



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room. 704, Waizayantar Tower, Waizayantar Road

Thingangyun Township, Yangon, Myanmar

ALPHA BEST GLOBAL LIMITED

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR

MANUFACTURING OF VARIOUS KINDS OF SHOES

PROJECT NO.: 173-2020
DATE: March, 2023
DOCUMENT NO. EIA/002/2020

DISTRIBUTION:
ABGL: 3 Copies
TBS: 1 Copy

ကတိကဝတ်များ

- (က) ဤပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းကို တိကျခိုင်မာမှုများနှင့်ပြည့်စုံစွာ ဆောင်ရွက်ထားပါသည်။
- (ခ) ဤအစီရင်ခံစာကို လုပ်ထုံးလုပ်နည်းများအပါအဝင် သက်ဆိုင်ရာဥပဒေများကို တိကျစွာလိုက်နာ၍ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်များကို ရေးဆွဲထားပါသည်။
- (ဂ) စီမံကိန်းသည် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာပါ ကတိကဝတ်၊ ပတ်ဝန်းကျင်ထိခိုက်မှု လျော့ချရေး လုပ်ငန်းများနှင့် အစီအစဉ်များကို အပြည့်အဝ အစဉ်အမြဲလိုက်နာ ဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြုပါသည်။
- (ဃ) လုပ်ငန်းလည်ပတ်ဆောင်ရွက်နေသည့် ကာလအတွင်း အတည်ပြုထားသည့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာအား တိုးတက် နေသည့် နည်းပညာများ၊ စနစ်များနှင့် လုပ်ငန်းလိုအပ်ချက် အပေါ်မူတည်၍ ပိုမိုကောင်းမွန်သည့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ ဖြစ်စေရန်အတွက် ပြင်ဆင်ဖြည့်စွက်ရန် ညွှန်ကြားချက်ရှိလာပါက ဆောင်ရွက်မည် ဖြစ်ကြောင်းနှင့် စီမံကိန်းဖော်ဆောင်သူမှ ပြင်ဆင်ဖြည့်စွက်လိုပါက တင်ပြအတည်ပြုချက် ရယူ၍ ပြင်ဆင်ဆောင်ရွက်ပေးမည် ဖြစ်ပါသည်။
- (င) စီမံကိန်းပိတ်သိမ်းချိန်တွင် လူမှုပတ်ဝန်းကျင်အား ထိခိုက်မှုအနည်းဆုံး ဖြစ်စေရန် စီမံဆောင်ရွက်ပေးမည်ဖြစ်ပြီး ထိခိုက်မှုများ ရှိလာပါက မူလအခြေအနေသို့ ရောက်ရှိစေရန် ဆောင်ရွက် ပေးမည် ဖြစ်ပါသည်။



Alpha Best Global Limited

MR. TSENG, YA-PO
DIRECTOR

ALPHA BEST GLOBAL LIMITED

ကတိကဝတ်များ

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
၁။	မူဝါဒ၊ ဥပဒေနှင့် အဖွဲ့အစည်းဆိုင်ရာ မူဘောင်များ	<p>ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊</p> <p>ညစ်ညမ်းမှုထိန်းချုပ်ခြင်းနှင့် ကျန်းမာရေးဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊</p> <p>ဇီဝမျိုးစုံမျိုးကွဲများနှင့် သဘာဝအရင်းအမြစ် ထိန်းသိမ်းရေးဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊</p> <p>မြေသိမ်းဆည်းရေးဆိုင်ရာ ဥပဒေ/ နည်းဥပဒေများ၊</p> <p>မြို့ပြဖွံ့ဖြိုးတိုးတက်မှုနှင့် စီမံခန့်ခွဲမှုဆိုင်ရာ ဥပဒေ နှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊</p> <p>လူ့အခွင့်အရေးဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊</p> <p>ရှေးဟောင်းယဉ်ကျေးမှုအမွေအနှစ်ဆိုင်ရာ ဥပဒေ/ နည်းဥပဒေများ၊</p> <p>အလုပ်သမားဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊</p> <p>စက်တပ်ယဉ်များဆိုင်ရာ ဥပဒေ/ နည်းဥပဒေများ၊</p> <p>နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှုဆိုင်ရာဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊</p> <p>စီမံကိန်းနှင့် ဆက်စပ်သည့် အခြားဥပဒေ/ နည်းဥပဒေများ</p> <p>အပြည်ပြည်ဆိုင်ရာနှင့် မြန်မာနိုင်ငံမှ သဘောတူလက်မှတ်ရေးထိုးထားသော သဘောတူစာချုပ်/ညီလာခံများ အစရှိသည့် မူဝါဒ၊ ဥပဒေနှင့် အဖွဲ့အစည်းဆိုင်ရာမူဘောင်များကို စီမံကိန်းအဆိုပြုသူမှ လိုက်နာဆောင်ရွက် သွားမည်ဖြစ်ကြောင်း ကတိပြုဖော်ပြအပ်ပါသည်။</p>	အခန်း (၂)
၂။	စီမံကိန်းအကြောင်းအရာဖော်ပြချက်	<p>စီမံကိန်းနှင့် သက်ဆိုင်သောအချက်အလက်များကို တိကျသေချာမှန်ကန်စွာ ပြုစုရေးသားထားကြောင်း ကတိကဝတ်ပြုဖော်ပြအပ်ပါသည်။</p> <p>နည်းပညာဆိုင်ရာ မြေပုံများ၊ အဆောက်အအုံဒီဇိုင်းပုံများ၊ အသုံးပြုမည့် ကုန်ကြမ်းပစ္စည်းများ၊ ဓာတုပစ္စည်းများ၊ စက်ပစ္စည်းများနှင့် ဖိနပ်ထုတ်လုပ်ပုံလုပ်ငန်းအဆင့်ဆင့်ကို တိကျသေချာမှန်ကန်စွာ ပြုစုရေးသားထားကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။</p>	အခန်း (၃)
၃။	အနီးပတ်ဝန်းကျင်အကြောင်းအရာ များဖော်ပြချက်	<p>စီမံကိန်းနှင့် သက်ဆိုင်သော အနီးပတ်ဝန်းကျင်ရှိ အကြောင်းအရာများကို လေ့လာရာတွင် စီမံကိန်းတည်နေရာ မှ (၁) ကီလိုမီတာ နှင့် (၃) ကီလိုမီတာ အတွင်း ကွင်းဆင်းလေ့လာခြင်းနှင့် စီမံကိန်းမြို့နယ်၏ အထွေထွေအုပ်ချုပ်ရေးမှူးရုံး (၂၀၂၀) မှ ရရှိ လာသော အချက်အလက်များကို အခြေခံ၍ စီမံကိန်းဧရိယာ၏</p>	အခန်း (၄)

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
		ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားဆိုင်ရာ အခြေအနေများကို လေ့လာရေးဆွဲထားကြောင်း ကတိကဝတ်ပြုဖော်ပြထားပါသည်။ ထို့အပြင် ဇီဝမျိုးစုံမျိုးကွဲများကို လေ့လာရာတွင် စီမံကိန်းအတွက် အပင်နှင့် သတ္တဝါများဆိုင်ရာ စစ်တမ်းကောက်ယူခြင်း ကို သက်ဆိုင်ရာ ကျွမ်းကျင် ပညာရှင်များမှ GPS၊ ကင်မရာနှင့် မှန်ဘီလူးများကို အသုံးပြု၍ ဆောင်ရွက်ခဲ့ပါသည်။ စစ်တမ်း ကောက်ယူခြင်းမှ လေ့လာတွေ့ရှိချက်များကို အင်တာနက်စာမျက်နှာမှ ရရှိသော အချက်အလက်များနှင့် သုတေသန စာတမ်းများ စသည်တို့ကို ကိုးကား၍ ထပ်မံအတည်ပြုထားကြောင်း ကတိကဝတ်ပြုဖော်ပြအပ်ပါသည်။	
၃.၁။	လေအရည်အသွေး	အစီရင်ခံစာတွင် လေအရည်အသွေးအား အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် (၂၀၁၅)အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက်အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	စာပိုဒ်ခွဲ (၄.၃.၁)
၃.၂။	ရေအရည်အသွေး	အစီရင်ခံစာတွင် ရေနမူနာကောက်ယူပြီး တိုင်းတာရရှိလာသော ရလဒ်တို့ကို သောက်သုံးရေအရည်အသွေးဆိုင်ရာ မြန်မာစံချိန်စံညွှန်း (၂၀၁၉)နှင့် အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် (၂၀၁၅)အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက် အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	စာပိုဒ်ခွဲ (၄.၃.၅)
၃.၃။	ဆူညံသံ	အစီရင်ခံစာတွင် အသံဆူညံမှုအား အမျိုးသားပတ်ဝန်းကျင် ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် (၂၀၁၅) အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက်အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	စာပိုဒ်ခွဲ (၄.၃.၃)
၃.၄။	တုန်ခါမှု	အစီရင်ခံစာတွင် တုန်ခါမှုအား Normis Seismograph (Mini Supergraph II) ကို အသုံးပြု၍ တိုင်းတာပြီး ဂျာမန်စံသတ်မှတ်ချက် Din 4150-3 နှင့် နှိုင်းယှဉ်ဖော်ပြထားကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	စာပိုဒ်ခွဲ (၄.၃.၄)
၃.၅။	ယာဉ်ကြောအခြေအနေ လေ့လာခြင်း	စီမံကိန်းအတွက် အဓိကအသုံးပြုမည့် လမ်းစုစုပေါင်း (၅) လမ်း၏ ယာဉ်ကြောအခြေအနေများကို မှတ်တမ်းမှတ်သွင်း နှစ်ယောက်မှ လေ့လာ၍ ဖော်ပြထားကြောင်း ကတိကဝတ်ပြုဖော်ပြအပ်ပါသည်။	စာပိုဒ်ခွဲ (၄.၃.၆)
၃.၆။	အလင်းနှင့် အပူချိန်	အစီရင်ခံစာတွင် အလင်းနှင့် အပူချိန်အား တိုင်းတာပြီး ရရှိလာသောရလဒ်တို့ကို International Finance Corporation (Environmental Health and Safety Guideline) General အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက် အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	စာပိုဒ်ခွဲ (၄.၃.၇) နှင့် (၄.၃.၈)
၄။	ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်	ABGL ၏ CMP စနစ်ဖြင့် ဖိနပ်အမျိုးမျိုးထုတ်လုပ်ခြင်းလုပ်ငန်းနှင့် ပတ်သက်၍ အကောင်အထည်ဖော်မည့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ပတ်ဝန်းကျင် အရည်အသွေးများ ထိခိုက်မှုမရှိစေရန် လျှော့ချခြင်း၊	အခန်း(၇)

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
		စောင့်ကြပ်ကြည့်ရှုခြင်းများတွင် တာဝန်ယူ ဆောင်ရွက်မည့် အဖွဲ့အစည်း ပုဂ္ဂိုလ်များ၊ တာဝန်ဝတ္တရားများ၊ အရေးပေါ်တုံ့ပြန်ရေး အစီအစဉ် များနှင့် ရန်ပုံငွေလျာ ထားချက်များကိုလည်း ပြည့်စုံစွာ ပြုစုရေးသားထားကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	
တည်ဆောက်စဉ်နှင့် ရပ်ဆိုင်းစဉ်ကာလ			
၄.၁	လေထုညစ်ညမ်းမှုနှင့် ဖုန်မှုန့်များ	ဖုန်မှုန့်များ ပျံ့နှံ့မှု လျော့နည်းအောင် လူနေဧရိယာ ဝန်းကျင်တွင် မြေသားလမ်းများကို ရေဖြန်းပေးခြင်း၊ ဆောက်လုပ်ရေး လုပ်ငန်းသုံးယာဉ်များကို ကုန်ပစ္စည်းနှင့် မြေစာများသယ်ဆောင်စဉ် တာလပတ်များ လုံခြုံစွာ ဖုံးအုပ်စေခြင်း၊ အလုပ်သမားများကို နှာခေါင်းစည်းများ လုံလောက်စွာထောက်ပံ့ ပေးခြင်း၊ အရည်အသွေး ကောင်းမွန်သော လောင်စာဆီများ အသုံးပြုခြင်း၊ လုပ်ငန်းခွင်မှ ထွက်လာသော စွန့်ပစ်အမှိုက်များကို ဆောက်လုပ်ရေးလုပ်ငန်းခွင် နေရာတွင် မီးရှို့ခြင်းများကို တားမြစ်ခြင်း အစရှိသည်တို့ကို လိုအပ်သလို တိကျစွာလိုက်နာ၍ အကောင်အထည်ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
၄.၂	စွန့်ပစ်အမှိုက်အခဲ	စွန့်ပစ်အမှိုက် များကို အမှိုက်ပုံးများထဲတွင် စွန့်ပစ်စေခြင်း၊ အမှိုက်များကို နေ့တိုင်း အစိုင်အခဲစွန့် သိုလှောင်ကန် တွင် သီးခြား စွန့်ပစ်ထားခြင်းနှင့် ဖြိုဖျက်ထားသော ပစ္စည်းများကို သတ်မှတ်ထားသော နေရာတွင် စွန့်ပစ်ခြင်း အစရှိသည်တို့ကို လိုအပ်သလို တိကျစွာလိုက်နာ၍ အကောင်အထည်ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
၄.၃	စွန့်ပစ်ရေ	ဆောက်လုပ်ရေး/ဖြိုဖျက်ရေးလုပ်ငန်းခွင် အတွင်း သန့်ရှင်းပြီး/ စနစ်ကျသော ယာယီ အိမ်သာများ စီစဉ် ပေးခြင်းနှင့် ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီ၏ လမ်းညွှန်ချက်နှင့်အညီ မိလ္လာကန်များ ဆောက်လုပ်၍ မိလ္လာများစနစ်တကျ စွန့်ပစ်ခြင်း အစရှိသည်တို့ကို တိကျစွာလိုက်နာ၍ အကောင်အထည်ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
၄.၄	ဆူညံသံနှင့် တုန်ခါမှု	ဆူညံမှုနှင့် တုန်ခါမှုနည်းသော စက်ပစ္စည်းများကို အသုံးပြုခြင်း၊ ယာဉ်အမျိုးအစားနှင့် မောင်းနှင်မှုပုံစံကို ပြောင်းလဲခြင်းဖြင့် ဆူညံသံနှင့် တုန်ခါမှု ထွက်ရှိမှုကို လျော့ချနိုင်ခြင်း၊ ဆူညံမှုများသောနေရာတွင် လုပ်ကိုင်နေသော လုပ်သားများ ကို နားအကာအကွယ်ပစ္စည်းများ ဖြစ်သော နားကြပ်၊ နားအကာများ ထောက်ပံ့ပေးခြင်းနှင့် တုန်ခါမှု ဖြစ်ပေါ်သောနေရာများတွင် အလုပ်အချိန် အကန့်အသတ်ဖြင့် ဆောင်ရွက်ခြင်း အစရှိသည်တို့ကို လိုအပ်သလို တိကျစွာလိုက်နာ၍ အကောင်အထည်ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
၄.၅	မြေထုအရည်အသွေး	သယ်ယူပို့ဆောင်ရေး ယာဉ်များ၊ စက်ယန္တရားများနှင့် မီးစက်များကို ပုံမှန်ပြုပြင်ထိန်းသိမ်းခြင်းများပြုလုပ်ခြင်း၊ စီမံကိန်းနေရာအတွင်း မိလ္လာစနစ်ဆိုင်ရာများကို စနစ်တကျဆောင်ရွက်ထားခြင်းနှင့် စက်ဆီ၊ချောဆီများ	ဇယား (၇-၃)

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
		သို့လှောင်သည့်နေရာများကို ကွန်ကရစ်အခင်းများခင်းထားခြင်း အစရှိသည်တို့ကို လိုအပ်သလို တိကျစွာ လိုက်နာ၍ အကောင်အထည်ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	
၄.၆	လုပ်ငန်းခွင်လုံခြုံမှုနှင့် ကျန်းမာရေး	လုပ်ငန်းလုပ်ကိုင်စဉ်တွင် တစ်ကိုယ်ရေ ကာကွယ်ရေးသုံးပစ္စည်း များကို အလုပ်သမားအား ထောက်ပံ့ ပေးခြင်း၊ အလုပ်သမားများအတွက် ဘေးအန္တရာယ် ကင်းရှင်းရေး ဆိုင်ရာ သင်တန်းများပေးခြင်း၊ ယာယီဆေးပေးခန်း၊ ရှေးဦးသူနာပြု ဆေးသေတ္တာများကို လုပ်ငန်း ဆောင်ရွက်နေသော ဧရိယာအတွင်း ထောက်ပံ့ ပေးခြင်း၊ သတိပေးဆိုင်ဘုတ် အမှတ်အသားများ ရှင်းလင်းစွာ တပ်ဆင်ထားပေးခြင်း၊ မီးငြိမ်းသတ်ပစ္စည်းများ၊ မီးသတ်ဆေးဗူးများကို လုပ်ငန်းဧရိယာအတွင်း တပ်ဆင်ထားပေးခြင်း၊ ယာဉ်မောင်းများအား ဘေးအန္တရာယ်ကင်းရှင်းစွာ မောင်းနှင်စေခြင်းနှင့် အရေးပေါ်အခြေအနေအတွက် သက်ဆိုင်ရာမြို့နယ်၏ ဆေးရုံ၊ ဆေးခန်းများနှင့် မီးသတ်ဌာနတို့၏ ဆက်သွယ်ရန်ဖုန်းနံပါတ်များကို အများပြည်သူမြင်နိုင်သည့် နေရာများတွင် ချိတ်ဆွဲထားရှိခြင်း အစရှိသည်တို့ကို လိုအပ်သလို တိကျစွာလိုက်နာ၍ အကောင်အထည်ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
လုပ်ငန်းလည်ပတ်စဉ်ကာလ			
၄.၇	လေထုညစ်ညမ်းမှုနှင့် ဖုန်မှုန့်များ	စက်ပစ္စည်းများအား ပုံမှန်စစ်ဆေး ထိန်းသိမ်း ပြုပြင်ခြင်း၊ ဆာလ်ဖာပါဝင်မှုနည်းသော ဒီဇယ်လောင်စာများ အသုံးပြုခြင်း၊ ဖိနပ်အောက်ဆိုးကြမ်းအောင် ပြုလုပ်သောလုပ်ငန်းစဉ်မှ အန္တရာယ်ရှိသော အမှုန်များထွက်ခြင်းကို ကာကွယ်ရန် အပေါက် ၆ ခုပါသော အမှုန်စုပ်စက်များတပ်ဆင်ခြင်းနှင့် အလုပ်သမားများအား ဖုန်မှုန့်ကာကွယ်နိုင်သော နှာခေါင်းစည်းများ ထောက်ပံ့ပေးခြင်း အစရှိသည်တို့ကို တိကျစွာလိုက်နာ၍ အကောင်အထည် ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
၄.၈	စွန့်ပစ်အစိုင်အခဲ	အမှိုက်ပုံးများနှင့် ခွဲခြားစုဆောင်းထားသော စွန့်ပစ်အမှိုက်များကို ရန်ကုန်မြို့တော်စည်ပင် သာယာရေး ကော်မတီမှ လာရောက် သိမ်းဆည်းခြင်း မပြုလုပ်မီ ယာယီစွန့်ပစ်အမှိုက်သိမ်းဆည်းသည့် နေရာတွင် သိမ်းဆည်းထားရှိခြင်း၊ စက်ရုံအလုပ်သမားထံမှ စားကြွင်းစားကျန်များကို ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်နှင့် အညီ နေ့စဉ် စွန့်ပစ်ခြင်းနှင့် အသုံးပြုပြီးသော ဓာတ်ခဲများ၊ ဓာတုပစ္စည်းများ ထည့်သည့် ပုံးခွံများတွင် ကြွင်းကျန် ဓာတုပစ္စည်းများ၊ မီးချောင်းများကဲ့သို့သော အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းများနှင့် ယာယီစွန့်ပစ်အမှိုက်ကန်များမှ ဖြတ်တောက်စုများ၊ အပ်ချည်များနှင့် အရည်အသွေး မပြည့်မီသော ထုတ်ကုန်များကို ရန်ကုန်မြို့တော် စည်ပင်သာယာရေး ကော်မတီ၏ လမ်းညွှန်ချက်နှင့် အညီ လစဉ်စွန့်ပစ်ခြင်း အစရှိသည်တို့ကို တိကျစွာလိုက်နာ၍ အကောင်အထည် ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
၄.၉	စွန့်ပစ်ရေ	စနစ်ကျသော ရေစီးရေလာကောင်းမွန်သော ရေနုတ်မြောင်းကို စက်ရုံဝန်းအတွင်း ဆောက်လုပ်ခြင်း၊ အိမ်သုံးစွန့်ပစ်ရေများကို အရံရေနုတ်မြောင်းမှ တစ်ဆင့် ပင်မရေနုတ်မြောင်းသို့ ပို့ဆောင်ပြီး စက်မှုရေနုတ်မြောင်းအတွင်းသို့ ပို့ဆောင်စွန့်ပစ်ခြင်း၊ စက်ရုံအလုပ်သမားများအတွက် လုံလောက်သော အိမ်သာများနှင့် ရေချိုးခန်းများကို ထောက်ပံ့ပေးခြင်း၊ စီမံကိန်းအတွင်းရှိ အဆောက်အဦများမှ မိလ္လာများကို မိလ္လာကန်အသေးနှင့် ပင်မ မိလ္လာကန်တွင် ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်များနှင့် အညီ စွန့်ပစ်မ အစရှိသည်တို့ကို တိကျစွာလိုက်နာ၍ အကောင်အထည်ဖော် ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
၄.၁၀	ဆူညံသံနှင့် တုန်ခါမှု	ဆူညံသံနည်းသော စက်ပစ္စည်းကိရိယာများကို အသုံးပြုခြင်း၊ ဆူညံသံများသော နေရာတွင် အလုပ်လုပ်နေသော အလုပ်သမားများကို နားအကာအကွယ်ပစ္စည်းများ ကဲ့သို့သော တစ်ကိုယ်ရေကာကွယ်သုံးပစ္စည်းများ ထောက်ပံ့ပေးခြင်း၊ ဒီဇယ်မီးစက်များကို လူနေဧရိယာနှင့် ဝေးသော နေရာတွင် ထားရှိခြင်း၊ ဆူညံသံနှင့် တုန်ခါမှုများကို လျှော့ချရန် စက်ပစ္စည်းများ ကိရိယာများ၊ သယ်ယူပို့ဆောင်ရေး မော်တော်ယာဉ်များနှင့် ဒီဇယ်မီးစက်များကို ပုံမှန်စစ်ဆေး ထိန်းသိမ်းထားရှိမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
၄.၁၁	မြေထုအရည်အသွေး	လည်ပတ်ရေးလုပ်ငန်းစဉ်အတွက်အသုံးပြုသော သယ်ယူပို့ဆောင်ရေး မော်တော်ယာဉ်များနှင့် စက်ပစ္စည်းကိရိယာများကို စနစ်တကျ ပုံမှန် စစ်ဆေးခြင်း၊ စွန့်ပစ်ပစ္စည်းများ သင့်လျော်စွာ စွန့်ပစ်မှု မရှိခြင်းကို ကာကွယ်ရန်အတွက် စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှုစနစ်ကို သင့်လျော်စွာ တပ်ဆင်အသုံးပြုခြင်း၊ မြေပြင်ပေါ်သို့ စွန့်ပစ်ရေများ စနစ်တကျ စွန့်ပစ်မှုမရှိခြင်းကို ကာကွယ်ရန် အိမ်သုံး စွန့်ပစ်ရေများကို စနစ်တကျ စွန့်ပစ်မည်ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)
၄.၁၂	လုပ်ငန်းခွင်လုံခြုံမှုနှင့် ကျန်းမာရေး	လုပ်ငန်းလုပ်ကိုင်စဉ်တွင် တစ်ကိုယ်ရေ ကာကွယ်ရေးသုံးပစ္စည်း များကို အလုပ်သမားအား ထောက်ပံ့ ပေးခြင်း၊ အလုပ်သမားများအတွက် ဘေးအန္တရာယ်ကင်းရှင်းရေး ဆိုင်ရာ သင်တန်းများပေးခြင်းရေးဦးသူနာပြု ဆေးသေတ္တာ များကို လုပ်ငန်းလည်ပတ်နေ ဧရိယာအတွင်း ထောက်ပံ့ပေးခြင်း၊ သတိပေးဆိုင်းဘုတ် အမှတ်အသားများ ရှင်းလင်းစွာ တပ်ဆင်ထားပေးခြင်း၊ မီးငြိမ်းသတ်ပစ္စည်းများ၊ မီးသတ်ဆေးဗူးများကို လုပ်ငန်း ဧရိယာအတွင်း တပ်ဆင်ထားပေးခြင်း၊ ယာဉ်မောင်းများအား ဘေးအန္တရာယ်ကင်းရှင်းစွာ မောင်းနှင်စေခြင်းနှင့် အရေးပေါ် အခြေအနေအတွက် သက်ဆိုင်ရာမြို့နယ်၏ ဆေးရုံ၊ ဆေးခန်းများနှင့် မီးသတ်ဌာနတို့၏ ဆက်သွယ်ရန် ဖုန်းနံပါတ်များကို အများပြည်သူမြင်သာနိုင်သည့် နေရာများတွင် ချိတ်ဆွဲထားရှိခြင်း အစရှိသည်တို့ကို တိကျစွာလိုက်နာ၍ အကောင်အထည်ဖော်ဆောင်ရွက်မည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇-၃)

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
၅	ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုရေး အစီအစဉ်	တည်ဆောက်စဉ်ကာလ၊ လုပ်ငန်းလည်ပတ်စဉ်ကာလနှင့် ပိတ်သိမ်းစဉ်ကာလအတွက် ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုရေး အစီအစဉ်များအတွက် လေထုအရည်အသွေး တိုင်းတာခြင်းကို စီမံကိန်းအတွင်း တစ်နေရာတွင် တစ်နှစ်လျှင် နှစ်ကြိမ်၊ ရေအရည်အသွေးတိုင်းတာခြင်းကို စီမံကိန်းအတွင်းရှိ မြေအောက်ရေနှင့် စွန့်ပစ်ရေ အရည်အသွေးကို တစ်နှစ်လျှင် နှစ်ကြိမ်၊ စွန့်ပစ်အမှိုက်ကို အပတ်စဉ်၊ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေးကို လစဉ်၊ ဆူညံသံနှင့် တုန်ခါမှုကို စီမံကိန်းအတွင်း တစ်နှစ်လျှင် နှစ်ကြိမ် တိုင်းတာမည်ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	ဇယား (၇.၄)
၆	အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းနှင့် သတင်းအချက်အလက်များ ထုတ်ဖော်တင်ပြခြင်း	အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးပွဲကို ပြည်ထောင်စုသမ္မတ မြန်မာနိုင်ငံတော်အစိုးရမှ ထုတ်ပြန် ထားသော လမ်းညွှန်ချက် စည်းကမ်းများနှင့်အညီ အနီးဝန်းကျင်ရှိ ဒေသခံပြည်သူများ၊ သက်ဆိုင်ရာ ဌာနဆိုင်ရာများနှင့် အဖွဲ့အစည်းများ၊ ABGL မှ ဝန်ထမ်းများနှင့် TBS မှ ဝန်ထမ်းများ ပူးပေါင်း၍ ၂၀၂၂ ခုနှစ် ဒီဇင်ဘာလ ၂၁ ရက်နေ့တွင် တစ်ကြိမ်နှင့် ၂၀၂၃ ခုနှစ် ဖေဖော်ဝါရီလ ၂၁ ရက်နေ့တွင် တစ်ကြိမ် စုစုပေါင်း နှစ်ကြိမ်ကို စီမံကိန်းတည်ရှိရာ ရှင်းလင်းဆောင်တွင် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ်(၆၁) အတိုင်းကျင်းပခဲ့ကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။ အစီရင်ခံစာတွင် ဆွေးနွေးပွဲ နှစ်ကြိမ်လုံးမှ ရရှိခဲ့သော အကြံပြုချက်များနှင့် သဘောထားမှတ်ချက်များကိုလည်း ထည့်သွင်း စဉ်းစားရေးဆွဲထားကြောင်း ကတိကဝတ်ပြု ဖော်ပြအပ်ပါသည်။	အခန်း (၈)

အကြံပေးအဖွဲ့အစည်း၏ဝန်ခံချက်

ဤပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာကို Total Business Solution Co., Ltd. မှ ဆောင်ရွက်ထားပါသည်။ ဤအစီရင်ခံစာကို သက်ဆိုင်ရာ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများ အပါအဝင် သက်ဆိုင်ရာ ဥပဒေများ၊ နည်းဥပဒေများနှင့်အညီ ရေးသားထားပြီး စီမံကိန်းဖော်ဆောင်သူမှ ပေးအပ်သော အချက်အလက်များ၊ အကြံပေးအဖွဲ့အစည်း၏ ကွင်းဆင်း လေ့လာဆောင်ရွက်မှု ရလဒ်များနှင့် အများပြည်သူတို့ အသုံးပြုနိုင်သော အချက်အလက်များကို ကိုးကားကာ ပြုစု ရေးသားထားကြောင်း ကတိကဝတ်ပြုပါသည်။




Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

အစီရင်ခံစာအကျဉ်းချုပ်

၁. စီမံကိန်းအကြောင်းအရာ

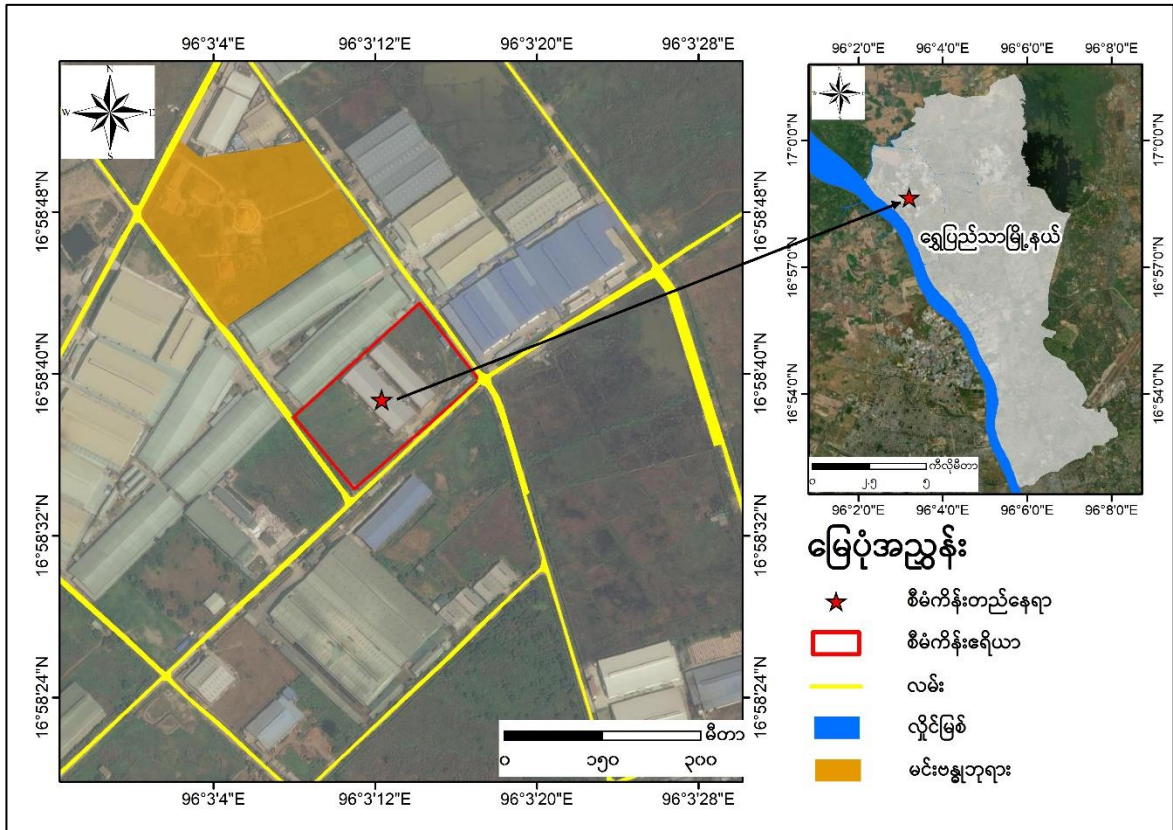
Alpha Best Global Limited (ABGL) သည် ၁၀၀ ရာခိုင်နှုန်း နိုင်ငံခြား ရင်းနှီးမြုပ်နှံမှုဖြင့် ဖိနပ်အမျိုးမျိုးကို ဖြတ်တောက်ခြင်း၊ ပြုလုပ်ခြင်းနှင့် ထုပ်ပိုးခြင်း (CMP) စနစ်ဖြင့် ထုတ်လုပ်ရန် စီစဉ်လျှက်ရှိသော စက်ရုံတစ်ခုဖြစ်ပါသည်။ စီမံကိန်းစက်ရုံသည် မြေကွက်အမှတ် (၁၄၉၊ ၁၅၀၊ ၁၅၁၊ ၁၅၂)၊ မြေတိုင်းအမှတ် ၄၉၊ ဝါးတစ်ရာ စက်မှုဇုန်၊ ရွှေပြည်သာမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီးတွင်တည်ရှိပါသည်။ အဆိုပြုစီမံကိန်း၏ စုစုပေါင်း မြေဧရိယာမှာ ၈.၇၀၈ ဧက (၃၅,၂၄၀.၀၅၇ စတုရန်းမီတာ) ဖြစ်သည်။ စီမံကိန်းတည်နေရာကို အောက်ပါ ပုံ ၁ တွင် ဖော်ပြထားပါသည်။ စက်ရုံတည်ဆောက်ရေးကာလမှာ (၂) နှစ်ခန့် ကြာမြင့်မည်ဟုခန့်မှန်းထားသော်လည်း ဆောက်လုပ်ရေးကာလကို (၅) နှစ် အထိ တိုးမြှင့် ခန့်မှန်းထားပါသည်။

