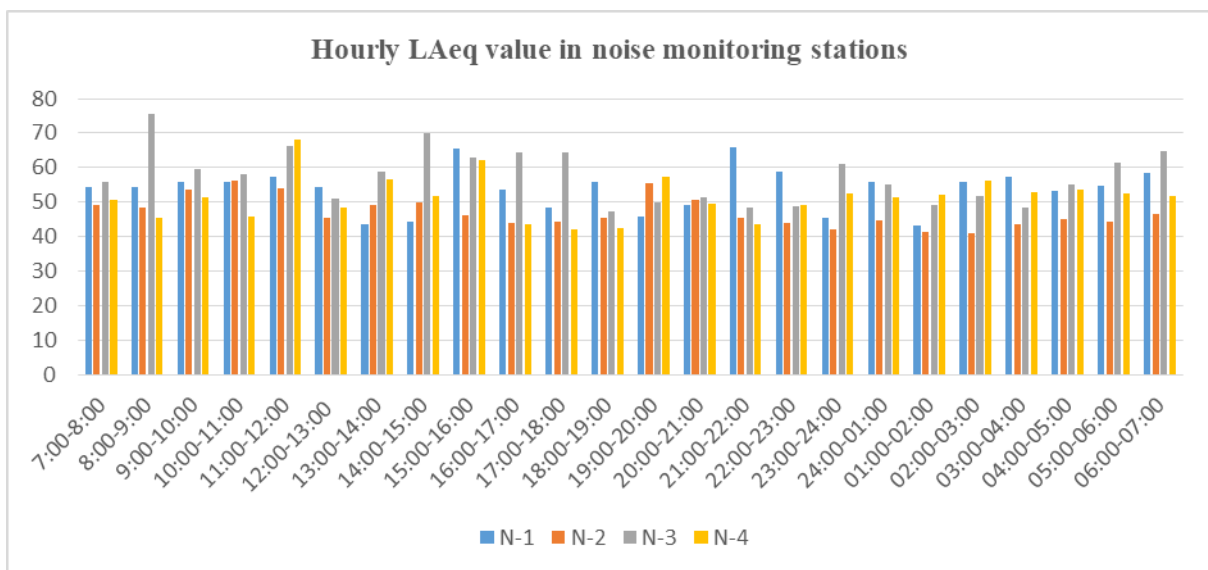


Figure 5.10 Hourly LAeq value in noise monitoring stations

4.5.5.3 Vibration Level

c) Survey Item

Parameter for vibration level was determined by referring the environmental quality standards as shown in Table 4.5.13. As there is no the environmental standards for vibration level in Republic of Myanmar, the survey result was evaluated by comparing with the Japan standard.

Table 4.5-13 Survey Items for Vibration Level

No.	Item
1	Lv (dB), Lv,max, Lv,min, Lv5, Lv10, Lv50, Lv90, Lv95, and Lveq. Lv10

As there is no vibration standard to receptors in Myanmar, the target vibration level at construction phase shall be set based on the standards in some foreign countries. Accordingly, the target level of vibration is set based on the following policies.

Monastery and residential house where are necessary to keep quiet and sleep shall comply with the Japanese standard for residential area,

Office, commercial facilities, and factories areas shall comply with the Japanese standard for mixed areas including residential and commercial and industrial areas.

Table 4.5-14 Vibration standards in Japan

Time Area	Daytime	Nighttime	Applicable Areas
I	60 – 65 dB	55 – 60 dB	Areas where maintenance of quiet is particularly needed to preserve a good living environment and where quiet is needed for as they are used for residential purposes.
II	65 – 70 dB	60 – 65 dB	Areas used for commercial and industrial as well as residential purposes where there is a need to preserve the living environment of local residents and areas mainly serving industrial purposes which are in need of measures to prevent the living environment of local residents from deteriorating.

Note: Vibration level shall be measured at the boundary line of the specified factory.

d) Survey Location

The locations of noise level points are as same as the location of air quality monitoring.

e) Survey Period

Vibration level was conducted for 24hours continuously in each monitoring stations.

Table 4.5-15 Monitoring Duration for Vibration Level

Sample Point	Date/Time
V-1	4.11.2021
V-2	4.11.2021
V-3	3.11.2021
V-4	3.11.2021

f) Survey Method

The VM-55 Vibration Level Meter accompanied by a 3-axis accelerometer which will be placed on solid soil ground near the roads. Vertical vibration (Z axis), Lv, will be hourly measured and recorded. Lv (dB) vibration levels are recorded as Lv,max, Lv,min, Lv5, Lv10, Lv50, Lv90, Lv95, and Lveq. Lv10 is the vibration level used in accordance with referred standard. There has not been emitted the point sources of vibration around the project site. So, vibration level monitoring was conducted by the short time monitoring method.

g) Survey Result

Average three-hour vibration level in all monitoring station is presented in Table 4.5.16. Average 24-hours vibration levels in all monitoring stations are within the applied standard.

Table 4.5-16 Average 24-hours vibration level in all monitoring stations

Parameter		Result				Target Value (Japan Standard)
		V-1	V-2	V-3	V-4	
X-axis	Lveq	13	13	14	17	55
X-axis	Lvmax	20	19	20	24	55
X-axis	Lvmin	8	8	8	9	55
X-axis	Lv5	17	16	17	21	55
X-axis	Lv10	16	15	16	19	55
X-axis	Lv50	13	12	13	15	55
X-axis	Lv90	10	10	10	12	55
X-axis	Lv95	10	9	10	11	55
Y-axis	Lveq	18	19	15	19	55
Y-axis	Lvmax	25	28	21	25	55
Y-axis	Lvmin	10	9	10	11	55
Y-axis	Lv5	22	24	18	22	55
Y-axis	Lv10	21	21	18	21	55
Y-axis	Lv50	16	14	15	17	55
Y-axis	Lv90	13	11	12	14	55
Y-axis	Lv95	12	11	12	13	55
Z-axis	Lveq	17	16	16	19	55
Z-axis	Lvmax	18	18	19	23	55
Z-axis	Lvmin	16	16	14	16	55
Z-axis	Lv5	17	17	17	20	55
Z-axis	Lv10	17	17	17	19	55
Z-axis	Lv50	17	16	16	18	55
Z-axis	Lv90	17	16	15	17	55
Z-axis	Lv95	16	16	15	17	55

4.5.5.4 Water Quality

c) Survey Item

Water quality survey parameters are determined to cover the parameters of existing environmental standards of Myanmar (NEQG General Application).

Table 4.5-17 Water Quality survey parameters

Item	Parameter
Water Quality	Ammonia (NH ₄), Arsenic, BOD, TSS, Total coliform, COD, Oil and grease, Zinc, Chromium (total), Copper, Iron, Mercury, Nitrate, Sulphide, Total Nitrogen, Total Phosphorus, Nickel, Lead, Cyanide

d) Survey Locations

The locations of water sampling survey points are shown in Table 5.19 and Figure 5.12. The detail of each sampling points is described as below.

Table 4.5-18 Sampling and survey points of surface water quality survey

Category	Sampling Point	Coordinates	Description of Sampling Point
Surface Water	SW-1	21°57'32.31"N 96°11'7.08"E	Collected at the inlet part where is the site intended for the construction of water supply area for construction phase
Surface Water	SW-2	21°56'3.03"N 96°11'46.58"E	collected at the outlet part where is the site intended for the construction of a sewage treatment plant
Ground water	GW-1	21°57'17.15"N 96°11'41.87"E	Theyetdaw Village

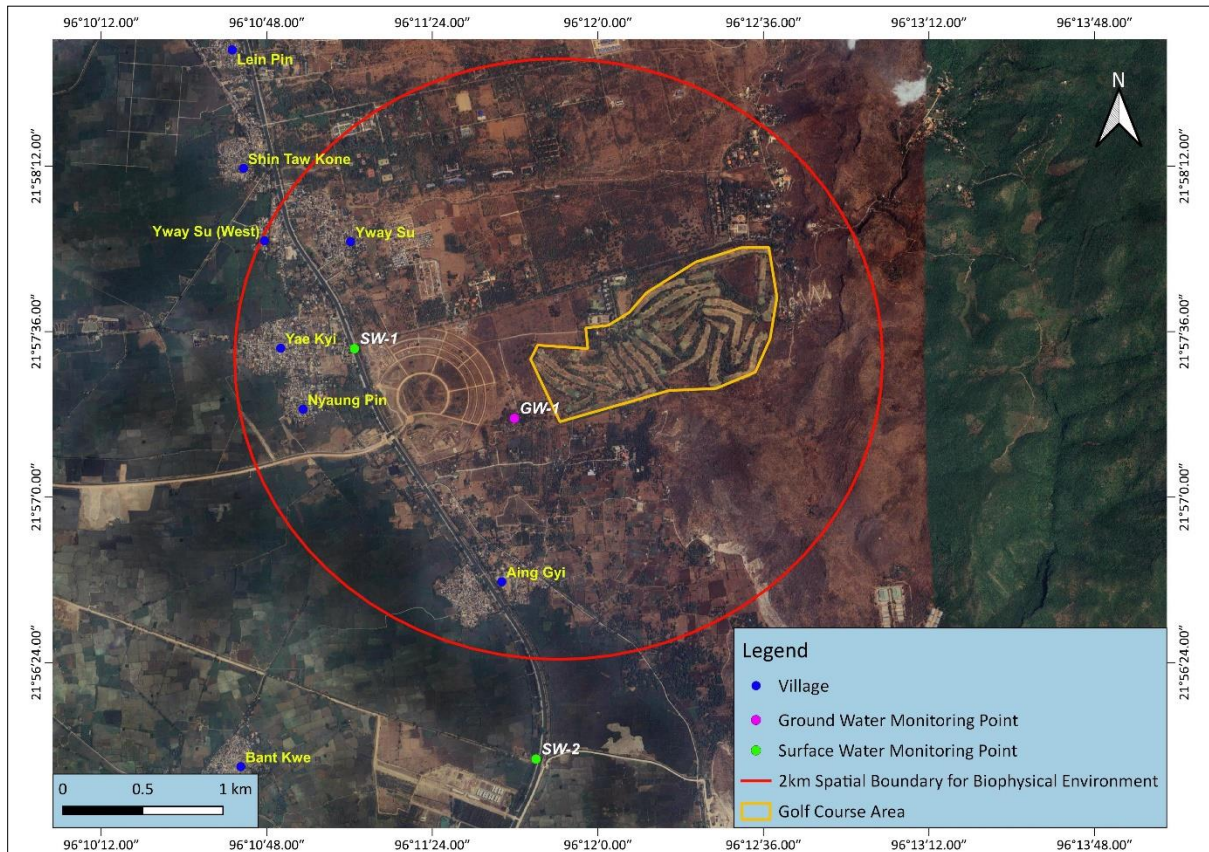


Figure 5.11 Location map of Water Quality Survey

e) Detail Site Description

SW-1

Surface water sampling point (SW-1) was collected at the water inlet where is the site intended for the construction of water supply area for construction phase. SW-1 is situated into the Sedaw canal, eastern fence of project boundary and near the Yeagyi Village.



Figure 5.12 Water quality sampling at SW-1

SW-2

Surface water sampling point (SW-2) was collected at the outlet part where is the site intended for the construction of a sewage treatment plant. SW-2 is situated at the Payandaw Stream. SW-2 is fared from about 2.15km south of Project boundary.



Figure 5.13 Water quality sampling at SW-2

GW-1

Ground water sampling (GW-1) was measured and collected at the handed well of Theyetdaw Village where is located within the southern fence of boundary. Water colour is colourless and high transpency. The depth of well is about 15m.



Figure 5.14 Ground water quality sampling at GW-1

f) Survey Period

The sampling and measuring of the surface water were conducted on 4 – 5 November 2021.

g) Survey Method

Water samples were taken by Alpha Horizontal water sampler and collected in sterilized sample containers. All samples were collected in accordance with recognized standard procedures. The parameters pH, temperature, Dissolved Oxygen (DO), Electrical Conductivity (EC), Total Dissolved Solid (TDS) and salinity were measured at each monitoring point concurrently with sample collection using On Site, Horiba Equipment. All samples were kept in iced boxes and were transported to the laboratory and stored at 2-4°C refrigerators.

Table 4.5-19 Field Equipment for water quality sampling

Equipment	Manufacturer	Originate Country	Model/Serial No.	
Multi Parameters for water quality (water checker)	HORIBA	Japan	Model – U52G SN – G2YBAJWD	

The following table provides the test method for water quality.

Table 4.5-20 Analysis Method for Water Samples

No.	Item	Analysis Method
1.	Temperature	HORIBA @MP_Multi parameter for in-situ water testing equipment
2.	pH	HORIBA @MP_Multi parameter for in-situ water testing equipment
3.	Dissolved Oxygen	HORIBA @MP_Multi parameter for in-situ water testing equipment
4.	Total Dissolved Solid (TDS)	HORIBA @MP_Multi parameter for in-situ water testing equipment
5.	Electrical Conductivity (EC)	HORIBA @MP_Multi parameter for in-situ water testing equipment
6.	Ammonia	ISO Tech Laboratory
7.	Arsenic	ISO Tech Laboratory
9.	Total coliform	REM-UAE Laboratory
10.	TSS	REM-UAE Laboratory
11.	Oil & Grease	REM-UAE Laboratory
12.	Chemical Oxygen Demand	REM-UAE Laboratory
13.	Biochemical Oxygen Demand	REM-UAE Laboratory
14.	Chromium (Total)	SGS Myanmar Laboratory
15.	Copper	ISO Tech Laboratory
16.	Iron	ISO Tech Laboratory
17.	Mercury	SGS Myanmar Laboratory
18.	Nitrate	ISO Tech Laboratory
19.	Sulphide	SGS Myanmar Laboratory
20.	Total Nitrogen	SGS Myanmar Laboratory
21.	Total Phosphorous	SGS Myanmar Laboratory
22.	Nickel	SGS Myanmar Laboratory
23.	Lead	ISO Tech Laboratory

24	Cyanide	ISO Tech Laboratory
25	Zinc	ISO Tech Laboratory

h) Water Quality Result

Table 4.5-21 presented the result of water quality for all sampling points. The water quality analysis parameters were compared by national emission quality guideline and Myanmar Drinking water quality standard. According to the analysis results, total coliform results in surface water are higher than the applied standards. The reason for the increase in total coliform values in surface water quality, water quality sample were collected at Sedaw Dam which is situated the nearby villages, and this canal is mainly applied by washing and usage for agriculture. Solid wastes from villagers are dumped near the canal. So, these activities may be higher the coliform value. Laboratory analysis results show in appendix.

Table 4.5-21 Water Quality Result

Parameter	Unit	SW-1	SW-2	GW-1	Standard	
					EQEG	MNDWQS
Water Temperature	°C	30.8	31.3	30.47	<31	-
pH		8.31	7.8	7.4	6-9	6.5-8.5
Dissolved oxygen	mg/l	5.12	5.08	3.24	-	-
Conductivity	ms/cm	0.20	0.41	1.26	-	-
Total dissolved solid	g/l	0.13	0.27	0.80	-	1000
Turbidity	ntu	47.7	72.9	0	-	5
Salinity	ppt	0.09	0.2	0.6	-	-
Ammonia	mg/l	nil	nil	nil	10	-
Arsenic	mg/l	nil	nil	nil	0.1	0.05
Total coliform	mg/l	23	23	1.3	400	3
TSS	mg/l	21.7	16.2	ND (<3)	50	-
Oil & Grease	mg/l	ND (<3)	ND (<3)	ND (<3)	10	-
Chemical Oxygen Demand	mg/l	35	39	ND (<25)	250	-
Biochemical Oxygen Demand	mg/l	2.0	2.3	1.8	50	-
Chromium (Total)	mg/kg	<0.1	<0.1	<0.1	0.5	0.5
Copper	mg/l	nil	nil	nil	0.5	2
Iron	mg/l	0.69	0.72	0.13	3.5	1
Mercury	mg/kg	<0.1	<0.1	<0.1	0.01	0.001
Nitrate	mg/l	0.5	0.6	0.1	-	1
Sulphide	mg/l	<2	<2	<2	1	0.05
Total Nitrogen	mg/l	1.90	1.90	<1	10	-
Total Phosphorous	mg/l	0.043	0.039	<0.01	2	-
Nickel	mg/kg	<0.1	<0.1	<0.1	0.5	0.07
Lead	mg/l	nil	nil	nil	0.1	0.01
Cyanide	mg/l	nil	nil	nil	1	0.07
Zinc	mg/l	nil	nil	nil	2	3

4.5.5.5 Soil Quality

c) Summary of soil quality survey

The survey location is situated at Ye Dakun Taung are near Yaygyi village, Patheingyi Township, Mandalay Region. The soil samples collected one location within the project compound and another location point were taken at the site intended for the construction of a sewage treatment plant.

d) Survey Item

Parameters for soil quality survey are determined to cover the parameters of existing available environmental standards. Soil sample was taken by the manual hand auger.

Table 4.5-22 Analysis parameters for soil quality

Category	Parameter
Soil Quality	Soil pH, Moisture content, lead, Arsenic, Cadmium, Copper, Iron, Zinc

e) Survey Locations

The locations of soil samples and surveys are shown in Table 4.5-23 and Figure 4.5-8. The detail of sampling points is described as below.

Table 4.5-23 Sampling and survey points of surface soil quality survey

Category	Sampling Point	Coordinates	Description of Sampling Point
Soil	S-1	21°56'4.74"N 96°11'51.69"E	Collected at the site intended for the construction of a sewage treatment plant.
Soil	S-2	21°57'44.38"N 96°12'0.11"E	Collected at the site intended for the construction of workshop area



Figure 4.5-8 Location map of Soil Quality

f) Detail Site Description

S-1

Soil sampling point (S-1) was collected at the site intended for the construction of a sewage treatment plant. S-1 is located about 2.19km south of project site. Physical soil quality is dark grey colour, highly moisture and plasticity. Soil type of S-1 is clayey silt soil.



Figure 4.5-9 Soil sampling at S-1

S-2

Soil sampling point (S-2) was taken at the site intended for the construction of workshop area for construction phase. S-2 is located within the project boundary. Physical soil quality is reddish brown colour, medium moisture content and low plasticity. Soil type of S-2 is silty clay.



Figure 4.5-10 Soil sampling at S-2

g) Survey Method

For soil sampling, the standard environmental sampler (soil auger) was applied. The sampler is a stainless-steel tube that is sharpened on one end and fitted with a long, T-shaped handle. This tube is approximately three inches inside diameter. In order to refrain from contamination, about 00-10 cm of topsoil was removed by the sampler before sampling. The topsoil samples take 10-30 cm and 40-60 cm is sub soil. During sample collection, wear the glove, rinse glove and soil auger with clean water. Then sample was taken and collected in cleaned wide-mouth glass bottle. Chemical preservation of soil is not generally recommended. Samples were cooled in an ice box which temperature was under 4°C. Samples were protected from sunlight to minimize any potential reaction. Field equipment used on site is also shown in the table.

Table 4.5-24 Field Equipment for Sediment and Soil Quality Survey

No.	Equipment	Originate Country	Model
1	Soil Auger (for soil sampling)	U.S.A	AMS

h) Survey period

The soil samplings were conducted on 4 November 2021.

i) Soil Quality Results

Soil samples were analyzed at the Land Use Department of Yangon Region. Soil quality results of soil on each point are shown in table 4.5.25 and appendix.

Table 4.5-25 Soil quality laboratory result

Parameter	unit	S-1	S-2
pH		7.61	7.86
Moisture content		7.44	3.09
Lead		5.06	Not detected
Cadmium		Not detected	Not detected
Copper		1.992	0.534
Arsenic		18.54	91.9
Zinc		Not detected	Not detected

4.6 Environmental Biological Components

The biological constituent of the environment is called the biotic components of the environment. The component consists of all living things like plants, animals and small micro-organism like bacteria it interacts with the abiotic component of the environment. This interaction of two components of the environment forms various ecosystems, like pond ecosystem, marine ecosystem, limestone ecosystem etc. As parts of this study, a desktop study was carried out of policy available scientific publication to investigate the ecology and biodiversity of the project AOI.

A site visit was undertaken where the Different biodiversity features, habitat, vegetation and landscape units present at site were identified and mapped in the field. They include generating a fine-scale vegetation map for the site which identified and mapped the different plant communities. Walk through survey were conducted across the site and all plant and animals species observed were recorded. Searches for listed and protected plant species at the site were conducted and the location of all listed plant species observed was recorded using a GPS. Active searches for reptiles and amphibian were also conducted within habitats likely to be important for such species. The impact assessment phase will involve the determination of the nature of likely impact of the development and recommendation on mitigation. The biodiversity survey had been carried out 27th December to 31st December, 2022 the survey areas were within buffer zone 3 km. The following information was collected during the biodiversity field survey.

4.6.1 Scope and Purpose of the baseline survey

The scope and purpose of the ecological baseline study are:

- To provide comprehensive and accurate information on the ecological baseline;
- To identify and predict potential ecological impacts;
- To evaluate the significance of the impacts identified;
- To recommend effective and practicable alternatives and mitigation measures; and
- To recommend the need for and the scope of an appropriate monitoring and audit programme.

4.6.2 Site Reconnaissance

A targeted site reconnaissance was conducted from 27th December to 31st December, 2022 to ground-truth information gathered and supplements it with site observations, data and photographs. The site reconnaissance targeted the following specific ecological objectives:

- To name, describe and map vegetation communities and habitats present within the Project Area at a suitable scale, using existing community nomenclature where possible;

- To identify, describe and map other ecologically sensitive areas within the Project Area such as springs, watercourses and other water bodies;
- To the extent possible within the survey time frame and season, determine if species of conservation significance known or predicted likely to be present in the Study Area are actually present within the Project Area;
- To identify opportunities for future ecological monitoring and enhancement within the framework of the proposed project.

4.6.3 Methodology

The methodologies used in the baseline study were discussed below.

4.6.3.1 Desktop Survey

Publicly available sources of information were analyzed to build an outline of known and likely ecological values for the Study Area. Aerial imagery was used to build a more complete spatial understanding of the pattern of vegetation communities and human uses on the site, and to map access routes and internal tracks. In addition, ecologists with experience of the Study Area were consulted where possible to obtain information about species known to be present or previously recorded from the site, and other ecological values considered by them to be relevant.

4.6.3.2 Field Observation

a. Flora

A Global Positioning System was used to navigate and mark coordinates around the study area. Field observation was conducted in and around the project area. During the field survey period, plot less sampling method was used. Plot less sampling methods are based on the random selection of points within a particular survey area. In addition, all trees, shrubs, herbs and cultivated crops were recorded and listed. Identification of plants and animal species was conducted with assistances of skilled local people. The identified species and families were translated to scientific name with assistance of a checklist of trees, shrubs, herbs and climbers of Myanmar.

b. Fauna

Table 4.6-1 List of Fauna Methodology

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Herpetology	Herpeto fauna surveys was conducted through direct observation and active searching in all major representative habitat types and in potential hiding places such as among leaf litter, inside holes and under stones and logs within the study area. Visual observations, documented where possible by photographs were made of some captured specimens that were not collected for preservation. Photo records were taken by digital.
Butterflies	Butterflies of different habitats within the study area were surveyed using point count method subject to the on-site conditions. Butterflies species were identify in field so that we took photo and identify the species with reference book.
Bird	Random point count method was used for the bird survey and took the photograph of birds. Birds were observed with binocular and identified aided with field guided book for (Crib Robson 2011). Species identification observed number of birds habitat utilization, were examined. Nocturnal birds were observed when it becomes dusk. Point count and opportunistic methods were used to census the species richness and point counting was used to get the relative measure of bird abundance.
Fish	Interviewed with local fisherman and local villager from the Study area were conducted during the collection of the specimen. The fishes were photographed soon after the collection and measurements were also taken for key characteristics. Indirect observation was conducted at a market and interviewed with fishermen about kind and quality of fishery product.

4.6.3.3 Interviewing Survey

In addition to the field observation, secondary data was also surveyed by interviewing from local residents and literature reviewing. In the interview survey, the surveyor visited the residents in and around the survey area and interviewed the name of plants and animals existing in and around the area. Also, the past situation of flora and fauna, and the change on biodiversity and ecosystem in the area was interviewed for examination.



Figure 4.6-1 Photo of Interview from Local people

4.6.3.4 Survey Area of Biodiversity

The location of the survey area was shown in figure 4.6-2.

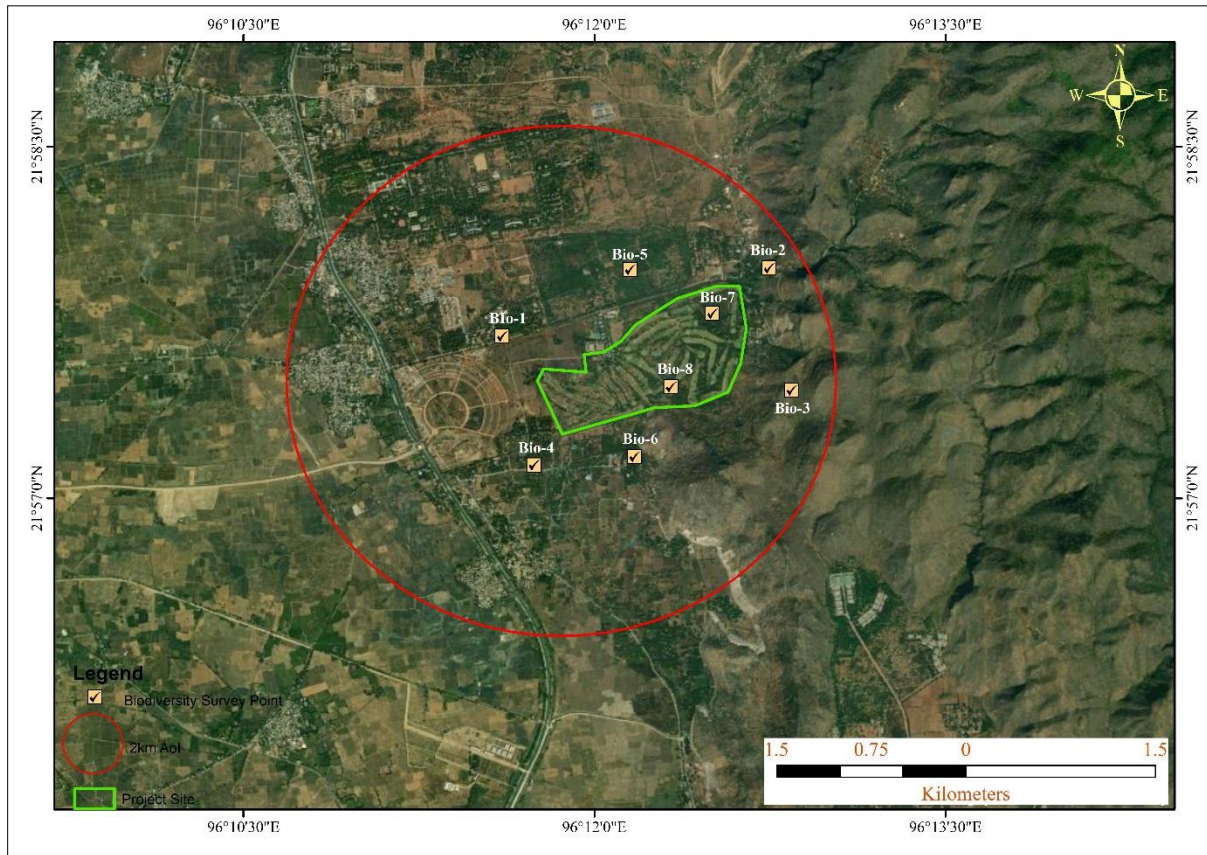


Figure 4.6-2 Location of Biodiversity survey area around the project site

4.6.4 Survey Result

4.6.4.1 Flora Result

Flora survey was conducted to obtain an understanding of the diversity of flora taxa group. A total of 88 flora species identified during the survey. One (1) species is endangered species were classified and 31 species of least concern. (2) Data Deficient and 54 species of Not Yet Assessed on the Iucn Red List. There was no endemic species in this area.

Htan or Palmyrah palm (*Borassus flabelifer*) is identified as Endangered on IUCN Red List and is found in India and Myanmar and Cambodia. It is economically important flora species and the part of the plant such as root, leaves, seeds and fruit are used for various purpose. The exploration of natural resources and expansion of agricultural and human settlement are the main threats to the species.

Table 4.6-2 List of plant species recorded in survey area

No	Family Name	Scientific Name	Common Name	Habitat	Distribution	IUCN	Remark
1	Asclepiadaceae	<i>Calotropis procera</i>	Mayo	S	Magway, Mandalay, Sagaing, Shan	NE	
2	Bombaceae	<i>Bombax ceiba</i>	Letpan	T	Wide	LC	
3	Meliaceae	<i>Azadirachta indica</i>	Tama	T	Wide	LC	
4	Mimosaceae	<i>Acaccia catechu</i>	Sha	T	Magway, Mandalay	NE	
5	Arecaceae	<i>Borassus flabellifer</i>	Htan	T	Bago, Mandalay, Sagaing, Taninthayi	EN	
6	Mimosaceae	<i>Leucaena leucocephala</i>	Bawsagain g	T	Mandalay, Sagaing, Yangon	NE	
7	Mimosaceae	<i>Albizia lebbek</i>	Anyakokko	T	Reported from Myanmar	LC	
8	Anacardiaceae	<i>Mangifera indica</i>	Thayet	T	Wide	DD	
9	Myrtaceae	<i>Psidium guajava</i>	Malaka	ST	Cultivated	LC	
10	Steruliaceae	<i>Scaphium scaphigerum</i>	Mohbin	T	Mon, Taninthayi	NE	
11	Moraceae	<i>Ficus glomerata</i>	Thapan	T	Bago, Kachin, Mandalay, Yangon	NE	
12	Euphorbiaceae	<i>Croton roxburghianus</i>	Thetyin-gyi	ST	Wide	NE	
13	Myrtaceae	<i>Syzygium grande</i>	Thabye	T	Bago, Kachin, Yangon, Sagaing, Taninthayi	NE	
14	Boraginaceae	<i>Cordia dichotoma</i>	Thanat	T	Kachin, Kayah, Mandalay, Sha, Yangon	LC	
15	Mimosaceae	<i>Acacia leucophloea</i>	Tanaung	T	Bago, Magway, Mandalay, Shan	LC	
16	Solanaceae	<i>Physalis angulata</i>	Bauk-pin	H	Bago, Taninthayi, Yangon	LC	
17	Mimosaceae	<i>Prosopis juliflora</i>	Gandasein	T	Cultivated	NE	
18	Passifloraceae	<i>Adenia cardiophylla</i>	Kinmon	Cr	Yangon, Sagaing	NE	
19	Caesalpinaceae	<i>Delonix rigia</i>	Sein-ban gyi	T	Cultivated	NE	
20	Amaranthaceae	<i>Amaranthus spinosus</i>	Hin-nu-new-subauk	H	Cultivated	NE	
21	Anacardiaceae	<i>Spondias pinnata</i>	Gwe	T	Reported from Myanmar	NE	
22	Caesalpinaceae	<i>Tamarindus indica</i>	Magyi	T	Cultivated	LC	
23	Rubiaceae	<i>Anthocephalus morindaefolius</i>	Ma-u	T	Bago, Magway, Mandalay, Sagaing, Yangon	NE	
24	Fabaceae	<i>Sesbania grandiflora</i>	Paukpan-byu	ST	Cultivated	NE	
25	Hypericaceae	<i>Mesua ferrea</i>	Gangaw	T	Cultivated	NE	
26	Combretaceae	<i>Terminalia catappa</i>	Banda	T	Cultivated	LC	
27	Moringaceae	<i>Moringa aleifera</i>	Dantalon	T	Cultivated	NE	
28	Poaceae	<i>Bambusa vulgaris</i>	Shwe-wa	B	Cultivated	NE	
29	Apocynaceae	<i>Nerium oleander</i>	Nwe-tha-gee	Cl/Cr	Cultivated	LC	

30	Moraceae	<i>Ficus obtusifolia</i>	Nyaung-gyat	T	Wide	LC	
31	Euphorbiaceae	<i>Flueggea virosa</i>	Chin ya	ST	Wide	NE	
32	Rutaceae	<i>Limonia acidissima</i>	Thi	T	Magway, Mandalay	NE	
33	Anacardiaceae	<i>Lannea coromandelica</i>	Nabe	T	Bago, Kayin, Mandalay, Rakhine, Shan, Taninthayi, Yangon	LC	
34	Capparaceae	<i>Crateva magna</i>	Kadet	T	Wide	NE	
35	Sapotaceae	<i>Manikara hexandra</i>	Khayay	T	Cultivated	NE	
36	Rubiaceae	<i>Morinda angustifolia</i>	Yeyo	ST	Wide	NE	
37	Mimosaceae	<i>Pithecellobium dulce</i>	Kala-magyi	T	Magway, Mandalay	LC	
38	Boraginaceae	<i>Heliotropium indium</i>	Sin-hna-maung	H	Yangon	NE	
39	Bignoniaceae	<i>Millingtonia hortensis</i>	Egayit	T	Wide	NE	
40	Bignoniaceae	<i>Oroxylum indica</i>	Kyaung-sha	T	Wide	NE	
41	Annonaceae	<i>Annona squamosa</i>	Awzar	ST	Cultivated	LC	
42	Euphorbiaceae	<i>Euphorbia nivulia</i>	Tazaung-myin-na	ST	Wide	NE	
43	Mimosaceae	<i>Mimosa pudica</i>	Htikayon	H	Wide	LC	
44	Lythraceae	<i>Lawsonia alba</i>	Dan	S	Cultivated	NE	
45	Mimosaceae	<i>Acacia farnesiana</i>	Nan-lon-kyaing	ST	Cultivated	LC	
46	Caesalpiniaceae	<i>Bauhinia acuminata</i>	Swe-daw	ST	Wide	LC	
47	Sapotaceae	<i>Madhuca longifolia</i>	Meze	T	Magway, Mandalay, Yangon, Unknown	NE	
48	Malvaceae	<i>Urena lobata</i>	Kat-sine	S	Bago, Chin, Mandalay, Taninthayi, Yangon	LC	
49	Casuarinaceae	<i>Casuarina equisetifolia</i>	Pinle-kabwe	T	Cultivated	LC	
50	Fabaceae	<i>Mucuna pruriens</i>	Khwele-ya	Cl	Bago, Chin, Kayin, Kayin, Mandalay, Mandalay, Sagaing, Sagaing, Shan, Yangon	LC	
51	Asteraceae	<i>Coreopsis tinctoria</i>	Sein-chai-pan	H	Cultivated	NE	
52	Fabaceae	<i>Butea frondosa</i>	Pauk	T	Reported from Myanmar	NE	
53	Asteraceae	<i>Chromolaena odorata</i>	Bizat	S	Wide	NE	
54	Euphorbiaceae	<i>Embllica officinalis</i>	Zi-phyu	T	Wide	LC	
55	Euphorbiaceae	<i>Jatropha gossypifolia</i>	Kyetsu-kanako	S	Cultivated	NE	
56	Capparaceae	<i>Crateva magna</i>	Kadet	T	Wide	NE	

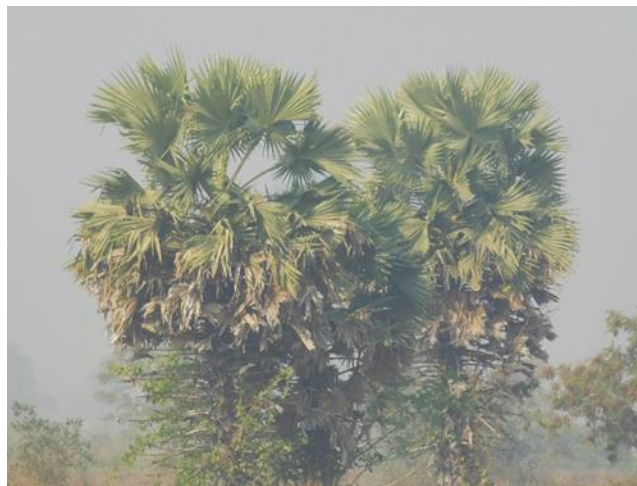
57	Caesalpinaceae	<i>Cassia fistula</i>	Ngu	T	Wide	LC	
58	Musaceae	<i>Musa sapientum</i>	Nget-pyaw	H	Cultivated	NE	
59	Arecaceae	<i>Areca catechu</i>	Kunthi-pin	ST	Cultivated	NE	
60	Anacardiaceae	<i>Rhus paniculata</i>	Khaung-bin	ST	Chin, Kachin, Magway, Mandalay, Sagaing, Shan	NE	
61	Verbenaceae	<i>Clerodendrum nutans</i>	Ngayan-padu	S	Reported from Myanmar	NE	
62	Arecaceae	<i>Caryota mitis</i>	Minbaw	T	Ayeyarwady, Bago, Kayah, Mon, Rskhine, Shan, Taninthayi, Yangon	LC	
63	Fabaceae	<i>Crotalaria sericea</i>	Taw-pike-san	S	Wide	LC	
64	Araceae	<i>Colocasia esculenta</i>	Pein	H	Cultivated	LC	
65	Arecaceae	<i>Cocas nucifera</i>	Ohn	T	Cultivated	NE	
66	Caesalpiniceae	<i>Cassia occidentalis</i>	Dangwe	S	Wide	LC	
67	Moraceae	<i>Ficus religiosa</i>	Bawdi-nyaung	T	Cultivated	NE	
68	Vrebenaceae	<i>Duranta repens</i>	Bo-kadaw-myet-hkone	S	Cultivated	NE	
69	Rhamnaceae	<i>Ziziphus jujuba</i>	Zi	T	Cultivated	LC	
70	Araceae	<i>Amorphophallus paeoniifolius</i>	Wa-u-bin	H	Ayeyarwady, Bago, Kayah, Kayin, Mandalay, Mon, Rakhine, Taninthayi, Yangon	LC	
71	Euphorbiaceae	<i>Codiaeum variegatum</i>	Ywet-hla	S	Cultivated	LC	
72	Caricaceae	<i>Carica papaya</i>	Thinbaw	ST	Cultivated	DD	
73	Moraceae	<i>Artocarpus heterophyllus</i>	Peinne	T	Cultivated	NE	
74	Cannaceae	<i>Canna indica</i>	Budatharana	H	Cultivated	NE	
75	Apocynaceae	<i>Plumeria obtusa</i>	Tayok-saga	ST	Cultivated	LC	
76	Poaceae	<i>Cynodon dactylon</i>	Mye-sa-myet	G	Wide	NE	
77	Rubiaceae	<i>Oldenlandia corymbosa</i>	Hingalar	H	Kachin, Mandalay, Yangon	LC	
78	Nyctaginaceae	<i>Bougainvillea spectabilis</i>	Sekku-pan	Cl/Cr	Cultivated	NE	
79	Cucurbitaceae	<i>Citrullus colocynthis</i>	Kyi-ah	Cl/Cr	Wide	NE	
80	Euphorbiaceae	<i>Croton calococcus</i>	Kanakho-gale	S	Wide	NE	
81	Lamiaceae	<i>Leucas aspera</i>	Taw-pin-sein	S	Bago, Mandalay, Shan, Yangon	NE	
82	Euphorbiaceae	<i>Acalypha indica</i>	Kyaung-se-pin	S	Mandalay, Taninthayi, Yangon	NE	

83	Verbenaceae	<i>Tectona hamitoniana</i>	Dahat	T	Bago, Magway, Mandalay	NE	
84	Cucurbitaceae	<i>Momordica dioica</i>	Kyet-hin-ga	Cl/Cr	Cultivated	NE	
85	Amaranthaceae	<i>Achyranthes aspera</i>	Kyet-mauk-pyan	H	Magway, Yangon	NE	
86	Fabaceae	<i>Clitoria ternatea</i>	Aung-mai-nyo	Cl/Cr	Kachin, Mandalay, Sagaing, Yangon	NE	
87	Cucurbitaceae	<i>Luffa aegyptiaca</i>	Tha-but-kha	Cl/Cr	Cultivated	NE	
88	Annonaceae	<i>Miliusa velutina</i>	Thabut-gyi	T	Bago, Mandalay, Yangon	NE	

NE-Not Evaluated, LC-Least concerned, NT-Near Threatened

Table 4.6-3 IUCN Red List of Flora species

No	Family Name	Scientific Name	Common Name	Habitat	Distribution	IUCN	Myanmar IUCN
1	Arecaceae	<i>Borassus flabellifer</i>	Htan	T	Bago, Mandalay, Sagaing, Taninthayi	EN	NE



Borassus flabellifer (Htan)

Figure 4.6-3 Photo of Flora threatened species

4.6.4.2 Habitat

In and around the Area of proposed project area, four major habitat types were observed namely (1) cultivation land and (2) Shrub land (green area) (3) Plantation land and 4) Mixed Deciduous Forest. Habitat Map of proposed project area was shown in Figure 4.6-4 and Survey Area was shown in Figure 4.6-5.



Figure 4.6-4 Sceneries of the Survey Area

4.6.4.3 Habitat Map and Land use map

To obtain the habitat map, there is combination between field observation and secondary image from Google Earth and generate it applying in GIS software. At first, the field observations were performed for habitat survey at site collecting the data with the Garmin GPS and upload it in Map Info Software. On the other hand, the Google image was visually digitized based on the primary field survey. Finally, the habitat map was analyzed based on both of field survey and secondary image data using the Map Info software.

Sources & Tools

- Google Earth Image
- Map Info 11.0 and Discover
- Garmin GPS 62 cx
- Field survey

The habitat map of the Project area and surrounding region is shown in Figure 5.22.

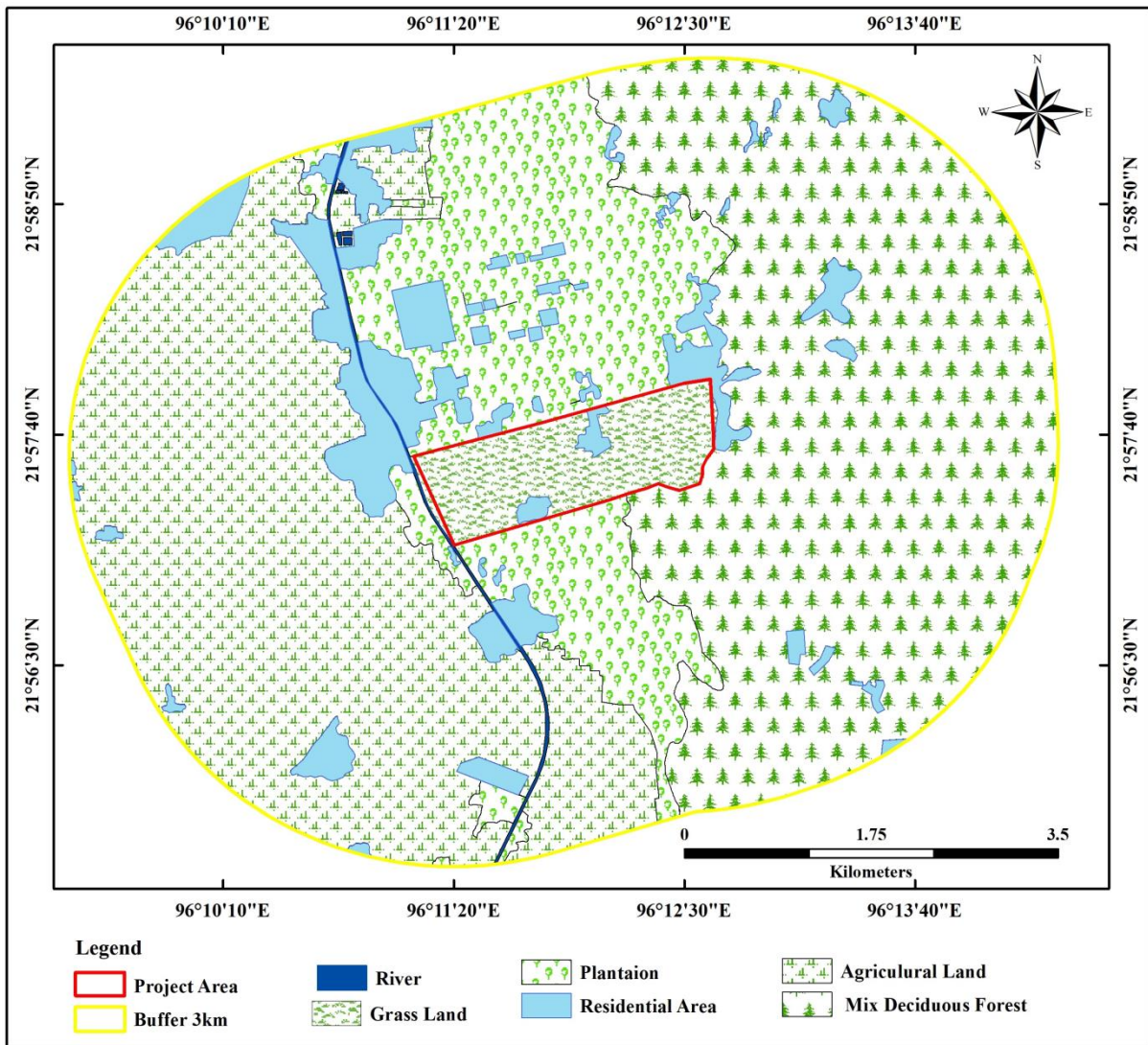


Figure 4.6-5 Habitat nature of project site and it surrounding area

4.6.4.4 Fauna Result

A biodiversity survey was conducted that covered a range of fauna species including mammals, birds, reptiles, butterflies. The fauna survey was conducted via direct observation in the field observation of track and sign such as footprint and feeding signs in their natural habitats and interview survey were local communities. Fauna species were found least concern and Not Evaluated, reptile was found one vulnerable species and Bird species were found two species of near threatened according to Iucn red list. Four endemic bird species were found in survey area.

Table 4.6-4 Number of Species Record during Survey

Mammal	8
Bird	45
Butterflies	22

Reptiles	10
Fish	7
Total	92

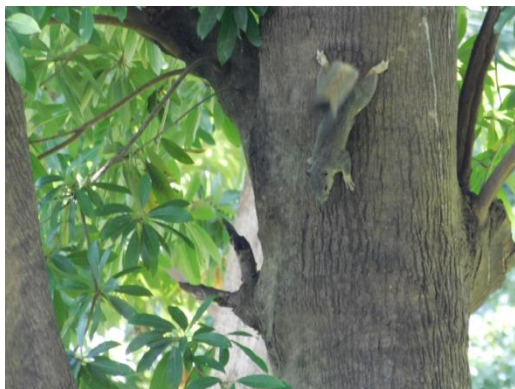
(a)Mammal

Mammals were identified through direct observation and interview survey four mammal species were recorded. Four species was interview from local people in survey area. According to the IUCN Red List of threatened species, all species was least concerned, there was no threatened and no endemic species.

Table 4.6-5 Mammal Species List around the Survey area

1	<i>Callosciurus pygerythrus</i>	Irrawaddy Squirrel	Sciuridae	LC	Observed
2	<i>Tupaia belangeri</i>	Northern Treeshrew	Tupaiaidae	LC	Observed
3	<i>Viverra zibetha</i>	Large Indian Civet	Viverridae	LC	Interviewed
4	<i>Paradoxurus hermaphroditus</i>	Common Palm Civet	Viverridae	LC	Interviewed
5	<i>Herpetes javaricus</i>	Small Asian Mongoose	Herpestidae	LC	Interviewed
6	<i>Sus scrofa</i>	Eurasian Wildpig	Suidae	LC	Interviewed
7	<i>Cannomys badius</i>	Lesser Bamboo Rat	Spalacidae	LC	Observed
8	<i>Lepus peguensis</i>	Burmese Hare	Leporidae	LC	Observed

LC- Least concerned



Ayeyarwaddy Squirrel(*Callosciurus pygerythrus*)



Malayan Porcupine(*Hystrix brachyura*)

Figure 4.6-6 Photo of Mammal Species were recorded survey area

(b)Herpetology

A total of 10 reptile species was identified during the survey. Ten species were recorded and one species were interview from local people in survey area. According to IUCN Red List of threatened species, these areas was no threatened species. All species were observed in this area. This area was found no endemic species. All species classified as 3 species were Not

Evaluated and Seven Species were Least concerned.

Table 4.6-6 Herpet Species List around the Survey area

1	<i>Varanus nebulosus</i>	Southeast Asian Water Monitor Lizard	Varanidae	LC	Observed
2	<i>Eutropis multifasciata</i>	Common Sun Skink	Scincidae	NE	Observed
3	<i>Hemidactylus frenatus</i>	Common House Gecko	Gekkonidae	LC	Observed
4	<i>Gekko gekko</i>	Tokay Gecko	Gekkonidae	LC	Observed
5	<i>Calotes versicolor</i>	Garden Lizard	Agamidae	NE	Observed
6	<i>Ptyas mucosa</i>	Indian Rat Snake	Colubridae	NE	Observed
7	<i>Fejervarya limnocharis</i>	Paddy Field Frog	Dicroglossidae	LC	Observed
8	<i>Bufo bufo</i>	Common Toad	Bufoidea	LC	Observed
9	<i>Kaloula pulchra</i>	Banded Bull Frog	Microhylidae	LC	Observed
10	<i>Microhyla onata</i>	Ornate narrow-mouth Frog	Microhylidae	LC	Observed

LC-Least Concerned, NE-Not Evaluated



Figure 4.6-7 Photo of Herpet Species

(c) Butterflies

A total of 22 species with 18 genera of butterflies under the order Lepidoptera belonging to 5 families

were recorded. The family Nymphalidae and Pieridae were found dominant. According to the IUCN Red List of (2021-3), all species were not evaluated under any major threatened.

Table 4.6-7 Butterflies species were recorded during the survey area

No	Scientific Name	Common Name	Family Name	IUCN/Status
1	<i>Troides aeacus</i>	Golden Birdwing	Papilionidae	NE
2	<i>Papilio polytes</i>	Common Mormon	Papilionidae	NE
3	<i>Papilio demoleus</i>	Northern line Butterflies	Papilionidae	NE
4	<i>Catopsilia Scylla</i>	Orange Emigrant	Pieridae	NE
5	<i>Eurema nilgiriensis</i>	Nilgiri Grass Yellow	Pieridae	NE
6	<i>Delias acalis</i>	Red breast Jezebel	Pieridae	NE
7	<i>Cepora nadina</i>	Khasi Lesser Gull	Pieridae	NE
8	<i>Appias olferna</i>	Eastern Striped Albatross	Pieridae	NE
9	<i>Danaus chrysippus</i>	Milkweeds	Nymphalidae	NE
10	<i>Junonia lemonias</i>	Lemon Pansy	Nymphalidae	NE
11	<i>Neptis hylas</i>	Indian Common Sailer	Nymphalidae	NE
12	<i>Neptis miah</i>	Small Yellow Sailer	Nymphalidae	NE
13	<i>Lethe dakwania</i>	White Wedge-wood Brown	Nymphalidae	NE
14	<i>Mycalesis francisca</i>	Bush Brown	Nymphalidae	NE
15	<i>Hypolimnas bolina</i>	Oriental Great Eggfly	Nymphalidae	NE
16	<i>Euthalia aconthea</i>	Common Baron	Nymphalidae	NE
17	<i>Cathosia mahratta</i>	Sahyadri Lacewing	Nymphalidae	NE
18	<i>Callerebia narasingha</i>	Mottled Argus	Nymphalidae	NE
19	<i>Monodontides musina</i>	Hedge Blue	Lycaenidae	NE
20	<i>Castalius rosimon</i>	The Common Pierrot	Lycaenidae	NE
21	<i>Notocrypta feislhamelii</i>	Himalayan Spotted Damon	Hesperiidae	NE
22	<i>Spialia galbo</i>	Indian Grizzled Skipper	Hesperiidae	NE

NE-Not Evaluated



Indian Angled Castor (*Ariadne ariadne*)



Khasi Lesser Gull (*Cepora nadina*)



Lemon Pansy (*Junonia lemonias*)



Oriental Great Eggfly (*Hypolimnas bolina*)



Junonia lemonias (Lemon Pansy)



Bush Brown (*Mycalesis francisa*)



White-wedge Woodbrown (*Lethe dakwania*)



Blue Tiger (*Tirumala septentrionis*)

Figure 4.6-8

Photo of Butterflies Species were recorded in survey area

(d) Bird

A total of 45 birds species were recorded during the survey period. Member of the family Columbidae Spotted Dove (*Streptopelia chinensis*), Red-collared Dove (*Streptopelia tranquebarica*) and family of Megalaimidae, Coppersmith Barbet (*Megalaima baemacephala*) are found near the survey site and listed as forest birds. A part from the species family Laniidae Burmese Shrike (*Lanius collurioides*), Brown Shrike (*Lanius cristatus*) were also noted as forest bird. A part from the species family Dicruridae, Ashy Drongo (*Dicrurus leucophaeus*) and Lesser Racket-tailed Drongo (*Dicrurus remifer*) are found near the survey site and listed as forest bird's species. Family (Accipitridae) Black-shoulder kite (*Elanus axillaris*), Oriental Honey Buzzard (*Pernis ptilorhyncus*) and Shikra (*Accipiter badius*) were found the project site as known as predator species and list of forest birds. According to the Iucn Red List of threatened species, These area was no threatened species .

Table 4.6-8 List of the bird species recorded in project site area

No.	Common Name	Scientific name	Family	IUCN status
1	Copper smith Barbet	<i>Megalaima baemacephala</i>	Ramphastidae	LC
2	White- throated Kingfisher	<i>Halcyon smynensis</i>	Alcedinidae	LC
3	Indian Roller	<i>Coracias benghalensis</i>	Coraciidae	LC
4	Little Green Bee eater	<i>Merops orientalis</i>	Meropidae	LC
5	Grey headed parakeet	<i>Psittacula finschii</i>	Psittadae	NT
6	Asian Palm Swift	<i>Cypsiurus balasiensis</i>	Apodidae	LC
7	Spotted Dove	<i>Streptopelia chinensis</i>	Columbidae	LC
8	Red-collared Dove	<i>Streptopelia tranquebarica</i>	Columbidae	LC
9	Red- wattled Lapwing	<i>Vanellus indicus</i>	Vanellidae	LC
10	Oriental Honey Buzzard	<i>Pernis ptilorhyncus</i>	Falconidae	LC
11	Black-shouldered Kite	<i>Elanus axillaris</i>	Falconidae	LC
12	Shikra	<i>Accipiter badius</i>	Falconidae	LC
13	Little Cormorant	<i>Phalacrocorax niger</i>	Phalacrocoracidae	LC
14	Cattle Egret	<i>Bubulcus ibis</i>	Ardeidae	LC
15	Pond Heron	<i>Ardeola spp.</i>	Ardeidae	LC
16	Common Iora	<i>Aegithina tiphia</i>	Aegithinidae	LC
17	House Crow	<i>Corvus splendens</i>	Corvidae	LC
18	Large- billed Crow	<i>Corvus macrohynchus</i>	Corvidae	LC
19	Rufous Treepie	<i>Dendrocitta vagabunda</i>	Corvidae	LC
20	Ashy Drongo	<i>Dicrurus leucophaeus</i>	Dicruridae	LC
21	Lesser Racket-tailed Drongo	<i>Dicrurus remifer</i>	Dicruridae	LC
22	Black naped Monarch	<i>Hypothymis azurea</i>	Monarchidae	LC
23	Grey- headed canary Flycatcher	<i>Culicicapa ceylonensis</i>	Stenostiridae	LC
24	Oriental Magpie Robin	<i>Copsychus saularis</i>	Muscicapidae	LC
25	White- rumped Shama	<i>Copsychu malabaricus</i>	Muscicapidae	LC

26	Brown Shrike	<i>Lanius Cristatus</i>	Laniidae	LC
27	Burmese Shrike	<i>Lanius colluriooides</i>	Laniidae	LC
28	Common hoopoe	<i>Upupa marginata</i>	Upupidae	LC
29	Common Myna	<i>Acridotheres tristis</i>	Sturnidae	LC
30	Jungle Myna	<i>Acridotheres fuscus</i>	Sturnidae	LC
31	Chestnut-tailed Starling	<i>Sturnus malabaricus</i>	Sturnidae	LC
32	Vinous-breasted Starling	<i>Sturnus burmannicus</i>	Sturnidae	LC
33	Barn Swallow	<i>Hirundo rustica</i>	Hirundinidae	LC
34	Black- crested Bulbul	<i>Pyconotus melanicterus</i>	Pycnonotidae	LC
35	Red- vented Bulbul	<i>Pyconotus jocosus</i>	Pycnonotidae	LC
36	Plain Prinia	<i>Prinia inornata</i>	Cisticolidae	LC
37	Common Tailorbird	<i>Orthotomus sutorius</i>	Sylviidae	LC
38	White-browed Scimitar babbler	<i>Pomatorhinus schisticeps</i>	Leiothrichidae	LC
39	White-throated babbler	<i>Argya gularis</i>	Leiothrichidae	Endemic
40	Burmese bush lark	<i>Mirafra microptera</i>	Alaudidae	Endemic
41	Purple Sunbird	<i>Cinnyris asiaticus</i>	Nectariniidae	LC
42	White Wagtail	<i>Motacilla alba</i>	Motacillidae	LC
43	Scaly- breasted Munia	<i>Lonchura punctulata</i>	Estrildidae	LC
44	Eurasian Tree Sparrow	<i>Passer montanus</i>	Passeridae	LC
45	House Sparrow	<i>Passer domesticus</i>	Passeridae	LC

LC - Least Concern, NT - Near-threatened



Red- wattled Lapwing (*Vanellus indicus*)



White-throated babbler (*Argya gularis*)



White- rumped Shama (*C. malabaricus*)



Burmese Shrike (*Lanius colluriooides*)



Common Tailorbird (*Orthotomus sutorius*)



Shikra (*Accipiter badius*)

Figure 4.6-9 Photo of recorded in projected site area

(e) Fish

Field surveys and interviews with local people who lived near the study area were conducted during the collection of the specimens. Fishing activities are mostly traditional method. Fishermen were interviewed with regard to fishery process. A total of 7 species distributed 6 family were identified and recorded from Yay Kyi Canal. According to the Iucn red list of threatened species, these area was no threatened species.

Table 4.6-9 Fish species were recorded around the survey area

1	Mastacembelidae	<i>Macrogathus aculeatus</i>	Lesser Spiny Eel	LC	Interviewed
2	Mastacembelidae	<i>Macrogathus zebrinus</i>	Burmese spinyeel	LC	Interviewed
3	Anabantidae	<i>Anabas testudineus</i>	Climbing Perch	LC	Interviewed
4	Cichlidae	<i>Oreochromis mossambicus</i>	Tilapia	LC	Interviewed
5	Channidae	<i>Channa Striata</i>	Striped Snakehead	LC	Interviewed
6	Cyprinidae	<i>Puntius chola</i>	Chola barb	LC	observed
7	Gobiidae	<i>Glossogobius giuris</i>	Tank goby	LC	Interviewed



Tank Goby (*Glossogobius giuris*)



Chora Barb (*Puntius chola*)

Figure 4.6-10 Photo of Fish Species were recorded around the survey area

4.6.5 Protected Area and Environmental Sensitive Area

The project is located 14.49 kilometers away from May Myo Game Sanctuary and 29.97 kilometers away from Pyin Oo Lwin Wildlife Sanctuary 1.58 kilometers from Minsontaung Reserve forest .

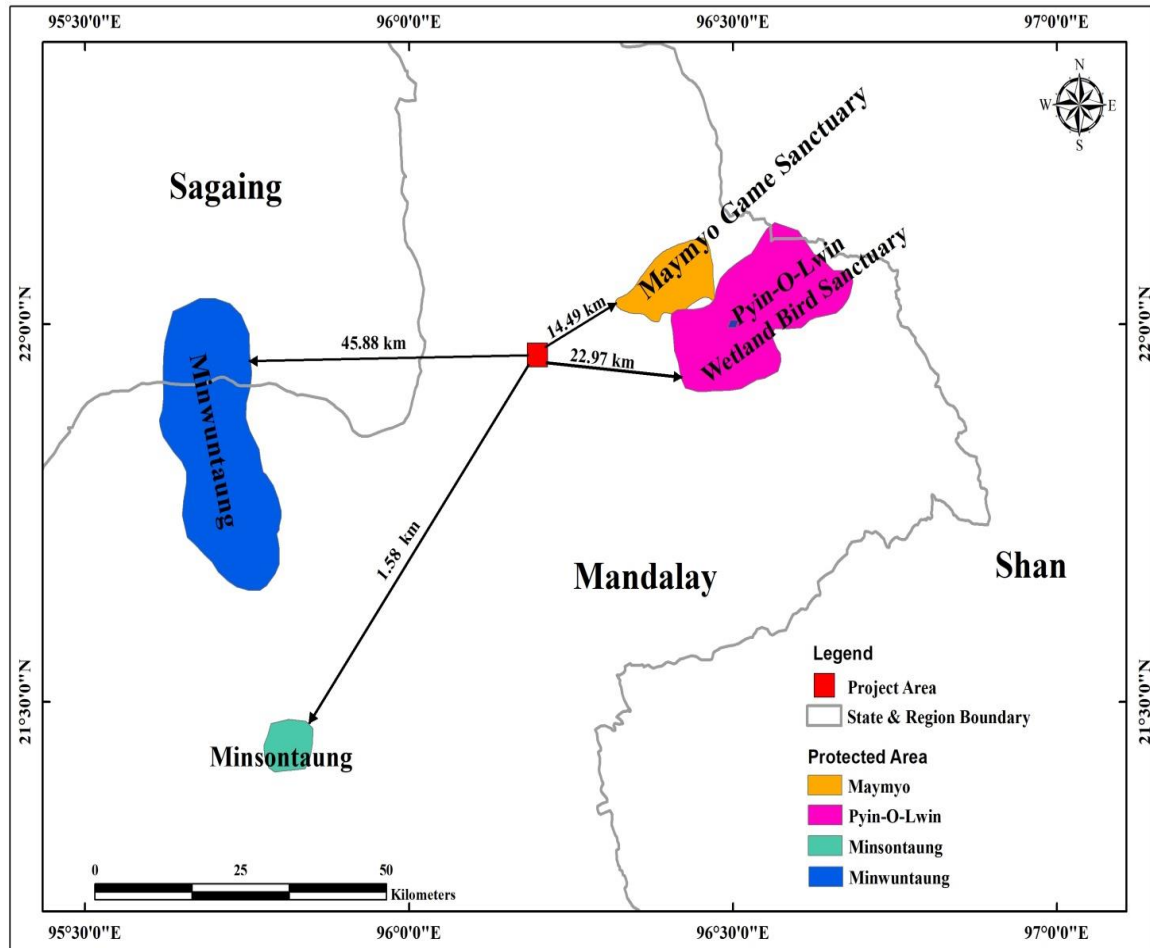


Figure 4.6-11 Map of Protected area and Sensitive area around the project site

4.7 Social Environment

4.7.1 Patheingyi Township Boundary and Population

Patheingyi is one of the townships in the Mandalay Region of Myanmar. Patheingyi Township is 5 miles far from Manadalay City. Patheingyi Township is between North Latitude between 21° 51" and 22° 09" and East Longitude between 96° 01" and 96° 22". The total area is 231.55 square miles. It is 140 villages with 58 village tracts and 1 urban ward. The population and household are shown in the following table.

Table 4.7-2 The population and household of Patheingyi Township (as of December 2019)

Township	Description	House	Household (Family)	Ward	Village Tract	Village
Patheingyi	Urban	2283	2874	1	-	-
	Rural	45612	53461	-	58	140
	Total	47895	56335	1	58	140

4.7.2 Sample coverage in the social and health impact assessment

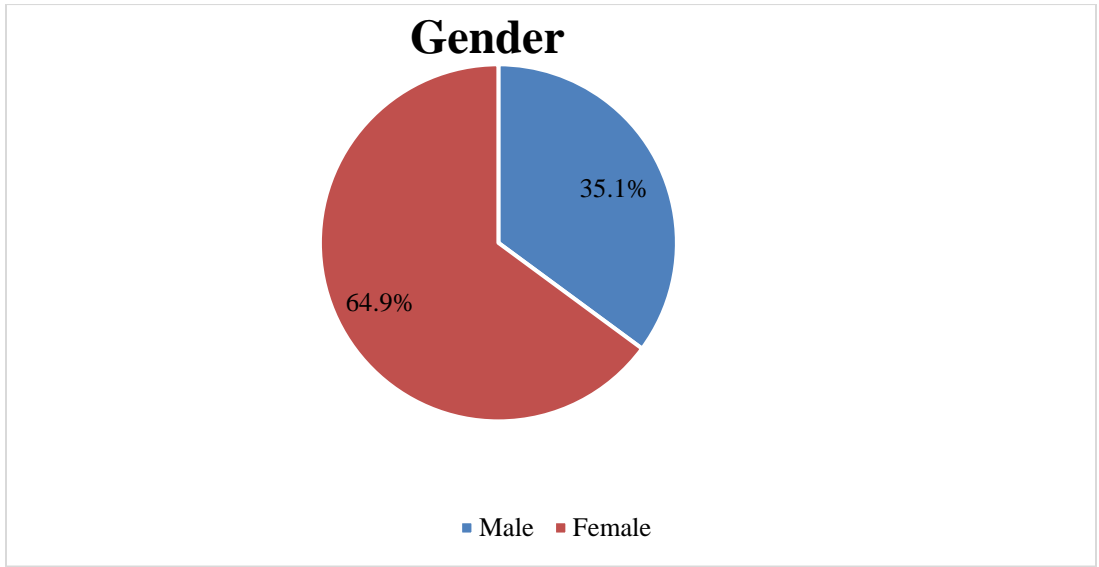
To assess the social conditions within the project area, the social and health impact assessment was conducted in Patheingyi Township, situated in the Mandalay region. This assessment encompassed a total of four villages within the township: Yay Kyi Village, Aik Gyi Village, Thayattaw Village, and Yway Su Village. The distribution of the household sample across these villages is as follows: 168 families were surveyed in Yay Kyi Village, 70 households in Aik Gyi Village, 152 households in Thayattaw Village, and 117 households in Yway Su Village. In total, the assessment covered 507 households. Regarding the composition of the household assessment, the sample from each village is provided in Table 4.7-2 below.

Table 4.7-3 Sample from each village

Township	Village Name	Sample HH
Patheingyi	Yay Kyi Village	168
	Aik Gyi Village	70
	Thayattaw Village	152
	Yway Su Village	117
Total		507

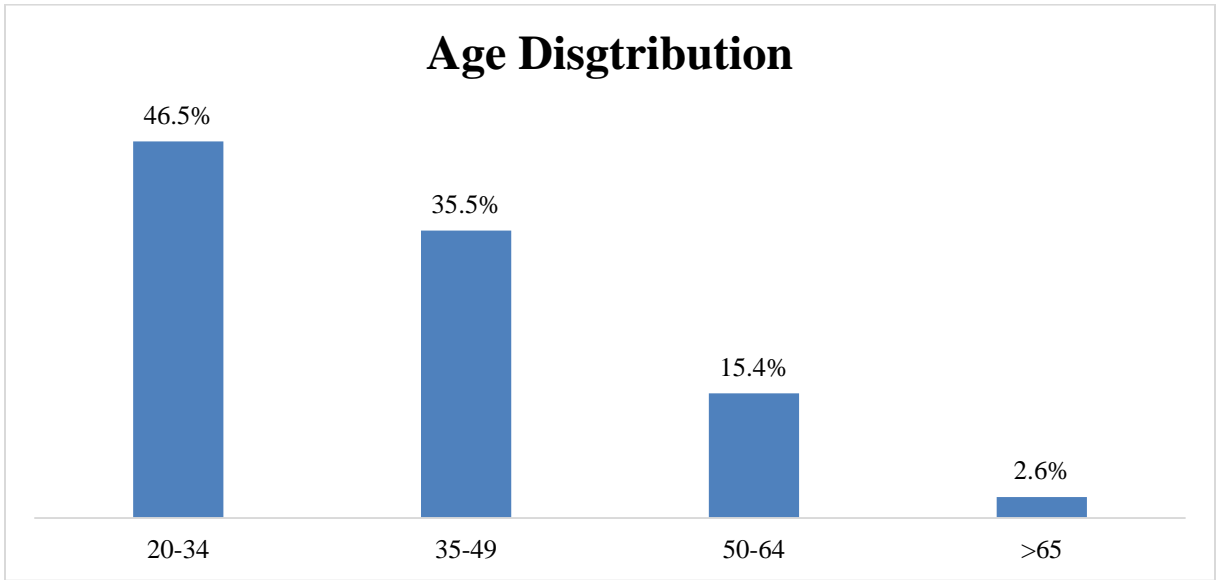
Gender proportion

Regarding the sex ratio of the respondents, it is observed that 64.9% are females, and 35.1% are males. Remarkably, female involvement far exceeds that of males.



Age Distribution of Respondent

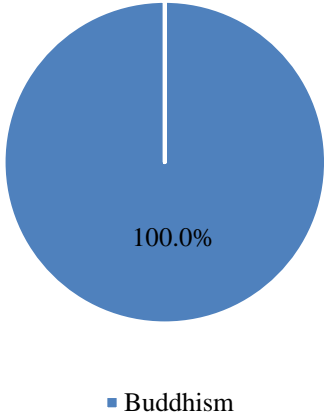
The majority of the HH assessment respondents were in the age range of 20–34 (46.5%), which resulted in involvement in the study from 35–49 (35.5%), 50–64 (15.4%), and above 65 (2.6%).



Religions

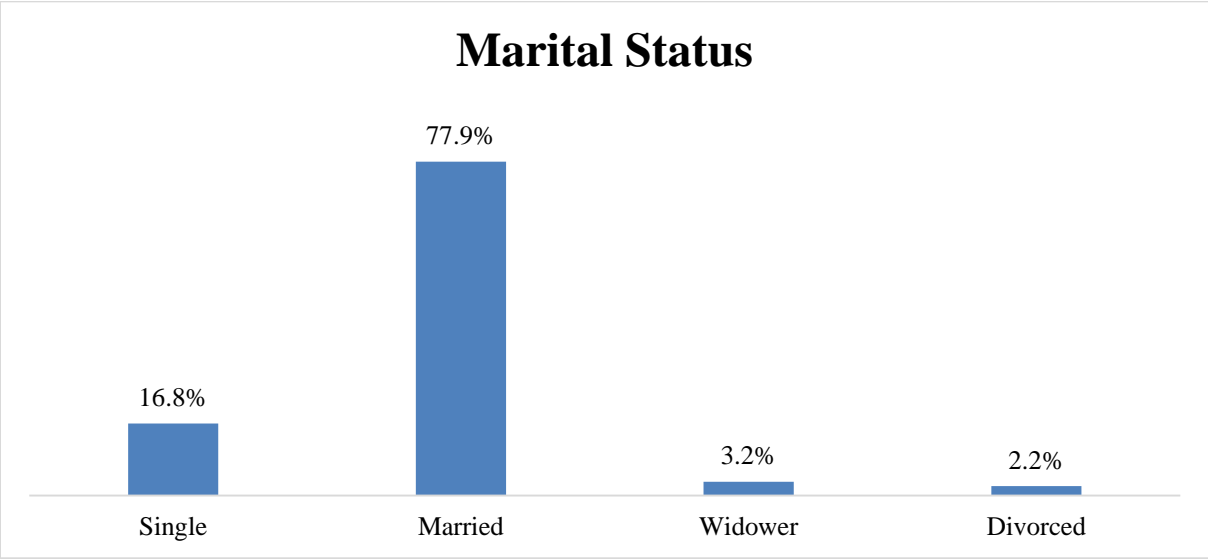
Interestingly, every single participant in the social and health impact assessment is an indigenous Buddhist.

Religious of the respondent



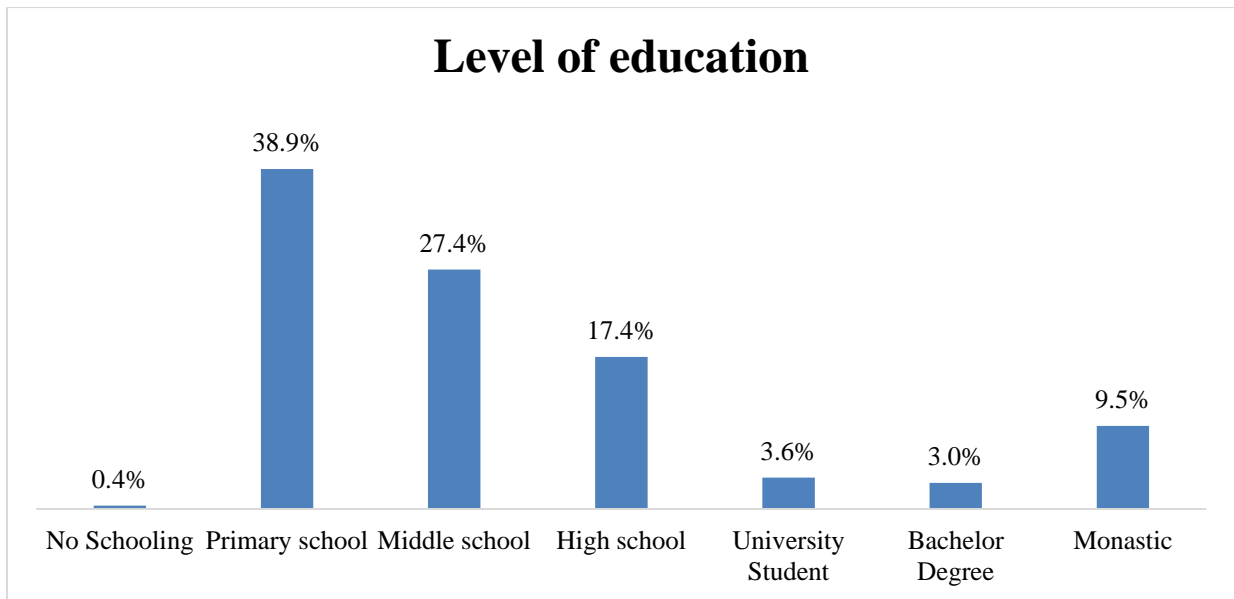
Marital Status

Regarding the marital status of respondents, a majority of the respondents (77.9%) are married. This is followed by single respondents (16.8%), widower respondents (3.2%), and divorced respondents (2.2%).



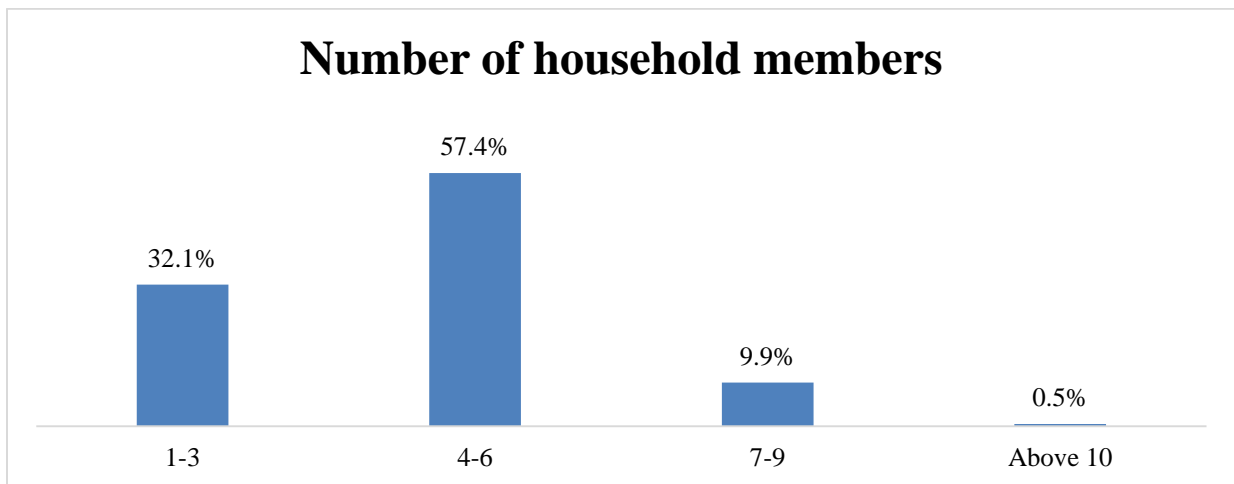
Level of education

Examining the difference in educational background within all respondents from the household, the majority have completed primary school (38.9%), followed by middle school (27.4%), high school (17.4%), monastic education (9.5%), university student (3.6%), and bachelor degree (3.0%). The distribution of this data illustrates the broad range of educational backgrounds within the respondents in the assessment.



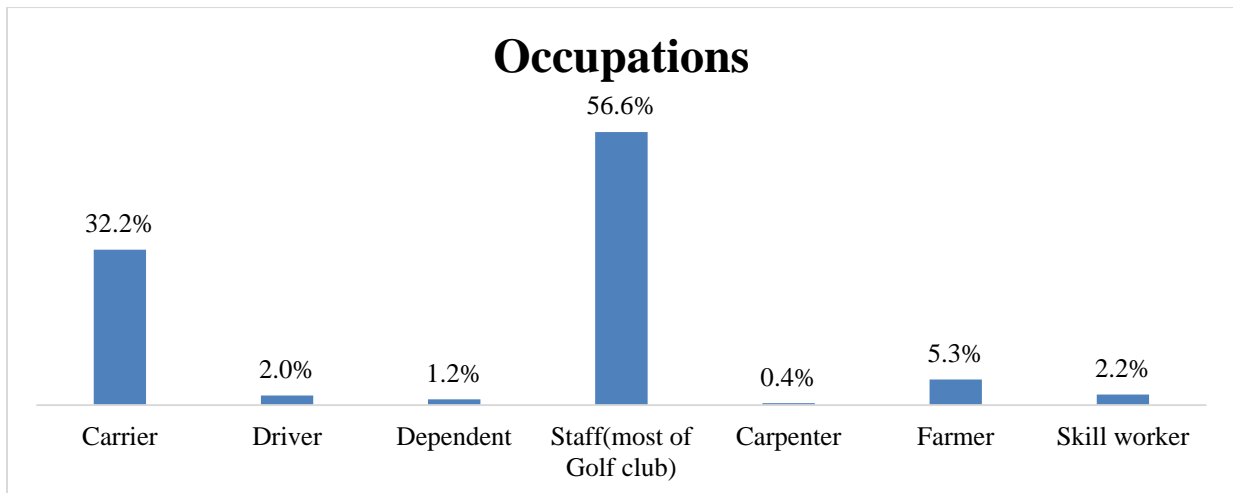
Member in your household

According to the social assessment, the majority of household members are among 4-6 members 57.4%, 7-9 members 9.9%, 1-2 members 32.1%, and over 10 members 0.5%. The study found that family sizes in the study area are somewhat higher than national household sizes, with an average of four people per household.



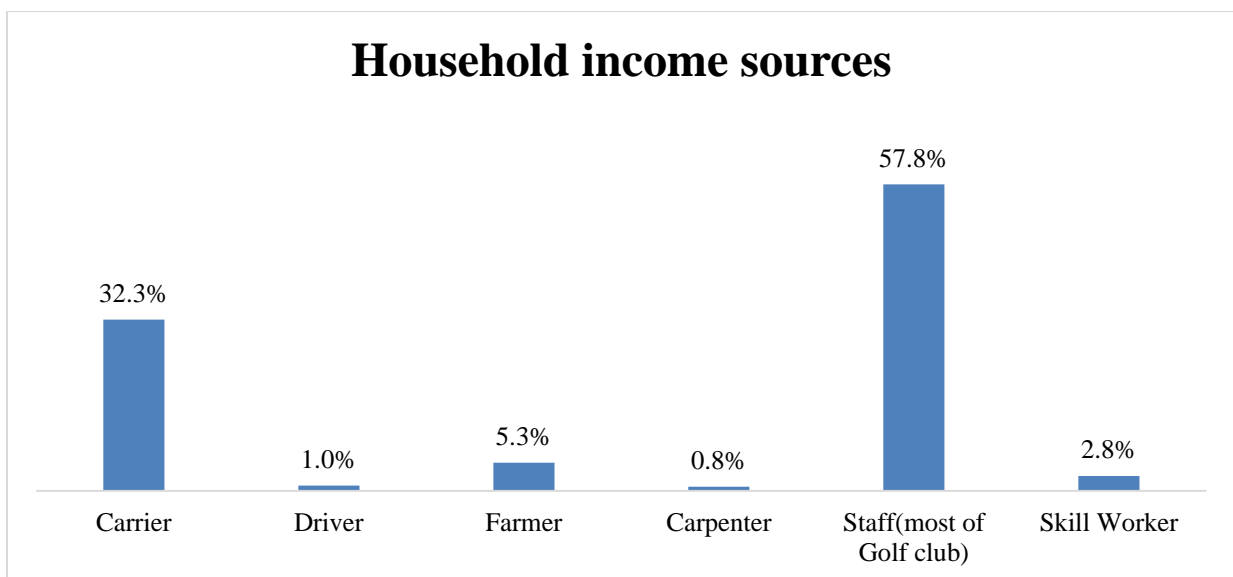
Types of Occupation

The majority of the respondent occupations include those of golf club staff 56.6% and carriers 32.2%. The remaining job categories are those of a farmer 5.3%, skilled worker 2.2%, driver 2.0%, and dependent 1.2%. According to the study, around 90% of respondents in the area engage in occupations related to golf courses, such as staff and carriers.