စီမံကိန်းစက်ရုံမှ ထုတ်လုပ်မည့် ကုန်ပစ္စည်းများမှာ အားကစားဖိနပ်များ (အမျိုးသားနှင့် အမျိုးသမီး)၊ အားကစားဖိနပ်များ (ကလေး) နှင့် ပေါ့ပေါ့ပါးပါးဖိနပ်များ (အမျိုးသားနှင့် အမျိုးသမီး) ဖြစ်ပြီး ၎င်းတို့ကို အီတလီ၊ အမေရိကန်၊ ဟောင်ကောင်၊ တရုတ်၊ ဂျပန်၊ ထိုင်း၊ ဗီယက်နမ် နှင့် ကိုရီးယား စသည့် ပြည်ပနိုင်ငံများသို့ တင်ပို့မည်ဖြစ်သည်။ ကုန်ကြမ်းနှင့် လိုအပ်သော စက်ကိရိယာများကို ပြည်တွင်းမှ ဝယ်ယူခြင်းအပြင် တရုတ်နိုင်ငံတို့မှ ဝယ်ယူ တင်သွင်းမည်ဖြစ်သည်။ စီမံကိန်းစက်ရုံ၏ ဖောက်သည်များမှာ PRADA, HELLY HANSEN, STONEFLY, MERRELL, PREMIATA, FESDA, Le Coq Sportif, DUCA DEL COSMA, ON RUNNING, ALBERTO GUARDIANI, VIKING, GEOX, MICHAEL KORS, ASTON ARTIN, Vibram Five Fingers နှင့် BIKKEMBERGS တို့ဖြစ်သည်။

အဆိုပြုစီမံကိန်းကို အကောင်အထည်ဖော်ရသည့် ရည်ရွယ်ချက်မှာ

- ❖ တိုင်းပြည်၏ စီးပွားရေးပြုပြင်ပြောင်းလဲမှုလုပ်ငန်းစဉ်တွင် ပါဝင်ရန်၊
- ❖ မြန်မာပြည်သူပြည်သားများအတွက် သက်တောင့်သက်သာရှိပြီး အဆင်ပြေစေသော နေထိုင်မှုဘဝပုံစံကို ရရှိစေရန်၊
- ❖ မျိုးဆက်သစ်လူငယ်များအတွက် ပိုမိုတောက်ပသောအနာဂတ်ကိုဖန်တီးပေးနိုင်ရန်။

အဆိုပြုစီမံကိန်းဖော်ဆောင်သူသည် Total Business Solution Co., Ltd. (TBS) (အတိုင်ပင်ခံ) ကို ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ ရေးဆွဲရန် ညှိနှိုင်း ဌားရမ်း ခဲ့ပါသည်။ TBS သည် ABGL အတွက် ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာကို နယ်ပယ်တိုင်းတာ သတ်မှတ်ခြင်းအစီရင်ခံစာတွင်ပါဝင်သော ဆောင်ရွက်မည့်လုပ်ငန်းတာဝန်များကို အခြေခံ၍ ရေးဆွဲသွားမည်ဖြစ်သည်။ ထို့အပြင် သဘာဝ သယံဇာတနှင့် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဝန်ကြီးဌာန မှ ထုတ်ပြန်ထားသော ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅) အပိုဒ် (၅၅)၊ (၅၆)၊ (၅၇)၊ (၅၈)၊ (၅၉)၊ (၆၀)၊ (၆၁)၊ (၆၂)၊ (၆၃)၊ (၆၄) နှင့် (၆၅) အညီ ပြင်ဆင်ရေးဆွဲ သွားမည်ဖြစ်သည်။



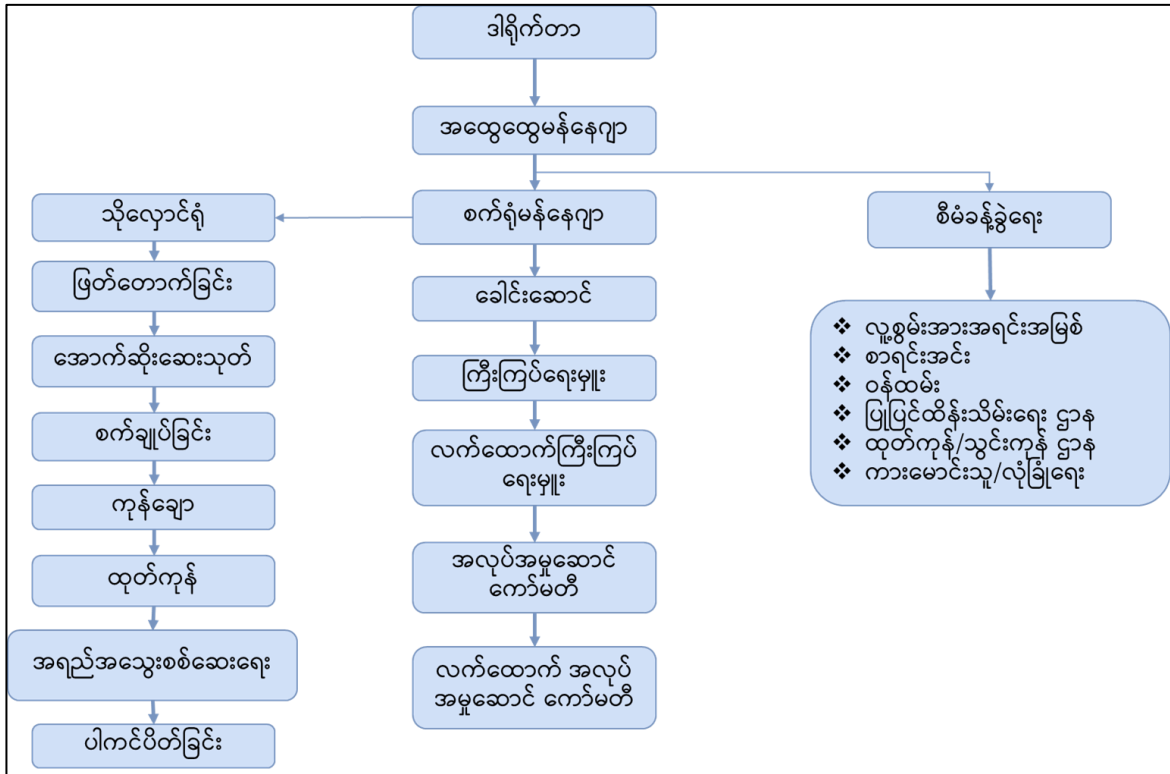
ပုံ ၁ စီမံကိန်းတည်နေရာပြပုံ

၁.၁. စီမံကိန်းအဆိုပြုသူ

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ အတွက် စီမံကိန်းအဆိုပြုသူ (AGBL) ၏ ဆက်သွယ်ရန်လိပ်စာကို ဇယား ၁ နှင့် စီမံကိန်းစက်ရုံ၏ ဖွဲ့စည်းပုံကို ပုံ ၂ တွင် ဖော်ပြ ထားပါသည်။

ဇယား ၁ စီမံကိန်းအဆိုပြုသူ၏ ဆက်သွယ်ရန်လိပ်စာ

အမည်	ဦးထွန်းထွန်းဦး
ရာထူး	လူ့စွမ်းအားအရင်းအမြစ်မန်နေဂျာ
လိပ်စာ	မြေကွက်အမှတ် (၁၄၉၊ ၁၅၀၊ ၁၅၁၊ ၁၅၂)၊ မြေတိုင်းအမှတ် ၄၉၊ ဝါးတစ်ရာ စက်မှုဇုန်၊ ရွှေပြည်သာမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး၊ မြန်မာ။
ဖုန်းနံပါတ်	၀၉-၇၉၇၆၅၄၆၆၆
အီးမေးလ်	larrylu@china.jimbrother.com.tw

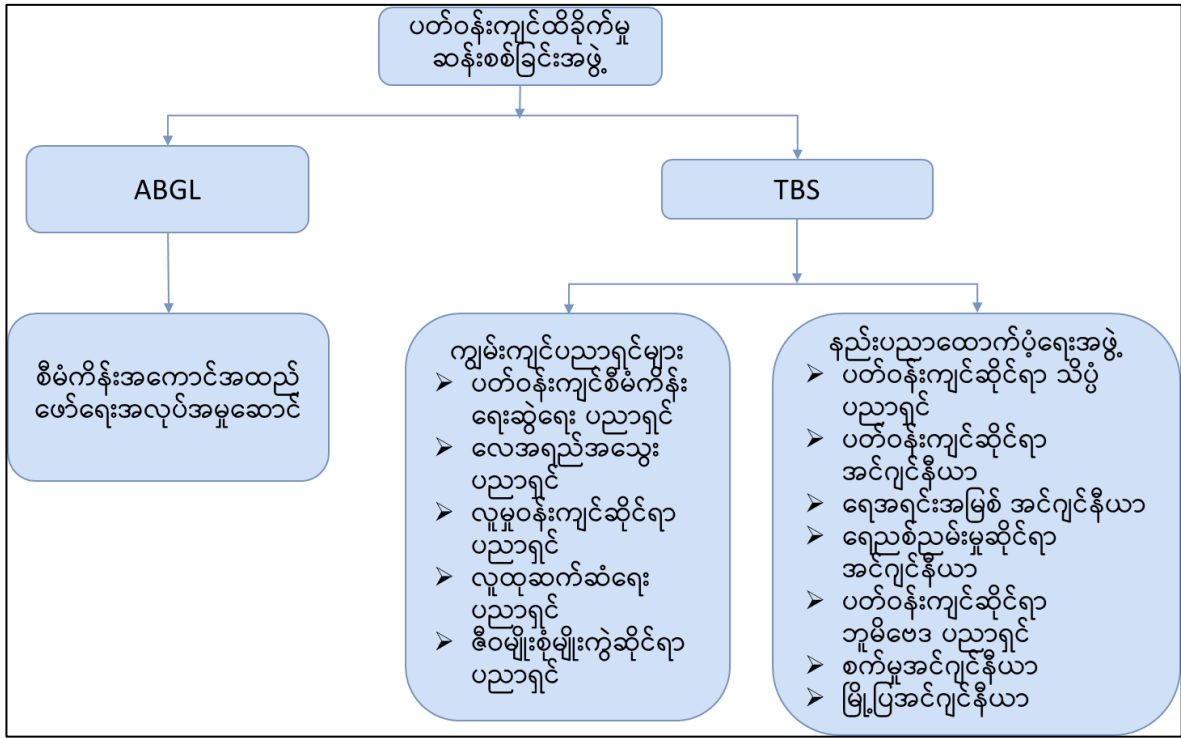


ပုံ ၂ စီမံကိန်းစက်ရုံ၏ ဖွဲ့စည်းပုံ

TBS သည် ပတ်ဝန်းကျင် နှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှုများနှင့် သက်ဆိုင်သော နည်းပညာဆိုင်ရာနယ်ပယ်အမျိုးမျိုးတွင် အရည်အချင်း ပြည့်ဝသော အတွေ့အကြုံရှိသော ပညာရှင်များဖြင့် ဖွဲ့စည်းထားသည်။ TBS သည် မြန်မာနိုင်ငံရှိ အင်ဂျင်နီယာနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ အကြံပေးလုပ်ငန်းများကို လုပ်ကိုင်လျက်ရှိသော ပြည်တွင်းအကြံပေး ကုမ္ပဏီတစ်ခုဖြစ်ပါသည်။ TBS ကုမ္ပဏီကို အောက်ဖော်ပြပါ လိပ်စာအတိုင်း ဆက်သွယ်နိုင်ပါသည်။

အမည်	ဒေါက်တာစိုးမိုးကျော်ဝင်း
ရာထူး	ဦးဆောင်ညွှန်ကြားရေးမှူး
ဖုန်းနံပါတ်	၀၉-၄၀၁၆၀၄၄၉၃
အီးမေးလ်	soemoe@tbs.com.mm
လိပ်စာ	အမှတ် ၅၄၊ အခန်း ၇၀၄၊ ဝေဇယန္တတာဝါ၊ ဝေဇယန္တလမ်း၊ သင်္ဃန်းကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့။

TBS ကုမ္ပဏီ၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း လေ့လာရေး အဖွဲ့ ဝင်များကို ပုံ ၃ နှင့် ဇယား ၂ တွင်ဖော်ပြထားပါသည်။



ပုံ ၃ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလေ့လာရေးအဖွဲ့၏ ဖွဲ့စည်းပုံ

ဇယား ၂ TBS ကုမ္ပဏီ၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလေ့လာရေးအဖွဲ့

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်ယူမှုများ	ဆက်သွယ်ရန်လိပ်စာ
၁။	ဒေါက်တာစိုးမိုးကျော်ဝင်း ဦးဆောင်ညွှန်ကြားရေးမှူး ဘူမိနည်းပညာနှင့် ဘူမိပတ်ဝန်းကျင် ဆိုင်ရာ အင်ဂျင်နီယာ	ပါရဂူဘွဲ့ ဘူမိ) (အင်ဂျင်နီယာ မဟာသိပ္ပံဘွဲ့ (ဘူမိ အင်ဂျင်နီယာ) သိပ္ပံဘွဲ့ (ဘူမိဗေဒ)	အရှေ့တောင်အာရှနိုင်ငံများ၊ အမေရိကန်နှင့် ကနေဒါနိုင်ငံ များ၌ ပတ်ဝန်းကျင်ဆိုင်ရာဆန်းစစ်ခြင်း၊ ဘူမိနည်းပညာ နှင့် ဘူမိဗေဒဆိုင်ရာ အင်ဂျင်နီယာလုပ်ငန်း နယ်ပယ်များ၊ ပတ်ဝန်းကျင်ဆိုင်ရာ ဆန်းစစ်ခြင်း၊ သတ္တုတူးဖော်ခြင်းမှ ထွက်ရှိသော စွန့်ပစ်အမှိုက်များ စီမံခန့်ခွဲခြင်း၊ ကွင်းဆင်း တိုင်းတာ ဆောင်ရွက်ခြင်းများ၊ မြေအရည်အသွေး ကောင်းမွန်အောင်ရွက်ခြင်းများ၊ မြေပြုပြင်ခြင်းများ နှင့် မြေပြိုမှုဆိုင်ရာ လေ့လာခြင်းများ တွင် နှစ် ၃၀ လုပ်ငန်း အတွေ့အကြုံ ပါသည်။	အစီရင်ခံစာအားလုံးကို ခြုံငုံသုံးသပ်ခြင်း။	ဖုန်း - ၀၉-၄၀၁၆၀၄၄၉၃ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယံဇာတကုန်မြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၂။	ဦးမြတ်သူကျော် အထွေထွေ မန်နေဂျာ	မဟာသိပ္ပံဘွဲ့ (ပတ်ဝန်းကျင်ဆိုင်ရာ အင်ဂျင်နီယာ နှင့် စီမံခန့်ခွဲမှု) သိပ္ပံဘွဲ့ (သစ်တော)	ပတ်ဝန်းကျင်အရည်အသွေး စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း (လေအရည်အသွေး၊ ဆူညံသံနှင့် တုန်ခါမှု၊ မြေအရည်အသွေးနှင့် ရေထုအရည်အသွေး)၊ ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုဆန်းစစ်ခြင်း လုပ်ငန်းများတွင် ၇ နှစ်ကျော် လုပ်ငန်းအတွေ့အကြုံရှိပါသည်။	ကွင်းဆင်းလေ့လာမှုများကို ကြီးကြပ်ခြင်း၊ ပတ်ဝန်းကျင် အရည်အသွေး ဆန်းစစ် လေ့လာရေး ကျွမ်းကျင်ပညာရှင်။	ဖုန်း - ၀၉-၄၂၀၀၄၉၂၈၅ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယံဇာတကုန်မြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၃။	ဒေါ်သက်ထားမြင့် လူမှုရေး သက်ရောက်မှုများ ဆန်းစစ်ခြင်း ကျွမ်းကျင်ပညာရှင်	မဟာသိပ္ပံဘွဲ့ (ကျားမရေးရာ / ဖွံ့ဖြိုးတိုးတက်ရေး) မဟာသိပ္ပံဘွဲ့ (သတ္တဗေဒ)	ပတ်ဝန်းကျင်၊ ကျား/မ ရေးရာဖွံ့ဖြိုးတိုးတက်ရေး နယ်ပယ် တွင် အလုပ်အတွေ့အကြုံ နှစ် ၂၀ ကျော်ရှိပါသည်။ အလုပ်အတွေ့အကြုံများတွင် ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှု ဆန်းစစ်ခြင်း၊ ကျား/မ ရေးရာဖွံ့ဖြိုးရေးလေ့လာခြင်း၊ လူမှုရေး	လူမှုရေးသက်ရောက်မှုများ ဆန်းစစ်ခြင်း (ကျား/မ ရေးရာ၊ လူမှုရေးနှင့် စီးပွားရေး)	ဖုန်း - ၀၉-၄၀၁၆၀၄၄၉၃ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယံဇာတကုန်မြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်ယူမှုများ	ဆက်သွယ်ရန်လိပ်စာ
		သိပ္ပံဘွဲ့ (ဂုဏ်ထူးတန်း) (သတ္တဗေဒ)	ဆိုင်ရာ ထိခိုက်မှုဆန်းစစ်ခြင်း၊ ဘေးအန္တရာယ် ကာဆီးရေးနှင့် ပြန်လည်နေရာချထားရေး အစီအစဉ်၊ ရုပ်ရွာနှင့် အုပ်ချုပ်ရေးဆိုင်ရာ လုပ်ငန်း များ စွမ်းဆောင်ရည်မြှင့်တင်ခြင်း စသည့် လုပ်ငန်းများ ပါဝင်ပါသည်။		
၄။	ဒေါ်နှင်းလဲ့ဝင်း ပတ်ဝန်းကျင်ဆိုင်ရာ မန်နေဂျာ	မဟာသိပ္ပံဘွဲ့ (ပတ်ဝန်းကျင်ဆိုင်ရာ အင်ဂျင်နီယာ နှင့် စီမံခန့်ခွဲမှု) သိပ္ပံဘွဲ့ (ဆေးဝါးကျွမ်းကျင်)	စီမံခန့်ခွဲမှုများ၊ ဈေးကွက်ဖြန့်ဖြူးခြင်းများနှင့် အငယ်တန်း ဝန်ထမ်းများကို လေ့ကျင့် ပေးခြင်းများတွင် ၅ နှစ် အတွေ့ အကြုံရှိပါသည်။ မြေအသုံးချမှုအစီအစဉ်များ၊ ပတ်ဝန်းကျင် ဆိုင်ရာ ဆန်းစစ်ခြင်းနှင့် အစိုးရအဖွဲ့အစည်း များနှင့် ဒေသခံပြည်သူများနှင့် ပူးပေါင်း ဆောင်ရွက်ခြင်းများတွင် အတွေ့အကြုံ ၄ နှစ် ရှိပါသည်။ ပတ်ဝန်းကျင် ဘေးအန္တရာယ်ဆိုင်ရာဆန်းစစ်ခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ် ကြည့်ရှု တိုင်းတာမှုများနှင့် ပတ်ဝန်းကျင် ဆိုင်ရာ အစီရင်ခံစာ ပြင်ဆင်ရေးသားခြင်း များတွင် အတွေ့အကြုံ ရှိပါသည်။	ဆက်စပ်ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှု ဆန်းစစ်လေ့လာခြင်းနှင့် လျှော့ချရေးနည်းလမ်းများ ရေးဆွဲခြင်း။ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်နှင့် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းများ။	ဖုန်း - ၀၉-၄၂၁၀၂၇၆၆၂ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တလမ်း၊ သယံဇာတကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၅။	ဒေါက်တာအောင်အောင် ဇီဝမျိုးစုံမျိုးကွဲ သတ္တဗေဒ ပညာရှင်	ပါရဂူဘွဲ့ (သတ္တဗေဒ) မဟာသိပ္ပံဘွဲ့(သတ္တဗေဒ) သိပ္ပံဘွဲ့(သတ္တဗေဒ)	တိရစ္ဆာန်များနှင့် ဇီဝမျိုးစုံမျိုးကွဲ လေ့လာခြင်းများ၊ သင်ကြားရေးနှင့် ကွင်းဆင်းသုတေသနပြုခြင်းများတွင် ၁၉ နှစ် ကျော် လုပ်ငန်းအတွေ့အကြုံ ရှိပါသည်။	ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း၊ ဇီဝမျိုးစုံမျိုးကွဲများ ထိန်းသိမ်းခြင်းနှင့် နို့တိုက်သတ္တဝါများနှင့် ဂေဟဗေဒ။	ဖုန်း - ၀၉-၄၂၀၀၄၉၂၈၅ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တလမ်း၊ သယံဇာတကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၆။	ဒေါက်တာ ပြုံးပြုံးမြင့်	ပါရဂူဘွဲ့ (သတ္တဗေဒ) (မဟာသိပ္ပံဘွဲ့(သတ္တဗေဒ))	တိရစ္ဆာန်များနှင့် ဇီဝမျိုးစုံမျိုးကွဲ လေ့လာခြင်းများ၊ သင်ကြားရေးနှင့်	ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း၊ ခန္ဓာဗေဒ၊ အပြုအမူ ဆိုင်ရာများ။	ဖုန်း - ၀၉-၄၂၀၀၄၉၂၈၅

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်ယူမှုများ	ဆက်သွယ်ရန်လိပ်စာ
	ဇီဝမျိုးစုံမျိုးကွဲ သတ္တဗေဒ ပညာရှင်	သိပ္ပံဘွဲ့.(သတ္တဗေဒ)	ကွင်းဆင်းသုတေသနပြုခြင်းများတွင် ၁၉ နှစ် လုပ်ငန်းအတွေ့အကြုံ ရှိပါသည်။	ဂေဟဗေဒဆိုင်ရာဖြစ်ပေါ်လာပုံ၊ ဇီဝကမ္မဗေဒ၊ ကာကွယ်ထိန်းသိမ်းရေးများ နှင့် ငှက်များ၏ ဇီဝဗေဒ။	နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယ်န်းကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၇။	ဒေါက်တာ သန့်ဇော်ဝင်း၊ ဇီဝမျိုးစုံမျိုးကွဲ ရုက္ခဗေဒ ပညာရှင်	ပါရဂူဘွဲ့ (ရုက္ခဗေဒ)၊ မဟာသိပ္ပံဘွဲ့(ရုက္ခဗေဒ)၊ သိပ္ပံဘွဲ့(ရုက္ခဗေဒ)	သစ်ပင်ပန်းမန်များနှင့် ဇီဝမျိုးစုံမျိုးကွဲ လေ့လာခြင်းများ၊ သင်ကြားရေးနှင့် ကွင်းဆင်းသုတေသနပြုခြင်းများတွင် ၉ နှစ် လုပ်ငန်းအတွေ့အကြုံ ရှိပါသည်။	ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း၊ ဇီဝကမ္မဗေဒ၊ ရေဝပ်ဒေသ စီမံခန့်ခွဲရေး နှင့် ဇီဝအပင် လေ့လာခြင်း။	ဖုန်း - ၀၉-၄၂၀၀၄၉၂၈၅၊ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယ်န်းကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၈။	ဒေါက်တာ သန်းသန်းမြင့်၊ ဇီဝမျိုးစုံမျိုးကွဲ အဏ္ဏဝါ ဇီဝ ပညာရှင်	ပါရဂူဘွဲ့ (သတ္တဗေဒ)၊ မဟာသိပ္ပံဘွဲ့(သတ္တဗေဒ)၊ သိပ္ပံဘွဲ့(သတ္တဗေဒ)	တိရစ္ဆာန်များနှင့် အဏ္ဏဝါဇီဝ လေ့လာခြင်းများ၊ သင်ကြားရေးနှင့် ကွင်းဆင်းသုတေသနပြုခြင်းများတွင် ၁၆ နှစ် လုပ်ငန်းအတွေ့အကြုံ ရှိပါသည်။	ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း၊ အဏ္ဏဝါဇီဝ အဓိက အားဖြင့် ငါးမျိုးစိတ်များ လေ့လာခြင်း။	ဖုန်း - ၀၉-၄၂၀၀၄၉၂၈၅၊ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယ်န်းကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၉။	ဒေါ်ဖူးပွင့်ခိုင်၊ ပတ်ဝန်းကျင်ဆိုင်ရာ အင်ဂျင်နီယာ	မဟာအင်ဂျင်နီယာဘွဲ့ (ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အင်ဂျင်နီယာ)၊ အင်ဂျင်နီယာဘွဲ့ (မြို့ပြ)	ဆောက်လုပ်ရေးစီမံကိန်းများတွင် ဆိုဒ်အင်ဂျင်နီယာအဖြစ် အတွေ့အကြုံ ၁ နှစ် ရှိပါသည်။ အဆောက်အဦ ဆောက်လုပ် ခြင်း ဆိုင်ရာ ကုန်ကျစရိတ် ခန့်မှန်း တွက်ချက်ခြင်းအဖွဲ့တွင် အရည်အသွေး ထိန်းချုပ် အင်ဂျင်နီယာအဖြစ် အတွေ့အကြုံ ၆ လ ရှိပါသည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ အတွေ့အကြုံ ၂ နှစ်ကျော် ရှိပါသည်။	စွန့်ပစ်ရေ စီမံခန့်ခွဲမှု၊ အန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲမှု၊ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်။ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းများ။	ဖုန်း - ၀၉-၉၄၃၅၅၇၃၈၇၊ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယ်န်းကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်ယူမှုများ	ဆက်သွယ်ရန်လိပ်စာ
၁၀။	ဒေါ်အေးမွန်အောင် ပတ်ဝန်းကျင်ဆိုင်ရာ အင်ဂျင်နီယာ	မဟာအင်ဂျင်နီယာဘွဲ့ (ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အင်ဂျင်နီယာ) အင်ဂျင်နီယာဘွဲ့ ခြံပစ္စည်းနှင့်) (သတ္တုဗေဒ	လက်ထောက်ဆရာမ အဖြစ် အတွေ့အကြုံ ၁၀ လ ရှိပါသည်။ အရောင်းကိုယ်စားလှယ်အဖြစ် အတွေ့အကြုံ ၂ နှစ် ရှိပါသည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ အတွေ့အကြုံ ၂ နှစ်ကျော် ရှိပါသည်။	စီမံကိန်းအကြောင်းအရာ၊ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှု ဆန်းစစ်ခြင်းနှင့် လျှော့ချရေးအစီအစဉ်များ။ ပတ်ဝန်းကျင်ဆိုင်ရာ ဘေးအန္တရာယ် ဆန်းစစ်ခြင်း။ ပတ်ဝန်းကျင်အရည်အသွေးဆိုင် ရာ အချက်အလက်များ စာရင်းပြုစုခြင်း။ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းများ။	ဖုန်း - ၀၉-၄၀၂၆၄၇၈၈၁ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယံဇာတကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၁၁။	ဦးထက်သီဟဖုန်းမြင့် ပတ်ဝန်းကျင်ဆိုင်ရာ ဘူမိဗေဒပညာရှင်	သိပ္ပံဘွဲ့ (ဘူမိဗေဒ)	ဘူမိဗေဒဆိုင်ရာ မြေအောက်လွှာလေ့လာခြင်း၊ မြေ အသုံးချ အစီအစဉ်များဆောင်ရွက်ခြင်း၊ ပတ်ဝန်းကျင် ဆိုင်ရာ အရည်အသွေး ကွင်းဆင်းတိုင်းတာခြင်း (လေ၊ ဆူညံသံ၊ ရေနမူနာကောက်ယူခြင်း) အစိုးရ အဖွဲ့အစည်းများ၊ ဒေသခံပြည်သူများနှင့် ညှိနှိုင်းတွေ့ဆုံ ဆွေးနွေးခြင်း၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုဆိုင်ရာ စာရွက်စာတမ်းများပြင်ဆင်ခြင်းများတွင် အတွေ့အကြုံ (၇)နှစ်ရှိပါသည်။	အစိုးရအဖွဲ့အစည်းများနှင့် ဒေသခံများနှင့် ညှိနှိုင်း တွေ့ဆုံဆွေးနွေးခြင်း၊ လူမှုစီးပွား စစ်တမ်းကောက်ယူခြင်း၊ လူမှုစီးပွားအချက်အလက်များ စိစစ်ခြင်း။	ဖုန်း - ၀၉-၇၆၀၀၅၆၀၃ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယံဇာတကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၁၂။	ဦးဖြိုးသူကျော် အဆောက်အဦး ဒီဇိုင်းရေးဆွဲသူ	အင်ဂျင်နီယာဘွဲ့ (စက်မှုလုပ်စစ်)	စီမံကိန်းဆိုင်ရာ ညှိနှိုင်းဆောင်ရွက်ခြင်းများ၊ စာရွက် စာတမ်းများ ပြင်ဆင်ပေးခြင်း၊ အဆောက်အဦး ပုံစံရေးဆွဲခြင်းများတွင် အတွေ့အကြုံ ၃ နှစ် ရှိပါသည်။	ပုံကြမ်းရေးဆွဲခြင်းများ။	ဖုန်း - ၀၉-၄၂၁၁၈၁၉၉ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်ယူမှုများ	ဆက်သွယ်ရန်လိပ်စာ
			ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြည့်လေ့လာမှုများ လေနှင့် ဆူညံသံ တိုင်းတာခြင်း၊ ရေနမူနာ ကောက်ယူခြင်း၊ ကွန်ပျူတာများ ပြုပြင် ထိန်းသိမ်းခြင်း များတွင် အတွေ့အကြုံ ၄ နှစ် ရှိပါသည်။		သယ်နိုးကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၁၃။	ဦးဝေဖြိုးအောင် ကွင်းဆင်းလေ့လာရေး ပညာရှင်	သိပ္ပံဘွဲ့ (ဘူမိဗေဒ)	ဘူမိနည်းပညာနှင့်ဘူမိဗေဒဆိုင်ရာများတွင် အတွေ့အကြုံ ၇ နှစ် ရှိပါသည်။ ကွင်းဆင်းလေ့လာရေး အဖွဲ့ခေါင်းဆောင်အဖြစ် ၅ နှစ် ရှိပါသည်။	ပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး စောင့်ကြည့်ခြင်းနှင့် ကွင်းဆင်း လေ့လာဆောင်ရွက်ခြင်းများ၊ ဒရုန်းဖြင့် ကွင်းဆင်းလေ့လာ ဆောင်ရွက်ခြင်းများ။	ဖုန်း - ၀၉-၇၈၄၁၈၁၉၈၀ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေယန္တလမ်း၊ သယ်နိုးကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၁၄။	ဦးဇော်မျိုးဟိန်း ပတ်ဝန်းကျင်ဆိုင်ရာ ဘူမိဗေဒပညာရှင်	သိပ္ပံဘွဲ့ (ဘူမိဗေဒ)	ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြည့်လေ့လာခြင်း လုပ်ငန်းစဉ်များနှင့် ကွင်းဆင်းလေ့လာ ဆောင်ရွက်ခြင်းများတွင် အတွေ့အကြုံ ၂ နှစ် ရှိပါသည်။	ပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး စောင့်ကြည့်ခြင်းနှင့် ကွင်းဆင်း လေ့လာဆောင်ရွက်ခြင်းများ၊ ဒရုန်းဖြင့် ကွင်းဆင်းလေ့လာ ဆောင်ရွက်ခြင်းများ။	ဖုန်း - ၀၉-၇၅၁၃၆၃၃၂၁ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေယန္တလမ်း၊ သယ်နိုးကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
၁၅။	ဒေါ်ကြည်ဖြူခင်	MBA (Thesis) ABE (Level 6 – UK) ဝိဇ္ဇာဘွဲ့ (အင်္ဂလိပ်စာ) ဒီပလိုမာ (စီးပွားရေးဆိုင်ရာ ဥပဒေ)	စီးပွားရေးဆိုင်ရာ ဥပဒေစီမံခန့်ခွဲခြင်း လုပ်ငန်းများတွင် လုပ်ငန်းအတွေ့အကြုံ ၁ နှစ်ရှိပါသည်။	ဥပဒေနှင့် စည်းမျဉ်းစည်းကမ်းများ	ဖုန်း - ၀၉-၄၃၁၉၃၃၃၇ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေယန္တလမ်း၊ သယ်နိုးကျွန်းမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်ယူမှုများ	ဆက်သွယ်ရန်လိပ်စာ
၁၆။	ဒေါ်သဉ္ဇာထွန်း ပတ်ဝန်းကျင်ဆိုင်ရာသိပ္ပံ ပညာရှင်	သိပ္ပံဘွဲ့ (သစ်တော)	ပတ်ဝန်းကျင်ဆိုင်ရာ အစီရင်ခံစာဆန်းစစ်ခြင်းနှင့် လူမှုရေးဆိုင်ရာ ကွင်းဆင်းလေ့လာခြင်းတွင် အလုပ်အတွေ့အကြုံ ၂ နှစ်ရှိပါသည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ အစီရင်ခံစာ ပြင်ဆင်ရေးဆွဲခြင်းတွင် ၅ လ အတွေ့အကြုံရှိပါသည်။	ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး စောင့်ကြပ်ကြည့်ရှုခြင်း၊ စီမံကိန်းအကြောင်းအရာနှင့် လူထု တိုင်ပင်ဆွေးနွေးပွဲများ ကျင်းပခြင်း။	ဖုန်း - ၀၉-၂၆၄၅၇၆၂၇၁ နေရပ်လိပ်စာ - နံပါတ် (၅၄)၊ အခန်း (၇၀၄)၊ ဝေဇယန္တာလမ်း၊ သယံဇာတကုန်မြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။

၁.၂. စီမံကိန်းနှင့်ဆက်စပ်လျက်ရှိသော အစိုးရဌာနများ

စီမံကိန်းနှင့်ဆက်စပ်လျက်ရှိသော အစိုးရဌာနများကို ပုံ ၄ တွင် ဖော်ပြထားပါသည်။



ပုံ ၄ စီမံကိန်းနှင့် ဆက်စပ်လျက်ရှိသော အစိုးရဌာနများ

၂. မူဝါဒများ၊ ဥပဒေဆိုင်ရာနှင့် ဖွဲ့စည်းဆောင်ရွက်ပုံဆိုင်ရာ လေ့လာသုံးသပ်ချက်

ဤအခန်းတွင် စီမံကိန်း၏ ပတ်ဝန်းကျင်၊ လူမှုစီးပွားရေးနှင့် သက်ဆိုင်သော မြန်မာနိုင်ငံ ၏မူဝါဒများ၊ သက်ဆိုင်သောဥပဒေများကို ဇယား ၃ တွင် အကျဉ်းချုပ်ဖော်ပြထားပါသည်။ စီမံကိန်း ဖော်ဆောင်သူသည် ဤဥပဒေ ပြဋ္ဌာန်းချက်များကို လိုက်နာကာ စီမံကိန်းကို အကောင်အထည်ဖော် ဆောင်ရွက်မည်ဖြစ်ပါသည်။

ဇယား ၃ သက်ဆိုင်သော မြန်မာနိုင်ငံ၏ ဥပဒေနှင့် စည်းမျဉ်းစည်းကမ်းများ

စဉ်	ဥပဒေများနှင့် နည်းဥပဒေများ၏ နာမည်များ	ခုနှစ်
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး		
၁	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ	၂၀၁၂
၂	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေများ	၂၀၁၄
၃	ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများ	၂၀၁၅
၄	မြန်မာနိုင်ငံ အမျိုးသားပတ်ဝန်းကျင်ရေးရာမူဝါဒ	၂၀၁၉
ညစ်ညမ်းမှုထိန်းချုပ်ခြင်းနှင့်ကျန်းမာရေး		
၅	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေးလမ်းညွှန်ချက်များ(ထုတ်လွှတ်မှု)	၂၀၁၅
၆	အမျိုးသားသောက်သုံးရေအရည်အသွေးစံချိန်စံညွှန်း (မူကြမ်း)	၂၀၁၉
၇	ပြည်ထောင်စုမြန်မာနိုင်ငံပြည်သူ့ကျန်းမာရေးဥပဒေ	၁၉၇၂
၈	ကူးစက်ရောဂါများ ကာကွယ်ထိန်းချုပ်ရေးဥပဒေ	၁၉၉၅
၉	ဆေးလိပ်နှင့်ဆေးရွက်ကြီးထွက် ပစ္စည်းသောက်သုံးမှုထိန်းချုပ်ရေးဥပဒေ	၂၀၀၆
၁၀	လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ကျန်းမာရေးဆိုင်ရာဥပဒေ	၂၀၁၉
၁၁	မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ဥပဒေ	၂၀၁၅
ဇီဝမျိုးစုံမျိုးကွဲများနှင့် သဘာဝအရင်းအမြစ်ထိန်းသိမ်းရေး		
၁၂	ဇီဝမျိုးစုံမျိုးကွဲများနှင့် သဘာဝထိန်းသိမ်းရေးနယ်မြေများ ကာကွယ် စောင့်ရှောက်ခြင်းဆိုင်ရာ ဥပဒေ	၂၀၁၈
၁၃	ငါးမွေးမြူခြင်းဆိုင်ရာဥပဒေ	၁၉၈၉
၁၄	ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ထိန်းသိမ်းရေးဥပဒေ	၂၀၀၆
၁၅	ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းထိန်းသိမ်းရေးနည်းဥပဒေ	၂၀၁၃
၁၆	မြေအောက်ရေဥပဒေ	၁၉၃၀
၁၇	သစ်တောဥပဒေ	၁၉၉၂
မြေယာဥပဒေ		
၁၈	မြေယာသိမ်းဆည်းမှု၊ ပြန်လည်နေရာချထားရေးနှင့် ပြန်လည်ထူထောင်ရေး ဥပဒေ	၂၀၁၉
၁၉	မြန်မာနိုင်ငံ အမျိုးသား မြေအသုံးချမှု မူဝါဒ	၂၀၁၆
၂၀	နိုင်ငံပိုင်မြေငှားရမ်းခြင်း၊ လွှဲပြောင်းခြင်းနှင့် ဖက်စပ်လှုပ်ငန်းများတွင် လိုက်နာရမည့် ညွှန်ကြားချက်များ	၃/၂၀၁၈
၂၁	လယ်ယာမြေဥပဒေ	၂၀၁၂
၂၂	လယ်ယာမြေနည်းဥပဒေ	၂၀၁၂
၂၃	မြေလွတ်၊ မြေလပ်နှင့်မြေရိုင်းများစီမံခန့်ခွဲရေးဥပဒေ	၂၀၁၈
၂၄	စာချုပ်စာတမ်းများမှတ်ပုံတင်ဥပဒေ	၂၀၁၉

စဉ်	ဥပဒေများနှင့် နည်းဥပဒေများ၏ နာမည်များ	ခုနှစ်
၂၅	နယ်နိမိတ်တိုင်းတာပိုင်းခြား သတ်မှတ်ရေးဥပဒေ	၂၀၁၉
မြို့ပြဖွံ့ဖြိုးတိုးတက်မှုနှင့်စီမံခန့်ခွဲမှု		
၂၆	ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ ဥပဒေ	၂၀၁၈
၂၇	လျှပ်စစ်ဥပဒေ	၂၀၁၄
၂၈	အသေးစားနှင့် အလတ်စား စီးပွားရေးလုပ်ငန်းများ ဖွံ့ဖြိုးတိုးတက်ရေး ဥပဒေ	၂၀၁၅
၃၉	ဆက်သွယ်ရေးဥပဒေ	၂၀၁၃
လူ့အခွင့်အရေး		
၃၀	တိုင်းရင်းသားလူမျိုးများ၏အခွင့်အရေးကာကွယ်စောင့်ရှောက်သည့် ဥပဒေ	၂၀၁၅
၃၁	မသန်စွမ်းသူများ၏ အခွင့်အရေးဥပဒေ	၂၀၁၅
၃၂	ကလေးသူငယ် အခွင့်အရေးများဆိုင်ရာ ဥပဒေ	၂၀၁၉
ယဉ်ကျေးမှုအမွေအနှစ်များ		
၃၃	ယဉ်ကျေးမှုအမွေအနှစ်ဒေသများ ကာကွယ်ထိန်းသိမ်းရေးဥပဒေ	၂၀၁၉
၃၄	ရှေးဟောင်းဝတ္ထုပစ္စည်းကာကွယ်စောင့်ရှောက်ရေးဥပဒေ	၂၀၁၅
၃၅	ရှေးဟောင်းအဆောက်အအုံများ ကာကွယ်ထိန်းသိမ်းရေးဥပဒေ	၂၀၁၅
အလုပ်သမား		
၃၆	အလုပ်သမားအဖွဲ့အစည်းဥပဒေ	၂၀၁၁
၃၇	အလုပ်အကိုင်နှင့်ကျွမ်းကျင်မှု ဖွံ့ဖြိုးတိုးတက်ရေး ဥပဒေ	၂၀၁၃
၃၈	အနည်းဆုံးအခကြေးငွေဥပဒေ	၂၀၁၃
၃၉	အခကြေးငွေပေးချေရေးဥပဒေ	၂၀၁၆
၄၀	အလုပ်သမားလျှော့ကြေးအက်ဥပဒေ	၂၀၀၅
၄၁	အလုပ်သမားရေးရာ အငြင်းပွားမှုဖြေရှင်းရေးဥပဒေ	၂၀၁၂
၄၂	ခွင့်ရက်နှင့်အလုပ်ပိတ်ရက်အက်ဥပဒေ	၁၉၅၁
၄၃	လူမှုဖူလုံရေးဥပဒေ	၂၀၁၂
မော်တော်ယာဉ်များ		
၄၄	ယာဉ်အန္တရာယ်ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ်စီမံခန့်ခွဲမှုဥပဒေ	၂၀၂၀
၄၅	မော်တော်ယာဉ်နည်းဥပဒေ	၁၉၈၉
၄၆	မော်တော်ယာဉ်ဥပဒေ	၂၀၁၅
အခြားဆက်နွယ်နေသောဥပဒေများနှင့် စည်းမျဉ်းများ		
၄၇	မြန်မာအာမခံ လုပ်ငန်း ဥပဒေ	၁၉၉၃
၄၈	မြန်မာအာမခံ လုပ်ငန်း နည်းဥပဒေ	၂၀၁၇
၄၉	မြန်မာရင်းနှီးမြုပ်နှံမှု ဥပဒေ	၂၀၁၆

စဉ်	ဥပဒေများနှင့် နည်းဥပဒေများ၏ နာမည်များ	ခုနှစ်
၅၀	မြန်မာရင်းနှီးမြုပ်နှံမှု နည်းဥပဒေ	၂၀၁၇
၅၁	ရေနံနှင့် ရေနံထွက်ပစ္စည်းဆိုင်ရာဥပဒေ	၂၀၁၇
၅၂	ရေနံအက်ဥပဒေ	၁၉၃၄
၅၃	ပို့ကုန်သွင်းကုန်ဥပဒေ	၂၀၁၂
၅၄	ငါးမွေးမြူခြင်းဆိုင်ရာဥပဒေ	၁၉၈၉
၅၅	သဘာဝဘေးအန္တရာယ်ဆိုင်ရာ စီမံခန့်ခွဲမှုဥပဒေ	၂၀၁၃
၅၆	ရာသီဥတုပြောင်းလဲမှုဆိုင်ရာ မူဝါဒ	၂၀၁၉
၅၇	အခွန်ဆိုင်ရာစီမံအုပ်ချုပ်မှုဥပဒေ	၂၀၁၄
၅၈	ပြည်ထောင်စု၏အခွန်ကောက်ဥပဒေ	၂၀၁၉
၅၉	မြန်မာနိုင်ငံသားများရင်းနှီးမြုပ်နှံမှုဥပဒေ	၂၀၁၃
၆၀	နိုင်ငံခြားရင်းနှီးမြုပ်နှံမှုဥပဒေ	၂၀၁၂
၆၁	ပုဂ္ဂလိက စက်မှုလုပ်ငန်း ဥပဒေ	၁၉၉၀
၆၂	ဓာတုနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီးကာကွယ်ရေး ဥပဒေ	၂၀၁၃
၆၃	စံပြုခြင်းဆိုင်ရာ ဥပဒေ	၂၀၁၄
၆၄	စက်ရုံများ အက်ဥပဒေ	၁၉၅၁
၆၅	မြန်မာနိုင်ငံ အင်ဂျင်နီယာကောင်စီ ဥပဒေ	၂၀၁၃
၆၆	ကုန်အမှတ်တံဆိပ် ဥပဒေ	၂၀၁၉
၆၇	စက်မှုဒီဇိုင်း အခွင့်အရေး ဥပဒေ	၂၀၁၉
၆၈	စားသုံးသူကာကွယ်ရေး ဥပဒေ	၂၀၁၄
၆၉	မြန်မာနိုင်ငံ ကုမ္ပဏီများ ဥပဒေ	၂၀၁၇
၇၀	မြေအောက်ရေ အက်ဥပဒေ	၁၉၃၀
၇၁	တန်ဖိုးမြှင့် အခွန် ဥပဒေ	၂၀၁၉
နိုင်ငံတကာဆိုင်ရာနှင့် ဒေသဆိုင်ရာ စံချိန်စံညွှန်းနှင့် သဘောတူစာချုပ်များ		
၇၂	သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုဘဝရေရှည်ဖွံ့ဖြိုးတိုးတက်ရေးနှင့် ပတ်သက်၍ အပြည်ပြည်ဆိုင်ရာ ဘဏ္ဍာရေးကော်ပိုရေးရှင်း၏ လုပ်ဆောင်မှု စံသတ်မှတ်ချက်များ	၂၀၁၂
၇၃	အပြည်ပြည်ဆိုင်ရာ ဘဏ္ဍာရေးကော်ပိုရေးရှင်း၏ ပတ်ဝန်းကျင်၊ ကျန်းမာရေးနှင့် ဘေးကင်းလုံခြုံရေးဆိုင်ရာ အထွေထွေလမ်းညွှန်ချက်များ	၂၀၀၇
၇၄	ဘေးအန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းများနှင့် ၎င်းတို့၏ စွန့်ပစ်ခြင်းဆိုင်ရာ နယ်နိမိတ်ဖြတ်ကျော်ရွေ့လျားမှုများ ထိန်းချုပ်ရေးဆိုင်ရာ ဘာဆယ်ကွန်ဗေးရှင်း	၁၉၉၂
၇၅	Cartagena Protocol on Biosafety Convention on Biological Diversity	၂၀၀၀
၇၆	ဇီဝမျိုးစုံမျိုးကွဲဆိုင်ရာ ကွန်ဗေးရှင်း	၁၉၉၃

စဉ်	ဥပဒေများနှင့် နည်းဥပဒေများ၏ နာမည်များ	ခုနှစ်
၇၇	နိုင်ငံတကာဆိုင်ရာ အလုပ်သမားအဖွဲ့အစည်း၏ အတင်းအကျပ်ခိုင်းစေခြင်းခံရသော အလုပ်သမားဆိုင်ရာ ကွန်ဗေးရှင်း	၁၉၃၀
၇၈	ကုလသမဂ္ဂ၏ ရာသီဥတု အပြောင်းအလဲဆိုင်ရာ ကျိုးတိုသဘောတူညီလာခံ	၁၉၉၇
၇၉	အိုဇုန်းလွှာပျက်စီးစေသော အရာဝတ္ထုများဆိုင်ရာ မွန်ထရီရယ်သဘောတူစာချုပ်	၁၉၈၇
၈၀	Stockholm Convention on Persistent Organic Pollutants	၂၀၀၁
၈၁	အိုဇုန်းလွှာထိန်းသိမ်းခြင်းဆိုင်ရာ ဗီယင်နာသဘောတူစာချုပ်	၁၉၈၅
၈၂	ရာသီဥတု အပြောင်းအလဲဆိုင်ရာ ကုလသမဂ္ဂသဘောတူစာချုပ်	၁၉၉၄

၃. စီမံကိန်းအကြောင်းအရာဖော်ပြချက်နှင့် အခြားနည်းလမ်းများ

၃.၁. စီမံကိန်းတည်နေရာ

စီမံကိန်းသည် မြေကွက်အမှတ် (၁၄၉၊ ၁၅၀၊ ၁၅၁၊ ၁၅၂)၊ မြေတိုင်းအမှတ် ၄၉၊ ဝါးတစ်ရာ စက်မှုဇုန်၊ ရွှေပြည်သာမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီးတွင် တည်ရှိပါသည်။ စီမံကိန်းဧရိယာ စုစုပေါင်းသည် ၈.၇၀၈ ဧက (၃၅,၂၄၀.၀၅၇ စတုရန်းမီတာ) ဖြစ်ပြီး စီမံကိန်းနေရာသည် ဝါးတစ်ရာ စက်မှုဇုန် အတွင်းရှိ မဟာမြင်လမ်းနှင့် ဝန်ဆောင်မှုလမ်းကြား တွင်ရှိသည်။ စီမံကိန်းမြေကွက်သည် အနားပြိုင်စတုဂံ ပုံသဏ္ဍာန် ဖြစ်ပြီး လှိုင်မြစ်သည် စီမံကိန်းနေရာနှင့် ၀.၈ ကီလိုမီတာခန့် ဝေးသည်။ စီမံကိန်းတည်နေရာပြ မြေပုံကို ပုံ ၁ တွင် ပြထားသည်။

၃.၂. စီမံကိန်းအခြားနည်းလမ်းများ

အဆိုပြုစီမံကိန်းအတွက် စီမံကိန်းအခြားနည်းလမ်းများကို စဉ်းစားရာတွင် စီမံကိန်းတည်နေရာ၏ အခြားနည်းလမ်း၊ စီမံကိန်း၏ ကုန်ထုတ်လုပ်ငန်းစဉ်၏ အခြားနည်းလမ်း၊ စီမံကိန်းတွင် အသုံးပြုမည့် ကုန်ကြမ်းပစ္စည်းနှင့် စွမ်းအင်အရင်းအမြစ် အခြားနည်းလမ်းနှင့် စီမံကိန်းလုပ်ငန်း ဆောင်ရွက်ခြင်းမရှိ စသည့် အခြားနည်းလမ်းများကို ထည့်သွင်းစဉ်းစားထားပါသည်။

စီမံကိန်းတည်နေရာ အခြားနည်းလမ်းစဉ်းစားခြင်းနှင့် ပတ်သက်၍ စီမံကိန်းသည် ဝါးတစ်ရာစက်မှုဇုန်အတွင်း တည်ရှိသောကြောင့် အဆိုပြုစီမံကိန်းအတွက် စီမံကိန်းတည်နေရာ ပြောင်းရွှေ့ခြင်းကို ထည့်သွင်းမစဉ်းစားထားပါ။

စီမံကိန်းကုန်ထုတ်လုပ်သည့် လုပ်ငန်းစဉ် အခြားနည်းလမ်းစဉ်းစားခြင်းတွင် လက်တွေ့ကျသော အကောင်းဆုံး ပတ်ဝန်းကျင်ဆိုင်ရာ ရွေးချယ်မှုကိုအခြေခံ၍ စက်ပစ္စည်းကိရိယာများအခြားနည်းလမ်းကို ထည့်သွင်းစဉ်းစားထားပါသည်။ လက်တွေ့ကျသော အကောင်းဆုံး ပတ်ဝန်းကျင်ဆိုင်ရာ ရွေးချယ်မှုဆိုသည်မှာ အကျိုးရလဒ်အများဆုံးနှင့် ပတ်ဝန်းကျင်ကို ထိခိုက်မှုအနည်းဆုံးဖြစ်သော ရွေးချယ်မှုကို ဆိုလိုပါသည်။ ကုန်ကြမ်းပစ္စည်းဖြတ်တောက်ခြင်း လုပ်ငန်းစဉ်အတွက် ရိုးရိုးဖြတ်တောက်စက်များအစား အရည်ဖိအားသုံး ဖြတ်တောက်စက်များကို အသုံးပြုခြင်းနှင့် ချုပ်လုပ်ခြင်းလုပ်ငန်းစဉ်တွင်လည်း ရိုးရိုးအိမ်သုံးအပ်ချုပ်စက်များအစား စက်ရုံသုံး တစ်ချောင်းထိုးအပ်စက်များနှင့် နှစ်ချောင်းထိုး အပ်ချုပ်စက်များကို အသုံးပြုထားပါသည်။

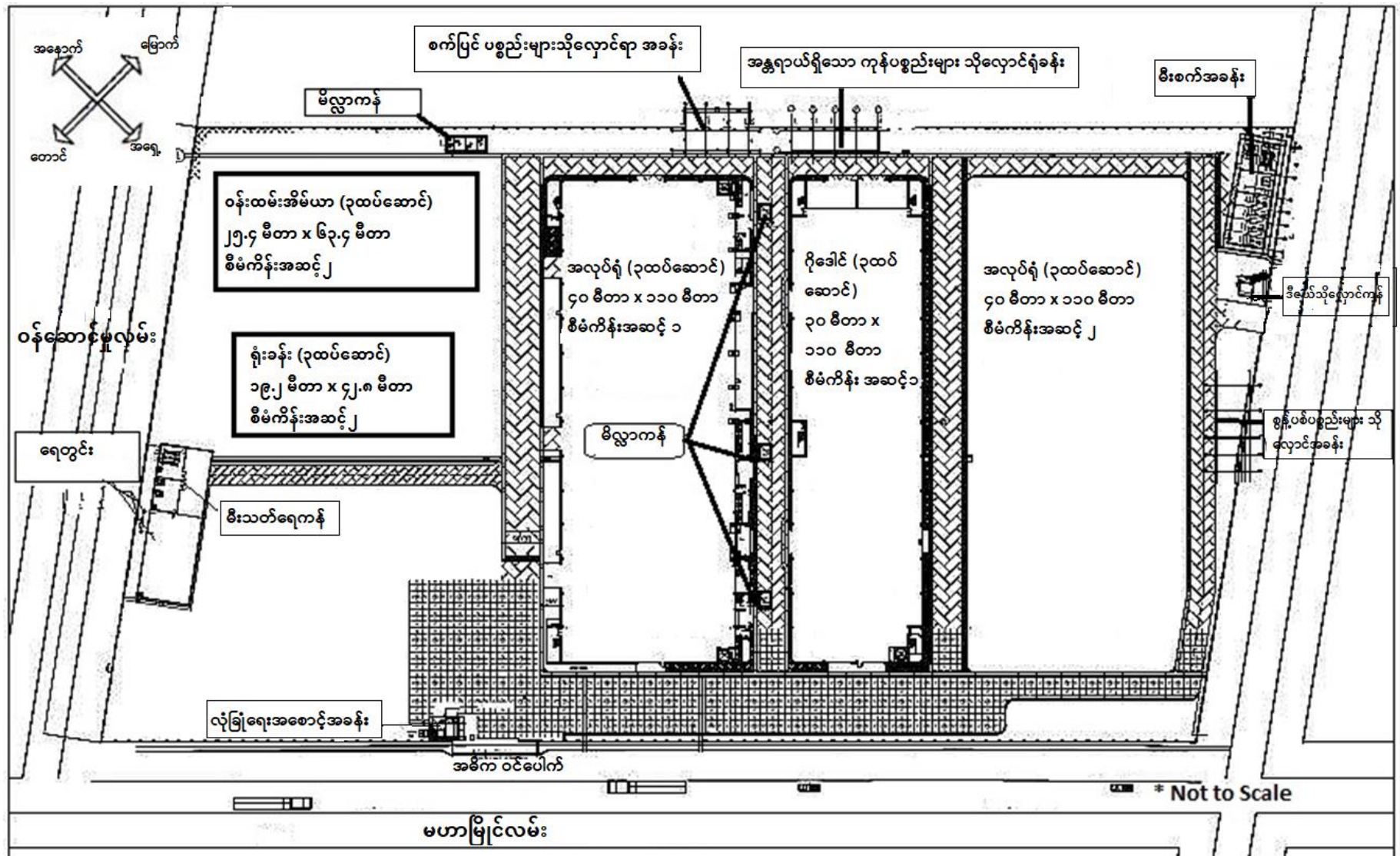
စီမံကိန်းတွင် အသုံးပြုသော အရင်းအမြစ်များ အခြားနည်းလမ်းစဉ်းစားခြင်းနှင့် ပတ်သက်၍ ကုန်ကြမ်းပစ္စည်းနှင့် စွမ်းအင်အသုံးပြုမှု အရင်းအမြစ်များဆိုင်ရာ အခြားနည်းလမ်းများကို ထည့်သွင်းစဉ်းစားပါသည်။ ကုန်ကြမ်းပစ္စည်းများတွင် ဓာတုပစ္စည်းဖြစ်သော ကော်များကို အသုံးပြုမည်ဖြစ်ရာ ဤစီမံကိန်းအတွက် အနံ့ပျင်းပြီး အဆိပ်အတောက်များသော benzene၊ toluene နှင့် xylene များအစား MEK (methyl ethyl ketone)၊ acetone နှင့် အခြားပေါင်းစပ်ဓာတုပစ္စည်းများပါဝင်သော ကော် (၁၃)မျိုးကို သာ အသုံးပြုမည်ဖြစ်ပါသည်။ စီမံကိန်းစက်ရုံသည် ယခုအခါ ဒီဇယ်မီးစက်ကိုအသုံးပြု၍ လည်ပတ်နေရသော်လည်း အစိုးရထံမှ လျှပ်စစ်ဓာတ်အားရရှိနိုင်ရန် လျှောက်ထားလျှက်ရှိပါသည်။ ၂,၀၀၀ ကီလိုဗို့အားရှိသော ထရန်စဖော်မာ တစ်လုံးကို တပ်ဆင်ပြီးပါက ဒီဇယ်မီးစက်မှထွက်ရှိနိုင်သော လေထုညစ်ညမ်းမှုလျော့ကျစေနိုင်ပါသည်။

စီမံကိန်းသည် စက်မှုဇုန်ရှိ လူနေရပ်ကွက်များ အနီးတွင် တည်ရှိပါသည်။ ထို့ကြောင့် ဒေသခံပြည်သူများအတွက် အလုပ်အကိုင် အခွင့်အလမ်းများ ဖန်တီးပေးခြင်းဖြင့် ဒေသတွင်း စီးပွားရေးကို အထောက်အကူဖြစ်စေနိုင်ပါသည်။ ထို့အပြင် အခြားနည်းလမ်းဖြစ်သည့် “စီမံကိန်း အကောင်အထည် မဖော်ခြင်း” ကြောင့် အလုပ်အကိုင်အခွင့်အလမ်းများ ဆုံးရှုံးခြင်းနှင့် အလုပ်လက်မဲ့များ များလာနိုင်ခြင်း အစရှိသည့် ဆိုးကျိုးသက်ရောက်မှုများဖြစ်ပေါ် လာနိုင်ပါသည်။ ထို့အပြင် ပတ်ဝန်းကျင်အပေါ် ရေရှည်သက်ရောက်နိုင်သော ဆိုးကျိုးများ မဖြစ်ပေါ်နိုင်ဟု ခန့်မှန်းထားသဖြင့် ဤစီမံကိန်းအတွက် “စီမံကိန်း အကောင်အထည် မဖော်ခြင်း” အခြားနည်းလမ်းကိုလည်း မရွေးချယ်ထားပါ။

၃.၃. စီမံကိန်းအကြောင်းအရာဖော်ပြချက်

၃.၃.၁. စီမံကိန်းဖော်ပြချက်

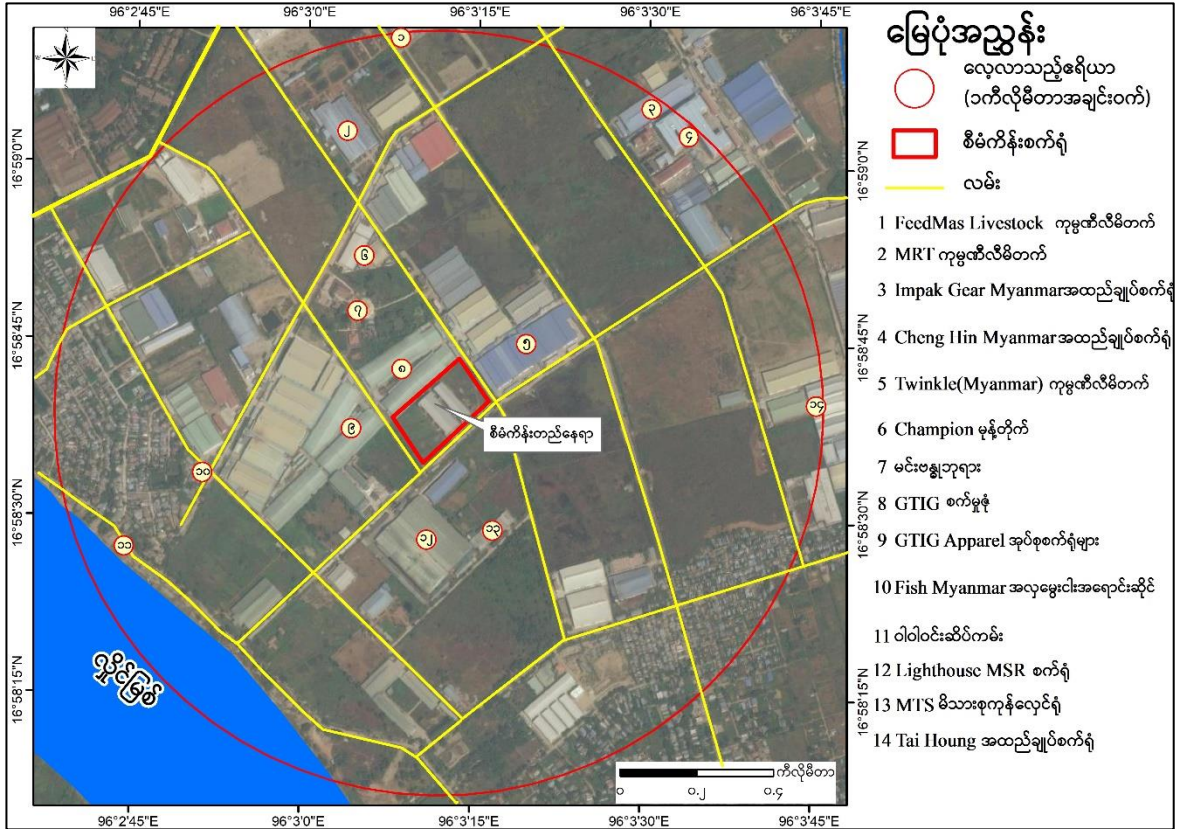
စီမံကိန်းသည် မြေကွက်အမှတ် (၁၄၉၊ ၁၅၀၊ ၁၅၁၊ ၁၅၂)၊ မဟာမြိုင်လမ်းနှင့် ဝန်ဆောင်မှု လမ်းထောင့်၊ ဝါးတစ်ရာ စက်မှုဇုန်၊ ရွှေပြည်သာမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီးတွင် တည်ရှိပါသည်။ စုစုပေါင်းကြမ်းခင်းဧရိယာမှာ ၄၀,၆၆၄.၈၄ စတုရန်းမီတာရှိပါသည်။ အဆောက်အဦ တည်ဆောက်မည့် ပုံစံကို ပုံ ၅ တွင် ဖော်ပြထားပါသည်။



ပုံ ၅ အဆောက်အဦပုံစံပြပုံ

၃.၃.၂. စီမံကိန်း၏အနီးပတ်လည်ရှိစီမံကိန်းနှင့် ဆက်စပ်သော စီမံကိန်းများနှင့် ဖွံ့ဖြိုးမှုလုပ်ငန်းများ

စီမံကိန်းနေရာနှင့် အနီးပတ်လည် ၁ ကီလိုမီတာ အချင်းဝက်တွင် စက်ရုံအများအပြားနှင့် မင်းဗန္ဓုစေတီတော်တို့ တည်ရှိပါသည်။ စီမံကိန်းဧရိယာ အနီးပတ်လည်ရှိ နေရာပြမြေပုံကို ပုံ ၆ တွင် ဖော်ပြထားပါသည်။



ပုံ ၆ စီမံကိန်း၏ အနီးပတ်လည်ရှိ စီမံကိန်းနှင့် ဆက်စပ်နေသော စီမံကိန်းများနှင့် ဖွံ့ဖြိုးမှုလုပ်ငန်းများ

၃.၄. စီမံကိန်းတည်ဆောက်ခြင်းအကြောင်းအရာဖော်ပြချက်

၃.၄.၁. အဆောက်အဦနှင့် လုပ်ငန်းဧရိယာအမျိုးအစား

အဆိုပြုစီမံကိန်းကို အဆင့် ၂ ဆင့်ဖြင့် တည်ဆောက်ရန် စီစဉ်ထားပါသည်။ စီမံကိန်း အဆင့် ၁ တွင် အလုပ်ရုံတစ်ရုံ၊ ဂိုဒေါင်တစ်လုံး နှင့် စက်ပြင် ပစ္စည်းများသိုလှောင်ရုံခန်း၊ အန္တရာယ်ရှိသော ကုန်ပစ္စည်းများ သိုလှောင်ရုံခန်း၊ မီးစက်အခန်း၊ လုံခြုံရေးအစောင့်အခန်း၊ စွန့်ပစ်ပစ္စည်းများ သိုလှောင် အခန်း၊ မြေအောက်မီးသတ်ရေကန်နှင့် မိလ္လာကန်များ အစရှိသည့် ဆက်စပ် အဆောက်အဦများကိုလည်း ဆောက်လုပ်မည်ဖြစ်သည်။ စီမံကိန်းအဆင့် ၂ တွင် ဝန်ထမ်းအိမ်ယာအဆောက်အဦ၊ ရုံးခန်းတစ်ခန်းနှင့် အလုပ်ရုံတစ်ရုံ တို့ကို တည်ဆောက်မည်ဖြစ်သည်။ အလုပ်ရုံ ၂ ခု၊ ဂိုဒေါင် ၁ လုံး၊ အိပ်ဆောင် နှင့် ရုံးခန်း အစရှိသော အဓိက အဆောက်အဦအားလုံးကို ၃ ထပ်ဆောင် သံမဏိအဆောက်အဦ အမျိုးအစား ဆောက်လုပ်ရန် စီစဉ်ထားသည်။ အဆောက်အဦများ၏ အသေးစိတ်အချက်အလက်များကို ဇယား ၄ တွင် အသေးစိတ် ဖော်ပြထားပါသည်။

ဇယား ၄ အဆောက်အဦများ၏ အသေးစိတ်အချက်အလက်များ

စဉ်	အဆောက်အဦများ	ဧရိယာ (မီတာ)	အရေအတွက်	အဆင့်
၁	ဂိုဒေါင်	၃၀ x ၁၁၀	၁	၁
၂	အလုပ်ရုံ	၄၀ x ၁၁၀	၁	၁
၃	အလုပ်ရုံ	၄၀ x ၁၁၀	၁	၂
၄	ဝန်ထမ်းအိမ်ယာ	၂၅.၃ x ၆၃.၄	၁	၂
၅	ရုံးခန်း	၁၉.၂ x ၄၁.၈	၁	၂
၆	စက်ပြင် ပစ္စည်းများ သိုလှောင်ရာ အခန်း	၅ x ၁၅	၁	၁
၇	အန္တရာယ်ရှိသော ကုန်ပစ္စည်းများ သိုလှောင်ရုံခန်း	၄.၁ x ၂၀	၁	၁
၈	မီးစက်အခန်း	၈.၂ x ၂၄	၁	၁
၉	လုံခြုံရေးအစောင့်အခန်း	၃ x ၆	၁	၁
၁၀	စွန့်ပစ်ပစ္စည်းများ သိုလှောင်အခန်း	၂၀ x ၈.၁	၁	၁
၁၁	မြေအောက်မီးသတ်ရေကန်	၁၂ x ၃၅	၁	၁
၁၂	အလုပ်ရုံနှင့် ဂိုဒေါင်ကြားရှိ မိလ္လာကန်	၂.၅ x ၃.၅	၃	၁
၁၃	လုံခြုံရေးအစောင့်အခန်းနားရှိ မိလ္လာကန်	၁.၇၂ x ၂.၂၂	၁	၁
၁၄	ပင်မ မိလ္လာကန်	၁၂ x ၁၂	၁	၁