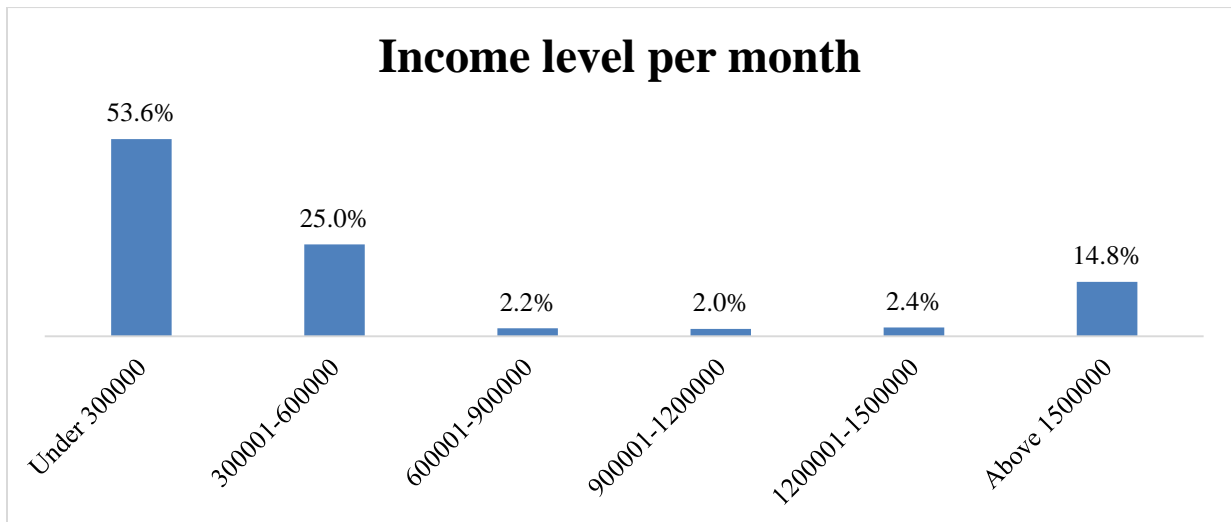
Sources of Household Income

Regarding the sources of income for every respondent, more than half of respondents reported that the most important of household income is working as golf course staff 57.8%, followed by Carrier jobs 32.3%, farming 5.3%, skilled workers 2.8%, drivers 1.0%, and carpenters 0.8%. Their primary source of income in the area depends on the type of work they employ.



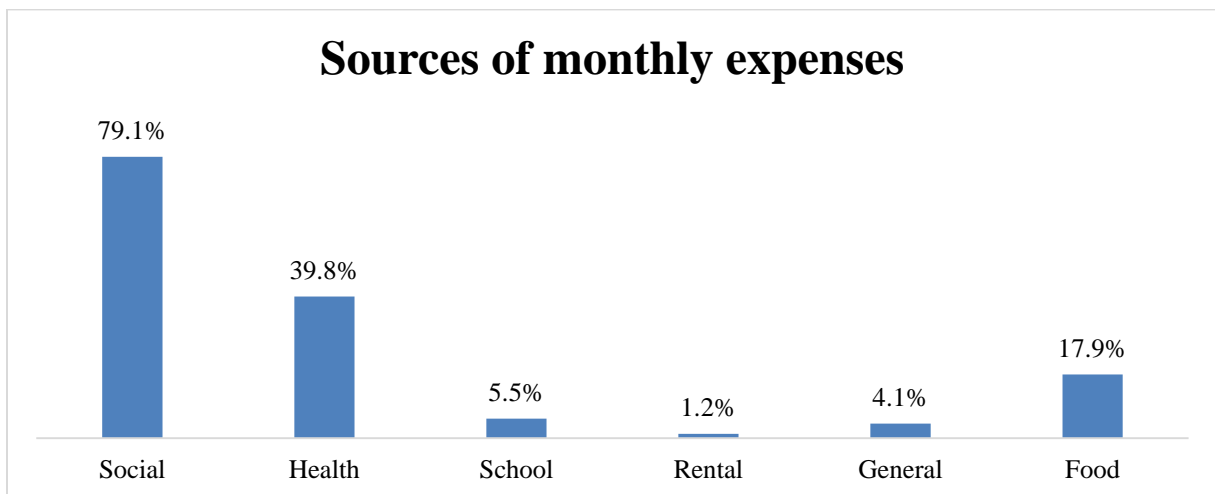
Average household monthly income

According to the social assessment, in terms of monthly income, over half of the respondents—53.6%—earn below 300,000 MMK per month; the percentage who are an income winner between 300,000 to 600,000 MMK per month is 25%; the income winner over 1500,000 MMK per month is only 14.8%; the income winner between 1,200,000 to 1,500,000 MMK per month is 2.4%; the income winner within 600,000 to 900,000 MMK per month is 2.0%. This was a closed question using set ranges of monthly income.



Household monthly expenses Source

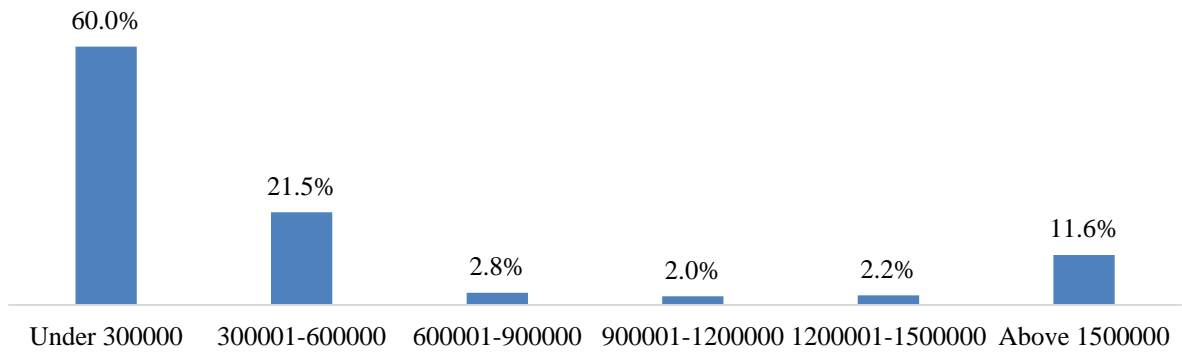
Simply asked to provide information about their sources of monthly household expenses, respondents reported that, interestingly, the most common category is social expense 79.1%, followed by health 39.8%, food 17.9%, education/school 5.5%, general utilization 4.1%, and rental charge 1.2%. Findings indicate that residents in a study area are more likely to engage in charitable and social events, including contributing to charities, attending celebrations, and other social activities.



Average household expenses per month

In this study, the respondent was asked how much money they spent each month. Under 300,000 MMK, 60.0% is the highest monthly amount, followed by 300,000 to 600,000 MMK. It was shown that it has been closely associated with their monthly income. Households with higher incomes typically have higher expenses every month.

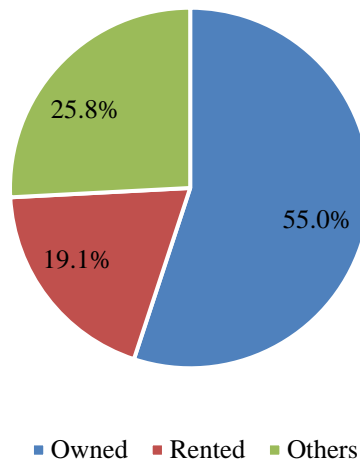
Average household expenses per month



What is your household house ownership?

According to the assessment, there were three groups for housing ownership: owned 55.0%, rented 19.1%, and others 25.7%. A staff housing or hostel in the study area might be included under the "others" category.

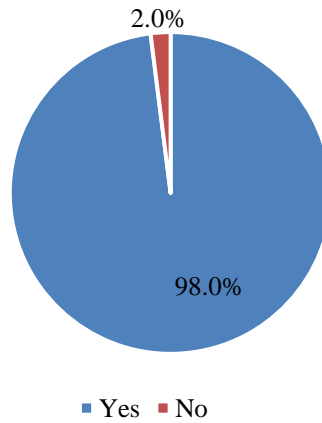
Type of housing ownership



B. Opinions on the project

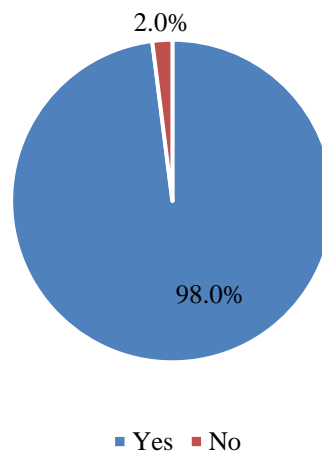
The study team was asked about awareness of the project as well as worries regarding the project during the construction phase. It was found that 98.0% of the respondents are aware of the golf course project, while only 2.0% are not aware of the project.

Do you know this project(Golf course)?



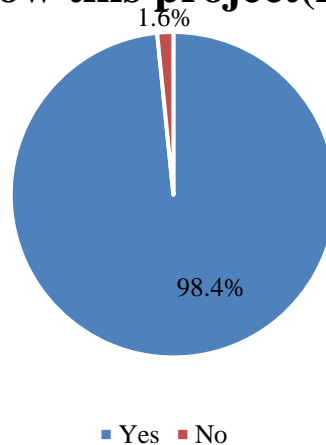
Concerning awareness of the hotel project, 98.0% of the respondents were aware, while only 2.0% were not aware of it.

Do you know this project(Hotel)?



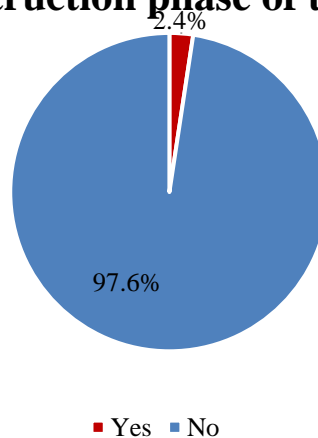
In relation to the commercial and/or business project, 98.4% of respondents were knowledgeable, while only 1.6% was unaware in the study area. The survey results indicate that the community is slightly more aware of the commercial (business) project plans compared to the golf course and hotel projects.

Do you know this project(Business)?



While exploring the concerns related to the project, it was found that 97.6% of respondents answered "No," indicating low levels of worry, while only 2.4% responded "Yes." Based on these results, the awareness level of the community on the project plan is high, and it indicates that the public consultation meetings and the sharing of project information have been effective in the community.

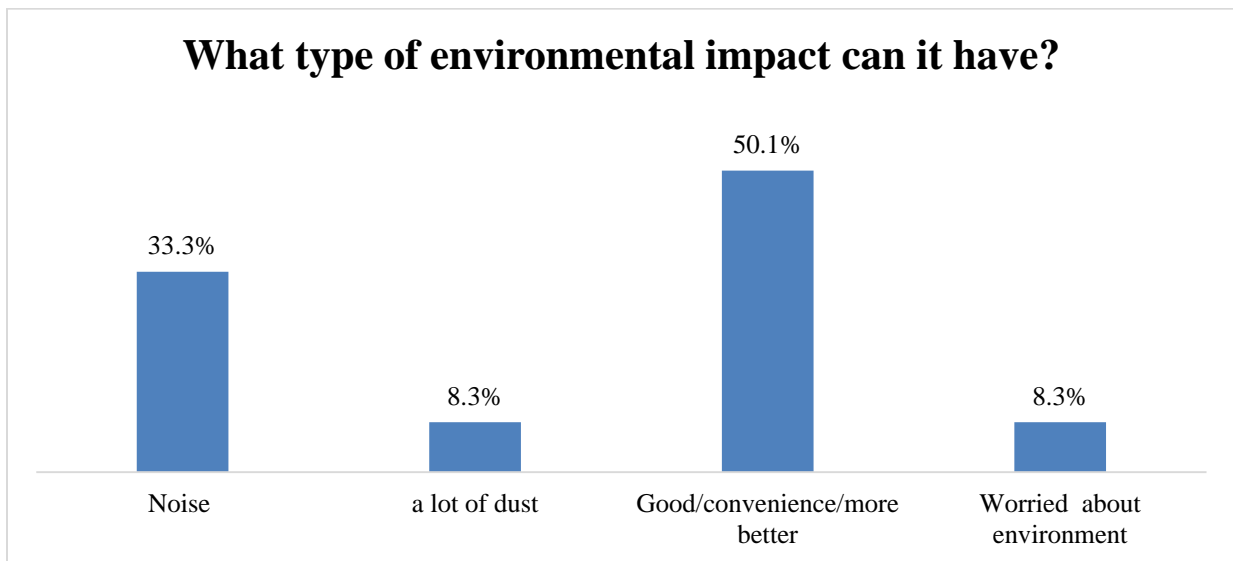
Do you feel worried about environmental impact during construction phase of the project?



The survey team continued to ask follow-up questions to the respondents, inquiring about the specific environmental impacts they anticipated from the project. Regarding the environmental impact during the construction phase of the project, the survey results indicate that 50.1% of respondents expect the project to bring about positive or improved conditions in the community.

However, concerns were also raised, with 33.3% of respondents expecting noise disturbances, and 8.3% expressing concerns about dust and potential environmental harm due to the construction activities. This data suggests that while there is general optimism about the construction of the project's potential benefits, there are significant concerns about the environmental and health impacts during the construction phase. These concerns primarily revolve around noise pollution and dust,

which can have negative effects on air quality and overall community health.

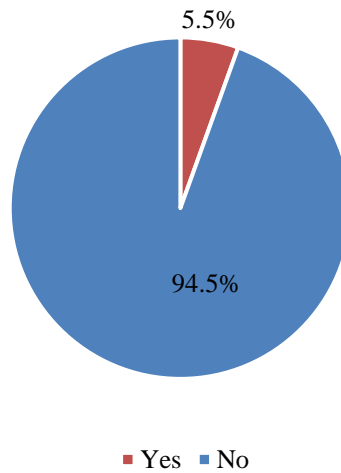


Do you feel worried about the social impact during the construction phase of the project?

The survey results show that 94.5% of respondents expressed no significant concern about the social impact of the project's construction, while only 5.5% indicated some level of concern about its social impact on the community.

This data suggests that the majority of the community does not expect negative social effects due to project construction. However, the project developer needs to address and mitigate concerns raised by 5.5% of respondents to ensure that the social impact of the project is managed effectively and aligned with community well-being and expectations.

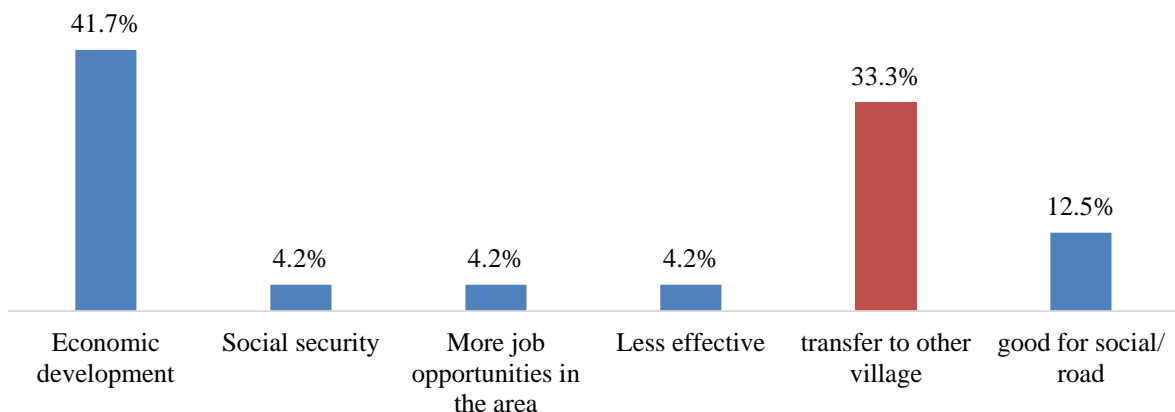
Do you feel worried about social impact during construction phase of the project?



What type of social impact can it have?

According to the results of the social impact consequences question, 41.7% of respondents anticipated economic development, 12.5% expected social and road infrastructure favorably, 4.2% expected more job opportunities, and 4.2% perceived lessened effectiveness. On the other hand, because of project development in the area, social security 4.2% and transfer to other villages 33.3% have negative opinions in the community. The results show that the respondent opinions consist of three components. One is a positive perception; two is a negative expectation and three is mutual, which is less effective, due to the project operation in the area.

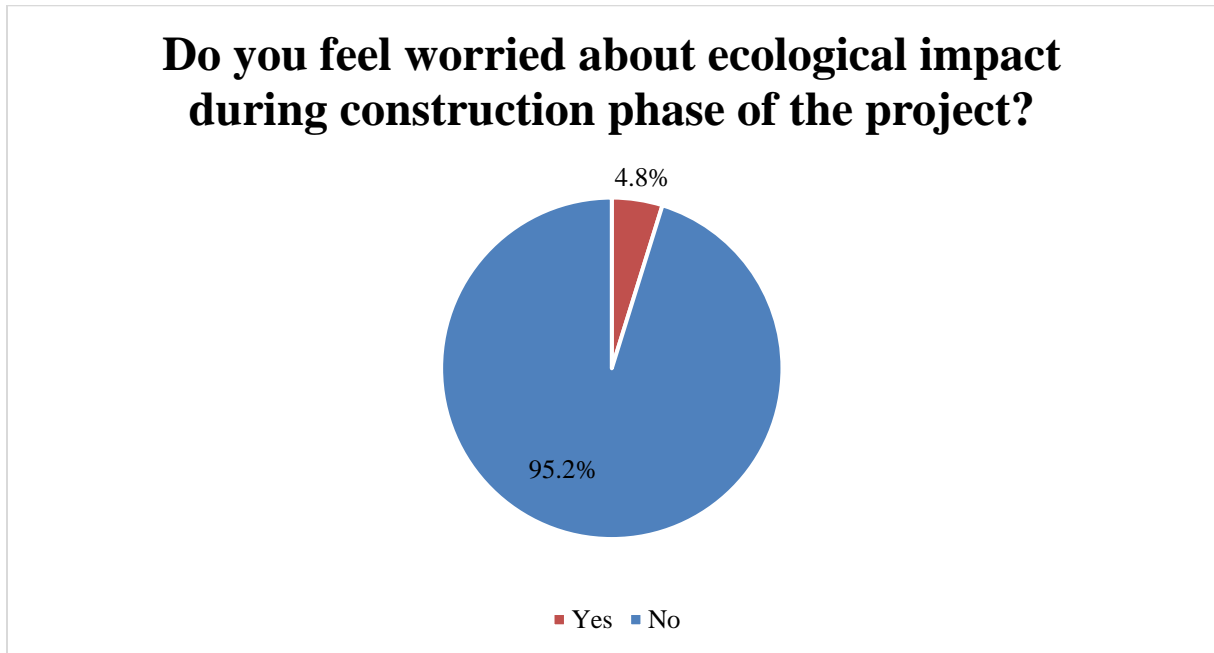
What type of social impact can it have?



Do you feel worried about the ecological impact during the construction phase of the project?

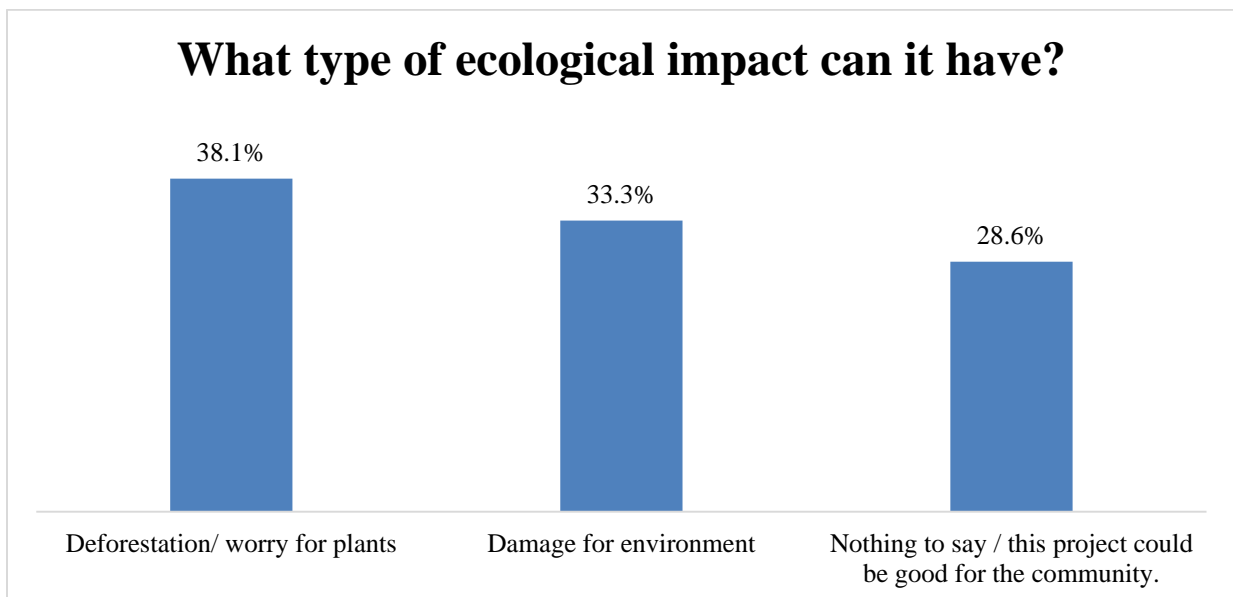
There are no significant findings that indicate concerns regarding the development of the project into

the ecological impact during construction. 4.8% answered, "Yes, worrying," and 95.2% said, "No, worrying."



What type of ecological impact can it have?

In response to ecological follow-up questions, 38.1% of respondents expected to make an impact on deforestation, 33.3% anticipated causing environmental damage, and 28.6% either had nothing to say or expected to contribute to a better community. The data shows that the project operator and the point of contact ensured that the community was updated about the specific project operation plans and ecological management plans.



Do you give suggestions about the project?

An important question was asked by the social assessment team to get suggestions from the respondents concerning the project. The findings show that there are various points of view and needs in the community (Table (4.7-3). Notably, 43.8% of respondents said they were supportive of the initiative because they thought it would lead to job opportunities. Furthermore, 29.4% stated that they wanted to take advantage of the project to get work/job opportunities. In addition, 13.9% highlighted the importance of community support for educational and health services.

In response to concerns about the reallocation of land, 5.7% of respondents said they would rather stay where they are now or move to a better location. Additionally, 3.1% expressed the importance of improving children's prospects for the future, whereas 0.5% highlighted the necessity of transportation support. Notably, farmers stated that they were reluctant to sell or give their land because it was an essential source of livelihood for them. The findings show the wide range of factors that need to be taken into account to make sure that the project is in alignment with the aspirations and needs of the community.

Table 4.7-4 Suggestion About the Project

Response	Percent
Want to job this company	29.4
We like this project because it can create and/or get job opportunities	43.8
Develop our village	2.1
Need to support for health and education	13.9
Need electricity and water	1.0
Want to live exactly the place	5.7
Can be good for a child's future	3.1
Need good transportation	.5
Farmer don't like it because they lose their lands	.5
Total	100.0

C. Health Impact Assessment

4.7.3 Public Health Condition

The overall condition of the health including life expectancy (male/female), morbidity/ major disease, Infant mortality rates are defined in table. According to health index per 1,000 people in affected Townships, birth rate, maternal mortality rate and infant mortality rate are shown in the following table.

Table 4.7-5 Health condition of Affected Townships

No.	Total Population	Mother Population	Population of Children	(1000) people				Major Disease (person)			
				% of Birth rate	% of Mother Death	% of Infant mortality	Abortion Rate	Diar rhea	TB	Mal aria	Hepa titis
1	241540	5808	5749	21	0.39	6.28	11.5	2517	314	14	3

Total	241540	5808	5749	21	0.39	6.28	11.5	166	860	-	-
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Source: General Administrative Department, Patheingyi Township

Number of health care facilities, Number of Clinics and Types of Treatments, Number of Rural Health Centre, Number of Doctors, Nurses, Health Assistant and Related Ratios in Pyapon Township are shown in the following tables.

Table 4.7-6 Health facilities at Patheingyi Township (as of December 2019)

No.	Name of Hospital	Government/Private	Total no. of bedstead
	Patheingyi Hospital	Government	25
	Kyauk Mee Hospital	Government	16
	University Hospital (Technology)	Government	16
	University Hospital (Computer)	Government	16
	Tuberculosis Hospital (Upper Myanmar)	Government	200
	U Hla Tun Cancer Hospital	Private	50
	Nyaing Chan Hospital	Private	16
	Ohn Chaw Eye Hospital	Private	100
	Township	8	839

Source: General Administrative Department, Patheingyi Township

Table 4.7-7 Number of Clinics and Types of Treatments in Affected Townships

Township	Number of Clinic (Government)	Number of Clinic (Private)
Patheingyi	-	35

Source: General Administrative Department, Patheingyi Township

Table 4.7-8 Number of Rural Health Centre/ Sub-Rural Health

Township	Patheingyi
Number of RHCs/ Sub-RHCs	25

Source: General Administrative Department, Patheingyi Township

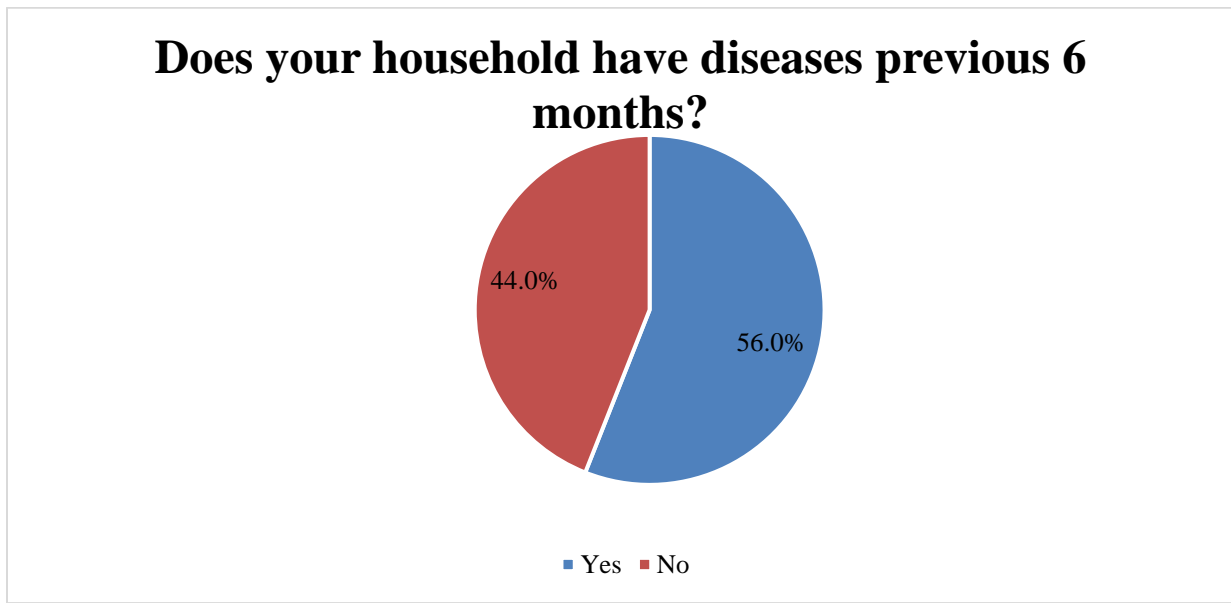
Table 4.7-9 Number of Doctors, Nurses, Health Assistant and Related Ratios in Affected Township

Township	Township Population	Doctors' Health Care Status		Nurses' Health Care Status		Health Assistants' Health Care Status	
		No. of Doctors	Doctor: Population	No. of Nurses	Nurse: Population	No. of Health Assistant	Health Assistant: Population
Patheingyi	241540	19	1:12798	33	1:7317	8	1:30183

Source: General Administrative Department, Patheingyi Township

The following section presents concerns about the health impact assessment findings by all respondents.

56.0% of the respondents reported that within the last 6 months, their household members had experienced diseases, while 44.0% did not report any instances of diseases within their households. This indicates that a majority of the respondents have had experiences with diseases within their households over the specified period.



If yes, what are the common types of diseases?

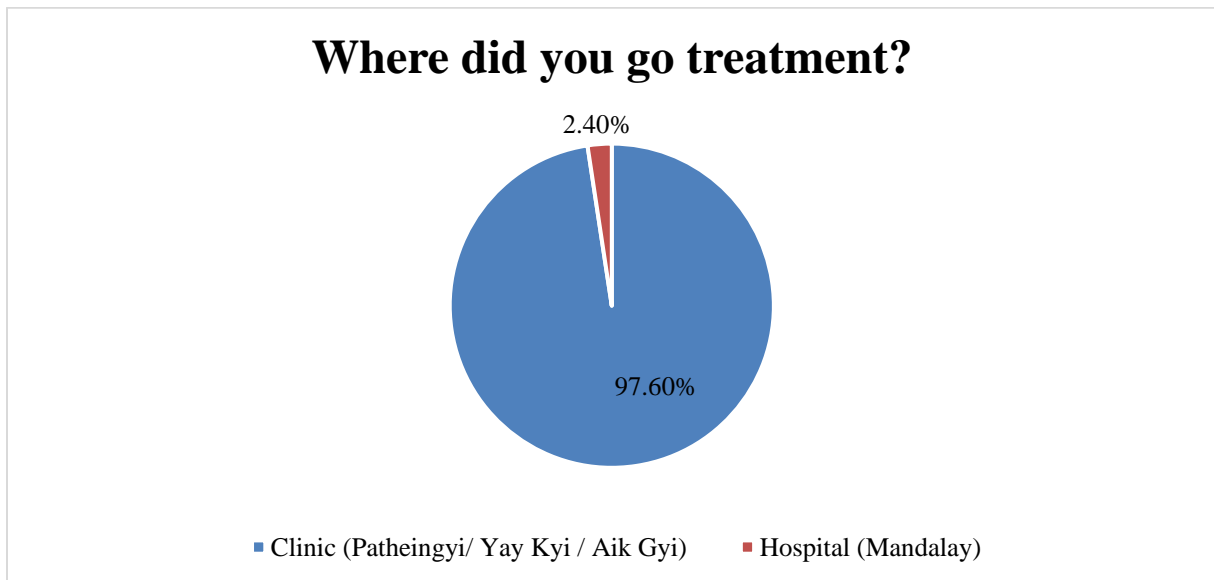
Based on the findings related to the occurrence of diseases in the last 6 months, the following table 4.7-4 presents the types of common diseases reported by the community. The data indicates that 31.3% of respondents reported fever as a common disease, followed by seasonal flu at 22.5%, and nerve pain-related diseases at 16.9%. It is important to note that these responses reflect the personal perceptions and understanding of respondents regarding common diseases in the community, and are not based on medical surveillance data or measurement results.

Table 4.7-10 Common Types of diseases

Response	Percent
Fever	31.3
Flu	22.5
Covid-19	2.5
Stomach	10.2
Stroke	.7
Hypertention	9.9
Heartattact	.7
Asthma	1.1
Spinal nerve pain	16.9
Other diseases (diabetes/Ovary/accident/knee/liver stone..)	4.2

Where did you go to get treatment?

Healthcare service accessibility and availability are important to the community. It was found that nearly all respondents 97.6% are taking services from private clinics located in Patheingyi, Yay Kyi, and Aik Gyi villages, while only 2.4% rely solely on public health services (hospitals) in Mandalay. This suggests that private clinic health care services are more accessible to the community in the region.



Which person did you meet for treatment if you are unhealthy?

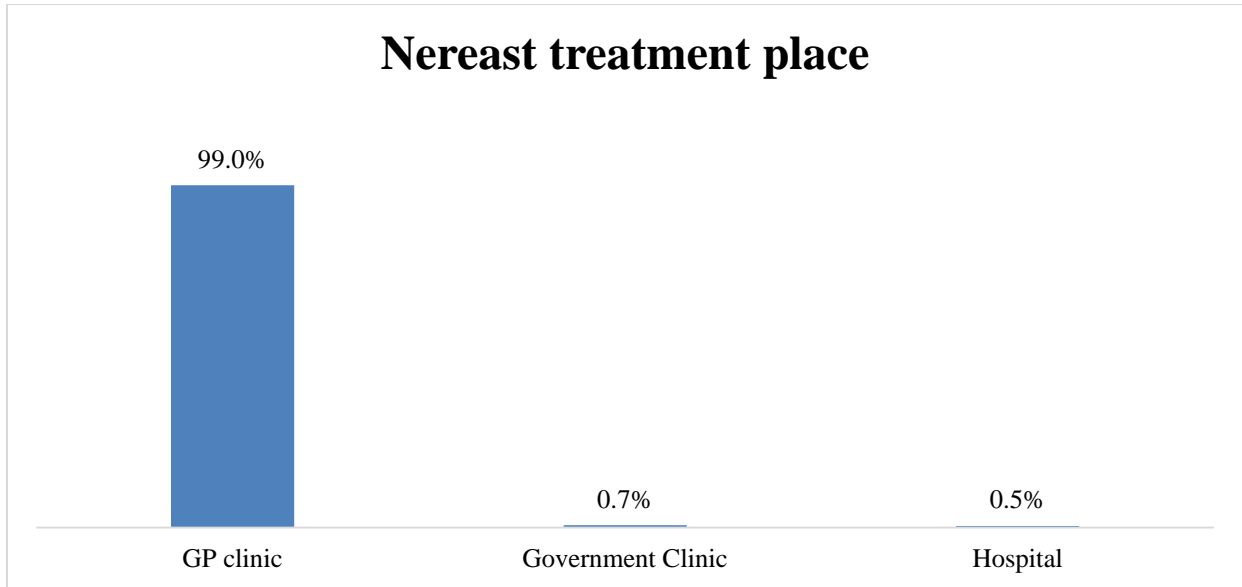
When they felt unhealthy, 100% of the respondents reported they relied on medical doctors.

Response	Percent
Doctor	100.0

Health care center/service provider

The survey results show that for the majority of respondents 99.0%, the nearest treatment center is the GP clinic. Conversely, less than two percent of respondents said they depend on government and public health centers. This highlights the preference for GP clinics as the primary healthcare providers within the community.

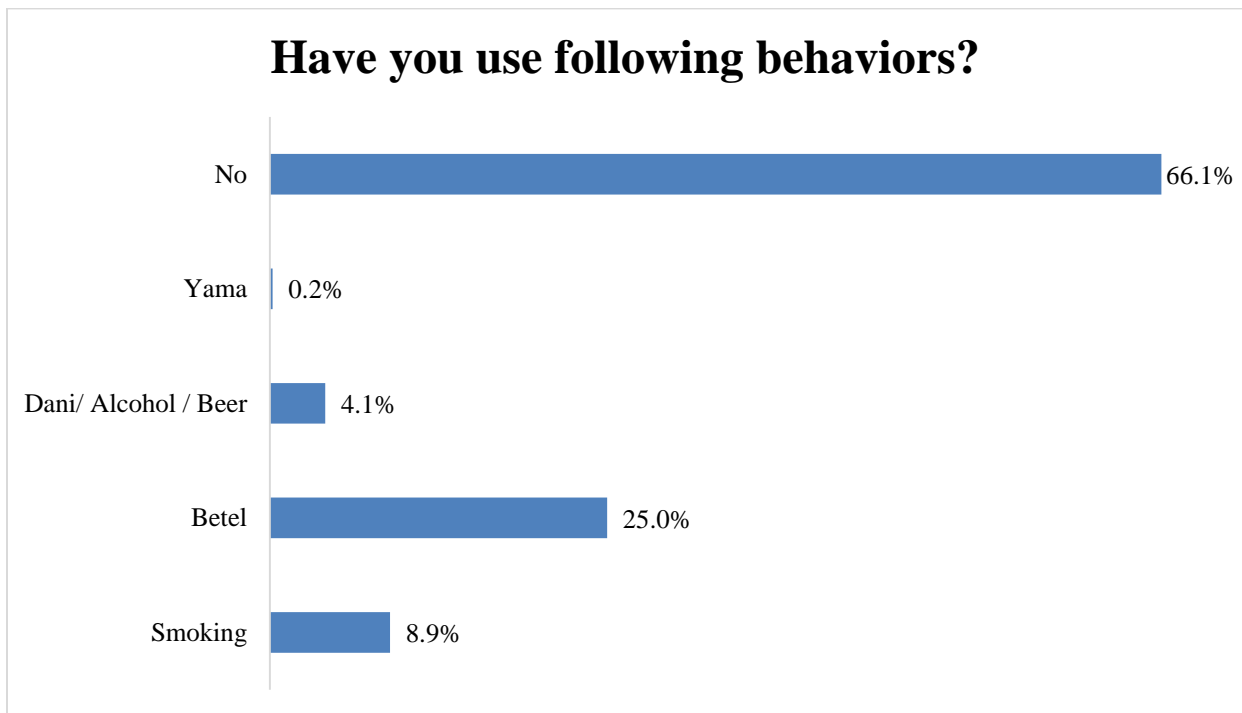
Nereast treatment place



Healthcare and health-impacted behavior

People's health behaviors and healthy lifestyles play an important role in assessing the health impact on the community. When exploring daily behaviors related to health-related issues, the habit of chewing betel or betel nut is 25.0%, smoking is 8.9%, alcohol-based consumption (i.e beer or dani) behavior based on confinement is 4.1, and narcotic or Yama consumption behavior is 0.2%. Interestingly, 66.1% of respondents do not use or engage in the above health-related behaviors.

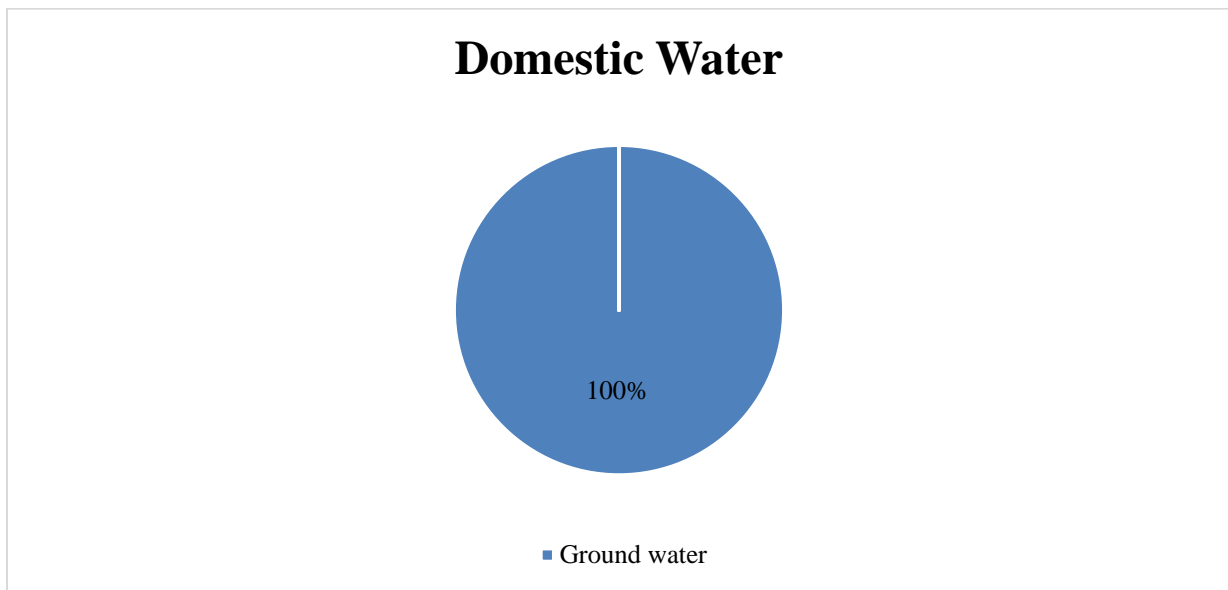
Have you use following behaviors?



Source of Domestic water

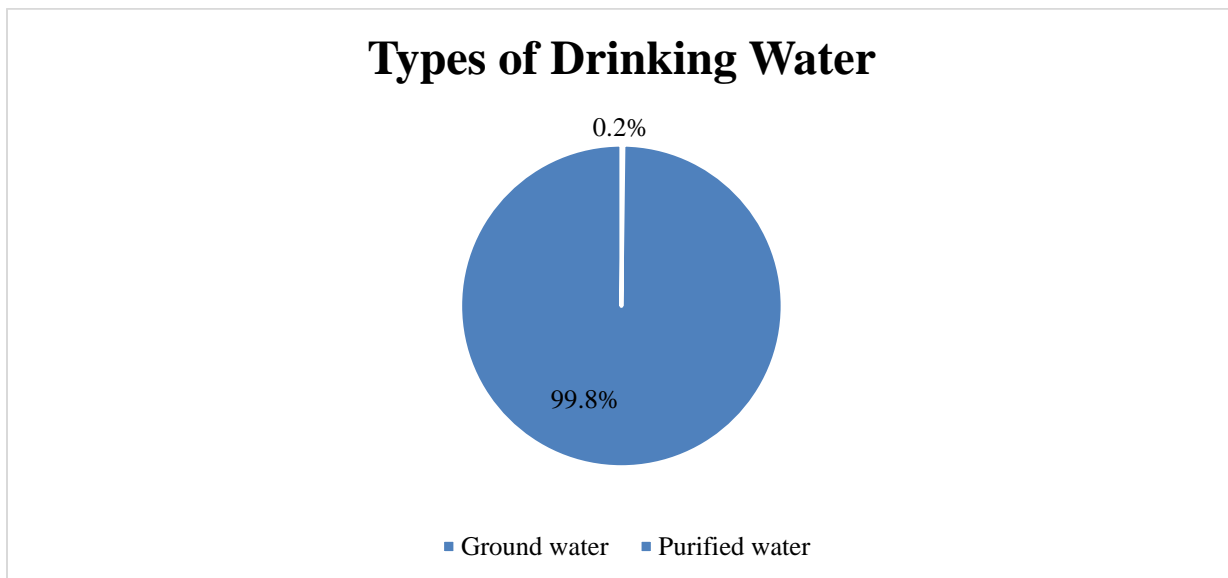
The entire community surveyed relies heavily on groundwater for their domestic needs. Sources of

domestic water are tube wells, hand-dug wells, and boreholes.



Source of drinking water

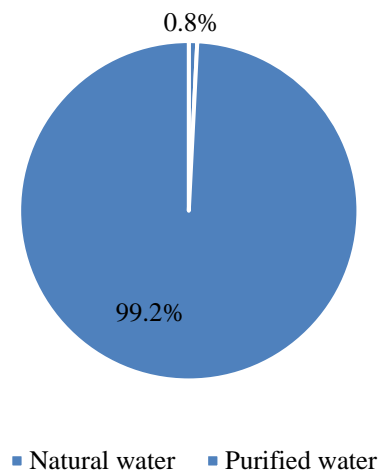
There are not many options accessible when assessing the sources of drinking water in the area. The majority of respondents, or 99.8%, solely were utilization of drinking water from purified water. On the other hand, only 0.2% of people rely on their drinking water from groundwater.



Accessibility of Drinking water source

In the surveyed community, 99.2% of respondents stated that they have access to a purified water system. These findings suggest that the project area primarily relies on bottled water or purified water sourced from Mandalay City, provided by a private drinking water supplier.

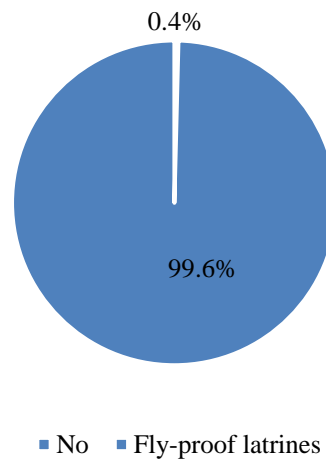
Which water where are you drinking?



Toilet using practices

Almost all of the respondents, 99.6% indicated that the community used fly-proof toilets. Only 0.4% of the respondents do not have the toilet in their house. It is important to note that sharing toilet habits and toilet coverage among the respondents was not taken into account in the study.

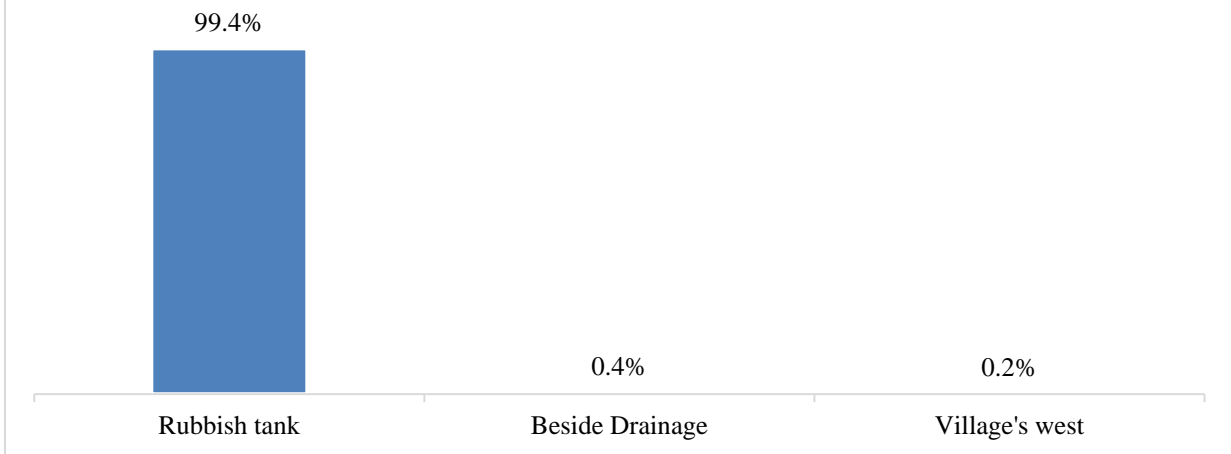
Use of toilet



Waste management practices

In assessing waste management practices within the project community, the survey team focused on examining waste disposal methods. The findings indicate that the vast majority, amounting to 99.4% of respondents, reported using rubbish tank bases for waste disposal. However, it is noteworthy that a small minority, comprising less than 1% of respondents, engage in unsystematic waste disposal practices such as throwing waste beside drainage or into the village of West basic. This data highlights commendable waste management practices among the majority of respondents.

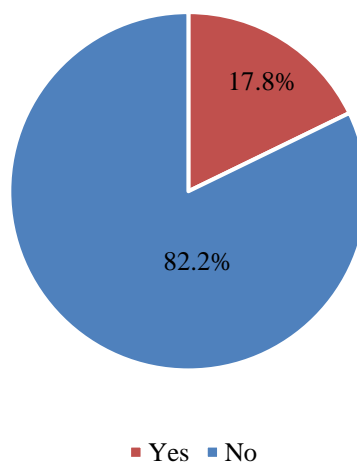
How do you throw the waste?



Worrying about HIA because of project construction in the community

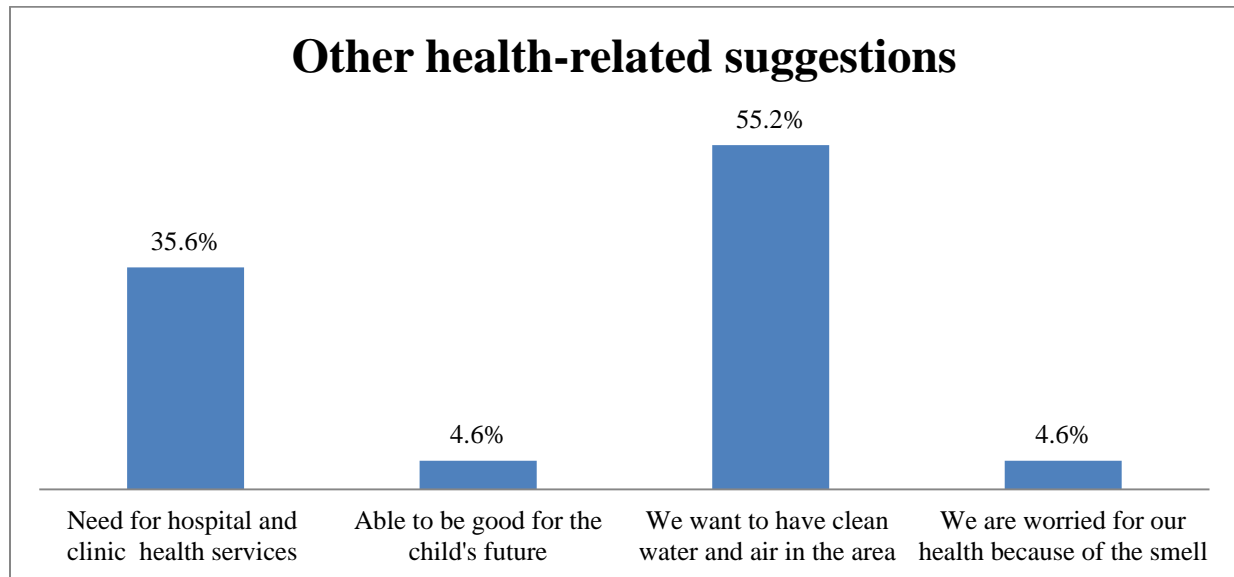
Fortunately, the majority of the community, comprising 82.2% of respondents, does not express significant worries regarding the health impacts from the project construction. However, it is crucial to acknowledge the concerns voiced by the remaining 17.8% of respondents. The project developer should take note of these concerns and address them promptly to ensure that the communities of health-related worries are adequately addressed. Timely exploration and resolution of community concerns regarding health impacts demonstrate a proactive approach to fostering community trust and well-being.

Do you feel worried about Health impact during construction phase of the project?



Other health-related suggestions

To gather more insights on health-related suggestions, the survey team asked follow-up questions to all respondents. Among them, 55.2% expressed a desire for cleaner water and air in the area, while 35.6% expressed a need for healthcare services from hospitals and clinics nearby. Furthermore, 4.6% mentioned concerns about child development for the future. Moreover, 4.6% said they worried about smell control measures. These findings highlight the importance of addressing environmental and healthcare concerns to improve overall community well-being.



4.7.4 Public Transportation

Patheingyi Township is very closed the Mandalay city. Mostly local peoples are mainly used the roadways for transport to go by both car and motorbike. By roadway, Mandalay was 19km away. Recently, township road network was previously connected only by road-transport network (even if some of the connections consist only of earth roads). Table 4.7.10 shows the public access railway stations, roads and bridges in Patheingyi Township.

Table 4.7-11 Public Access Railway Station, Roads, Bridges Patheingyi Township

Air port	Navigation Channel	Railway Station	Rail Road Length (mile)	Car Gates	Road	Township Linked Road	Bridges (Above 180ft)	Bridges (Under 180ft)
-	-	1	2.24	4	5	4	-	27

Source: General Administration Department, 2019

4.7.5 Cultural Characteristic

4.7.5.1 Religion

There are different kind of religion present in Patheingyi Township is shown in the following table.

The Religion of Patheingyi Township (as of December 2019)

No.	Township	Buddhist	Christian	Hindi	Islam	Other	Total
1	Patheingyi	240930	205	88	305	-	241540
	Township	240930	205	88	305	-	241540

4.7.5.2 Cultural Components

This section provides an overview of the cultural heritage resources known to be present or potentially located in the Project study area. The Protection and Preservation of Cultural Heritage Regions Law, (PPCHRL), which as amended in 2009, is the principal piece of cultural heritage legislation in Myanmar. The PPCHRL defines cultural heritage as an ancient monument or ancient site that is required to be protected and preserved by reason of its historical, cultural, artistic, or anthropological value. This includes:

- Archaeological resources (e.g. sites, artifacts, ruins);
- Ancient above ground resources (e.g. monuments, buildings, structures and facilities over 100 years old); and
- Living heritage sites (e.g. temples, Pagoda, cemeteries, shrines, and sacred sites).

a. Data collection

The data presented in this section was collected through a two-step process. Step 1 was a desktop review of publicly available information and step 2 was a field survey.

The objectives of the desktop study were to: establish the cultural context, including an understanding of the history of the Project study area, and identify known cultural heritage resources within the Project study area. The desktop study involved a review of relevant secondary data, including information available from academic journals and books, government agencies, non-governmental organizations and other online publications.

The field survey was designed to ground truth the secondary data and identifies additional cultural heritage sites. The survey involved focus groups and interviews with key representatives from village. i.e the villages potentially impacted by the project.

Information from the desktop review and field survey was used to help identify known sites as well as identify potential locations of undiscovered cultural heritage sites in the Project study area.

b. Ancient above Ground Resources

Ancient above ground cultural heritage resources are immovable structures, groups of structures, monuments, or facilities with historic and/or artistic value to stakeholders. Historic significance can stem from association with important persons, events, or periods in local, regional, or national history.

Artistic importance can result from the form, uniqueness, aesthetic value, or association with a local, regional, or nationally important artist.

Examples of ancient above ground resources include temples, stupas, mosques, churches, places and government buildings, residential buildings, commemorative monuments or markers, infrastructure such as roads and bridges, city-walls, moats and forts, and artificial landscape features irrigation canals and ponds.

c. Living Heritage Sites

Living heritage sites are structure or natural features that are part of a living cultural tradition. These often include structures, buildings, important locations, or natural landscape features that have religious, sacred, ritual, or cultural significance to stakeholders. Potential types of living heritage sites in the Project study area include: churches, mosques, cemeteries, temples, shrines, pilgrimage sites, ritual sites, stupas, and monasteries.

Since the majority of the population in Myanmar practices Buddhism, including those living in the villages in the Project study are Buddhist living heritage sites are type of living cultural heritage sites most likely to be found in the Project study area.

d. Intangible Cultural Heritage

A range of national festivals and ceremonies (i.e intangible cultural heritage) are held throughout Myanmar. Examples include the Water Festival and Myanmar New Year. Pagoda complex and monasteries are often at the center of these festivals and ceremonies. No intangible cultural heritage (e.g tradition, ritual and religious practice, ceremonies) was identified through the desktop review or field survey specific to the Project study area. There are many religious buildings in the study townships as shown in table 4.7-11

Table 4.7-12 Religious Building in Patheingyi Township (as of December 2019)

No	Type of Diseases				
1	Pagoda	Temple	Monastery	Nunnery	Chapels
1	853	360	392	41	81

Source: General Administrative Department, Patheingyi Township

4.7.5.3 Historical Building

Historical building of Patheingyi Township is described in following table. There is no cultural zone in Patheingyi Township. There are six locations of historical buildings in Patheingyi Township. They are Yankin Hill, Myakyauk Pagoda, Shwesaryan Pagoda, Sannasan Pagoda, Thakhinma Taungtaw, Eainsheminhtantaw.

Table 4.7-13 Historical Building in Patheingyi Township (as of December 2019)

Township	Number of Historical Building	Number of Cultural Zone
Patheingyi	6	-

Source: General Administrative Department, Patheingyi Township

Chapter 5 Environmental and Social Impact Assessment and Mitigation Measures

Introduction

This Chapter identifies and evaluates the actual and potential environmental consequences of the proposed activity. Furthermore, the potential for mitigation of negative impacts and enhancement of positive impacts are described.

Assessment of key environmental impacts of the project construction, operation and decommissioning is based on the nature and scope of the project and information on the environment. This chapter outlines the potential positive and negative impacts that will be associated with the project activities. The impacts are predicted by categorizing the activities to be carried out during construction, operation and decommissioning phases.

5.1 Objective of the study

Assessments aim to develop a proper management plan to eliminate or reduce adverse impacts and to augment positive impacts by predicting the consequences of the project development. Therefore, this chapter highlights significant impacts which will be induced by the project.

5.2 Impact Assessment Methodology

Impact identification and assessment starts with scoping and continues through the remainder of the impact assessment process. The principal impact assessment steps are summarized in Figure 5.2-1 and comprise:

Impact prediction: to determine what could potentially happen to resources/receptors because of the Project and its associated activities.

□ Impact evaluation: to evaluate the significance of the predicted impacts by considering their magnitude and likelihood of occurrence, and the sensitivity, value and/or importance of the affected resource/receptor.

□ Mitigation and enhancement: to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts.

□ Residual impact evaluation: to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.

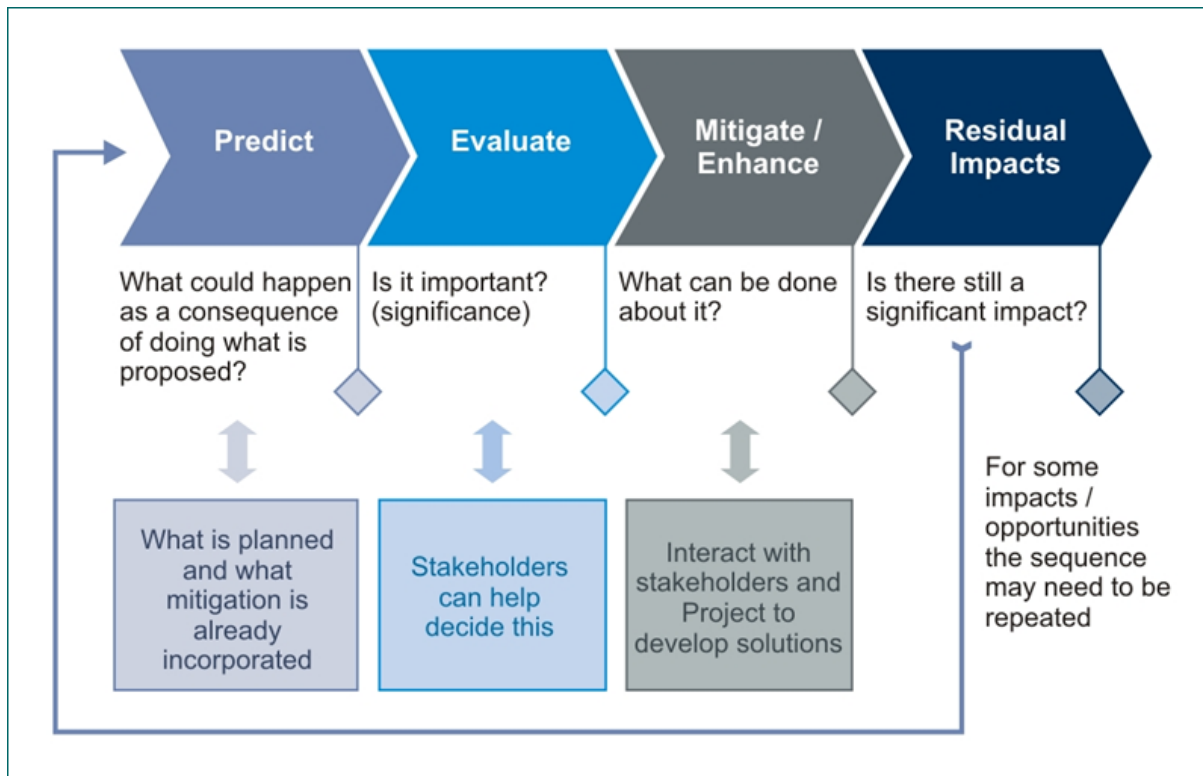


Figure 5.2-2 Impact Assessment Process

5.2.1 Prediction of Impacts

Prediction of impacts is an objective exercise to determine what could potentially happen to the environment as a consequence of the Project activities. This is a repeat of the process undertaken in scoping, whereby the potential interactions between the Project and the baseline environment are identified. In the impact assessment stage, these potential interactions are updated based on additional Project and baseline information. From these potential interactions, the potential impacts to the various resources/receptors are identified, and are elaborated to the extent possible. The diverse range of potential impacts considered in the impact assessment process typically results in a wide range of prediction methods being used including quantitative, semi-quantitative and qualitative techniques.

5.2.2 Evaluation of Impacts

Once the prediction of impacts is complete, each impact is described in terms of its various relevant characteristics (e.g., type, scale, duration, frequency, extent). The terminology used to describe impact characteristics is shown in Table 5.2-1.

Table 5.2-1 Impact Characteristic Terminology

Characteristic	Definition	Designations
Type	The relationship of the impact to the Project (in terms of cause and effect).	Direct Indirect

		Induced
Extent	The “reach” of the impact (e.g., confined to a small area around the Project footprint, projected for several kilometers, etc.).	Local Regional International
Duration	The time period over which a resource / receptor is affected.	Temporary Short-term Long-term Permanent
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.)	<i>[no fixed designations; intended to be a numerical value]</i>
Frequency	A measure of the constancy or periodicity of the impact.	<i>[no fixed designations; intended to be a numerical value]</i>

The definitions for the type designations are shown in Table 6.2. Definitions for the other designations are resource/receptor-specific, and are discussed in the resource/receptor-specific chapters.

Table 5.2-2 Impact Type Definitions

Designations (Type)	Definition
Direct	Impacts that result from a direct interaction between the Project and a resource/receptor (e.g., between occupation of a plot of land and the habitats which are affected).
Indirect	Impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g., viability of species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land).
Induced	Impacts that result from other activities (which are not part of the Project) that happen because of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).

The above characteristics and definitions apply to planned and unplanned events. An additional characteristic that pertains only to unplanned events is likelihood. The likelihood of an unplanned event occurring is designated using a qualitative scale, as described in Table 5.2-3.

Table 5.2-3 Definitions for Likelihood Designations

Likelihood	Definition
Unlikely	The event is unlikely but may occur at some time during normal operating conditions.
Possible	The event is unlikely but may occur at some time during normal operating conditions.
Likely	The event will occur during normal operating conditions (i.e., it is essentially inevitable).

5.2.3 Impact Magnitude, Receptor/Resource Sensitivity and Impact Significance

Once an impact’s characteristics are defined, the next step in the impact assessment phase is to assign each impact a ‘magnitude’. Magnitude is a function of some combination (depending on the resource/receptor in question) of the following impact characteristics:

- Extent
- Duration
- Scale
- Frequency

Additionally, for unplanned events only, magnitude incorporates the ‘likelihood’ factor discussed above.

Magnitude essentially describes the intensity of the change that is predicted to occur in the resource/receptor because of the impact. As discussed above, the magnitude designations themselves are universally consistent, but the definitions for these designations vary on a resource/receptor-by-resource/receptor basis, as further discussed in each of the resource/receptor specific chapters. The universal magnitude designations are:

- Positive
- Negligible
- Small
- Medium
- Large

In the case of a positive impact, no magnitude designation (aside from ‘positive’) is assigned. It is considered sufficient for the purpose of the IA to indicate that the Project is expected to result in a positive impact, without characterizing the exact degree of positive change likely to occur.

Once magnitude of impact and sensitivity/vulnerability/importance of resource/receptor have been characterized, the significance can be assigned for each impact.

Impact significance is designated using the matrix shown in **Table 5.2-4**

Table 5.2-4 Impact Significance

		Sensitivity/Vulnerability/ Resource/Receptor Importance of		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The matrix applies universally to all resources/receptors, and all impacts to these resources/receptors, as the resource/receptor-specific considerations are factored into the assignment of magnitude and sensitivity/vulnerability/ importance designations.

It is important to note that impact prediction and evaluation take into account any embedded controls (i.e., physical or procedural controls that are already planned as part of the Project design, regardless of the results of the EIA Process). This avoids the situation where an impact is assigned a magnitude based on a hypothetical version of the Project that considers none of the embedded controls.

An impact of **negligible** significance is one where a resource/receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.

An impact of **minor significance** is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity/vulnerability/ importance. In either case, the magnitude should be well within applicable standards.

An impact of **moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. An aim of ESHIA is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

- **Mitigation and Enhancement Measures**

Once the significance of an impact has been characterized, the next step is to evaluate what mitigation and enhancement measures are warranted. The priority in mitigation is to first apply mitigation

measures to the source of the impact (i.e to avoid or reduce the magnitude to the resource/receptor via abatement or compensatory measures or offsets (i.e., to reduce the significance of the effect once all reasonably practicable mitigation measures have been applied to reduce the impact magnitude).

- **Residual Impact Evaluation**

Once mitigation and enhancement measures are declared, the next step in the EIA Process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the implementation of the proposed mitigation and enhancement measures.

5.3 Identification and Assessment of Physical Environmental Impacts

Valued Ecosystem Components (VECs) such as fundamental elements of the physical, biological or socio-economic environment, include the air, water, soil, terrain, vegetation, wildlife, fish, birds and land use, as well as the added contributed effects to same VECs from other past, present and future projects or actions located in the same area.

The key VEC physical components include:

Atmosphere: climate conditions and trends, and extreme weather events and air-quality conditions.

Physiography and Geology: physiography such as landforms, elevations, relief and unique features; surficial geology including types and depths; and bedrock geology including types, location and depths.

Soils: soil types and characteristics, soil capabilities and limitations, and permafrost conditions.

Surface Water: watersheds and waterbodies characteristics, shoreline environment, and sources of potable water.

The selected criteria will be considered on the followings;

- Overall importance/value to people
- Regulatory requirements
- Potential for substantial Project effects
- Key for ecosystem function, such as **star fishes, humming birds, sea otter, etc.**
- Umbrella indicator

5.4 Impact Assessment during Construction Phase

During construction phase which will be last for at least 5 years for the construction of the proposed

project, a number of impacts can be expected by the vehicles movements and their fuel uses. The earth moving, and concrete works are critical for the foundation works.

The vehicles and equipment will be used for the following activities;

- Excavation
- Concrete works
- Structure installation and assembling works

5.4.1 Impacts on Soil

Soil can be likely impacted due to accidental spillage of vehicle oils while there has no proper maintenance of vehicles and equipment during construction phase. This oil contaminated soil run off with the rain can be brought into the drainage system, then into the water bodies. The oils can be brought into the drainage while the vehicles and equipment are washing down with water and/or rain. However, these impacts can be considered as temporarily affected during the earth works/excavation in the project area. After the mitigation measure will be done, the potential impact can be considered as “Small”.

5.4.2 Impacts on Air Emissions

The air emissions, especially NO_x, SO_x, and Dust (Particulate matters) can be expected during construction phase hotel due to light machinery use and minor excavation, and earth works. Dust emission is likely the most from construction activities.

Dust Emission: During the construction activities, atmospheric dust levels are anticipated by the movement of trucks and vehicles transporting construction material and equipment. Dust emission can be critically related from the distinct source activities;

- loading of aggregate onto storage piles (batch or continuous drop operations);
- wind erosion of pile surfaces and ground areas around piles; and

Estimation of the quantity of dust generated is closely related to the type of equipment used, and the duration and nature of the civil works.

The various construction related vehicles expected to be used during construction phases for club house were:

- Backhoe excavator
- Truck crane
- Dump truck

- Forklift
- Crane
- Concrete mixer
- Wheeled loader
- Concrete pump

SOx and NOx Emissions: As concern traffic, in general, an overall increase in traffic and heavy machinery movement is foreseen during the construction phase with an increase in dust emission levels. The fugitive dust generated by earthworks including excavation, backfilling, grading, equipment movement, material piling, loading and unloading of materials. Such emissions together with combustion and exhaust emissions generated from the construction equipment, generators and vehicles from road transportation are likely to result in marginal increases in levels of SOx and NOx.

The impacts from air emissions during construction phase are the main environmental concerns which are likely to be limited to occupational health risk and irritation to humans (i.e. construction workers and community lived in the closed surroundings of the construction site).

5.4.3 Impacts on Noise and Vibration

Noise Emission: Noise emission can be anticipated as the worst impact as much as dust emissions for the receiving bodies due to construction activities and the impacts are inevitable for residents nearby the construction site due to the activities such as;

- Earthwork: the main noise sources are related to the use of equipment and earthwork machinery such as: bulldozers, excavators, loaders, and various transport vehicles.
- structure installation: the main noise sources during the structure installation stage are concrete mixer, vibrating machine, electric saw, etc., and collision noise impact during the load and unload of materials and;
- Equipment installation: the main noise source during the equipment stage is crane elevator.

The nearest noise sensitive receiver is Thitsa Waydagu Meditation center and is located about 250 meters north of the project compound. Therefore, the ambient noise level around the location will be collected and propose appropriate mitigation measure.

Vibration: Vibration can be expected from heavy vehicles movement and some earth works during construction phase. Huge noise activity could be also related occasionally generates vibration.

5.4.4 Impacts on Water Quality

During the construction phase, the water consumption is mainly related to:

- domestic use due to the presence of the staff and construction workers;
- water for concrete batching;
- soil watering for dust mitigation and management during excavation works and construction vehicles transits and washing down and cleaning equipment at localized work sites; and
- fire-fighting system.

Temporary water pollution due to concrete mixing, aggregate collection and excavation is expected. Another source of water pollution can be of the spill of fuel used for construction equipment and generators. The construction work will involve transportation, handling, storage and transferring the fuel potential spill could be raised due to the leakage of fuel tank, drum, and equipment failure. Oil leakage can contaminate ground water and surface water degrading their water quality through lack of secondary containment and improper control. Spill and leaks are nature of unplanned event and can be avoidable to zero incident by applying in place control measures.

Another potential source of water contamination can be of the domestic wastewater from construction contractor's camp. Domestic wastewater from kitchen, toilets, and washing facilities will be generated by the workers on-site during construction period. Surface runoff following the heavy rain brings the sediment load and other impurities including contaminated substances down into the nearby canal degrading the water quality.

5.4.5 Impacts on Vegetation and Terrestrial Fauna

There is not any intact forest around the project site. Vegetation/flora and fauna that belong to the IUCN Red List were not observed based on the desk study. So, the potential impacts on vegetation and terrestrial fauna can be considered as low.

5.4.6 Impacts of Solid Wastes

In general, waste streams, generated during construction phase of the project, shall be related to:

- excavation spoil;
- construction waste;
- domestic waste;

Non-Hazardous Wastes

A variety of non-hazardous materials including;

- paper, food residues, used containers (bottles, can, etc.), broken furniture and packaging, and sanitary effluent;
- surplus of concrete, asphalt, plastic, glass, metals, vehicle tires and packaging materials (plastic, card, cardboard, etc.);

Hazardous Wastes

A small amount of hazardous waste (produced also during maintenance of vehicles) is;

- used oil (lubricating and hydraulic oils) and air filters from machinery and vehicles;
- used batteries from vehicles and trucks; and
- other maintenance waste (i.e. oily rags, paint residues, etc.); and
- paints
- Fluorescent light bulbs and contaminated containers (such as old paint tins, etc.)

The construction phase will be carried out through different activities as civil, mechanical, electrical installation operations and liquid effluents which in turn will generate volumes of waste with typology characteristic of the nature of each activity.

Concerning the management of general waste (like food, plastic, etc.), the disposal at existing dumpsites will increase associated environmental issues such as windblown litter, vermin and other disease vectors. There is also health impacts related to the direct contact of waste scavengers with the disposed waste.

5.4.7 Impacts on Local Traffic

A significant traffic volume increase, especially on the current access road, is expected to occur during the construction activities within the project area. In any case, heavy traffic movement will negatively impact the road condition; will cause disturbances to road bordering residents due to noise, and dust, which might cause temporary disruptions to local traffic. Furthermore, the limited understanding of road safety among local drivers and pedestrians is likely to increase the number of accidents. These might particularly involve the numerous cars/vehicles and pedestrians using the road, especially vulnerable groups (i.e.: children walking to school).

5.4.8 Impacts on Geology and Landscaping

Modification of the geomorphological condition: The construction activities at the site of interest will not cause detrimental changes in geomorphologic landforms and site setting, considering that the site is quite flat.

Changes in geological and lithological conditions: After excavation activities and following backfilling, compaction of soil as well as mixing of construction material with natural soil, should lead to changes in the physical, mechanical and other soil properties. These modifications are in any case evaluated as negligible because of a small entity. Furthermore, the changes will not affect soil with particular archaeological or natural landscape values, therefore the possible related impacts could be considered negligible also on the historical and archaeological point of view.

5.4.9 Social Impacts

The project is aimed to develop the existing golf course and new club house as a part of Yedagun Hill City Development Project. The objective of the project development is to develop the sustainable hotel and tourism industry for the regional level and country level. Thus, the project beneficiaries are local people and visitors who visit and spent their holidays and to support the hotel and tourism development of Myanmar.

Ethnic minorities and indigenous peoples are not identified in and around the project site.

It can be considered that there will be social impacts such as traffic congestions, traffic accidents and STD like HIV/AIDS and so on which can basically be managed by the introduction of time regulations for the construction and implementation of safety and public health education to workers as well as the surrounding peoples.

The social impact of the Project is very attractive for all stakeholders given its role in connecting the business and residential area together with its associated international standardized school, hotels, hospitals and shopping mall area to the neighboring communities, thus turning them into productive units serving the local economy and providing extra income that may be used in enhancing the social services for the surrounding communities.

Though it is expected for the positive effects on community, the project should undertake intensive care manner when handling the land access process for the project site with the nearby community. The impact is likely to lead loss of the land for the project site assessment. It should be proper consultation and compensation plan for those whose land assets were lost/compensated for the project site. The impact reaches to landowners, tenants, and sharecroppers in different manners.

About 100-200 jobs are expected to be created related to the construction work of the project. Local job creations, although of temporary nature (the construction period being 5 years), would boost local economy together with the associate business creations (e.g. amenity facilities such as shops and restaurants to cater the construction workers).

Likewise, the proposed project could be a contributing factor for longer-term regional development and improvement of livelihood of the communities when combined with a set of the National

Development Plan, such as the Tourism Master Plan 2013-2020.

5.5.10 Onsite Occupational Health and Safety

(a) Physical Hazards

Because of the intensive engineering and construction activities including erection and fastening of roofing materials, metal grinding and cutting, concrete work, steel erection and welding among others, construction workers will be exposed to risks of accidents and injuries. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of metal sheets and collapse of building sections among others.

(b) Exposure to Noise and Vibration

Normal construction noise and vibrations typical to those of construction works will be generated at the project site during this phase. This noise impact is expected to be negative in the long and short-term. The major sources of noises and vibration will be construction equipment vehicles and workers. Elevated noise and vibration levels within the site are adverse to the health and safety of the project workers, the residents, passers-by and, other persons and animals within the vicinity of the project site. The major receptors exposed to the noise are expected to be at a minimum and will include mainly the construction workers.

(c) Communicable Diseases

The project will attract new people to the project area and this can lead to several repercussions leading to the spread of HIV/AIDS and/or other sexually transmitted diseases (STDs). Influx of new people to the project area especially construction workers can affect the number of new cases of HIV, because they often interfere with an otherwise stable situation but the contrary can also happen where the newcomers find themselves at higher risk. Another health concern during construction is diarrhea due to the poor sanitation facilities.

Table 5.4-2 Environmental Impact and Significance

Action Affecting Environmental Resources & Value	Impacts/ Sources	Recommended Feasible Protection/ Mitigation Measures	Impact Significance			
			Insignificant	Significant Effect		
				Small	Moderat	Major
Soil	<ul style="list-style-type: none"> -Clearance of Trees might affect soil erosion. -The accidental spillage of oil from vehicles used for transportation of construction material and accidental spillage from the building material used for construction purposes are also considered as soil contamination sources. - Soil erosion during the construction phase is expected that can indirectly impact to natural landscape values. 	<ul style="list-style-type: none"> - Prevent soil contamination by oil or grease spills, leakages or releases, all manipulations of oil derivate in the process of construction and provision of fuel to the machines should be performed with maximum attention; -Leak proof containers should be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through drains and treated properly before disposal; - Construction waste and debris shall be collected on a regular basis, covered by roof and disposed of at designated landfills; - Prohibit to operate with equipment and vehicles outside the designated work areas and roads; - Training and equipment will be in place to minimize the potential environmental impact in the case of accidents (for example using spill kits). 		X		
Air Quality	<ul style="list-style-type: none"> -Increases in air pollutants caused by fugitive dust from foundation work, site excavation, and emissions from operation of vehicles and trucks and heavy construction equipment. -Occupational health concern for construction workers and community 	<ul style="list-style-type: none"> - Contract with the license contractors for compliance of environmental management consistence with the concerned government authorized department; - Sprinkling of water on dust generating areas; - Restricting the speed limits of vehicles during movement on unpaved roads; - Covering of vehicles carrying loose soil/construction material; - Applying preventive maintenance system; 				

	<p>health lived in the closed surroundings of the construction site are expected.</p>	<ul style="list-style-type: none"> - Checking vehicle and equipment inspection daily; - Stopping dust generating activities in high wind; - Applying good site practice and housekeeping; - Turning off the engine while not in use; - Optimizing construction schedule to minimize time that vehicles are in operation; - Covering load-carrying platform properly when carrying earth/sand; - Vehicle engines and other machinery will be kept turned on only if necessary, avoiding any unnecessary emission; - Activities will be conducted trying to use the minimum required number of means at the same time; - Electric small-scale mechanization and technical tools will be used when available and feasible; and - Repair and maintenance of construction equipment and vehicles will be performed outside of the construction site by at specialized enterprises. 				
<p>Noise and Vibration</p>	<ul style="list-style-type: none"> - Increase ambient noise level at the construction site, and communities near the material transport routes, especially, the poor buildings which could be destroyed by vibration. - Long-term noise exposure will reduce hearing and labour productivity, and will cause fatigue, stress, and insomnia. 	<ul style="list-style-type: none"> - Select adequate equipment (fit with noise mufflers); - Minimize machinery and equipment unused conditions with engines in action; - Maintain machinery and equipment in good conditions; - Maintain an active community consultation and positive relations with residents that will assist in alleviating concerns that might arise and resolve any potential noise complaints; - Post warning signs within the vicinity of the impact and all personnel shall be provided with personal protective equipment. For example, workers operating equipment that generates noise should be equipped with the appropriate noise protection gear; and 			<p>X</p>	

		- Restrict the construction activities that will generate disturbing sounds to normal working hours.				
Water Resources and quality	Degradation of water quality due to inappropriate management of construction wastes and domestic waste from camp site. -Impacts on groundwater quality as a result of construction activities such as deep foundation and piling works, and discharges.	-No storage for fuel and lubricants/oil; - regular maintenance and checking of all vehicles and machinery to minimize the risk of fuel or lubricant leakages; - As construction activities typically generate disturbed soil, concrete fines, oils and other waste, on-site collection and settling of storm water, prohibition of equipment washes down, and prevention of soil loss and toxic releases from the construction site are necessary to minimize water pollution; - Training and equipping relevant staff in protected storage and handling practices, and rapid spill response and clean up techniques; - Preparing proper sewage system/Use portable toilet for construction workers.		X		
Solid wastes	-Demolition wastes and plant wastes from clearance of trees are expected at pre-construction phase. -Various types of construction solid wastes are likely to occur during the implementation stage of the project construction.	- A waste management plan shall be developed including requirements for separation, handling and disposal of all waste generated; - All hazardous materials shall be stored in clearly labelled containers; - Storage and handling of hazardous materials should be in accordance with national and local regulations appropriate to their hazard characteristics; - Waste shall be separated on site and waste storage areas shall be roofed and bounded to prevent potential cross-contamination; - Spent oils (including transformer oil) shall be recycled; - Fire prevention systems and secondary containment shall be provided for storage facilities, where necessary, to prevent fires or releases			X	
Vegetation And Terrestrial fauna	- A removal of the tree and bushes in the construction area will be done so potential impact on vegetation was expected.	- Routine checking of trenches (if any) and escape routes to minimize, if not prevent, entrapment of fauna; - Reporting of any violation relating to hunting birds, snakes and trading		X		

	<ul style="list-style-type: none"> - The regional fauna species are also expected to face loss of their habitats due to clearance of vegetation. 	<ul style="list-style-type: none"> activities; - Implementing good housekeeping practices on the field and implementing good Solid Waste Management Plan in order to eliminate any source of hazard to the native fauna; - Minimize vegetation clearance and habitat disturbance by demarcating the clearing boundaries in the project site; - Unnecessary cleaning the trees is to avoid; - Environmental awareness training to be given to all workers for the preservation of local biodiversity species and induct the nature of the sensitivity of project area; - Works areas in temporarily affected areas shall be reinstated with tree/shrub/grass upon completion of the works. 				
Traffic loads	<ul style="list-style-type: none"> - Heavy vehicle movements during construction phase are highly expected to transport construction machinery. 	<ul style="list-style-type: none"> - Definition of speed limits and make sure that they are respected by Project drivers (including contractors); - Adopt a Traffic Management Plan to ensure traffic safety, which should foresee safe drive trainings, regular alcohol and drug tests for drivers and driving restrictions during rush hours (especially close to schools). 		X		
Aesthetic view	<ul style="list-style-type: none"> - During construction phase the community can be unfamiliar and affect loss of aesthetic view to the surrounding community. 	<ul style="list-style-type: none"> - No introduce the vertical structures which can be overseen from various parts of the region; - Adopt the control measures during the detailed design of the project such as building design, and growing vegetation, etc.; - Color for project facilities should be carefully selected. Lighter color can be utilized to complement the surrounding areas. Where technically feasible, to decrease the visibility of facilities, plantation around the building should be planned. 		X		
Occupational	<ul style="list-style-type: none"> - The construction dust and noise emissions 	<ul style="list-style-type: none"> - Adopting and training all personnel (including contractor workers) in the use 		X		

Health and Risk	<p>will be affected to the construction workers.</p>	<p>of Personal Protective Equipment (PPE) and chemical handling;</p> <ul style="list-style-type: none"> - Training in recognition of hazard symbols; -Adoption of work site hazards signage in Myanmar language; - Training of all personnel in health and safety risk prevention and protection; - Regular noise surveys to ensure the on-site maximum levels are not exceeded; - Development of inspection, testing and maintenance programs for machinery and equipment; - Accident recording and investigation and prevention initiatives; - Development of training in site emergency response plans both for the construction phase; and - Compliance to all international, national or local health safety standards that may exist. 				
Community Health	<p>- The construction dust and noise emissions and fugitive emission by heavy transportation will be affected to the construction workers.</p>	<ul style="list-style-type: none"> - Guarantee proper vehicle maintenance to reduce noise and accidents; - Maintain the Project roads to reduce the possibility of accidents, including clearing of vegetation on to improve sight distance and visibility; - A series of traffic measures should be also considered: dust suppression measures, as vehicle speed restrictions, wheel washing area installed at all site access points, containment for dusty materials, and frequent watering or covering of exposed areas of ground, and prompt site restoration; installation of appropriate temporary road sign points on the roads used by Project traffic at bends, junctions, schools and populated areas; - Engage with local communities through traffic safety awareness campaigns. 		X		
Social Community	<p>Some may have loss land asset for project site through the consultation and compensation process. If this process not</p>	<ul style="list-style-type: none"> - Engage and well consult with local communities for project development activities within the region. - Establish an entitlement matrix covering a comprehensive list of the direct 		X		

	<p>properly implemented, the project may face some delay in accessing the land area due to poor agreement of local communities on the project development.</p> <p>Acquisition of the land and associated properties (such as buildings, structures, crops, trees and other economic and social investments) for construction work either permanently and temporarily are expected to occur in a sizable scale.</p>	<p>affected land and any asset by the project, including both landowner, tenants, private business operators as well as sharecroppers and according to compensation measures should be established in accordance with the related laws and regulations in Myanmar.</p>				
<p>Physical Hazard</p>	<p>Several of the construction phase activities can pose serious threat of accidents and injuries to the construction crew and general public</p> <p>Construction materials falling from above can cause injuries and accidents to those below while general handling of equipment poses a risk of injuries to the handlers.</p>	<ul style="list-style-type: none"> • Train all the workers for first aid • Clean up excessive waste debris and liquid spills regularly • Use slip retardant footwear • Provide temporary fall arrestors • Use control zones and safety monitoring systems • Use a designated and restricted waste disposal area • Maintain clear traffic ways to avoid driving of heavy equipment over loose scrap • Wear appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes • Plan and segregate the location of vehicle traffic, machine operation, and walking areas • Control vehicle speed • Use checked and well-maintained devices 		<p>X</p>		

5.5 Impact Assessment during Operation Phase

The main project activities are not related any impact on the regional air quality, water quality, soil quality and noise quality. As a back-up power supply, a diesel engine generator which shall have an environmental performance is planned to be operated in limited utilization based on an assumption of the power failure frequency. The operation of the project and associated facilities are planned to be connected to the electricity distribution system in the project compound by which no emission of air pollutants will be expected.

During operation, the EIA will be assessed potential impacts to transportation systems including but not limited to the followings: potential changes to traffic patterns, densities, and traffic safety issues in area affected by project, determination of vehicular traffic density in the project area (before, during, and after the proposed activities), potential for traffic accidents, congestion and noise, and potential impacts to previously inaccessible areas from improvement of roads.

There might be some increment in solid wastes and water effluent from hotel as well during the operation of hotel due to the fully operation of the facilities, however, the positive effect of the project activities which will be likely to lead the tourism sector improvement towards the whole region.

Domestic wastewater from the hotel is planned to be treated with BIOTANK wastewater treatment facilities.

5.5.1 Impact on Topography

During the operational phase of the project, no impact on topography of the project site is experienced, as all the land levelling and construction activities had been completed during the construction phase of the project itself. However, the green belt and avenue plantation is being developed with which the aesthetics is to improve further.

5.5.2 Impact on Land use

This expansion project is already categorized as Master Plan Project by the Authorized Government of Mandalay. There is no impact on the land use during the operational phase, as the project does not alter the land use pattern.

5.5.3 Impact on Soil

All the impacts related with soils are restricted to the construction phase only; hence there is no major impact on soils of the project site during the operational phase. The top soil removed during construction stage was spread on landscaped areas and plantation has been developed. The matured plantation helps in reduction of possible soil erosion.

The probable sources causing degradation of soil in the project site are due to generation of solid wastes and wastewater from the project. As appropriate solid waste management system is being followed, no soil pollution is experienced in the project area. Further, the greenbelt / green cover and avenue plantation measures is enriching the soil binding characteristics and preserve top soil from erosion.

5.5.4 Impact on Air Quality

The major source of air pollution is the emission of dust from vehicles and stacks of Diesel Generator sets. In the project, Diesel Generator sets are provided as standby power source and very insignificant pollution is expected to occur. Potential impacts to air resources shall be described including but not limited to the followings such as impacts on ambient air quality, sources (e.g., windblown dust, fixed and mobile equipment), receptors (e.g., communities, schools, soils, water bodies, ecosystems) and greenhouse gas generation.

(a) Fugitive Emissions

The project site is excellently landscaped and provided with black topped roads. As the entire project site is covered with good landscaping and tree / grass cover, generation of fugitive dust within the premises is minimal. Even the dust, outside the project site is minimal due to the proposed compound walls, which is functioning as barriers- and tree plantations along the boundary. Further, all fugitive emissions are likely to be controlled to a great extent, through proper maintenance of tree plantations and the green belt development undertaken within the project area.

(b) Gaseous Emissions

The sources of gaseous pollutants within the project site are Diesel Generator sets and vehicular movement within the premises. The emissions of Sulphur Dioxide (SO₂) and Oxides of Nitrogen (NO_x) are due to operation of Diesel Generator sets, in case of the failure of the power grid.

In order to control emissions of particulates during operation of the DG sets, adequate control equipment is installed.

5.5.5 Impact due to Vehicular Traffic

It is ensured that all such vehicles are maintained on a regular basis and meet the norms. Development of Green belt with specific species is helping in reducing the PM levels.

Information sign is also provided to encourage vehicle owners to maintain their vehicle and follow the emission standards fixed by Government Authorities.

5.5.6 Noise and Vibration

Potential impacts from noise shall be described including but not limited to the followings: potential noise levels at different representative sites in the project area and in communities near the project area and potential vibration due to blasting and movement of heavy equipment, and related damage to materials and structures. Noise pollution is caused due to the various activities which involve the vehicular movement, Diesel Generator sets, etc. Proper and suitable acoustic barrier has been provided around areas generating high noise. D.G sets are also housed in acoustically treated room so that the ambient noise level at 1 m from the periphery of the service block is less than 75 - dB (A) (day time). Plantation and landscaping plan are designed to ensure that there is adequate green belt near the service block so that further noise attenuation is achieved. Effective preventive maintenance and vibration measurement of all rotating equipment is also helping in the noise reduction.

5.5.7 Water Conservation

When the hotel run in its full strength, employees will use restaurants, bar, washing machines and toilet facilities attached in various parts of the hotel. Therefore, there is a tendency to occur soil and groundwater pollution through wastewater and sewage mismanagement. In addition, water consumption will increase which is related to personal use by guest and facility requirements for housekeeping, laundry, and cooking and grounds maintenance.

5.5.8 Increased Energy consumption

The hotel activities will require a lot of electricity for lighting, running office equipment and electrical gadgets, air conditioning, refrigeration system, air compressors and pumping water from the borehole. Electricity is generated using natural resources; excessive electricity consumption will have a big drain on the same and negatively impact the environment.

As the proposed hotel is located far from urban development, energy consumption is the one of the most essential issue of environmental impact in the project.

5.5.9 Waste generation

In the operation phase, major solid wastes will be generated form daily guest room cleaning, kitchen, restaurant, and reception/office and staff quarters. Different kinds of solid wastes, such as personal left-overs, oil wastes, food residues (organic wastes), glasses, tins, bottles, packing materials, papers, stationaries, damaged/expired devices or appliances and other miscellaneous will be generated. The

liquid waste generated from the use of bathrooms, toilet and cleaning activities of the rooms/ hotel and the same will need to be properly disposed or else it will pose a risk of ground contamination.

In addition, all hotel guest and about 100 employees will use toilet, facilities, kitchen, restaurant, and using laundry service in daily basis. Two different types of liquid wastes are expected, used water (grey water) and sewer from toilets. The wastewater should be recycled and used to water the grounds instead of directing the same to the stream.

5.5.10 Biological Impacts

It is not expected for any change by the project activities on the biodiversity components as the project area is developed in local settlement area and the project type is not readily correlated with deep clearance of forestry area. Also, the project region has no relation with the protected wildlife.

Potential impacts to biological resources shall be described and quantified including but not limited to the followings: vegetation/Flora and Associated Ecosystems, quantify alterations in vegetative cover due to deforestation or wetlands destruction, other vegetative type conversions, direct vegetative removal, indirect (e.g., poisoning by dust and pesticides), wildfires, increased road access in remote areas leading to destruction of existing vegetative cover (land use changes) and spread of noxious or invasive species.

Aquatic and Terrestrial Wildlife/Fauna Ecosystems

Potential impacts include the followings such as quantify alterations in aquatic and terrestrial wildlife populations due to fish and aquatic Resources loss in habitat (e.g., spawning, rearing, juvenile, or adult habitats) from changes in water quality due to sedimentation and use of chemicals for vegetation maintenance, disturbance of aquatic resources during construction, operations, or maintenance activities, including equipment noise, erosion and sedimentation, vehicular movements, or blasting, wildlife resources loss of habitat, migratory routes/corridors, and breeding areas due to changes in vegetative cover/wetlands loss, disturbance of habitat, migratory routes/corridors and breeding areas due to project construction, operation, and maintenance, recreational use, and human settlement associated with the project (e.g., noise, vibration, illumination, vehicular movement), loss or contamination of drinking water for wildlife species, poisoning (e.g., direct contact with toxic wastes/substances), animals attracted to garbage and food waste generated at construction camps, restaurants and on-site employee housing and increased hunting.

Endangered or Threatened Species or Habitats

Potential impacts may include quantify impacts to endangered or threatened species or habitats, biodiversity and individual species (with special emphasis on endemic, rare, threatened and endangered species).

5.5.11 Social Impacts

The EIA shall assess potential positive and negative impacts to socioeconomic and cultural resources including but not limited to the followings: socioeconomic conditions, increased individual incomes, direct employment at the project, indirect employment generated by project activities, increased purchases from local businesses, other economic activities stimulated in the community as a result of the project, employment opportunities for local residents, increased tax base, displacement and relocation of current settlements, residents or community resources, Displacement or disruption of people's livelihoods (e.g., fishing, hunting, grazing, farming, forestry and tourism), public finance requirements – will more infrastructure need to be built and maintained to meet the demands of increased population in the areas of public education and public service (water, sanitation, roads, emergency services, etc.), reduction in quality of life for residents from visual and noise impacts, change in crime rate (drugs, alcohol, prostitution, etc.), change in population (temporary or permanent), change in character of community,

Positive impacts can be expected for the region due to project activities which include the infrastructure improvement, promote socioeconomic sector by creating the business opportunities for local people to provide food and water, the construction materials and other domestic use, and favor to get job opportunities for unskilled and skilled workers.

Existing tourism and recreation infrastructure, change in tourist activities, increased need for tourism and recreation infrastructure, alterations to tourism and recreation infrastructure, housing market (during construction and operation and after closure) are expected.

5.5.12 Occupational and Public Health

Human: Occupation health and safety is a minor impact during the operation of hotel facilities primarily include physical hazards such as slip and fall accidents in hotel room, lobbies and stairs or injury or illness due to repetitive exposure to work activities.

Potential impacts on occupational and public health include water-related vector diseases (malaria, dengue, etc.), health impacts of pesticide and fertilizer use, impacts on worker health and safety, identification of hazardous jobs and number of workers exposed with duration of exposure, occupational diseases due to exposure to dust and other project related activities such as handling of explosives, solvents, petroleum products, etc., and identification of physical risks and safety aspects and potential for fires.

5.5.13 Infrastructure

The increase in infrastructure development can be expected in transportation infrastructure, public

health infrastructure, communication infrastructure, and energy infrastructure.

The transportation infrastructure of the EIA addresses impacts of transportation and traffic patterns on existing roads, the impacts of new and existing roads on water quality, biological resources and land use should be addressed in those respective sections. The EIA shall assess potential impacts to transportation systems including but not limited to the followings: potential changes to traffic patterns, densities, and traffic safety issues in area affected by project, determination of vehicular traffic density in the project area (before, during, and after the proposed activities), potential for traffic accidents, congestion and noise, and potential impacts to previously inaccessible areas from improvement of roads.

The project activities may increase the need for public health infrastructure, and alterations to public health infrastructure.

Increased need for communications infrastructure and alterations to communications infrastructure can be expected.

Social infrastructure (schools, cemeteries, churches, other public buildings, communication systems and housing), increased need for additional infrastructure, alterations to social infrastructure are also expected due to project implementation.

Existing tourism and recreation infrastructure, change in tourist activities, increased need for tourism and recreation infrastructure, alterations to tourism and recreation infrastructure, housing market (during construction and operation and after closure) are expected and they may have identification of any components of the proposed project that would fall within 25- or 100-year flood plains.

5.5.14 Aesthetic and Visual Resources

Potential impacts to Aesthetic Resources, including light pollution, shall be described including but not limited to the following: impacts on visual resources and landscapes and increases in light contamination

5.5.15 Cultural, Archaeological, Ceremonial and Historic and Resources

Destruction during construction, damage and alteration, removal from historic location, introduction of visual or audible elements that diminish integrity, neglect that causes deterioration, loss of medicinal plants, loss of access to traditional use areas, damage to resources due to increased visitation promoted by the project and the impacts to previously inaccessible resources from development/improvement of roads.

Table 5.4-3 Environmental Impact and Significance

Action Affecting Environmental Resources & Value	Impacts/ Sources	Recommended Feasible Protection/ Mitigation Measures	Impact Significance			
			Significant	Significant Effect		
				Small	Moderate	Major
Air Quality	Major pollutants envisaged are Particulate Matter, Sulphur dioxide and Oxides of Nitrogen due to traffic activities and emergency operation of DG sets. Being, the operation of DG sets will only be a temporary phenomenon, it will not cause any major adverse impacts on air environment.	<ul style="list-style-type: none"> - Emission standards of the vehicles applying in the complex are of international standards. - Adequate height of stack is provided for the DG sets. 		X		
Noise and Vibration	The noise levels in the project were high due to the traffic movement within the city and further due to the usage of DG set. However, the greenbelt is provided to further attenuate the noise levels.	<ul style="list-style-type: none"> - DG sets are provided with acoustic enclosures. - Noise levels would be reduced by the use of absorbing material on roof walls and floors. - The project area would be thickly vegetated with species of rich canopy. 		X		
Water Resources and quality	<ul style="list-style-type: none"> - In order to reduce the water consumption, suitable measures are taken. For watering the plants and landscaped areas, adequately treated sewage is used, thus conserving water. -Wastewater discharge from activities during operation phase. 	The hotel should be planned to use proper wastewater drainage systems and efficient machines should be used in the laundry department and kitchen. In order to mitigate water pollution, procedures for spill preventive measures will be developed such as due care to be taken to prevent from spillage while filling diesel oil and lubricants and also adequate secondary containment will be			X	

		<p>provided for the diesel and engine oil storage containers.</p> <p>Water-saving equipment such as ultra-low flush toilets, spray nozzles, urinals, faucet aerators and low-flow shower head, infrared and ultrasonic sensor, water spigots, and pressure-control valves should be installed to reduce wastewater generation.</p>				
	<p>There is generation of surface run-off from the premises during monsoon season. The runoff is of two types i.e. run-off from the previous areas of the site and run-off from the built-up area of the complex.</p>	<p>Run-off from the Built-up area</p> <p>The run-off from the previous surfaces and built up areas of the project site is being routed through a carefully designed storm water drainage network discharging into rainwater harvesting structures provided along the boundary of the project site. Surplus storm water after percolation into ground will flow into the storm water drain and is disposed of by gravity into the existing public storm water drain adjacent to the project site.</p> <p>Run-off from other area</p> <p>The run-off from other area is being routed directly to the rainwater harvesting structures, proposed to be constructed at suitable locations as per the contours.</p>			X	
		<p>For augmenting the ground water resources in the project site, appropriate numbers of rainwater harvesting structures were constructed along the boundary of the blocks. These structures will facilitate percolation of water into the ground and thus augmenting the groundwater sources. This will result in increase in groundwater table. Only the surplus water after possible percolation into the ground is discharged into the municipal storm water drains outside the project site.</p> <p>Water harvesting connotes collection and storage of rainwater and</p>				

		also other activities aims at harvesting surface water and ground water, prevention of losses through evaporation.				
Energy Saving	Electricity is crucial for hotels, powering essential services like lighting, heating, cooling, and electronic systems. Its impact is felt in guest comfort, safety, and overall operational efficiency. A power outage can disrupt services, inconvenience guests, and affect revenue.	<p>Energy saving devices such as energy saving bulbs, intelligent door lock and energy saving switch card will be used to reduce energy consumption. As the electricity consumed for the proposed project is 160 KVA (128kWh) per year, the energy consumption for the proposed hotel area (1.9 acre) 7,689.03 m² is 0.017kWh/m² which is excellent and it is satisfactory energy consumption for the proposed hotel</p> <p>Save energy by implementing practices such as using energy-efficient lighting, appliances, and HVAC systems. Implementing key card systems to control room electricity, encouraging guests to reuse towels, and regularly maintaining equipment for optimal efficiency are effective strategies. Additionally, incorporating renewable energy sources and investing in energy management systems can contribute to long-term sustainability and cost savings.</p>			X	
Solid wastes	-Domestic solid wastes, office wastes, wastes from guests and other wastes are expected during operation phase.	<ul style="list-style-type: none"> - In order to prevent water contamination, Hotel has collected all solid waste separately and disposes of based on their types and wet and dry status. All-wet-wastes such as kitchen wastes are disposed in the underground tank measuring (L 10 ft. x W 10 ft. x H 10 ft.) The other used plastic bottles, oil containers and cans are collected-daily and-return to recycle business. - Biodegradable waste and Non-biodegradable wastes are collected using different colour coded bins and stored in garbage collection room. - Biodegradable wastes are disposed through MCDC. 			X	

		<ul style="list-style-type: none"> - The Inorganic non- biodegradable / recyclable waste like plastic paper, glasses, etc is disposed to different type of authorized vendors. - Dewatered STP sludge is treated through Organic Waste Convertor. - Dewatered ETP sludge will be sent to Authorized Recycler. 				
Traffic and Transport	<ul style="list-style-type: none"> - Increase in traffic volume due to project developments and eventual likelihood of congestion on the road network; - Random parking of vehicles and unplanned loading / unloading areas can lead to confusion. 	<ul style="list-style-type: none"> - Comprehensive traffic and travel survey to be conducted for every 5 years to monitor the characteristics and behaviour of traffic and travel respectively to consequently develop strategies for effective transportation. - Hierarchy in roads is adopted to categorize and segregate the traffic based on its size, frequency and density of traffic. 			X	
Social Economy and Livelihood	<ul style="list-style-type: none"> - certain impacts emerged which will affect the local population positively 	<ul style="list-style-type: none"> - With increasing demand for medical care, there is a strong need for enhancement of the existing infrastructure. - The unskilled local population of the adjoining areas will find job opportunities as drivers, security guards, cleaners, housekeeping etc. which will improve their economic condition. - Development of infrastructure will also take place with the coming of the project in the area. The project will involve activities like amusement, hotel, and golf club. This will enhance the existing structure and also encourage further development in the surroundings. 				
Occupational Health and Risk	<ul style="list-style-type: none"> - The construction dust and noise emissions will be affected to the construction workers. 	<ul style="list-style-type: none"> - About 100 employees will in administration and management department of the Hotel. Hotel buildings will be designed and constructed in careful consideration of physical stability, structural 			X	

		<p>load capacity, proper ventilation, lighting, fire prevention, sanitation and general safety issues, and shall comply with all relevant health and safety requirements, mainly issued by Ministry of Hotels and Tourism. To prevent and reduce of occupational health and safety, anti-slip stair tape treads should be equipped along the stair for highlighting step edge and avoid slipping. Also, qualified first-aiders will be provided at all times. A good ventilation rest room for employee is provided at a level appropriate for the purpose of the facility shown in the following figure. Food-handling, preparation and storage areas for dry and wet food are adopted to workers and guests' food hygiene.</p>				
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5.6 Impact and Mitigation Measures during Decommissioning Phase

5.6.1 Direct Impact and Mitigation and Measures

Water Pollution: The project may impact on ground water quality during decommissioning through accidental contamination.

Mitigation Measure: Contaminate water shall be reduced by discharging wastewater into existing sewer line, provision of temporary toilet for labor, using leak proof containers for storage and transportation of oil and grease, and keeping the impervious floors of oil and grease handling areas.

Noise pollution: The demolition works will lead to significant deterioration of the acoustic environment within the hotel area and the surrounding areas. This will be as a result of the noise and vibration that will be experienced as a result of demolishing the proposed Project.

Mitigation Measure: To reduce noise pollution from demolition, the noisy construction works should be planned to be during the day. The demolition machineries, generators and other equipment should be used in good condition and insulated.

Waste: Demolition of the proposed hotel and related infrastructure will result in large quantities of solid waste. The waste will contain the materials used in construction including concrete, metal, drywall, wood, glass, paints, adhesives, sealants and fasteners. Demolition waste is generally considered as less harmful to the environment since they are composed of inert materials only. In addition, even the generally non-toxic chemicals such as chloride, sodium, sulphate and ammonia which may be released as a result of leaching of demolition waste, are known to lead to degradation of groundwater quality.

Mitigation Measure: To control the waste generation by using of effective solid waste management system. Where recycling/reuse is not possible, the material should be taken to a waste disposal site.

Occupational Health and Safety: During decommissioning phase, risks of accidents and ill health as a result of demolition activities are likely to take place. Demolition workers, neighboring premises are also likely to be affected by the dust generated and other fumes generated by the demolition machines. When the project terminates the local people will become jobless and affect their income also.

Mitigation Measure: In order to control occupational health and safety, mitigate demolition workers' accidents by enforcing adherence to safety procedures and preparing contingency plan for accident response. In addition, adherence to the Occupational Health and Safety Rules and Regulations should be adopted. Appropriate personal protective equipment should be provided as well as ensuring a safe and healthy environment for demolition workers.

Public and Community Services: direct impact of CO₂ and SO₂ emission from vehicles movement of demolished materials to the project site may effect to the increasing of travel amount, time on the public and community services at the project site. Therefore, vehicles movement will be increased that could result increasing CO₂ and SO₂ emission, spill and leakage rate and accidents.

Mitigation Measure: Adoption of transport safety practices across all aspects of the project demolition with the goals of preventing traffic accidents and minimizing injuries suffered by pilgrims, tourists and local community. Mitigation measures include:

- ✓ Emphasizing safety aspects among drivers
- ✓ Improving driving skills and requiring licensing of drivers

CHAPTER 6 PUBLIC CONSULTATION AND DISCLOSURE

6.1 Methodology and Purpose

The Project Proponent (PPT) developed a preliminary Stakeholder Engagement Plan (SEP) which contained an overview of the relevant stakeholder groups to be consulted and the estimate schedule for engagement activities. During the scoping, information was disclosed to various stakeholders, which included:

- Brief details about the Project;
- EIA process, study and measures;
- Purpose of the consultations;
- Expectations from the local stakeholders in regards to the consultation etc.; and
- The likely adverse impacts to the public and/or environment.

The meeting was conducted at the regional level and was structured as follows:

- Presentation of Project and Project Proponent (in Myanmar language);
- Presentation of the proposed EIA study and measures; and
- Question and Answer Session.

6.2 Stakeholder Engagement Plan

The preliminary stakeholder identification and analysis will need to be further consolidated and based around a detailed stakeholder consultation programme during the EIA Study. The importance of such an analysis lies in the role played by such an understanding in the assessment of the socio-political environment surrounding the Project. It allows for:

- Identification of key stakeholders, their primary groupings and sub-groupings;
- Identification of the interests, concerns and potential risks surrounding the stakeholders, as well as conflicts of interests (if any);
- Identification of key groups/ individuals who need to be informed about the Project;
- Identification of the impact and influence of the Project on the stakeholders and of the stakeholders on the Project;
- Generation of information essential to the planning, implementation and monitoring of the Project; and

- Development of a framework for participatory planning and implementation of various Project activities.

The process of stakeholder identification and analysis should allow for the formulation of a robust engagement strategy, which will then provide opportunity for the concerned stakeholders to be involved in the process of identification of areas of concerns as well as formulation of mitigation strategies for the same. This in turn should allow for the stakeholders to develop an understanding of the Project as well as the maintenance of positive relations between stakeholders and the Project Proponent.

Potentially relevant stakeholders and potentially affected communities are identified through a preliminary site visit, discussions with Irrigation and Water Utilization Management Department and a review of Google Earth imagery. A top-down approach is followed; firstly, the national level stakeholder will be consulted and contacted such as Regional, District and Township GADs. These discussions will allow the survey team to gain permission to enter the villages and also helped to map out which villages are closest to the Project Site and could be potentially affected. The stakeholder engagement plan is provided in **Table**.

Table 6.2-1 Stakeholder Engagement Plan

Level	Stakeholder Group	Purpose of Engagement	Method of Engagement
National	Ministry of Natural Resource and Environmental Conservation (MONREC);	<ul style="list-style-type: none"> • Seek clarity on the expectations on stakeholder engagement and disclosure; • Get necessary permission and contacts to engage with government departments at different levels as well as to hold consultations in the Study Area; and • Get access to useful data from 	Letter

Regional	<ul style="list-style-type: none"> • Mandalay Regional Government • Mandalay City Development Committee • District and Township General Administration • Department (GAD); • Irrigation, Water Utilization Management • Department 	<ul style="list-style-type: none"> • Seek expectations on stakeholder engagement and disclosure; • Seek introductory letters to meet various government departments and agencies; • Seek clarity on the range of permission and approvals required at different levels of regional government; • Obtain regional level data and information; 	Meeting
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Table 6.2-2 Stakeholder Engagement Plan

Level	Stakeholder Group	Purpose of Engagement	Method of Engagement
National Level	Government Authorities concerning on Project License and relevant project permissions	<ul style="list-style-type: none"> • Seek an understanding of the requirements and plan for government presence/participation in 	Meeting/Official Letter
District/ Township	<ul style="list-style-type: none"> • District/ Township Administration Department • District/Township Farmland Management Committee; • District Environmental Conservation • Department (ECD); • Related Governmental 	<ul style="list-style-type: none"> • Seek instructions for obtaining telephone numbers from GAD departments • Obtain necessary local permissions for telephone interviews at local level; • Provide an understanding of the specific issues and stakeholder concerns at the local level; 	Meeting/ Telephone
Village Tract / Village	<ul style="list-style-type: none"> • Village/ward Leaders, • Community Opinion Leaders; • Local community; and 	<ul style="list-style-type: none"> • Obtain information on local potential • impacts from the Project; and 	Meeting/ Telephone

For the public consultation meetings, one session of PCM are planned at a venue on one day in Meeting Room, Ye Dagon Taung City Show Room, Patheingyi Township, and Mandalay Region. The venue was selected in terms of easy accessibility from villages in and around project area and the meeting room capacity of the building. The public consultation meeting for the Project is show in **Table**.

The project proponent prepared the invitation letter in Myanmar language and announced to the invitees, who are villagers, and relevant governmental organizations, and anyone who are interested.

Table 6.2-3 Stakeholder Engagement Selection

No.	Region	District/Township
1	Mandalay Region	<ul style="list-style-type: none"> • AungMyay Tharzan District • Patheingyi Township

Basically, information on the meeting was announced to the invitees one week in advance before the meeting by sending invitation letters to the respective invitees. Afterward, the information on the meeting under the village level was requested to be disseminated by village tract heads of the respective villages in accordance with local practice.

6.3 Public Consultation Meeting during Scoping Stage

The Golf Course and Club House Project is one of the sub-project of Ye Dagon Taung Master Plan Project therefore, the Public Consultation and Stakeholder Meeting were done at once for all project packages.

Overall, it is important that engagement with stakeholders will start at the early stages of the planned project and the EIA process. Therefore, the PCM was conducted according to the requirements on the focus list of the following activities (World Bank, 2010);

- Initial announcements about the scoping process through GAD office to relevant government departments, wards administration and residents;
- Posting notices announcing the scoping process at the site, in the project site and at the offices of local authorities;
- Preparing a leaflet or brochure about the project giving brief details of what is proposed with a plan or map, describing the EIA process and the purpose of scoping, and inviting comments;
- Distributing letters or questionnaires to potentially interested organizations;
- Telephone discussions or meetings with key organizations, groups or individuals;
- Focus Group Discussion and public meetings (it may be helpful to invite an independent person to chair public meetings);

6.3.1 Tools Supported and Document Preparation for the PCM

Table 6.3-1 Tools used for Stakeholder Consultations

Checklists/Tools	Purpose
Presentation	Approximately 20 slides which include information on the Project Proponent, information on the Project activities and timeline, potential impacts and mitigation, and contacts details.
Maps and other visual tools	A large map that shows the Study Area used during meetings to discuss potential impacts and locations of key documents.

6.3.2 Stakeholders Participation and Details of Consultation Meeting

Township level stakeholders with Township General Administrative Department, GAD, Mandalay City Development Committee, MCDC and communities joined the meeting.

The consultation was structured as follows:

- Presentation of Project and Project Proponent (in Myanmar language);
- Presentation of the proposed EIA study and measures; and
- Question and Answer Session.

Table 6.3-2 Details of Consultation Meeting during Scoping Stage

Date:	1-10-2021
Time:	1:00 pm – 2:00 pm
Venue:	Meeting Room, Ye Dagon Taung City Show Room
Attendees:	Administrator, General Administrative Department Officers from MCDC REM Consultants General Manager, Ye Dagon Taung Project AGM, PPT Managers of Ye Dagon Taung Project
Objective:	Ye Dagon Taung City Project’ Description and Objectives of Scoping stage study
U Aung Kyaw , Administrative Dept, Ye Dagon Taung City Project	Implementation between Mandalay City Development Committee and Phwint Phyto Thit Company Limited 1. On 22 June 2015, a Memorandum of Understanding (MOU) for a partnership was signed between Mandalay City Development

	<p>Course, Club House, Amusement Park and Business Buildings and Villas in Patheingyi Township, Mandalay Division. Coordination of a Memorandum of Agreement (MOA) was made on 11 February, 2016 with the recommendation of Union Attorney General’s Office.</p> <p>Receiving Permission from Myanmar Investment Commission (MIC)</p> <p>Myanmar Investment Commission (MIC) gave permissions on 11 November, 2016 for Hotel service project with Permission Number: Ma Na Tha- 1216/2016, for Ye Dagon Taung Candidate School with Permission Number: Ma Na Tha- 1218/2016, for Ye Dagon Taung International Hospital with Permission Number: Ma Na Tha- 1219/2016, for Ye Dagon Taung Candidate School with Permission Number: Ma Na Tha- 1218/2016. Construction period is defined as 2 years for them.</p> <p>Permission Number: Ma Na Tha- 1233/2017 for Ye Dagon Taung International Golf Course, Club House, Amusement Park and Permission Number: Ma Na Tha- 1234/2017 for Construction and renting of Ye Dagon Taung Business Buildings and Villas were given by MIC on 15 January, 2017. Project implementation within 1 year and construction period is defined as 4 years for them.</p> <p>Finished Solving Squatter Cases within Project Area</p> <p>Even though Phwint Phyo Thit Company wanted to start implementation within 6 months from the last permission date of MIC (15 January, 2017), project implementation could not start because there were some squatters and disturbances within project area. The company reported this situation to Mandalay Region Government and Mandalay City Development Committee to take responsibility according to the regulations in the contract. France Engineers were hired during this time to prepare project architecture and engineering designs, detail construction designs with coordination of Mandalay Region Government, Mandalay City Development Committee and Phwint Phyo Thit Company. Moreover, 17 machineries for construction were imported under MIC permission license and arrived</p>		
	No.	Project	Completion (%)
	(a)	Hotel Service Project	0%
	(b)	International Standardized School Project	0.1%

	(c)	International Standardized Hospital Project	0%															
	(d)	Golf Course, Club House, Amusement Park Project	1.1%															
	(e)	Construction and Leasing of Business and Residential Buildings Complex Project	3.1%															
<p>Environmental Impact Assessment for Ye Dagon Taung City Project</p> <p>5. A third party organization named Resources and Environment Myanmar (REM) was appointed to carry out Environmental Impact Assessment (EIA) for Ye Dagon Taung City Project with the guidelines of Environmental Conservation Department (ECD), Ministry of Natural Resources and Environmental Conservation.</p>																		
Daw Khin Ohnmar Htwe Director, REM	<p>Approximately 20 slides for Scoping stage which include information on the Project Proponent, information on the Project activities and timeline, potential impacts and mitigation, and contacts details.</p> <p>The area of project area is 547.80 acres.</p> <p>REM will study the three EIAs and one IEE. They are as follows;</p> <table border="1"> <thead> <tr> <th>No.</th> <th>Project</th> <th>EIA/ IEE</th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>Hotel Service Project</td> <td>EIA</td> </tr> <tr> <td>(b)</td> <td>Golf Course, Club House, Amusement Park Project</td> <td>EIA</td> </tr> <tr> <td>(c)</td> <td>Construction and renting of Business Buildings and Villas Project</td> <td>EIA</td> </tr> <tr> <td>(d)</td> <td>International Hospital Project</td> <td>IEE</td> </tr> </tbody> </table>			No.	Project	EIA/ IEE	(a)	Hotel Service Project	EIA	(b)	Golf Course, Club House, Amusement Park Project	EIA	(c)	Construction and renting of Business Buildings and Villas Project	EIA	(d)	International Hospital Project	IEE
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(d)	International Hospital Project	IEE																
Questions and Answers																		
U Myint Oo, Administrator Patheingyi, Township, Mandalay Region	<p>Question: How would you measure water quality conditions? Seasonally or not?</p> <p>How does construction work measure the drainage?</p>																	
Daw Khin Ohnmar Htwe Director, REM	<p>Answer: Water quality will be measured by sample points representing for both rainy season and summer season. Ground water quality will be measured in both seasons. Quality of water from Sedawgyi Canal which is nearby the project site will also be tested.</p>																	

U Myint Oo, Administrator Patheingyi, Township, Mandalay Region	<p>Question: How many housing units in Villa Project? What is the source of water supply for this villa? If the project uses Sedawgyi canal water, how the project will manage water supply for the long term period?</p> <p>Answer: There will be 5000 housing units there. We will use the water resources from Sedawgyi Canal, Myitnge River and ground water.</p>
U Aung Kyaw , Manager	
Administrative Dept, Ye Dagun Taung City Project	
U Myint Oo, Administrator Patheingyi, Township, Mandalay	<p>Question: How would you conserve native fauna such as monkeys? The project should emphasize SIA and should listen to the public voices. Township Administrative Department would cooperate to get official data and to manage security concerns. And then Township Administrative Department would like to suggest MCDC to participate in the road development sector and communication facilities.</p> <p>Answer: Of course. REM will inform to GAD before conduction field observation and data collection. Disclosure plan of the project will also be launched in official web page of the project related company.</p>
Daw Khin Ohnmar Htwe Director, REM	
Daw Khin Pyone Lwin, Officer, MCDC	In this meeting, representative of MCDC only belong to Garden Department. Representative from Water and Sanitary Department of MCDC will attend in the next meeting.
U Aung Linn, AGM, Ye Dagun Taung City Project	U Aung Linn explained about CSR programmes during construction period. These included <ul style="list-style-type: none"> - Spent 2.2 billion kyats for CSR programmes to local people - Spent 3.5 billion kyats for main road (6 lanes) construction from the project site to Junction of Aungpinle (2018-2019 to 2020-
U Thant Zin Oo, GM, Ye Dagun Taung City Project	U Thant Zin Oo explained about water resources near the project area. <ul style="list-style-type: none"> - It is observed that there is a water fall near the project area but it appears once in only 2 or 3 years when the rain is heavy in PyinOoLwin area. - Access road to the project is 3.47 miles from the project site and
<p>U Myint Oo, Administrator, Patheingyi Township gave concluding remarks as follows.</p> <ul style="list-style-type: none"> - It is necessary to continue consultation meeting for sustainable development. - It is one of the encouragements for the development of Patheingyi Township. Therefore, it is 	

necessary to consider the sustainability.

- The project will also be the main development area of Mandalay City also. Therefore, it is better to consider sustainability of the project and to consider the strategic view point of CSR programmes.

Meeting was successfully completed.



Figure 6.3-1 Photographic Records of Stakeholder Consultation Meeting

Table 6.3-3 List of Attendees (1-10-2021)

N o	Name	Section/Department	Phone Number
1.	Daw Mon Mon	Branch Head (Parks, Garden and Play Ground department)	09-2019395
2.	Daw Hnin Theingi	Section Head (Parks, Garden and Play Ground department)	09-402578307
3.	Daw Khin Lay Nwe	In Change (Parks, Garden and Play Ground department)	09-2052133
4.	Daw Khin Ohnmar Htwe	Director (REM)	09-798546232
5.	Dr.Saw Pyone Naing	Principle Consultant (REM)	09-977788825

6.	Daw Hay Mar Htet Naing	Consultant (REM)	09-970433415
7.	U Thant Zin Oo	General Manger	09-5121451
8.	U Ohnm Maung	Manager (Maintaince)	09-251170809
9.	U Aung Linn	A.G.M (PPT)	09-450055314
10	U Kyaw Kyaw Swe	Manger (Management Manager)	09-421711859
11	U Aung Kyaw	Admin Department	09-970365416
12	U Khin Pyone Lwin	Engineering Department	09-977293841
13	Daw Win Win Maw	Sales & Marketing	09-797770717
14	Daw Htay Htay Myint	Engineer Department	09-444009925
15	Daw May Pwint Thu Aye	HR Department	09-448546904
16	U Myint Oo	Administrator	09-254082322
17	U Thein San	Yae Kyi Village	09-420621858
18	U Paing Soe	Yae Kyi Village	09-777811859

6.4 Public Consultation Meeting (PCM) at the EIA Stage

Public consultations with the three identified categories of stakeholders were held on 30th January 2024. The meeting dates, group of agencies, and number of participants are given in Table 6.4-1. Minutes of meeting and list of participants in each meeting are shown in below.

Table 6.4-2 Meeting with Projects Stakeholders

Meeting Dates	Stakeholders	Number of Participants
30 th January 2024	Patheingyi Township	
	1.Government officials	5
	2.Project Proponent's representatives	5
	3.EIA Consultant (TEAM)	4
	4. Local people	16
	Total	30

6.4.1 Summary of the Outcomes of PCMs at the EIA Stage

Four PCMs were organized on 30th January 2024 a Meeting Room, Ye Dagon Taung City Show Room. In the consultation meeting, after the explanation on the project plan, the expected key environmental and social benefits as well as major positive and negative environmental and social impacts analyzed in the draft EIA report were explained. In addition, findings of the EIA study and further schedule of the EIA

were presented to the participants. All the meeting was ended with the question and answer session. As a whole, about 4 suggestions were raised from the participants and discussed with the project proponent and representatives from REM.

6.4.2 Summary of Comments from PCMs at the EIA Stage

The following topics and concerns have been discussed and collected during the meetings:

- Establish the own fire station
- Control the workers to stay with discipline
- Concerns about garbage within the surrounding environment.

The detailed of minutes of meeting and power point presentation used in public consultation meeting are presented in below and Annex.

Table 6.4-3 Summary of the Outcomes of PCMs at the EIA Stage

Date:	30-1-2024
Time:	10:00 pm – 12:00 pm
Venue:	Meeting Room, Ye Dagon Taung City Show Room
Attendees:	<ul style="list-style-type: none"> - Administrator, General Administrative Department , Patheingyi Township - Department of Rural Development, - Fire department Patheingyi Township - Environmental Conservation Department (Zoom Meeting) - Administrator of YayKyi Village Group - REM Consultants - Ye Da Gyun Taung Project General Manager; - Managers of Ye Da Gyun Taung Project - Ye Da Gyun Taung Project HR Department - Ye Da Gyun Taung Project Sales & Marketing Department - YayKyi villagers
Objective:	Ye Dagon Taung City Project' Description and Objectives of EIA stages study
U Thet Lwin Swe Deputy (CEO) Ye Da Gyun Taung Project	Opening remarks and explanation of the contents of the Ye Da Gyun Taung Project
U D Hlaing Zaw (Consultant)	Each of the 3 project was explained with presentation slides including project content; existing environmental data results; project impacts and mitigation

Project	measures methods; Environmental management plans were explained.													
Manager, REM	<table border="1"> <thead> <tr> <th>No.</th> <th>Project</th> <th>EIA</th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>Hotel Service Project</td> <td>EIA</td> </tr> <tr> <td>(b)</td> <td>Golf Course, Club House, Amusement Park Project</td> <td>EIA</td> </tr> <tr> <td>(c)</td> <td>Construction and renting of Business Buildings and Villas Project</td> <td>EIA</td> </tr> </tbody> </table>	No.	Project	EIA	(a)	Hotel Service Project	EIA	(b)	Golf Course, Club House, Amusement Park Project	EIA	(c)	Construction and renting of Business Buildings and Villas Project	EIA	
No.	Project	EIA												
(a)	Hotel Service Project	EIA												
(b)	Golf Course, Club House, Amusement Park Project	EIA												
(c)	Construction and renting of Business Buildings and Villas Project	EIA												
A large map that shows the Study Area used during meetings to discuss potential impacts and locations of key documents.														
Question and Answer														
U Thein Lwin Oo YayKyi village administrator,	Question: I want the families of the surrounding villages to be considered first when projects are being carried out and employment opportunities are available. During the construction period, I would like to suggest that the													
U D Hlaing Zaw (Consultant) Project Manager, REM	worker who are working in this area so that they should stay disciplined and for security reasons. They are from different places and they are not from this place. Therefore, it is very difficult to manage them, so I want them to do it systematically.													
I don't understand about environment issues. However, I would like to proceed systematically in accordance with the instructions of the responsible departments.														
Answer: Follow as per suggestion.														
U Than Tun Deputy Township Officer Pathein Gyi District, Mandalay Region	Question: Greetings to all the parents who came.													
U D Hlaing Zaw (Consultant) Project Manager, REM	I am the deputy Township Officer of Pathein Gyi District. I attended because the governor could not attend. All of the three projects discussed by the earlier, the golf course project, housing project and the hotel project I am not worried about and there is fewer the main environmental protection issue in those projects. If it is maintained as it is now, it will be a very good project; there will be no environmental pollution, and the cleanliness of the water that the discussed earlier will be good if the septic tanks are maintained with the BOD system that said earlier.													
Since this is a housing project, there is no need to worry about the waste water coming out like the factory. Also, I don't think there is a low standard of people who will come here, and the loss of species such as environmental damage is not possible. The monkeys around here are also monasteries at the under of mountain, so it is impossible for them to disappear. That can't be impact on it, Air pollution is not possible,														
The main problem we have to face is that if the people here throw their garbage														

	<p>in a line that does will be fine. Neither wind nor sound has anything to say. If you will be management for garbage that will be better.</p> <p>Answer ,, thank you very much,,</p>
<p>U Min Thanat Fire department, Pathein Gyi Township, Mandalay Region</p>	<p>Question: There is law enforcement in the Myanmar Fire Brigade section. ,, According to Section 18, relevant government departments and organizations for the construction or development of project. If we are going to develop the projects, we will take the opinion of the specialized fire department when dealing with fire safety issues. When working on projects, we would like to follow the comments of the fire safety department.</p>
<p>U D Hlaing Zaw (Consultant) Project Manager, REM</p>	<p>The second point is that when working on projects, we would like to strictly follow the rules of the relevant fire department and pay attention to fire safety. Since this place is about 3 miles away from the fire station, I would like to suggest a separate fire brigade should be developing if available. I would like to suggest that we would like to put FIRE STATIONS for the hotels after finished the full projects.</p> <p>Answer ,, thank you very much,,</p>
<p>U Than Tun Deputy Township Officer Pathein Gyi District, Mandalay Region</p>	<p>I would like not to employ foreigners for the job, but to give job opportunity for Myanmar people and the people around the project a special job.</p>

EIA အစည်းအဝေးပွဲသို့ တက်ရောက်သည့် လူကြီးများစာရင်း

စဉ်	အမည်	ရာထူး/ဌာန	ဖုန်းနံပါတ်	မှတ်ချက်
၁	ဦးသန်းထွန်း	၃/ဦးစီး	09-421741823	အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ပုသိမ်ကြီးမြို့နယ်။
၂	ဦးစန်းယုလွင်	မြို့နယ်မှူး	09-250990250	ကျေးလက်ဒေသဖွံ့ဖြိုးရေးဦးစီးဌာန၊ ပုသိမ်ကြီးမြို့နယ်။
၃	ဦးမင်းသန့်	ဦးစီးအရာရှိ	09-256113896	ပိသတ်ဦးစီးဌာန၊ ပုသိမ်ကြီးမြို့နယ်။
၄	ဒေါ်အေးမြတ်ထွန်း	ဦးစီးအရာရှိ		ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ မန္တလေးတိုင်းဒေသကြီး၊ Zoon မြင့်တက်ရောက်။
၅	ဦးသိန်းလွင်ဦး	ရပ်/ကျေးအုပ်ချုပ်ရေးမှူး	09-259141846	ရေကြည်ကျေးရွာအုပ်စု အုပ်ချုပ်ရေးမှူး။
၆	ဦးစိန်သောင်း	ရပ်မိရပ်မ	09-794624036	ရေကြည်ကျေးရွာ။
၇	ဦးသောင်းတင်	ရပ်မိရပ်မ	09-789372186	ရေကြည်ကျေးရွာ။
၈	ဦးကျော်စိုး	ရပ်မိရပ်မ	09-2063758	ရေကြည်ကျေးရွာ။
၉	ဦးသန့်ဇင်ဦး	ဗိုလ်မှူးကြီး		
၁၀	ဦးကျော်ကျော်ဆွေ	ဗိုလ်ကြီး	09-421711859	
၁၁	ဦးသက်လွင်ဆွေ	Deputy CEO	09-253092406	
၁၂	ဦးအောင်ကျော်		09-970365416	
၁၃	ဦးကျော်ဝင်း	အထွေထွေမန်နေဂျာ	09-256439278, 09-773719870	
၁၄				
၁၅				

EIA အစည်းအဝေးတက်ရောက်ရွာသူ/ရွာသားများ စာရင်း

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁	ဦးရဲသူဝင်း		
၂	ဦးကျော်ကျော်နိုင်		
၃	ဦးအေးကြူ		
၄	ဦးဝင်းညွန့်အောင်		
၅	ဒေါ်မြိုးမြိုးဝင်း		
၆	ဦးအေးကျော်		
၇	ဦးဆန်းညွန့်		
၈	ဦးမောင်ဝင်း		
၉	ဦးခင်မောင်ဌေး		
၁၀	ဦးကိုကိုနိုင်		
၁၁	ဦးနိုင်လင်း		
၁၂	ဦးကျော်သူဌေး		
၁၃	ဦးအောင်သူလင်း		
၁၄	ဦးစံရွှေ		
၁၅	ဦးမျိုးမြင့်ဝင်း		

၁၆	ဦးမျိုးမင်းထိုက်		
၁၇	ဦးမောင်ယဉ်ထွေး		
၁၈	ဦးမျိုးခန့်		
၁၉	ဦးကျော်ထိုက်		
၂၀	ဒေါ်မိမိအောင်		
၂၁	ဒေါ်နွဲ့နွဲ့နိုင်		
၂၂	ဒေါ်ဝန်းဥက္ကလှိုင်		
၂၃	ဒေါ်ရီမြင့်		
၂၄	ဒေါ်ဌေးဌေးဝင်း		
၂၅	ဒေါ်နန်းမွန်နီဦး		
၂၆	ဒေါ်နန်းလှိုင်ဦး		







Figure 6.3-2 Photographic Records of Stakeholder Consultation Meeting (EIA Stage)

6.5 Future Plan for Stakeholders and Public Consultation Meetings

- Public consultation activities should be conducted throughout all the stages of the project.
- The establishment and operation of GRM (Grievance Redress Mechanism) is highly recommended as a vital consultation activity.
- Monitoring by the project proponent and external agents/specialists should include both regular and ad-hoc consultations and discussions with diverse stakeholders of the project, especially project-affected people, in order to supervise environmental and social performances and to manage unexpected impacts, if any.
- Installation of comment boxes at GAD offices of each village could be a good means of collecting opinions, concerns, and feedback from local communities, with timely delivery to the project proponent the local government, and the Contractor for construction.
- Last but not least, public consultation during the project is to be carried out and improved in

accordance.

6.6 Grievance Redress Mechanism (GRM)



အကြံပြုလွှာတောင်းခံခြင်း

မန္တလေးတိုင်းဒေသကြီး၊ ပုသိမ်ကြီးမြို့နယ်တွင် မန္တလေးမြို့တော်စည်ပင်သာယာရေးကော်မတီနှင့် ဖွံ့ဖြိုးသစ်ကုမ္ပဏီတို့ ပူးပေါင်း အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိသည့်

ရေတံခွန်တောင်စီးတီးစီမံကိန်း (YE DAGUN TAUNG CITY PROJECT)အား ပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်းအစီရင်ခံစာ ကို မြန်မာနိုင်ငံမှ Resource and Environment Myanmar Co., Ltd. (REM)နှင့် တွဲဖက်ဆောင်ရွက်မည်ဖြစ်ပြီး ပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်းအစီရင်ခံစာအတွက် သက်ဆိုင်သူများနှင့်တွေ့ဆုံခြင်းအစည်းအဝေးကို (၁.၁၀.၂၀၂၁) ရက်နေ့တွင် ဆောင်ရွက်ခဲ့ပါသည်။

သို့ဖြစ်ပါ၍ ရေတံခွန်တောင်စီးတီးစီမံကိန်း (YE DAGUN TAUNG CITY PROJECT)နှင့် ပတ်သက်သော အကြံဉာဏ်များပေးပို့လိုပါက ဖွံ့ဖြိုးသစ်ကုမ္ပဏီ၏ phwintphyothit.com website ၏ chat box တွင်လည်းကောင်း၊ info@phwintphyothit.com သို့လည်းကောင်း အကြံပြုစာများ ရေးသားပေးပို့နိုင်ပါသည်။

Contact
Send us message

6.6.1 Introduction

Grievance redress mechanism (GRMs) is an integrated system consisting of institutions, instruments, methods, and processes to settle down grievances from diverse stakeholders with regard to the project. Grievances and dissatisfactions about the actual and perceived impacts of development projects are normally raised by project affected people or communities who are adversely influenced by such projects. These grievances usually stem from physical, situational, and social losses and can be imposed on the project developer at different stages of the project cycle.

GRM for the present project will also be implemented with establishment Grievance Redress Committees (GRCs). GRM provides a predictable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, and lasting. The specific procedures receiving complaints shall be prepared in advance, and all details of purpose, investigation, analysis and response of complaints shall be recorded in the Grievance Redress System (GRS).

6.6.2 Guidelines for GRM Establishment

GRM needs to be mutually beneficial in ways that grievances and dissatisfactions could be easily raised and enough hearing should be provided and that satisfactory solutions should be identified (ADB, 2010).

Since there is no legal procedure related with grievance redress mechanism in Myanmar EIA procedure

(2015), the project proponent shall follow the best international practices to cope with grievances and facilitate the resolution process.

Purpose

Phwint Phyo Thit Co., Ltd. will be responsible for establishing the Grievance Redress Mechanism and setting the contact point at the place where the project will be located; and ensuring the stakeholders get informed about the GRM. The main purpose of GRM is to create a platform where grievances and complaints from PAPs due to the project could be collected and the finest resolutions for such grievances and complaints could be identified and conducted.

Objectives

The objectives are:

- To prevent any potential disputes among diverse stakeholders, especially PAPs
- To register and resolve the grievances and complaints of the project affected people
- To promote transparency and accountability during the project implementation
- To deter fraud and corruption
- To mitigate adverse impacts and potential risks from the project

During the impact assessment and mitigation phase, stakeholder participation has the following roles and contributions:

- To identify specific impacts relevant for the stakeholders' groups;
- To explore cumulative impacts on stakeholders' groups that are caused in conjunction with already ongoing other developments and projects in the area;
- To review, modify, add and remove mitigation measures that are not relevant or effective to address the impacts of the development based on the stakeholders' views;
- To review together with stakeholders, the environmental management plans and other relevant plans;
- Agree on the follow-up in terms of regular review, sharing outcomes of monitoring and other means as agreed with the stakeholders; and
- Finally, to document the outcomes of the conclusions and place them in the EIA.

CHAPTER 7 ENVIRONMENTL MANAGEMENT AND MONITORING PLANS

The EIA shall include an Environmental Management and Monitoring Plans to prevent, mitigate and monitor each impact identified in the EIA. Plans will describe actions to be taken in sufficient detail to provide a basis for subsequent auditing of compliance with commitments made in the EIA process including who is responsible, how and when it will be implemented, what will be done and what results will be achieved, why it is being done, and how to know whether it is effective in addressing the underlying concerns.

The Environmental Management Plan shall have the following elements such as overview of Environmental Management Plan Organization and Policy, the project management and how environmental management and organization relates to overall project responsibility with the specified personnel and performance accountability system for design, operation, maintenance and closure for implementation of mitigation and monitoring measures.

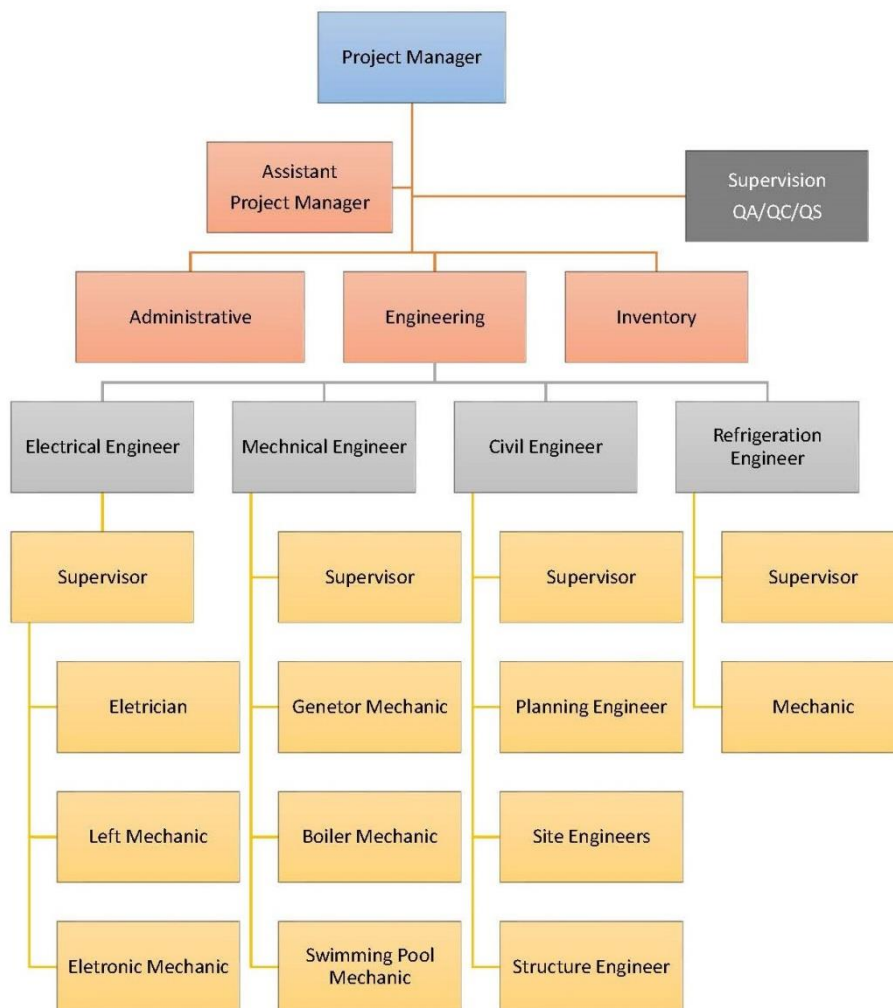


Figure 7.1- 1 Organization Chart for EMP Implementation

The monitoring plan must include monitoring throughout the life of the project for each potential mitigation to confirm the effectiveness of the measure and support contingency plans to provide assurance that the project, at the site preparation, construction, operation, expansion, and closure stages will meet applicable environmental requirements/standards by law and fall within the limits of impacts deemed acceptable upon approval of the EIA.

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
Construction Phase: In this phase, the activities of buildings' construction are, for example, construction of guest rooms, office, quarter for staff and workers, guard post, retaining walls and clear water tank etc.						
Direct Impact						
Water Quality	All construction sites	The following mitigation measures should be taken: <ul style="list-style-type: none"> ✓ Contaminate water shall be reduced by avoiding earthwork in rainy season, and the proper wastewater drainage system shall be provided ✓ Temporary toilet should be provided for labors ✓ Leak proof containers should be used for storage and transportation of oil and grease, and keeping the impervious floors of oil and grease handling areas. 	Throughout Construction period	30lakhs	Construction company supervisor	HSE Coordinator
Soil Erosion and Landslide	All construction site	<ul style="list-style-type: none"> ✓ prevention of soil contamination by oil or grease spills, leakages or releases, all manipulations of oil derivate in the process of construction and provision of fuel to the machines should be performed with maximum attention; ✓ it must be prohibited to operate with equipment and vehicles outside the designated work areas and roads; 	Throughout Construction period	20lakhs	Construction company/ supervisor	HSE Coordinator
Ail quality	All construction site	<ul style="list-style-type: none"> ✓ Cover or control equipment should be used such as spraying water, bag house in the material handling process. ✓ All machineries and equipment shall have effective engines and exhaust systems so as to maintain exhaust 	Throughout Construction period	50lakhs	Construction company/ supervisor	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		emissions within permissible limit. ✓ Open burning of waste materials shall not be allowed.				
Noise pollution	All construction site	<ul style="list-style-type: none"> ✓ Construction work should be completed in as short a period by assigning qualified engineers and supervisors. ✓ Construction works should also be confined to daytime hours. ✓ Noise control devices should be applied such as temporary noise barriers and deflectors for impact blasting activities, and exhaust muffling devices for combustion engines. ✓ For generator, noise enclosure should be built. 	Throughout Construction period	10lakhs	Construction company/ supervisor	HSE Coordinator
Waste	All construction site	<p>To reduce and control of these waste disposal,</p> <ul style="list-style-type: none"> ✓ Construction activities should be conducted with the use of appropriate health and safety procedures in accordance with the regulatory requirements. ✓ Some types of the waste should be land filling, some be reused and some be recycled. 	Throughout Construction period	30lakhs	Construction company/ supervisor	HSE Coordinator
Floral	All construction site	<ul style="list-style-type: none"> ✓ Where possible the design and the site construction team should seek to retain the trees, reducing the visual impact as possible. ✓ The project alignment should be carefully selected to minimize potential adverse impacts on the 	Throughout Construction period	50lakhs	Construction company/ supervisor	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		environment and surrounding communities.				
Occupational health and safety	All construction site	<p>For management of occupational health and safety,</p> <ul style="list-style-type: none"> ✓ The representative of project proponent should a health and safety management plan for the construction workers based on the EMP. ✓ Posters shown in Myanmar language and any other language appropriate for the contractors drawing attention to relevant health regulations should be made or obtained from the appropriate sources and be displayed prominently at the site. ✓ Personal Protective Equipment such as safety gloves, helmets, goggles, earmuffs etc., be provided during construction. ✓ For the safety of construction staff, adequate safety measures including availability of first-aid facilities are implemented on the project site. 	Throughout Construction period	30lakhs	Construction company/supervisor	HSE Coordinator
Indirect Impact						
Public and community services	Along the vehicles route	<p>Mitigation measures include:</p> <ul style="list-style-type: none"> ✓ Emphasizing safety aspects among drivers ✓ Improving driving skills and requiring of drivers ✓ Adopting limits for trip duration and arranging driver rosters to avoid overtiredness and fatigue ✓ Avoiding dangerous routes and times of day to reduce 	Throughout Construction period	30lakhs	Construction company/supervisor	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		the risk of accidents				
Wildlife impact	All construction site	✓ Noise impact from construction machineries and traffic. Light at night time.	Throughout Construction period	20lakhs	Construction company/ supervisor	HSE Coordinator
Cumulative Impact						
Cumulative air, water and energy conservation and waste impact	In the vicinity of the project site	The mitigation measures are as follows: ✓ Environmental awareness talks should be provided with the cooperation of hotels in the vicinity of the Hotel.	Throughout Construction period	50lakhs	Construction company/ supervisor	HSE Coordinator and ABM company
Operation/ Hotel Service Phase: The main project activities of hotel services and maintenance are, hotel rooms services for guests, restaurants, bar, meeting, travel and communication.						
Direct Impact						
Water conservation	Laundry, kitchen and guest rooms	✓ The hotel should be planned to use proper wastewater drainage and efficient machines should be used in the laundry department and kitchen. ✓ Procedures for spill preventive measures will be developed such as due care to be taken to prevent from spillage while filling diesel oil and lubricants and also adequate secondary containment will be provided for the diesel and engine oil storage containers. ✓ Water-saving equipment such as ultra-low flush toilets, spray nozzles, urinals, faucet aerators and low-flow shower head, infrared and ultrasonic sensor,	Throughout Operation period	30lakhs	General manager and proponent	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		water spigots, and pressure-control valves should be installed to reduce wastewater generation.				
Energy conservation	All the proposed hotel site	<ul style="list-style-type: none"> ✓ Energy saving devices such as energy saving bulbs, intelligent door lock and energy saving switch card will be used to reduce energy consumption. ✓ Auto switching off electrical equipment will be installed to control energy conservation. 	Throughout Operation period	10lakhs	General manager and proponent	HSE Coordinator
Soil quality and structure	All the proposed hotel site	<ul style="list-style-type: none"> ✓ Install grey water treatment plant. Proper treatments are given before discharging into channels. Standard septic type toilets of well-lit, well-cleaned and well-maintained will be used. ✓ Use of the grease trap from the wastewater from kitchen before bio-tank. ✓ Special cautions shall be taken to make sure that the septic tanks are not overloaded. ✓ Regular monitoring and maintain the bio-tank for final disposal of sewage& sludge. 	Throughout Operation	10lakhs	General manager and proponent	HSE Coordinator
Air quality	All the proposed hotel site	<ul style="list-style-type: none"> ✓ Burning of rubber and plastic shall not be allowed at the incinerator and the best combustion practice shall be applied. ✓ Turn off the engine while not in use ✓ advance machines, equipment and methods are utilized to minimize air pollutions, such as covering 	Throughout Operation period	0lakhs	General manager and proponent	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		<p>machines, watering accessible road</p> <ul style="list-style-type: none"> ✓ regular inspection and maintenance of generator are carried out to maintain a good operational condition; ✓ sprinkle the road used for material transportation; 				
Noise	Visitor rest place, kitchen and landscaping	<ul style="list-style-type: none"> ✓ Windows with sound-reduction materials should be installed. ✓ As biological control of noise impact of the proposed hotel, the investor has greening and landscaping plan including planting trees at the perimeter of the boundary line. 	Throughout Operation period	10lakhs	Hotel general manager and proponent	HSE Coordinator
Waste	kitchen and incinerator	<ul style="list-style-type: none"> ✓ Laundry usage should be minimized by asking guest to reuse towels and bedding. ✓ The hotel has to all solid waste separately and of based on their types and wet and dry status. ✓ Consumption of detergents should be controlled ✓ Disposing of waste only after all waste control and recycling have been explored and minimized. 	Throughout Operation period	30lakhs	Hotel general manager and proponent	HSE Coordinator
Human	All the proposed project site	<p>To prevent and reduce of occupational health and safety,</p> <ul style="list-style-type: none"> ✓ Anti-slip stair tape treads should be equipped along the highlighting step edge and avoid slipping. ✓ Workers should not be allowed to enter kitchen without kitchen wear. ✓ Site plan should be provided at the lobby. 	Throughout Operation period	50lakhs	Hotel general manager and proponent	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		<ul style="list-style-type: none"> ✓ Qualified first-aider is provided at all times. ✓ A good ventilation rest room for provided at a level appropriate for the purpose of the facility. ✓ Food-handling, preparation and storage areas for dry and wet food adapted to workers and guests' food hygiene. ✓ 24 hours' security in the proposed hotel should be managed for the guest safety 				
Indirect Impact						
Wildlife Sanctuary	In the proposed site	<p>To reduce the indirect impact of wildlife,</p> <ul style="list-style-type: none"> ✓ In hotel restaurant, seek sustainable sources of food supplies, especially of fish, fruits and vegetables and farmed meats. ✓ Any souvenir shop at Mountain Top Hotel should not allow selling souvenirs made from threatened or protected plant and wildlife species. ✓ Project proponent should alert not to hunt in order to avoid wildlife extinction. ✓ Tree plantations should be formed in the verdant area after the construction period. It can also increase the ability of absorbing and storage of water and also protect the biodiversity. 	Throughout Operation	30lakhs	Hotel general manager and proponent	HSE Coordinator
Cumulative Impact						

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
Occupancy rate	In the proposed project and those nearby	To reduce impact on cumulative rate, <ul style="list-style-type: none"> ✓ Hotel should be charged for foreign guest and local guest especially different rates during peak season. ✓ Promotion plan such as reserved guest be allowed to get discount room charges rate during peak season. 	Throughout Operation	30lakhs	Hotel general manager and proponent	HSE Coordinator
Water and energy consumption, air, noise and waste generation	In the proposed project and those nearby	To reduce the cumulative physical impact such as water and energy consumption, air pollution, noise pollution and waste generation. <ul style="list-style-type: none"> ✓ Hotel Management and Development Committee should be organized for abiding the Myanmar Hotels and Tourisms Law. ✓ Public talks and meetings should be held in order to accrue knowledge for people regarding environmental friendly best practices. 	Throughout Operation	30lakhs	Hotel general manager and proponent	HSE Coordinator
<p>Decommissioning Phase: After 50 years later, this is the final phase of the project and it will be in relation to the condition as stated in the investment contract. Decommissioning would require use of the demolishing equipment. Where needed, any existing hazardous material used in demolition of these would be properly handled and disposed of in accordance with governing authority requirements.</p>						
Direct Impact						
Water	All the decommissioning site	The mitigation measure is similar to the construction phase, <ul style="list-style-type: none"> ✓Contaminate water shall be reduced by discharging wastewater properly ✓Temporary toilet for labor and leak proof containers 	Throughout the phase	20lakhs	company	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
		should be used for storage and transportation of oil and grease, and keeping the impervious floors of oil and grease handling areas.				
Noise	All the decommissioning site	To reduce noise pollution from demolition, <ul style="list-style-type: none"> ✓ The noisy construction works should be planned to be during the day. ✓ The demolition machineries, generators and other equipment should be used in good condition and insulated. 	Throughout the phase	10lakhs	Demolish company	HSE Coordinator
Waste	All the decommissioning site	To control the waste generation, <ul style="list-style-type: none"> ✓ The effective solid waste management system should be provided. ✓ Where recycling/reuse is not possible, the material should be taken to a waste disposal site. 	Throughout the phase	20lakhs	Demolish company	HSE Coordinator
Occupational health and safety	All the decommissioning site	In order to control occupational health and safety, <ul style="list-style-type: none"> ✓ Mitigate demolition workers' accidents by enforcing adherence to safety procedures and preparing contingency plan for accident response. ✓ Adherence to the Occupational Health and Safety Rules and Regulations should be adopted. ✓ Appropriate personal protective equipment should be provided as well as ensuring a safe and healthy environment for demolition workers. 	Throughout the phase	30lakhs	Demolish company	HSE Coordinator

Issue	Location	Mitigation Measure	Timeframe	Estimated Cost (MMK in thousands)	Implemented by	Supervised/ Approved by:
Public and community services	All the decommissioning site	Mitigation measures include: <ul style="list-style-type: none"> ✓ Safety aspects should be emphasized among drivers ✓ Driving skills and requiring of drivers should be improved 	Throughout the phase	10lakhs	Demolish company	HSE Coordinator
Wildlife Sanctuary	All the site	To prevent impact on wildlife sanctuary during decommissioning phase, <ul style="list-style-type: none"> ✓ Hotel management and development committee should be guided by a long-term vision that incorporates ecosystem and biodiversity. ✓ In this regard, as detailed described in the following Biodiversity Management Plan, the hotel project has carefully planned to implement all necessary precaution measures to avoid any potential negative impact on the wildlife and its ecosystem 	Throughout the phase	30lakhs	Demolish company	HSE Coordinator

7.2 Environmental Monitoring Plan

The following table presents the project monitoring plan. It includes (i) aspects or parameter to be monitored, (ii) location for monitoring, (iii) methodology, (iv) frequency, and (v) responsibilities. The project proponent performance will be monitored based on the mitigation measures.

Table 7.2-1 Monitoring Requirements

No.	Environmental Issue	Location, Parameter, Monitoring Technique	Responsibility & Frequency	Time Frame	Estimated Budget (MMK/annual) In thousand
1	Health and safety	Appointment of Environmental In-Charge Officer	Managing Director	50 years	1600
2	Water quality	Method: Measure water quality and compare with baseline data, assess against WHO limits and standards. Regular check the restricted and controlled water consumption. Location: Source of water Parameter: pH, Total dissolve solid (TSS), dissolved oxygen (DO), Turbidity, Suspended solid, Phosphate, Temperature	General Manager/ HSE Manager	Yearly	30lakhs
		Location: Treated water for drinking Parameter: pH, Total dissolve solids (TDS), dissolved oxygen (DO), Nitrate, Suspended solid, Iron, Chlorine, Total hardness, Manganese, Temperature		Twice every year	
3	Ambient air quality	Method and Location: Measure ambient air quality and compare with baseline data, assess against WHO limits and standards between existing new buildings Parameter: SO ₂ , NO ₂	HSE Manager	Twice every year	50lakhs
4	Noise level	Method and Location: Measure noise level and compare with baseline data, assess against WHO limits and standards and regular check the machine from kitchen and laundry.	HSE Manager	Twice every year	10lakhs
5	Soil and liquid waste management	Method and Location: Visual inspection of laundry, kitchen and guest room.	HSE Manager	Yearly	30lakhs
6	Occupational health	Method and Location: Visual inspection and regular check of	HSE Manager	Monthly	20lakhs

No.	Environmental Issue	Location, Parameter, Monitoring Technique	Responsibility & Frequency	Time Frame	Estimated Budget (MMK/annual) In thousand
	and safety	laundry, kitchen and guest room. Parameter: Personal Protective Equipment and outfit for workers			
7	Public and community services	Method and Location: Giving information about potential impacts and restrictions, regular check of vehicles times.	General Manager/ HSE Manager	Yearly	20laks

7.3 Greenbelt Development Plan

The main objective of developing greenbelt is to provide a barrier between the project site and the surrounding areas. The greenbelt helps to capture the fugitive emissions and to attenuate the noise generated in the site apart from improving the aesthetics of the plant site. Plantation program should be undertaken in all available areas. This should include plantation in the project site premises, along the internal and external roads, along the buildings and other open areas.

Implementation of afforestation program is of paramount importance for any industrial development. In addition to augmenting present vegetation, it will also check soil erosion, make the ecosystem more complex and functionally more stable, make the climate more conducive and restore water balance. It can also be employed to bring areas with special problems under vegetal cover and prevent further land deterioration. The main objective of the greenbelt is to provide a barrier between the plant and the surrounding areas. The greenbelt helps to capture the fugitive emissions and to attenuate the noise generated in the plant apart from improving the aesthetics of the plant site. Plantation program should be undertaken in all available areas. This should include plantation in the plant premises, along the internal and external roads, along the administrative buildings and other open areas near dumping yards. The tree species selected for greenbelt include the native species.

Greenbelt area concept is to reserve a certain amount of land for the development of green patches with an idea to mitigate pollution Apart from the existing green belt; it is proposed to develop additional green belt area as part of the expansion project which is presented in the Figure 8.3-1.

- Six species greenbelt shall be developed along the boundary of the Hospital project. Which naturally trap the particulate matter that is present in the air. The native species that are tolerant to dust and other pollutants are given in Table 7.3-1 and the reference photographs are shown in figure 7.3-1.
- Quick growing and coal dust resistant tree species like Padauk and Kan Kaw could contain the particulate matter emissions within the storage yard.

Table 7.3-1 Proposed of Native species on Green Belt Development

No	Category	Species
1	Trees	Padauk
2	Trees	Kan Kaw
3	Trees	Mezel
4	Trees	Phat Than
5	Trees	Tha nut
6	Trees	Tama





Figure 7.3- 1 Proposed Native species in Green belt Development

7.4 Solid Wastes Management Plan

The solid waste management plan for the Phwint Phyo Thit International Hotel Project in Mandalay, Myanmar, is designed to address the specific waste generation within the hospital premises, aligning with the National Waste Management Strategy and Master Plan for Myanmar (2018-2030). The solid waste generated by the hospital will primarily consist of household items, including papers, plastics, kitchen waste (including organic matter), and gardening waste resulting from project activities.

The hospital's waste management process involves the systematic collection of solid waste, ensuring segregation into at least two types: wet waste and dry waste. Initially, the waste will be gathered at a dedicated temporary waste camp on the hospital premises. Subsequently, Mandalay Municipals trucks will collect the segregated waste for transportation to the final disposal area, identified as the Aung Pin Lal Landfill.

The waste management plan for the international hospital explicitly follows the waste management hierarchy outlined in the national strategy, emphasizing the following priorities within the hospital setting:

Reduce:

Implementing measures within the hospital to minimize waste generation, such as efficient procurement practices and waste reduction initiatives.

Reuse:

Identifying opportunities for reusing items within the hospital, particularly focusing on materials like packaging and non-medical supplies.

Recycle:

Establishing a dedicated recycling program within the hospital for materials like paper, plastics, and other recyclables generated from medical and non-medical activities.

Recovery:

Exploring options for energy recovery or other beneficial uses from certain types of medical waste within the hospital's waste management system.

7.5 Comprehensive Disaster Management Plan

7.5.1 Introduction

Disaster is an unexpected event due to sudden failure of the system, external threats, internal disturbances, earthquakes, fire and accidents. Disaster Management Plan (DMP) gives a broad idea of Emergency preparedness in case of an accident. Thus, an appropriate DMP shall be prepared in

consultation with the project proponent, architect, service consultant and maintenance staff. DMP envisages the need for providing appropriate action so as to minimize loss of life/property and for restoration of normalcy within the minimum time. Adequate manpower, training and infrastructure shall achieve this. An appropriate fire protection system is also developed to meet any emergency. The emergencies are classified as construction hazard, natural hazard and Man-made hazard. Disaster risk reduction begins throughout our local communities. For greatest impact, these steps must be grounded in local knowledge and communicated broadly.

7.5.2 Construction Hazard

During the construction time, good construction practice and safety requirement were enforced by the contractor at site. The construction manager is the coordinator for the emergency management, before commencement of the work, the hospital facilities were identified and the address and phone numbers were available to the contractor as well as the construction manager. Proper measures were taken to ensure safety at heights. Fencing/rallying is provided at construction openings to prevent physical injuries and fall of construction workers.

7.5.3 Natural Hazard

During natural hazard the emergency plan to be implemented with the help and guidance from the district collector, who is the co-ordinator for such activity. Disaster Management Team (DMT) will also be responsible for disaster mitigation and disaster recovery. The primary mass disaster potential for the area is fire and water damage. Fire has an immediate response that can be delivered by tip occupants or nearby Fire Service Department.

Manmade/ Operational Hazard:

During the phase, project proponent and maintenance staff becomes the co-ordinator for the emergency activity and the emergency cell is acting in accordance with the disaster management plan (DMP).

Insurance: Key to the management of any disaster is having adequate insurance in place to:

- Reduce the loss in terms of assets if a disaster happens; and
- Reduce lost Income in the event that the facility becomes unavailable or partly unavailable.

Objectives of Plan

This plan is developed to make best possible use of resources to:

- Rescue the victims and treat them suitably.
- Safeguard other (evacuating them to safer places).
- Contain the incident and control it with minimum damage.

- Identify the persons affected.
- Preserve relevant records and equipment needed as evidence in case on an inquiry.
- Rehabilitate the affected areas.

The following important elements in the disaster management plan (DMP) are suggested to

- Reliable and early detection of an emergency and careful planning.
- The command, co-ordination, and response organization structure along with efficient trained personnel.
- The availability of resources for handling emergencies.
- Effective notification and communication facilities.
- Regular review and updating of the DMP Proper training of the concerned personnel

In order to handle disaster/emergency situations, an organizational chart entrusting responsibility to various plant personnel has been prepared along with their specific roles during an emergency.

Prevention and Mitigation

Prevention and mitigation against and during a crisis is important. In terms of the ability of people (occupants) to be proactive this is limited by the actual event There are some aspects that fall within people (occupants) control and many that do not. Natural disasters cannot be controlled and there may be short notice in terms of storm events etc. people (occupants) can however mitigate the Impact of such events through:

- Storage of potentially airborne items within the buildings (e.g. Dustbins).
- Periodic structural reviews of the facilities to ensure integrity in a major storm event.
- Good Housekeeping service around the site.
- Ensuring that trees / bushes are trimmed.
- Removal of cars and other important/expensive assets to higher ground in the eventof heavy rains that may lead to flooding.
- Storage of flammable liquids in the appropriate location and container.
- Storage of gas cylinders in appropriate location and containers.
- Maintenance of the facility to a high standard including repair of damaged / deteriorated buildings in an urgent manner.
- Maintenance of the roadways and car parks.
- Maintenance of budding fire detection and fire-fighting equipment in line with the Standards.

- Close observation of weather patterns.
- A preparedness to evacuate from the area early enough to save people (occupants) as safe as possible.
- Maintaining a means to alert tenants of an impending crisis.
- Provision of monitored cameras in the security office which captures recorded footage of die entry to people (occupants/Visitors), the entry to the Building andthe area around the office.
- Having a well-equipped first aid room and trained staff to complement.
- Having a well-drilled plan and people who are familiar with its application.

Table 7.5-1 Management plan for natural & manmade disaster

Threat / Emergency	Mitigation	Actions During Emergency	Actions After Emergency
Chemical incident (Spill)	Good housekeeping and safe handling practice. Allocation of spill kits throughout the area. Staff trained in use of spill kits	Immediate deployment of spill kit especially bunding to ensure that chemical does not get into drains/water ways. Soak-up with spill kit contents. Where actual spill/release has occurred then PPE for those who are involved. Evacuate as required.	Advise the occupants as soon as practicable. Shut the zone as required to allow forensic investigation and for any contamination cleanup. Write Incident report for review.
Fire and Smoke	Good housekeeping, responsive and well trained person, regularly maintained detection and Fire-fighting capability. Adequate no of external and internal fire hydrants system provided	As per Fire and Evacuation Plan	Incident Report Contact Insurer as required.
Theft	Security and monitoring company employed, good housekeeping, secure by design thinking, common sense e.g. expensive items out of sight	Call Police. Where this occurs during the day provide description to Police	Run CCTV footage for provision to Police (If available). Incident Report written. Consideration to be given to tightening security as required.
Cyclone	Good housekeeping,	Activate the ECR as	Re-open the area as

	particularly in the lead up to the stormy season. Structural engineering reports on any vulnerable building's/structures.	required. Consideration to the given to area closure if required	required. Comprehensive walk around the area checking buildings and damage. Initiate Normal life Continuity plan. Engage Insurance company. Undertake structural assessments as required
Earthquake	Good housekeeping. Earthquake awareness sessions to include what to do when an earthquake strikes (shelter beneath desks or door jams if desks not available).	Evacuate persons as required. Need to be clear of buildings and glass in particular Key will be roll calls so rescue crews know where to concentrate their efforts in the event of building collapse. Be aware that items, especially those stored overhead may well have become dislodged.	Re-open the area when safe to do so. Structural assessments may be necessary. Initiate Normal life. Involve insurer as required.

7.6 Energy Conservation and Management

Energy Saving Practices

- Purchase of Energy efficient appliances
- Constant Monitoring of Energy consumption and defining targets for energy conservation
- Use of compact fluorescent lamps and low voltage lighting
- Adjusting the settings and illumination levels to ensure minimum energy used for desired comfort levels.

Behavioral Change on Consumption

- Promoting self-awareness on energy conservation
- Training staff on methods energy conservation and to be vigilant to such opportunities

Energy Management

Some of the energy saving options is informed to the staffs and workforce;

- ✓ Switch off lights that are not needed
- ✓ Make maximum use of daylight

- ✓ Don't leave lights on in unoccupied areas
- ✓ Reduce decorative lighting where possible
- ✓ Ensure that someone has responsibility for switching off lights after hours
- ✓ Don't switch on all lights when only a few are needed
- ✓ Kit labels on switched so people know which switches operate particular lights
- ✓ Use local desk lights if few people are in the building
- ✓ Report faulty lighting promptly- a flicker tube uses more electricity and is a contributing factor to sick
- ✓ If practical save your data and switch off your PC during lunch time.
- ✓ Do not switch on computers, printers and photocopiers until they are needed
- ✓ Switch off equipment and lighting where possible to reduce heat gains

7.7 Emergency Preparedness System

Once the likelihood of a disaster is suspected, action has to be initiated to prevent a failure. The project in-charge, responsible for preventive action will identify sources of repair equipment, materials, labour and expertise for use during emergency. The multiple floors of a high-rise building create the cumulative effect of requiring great numbers of persons to travel great vertical distances on stairs in order to evacuate the building.

The Building in-charge will notify the occupants for the following information:

- Early Warnings (Through an alarm or Voice communication system)
- Exit routes (Adequate means of egress).
- Safety areas (Assembly points)
- Nearest infrastructure facilities (Medical aid / Fire aid)
- Occupant Familiarity with the plan through and Practice (Signage / Evacuation plan)

7.7.1 Emergency Communication System

An efficient communication system is absolutely essential for the success of any disaster management plan. Different types of alarms to differentiate types of emergencies should be provided. In case of failure of alarm, placards/boards of various colors should be used to indicate the situations. If everything fails, a messenger should be used for sending the information and the various placards mentioned would also be used. This has to be worked out in consultation with local authorities involving police and fire department, hospital department considering the following points.

- Identify the relevant officials to be involved for the first, second and third level of information
- Preparation of the telephone directory of these officials and making available to all concerned

- Allotment of toll-free number to a central communication center with Provide wireless communication tools to safety and security and communication officers
- Empowering central communication center with latest communication equipment and tools.

7.7.2 Emergency Planning Committee

To ensure coordinated action, an Emergency Planning Committee is constituted. An Emergency evacuation plan based on local needs and facilities available has been prepared. The broad content of plan will include following:

- Demarcation of the areas to be evacuated with priorities, v' Safe area and shelters.
- Security of property left behind in the evacuated areas.
- Functions and responsibilities of various members.
- Setting up of joint control action.

Assembly Points

Assembly points are to be set up farthest from the location of likely hazardous events, where pre-designated persons would assemble in case of emergency. The location near to the entrance gate is one of the safest places.

Evacuation Path

The road straight to the entrance gate is quite wide and no hazardous installation besides the road. This road can be taken as the evacuation path. The occupants of the fire floor and floors above and below should immediately use the exit stairs to descend to a floor level that is least a few floors below the Fire Floor. It is never appropriate to use the elevator during building emergency. Buildings have written evacuation procedure for all emergencies.

Infrastructure

Following Infrastructure & systems should be provided to meet emergencies.

- First aid boxes
- Gas masks
- Telephone line with STD facility (1) Emergency lighting system
- Stretchers
- Transport facility
- Fire-fighting machinery

Emergency Services

This includes fire-fighting system, first aid center, hospital etc. Alternate sources of power supply for operating fire-pumps, communication with local bodies, fire-brigade etc. should also be clearly identified. Adequate number of external and internal telephone connections should be installed.

Fire Safety Provisions

Fire protection is one of the most essential services to be provided. The principal objective of the rescue and fire- fighting services is to save lives. For this reason, the provision for means of quick dealing with an accident or incident occurring at, or in the immediate vicinity of, any building, assumes primary Importance because it is within this area that there is the greatest opportunity of saving lives. This must assume at all times the possibility of and need for, extinguishing a fire which may occur either immediately following an accident or incident, or any time during rescue operations.