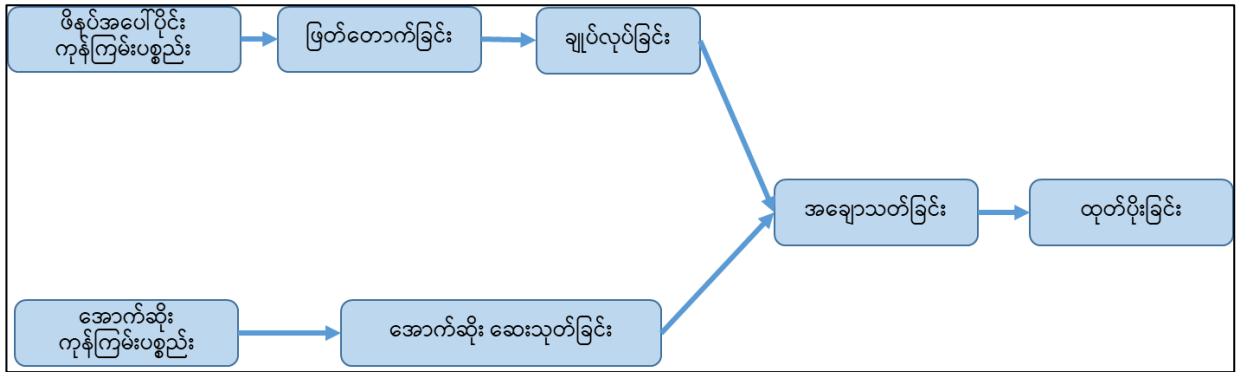
၃.၅. စီမံကိန်း၏ အစိတ်အပိုင်းများ

စီမံကိန်းလုပ်ငန်းလည်ပတ်စဉ်တွင် ဖိနပ်အမျိုးမျိုးကိုထုတ်လုပ်ရန်အတွက် ကုန်ကြမ်းပစ္စည်းများ၊ စက်ပစ္စည်းများနှင့် ကိရိယာများ၊ ဓာတုပစ္စည်းအသုံးပြုမှုနှင့် အလုပ်သမားများခန့်အပ်မှု အစရှိသည် တို့လိုအပ်ပါသည်။ လိုအပ်သော ကုန်ကြမ်းပစ္စည်းများအားလုံးကို ထိုင်ဝမ်၊ တရုတ်၊ အီတလီ၊ ဟောင်ကောင်၊ အင်္ဂလန်၊ ဂျပန်၊ မော်ရိုကို၊ ထိုင်းနိုင်ငံ၊ ဗီယက်နမ်၊ အိန္ဒိယ၊ အာဂျင်တီးနားနှင့် ဂရိနိုင်ငံများသို့ တင်ပို့ရောင်းချမည် ဖြစ်သည်။ လိုအပ်သော စက်ပစ္စည်းများနှင့် ကိရိယာများကို တရုတ်နိုင်ငံနှင့် ပြည်တွင်းမှ ဝယ်ယူအသုံးပြုမည်ဖြစ်သည်။ ထို့အပြင် လျှပ်စစ်ပစ္စည်းများ၊ အခြားဆက်စပ်ပစ္စည်းများနှင့် ရုံးသုံး စက်ပစ္စည်းကိရိယာများကို ပြည်တွင်းမှ ဝယ်ယူအသုံးပြုမည်ဖြစ်သည်။ အသေးစိတ်ကျသော ကုန်ကြမ်းပစ္စည်းများ၊ စက်ပစ္စည်းများ၊ ကိရိယာများ၊ လျှပ်စစ်ပစ္စည်းများ၊ ဆက်စပ်ပစ္စည်းများနှင့် ရုံးသုံးစက်ပစ္စည်းကိရိယာများ စာရင်းကို အခန်း (၃)၊ အပိုဒ် (၃.၅) တွင် ဖော်ပြထားပါသည်။

စီမံကိန်း၏ ဆောက်လုပ်ရေးလုပ်ငန်းအဆင့်တွင် အလုပ်ရုံ၊ ဂိုဒေါင်နှင့် အခြား ဆက်စပ်သော အဆောက်အဦများကို ဆောက်လုပ်ရန်လိုအပ်ပါသည်။

၃.၅.၁. ကုန်ထုတ်လုပ်ငန်းစဉ်

ကုန်ထုတ်လုပ်ငန်းစဉ် ပုံစံကားချပ်ကို ပုံ ၇ တွင်ဖော်ပြထားပါသည်။ ကုန်ထုတ်လုပ်ငန်းစဉ်တွင် အဓိကအားဖြင့် ကုန်ကြမ်းပစ္စည်းဖြတ်တောက်ခြင်း၊ ချုပ်လုပ်ခြင်း၊ ဖိနပ်အောက်ဆိုးကော်သုတ်ခြင်း၊ အချောသတ်ခြင်းနှင့် ထုတ်ပိုးခြင်းဟူ၍ လုပ်ငန်းစဉ် ၅ ဆင့်ရှိပါသည်။ အသေးစိတ်ကျသော ကုန်ထုတ်လုပ်ငန်းစဉ် အဆင့်ဆင့်ကို အခန်း (၃)၊ အပိုဒ် (၃.၅.၅) တွင် ဖော်ပြထားပါသည်။



ပုံ ၇ ကုန်ထုတ်လုပ်ငန်းစဉ် အဆင့်ဆင့်

၃.၅.၂. ကုန်ထုတ်လုပ်နှုန်းနှင့် ထုတ်ကုန်အမျိုးအစား

လူကြီး(ကျား/မ)စီး အားကစားဖိနပ်၊ ကလေး(ကျား/မ)စီး အားကစားဖိနပ်နှင့် ကျား/မစီး ထသွားထလာပုံမှန် ဖိနပ် စသည်ဖြင့် ထုတ်ကုန်အမျိုးအစား (၃) မျိုးကို စီမံကိန်းစက်ရုံမှ ထုတ်လုပ်မည်ဖြစ်သည်။ စီမံကိန်းစက်ရုံသည် ထုတ်ကုန်များကို အီတလီ၊ အမေရိကန်၊ ဟောင်ကောင်၊ တရုတ်၊ ဂျပန်၊ ထိုင်း၊ ဗီယက်နမ်နှင့် ကိုရီးယားနိုင်ငံများသို့ တင်ပို့မည်ဖြစ်သည်။ စုစုပေါင်း ကုန်ထုတ်လုပ်မှုနှုန်းမှာ ပထမနှစ်အတွက် ၅၂၀,၀၀၀ စုံနှင့် နောက် ဆဌမနှစ်နှင့် နှစ် ၃၀ အတွင်း ကုန်ထုတ်လုပ်မှုနှုန်းမှာ ၁,၀၅၈,၀၀၀ စုံဖြစ်သည်။ ကုန်ထုတ်လုပ်မှုနှုန်းနှင့် ကုန်ပစ္စည်းအမျိုးအစားများ အသေးစိတ်အချက်အလက်ကို အခန်း (၃)၊ အပိုဒ်ခွဲ (၃.၅.၆) နှင့် (၃.၅.၇) တွင်ဖော်ပြထားပါသည်။

၃.၅.၃. အခြေခံအဆောက်အအုံများနှင့် ကွန်ဒို အဆောက်အအုံ အထောက်အပံ့များ

၃.၅.၄. စီမံကိန်း တည်ဆောက်မှုအခြေအနေ

အခန်း (၃)၊ အပိုဒ် (၃.၆) တွင်ဖော်ပြထားသကဲ့သို့ အဆိုပြုထားသော စီမံကိန်းတည်ဆောက်မှုတွင် အောက်ဖော်ပြပါ အဆောက်အအုံများ ပါဝင်ပါသည်။

- ဂိုဒေါင် (၃ထပ်, စီမံကိန်းအဆင့် ၁)
- အလုပ်ရုံ (၃ထပ်, စီမံကိန်းအဆင့် ၁)
- အလုပ်ရုံ (၃ထပ်, စီမံကိန်းအဆင့် ၂)
- ဝန်ထမ်းအိမ်ယာ (၃ထပ်, စီမံကိန်းအဆင့် ၂)

- ရုံးခန်း (၃ထပ်, စီမံကိန်းအဆင့် ၂)
- အခြားသော ဆက်စပ်အဆောက်အဦများ (စက်ပြင် ပစ္စည်းများသိုလှောင်ရုံခန်း၊ အန္တရာယ်ရှိသော ကုန်ပစ္စည်းများ သိုလှောင်ရုံခန်း၊ မီးစက်အခန်း၊ လုံခြုံရေးအစောင့်အခန်း၊ စွန့်ပစ်ပစ္စည်းများ သိုလှောင်အခန်း၊ မြေအောက်မီးသတ်ရေကန်နှင့် မိလ္လာကန်များ) (စီမံကိန်းအဆင့် ၁)။

၃.၅.၅. မြေအသုံးချမှုအညွှန်း

မြေအသုံးချမှုအညွှန်းအတွက် အသေးစိတ်အချက်အလက်များကို ဇယား ၅ တွင် ဖော်ပြထားပါသည်။

ဇယား ၅ စီမံကိန်းအတွင်း မြေအသုံးချမှု

စဉ်	အကြောင်းအရာ	အဆင့်	တင်ပြသည့်ရက်စွဲ (ဖေဖော်ဝါရီလ၊ ၂၀၂၀)		မှတ်ချက်
			ဧရိယာ	ယူနစ်	
၁	စီမံကိန်း ဧရိယာ	-	၃၅,၂၄၀.၀၅၇	စတုရန်းမီတာ	ပြောင်းလဲမှုမရှိပါ
၂	စီမံကိန်း အဆောက်အဦ ကြမ်းခင်း ဧရိယာ	-	၄၀,၆၆၄.၈၄၀	စတုရန်းမီတာ	ပြောင်းလဲမှုမရှိပါ
၃	အလုပ်ရုံ အဆောက်အဦ	၁	၄,၆၉၂	စတုရန်းမီတာ	
၄	ဂိုဒေါင် အဆောက်အဦ	၁	၃,၃၀၀	စတုရန်းမီတာ	
၅	စက်ပြင် ပစ္စည်းများ သိုလှောင်ရာ အခန်း	၁	၇၅	စတုရန်းမီတာ	
၆	အန္တရာယ်ရှိသော ကုန်ပစ္စည်းများ သိုလှောင်ရုံခန်း	၁	၈၂	စတုရန်းမီတာ	
၇	မီးစက်အခန်း	၁	၁၉၆.၈	စတုရန်းမီတာ	
၈	လုံခြုံရေးအစောင့်အခန်း	၁	၁၈	စတုရန်းမီတာ	
၉	စွန့်ပစ်ပစ္စည်းများ သိုလှောင်အခန်း	၁	၁၆၂	စတုရန်းမီတာ	
၁၀	မြေအောက်မီးသတ်ရေကန်	၁	၄၂၀	စတုရန်းမီတာ	
၁၁	အလုပ်ရုံနှင့် ဂိုဒေါင်ကြားရှိ မိလ္လာကန်	၁	၂၆.၂၅	စတုရန်းမီတာ	
၁၂	လုံခြုံရေးအစောင့်အခန်းနားရှိ မိလ္လာကန်	၁	၃.၈၂	စတုရန်းမီတာ	
၁၃	ပင်မ မိလ္လာကန်	၁	၁၄၄	စတုရန်းမီတာ	
စုစုပေါင်း ဧရိယာ		၁	၁၅,၆၃၄.၄၅	စတုရန်းမီတာ	
၁၄	အလုပ်ရုံ အဆောက်အဦ	၂	၄,၆၈၂	စတုရန်းမီတာ	
၁၅	ဝန်ထမ်းအိမ်ယာ	၂	၁,၆၁၀.၃၆	စတုရန်းမီတာ	
၁၆	ရုံးခန်း	၂	၈,၂၅၆	စတုရန်းမီတာ	
စုစုပေါင်း ဧရိယာ		၂	၇,၀၉၄.၉၂	စတုရန်းမီတာ	

၃.၅.၆. ယာဉ်ကြောစနစ်

မဟာမြိုင်လမ်းမှ စီမံကိန်းဧရိယာအတွင်းသို့ ဝင်ရန် အဓိကဝင်ပေါက် ၁ ခုရှိပါသည်။ စီမံကိန်းအတွင်းတွင် ကားအစီး ၂၀ ဆုံသည့် ကားရပ်နားရန် နေရာကို တည်ဆောက်ရန် စီစဉ်ထားပါသည်။

၃.၅.၇. အိမ်သုံးရေအတွက် ရေထောက်ပံ့မှုစနစ်

၃.၅.၇.၁. ရေအရင်းအမြစ်

စက်ရုံနှင့် ဝန်ထမ်းအိမ်ယာအတွက် ရေအသုံးပြုမည့်စနစ်အား အဝီစိရေတွင်းမှ အဓိက ရေပေးဝေမည် ဖြစ်ပါသည်။ အဝီစိရေတွင်းသည် စီမံကိန်းဧရိယာ၏ မြေအောက်မီးသတ်ကန် အနီးတွင် ရှိပြီး အဝီစိရေတွင်း၏ အနက်မှာ ၄၂.၆၇ မီတာ ဖြစ်သည်။ ရေများကို ရေသိုလှောင်ကန်များတွင် သိုလှောင်ပြီး စီမံကိန်းဧရိယာ၏ အဆောက်အဦတစ်ခုချင်းစီသို့ ပိုက်လိုင်းစနစ်ဖြင့် ဖြန့်ဝေပါသည်။

၃.၅.၇.၂. ရေလိုအပ်ချက်ပမာဏ

စီမံကိန်း အဆင့် ၁ ဆောက်လုပ်ရေး အတွက် ခန့်မှန်းတွက်ချက်ထားသော ရေလိုအပ်ချက်မှာ ၃၂၅,၁၉၆.၅ ကုဗမီတာ ဖြစ်ပြီး စီမံကိန်း အဆင့် ၂ အတွက် ခန့်မှန်းတွက်ချက်ထားသော ရေလိုအပ်ချက်မှာ ၁၄၇,၅၇၄.၃ ကုဗမီတာဖြစ်သည်။ ထို့အပြင် လုပ်ငန်းလည်ပတ်နေစဉ် ကာလအတွက် ခန့်ထားမည့် ဝန်ထမ်းဦးရေ ၃,၀၁၄ ဦးကိုအခြေခံ၍ ခန့်မှန်းတွက်ချက်ထားသော ရေလိုအပ်ချက်မှာ တစ်ရက်လျှင် ၃၃၁.၅၄ ကုဗမီတာ ဖြစ်သည်။ သို့သော်လည်း စီမံကိန်းစက်ရုံသည် CMP စနစ်ဖြင့် ဖိနပ်ထုတ်လုပ်သည့် လုပ်ငန်းဖြစ်သဖြင့် ကုန်ထုတ်လုပ်စဉ်များအတွက် သိသာထင်ရှားသော ရေအသုံးပြုမှု မရှိပါ။

၃.၅.၈. စွန့်ပစ်ရေ စွန့်ပစ်ခြင်း စနစ်

စီမံကိန်းတည်ဆောက်စဉ် ကာလနှင့် လည်ပတ်စဉ် ကာလတွင် စီမံကိန်းမှ စွန့်ပစ်ရေများ ထွက်ရှိမည် ဖြစ်သည်။ CMP စနစ်ဖြင့် ဖိနပ်ထုတ်လုပ်သည့် လုပ်ငန်းဖြစ်သဖြင့် စီမံကိန်း လုပ်ငန်းလည်ပတ်စဉ်ကာလတွင် စက်ရုံအလုပ်သမားများ အသုံးပြုပြီးသော အိမ်သုံးစွန့်ပစ်ရေသာ ထွက်ရှိမည်ဖြစ်သည်။ စီမံကိန်းမှ ထွက်ရှိသော အိမ်သုံးစွန့်ပစ်ရေများကို ရေနုတ်မြောင်းထဲသို့ တိုက်ရိုက် စွန့်ပစ်မည်ဖြစ်သည်။ စီမံကိန်းရှိ အဆောက်အဦမှထွက်ရှိလာသော မိလ္လာ အညစ်အကြေးများကို မိလ္လာကန်များနှင့် စုဆောင်းထားမည် ဖြစ်ပြီး သက်ဆိုင်ရာဌာနများ၏ လမ်းညွှန်ချက်များနှင့် အညီ စွန့်ပစ်မည် ဖြစ်ပါသည်။

၃.၅.၉. ရေနုတ်မြောင်းစနစ်

စီမံကိန်းဧရိယာတစ်ခုလုံး၏ အတွင်းဘက်တွင် ရေနုတ်မြောင်းနှစ်ခု ရှိသည်။ အလုပ်ရုံ နှင့် ဂိုဒေါင် အဆောက်အဦများ၏ အရံရေနုတ်မြောင်းသည် စီမံကိန်း၏ အဓိကရေနုတ်မြောင်း နှင့် ဆက်သွယ်ထားပါသည်။ အရံရေနုတ်မြောင်းမှထွက်ရှိသော စွန့်ပစ်ရေများသည် အဓိကရေမြောင်းထဲသို့ စွန့်ထုတ်ပြီး စက်မှုဇုန် ရေနုတ်မြောင်းသို့ စီးဆင်းသွားမည်ဖြစ်သည်။

၃.၅.၁၀. အစိုင်အခဲစွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု

ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း လုပ်သား ၄၆၂ ဦးရှိပြီး ဆောက်လုပ်ရေးလုပ်သားများထံမှ အမှိုက်ထွက်ရှိနှုန်းမှာ ခန့်မှန်းခြေအားဖြင့် တစ်ရက်လျှင် ၁၈၄.၈ ကီလိုဂရမ်ခန့်ရှိပါသည်။ စီမံကိန်းလည်ပတ်စဉ်ကာလတွင် စက်ရုံဝန်ထမ်းများ၏ အရေအတွက်ပေါ်မူတည်၍ ခန့်မှန်း တွက်ချက်ထားသော စွန့်ပစ်ပစ္စည်းထွက်ရှိမှုမှာ တစ်ရက်လျှင် ခန့်မှန်းခြေ ၁,၁၉၃.၆ ကီလိုဂရမ်ရှိပြီး ထုတ်လုပ်မှု လုပ်ငန်းစဉ်များမှ ထွက်ရှိမည့် ခန့်မှန်းတွက်ချက်ထားသော စွန့်ပစ်အမှိုက်ပမာဏမှာ တစ်လလျှင် ၆၅၀ ကီလိုဂရမ်ခန့်ဖြစ်သည်။ စီမံကိန်းနေရာတွင် အမှိုက်ပုံးများ လုံလောက်စွာ ထားရှိမည် ဖြစ်ပြီး ထိုအမှိုက်များကို စွန့်ပစ်ပစ္စည်းများ သိုလှောင်သော အခန်းတွင် စနစ်တကျ စုဆောင်း ထားကာ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်များ အတိုင်း စွန့်ပစ်မည် ဖြစ်သည်။

၃.၅.၁၁. စွမ်းအင်ထောက်ပံ့မှုစနစ်

စီမံကိန်း တည်ဆောက်စဉ် ကာလတွင် လျှပ်စစ်ဓာတ်အား အတွက် ယာယီသုံး မီးစက်များကို အသုံးပြုပါမည်။ စီမံကိန်း လုပ်ငန်းလည်ပတ်စဉ် ကာလတွင် လျှပ်စစ်ဓာတ်အား အတွက် ၃၃ kV လိုင်းမှ ၂,၀၀၀ kVA ထရန်စဖော်မာ တစ်လုံးကို ရန်ကုန်မြို့တော် လျှပ်စစ်ဓာတ်အားပေးရေး ကော်ပိုရေးရှင်း ၏ စည်းမျဉ်း၊ စည်းကမ်းဥပဒေများနှင့် အညီ တပ်ဆင်အသုံးပြုရန်လျာထားပါသည်။ ထို့အပြင် လျှပ်စစ်ဓာတ်အားအတွက် ၆၄၀ kVA ရှိသော ဒီဇယ်မီးစက်သုံးလုံးကို လက်ရှိအချိန်တွင် တပ်ဆင်အသုံးပြုနေပါသည်။

၃.၅.၁၂. လေဝင်လေထွက်ကောင်းမွန်စေသော စနစ်

အဆောက်အဦများတွင် လေဝင်လေထွက်ကောင်းမွန်စေရန် စက်ရုံသုံးလေဝင်လေထွက်ကောင်းမွန်စေသော ပန်ကာများ၊ လေအေးပေးစက် အလုံး ၄၀ နှင့် ပြတင်းပေါက်များကို စီမံကိန်းအဆောက်အဦများတွင် တပ်ဆင်အသုံးပြုသွားမည် ဖြစ်ပါသည်။ လက်ရှိအချိန်တွင် တပ်ဆင်ထားသော လေအေးပေးစက် ၁၅ လုံး ရှိပြီး စီမံကိန်းဆောက်လုပ်ခြင်း အဆင့် ၂ တွင် အလုံး ၄၀ အထိ တိုးမြှင့်လာနိုင်ပါသည်။ လေအေးပေးစက်များတွင် အသုံးပြုသော ဓာတ်ငွေ့များသည် အိုဇုန်းလွှာပျက်စီးစေတတ်သော တားမြစ်ထားသော စာရင်းတွင်မပါဝင်သော ဓာတ်ငွေ့များကိုသာ အသုံးပြုထားပါသည်။

၃.၅.၁၃. မီးငြိမ်းသတ်ရေးစနစ်နှင့် အရေးပေါ်ထွက်ပေါက်

ရေ ၂၆၂,၀၅၃ ဂါလန် ဆံ့သော မြေအောက်မီးသတ်ကန်ကို စက်ရုံဝန်းအတွင်း ဆောက်လုပ်မည်ဖြစ်ပြီး မီးသတ်ကန်၏ ဧရိယာအကျယ်အဝန်းမှာ ၄၂၀ စတုရန်းမီတာ ကျယ်ဝန်းပါသည်။ စီမံကိန်းအတွင်းရှိ အဆောက်အဦများကို မီးဘေးအန္တရာယ် ကာကွယ်ရန် သံမဏိဖြင့် ဆောက်လုပ်ထားပါသည်။ လက်ရှိအချိန်တွင် မီးသတ်ဆေးဗူး ၁၄၀၊ မီးသတ်ပိုက် ၃၄ ခုနှင့် မီးအန္တရာယ်သတိပေးစနစ် ၃၄ ခုကို တပ်ဆင်ထားပြီး မီးသတ်ဆေးဗူး အရေအတွက်၊ မီးသတ်ပိုက်နှင့် မီးအန္တရာယ်သတိပေးစနစ် အရေအတွက်မှာ ဆောက်လုပ်ရေးအဆင့်၂ ပြီးဆုံးပါက တိုးမြှင့်လာနိုင်ပါသည်။ အသေးစိတ်ကျသော မီးသတ်စနစ်နှင့် အရေးပေါ်ထွက်ပေါက်အခြေအနေကို အခန်း (၃)၊ အပိုဒ်ခွဲ (၃.၆.၁၂) တွင် ဖော်ပြထားပါသည်။

၄. ပတ်ဝန်းကျင်ဆိုင်ရာအခြေခံအချက်အလက်များ

စီမံကိန်း၏လေ့လာသည့် ဧရိယာအတွင်းတွင် သဘာဝပတ်ဝန်းကျင်၊ ပတ်ဝန်းကျင် အရည်အသွေး တိုင်းတာမှု၊ လူမှုစီးပွားနှင့် ဇီဝဗေဒဆိုင်ရာလေ့လာမှုများ စသည့် ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များကို တိုင်းတာခဲ့ပြီး အနှစ်ချုပ်ကို ဇယား ၆ တွင်ဖော်ပြထားပါသည်။

ဇယား ၆ ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များ ကောက်ယူခြင်းအနှစ်ချုပ်

စဉ်	အမျိုးအစား	အကြောင်းအရာ
သဘာဝပတ်ဝန်းကျင်		
၁	ရာသီဥတု	<p>ဤအချက်အလက်များကို ရွှေ့ပြည်သာမြို့နယ် ဒေသဆိုင်ရာ အချက်အလက်များ (၂၀၂၀) မှ ကောက်နှုတ်ထားပါသည်။ တစ်နှစ်တာ ကာလအတွင်း ပျမ်းမျှအမြင့်ဆုံးအပူချိန်မှာ ၃၈ ဒီဂရီစင်တီဂရိတ် နှင့် ပျမ်းမျှအနိမ့်ဆုံးအပူချိန်မှာ ၃၀ ဒီဂရီစင်တီဂရိတ် ရှိပါသည်။ ၂၀၂၀ ခုနှစ် တွင် စုစုပေါင်း မိုးရေချိန် ၇၉.၇၉ လက်မ ရှိပြီး မိုးရွာရက်မှာ ရက်ပေါင်း ၁၀၀ ရှိပါသည်။</p> <p>မိုးလေဝသနှင့်ဇလဗေဒညွှန်ကြားမှုဦးစီးဌာန (၂၀၂၀) အချက်အလက်များအရ တောင်တန်းစံတော်ချိန် ၆နာရီခွဲတွင် တိုင်းတာချက်များအရ တစ်ရက်ပျမ်းမျှ စိုထိုင်းဆမှာ နွေရာသီတွင် ၉၈ ရာခိုင်နှုန်း၊ မိုးရာသီတွင် ၉၉ ရာခိုင်နှုန်းနှင့် ဆောင်းရာသီတွင် ၉၅ ရာခိုင်နှုန်း၊ တောင်တန်းစံတော်ချိန် ၁၂နာရီခွဲတွင် တိုင်းတာချက်များအရ တစ်ရက်ပျမ်းမျှ စိုထိုင်းဆမှာ နွေရာသီတွင် ၄၂ ရာခိုင်နှုန်း၊ မိုးရာသီတွင် ၇၆ ရာခိုင်နှုန်းနှင့် ဆောင်းရာသီတွင် ၄၈ ရာခိုင်နှုန်းနှင့် တောင်တန်းစံတော်ချိန် ၁၈နာရီခွဲတွင် တိုင်းတာချက်များအရ တစ်ရက်ပျမ်းမျှ စိုထိုင်းဆမှာ နွေရာသီတွင် ၄၅ ရာခိုင်နှုန်း၊ မိုးရာသီတွင် ၈၇ ရာခိုင်နှုန်းနှင့် ဆောင်းရာသီတွင် ၆၆ ရာခိုင်နှုန်းရှိပါသည်။</p> <p>စီမံကိန်းမြို့နယ်၏ နေ့စဉ်ပျမ်းမျှအများဆုံး အပူချိန်မှာ နွေရာသီတွင် ၃၈ ဒီဂရီစင်တီဂရိတ်၊ မိုးရာသီတွင် ၃၃ ဒီဂရီစင်တီဂရိတ်နှင့် ဆောင်းရာသီတွင် ၃၃ ဒီဂရီစင်တီဂရိတ်ရှိပါသည်။ စီမံကိန်းမြို့နယ်၏ နေ့စဉ်ပျမ်းမျှအနည်းဆုံး အပူချိန်မှာ နွေရာသီတွင် ၂၂ ဒီဂရီစင်တီဂရိတ်၊ မိုးရာသီတွင် ၂၄ ဒီဂရီစင်တီဂရိတ်နှင့် ဆောင်းရာသီတွင် ၁၇ ဒီဂရီစင်တီဂရိတ်ရှိပါသည်။</p>

စဉ်	အမျိုးအစား	အကြောင်းအရာ
		<p>ထို့အပြင် နေ့စဉ်ပျမ်းမျှမိုးရွာသွန်းမှာ နေ့ရာသီတွင် ၀.၀၀ လက်မ၊ မိုးရာသီတွင် ၁၁.၈၄ လက်မနှင့် ဆောင်းရာသီတွင် ၀.၁၈ လက်မရှိပါသည်။</p> <p>စီမံကိန်းမြို့နယ်၏ တောင်တန်းစံတော်ချိန် ၆နာရီခွဲတွင် တိုင်းတာချက်များအရ နေ့စဉ်ပျမ်းမျှလေတိုက်နှုန်းမှာ နေ့ရာသီတွင် တစ်နာရီလျှင် ၀.၇၈ မိုင်၊ မိုးရာသီတွင် တစ်နာရီလျှင် ၀.၇၆ မိုင်နှင့် ဆောင်းရာသီတွင် တစ်နာရီလျှင် ၃၃ မိုင်၊ တောင်တန်းစံတော်ချိန် ၉နာရီခွဲတွင် တိုင်းတာချက်များအရ နေ့စဉ်ပျမ်းမျှလေတိုက်နှုန်းမှာ နေ့ရာသီတွင် တစ်နာရီလျှင် ၃.၅၅ မိုင်၊ မိုးရာသီတွင် တစ်နာရီလျှင် ၃.၄၃ မိုင်နှင့် ဆောင်းရာသီတွင် တစ်နာရီလျှင် ၂.၄၆ မိုင်၊ တောင်တန်းစံတော်ချိန် ၁၂နာရီခွဲတွင် တိုင်းတာချက်များအရ နေ့စဉ်ပျမ်းမျှလေတိုက်နှုန်းမှာ နေ့ရာသီတွင် တစ်နာရီလျှင် ၅.၁၃ မိုင်၊ မိုးရာသီတွင် တစ်နာရီလျှင် ၄.၅၃ မိုင်နှင့် ဆောင်းရာသီတွင် တစ်နာရီလျှင် ၄.၅၃ မိုင်နှင့် တောင်တန်းစံတော်ချိန် ၁၈နာရီခွဲတွင် တိုင်းတာချက်များအရ နေ့စဉ်ပျမ်းမျှလေတိုက်နှုန်းမှာ နေ့ရာသီတွင် တစ်နာရီလျှင် ၃.၆၆ မိုင်၊ မိုးရာသီတွင် တစ်နာရီလျှင် ၂.၃၃ မိုင်နှင့် ဆောင်းရာသီတွင် တစ်နာရီလျှင် ၀.၄၁ မိုင် ရှိပါသည်။</p>
၂	မြေမျက်နှာသွင်ပြင်	<p>စီမံကိန်းဧရိယာသည် ရွှေပြည်သာမြို့နယ်တွင် တည်ရှိပြီး အရှေ့ဘက်တွင် မင်္ဂလာဒုံမြို့နယ်နှင့် လှော်ကားကန်၊ အနောက်ဘက်တွင် လှိုင်မြစ် (ခ) ဝါးတစ်ရာမြစ် နှင့် ထန်းတစ်ပင်မြို့နယ်၊ တောင်ဘက်တွင် အင်းစိန်မြို့နယ် နှင့် မြောက်ဘက်တွင် မှော်ဘီမြို့နယ်တို့ဖြင့် နယ်နိမိတ် ထိစပ် တည်ရှိနေသည်။ စီမံကိန်းဧရိယာသည် လှိုင်မြစ်ကမ်း အနီး ပင်လယ်ရေ မျက်နှာပြင်အထက် ၈ မီတာခန့်အမြင့်တွင် တည်ရှိပြီး ရွှေပြည်သာမြို့နယ် သည် ပင်လယ်ရေ မျက်နှာပြင်အထက် ၃၀.၄၈ မီတာ အမြင့်တွင် ရှိပါသည်။</p>
၃	ဘူမိဗေဒ၊ မြေဆီလွှာနှင့် ငလျင်	<p>စီမံကိန်းတည်ရှိရာ ရွှေပြည်သာမြို့နယ်ရှိ စီမံကိန်းဧရိယာသည် ရန်ကုန်တိုင်း ဒေသကြီးတွင် တည်ရှိပြီး ပလစ်တိုဆင်းအဏုယုဂ်မှ ခေတ်သစ် Pleistocene to recent) သက်တမ်းရှိသည့် ဧရာဝတီ ကျောက်လွှာ၏ မြစ်ချောင်းမှ ပို့ချသော အနည်ကျ ကျောက်များ နှင့် အစောပိုင်းမှ အနောင်းပိုင်း မိုင်ယိုဆင်း အဏုယုဂ် (Early-late Miocene) သက်တမ်းရှိသည့် ပဲခူးကျောက်စဉ်တန်း၏ မာကျောပြီး ထုထည်လိုက် ပေါ်ထွက်နေသော သဲကျောက်များအပေါ်တွင် တည်ရှိနေသည်။ နန်းမြေပို့ချမှု အောက်တွင် ရှိပါသည်။</p> <p>ရွှေပြည်သာမြို့နယ်ရှိ စီမံကိန်းဧရိယာသည် ရန်ကုန်တိုင်း ဒေသကြီးတွင် တည်ရှိပြီး မြေဆီလွှာ အနေအထားအရ မြက်နုမြေများ၊ ရွှံ့နွံ ရွှံ့မြေများ၊ စိမ့်မြေများ၊ ဂဝံမြေများ၊ အဝါရောင် သစ်တောမြေများ၊ သဲတောများ နှင့် သဲသောင်ပြင်၊ ဒီရေတောမြေများ နှင့် ဆားငံစပ်မြက်ခင်းများ၊ ရွှံ့မြေများ ဖြစ်ပါသည်။</p> <p>ငလျင်ဇုန်မြေပုံအရ ရန်ကုန်တိုင်းဒေသကြီးသည် ပြင်းထန်၍ အင်အား အသင့်အတင့်ရှိသော နေရာတွင်တည်ရှိသည်။ ထို့ကြောင့် ငလျင်ဒဏ်ခံ ဒီဇိုင်းပုံစံကို လေ့လာသင့်သည်။ ထို့အပြင် မြေပြင်ရွေ့လျားမှု ပုံစံကိုလည်း စနစ်တကျလေ့လာသင့်သည်။ ငလျင်လှုပ်မှု မှတ်တမ်းများ အရ ရန်ကုန်တိုင်း ဒေသကြီးသည် နိမ့်ရာမှ အလယ်အလတ်အဆင့် ရှိသော ငလျင်ရပ်ဝန်းတွင် ရှိနိုင်ပါသည်။</p>
၄	ဇလဗေဒ	<p>စီမံကိန်းဧရိယာ တဝိုက်ရှိ အဓိကမြစ်မှာ လှိုင်မြစ် (ခ) ဝါးတစ်ရာမြစ် ဖြစ်ပြီး ဝါးတစ်ရာ စက်မှုဇုန်၏ အနောက်ဘက်ခြမ်းတွင် စီးဆင်းနေသော</p>