The fire-fighting system will comprise the following:

- Fire hydrant system
- Number of Exit, location and their width should conform to the requirements of NBC

2005 (II Revision)

- Adequate fire water storage tank capacity to be provided
- Hose reel assembly should be provided covering each floor.
- Manual fire call points should be provided
- Alternative and Independent power system should be provided to fire pumps.
- Emergency lighting system

The project is provided with all the above and adequate nos. of external and internal fire hydrants with fire hose cabinet refer layout - Fire Hydrant.

7.8 Fire & Evacuation Plan

Fire Extinguishers

1. Select appropriate extinguisher for type of fire.
2. Pull pin from squeeze handle.
3. Test extinguisher by squeezing handles briefly.
4. Approach fire aiming nozzle at base office.
5. Squeeze handles and operate extinguisher in a sweeping motion.
6. Public Address System

7. Every' high rise building should have a public address system with 2-way communication to conduct evacuation in a systematic manner & to communicate any messages to occupants on every floor from the control room.

8. Escape Route.

9. The escape route should be marked with a sign board on the corridor & passage to guide evaluation. Normally, the escape route sign board must be written in luminous paint for easy identification. This is to guide every occupant of the building who is bound to panic in the event of accident.

10. Portable fire extinguishers.

11. Water fire extinguishers

12. Two extinguishers per compartment/floor of building is provided.

13. Sprinkler System

14. Sprinkler system is a must for basement parking & other risk areas where large quantities of combustible materials are stored.

15. The capacity of water tank shall be calculated on the basis of sprinklers.

21. Sprinklers may connect to main water tank & pump, but capacity of the tank & pump shall be increased in that proportionate.

Hose Reels

- Hose reels are used on fires Involving wood, paper and textiles only, they are not to be used on live electrical appliances or flammable liquids.
- To release the hose reel, turn the valve on this will charge the hose and release the nozzle (if fitted with a nozzle release lock).
- The hose can then he pulled out to the fire, the nozzle operates like a garden hose in most cases by twisting the nozzle, and the nozzle can be adjusted to give a spray pattern or a straight jet.

Alternate Power Supply

A stand by generator should be installed to supply power for staircase lighting, corridor lighting, fire pump, pressurization fan & blowers, in the event of disconnection of failure of main supply.

7.8.1 Fire Risk & Emergency Preparedness Plan

Emergencies can occur at any tune usually without warning. When an emergency occurs, the safety and prompt recovery of the project site depends on the preparedness and careful response of our

workers, peoples and visitors.

The information listed below provides basic emergency information to help individuals respond thoughtfully in an emergency event. Each building contact and emergency preparedness coordinator will have regular meetings with people in their building to be certain everyone knows what to do and what to expect, as much as possible. These meetings are held often enough to keep everyone properly informed. Training sessions is being coordinated through the Environmental Management Cell.

7.9 Earthquake Resistant Construction

Promotion of Earthquake resistant construction mainly includes construction safety, quality control and proper inspection. Previously there were no specific guidelines on earthquake resistant constructions and seismic strengthening. Due to the very fact, most of the buildings till 1990s were built without any safety measures. But In the present scenario, there are building byelaws and guidelines to construct earthquake resistant structures.

Preparedness Methodology

In a disaster management cycle, preparedness shall be the first step, instead of waiting for a disaster to occur and then to manage it. It has plan contains a series of measures for preparedness in schools, colleges, hospitals and communities. People of every part of the Urban Local Bodies have to be guided to prepare themselves or to prepare their own cropping mechanism.

Sensitization Programmes

A series of awareness programmes to be organized to reach out to the local residents Disaster can strikes everywhere everyone irrespective of land, caste, people and gender.

The objectives of the programmes shall be:

- To bring awareness about disasters among the inmates of all institutions and residents of all communities in the district.
- To pave way for strict enforcement of building rules in construction department and contractors.
- Preparation of Building evacuation plans and training the general public to save their lives at the time of Cyclone, Flood, earthquake, fire accidents or any other major disaster.

Weather Warning System

Severe weather events are the most common hazard. Thunderstorms, cyclones and severe weather events are the possible scenarios than any other group of disasters. The warnings are provided when severe weather is expected that is not directly related to severe thunderstorms, tropical cyclones or bushfires. Examples include land winds, storms, flash flooding, dangerous waves or tides.

Pre disaster phase

- (a) Measures for rapid dissemination of warnings issued by the nearest Cyclone Warning Centre.
- (b) Evacuation readiness in case of emergencies
- (c) Identification of cyclone shelters

Disaster phase

- (a) Quick communication between communities about the earthquake occurrence by telecommunication, electronic media, e-mail etc., to relocate at cyclone shelters.
- (b) Mobilization of fire services.
- (c) Inform rescue team of state government and hospital about the causality.

Post disaster phase

- (a) Establishment of control room
- (b) Medical aids
- (c) Deployment of resources
- (d) Outside relief receiving, stocking, safety, dispatch

Record Maintenance and Reporting

Records are maintained for regulatory, monitoring and operational issues. Log book for inspection of equipment's and calibration of equipment's vehicle maintenance and inspection records, incident records, maintenance of Corporate Social Responsibilities towards the society even after the completion of construction of the project work and during the operation / maintenance Phase.

7.10 Social Management

The company shall avoid the worker's problem specified in impact statement by taking care of the rights of labour, especially of female employee, in accordance with international best practice as well as Myanmar's customary rules and regulations. Best suited pay scale will be utilized and over time cost and other compensation due to impact on social life will be applied.

7.11 Safety and Security Plan

This safety and security plan is intended to implement during the construction phase and operation phase of the factory. It aims to provide maximum Occupational Health and Safety (OHS) for factory workers. It also considers possible emergency situations and evacuation and clean up procedures for emergency uses.

Table 7.11-1 Safety and Security Monitoring Plan

Sr.	Activity	Responsibility	Time Frame
1	Monitor Personal Protective Equipment (PPE) of all factory workers, and ensure all workers use PPE properly at work site (coveralls, dust mask, safety glass, glove, ear plug, apron and safety shoes as necessary)	HSE Manager	Annually
2	Provide onsite safety and security training for all workers to understand working environment, safety and security signs, safety and security standards and emergency response procedures	HSE Manager	Annually
3	Human Resource Development training for HSE Coordinator or Manager	Managing Director	Annually
4	Check and regular maintenance of electronic equipment, electrical system and fuel storage facilities	HSE Manager	Monthly
5	Installation of new firefighting equipment including fire alarm system, fire extinguishers, spill kits at key areas of the site, and regular check-up and maintenance	HSE Manager	Annually
7	Organizing and firefighting training, fire drills for all workers	HSE Manager	Annually

Table 7.11-2 Safety Signage and Their Description


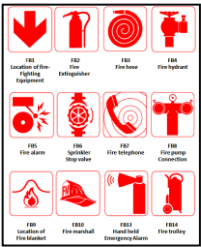









Description	Safety Signage
These signs indicate all visitors must report to the site office and obtain permission to proceed on to the site or any work area and safety equipment must be used at all time.	
These signs should be tagged to indicate the location of fire-fighting equipment, fire extinguisher, fire hose, fire hydrant, fire alarm, fire telephone, fire pump connection, fire blanket, fire trolley, etc.	
These signs should be used to make workers and visitors must be worn within the operation area.	
These signs indicate exit routes in the event of a fire or emergency.	
These signs should be used to make people aware of a nearby danger (eg, transformer, generator.)	
These signs indicate food must not be stored or consumed outside in chemical storage area.	
Use these safety signs to warn employees of hazards and warn employees on ways they can avoid injuries.	
Warning sign - WATCH OUT FORKLIFT OPERATION IN THIS AREA and logging truck (These warning sign should be used to indicate potential hazard within a designated area.)	
Use these safety signs to inform employee of first aid equipment and emergency information.	

Table 7.11-3 Personal Protective Equipment (PPE) and Their Functions

Function of PPE	Feature and Characteristics
Protective Goggles (Suitable for protection from dust, particle, chips, chemical splattering)	

Goggles with direct vents are not suitable for protection from chemical splattering or smoke.	
Hearing Protection	
Cotton earplugs: disposable earplugs for short-term use – not suitable for high noise levels	
Elastic earplugs: washable, reusable earplugs	
Earmuffs: They offer a high level of sound reduction and are suitable for high noise levels. They can be used in combination with a safety helmet.	
Respiratory Protection	
Dust mask: lightweight mask that is fitted over the nose and mouth and secured behind the head with elastic.	
Head Protection	
Use head gear which conforms to recognized safety standards	
Hand and Arm Protection	
Gloves for common tasks (cotton/ leather)	
Gloves for handling chemicals	
Heat-resistant gloves	
Foot Protection	
Select footwear that fits the purpose and conforms to recognized safety standards.	
Body Protection	
General-purpose protective clothing: Work clothing to prevent cut; suitable for employees operating sharp blades and machines. Including raincoats	
Reflective clothing: For working in busy traffic: brightly-colored reflective clothing can increase the visibility of employees and reduce their chances of being struck by vehicles or machinery	

7.12 Corporate Social Responsibility (CSR) Plan

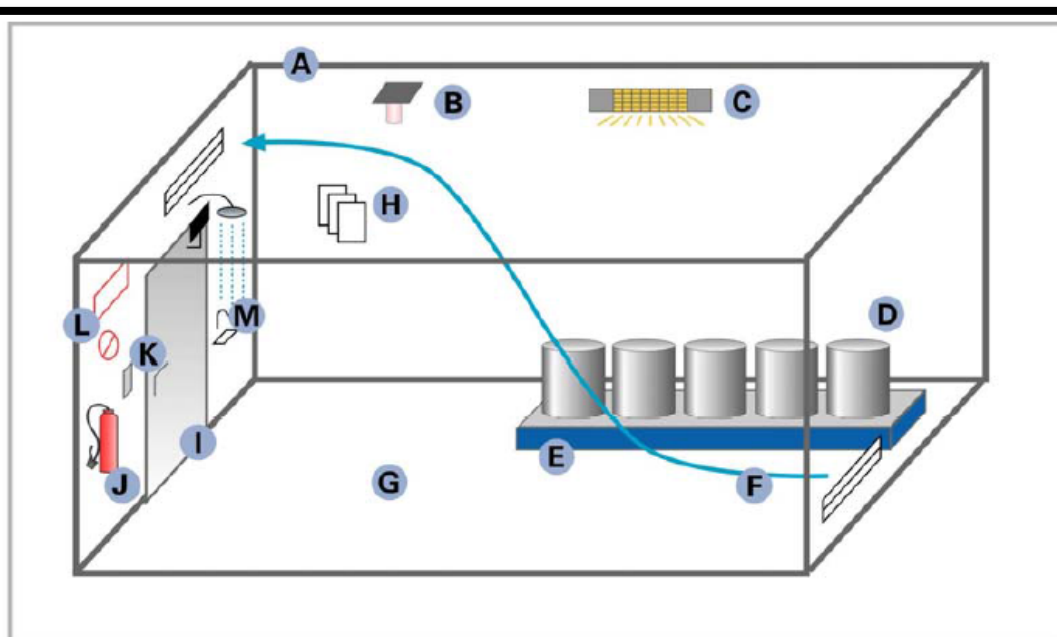
It is the truth that the implementation of the proposed project would generate both negative and positive impact on the community's daily life. The objective of this plan is to ensure social well-being of the employees and their family members for better community. It is stated in the document of the proponent, submitted to MIC that 2% of the profit will be allocated for Corporate Social Responsibility (CSR) program every year starting by the year of factory running. However, the company should implement CSR program based on their first-year net profit at the very first year of the project. The proponent is urged to formulate the budget allocation to CSR plan as the following plan:

Process	Responsibility	Time Frame	Percent
In order to develop the education sector	HSE manager/ Management	Annually	20%
In order to develop the health care sector	HSE manager/ Management	Annually	20%
In order to develop the social security sector	HSE manager/ Management	Annually	20%
To develop the field of natural disaster mitigation	HSE manager/ Management	Annually	20%
To develop the local communities sector	HSE manager/ Management	Annually	20%
Total			

Remarks: Corporate Social Responsibility (CSR) plan for the 1st year is based on 2% of net profit during the first year. For the, subsequent years CSR will be based on 2% of the net profit for the respective period

7.13 Chemical Safety Management Guidelines

Guidelines for chemical storage room:



- A** fire resistant building ●
 - B** vapor/smoke detection system ●
 - C** explosion-proof lights ●
 - D** containers:
 - grounded/bonded ●
 - closed ●●
 - labelled ●●
 - E** secondary containment ●●
 - F** forced ventilation across the storage room ●●
 - G** no floor drains ●●
 - H** CSDS's ●●
 - I** self closing fire resistant door ●
 - J** fire extinguisher or appropriate fixed system ●
 - K** explosion-proof light switch ●
 - L** warning signs ●●
 - M** emergency shower and eye wash facility ●●
- required for storage of flammable chemicals
 ● required for storage of other hazardous chemicals

Figure 6.13-1

Guidelines for Chemical Storage Room

Guidelines for chemical storage area:

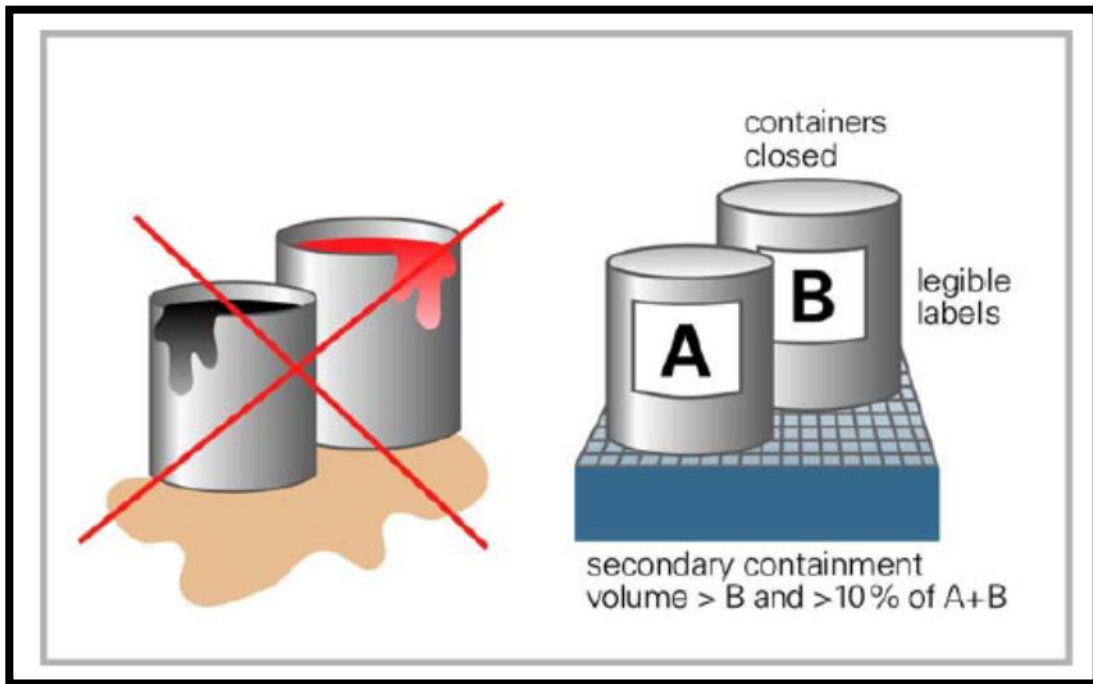


Figure 6.13-2

Guidelines for Chemical Storage Area

Guidelines for Chemical Storage Room and Area:

- Chemicals should be stored in such a manner that minimal impact to workers and the environment may occur.
- The floor must be sealed with an impermeable coating (e.g. special paint) since a regular concrete floor is porous to many organic solvents.
- All electrical installations (Lights, switches, ventilation equipment, wiring, junction boxes, and other equipment) should be explosion-proof or protected.
- Lightning protection should be installed.
- The facility should be kept in a general state of cleanliness.
- There should be an appropriate water supply for eye or body cleaning within a distance of 30 meters.
- This water supply should be tested regularly.
- Containers should be inspected upon receipt to ensure that the contents, concentrations and quality comply with purchasing specifications.
- There should be legible and durable labels on all containers.
- Containers should be kept closed or capped when not in use.
- Secondary containment should be available for hazardous liquid storage to prevent ground and water contamination.
- Proper tools and equipment must be used for opening containers and drums.

CHAPTER 8

CONCLUSTION AND RECOMMENDATIONS

In this EIA report, based on finding impacts, an Environmental Management Plan (EMP) with attached Environmental Monitoring Plan is prepared as an environmental management, health and safety and Corporate Social Responsibility framework for all three phases (construction, operation and decommissioning) of hotel. The EMP, as major institutional requirement, aims to minimize or offset the potential environmental impacts generated by hotel operations, to provide maximum occupational health and safety and to ensure better community living. The environmental management and monitoring practices, procedures and responsibilities are comprehensively expressed here to get full compliance with the existing environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar.

Environmental Monitoring Plan prepared as part of EMP proposed appointment of a Health, Safety and Environment (HSE) team to implement and enforce EMP. The main responsibility of HSE team is to carry out strategic working procedure of “Plan, Do, Check, Act” for proper care and handling of health, safety and environmental issues of the hotel in accordance with both local and international norms and standards. *However, the best option is to develop the Development Committee to organize for abiding the Myanmar Hotels and Tourisms Law to reduce the cumulative physical impact such as water and energy consumption, air pollution, noise pollution and waste generation. Often, public talks and meetings should be held in order to accrue knowledge for people regarding environmental friendly best practices.*

Recommendations

According to the study conducted, the proposed Hotel will have the least impact by successful implementation of Environmental Management Plan, Monitoring Plan and Corporate Social Responsibility.

The following recommendations have been made for efficient and effective implementation of environmental conservation, health & safety, social responsibilities measures through the lifecycle of the proposed hotel.

- Follow the comments and suggestions made by ECD after reviewing this EIA report
- Once EMP is approved by concerned authorities, strict implementation is essential
- For contributing the construction activities and design shall be developed by license engineer with the provisional Myanmar Building Code 2012
- Fully implement Corporate Social Responsibility (CSR) Plan as an ethical obligation, so as to be regarded as good neighbor/investor in the neighborhood
- Well experienced and knowledgeable HSE Coordinator and HSE assistants shall be appointed
- Daily, monthly and annual action plan shall be formulated based on EMP and fully practiced

- Keep full records of environmental management activities and present to annual independent third party environment audit
- Follow the audit report and comments
- Abide environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar

To address stakeholder participation, the EIA includes a series of consultation plans that outline:

- Stakeholder groups that need to be consulted; when and how they will be reached out to and which ways of involvement will be considered during the EIA;
- Information dissemination about the project (and the aspects of the EIA) to the stakeholders;
- Summary of the initial interests from the stakeholders based on their input;
- Key steps and ways of consultation during the scoping phase and assistance provided to the stakeholders in establishing mechanisms for consulting with communities and representative groups;
- Key steps and ways of consultation during the scoping phase;
- Summary of the consultation outcomes and how they were integrated into the EIA;
- Summary of the follow-up and future engagement.

Commitment Source	Commitment
Chapter II	Pwint Phyo Thit Co.ltd will follow National and international Laws, By Laws, Regulations and Guidelines Relevant to operation of dam. Also, the project will meet the emission and effluent standards with national guidelines.
Chapter II	Pwint Phyo Thit Co.ltd will specifically commit itself to the prevention of pollution through the implementation of processes, practices, and techniques to avoid, reduce and control the creation, emission and discharge of any type of pollutant and waste.
Chapter II, Use of Natural Resources	Pwint Phyo Thit Co.ltd will specifically commit itself to minimize the use of consumptive resources and promote the reduction and recycling of waste products where possible.
Chapter II, Air quality standard	Pwint Phyo Thit Co.ltd will follow National Environmental Quality (Emission) Guideline and IFC General EHS Guidelines for the ambient air quality especially in operation phase as in Secction 2.6 (NEQG).
Chapter II, Drinking Water and Wastewater Effluent	Pwint Phyo Thit Co.ltd will follow National Environmental Quality (Emission) Guideline and the water quality guideline for the drinking water and wastewater effluent as in Secction 2.6 (NEQG).
Chapter II, Ambient Noise Standard	Pwint Phyo Thit Co.ltd will follow NEQG for the industrial noise standard during construction and operation phase as in Secction 2.6 (NEQG).
Chapter II Commitments	Pwint Phyo Thit Co.ltd will prepare an EIA report with fully compliment with EIA procedure 2015 and the said laws mentioned in timely and precisely manner.
Chapter III Designs and Equipment	Pwint Phyo Thit Co.ltd will utilize the facilities ‘designs and modernized equipment and machinery as described in Project description for construction and operation.
Chapter V Impact Assessments and Mitigation Measures	Pwint Phyo Thit Co.ltd will be adopted mitigation measures for avoiding or reducing such environmental and socio-economic impacts potentially generated by the Project during both the construction and operation phases.
Chapter V Ambient Air Emission	Pwint Phyo Thit Co.ltd will implement mitigation measures for ambient air emission with the regular monitoring plan.
Chapter V Noise emission	Pwint Phyo Thit Co.ltd will implement mitigation measures in with the regular monitoring plan.
Chapter V Water Pollution	Pwint Phyo Thit Co.ltd will implement mitigation measures for water pollution.
Chapter V Terrestrial biodiversity	Pwint Phyo Thit Co.ltd will implement mitigation measures for river biodiversity during construction and operation phase with the regular monitoring plan.
Chapter V	Pwint Phyo Thit Co.ltd will assess the cumulative impacts and implement

Cumulative Impact	mitigation measures.
Chapter VII	Pwint Phyto Thit Co.ltd will develop and implement environmental and social management plan in accordance with the impacts for emission, effluents, noise, , Terrestrial and aquatic habitat alteration and biodiversity, occupational health and safety. Chapter 7
Chapter VII Green Belt Development Plan	Pwint Phyto Thit Co.ltd will develop and implement an ecological management plan as shown in Section 7.3.
Chapter VII	Pwint Phyto Thit Co.ltd will develop and implement emergency preparedness plans according to section 7.7.
Chapter VII Occupational Health	Arrangement of personal protective equipment such as gloves, helmet, sunglasses and other tools, dress (life jackets) and uniforms for each worker so that the workers can keep themselves safe from any kinds of accident and the occupational health training will also be provided.
Chapter VI Social Management Plan	Pwint Phyto Thit Co.ltd. will develop and follow social management plan as shown in Section 7.10
Chapter VI Grievance Redress Procedure	Pwint Phyto Thit Co.ltd will develop and implement a grievance redress mechanism as shown in Section 6.6 for social management with the monitoring and evaluation as mentioned in Section 6.6.
Chapter VI, Environmental Monitoring Plan	The compliance monitoring report along with the checklist will be indexed and annexed with the monthly and annual monitoring report. It may be required to submit the annual monitoring report to Department of Environmental Conservation for renewing of the Environmental Clearance Certificate each year.
Chapter VI, Monitoring and Reporting	Pwint Phyto Thit Co.ltd will develop and implement a monitoring and reporting plan as presented in Section 7.2.
CSR Program	Pwint Phyto Thit Co.ltd reserve for Cooperate social responsibility (CSR) (during operation period). Section 7.12.
Chapter VII	Pwint Phyto Thit Co.ltd will assess the public's opinion and attitudes on the project through the public consultation meetings during scoping stage and EIA investigation stage according to the EIA procedure: Article 61.

Appendix -1
Third Party Confirmation Letter



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
 သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
 ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန
 ညွှန်ကြားရေးမှူးချုပ်ရုံး

စာအမှတ်၊ အီးအိုင်အေ - ၁/၇ (၉၁၉/၂၀၂၁)
 ရက်စွဲ ၊ ၂၀၂၁ ခုနှစ် မေလ ၁၄ ရက်

သို့

အထွေထွေမန်နေဂျာ
 ဖွံ့ဖြိုးသစ်ကုမ္ပဏီလီမိတက်

အကြောင်းအရာ။ ဖွံ့ဖြိုးသစ်ကုမ္ပဏီလီမိတက်မှ အကောင်အထည်ဖော်ဆောင်ရွက်မည့် စီမံကိန်းများအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment - EIA) အစီရင်ခံစာများ ရေးသားပြုစုမည့် တတိယအဖွဲ့အစည်းငှားရမ်းခြင်းနှင့်ပတ်သက်၍ သဘောထားမှတ်ချက်ပြန်ကြားခြင်း

ရည်ညွှန်းချက်။ ဤဝန်ကြီးဌာန၊ ပြည်ထောင်စုဝန်ကြီးရုံး၏ ၁၆-၂-၂၀၂၁ ရက်စွဲပါစာအမှတ်၊ (သစ်တော) ၃(၂)/၁၆(ဃ)(၅၈၂/၂၀၂၁)

၁။ အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ ဖွံ့ဖြိုးသစ်ကုမ္ပဏီလီမိတက်မှ မန္တလေးတိုင်းဒေသကြီး၊ မန္တလေးခရိုင်၊ ပုသိမ်ကြီးမြို့နယ်၊ ရေကြည်ကျေးရွာအုပ်စု၊ ကွင်းအမှတ် (၅၄၈) ရှိ မြေဧရိယာ (၅၄၇.၈၀) ဧကပေါ်တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် (က) နိုင်ငံတကာအဆင့်မီဆေးရုံလုပ်ငန်း (IEE)၊ (ခ) ဟိုတယ်ဝန်ဆောင်မှုလုပ်ငန်း (EIA)၊ (ဂ) စီးပွားရေးနှင့်လူနေမှုအဆောက်အဦများတည်ဆောက်ငှားရမ်းခြင်းလုပ်ငန်း(EIA)၊ (ဃ) နိုင်ငံတကာအဆင့်မီဂေါက်ကွင်း၊ Club House နှင့် အပန်းဖြေအားကစားဥယျာဉ်လုပ်ငန်း (EIA) စသည့် စီမံကိန်းများအတွက် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ သဘောထားမှတ်ချက်နှင့်အညီ EIA/ IEE အစီရင်ခံစာများ ရေးသားပြုစုနိုင်ရန် Resource and Environment Myanmar Co., Ltd အား တတိယအဖွဲ့အစည်းအဖြစ် ငှားရမ်းဆောင်ရွက်ခွင့်ပြုနိုင်ရေးအတွက် တင်ပြလာခြင်းအပေါ် ဤဝန်ကြီးဌာန၊ ပြည်ထောင်စုဝန်ကြီးရုံးမှ ဥပဒေ၊ လုပ်ထုံးလုပ်နည်းများနှင့်အညီ ဆောင်ရွက်ရန်ဟု ရည်ညွှန်းပါစာဖြင့် ပြန်လည်အကြောင်းကြားလာပါသည်။

၂။ အဆိုပြုစီမံကိန်းများအတွက် EIA/IEE အစီရင်ခံစာများကို ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ် (အဖွဲ့အစည်း) အမှတ် (၀၀၀၂/၂၀၁၇) ရရှိထား

သည့် Resource and Environment Myanmar Co., Ltd နှင့် ကြားကာလအကြံပေးလုပ်ကိုင်သူ မှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ် (အဖွဲ့အစည်း) အမှတ် (၀၀၂၅/၂၀၁၇) ရရှိထားသည့် Sustainable Environment Myanmar Co., Ltd တို့မှ ရေးဆွဲသွားမည်ဖြစ်ပြီး အဆိုပါအဖွဲ့တွင် Geology and Soil; Waste Management; Socio-economy; Facilitating of Meeting; Cultural Heritage Management; Stakeholder Engagement Plan and Public Consultation; Social Management Plan ဆိုင်ရာ ကျွမ်းကျင်ပညာရှင်များအပါအဝင် Ecology & Biodiversity; Air Pollution Control; Water Pollution Control; Risk Assessment and Hazard Management; Noise and Vibration; Groundwater and Hydrology; Land Use and Legal Analysis ဆိုင်ရာ ပညာရှင်များ ထပ်မံဖြည့်စွက်၍ ပြုစုရေးဆွဲသွားမည်ဖြစ်သည့် အတွက် လုံလောက်မှုရှိကြောင်း စိစစ်သုံးသပ်ရပါသည်။

၃။ သို့ဖြစ်ပါ၍ ဖွံ့ဖြိုးသစ်ကုမ္ပဏီလီမိတက်မှ အကောင်အထည်ဖော်ဆောင်ရွက်မည့် စီမံကိန်း များအတွက် EIA၊ IEE အစီရင်ခံစာများ ရေးသားပြုစုမည့် တတိယအဖွဲ့အစည်းဖြစ်သော Resource and Environment Myanmar Co., Ltd ကို ရွေးချယ်ခြင်းနှင့်ပတ်သက်၍ ကန့်ကွက် ရန်မရှိပါကြောင်းနှင့် အောက်ပါအတိုင်းဆက်လက်ဆောင်ရွက်ရန်လိုအပ်ကြောင်း သဘောထား မှတ်ချက်ပြန်ကြားအပ်ပါသည်-

(က) မြေဧရိယာ (၅၄၇.၈၀) ဧကပေါ်တွင် အကောင်အထည်ဖော် ဆောင်ရွက်မည့် ဟိုတယ်ဝန်ဆောင်မှုလုပ်ငန်း၊ စီးပွားရေးနှင့်လူနေမှုအဆောက်အဦများတည်ဆောက် ငှားရမ်းခြင်းလုပ်ငန်း၊ နိုင်ငံတကာအဆင့်မီဂေါက်ကွင်း၊ Club House နှင့် အပန်းဖြေ အားကစားဥယျာဉ်လုပ်ငန်းများအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) အစီရင်ခံစာများရေးဆွဲရာတွင် အောက်ပါအတိုင်းဆောင်ရွက်ရန်-

- (၁) ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၄၉၊ ၅၀၊ ၅၁ နှင့် ၅၂ တို့နှင့်အညီ နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း အစီရင်ခံစာနှင့် ဆောင်ရွက်ရမည့် လုပ်ငန်းတာဝန်များကို ရေးဆွဲပြုစု၍ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၅၃ အရ နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း အစီရင်ခံစာကို သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီး ဌာနသို့ တင်ပြ၍ အတည်ပြုချက်ရယူရန်၊
- (၂) အတည်ပြုထားသည့် နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအစီရင်ခံစာကို အခြေခံ၍ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၅၆၊ ၅၇၊ ၅၈၊ ၅၉၊ ၆၀၊ ၆၁၊ ၆၂၊ ၆၃၊ ၆၄ နှင့် ၆၅ တို့နှင့်အညီ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာကိုပြုစု၍ သယံဇာတနှင့်

သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသို့ တင်ပြအတည်ပြုချက် ရယူရန်။

- (ခ) နိုင်ငံတကာအဆင့်မီဆေးရုံလုပ်ငန်းအတွက် ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း (IEE) အစီရင်ခံစာအား ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၃၄၊ ၃၅၊ ၃၆၊ ၃၇၊ ၃၈ တို့နှင့်အညီ ရေးဆွဲပြုစု၍ သယံဇာတနှင့်သဘာဝ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသို့ တင်ပြအတည်ပြုချက်ရယူရန်၊
- (ဂ) ပြဋ္ဌာန်းထားသည့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ၊ နည်းဥပဒေများ၊ လုပ်ထုံး လုပ်နည်း၊ ညွှန်ကြားချက်များနှင့်အညီ လိုက်နာဆောင်ရွက်ရန်၊
- (ဃ) သက်ဆိုင်ရာတိုင်းဒေသကြီးအစိုးရအဖွဲ့နှင့် စီမံကိန်းဧရိယာအနီးဝန်းကျင်ရှိ ဒေသခံ ပြည်သူများ၏ ဆန္ဒနှင့်သဘောထားများကို ရယူဆောင်ရွက်ရန်။

(Handwritten signature)

(လှမောင်သိန်း)

ညွှန်ကြားရေးမှူးချုပ်

မိတ္တူကို

ညွှန်ကြားရေးမှူး၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ မန္တလေးတိုင်းဒေသကြီး
ရုံးလက်ခံ၊ မျှောစာတွဲ

Real Estate Project



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်
ခွင့်ပြုမိန့်



- ခွင့်ပြုမိန့် အမှတ်၊ မနသ-၁၂၃၄/၂၀၁၇။ ၂၀၁၇ ခုနှစ် ဇန်နဝါရီလ ၂၅ ရက်
- မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်သည် မြန်မာနိုင်ငံသားများ ရင်းနှီးမြှုပ်နှံမှု ဥပဒေပုဒ်မ ၁၂(ခ) အရ ဤခွင့်ပြုမိန့်ကို ထုတ်ပေးလိုက်သည်-
- (က) ရင်းနှီးမြှုပ်နှံသူ၏အမည် ဦးရဲမြင့်
 - (ခ) အဘ အမည် ဦးထွန်းမြင့်
 - (ဂ) နိုင်ငံသား/ အမျိုးသားမှတ်ပုံတင်အမှတ် ၁၃/လရန (နိုင်) ၀၀၄၂၁၁
 - (ဃ) နေရပ်လိပ်စာ အမှတ်(၅)၊ အခန်း(၆)၊ ပွဲရုံတန်း၊ ချမ်းမြသာယာရပ်ကွက်၊ ပြည်ကြီးတံခွန်မြို့နယ်၊ မန္တလေးမြို့
 - (င) ဖွဲ့စည်းထားသည့် သို့မဟုတ် ဖွဲ့စည်းမည့် အဖွဲ့အစည်း Phwint Phyto Thit Company Limited (ဖွဲ့ဖွားသစ် ကုမ္ပဏီ လီမိတက်)
 - (စ) ရင်းနှီးမြှုပ်နှံမှု ပြုလုပ်မည့် လုပ်ငန်းအမျိုးအစား ရေတံခွန်တောင် စီးပွားရေးနှင့် လူနေအဆောက်အအုံများ တည်ဆောက်ငှားရမ်းခြင်းလုပ်ငန်း
 - (ဆ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်သည့်အရပ်ဒေသ(များ) မန္တလေးတိုင်းဒေသကြီး၊ မန္တလေးခရိုင်၊ ပုသိမ်ကြီးမြို့နယ်၊ ရေကြည်ကျေးရွာအုပ်စု၊ ကွင်းအမှတ် (၅၄၈)၊ ရေကြည်အရှေ့ကွင်း၊ ဦးပိုင်ပေါင်း (၇၂ ၉၉)၊ ကွင်းအမှတ် (၅၄၉)၊ ချောင်းကြီးဝ မြောက်ကွင်း၊ ဦးပိုင်ပေါင်း (၄၀) နှင့် အိုင်ကြီးကျေးရွာအုပ်စု၊ ကွင်းအမှတ် (၅၅၀)၊ ချောင်းကြီးဝအရှေ့ကွင်း၊ ဦးပိုင်အမှတ် (၁၊ ၂/၁၊ ၂/၂၊ ၃၊ ၄၊ ၅၊ N၁) တို့ရှိ စုစုပေါင်း မြေဧရိယာ (၅၄၇.၈၀) ဧကအနက် မြေဧရိယာ (၁၉၇.၆၀) ဧက
 - (ဇ) မတည်ငွေရင်းပမာဏ(ကျပ်) ၄၀၉,၉၇၂.၁၀ သန်း (အမေရိကန်ဒေါ်လာ ၂၀၃.၈၄ သန်း အပါအဝင် စုစုပေါင်း ကျပ် လေးသိန်း ကိုးထောင် ကိုးရာ ခုနစ်ဆယ်နှစ် သန်း နှင့် တစ်သိန်း ခန့်)
 - (ဈ) တည်ဆောက်မှုကာလ ၄ နှစ်

[Signature]
၂၀၁၇
မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်



NOTARIAL TRANSLATION
(From Myanmar Version)
REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION
PERMISSION ORDER



Permission Order No. Ma Na Tha-1234/2017. 2017, January 15th.

This permission order has been issued in accordance with Myanmar Citizenship Investment Law under 12 (b) by Myanmar Investment Commission.

- (a) Name of Investor - YE MYINT
- (b) Father's Name - U Tun Myint
- (c) Citizen/ NRC No. - 13/La Ya Na (Naing) 004211
- (d) Address - Room (5), Hall (6), Pweyontan, Chamyathaya Quarter, Pyigyitagon Township, Mandalay.
- (e) Already Formed (or) Association to be Formed - (Phwint Phyto Thit Company Limited)
- (f) Kinds of Investment Business - Yaytagon Hill Economic & Dwelling Building, Rental Building Business
- (g) Place (Places) of Investment - Out of total Holding No. (1,2/1,2/2,3,4,5, N 1) plot of land, area (372.92) acres, Chaunggyiwa-East Kwin, Kwin No. (550 Ka), Aigy Village Group and total Holding (40), Chaunggyiwa - North Kwin, Kwin No. (549) and total Holding (7,99), Yaykyi - East Kwin, Kwin No. (548), Yaykyi Village Group, Patheingyi Township, Mandalay District, Mandalay Region Plot of Land area (197.60) acres.
- (h) Amount of Capital - Kyats 409,972.10 million, (including US dollar 203.84 million, total about Kyats four hundred & nine thousand, nine hundred & seventy-two million & one hundred thousand.)
- (i) Period of Investment - (4) years

Sd/-x xx
15-1-17
Chairperson,
Myanmar Investment Commission.

Authenticated as correct & faithful English Translation from Myanmar (Burmese) Version.

[Signature]
U HTUN WAY, B.A., B.L.,
Advocate & Notary Public;
Small & Medium Industrial Development Bank Lawyers,
House No. (4), Thabyay Villa,
83 rd Street, (Bet: 67 th & 68 th Streets),
New Civil Lines,
Mandalay, Myanmar.
☎ 09-5261831, ☎ 02-64879



DOC. NO. 3174/2017 19 SEP 2017

Private School



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်
ခွင့်ပြုမိန့်



ခွင့်ပြုမိန့်အမှတ်၊ မနာ- ၁၂၁၈/၂၀၁၆။ ၂၀၁၆ ခုနှစ်၊ နိုဝင်ဘာလ ၂၁ ရက်

မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်သည် မြန်မာနိုင်ငံသားများ ရင်းနှီးမြှုပ်နှံမှု ဥပဒေပုဒ်မ ၁၂(ခ) အရ ဤခွင့်ပြုမိန့်ကို ထုတ်ပေးလိုက်သည် -

- (က) ရင်းနှီးမြှုပ်နှံသူ၏အမည် ဦးရဲမြင့်
- (ခ) အဘအမည် ဦးထွန်းမြင့်
- (ဂ) နိုင်ငံသား/ အမျိုးသားမှတ်ပုံတင်အမှတ် ၁၃/ လရန (နိုင်) ၀၀၄၂၁၁
- (ဃ) နေရပ်လိပ်စာ အခန်း(၅)၊ အဆောင် (၆)၊ ပွဲရုံတန်း၊ ချမ်းမြသာယာရပ်ကွက်၊ ပြည်ကြီးတံခွန်မြို့နယ်၊ မန္တလေးမြို့
- (င) စွဲစဉ်းထားသည့် သို့မဟုတ် စွဲစဉ်းမည့် အဖွဲ့အစည်း ဖွံ့ဖြိုးသစ်ကုမ္ပဏီလီမိတက် (Phwint Phyto Thit Company Limited)
- (စ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်မည့် လုပ်ငန်းအမျိုးအစား ရေတံခွန်တောင် ကိုယ်ပိုင်စာသင် ကျောင်းလုပ်ငန်း
- (ဆ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်သည့်အရပ်ဒေသ(များ) မန္တလေးတိုင်းဒေသကြီး၊ မန္တလေးခရိုင်၊ ပုသိမ်ကြီးမြို့နယ်၊ ရေကြည်ကျေးရွာအုပ်စု၊ ကွင်းအမှတ်(၅၄၈)၊ ရေကြည်အရှေ့ကွင်း ဦးပိုင်ပေါင်း (၉၉) ကွက်ရှိ မြေ (၃၇၂.၉၂) ဧက အနက် (၆.၂) ဧက
- (ဇ) မတည်ငွေရင်းပမာဏ(ကျပ်) ၂၈,၆၇၉.၆၅ သန်း (အမေရိကန်ဒေါ်လာ ၁၃,၄၀၀သန်း အပါအဝင် စုစုပေါင်း ကျပ်နှစ်သောင်း ရှစ်ထောင် ခြောက်ရာ ခုနစ်ဆယ့် ကိုးသန်းနှင့် ခြောက်သိန်း ငါးသောင်းခန့်)
- (ဈ) တည်ဆောက်မှုကာလ ၂ နှစ်

Handwritten signature and date: 11.11.16

ဗိဇ္ဇာ
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်



NOTARIAL TRANSLATION

(From Myanmar Version)

Form (Ma Na Tha-2)

REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION
PERMISSION ORDER



Permission Order No. Ma Na Tha-1218/2016.

2016. November 11th.

This permission order has been issued in accordance with Myanmar Citizenship Investment Law under 12 (b) by Myanmar Investment Commission.

- (a) Name of Investor - YEMYINT
- (b) Father's Name - U Tun Myint
- (c) Citizen/ NRC No. - 13/La Ya Na (Naing) 004211
- (d) Address - Room (5), Hall (6), Pweyontan, Chamyathaya Quarter, Pyigyitagon Township, Mandalay.
- (e) Already Formed (or) Association to be Formed - (Phwint Phyto Thit Company Limited)
- (f) Kinds of Investment Business - Yaytagon Hill Private School Business
- (g) Place (Places) of Investment - Out of total Holding (99) plot of land, area (372.92) acres, Yaykyi-East Kwin, Kwin No. (548), Yaykyi Village Group, Patheingyi Township, Mandalay District, Mandalay Region Plot of Land area (6.2) acres.
- (h) Amount of Capital - Kyats 28679.65 million, (including US dollar 13.40 million, total about Kyats twenty-eight thousand, six hundred & seventy-nine million & six hundred & fifty thousand.)
- (i) Period of Investment - (2) years

Handwritten signature: Sd-x x x
Handwritten date: 11-11-16

Chairperson,
Myanmar Investment Commission.

Authenticated as correct & faithful English Translation from Myanmar (Burmese) Version.



Handwritten signature: Htun Way
U HTUN WAY, B.A., B.L.,
Advocate & Notary Public;
Small & Medium Industrial Development Bank Lawyers,
House No. (4), Thabyay Villa,
33 rd Street, (Bet: 67 th & 68 th Streets),
New Civil Lines,
Mandalay, Myanmar.
09-5261831, 02-64879

DOC. NO. 3172 / 2017 19 SEP 2017

Real Estate Project




ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်
ခွင့်ပြုမိန့်



ခွင့်ပြုမိန့် အမှတ်၊ မနုသ-၁၂၃၄/၂၀၁၇ ။ ၂၀၁၇ ခုနှစ် ဇန်နဝါရီလ ၂၅ ရက်
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်သည် မြန်မာနိုင်ငံသားများ ရင်းနှီးမြှုပ်နှံမှု ဥပဒေပုဒ်မ
၁၂(ခ) အရ ဤခွင့်ပြုမိန့်ကို ထုတ်ပေးလိုက်သည်-

- (က) ရင်းနှီးမြှုပ်နှံသူ၏အမည် ဦးရဲမြင့်
- (ခ) အဘ အမည် ဦးထွန်းမြင့်
- (ဂ) နိုင်ငံသား/ အမျိုးသားမှတ်ပုံတင်အမှတ် ၁၃/လရန (နိုင်) ၀၀၄၂၁၁
- (ဃ) နေရပ်လိပ်စာ အမှတ်(၅)၊ အခန်း(၆)၊ ပွဲရုံတန်း၊ ချမ်းမြသာယာရပ်ကွက်၊
ပြည်ကြီးတံခွန်မြို့နယ်၊ မန္တလေးမြို့
- (င) ဖွဲ့စည်းထားသည့် သို့မဟုတ် ဖွဲ့စည်းမည့် အဖွဲ့အစည်း Phwint Phyto Thit
Company Limited (ဖွဲ့ဖွားသစ် ကုမ္ပဏီ လီမိတက်)
- (စ) ရင်းနှီးမြှုပ်နှံမှု ပြုလုပ်မည့် လုပ်ငန်းအမျိုးအစား ရေတံခွန်တောင် စီးပွားရေးနှင့်
လူနေအဆောက်အအုံများ တည်ဆောက်ငှားရမ်းခြင်းလုပ်ငန်း
- (ဆ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်သည့်အရပ်ဒေသ(များ) မန္တလေးတိုင်းဒေသကြီး၊
မန္တလေးခရိုင်၊ ပုသိမ်ကြီးမြို့နယ်၊ ရေကြည်ကျေးရွာအုပ်စု၊ ကွင်းအမှတ် (၅၄၈)၊
ရေကြည်အရှေ့ကွင်း၊ ဦးပိုင်ပေါင်း (၇၂ ဧက)၊ ကွင်းအမှတ် (၅၄၉)၊ ချောင်းကြီးဝ
မြောက်ကွင်း၊ ဦးပိုင်ပေါင်း (၄၀) နှင့် အိုင်ကြီးကျေးရွာအုပ်စု၊ ကွင်းအမှတ်
(၅၅၀)၊ ချောင်းကြီးဝအရှေ့ကွင်း၊ ဦးပိုင်အမှတ် (၁) ၂/၁၊ ၂/၂၊ ၃၊ ၄၊ ၅၊ (၆)၊
တို့ရှိ စုစုပေါင်း မြေဧရိယာ (၅၄၇.၈၀) ဧကအနက် မြေဧရိယာ (၁၉၇.၆၀) ဧက
- (ဇ) မတည်ငွေရင်းပမာဏ(ကျပ်) ၄၀၉,၉၇၂.၁၀ သန်း (အမေရိကန်ဒေါ်လာ ၂၀၃.၈၄
သန်း အပါအဝင် စုစုပေါင်း ကျပ် လေးသိန်း ကိုးထောင် ကိုးရာ ခုနစ်ဆယ့်နှစ်
သန်း နှင့် တစ်သိန်း ခန့်)
- (ဈ) တည်ဆောက်မှုကာလ ၄ နှစ်


ဥက္ကဋ္ဌ
မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်



NOTARIAL TRANSLATION

(From Myanmar Version)

Form (Ma Na Tha-2)

REPUBLIC OF THE UNION OF MYANMAR MYANMAR INVESTMENT COMMISSION PERMISSION ORDER



Permission Order No. Ma Na Tha-1234/2017.

2017, January 15th.

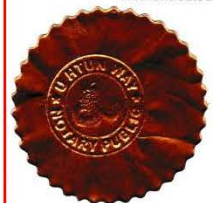
This permission order has been issued in accordance with Myanmar Citizenship Investment Law under 12 (b) by Myanmar Investment Commission.

- (a) Name of Investor - YE MYINT
- (b) Father's Name - U Tun Myint
- (c) Citizen/ NRC No. - 13/La Ya Na (Naing) 004211
- (d) Address - Room (5), Hall (6), Pweyontan, Chamyathaya
Quarter, Pyigyitagon Township, Mandalay.
- (e) Already Formed (or)
Association to be Formed - (Phwint Phyto Thit Company Limited)
- (f) Kinds of Investment Business - Yaytagon Hill Economic & Dwelling Building, Rental
Building Business
- (g) Place (Places) of Investment - Out of total Holding No. (1,2/1,2/2,3,4,5, N 1) plot of
land, area (372.92) acres, Chaunggyiwa-East Kwin, Kwin No. (550 Ka), Aigy Village Group and total
Holding (40), Chaunggyiwa - North Kwin, Kwin No. (549) and total Holding (7,99), Yaykyi - East Kwin,
Kwin No. (548), Yaykyi Village Group, Patheingyi Township, Mandalay District, Mandalay Region Plot
of Land area (197.60) acres.
- (h) Amount of Capital - Kyats 409,972.10 million, (including US dollar 203.84
million, total about Kyats four hundred & nine thousand, nine hundred & seventy-two million & one
hundred thousand.)
- (i) Period of Investment - (4) years

Sd/-x x x
15-1-17

Chairperson,
Myanmar Investment Commission.

Authenticated as correct & faithful English Translation from Myanmar (Burmese) Version.




U HTUN WAY, B.A., B.L.,
Advocate & Notary Public;
Small & Medium Industrial Development Bank Lawyers,
House No. (4), Thabyay Villa,
83 rd Street, (Bet: 67 th & 68 th Streets),
New Civil Lines,
Mandalay, Myanmar.
☎ 09-5261831, ☎ 02-64879

DOC. NO. 3174/2017 19 SEP 2017

Appendic-3 (Lab Result)**SGS**

Report No. : 21520-00033
 Job Ref. : 5000064
 Date : 16-Nov-21
 Page 1 of 2

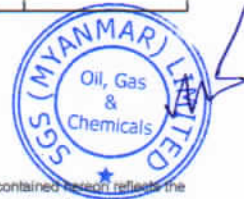
TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Ground Water (GW-1)
Sample Condition : Plastic Bottle at Ambient Temperature
Lab Code : W-70
Date Sample(s) Received : 8-Nov-21
Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
1	Nitrogen(Kjeldahl)	APHA 4500-NorgB (Macro Kjeldahl Method) (23rd Edition) (In-house Method)	<1	mg/L
2	Sulfide	APHA 4500-S2- A&F (Iodometric Method) (23rd Edition)	< 2	mg/L
3	Phosphorus	APHA 4500-P E (Ascorbic Acid Method) (23rd Edition)	<0.01	mg/L
4	Nickel	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg
5	Chromium	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg



This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
 REPORTED RESULTS REFER TO SUBMITTED SAMPLE (S) ONLY. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF COMPANY.
 Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only.
 WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Ground Water (GW-1)
 Sample Condition : Plastic Bottle at Ambient Temperature
 Lab Code : W-70
 Date Sample(s) Received : 8-Nov-21
 Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
6	Mercury	APHA 3030 & 3112B (Cold Vapor Atomic Absorption Spectrometric method) (23rd Edition) and User's Guide of Agilent Vapor Generation - Analytical notes	<0.1	mg/kg

***** End of Report *****

M.C.Z

SGS (Myanmar) Limited

(Signature)
 (Thin Thin Maw)
 Laboratory Manager

This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

REPORTED RESULTS REFER TO SUBMITTED SAMPLE (S) ONLY. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF COMPANY.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only.

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.



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-001

Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 1 of 2

W1121 138

WATER QUALITY TEST RESULTS FORM

Client Resources & Environment Myanmar Co.,Ltd.
 Nature of Water Ground Water
 Location Pathein Gyi Township, Mandalay, Region.
 Date and Time of collection 4.11.2021
 Date and Time of arrival at Laboratory 8.11.2021
 Date and Time of commencing examination 9.11.2021
 Date and Time of completing 11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH		6.5 - 8.5
Colour (True)	TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	mg/l as CaCO ₃	
Magnesium Hardness	mg/l as CaCO ₃	
Total Alkalinity	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	mg/l as CaCO ₃	
Iron	0.13 mg/l	0.3 mg/l
Chloride (as CL)	mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO ₄)	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Total Suspended Solids	mg/l	
Total Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

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

Tested by Hexu
 Signature: Zaw Aung Co
 Name: B.Sc. (Chemistry)
 Sr.Chemist

Approved by Myanmar
 Signature: Myanmar Technical Officer
 Name: B.E(Civil)
 Assistant Technical Officer
 ISO TECH Laboratory

(a division of WEG Co.,Ltd.) ISO TECH 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-001
 Issue Date - 01-12-2012
 Effective Date - 01-12-2012
 Issue No - 1.0/Page 2 of 2

W1121 138

WATER QUALITY TEST RESULTS FORM

Client	Resources & Environment Myanmar Co.,Ltd.
Nature of Water	Ground Water
Location	Pathein Gyi Township, Mandalay, Region.
Date and Time of collection	4.11.2021
Date and Time of arrival at Laboratory	8.11.2021
Date and Time of commencing examination	9.11.2021
Date and Time of completing	11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Parameter	Result	Unit	Guideline
Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.1	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia Nitrogen (NH ₃)	Nil	mg/l	
Ammonium Nitrogen (NH ₄)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)		mg/l	
Cyanide (CN)	Nil	mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (SiO ₂)		mg/l	

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

Tested by

Signature: _____

Name: _____

Zaw Aem Co
Zaw Aem Co
 B.Sc (Chemistry)
 Sr.Chemist
 ISO TECH Laboratory

Approved by

Signature: _____

Name: _____

Thinzar Thant
Thinzar Thant Thant
B.E(Civil)
 Assistant Technical Officer
 ISO TECH 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-001

Issue Date - 01-12-2012

Effective Date - 01-12-2012

Issue No - 1.0/Page 1 of 2

W1121 139

WATER QUALITY TEST RESULTS FORM

Client	Resources & Environment Myanmar Co.,Ltd.
Nature of Water	Surface Water (1)
Location	Patheingyi Township, Mandalay, Region.
Date and Time of collection	3.11.2021
Date and Time of arrival at Laboratory	8.11.2021
Date and Time of commencing examination	9.11.2021
Date and Time of completing	11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH		6.5 - 8.5
Colour (True)	TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	mg/l as CaCO ₃	
Magnesium Hardness	mg/l as CaCO ₃	
Total Alkalinity	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	mg/l as CaCO ₃	
Iron	0.69 mg/l	0.3 mg/l
Chloride (as CL)	mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO ₄)	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Total Suspended Solids	mg/l	
Total Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

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

Tested by

Signature: Zaw Htet Co

Name: B.Sc (Chemistry)

Sr.Chemist

Approved by

Signature: B.E(Civil)

Name: Assistant Technical Officer

ISO TECH Laboratory

(a division of WEG Co.,Ltd) ISO TECH 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-001
 Issue Date - 01-12-2012
 Effective Date - 01-12-2012
 Issue No - 1.0/Page 2 of 2

W1121 139

WATER QUALITY TEST RESULTS FORM

Client Resources & Environment Myanmar Co.,Ltd.
 Nature of Water Surface Water (1)
 Location Pathein Gyi Township, Mandalay, Region.
 Date and Time of collection 3.11.2021
 Date and Time of arrival at Laboratory 8.11.2021
 Date and Time of commencing examination 9.11.2021
 Date and Time of completing 11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.5	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia Nitrogen (NH ₃)	Nil	mg/l	
Ammonium Nitrogen (NH ₄)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)		mg/l	
Cyanide (CN)	Nil	mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (SiO ₂)		mg/l	

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

Tested by

Signature: _____

Name: _____

Handwritten Signature
Zaw Aem Co
D.E. (Civil)
 Sr.Chemist
 ISO TECH Laboratory

Approved by

Signature: _____

Name: _____

Handwritten Signature
Technical Officer
B.E(Civil)
 Assistant Technical Officer
 ISO TECH 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-001
 Issue Date - 01-12-2012
 Effective Date - 01-12-2012
 Issue No - 1.0/Page 1 of 2

W1121 140

WATER QUALITY TEST RESULTS FORM

Client Resources & Environment Myanmar Co.,Ltd.
 Nature of Water Surface Water (2)
 Location Patheingyi Township, Mandalay, Region.
 Date and Time of collection 3.11.2021
 Date and Time of arrival at Laboratory 8.11.2021
 Date and Time of commencing examination 9.11.2021
 Date and Time of completing 11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH		6.5 - 8.5
Colour (True)	TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	mg/l as CaCO ₃	
Magnesium Hardness	mg/l as CaCO ₃	
Total Alkalinity	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	mg/l as CaCO ₃	
Iron	0.72 mg/l	0.3 mg/l
Chloride (as CL)	mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO ₄)	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Total Suspended Solids	mg/l	
Total Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

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

Tested by

Signature: Zaw Aem Co
 Name: B.S. (Chemistry)
 Sr.Chemist

Approved by

Signature: U Saw Christopher Maung
 Name: B.E(Civil)
 Assistant Technical Officer
 ISO TECH Laboratory

(a division of WEG Co.,Ltd) ISO TECH Laboratory



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-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 2 of 2

W1121 140

WATER QUALITY TEST RESULTS FORM

Client	Resources & Environment Myanmar Co.,Ltd.
Nature of Water	Surface Water (2)
Location	Pathein Gyi Township, Mandalay, Region.
Date and Time of collection	3.11.2021
Date and Time of arrival at Laboratory	8.11.2021
Date and Time of commencing examination	9.11.2021
Date and Time of completing	11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.6	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia Nitrogen (NH ₃)	Nil	mg/l	
Ammonium Nitrogen (NH ₄)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)		mg/l	
Cyanide (CN)	Nil	mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (SiO ₂)		mg/l	

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

Tested by

Signature:

Name:

Zaw Hein Go
Zaw Hein Go
(Chemistry)
Sr.Chemist
ISO TECH Laboratory

Approved by

Signature:

Name:

U Tun Aung
U Tun Aung
B.E(Civil)
Assistant Technical Officer
ISO TECH Laboratory



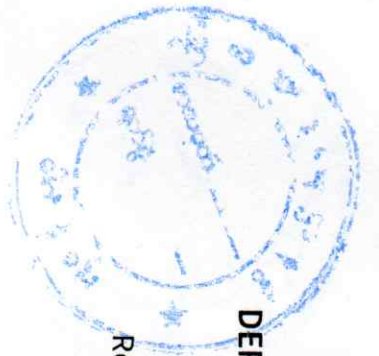
ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
စိုက်ပျိုးရေး၊ မွေးမြူရေးနှင့် ဆည်မြောင်းဝန်ကြီးဌာန
စိုက်ပျိုးရေးဦးစီးဌာန
(မြေအသုံးချရေးဌာနခွဲ)
ရန်ကုန်မြို့

စာအမှတ်- ၈၁- ၂(၁) / ၂၀၂၁-၂၀၂၂ (၀၃၃)
နေ့စွဲ၊ ၂၀၂၁ ခုနှစ်၊ ဒီဇင်ဘာလ (၂) ရက်

အကြောင်းအရာ။ မြေနမူနာ ဓာတ်ခွဲအဖြေများပေးပို့ခြင်း။
ရည် ညွှန်း ချက် ။ **Resource and Environment Myanmar** မှ (၈.၁၁.၂၀၂၁) နေ့တွင်
ပေးပို့သော နမူနာများ။

အထက်အကြောင်းအရာပါ ကိစ္စနှင့်ပတ်သက်၍ ရည်ညွှန်းစာဖြင့်
ပေးပို့လာသော မြေနမူနာ (၂ - မျိုး) အား ဓါတ်ခွဲစစ်ဆေးပြီးဖြစ်၍ ဓါတ်ခွဲတွေ့ရှိချက်
အဖြေများကို ဤစာနှင့် အတူ ပူးတွဲပေးပို့ပါသည်။

(ဒေါက်တာသန္တာညီ)
ဒုတိယညွှန်ကြားရေးမှူး
ဓာတ်ခွဲခန်းတာဝန်ခံ
မြေအသုံးချရေးဌာနခွဲ



DEPARTMENT OF AGRICULTURE (LAND USE)

SOIL ANALYTICAL DATA SHEET


Resource & Environment Myanmar(8.11.2021)

Sheet No. 1

Sr No. S 1-2/2021

Division -မန္တလေးတိုင်း
Township - ပုသိမ်ကြီး

Sr No.	Sample	Moisture %	pH Soil:Water 1:2.5	SOIL INTERPRETATION OF RESULTS	
				pH	
1	မြေနမူနာ	7.44	7.61		Moderately alkaline
2	မြေနမူနာ	3.09	7.86		Moderately alkaline


(ဒေါက်တာသန္တာညီ)
ဒုတိယညွှန်ကြားရေးမှူး
ဓာတ်ခွဲခန်းတာဝန်ခံ
မြေအသုံးချရေးဌာနခွဲ



DEPARTMENT OF AGRICULTURE (LAND USE)
SOIL ANALYTICAL DATA SHEET
Resource & Environment Myanmar(8.11.2021)

Division -မန္တလေးတိုင်း
Township - ပုသိမ်ကြီး

Sheet No. 1
Sr No. S 1-2 / 2021

Sr No.	Sample	Lead(Pb) ppm	Cadmium(Cd) ppm	Ascenic(As) ppm	Zinc(Zn) ppm	Copper(Cu) ppm	Iron(Fe) ppm
1	မြေနမူနာ	5.06	Not detected	18.54	Not detected	1.992	4.1
2	မြေနမူနာ	Not detected	Not detected	91.9	Not detected	0.534	0.352

MWm
(အောက်တာယန္တရည်)
ဒုတိယညွှန်ကြားရေးမှူး
ဓာတ်ခွဲခန်းတာဝန်ခံ
မြေအသုံးချရေးဌာနခွဲ

8

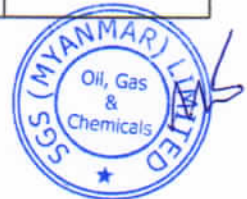
TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Pathcingyi Township.
 Surface Water (SW-1)
Sample Condition : Plastic Bottle at Ambient Temperature
Lab Code : W-68
Date Sample(s) Received : 8-Nov-21
Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
1	Nitrogen(Kjeldahi)	APHA 4500-NorgB (Macro Kjeldahl Method) (23rd Edition) (In-house Method)	1.90	mg/L
2	Sulfide	APHA 4500-S2- A&F (Iodometric Method) (23rd Edition)	<2	mg/L
3	Phosphorus	APHA 4500-P E (Ascorbic Acid Method) (23rd Edition)	0.043	mg/L
4	Nickel	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg
5	Chromium	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg



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Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

REPORTED RESULTS REFER TO SUBMITTED SAMPLE (S) ONLY. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF COMPANY.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only.

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD, BAHAN TOWNSHIP.


The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Surface Water (SW-1)
 Sample Condition : Plastic Bottle at Ambient Temperature
 Lab Code : W-68
 Date Sample(s) Received : 8-Nov-21
 Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
6	Mercury	APHA 3030 & 3112B (Cold Vapor Atomic Absorption Spectrometric method) (23rd Edition) and User's Guide of Agilent Vapor Generation - Analytical notes (Mercury) (Modified Method)	<0.1	mg/kg

***** End of Report *****

M.C.Z

SGS (Myanmar) Limited

 (Thin Thin Maw)
 Laboratory Manager

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TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Surface Water (SW-2)
 Sample Condition : Plastic Bottle at Ambient Temperature
 Lab Code : W-69
 Date Sample(s) Received : 8-Nov-21
 Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
1	Nitrogen(Kjeldahl)	APHA 4500-NorgB (Macro Kjeldahl Method) (23rd-Edition) (In-house Method)	1.90	mg/L
2	Sulfide	APHA 4500-S2- A&F (Iodometric Method) (23rd Edition)	< 2	mg/L
3	Phosphorus	APHA 4500-P E (Ascorbic Acid Method) (23rd Edition)	0.039	mg/L
4	Nickel	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg
5	Chromium	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg



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TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

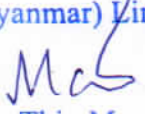
The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Surface Water (SW-2)
 Sample Condition : Plastic Bottle at Ambient Temperature
 Lab Code : W-69
 Date Sample(s) Received : 8-Nov-21
 Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
6	Mercury	APHA 3030 & 3142B (Cold Vapor Atomic Absorption Spectrometric method) (23rd Edition) and User's Guide of Agilent Vapor Generation - Analytical notes (Mercury) (Modified Method)	≤0.1	mg/kg

***** End of Report *****

M.C.Z

SGS (Myanmar) Limited

 (Thin Thin Maw)
 Laboratory Manager

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TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Ground Water (GW-1)
Sample Condition : Plastic Bottle at Ambient Temperature
Lab Code : W-70
Date Sample(s) Received : 8-Nov-21
Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
1	Nitrogen(Kjeldahl)	APHA 4500-NorgB (Macro Kjeldahl Method) (23rd Edition) (In-house Method)	<1	mg/L
2	Sulfide	APHA 4500-S2- A&F (Iodometric Method) (23rd Edition)	< 2	mg/L
3	Phosphorus	APHA 4500-P E (Ascorbic Acid Method) (23rd Edition)	<0.01	mg/L
4	Nickel	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg
5	Chromium	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg



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TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Ground Water (GW-1)
 Sample Condition : Plastic Bottle at Ambient Temperature
 Lab Code : W-70
 Date Sample(s) Received : 8-Nov-21
 Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
6	Mercury	APHA 3030 & 3112B (Cold Vapor Atomic Absorption Spectrometric method) (23rd Edition) and User's Guide of Agilent Vapor Generation - Analytical notes	<0.1	mg/kg

***** End of Report *****

M.C.Z

SGS (Myanmar) Limited

(Signature)
 (Thin Thin Maw)
 Laboratory Manager

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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-001

Issue Date - 01-12-2012
 Effective Date - 01-12-2012
 Issue No - 1.0/Page 1 of 2

W1121 139

WATER QUALITY TEST RESULTS FORM

Client Resources & Environment Myanmar Co.,Ltd.
 Nature of Water Surface Water (1)
 Location Patheingyi Township, Mandalay, Region.
 Date and Time of collection 3.11.2021
 Date and Time of arrival at Laboratory 8.11.2021
 Date and Time of commencing examination 9.11.2021
 Date and Time of completing 11.11.2021

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

pH		6.5 - 8.5
Colour (True)	TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	mg/l as CaCO ₃	
Magnesium Hardness	mg/l as CaCO ₃	
Total Alkalinity	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	mg/l as CaCO ₃	
Iron	0.69 mg/l	0.3 mg/l
Chloride (as CL)	mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO ₄)	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Total Suspended Solids	mg/l	
Total Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

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

Tested by

Signature: Zaw Aem Co

Name: B.Sc (Chemistry)

Sr.Chemist

Approved by

Signature: B.E(Civil)

Name: Assistant Technical Officer

ISO TECH Laboratory

(a division of WEG Co.,Ltd) **ISO TECH 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.
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Client Resources & Environment Myanmar Co.,Ltd.
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 Location Pathein Gyi Township, Mandalay, Region.
 Date and Time of collection 3.11.2021
 Date and Time of arrival at Laboratory 8.11.2021
 Date and Time of commencing examination 9.11.2021
 Date and Time of completing 11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.5	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia Nitrogen (NH ₃)	Nil	mg/l	
Ammonium Nitrogen (NH ₄)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)		mg/l	
Cyanide (CN)	Nil	mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (SiO ₂)		mg/l	

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

Tested by

Signature: _____

Name: _____

Handwritten Signature
Zaw Aem Co
B.E. (Civil)
 Sr. Chemist
 ISO TECH Laboratory

Approved by

Signature: _____

Name: _____

Handwritten Signature
Technical Officer
B.E(Civil)
 Assistant Technical Officer
 ISO TECH Laboratory

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WATER QUALITY TEST RESULTS FORM

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 Date and Time of arrival at Laboratory 8.11.2021
 Date and Time of commencing examination 9.11.2021
 Date and Time of completing 11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH		6.5 - 8.5
Colour (True)	TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	mg/l as CaCO ₃	
Magnesium Hardness	mg/l as CaCO ₃	
Total Alkalinity	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	mg/l as CaCO ₃	
Iron	0.72 mg/l	0.3 mg/l
Chloride (as CL)	mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO ₄)	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Total Suspended Solids	mg/l	
Total Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

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

Tested by

Signature: Zaw Aem Co
 Name: B.S. (Chemistry)
 Sr.Chemist

Approved by

Signature: B.E(Civil)
 Name: B.E(Civil)
 Assistant Technical Officer
 ISO TECH Laboratory

(a division of WEG Co.,Ltd) ISO TECH Laboratory

No.18. Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.

Ph: 01-640955, 09-73225175, 09-30339681, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com



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-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 2 of 2

W1121 140

WATER QUALITY TEST RESULTS FORM

Client	Resources & Environment Myanmar Co.,Ltd.
Nature of Water	Surface Water (2)
Location	Pathein Gyi Township, Mandalay, Region.
Date and Time of collection	3.11.2021
Date and Time of arrival at Laboratory	8.11.2021
Date and Time of commencing examination	9.11.2021
Date and Time of completing	11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.6	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia Nitrogen (NH ₃)	Nil	mg/l	
Ammonium Nitrogen (NH ₄)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)		mg/l	
Cyanide (CN)	Nil	mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (SiO ₂)		mg/l	

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

Tested by

Signature:

Name:

Zaw Hein Go
Zaw Hein Go
(Chemistry)
Sr.Chemist
ISO TECH Laboratory

Approved by

Signature:

Name:

U Tun Aung
U Tun Aung
B.E(Civil)
Assistant Technical Officer
ISO TECH Laboratory



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-001

Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 1 of 2

W1121 138

WATER QUALITY TEST RESULTS FORM

Client Resources & Environment Myanmar Co.,Ltd.
 Nature of Water Ground Water
 Location Pathein Gyi Township, Mandalay, Region.
 Date and Time of collection 4.11.2021
 Date and Time of arrival at Laboratory 8.11.2021
 Date and Time of commencing examination 9.11.2021
 Date and Time of completing 11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH			6.5 - 8.5
Colour (True)	TCU		15 TCU
Turbidity	NTU		5 NTU
Conductivity	micro S/cm		
Total Hardness	mg/l as CaCO ₃		500 mg/l as CaCO ₃
Calcium Hardness	mg/l as CaCO ₃		
Magnesium Hardness	mg/l as CaCO ₃		
Total Alkalinity	mg/l as CaCO ₃		
Phenolphthalein Alkalinity	mg/l as CaCO ₃		
Carbonate (CaCO ₃)	mg/l as CaCO ₃		
Bicarbonate (HCO ₃)	mg/l as CaCO ₃		
Iron	0.13 mg/l		0.3 mg/l
Chloride (as CL)	mg/l		250 mg/l
Sodium Chloride (as NaCL)	mg/l		
Sulphate (as SO ₄)	mg/l		500 mg/l
Total Solids	mg/l		1500 mg/l
Total Suspended Solids	mg/l		
Total Dissolved Solids	mg/l		1000 mg/l
Manganese	mg/l		0.05 mg/l
Phosphate	mg/l		
Phenolphthalein Acidity	mg/l		
Methyl Orange Acidity	mg/l		
Salinity	ppt		

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

Tested by Hexu
 Signature: Zaw Aung Co
 Name: B.S. (Chemistry)
 Sr.Chemist

Approved by Asst. Tech. Officer
 Signature: B.E(Civil)
 Name: Assistant Technical Officer
 ISO TECH Laboratory

(a division of WEG Co.,Ltd.) ISO TECH 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-001
 Issue Date - 01-12-2012
 Effective Date - 01-12-2012
 Issue No - 1.0/Page 2 of 2

W1121 138

WATER QUALITY TEST RESULTS FORM

Client Resources & Environment Myanmar Co.,Ltd.
 Nature of Water Ground Water
 Location Pathein Gyi Township, Mandalay, Region.
 Date and Time of collection 4.11.2021
 Date and Time of arrival at Laboratory 8.11.2021
 Date and Time of commencing examination 9.11.2021
 Date and Time of completing 11.11.2021

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.1	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia Nitrogen (NH ₃)	Nil	mg/l	
Ammonium Nitrogen (NH ₄)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)		mg/l	
Cyanide (CN)	Nil	mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (SiO ₂)		mg/l	

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

Tested by

Signature: _____

Name: _____

Zaw Aem Co
Zaw Aem Co
B.Sc. (Chemistry)
 Sr.Chemist
 ISO TECH Laboratory

Approved by

Signature: _____

Name: _____

Thinzar Thant
Thinzar Thant Thant
B.E(Civil)
 Assistant Technical Officer
 ISO TECH Laboratory

(a division of WEG Co.,Ltd.)



DEPARTMENT OF AGRICULTURE (LAND USE)
SOIL ANALYTICAL DATA SHEET
Resource & Environment Myanmar(8.11.2021)

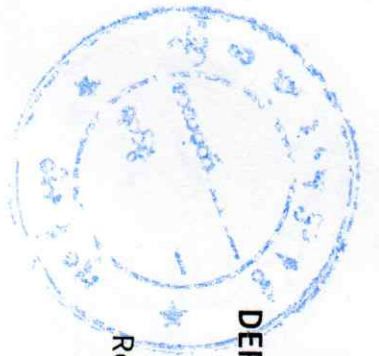
Division -မန္တလေးတိုင်း
Township - ပုသိမ်ကြီး

Sheet No. 1
Sr No. S 1-2 / 2021

Sr No.	Sample	Lead(Pb) ppm	Cadmium(Cd) ppm	Ascenic(As) ppm	Zinc(Zn) ppm	Copper(Cu) ppm	Iron(Fe) ppm
1	မြေနမူနာ	5.06	Not detected	18.54	Not detected	1.992	4.1
2	မြေနမူနာ	Not detected	Not detected	91.9	Not detected	0.534	0.352

M.M.M.
(အောက်တာယန္တရည်)
ဒုတိယညွှန်ကြားရေးမှူး
ဓာတ်ခွဲခန်းတာဝန်ခံ
မြေအသုံးချရေးဌာနခွဲ

8



DEPARTMENT OF AGRICULTURE (LAND USE)

SOIL ANALYTICAL DATA SHEET


Resource & Environment Myanmar(8.11.2021)

Sheet No. 1

Sr No. S 1-2/2021

Division -မန္တလေးတိုင်း
Township - ပုသိမ်ကြီး

Sr No.	Sample	Moisture %	pH Soil:Water 1:2.5	SOIL INTERPRETATION OF RESULTS	
				pH	
1	မြေနမူနာ	7.44	7.61		Moderately alkaline
2	မြေနမူနာ	3.09	7.86		Moderately alkaline


(ဒေါက်တာသန္တာညီ)
ဒုတိယညွှန်ကြားရေးမှူး
ဓာတ်ခွဲခန်းတာဝန်ခံ
မြေအသုံးချရေးဌာနခွဲ



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
စိုက်ပျိုးရေး၊ မွေးမြူရေးနှင့် ဆည်မြောင်းဝန်ကြီးဌာန
စိုက်ပျိုးရေးဦးစီးဌာန
(မြေအသုံးချရေးဌာနခွဲ)
ရန်ကုန်မြို့

စာအမှတ်- ၁၁- ၂(၁) / ၂၀၂၁-၂၀၂၂ (၀၃၃)
နေ့စွဲ၊ ၂၀၂၁ ခုနှစ်၊ ဒီဇင်ဘာလ (၂) ရက်

အကြောင်းအရာ။ **မြေနမူနာ** ဓာတ်ခွဲအဖြေများပေးပို့ခြင်း။
ရည် ညွှန်း ချက် ။ **Resource and Environment Myanmar** မှ (၈.၁၁.၂၀၂၁) နေ့တွင်
ပေးပို့သော နမူနာများ။

အထက်အကြောင်းအရာပါ ကိစ္စနှင့်ပတ်သက်၍ ရည်ညွှန်းစာဖြင့်
ပေးပို့လာသော **မြေနမူနာ (၂ - မျိုး)** အား ဓါတ်ခွဲစစ်ဆေးပြီးဖြစ်၍ ဓါတ်ခွဲတွေ့ရှိချက်
အဖြေများကို ဤစာနှင့် အတူ ပူးတွဲပေးပို့ပါသည်။

(ဒေါက်တာသန္တာညီ)
ဒုတိယညွှန်ကြားရေးမှူး
ဓာတ်ခွဲခန်းတာဝန်ခံ
မြေအသုံးချရေးဌာနခွဲ

ANALYSIS REPORT

PROJECT : EIA FOR YEDAKUN TAUNG CITY PROJECT, PATHEINGYI TOWNSHIP, MANDALAY REGION
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO.,LTD
ADDRESS : B 402, DELTA PLAZA, SHWEGONDAING ROAD, BAHAN TOWNSHIP, YANGON, MYANMAR. TEL.+95973013448
SAMPLING SOURCE : GW-1
SAMPLE TYPE : GROUNDWATER **SUBMITTAL/ RECEIPT NO.** : 1/11/2021
SAMPLING DATE : NOVEMBER 04, 2021 **RECEIVED DATE** : NOVEMBER 08, 2021
SAMPLING TIME : 14:26 HOUR **ANALYSIS DATE** : NOVEMBER 04 – 24, 2021
SAMPLING METHOD : GRAB **ANALYSIS NO.** : LAA073/2021
SAMPLING BY : REM **REPORT NO.** : L00078/2021

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			GW-1
			LAA073/2021
BIOCHEMICAL OXYGEN DEMAND	mg/L	MEMBRANE ELECTRODE METHOD (SM : 5210 B AND 4500-O G)	1.8
CHEMICAL OXYGEN DEMAND	mg/L	CLOSED REFLUX, TITRIMETRIC METHOD (SM : 5220 C)	ND (<25)
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105°C (SM : 2540 D)	ND (<5.0)
FECAL COLIFORM BACTERIA	MPN/100 mL	MULTIPLE TUBE FERMENTATION TECHNIQUE (SM : 9221 E)	130
OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM : 5520 B)	ND (<3)
SAMPLE CONDITION			
WATER'S COLOUR/TURBID			COLORLESS / CLEAR
SEDIMENT			-

SM : APHA/AWWA/WEF STANDARD METHOD FOR THE EXAMINATION OF WATER AND WASTEWATER, 23rd EDITION, 2017

ND : NON-DETECTABLE.



(MS TOE TOE HLAING)

GENERAL MANAGER

DATE DECEMBER 14,2021

- DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL.
- REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.

ANALYSIS REPORT

PROJECT : EIA FOR YEDAKUN TAUNG CITY PROJECT, PATHEINGYI TOWNSHIP, MANDALAY REGION
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO.,LTD
ADDRESS : B 402, DELTA PLAZA, SHWEGONDAING ROAD, BAHAN TOWNSHIP, YANGON, MYANMAR. TEL.+95973013448
SAMPLING SOURCE : SW-1
SAMPLE TYPE : SURFACE WATER **SUBMITTAL/ RECEIPT NO.** : 1/11/2021
SAMPLING DATE : NOVEMBER 03, 2021 **RECEIVED DATE** : NOVEMBER 08, 2021
SAMPLING TIME : 16:18 HOUR **ANALYSIS DATE** : NOVEMBER 04 – 24, 2021
SAMPLING METHOD : GRAB **ANALYSIS NO.** : LAA074/2021
SAMPLING BY : REM **REPORT NO.** : L00079/2021

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			SW-1
			LAA074/2021
BIOCHEMICAL OXYGEN DEMAND	mg/L	MEMBRANE ELECTRODE METHOD (SM : 5210 B AND 4500-O G)	2.0
CHEMICAL OXYGEN DEMAND	mg/L	CLOSED REFLUX, TITRIMETRIC METHOD (SM : 5220 C)	35
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105°C (SM : 2540 D)	21.7
FECAL COLIFORM BACTERIA	MPN/100 mL	MULTIPLE TUBE FERMENTATION TECHNIQUE (SM : 9221 E)	2,300
OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM : 5520 B)	ND (<3)
SAMPLE CONDITION			
WATER'S COLOUR/TURBID			LIGHT BROWN / LITTLE
SEDIMENT			TURBID BROWN

SM : APHA/AWWA/WEF STANDARD METHOD FOR THE EXAMINATION OF WATER AND WASTEWATER, 23rd EDITION, 2017

ND : NON-DETECTABLE.

Toe Toe Hlaing

(MS TOE TOE HLAING)

GENERAL MANAGER

DATE DECEMBER 14,2021

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- REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.

ANALYSIS REPORT

PROJECT : EIA FOR YEDAKUN TAUNG CITY PROJECT, PATHEINGYI TOWNSHIP, MANDALAY REGION
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO.,LTD
ADDRESS : B 402, DELTA PLAZA, SHWEGONDAING ROAD, BAHAN TOWNSHIP, YANGON, MYANMAR. TEL.+95973013448
SAMPLING SOURCE : SW-2
SAMPLE TYPE : SURFACE WATER **SUBMITTAL/ RECEIPT NO.** : 1/11/2021
SAMPLING DATE : NOVEMBER 03, 2021 **RECEIVED DATE** : NOVEMBER 08, 2021
SAMPLING TIME : 14:50 HOUR **ANALYSIS DATE** : NOVEMBER 04 – 24, 2021
SAMPLING METHOD : GRAB **ANALYSIS NO.** : LAA075/2021
SAMPLING BY : REM **REPORT NO.** : L00080/2021

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			SW-2
			LAA075/2021
BIOCHEMICAL OXYGEN DEMAND	mg/L	MEMBRANE ELECTRODE METHOD (SM : 5210 B AND 4500-O G)	2.3
CHEMICAL OXYGEN DEMAND	mg/L	CLOSED REFLUX, TITRIMETRIC METHOD (SM : 5220 C)	39
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105°C (SM : 2540 D)	16.2
FECAL COLIFORM BACTERIA	MPN/100 mL	MULTIPLE TUBE FERMENTATION TECHNIQUE (SM : 9221 E)	2,300
OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM : 5520 B)	ND (<3)
SAMPLE CONDITION			
WATER'S COLOUR/TURBID			LIGHT BROWN / LITTLE
SEDIMENT			TURBID BROWN

SM : APHA/AWWA/WEF STANDARD METHOD FOR THE EXAMINATION OF WATER AND WASTEWATER, 23rd EDITION, 2017

ND : NON-DETECTABLE.

Toe Toe Hlaing

(MS TOE TOE HLAING)

GENERAL MANAGER

DATE DECEMBER 14,2021

- DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL.
- REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.

TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Pathcingyi Township.
 Surface Water (SW-1)
Sample Condition : Plastic Bottle at Ambient Temperature
Lab Code : W-68
Date Sample(s) Received : 8-Nov-21
Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
1	Nitrogen(Kjeldahi)	APHA 4500-NorgB (Macro Kjeldahl Method) (23rd Edition) (In-house Method)	1.90	mg/L
2	Sulfide	APHA 4500-S2- A&F (Iodometric Method) (23rd Edition)	<2	mg/L
3	Phosphorus	APHA 4500-P E (Ascorbic Acid Method) (23rd Edition)	0.043	mg/L
4	Nickel	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg
5	Chromium	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg



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REPORTED RESULTS REFER TO SUBMITTED SAMPLE (S) ONLY. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF COMPANY.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only.

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.