စဉ်	အမျိုးအစား	အကြောင်းအရာ
		ကြီးမားသော ရေချိုမြစ်ဖြစ်သည်။ ဤမြစ်သည် စီမံကိန်းနေရာမှ ၀.၈ ကီလိုမီတာခန့်တွင် တည်ရှိပါသည်။
ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအရည်အသွေး တိုင်းတာမှု		
၅	လေထုအရည်အသွေး	<p>ကာဗွန်ဒိုင်အောက်ဆိုဒ်၊ ကာဗွန်မိုနောက်ဆိုဒ်၊ နိုက်ထရိုဂျင်ဒိုင် အောက်ဆိုဒ်၊ ဆာလဖာဒိုင်အောက်ဆိုဒ်၊ မီသိန်း၊ အငွေ့ပြန်လွယ်သော အော်ဂဲနစ် ဒြပ်ပေါင်းများ၊ အိုဇုန်း၊ လေထုထဲရှိ အမှုန်အမွှားများ၊ အပူချိန် နှင့် စိုထိုင်းစ ကဲ့သို့သော လေထုအရည်အသွေးများကို ရွှေ့ပြည်သာမြို့နယ်၏ စီမံကိန်း ဝန်းကျင်တွင် ၅ နေရာခွဲ၍ နှစ်ကြိမ် တိုင်းတာခဲ့ပါသည်။ ပထမအကြိမ်ကို ၂၀၂၀ ခုနှစ် ဧပြီလ ၂၄ရက်မှ ဇွန်လ ၅ ရက်နှင့် ဒုတိယအကြိမ်ကို ၂၀၂၂ ခုနှစ် ဒီဇင်ဘာလ ၈ရက်မှ ၁၂ ရက်ထိ တိုင်းတာခဲ့ပါသည်။ ရလဒ်များကို အမျိုးသား ပတ်ဝန်းကျင် အရည်အသွေး ဓာတ်ငွေ့ထုတ်လုပ်မှု လမ်းညွှန်ချက်များ (၂၀၁၅) နှင့် နှိုင်းယှဉ်ခဲ့သည်။</p> <p>နေရာ ၅ နေရာလုံးတွင် တိုင်းတာခဲ့သော တိုင်းတာမှု နှစ်ခုလုံး၏ လေထုအရည်အသွေးများမှာ အမျိုးသား ပတ်ဝန်းကျင် အရည်အသွေး ဓာတ်ငွေ့ ထုတ်လုပ်မှု လမ်းညွှန်ချက်များ (၂၀၁၅) အတွင်းတွင် ရှိပါသည်။</p>
၆	လေတိုက်နှုန်းနှင့် လေတိုက်ရာအရပ်	<p>ပထမအကြိမ်တိုင်းတာမှုများအရ လေတိုက်ရာ အရပ်မှာ A1 နှင့် A2 တွင် အရှေ့တောင်အရပ်၊ အမှတ် A3 တွင် အရှေ့အရှေ့တောင်အရပ်နှင့်၊ A4 နှင့် A5 တွင် အနောက်တောင်အရပ်သို့ တိုက်ခတ်ပါသည်။</p> <p>ပျမ်းမျှလေတိုက်နှုန်းမှာ A1 တွင် တစ်စက္ကန့်လျှင် ၁.၀၂ မီတာ၊ A2 တွင် တစ်စက္ကန့်လျှင် ၁.၃၀ မီတာ၊ A3 တွင် တစ်စက္ကန့်လျှင် ၁.၆၃ မီတာ၊ A4 တွင် တစ်စက္ကန့်လျှင် ၀.၆၆ မီတာနှင့်၊ A5 တွင် တစ်စက္ကန့်လျှင် ၁.၃၇ မီတာ နှုန်းဖြင့် တိုက်ခတ်ပါသည်။</p> <p>ဒုတိယအကြိမ်တိုင်းတာမှုများအရ လေတိုက်ရာ အရပ်မှာ A1၊ A2၊ A3၊ A4 နှင့် A5 တွင် အရှေ့နောက်အရပ်သို့ တိုက်ခတ်ပါသည်။</p> <p>ပျမ်းမျှလေတိုက်နှုန်းမှာ A1 တွင် တစ်စက္ကန့်လျှင် ၁.၁ မီတာ၊ A2 တွင် တစ်စက္ကန့်လျှင် ၁.၀ မီတာ၊ A3 တွင် တစ်စက္ကန့်လျှင် ၀.၈ မီတာ၊ A4 တွင် တစ်စက္ကန့်လျှင် ၀.၉ မီတာနှင့်၊ A5 တွင် တစ်စက္ကန့်လျှင် ၀.၈ မီတာ နှုန်းဖြင့် တိုက်ခတ်ပါသည်။</p>
၇	ဆူညံသံ	<p>ဆူညံသံကို စီမံကိန်းဧရိယာအတွင်း ၅ နေရာတွင် နှစ်ကြိမ် တိုင်းတာခဲ့ပါသည်။ ရလဒ်များကို အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး ထုတ်လွှတ်မှု လမ်းညွှန်ချက် (၂၀၁၅) နှင့် နှိုင်းယှဉ်ဖော်ပြထားပါသည်။ N1၊ N2 နှင့် N3 နေရာ၌ နေအချိန်နှင့် ညအချိန်တိုင်းတာသော ရလဒ်များနှင့် N4 (နေအချိန်) တွင် တိုင်းတာခဲ့သော တိုင်းတာမှုနှစ်ခုလုံး၏ရလဒ်များသည် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေးထုတ်လွှတ်မှု လမ်းညွှန်ချက် (၂၀၁၅) (စက်မှုဆိုင်ရာ (သို့မဟုတ်) စီးပွားရေးဆိုင်ရာ) ဆူညံသံအဆင့် အတွင်းတွင် ရှိပါသည်။ N4 (နေအချိန်နှင့် ညအချိန်) နှင့် N5 (ညအချိန်) တွင် တိုင်းတာခဲ့သော ဆူညံသံရလဒ်များသည် မိုးရာသီတွင် တိုင်းတာခဲ့သော ကြောင့် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး ထုတ်လွှတ်မှု လမ်းညွှန်ချက် (၂၀၁၅) ထက် အနည်းငယ် ကျော်လွန်နေသည်ကို တွေ့ရပါသည်။ ထို့အပြင် N4 နေရာသည် လိုတရဟာသီတဘုန်းကြီးကျောင်း (ဘုန်းတော်ကြီးသင်</p>

စဉ်	အမျိုးအစား	အကြောင်းအရာ
		စာသင်ကျောင်း) တွင် ရှိပြီး စာသင်ခြင်းနှင့် ရှိခိုးပူဇော်ရွတ်ဖတ်ခြင်း လုပ်ငန်းများကြောင့် ဆူညံသံပိုများခြင်းဖြစ်နိုင်ပါသည်။
၈	တုန်ခါမှု	တုန်ခါမှုကို နေရာ ၅ နေရာ၌ တိုင်းတာခဲ့ပြီး တုန်ခါမှုရလဒ်များကို ဂျာမန် တုန်ခါမှုစံသတ်မှတ်ချက် Din 4150-3 နှင့် နှိုင်းယှဉ်ထားပါသည်။ ကွင်းဆင်း တိုင်းတာချက်များအရ နေရာအားလုံးရှိ တုန်ခါမှု ရလဒ်များမှာ ဂျာမန် တုန်ခါမှုစံသတ်မှတ်ချက် Din 4150-3 အတွင်းတွင် ရှိပါသည်။
၉	ရေအရည်အသွေး	<p>ရေနမူနာများကို ပထမအကြိမ်တွင် (၄) နေရာနှင့် ဒုတိယအကြိမ်တွင် (၅) နေရာ၌ ကောက်ယူတိုင်းတာခဲ့ပါသည်။ လိန်ကုန်းချောင်းနှင့် လှိုင်မြစ်တွင် မြေပေါ်ရေနမူနာ ၃ နေရာနှင့် စီမံကိန်းအတွင်းတွင် မြေအောက်ရေ တစ်နေရာနှင့် စွန့်ပစ်ရေ တစ်နေရာကို ကောက်ယူခဲ့ပါသည်။ ရေအရည်အသွေး ရလဒ်များကို အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေးထုတ်လွှတ်မှု လမ်းညွှန်ချက် (၂၀၁၅)နှင့် မြန်မာအမျိုးသား သောက်သုံးရေ အရည်အသွေး လမ်းညွှန်ချက် (၂၀၁၉) တို့ဖြင့် နှိုင်းယှဉ်ထားပါသည်။</p> <p><u>မိုးရာသီတွင် တိုင်းတာသည့်ရလဒ်</u></p> <p>လိန်ကုန်းချောင်းရေ၏ နောက်ကျိုမှု နှင့် သံဓာတ်၊ လှိုင်မြစ်ရေ၏ နောက်ကျိုမှု နှင့် ပျော်ဝင်နေသည့် စုစုပေါင်းဒြပ်များသည် မြန်မာအမျိုးသား သောက်သုံးရေ လမ်းညွှန်ချက် (၂၀၁၉) ထက် မြင့်မားနေပါသည်။ လိန်ကုန်းချောင်းရေ နှင့် လှိုင်မြစ်ရေ၏ ဆိုင်းငံ့နေသော စုစုပေါင်းဒြပ်များသည် အမျိုးသား အရည်အသွေး ထုတ်လွှတ်မှုလမ်းညွှန်ချက် (၂၀၁၅) ထက်မြင့်မားနေပါသည်။ လှိုင်မြစ်နှင့် လိန်ကုန်းချောင်းရေများသည် သောက်သုံးရန်အတွက် မသင့်တော်ပါ။</p> <p><u>ခြောက်သွေ့ချိန်တွင် တိုင်းတာသည့်ရလဒ်</u></p> <p>လိန်ကုန်းချောင်းရေ၏ နောက်ကျိုမှု၊ လှိုင်မြစ်ရေ၏ နောက်ကျိုမှု နှင့် ပျော်ဝင်နေသည့် စုစုပေါင်းဒြပ်များသည် မြန်မာအမျိုးသား သောက်သုံးရေ လမ်းညွှန်ချက် (၂၀၁၉) ထက် မြင့်မားနေပါသည်။ လှိုင်မြစ်အောက်ရေ၏ ဆိုင်းငံ့နေသော စုစုပေါင်းဒြပ်များသည် အမျိုးသား အရည်အသွေး ထုတ်လွှတ်မှုလမ်းညွှန်ချက် (၂၀၁၅) ထက်မြင့်မားနေပါသည်။ စီမံကိန်းအတွင်းရှိ မြေအောက်ရေအရည်အသွေးသည် နောက်ကျိုမှုမှအပ ကျန်ပါရာမီတာများသည် မြန်မာအမျိုးသား သောက်သုံးရေ လမ်းညွှန်ချက် (၂၀၁၉) အတွင်းတွင်ရှိပါသည်။ ထို့အပြင် စွန့်ပစ်ရေရလဒ်များသည် အမျိုးသား အရည်အသွေး ထုတ်လွှတ်မှုလမ်းညွှန်ချက် (၂၀၁၅)အတွင်းသာ ရှိပါသည်။</p>
၁၀	ယာဉ်သွားလာမှု ကောက်ယူခြင်း	ယာဉ်သွားလာမှုများကို လေ့လာသည့် ဧရိယာ၌ ၅ နေရာတွင် နှစ်ကြိမ် ကောက်ယူခဲ့ပါသည်။ ကောက်ယူမှတ်တမ်းတင်ခြင်းကို မနက် ၇ နာရီမှ ညနေ ၇ နာရီအထိ ၁၂ နာရီအကြာ ဆောင်ရွက်ခဲ့ပါသည်။ ၅ နေရာလုံးတွင် ပုံမှန်ယာဉ်သွားလာမှု နှင့် သင့်လျော်သော ယာဉ်သွားလာမှုအခြေအနေတွင် ရှိပါသည်။
လူမှုစီးပွားဆိုင်ရာ ပတ်ဝန်းကျင်		
၁၁	မြေအသုံးပြုမှု	မြေအသုံးပြုမှုကို စီမံကိန်း၏ ၃ ကီလိုမီတာ အတွင်းတွင် လေ့လာခဲ့ ပါသည်။ လေ့လာရာတွင် သုဿန်မြေ၊ အပန်းဖြေရန်နေရာ၊ မြေကွက်၊ လမ်း၊

စဉ်	အမျိုးအစား	အကြောင်းအရာ
		ဘာသာရေးနယ်မြေ၊ အစိုးရမြေဧရိယာ၊ စီးပွားရေးမြေဧရိယာ၊ ရေပိုင်နက်၊ စက်မှုဇုန်၊ စိုက်ပျိုးရေးမြေဧရိယာ နှင့် လူနေဧရိယာများ ကဲ့သို့သော လမ်းအသုံးပြုမှု အမျိုးအစား ၁၁ မျိုး တွေ့ရှိရပါသည်။ လေ့လာတွေ့ရှိချက် အရ လူနေဧရိယာသည် ၃ ကီလိုမီတာအတွင်းတွင် အကြီးဆုံးအပိုင်းဖြစ်ပြီး သုဿန် ဧရိယာသည် အသေးဆုံးအပိုင်း ဖြစ်သည်။
၁၂	လူဦးရေနှင့်အသက်အုပ်စု	<p>လူမှုစီးပွားအချက်အလက်များကို အဆိုပြုစီမံကိန်းတည်ရှိရာ ရွှေပြည်သာ မြို့နယ်ရှိ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန (၂၀၂၀)မှ ကိုးကား ဖော်ပြ ထားပါသည်။ အဓိကအချက်အလက်များကို အိမ်ထောင်စုအဆင့် အင်တာဗျူးနှင့် ၂၃ ရပ်ကွက် အုပ်ချုပ်ရေးမှူး (ပဓာဏကျသူများအား တိုက်ရိုက်အင်တာဗျူးခြင်း)မှ ကောက်နုတ်ထားပါသည်။</p> <p>ရွှေပြည်သာမြို့နယ်တွင် စုစုပေါင်း လူဦးရေ ၃၀၃,၄၂၀ ဦး ရှိပါသည်။ ရွှေပြည်သာမြို့နယ် အသက် ၁၈နှစ် အောက် နှင့် ၁၈ နှစ်အထက် အားလုံး တွင် မြို့ပြလူဦးရေမှာ ပို၍များပါသည်။ အချုပ်အားဖြင့် ဆိုသော် စုစုပေါင်း လူဦးရေ၏ ၈၆ ရာခိုင်နှုန်းသည် မြို့ပြ လူဦးရေ ဖြစ်သောကြောင့် မြို့ပြလူဦးရေသည် ကျေးလက်လူဦးရေထက် များစွာ မြင့်မားနေပါသည်။</p> <p>ပဓာဏကျသူများအား အင်တာဗျူးခြင်းမှရရှိလာသော အချက်အလက်များ အရ ၂၃ ရပ်ကွက်တွင် ဗမာ လူမျိုးအိမ်ထောင်စု ၈၀၀ စု၊ ကရင်လူမျိုးအိမ်ထောင်စု ၁၀ စုနှင့် ရခိုင်လူမျိုး အိမ်ထောင်စု ၁၀ စု ရှိပါသည်။ အိမ်ထောင်စုအဆင့်အင်တာဗျူးအရ ဗမာလူမျိုးသာ စစ်တမ်းကောက်ယူသည့် နေရာအတွင်းအတွင်ရှိပါသည်။</p>
၁၃	လူမျိုးများနှင့် ကိုးကွယ်မှု	<p>စီမံကိန်းဧရိယာတွင် ဗမာလူမျိုးများ အဓိကနေထိုင်ကြပြီး ရခိုင်နှင့် ကရင် လူမျိုးများမှာ ဒုတိယအများဆုံး ဖြစ်ပါသည်။ ရွှေပြည်သာမြို့နယ်တွင် ချင်းလူမျိုးများသည် မွန်လူမျိုးများနှင့် လူဦးရေ တန်းတူနီးပါးရှိပါသည်။ ကျန်လူမျိုးများ ဖြစ်သော ကချင်၊ ရှမ်း နှင့် ကယား လူမျိုးများမှာ အနည်းငယ် သာတွေ့ရပါသည်။</p> <p>ရွှေပြည်သာမြို့နယ်တွင် ဗုဒ္ဓဘာသာ ကိုးကွယ်သူအများဆုံး ဖြစ်သည်။ ကျန်သောသူများမှာ ခရစ်ယာန်ဘာသာ နှင့် မူဆလင်ဘာသာကို ကိုးကွယ် ကြသည်။ ထို့အပြင် စစ်တမ်းကောက်ယူသည့်နေရာနှင့် ၂၃ ရပ်ကွက်တွင် ဗုဒ္ဓဘာသာကိုးကွယ်သူများသာ တွေ့ရပါသည်။</p>
၁၄	ပညာရေး	<p>စီမံကိန်းတည်ရှိရာ မြို့နယ်တွင် ဘုန်းတော်ကြီးသင် ပညာရေးကျောင်း (၁၃)ခု၊ မူကြိုကျောင်း (၁)ခု၊ မူလတန်းကျောင်း (၃၉)ခု၊ မူလတန်း လွန်ကျောင်း (၆)ခု၊ အလယ်တန်းကျောင်း (၁၁)ခု၊ အထက်တန်းကျောင်း (၉)ခုနှင့် တက္ကသိုလ် (၁) ခုရှိပါသည်။</p>
၁၅	အသက်မွေးမှု (အလုပ်အကိုင်၊ ဝင်ငွေ ကျန်းမာရေး၊ အခြေခံအဆောက်အအုံ နှင့် လျှပ်စစ်)	<p><u>အလုပ်အကိုင်</u></p> <p>ရွှေပြည်သာမြို့နယ်တွင် နေထိုင်ကြသူ အများစုသည် အထွေထွေ လုပ်သားများဖြစ်ကြပြီး အစိုးရဝန်ထမ်းများ၊ ဝန်ဆောင်မှုလုပ်ငန်းများနှင့် ရောင်းဝယ်ရေး လုပ်ငန်းများတွင် ဒုတိယအများဆုံး လုပ်ကိုင်ကြသည်။ ငါးဖမ်းလုပ်ငန်းသည် လူဦးရေ ၅၄ ဦး သာရှိပြီး လုပ်ကိုင်အသက်မွေးမှု အနည်းဆုံးသော လုပ်ငန်း ဖြစ်သည်။</p> <p><u>ဝင်ငွေ</u></p>

စဉ်	အမျိုးအစား	အကြောင်းအရာ
		<p>တစ်ဦးချင်း ပျမ်းမျှဝင်ငွေမှာ ၂၀၁၇-၂၀၁၈ ဘဏ္ဍာရေးနှစ်တွင် ၂.၆သန်းခန့်၊ ၂၀၁၈-၂၀၁၉ ဘဏ္ဍာရေးနှစ်တွင် ၃မီလီယံ နှင့် ၂၀၁၉-၂၀၂၀ ဘဏ္ဍာရေးနှစ်တွင် ၂.၂ မီလီယံ အသီးသီးရှိခဲ့ပါသည်။ အိမ်ထောင်စုအဆင့်စစ်တမ်းကောက်ယူခြင်းအရ ဝင်ငွေနှင့် အသုံးစရိတ်မှာ ညီမျှပါသည်။</p> <p><u>ကျန်းမာရေး</u></p> <p>ရွှေပြည်သာမြို့နယ်တွင် ဆေးရုံ ၄ ရုံ (အစိုးရဆေးရုံ ၁ ရုံ၊ ပုဂ္ဂလိကဆေးရုံ ၃ ရုံ)၊ ပုဂ္ဂလိက ဆေးခန်း ၂၀၊ ကျန်းမာရေး စောင့်ရှောက်မှုဌာန ၁၁ ခု (ကျေးလက် ၂ ခု၊ ကျေးလက်ခွဲ ၉ ခု) ရှိပါသည်။ HIV/AIDS ရောဂါ ဖြစ်ပွားမှုသည် ၂၀၁၈-၂၀၁၉ ခုနှစ်တွင် ၃ ခု၊ ၂၀၁၉-၂၀၂၀ ခုနှစ်တွင် ၅ ခု ဖြစ်ပွားခဲ့သော်လည်း သေဆုံးမှုမရှိပါ။</p> <p><u>အခြေခံအဆောက်အအုံ</u></p> <p>ရွှေပြည်သာမြို့နယ်တွင် ဈေး၊ ဈေးဝယ်စင်တာ၊ ဘဏ်၊ ကုန်တိုက်၊ စက်ရုံ၊ ပြည်တွင်းစက်မှုလုပ်ငန်း၊ ဟိုတယ်၊ မိုတယ်၊ တည်းခိုခန်း စသော စီးပွားရေးဆိုင်ရာ အခြေခံ အဆောက်အအုံ ၂,၉၆၄ ခု ရှိပြီး INGO၊ NGO နှင့် အခြား လူမှုရေးအဖွဲ့အစည်းများ ကဲ့သို့သော လူမှုရေးဆိုင်ရာ အခြေခံ အဆောက်အအုံ ၂၁ ခု ရှိပါသည်။</p> <p><u>လျှပ်စစ်စွမ်းအင်</u></p> <p>ရန်ကုန်တိုင်း ဒေသကြီးရှိ စီမံကိန်းမြို့နယ်တွင် အစိုးရ လျှပ်စစ်ဓါတ်အား လိုင်းများရှိပါသည်။</p>
၁၆	သယ်ယူပို့ဆောင်ရေး	ရွှေပြည်သာမြို့နယ်တွင် လေယာဉ်ကွင်းမရှိပါ။ ထို့ကြောင့် ဘတ်စ်ကား၊ မီးရထား စသော ကုန်းလမ်းသယ်ယူပို့ဆောင်ရေး နှင့် သင်္ဘော စသော ရေလမ်းပို့ဆောင်ရေး ကဲ့သို့ အများပြည်သူသုံး သယ်ယူပို့ဆောင်ရေး များသည် ယုံကြည်စိတ်ချရပြီး သွားလာနိုင်သော နည်းလမ်းများဖြစ်ပါသည်။
ဇီဝဗေဒဆိုင်ရာ ပတ်ဝန်းကျင်		
၁၇	အပင်များကို လေ့လာခြင်း	လေ့လာသည့် ဧရိယာတွင် အလေ့ကျပေါက်သော အပင်များမှာ သစ်ပင်၊ ချုံပုတ်၊ ဆေးဖက်ဝင်အပင်များ၊ နွယ်ပင် နှင့် ဝါးမျိုးစိတ် များဖြစ်ပြီး စုစုပေါင်း ၅၆ မျိုး ကို စုဆောင်းခဲ့ပြီး ဆေးဖက်ဝင်အပင် ၁၀ မျိုးအား တွေ့ရှိရပါသည်။ စီမံကိန်းဧရိယာ စက်ရုံနှင့် ၎င်း၏ ပြင်ပနယ်နိမိတ်တွင် အပင်မျိုးစိတ်ပေါင်း ၄၂ မျိုးကို IUCN Red List ၏ ထိန်းသိမ်းစောင့်ရှောက်မှု အခြေအနေများအတူ တွေ့ရှိရပါသည်။
၁၈	သတ္တဝါများကို လေ့လာခြင်း	ဂေဟဗေဒကို လေ့လာသောအခါ လိပ်ပြာနှင့် ပုစဉ်းပျံမျိုးစိတ် ၃၃ မျိုး၊ ငါးမျိုးစိတ် ၂၄ မျိုး၊ တွားသွားသတ္တဝါနှင့် ကုန်းနေရေနေ သတ္တဝါမျိုးစိတ် (herpetofauna) ၆ မျိုး နှင့် ကုန်းနေငှက်မျိုးစိတ် ၃၀ မျိုး၊ ရေငှက်မျိုးစိတ် ၁၇ မျိုး တို့ကို IUCN Red List ၏ ထိန်းသိမ်းစောင့်ရှောက်ရေး အခြေအနေ များနှင့် အတူ လေ့လာတွေ့ရှိရ ပါသည်။

၅. ဖြစ်နိုင်ချေရှိသော သဘာဝပတ်ဝန်းထိခိုက်နိုင်မှုနှင့်လျော့ချခြင်း

၅.၁. အန္တရာယ်ရှိသောထိခိုက်မှုဆန်းစစ်ခြင်း

အမျိုးသား သဘာဝပတ်ဝန်းကျင်မူဝါဒ (၁၉၆၉) အရ ဖြစ်နိုင်ခြေရှိသော ပတ်ဝန်းကျင်ထိခိုက်မှု အန္တရာယ်ကို ဆန်းစစ်လေ့လာရာတွင် ယေဘုယျအားဖြင့် အဆိုပြုစီမံကိန်း၏ ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွား အပေါ် အခြေခံ၍ ဆန်းစစ်တွက်ချက်ရပါမည်။ အဆိုပါလေ့လာဆန်းစစ်မှုတွင် ကာလတို၊ ကာလရှည် ဖြစ်နိုင်ချေရှိသော လေထုညစ်ညမ်းမှု၊ ရေထုညစ်ညမ်းမှုနှင့် အသံဆူညံမှု စသော အချက်များ၊ ဒေသခံ ပြည်သူများအပေါ် သက်ရောက်မှု၊ အသက်ရှင်နေထိုင်မှုနှင့် ကျန်းမာရေး စံချိန်စံညွှန်း များအပြင် အခြားသောစိတ်ပိုင်းဆိုင်ရာများအပေါ် သက်ရောက်မှုအချက်အလက်များ ပါဝင်ပါသည်။

စီမံကိန်းဖော်ဆောင်မှုများကြောင့် ပတ်ဝန်းကျင်အပေါ် ကောင်းကျိုးသက်ရောက်မှုနှင့် ဆိုးကျိုး သက်ရောက်မှုများကို လေ့လာရာတွင် ရုပ်ပိုင်းဆိုင်ရာ၊ လူမှုစီးပွား၊ ဇီဝမျိုးစုံမျိုးကွဲ၊ ကျန်းမာရေး စသည် တို့အပေါ် အခြေခံ၍ လေ့လာခြင်း ဖြစ်ပါသည်။

၅.၁.၁. သိသာသော သက်ရောက်မှု အကဲဖြတ်ခြင်း

စီမံကိန်းကြောင့် ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်ဆိုင်ရာ သိသာထင်ရှားသည့် ဆိုးကျိုး သို့မဟုတ် ကောင်းကျိုး သက်ရောက်မှုများကို ဖြစ်နိုင်ချေ၊ သက်ရောက်မှုပမာဏ၊ သက်ရောက်နိုင်မည့် နေရာ နှင့် အချိန်ကာလ စသည့် အဆင့်အဆင့် သတ်မှတ်၍ ခွဲခြားထားပါသည်။ ဖြစ်နိုင်ချေရှိသော သက်ရောက်မှု တစ်ခုချင်းစီကို အကဲဖြတ်ရာတွင် အသုံးပြုရန် အဆင့်သတ်မှတ်ချက်များကို ဇယား ၇ တွင် ဖော်ပြထားပါသည်။

ဇယား ၇ အန္တရာယ်ထိခိုက်မှုဆန်းစစ်တွက်ထုတ်ခြင်း

ဖြစ်နိုင်ချေ	အချိန်ကာလ
၁. ဖြစ်နိုင်ချေအလွန်နည်းပါး ၂. ဖြစ်နိုင်ချေအနည်းငယ် ၃. ဖြစ်နိုင်ချေရှိ အသင့်အတင့် ၄. ဖြစ်နိုင်ချေရှိ အလွန်များ ၅. ဖြစ်ရန်သေချာ	၁. အလွန်တိုတောင်းသောအချိန်ကာလ(၁နှစ်အတွင်း) ၂. တိုတောင်းသောအချိန်ကာလ (၂-၅ နှစ်အတွင်း) ၃. အလယ်အလတ်အချိန်ကာလ(၆-၁၅နှစ်အတွင်း) ၄. အချိန်ကာလကြာမြင့်စွာ (၁၅ နှစ်အထက်) ၅. အစဉ်အမြဲ
သက်ရောက်မှု ပမာဏ	သက်ရောက်နိုင်မည့် နေရာ
၁. ပတ်ဝန်းကျင်အပေါ်သိသာသောထိခိုက်မှုမရှိ ၂. ပတ်ဝန်းကျင်အပေါ် ထိခိုက်မှုအနည်းငယ်ရှိ ၃. ပတ်ဝန်းကျင်အပေါ်ထိခိုက်မှု အသင့်အတင့် ရှိ ၄. ပတ်ဝန်းကျင်အပေါ် ဆိုးရွားစွာ ထိခိုက်မှုရှိ ၅. ပတ်ဝန်းကျင်အပေါ် ရေရှည်အလွန်ဆိုးရွားစွာ ထိခိုက်မှုရှိ	၁. စီမံကိန်းဧရိယာအတွင်းသက်ရောက်မှု ၂. စီမံကိန်းအနီးဒေသခံပြည်သူအဆင့် သက်ရောက်မှု ၃. ဒေသတွင်းသက်ရောက်မှု ၄. နိုင်ငံအဆင့်သက်ရောက်မှု ၅. နိုင်ငံတကာအဆင့်သက်ရောက်မှု

ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှုများကို အကဲဖြတ်လေ့လာရာတွင် အောက်ပါ ဖော်မြူလာကို အသုံးပြုထားပါသည်။

$$\text{သိသာထင်ရှားမှု ရမှတ် (SP)} = (\text{ပမာဏ} + \text{အကွာအဝေး} + \text{ကြာချိန်}) \times \text{ဖြစ်နိုင်ခြေ}$$

ပတ်ဝန်းကျင်အပေါ်တွင် ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှုများကို ထိခိုက်မှုမရှိ၊ အနည်းငယ်၊ အသင့်အတင့် နှင့် အမြင့်ဆုံး စသည့် သိသာသော သတ်မှတ်ချက်များအပေါ်အခြေခံပြီး ခွဲခြားနိုင်သည်။ ဖြစ်နိုင်ခြေရှိသော ပတ်ဝန်းကျင် ထိခိုက်မှု အဆင့်များကို ဇယား ၈ တွင် တွေ့နိုင်ပါသည်။ တည်ဆောက်ချိန်၊ ပိတ်သိမ်းချိန် နှင့် လုပ်ငန်းဆောင်ရွက်စဉ်ကာလများ တွင် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်အပေါ်ထိခိုက်မှု ဖြစ်နိုင်ခြေများအား ဆန်းစစ်ခန့်မှန်းခြင်းများကို ဇယား ၉ နှင့် ဇယား ၁၀ တွင် ဖော်ပြထားပါသည်။

ဇယား ၈ ဖြစ်နိုင်ခြေရှိသော ပတ်ဝန်းကျင်ထိခိုက်မှုအဆင့်သတ်မှတ်ချက်

သတ်မှတ်ချက်	ပတ်ဝန်းကျင်ဆိုင်ရာသတ်မှတ်မှု ပမာဏ
<၁၅	ထိခိုက်မှုမရှိ
၁၅-၃၀	အနည်းငယ်
၃၁-၆၀	အသင့်အတင့်
>၆၀	အမြင့်ဆုံး

ဇယား ၉ တည်ဆောက်ချိန်နှင့် ပိတ်သိမ်းချိန်ကာလတွင် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်ထိခိုက်မှု ဖြစ်နိုင်ခြေအားဆန်းစစ်ခန့်မှန်းခြင်း

ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှု	သက်ရောက်နိုင်သောအရင်းအမြစ်	စောင့်ကြည့်ရမည့် အချက်များ	ပမာဏ	နယ်ပယ်အတိုင်းအတာ	အချိန်ကာလ	ဖြစ်နိုင်ခြေ	အရင်းအမြစ်	အကဲဖြတ်မှုရလဒ်
ဖြစ်နိုင်ချေရှိသော ဆိုးကျိုးသက်ရောက်မှု								
လေထုအရည်အသွေး	တည်ဆောက်ခြင်းနှင့် ပိတ်သိမ်းခြင်း လုပ်ဆောင်မှုများ၊ ဒီဇယ်မီးစက်များ၊ စက်ယန္တရားတပ် မော်တော်ယာဉ်များ မောင်းနှင်မှု	CO ₂ , CO, SO ₂ , O ₃ , CH ₄ , NO ₂ , PM ₁₀ , PM _{2.5}	၃	၂	၂	၄	၂၈	အနည်းငယ်
ဆူညံသံနှင့် တုန်ခါမှု	အရေးပေါ် ဒီဇယ်မီးစက် အသုံးပြုမှု၊ တည်ဆောက်ခြင်းဆိုင်ရာ ကိရိယာများ အသုံးပြုမှုနှင့် ဝန်ချိစက် မော်တော်ယာဉ်များ သုံးစွဲမှု	ဆူညံသံနှင့် တုန်ခါမှု	၃	၁	၂	၄	၂၄	အနည်းငယ်
ရေထုအရည်အသွေး	မြေပေါ်ရေစီးဆင်းခြင်းနှင့် အိမ်သုံးစွန့်ပစ်ရေ	စွန့်ပစ်ရေထဲရှိ အော်ဂဲနစ် ဓာတ်ပေါင်းများ	၂	၂	၂	၃	၁၈	အနည်းငယ်
မြေအသုံးချမှု	အဆောက်အဦးတည်ဆောက်ရာတွင် သီးပင်စားပင်နှင့် အပေါ်ယံ မြေဆီလွှာ ဖယ်ရှားခြင်း	မြေအသုံးချမှု ပြောင်းလဲခြင်း	၁	၂	၄	၄	၂၈	အနည်းငယ်
မြေထုအရည်အသွေး	တည်ဆောက်မှုလုပ်ငန်းများ	လောင်စာဆီ၊ ရေနံနှင့် အခြားအညစ်အကြေးများ ယိုစိမ့်မှု	၃	၂	၃	၂	၁၆	အနည်းငယ်
စွန့်ပစ်အစိုင်အခဲ	တည်ဆောက်မှုလုပ်ငန်းများနှင့် အလုပ်သမားများမှ စွန့်ပစ်အစိုင်အခဲ	အညစ်အကြေးစွန့်ပစ်ပစ္စည်းများနှင့် အိမ်သုံးစွန့်ပစ်ပစ္စည်းများ	၃	၃	၃	၂	၁၈	အနည်းငယ်

ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှု	သက်ရောက်နိုင်သောအရင်းအမြစ်	စောင့်ကြည့်ရမည့် အချက်များ	ပမာဏ	နယ်ပယ်အတိုင်းအတာ	အချိန်ကာလ	ဖြစ်နိုင်ခြေ	အရင်းအမြစ်	အကဲဖြတ်မှုရလဒ်
ယာဉ်ကြောအခြေအနေ	ဆောက်လုပ်ရေး ပစ္စည်းများ၊ ကိရိယာများနှင့် ဆောက်လုပ်ရေးသုံးစွန့်ပစ်ပစ္စည်းများ သယ်ယူပို့ဆောင်ခြင်း	ယာဉ်ကြောအခြေအနေမှတ်တမ်းကောက်ယူခြင်း	၁	၂	၂	၂	၁၀	ထိခိုက်မှုမရှိ
ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းမှု	အလုပ်သမားများ၏ ကျန်းမာရေး နှင့် မတော်တဆထိခိုက်မှု (တည်ဆောက်ချိန်နှင့် ပိတ်သိမ်းချိန်ကာလ)	AIDS/HIV နှင့် အသဲရောင် အသားဝါ ဘီ၊ စီ စသော ကူးစက်ရောဂါများ၊ ကိုဗစ်-၁၉ နှင့် အခြား ရုပ်ပိုင်းဆိုင်ရာ ထိခိုက်မှုများ	၂	၁	၂	၃	၁၅	အနည်းငယ်
ယာဉ်ကျေးမှုအမွေအနှစ်	အမွေအနှစ်ဆိုင်ရာဧရိယာများ အနီးရှိ တည်ဆောက်ရေးလုပ်ငန်းများ	ရှေးဟောင်းသုတေသနအဆောက်အဦများနှင့် ရိုးရာအဆောက်အဦများ	၁	၂	၁	၂	၈	ထိခိုက်မှုမရှိ
ဂေဟစနစ်	တည်ဆောက်မှုလုပ်ငန်းများ	အပင်နှင့် သတ္တဝါ	၁	၁	၁	၃	၉	ထိခိုက်မှုမရှိ
ရာသီဥတုပြောင်းလဲခြင်း	မော်တော်ယာဉ်များနှင့် ဒီဇယ်မီးစက်များ သယ်ယူပို့ဆောင်ခြင်း	ဖန်လုံအိမ်အာနိသင် ဓာတ်ငွေ့များထုတ်လွှတ်ခြင်း	၁	၂	၂	၂	၁၀	ထိခိုက်မှုမရှိ
ဖြစ်နိုင်ချေရှိသော ကောင်းကျိုးသက်ရောက်မှု								
အလုပ်အကိုင်နှင့် အသက်မွေးဝမ်းကြောင်း ကဲ့သို့သော ဒေသတွင်းစီးပွားရေး	တည်ဆောက်မှုလုပ်ငန်း၊ ကုန်ကြမ်းများနှင့် ကိရိယာများဝယ်ယူမှု	အလုပ်အကိုင်နှင့် စီးပွားရေးဆိုင်ရာ အခွင့်အလမ်း	၃	၂	၂	၄	၂၈	အနည်းငယ်