The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Surface Water (SW-1)
 Sample Condition : Plastic Bottle at Ambient Temperature
 Lab Code : W-68
 Date Sample(s) Received : 8-Nov-21
 Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
6	Mercury	APHA 3030 & 3112B (Cold Vapor Atomic Absorption Spectrometric method) (23rd Edition) and User's Guide of Agilent Vapor Generation - Analytical notes (Mercury) (Modified Method)	<0.1	mg/kg

***** End of Report *****

M.C.Z

SGS (Myanmar) Limited

 (Thin Thin Maw)
 Laboratory Manager

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 REPORTED RESULTS REFER TO SUBMITTED SAMPLE (S) ONLY. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF COMPANY.
 Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only.
 WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Surface Water (SW-2)
 Sample Condition : Plastic Bottle at Ambient Temperature
 Lab Code : W-69
 Date Sample(s) Received : 8-Nov-21
 Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
1	Nitrogen(Kjeldahl)	APHA 4500-NorgB (Macro Kjeldahl Method) (23rd-Edition) (In-house Method)	1.90	mg/L
2	Sulfide	APHA 4500-S2- A&F (Iodometric Method) (23rd Edition)	< 2	mg/L
3	Phosphorus	APHA 4500-P E (Ascorbic Acid Method) (23rd Edition)	0.039	mg/L
4	Nickel	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg
5	Chromium	APHA 3030 &3111B (Direct Air Acetylene Flame Method) (23rd Edition)	<0.1	mg/kg



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 REPORTED RESULTS REFER TO SUBMITTED SAMPLE (S) ONLY. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF COMPANY.
 Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only.
 WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

TEST REPORT

CLIENT NAME : RESOURCE & ENVIRONMENT MYANMAR COMPANY LIMITED
ADDRESS : ROOM-702/B, DELTA PLAZA, SHWEGONDAING ROAD,
 BAHAN TOWNSHIP.

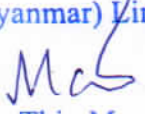
The following sample was submitted and identified by client and analysed at our lab with the following results.

Sample Description : Yedakun Taung Area, Patheingyi Township.
 Surface Water (SW-2)
 Sample Condition : Plastic Bottle at Ambient Temperature
 Lab Code : W-69
 Date Sample(s) Received : 8-Nov-21
 Testing Period : 9-Nov-21 TO 12-Nov-21

No.	Test Items	Methods	Results	Units
6	Mercury	APHA 3030 & 3142B (Cold Vapor Atomic Absorption Spectrometric method) (23rd Edition) and User's Guide of Agilent Vapor Generation - Analytical notes (Mercury) (Modified Method)	≤0.1	mg/kg

***** End of Report *****

M.C.Z

SGS (Myanmar) Limited

 (Thin Thin Maw)
 Laboratory Manager

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 REPORTED RESULTS REFER TO SUBMITTED SAMPLE (S) ONLY. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF COMPANY.
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 WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

ANALYSIS REPORT

PROJECT : EIA FOR YEDAKUN TAUNG CITY PROJECT, PATHEINGYI TOWNSHIP, MANDALAY REGION
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO.,LTD
ADDRESS : B 402, DELTA PLAZA, SHWEGONDAING ROAD, BAHAN TOWNSHIP, YANGON, MYANMAR. TEL.+95973013448
SAMPLING SOURCE : GW-1
SAMPLE TYPE : GROUNDWATER **SUBMITTAL/ RECEIPT NO.** : 1/11/2021
SAMPLING DATE : NOVEMBER 04, 2021 **RECEIVED DATE** : NOVEMBER 08, 2021
SAMPLING TIME : 14:26 HOUR **ANALYSIS DATE** : NOVEMBER 04 – 24, 2021
SAMPLING METHOD : GRAB **ANALYSIS NO.** : LAA073/2021
SAMPLING BY : REM **REPORT NO.** : L00078/2021

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			GW-1
			LAA073/2021
BIOCHEMICAL OXYGEN DEMAND	mg/L	MEMBRANE ELECTRODE METHOD (SM : 5210 B AND 4500-O G)	1.8
CHEMICAL OXYGEN DEMAND	mg/L	CLOSED REFLUX, TITRIMETRIC METHOD (SM : 5220 C)	ND (<25)
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105°C (SM : 2540 D)	ND (<5.0)
FECAL COLIFORM BACTERIA	MPN/100 mL	MULTIPLE TUBE FERMENTATION TECHNIQUE (SM : 9221 E)	130
OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM : 5520 B)	ND (<3)
SAMPLE CONDITION			
WATER'S COLOUR/TURBID			COLORLESS / CLEAR
SEDIMENT			-

SM : APHA/AWWA/WEF STANDARD METHOD FOR THE EXAMINATION OF WATER AND WASTEWATER, 23rd EDITION, 2017

ND : NON-DETECTABLE.



(MS TOE TOE HLAING)

GENERAL MANAGER

DATE DECEMBER 14,2021

- DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL.
- REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.

ANALYSIS REPORT

PROJECT : EIA FOR YEDAKUN TAUNG CITY PROJECT, PATHEINGYI TOWNSHIP, MANDALAY REGION
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO.,LTD
ADDRESS : B 402, DELTA PLAZA, SHWEGONDAING ROAD, BAHAN TOWNSHIP, YANGON, MYANMAR. TEL.+95973013448
SAMPLING SOURCE : SW-1
SAMPLE TYPE : SURFACE WATER **SUBMITTAL/ RECEIPT NO.** : 1/11/2021
SAMPLING DATE : NOVEMBER 03, 2021 **RECEIVED DATE** : NOVEMBER 08, 2021
SAMPLING TIME : 16:18 HOUR **ANALYSIS DATE** : NOVEMBER 04 – 24, 2021
SAMPLING METHOD : GRAB **ANALYSIS NO.** : LAA074/2021
SAMPLING BY : REM **REPORT NO.** : L00079/2021

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			SW-1
			LAA074/2021
BIOCHEMICAL OXYGEN DEMAND	mg/L	MEMBRANE ELECTRODE METHOD (SM : 5210 B AND 4500-O G)	2.0
CHEMICAL OXYGEN DEMAND	mg/L	CLOSED REFLUX, TITRIMETRIC METHOD (SM : 5220 C)	35
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105°C (SM : 2540 D)	21.7
FECAL COLIFORM BACTERIA	MPN/100 mL	MULTIPLE TUBE FERMENTATION TECHNIQUE (SM : 9221 E)	2,300
OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM : 5520 B)	ND (<3)
SAMPLE CONDITION			
WATER'S COLOUR/TURBID			LIGHT BROWN / LITTLE
SEDIMENT			TURBID BROWN

SM : APHA/AWWA/WEF STANDARD METHOD FOR THE EXAMINATION OF WATER AND WASTEWATER, 23rd EDITION, 2017

ND : NON-DETECTABLE.



(MS TOE TOE HLAING)

GENERAL MANAGER

DATE DECEMBER 14,2021

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ANALYSIS REPORT

PROJECT : EIA FOR YEDAKUN TAUNG CITY PROJECT, PATHEINGYI TOWNSHIP, MANDALAY REGION
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO.,LTD
ADDRESS : B 402, DELTA PLAZA, SHWEGONDAING ROAD, BAHAN TOWNSHIP, YANGON, MYANMAR. TEL.+95973013448
SAMPLING SOURCE : SW-2
SAMPLE TYPE : SURFACE WATER **SUBMITTAL/ RECEIPT NO.** : 1/11/2021
SAMPLING DATE : NOVEMBER 03, 2021 **RECEIVED DATE** : NOVEMBER 08, 2021
SAMPLING TIME : 14:50 HOUR **ANALYSIS DATE** : NOVEMBER 04 – 24, 2021
SAMPLING METHOD : GRAB **ANALYSIS NO.** : LAA075/2021
SAMPLING BY : REM **REPORT NO.** : L00080/2021

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			SW-2
			LAA075/2021
BIOCHEMICAL OXYGEN DEMAND	mg/L	MEMBRANE ELECTRODE METHOD (SM : 5210 B AND 4500-O G)	2.3
CHEMICAL OXYGEN DEMAND	mg/L	CLOSED REFLUX, TITRIMETRIC METHOD (SM : 5220 C)	39
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105°C (SM : 2540 D)	16.2
FECAL COLIFORM BACTERIA	MPN/100 mL	MULTIPLE TUBE FERMENTATION TECHNIQUE (SM : 9221 E)	2,300
OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM : 5520 B)	ND (<3)
SAMPLE CONDITION			
WATER'S COLOUR/TURBID			LIGHT BROWN / LITTLE
SEDIMENT			TURBID BROWN

SM : APHA/AWWA/WEF STANDARD METHOD FOR THE EXAMINATION OF WATER AND WASTEWATER, 23rd EDITION, 2017

ND : NON-DETECTABLE.

Toe Toe Hlaing

(MS TOE TOE HLAING)

GENERAL MANAGER

DATE DECEMBER 14,2021

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Phwint Phyo Thit Company Limited

မန္တလေးတိုင်း ဒေသကြီး၊ ပုသိမ်ကြီးမြို့နယ်၊
ရေတံခွန် တောင် Master Plan Project
(အဆင့်မြင့် ဟိုတယ်) စီမံကိန်းအဆိုငံရာ

ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှု
ဆန်းစစ်လေ့လာခြင်း
(Environmental Impact Assessment)

တင်ပြချက်များ

- စီမံကိန်းအကြောင်းအရာ
- EIA လေ့လာခြင်းအတွက် ခြုံငုံသုံးသပ်ချက်
- လူထုတွေ့ဆုံဆွေးနွေးခြင်း လုပ်ငန်းစဉ်
- ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များ ကွင်းဆင်းလေ့လာခြင်းနှင့် ပုံစံဖော်လေ့လာခြင်း
- ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ခြုံငုံသုံးသပ်ချက်
- အဓိကသက်ရောက်မှုများနှင့် ထိခိုက်မှုလျှော့ချရေး နည်းလမ်းများ
- စောင့်ကြည့်လေ့လာရေး အစီအစဉ်များ
- ဆက်သွယ်ရန် လိပ်စာများ

ပတ်ဝန်းကျင်သက်ရောက်မှု ဆန်းစစ်ခြင်း ၏ရည်ရွယ်ချက်

- စီမံကိန်းဧရိယာနှင့်သက်ဆိုင်သောအခြေခံအချက်အလက်များရရှိရန်
- ပတ်ဝန်းကျင်နှင့် လူမှုရေးရှုထောင့်မှဖြစ်နိုင်သည့်သိသာသော ကောင်းကျိုး၊ ဆိုးပြစ်များ ကိုတန်ဖိုးဖြတ်ရန်
- ဆိုးပြစ်များကိုလျော့ချနိုင်မည့်နည်းလမ်းများကိုအကြံပြုရန်
- ဆောက်လုပ်ရေးလုပ်ငန်းလုပ်ကိုင်ချိန်နှင့် လုပ်ငန်းလည်ပတ်ချိန်တွင် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုကိုထိန်းချုပ်နိုင်ရန်အတွက် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးစီမံခန့်ခွဲမှု အစီအစဉ် တစ်ရပ်ကိုတည်ထောင်ရန်
- ESIA လုပ်ငန်းစဉ်များအား (နယ်ပယ်သက်မှတ်ခြင်း၊ ကွင်းဆင်းလေ့လာခြင်း၊ စစ်တမ်းကောက်ယူခြင်း၊ အစီရင်ခံစာရေးသားခြင်း)

အများပြည်သူနှင့် ဆွေးနွေးညှိနှိုင်း သဘောထားရယူခြင်း၏ ရည်ရွယ်ချက်များ

- ဖြစ်ပေါ်လာနိုင်သည့် ကောင်းကျိုး/ဆိုးကျိုးများကို အများပြည်သူသိရှိနိုင်ရန်
- ပါဝင်ပတ်သက်သူများ၏ အမြင်နှင့် အကြံပြုချက်များ၊ ထိခိုက်သက်ရောက်လာနိုင်မှုများကို လျှော့ချပေးနိုင်မည့် အစီအစဉ်များထည့်သွင်း စဉ်စားပေးနိုင်ရန်
- စီမံကိန်းအကောင်အထည်ဖော်ဆောင်ရွက်ခြင်းနှင့် လည်ပတ်ခြင်းလုပ်ငန်းများနှင့် ဆက်လျဉ်း၍ ပွင့်လင်းမြင်သာမှု နှင့် တာဝန်ယူနိုင်မှု တိုးတက်စေရန်
- အမြင်မတူမှုများညှိနှိုင်းရန်နှင့် စီမံကိန်းအကောင်အထည်ဖော်ရာတွင် ချောမွေ့မှုရှိစေရန်

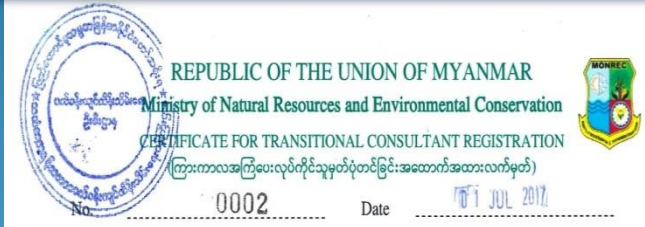
စီမံကိန်းအကြောင်းအရာမိတ်ဆက်ခြင်း

EIA အကြံပေးအဖွဲ့အစည်း



Resource and Environment Myanmar Co., Ltd. (REM)

- REM ဆိုသည်မှာ နယ်ပယ်အသီးသီးမှ တက္ကသိုလ်ဆရာဟောင်းများနှင့် တာဝန်ထမ်းဆောင်ဆဲပါမောက္ခများ ပါဝင်သော သဘာဝပတ်ဝန်းကျင်၊ လူမှုစီးပွား နှင့် မြေပြင်ပထဝီဝင်အရင်းအမြစ်များ စီမံခန့်ခွဲမှု ဆိုင်ရာလုပ်ငန်း စသည်တို့ကို ဝန်ဆောင်မှုပေးသည့် ထိပ်တန်း သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ အတိုင်ပင်ခံကုမ္ပဏီ တစ်ခု ဖြစ်သည်။
- REM သည် မြန်မာနိုင်ငံတွင် ၂၀၀၇ ခုနှစ်တွင် စတင်တည်ထောင်ခဲ့ပြီး IEE၊ EIA နှင့် EMP အစီရင်ခံစာပေါင်း ၁၀၀ ကျော်ပြီးစီးဆောင်ရွက်ခဲ့သည်။
- REM သည် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနတွင် EIA အတိုင်ပင်ခံ ကုမ္ပဏီအဖြစ် မှတ်ပုံတင်ရရှိထားသောကုမ္ပဏီဖြစ်သည်။
- REM ရုံးသည် ရန်ကုန်မြို့၊ ရွှေဂုံတိုင်မြို့နယ်တွင် တည်ရှိပြီး ဝန်ထမ်း ၄၀ ကျော်ဖြင့် လည်ပတ်လျက် ရှိပါသည်။



The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the organization under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၅၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို အဖွဲ့အစည်းအား ထုတ်ပေးလိုက်သည်။)

(a) Name of Organization (အဖွဲ့အစည်းအမည်)	Resources & Environment Myanmar Co.,Ltd.
(b) Name of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ အမည်)	U Win Naing Tun
(c) Citizenship of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ နိုင်ငံသား)	Myanmar
(d) Identity Card /Passport Number of the representative person in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ မှတ်ပုံတင်/ နိုင်ငံတူးလက်မှတ် အမှတ်)	14/Ah Ga Pa (N) 039780
(e) Address of organization (ဆက်သွယ်ရန်လိပ်စာ)	No. 702, Building B, Delta Plaza Compound, Shwegondaing Road, Bahan Township, service@gmail.com , 09 73013448
(f) Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)	Organization
(g) Duration of validity (သက်တမ်းကုန်ဆုံးရက်)	31 March 2018

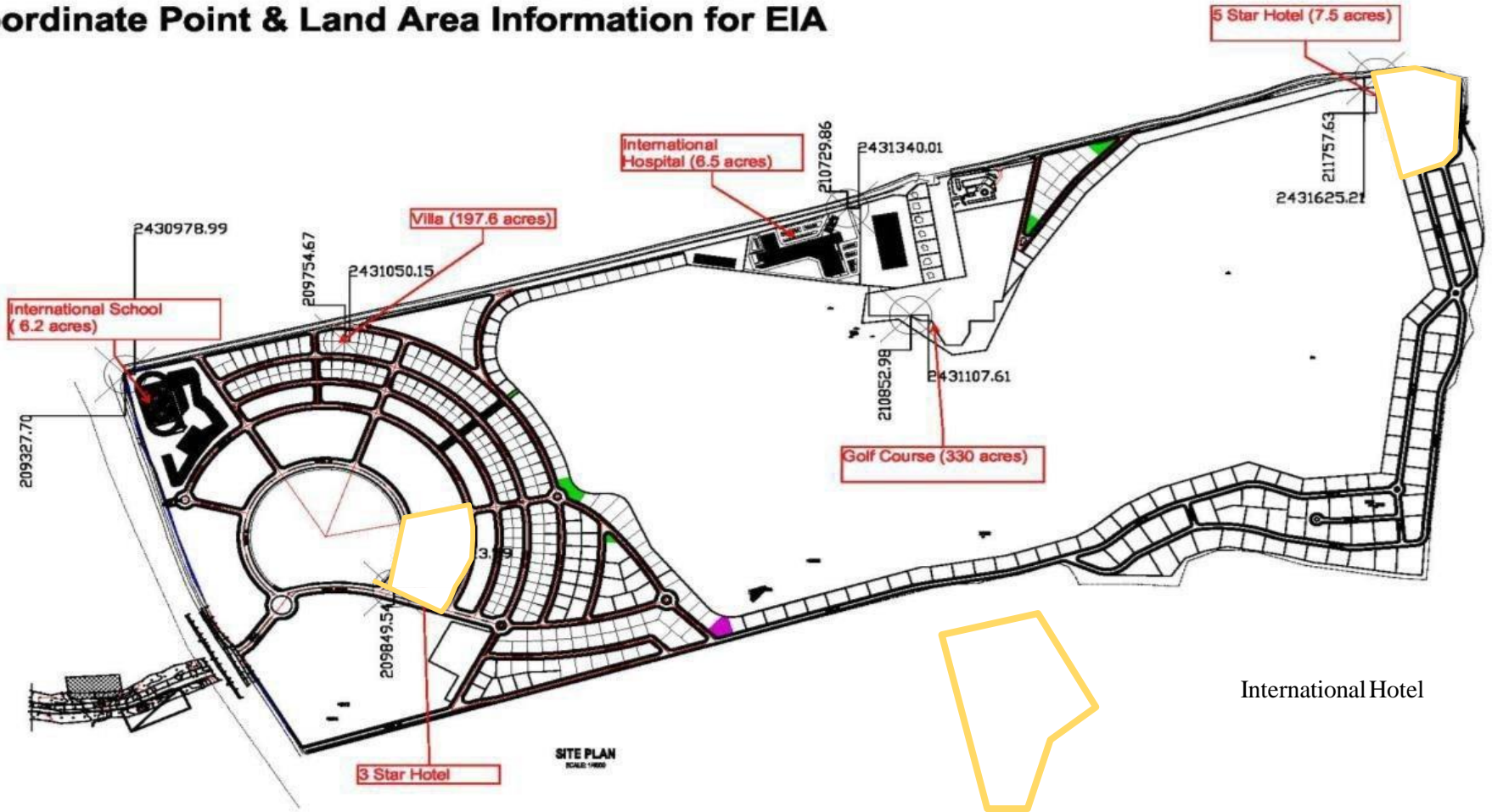

 Director General
 Environmental Conservation Department
 Ministry of Natural Resources and Environmental Conservation

စီမံကိန်း အကြောင်းအရာ

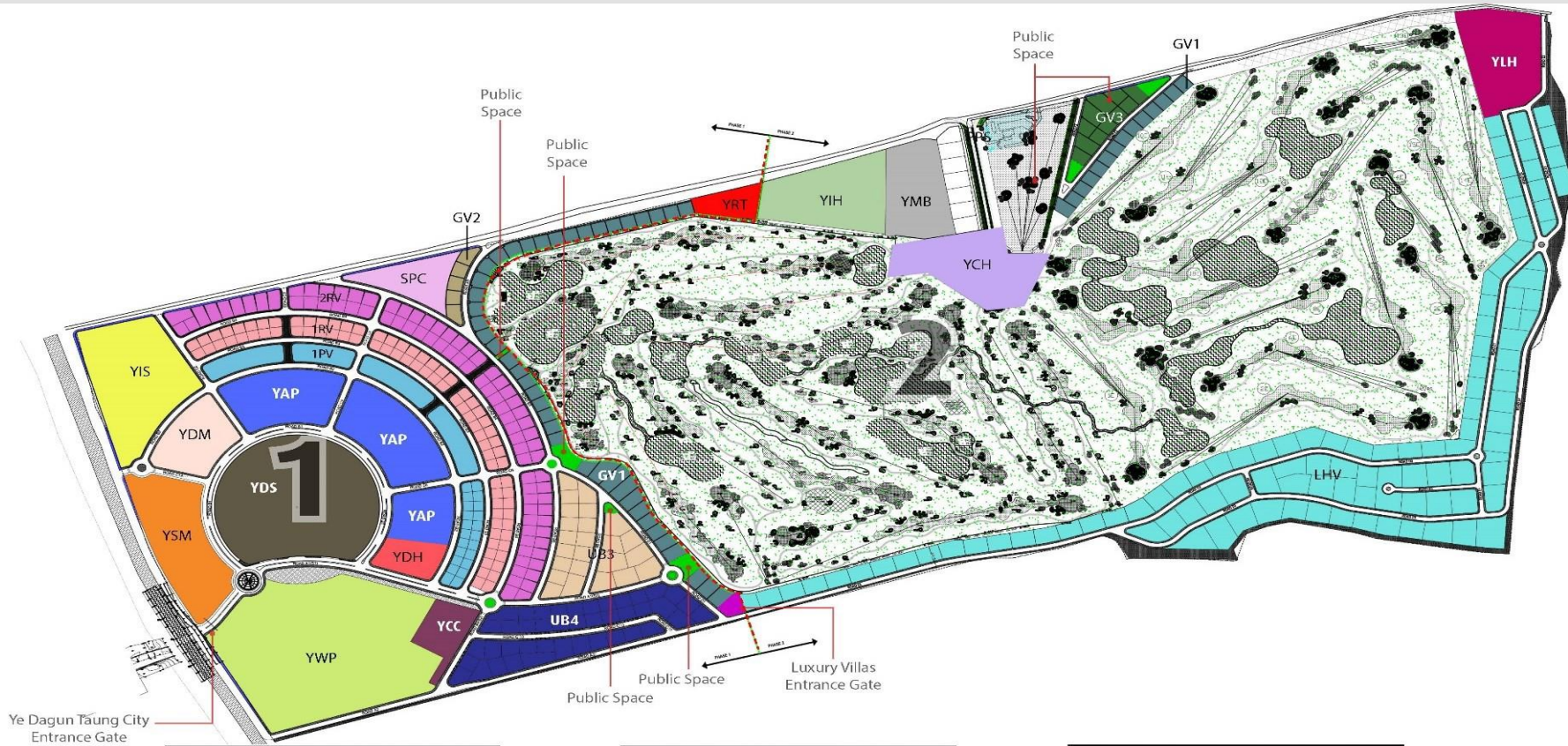
- ရေတံခွန်တောင် Master Plan Project သည် ရေကြည်အရှေ့ခြမ်း၊ ကွင်းအမှတ် (၅၄၈)၊ ရေကြီးကျေးရွာ၊ ပုသိမ်ကြီးမြို့နယ်၊ မန္တလေးခရိုင်၊ မန္တလေးတိုင်း ဒေသကြီး တွင် တည်ရှိပြီး ၇.၅ ဧက ကျယ်ဝန်းပါသည်။
- စီမံကိန်းတွင် ပက်ကော့ချ် ၄ ခု ပါဝင်ပါသည်။
- Package-1- International Hotel (ကြယ်ငါးပွင့်ဟိုတယ်) စီမံကိန်း၊
- Package-2- International School၊
- Package-3- International Hospital၊ နှင့်
- Package-4- International Standardized Yaytagon Hill Golf Course၊ Club House၊ Amusement Park၊ Commercial and Urban Residential Buildings .

ဟိုတယ်တည်နေရာ Coordinates များ

Coordinate Point & Land Area Information for EIA



Yaytagon Hill Master Plan စီမံကိန်း၏ အပိုင်းများ



Code	Project Name	Nos. of Plots
YIS	International School	1
YSM	Shopping Mall	1
YWP	Amusement-Water Park	by other
YCC	Community Center	1
YOM	Open Market	1
YDS	Shophouses	1
YAP	Apartments	3
YDH	3-Star Hotel	1

Code	Project Name	Nos. of Plots
1PV	Single Villas	84
1RV	1st Row Villas	82
2RV	2nd Row Villas	82
UB3	Urban Villas Type 1	24
UB4	Urban Villas Type 2	42
GV1	Golf Course Villas 1	56
GV2	Golf Course Villas 2	5
GV3	Golf Course Villas 3	11

Code	Project Name	Nos. of Plots
SPC	Sports Center	1
YRT	Retails	1
LHV	Luxury Hill Villas	104
YLH	5-Star Hotel	1
PPS	Showroom	1
YCH	Club House	1
YMB	Management Building	1
YIH	International Hospital	1

5.12.10 PERSPECTIVES

ARCHITECTURAL CONCEPT DESIGN > THREE-STAR HOTEL



archetype

• 5-Star Hotel

Name	Novotel Mandalay
Land Area	5.27 Acres
Ground Floor Area (GFA)	97301.5 SQFT
No. of Storey	11
No. of Rooms	311

5.15 FIVE-STAR HOTEL ARCHITECTURAL CONCEPT DESIGN



PARCEL 15 5 star Hotel



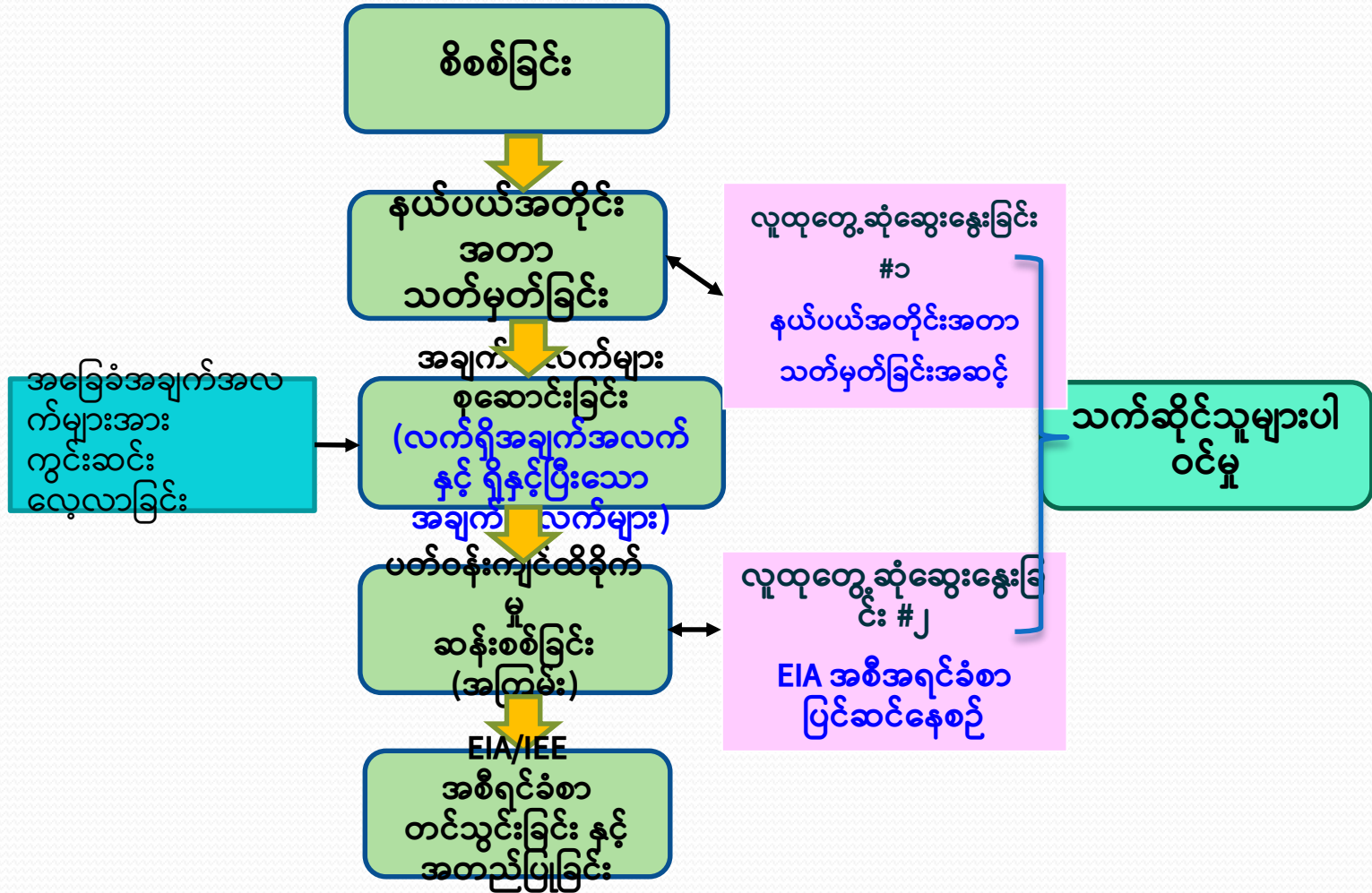
Designated Land Use	Hotel	300 rooms
Building Land Plot	20,716m ²	222,985 ft ²
Approx. GFA	23,700m ²	255,105 ft ²
Footprint	3,865 m ²	41,603 ft ²
FAR	1.14	
BCR	18.7%	
Maximum Building Height	40m	131 ft
Number of Storeys	7	(from 2-10 floors)
Green Space Ratio Min.	35%	
Required Setback	6m	20ft

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA)
ခြုံငုံတင်ပြချက်

EIA ခြုံငုံတင်ပြချက်

- သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနမှ ထုတ်ပြန်ထားသော ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅) အရ စီမံကိန်းသည် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း EIA ကို ဆောင်ရွက်ရန်လိုအပ်ပါသည်။
- EIA လုပ်ထုံးလုပ်နည်းအရ ကုမ္ပဏီသည် စီမံကိန်းအတွက် EIA လေ့လာမှုများ ကို ပြင်ဆင်ဆောင်ရွက် လျှက်ရှိပါသည်။
- EIA သည် အဆိုပြုစီမံကိန်းနှင့် ဆက်စပ်လျက်ရှိသော ဖြစ်နိုင်ခြေရှိသည့် ပတ်ဝန်းကျင်ဆိုင်ရာ၊ လူမှုဝန်းကျင်ဆိုင်ရာ နှင့် အများပြည်သူကျန်းမာရေးဆိုင်ရာ သက်ရောက်မှုများကို အကဲဖြတ်ဆန်းစစ်ခြင်း နှင့်
- သက်ရောက်မှုကာကွယ်ရေး၊ လျော့ပါးရေးအစီအမံများနှင့် စောင့်ကြည့်ရေးအစီအစဉ်ကို ခွဲခြားသတ်မှတ် ရန် ဖြစ်ပါသည်။

EIA လေ့လာခြင်း လုပ်ငန်းစဉ်



ပတ်ဝန်းကျင်ဆိုင်ရာ
အခြေခံအချက်အလက်များ
ကွင်းဆင်းလေ့လာခြင်းနှင့်
ပုံစံဖော်လေ့လာမှုများ

ပတ်ဝန်းကျင်ဆိုင်ရာ နောက်ခံအချက်အလက်များ

- **ရူပပတ်ဝန်းကျင် (Physical Environment)**
 - ဥတုရာသီ၊ လေထု၊ ရေ၊ နုန်းအနည်အနှစ်၊ ဘူမိဗေဒ၊ စသည်ဖြင့်
- **ဇေယျဗေဒ (Hydrology)**
- **ဂေဟပတ်ဝန်းကျင် (Ecological Environment)**
 - ရေအောက် အပင်နှင့် တိရိစ္ဆာန်များ၊ ရွှေ့ပြောင်းငှက်များ၊ အထူးထိန်းသိမ်းထားသည့် နယ်မြေများနှင့် မျိုးစိတ်များ၊ ကာကွယ်ခြင်း၊ ၎င်းတို့နှင့်ပတ်သက်၍ စိုးရိမ်စရာအခြေအနေ စသည်ဖြင့်
- **လူမှုပတ်ဝန်းကျင် (Social Environment)**
- **လူနေမှုဘဝ (Quality of Life)**
 - အလုပ်အကိုင်နှင့် ဝင်ငွေ၊ အလုပ်သမားများနှင့် ဒေသခံလူထု၏ ကျန်းမာရေး၊ သိသာထင်ရှားသည့် ကျန်းမာရေးပြဿနာများနှင့် စိုးရိမ်ပူပန်မှုများ၊ ကျန်းမာရေးဆိုင်ရာအဆောက်အဦများနှင့် စိုးရိမ်ပူပန်မှုများ၊ ဝန်ဆောင်မှုများ၊ ငါးဖမ်းခြင်း၊ ရေယာဉ်အသွားအလာ၊ ရေရရှိမှု၊ စွမ်းအင်ရရှိမှု၊ စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု စသည်ဖြင့်

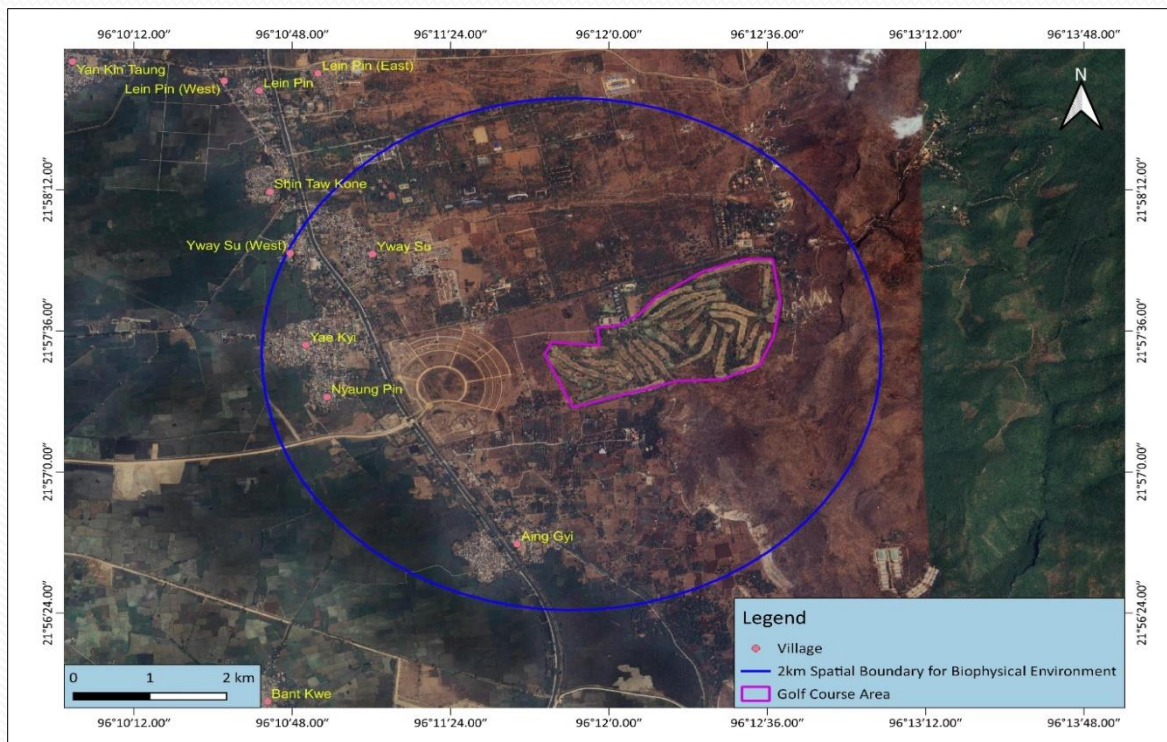
ရူပ နှင့် ဇီဝတ်ဝန်းကျင် (Bio-Physical Environment)

ဧရိယာ သတ်မှတ်မှု

- စီမံကိန်း ဧရိယာနယ်နိမိတ်မှ ၂ ကီလိုမီတာ အကွာကြားခံ ဧရိယာ အား လေ့လာမှု ပြုလုပ်ခဲ့ပါသည်။

သတ်မှတ်ရသည့်ရည်ရွယ်ချက်

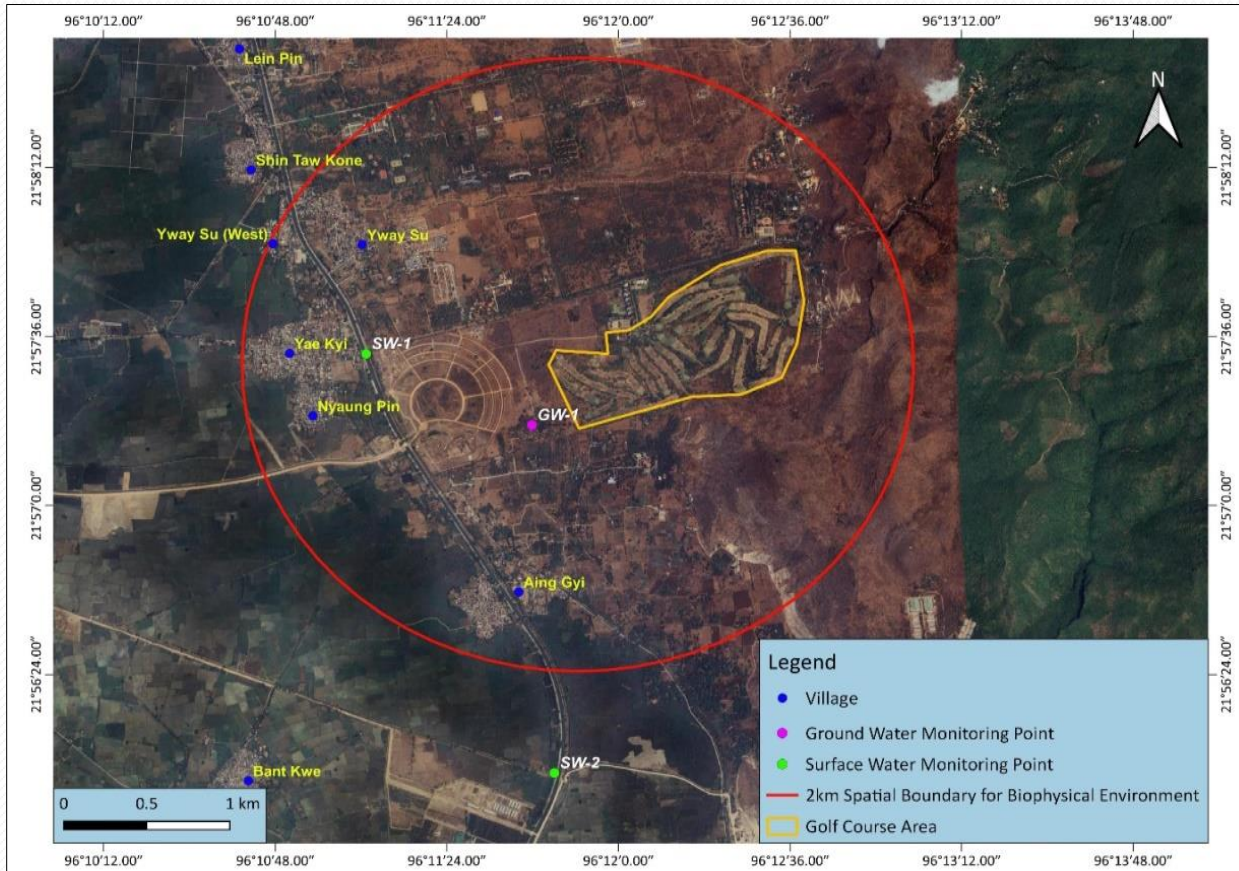
- (စီမံကိန်းအမျိုးအစား၊ သက်ရောက် ခံစားရနိုင်သည့် Receptor အကွာအဝေး၊ စီမံကိန်းတည်ရှိရာ နေရာ၏ လက်ရှိအခြေအနေ များ ပေါ်မူတည်၍ သတ်မှတ်ထားပါသည်။



အခြေခံအချက်အလက်ကောက်ယူခြင်း

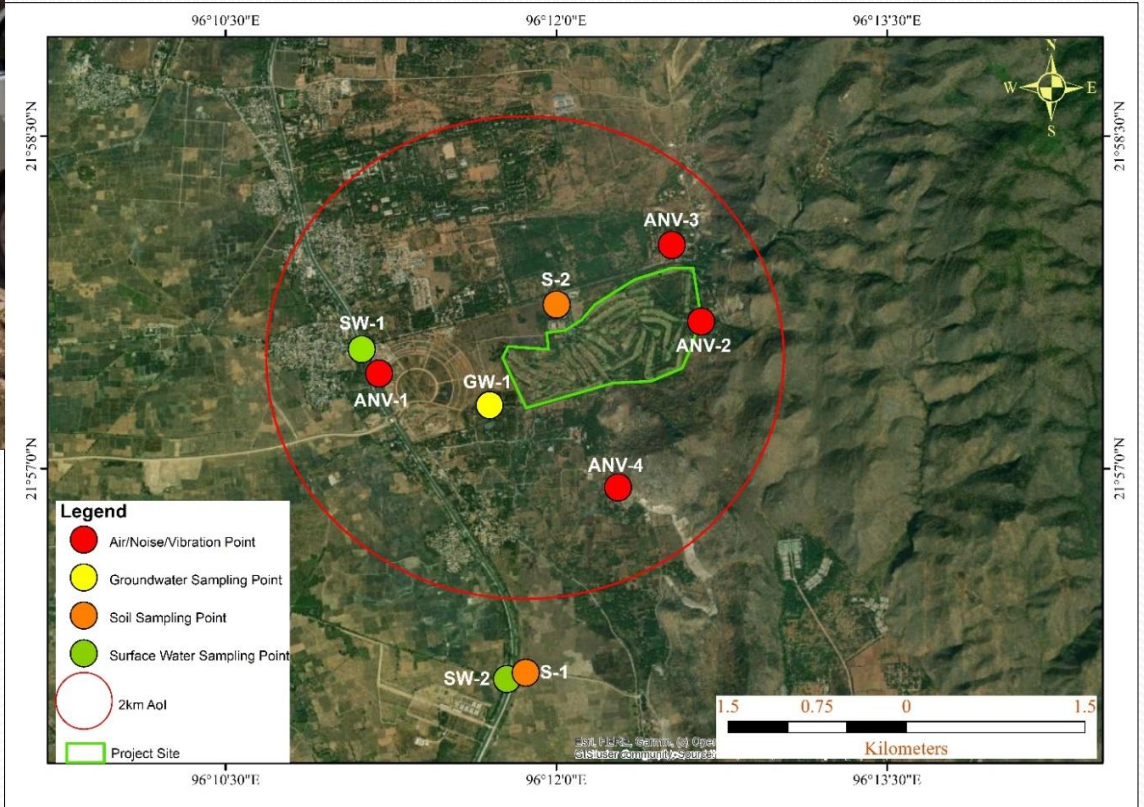
Item	Parameter
(1) Ambient Air Quality	(1) Sulphur Dioxide (SO ₂), (2) Nitrogen Dioxide (NO ₂), (3) Carbon Monoxide (CO), (4) Ozone (O ₃), (5) Total Suspended Particles (TSP), (6) Particulate Matter (PM ₁₀ & PM _{2.5}), (7) Air Pressure and (8) Wind Speed & Wind Direction
(2) Water Quality	Ammonia (NH ₄), Arsenic, BOD, TSS, Total coliform, COD, Oil and grease, Zinc, Chromium (total), Copper, Iron, Mercury, Nitrate, Sulphide, Total Nitrogen, Total Phosphorus, Nickel, Lead, Cyanide
(3) Noise and Vibration Level	A-weighted loudness equivalent (LAeq) for noise Vibration level, vertical, percentile (LV ₁₀) for vibration
(4) Traffic Volume	Number of vehicles, types of vehicles, and direction of vehicle movement
(5) Soil Quality	Soil pH, Moisture content, lead, Arsenic, Cadmium, Copper, Iron, Zinc
(6) Flora and Fauna	Vegetation, flora species, fauna species, important species
(7) Cultural Assets	Existing cultural assets such as pagoda and cemetery
(8) Hydrology	Topography, surface water flow direction

ကောက်ယူသည့် နေရာများ



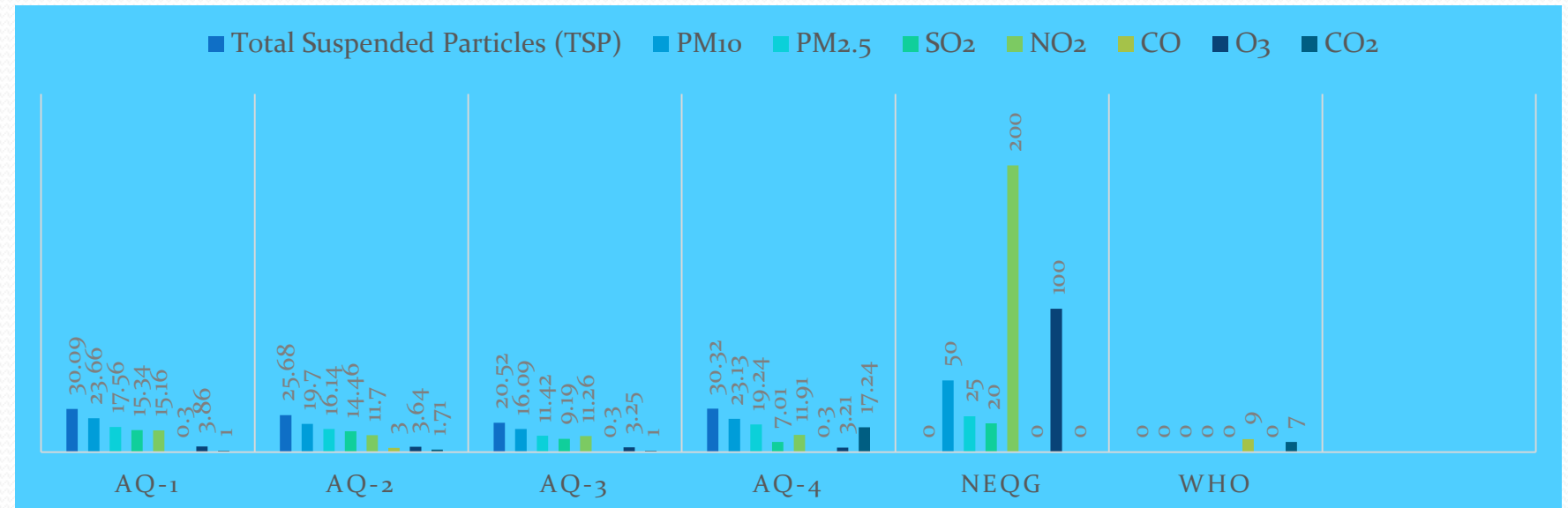
- Air Quality (AQ₁₋₂)
- Surface Water Quality (SW₁₋₅)
- Soil (SO₁₋₄)
- Noise, Vibration and Traffic (N · V · T₁₋₂) and Noise (N₃₋₄)
- Groundwater Quality (GW₁₋₂)

I. လေအရည်အသွေး နှင့် အသံဆူညံမှု တိုင်းတာခြင်းဆိုင်ရာ အချက်အလက်များ



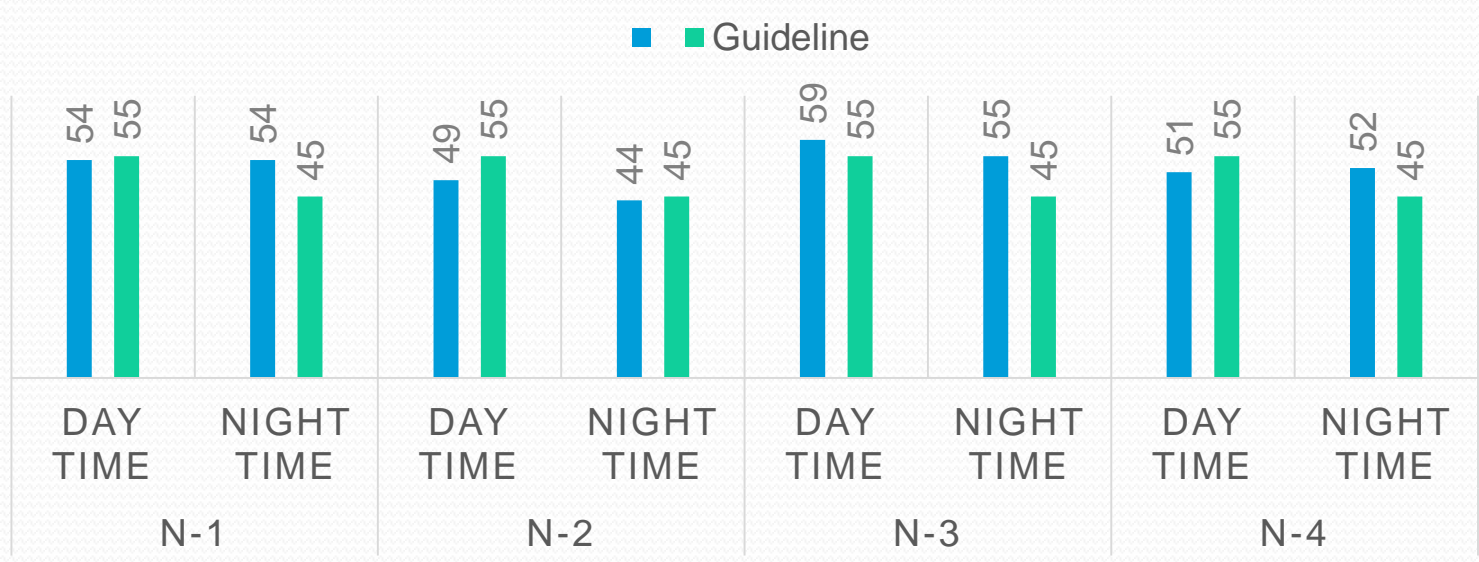
လေထုအရည်အသွေးရလဒ်

Monitoring ID	Total Suspended Particles (TSP)	PM10 $\mu\text{g}/\text{m}^3$	PM2.5 $\mu\text{g}/\text{m}^3$	SO2 $\mu\text{g}/\text{m}^3$	NO2 $\mu\text{g}/\text{m}^3$	CO ppm	O3 $\mu\text{g}/\text{m}^3$	CO2 ppm
AQ-1	30.09	23.66	17.56	15.34	15.16	0.3	3.86	1
AQ-2	25.68	19.7	16.14	14.46	11.7	0.3	3.64	1.71
AQ-3	20.52	16.09	11.42	9.19	11.26	0.3	3.25	1
AQ-4	30.32	23.13	19.24	7.01	11.91	0.3	3.21	17.24
NEQG	-	50	25	20	200	-	100 (8hour average)	-
WHO	-	-	-	-	-	9ppm USEPA	-	7ppm



ဆူညံသံရလဒ်များ

	N-1		N-2		N-3		N-4	
	Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time
	54	54	49	44	59	55	51	52
NEQG	55	45	55	45	55	45	55	45



II. ရေ အရည်အသွေးဆိုင်ရာ အချက်အလက်များ



Category	Sampling Point	Coordinate	Description
Surface Water	SW-1	21°57'32.31"N 96°11'7.08"E	Collected at the inlet part where is the site intended for the construction of water supply area for construction phase
Surface Water	SW-2	21°56'3.03"N 96°11'46.58"E	collected at the outlet part where is the site intended for the construction of a sewage treatment plant
Ground water	GW-1	21°57'17.15"N 96°11'41.87"E	Theyetdaw Village

Item	Parameter					
Water Quality	Ammonia (NH4), Arsenic, BOD, TSS, Total coliform, COD, Oil and grease, Zinc, Chromium (total), Copper, Iron, Mercury, Nitrate, Sulphide, Total Nitrogen, Total Phosphorus, Nickel, Lead, Cyanide					
Parameter	Unit	SW-1	SW-2	GW-1	Standard	
					EQEG	MNDWQS
Water Temperature	°C	30.8	31.3	30.47	<3	-
pH		8.31	7.8	7.4	6-9	6.5-8.5
Dissolved oxygen	mg/l	5.12	5.08	3.24	-	-
Conductivity	ms/cm	0.20	0.41	1.26	-	-
Total dissolved solid	g/l	0.13	0.27	0.80	-	1000
Turbidity	ntu	47.7	72.9	0	-	5
Salinity	ppt	0.09	0.2	0.6	-	-
Ammonia	mg/l	nil	nil	nil	10	-
Arsenic	mg/l	nil	nil	nil	0.1	0.05
Total coliform	mg/l	23	23	1.3	400	3
TSS	mg/l	21.7	16.2	ND (<3)	50	-
Oil & Grease	mg/l	ND (<3)	ND (<3)	ND (<3)	10	-
Chemical Oxygen Demand	mg/l	35	39	ND (<25)	250	-
Biochemical Oxygen Demand	mg/l	2.0	2.3	1.8	50	-
Chromium (Total)	mg/kg	<0.1	<0.1	<0.1	0.5	0.5
Copper	mg/l	nil	nil	nil	0.5	2
Iron	mg/l	0.69	0.72	0.13	3.5	1
Mercury	mg/kg	<0.1	<0.1	<0.1	0.01	0.001
Nitrate	mg/l	0.5	0.6	0.1	-	1
Sulphide	mg/l	<2	<2	<2	1	0.05
Total Nitrogen	mg/l	1.90	1.90	<1	10	-
Total Phosphorous	mg/l	0.043	0.039	<0.01	2	-
Nickel	mg/kg	<0.1	<0.1	<0.1	0.5	0.07
Lead	mg/l	nil	nil	nil	0.1	0.01

**ရေအရည်အသွေး
ရလဒ်များ**

III. မြေဆီလွှာ အရည်အသွေးဆိုင်ရာ အချက်အလက်



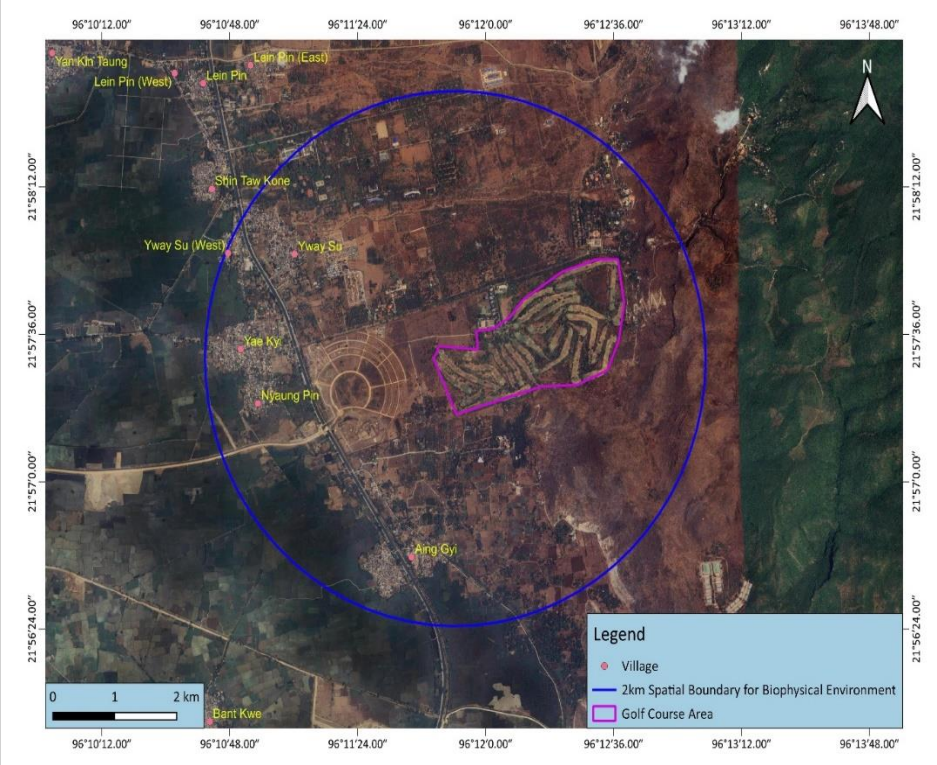
Category	Sampling Point	Coordinates	Description of Sampling Point

မြေအရည်အသွေးရလဒ်များနှင့် တိုင်းတာသည့် Parameterများ

Category	Parameter
Soil Quality	Soil pH, Moisture content, lead, Arsenic, Cadmium, Copper, Iron, Zinc

Parameter	unit	S-1	S-2
pH		7.61	7.86
Moisture content		7.44	3.09
Lead		5.06	Not detected
Cadmium		Not detected	Not detected
Copper		1.992	0.534
Arsenic		18.54	91.9
Zinc		Not detected	Not detected
Iron		4.1	0.352

လူမှု-စီးပွားရေး လေ့လာဆန်းစစ်ခြင်း



ပုသိမ်မြို့: မြို့နယ် အတွင်း ရှိ အိမ်ခြေ ပြဇယားအား လေ့လာစစ်ဆေး ကောက်ယူခဲ့ပါသည်။

Township	Description	House	Household (Family)	Ward	Village Tract	Village
Patheingyi	Urban	2283	2874	1	-	-
	Rural	45612	53461	-	58	140
	Total	47895	56335	1	58	140

ကျက်စားရာနေရာ

အဆိုပြုထားသည့် စီမံကိန်းဧရိယာအတွင်းနှင့် အနီးတစ်ဝိုက်တွင် အဓိကနေထိုင်ရာ အမျိုးအစား လေးမျိုးဖြစ်သည်။

- (၁) စိုက်ပျိုးမြေနှင့်
- (၂) ချုံပုတ်မြေ (အစိမ်းရောင်နယ်မြေ)
- (၃) စိုက်ခင်းမြေနှင့်
- (၄) ဗလာမြေ၊



အပင်စစ်တမ်းရလဒ်

- စစ်တမ်းကောက်ယူမှုအတွင်း စုစုပေါင်း သစ်ပင်ပန်းမန်မျိုးစိတ် ၈၁ မျိုးကို တွေ့ရှိခဲ့သည်။
- မျိုးစိတ်(၁)မျိုးသည် မျိုးသုဉ်းလုနီးပါးမျိုးစိတ် အဖြစ် ခွဲခြား သတ်မှတ်ထားပြီး စိုးရိမ်စရာအနည်းဆုံးမျိုးစိတ် (၂၈)မျိုးရှိသည်။
- ဒေတာချို့တဲ့မှုနှင့် Iucn Red List တွင် အကဲဖြတ်မရသေးသည့် မျိုးစိတ် ၅၀ တွေ့ရှိရပါသည်။
- ဤဧရိယာတွင် အစုလိုက်မျိုးစိတ်မရှိပေ။
- IUCN Red List အရ မျိုးသုဉ်းလုနီးပါးမျိုးစိတ် (Htan) မျိုးစိတ်များကို ဤစစ်တမ်းဧရိယာတွင် မှတ်တမ်းတင်ထားသည်။
- ဤခြမ်းခြောက်ခံရသောမျိုးစိတ်များသည် မြန်မာနိုင်ငံအလယ် ပိုင်းတွင် ပေါများသည်။

သတ္တဝါ စစ်တမ်းရလဒ်

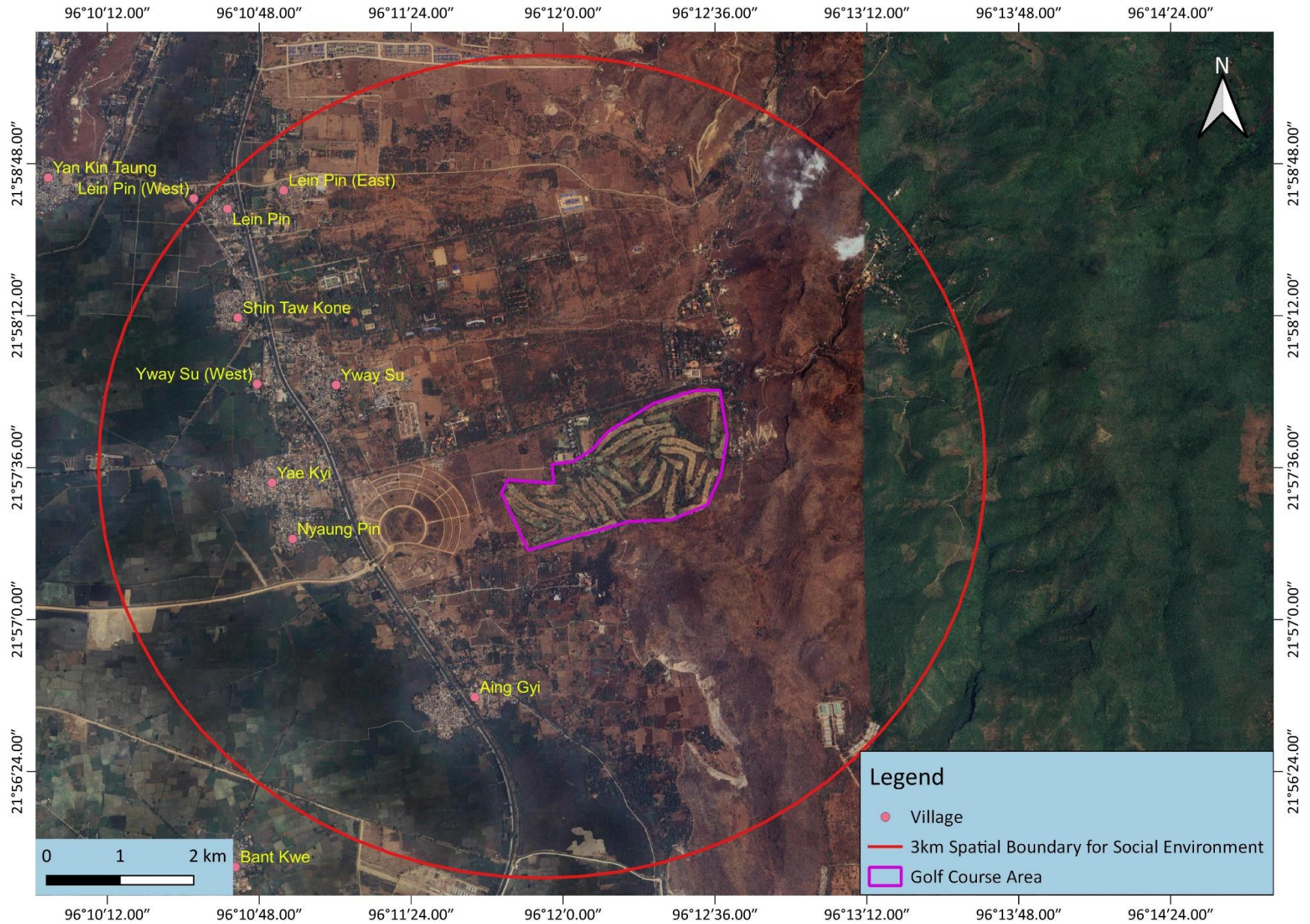
အကောင်မျိုးစိတ်	စုစုပေါင်းမျိုးစိတ်အရေအတွက်
နို့တိုက်သတ္တဝါ	၇
ငှက်	၄၂
လိပ်ပြာ	၂၁
တွားသွားသတ္တဝါများ	၁၀
ငါး	၈
စုစုပေါင်း	၈၈

အကောင်စစ်တမ်းရလဒ်

- ခြိမ်းခြောက်ခံရသောမျိုးစိတ်များ၏ IUCN အရ၊ ခြိမ်းခြောက်ခံထားရသော ငှက်မျိုးစိတ် (NT) မျိုးစိတ်တစ်မျိုးကို ဤစစ်တမ်းဧရိယာတွင် မှတ်တမ်းတင်ထားသည်။
- အခြားသော တိရစ္ဆာန်မျိုးစိတ်များသည် စစ်တမ်းအရ ခြိမ်းခြောက်ခံရသော မျိုးစိတ်များ မရှိပါ။



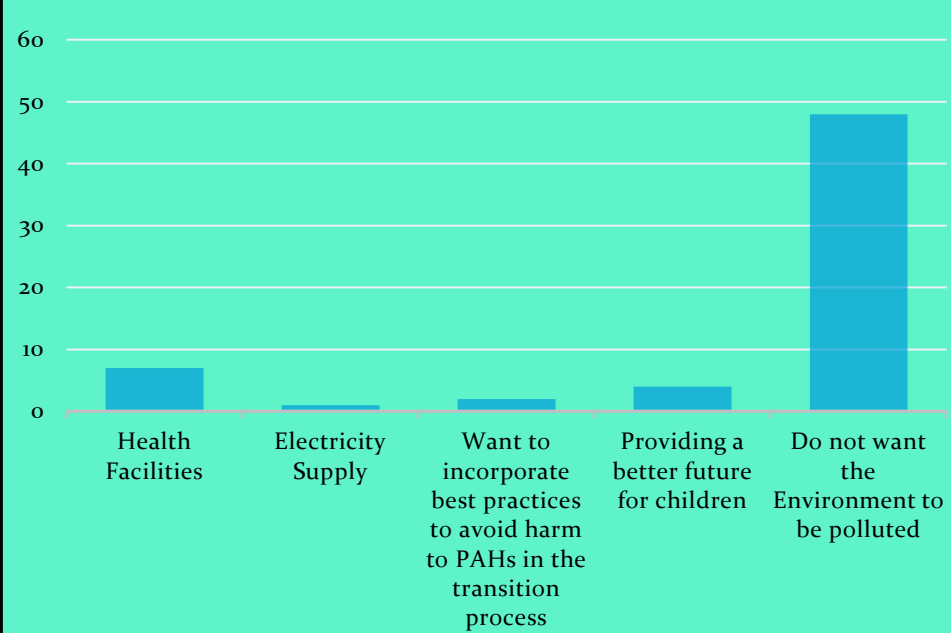
စီမံကိန်းဧရိယာအတွင်း လူမှုစီးပွားရေးဆိုင်ရာ စစ်တမ်းကောက်ယူမှုများ



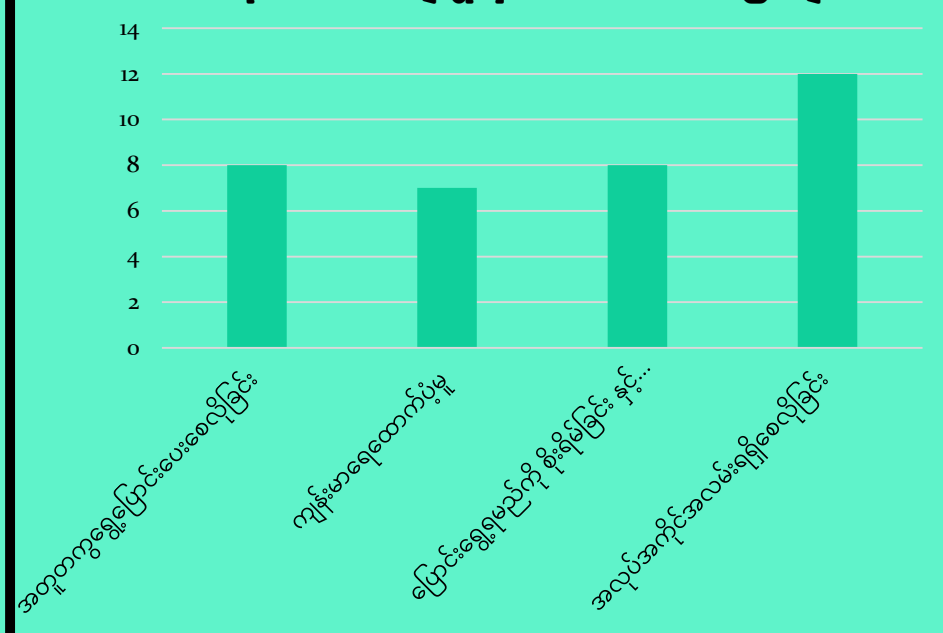
စီမံကိန်းဧရိယာအတွင်း လူမှုစီးပွားရေးဆိုင်ရာ စစ်တမ်းကောက်ယူမှုများနှင့် သဘောထားအမြင်များ

ကျေးရွာ	စစ်တမ်းကောက်ယူခဲ့သည့် အရေအတွက်	စီမံကိန်းအပေါ် ထားရှိသော အဘောထားအမြင်
ရေကြည်	၁၆၈	<ul style="list-style-type: none"> ကျန်းမာရေးထောက်ပံ့မှု လျှပ်စစ်မီးရရှိရေး ရွှေ့ပြောင်းမှုများလုပ်ဆောင်ရာတွင် PAHsများအတွက် နစ်နာမှုမရှိစေရန် အကောင်းဆုံးနည်းလမ်းများအား ထည့်သွင်းလုပ်ဆောင်ပေးစေလို ကလေးသူငယ်များအတွက် အနာဂတ်ကောင်းမွန်စေခြင်း လေထုနှင့်ရေထုကို ညစ်ညမ်းမှုမရှိစေလိုခြင်း
အိုင်ကြီး	၇၁	<ul style="list-style-type: none"> အနံ့ဆိုးများထွက်ရှိမည်ကို စိုးရိမ်ခြင်း ကျန်းမာရေးထောက်ပံ့မှု အလုပ်အကိုင်အလမ်းရရှိစေလိုခြင်း ပတ်ဝန်းကျင်ထိခိုက်မည်ကို စိုးရိမ်ခြင်း
ရေစု	၁၁၇	<ul style="list-style-type: none"> ကျေးရွာများအနီး ဆေးရုံဆေးခန်းများ တည်ဆောက်ပေးစေလိုခြင်း လုံလောက်သော အိမ်လျော်ကြေးပေးစေလိုခြင်း ကျန်းမာရေးထောက်ပံ့မှု အလုပ်အကိုင်အလမ်းရရှိစေလိုခြင်း ကိုယ်ပိုင်မြေနေရာ ပြန်လည်ရရှိစေလိုခြင်း ပတ်ဝန်းကျင် ထိခိုက်မည်ကို စိုးရိမ်ခြင်း
သရက်တော	၁၅၂	<ul style="list-style-type: none"> အတူတကွရွှေ့ပြောင်းပေးစေလိုခြင်း ကျန်းမာရေးထောက်ပံ့မှု ပြောင်းရွှေ့ရမည်ကို စိုးရိမ်ခြင်း နှင့် အတူတကွရွှေ့ပြောင်းပေး စေလိုခြင်း အလုပ်အကိုင်အလမ်းရရှိစေလိုခြင်း
စုစုပေါင်းအိမ်ထောင်စုအရေအတွက်	၅၀၈	

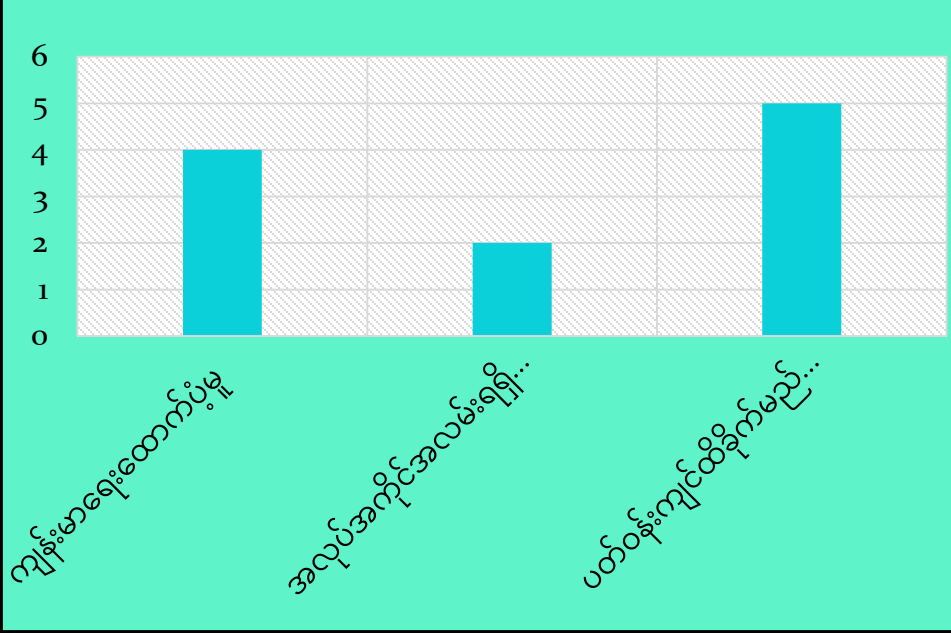
ရေကြည်ကျေးရွာမှ သဘောထားအမြင်များ



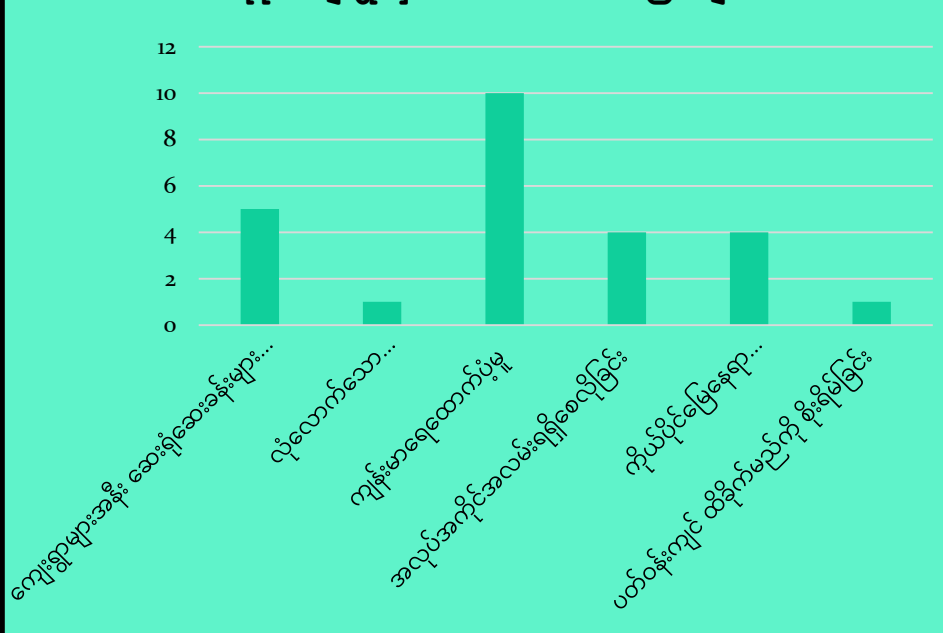
သရက်တောကျေးရွာမှ သဘောထားအမြင်များ



အိုင်ကြီးကျေးရွာမှ သဘောထားအမြင်များ



ရေစုကျေးရွာမှ သဘောထားအမြင်များ



ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်

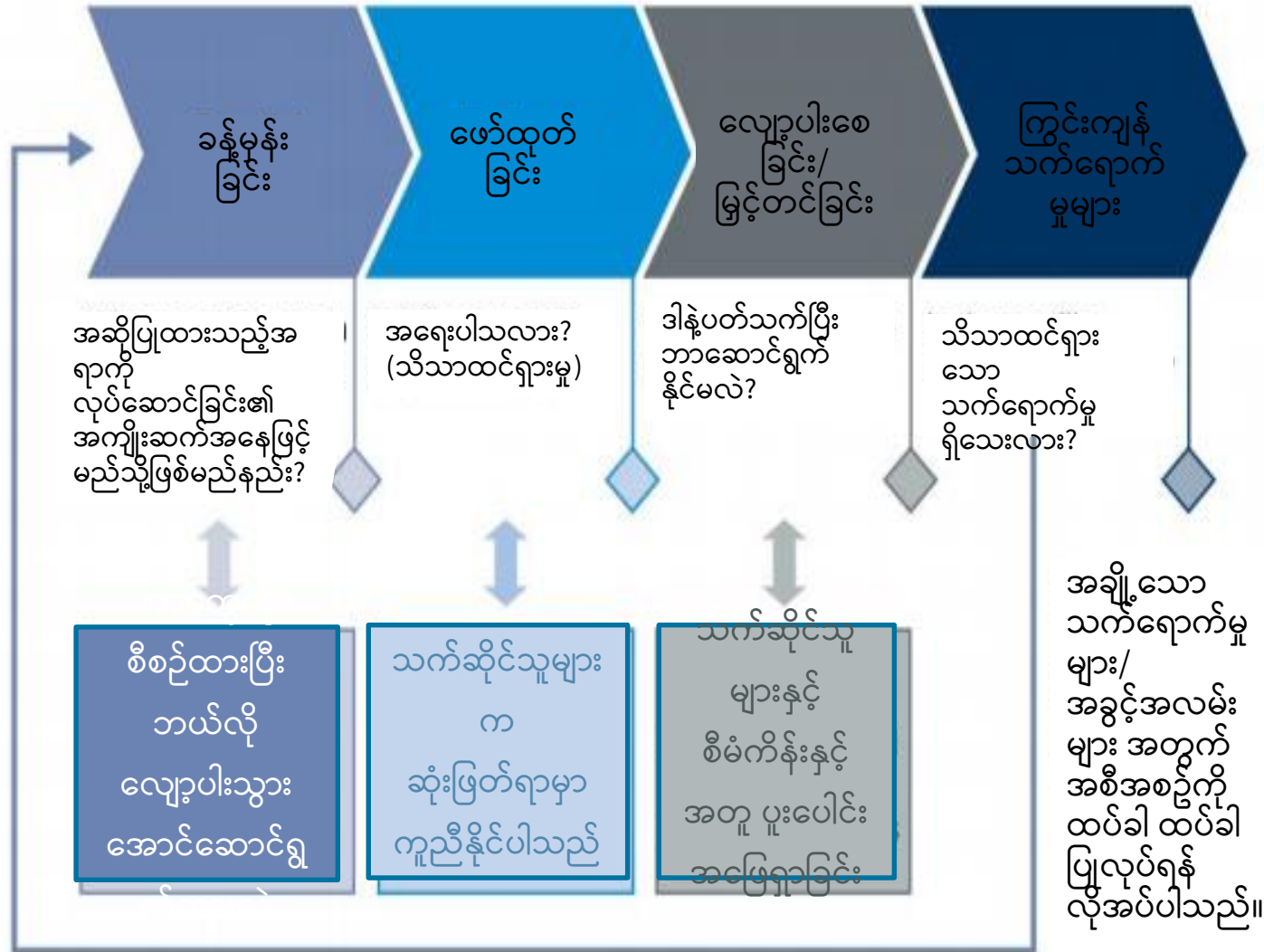
ခြင်းဆိုင်ရာ

ခြံငုံသုံးသပ်ချက်

အဓိကသက်ရောက်မှုများ (ဆောက်လုပ်ရေး အကြံပြုကာလ၊ ဆောက်လုပ်ရေးကာလ နှင့် လည်ပတ်ရေးကာလများ)

- ❖ ဝန်းကျင်လေထုအပေါ်သက်ရောက်မှု
- ❖ ဝန်းကျင်အသံဆူညံမှု နှင့် တုန်ခါမှု
- ❖ ရေအရည်အသွေးအပေါ်တွင် သက်ရောက်မှု
- ❖ ဇီဝဝန်းကျင် နှင့် ရေနေသတ္တဝါများ အပင်များ အပေါ်တွင် သက်ရောက်မှု
- ❖ ဆောက်လုပ်ရေးကာလတွင် စီမံကိန်းဆိုင်ရာလုပ်ငန်းများ ဆောင်ရွက်ခြင်းကြောင့် မြစ်၏ဂေဟစနစ်တွင် သက်ရောက်မှု

ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ အခြေခံသဘောတရား



ဖြစ်နိုင်ခြေရှိသော
သက်ရောက်မှုများနှင့်
လျော့ပါးရေး နည်းလမ်းများ

စီမံကိန်းကြောင့်ပတ်ဝန်းကျင်နှင့်ဒေသခံပြည်သူ

များအပေါ်သက်ရောက်မှုများနှင့်

အကျိုးကျေးဇူးများ ကို တွက်ချက်ခြင်း
Significant Point (SP) = (Magnitude + Duration + Extent) * Probability

သတ်မှတ်ချက်	ပမာဏ				
	၁	၂	၃	၄	၅
သက်ရောက်မှု ပမာဏ	သိသာထင်ရှားသော ထိခိုက်မှုမရှိ	အနည်းငယ် ထိခိုက်နိုင်မှု	ထင်ရှားသော ထိခိုက်နိုင်မှု	ကြီးမားသော ထိခိုက်နိုင်မှု	အလွန်ကြီးမားသော ထိခိုက်နိုင်မှု
သက်ရောက်မှု အချိန်ကာလ	၀-၁ နှစ်	၂-၅ နှစ်	၆-၁၅ နှစ်	လုပ်ငန်းလည်ပတ်အတော်ချိန်အထိ	လုပ်ငန်းပိတ်သိမ်းချိန်နောက်ပိုင်းအထိ
သက်ရောက်မည့် ဧရိယာ	လုပ်ငန်းခွင်ဧရိယာ	ဒေသန္တရ	ဒေသအဝန်း	နိုင်ငံအဝန်း	အပြည်ပြည်ဆိုင်
ဖြစ်နိုင်ခြေကြိမ်နှုန်း	လုံးဝဖြစ်နိုင်ခြေမရှိခြင်း	ဖြစ်နိုင်ခြေ မရှိခြင်း	ဖြစ်နိုင်ခြေ ရှိခြင်း	လုံးဝဖြစ်နိုင်ခြေ ရှိခြင်း	တိတိကျကျ ဖြစ်နိုင်ခြေရှိခြင်း

သက်ရောက်နိုင်မှု အမှတ်	သက်ရောက်နိုင်မှု အဆင့်
<၁၅	သိသာထင်ရှားသောထိခိုက်မှုမရှိ
၁၅-၂၉	အနည်းငယ် ထိခိုက်နိုင်မှု
၃၀-၄၄	ထင်ရှားသောထိခိုက်နိုင်မှု
၄၅-၅၉	ကြီးမားသောထိခိုက်နိုင်မှု
> ၆၀	အလွန်ကြီးမားသောထိခိုက်နိုင်မှု

(Source: International Association of Impact Assessment- IAIA, 2014)

ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှုများ

ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှု		
	ဆောက်လုပ်ရေး ကာလ	လုပ်ငန်းလည်ပတ်ခြင်း
လေထုနှင့် ဆူညံသံ	●	●
ရေအရည်အသွေးနှင့် ရေနေသတ္တဝါများ	●	●
နေရင်းဒေသများ ပျက်စီးခြင်း/ ရွှေ့ပြောင်းနေထိုင်သော မျိုးစိတ်များ	●	●
စွန့်ပစ်ပစ္စည်းထွက်ရှိမှု	●	●
ယာဉ်အသွားအလာ (ရေယာဉ်လမ်းကြောင်း/ သယ်ယူပို့ဆောင်ရေး လမ်းကြောင်း)	●	●
လူမှုစီးပွားရေးနှင့် ငါးဖမ်းလုပ်ငန်း	●	●
ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	●	●

ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှု အစီအစဉ် စီမံကိန်းအတွက် သက်ရောက်မှုနှင့် လျော့ပါးသက်သာရေး နည်းလမ်းများ

သက်ရောက်မှု အမျိုးအစား	သက်ရောက်မှုများ	လျော့ပါးသက်သာရေးနည်းလမ်းများ
လေထုအရည် အသွေးကျဆင်း လာခြင်း	<ul style="list-style-type: none"> လုပ်ငန်းလည်ပတ်ရေးအဆင့်တွင် ဒီဇယ်စက်များ၊ စက်ယန္တရားကြီးများ၊ လေထုထဲသို့ ထုတ်လွှတ်မှုများ 	<ul style="list-style-type: none"> လုပ်ငန်းလည်ပတ်ရာတွင် သုံးသည့် ကိရိယာများနှင့် စက်ယန္တရားများ၏ လုပ်ဆောင်နိုင်မှုကို ထိန်းသိမ်းပြုပြင်သွားရန် သင့်လျော်သော ကြိုတင် ကာကွယ်မှုနှင့် ပြုပြင်ထိန်းသိမ်းမှုများကို ဆောင်ရွက်ပေးရမည်။ လောင်စာဓာတ်ငွေ့ယိုစိမ့်မှုနှင့် မီးလောင်မှုများအတွက် အချက်ပေးစနစ်များ ရှိရမည်။
ဆူညံသံနှင့် တုန်ခါမှု	<ul style="list-style-type: none"> လည်ပတ်ရေးအဆင့်တွင် စက်များမှ ထွက်ပေါ်လာသော ဆူညံသံ 	<ul style="list-style-type: none"> ကောင်းမွန်စွာပြုပြင်ထိန်းသိမ်းထားသော စက်ယန္တရားများနှင့် လည်ပတ်ရမည်။ စက်နှင့်စက်ပစ္စည်းများကို အသုံးမပြုချိန်တွင် ပိတ်ထားရမည်။ ဆူညံသံသက်ရောက်မှုများကို လျော့ချရန် ဆူညံသံအတားအဆီးကို ထားရှိရမည်။ ဆူညံသံထွက်ရှိသော စက်ယန္တရားများနှင့် စက်ကိရိယာများကို လက်တွေ့တွင် ဖြစ်ပေါ်နိုင်သည့် ထိရလွယ်သော သက်ရောက်ခံများ၏ ဝေးဝေးတွင် ထားရှိရမည်။ လိုအပ်ပါက အသံတိတ်စက်များ၊ အသံအကာအကွယ်ပစ္စည်းများ သို့မဟုတ် အသံကာ များကိုထားရှိပေးရမည်။

<p>ရေ အရင်းအမြစ် ရေ အရည်အသွေး</p>	<p>- ရေသုံးစွဲမှု လျော့နည်းစေရန်အတွက် သင့်လျော်သော အစီအမံများ ဆောင်ရွက်ပေးသင့်ပါသည်။</p> <p>- မိလ္လာကန်မှ ထွက်ရှိလာသော ရေဆိုး များကို ရေသန့်စင်စက် ဖြင့်သန့်စင်ပြီး အပင်များနှင့် ရှုခင်းဧရိယာများကို ရေလောင်းရန်အတွက် ပြန်လည် အသုံးပြုပါက လုံလောက်သော ရေကို ထိန်းသိမ်းပေးသည်။</p>	<p>ဟိုတယ်သည် သင့်လျော်သော ရေဆိုးထုတ်မြောင်းစနစ်များကို အသုံးပြုရန် စီစဉ်သင့်ပြီး အဝတ်လျှော်ခြင်နှင့် မီးဖိုချောင်တွင် ထိရောက်သော စက်များကို အသုံးပြုသင့်သည်။ ရေညစ်ညမ်းမှု လျော့ပါးစေရန်အတွက် ဒီဇယ်ဆီနှင့် ချောဆီဖြည့်နေစဉ် ယိုဖိတ်မှုမှ ကာကွယ်ရန် သတိပြုရမည့် နည်းလမ်းများ နှင့် ဒီဇယ်ဆီ နှင့် အင်ဂျင်ဆီ သိုလှောင်သည့် ကွန်တိန်နာများအတွက် လုံလောက်သော ဒုတိယ ကွန်တိန်နာများ ကိုလည်း ပံ့ပိုးပေးမည်ဖြစ်သည်။</p>
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<p>စွမ်းအင်ချွေတာရေး</p>	<p>လျှပ်စစ်မီးသည် ဟိုတယ်များအတွက် အလင်းရောင်၊ အပူပေး၊ အအေးနှင့် အီလက်ထရွန်နစ် စနစ်များကဲ့သို့သော မရှိမဖြစ်လိုအပ်သော ဝန်ဆောင်မှုများဖြစ်သော ကြောင့် အရေးကြီးပါသည်။ ၎င်း၏အကျိုးသက်ရောက်မှုကို ဧည့်သည်များ သက်တောင့်သက်သာရှိမှု၊ ဘေးကင်းမှုနှင့် အလုံးစုံလည်ပတ်မှုထိရောက်မှုတို့၌ အရေးပါသည်။ ဓာတ်အားပြတ်တောက်ခြင်းသည် ဝန်ဆောင်မှုများကို အနှောင့်အယှက်ဖြစ်စေနိုင်ပြီး ဧည့်သည်များ အဆင်မပြေမှုများနှင့် ဝင်ငွေကို ထိခိုက်နိုင်ပါသည်။</p>	<p>စွမ်းအင်ချွေတာရေးမီးသီးများ၊ အလိုအလျောက်တံခါးသော့နှင့် စွမ်းအင်ချွေတာရေးခလုတ်ကတ်ကဲ့သို့သော စွမ်းအင်ချွေတာသည့် ကိရိယာများကို စွမ်းအင်သုံးစွဲမှုကို လျှော့ချရန်အတွက် အသုံးပြုပါမည်။ စွမ်းအင်သက်သာသောအလင်းရောင်၊ စက်ပစ္စည်းများနှင့် HVAC စနစ်များအသုံးပြုခြင်းကဲ့သို့သော အလေ့အကျင့်များကို အကောင်အထည်ဖော်ခြင်းဖြင့် စွမ်းအင်ကို ချွေတာပါ။ အခန်းတွင်း လျှပ်စစ်ဓာတ်အားကို ထိန်းချုပ်ရန် သော့ကတ်စနစ်များကို အကောင်အထည်ဖော်ခြင်း၊ ဧည့်သည်များအား မျက်နှာသုတ်ပုဝါများ ပြန်လည်အသုံးပြုရန် တွန်းအားပေးခြင်းနှင့် အကောင်းဆုံးစွမ်းဆောင်ရည်အတွက် စက်ကိရိယာများကို ပုံမှန်ထိန်းသိမ်းခြင်းသည် ထိရောက်သော နည်းဗျူဟာဖြစ်ပါသည်။</p>
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<p>အမှိုက်များ</p>	<p>- အိမ်တွင်းအမှိုက်များ၊ ရုံးသုံးအမှိုက်များ၊ ဧည့်သည်များမှ စွန့်ပစ်ပစ္စည်းများနှင့် အခြားစွန့်ပစ်ပစ္စည်းများကို လုပ်ငန်းဆောင်ရွက်မှုအဆင့်တွင် မျှော်မှန်းထားပါသည်။</p>	<p>- ရေညစ်ညမ်းမှုကို တားဆီးရန်အတွက် ဟိုတယ်မှ စွန့်ပစ်အမှိုက်များအားလုံးကို ၎င်းတို့၏ အမျိုးအစားများနှင့် သီးခြားစီ စုဆောင်းပြီး စိုစွတ်သော ခြောက်သွေ့မှု အခြေအနေတို့ကို အခြေခံ၍ စွန့်ပစ်သင့်ပါသည်။ ဇီဝဆွေးမြေ့ပျက်စီးနိုင်သော စွန့်ပစ်ပစ္စည်းများနှင့် ဇီဝမပျက်စီး နိုင်သော စွန့်ပစ်ပစ္စည်းများကို ကွဲပြားခြားနား သောအရောင်ကုတ်ပုံးများအသုံးပြု၍ စုဆောင်းပြီး အမှိုက်များ စုစည်းခန်းတွင် သိမ်းဆည်းထားပါသည်။</p> <p>- ဇီဝဆွေးမြေ့နိုင်သော အမှိုက်များကို MCDC မှတဆင့် စွန့်ပစ်ပါသည်။</p>
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ဇီဝမျိုးစုံမျိုးကွဲ

- ယာဉ်ကြောပိတ်ဆို့မှုသည် တိရစ္ဆာန် မျိုးစိတ်များ ဖြတ်သန်းသွားလာခြင်း သို့မဟုတ် ဧရိယာအတွင်း နေထိုင်ခြင်းကို ဟန့်တားနိုင်စေပါသည်။
- စီမံကိန်း ဖွံ့ဖြိုးတိုးတက်မှုကြောင့် ယာဉ်နှင့် အခြားလုပ်ငန်းများ သွားလာမှု တိုးလာခြင်း သည် ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် ဆူညံသံများ သက်ရောက်မှုအပေါ် အဓိကအားဖြင့် ဖြစ်ပေါ်မည်ဖြစ်သည်။

- ရေတံခွန်တောင်ရှိ အမှတ်တရပစ္စည်းဆိုင်တိုင်းတွင် ခြိမ်းခြောက်နိုင်သော သို့မဟုတ် ကာကွယ်ထားသော အပင်နှင့် တောရိုင်းတိရစ္ဆာန်မျိုးစိတ်များမှ ထုတ်လုပ်သည့် အမှတ်တရပစ္စည်းများ ရောင်းချခြင်းမှ ရှောင်ကြဉ်ပါ။
- သတ်မှတ်ထားသော ဧရိယာပြင်ပရှိ အသီးအရွက်များကို အနှောင့်အယှက်မဖြစ်စေပါ။ တောရိုင်းတိရစ္ဆာန်အမဲလိုက်ခြင်းကို တင်းတင်းကျပ်ကျပ်တားမြစ်မည်ဖြစ်ပြီး ဝန်ထမ်းအားလုံးကို လည်း လိုက်နာစေပါမည်။

လူမှုရေး နှင့် အသက်မွေးဝမ်းကျောင်း

- အချို့သော သက်ရောက်မှုများ ထွက်ပေါ်လာပြီး ဒေသခံလူထုကို အပြုသဘော သက်ရောက်စေမည်ဖြစ်သည်။

- ကျွမ်းကျင်မှုမရှိသောဒေသခံများသည် ယာဉ်မောင်းများ၊ လုံခြုံရေး အစောင့်များ၊ သန့်ရှင်းရေး၊ အိမ်သန့်ရှင်းရေးစသည်ဖြင့် အလုပ်အကိုင် အခွင့်အလမ်းများ ရှာဖွေကြမည်ဖြစ်ပြီး ၎င်းတို့၏ စီးပွားရေးအခြေအနေ တိုးတက်လာမည်ဖြစ်သည်။
- ထိုဒေသတွင် စီမံကိန်းများ ပေါ်ပေါက်လာသည်နှင့်အမျှ အခြေခံအဆောက်အအုံများ ဖွံ့ဖြိုးတိုးတက်လာမည်ဖြစ်သည်။ စီမံကိန်းတွင် အပန်းဖြေခြင်း၊ ဟိုတယ်နှင့် ဂေါက်ကလပ်ကဲ့သို့သော လှုပ်ရှားမှုများ ပါဝင်မည်ဖြစ်သည်။ ယင်းသည် ရှိပြီးသား ဖွဲ့စည်းပုံကို မြှင့်တင်ပေးပြီး ပတ်ဝန်းကျင်တွင် ပိုမိုဖွံ့ဖြိုးတိုးတက်ရေးကို အားပေးမည်ဖြစ်သည်။

နယ်ပယ်တိုင်းတာ

သတ်မှတ်ခြင်း အဆင့် မှတ်တမ်းများ

လူထုဆွေးနွေးပွဲအစည်းအဝေး

ရက်စွဲ:	၁-၁၀-၂၀၂၁
အချိန် -	နေ့လည် ၁:၀၀ မှ ၂:၀၀ နာရီ
ကျင်းပမည့်နေရာ	ရေတံခွန် တောင်မြို့ ပြခန်း
တက်ရောက်သူများ	<ul style="list-style-type: none"> - အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ - - MCDC မှ အရာရှိများ - - REM အတိုင်ပင်ခံများ - - Ye Dun Taung Project အထွေထွေမန်နေဂျာ၊ - - AGM, PPT - Ye Dun Taung Project ၏ မန်နေဂျာများ - - ရဲတံခွန်တောင်စီမံကိန်း အင်ဂျင်နီယာဌာန - - Ye Dun Taung Project ၏ HR ဌာန၊ - - Ye Dun Taung Project ၏ Sale & Marketing Department ၊
ရည်ရွယ်ချက်	ရေတံခွန် တောင်မြို့ စီမံကိန်း၏ ရှင်းလင်းချက်နှင့် နယ်ပယ်တိုင်းတာ သတ်မှတ်ခြင်း ရည်မှန်းချက်များ အဆင့်လေ့လာမှု
ဦးအောင်ကျော်၊ မန္တလေးမြို့တော်စည်ပင်သာယာ ရေးကော်မတီနှင့် ပွင့်ဖြိုးသစ်ကုမ္ပဏီလီမိတက်	မန္တလေးမြို့တော်စည်ပင်သာယာရေးကော်မတီနှင့် ပွင့်ဖြိုးသစ်ကုမ္ပဏီလီမိတက်တို့အကြား ရေးအကောင်အထည်ဖော်ရေး1. အပြည်ပြည်ဆိုင်ရာ ဂေါ်ကွင်း အကောင်အထည်ဖော်ရန် မန္တလေးမြို့တော် စည်ပင်သာယာရေး ကော်မတီနှင့် ပွင့်ဖြိုးသစ် ကုမ္ပဏီလီမိတက်တို့ ပူးပေါင်း၍ နားလည်မှုစာချွန်လွှာ (MOU) ကို ၂၀၁၅ ခုနှစ် ဇွန်လ ၂၂ ရက်နေ့တွင် လက်မှတ်ရေးထိုးခဲ့ပါသည်။

နယ်ပယ်တိုင်းတာ သတ်မှတ်ခြင်း အဆင့် လူထုတွေ့ဆုံ ဆွေးနွေးပွဲအစည်းအဝေး မှတ်တမ်းများ

- ရေအရည်အသွေး အခြေအနေတွေကို ဘယ်လိုတိုင်းတာမလဲ။
- ဖြေ- ၆ လ တစ်ကြိမ် တိုင်းတာဆောင်ရွက်ပါမည်
- စီမံကိန်းက Sedawgyi တူးမြောင်းကို အသုံးပြုမယ်ဆိုရင် ရေရှည်အတွက် ရေပေးဝေမှုကို ဘယ်လိုစီမံမလဲ။
- ဖြေ- ဆည်ကြီးကြီးတူးမြောင်း၊ မြစ်ဆုံနှင့် မြေအောက်ရေတို့မှ ရေအရင်းအမြစ်များကို အသုံးပြုမည်ဖြစ်သည်။
- ပုသိမ်ကြီးမြို့နယ် အုပ်ချုပ်ရေးမှူး ဦးမြင့်ဦးက အောက်ပါအတိုင်း နှိပ်ချပုံအမှာစကား ပြောကြားသည်။
- ရေရှည်တည်တံ့ခိုင်မြဲသော ဖွံ့ဖြိုးတိုးတက်ရေးအတွက် ညှိနှိုင်းအစည်းအဝေးကို ဆက်လက်ဆောင်ရွက်ရန် လိုအပ်ပါသည်။
- - ပုသိမ်ကြီးမြို့နယ် ဖွံ့ဖြိုးတိုးတက်ရေး အထွက် အားပေးမှု တစ်ခုဖြစ်သည်။ ထို့ကြောင့် ရေရှည်တည်တံ့မှုကို ထည့်သွင်းစဉ်းစားရန် လိုအပ်ပါသည်။
- - စီမံကိန်းသည် မန္တလေးမြို့၏ အဓိက ဖွံ့ဖြိုးတိုးတက်ရေး နယ်မြေအဖြစ်လည်း ဆောင်ရွက်မည်ဖြစ်သည်။ ထို့ကြောင့် စီမံကိန်း၏ ရေရှည်တည်တံ့မှုကို ထည့်သွင်းစဉ်းစားရန်နှင့် CSR အစီအစဉ်များ၏ ဗျူဟာမြောက် ရှုထောင့်ကို ထည့်သွင်းစဉ်းစားရန် ပိုမိုကောင်းမွန်ပါသည်။ အစည်းအဝေး အောင်မြင်စွာ ပြီးမြောက်ခဲ့ပါသည်။

နယ်ပယ်တိုင်းတာ သတ်မှတ်ခြင်း အဆင့် လူထုတွေ့ဆုံ ဆွေးနွေးပွဲအစည်းအဝေး မှတ်တမ်းများ



စီမံခန့်ခွဲမှု စောင့်ကြပ်စစ်ဆေးမှု (ခန့်မှန်းကုန်ကျစရိတ်)

လေ့လာမည့်နယ်ပယ်များ	အချက်အလက် ကောက်ယူမည့်နေရာ များ	နည်းလမ်းနှင့် အကြိမ်ရေနှုန်း	ဆောက်ရွက်မည့် အဖွဲ့အစည်း	နှစ်စဉ်ကုန်ကျ စရိတ် (USD)
တည်ဆောက်ရေးကာလ				
Monitoring EMP implementation Mitigation measures Enhancement measures Contingency Compensation	Project area	Daily monitoring and documenting, and quarterly reporting	Site and Department	Manager Operation 10 000
Air quality (NO ₂ , SO ₂ , CO, PM _{2.5} , PM ₁₀)	2 locations	Twice a year	Third Party	6,000
Noise	2 locations	Twice a year	Third Party	3,000
Surface Water Quality Analysis (DO, BOD, COD, Heavy metal, pH, salinity, Total hardness, Nitrate, TDS, TSS, Temperature, etc.)	2 Locations	Twice a year	Third Party	5,000
Ground Water Quality Analysis	1 Location	Twice a year	Third Party	2000
Soil Quality	1 Location	Twice a year	Third Party	3000
River Sediment	1 Location	Twice a year	Third Party	6000
EIA/EMP Report Preparation	-	-	Third Party	40,000

Con't : E&S Management and Monitoring (Estimated Cost)

စီမံကိန်း လည်ပတ်ရေးကာလ

Air quality (NO₂, SO₂, CO, PM_{2.5}, PM₁₀)	2 locations (same as baseline data collection locations)	Once a year	Third Party	3,000
Noise	2 locations (same as baseline data collection locations)	Once a year	Third Party	1,500
Surface Water Quality Analysis (DO, BOD, COD, Heavy metal, pH, salinity, Total hardness, Nitrate, TDS, TSS, Temperature, etc.)	2 Locations and number of samples are same as baseline data collection	Once a year	Third Party	2,500
Ground Water Quality Analysis	1 Location and number of samples are (same as baseline data collection)	Once a year	Third Party	1000
Soil	1 Location and number of samples are (same as baseline data collection)	Once a year	Third Party	1500
Implementation of Ecosystem Management plan	Within project area	Regular monitoring and quarterly reporting	Operation Department	4000
Occupational Health and Safety	Work site and offices	Twice a year Record of accidents and infectious diseases	Operation Department	3000
Community Health and Safety	Resident area nearby the project sites	once a year Record of accidents and infectious diseases related to the community	Operation Department	5000
Monitoring Report Preparation		Once a year	Third Party	3000
The implementation status for CSR activities such as community support program	community nearby the project site	Once a year	Operation Department	Upto 2 % of annual net profits

တာဝန်သိလူ မူ စောင့်ရှောက်ရေး လုပ်ငန်းများ (CSR) €

- အားပေးမှု- ပိုကောင်းသော လူမှုအဖွဲ့အစည်း ဖြစ်လာစေရေး အတွက် စိတ်ကူးအကြံဉာဏ်သစ်များ ထွက်ပေါ်လာစေရေး
- ယုံကြည်မှု- ပါဝင်ဆောင်ရွက်ပေးသူများ သက်ဆိုင်သူများ အားလုံး အပေါ် ယုံကြည်မှု တည်ဆောက်ရေး
- ကတိကဝတ် - တာဝန်သိလူမှု စောင့်ရှောက်ရေး လုပ်ငန်းများ (CSR) အားလုံးကို ခိုင်မြဲသောကတိဖြင့် အဆင့်အတန်းမြင့်မားစွာ ဆောင်ရွက်နိုင်ရန်



ကုမ္ပဏီ အနေဖြင့် ဘဏ္ဍရေး နှစ်တိုင်းတွင် တာဝန်သိလူမှု စောင့်ရှောက်ရေး လုပ်ငန်းများ (CSR) လုပ်ငန်းအတွက် အသုံးပြုရန် ရည်ရွယ်ထားသော အသားတင်အမြတ်ငွေ၏ (၂ ရာခိုင်နှုန်း) ပမာဏကို ရည်မှန်းထားသည့် လုပ်ငန်းများ အောင်မြင်ပြီးမြောက်စေရေး အတွက် အသုံးပြုပါမည်။

လုပ်ငန်းကျွမ်းကျင်မှု ရှိလာစေရေး

- တာဝန်သိလူမှု စောင့်ရှောက်ရေး လုပ်ငန်းများ (CSR) များ သတ်မှတ်ထားရှိရေး

အကောင်အထည်ဖော်ရေး

- စောင့်ကြပ်စစ်ဆေးရေး

ကျေးဇူးတင်ပါသည်။

Appendix-5

Daiki Axis

Johkasou System

Documents

for MOU

with PPT and Daiki Axis

Company Profile

Company name	Daiki Axis Co., Ltd.
Company addresses	<ul style="list-style-type: none">• Matsuyama Headquarter / 1-9-1 Misawa, Matsuyama-shi, Ehime 791-8022• Tokyo Headquarter / PMO Higashi Nihonbashi, 2-15-4 Higashi Nihonbashi, Chuo-ku, Tokyo 103-0004
Date founded	July 12, 2005
Listed	Prime Section, Tokyo Stock Exchange (Securities code: 4245)
Capital	2.54746 billion yen (as of December 31, 2021)
Number of employees	868 (consolidated basis, as of December 31, 2021) *Part-time and contract employees not included
Business Activities	<ul style="list-style-type: none">• Design, construction, and maintenance of various types of wastewater treatment equipment• Manufacturing, distribution, designing, and construction of products using synthetic resin and other materials• Distribution and installation of various construction materials and household equipment• Production and distribution of drinking water
Business Establishments	<ul style="list-style-type: none">• Headquarters: Tokyo, Ehime• Branch Offices: Miyagi, Osaka, Okayama, Hiroshima, Kagawa, Kochi, Fukuoka• Business Offices: Fukushima, Ibaraki, Tochigi, Saitama, Chiba, Niigata, Nagano, Shizuoka, Aichi, Wakayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Kumamoto, Kagoshima

<p>Factories</p>	<ul style="list-style-type: none"> • Matsuyama(Ehime Pref.) • Tsushima(Ehime Pref.) • Shinshu(Nagano Pref.) • Fukushima(Fukushima Pref.) 	
<p>Affiliated Companies</p>	<p>Domestic (Japan)</p>	<ul style="list-style-type: none"> • DAITEC Co., Ltd. [Ehime Pref.] • Environmental Analysis Center Co., Ltd. [Ehime Pref.] • TOBU Co., Ltd. [Aichi Pref.] • Daiki Axis Sustainable Power Co.,Ltd. [Tokyo] • Fujiwara Reiki Co., Ltd. [Ehime Pref.] • Nihon Air Solutions Co., Ltd. [Ehime Pref.] • CAP Co., Ltd. [Ehime Pref.] • Sanei Ecohome Inc [kanagawa Pref.] • Alumi kobo Hagio Co., Ltd. [Ehime Pref.]
	<p>Overseas (Outside Japan)</p>	<ul style="list-style-type: none"> • Daqi Environmental Protection Engineering (Dalian) Co., Ltd. [China] • DAIKI AXIS SINGAPORE PTE. LTD. [Singapore] • PT. DAIKI AXIS INDONESIA [Indonesia] • DAIKI AXIS INDIA PVT.LTD. [India] • CRYSTAL CLEAR CONTRACTOR PTE. LTD. [Singapore] • DAIKI USAFI [Kenya] • DAIKI AXIS ENVIRONMENT (PVT) LTD. [Sri Lanka] • DAIKI AXIS ENVIRONMENT PVT.LTD. [India]

JOHKASOU

မိလ္လာန့ငံ အထွေထွေရေဆိုးသန့်စင်စက်



A.C.R Thu Kha Chan Thar Co., Ltd.

Daiki Axis Co., Ltd. (Japan)

Date Founded : 1958
Address : • Matsuyama Headquarter / 1-9-1
Misawa, Matsuyama-shi, Ehime 791-8022
• Tokyo Headquarter / PMO Higashi
Nihonbashi, 2-15-4 Higashi Nihonbashi,
Chuo-ku, Tokyo 103-0004
Listed : Prime Section, Tokyo Stock Exchange
Securities code: 4245)
Capital : 2.54746 billion yen (December 31, 2021)
Employees : 868 (December 31, 2021)



Hiroshi Ogame
President & CEO
Daiki Axis Co., Ltd., Japan



A.C.R Thu Kha Chan Thar Co., Ltd.

Daiki Axis - ACR Thu Kha Chan Thar Co., Ltd. (Ygn)

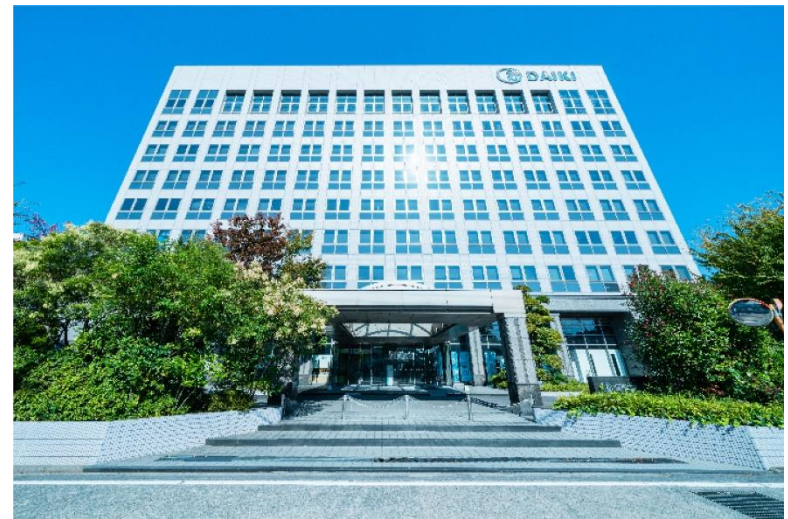
Date Founded : July 22, 2014
Address : No.5/52, Aung Tayza street, 6 Quarter,
Mayangon Township, Yangon, Myanmar.
Mobile : 09-404229669, 09-250007541, 09-795555393
Email : daikiaxismyanmar@gmail.com
sale.daikiaxis@gmail.com
Facebook : Daiki Axis ရေဆိုးသန့်စင်စက်

Daiki Axis - ACR Thu Kha Chan Thar Co., Ltd. (Mdy)

Date Founded: July 22, 2014
Address : No. 6/3, 39 street, Bet; 57*58 street,
Yemontaung Quarter, Maha Aung Myay Tsp,
Mandalay, Myanmar.
Mobile : 09-965262525, 09-975250008
Email : thukhachanthar.mdy@gmail.com

ကုမ္ပဏီအချက်အလက်များ

- Daiki Axis ကုမ္ပဏီ
- တည်ထောင်သည့်နှစ် - ၁၉၆၄ ခုနှစ်
- စက်ရုံများ -
 - ဂျပန်နိုင်ငံတွင် စက်ရုံ (၄)ရုံ
 - အင်ဒိုနီးရှားနိုင်ငံတွင် စက်ရုံ (၁)ရုံ
 - တရုတ်နိုင်ငံတွင် စက်ရုံ (၁)ရုံ
 - အိန္ဒိယနိုင်ငံတွင် စက်ရုံ (၂)ရုံ
 - သီရိလင်္ကာနိုင်ငံတွင် စက်ရုံ (၁)ရုံ

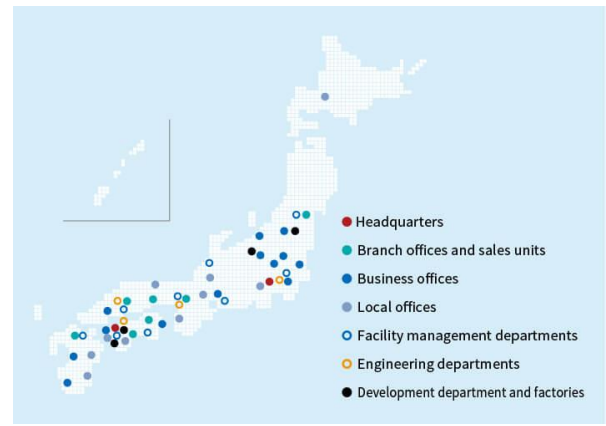


အထက်ပါစက်ရုံများအား အရည်အသွေး စံချိန်စံညွှန်းနှင့် စီမံခန့်ခွဲမှုအား Daiki Axis ဂျပန်မှ တိုက်ရိုက် လုပ်ကိုင်ဆောင်ရွက်ပေးပါသည်။

[Number of sales agencies]
 ※ as of the end of Dec. 2020

Signing agency contracts with local companies, the Group is aiming to expand the sales network of each country and to work together to root this business in the region, for an efficient expansion.

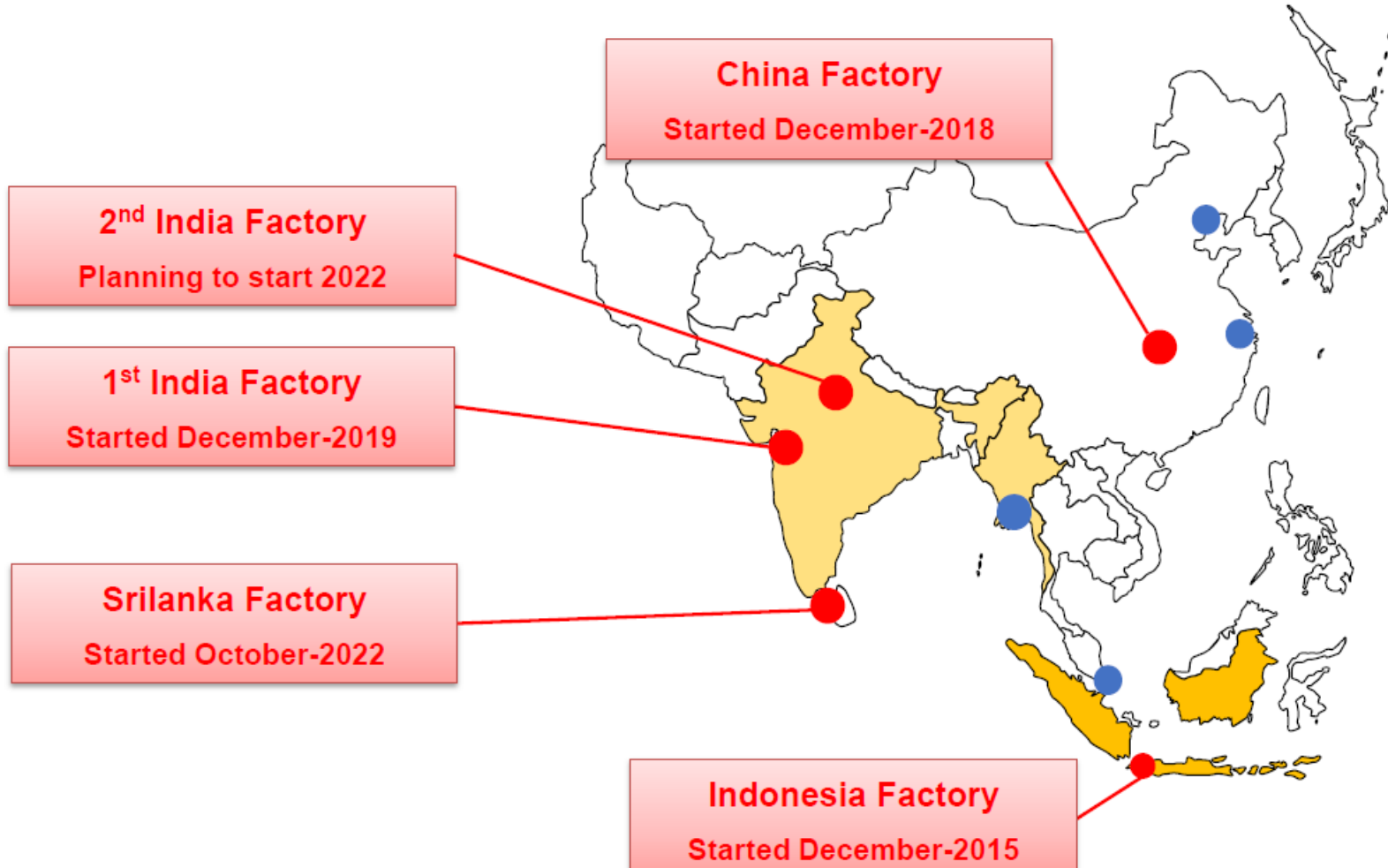
International Offices



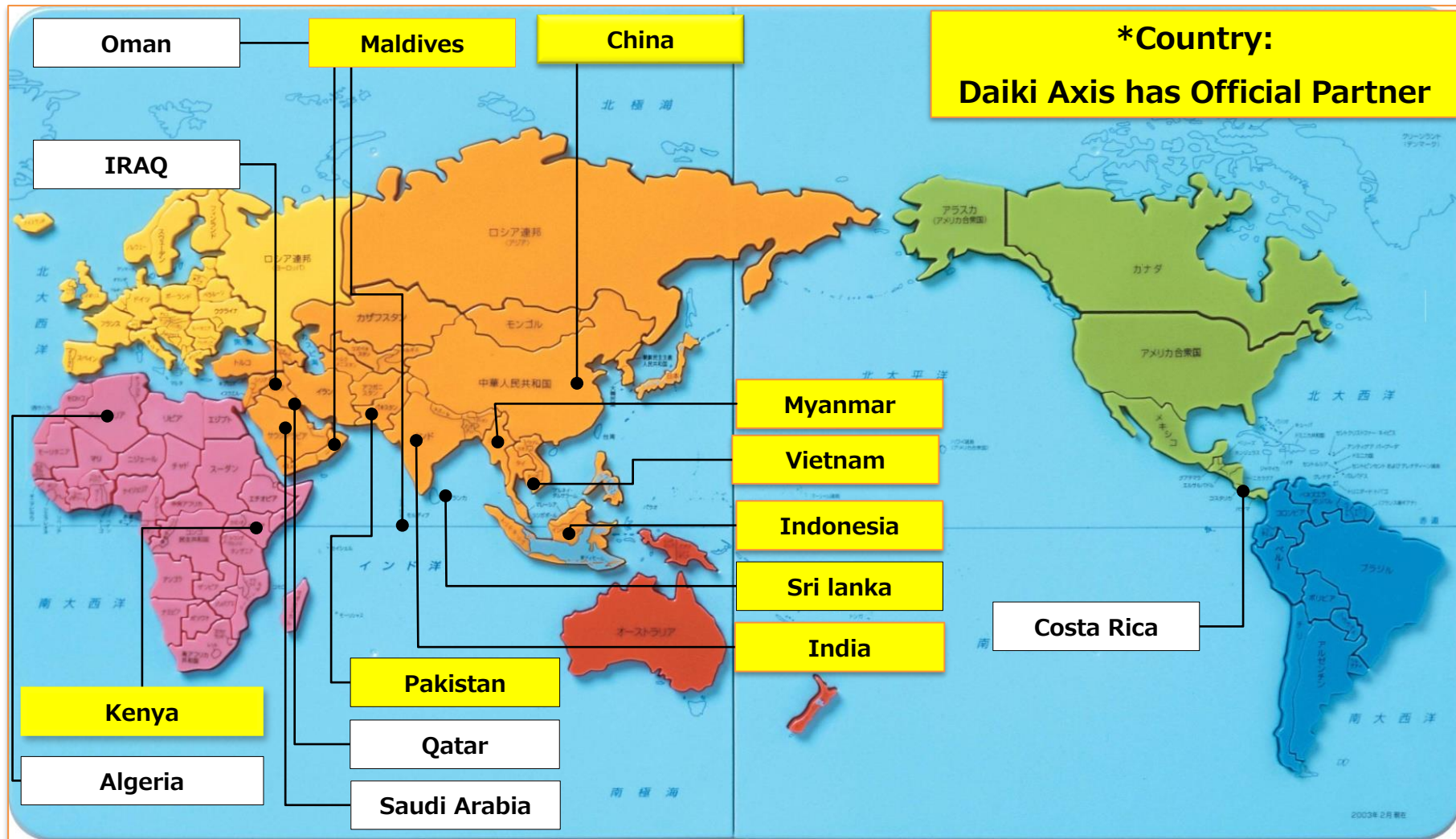
Domestic Offices

Daiki Axis ကုမ္ပဏီစက်ရုံများ

- မြန်မာနိုင်ငံ၊ ရန်ကုန်မြို့၌ ရေဆိုးသန့်စက်စနစ် ထုတ်လုပ်သည့်စက်ရုံ ဖွင့်လှစ်နိုင်ရန် လျာထားလျက်ရှိပါသည်။



Daiki Axis Johkasou Delivery Record 2021

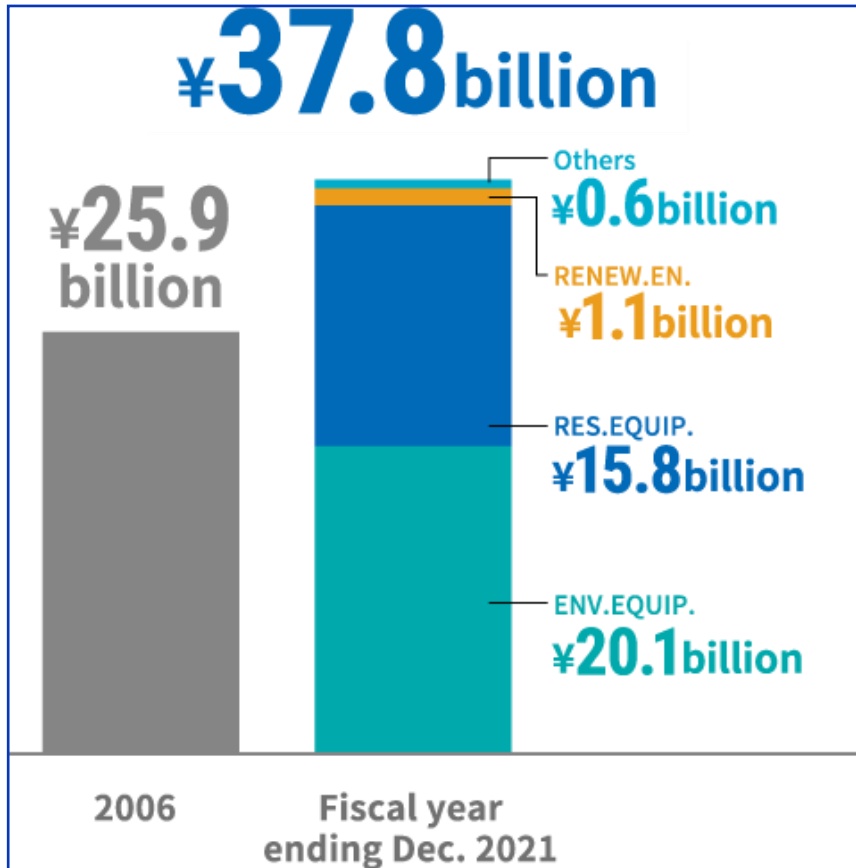


Overseas Factory: Capsule Type = 1,500 Units
 Japan Factory: Capsule Type = 10,000 Units

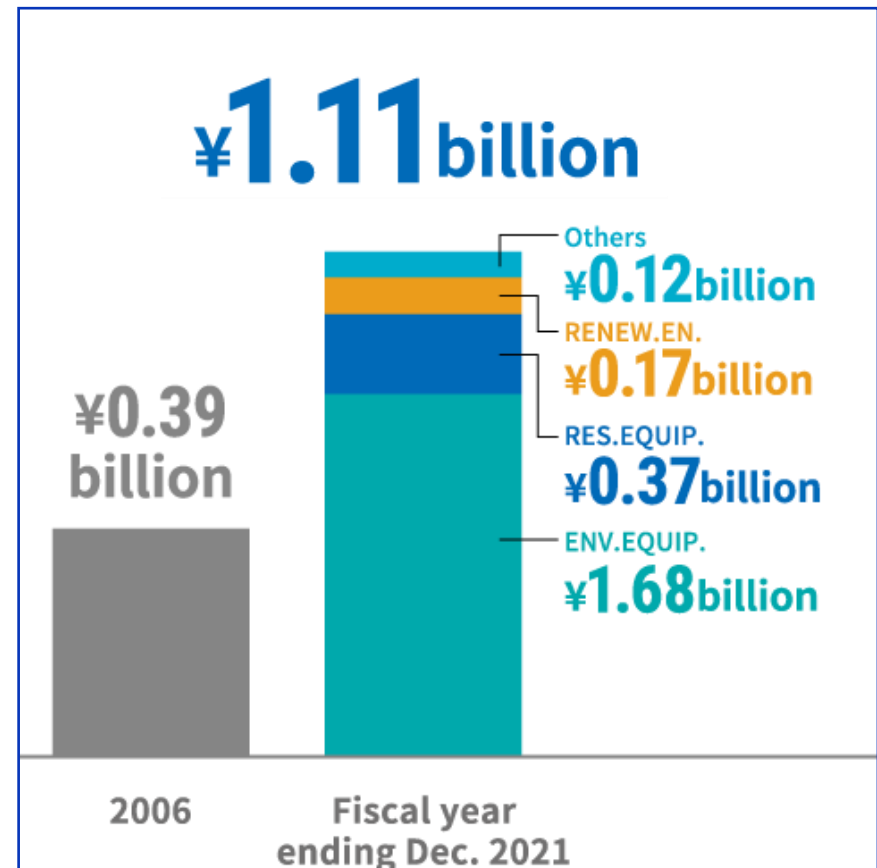
Cylindrical Type = 800 Units
 Cylindrical Type = 1,000 Units

Daiki Axis Business Performance History

- Sales 100 millions/unit



- Operating Income



Factory in Japan (ဂျပန်နိုင်ငံရှိ စက်ရုံများ)



Fukushima Factory



Matsuyama Factory



Shinshu Factory



Tsushima Factory

စက်ရုံမြင်ကွင်းတချို့



Japanese Government's Certificate for Johkasou System

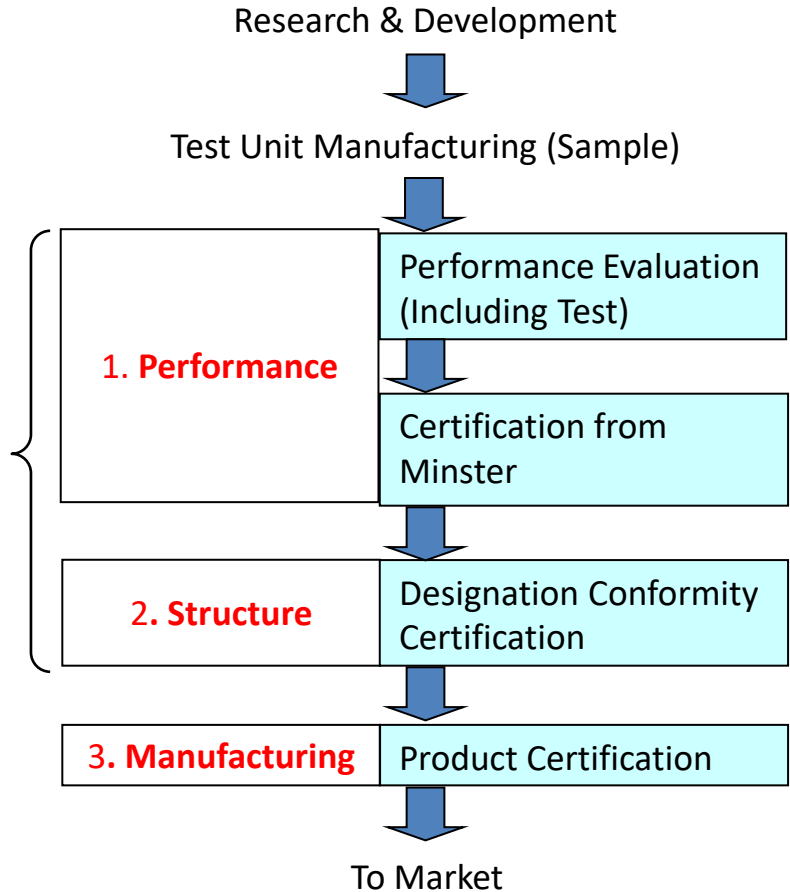
Without Government Certificate, Johkasou cannot be in Japan.

1. MLIT (Ministry of Land, Infrastructure, Transportation and Tourism of Japan) certifies the **performance** of Johkasou.
2. The Building Center of Japan certifies for **Structure** of Johkasou.
3. **Manufacturing process** needs to be approved by government.

Building Standards Act

Johokasou Act

Product Certification Process



Johkasou Product = Performance and Structural Strength is approved by government

What is Johkasou?

- ❖ Johka = Purify (သန့်စင်ခြင်း)
- ❖ Sou = Tank (ပုံး)



Capsule Type: 1~15 m³/day



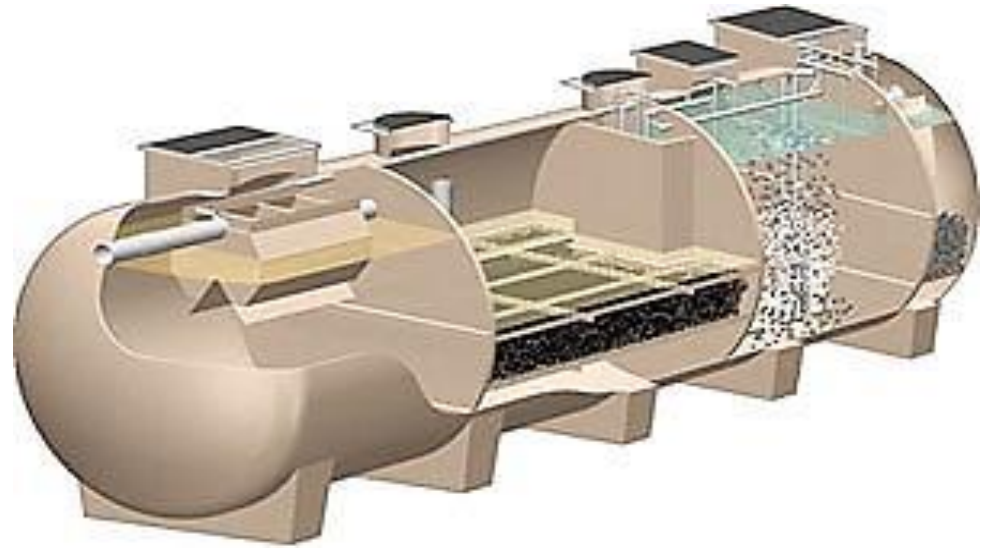
Cylinder Type: 20~50 m³/day

ရေဆိုးသန့်စင်စနစ် လုပ်ဆောင်မှု

Capsule Type: 1~15 m³/day



Cylinder Type: 20~50 m³/day



အထွေထွေ
အိမ်သုံးရေဆိုး

BOD
200 mg/L



ရေဆိုး
သန့်စင်စက်

BOD
20 mg/L



မသန့်သေးသောရေ

သန့်စင်ပြီးရေ

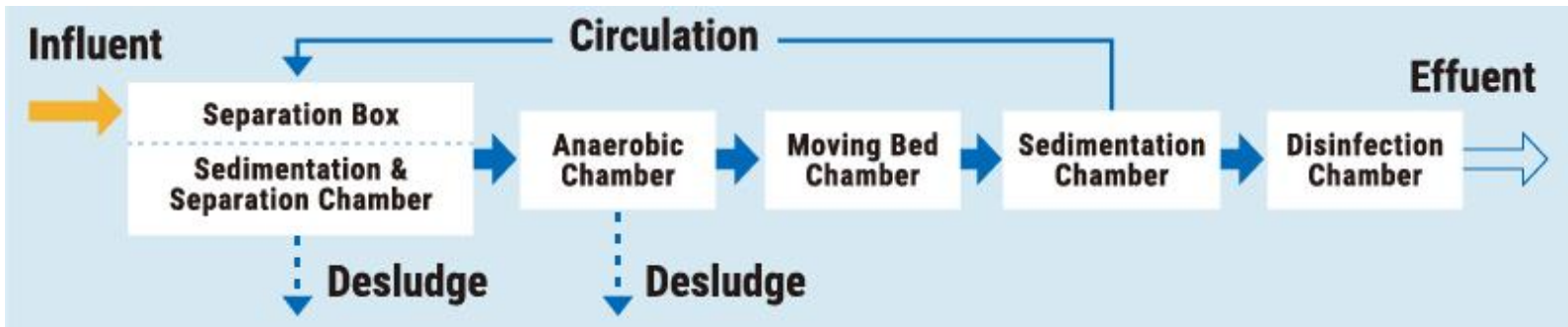
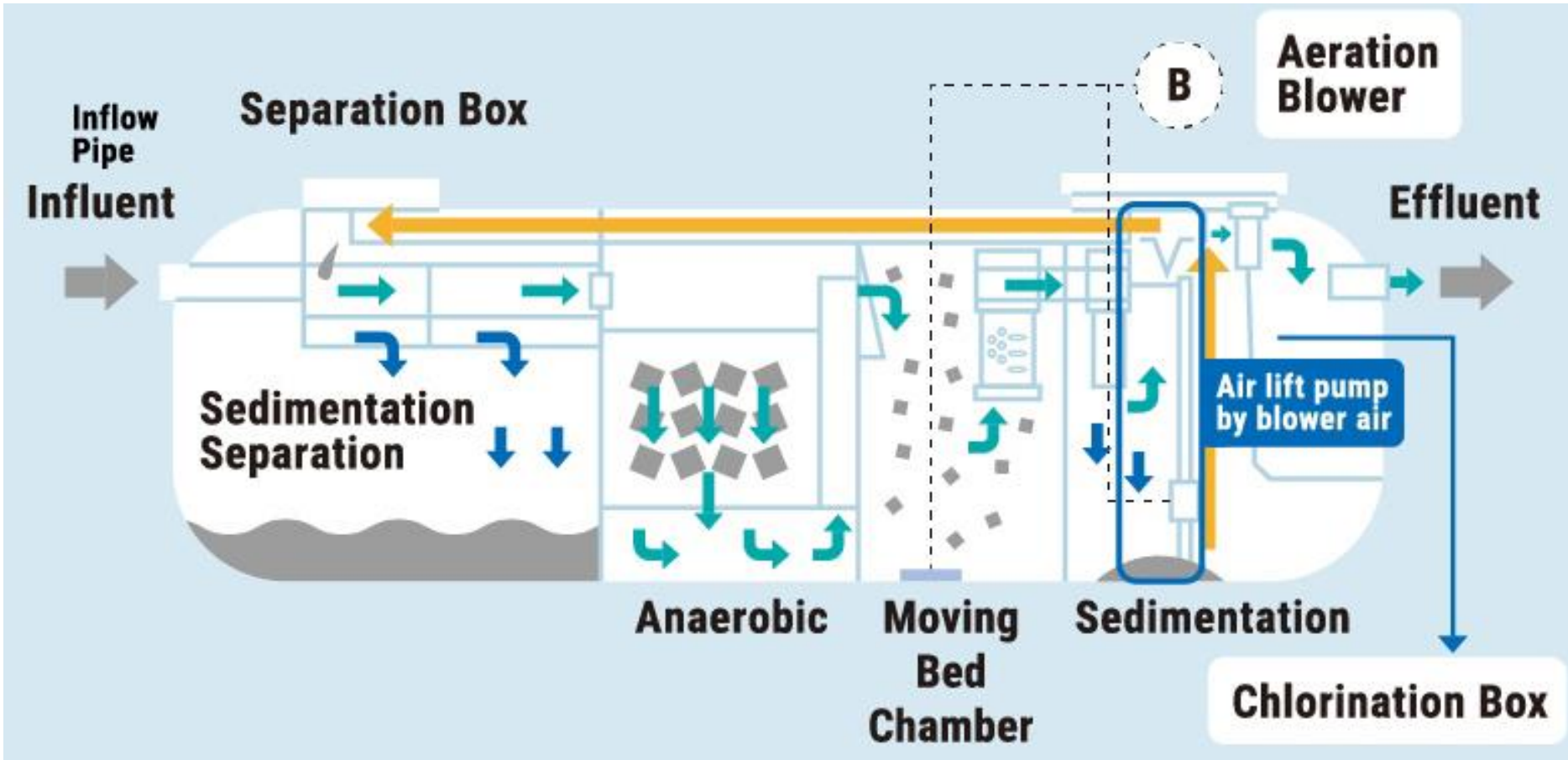
ရေဆိုးသန့်စင်မှုစနစ်အတွက် တွက်ချက်မှုဇယား

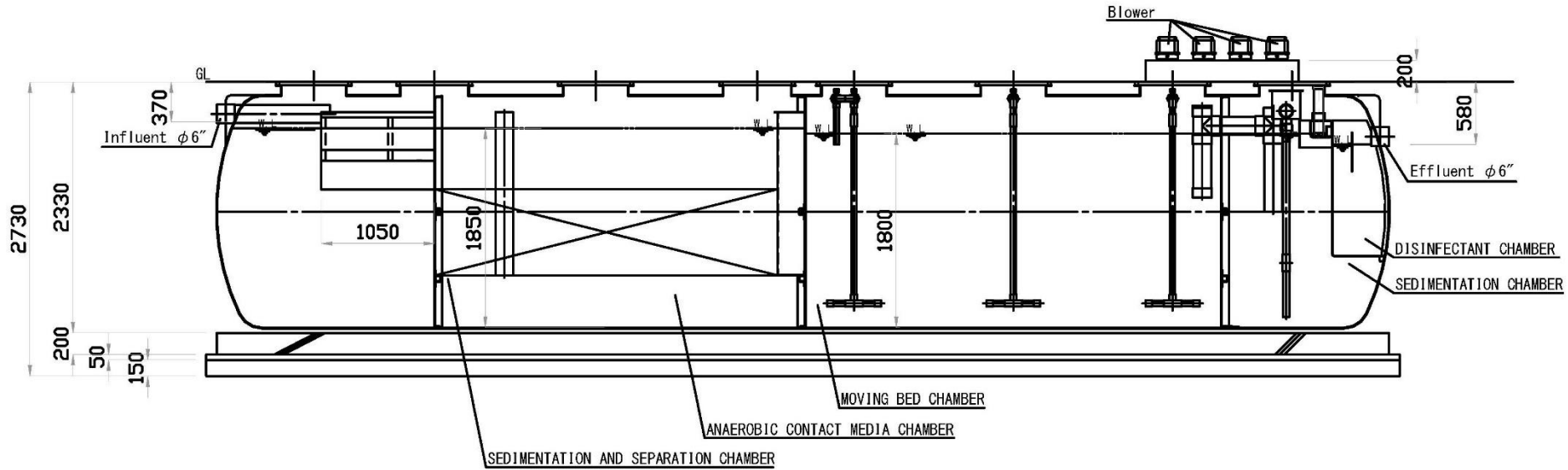
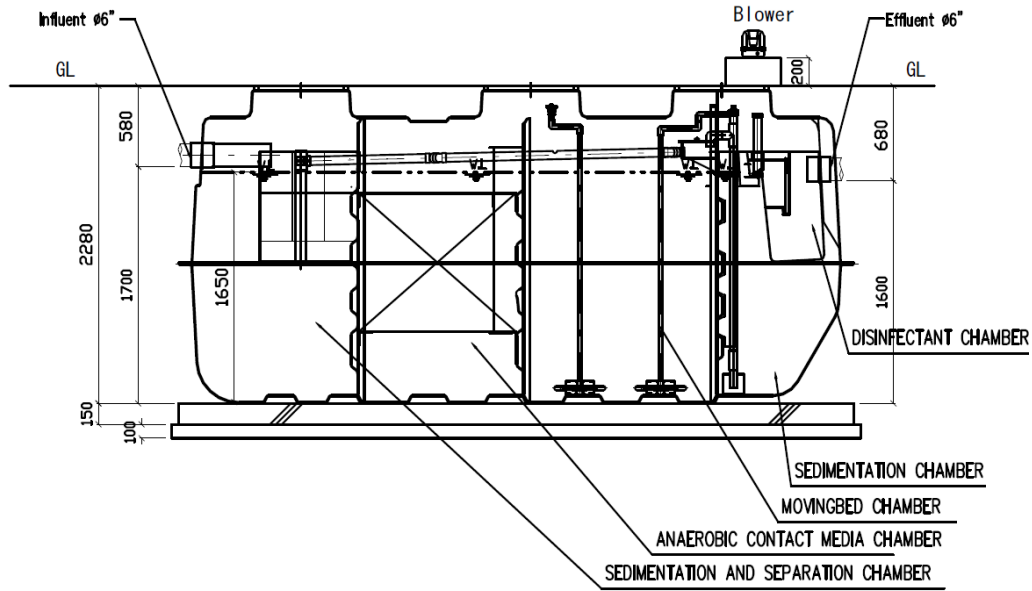
အထွေထွေအိမ်သုံးရေဆိုး အသုံးပြုမှုပမာဏနှင့် သန့်စင်ပြီးရေ စွန့်ထုတ်မှုပမာဏ Typical Quantity and Quality for Domestic Wastewater				
အသုံးပြုရေ အမျိုးအစား	အရေအတွက်	BOD (Biochemical Oxygen Demand) ရေတွင်ပါဝင်သော အောက်စီဂျင်ပမာဏ		
		ဝန်ဆောင်နိုင်မှု	Concentration ပြင်းအား	
	L/Person. Day လူတစ်ဦး တစ်နေ့ အသုံးပြုပမာဏ (လီတာဖြင့်)	g/Person. Day လူတစ်ဦး တစ်နေ့ အသုံးပြုပမာဏ (ဂရမ်ဖြင့်)	Mg/L	
အိမ်သာ	50	13	260	
အထွေထွေ အိမ်သုံးရေ အမျိုးမျိုး	မီးဖိုချောင်အသုံးပြုခြင်း	30	18	75
	အပတ်လျှော်ခြင်း	40	9	
	ရေချိုးခြင်း	50		
	လက်ဆေးစင်	20		
	သန့်ရှင်းရေးနှင့် အခြားအသုံးပြုရေ	10		
စုစုပေါင်း	200	40	200	

200

BOD ≤ 20 mg/L

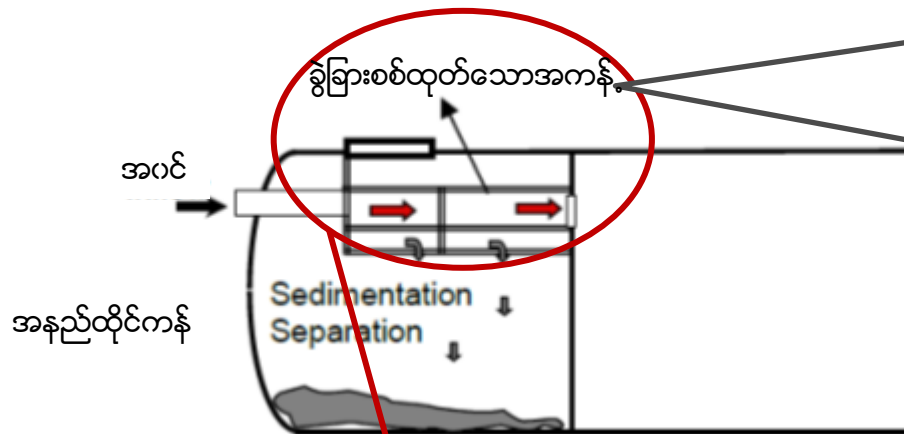
Johkasou နည်းပညာနှင့်လုပ်ဆောင်ချက်များရှင်းပြချက်



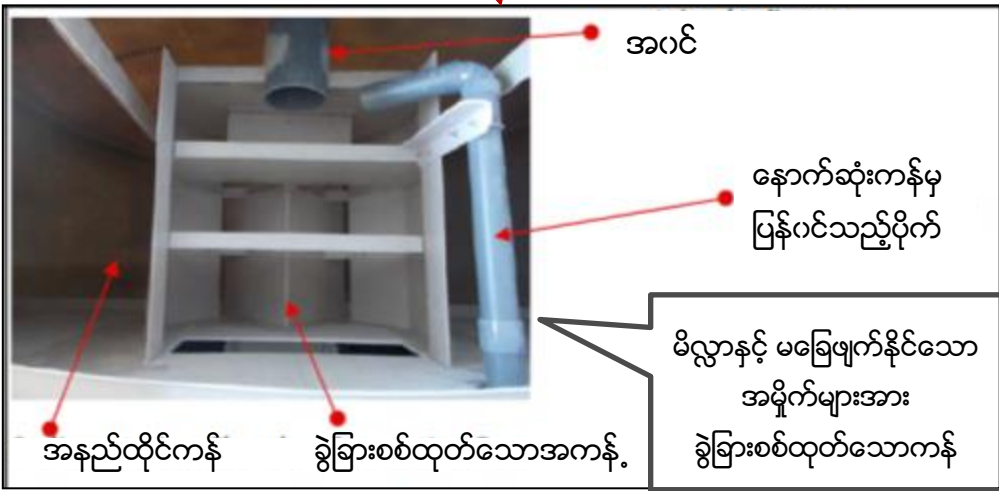


လုပ်ဆောင်ချက်များရှင်းပြချက်

- ဝင်လာသော အနည်အနှစ်နှင့် အမှိုက်များကို ခွဲခြားစစ်ထုတ်ပေးသည်။



ကန်ထဲသို့ ဝင်ရောက်လာသော မိလ္လာရေဆိုးနှင့် အမှိုက်များအား စစ်ထုတ်ခြင်း၊ ခွဲထုတ်ခြင်း။ သန့်စင်ပြီးအနည်အနှစ်များ အနည်ထိုင်သိုလှောင်ကန် ။ ၆ လ (သို့မဟုတ်) ၁ နှစ်တွင် သန့်ရှင်းရေး လုပ်ပေးရန် လိုအပ်သည်။



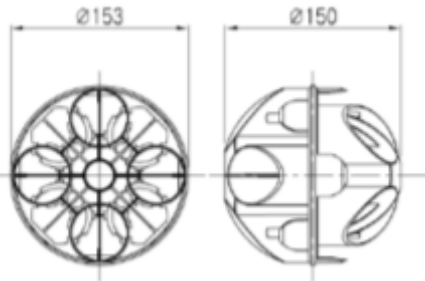
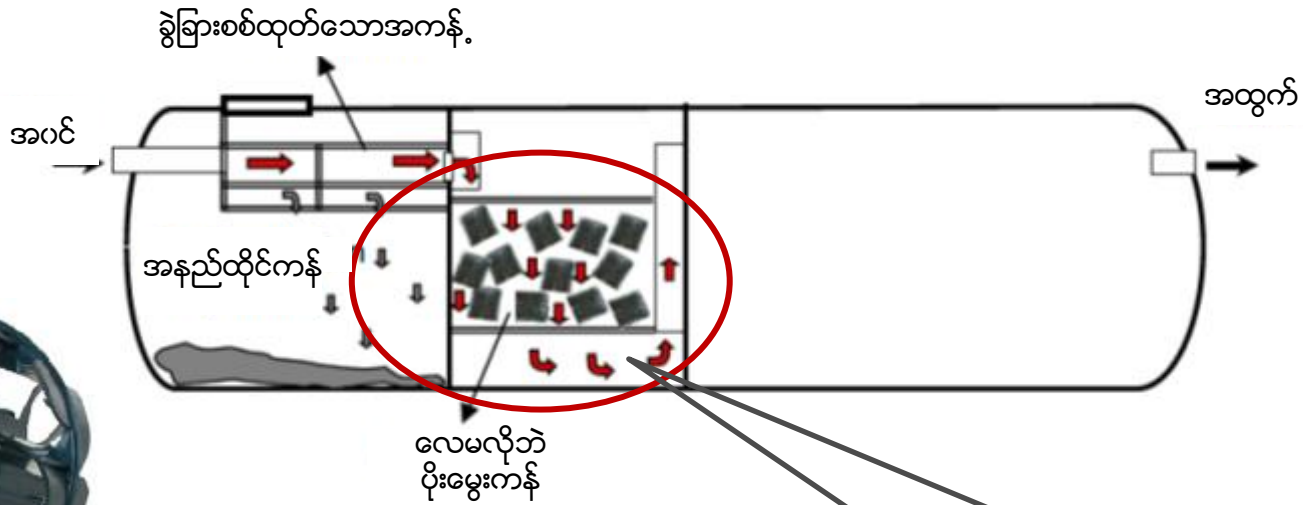
Screen Box

မိလ္လာနှင့် မခြေဖျက်နိုင်သော အမှိုက်များအား ခွဲခြားစစ်ထုတ်သောကန်



လုပ်ဆောင်ချက်များရှင်းပြချက်

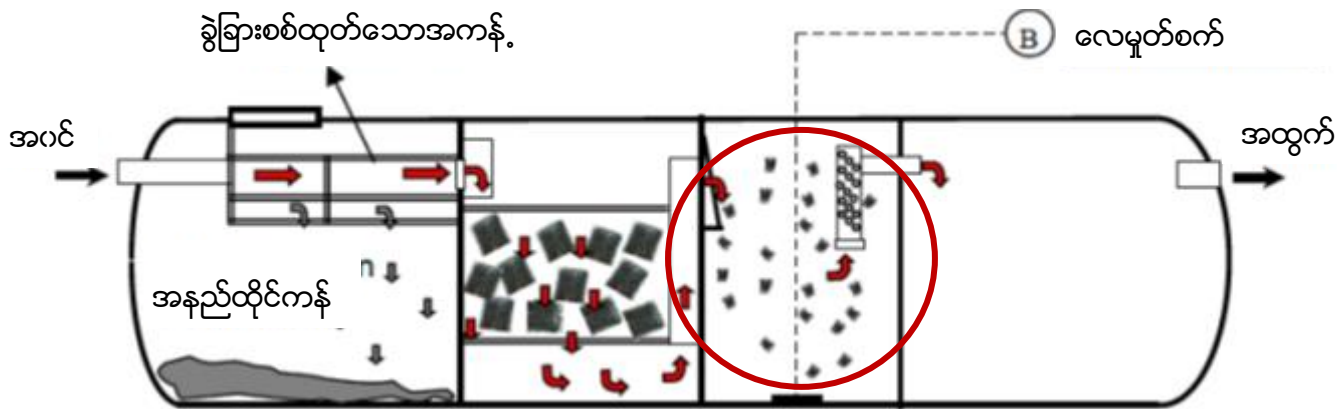
- လေလိုအပ်မှုမရှိသော ပိုးမွှေးကန်သည် အိမ်သုံးမိလ္လာရေဆိုးများမှ ပါရှိလာသော အညစ်အကြေးများမှ ပေါက်ဖွားလာသော ပိုးမွှားများ (microorganism) မွေးဖွားရာကန်ဖြစ်သည်။



မစင်များအား လေမလိုသော နည်းပညာဖြင့် အဖတ်အဖြစ်မှ အရည်အဖြစ်သို့ ချေဖျက် ပြောင်းလဲပြီး Nitric acid မှ နိုင်ထရိုဂျင်ဂက်စ်အဖြစ်သို့ ပြောင်းလဲစေသည့် နည်းပညာ

လုပ်ဆောင်ချက်များရှင်းပြချက်

- လေဖြင့်ပိုးမွေးကန်အတွင်းရှိ ပိုးမွှားအိမ်လေးများအား လေမှုတ်စက်ဖြင့် လှုပ်ရှားစေသည်။ ၎င်းကန်အတွင်း၌ လေနှင့် ပိုးမွှားအိမ်လေးများ၏ ၅၀%မှာ ယခုကန်အတွင်း၌ မရှိမဖြစ်လိုအပ်ပါသည်။



AP Series



LW Series



ပိုးအိမ်ကလေးများ

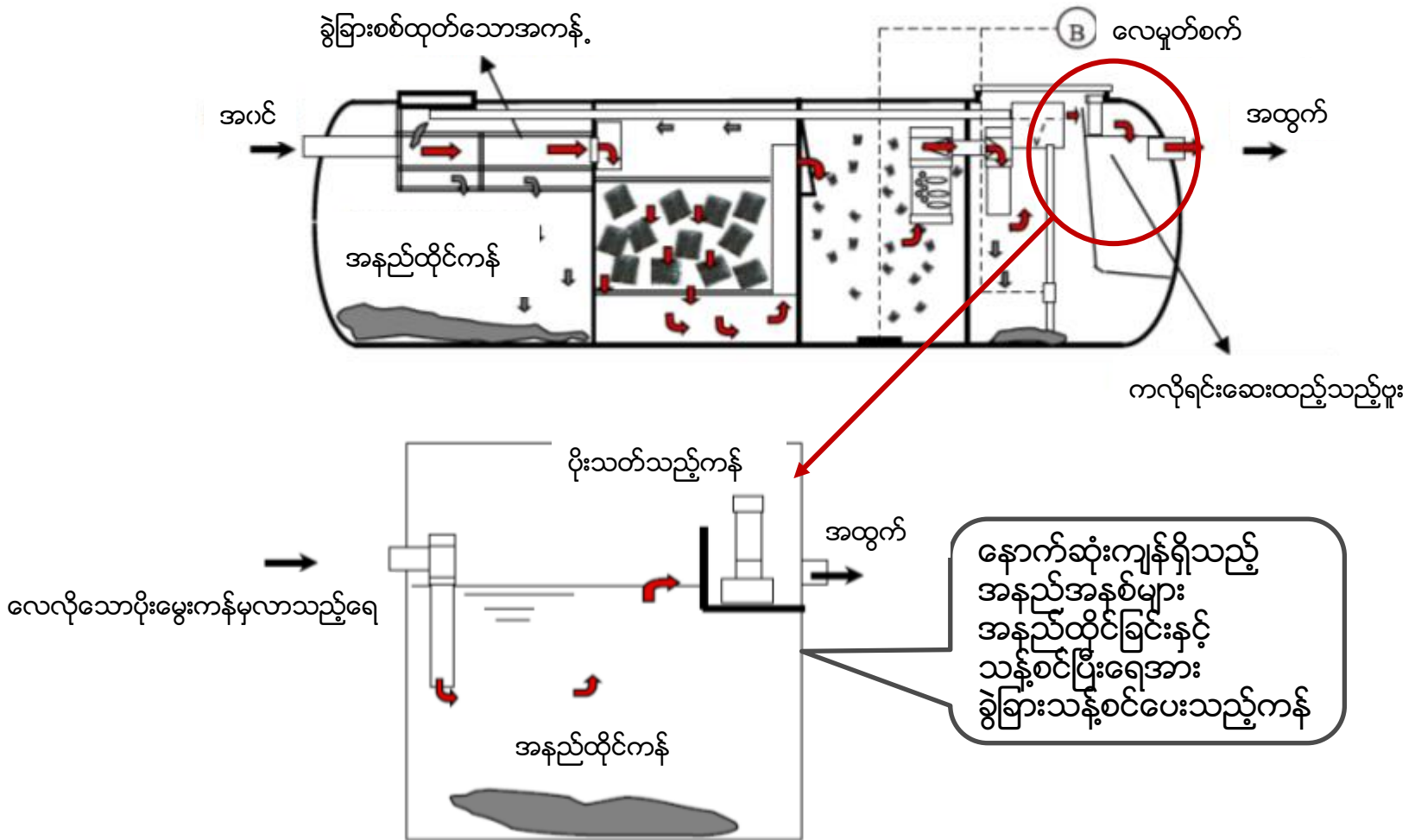
ပိုးမွှားလေးများသည် လေဖြင့် ပိုးမွေးသောကန် အတွင်းရှိ ပိုးအိမ်ကလေးများအတွင်းတွင် အသက်ရှင်နေထိုင်ပြီး BOD ပမာဏကို လျော့ချပေးပါသည်။



Nitrogen content of the ammonium ion → (Nitrate + Nitrite)

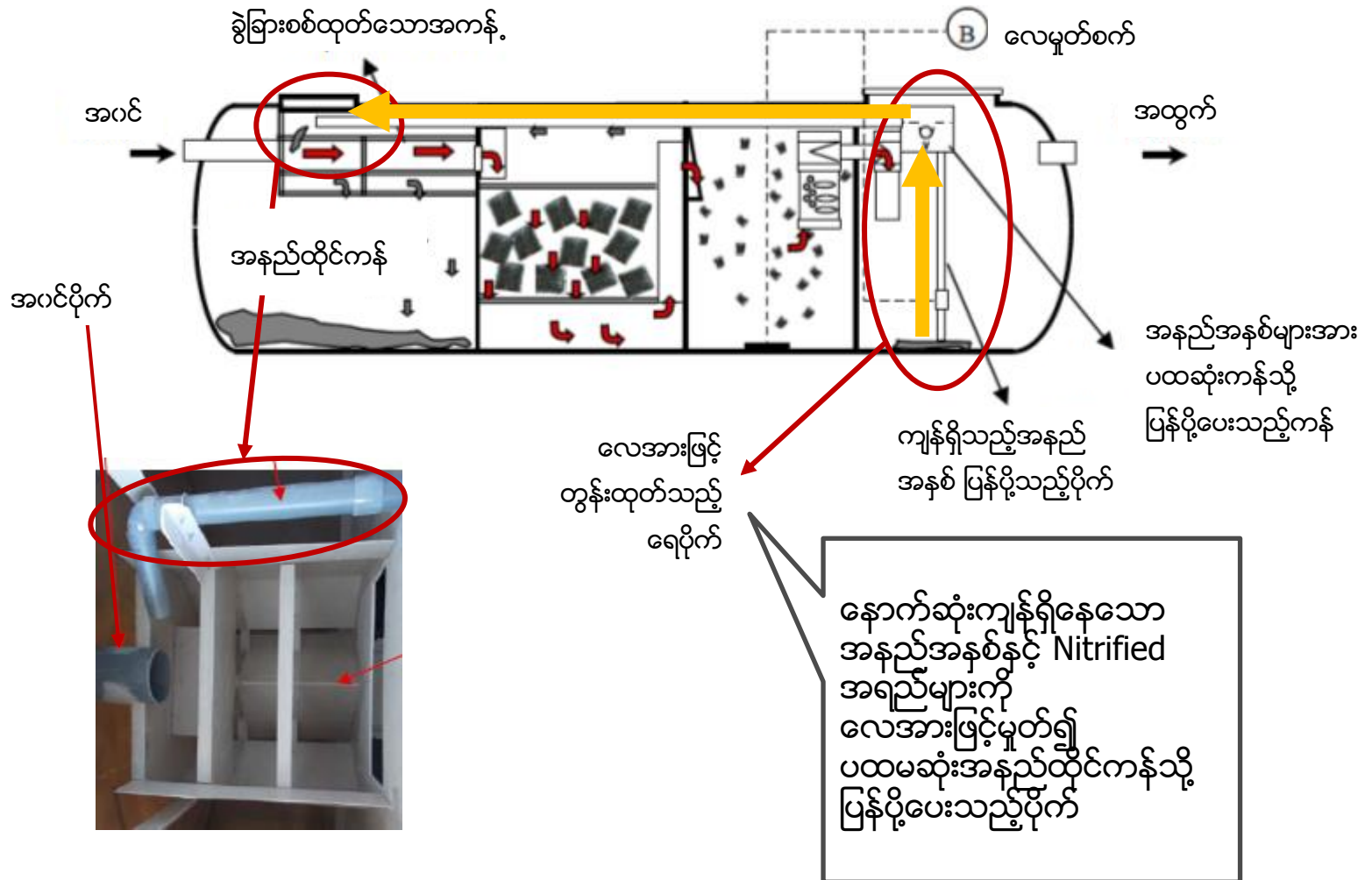
လုပ်ဆောင်ချက်များရှင်းပြချက်

- အနည်အနှစ်များအား အနည်ထိုင်စေသည့်ကန်အတွင်းမှ စွန့်ထုတ်ရေးများအား ရောဂါပိုးမွှားများနှင့် အနံ့အသက်များ မပါရှိစေရန်အတွက် ကလိုရင်းကိုဖြတ်သန်းစီးဆင်းပြီးမှ မြစ်ချောင်းအင်းအိုင် (သို့မဟုတ်) ရေမြောင်းများအတွင်းသို့ လုံခြုံစိတ်ချစွာဖြင့် စွန့်ထုတ်နိုင်ပါသည်။



လုပ်ဆောင်ချက်များရှင်းပြချက်

- နောက်ဆုံးအနည်စုကန်မှ ကျန်ရှိသည့်အနည်များအား ပြန်လည်သန့်စင်ပေးရန် ပထမဆုံးကန်သို့ ပြန်လည်ပို့ဆောင်ပေးသည့် နည်းစနစ်ပိုက်လိုင်း

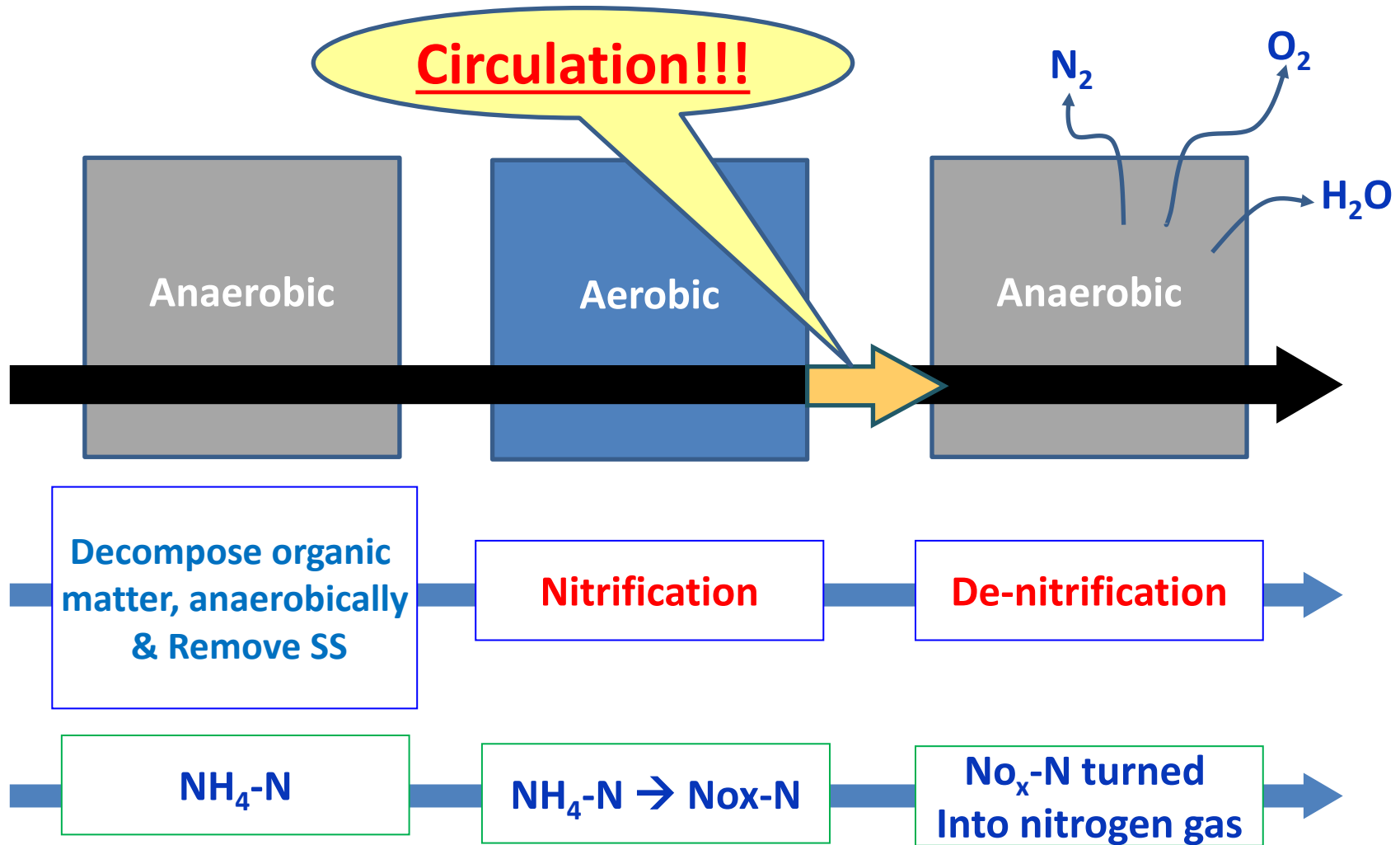


Basic Retention Time of Each Chamber

Chamber	BAE Type
Sedimentation Separation	3.0 hr
Anaerobic	5.5 hr
Moving bed (Aerobic)	6.0 hr
Sedimentation	2.0 hr
Disinfection	7 Min
Total retention time	16.5 hr 7 min

Key Point of Johkasou Treatment

- Key point for the treatment is to react “Nitrification” and “De-nitrification”
Continuously in succession



Function of "Johkasou" - Blower

- Small air blower is the only product that Johkasou System require electricity

Less Noise! Just below 48 db

Noise?

- ✓ **Roots-type blower : 65 db or more**
It's like a truck engine sounds
- ✓ **Our blower sound is like vibration of your mobile phone!**



Chlorine Consumption of Johkasou System

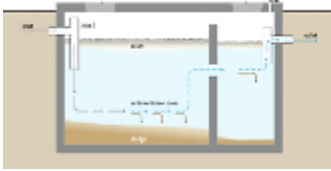
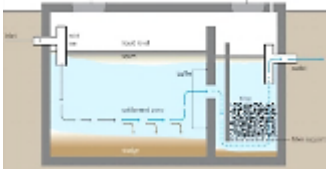
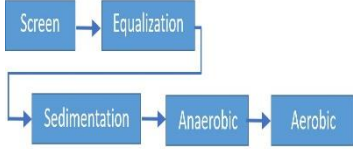
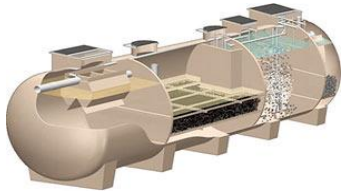
Inflow Capacity	Type	Chlorine Consumption			
		Kg/day		Kg/year	
1 m ³ /day	BAE - 1	0.01	kg	3.65	kg
2 m ³ /day	BAE - 2	0.01	kg	3.65	kg
3 m ³ /day	BAE - 3	0.01	kg	3.65	kg
4 m ³ /day	BAE - 4	0.01	kg	3.65	kg
5 m ³ /day	BAE - 5	0.02	kg	7.30	kg
8 m ³ /day	BAE - 8	0.03	kg	10.95	kg
10 m ³ /day	BAE - 10	0.04	kg	14.60	kg
12 m ³ /day	BAE - 12	0.05	kg	18.25	kg
15 m ³ /day	BAE - 15	0.05	kg	18.25	kg
20 m ³ /day	BAE - 20	0.07	kg	25.55	kg
25 m ³ /day	BAE - 25	0.09	kg	32.85	kg
30 m ³ /day	BAE - 30	0.10	kg	36.50	kg
35 m ³ /day	BAE - 35	0.12	kg	43.80	kg
40 m ³ /day	BAE - 40	0.14	kg	51.10	kg
45 m ³ /day	BAE - 45	0.15	kg	54.75	kg
50 m ³ /day	BAE - 50	0.17	kg	62.05	kg
55 m ³ /day	BAE - 55	0.19	kg	69.35	kg
60 m ³ /day	BAE - 60	0.20	kg	73.00	kg
65 m ³ /day	BAE - 65	0.22	kg	80.30	kg
70 m ³ /day	BAE - 70	0.24	kg	87.60	kg
75 m ³ /day	BAE - 75	0.25	kg	91.25	kg
80 m ³ /day	BAE - 80	0.27	kg	98.55	kg
85 m ³ /day	BAE - 85	0.29	kg	105.85	kg
90 m ³ /day	BAE - 90	0.30	kg	109.50	kg
95 m ³ /day	BAE - 95	0.32	kg	116.80	kg
100 m ³ /day	BAE - 100	0.34	kg	124.10	kg

Benefit of using Johkasou STP

1. Save Energy Cost
2. No Need Resident Operator
3. Japanese Government Certified Products
4. Advanced Treatment
5. Less Noise
6. No Need Equalization Tank
7. Against Peak Flow Rate
8. Easy to Install
9. Easy Maintenance



"ရေဆိုးသန့်စင်မှုစနစ် (ဂျီကားဆိုး) ဖြင့် ရေဆိုးသန့်စင်ခြင်းနှင့် အခြားသောစနစ်များဖြင့် ရေဆိုးသန့်စင်ခြင်းတို့ နှိုင်းယှဉ်ချက်"

	သမားရိုးကျ မိလ္လာကန် (RC)	သမားရိုးကျမိလ္လာကန်ကို ပြုပြင် မွမ်းမံထားသည့်ကန် (RC)	ရေဆိုးသန့်စင်မှုစနစ်ဖြင့် တည်ဆောက်ထားသော မိလ္လာကန် (RC)	Johkasou စနစ် ရေဆိုးသန့်စင်စက်
အသုံးပြုနိုင်သော ရေဆိုးအမျိုးအစား	မိလ္လာ	မိလ္လာ၊ မီးဖိုချောင် ၊ ရေချိုးခန်း		
				
အသုံးပြုသော လုပ်ငန်းစဉ်များ	ရိုးရိုးအနည်အနှစ်စုကန်	အနည်အနှစ်စုကန် + လေမလိုသည့်စနစ်ဖြင့် ပိုးမွှေးကန်	အနည်အနှစ်စုကန် + လေမလိုသည့်စနစ်ဖြင့် ပိုးမွှေးကန် + လေလိုသည့်စနစ်ဖြင့် ပိုးမွှေးကန်	
သန့်စင်ပြီးသော ရေတွင်ပါဝင်သည့် BOD ပမာဏ	100 ~ 150 mg/L	75 ~ 100 mg/L	< 20 ~ 50 mg/L	≤ 20 mg/L (ရေဆိုးအား 90% သန့်စင်ပေးနိုင်ပါသည်။)
ရေဆိုးသန့်စင်ပေး နိုင်သည့် ပမာဏ	1 ~ 2 m ³ /day	1 ~ 200 m ³ /day	1 ~ 1000 m ³ /day (1 m ³ /day = လူ (၅)ဦးနှုန်းဖြင့် အခြေခံထားတွက်ချက်၍ အသုံးပြုနိုင်ပါသည်။)	
တပ်ဆင်မှုကာလ (eg, 20 m ³ /day)	၂ ပတ်	၃ ပတ်	၂ လခန့်	၁ ပတ်
ခိုင်ခံ့မှုနှင့် သန့်စင်ပေးနိုင်မှု	ဆောက်လုပ်မှုအပေါ် မူတည်ပါသည်။			အာမခံမှု အပြည့်အဝ ပေးနိုင်ပါသည်။

Influent and Effluent Water Quality

Item	Influent Water Quality	Effluent Water Quality	Unit
pH	6 – 8	6 – 8	-
BOD	300	20	mg/L
COD	400	50	mg/L
SS	240	30	mg/L
Oil & Grease	40	10	mg/L
T-P (Total Phosphorus)	7.5	6 – 7	mg/L
T-N (Total Nitrate)	50	45	mg/L
NH ₄ -N (Ammonia)	50	40 – 45	mg/L
Coliforms	-	≤ 3000	MPN/100mL

မျက်စိပသာဒဖြစ်အောင်လည်း အလွယ်တကူတပ်ဆင်နိုင်ပါသည်။



မိမိတို့၏ ကားရပ်နားရာနေရာများတွင်လည်း တပ်ဆင်နိုင်ပါသည်။



မြေပေါ်နှင့် မြေအောက် (Underground basement) များတွင်လည်းတပ်ဆင်နိုင်ပါသည်။



မိမိတို့၏ အိမ်/ရုံး/ဟိုတယ်/စားသောက်ဆိုင်များမှ ထွက်ရှိသောရေဆိုး အဝင်နှင့်အထွက် များကို တပ်ဆင်ပြီး လေပေးသည့် Blower စက်အား လျှပ်စစ်သွယ်တန်းပြီး ချက်ချင်း အသုံးပြုနိုင်ခြင်း။

- 1 day installation: just connect inlet & outlet pipe, and electric cable!



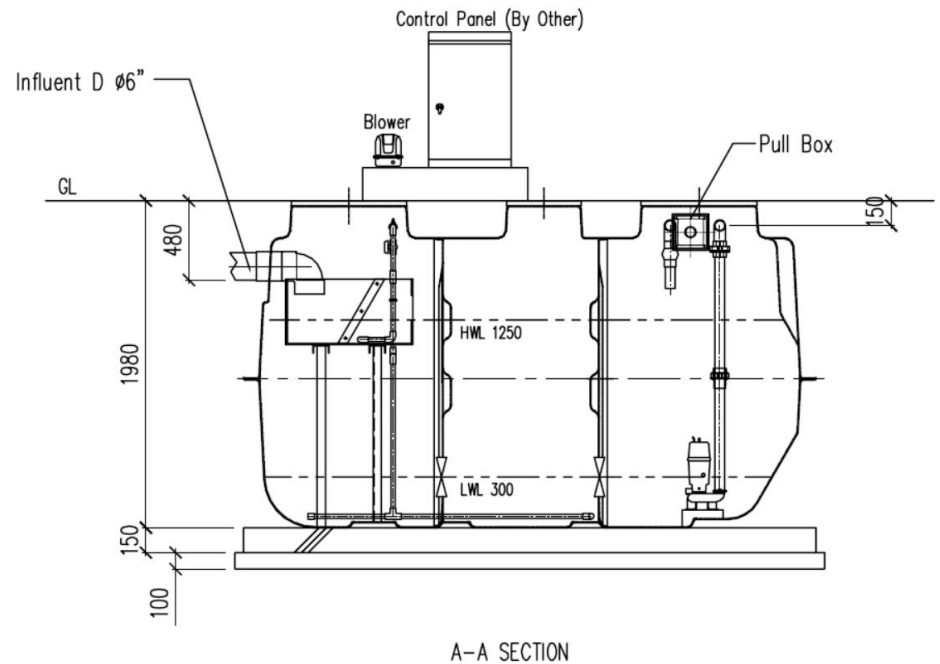
နည်းပညာပိုင်းများအား စဉ်ဆက်မပြတ်လေ့ကျင့်သင်ကြားပေးနေမှုပုံရိပ်အချို့



❖ Daiki Axis - A.C.R သုခချမ်းသာကုမ္ပဏီမှ အခြားဝန်ဆောင်မှု ထုတ်ကုန်များ ဖြစ်သော -

Raw Water Tank

သုံးစွဲမှုများပြားသည့် အများသုံးအိမ်သာများ၊ ဟိုတယ်ကြီးများနှင့် တိုက်ခန်းများမှ ထွက်ရှိသည့် မိလ္လာရေဆိုးများနှင့်အမှိုက်များအား Johkasou System အတွင်းသို့ မိလ္လာရေဆိုးများ တိုက်ရိုက်ဝင်ရောက်ရန် ခက်ခဲသည့်အခြေအနေတွင် Raw Water Tank မှတစ်ဆင့် Pump ဖြင့် ပို့ဆောင်ပေးသောစနစ် ဖြစ်ပါသည်။

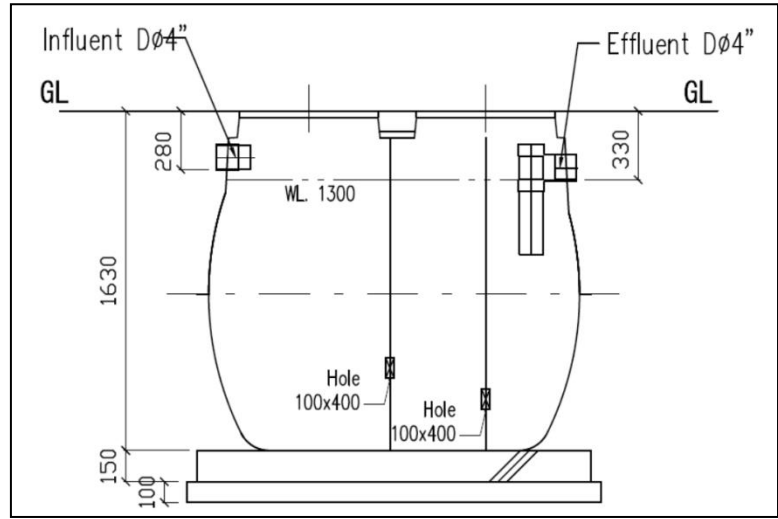


Grease Trap (အဆီစစ်ကန်)

အဆီစစ်ကန်၏ လုပ်ဆောင်မှုမှာ ဟိုတယ်ကြီးများ၊ စားသောက်ဆိုင်များနှင့် အခြားသော စက်မှုလုပ်ငန်းများမှ ထွက်ရှိသည့်ရေနှင့် အဆီအနှစ်များရောနေသောအရည်များ (Fats, Oil & Grease)အား သီးခြားခွဲခြားပြီး အဆီအနှစ်များအား စုဆောင်းသိုလှောင်ပေးပြီး အဆီအနှစ်နှင့် စားကြွင်းစားကျန်များမှာ Grease Trap အတွင်း၌ ကျန်ရှိနေခဲ့ပြီး အဆီမပါသောရေအနေဖြင့် စွန့်ထုတ်ပေးပါသည်။ စားကြွင်းစားကျန်များမှာ Grease Trap အတွင်း၌ အနည်ထိုင်ကျန်ရှိနေသည့်အတွက် အသုံးပြုသည့်အဆီစစ်ကန်အရွယ်အစားအပေါ် မူတည်၍ ပုံမှန်သန့်စင်ထုတ်ပေးရန် လိုအပ်ပါသည်။

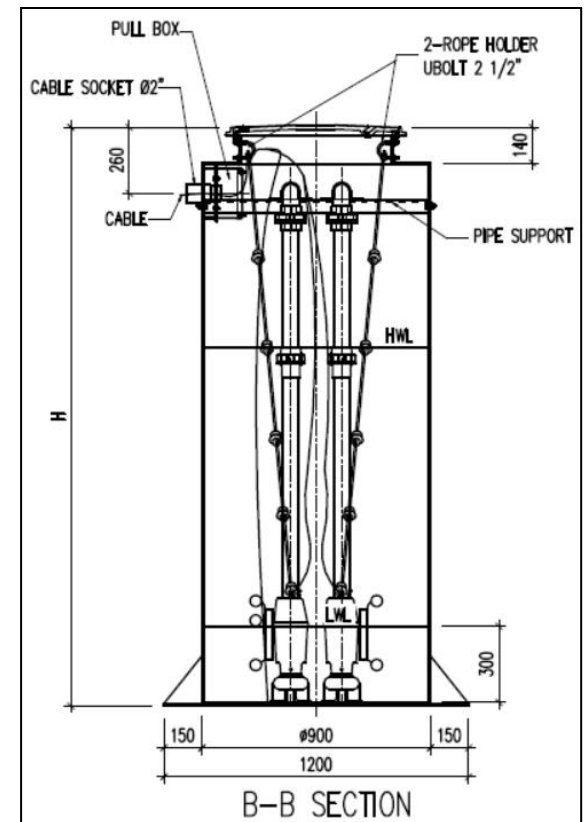
Where are they Needed?

- Hotels
- Schools and Colleges
- Restaurants
- Pubs and Inns
- Cafes
- Take Aways
- Conference Centres
- Bakeries
- Food Manufacturers
- Canteens at factories and offices
- Golf Courses
- Sports Venues



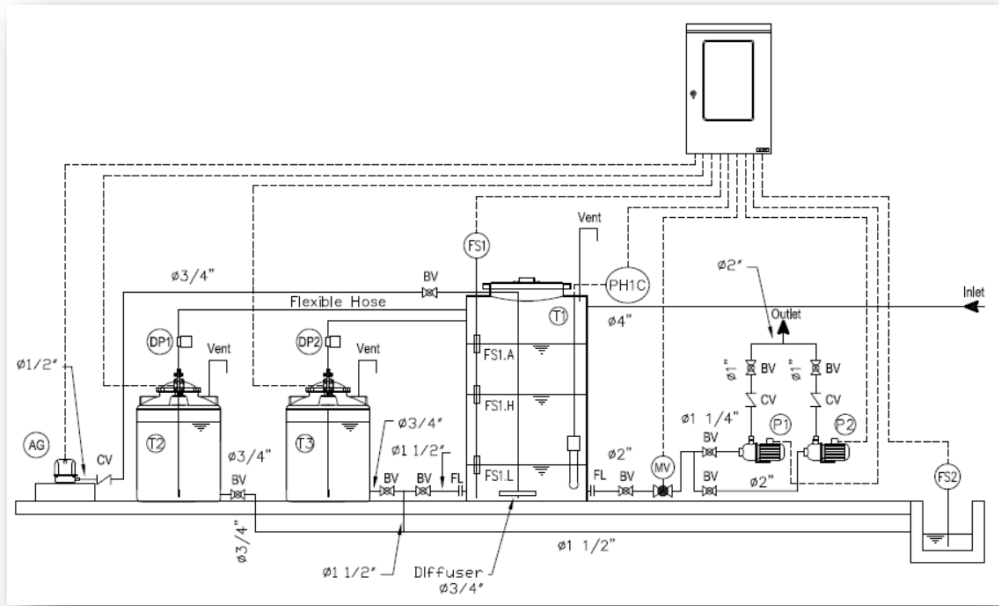
Effluent Tank (ZP Tank)

Effluent Tank ၏ လုပ်ဆောင်မှုမှာ အဆောက်အဦး၏ အနိမ့်အမြင့်အပေါ်မူတည်၍ စွန့်ထုတ်မည့်မြောင်း အခက်အခဲရှိပါက ၎င်းနှင့်ဆက်စပ်တပ်ဆင်ထားသော Johkasou System မှထွက်ရှိသော သန့်စင်ပြီးစွန့်ထုတ်ရေးအား စုဆောင်း၍ မိမိစွန့်ထုတ်လိုသောနေရာသို့ Sewage Submersible Pump ဖြင့် တွန်းပို့စွန့်ထုတ်ပေးသည့်ကန်။ ၎င်းတို့အား Sewage Treatment Plant, Sewer Pipe, Industrial Wastewater Treatment Plant အစရှိသည့်နေရာများတွင် လိုအပ်သလို တပ်ဆင်အသုံးပြုနိုင်ပါသည်။



Neutralized System

Neutralized System သည် လုပ်ငန်းသုံးရေဆိုးများတွင် Acid နှင့် Alkaline ပါဝင်မှုများသည့်ရေဆိုးများအား pH level ပြန်လည်ထိန်းညှိပေးသည့်စနစ် ဖြစ်ပါသည်။ ဓာတုစွန့်ပစ်ရေများအား တိုက်ရိုက်စွန့်ထုတ်ပါက သဘာဝပတ်ဝန်းကျင်အား ပျက်စီးစေနိုင်သလို စက်ရုံ၊ အလုပ်ရုံများတွင် တပ်ဆင်ထားသည့်ရေဆိုးပိုက်များနှင့် Pump များအား ပျက်စီးစေနိုင်ပါသည်။ ၎င်းစွန့်ပစ်ရေများအား Johkasou System အတွင်းသို့ တိုက်ရိုက်စွန့်ထုတ်ပါကလည်း Johkasou System အတွင်းရှိ Media လေးများ အသက်မရှင်နိုင်ဖြစ်စေပါမည်။ ဆေးရုံများရှိ ဓာတ်ခွဲခန်း၊ ခွဲစိတ်ခန်း၊ ကျောက်ကပ်ဆေးစက်များမှ ထွက်ရှိလာသော ဓာတုစွန့်ပစ်ရေများအား ၎င်းစနစ်ဖြင့် pH level အား ပြန်လည်ထိန်းညှိပေးပြီး ၎င်းမှတစ်ဆင့် အခြားသော သန့်စင်စနစ် (Johkasou System) အတွင်းသို့ ထည့်သွင်းကာ သန့်စင်ပါက ရေသန့်စင်မှု ပိုမိုကောင်းမွန်ပြီး ဒေသန္တရမိမိခန်းခွဲမှု ဌာနများ၏ Guide Line သတ်မှတ်ချက်နှင့်ကိုက်ညီမှုရှိသော နည်းစနစ် ဖြစ်ပါသည်။





Neutralized System
1 m³/day



Johkasou (အထွေထွေအိမ်သုံးရေဆိုးသန့်စင်မှု) နည်းပညာအသုံးပြုခြင်း၏ ကောင်းကျိုးရလဒ်များ

- ❖ Johkasou စနစ်နှင့် နည်းပညာသည် ဂျပန်နိုင်ငံအစိုးရမှ အသိအမှတ်ပြု တီထွင် ထုတ်လုပ်သော နည်းပညာဖြစ်ပါသည်။
- ❖ နည်းပညာအရ မိမိတို့၏အိမ်များမှထွက်ရှိသော စွန့်ထုတ်ရေဆိုးများဖြစ်သည့် မိလ္လာရေ၊ မီးဖိုချောင်သုံးရေ ၊ အဝတ်လျှော်ရေ၊ အခြားအထွေထွေသုံးရေ များအား ဂျပန်နည်းပညာဖြင့် ထုတ်လုပ်ထားသည့် Johkasou ဟုခေါ်သော လေမလိုအပ်သော ပိုးမွှေးကန်၊ လေလိုအပ်သည့် ပိုးမွှေးကန်များဖြင့် တည်ဆောက်ထားသော အထွေထွေရေဆိုးသန့်စင်စက်စနစ် ဖြစ်ပါသည်။
- ❖ ဟိုတယ်များ၊ စားသောက်ဆိုင်များနှင့် စက်ရုံကြီးများ၊ ကျောင်းများ၊ အများသုံးအိမ်သာများ၊ ဆေးရုံများမှ စွန့်ထုတ်လိုက်သောရေဆိုးများအားလည်း သန့်စင်ပေးနိုင်သည့်နည်းပညာဖြင့်စနစ် ဖြစ်ပါသည်။

- ❖ အကျိုးအမြတ်များအနေဖြင့် ရေဆိုးများအား သန့်စင်ပေးသည့်အတွက် ညစ်ညမ်းသော သဘာဝပတ်ဝန်းကျင်ဖြစ်စေမှုအား ပြန်လည်သန့်စင်ပေးနိုင်ခြင်း၊ ရောဂါပိုးများနှင့် အနံ့ဆိုးများ မရှိသလောက် နည်းပါးသွားခြင်း။
- ❖ သန့်စင်ပြီးရေများအားလည်း မြစ်ချောင်းအင်းအိုင်၊ ရေမြောင်းများထဲသို့ တိုက်ရိုက်စွန့်ထုတ်နိုင်ခြင်း။
- ❖ ရေရှားသည့်နေရာများတွင် ၎င်းသန့်စင်ပြီးရေအား ကောက်ပဲသီးနှံ (သို့မဟုတ်) သစ်ပင် ပန်းမန်များအတွက် အသုံးပြုနိုင်ခြင်း။
- ❖ ရိုးရိုးရေဆိုးကန်များမှ စွန့်ထုတ်လိုက်သည့် ရေဆိုးများအားလည်း ပြန်လည်သန့်စင်ပေးနိုင်မှု ရှိခြင်း။

- ❖ ရေမြောင်းမရှိသည့်နေရာ မြစ်ချောင်းအင်းအိုင်နှင့်ဝေးသော နေရာများတွင် တပ်ဆင်ထားသည့် မိလ္လာရေဆိုးကန်များမှ စွန့်ထုတ်လိုက်သည့်ရေဆိုးများသည် မြေအောက်ရေအရင်းအမြစ်အား ပျက်စီးစေပြီး Johkasou စနစ်အား တပ်ဆင်ပါက ၎င်းမှထွက်ရှိသည့် စွန့်ထုတ်ရေသည် သန့်စင်ထားပြီးဖြစ်သည့်အတွက် မြေအောက်ရေအရင်းအမြစ် ပျက်စီးမှုအား ကာကွယ်မှုပေးနိုင်ခြင်း။
- ❖ ကြံ့ခိုင်အားနှင့် ရေရှည်လုပ်ဆောင်မှု အားကောင်းခြင်း၊ ကွဲရှနိုင်မှုဖြစ်နိုင်ခြေနည်းပါးခြင်း၊ သံချေးတက်နိုင်မှုနှင့် ယိုစိမ့်မှုများမရှိခြင်း၊ လွယ်ကူစွာအသုံးပြုနိုင်ခြင်း။
- ❖ အခြားသောနည်းပညာများနှင့်နှိုင်းယှဉ်လျှင် ထိန်းသိမ်းစောင့်ရှောက်မှုလွယ်ကူခြင်း၊ ကုန်ကျစရိတ်သက်သာခြင်း။
- ❖ လွယ်ကူစွာတပ်ဆင် အသုံးပြုနိုင်ခြင်းနှင့် တပ်ဆင်ပြီး ချက်ချင်းအသုံးပြုနိုင်ခြင်း၊ တပ်ဆင်ချိန်ကာလ တိုတောင်းခြင်း။
- ❖ Johkasou စနစ်မှ စွန့်ထုတ်လိုက်သည့်ရေသည် 90% သန့်စင်ပြီးရေဖြစ်ကြောင်း အာမခံနိုင်မှုအပြည့်အဝပေးနိုင်ခြင်း။

- **Quality and Warranty**

Influent & Effluent Quality

Item	Unit	Influent Water Quality	Effluent Water Quality
pH	-	6 – 8	6 – 8
BOD	mg/L	300	20
SS	mg/L	240	30
COD	Mg/L	400	50
Oil & Grease	mg/L	40	10
T-P	mg/L	7.5	6-7
T-N	mg/L	50	45
NH ₄ -N	mg/L	50	40 – 45
Coliforms	MPN/100mL	-	3000

Product Warranty

Johkasou Fibre Reinforcement Plastic (FRP)	-	50 years
Aerobic and Anaerobic Medias	-	15 years
Yasunaga Blowers (By other)	-	1 year (Factory warranty)
Tsurumi Submersible Pumps (By other)	-	1 year (Factory warranty)
Control Panel (If there any)	-	1 year

Technical Support Document

Appendix 2 (Drawing Attachment)

❖ BA – 2 Drawing

❖ BA – 5 Drawing

❖ BA – 12 Drawing

❖ BA – 15 Drawing

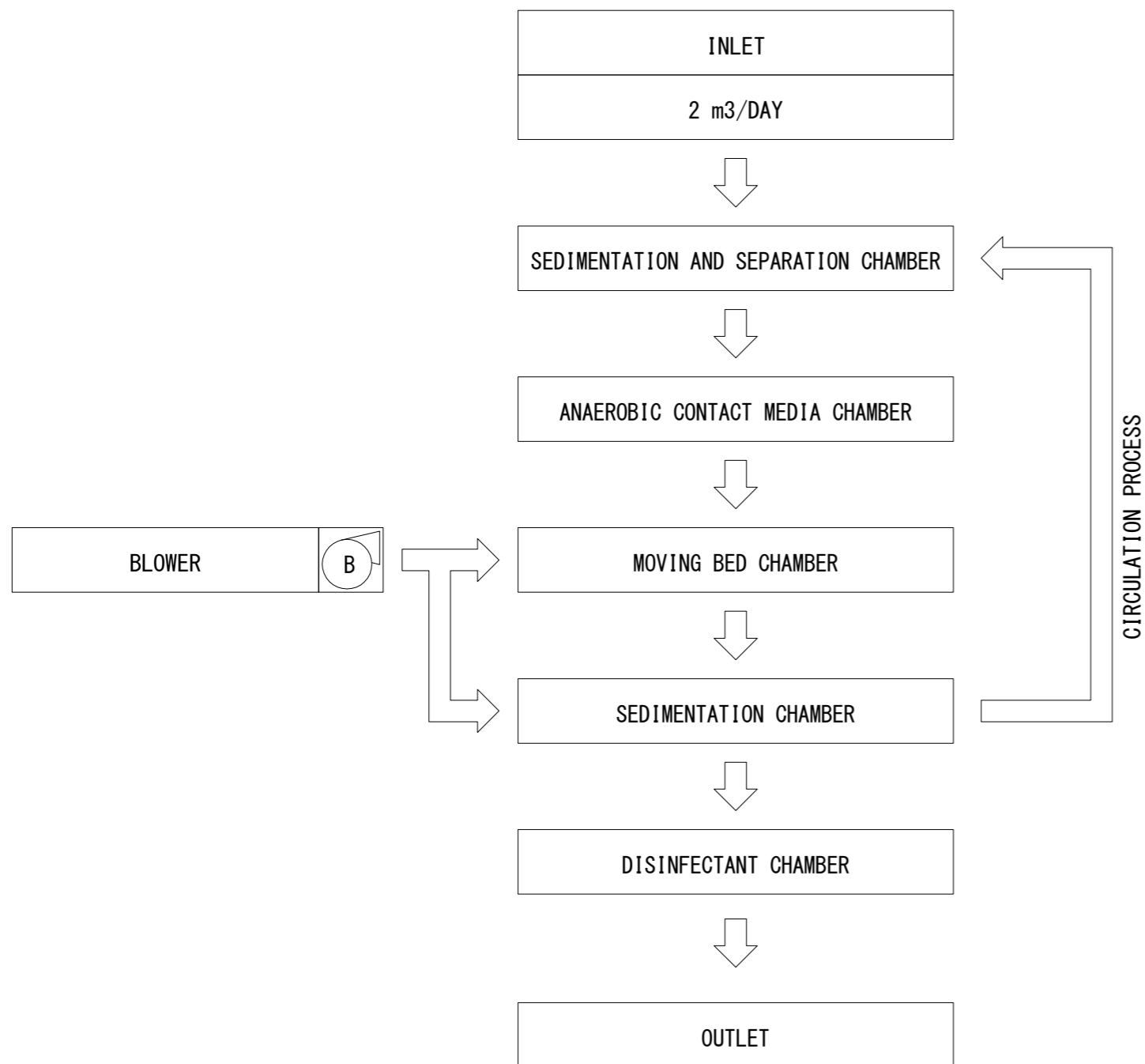
❖ BA – 20 Drawing

❖ BA – 35 Drawing

❖ BA – 90 Drawing

❖ BA – 100 Drawing

FLOW PROCESS



SPECIFICATION BAE-2	
Design Flow	2 m3/day
Influent BOD	300 mg/L
Effluent BOD	20 mg/L
Tank Weight	340 kg
Operation Weight	2100 kg

EFFECTIVE CAPACITY	
Sedimentation And Separation Chamber	0.376 m3
Anaerobic Contact Media Chamber	0.468 m3
Moving Bed Chamber	0.501 m3
Sedimentation Chamber	0.329 m3
Disinfectant Chamber	0.053 m3

EQUIPMENT SPECIFICATION						
Equipment Name	Voltage	Bore mm	Capacity L/min	Motor W	Qty	Pressure /Head
Blower	230	13	80	73	1	15 kPa

MANHOLE SPECIFICATION			
Loading Capacity T-0			
Mark	Measurement	Qty	Note
K1	PP Manhole φ 600	2	By Daiki Axis

INTERIOR PARTS SPECIFICATION	
Waste Water Pipe	PVC, 0.6 or 1.0 MPa
Air Pipe	PVC, 1.0 MPa
Air Valve	PVC, 1.0 MPa
Pipe Support	FRP

NOTE

NOTE :

- ALL DIMENSIONS ARE IN MM
- AIR PIPE OUT OF SCOPE

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
1-9-1 Misawa, Matsuyama-Shi,
Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
FLOW DIAGRAM & SPECIFICATION

NAME OF MODEL :

BAE-2
(CAP. 2 m3 / day)

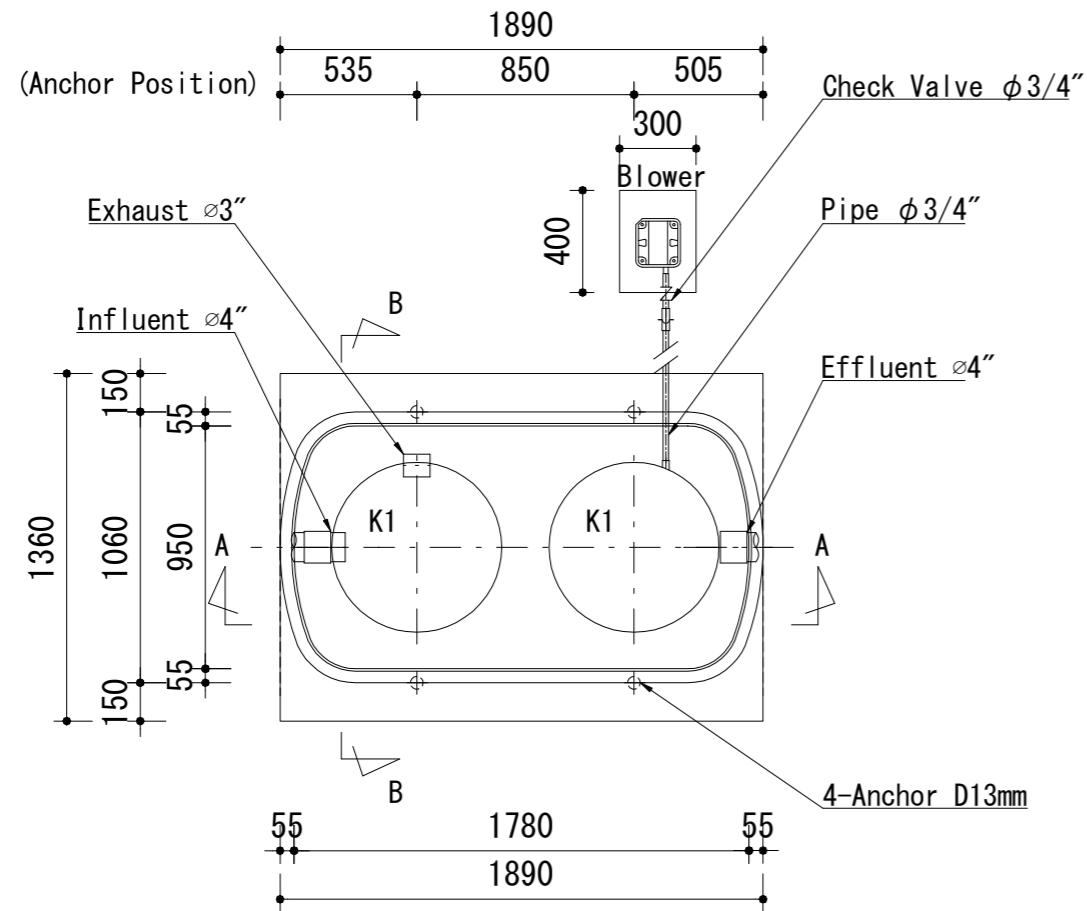
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DRAWING NO.	SCALE	SHEET NO.
-	NTS	1 of 2

AGREEMENT

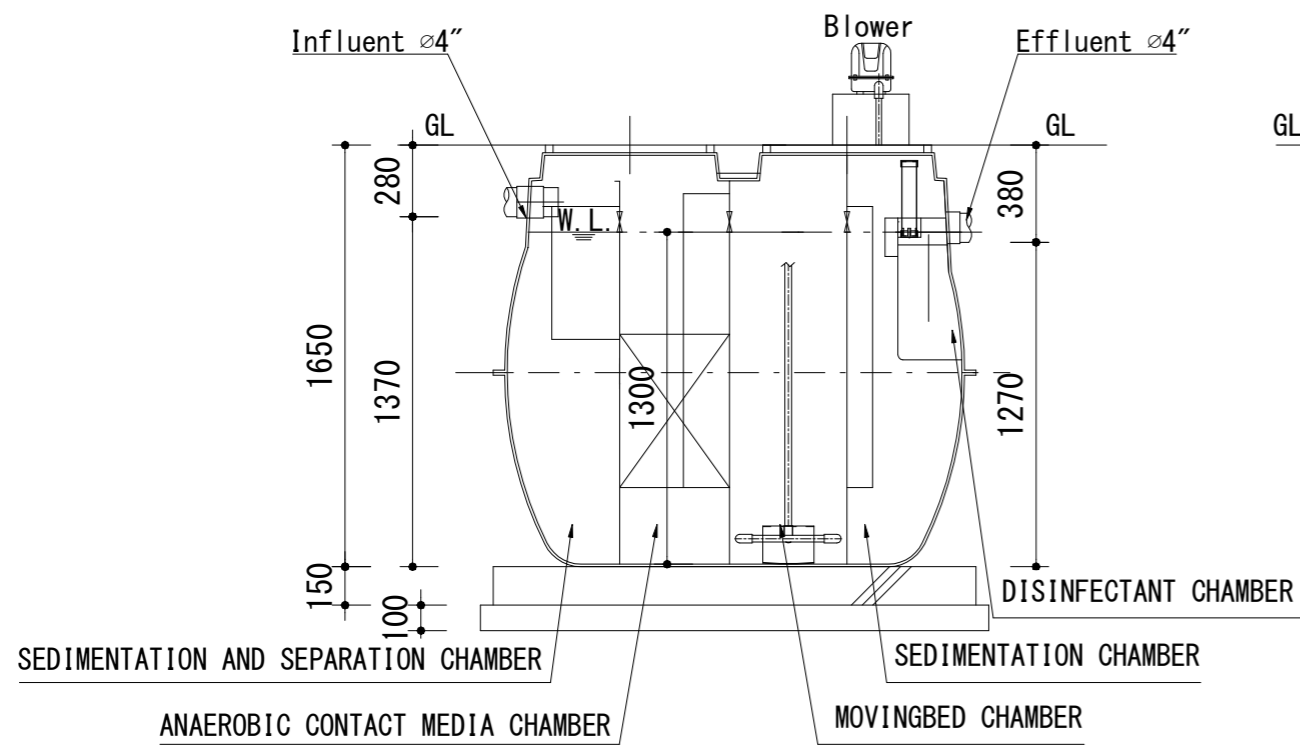
DRAWN BY	08/07/22	DED1
CHECKED BY	08/07/22	MURAKAMI
APPROVED BY	08/07/22	KUROISHI

REVISION

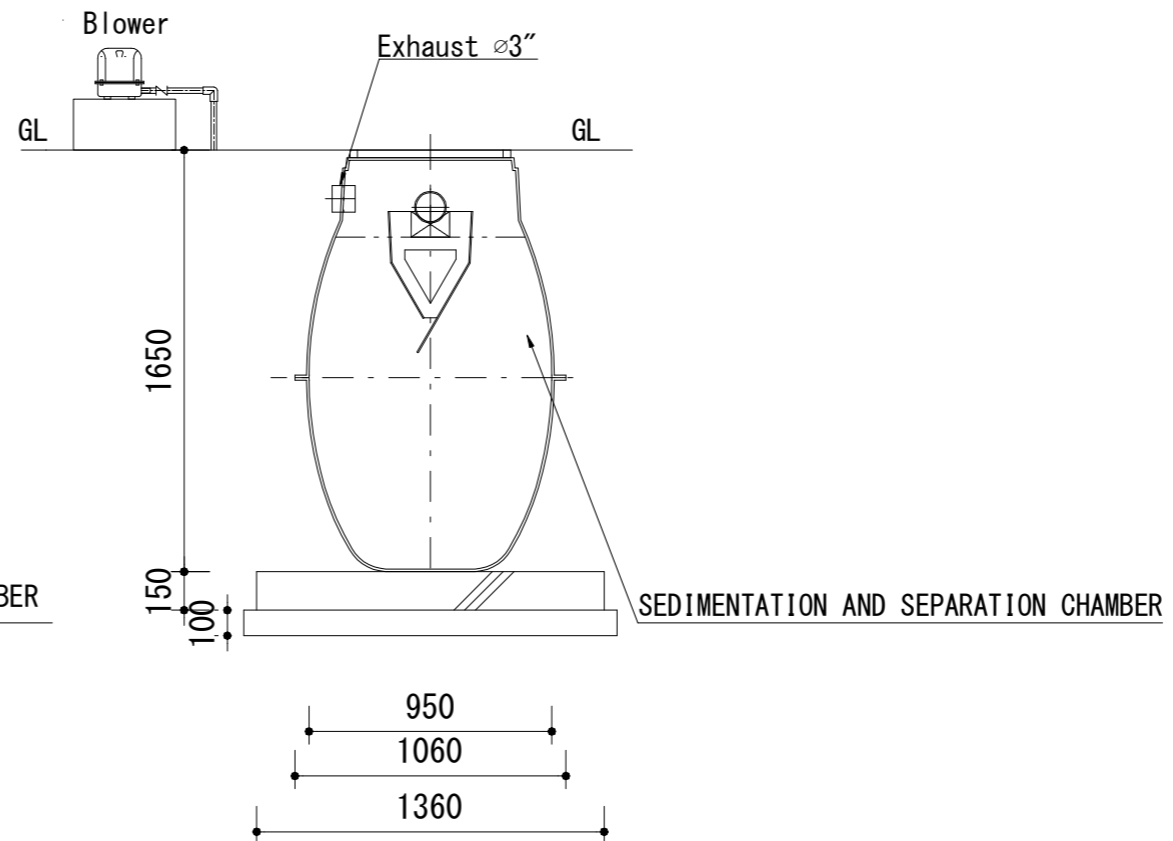
REV	DATE	DESCRIPTION	DRAWN
I	08/07/22	Design	DED1
J	26/10/22	Revise	SAW



UPPER VIEW



A-A SECTION



B-B SECTION

NOTE

- NOTE :
- ALL DIMENSIONS ARE IN MM
 - AIR PIPE OUT OF SCOPE

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
 1-9-1 Misawa, Matsuyama-Shi,
 Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
 LAYOUT & SECTION

NAME OF MODEL :

BAE-2
 (CAP. 2 m3 / day)

FILE NAME	-	
DATE	-	
DRAWING NO.	SCALE	SHEET NO.
-	NTS	2 of 2

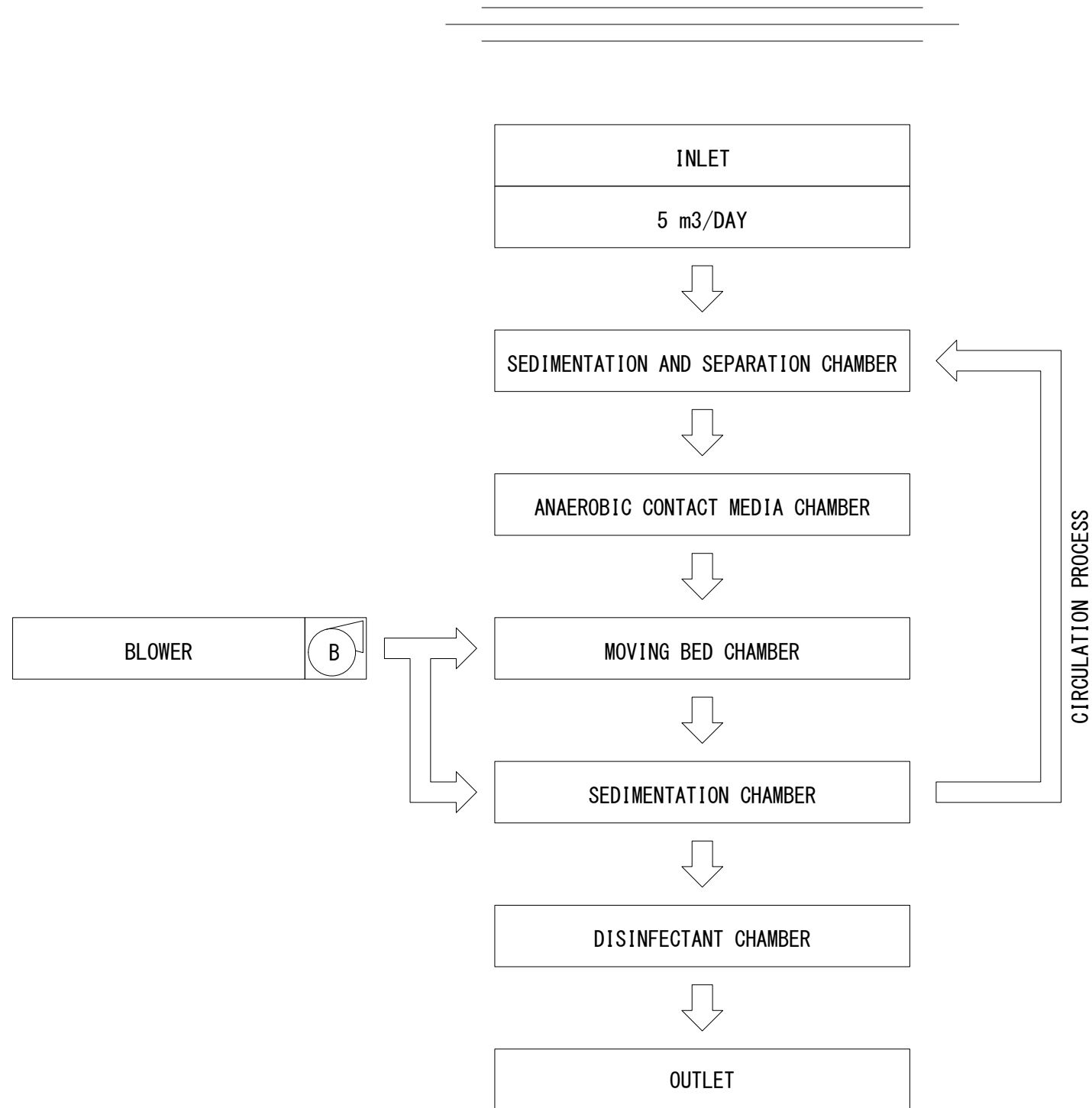
AGREEMENT

DRAWN BY	08/07/22	DED1
CHECKED BY	08/07/22	MURAKAMI
APPROVED BY	08/07/22	KUROISHI

REVISION

REV	DATE	DESCRIPTION	DRAWN
I	08/07/22	Design	DED1
J	26/10/22	Revise	SAW

FLOW PROCESS



SPECIFICATION BAE-5	
Design Flow	5 m ³ /day
Influent BOD	300 mg/L
Effluent BOD	20 mg/L
Tank weight	490 kg
Operation Weight	4000 kg

EFFECTIVE CAPACITY	
Sedimentation And Separation Chamber	0.627 m ³
Anaerobic Contact Media Chamber	1.100 m ³
Moving Bed Chamber	1.253 m ³
Sedimentation Chamber	0.427 m ³
Disinfectant Chamber	0.053 m ³

SPECIFICATION FOR EQUIPMENT						
Equipment Name	Voltage	Bore mm	Capacity L/min	Motor W	Qty	Pressure /Head
Blower	230	13	80	73	2	15 kPa

SPECIFICATION FOR MANHOLE			
Loading Capacity T-0			
Mark	Measurement	Qty	Note
K1	PP Manhole φ 600	3	By Daiki Axis

MATERIAL AND DESIGN PRESSURE FOR INTERIOR PARTS	
Waste Water Pipe	PVC, 0.6 or 1.0 MPa
Air Pipe	PVC, 0.6 MPa
Air Valve	PVC, 0.6 MPa
Pipe Support	FRP

NOTE

NOTE :

- ALL DIMENSIONS ARE IN MM
- AIR PIPE OUT OF SCOPE

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
1-9-1 Misawa, Matsuyama-Shi,
Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
FLOW DIAGRAM & SPECIFICATION

NAME OF MODEL :

BAE-5
(CAP. 5 m³ / day)

FILE NAME

DATE

DRAWING NO.

SCALE

SHEET NO.

-

NTS

1 of 2

AGREEMENT

DRAWN BY

08/07/22

DEDI

CHECKED BY

08/07/22

MURAKAMI

APPROVED BY

08/07/22

KUROISHI

REVISION

REV

DATE

DESCRIPTION

DRAWN

I

08/07/22

Design

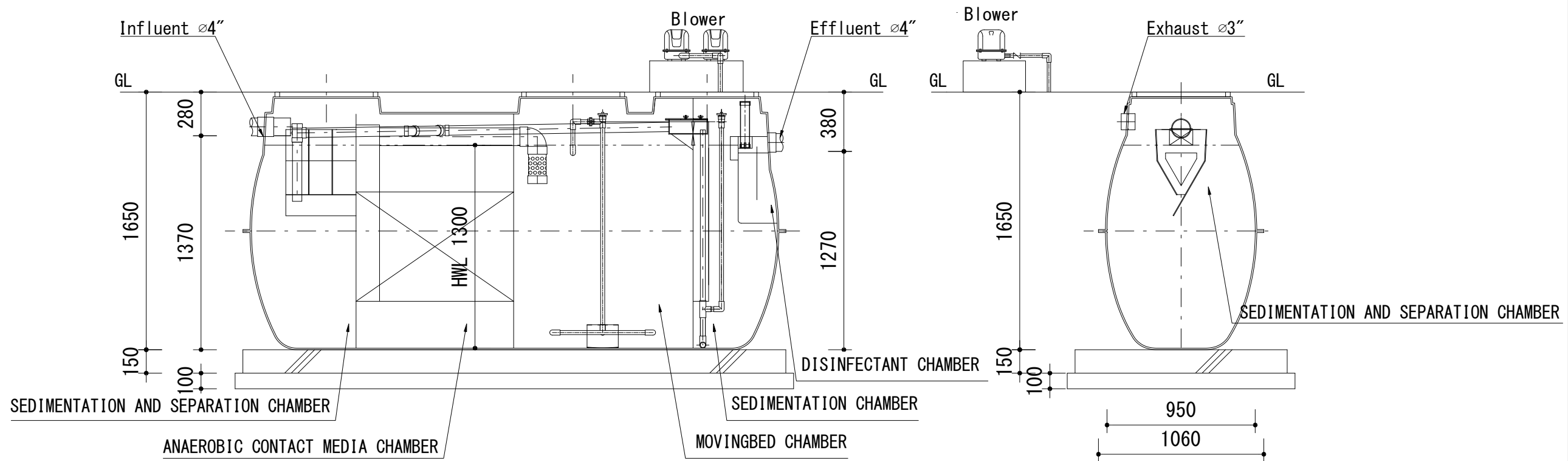
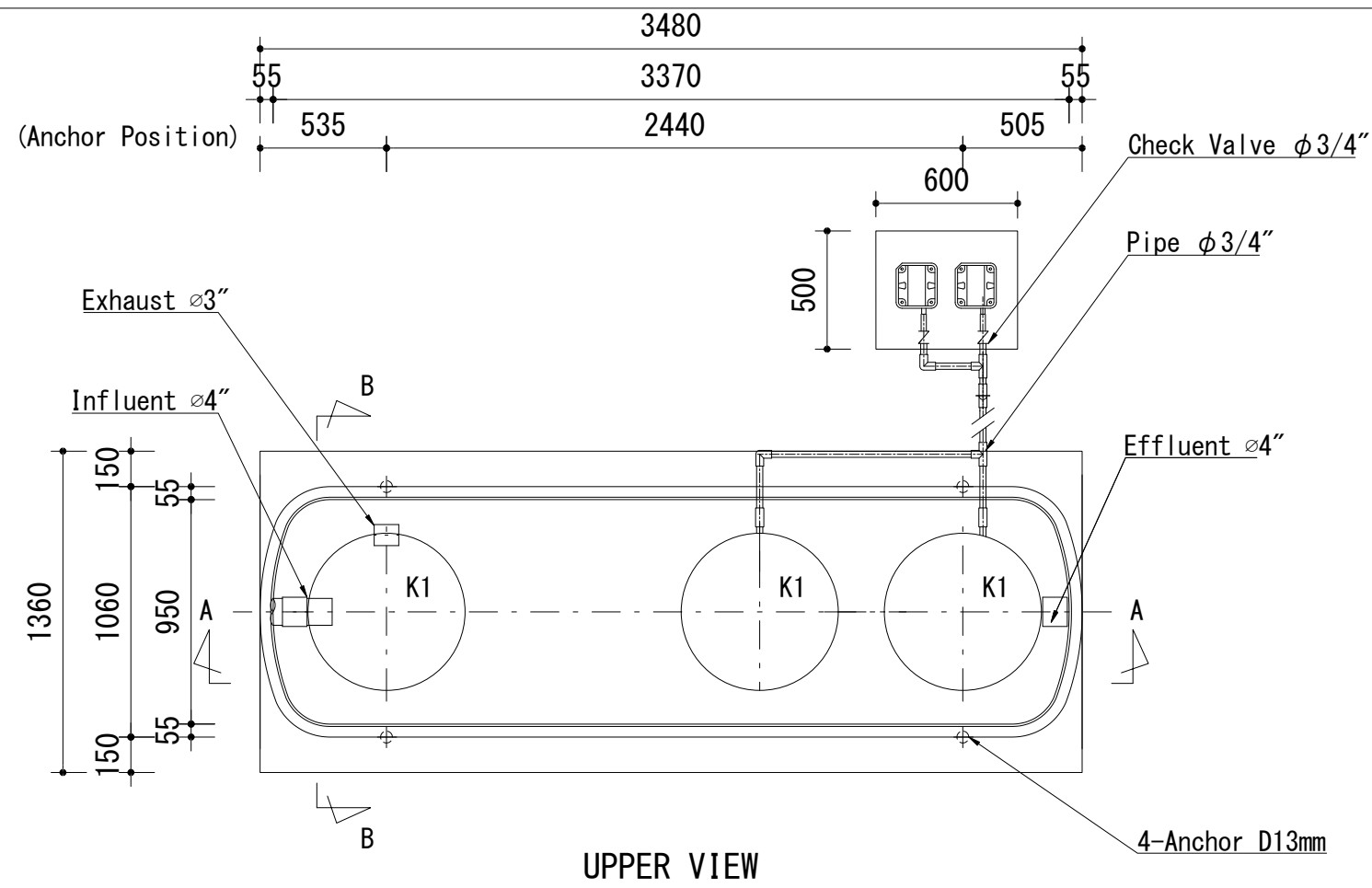
DEDI

J

26/10/22

Revise

SAW



NOTE

NOTE :

- ALL DIMENSIONS ARE IN MM
- AIR PIPE OUT OF SCOPE

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
 1-9-1 Misawa, Matsuyama-Shi,
 Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
 LAYOUT & SECTION

NAME OF MODEL :

BAE-5
 (CAP. 5 m³ / day)

FILE NAME

-

DATE

-

DRAWING NO.

SCALE

SHEET NO.

-

NTS

2 of 2

AGREEMENT

DRAWN BY

08/07/22

DED1

CHECKED BY

08/07/22

MURAKAMI

APPROVED BY

08/07/22

KUROISHI

REVISION

REV

DATE

DESCRIPTION

DRAWN

I

08/07/22

Design

DED1

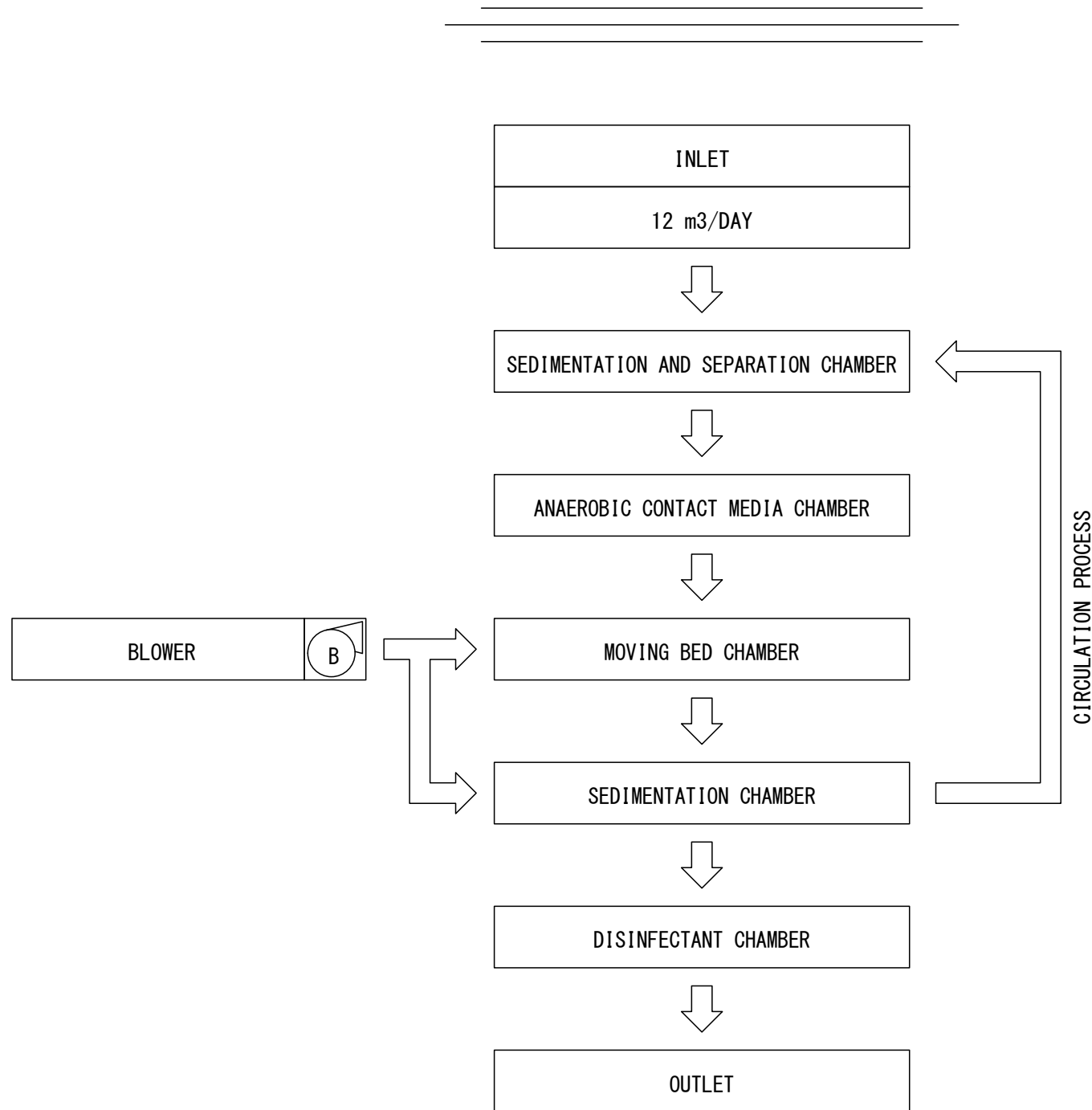
J

26/10/22

Revise

SAW

FLOW PROCESS



SPECIFICATION BAE-12

Design Flow	12 m3/day
Influent BOD	300 mg/L
Effluent BOD	20 mg/L
Tank Weight	1360 kg
Operation Weight	15200 kg

EFFECTIVE CAPACITY

Sedimentation And Separation Chamber	3.440 m3
Anaerobic Contact Media Chamber	3.798 m3
Moving Bed Chamber	4.452 m3
Sedimentation Chamber	2.006 m3
Disinfectant Chamber	0.115 m3

EQUIPMENT SPECIFICATION

Equipment Name	Voltage	Bore mm	Capacity L/min	Motor W	Qty	Pressure /Head
Blower	230	20	240	250	1	20 kPa

MANHOLE SPECIFICATION

Loading Capacity T-0			
Mark	Measurement	Qty	Note
K1	FRP Manhole ϕ 600	3	By Daiki Axis

INTERIOR PARTS SPECIFICATION

Waste Water Pipe	PVC, 0.6 or 1.0 MPa
Air Pipe	PVC 1.0 MPa
Air Valve	PVC 1.0 MPa
Pipe Support	FRP

NOTE

NOTE :
- ALL DIMENSION ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
1-9-1 Misawa, Matsuyama-Shi,
Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
FLOW DIAGRAM & SPECIFICATION

NAME OF MODEL :

BAE-12
(CAP. 12 m3 / day)

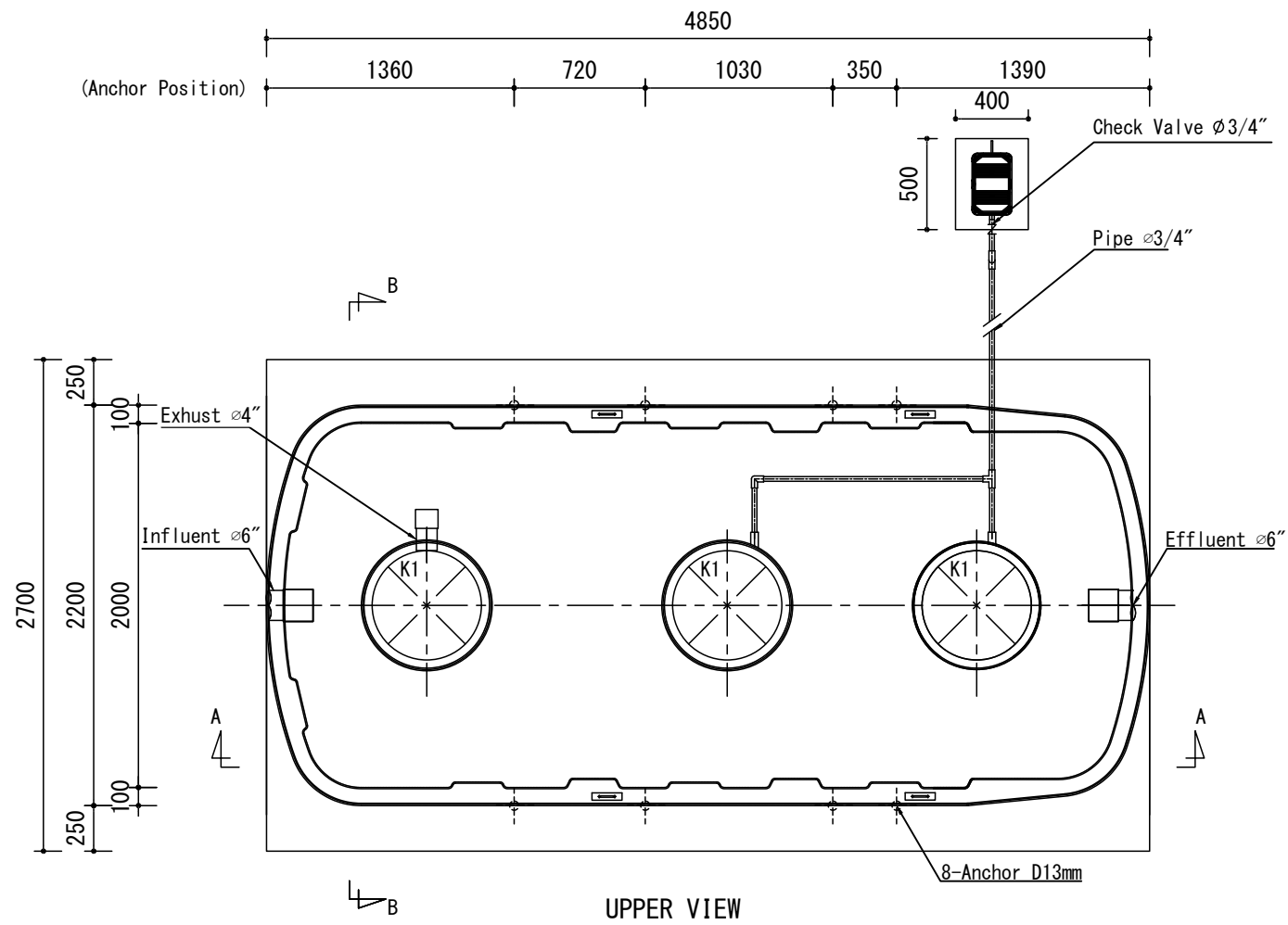
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DATE	-	
DRAWING NO.	SCALE	SHEET NO.
-	NTS	1 of 2

AGREEMENT

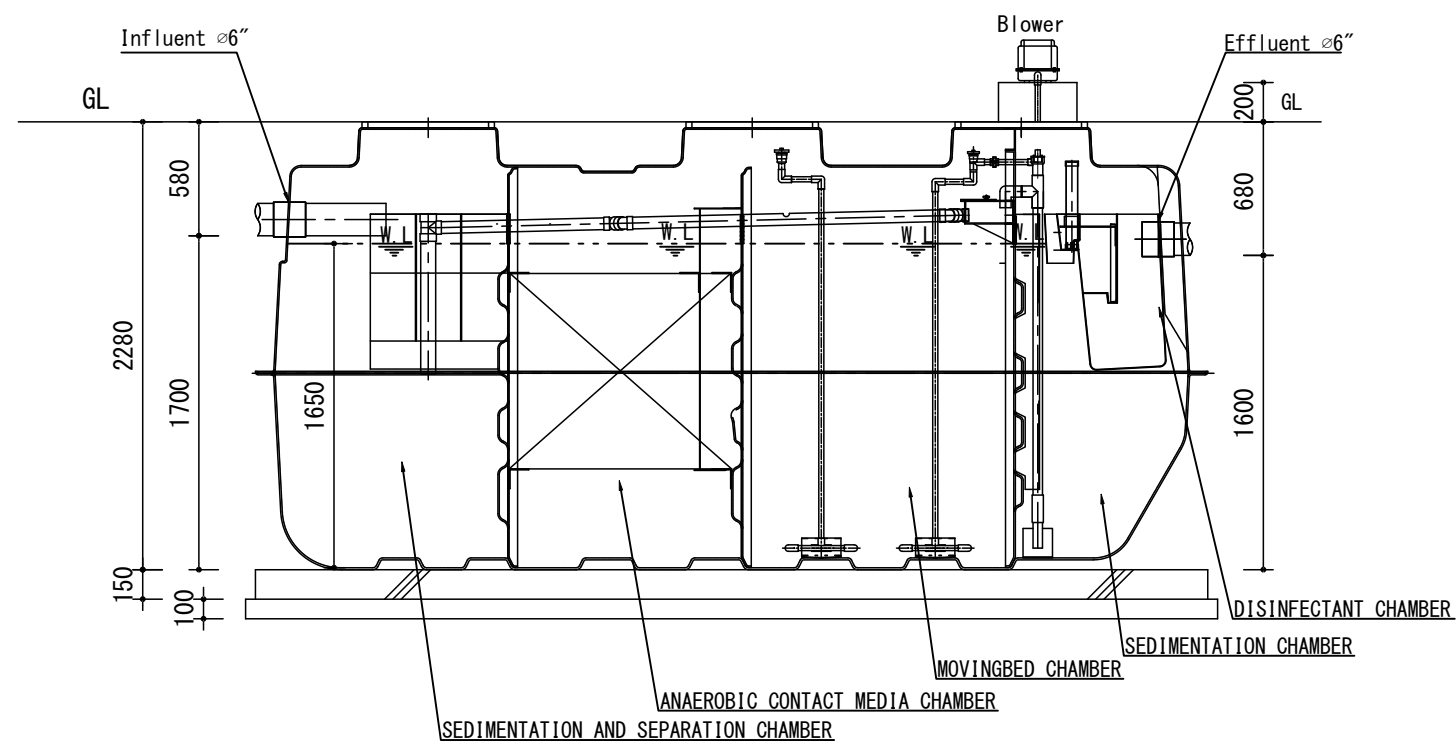
DRAWN BY	30/03/20	DEDI
CHECKED BY	30/03/20	MURAKAMI
APPROVED BY	30/03/20	KUROISHI

REVISION

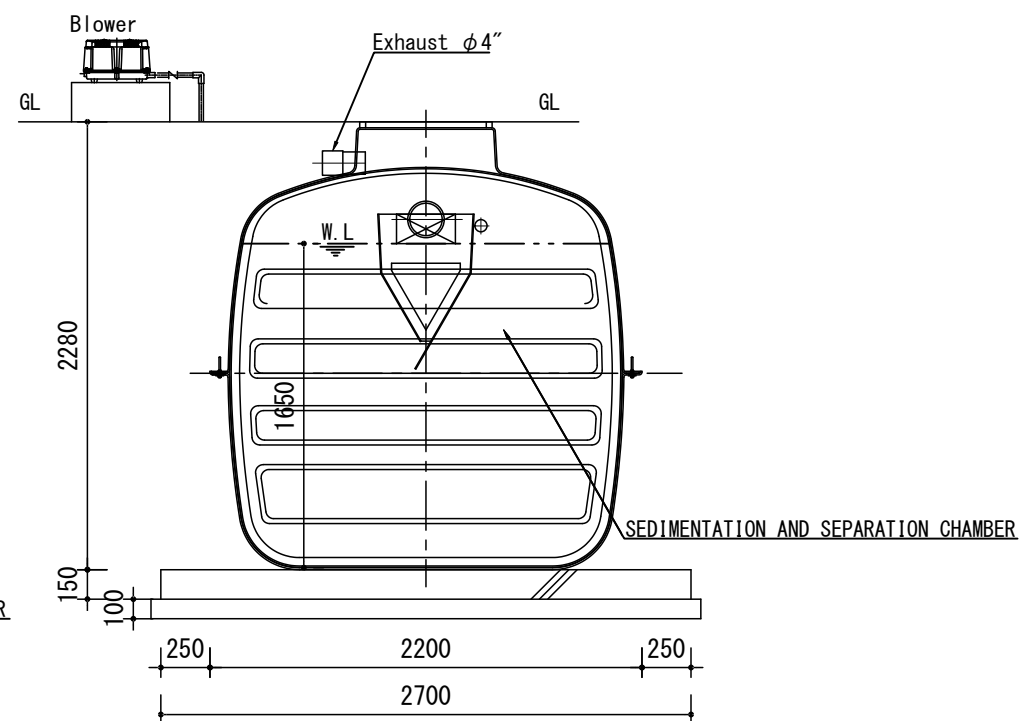
REV	DATE	DESCRIPTION	DRAWN
I	30/03/20	Design	DEDI
J	17/10/22	Revise	SAW
K	26/10/22	Revise	SAW



UPPER VIEW



A-A VIEW



B-B VIEW

NOTE

NOTE :

- ALL DIMENSION ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
 1-9-1 Misawa, Matsuyama-Shi,
 Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
 LAYOUT & SECTION

NAME OF MODEL :

BAE-12
 (CAP. 12 m3 / day)

FILE NAME

-

DATE

-

DRAWING NO.

-

SCALE

NTS

SHEET NO.

2 of 2

AGREEMENT

DRAWN BY

30/03/20

DEDI

CHECKED BY

30/03/20

MURAKAMI

APPROVED BY

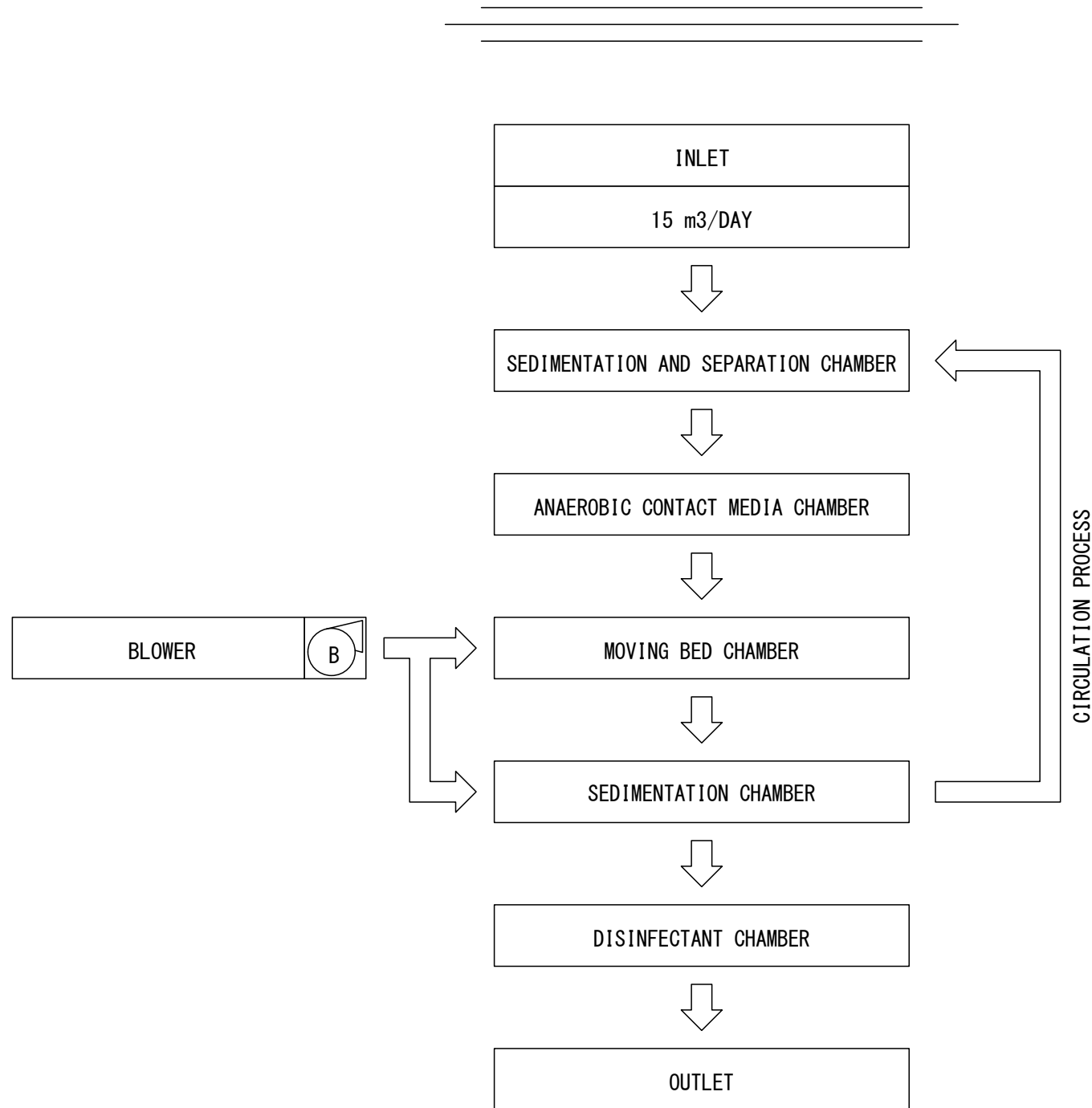
30/03/20

KUROISHI

REVISION

REV	DATE	DESCRIPTION	DRAWN
I	30/03/20	Design	DEDI
J	17/10/22	Revise	SAW
K	26/10/22	Revise	SAW

FLOW PROCESS



SPECIFICATION BAE-15

Design Flow	15 m3/day
Influent BOD	300 mg/L
Effluent BOD	20 mg/L
Tank Weight	1360 kg
Operation Weight	15200 kg

EFFECTIVE CAPACITY

Sedimentation And Separation Chamber	3.440 m3
Anaerobic Contact Media Chamber	3.798 m3
Moving Bed Chamber	4.452 m3
Sedimentation Chamber	2.006 m3
Disinfectant Chamber	0.115 m3

EQUIPMENT SPECIFICATION

Equipment Name	Voltage	Bore mm	Capacity L/min	Motor W	Qty	Pressure /Head
Blower	230	13	80	73	4	20 kPa

MANHOLE SPECIFICATION

Loading Capacity T-0			
Mark	Measurement	Qty	Note
K1	FRP Manhole ϕ 600	3	By Daiki Axis

INTERIOR PARTS SPECIFICATION

Waste Water Pipe	PVC, 0.6 or 1.0 MPa
Air Pipe	PVC 1.0 MPa
Air Valve	PVC 1.0 MPa
Pipe Support	FRP

NOTE

NOTE :
- ALL DIMENSION ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
1-9-1 Misawa, Matsuyama-Shi,
Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
FLOW DIAGRAM & SPECIFICATION

NAME OF MODEL :

BAE-15
(CAP. 15 m3 / day)

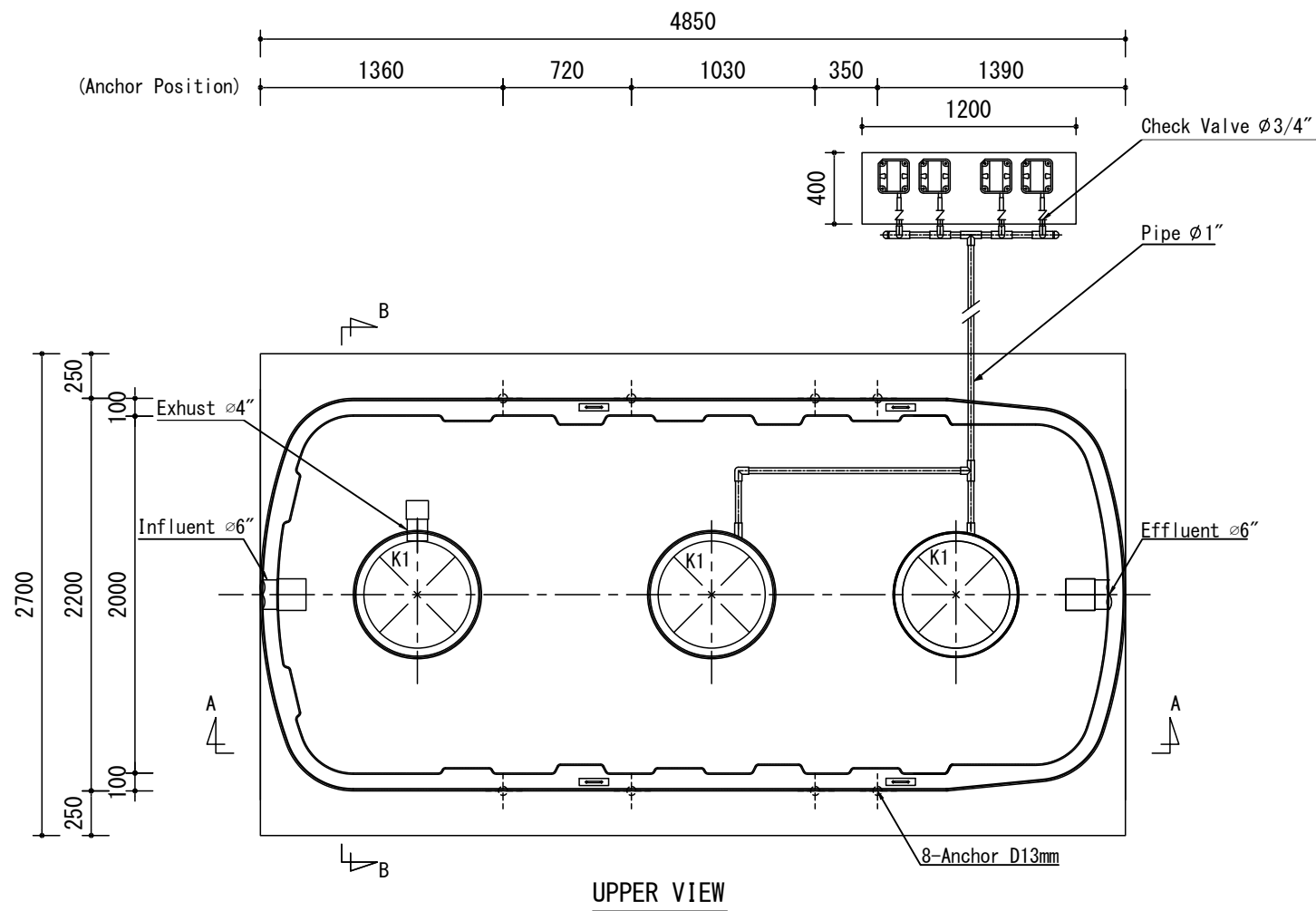
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DATE	-	
DRAWING NO.	SCALE	SHEET NO.
-	NTS	1 of 2

AGREEMENT

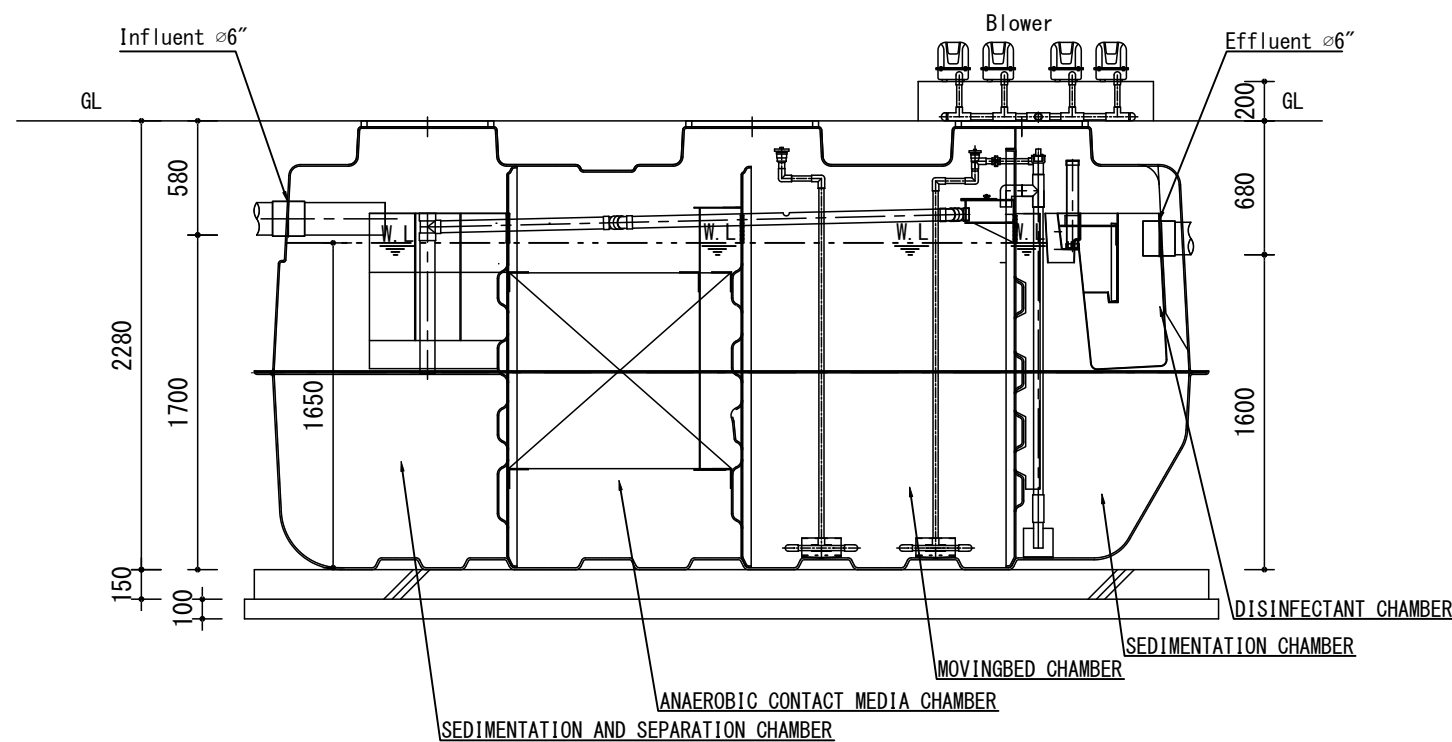
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CHECKED BY	30/03/20	MURAKAMI
APPROVED BY	30/03/20	KUROISHI

REVISION

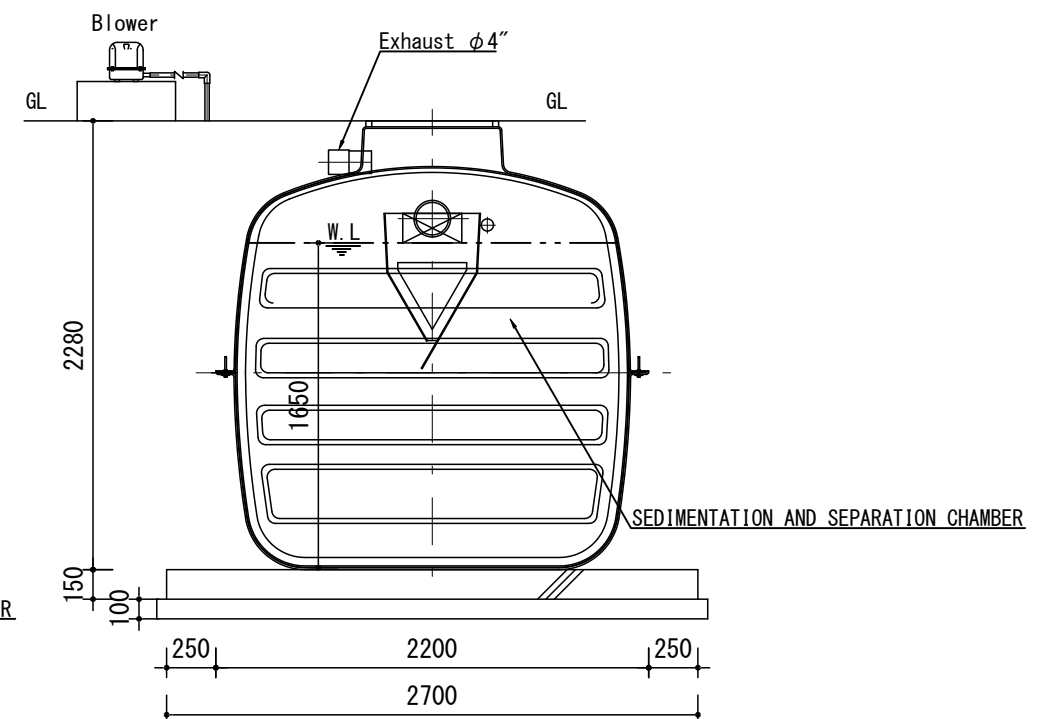
REV	DATE	DESCRIPTION	DRAWN
I	30/03/20	Design	DED1
J	17/10/22	Revise	SAW
K	26/10/22	Revise	SAW



UPPER VIEW



A-A VIEW



B-B VIEW

NOTE

NOTE :

- ALL DIMENSION ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
 1-9-1 Misawa, Matsuyama-Shi,
 Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
 LAYOUT & SECTION

NAME OF MODEL :

BAE-15
 (CAP. 15 m³ / day)

FILE NAME

DATE

DRAWING NO.