ဇယား ၁၀ စီမံကိန်းလုပ်ငန်းလည်ပတ်ချိန်ကာလတွင် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်ထိခိုက်မှု ဖြစ်နိုင်ခြေများအားဆန်းစစ်ခန့်မှန်းခြင်း

ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှု	သက်ရောက်နိုင်သောအရင်းအမြစ်	စောင့်ကြည့်ရမည့် အချက်များ	ပမာဏ	နယ်ပယ်အတိုင်းအတာ	အချိန်ကာလ	ဖြစ်နိုင်ခြေ	အရင်းအမြစ်	အကဲဖြတ်မှုရလဒ်
ဖြစ်နိုင်ချေရှိသော ဆိုးကျိုးသက်ရောက်မှု								
လေထုအရည်အသွေး	ဒီဇယ် မီးစက်နှင့် မော်တော်ယာဉ်အသုံးပြုခြင်း	CO ₂ , NO ₂ , CO, CH ₄ , O ₃ , PM ₁₀ , PM _{2.5} , SO ₂ , VOCs	၂	၂	၄	၃	၂၄	အနည်းငယ်
ဆူညံသံနှင့် တုန်ခါမှု	အရေးပေါ် ဒီဇယ်မီးစက် အသုံးပြုမှု၊ တည်ဆောက်ခြင်းဆိုင်ရာ ကိရိယာများ အသုံးပြုမှုနှင့် ဝန်ချိစက် မော်တော်ယာဉ်များ သုံးစွဲမှု	ဆူညံသံနှင့် တုန်ခါမှု	၂	၁	၄	၃	၂၁	အနည်းငယ်
ရေထုအရည်အသွေး	မသန့်စင်ရသေးသော စွန့်ပစ်ရေ စွန့်ထုတ်မှု	BOD, COD, Antibiotics, Oil and Grease, Total Nitrogen (TN), Total Phosphorous (TP), Total solid (TS), Total Oxygen Demand, Total coliform bacteria	၃	၃	၄	၃	၃၀	အနည်းငယ်
မြေထုအရည်အသွေး	သယ်ယူပို့ဆောင်ရေးလုပ်ငန်းများ	လောင်စာဆီ၊ ရေနံနှင့် အခြားအညစ်အကြေးများ ယိုစိမ့်မှု	၂	၃	၄	၃	၂၇	အနည်းငယ်
စွန့်ပစ်အစိုင်အခဲ	စက်ရုံ၏ ဖိနပ်ချုပ် လုပ်ငန်းစဉ်များ၊ ရုံးခန်း၊ ကန်တင်နှင့် ဝန်ထမ်းအဆောင် အဆောက်အအုံများ	စွန့်ပစ်အစိုင်အခဲ ထွက်ရှိသော အမျိုးအစားနှင့် ပမာဏ	၃	၂	၄	၃	၂၇	အနည်းငယ်

ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှု	သက်ရောက်နိုင်သောအရင်းအမြစ်	စောင့်ကြည့်ရမည့် အချက်များ	ပမာဏ	နယ်ပယ်အတိုင်းအတာ	အချိန်ကာလ	ဖြစ်နိုင်ခြေ	အရင်းအမြစ်	အကဲဖြတ်မှုရလဒ်
အနံ့	ယာယီ စွန့်ပစ်အစိုင်အခဲ စွန့်ပစ်သည့်နေရာ၊ ဆေးသုတ်ခြင်းကဲ့သို့သော ပြန်လည်တည်ဆောက်ရေး လုပ်ငန်းများ	အနံ့	၂	၁	၄	၄	၂၈	အနည်းငယ်
ယာဉ်ကြောအခြေအနေ	သယ်ယူပို့ဆောင်ရေးယာဉ်များ	ယာဉ်လမ်းကြောင်းကောက်ယူခြင်း	၁	၂	၄	၂	၁၄	ထိခိုက်မှုမရှိ
ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းမှု	အလုပ်သမားများ၏ ကျန်းမာရေး (တည်ဆောက်ချိန် နှင့် ပိတ်သိမ်းချိန်ကာလ)	AIDS/HIV နှင့် အသဲရောင် အသားဝါ ဘီ၊ စီ စသော ကူးစက်ရောဂါများ၊ ကိုဗစ်-၁၉ နှင့် အခြား ရုပ်ပိုင်းဆိုင်ရာ ထိခိုက်မှုများ	၃	၁	၄	၃	၂၄	အနည်းငယ်
ဂေဟစနစ်	စွန့်ပစ်ရေဆိုးနှင့် စွန့်ပစ်အစိုင်အခဲများ	အပင်နှင့် သတ္တဝါ	၂	၂	၄	၃	၂၄	အနည်းငယ်
ရာသီဥတုပြောင်းလဲခြင်း	သယ်ယူပို့ဆောင်ရေးယာဉ်များ၊ မီးစက်များနှင့် လေအေးပေးစက်များ	ဖန်လုံအိမ်အာနိသင် ဓာတ်ငွေ့ထုတ်လွှတ်ခြင်း	၁	၂	၄	၂	၁၄	ထိခိုက်မှုမရှိ
ဖြစ်နိုင်ချေရှိသော ကောင်းကျိုးသက်ရောက်မှု								
အလုပ်အကိုင်နှင့် အသက်မွေးဝမ်းကြောင်း ကဲ့သို့သော ဒေသတွင်းစီးပွားရေး	ကုန်ကြမ်းများနှင့် ကိရိယာများဝယ်ယူမှု	အလုပ်အကိုင်နှင့် စီးပွားရေးဆိုင်ရာ အခွင့်အလမ်း	၃	၃	၄	၄	၄၀	အသင့်အတင့်

၅.၂. ဘေးအန္တရာယ်ဆန်းစစ်ခြင်းနှင့် ဘေးအန္တရာယ်လျှော့ချရေးနည်းလမ်းများ

ဘေးအန္တရာယ်ဆန်းစစ်ခြင်းနည်းလမ်းကို အပြည်ပြည်ဆိုင်ရာ မြို့ပြလေကြောင်းအဖွဲ့အစည်း (၂၀၂၃) မှ ကောက်နုတ်ကိုးကားထားပါသည်။ ဘေးအန္တရာယ်ဆန်းစစ်ခြင်းကို ဘေးအန္တရာယ် သတ်မှတ်ခြင်း၊ ဘေးအန္တရာယ် ဖြစ်နိုင်ခြေ၊ ပြင်းထန်မှု၊ အကဲဖြတ်မှုနှင့် ခံနိုင်ရည်ရှိမှုကို အခြေခံ၍ အကဲဖြတ်တွက်ချက်ထားပါသည်။ ဘေးအန္တရာယ်ဆန်းစစ်ခြင်းနှင့် ခံနိုင်ရည်ရှိမှု အကဲဖြတ်ခြင်းကို ဇယား ၁၁ တွင်ဖော်ပြထားပြီး စီမံကိန်းလုပ်ငန်းတည်ဆောက်ချိန်၊ လည်ပတ်ချိန်နှင့် ပိတ်သိမ်းချိန်ကာလတွင် ဖြစ်ပေါ်နိုင်သော ဘေးအန္တရာယ်ဆန်းစစ်ခြင်းနှင့် လျှော့ချရေးနည်းလမ်းများကို ဇယား ၁၂ တွင်ဖော်ပြထားပါသည်။

ဇယား ၁၁ ဘေးအန္တရာယ်ဆန်းစစ်ခြင်းနှင့် ခံနိုင်ရည်ရှိမှု

ဘေးအန္တရာယ် ဖြစ်နိုင်ခြေ	ဘေးအန္တရာယ် ပြင်းထန်မှု				
	သေစေ တတ်သော-က	အန္တရာယ်ဖြစ် စေတတ်သော-ခ	အဓိက ကျသော-ဂ	သေးငယ်သော - ဃ	ထိခိုက်မှုမရှိ နိုင်သော-င
ကြိမ်ဖန်များစွာ- (၅)	(၅)(က) (လက်မခံ နိုင်သော)	(၅)(ခ) (လက်မခံ နိုင်သော)	(၅)(ဂ) (လက်မခံ နိုင်သော)	(၅)(ဃ) (ခံသာသော)	(၅)(င) (ခံသာသော)
ရံဖန်ရံခါ- (၄)	(၄)(က) (လက်မခံ နိုင်သော)	(၄)(ခ) (လက်မခံ နိုင်သော)	(၄)(ဂ) (ခံသာသော)	(၄)(ဃ) (ခံသာသော)	(၄)(င) (ခံသာသော)
ဖြစ်နိုင်ခြေ နည်းသော-(၃)	(၃)(က) (လက်မခံ နိုင်သော)	(၃)(ခ) (ခံသာသော)	(၃)(ဂ) (ခံသာသော)	(၃)(ဃ) (ခံသာသော)	(၃)(င) (လက်ခံ နိုင်သော)
မဖြစ်နိုင်သော-(၂)	(၂)(က) (ခံသာသော)	(၂)(ခ) (ခံသာသော)	(၂)(ဂ) (ခံသာသော)	(၂)(ဃ) (လက်ခံ နိုင်သော)	(၂)(င) (လက်ခံ နိုင်သော)
အလွန်မ ဖြစ်နိုင်သော- (၁)	(၁) (က) (ခံသာသော)	(၁)(ခ) (လက်ခံ နိုင်သော)	(၁)(ဂ) (လက်ခံ နိုင်သော)	(၁)(ဃ) (လက်ခံ နိုင်သော)	(၁)(င) (လက်ခံ နိုင်သော)

ဇယား ၁၂ တည်ဆောက်ချိန်၊ လုပ်ငန်းလည်ပတ်ချိန်နှင့် ပိတ်သိမ်းချိန်ကာလရှိ ဘေးအန္တရာယ်ဆန်းစစ်ခြင်းနှင့် လျှော့ချရေးနည်းလမ်းများ

လျှော့ချရေးလုပ်ငန်းများမလုပ်ဆောင်မီ ဘေးအန္တရာယ်ဆန်းစစ်ခြင်း	အကဲဖြတ်ထားသော ဘေးအန္တရာယ် အညွှန်းကိန်း	လျှော့ချရေးလုပ်ငန်းများလုပ်ဆောင်ပြီးနောက် ဘေးအန္တရာယ်ဆန်းစစ်ခြင်း	အကဲဖြတ်ထားသော ဘေးအန္တရာယ် အညွှန်းကိန်း
<p>အဆိပ်ရှိသောဓာတုပစ္စည်းများအသုံးပြုခြင်း</p> <ul style="list-style-type: none"> - Methyl ethyl ketone (MEK)၊ methylcyclohexane အစရှိသည်တို့ပါဝင်သော ကော်ကွဲသို့သော အဆိပ်ရှိသည့် ဓာတုပစ္စည်းများ မသင့်လျော်စွာ ကိုင်တွယ်ခြင်းနှင့် သိုလှောင်ခြင်းတို့ကြောင့် ဘေးအန္တရာယ် ဖြစ်ပေါ်နိုင်ပါသည်။ 	<p>(၃) (ဂ) (ခံသာသော)</p>	<ul style="list-style-type: none"> - ဓာတုပစ္စည်းများကို အခြားသော ကုန်ကြမ်း ပစ္စည်းများ နှင့် ခွဲခြားစွာ သိုလှောင်ထားရှိမည် ဖြစ်ပါသည်။ - အန္တရာယ်ရှိသော ဓာတုပစ္စည်းများကို လေဝင်လေထွက် ကောင်းသောနေရာများတွင်သာ သိုလှောင်မည် ဖြစ်သည်။ - ဓာတုပစ္စည်းများကို ကိုင်တွယ်ရာတွင် တစ်ကိုယ်ရေးသုံး ကာကွယ်ရေး ပစ္စည်းများဖြစ်သော လက်အိတ်၊ အဝတ်အထည်နှင့် မျက်စိအကာအကွယ်များကို အလုပ်သမားများထံ ထောက်ပံ့ပေးမည် ဖြစ်သည်။ 	<p>(၂) (ဃ) (လက်ခံနိုင်သော)</p>
<p>မီးလောင်လွယ်သော ဓာတုပစ္စည်းများ</p> <ul style="list-style-type: none"> - ကော်ကွဲသို့သော မီးလောင်လွယ်သော ဓာတုပစ္စည်းများ မသင့်လျော်စွာ ကိုင်တွယ်ခြင်းနှင့် သိုလှောင်ခြင်းတို့ကြောင့် ဘေးအန္တရာယ် ဖြစ်ပေါ်နိုင် ပါသည်။ 	<p>(၃) (ဂ) (ခံသာသော)</p>	<ul style="list-style-type: none"> - ဓာတုပစ္စည်းများကို အခြားသော ကုန်ကြမ်း ပစ္စည်းများ နှင့် ခွဲခြားစွာ သိုလှောင်ထားရှိမည် ဖြစ်ပါသည်။ - အန္တရာယ်ရှိသော ဓာတုပစ္စည်းများကို လေဝင်လေထွက် ကောင်းသောနေရာများတွင်သာ သိုလှောင်မည် ဖြစ်သည်။ - မီးသတ်ဆေးဗူးများ၊ MSDS၊ မျက်စိဆေးကြောသည့် နေရာ၊ “ဆေးလိပ်မသောက်ရ” ဆိုင်းဘုတ်နှင့် အရေးပေါ် သတိပေးစနစ်ခလုတ်များကို ဓာတုပစ္စည်းများ သိုလှောင်ရာအခန်းတွင် ထားရှိမည်ဖြစ်သည်။ 	<p>(၂) (ဃ) (လက်ခံနိုင်သော)</p>
<p>ကြီးမားသောစက်ပစ္စည်းများအသုံးပြုခြင်း</p> <ul style="list-style-type: none"> - ကြီးမားသော စက်ပစ္စည်းများအသုံးပြုခြင်းကြောင့် ရုပ်ပိုင်းဆိုင်ရာ ထိခိုက်မှုများဖြစ်ပေါ်ခြင်း 	<p>(၃) (ဂ) (ခံသာသော)</p>	<ul style="list-style-type: none"> - သင့်လျော်သော တစ်ကိုယ်ရေးသုံး ကာကွယ်ရေး ပစ္စည်းများဖြစ်သော လက်အိတ်၊ မျက်မှန်နှင့် နားကြပ်များကို တပ်ဆင်အသုံးပြုသွားမည်ဖြစ်သည်။ - ကျွမ်းကျင်သော အလုပ်သမားများကို ခန့်ထားပြီး ကြီးမားသော စက်များနှင့် အလုပ်လုပ်နေသော 	<p>(၂) (ဃ) (လက်ခံနိုင်သော)</p>

		<p>အလုပ်သမားများကို စနစ်တကျ လေ့ကျင့်သင်ကြားပေးမည် ဖြစ်သည်။</p> <ul style="list-style-type: none"> - ဆောက်လုပ်ရေးသုံးစက်များနှင့် ဖိနပ်ချုပ်စက်များကို ဂရုတစိုက် အသုံးပြုသွားမည်ဖြစ်သည်။ 	
<p>မီးဘေးအန္တရာယ်</p> <ul style="list-style-type: none"> - မီးဘေးကြောင့် လူ့အသက်များနှင့် ပိုင်ဆိုင်မှုများဆုံးရှုံးမှု ဖြစ်ပေါ်နိုင်ခြင်း 	<p>(၃) (ဂ) (ခံသာသော)</p>	<ul style="list-style-type: none"> - မီးသတ်ဆေးဗူး၊ မီးသတ်ရေကန်၊ မီးသတ်ပေးစနစ်နှင့် မီးသတ်ပိုက်များကို စီမံကိန်းစက်ရုံတွင် ထောက်ပံ့ပေးမည် ဖြစ်သည်။ - “ဆေးလိပ်မသောက်ရ” ဆိုင်းဘုတ်များကို မီးလောင်လွယ်သော ဓာတုပစ္စည်းများသိုလှောင်ရာ အခန်းအနီးတွင် ထားရှိမည်ဖြစ်သည်။ - အလုပ်သမားများကို နှစ်စဉ် မီးသတ်သင်တန်းများ ပို့ချပေးမည်ဖြစ်သည်။ 	<p>(၃) (င) (လက်ခံနိုင်သော)</p>
<p>လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး</p> <ul style="list-style-type: none"> - ဓာတုပစ္စည်းများကြောင့် ထိခိုက်ခြင်း၊ စက်ပစ္စည်းများကြောင့် ထိခိုက်ခြင်း၊ ဖုန်မှုန့်များရှူရှိုက်ခြင်းနှင့် ဆူညံသံကြောင့် ထိခိုက်ခြင်းများမှ ရှုပ်ပိုင်းဆိုင်ရာ ထိခိုက်မှုများနှင့် ကျန်းမာရေးပြဿနာများ ဖြစ်ပေါ်နိုင်ပါသည်။ 	<p>(၄) (ဃ) (ခံသာသော)</p>	<ul style="list-style-type: none"> - လေ့ကျင့်ထားသော ကျွမ်းကျင်အလုပ်သမားများမှ လေဝင်လေထွက်ကောင်းသော နေရာများတွင် အန္တရာယ်ရှိသော ဓာတုပစ္စည်းများကို သိုလှောင်သိမ်းဆည်း၍ ကိုင်တွယ်အသုံးပြုမည်ဖြစ်သည်။ - ဖိနပ်အောက်ဆိုး ကြမ်းအောင်ပြုလုပ်ခြင်းလုပ်ငန်းစဉ်မှ ထွက်ရှိသော အန္တရာယ်ရှိသော အမှုန်များကို ပေါက်(ဖိ)ခုပါသော အမှုန်စုပ်ကိရိယာများကို တပ်ဆင်အသုံးပြုမည် ဖြစ်သည်။ - အမှုန်များရှူရှိုက်ခြင်းမှ ကာကွယ်ရန် ဖိနပ်အောက်ဆိုး ကြမ်းအောင်ပြုလုပ်သည့် နေရာတွင်အလုပ်လုပ်နေသော အလုပ်သမားများကို နှာခေါင်းစီး၊ လက်အိတ်၊ နားကြပ်ကိရိယာကဲ့သို့သော တစ်ကိုယ်ရေသုံး ကာကွယ်ရေးပစ္စည်းများကို ထောက်ပံ့ပေးမည် ဖြစ်သည်။ 	<p>(၃) (င) (လက်ခံနိုင်သော)</p>

၆. ဆက်စပ်သက်ရောက်မှုများဆန်းစစ်ခြင်း

၆.၁. နည်းလမ်း

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာအရ အဖိုးတန်သော ပတ်ဝန်းကျင်ဆိုင်ရာ အစိတ်အပိုင်းများ (VECs)ကို ဆက်စပ်သက်ရောက်မှုများဆန်းစစ်ရန်အတွက် ရွေးချယ်ထားပါသည်။ ၎င်းတို့မှာ လေထုအရည်အသွေး၊ ရေအရည်အသွေး၊ စွန့်ပစ်အမှိုက်နှင့် ယာဉ်လမ်းကြောင်းအန္တရာယ်ကင်းရှင်းရေး ဖြစ်ပါသည်။ ဖြစ်စဉ်သုံးမျိုးဖြစ်သော ပုံမှန်၊ ကောင်းကျိုးနှင့် ဆိုးကျိုးများကို အဆိုပြုထားပါသည်။ အသေးစိတ်ကျသော အကဲဖြတ်ခြင်း အချက်အလက်များနှင့် ဆက်စပ်သက်ရောက်မှုများ၏ သိသာထင်ရှားမှု အဆင့်များသတ်မှတ်ခြင်းကို ဇယား ၁၃ တွင်ဖော်ပြထားပြီး သိသာထင်ရှားမှု အကဲဖြတ်ဆန်းစစ်ခြင်းကို အောက်တွင်ဖော်ပြထားပါသည်။

- ❖ အလွန်သိသာသော ကောင်းကျိုးသက်ရောက်မှု
- ❖ သိသာသော ကောင်းကျိုးသက်ရောက်မှု
- ❖ ပုံမှန်အခြေအနေ
- ❖ သိသာသော ဆိုးကျိုးသက်ရောက်မှု
- ❖ အလွန်သိသာသော ဆိုးကျိုးသက်ရောက်မှု

ဇယား ၁၃ ဆက်စပ်သက်ရောက်မှုများ၏ သိသာထင်ရှားခြင်းအတွက် အကဲဖြတ်ဆန်းစစ်ခြင်း

အကျိုးသက်ရောက်မှု	
ကောင်းကျိုး	ကြွင်းကျန်သက်ရောက်မှုများမှ အကျိုးကျေးဇူးများ
ပုံမှန်	ကြွင်းကျန်သက်ရောက်မှုများမှ အကျိုးကျေးဇူးများ (သို့မဟုတ်) ဆိုးကျိုးများမရှိခြင်း
ဆိုးကျိုး	ကြွင်းကျန်သက်ရောက်မှုများမှ ဆိုးကျိုးများ
အတိုင်းအတာ	
စီမံကိန်းနှင့် စီမံကိန်းအနီးတဝိုက်	လေ့လာသည့် ဧရိယာသည် တည်ဆောက်ချိန်၊ လည်ပတ်ချိန်နှင့် ပိတ်သိမ်းချိန်တွင် စီမံကိန်းကြောင့် တိုက်ရိုက် ထိခိုက်နိုင်ပါသည်။
စီမံကိန်းတည်ရှိရာမြို့	ရန်ကုန်မြို့
စီမံကိန်းတည်ရှိရာဒေသ	ရန်ကုန်တိုင်းဒေသကြီး
နိုင်ငံအတွင်း	မြန်မာနိုင်ငံ
ကြာချိန်	
ကာလတို	၃ နှစ်နှင့်အထက်
အလယ်အလတ်ကာလ	၃ နှစ် - ၁၀ နှစ် အထိ
ကာလရှည်	၁၀ နှစ် အထက်
ပမာဏ	

ထိခိုက်မှုမရှိ	အခြေခံလေ့လာတွေ့ရှိချက်များအရ သိသာထင်ရှားသော ပြောင်းလဲမှုများ မဖြစ်ပေါ်နိုင်ပါ။
နည်းသော	ပြောင်းလဲမှုများဖြစ်ပေါ်နိုင်သော်လည်း VECs ပေါ်တွင်သက်ရောက်မှုမှာ ကန့်သတ်ချက်များရှိပါသည်။
အလယ်အလတ်	ပြောင်းလဲမှုများဖြစ်ပေါ်နိုင်သော်လည်း VECs ပေါ်တွင်သက်ရောက်မှုမှာ အလယ်အလတ်သာရှိပါသည်။
များသော	ပြောင်းလဲမှုများဖြစ်ပေါ်နိုင်ပြီး VECs ပေါ်တွင်သက်ရောက်မှုမှာ ပြင်းထန်နိုင်ပါသည်။
ဖြစ်နိုင်ခြေ	
နည်းသော	ဖြစ်နိုင်ခြေမရှိခြင်း။
များသော	ဖြစ်နိုင်ခြေရှိခြင်း။
ယုံကြည်မှုအဆင့်	
နည်းသော	cause-effect relationships အပြည့်အဝနားမလည်ခြင်း။
အလယ်အလတ်	cause-effect relationships အသင့်အတင့်နားလည်ခြင်း။
များသော	cause-effect relationships ပြီးပြည့်စုံစွာနားလည်ခြင်း။

၆.၁.၁. လေထုအရည်အသွေးအကဲဖြတ်ဆန်းစစ်ခြင်း

လေထုအရည်အသွေးဆိုင်ရာ ဆက်စပ်အကဲဖြတ်ဆန်းစစ်ခြင်းကို ဇယား ၁၄ တွင်ဖော်ပြထားပါသည်။

ဇယား ၁၄ လေထုအရည်အသွေးဆိုင်ရာ ဆက်စပ်သက်ရောက်မှုများ

VEC	အဆင့်သတ်မှတ်ချက်	အခြေခံအကြောင်းအရာ
လေထုအရည်အသွေး	အကျိုးသက်ရောက်မှု ပုံမှန်	စီမံကိန်းသည် သိသာထင်ရှားသော လေထုညစ်ညမ်းမှုများ မဖြစ်ပေါ်နိုင်သည့်အတွက် လေထုအရည်အသွေးမှာ ပုံမှန်ဖြစ်ပေါ်မည်ဖြစ်သည်။
	အတိုင်းအတာ : စီမံကိန်းနှင့် စီမံကိန်းအနီးတဝိုက်	စီမံကိန်းနှင့် စီမံကိန်းအနီးတဝိုက်ကိုသာ သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်မည်ဟု ခန့်မှန်းထားပါသည်။
	ကြာချိန် : ကာလရှည်	စီမံကိန်းလည်ပတ်သည့် ကာလတစ်လျှောက်လုံး သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။
	ပမာဏ : နည်းသော	လေထုညစ်ညမ်းစေသော အမှုန်အမွှားနှင့် ဓာတ်ငွေ့များ ထုတ်လွှတ်နိုင်သော်လည်း လေထုအရည်အသွေးအပေါ် သက်ရောက်မှုမှာ ကန့်သတ်ချက်ရှိပါသည်။
	ဖြစ်နိုင်ခြေ : နည်းသော	ဖြစ်နိုင်မရှိပါ။
	ယုံကြည်မှုအဆင့်: အသင့်အတင့်	စီမံကိန်းကြောင့် လေထုညစ်ညမ်းမှုမှာ သင့်တင့်သော ယုံကြည်မှုအဆင့်မျှသာရှိပါသည်။
	သိသာထင်ရှားမှု : ပုံမှန်	လေထုအရည်အသွေးမှာ ပုံမှန်သာဖြစ်မည်ဟု ခန့်မှန်းထားပါသည်။

၆.၁.၂. ရေအရည်အသွေးအကဲဖြတ်ဆန်းစစ်ခြင်း

ရေအရည်အသွေးနှင့် ပတ်သက်၍ ဆက်စပ်သက်ရောက်မှုများအကဲဖြတ်ဆန်းစစ်ခြင်းကို ဇယား ၁၅ တွင်ဖော်ပြထားပါသည်။

ဇယား ၁၅ ရေအရည်အသွေးဆက်စပ်အကဲဖြတ်ဆန်းစစ်ခြင်း

VEC	အဆင့်သတ်မှတ်ချက်	အခြေခံအကြောင်းအရာ
ရေအရည်အသွေး	အကျိုးသက်ရောက်မှု: ပုံမှန်	စနစ်ကျသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်များ ထောက်ပံ့ပေးခြင်းဖြင့် စီမံကိန်း၏ ဆောက်လုပ်ရေး လုပ်ငန်းနှင့် လည်ပတ်ခြင်း လုပ်ငန်းများမှ ရေအရည်အသွေးမှာ ထိခိုက်မှုမရှိနိုင်ပါ။
	အတိုင်းအတာ : စီမံကိန်းနှင့် စီမံကိန်းအနီးတဝိုက်	စီမံကိန်းနှင့် စီမံကိန်းအနီးတဝိုက်ကိုသာ သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်မည်ဟု ခန့်မှန်းထားပါသည်။
	ကြာချိန် : ကာလရှည်	စီမံကိန်းလည်ပတ်သည့် ကာလတစ်လျှောက်လုံး သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။
	ပမာဏ : ထိခိုက်မှုမရှိနိုင်	ရေအရည်အသွေးတိုင်းတာသည့် ရလဒ်များအရ ရေအရည်အသွေးပေါ် သိသာထင်ရှားသော ပြောင်းလဲမှုများ မဖြစ်ပေါ်နိုင်ပါ။
	ဖြစ်နိုင်ခြေ : နည်းသော	ဖြစ်နိုင်မရှိပါ။
	ယုံကြည်မှုအဆင့်: အသင့်အတင့်	စီမံကိန်းကြောင့် ရေအရည်အသွေး ပြောင်းလဲမှုမှာ သင့်တင့်သောယုံကြည်မှုအဆင့်မျှသာရှိပါသည်။
	သိသာထင်ရှားမှု : ပုံမှန်	ရေအရည်အသွေးမှာ ပုံမှန်သာဖြစ်မည်ဟု ခန့်မှန်းထားပါသည်။

၆.၁.၃. စွန့်ပစ်အစိုင်အခဲအပေါ် အကဲဖြတ်ဆန်းစစ်ခြင်း

စွန့်ပစ်အစိုင်အခဲအပေါ် အကဲဖြတ်ဆန်းစစ်ခြင်းကို ဇယား ၁၆ တွင်ဖော်ပြထားပါသည်။

ဇယား ၁၆ စွန့်ပစ်အစိုင်အခဲအပေါ် အကဲဖြတ်ဆန်းစစ်ခြင်း

VEC	အဆင့်သတ်မှတ်ချက်	အခြေခံအကြောင်းအရာ
စွန့်ပစ်အစိုင်အခဲ	အကျိုးသက်ရောက်မှု: ပုံမှန်	စနစ်ကျသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်များ ထောက်ပံ့ပေးခြင်းဖြင့် စီမံကိန်း၏ ဆောက်လုပ်ရေး လုပ်ငန်းနှင့် လည်ပတ်ခြင်း လုပ်ငန်းများမှ စွန့်ပစ်အစိုင်အခဲဆိုင်ရာ ထိခိုက်မှုမရှိနိုင်ပါ။
	အတိုင်းအတာ : စီမံကိန်းနှင့် စီမံကိန်းအနီးတဝိုက်	စီမံကိန်းနှင့် စီမံကိန်းအနီးတဝိုက်ကိုသာ သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်မည် ဟု ခန့်မှန်းထားပါသည်။
	ကြာချိန် : ကာလရှည်	စီမံကိန်းလည်ပတ်သည့် ကာလတစ်လျှောက်လုံး သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။
	ပမာဏ : နည်းသော	ပြောင်းလဲမှုများ ဖြစ်ပေါ်နိုင်သော်လည်း ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှုများမှာ ကန့်သတ်ချက်ရှိပါသည်။
	ဖြစ်နိုင်ခြေ : နည်းသော	ဖြစ်နိုင်မရှိပါ။

	ယုံကြည်မှုအဆင့်: အသင့်အတင့်	စီမံကိန်းကြောင့် ဖြစ်ပေါ်နိုင်သော စွန့်ပစ်ပစ္စည်းများ စီမံခန့်ခွဲမှုကို အရ ဖြစ်ပေါ်နိုင်ခြေမှာ သင့်တင့်သော ယုံကြည်မှု အဆင့်မျှသာရှိပါသည်။
	သိသာထင်ရှားမှု : ပုံမှန်	သိသာထင်ရှားသော သက်ရောက်မှုများ မဖြစ်ပေါ်နိုင် ဟု ခန့်မှန်းထားပြီး သက်ရောက်မှုမှာ ပုံမှန်သာ ဖြစ်ပါသည်။

၆.၁.၄. ယာဉ်အန္တရာယ်ကင်းရှင်းရေး အကဲဖြတ်ဆန်းစစ်ခြင်း

ယာဉ်အန္တရာယ်ကင်းရှင်းရေး အကဲဖြတ်ဆန်းစစ်ခြင်းကို ဇယား ၁၇ တွင်ဖော်ပြထားပါသည်။

ဇယား ၁၇ ယာဉ်အန္တရာယ်ကင်းရှင်းရေး အကဲဖြတ်ဆန်းစစ်ခြင်း

VEC	အဆင့်သတ်မှတ်ချက်	အခြေခံအကြောင်းအရာ
ယာဉ်အန္တရာယ်ကင်းရှင်းရေး	အကျိုးသက်ရောက်မှု: ဆိုးကျိုး	စီမံကိန်း၏ ဆောက်လုပ်ရေး လုပ်ငန်းနှင့် လည်ပတ်ခြင်း လုပ်ငန်းများမှ ယာဉ်အန္တရာယ် ကင်းရှင်းရေးအပေါ် သက်ရောက်မှု ဖြစ်ပေါ်နိုင် ပါသည်။
	အတိုင်းအတာ : ဒေသတွင်း	သက်ရောက်မှုများကို ရန်ကုန်မြို့ဧရိယာအတွင်း ဖြစ်ပေါ်နိုင်မည် ဟု ခန့်မှန်းထားပါသည်။
	ကြာချိန် : ကာလရှည်	စီမံကိန်းလည်ပတ်သည့် ကာလတစ်လျှောက်လုံး သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။
	ပမာဏ : နည်းသော	ပြောင်းလဲမှုများ ဖြစ်ပေါ်နိုင်သော်လည်း ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှုများမှာ ကန့်သတ်ချက်ရှိပါသည်။
	ဖြစ်နိုင်ခြေ : နည်းသော	ဖြစ်နိုင်မရှိပါ။
	ယုံကြည်မှုအဆင့်: အသင့်အတင့်	စီမံကိန်းကြောင့် ဖြစ်ပေါ်နိုင်သော ယာဉ်အန္တရာယ် ကင်းရှင်းရေးဆိုင်ရာ သက်ရောက်မှုမှာ သင့်တင့် သော ယုံကြည်မှု အဆင့်မျှသာရှိပါသည်။
	သိသာထင်ရှားမှု : သိသာထင်ရှားသော ဆိုးကျိုးသက်ရောက်မှု	ယာဉ်အန္တရာယ်ကင်းရှင်းရေးနှင့် ပတ်သက်၍ သက်ရောက်မှုများမှာ သိသာထင်ရှားသော ဆိုးကျိုးသက်ရောက်မှု နိုင်ပါသည်။

၇. ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

အဆိုပြုစီမံကိန်းကြောင့် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများနှင့် လျော့ချရေးနည်းလမ်းများ အကျဉ်းချုပ်ကို ဇယား ၁၈ တွင်ဖော်ပြထားပါသည်။ တည်ဆောက်ချိန်ကာလ၊ လုပ်ငန်းလည်ပတ်စဉ်ကာလနှင့် ပိတ်သိမ်းချိန်ကာလရှိ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုရေး အစီအစဉ်များကို ဇယား ၁၉ နှင့် ဇယား ၂၀ တွင်ဖော်ပြထားပါသည်။

ဇယား ၁၈ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများနှင့် လျှော့ချရေးနည်းလမ်းများ အကျဉ်းချုပ်

စဉ်	ဖြစ်ပေါ်နိုင်သောသက်ရောက်မှုများ အကဲဖြတ်ဆန်းစစ်ခြင်း	လျှော့ချရေးနည်းလမ်းများ	တာဝန်ယူမည့်အဖွဲ့အစည်း	နှစ်စဉ်ခန့်မှန်း ကုန်ကျစရိတ် (မြန်မာကျပ်ငွေ)
တည်ဆောက်စဉ်နှင့် ပိတ်သိမ်းစဉ်				
၁။	<p>လေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - စီမံကိန်းတည်ဆောက်ခြင်းနှင့် ပိတ်သိမ်းခြင်း လုပ်ငန်းများ၊ ဒီဇယ်မီးစက်နှင့် မော်တော်ယာဉ် အသုံးပြုခြင်းမှ လေထုညစ်ညမ်းစေသော အမှုန်အမွှားများနှင့် ဓာတ်ငွေ့များ ထုတ်လွှတ် နိုင်ပါသည်။ 	<p>လေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - သယ်ယူပို့ဆောင်ရေး မော်တော်ယာဉ်များကို ပုံမှန်စစ်ဆေး ထိန်းသိမ်းထားမည်ဖြစ်သည်။ - ဆောက်လုပ်ရေးဧရိယာ အနီးတဝိုက်တွင် ရေဖျန်းပေးခြင်းနှင့် လုံခြုံရေးပိုက်ကွန်များ အသုံးပြုခြင်းကို ဆောင်ရွက်သွားမည်ဖြစ်သည်။ - ဘိလပ်မြေနှင့် သဲကဲ့သို့သော ဆောက်လုပ်ရေးသုံး ပစ္စည်းများကို အဖုံးအကာများဖြင့် သယ်ယူအသုံးပြု သွားမည်ဖြစ်သည်။ 	ကန်ထရိုက်တာ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေး အဖွဲ့	စီမံကိန်း ဆောက်လုပ်သည့် ကုန်ကျစရိတ်တွင် ပါဝင်ပြီး
၂။	<p>ဆူညံသံနှင့် တုန်ခါမှု</p> <ul style="list-style-type: none"> - ဒီဇယ်မီးစက်နှင့် ဆောက်လုပ်ရေးသုံး စက်ပစ္စည်းများနှင့် ကြီးမားသော မော်တော်ယာဉ် များမှ ဆူညံသံနှင့် တုန်ခါမှုများဖြစ်ပေါ် နိုင်ပါသည်။ 	<p>ဆူညံသံနှင့် တုန်ခါမှု</p> <ul style="list-style-type: none"> - ဆူညံသံများသော ဆောက်လုပ်ရေးလုပ်ငန်းများကို နေ့အချိန်တွင်သာ ဆောင်ရွက်သွားမည်ဖြစ်သည်။ - ဆူညံသံများသောနေရာတွင် အလုပ်လုပ်သော အလုပ်သမားများကို နားအကာအကွယ်ပစ္စည်းများ ထောက်ပံ့ပေးသွားမည် ဖြစ်သည်။ - ဆူညံသံများသော နေရာနှင့် တုန်ခါမှုများသော မျက်နှာပြင်တွင် အလုပ်လုပ်ကိုင်နေသော အလုပ်သမားများကို အလုပ်ချိန်ပြောင်းလဲ၍ လုပ်ကိုင်ဆောင်ရွက် သွားမည်ဖြစ်သည်။ 	ကန်ထရိုက်တာ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေး အဖွဲ့	စီမံကိန်း ဆောက်လုပ်သည့် ကုန်ကျစရိတ်တွင် ပါဝင်ပြီး

		<ul style="list-style-type: none"> - ဆူညံသံထွက်ရှိမှုနည်းသော မီးစက်များကို အသုံးပြုမည်ဖြစ်သည်။ - ဒီဇယ်မီးစက်များကို လူနေဧရိယာနှင့် ဝေးသောနေရာတွင် ထားရှိအသုံးပြုသွားမည်ဖြစ်သည်။ - ဆောက်လုပ်ရေးသုံး စက်ပစ္စည်းကိရိယာများ၊ ကုန်တင်ကားနှင့် မီးစက်များကို ပုံမှန်စစ်ဆေးခြင်းများ ပြုလုပ်သွားမည်ဖြစ်သည်။ 		
၃။	<p>ရေအရည်အသွေး</p> <ul style="list-style-type: none"> - ဆောက်လုပ်ရေးလုပ်ငန်းခွင်ကို ဖြတ်၍ စီးဆင်းသော မိုးရေနှင့် ဆောက်လုပ်ရေး အလုပ်သမားများမှ အိမ်သုံးစွန့်ပစ်ရေများ ထွက်ရှိမည်ဖြစ်သည်။ 	<p>ရေအရည်အသွေး</p> <ul style="list-style-type: none"> - ဆောက်လုပ်ရေးအလုပ်သမားများကို လုံလောက်သော အိမ်သာများနှင့် ရေချိုးခန်းများ ထောက်ပံ့ပေးသွားမည် ဖြစ်သည်။ - မိလ္လာကန်မှ မိလ္လာများကို စနစ်တကျစုဆောင်းထားရှိပြီး ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီ၏ လမ်းညွှန်ချက်များနှင့် အညီ စွန့်ပစ်မည်ဖြစ်သည်။ 	ကန်ထရိုက်တာ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေး အဖွဲ့	စီမံကိန်း ဆောက်လုပ်သည့် ကုန်ကျစရိတ်တွင် ပါဝင်ပြီး
၄။	<p>မြေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - ဆောက်လုပ်ရေးလုပ်ငန်းသုံး မော်တော်ယာဉ်များ နှင့် စက်များမှ ထွက်သော လောင်စာဆီများ ယိုဖိတ်ခြင်းနှင့် အခြားသော အမှိုက်များ မြေပေါ်သို့ စွန့်ပစ်ခြင်းအစရှိသည့် မြေထုညစ်ညမ်းမှုများ ဖြစ်ပေါ်နိုင်သည်။ - ယာယီစွန့်ပစ်အမှိုက်ကန်မှ စွန့်ပစ်အရည်များ အနီးပတ်ဝန်းကျင်ရှိမြေသို့ ယိုဖိတ်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။ 	<p>မြေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - လောင်စာဆီများမြေပေါ်သို့ ယိုဖိတ်ခြင်းမှ ကာကွယ်ရန် ဆောက်လုပ်ရေးလုပ်ငန်းသုံး မော်တော်ယာဉ်များနှင့် စက်များကို ပုံမှန် စစ်ဆေးခြင်းများ ပြုလုပ်သွားမည် ဖြစ်သည်။ - စွန့်ပစ်အရည်များ မြေပေါ်သို့ ယိုဖိတ်ခြင်းမှ ကာကွယ် နိုင်ရန် ယာယီအမှိုက်ကန်ကို စနစ်တကျ ဆောက်လုပ် ထားရှိမည်ဖြစ်သည်။ - လောင်စာဆီများကိုလည်း စနစ်တကျသိုလှောင် ထားရှိမည်ဖြစ်သည်။ 	ကန်ထရိုက်တာ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေး အဖွဲ့	စီမံကိန်း ဆောက်လုပ်သည့် ကုန်ကျစရိတ်တွင် ပါဝင်ပြီး

		<ul style="list-style-type: none"> - ဆောက်လုပ်ရေးသုံးစွန့်ပစ်အမှိုက်များကို ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်များနှင့် အညီ စွန့်ပစ်မည်ဖြစ်သည်။ 		
၅။	<p>စွန့်ပစ်အမှိုက်</p> <ul style="list-style-type: none"> - ဆောက်လုပ်ရေးလုပ်ငန်းများမှ ဆောက်လုပ်ရေးလုပ်ငန်းသုံး စွန့်ပစ်အမှိုက်များနှင့် ဆောက်လုပ်ရေး အလုပ်သမားများမှ အိမ်သုံးစွန့်ပစ် အမှိုက်များ 	<p>စွန့်ပစ်အမှိုက်</p> <ul style="list-style-type: none"> - အပေါ်ယံမြေဆီလွှာဖယ်ရှားခြင်း၊ အဆောက်အဦအဟောင်းများနှင့် ဆောက်လုပ်ရေးလုပ်ငန်းများမှ စွန့်ပစ်အမှိုက်များကို ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်နှင့် အညီ သင့်လျော်သော အမှိုက်ပုံသို့ စွန့်ပစ်မည်ဖြစ်သည်။ - ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီ၏ လမ်းညွှန်ချက်များနှင့် အညီ ဆောက်လုပ်ရေးလုပ်ငန်းသုံး စွန့်ပစ်အမှိုက်များကို အမှိုက်ထွက်ရှိရာ နေရာ၌ပင် ခွဲခြားစိတ်ဖြာပြီး စွန့်ပစ်မည်ဖြစ်သည်။ - ပလပ်စတစ်၊ အမှိုက်များ၊ ဖန်နှင့် စားကြွင်းစားကျန်များကဲ့သို့သော အန္တရာယ် မရှိသောစွန့်ပစ်အမှိုက်များကို ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်နှင့်အညီ ခွဲခြား၍ စွန့်ပစ်မည်ဖြစ်သည်။ - အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းများကို ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်းနှင့် လုပ်ငန်းခွင် အပြင်ဘက်ရှိ နေရာများတွင် စွန့်ပစ်ခြင်းကို တားမြစ်သွားမည် ဖြစ်သည်။ - အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းများကို ရန်ကုန်မြို့တော် စည်ပင်သာယာရေး ကော်မတီ၏ လမ်းညွှန်ချက်နှင့် အညီ သိုလှောင်ခြင်း၊ စုဆောင်းထားရှိခြင်းနှင့် စွန့်ပစ်ခြင်းတို့ကို ပြုလုပ်သွားမည် ဖြစ်သည်။ 	ကန်ထရိုက်တာ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေး အဖွဲ့	စီမံကိန်း ဆောက်လုပ်သည့် ကုန်ကျစရိတ်တွင် ပါဝင်ပြီး

<p>၆။</p>	<p>လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးအန္တရာယ်ကင်းရှင်းရေး</p> <ul style="list-style-type: none"> - သတိလက်လွတ် ဖြစ်ခြင်းကြောင့် ဆောက်လုပ်ရေး အလုပ်သမားများသည် ချော်လဲခြင်းနှင့် လဲကျခြင်းများ ဖြစ်ပေါ်နိုင်ပါသည်။ - မြင့်သော အဆောက်အဦးများ၏ ခေါင်မိုးမိုးခြင်းနှင့် ဆေးသုတ်ခြင်းလုပ်ငန်းများကြောင့် ထိခိုက်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။ - စက်ပစ္စည်းကိရိယာများနှင့် တိုးလာသော အပူချိန်သည် သတိလက်လွတ်ဖြစ်ခြင်းကြောင့် ထိခိုက်နိုင်ပါသည်။ - အလုပ်လုပ်သည့်နေရာ၏ လေထုထဲတွင် ဖုန်မှုန့်များသည် အသက်ရှူလမ်းကြောင်းဆိုင်ရာ ရောဂါ များဖြစ်ပွားနိုင်ပါသည်။ 	<p>လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးအန္တရာယ် ကင်းရှင်းရေး</p> <ul style="list-style-type: none"> - စီမံကိန်းဖော်ဆောင်သူသည် ဘေးအန္တရာယ်ကင်းရှင်းရေး မူဝါဒကို တည်ဆောက်မည်ဖြစ်သည်။ - ကန်ထရိုက်တာသည် ဘေးအန္တရာယ် ကင်းရှင်းရေး အစီအစဉ်ကို ပြင်ဆင်ရေးဆွဲမည်ဖြစ်သည်။ - ကန်ထရိုက်တာသည် တစ်ကိုယ်ရေကာကွယ်သုံး ပစ္စည်းများနှင့် ရှေးဦးသူနာပြုဆေးသေတ္တာကို ဆောက်လုပ်ရေး အလုပ်သမားများထံ ထောက်ပံ့ပေးမည် ဖြစ်သည်။ - ကန်ထရိုက်တာသည် ဆောက်လုပ်ရေး အလုပ်သမားများကို ဘေးအန္တရာယ်ကင်းရှင်းရေး လမ်းညွှန်ချက်များ၏ သတိပေးချက်များကို ပိုမိုမြှင့်တင် မည်ဖြစ်သည်။ - ကန်ထရိုက်တာသည် လုပ်ငန်းခွင်ရှိ ဘေးအန္တရာယ်ကင်းရှင်းရေး စောင့်ကြပ်ကြည့်ရှုသူများကို အလုပ်များခန့်အပ်သွားမည်ဖြစ်သည်။ - ကန်ထရိုက်တာသည် ဘေးအန္တရာယ်ကင်းရှင်းရေး လုပ်ငန်းများကို လိုက်နာသော အလုပ်သမားများကို ဆုပေး၍ မလိုက်နာသော အလုပ်သမားများကို ဒဏ်ပေးသော စနစ်ကို လုပ်ဆောင်သွားမည်ဖြစ်သည်။ - ကန်ထရိုက်တာသည် နံနက်ပိုင်းဆွေးနွေးပွဲနှင့် ဘေးကင်းရေး အစီအမံများ ရှင်းလင်းတင်ပြခြင်းကို စီစဉ်ပေးမည်ဖြစ်သည်။ 	<p>ကန်ထရိုက်တာ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေး အဖွဲ့</p>	<p>စီမံကိန်းဆောက်လုပ်သည့် ကုန်ကျစရိတ်တွင် ပါဝင်ပြီး</p>
<p>7.</p>	<p>ဂေဟစနစ်</p> <ul style="list-style-type: none"> - ဆောက်လုပ်ရေးနှင့် ဖျက်သိမ်းခြင်းလုပ်ငန်းများမှ အပင်နှင့် သတ္တဝါများကို သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။ 	<p>ဂေဟစနစ်</p> <ul style="list-style-type: none"> - အပင်နှင့် သစ်သီးပင်များ ခုတ်ထွင်ရှင်းလင်းခြင်းကို အနည်းဆုံးဖြစ်စေမည်ဖြစ်ပြီး သစ်ပင်များကို ပြန်လည်စိုက်ပျိုးပေးမည်ဖြစ်သည်။ 	<p>ကန်ထရိုက်တာ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေး အဖွဲ့</p>	<p>စီမံကိန်းဆောက်လုပ်သည့် ကုန်ကျစရိတ်တွင် ပါဝင်ပြီး</p>

		<ul style="list-style-type: none"> - စက်ဆီ၊ ချောဆီနှင့် ဆောက်လုပ်ရေးလုပ်ငန်းသုံး စွန့်ပစ်အမှိုက်များကို စနစ်တကျ သိုလှောင်ထားရှိပြီး မြေပြင်နှင့် ရေထုထဲသို့ စိမ့်ဝင်ခြင်းမှ ကာကွယ်ထားရှိမည် ဖြစ်သည်။ - ဆောက်လုပ်ရေးလုပ်ငန်းသုံး စွန့်ပစ်အမှိုက်များနှင့် စွန့်ပစ်ရေများကို စနစ်တကျ စွန့်ပစ်မည်ဖြစ်သည်။ 		
လုပ်ငန်းလည်ပတ်စဉ်ကာလ				
၁။	<p>လေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - ကုန်ပစ္စည်းအတင်အချ၊ မီးစက်အသုံးပြုမှု၊ ဓာတုပစ္စည်းအသုံးပြုခြင်းနှင့် သယ်ယူပို့ဆောင်ရေး လုပ်ငန်းများမှ PM₁₀ နှင့် PM_{2.5} ကဲ့သို့သော အမှုန်အမွှားများနှင့် ကာဗွန်ဒိုင်အောက်ဆိုဒ်၊ နိုက်ဒရိုဂျင်ဒိုင်အောက်ဆိုဒ်၊ ကာဗွန်မိုနောက်ဆိုဒ်၊ မီသိန်း၊ အိုဇုန်း၊ ဆာလဖာဒိုင်အောက်ဆိုဒ်နှင့် အငွေ့ပျံလွယ်သော အော်ဂင်းနစ်ဒြပ်ပေါင်းများ ထွက်ရှိခြင်း - ဖိနပ်အောက်ဆိုးကြမ်းအောင်ပြုလုပ်သည့် လုပ်ငန်းစဉ်မှ အန္တရာယ်ရှိသော ဖုန်မှုန့်များထွက်ရှိခြင်း 	<p>လေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - မီးစက်နှင့် မော်တော်ယာဉ်များကို ပုံမှန်စစ်ဆေး၍ ထိန်းသိမ်းထားရှိမည်ဖြစ်သည်။ - ဓာတ်ငွေ့များထုတ်လွှတ်မှုကို လျှော့ချရန် မီးစက်များ၊ စက်ပစ္စည်းများနှင့် မော်တော်ယာဉ်များတွင် ဆာလဖာပါဝင်မှုနည်းသော လောင်စာဆီများကို အသုံးပြုမည်ဖြစ်သည်။ - ဖိနပ်အောက်ဆိုးကြမ်းအောင် ပြုလုပ်သည့် လုပ်ငန်းစဉ်မှ ထွက်ရှိသော ဖုန်မှုန့်များကို အပေါက် ၆ ခုပါသော ဖုန်စုပ်စက်များ တပ်ဆင်အသုံးပြုသွားမည် ဖြစ်သည်။ - နှာခေါင်းစည်း၊ လက်အိတ်နှင့် အခြားသော တစ်ကိုယ်ရေ ကာကွယ်သုံးပစ္စည်းများကို ဖိနပ်အောက်ဆိုး ကြမ်းအောင်ပြုလုပ်သည့် အခန်းတွင် လုပ်ဆောင် နေကြသော အလုပ်သမားများကို ထောက်ပံ့ ပေးသွားမည်ဖြစ်သည်။ 	ABGL၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့အစည်း	၁,၀၀၀,၀၀၀
၂။	<p>ဆူညံသံနှင့် တုန်ခါမှု</p> <ul style="list-style-type: none"> - ဒီဇယ်မီးစက်များ၊ အပ်ချုပ်စက်များ၊ ဖြတ်တောက်စက်များ၊ အောက်ဆိုးကြမ်းအောင် 	<p>ဆူညံသံနှင့် တုန်ခါမှု</p> <ul style="list-style-type: none"> - ဆူညံသံနည်းသော စက်ပစ္စည်းကိရိယာများကို အသုံးပြုမည် ဖြစ်သည်။ 	ABGL၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့အစည်း	၅၀၀,၀၀၀

	<p>ပြုလုပ်သည့် စက်များနှင့် မော်တော်ယာဉ်များမှ ဆူညံသံနှင့် တုန်ခါမှု များထွက်ရှိနိုင်ပါသည်။</p>	<ul style="list-style-type: none"> - ဆူညံသံများသော နေရာတွင် အလုပ်လုပ်နေသော အလုပ်သမားများကို နားအကာအကွယ်ပစ္စည်းများ ကဲ့သို့သော တစ်ကိုယ်ရေကာကွယ်သုံးပစ္စည်းများ ထောက်ပံ့ပေးမည် ဖြစ်သည်။ - ဒီဇယ်မီးစက်များကို လူနေဧရိယာနှင့် ဝေးသော နေရာတွင် ထားရှိမည်ဖြစ်သည်။ - ဆူညံသံနှင့် တုန်ခါမှုများကို လျှော့ချရန် စက်ပစ္စည်းများ ကိရိယာများ၊ သယ်ယူပို့ဆောင်ရေး မော်တော်ယာဉ်များနှင့် ဒီဇယ်မီးစက်များကို ပုံမှန်စစ်ဆေး ထိန်းသိမ်းထားရှိမည်ဖြစ်သည်။ 		
<p>၃။</p>	<p>ရေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - ဝန်ထမ်းနားနေဆောင်၊ စားသောက်ခန်းနှင့် အိမ်သာမှ အိမ်သုံးစွန့်ပစ်ရေနှင့် မိလ္လာရေများ ထွက်ရှိနိုင်ပါသည်။ 	<p>ရေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - စနစ်ကျသော ရေစီးရေလာကောင်းမွန်သော ရေနုတ်မြောင်းကို စက်ရုံဝန်းအတွင်း ဆောက်လုပ်မည် ဖြစ်သည်။ - အိမ်သုံးစွန့်ပစ်ရေများကို အရံရေနုတ်မြောင်းမှ တစ်ဆင့် ပင်မရေနုတ်မြောင်းသို့ ပို့ဆောင်ပြီး စက်မှုဇုန် ရေနုတ်မြောင်းအတွင်းသို့ ပို့ဆောင်စွန့်ပစ်မည် ဖြစ်သည်။ - စက်ရုံအလုပ်သမားများအတွက် လုံလောက်သော အိမ်သာများနှင့် ရေချိုးခန်းများကို ထောက်ပံ့ပေးမည် ဖြစ်သည်။ - စီမံကိန်းအတွင်းရှိ အဆောက်အဦများမှ မိလ္လာများကို မိလ္လာကန်အသေးနှင့် ပင်မ မိလ္လာကန်တွင် ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်များနှင့် အညီ စွန့်ပစ်မည်ဖြစ်သည်။ 	<p>ABGL၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့အစည်း</p>	<p>၅၀၀,၀၀၀</p>

<p>၄။</p>	<p>မြေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - သယ်ယူပို့ဆောင်ရေးမော်တော်ယာဉ်များ၊ ဒီဇယ်မီးစက်များနှင့် ဒီဇယ်ဆီ သိုလှောင်ကန်များမှ လောင်စာဆီ ယိုဖိတ်ခြင်းနှင့် စနစ်တကျ မစွန့်ပစ်သော စွန့်ပစ်ရေများကြောင့် မြေထုအရည်အသွေးကို ညစ်ညမ်းစေပါသည်။ 	<p>မြေထုအရည်အသွေး</p> <ul style="list-style-type: none"> - လည်ပတ်ရေးလုပ်ငန်းစဉ်အတွက်အသုံးပြုသော သယ်ယူပို့ဆောင်ရေး မော်တော်ယာဉ်များနှင့် စက်ပစ္စည်းကိရိယာများကို စနစ်တကျ ပုံမှန် စစ်ဆေးခြင်းများ ပြုလုပ်သွားမည် ဖြစ်သည်။ - စွန့်ပစ်ပစ္စည်းများ သင့်လျော်စွာ စွန့်ပစ်မှု မရှိခြင်းကို ကာကွယ်ရန်အတွက် စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှုစနစ်ကို သင့်လျော်စွာ တပ်ဆင်အသုံးပြုမည်ဖြစ်သည်။ - မြေပြင်ပေါ်သို့ စွန့်ပစ်ရေများ စနစ်တကျ စွန့်ပစ်မှုမရှိခြင်းကို ကာကွယ်ရန် အိမ်သုံး စွန့်ပစ်ရေများကို စနစ်တကျ စွန့်ပစ်မည်ဖြစ်သည်။ 	<p>ABGL၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့အစည်း</p>	<p>စွန့်ပစ်အမှိုက်နှင့် စွန့်ပစ်ရေ စီမံခန့်ခွဲမှုစရိတ် တွင်ပါဝင်ပြီး</p>
<p>၅။</p>	<p>စွန့်ပစ်အမှိုက်</p> <ul style="list-style-type: none"> - ဓာတ်ခဲများ၊ မီးချောင်းများ၊ အိမ်သုတ်ဆေးနှင့် ပုံးခွံများ၊ ဓာတုပစ္စည်းအကြွင်းအကျန်များနှင့် ပုံးခွံများကဲ့သို့သော အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းများ ထွက်ရှိနိုင်ပါသည်။ - စာရွက်၊ ပလပ်စတစ်အိတ်၊ ပလပ်စတစ် ပုလင်းများ၊ ဖန်များ၊ အလူမီနီယံဗူးများ၊ သံဗူးများ၊ အဝတ်အထည်များ၊ အစားအစာ စွန့်ပစ်ပစ္စည်းနှင့် ရာဘာများကဲ့သို့သော အန္တရာယ်မရှိသော စွန့်ပစ်ပစ္စည်းများ ထွက်ရှိနိုင်ပါသည်။ 	<p>စွန့်ပစ်အမှိုက်</p> <ul style="list-style-type: none"> - အမှိုက်ပုံးများနှင့် ခွဲခြားစုဆောင်းထားသော စွန့်ပစ်အမှိုက်များကို ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီမှ လာရောက် သိမ်းဆည်းခြင်း မပြုလုပ်မီ ယာယီစွန့်ပစ်အမှိုက်သိမ်းဆည်းသည့် နေရာတွင် သိမ်းဆည်းထားရှိမည်ဖြစ်သည်။ - စက်ရုံအလုပ်သမားထံမှ စားကြွင်းစားကျန်များကို ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်နှင့် အညီ နေ့စဉ် စွန့်ပစ်မည်ဖြစ်သည်။ - အသုံးပြုပြီးသော ဓာတ်ခဲများ၊ ဓာတုပစ္စည်းများ ထည့်သည့် ပုံခွံများတွင် ကြွင်းကျန် ဓာတုပစ္စည်းများ၊ မီးချောင်းများကဲ့သို့သော အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းများနှင့် ယာယီစွန့်ပစ်အမှိုက်ကန်များမှ ဖြတ်တောက်စများ၊ အပ်ချည်များနှင့် အရည်အသွေး မပြည့်မီသော ထုတ်ကုန်များကို ရန်ကုန်မြို့တော် 	<p>ABGL၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့အစည်း</p>	<p>၅၀၀,၀၀၀</p>

		<p>စည်ပင်သာယာရေး ကော်မတီ၏ လမ်းညွှန်ချက်နှင့် အညီ လစဉ်စွန့်ပစ်မည်ဖြစ်သည်။</p>		
<p>၆။</p>	<p>အနံ့ဆိုး</p> <ul style="list-style-type: none"> - ယာယီစွန့်ပစ်အမှိုက် စွန့်ပစ်သည့်နေရာ၊ ကော်ကဲ့သို့သော ဓာတုပစ္စည်းများ အသုံးပြုသည့် နေရာနှင့် အဆောက်အဦများ ပြုပြင်သည့် လုပ်ငန်းများမှ အနံ့ဆိုးများ ထွက်ရှိနိုင်ပါသည်။ 	<p>အနံ့ဆိုး</p> <ul style="list-style-type: none"> - လေဝင်လေထွက်ကောင်းသော နေရာများတွင် ကော်များကို စနစ်တကျ ကိုင်တွယ်အသုံးပြုသွားမည် ဖြစ်သည်။ - မျက်နှာအကာအကွယ်နှင့် နှာခေါင်းစည်းကဲ့သို့သော တစ်ကိုယ်ရေကာကွယ်သုံးပစ္စည်းများကို အနံ့ဆိုးများ ရှုမိခြင်းမှ ကာကွယ်ရန်အသုံးပြုမည်ဖြစ်သည်။ - အနံ့ဆိုးအရမ်းထွက်သော နေရာတွင် လုပ်နေသော အလုပ်သမားများကို အလုပ်ချိန်ပြောင်းလဲ၍ လုပ်ကိုင် စေမည် ဖြစ်သည်။ - ယာယီအမှိုက်ကန်များကို စနစ်တကျ တည်ဆောက် ထားရှိပြီး ရန်ကုန်မြို့တော်စည်ပင် သာယာရေး ကော်မတီ၏ စည်းမျဉ်း စည်းကမ်းများနှင့် အညီ အမှိုက်ကန်မှ အမှိုက်များကို စွန့်ပစ်မည်ဖြစ်သည်။ 	<p>ABGL၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့အစည်း</p>	<p>လုပ်ငန်းခွင်ကျန်းမာရေး နှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး ကုန်ကျစရိတ်တွင် ပါဝင်ပြီး</p>
<p>၇။</p>	<p>လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးအန္တရာယ် ကင်းရှင်းရေး</p> <ul style="list-style-type: none"> - ကြမ်းပျဉ်ပေါ်တွင် ချော်လဲခြင်း၊ လျှပ်စစ် ဓာတ်လိုက်ခြင်းနှင့် ဂိုဒေါင်မှ ကုန်ပစ္စည်းများ အတင်အချကို စနစ်တကျ မပြုလုပ်ခြင်း ကဲ့သို့သော ရုပ်ပိုင်းဆိုင်ရာ ထိခိုက်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။ - စက်ရုံ ပြုပြင်ခြင်းလုပ်ငန်းမှလည်း မတော်တဆ ထိခိုက်မှုများ ဖြစ်ပေါ်နိုင်ပါသည်။ - ထို့အပြင် ကော် ကဲ့သို့သော ဓာတုပစ္စည်းများကို စနစ်တကျ မကိုင်တွယ်ခြင်းနှင့် ဖိနပ်အောက်ဆိုး 	<p>လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးအန္တရာယ် ကင်းရှင်းရေး</p> <ul style="list-style-type: none"> - ကြမ်းပျဉ်ပေါ်တွင် ချော်လဲခြင်းကို ကာကွယ်ရန် ထောင့်စွန်းများပါသော အစိုဓာတ်စုပ်သည့် ဖျာများကို အသုံးပြုပြီး သတိပေးဆိုင်းဘုတ်များကို အသုံးပြုသွား မည်ဖြစ်သည်။ - ကုန်ပစ္စည်းအတင်အချအတွက် အရည်အသွေး ပြည့်မီသော ဝန်ပင့်ယာဉ်များနှင့် လက်ကိုင်များကို အသုံးပြုသွားမည် ဖြစ်သည်။ - မတော်တဆထိခိုက်မှုများကို ကာကွယ်ရန် ကုန်ပစ္စည်းအတင်အချပြုလုပ်ရာတွင် သတ်မှတ် 	<p>ABGL၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့အစည်း</p>	<p>၁,၀၀၀,၀၀၀</p>

	<p>ကြမ်းအောင်ပြုလုပ်သည့် လုပ်ငန်းစဉ်များ မှလည်း အလုပ်သမားများကို အန္တရာယ်ဖြစ်စေပါသည်။</p>	<p>ထားသော ပမာဏထက် ပိုတင်ခြင်းကို ရှောင်ရှားမည် ဖြစ်သည်။</p> <ul style="list-style-type: none"> - အဆောက်အဦများ ပြုပြင်ခြင်းများလုပ်ဆောင်နေစဉ် အလုပ်သမားများကို တစ်ကိုယ်ရေကာကွယ်သုံးပစ္စည်းများ ထောက်ပံ့ပေးမည်ဖြစ်သည်။ - MSDS၊ မျက်စိဆေးသည့်နေရာ၊ အရေးပေါ်မီးသတိပေးစနစ်နှင့် “ဆေးလိပ်မသောက်ရ” သတိပေးဆိုင်းဘုတ်များကို ဓာတုပစ္စည်းသိုလှောင်ထားရှိရာ အခန်းတွင် ထားရှိမည်ဖြစ်သည်။ - ထို့အပြင် လက်အိတ်၊ အဝတ်အစား၊ မျက်မှန်၊ နှားအကာအကွယ် ပစ္စည်းများနှင့် မျက်နှာအကာအကွယ်များကဲ့သို့သော တစ်ကိုယ်ရေကာကွယ်ရေးသုံး ပစ္စည်းများကို ကော်ကဲ့သို့သော ဓာတုပစ္စည်းများ ကိုင်တွယ်အသုံးပြုသည့် အလုပ်သမားများနှင့် ဖိနပ်အောက်ဆိုး ကြမ်းအောင်ပြုလုပ်သည့် နေရာတွင် လုပ်ကိုင်နေသော အလုပ်သမားများကို ထောက်ပံ့ပေးမည်ဖြစ်သည်။ - ရှေးဦးသူနာပြုဆေးသေတ္တာနှင့် ဆေးခန်းကိုလည်း အလုပ်သမားများကို ထောက်ပံ့ပေးမည် ဖြစ်သည်။ - လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ရှေးဦးသူနာပြု သင်တန်းများကိုလည်း အလုပ်သမားများကို ထောက်ပံ့ပေးမည်ဖြစ်သည်။ 		
<p>၈။</p>	<p>ဂေဟစနစ်</p> <ul style="list-style-type: none"> - စီမံကိန်းမှ စွန့်ပစ်ရေနှင့် စွန့်ပစ်အမှိုက်များ စနစ်တကျ မစွန့်ပစ်ခြင်းကြောင့် ဂေဟစနစ်ကို ထိခိုက်စေနိုင်ပါသည်။ 	<p>ဂေဟစနစ်</p> <ul style="list-style-type: none"> - စီမံကိန်းအကောင်အထည်ဖော်သူသည် စီမံကိန်းဧရိယာအတွင်းရှိ မြေနှင့် ရေ ကဲ့သို့သော သဘာဝအရင်းအမြစ်များကို စနစ်တကျ စီမံခန့်ခွဲ အသုံးပြုမည် ဖြစ်သည်။ 	<p>ABGL၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့အစည်း</p>	<p>၅၀၀,၀၀၀</p>

		<ul style="list-style-type: none"> - ပိုးမွှားများ၊ ကုန်းနေရေနေ သတ္တဝါများ၊ တွားသွား သတ္တဝါများနှင့် ငှက်များကို ကဲ့သို့သော သတ္တဝါမျိုးစိတ်များနှင့် သစ်ပင်ကဲ့သို့သော အပင် မျိုးစိတ်များကို ထိန်းသိမ်းခြင်းနှင့် ပြန်လည် စိုက်ပျိုးခြင်းများ လုပ်ဆောင်သွားမည် ဖြစ်သည်။ - ဖိနပ်ထုတ်လုပ်သည့် လုပ်ငန်းစဉ်မှ စွန့်ပစ်ရေနှင့် စွန့်ပစ်အစိုင်အခဲများကို ရန်ကုန်မြို့တော်စည်ပင် သာယာရေးကော်မတီ၏ စည်းမျဉ်းစည်းကမ်းများနှင့် အညီ စနစ်တကျ စီမံခန့်ခွဲသွားမည် ဖြစ်သည်။ 		
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ဇယား ၁၉ စီမံကိန်းတည်ဆောက်ချိန်နှင့် ပိတ်သိမ်းခြင်းတွင် ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုခြင်းအစီအစဉ်