SCALE

SHEET NO.

AGREEMENT

DRAWN BY

30/03/20

DED1

CHECKED BY

30/03/20

MURAKAMI

APPROVED BY

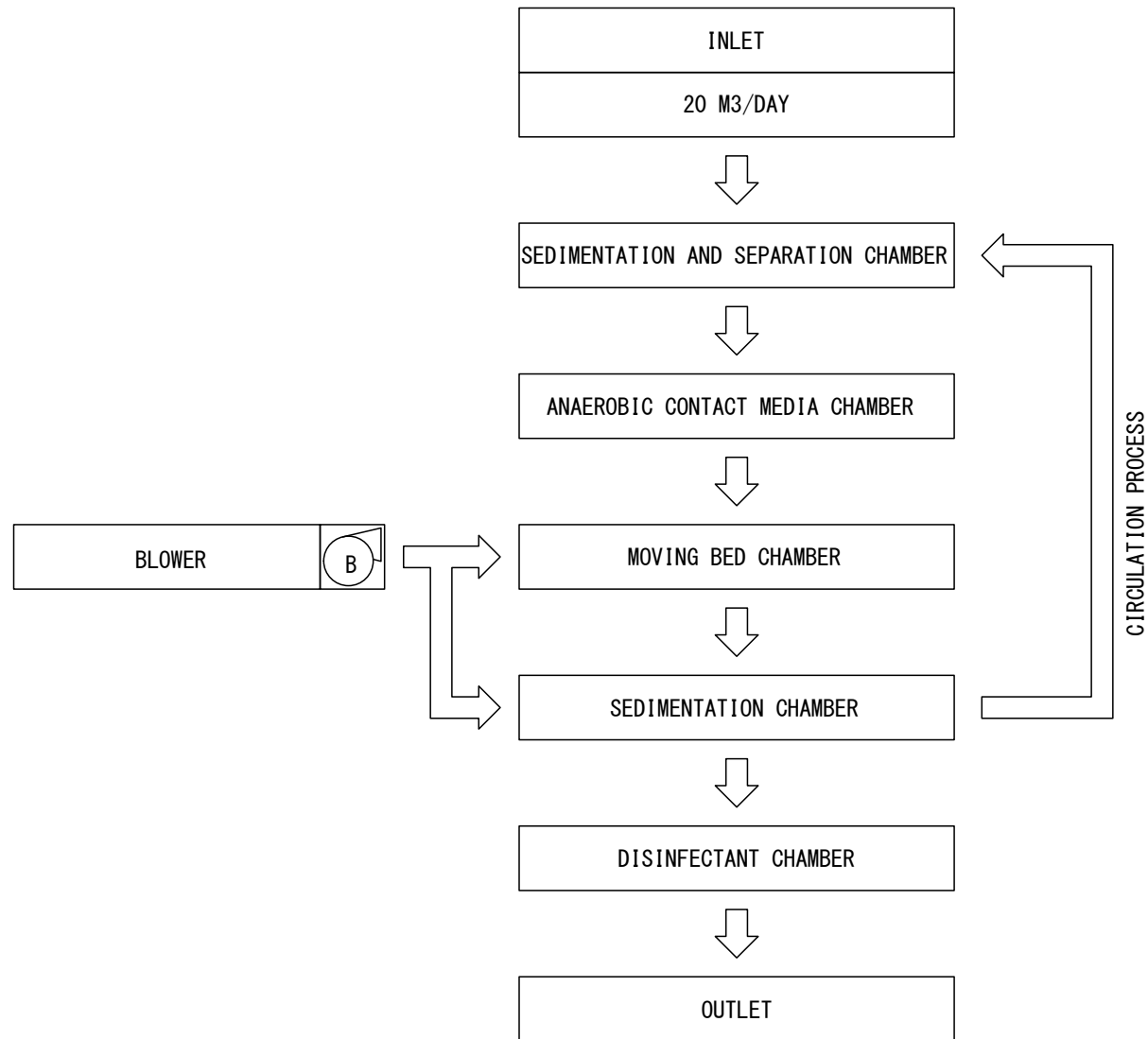
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KUROISHI

REVISION

REV	DATE	DESCRIPTION	DRAWN
I	30/03/20	Design	DED1
J	17/10/22	Revise	SAW
K	26/10/22	Revise	SAW

FLOW PROCESS



SPECIFICATION BAE-20	
Design Flow	20 m ³ /day
Influent BOD	300 mg/L
Effluent BOD	20 mg/L
Tank Weight	1390 kg
Operation Weight	19000 kg

EFFECTIVE CAPACITY	
Sedimentation And Separation Chamber	4.041 m ³
Anaerobic Contact Media Chamber	4.585 m ³
Moving Bed Chamber	5.842 m ³
Sedimentation Chamber	3.495 m ³
Disinfectant Chamber	0.438 m ³

EQUIPMENT SPECIFICATION						
Equipment Name	Voltage	Bore mm	Capacity L/min	Motor W	Qty	Pressure /Head
Blower	230	20	240	250	2	20 kPa

MANHOLE SPECIFICATION			
Loading Capacity T-0			
Mark	Measurement	Qty	Note
K1	FRP Manhole φ600	3	By Daiki Axis
K2	FRP Manhole 600x1000	2	By Daiki Axis

INTERIOR PARTS SPECIFICATION	
Waste Water Pipe	PVC, 0.6 or 1.0 MPa
Air Pipe	PVC, 1.0 MPa
Air Valve	PVC, 1.0 MPa
Pipe Support	FRP

NOTE

NOTE :

- ALL DIMENSIONS ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
1-9-1 Misawa, Matsuyama-Shi,
Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
FLOW DIAGRAM & SPECIFICATION

NAME OF MODEL :

BAE-20
(CAP. 20 m³ / day)

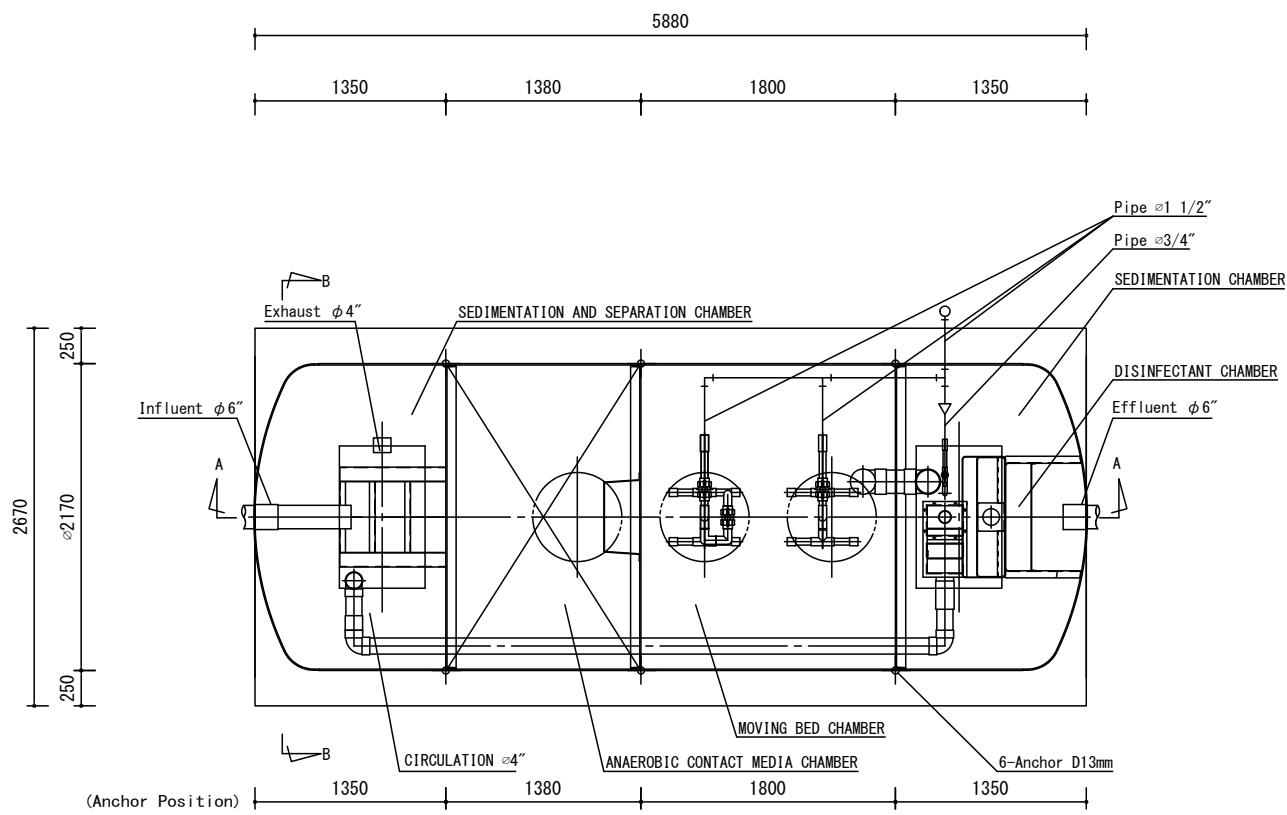
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DRAWING NO.	SCALE	SHEET NO.
-	NTS	1 of 2

AGREEMENT

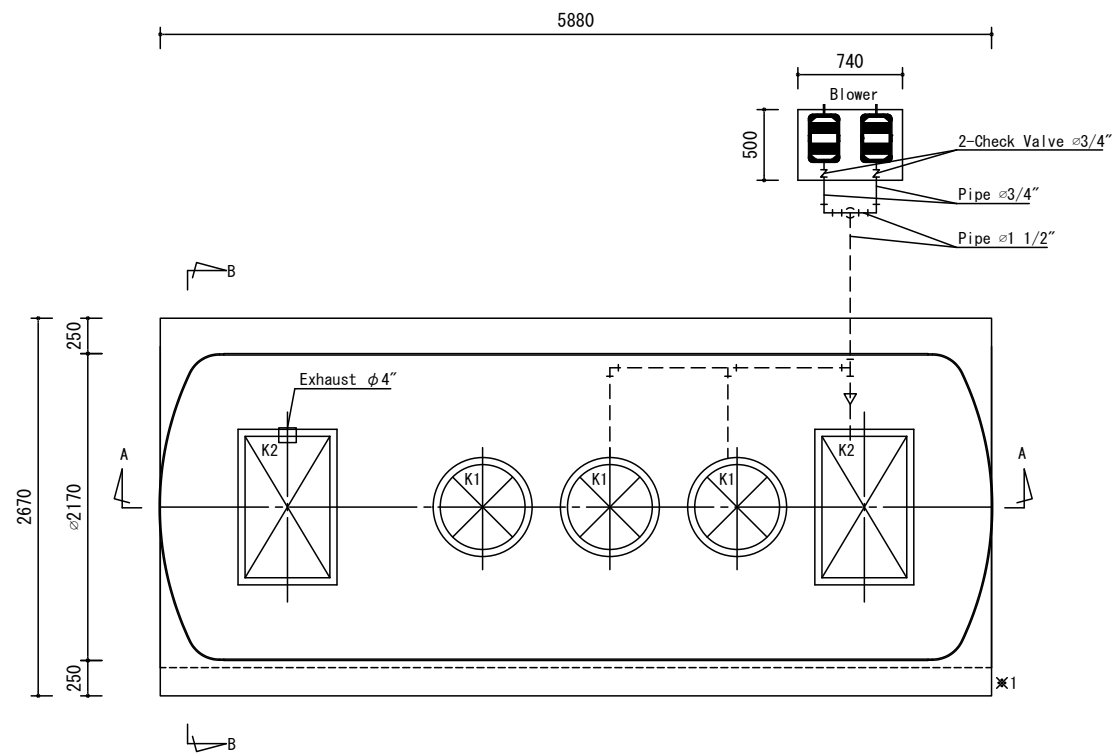
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CHECKED BY	13/07/20	MURAKAMI
APPROVED BY	13/07/20	KUROISHI

REVISION

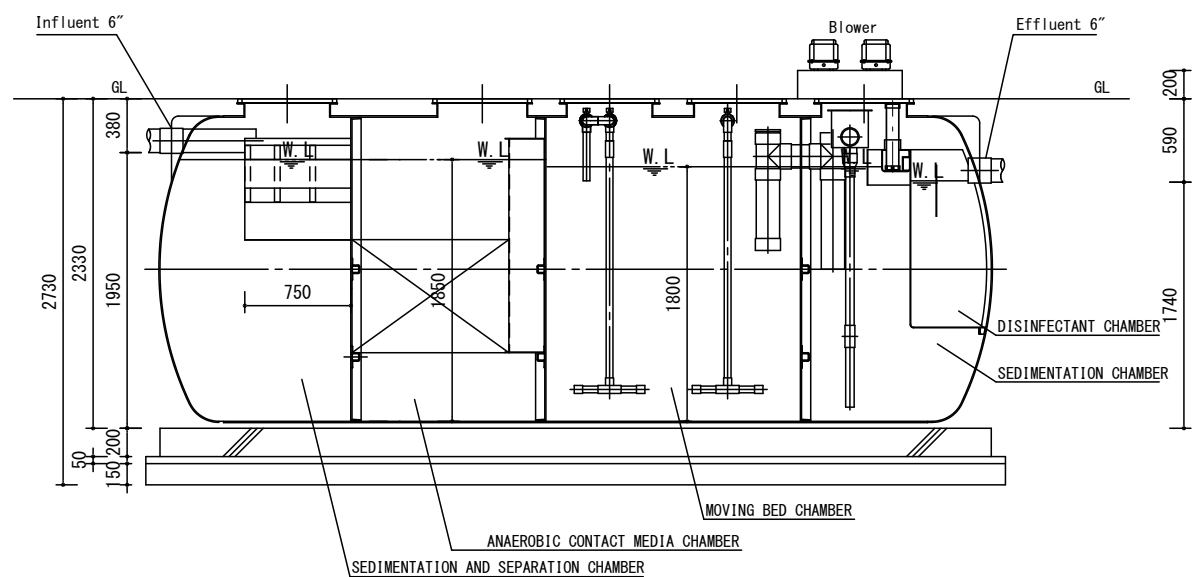
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J	13/07/20	Design	DED1
K	26/10/22	Revise	SAW



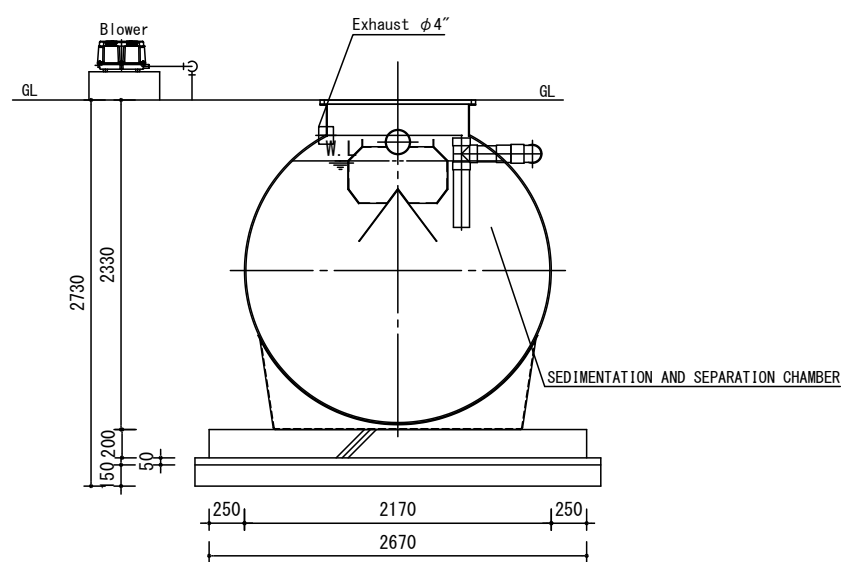
UPPER SECTION



UPPER VIEW



A-A SECTION



B-B SECTION

NOTE

NOTE :

- ALL DIMENSIONS ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
 1-9-1 Misawa, Matsuyama-Shi,
 Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
 LAYOUT & SECTION

NAME OF MODEL :

BAE-20
 (CAP. 20 m3 / day)

FILE NAME

DATE

DRAWING NO.

SCALE

SHEET NO.

-

NTS

2 of 2

AGREEMENT

DRAWN BY

13/07/20

DED1

CHECKED BY

13/07/20

MURAKAMI

APPROVED BY

13/07/20

KUROISHI

REVISION

REV

DATE

DESCRIPTION

DRAWN

J

13/07/20

Design

DED1

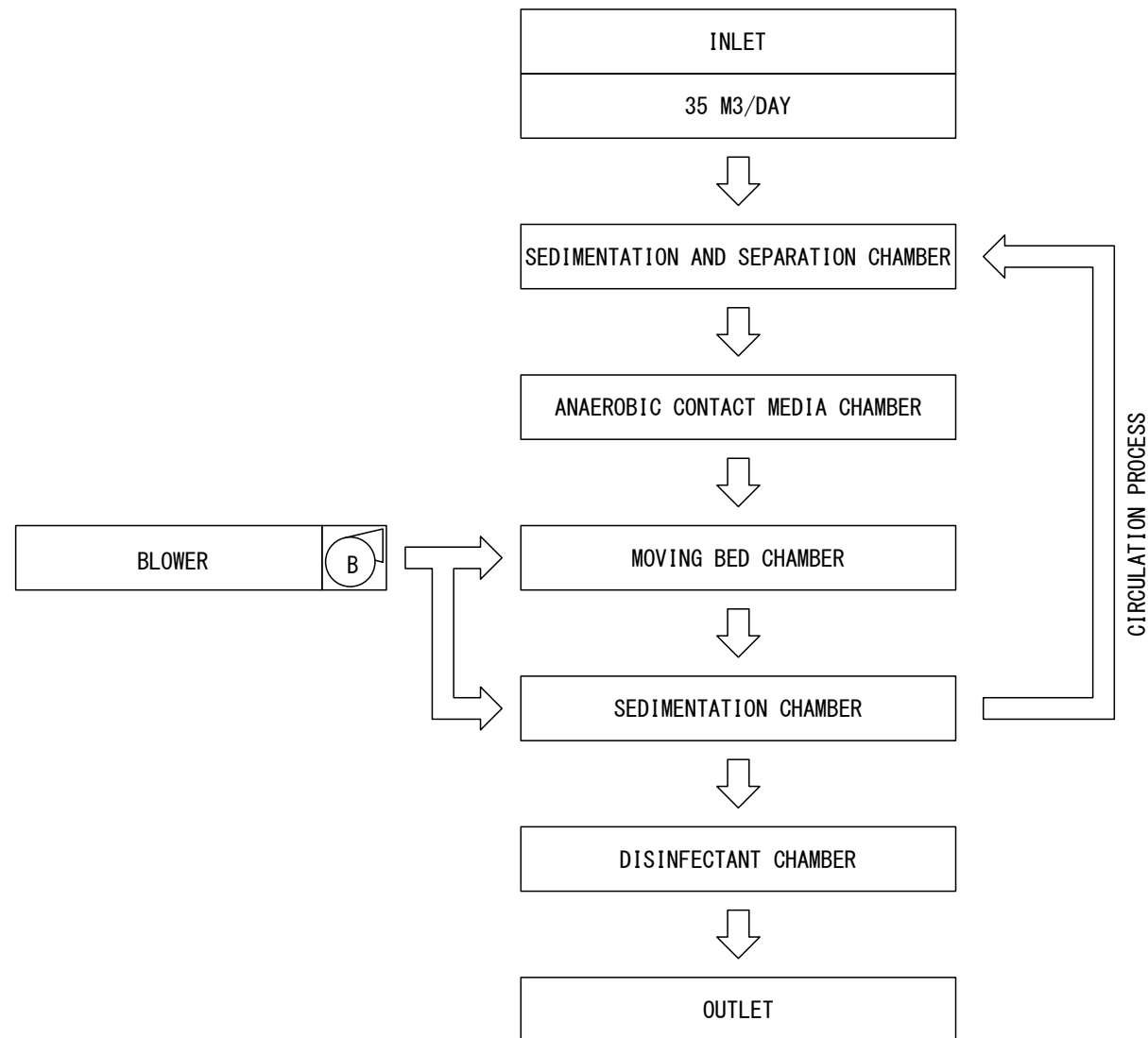
K

26/10/22

Revise

SAW

FLOW PROCESS



SPECIFICATION BAE-35	
Design Flow	35 m3/day
Influent BOD	300 mg/L
Effluent BOD	20 mg/L
Tank Weight	1870 kg
Operation Weight	27100 kg

EFFECTIVE CAPACITY	
Sedimentation And Separation Chamber	4.407 m3
Anaerobic Contact Media Chamber	8.041 m3
Moving Bed Chamber	8.764 m3
Sedimentation Chamber	3.495 m3
Disinfectant Chamber	0.438 m3

SPECIFICATION SPECIFICATION						
Equipment Name	Voltage	Bore mm	Capacity L/min	Motor W	Qty	Pressure /Head
Blower	230	20	240	250	3	20 kPa

MANHOLE SPECIFICATION			
Loading Capacity T-0			
Mark	Measurement	Qty	Note
K1	FRP Manhole φ600	4	By Daiki Axis
K2	FRP Manhole 600x1000	2	By Daiki Axis

INTERIOR PARTS SPECIFICATION	
Waste Water Pipe	PVC, 0.6 or 1.0 MPa
Air Pipe	PVC, 1.0 MPa
Air Valve	PVC, 1.0 MPa
Pipe Support	FRP

NOTE

NOTE :

- ALL DIMENSIONS ARE IN MM

REFERENCE :

LEGEND:

DAIKI AXIS CO.,LTD.
1-9-1 Misawa, Matsuyama-Shi,
Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
FLOW DIAGRAM & SPECIFICATION

NAME OF MODEL :

BAE-35
(CAP. 35 m3 / day)

FILE NAME

-

DATE

-

DRAWING NO.

SCALE

SHEET NO.

-

NTS

1 of 2

AGREEMENT

DRAWN BY

13/07/20

DED1

CHECKED BY

13/07/20

MURAKAMI

APPROVED BY

13/07/20

KUROISHI

REVISION

REV

DATE

DESCRIPTION

DRAWN

J

13/07/20

Design

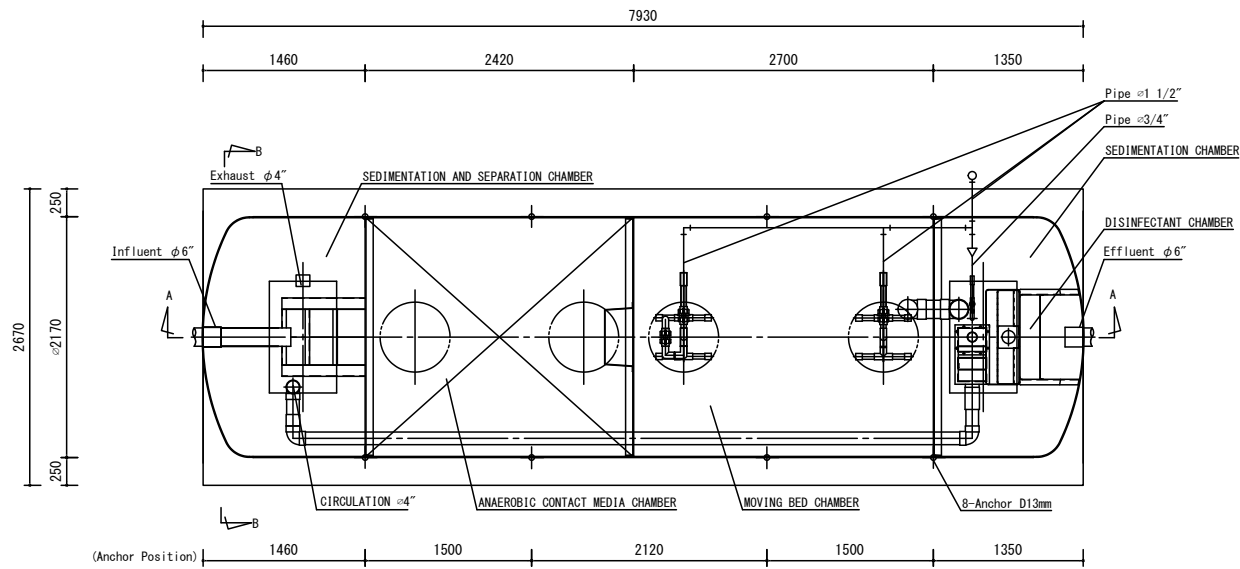
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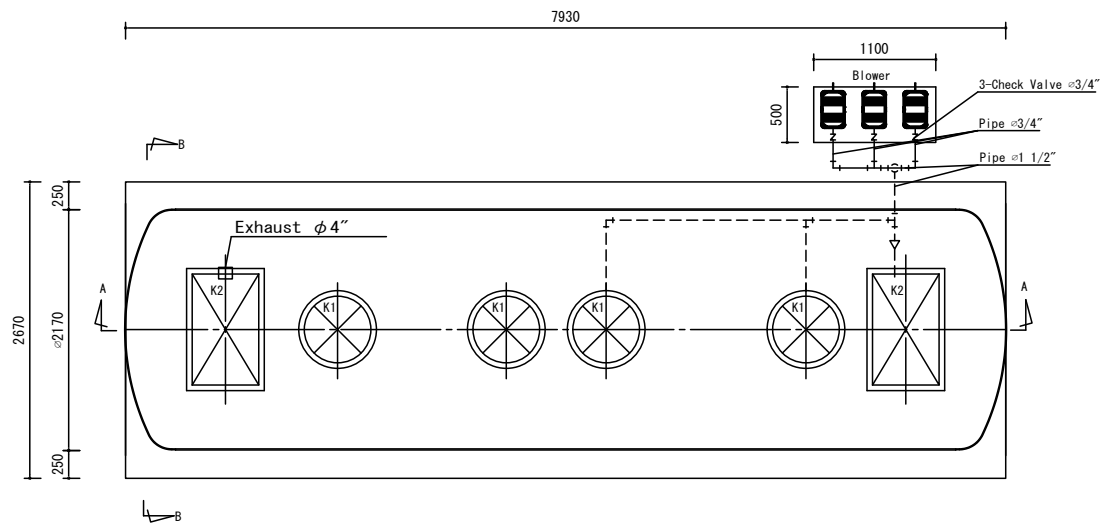
26/10/22

Revise

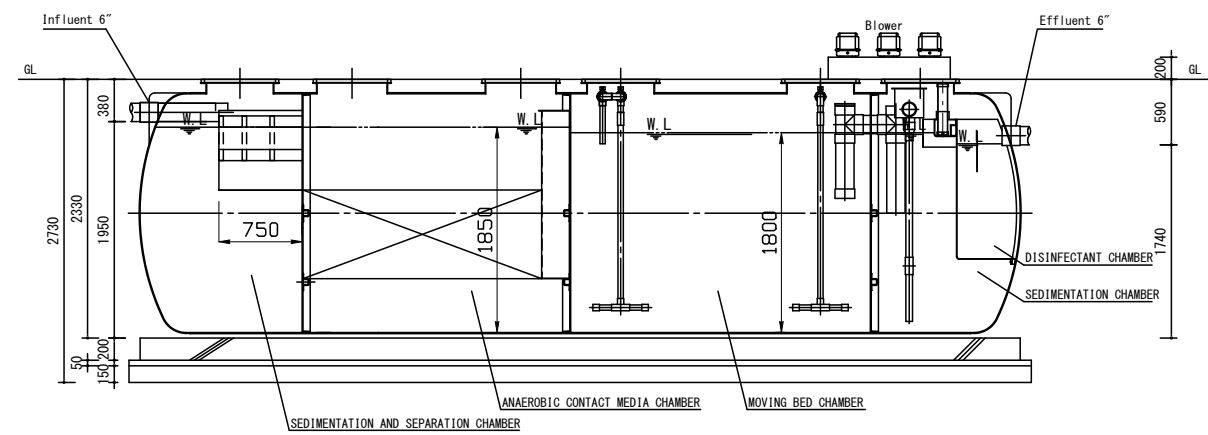
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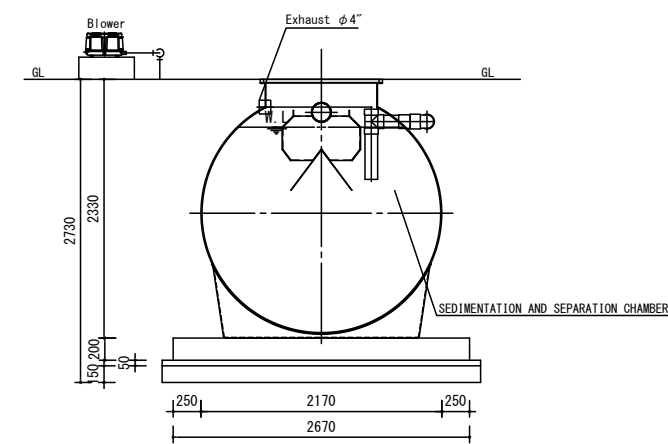
UPPER SECTION



UPPER VIEW



A-A SECTION



B-B SECTION

NOTE

NOTE :

- ALL DIMENSIONS ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
 1-9-1 Misawa, Matsuyama-Shi,
 Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

JOHKASOU
 LAYOUT & SECTION

NAME OF MODEL :

BAE-35
 (CAP. 35 m3 / day)

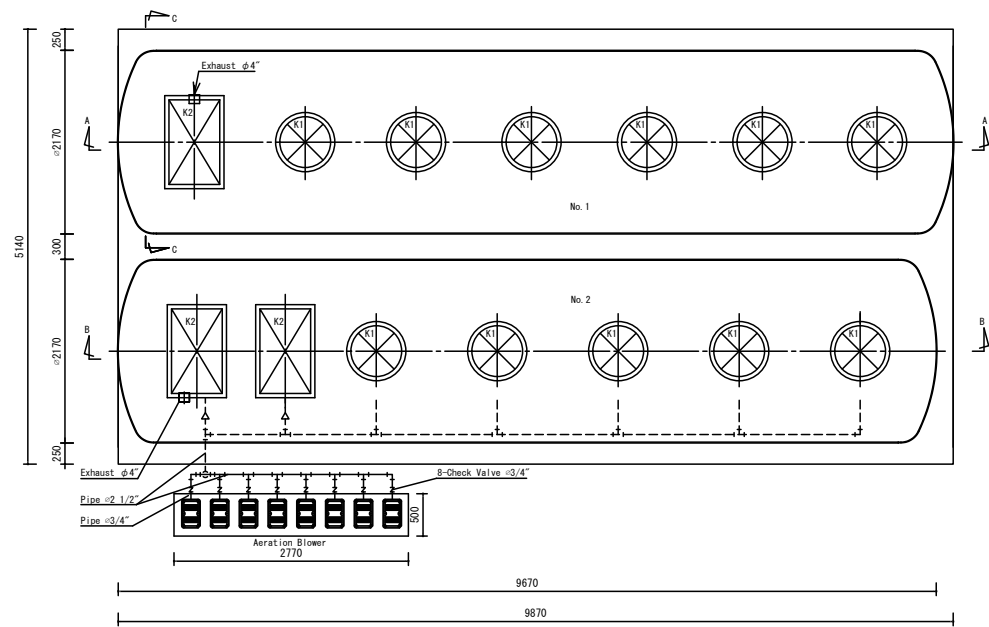
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DATE	-	
DRAWING NO.	SCALE	SHEET NO.
-	NTS	2 of 2

AGREEMENT

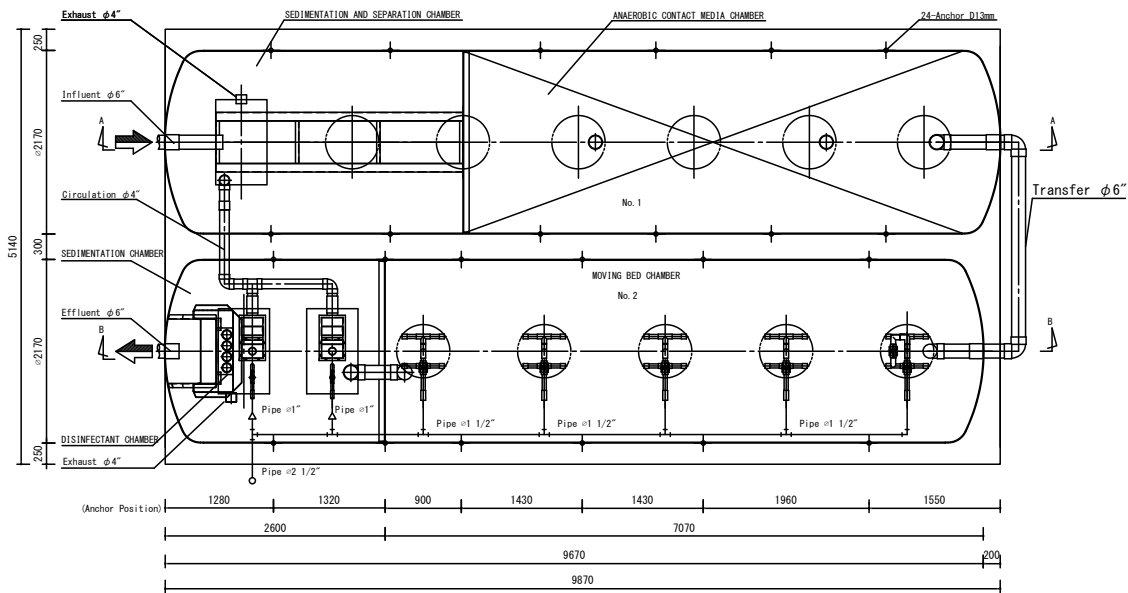
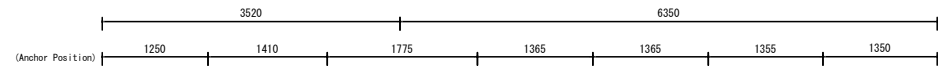
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CHECKED BY	13/07/20	MURAKAMI
APPROVED BY	13/07/20	KUROISHI

REVISION

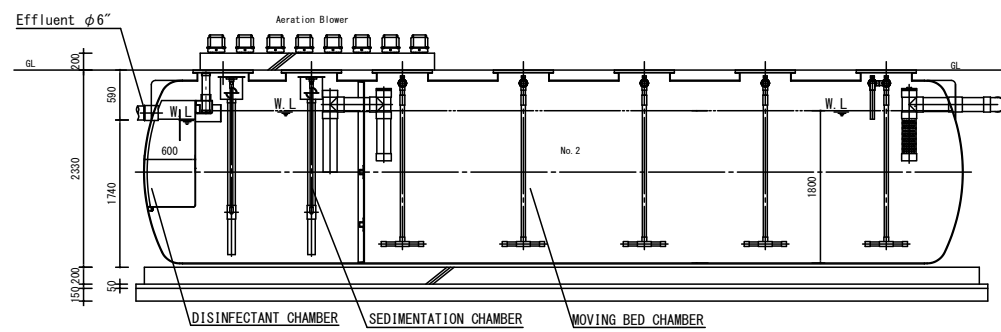
REV	DATE	DESCRIPTION	DRAWN
J	13/07/20	Design	DEDI
K	26/10/22	Revise	SAW



UPPER VIEW

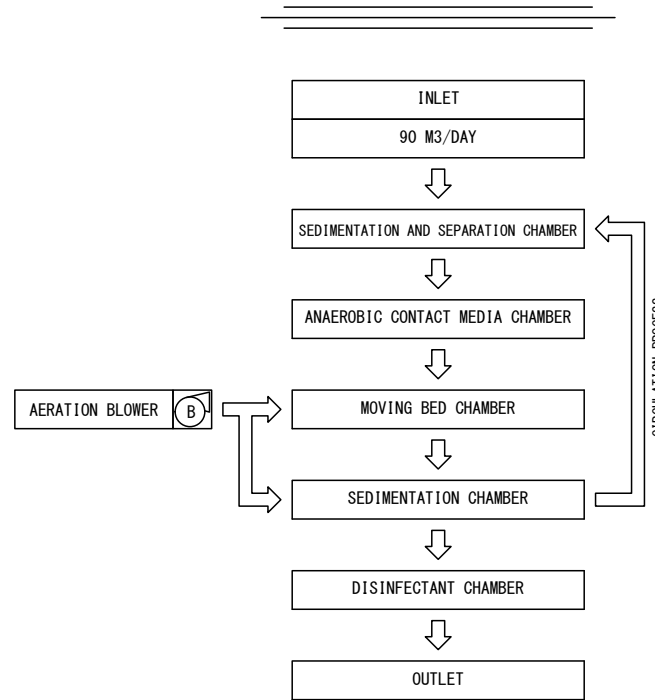


UPPER SECTION



B - B SECTION

FLOW PROCESS



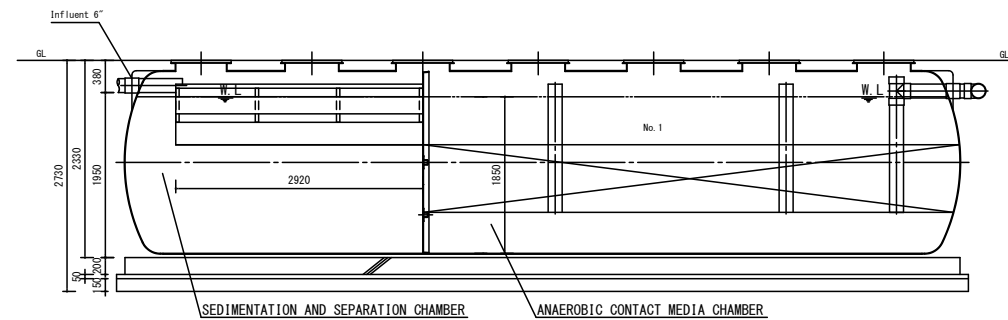
SPECIFICATION BAE 90	
Design Flow	90 m ³ /day
Influent BOD	300 mg/L
Effluent BOD	20 mg/L
Tank Weight (No. 1)	2690 kg
Tank Weight (No. 2)	1950 kg
Operation Weight (No. 1)	34600 kg
Operation Weight (No. 2)	32500 kg

EFFECTIVE CAPACITY	
Sedimentation And Separation Chamber	11.252 m ³
Anaerobic Contact Media Chamber	20.656 m ³
Moving Bed Chamber	22.519 m ³
Sedimentation Chamber	7.528 m ³
Disinfectant Chamber	0.444 m ³

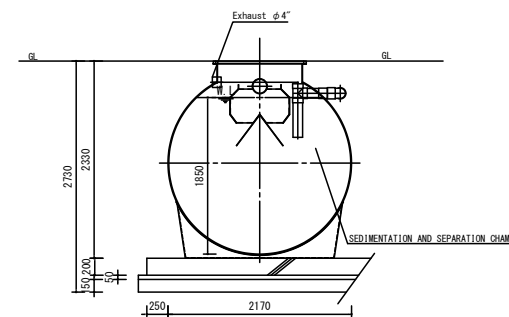
EQUIPMENT SPECIFICATION						
Equipment Name	Voltage	Bore mm	Capacity L/min	Motor Watt	Qty	Pressure /Head
Aeration Blower	230	20	200	190	4	20 kPa
	230	20	240	250	4	20 kPa

MANHOLE SPECIFICATION			
Loading Capacity T-0			
Mark	Measurement	Qty	Note
K1	PP Manhole φ600 (Flat)	11	By Daiki Axis
K2	FRP Manhole 600x1000 (Flat)	3	By Daiki Axis

INTERIOR PARTS SPECIFICATION	
Waste Water Pipe	PVC, 0.6 or 1.0 MPa
Air Pipe	PVC, 1.0 MPa
Air Valve	PVC, 1.0 MPa
Pipe Support	FRP



A - A SECTION



C - C SECTION

NOTE

NOTE :
- ALL DIMENSIONS ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
1-9-1 Misawa, Matsuyama-Shi,
Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

STP
FLOW DIAGRAM & SPECIFICATION
LAYOUT & SECTION

NAME OF PLANT :

BAE-90
(CAP. 90 m³ / day)

FILE NAME

DATE

DRAWING NO.

SCALE

SHEET NO.

AGREEMENT

DRAWN BY

15/04/20

DEDI

CHECKED BY

15/04/20

MURAKAMI

APPROVED BY

15/04/20

KUROISHI

REVISION

REV.

DATE

DESCRIPTION

DRAWN

I

15/04/20

Design

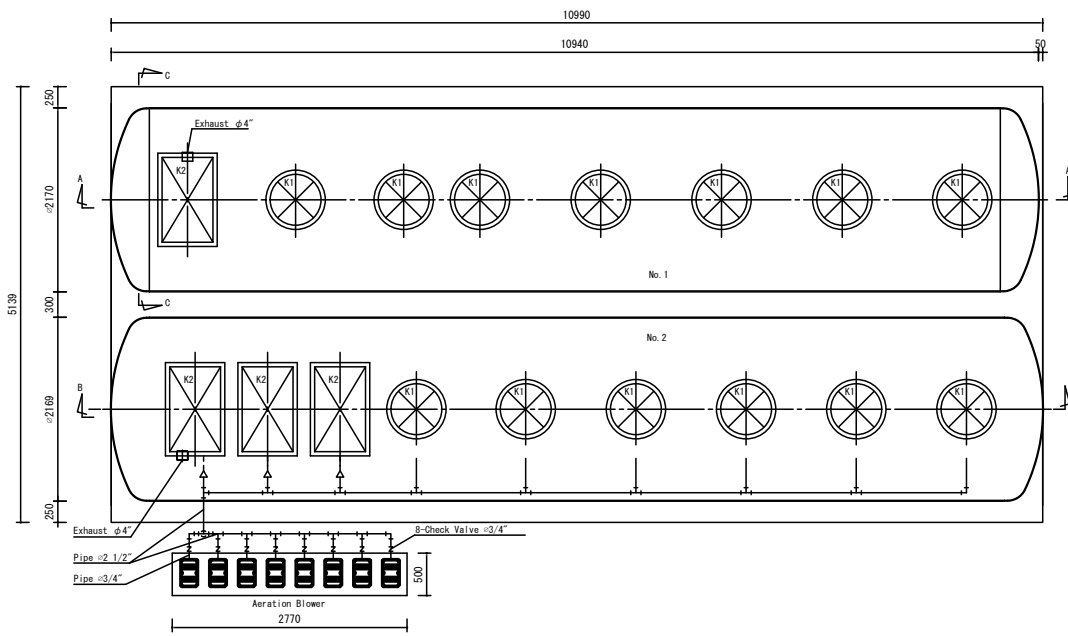
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J

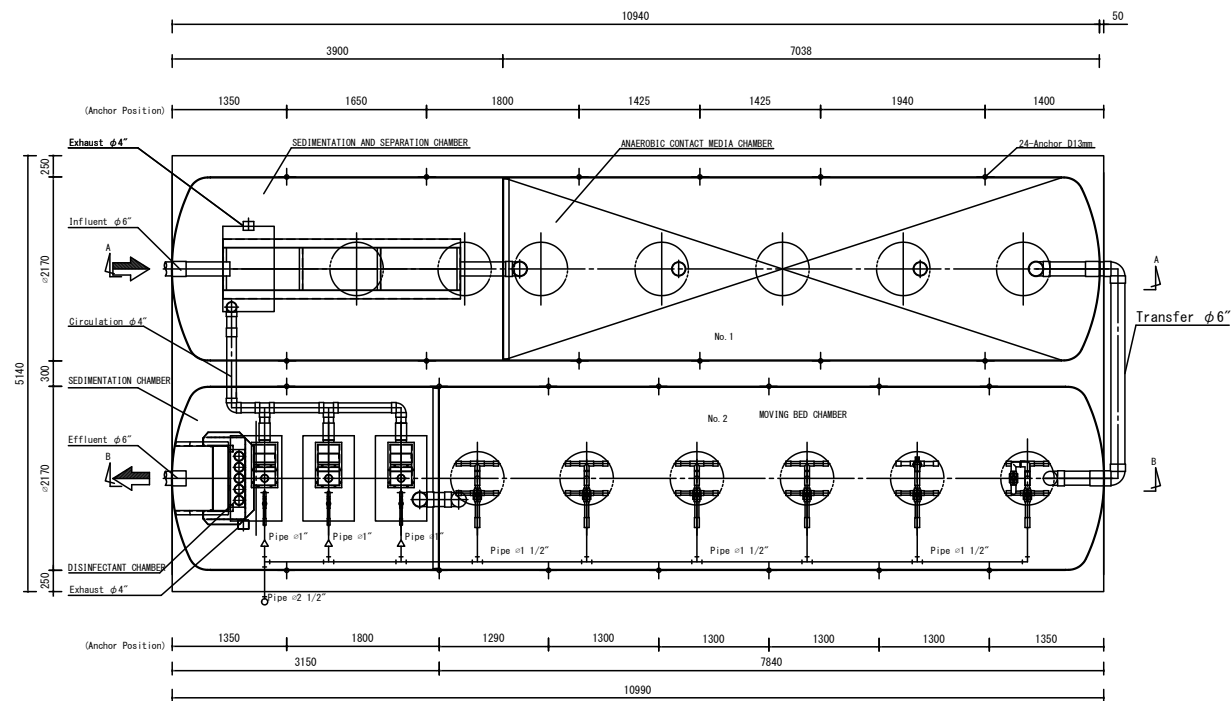
28/10/22

Revise

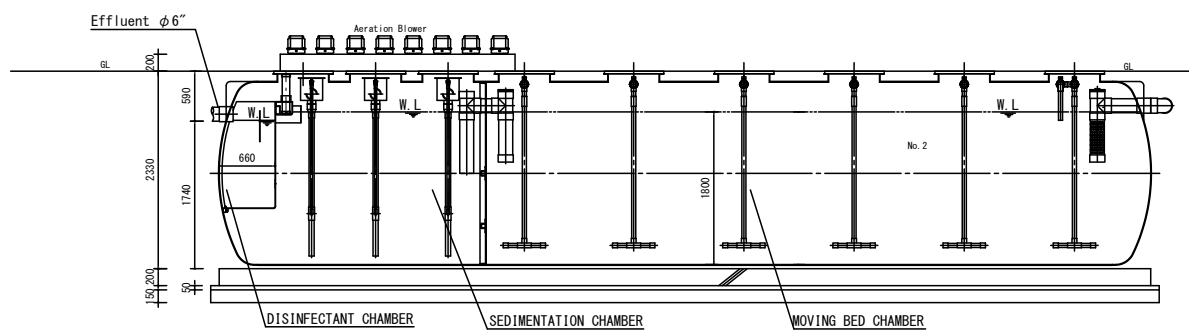
SAW



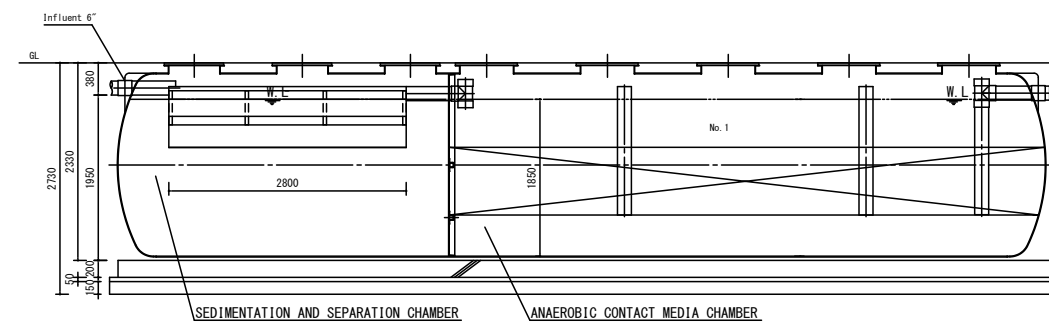
UPPER VIEW



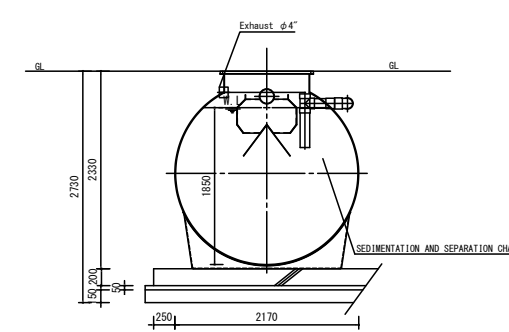
UPPER SECTION



B - B SECTION

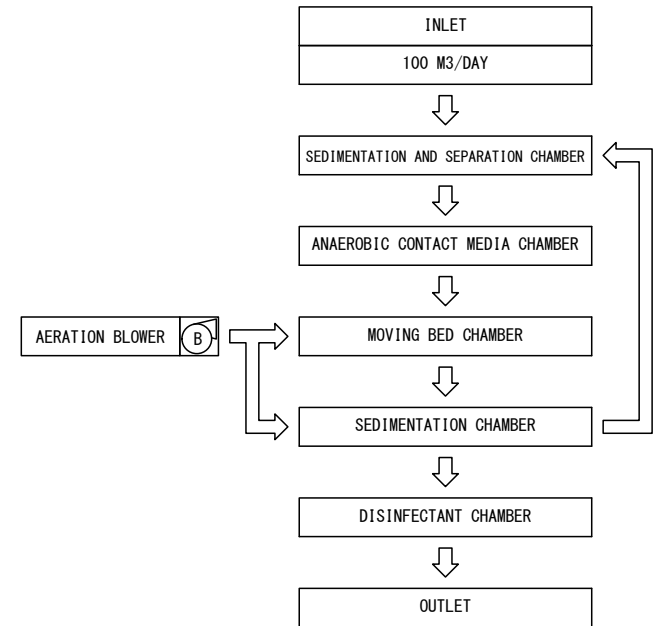


A - A SECTION



C - C SECTION

FLOW PROCESS



SPECIFICATION BAE 100	
Design Flow	100 m ³ /day
Influent BOD	300 mg/L
Effluent BOD	20 mg/L
Treatment Tank 1 Weight	2980 kg
Treatment Tank 2 Weight	2210 kg
Operation Weight (No.1)	38500 kg
Operation Weight (No.2)	37000 kg

EFFECTIVE CAPACITY	
Sedimentation And Separation Chamber	12.515 m ³
Anaerobic Contact Media Chamber	22.949 m ³
Moving Bed Chamber	25.019 m ³
Sedimentation Chamber	9.263 m ³
Disinfectant Chamber	0.491 m ³

EQUIPMENT SPECIFICATION					
Equipment Name	Voltage	Bore mm	Capacity L/min	Motor Watt	Qty Pressure /Head
Aeration Blower	230	20	240	250	8 20 kPa

MANHOLE SPECIFICATION			
Loading Capacity T-0			
Mark	Measurement	Qty	Note
K1	PP Manhole φ600 (Flat)	13	By Daiki Axis
K2	FRP Manhole 600×1000 (Flat)	4	By Daiki Axis

INTERIOR PARTS SPECIFICATION	
Waste Water Pipe	PVC 0.6 or 1.0 MPa
Air Pipe	PVC 1.0 MPa
Air Valve	PVC 1.0 MPa
Pipe Support	FRP

NOTE

NOTE :

- ALL DIMENSIONS ARE IN MM

REFERENCE :

LEGEND :

DAIKI AXIS CO.,LTD.
1-9-1 Misawa, Matsuyama-Shi,
Ehime 791-8517 Japan

PROJECT NAME :

DRAWING TITLE :

STP
FLOW DIAGRAM & SPECIFICATION
LAYOUT & SECTION

NAME OF PLANT :

BAE-100
(CAP. 100 m³ / day)

FILE NAME :

DATE :

DRAWING NO. :

SCALE :

SHEET NO. :

NTS

1 of 1

AGREEMENT

DRAWN BY :

15/04/20

DEDI

CHECKED BY :

15/04/20

MURAKAMI

APPROVED BY :

15/04/20

KUROISHI

REVISION

REV. :

DATE :

DESCRIPTION :

DRAWN :

I

15/04/20

Design

DEDI

J

28/10/22

Revise

SAW

Company Registration Certificate

Appendix 3

၀၃၆၃၈၇



The Government of The Republic of the Union of Myanmar
Ministry of Commerce
Department of Trade

CERTIFICATE OF EXPORTER/IMPORTER REGISTRATION

1. Enterprise Name (မြန်မာ/အင်္ဂလိပ်) A C R THU KHA CHAN THAR COMPANY LIMITED.
2. Registration No: 39583(21-03-16)
3. Registration Term: FIVE YEAR
4. Start Date : 22-07-2019
5. End Date : 21-07-2024

6. Address : (မြန်မာ/အင်္ဂလိပ်) No.(51), Insein Road, Ward No.(9), Hlaing Township, Yangon Region, Myanmar

7. Business Registration No : 103983916(22-07-2014)
8. Type of Business : Sole Proprietorship(တစ်ဦးတည်းပိုင်) Partnership(အစုအစပ်)
Limited Company(လီမိတက်ကုမ္ပဏီ)(Myanmar/Foreign)
Co-operative Society(သမဝါယမအသင်း)
Others(Please specify)အခြား(ဖော်ပြရန်) သင်းဖွဲ့မှတ်တမ်းပါလုပ်ငန်း()မျိုး ဆောင်ရွက်ခွင့်ရှိသည်။

9. Type of Service : New Extension

10. Contact No : 09-450038542 09368753356 daikiaxismyanmar@gmail.com
Telephone No. Fax No. e-mail

11. Remarks :

12. Terms and Conditions : စည်းကမ်းချက်များ
I hereby register the above mentioned enterprise as Exporter/Importer subject to the following terms and conditions: (အောက်ဖော်ပြပါစည်းကမ်းချက်များဖြင့် ပို့ကုန်သွင်းကုန် လုပ်ငန်းရှင်အဖြစ် မှတ်တမ်းတင်ခွင့်ပြုသည်)
(a) Line of goods permitted - all items except prohibited and restricted items.
(b) The enterprise must abide by the Export/Import rules and Regulations prescribed for the registered Exporters/Importers.



Handwritten signature and date 11.9.2019
For Director General
ဝင်းဝင်းစမ်းလက်ထောက်ညွှန်ကြားရေးမှူး

EIREGEX0919245EIREGEX12130012

DOT, TRADE POLICY



ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်
Certificate of Incorporation

အေစီအာရ် သုခချမ်းသာ ကုမ္ပဏီ လီမိတက်
A C R THU KHA CHAN THAR COMPANY LIMITED
Company Registration No. 103983916

မြန်မာနိုင်ငံကုမ္ပဏီများအက်ဥပဒေ ၁၉၁၄ ခုနှစ် အရ
အေစီအာရ် သုခချမ်းသာ ကုမ္ပဏီ လီမိတက်
အား ၂၀၁၄ ခုနှစ် ဇူလိုင်လ ၂၂ ရက်နေ့တွင်
အစုရှယ်ယာအားဖြင့် တာဝန်ကန့်သတ်ထား သည့် အများနှင့်မသက်ဆိုင်သောကုမ္ပဏီ
အဖြစ် ဖွဲ့စည်းမှတ်ပုံတင်ခွင့် ပြုလိုက်သည်။

This is to certify that
A C R THU KHA CHAN THAR COMPANY LIMITED
was incorporated under the Myanmar Companies Act 1914 on 22 July
2014 as a Private Company Limited by Shares.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ
Registrar of Companies

ရင်းနှီးမြုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန
Directorate of Investment and Company Administration



Myanmar Companies Online Registry - Company Extract

Company Name (English)

A C R THU KHA CHAN THAR COMPANY LIMITED

Company Name (Myanmar)

အေစီအာရ် သုခချမ်းသာ ကုမ္ပဏီ လီမိတက်

Company Information

Registration Number	Registration Date	Status
103983916	22/07/2014	Registered
Company Type	Foreign Company	Small Company
Private Company Limited by Shares	No	Yes
Principal Activity	Date of Last Annual Return	Previous Registration Number
37 - Sewerage	25/03/2019	1963/2014-2015

Addresses

Principal Place Of Business In Union	Between 57 x 58 St, , No.6/3 YeMon Taung Qtr, MaharAungMyay Tsp Mandalay, Myanmar
Registered Office In Union	Insein Road, No.51 Ward No.9, Hlaing Township Yangon, Myanmar

Officers

Name:	U AUNG BO BO LIN	Type:	Director
Date of Appointment:	N/A	Date of Birth:	13/03/1983
Nationality:	Myanmar	N.R.C./Passport:	12/LAMANA(N)121389
Gender:	Male	Business Occupation:	Managing Director
Name:	U KAUNG ZAW SHEIN	Type:	Director
Date of Appointment:	N/A	Date of Birth:	25/03/1991
Nationality:	Myanmar	N.R.C./Passport:	12/LAMATA(N)033598
Gender:	Male	Business Occupation:	-

Ultimate Holding Company

Name of Ultimate Holding Company	Jurisdiction of Incorporation	Registration Number
-	-	-

Share Capital Structure

Total Shares Issued by Company	Currency of Share Capital
1,040	MMK

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	1,040	10,400,000.00	0.00

Myanmar Companies Online Registry - Company Extract

Company Name (English)

A C R THU KHA CHAN THAR COMPANY LIMITED

Company Name (Myanmar)

အေစီအာရ် သုခချမ်းသာ ကုမ္ပဏီ လီမိတက်

Members				
Name:	U AUNG BO BO LIN			
Gender:	Male	Date of Birth:	13/03/1983	
Nationality:	Myanmar	N.R.C./Passport:	12/LAMANA(N)121389	
Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	250	2,500,000.00	0.00
Name:	U CHIT KO KO LIN			
Gender:	Male	Date of Birth:	22/06/1986	
Nationality:	Myanmar	N.R.C./Passport:	12/KAMATA(N)060832	
Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	250	2,500,000.00	0.00
Name:	U KAUNG ZAW SHEIN			
Gender:	Male	Date of Birth:	25/03/1991	
Nationality:	Myanmar	N.R.C./Passport:	12/LAMATA(N)033598	
Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	20	200,000.00	0.00
Name:	U NAY LIN			
Gender:	Male	Date of Birth:	08/09/1958	
Nationality:	Myanmar	N.R.C./Passport:	12/LAMANA(N)118774	
Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	250	2,500,000.00	0.00
Name:	U RICHARD LIN			
Gender:	Male	Date of Birth:	10/06/1995	
Nationality:	Myanmar	N.R.C./Passport:	12/LAMANA(N)153515	
Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	250	2,500,000.00	0.00
Name:	U THEIN HTOO			
Gender:	Male	Date of Birth:	09/10/1970	

Myanmar Companies Online Registry - Company Extract

Company Name (English)

A C R THU KHA CHAN THAR COMPANY LIMITED

Company Name (Myanmar)

အေစီအာရ် သုခချမ်းသာ ကုမ္ပဏီ လီမိတက်

Nationality:	Myanmar	N.R.C./Passport:	12/OUKATA(N)125087	
Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	20	200,000.00	0.00

Mortgages and Charges

Form / Filing Type

Effective Date

No records available

Details about all mortgages and charges can be accessed from the Company Profile Filing History at no charge.

Filing History

Form / Filing Type

Effective Date

D-1 Particulars of directors and secretary	07/05/2020
I-2C Notice from the Registrar of requested rectification	01/04/2020
I-2A Notice from Registrar of proposed rectification of register	03/03/2020
I-1A Application for rectification of register	03/03/2020
AR Annual Return	25/03/2019
B-1 Application for re-registration of a private company limited by shares	12/09/2018



評 定 書

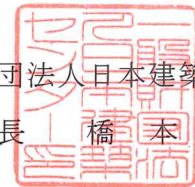
株式会社ダイキアクセス
代表取締役社長 大亀 裕 様

令和 3 年 8 月 4 日付けで、評定申込みのあった下記の案件について、当財団 FRP 評定委員会(委員長:邊 吾一)において慎重審議を行った結果、令和 3 年 8 月 6 日付け評定報告書(評定番号:BCJ評定-PA0009-04)のとおり、本件は、構造耐力上支障ないものと評定します。

なお、本評定書の有効期間は、本評定日より令和 8 年 11 月 20 日までとします。

令和3年8月6日

一般財団法人日本建築センター
理事長 橋本 公博



記

1. 件 名 ダイキアクセス FRP 製合併処理浄化槽 φ2000 型
2. 槽 の 種 類 円筒形横置槽
3. 設 計 者 株式会社ダイキアクセス
4. 製造管理者 株式会社ダイキアクセス及び関連工場
5. 施工管理者 株式会社ダイキアクセス及び指定施工業者
6. 建設地条件

項 目	建設地条件
長期許容地耐力	49kN/m ² 以上
垂直最深積雪量	1m以下の地域
積載荷重	1.76kN/m ² 以下
最高地下水位	地盤面下 20cm まで
設置方法	地下埋設及び地上設置
基礎床盤の位置 (最大埋設時)	GL-2.56m

評 定 報 告 書

FRP 評 定 委 員 会
委 員 長 邊 吾



件名:ダイキアクシス FRP 製合併処理浄化槽φ2000 型

本件は、FRP 製の円筒型横置合併処理浄化槽であり、その構造耐力について評定の申込みがなされたものである。

本委員会は下記について提出された資料に基づき慎重審議の結果、本件は構造耐力上支障のないものと判断した。

記

§ 1. 評定申込事項

- | | |
|--------------|--|
| 1. 申 込 者 | 株式会社ダイキアクシス
代表取締役社長 大亀 裕
〒791-8022 愛媛県松山市美沢一丁目 9 番 1 号 |
| 2. 評 定 事 項 | 構造耐力について |
| 3. 設 計 者 | 株式会社ダイキアクシス |
| 4. 製 造 管 理 者 | 株式会社ダイキアクシス及び関連工場 |
| 5. 施 工 管 理 者 | 株式会社ダイキアクシス及び指定施工業者 |

§ 2. 浄化槽の概要及び建設地条件

1. 各槽の寸法及び容量表

円筒形横置槽（1）

槽の名称	最小板厚(mm)				外径 (mm)	内径 (mm)	長さ (mm)	高さ (mm)	槽容量 (m ³)	リッパ数 (個)	仕切板 リッパの 間隔 (mm)	仕切板 の数 (枚)
	円筒部	鏡板	仕切板	開口部 立上り								
KRN-35	6.0	4.0	4.8	3.2	φ2016	φ2004	4940	2215 ～ 2515	12.649	2	最大 1000	2
KRN-40							5590		14.361	4		2
KRN-45							6040		15.533	4		2
KRN-50							6640		17.118	4		2

円筒形横置槽（2）

槽の名称	最小板厚(mm)				外径 (mm)	内径 (mm)	長さ (mm)	高さ (mm)	槽容量 (m ³)	リッパ数 (個)	仕切板 リッパの 間隔 (mm)	仕切板 の数 (枚)
	円筒部	鏡板	仕切板	開口部 立上り								
TRB-40	6.0	4.0	4.8	3.2	φ2016	φ2004	5020	2215 ～ 2515	12.583	3	最大 1000	2
TRB-45							5540		13.954	4		2
TRB-50							6040		15.296	5		2

円筒形横置槽（3）

槽の名称	最小板厚(mm)				外径 (mm)	内径 (mm)	長さ (mm)	高さ (mm)	槽容量 (m ³)	リッパ数 (個)	仕切板 リッパの 間隔 (mm)	仕切板 の数 (枚)
	円筒部	鏡板	仕切板	開口部 立上り								
RBF型	6.0	4.0	4.8	3.2	φ2016	φ2004	4530 ～ 10480	2215 ～ 2515	10.100 ～ 24.126	0～6	最大 1000	4

APPRAISAL

Mr. Hiroshi Ogame
 President & CEO
 DAIKI AXIS CO., LTD.

As a result of a careful consideration in our FRP Appraisal Committee (Chairman: Goichi Ben) concerning the following matter on which application for appraisal was submitted on August 4, 2021, we hereby appraise that the subject poses no problem in terms of structural yield strength, as shown in the Appraisal Report (BCJ Appraisal – PA0009-04) dated August 6, 2021.

This certification of appraisal is valid until November 20, 2026.

Kimihito Hashimoto, President
 The Building Center of Japan

1. Subject: FRP-made Johkasou, ϕ 2000 Model by Daiki Axis Co., Ltd.
2. Type of system: Cylindrical tank for horizontal installation
3. Designed by: Daiki Axis Co., Ltd.
4. Manufacturing controlled by: Daiki Axis Co., Ltd. and its affiliated factory
5. Construction controlled by: Daiki Axis Co., Ltd. and its designated construction company
6. Condition for construction site:

Long-term allowable bearing capacity of soil	49.0 kN/m ² or more
Vertical deepest snow accumulation	Area of 1.0 m or less
Loading capacity	1.76 kN/m ² or less
Highest groundwater level	20.0 cm under the ground level or deeper
Installation method	Aboveground installation and underground burial
Position of foundation floor board (in the case of the deepest burial)	GL-2.56m

APPRAISAL REPORT

Ben Goichi, Charman
FRP Appraisal Committee

Subject: Daiki Axis Johkasou – FRP-made Johkasou ϕ 2000

Application for appraisal of structural yield strength was submitted in relation to the changes of specifications of the tank main body, head plates and reinforcing rings of formerly appraised FRP-made Johkasou.

The Committee, as a result of careful consideration based on the submitted documents, has judged that the subject poses no problem in terms of structural yield strength.

§ 1. Matters on which appraisal was applied for

- | | |
|---------------------------------|---|
| 1. Applicant: | Daiki Co., Ltd.
President & CEO: Hiroshi Ogame
1-9-1, Misawa, Matsuyama City, Ehime Prefecture
791-8022, Japan |
| 2. Matters for Appraisal: | Structural yield strength |
| 3. Designed by: | Daiki Co., Ltd. |
| 4. Manufacturing controlled by: | Daiki Co., Ltd. and its affiliated factory |
| 5. Construction controlled by: | Daiki Co., Ltd. and its designated construction company |

§ 2. Outline of the Johkasou and the conditions of construction site

1. Table of dimensions and capacity of tanks

Cylindrical tank for horizontal installation

Name of tank	Minimal thickness (mm)				Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Height (mm)	Capacity (m ³)	Number of rings (pcs)	Gap between Partition board Or rings (mm)	Number of Partition boards (sheets)
	Cylindrical part	Head plate	Partition board	Neck								
RBF Model	6.0	4.0	4.8	3.2	φ 2016	φ 2004	4530 ~ 10480	2215 ~ 2515	10.100 ~ 24.126	0 ~ 6	1000 or less	4

ISO 9001

Management System Certificate

Certificate Number : JQA-QM4907

Organization :

DAIKI AXIS CO., LTD.

1-9-1 MISAWA, MATSUYAMA-CITY, EHIME, JAPAN



MS
CM009

JQA certifies that the above organization operates the Quality Management System, within the scope of the Appendix attached, which has been assessed and found to comply with the requirements of;

ISO 9001 :2015 / JIS Q 9001 :2015

Registration Date : June 16, 2000

Last Renewal Date : July 2, 2022

Expiry Date : July 1, 2025

Feel free to contact JQA for the validity of this certificate.



091

N. Kobayashi

NORIAKI KOBAYASHI
PRESIDENT

1-25 KANDASUDACHO, CHIYODA-KU, TOKYO, JAPAN

JAPAN QUALITY ASSURANCE ORGANIZATION

To be used in conjunction with attached Appendix.

JQA

Partner of
IQNet

21.02 D7501128E

ISO 9001

Appendix



Certificate Number : JQA-QM4907

1 / 1

Organization :

DAIKI AXIS CO., LTD.

Scope of Registration :

THE DESIGN / DEVELOPMENT, MANUFACTURE, INSTALLATION AND SERVICING (MAINTENANCE) OF WATER TREATMENT TANKS MADE BY PLASTIC.

ASSOCIATED ORGANIZATION:

- MATSUYAMA FACTORY
2357-5 KO SUNOUCHI, TOON-CITY, EHIME, JAPAN
- TSUSHIMA FACTORY
1607-8 KO CHIKAIE, TSUSHIMA-CHO, UWAJIMA-CITY, EHIME, JAPAN
- SHINSHU FACTORY
5574 TAGUCHI, SAKU-CITY, NAGANO, JAPAN
- FUKUSHIMA FACTORY
100-7 AKANIIDA, YAMADA, FUKUSHIMA-CITY, FUKUSHIMA, JAPAN
[MANUFACTURE].

Registration Date : June 16, 2000

Last Renewal Date : July 2, 2022

Expiry Date : July 1, 2025

Feel free to contact JQA for the validity of this certificate.

A handwritten signature in black ink, reading 'N. Kobayashi'.

NORIAKI KOBAYASHI
PRESIDENT

JAPAN QUALITY ASSURANCE ORGANIZATION

This Appendix is an integral part of the Certificate and should only be used in conjunction with the Certificate.

The logo for JQA (Japan Quality Assurance Organization), consisting of the letters 'JQA' in a bold, blue, sans-serif font.

Partner of
- IQNet -

14.07 D7501010E

Financial Report

for 2021

&

2022

Appendix 4



Translation

Notice: This document is an excerpt translation of the original Japanese document and is only for reference purposes. In the event of any discrepancy between this translated document and the original Japanese document, the latter shall prevail

**Summary of Consolidated Financial Results
for the Nine Months Ended September 30, 2022
(Based on Japanese GAAP)**

November 14, 2022

Company name: DAIKI AXIS CO., LTD.
 Stock exchange listing: Tokyo
 Stock code: 4245, URL: <https://www.daiki-axis.com>
 Representative: Hiroshi Ogame, President & CEO
 Inquiries: Akihiro Horibuchi, Executive Vice President & CFO
 Management Control Division TEL +81-89-927-2222
 Scheduled date to file Quarterly Securities Report: November 14, 2022
 Scheduled date to commence dividend payments: —
 Preparation of supplementary material on quarterly financial results: No
 Holding of quarterly financial results meeting: No

(Amounts less than one million yen are rounded down)

1. Consolidated financial results for the nine months ended September 30, 2022 (from January 1, 2022 to September 30, 2022)

(1) Consolidated operating results (Percentages indicate year-on-year changes)

	Net sales		Operating income		Ordinary income		Profit attributable to owners of parent	
	Millions of yen	%	Millions of yen	%	Millions of yen	%	Millions of yen	%
Nine months ended September 30, 2022	29,059	5.4	590	(35.9)	865	(16.5)	489	(1.1)
Nine months ended September 30, 2021	27,571	7.3	920	10.8	1,036	7.7	495	47.4

Note: Comprehensive income
 Nine months ended September 30, 2022: ¥826 million, 35.1% YoY
 Nine months ended September 30, 2021: ¥611 million, 56.2% YoY

	Earnings per share	Diluted earnings per share
	Yen	Yen
Nine months ended September 30, 2022	36.84	—
Nine months ended September 30, 2021	38.39	37.97

(2) Consolidated financial position

	Total assets	Net assets	Equity ratio
	Millions of yen	Millions of yen	%
As of September 30, 2022	29,573	9,389	31.7
As of December 31, 2021	32,252	8,839	27.4

Note: Equity
 September 30, 2022: ¥9,385 million
 December 31, 2021: ¥8,836 million

2. Cash dividends

	Annual dividends per share				
	1st quarter-end	2nd quarter-end	3rd quarter-end	Fiscal year-end	Total
	Yen	Yen	Yen	Yen	Yen
Year ended December 31, 2021	—	12.00	—	12.00	24.00
Year ending December 31, 2022	—	12.00	—	—	—
Year ending December 31, 2022 (Forecast)	—	—	—	12.00	24.00

Note: Revisions subsequent to the most recently announced dividend forecast: No

3. Forecast of consolidated results for the year ending December 31, 2022 (from January 1, 2022 to December 31, 2022)

(Percentages indicate year-on-year changes)

	Net sales		Operating income		Ordinary income		Profit attributable to owners of parent		Earnings per share
	Millions of yen	%	Millions of yen	%	Millions of yen	%	Millions of yen	%	Yen
Full year	40,000	5.8	1,150	2.7	1,300	(0.1)	700	14.6	51.29

Note: Revisions subsequent to the most recently announced forecast of consolidated results: No

Notes

(1) Changes in significant subsidiaries during the nine months ended September 30, 2022

(Changes in specified subsidiaries resulting in the change in scope of consolidation): No

Newly consolidated: None Eliminated: None

(2) Application of special accounting methods for preparing quarterly consolidated financial statements: No

(3) Changes in accounting policies, changes in accounting estimates, and restatement of prior period financial statements

Changes in accounting policies due to revisions to accounting standards and other regulations: Yes

Changes in accounting policies due to other reasons: No

Changes in accounting estimates: No

Restatement of prior period financial statements: No

(4) Number of issued shares (common shares)

Total number of issued shares at the end of the period (including treasury shares)

As of September 30, 2022	13,672,100 shares	As of December 31, 2021	13,648,100 shares
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Number of treasury shares at the end of the period

As of September 30, 2022	377,898 shares	As of December 31, 2021	379,498 shares
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Average number of shares during the period (cumulative from the beginning of the fiscal year)

Nine months ended September 30, 2022	13,284,729 shares	Nine months ended September 30, 2021	12,893,044 shares
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Note: Treasury shares, which are excluded from the calculation of the total number of issued shares at the end of the period and the average number of shares during the period, include holdings of the Company's shares by the BBT Trust and the J-ESOP Trust.

* Quarterly summaries of consolidated financial results are outside the scope of the quarterly review.

* Explanation regarding the appropriate use of forecasts of business results and other information

(Caution concerning forward-looking statements)

The forecasts and future projections contained herein have been prepared on the basis of rational decisions given the information available as of the date of announcement of this document. These forecasts do not represent a commitment by the Company, and actual performance may differ substantially from forecasts for a variety of reasons.

(Change in units used to present financial amounts)

To date, we have presented the line items in our quarterly consolidated financial statements, as well as other financial items, in thousands of yen. From the first three months of the fiscal period under review, we have begun presenting these figures in units of millions of yen. For ease of comparison, we have retroactively stated figures for the previous fiscal year and the first nine months of the previous fiscal year in millions of yen, as well.

Consolidated financial statements and important notes
Consolidated balance sheets

(Millions of yen)

As of December 31, 2021 As of September 30, 2022

Assets		
Current assets		
Cash and deposits	6,298	6,179
Notes and accounts receivable–trade	7,290	5,493
Accounts receivable from completed construction projects and contract assets	2,091	2,906
Merchandise and finished goods	547	797
Work in process	82	92
Work in process–construction	2,769	84
Raw materials and supplies	352	412
Real estate for sale in process	—	317
Other	710	801
Allowance for doubtful accounts	(161)	(240)
Total current assets	19,981	16,845
Non-current assets		
Property, plant and equipment		
Buildings and structures	2,223	2,294
Accumulated depreciation	(859)	(954)
Buildings and structures, net	1,364	1,339
Machinery, equipment and vehicles	7,934	8,318
Accumulated depreciation	(2,635)	(3,023)
Machinery, equipment and vehicles, net	5,298	5,295
Land	2,275	2,371
Construction in progress	350	767
Other	716	739
Accumulated depreciation	(584)	(628)
Other, net	131	110
Total property, plant and equipment	9,420	9,884
Intangible assets		
Goodwill	1,024	920
Other	182	155
Total intangible assets	1,207	1,076
Investments and other assets		
Investment securities	395	399
Other	1,486	1,608
Allowance for doubtful accounts	(239)	(242)
Total investments and other assets	1,642	1,766
Total non-current assets	12,270	12,727
Total assets	32,252	29,573

Liabilities		
Current liabilities		
Notes and accounts payable–trade	2,949	2,506
Accounts payable for construction contracts	1,771	1,346
Short-term loans payable	6,878	6,489
Current portion of long-term loans payable	269	269
Current portion of bonds	400	400
Income taxes payable	462	106
Advances received on uncompleted construction contracts	1,826	—
Contract liabilities	—	917
Provision for bonuses	382	441
Provision	115	161
Other	1,784	1,182
Total current liabilities	16,839	13,820
Non-current liabilities		
Bonds	3,125	2,850
Long-term loans payable	2,002	2,119
Provision	214	253
Asset retirement obligations	416	425
Other	813	715
Total non-current liabilities	6,572	6,363
Total liabilities	23,412	20,183
Net assets		
Shareholders' equity		
Capital stock	2,547	2,556
Capital surplus	2,286	2,295
Retained earnings	4,330	4,524
Treasury shares	(287)	(286)
Total shareholders' equity	8,876	9,089
Accumulated other comprehensive income		
Valuation difference on available-for-sale securities	54	32
Foreign currency translation adjustment	(94)	264
Total accumulated other comprehensive income	(40)	296
Share acquisition rights	1	1
Non-controlling interests	1	1
Total net assets	8,839	9,389
Total liabilities and net assets	32,252	29,573

Consolidated statements of income and consolidated statements of comprehensive income

Consolidated statements of income

(Millions of yen)

	Nine months ended September 30, 2021	Nine months ended September 30, 2022
Net sales	27,571	29,059
Cost of sales	21,750	22,981
Gross profit	5,820	6,077
Selling, general and administrative expenses	4,900	5,487
Operating income	920	590
Non-operating income		
Interest income	3	3
Dividend income	5	5
Purchase discounts	111	101
Foreign exchange gain	9	143
Other	60	91
Total non-operating income	190	345
Non-operating expenses		
Interest expenses	21	25
Bond interest expenses	8	8
Share of loss of entities accounted for using equity method	5	1
Provision of allowance for doubtful accounts	(0)	(1)
Commission fee	28	20
Other	10	16
Total non-operating expenses	74	70
Ordinary income	1,036	865
Extraordinary income		
Gain on sales of non-current assets	0	—
Gain on sales of investment securities	9	0
Gain on negative goodwill	—	36
Insurance proceeds	—	46
Total extraordinary income	10	83
Extraordinary losses		
Loss on sale of non-current assets	0	3
Loss on retirement of non-current assets	11	60
Impairment loss	54	—
Loss on sale of investment securities	—	0
Other	2	10
Total extraordinary losses	69	75
Profit before income taxes	977	873
Income taxes—current	538	456
Income taxes—deferred	(56)	(72)
Total income taxes	482	384
Profit	494	489
Profit (loss) attributable to non-controlling interests	(0)	(0)
Profit attributable to owners of parent	495	489

Consolidated statements of comprehensive income

(Millions of yen)

	Nine months ended September 30, 2021	Nine months ended September 30, 2022
Profit	494	489
Other comprehensive income		
Valuation difference on available-for-sale securities	3	(22)
Foreign currency translation adjustment	110	354
Share of other comprehensive income of entities accounted for using equity method	3	4
Total other comprehensive income	116	336
Comprehensive income	611	826
Comprehensive income (loss) attributable to:		
Owners of parent	611	826
Non-controlling interests	(0)	(0)

Maintenance Schedule

No.	Description
1	One Year Maintenance Service for Johkasou System FRP Tank
	Check List
1)	Control Panel (if there any) Electricity and Panel Check
2)	Sedimentation and Separation Chamber Inlet, Separation box and outlet, Odor, Scum conditions, Sedimentary sludge conditions, Presence of foreign matter, Presence of grease
3)	Anaerobic Contact Media Chamber Scum conditions, Sedimentary sludge conditions, Occlusion of filter bed, Presence of grease
4)	Moving Bed Chamber State of air diffusion, Bubbles, Water conditions in the tank, Dissolved Oxygen level (to be measure), pH level (to be measured)
5)	Sedimentation Chamber Scum conditions, Transparency level (to be measured), Ammonia nitrogen level (to be measured) for BJ Type, State of transfer water in the sludge transfer unit
6)	Disinfection Chamber State of attachment of agent container, Level of disinfectant, Existence or Absence of sediment in tank, Check level of Chlorine and refill
7)	Blower State of operation, Piping joint, Sounds and vibrations, Air filter
8)	Pump, Raw Water pump tank, Effluent Tank and Grease Trap (if there any) State of operation
2	Desludging (client cost)
3	BOD Analysis (client cost)

1. Memorandum of Understanding (MOU) duration
 - One Year - Right to renewal

2. Memorandum of Understanding (MOU) Goal
 - PPT will list your company as a main material supplier for Ye Dagun Taung City Project
 - Procurement progress will be according to the progress of each construction project.