စောင့်ကြပ်ကြည့်ရှုမည့် အကြောင်းအရာ	စောင့်ကြပ်ကြည့်ရှုမည့် ပါရာမီတာများ	စောင့်ကြပ်ကြည့်ရှုမည့် နေရာ	ကြိမ်နှုန်း	ခန့်မှန်းကုန်ကျ စရိတ် (မြန်မာကျပ်ငွေ)
လေထုအရည်အသွေး	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , O ₃ & CO, CO ₂ , CH ₄ , VOC, Humidity ,Temperature	<u>စီမံကိန်းအတွင်း</u> ၁၆° ၅၈' ၃၇.၇၆" N ၉၆° ၃'၁၄.၉၉" E	တစ်နှစ်လျှင် ၂ ကြိမ်	၂,၀၀၀,၀၀၀
ရေထုအရည်အသွေး	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Temperature, DO, Turbidity, TDS, TSS, Iron, Lead, Free Cyanide, Arsenic	<u>မြေအောက်ရေ</u> - <u>စီမံကိန်းအတွင်းရှိ ရေတွင်း</u> ၁၆°၅၈'၃၇.၅၂"N ၉၆° ၃'၁၄.၀၄"E <u>စီမံကိန်း၏ စွန့်ပစ်ရေထွက်ရှိရာနေရာမှ</u>	တစ်နှစ်လျှင် ၂ ကြိမ်	၅၀၀,၀၀၀

စောင့်ကြပ်ကြည့်ရှုမည့် အကြောင်းအရာ	စောင့်ကြပ်ကြည့်ရှုမည့် ပါရာမီတာများ	စောင့်ကြပ်ကြည့်ရှုမည့် နေရာ	ကြိမ်နှုန်း	ခန့်မှန်းကုန်ကျ စရိတ် (မြန်မာကျပ်ငွေ)
		၁၆°၅၈'၄၀.၃၁"N ၉၆° ၃'၁၀.၈၆"E		
စွန့်ပစ်အပိုင်အခဲ	စွန့်ပစ်ပစ္စည်းပမာဏနှင့် အမျိုးအစား	ယာယီစွန့်ပစ်အမှိုက်စွန့်ပစ်ရာနေရာ	အပတ်စဉ်	စီမံကိန်းတည်ဆောက်သည့် လုပ်ငန်းတွင် ပါဝင်ပြီး
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	မတော်တဆ ထိခိုက်မှုမှတ်တမ်းများ	စီမံကိန်းနှင့် ဆောက်လုပ်ရေး လုပ်ငန်းခွင်နေရာ	လစဉ်	
ဆူညံသံ	Noise level (dB (A) scale)	စီမံကိန်းအတွင်း ၁၆° ၅၈' ၃၇.၇၆" N	တစ်နှစ်လျှင် ၂ ကြိမ်	၁,၀၀၀,၀၀၀
တုန်ခါမှု	Radial, Transverse, Vertical	၉၆° ၃'၁၄.၉၉" E		၁,၀၀၀,၀၀၀

ဇယား ၂၀ လုပ်ငန်းလည်ပတ်စဉ်ကာလအတွင်း ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်

စောင့်ကြပ်ကြည့်ရှုမည့် အကြောင်းအရာ	စောင့်ကြပ်ကြည့်ရှုမည့် ပါရာမီတာများ	စောင့်ကြပ်ကြည့်ရှုမည့် နေရာ	ကြိမ်နှုန်း	နှစ်စဉ်ခန့်မှန်းကုန်ကျငွေ (မြန်မာကျပ်ငွေ)
လေထုအရည်အသွေး	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , O ₃ & CO, CO ₂ , CH ₄ , VOC, Humidity ,Temperature	စီမံကိန်းအတွင်း ၁၆° ၅၈' ၃၇.၇၆" N ၉၆° ၃'၁၄.၉၉" E	တစ်နှစ်လျှင် ၂ ကြိမ်	၂,၀၀၀,၀၀၀
ရေထုအရည်အသွေး	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Temperature, DO, Turbidity, TDS, TSS, Iron, Lead, Free Cyanide, Arsenic	မြေအောက်ရေ - စီမံကိန်းအတွင်းရှိ ရေတွင်း ၁၆°၅၈'၃၇.၅၂"N ၉၆° ၃'၁၄.၀၄"E စီမံကိန်း၏ စွန့်ပစ်ရေထွက်ရှိရာနေရာမှ	တစ်နှစ်လျှင် ၂ ကြိမ်	၅၀၀,၀၀၀

စောင့်ကြပ်ကြည့်ရှုမည့် အကြောင်းအရာ	စောင့်ကြပ်ကြည့်ရှုမည့် ပါရာမီတာများ	စောင့်ကြပ်ကြည့်ရှုမည့် နေရာ	ကြိမ်နှုန်း	နှစ်စဉ်ခန့်မှန်းကုန်ကျငွေ (မြန်မာကျပ်ငွေ)
		၁၆°၅၈'၄၀.၃၁"N ၉၆° ၃'၁၀.၈၆"E		
စွန့်ပစ်အစိုင်အခဲ	စွန့်ပစ်ပစ္စည်းပမာဏနှင့် အမျိုးအစား	ယာယီစွန့်ပစ်အမှိုက်စွန့်ပစ်ရာနေရာ	အပတ်စဉ်	၅၀၀,၀၀၀
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	မတော်တဆ ထိခိုက်မှုမှတ်တမ်းများ	စီမံကိန်းနှင့် ဆောက်လုပ်ရေး လုပ်ငန်းခွင်နေရာ	လစဉ်	၁၀၀,၀၀၀
ဆူညံသံ	Noise level (dB (A) scale)	<u>စီမံကိန်းအတွင်း</u> ၁၆° ၅၈' ၃၇.၇၆" N	တစ်နှစ်လျှင် ၂ ကြိမ်	၁,၀၀၀,၀၀၀
တုန်ခါမှု	Radial, Transverse, Vertical	၉၆° ၃'၁၄.၉၉" E		၁,၀၀၀,၀၀၀

၈. အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း။

အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း အဓိကရည်ရွယ်ချက်မှာ စီမံကိန်းနှင့် သက်ဆိုင်သော အဖွဲ့အစည်းများ၊ အာဏာပိုင်များနှင့် ပါဝင်ပတ်သက်သူများကို စီမံကိန်းအကြောင်းအရာများ၊ လုပ်ငန်းစဉ်များ၊ စွန့်ပစ်အမှိုက်စီမံခန့်ခွဲခြင်းများနှင့် ဖြစ်နိုင်ခြေရှိသော ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများကို ထောက်ပံ့ပေးနိုင်ရန် ဖြစ်ပါသည်။ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းများ ပြုလုပ်စဉ်တွင် ABGL နှင့် TBS သည် စီမံကိန်းနောက်ခံအကြောင်းအရာများ၊ လည်ပတ်ခြင်းလုပ်ငန်းစဉ်များ၊ ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေအနေများ၊ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများနှင့် အဆိုပြု လျှော့ချရေးနည်းလမ်းများကို ရှင်းလင်းတင်ပြခဲ့ပါသည်။ သက်ဆိုင်ရာ အဖွဲ့အစည်းများ၊ အာဏာပိုင်များနှင့် ပါဝင်ပတ်သက်သူများထံမှ ဆွေးနွေးအကြံပြုချက်များနှင့် သဘောထားမှတ်ချက်များကို EIA အစီရင်ခံစာတွင် စုဆောင်းထားရှိထားပါသည်။ EIA အစီရင်ခံစာရေးဆွဲရန် လိုအပ်ချက်များအရ ABGL သည် စီမံကိန်းကို စိတ်ဝင်စားသော ဆက်စပ်ပတ်သက်သူများကို စီမံကိန်း ဖွံ့ဖြိုးရေးလုပ်ငန်းများကို အောက်ပါအတိုင်း ထုတ်ဖော်ရှင်းလင်းမည်ဖြစ်ပါသည်။

- ❖ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများနှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှုများကို လျော့ချရန် လျှော့ချရေးနည်းလမ်းများ၊ စီမံကိန်းလုပ်ငန်းလည်ပတ်ခြင်းနှင့် ဆိုင်သော ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ပြဿနာများနှင့် စီမံကိန်းအကြောင်းအရာများကို ဆက်စပ်ပတ်သက်သူများကို သတင်းအချက်အလက်များ ဝေမျှခြင်း
- ❖ စီမံကိန်းကို စိတ်ဝင်စားသူများ (သို့မဟုတ်) စီမံကိန်းကြောင့် ထိခိုက်ခံစားရနိုင်သော သီးခြားလူပုဂ္ဂိုလ်များ၊ အဖွဲ့အစည်းများနှင့် ဆက်စပ်ပတ်သက်သူများ၏ အမြင်များ၊ ပူပန်မှုများနှင့် ထင်မြင်ချက်များကို ထည့်သွင်းစဉ်းစားပေးခြင်း
- ❖ ဆွေးနွေးတင်ပြချက်များနှင့် အကဲဖြတ်ချက်များတွင် ပူးပေါင်းပါဝင်ဆောင်ရွက်ခြင်း

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်းအဆင့်အတွက် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းကို ၂၀၂၂ ခုနှစ် ဒီဇင်ဘာလ ၂၁ ရက်နေ့တွင် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း လုပ်ထုံးလုပ်နည်းများအတိုင်း ABGL စက်ရုံနှင့် အွန်လိုင်း (ZOOM) အသုံးပြု၍ ကျင်းပခဲ့ပါသည်။ နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအဆင့် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း အရ ဆွေးပွဲသို့ စုစုပေါင်း ၃၆ ယောက်တက်ရောက်ခဲ့ပါသည်။ တက်ရောက်သော ရာခိုင်နှုန်းများမှာ အစိုးရအာဏာပိုင် ၁၉ ရာခိုင်နှုန်း၊ စီမံကိန်းဖော်ဆောင်သူဘက်မှ ၆ ရာခိုင်နှုန်း၊ TBS ဝန်ထမ်း ၁၁ ရာခိုင်နှုန်းနှင့် ဒေသခံပြည်သူ ၆၄ ရာခိုင်နှုန်း တက်ရောက်ခဲ့ပါသည်။ ထို့အပြင် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းအဆင့်အတွက် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းကို ၂၀၂၃ ခုနှစ် ဖေဖော်ဝါရီလ ၂၁ ရက်နေ့တွင် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း လုပ်ထုံးလုပ်နည်းများအတိုင်း ABGL စက်ရုံတွင် ကျင်းပခဲ့ပါသည်။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအဆင့် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းသို့ စုစုပေါင်း ၁၉ ယောက် တက်ရောက်ခဲ့ပါသည်။ တက်ရောက်လာသော ရာခိုင်နှုန်းများမှာ အစိုးရအာဏာပိုင် ၃၂ ရာခိုင်နှုန်း၊ စီမံကိန်း အကောင်အထည်ဖော်သူ ၁၀ ရာခိုင်နှုန်း၊ TBS ဝန်ထမ်း ၃၂ ရာခိုင်နှုန်းနှင့် ဒေသခံပြည်သူ ၂၆ ရာခိုင်နှုန်းတက်ရောက်ခဲ့ပါသည်။ တက်ရောက်လာသူများထံမှ ရရှိလာသော

အကြံပြုချက်များနှင့် သဘောထားမှတ်ချက်များကို အပိုဒ်ခွဲ ၈.၄.၁ နှင့် အပိုဒ်ခွဲ ၈.၅.၁ တွင် ပြီးပြည့်စုံစွာ ဖော်ပြထားပါသည်။

၉. နိဂုံးချုပ်နှင့် အကြံပြုခြင်း

၉.၁. နိဂုံးချုပ်

ဤပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာသည် အဆိုပြုစီမံကိန်း၏ တည်ဆောက်စဉ်၊ လုပ်ငန်းလည်ပတ်စဉ်နှင့် ပိတ်သိမ်းစဉ်ကာလများတွင် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်၊ လူမှုရေးနှင့် ကျန်းမာရေးဆိုင်ရာ သက်ရောက်မှုများကို အကဲဖြတ်ဆန်းစစ်ခြင်းများ ဆောင်ရွက်ထားပါသည်။ လေ့လာချက်များကို စီမံကိန်းအကြောင်းအရာ၊ သက်ဆိုင်ရာ အရင်းအမြစ်မျိုးစုံမှ သတင်းအချက်အလက်များ၊ စီမံကိန်းဧရိယာရှိ ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားဆိုင်ရာ ကွင်းဆင်းဖော်ပြချက်များ၊ စီမံကိန်းအတွင်းနှင့် အနီးနားရှိ အစိုးရကဏ္ဍများနှင့် အဖွဲ့အစည်းများတွင် ပါဝင်သော ဆက်စပ်ပတ်သက်သူများနှင့် ဆွေးနွေးတင်ပြချက်များနှင့် အဆိုပြုစီမံကိန်းနှင့် ပတ်သက်သော ပတ်ဝန်းကျင်နှင့် နည်းပညာဆိုင်ရာ အတွေ့အကြုံရှိသော အကြံပေးပုဂ္ဂိုလ်များအပေါ် အခြေခံ၍ ပြင်ဆင်ရေးဆွဲထားပါသည်။ ရရှိလာသော လေ့လာချက်များအရ အဓိကကျသော အကြောင်းအရာများ အပိုဒ် ၉.၁ ပါအတိုင်း နိဂုံးချုပ်ဖော်ပြထားပါသည်။

၉.၂. အကြံပြုချက်များ

ဤပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းလေ့လာခြင်းသည် ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ပြဿနာများ၊ လျှော့ချရေးနည်းလမ်းများနှင့် စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်များကို ရှင်းလင်းစွာ ဖော်ပြထားပါသည်။ စီမံကိန်းအဆိုပြုသူသည် ဤအစီရင်ခံစာတွင် ဖော်ပြထားသော လျှော့ချရေးအစီအစဉ်များ၊ စီမံခန့်ခွဲမှုအစီအစဉ်များနှင့် စောင့်ကြပ်ကြည့်ရှုရေးအစီအစဉ်များအားလုံးကို အကောင်အထည်ဖော်ဆောင်ရွက်ရမည်ဖြစ်သည်။ ထို့အပြင် စီမံကိန်းအကောင်အထည် ဖော်ဆောင်သူသည် ပတ်ဝန်းကျင်ဆိုင်ရာ လမ်းညွှန်ချက်များ၊ ဥပဒေအတိုင်း ရေးဆွဲရန်လိုအပ်သော လျှော့ချရေးနည်းလမ်း ဆောင်ရွက်ခြင်းနှင့် အခြားသော သက်ဆိုင်ရာ လိုအပ်ချက်များကို အစဉ်မပြတ်လိုက်နာရမည် ဖြစ်သည်။

EXECUTIVE SUMMARY

1. Context of the Project

Alpha Best Global Limited (ABGL) is a 100% foreign investment project to construct and operate a cutting, making and packaging (CMP) basic factory for manufacturing various kinds of shoes. It is located at Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon, Myanmar. The total land area of the proposed project is 8.708 Acres (35240.057 square meters). The location of the proposed project is shown in Figure 1. Although the construction period of factory is expect to take about 2 years, the construction period is extended to 5 years.

The final products such as sport shoes (Men and Ladies), Sport Shoes (Junior's) and Casual Shoes (Men and Ladies) from ABGL will be exported to foreign countries such as Italy, United States, Hong Kong, China, Japan, Thailand, Vietnam and Korea. The raw materials and required equipment will be purchased and imported from local suppliers and China. The customers of ABGL are PRADA, HELLY HANSEN, STONEFLY, MERRELL, PREMIATA, FESDA, Le Coq Sportif, DUCA DEL COSMA, ON RUNNING, ALBERTO GUARDIANI, VIKING, GEOX, MICHAEL KORS, ASTON ARTIN, Vibram Five Fingers and BIKKEMBERGS.

The purposes for the development of the proposed project are as follows:

- ❖ To join in the economic reform process of the country
- ❖ To offer comfortable life style to Myanmar people
- ❖ To create a brighter future for younger generation

The project proponent has engaged Total Business Solution Co., Ltd. (TBS) (Consulting Team) to study the Environmental Impact Assessment (EIA) for the proposed project. TBS will prepare EIA report for the manufacturing of various kinds of shoes of ABGL based on ToR which is prepared in Scoping Report. In addition, the preparation of EIA report will comply with the description of section (55), (56), (57), (58), (59), (60), (61), (62), (63), (64) and (65) of the Environmental Impact Assessment Procedure (EIA Procedure, 2015) issued by the Ministry of Natural Resources and Environmental Conservation (MONREC).

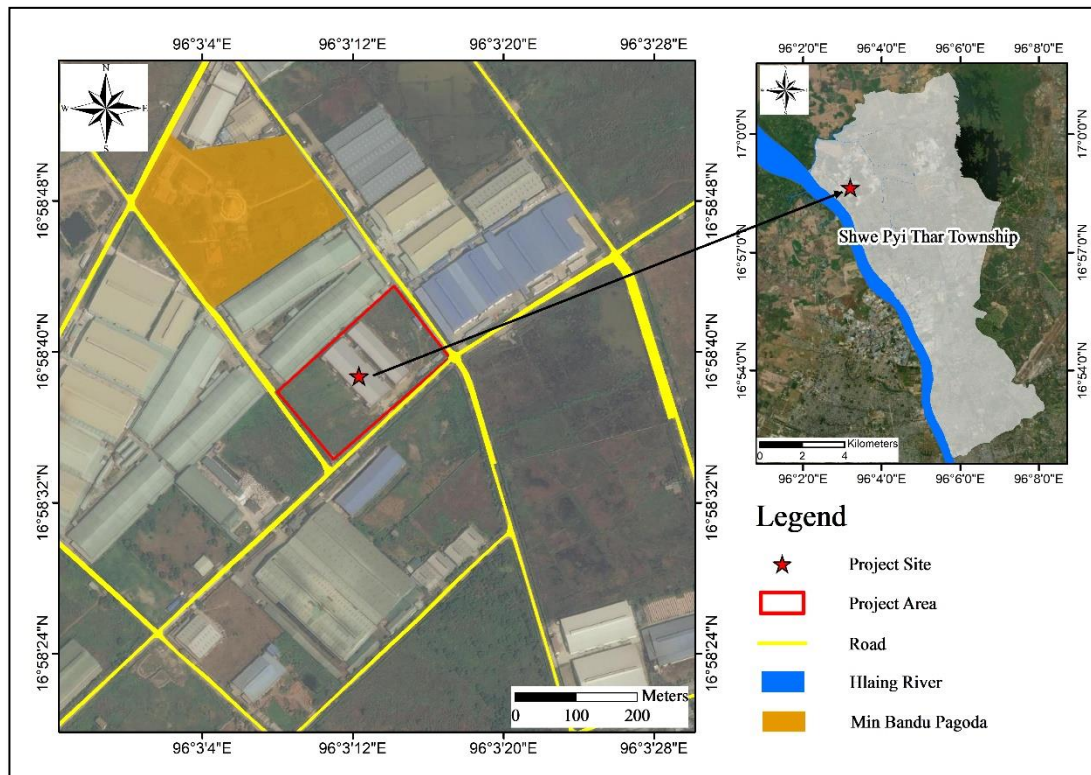


Figure 1 Location Map of the Project Site

1.1. Project Proponent

The contact of representative of the proposed project proponent is mentioned in Table 1 and the organization chart of the project proponent is shown in Figure 2.

Table 1 Contact of Project Proponent’s Representative

Representative	Mr. Htun Htun Oo
Position	Human Resource Manager
Address	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon, Myanmar
Contact No.	09-797654666
Email	larrylu@china.jimbrother.com.tw

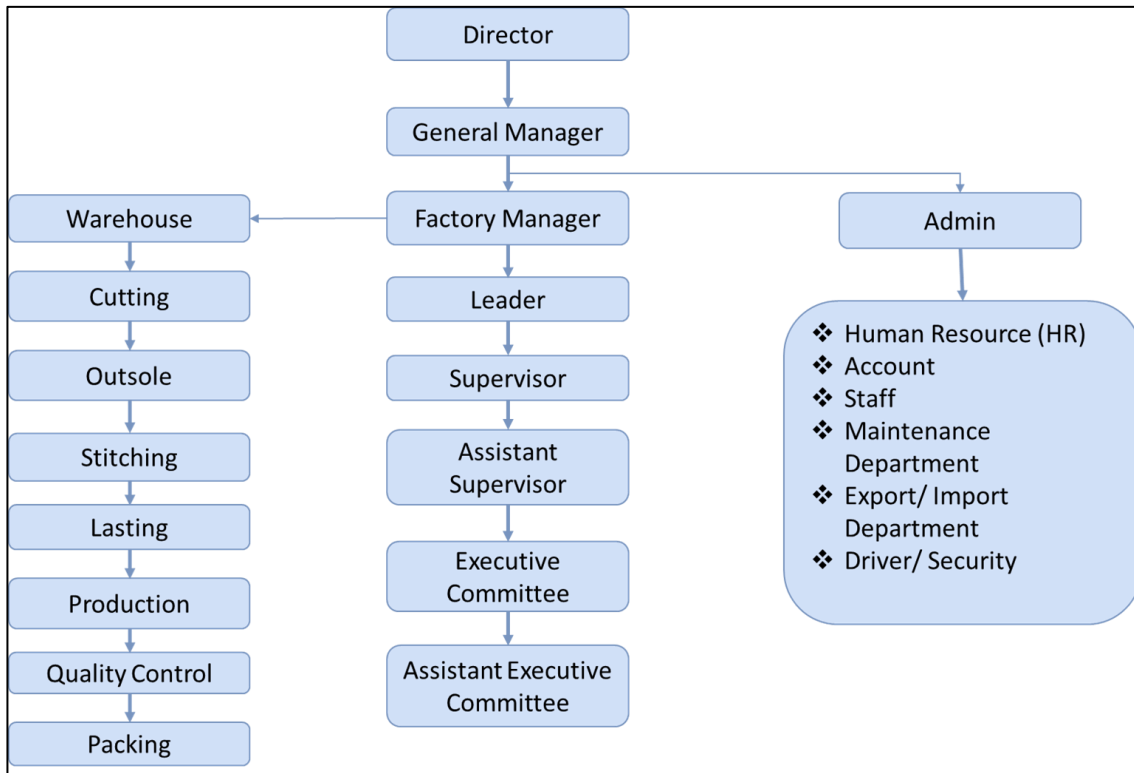


Figure 2 Organization Chart of ABGL

1.2. EIA Consultant

The Environmental and Social Experts are professionals provided by Total Business Solution Co., Ltd., (TBS). TBS is a Myanmar consulting firm, providing engineering and environmental services to various clients in Myanmar. The contact of representative of TBS is described as follow.

Name	Dr. Soe Moe Kyaw Win
Position	Managing Director
Contact No.	09-401604493
Email Address	soemoe@tbs.com.mm
Address	No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Yangon.

The organizational structure for conducting and managing the EIA study team is shown in Figure 3 and Table 2.

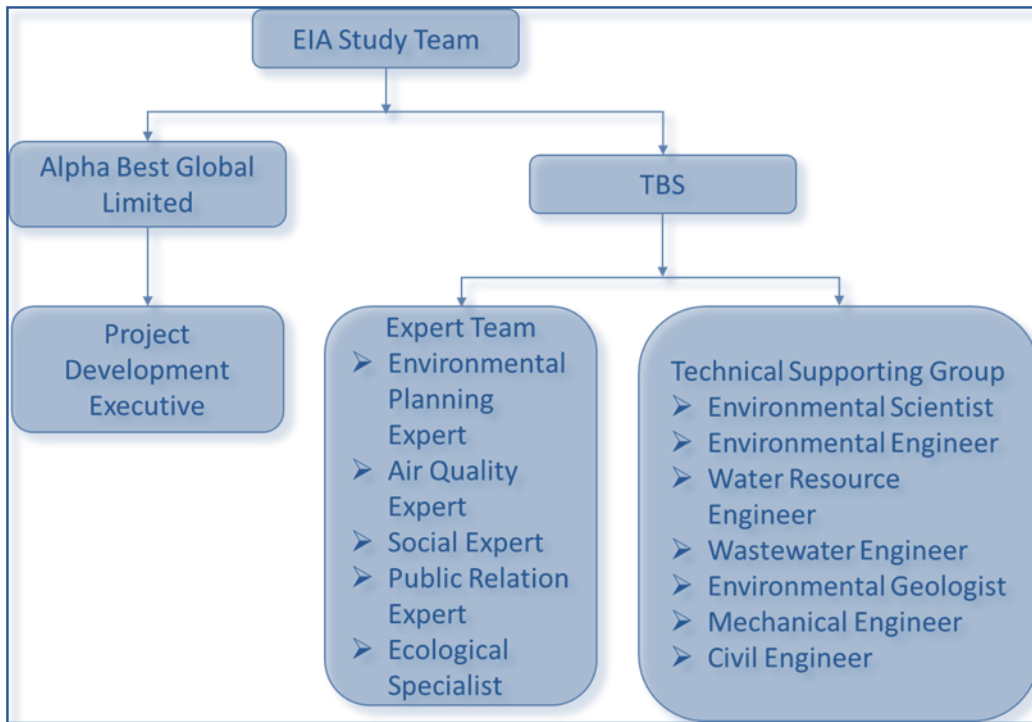


Figure 3 Organizational Structure of EIA Study Team

Table 2 EIA Study Team of TBS

No	Name	Education	Experience	Responsibilities	Contact Address
1.	Dr. Soe Moe Kyaw Win Managing Director Principal of Geotechnical and Geo environmental Engineer	Ph.D. (Geotechnical Engineering) M.Sc. (Geotechnical Engineering) B.Sc. (Geology)	30-year experiences in the areas of environmental assessment, geotechnical and geological engineering in Southeast Asian, U.S.A and Canada. Environmental assessments, mine waste management, site investigation, instrumentation, ground improvement, land reclamation and landslide investigation.	Final review of the report	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
2.	Mr. Myatthu Kyaw General Manager	M.Sc. (Environmental Engineering and Management) B.Sc. (Forestry)	Over 7 years' experience in environmental quality monitoring (air, noise and vibration, soil, water), environmental impact assessment industry.	Overall review the report Establish Environmental Management Plan-EMPs and Environmental Monitoring Plan-EMoP Arrange Public Consultation Meetings	Phone No. 09-420049285 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
3.	Ms. Thet Htar Myint Social Impacts Assessment Specialist	M.Sc. (Gender and Development) M.Sc. (Zoology) B.Sc. (Hons) (Zoology)	Over 20-year experiences in environmental, gender and social development fields. Experience included environmental impact assessment, gender and social development studies, social impacts assessment, safeguards and development of resettlement plans, Capacity Building of community and Administrative works.	Social Impact Assessment (Gender, Social and Economic)	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
4.	Ms. Hnin Lai Win Environmental Manager	M.Sc. (Environmental Engineering and Management) B.Pharm. (Pharmacy)	5-year experiences in management and marketing and training of junior staff in medical field Over 4-year experiences in land use planning, environmental impact	Cummulative Impact Assessment, Environmental Management Plan, Impact Mitigation Measure Public Consultation Meetings	Phone No. 09-421027662 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.

No	Name	Education	Experience	Responsibilities	Contact Address
			assessment and managing environmental projects. Environmental management plan, environmental monitoring, environmental risk assessment, facilitated the public consulting meetings, marketing, coordination with government organizations and local community.		
5.	Dr. Aung Aung	Ph.D. (Zoology) M.Sc. (Zoology) B.Sc. (Zoology)	Over 19-year experiences in teaching, researcher in Zoology field and biodiversity conservation.	Environmental impact assessment and Biodiversity conservation focus on mammalogy and ecology.	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
6.	Dr. Pyone Pyone Myint	Ph.D. (Zoology) M.Sc. (Zoology) B.Sc. (Zoology)	Over 19-year experiences in teaching and field research in Zoology field and Biodiversity observation.	Environmental impact assessment and biodiversity observation mainly in anatomy, behavior, ecology, evolution, physiology, conservation, or other aspects of bird biology.	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
7.	Dr. Thant Zaw Win	Ph.D. (Taxonomy) M.Sc. (Botany) B.Sc. (Botany)	Over 9-year experiences in teaching and field research in Botany field and biodiversity observation.	Environmental impact assessment and phytochemical analysis, wetland management, specialist in plant biology.	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
8.	Dr. Than Than Myint	Ph.D. (Zoology) M.Sc. (Zoology) B.Sc. (Zoology)	Over 16-year experiences in teaching and field research in Zoology field and marine biology observation.	Environmental impact assessment and marine biodiversity observation mainly in fish biology.	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
9.	Ms. Phoo Pwint Khine Environmental Engineer	M.E (Environmental Engineering and Management) B.E (Civil)	1-year experience as a site engineer in construction project. 6 months experience as a QC/QS at building estimate team.	Wastewater Management Hazardous Waste Management Environmental Management Plan	Phone No. 09 - 758009087 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.

No	Name	Education	Experience	Responsibilities	Contact Address
			Over 2-year experience in environmental field	Public Consultation Meetings	
10.	Ms. Aye Mon Aung Environmental Engineer	M.E (Environmental Engineering and Management) B.E (Materials and Metallurgy)	10-month experience as teaching assistance 2-year experience as sale representative Over 2-year experience in environmental field	Project Description Environmental Impact Assessment and Mitigation Measure Environmental Risk Assessment Environmental Baseline Quality Analysis Public Consultation Meetings	Phone No. 09 - 402647881 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
11.	Mr. Htet Thiha Phone Myint Environmental Geologist	B.Sc. (Geology)	7-year experiences in geological field, soil analysis, environmental management land use observation Environmental site survey, impacts monitoring (air, noise, water sampling), coordination with government organizations and local community, socioeconomic survey and documentation in environmental management projects.	Coordination with government organizations and local community, Social Survey, Social data Analysis	Phone No. 09 - 76005603 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
12.	Mr. Phyo Thu Kyaw Auto CAD Drafter	B.E. (Mechatronic)	3-year experiences in project coordination, documentation, Auto CAD drafter and graphic design and IT technician. Over 4-year experiences in environmental monitoring such as air and noise monitoring, water sampling and installing, maintaining and repair of computer system and office equipment.	Coordinator and Drafter	Phone No. 09 - 42118199 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
13.	Mr. Wai Phyo Aung Surveyor	B.Sc. (Geology)	7-year working experiences in geological and geotechnical engineering. 5 years experiences as a team leader in survey team.	Environmental Quality Monitoring Survey Drone Survey	Phone No. 09 - 784181980 Address: No. 54, Room (704), Waizayantar Road,

No	Name	Education	Experience	Responsibilities	Contact Address
					Thingungyun, Yangon, Myanmar.
14.	Mr. Zaw Myo Hein Environmental Geologist	B.Sc. (Geology)	2-year experience in environmental monitoring processes and conducting site survey	Environmental Quality Monitoring Survey, Drone Survey	Phone No. 09 - 751363321 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
15.	Ms. Kyi Phyu Khin	MBA (Thesis) ABE (Level 6 – UK) BA (English) Diploma in Business Law	1 years' experiences in management field specialized in business law	Law and Regulation	Phone No. 09 - 43193317 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
16.	Ms. Thinzar Tun Environmental Scientist	B.Sc (Forestry)	2 year's experience in environmental report examination and socio survey 5 months experiences in environmental report preparation field	Environmental Quality Monitoring Survey, Project Description Public Consultation Mettings	Phone No. 09 - 264576271 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.

1.3. Institutional Framework Related with the proposed project

The ABGL’s institutional framework with government departments is shown in figure 4.



Figure 4 ABGL’s Institutional Framework with Government Department

2. OVERVIEW OF THE POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

The activities carried out under the Project are subject to these legal requirements. Summarized relevant laws and regulations for the project are expressed in Table 3. It is sure that the project proponent will comply with the following laws and regulations.

Table 3 Relevant Myanmar Laws and Regulations

No.	Name of Laws and Regulations	Year
Environmental Conservation		
1.	Environmental Conservation Law	2012
2.	Environmental Conservation Rules	2014
3.	Environmental Impact Assessment Procedure	2015
4.	National Environmental Policy	2019
Pollution Control and Health		
5.	National Environmental Quality (Emission) Guidelines	2015
6.	National Drinking Water Quality Standards	2019
7.	Public Health Law	1972
8.	The Prevention and Control of Communicable Diseases Law	1995
9.	The Control of Smoking and Consumption of Tobacco Product	2006
10.	Occupational Safety and Health Law	2019
11.	Myanmar Fire Brigade Law	2015
Biodiversity and Resource Conservation		
12.	Conservation of Biodiversity and Natural Protected Area Law	2018

No.	Name of Laws and Regulations	Year
13.	The Law relating to Aquaculture	1989
14.	Conservation of Water Resource and River Law	2006
15.	Conservation of Water Resource and River Rules	2013
16.	Underground Water Act	1930
17.	Forest Law	1992
Land Acquisition		
18.	The Land Acquisition, Resettlement and Rehabilitation Law	2019
19.	Myanmar National Land Use Policy	2016
20.	State-Owned Land Leasing of Building; Instruction to be followed in Transfers and Joint Ventures	Instruction No. 3/2018
21.	Farmland Law	2012
22.	Farmland Rules	2012
23.	Vacant, Fallow and Virgin Land Management Law	2018
24.	Registration of Deeds Law	2019
25.	The Boundaries Law	2019
Urban Development and Management		
26.	Yangon City Development Committee Law	2018
27.	The Electricity Law	2014
28.	The Small and Medium Enterprises Development Law	2015
29.	The Telecommunications Law	2013
Human Rights		
30.	Protection of the Right of National Race Law	2015
31.	Rights of the Persons with Disabilities Law	2015
32.	Child Rights Law	2019
Cultural Heritages		
33.	The Protection and Preservation of Cultural Heritage Region Law	2019
34.	The Protection and Preservation Antique Object Law	2015
35.	The Protection and Preservation of Ancient Monument Law	2015
Labour		
36.	Labour Organization Law	2011
37.	The Employment and Skill Development Law	2013
38.	The Minimum Wage Law	2013
39.	Payment of Wage Law	2016
40.	The Workers' Compensation Act	2005
41.	The Settlement of Labour Dispute Law	2012
42.	The Leave and Holiday Act	1951
43.	Social Security Law	2012
Motor Vehicles		
44.	Vehicle Safety and Motor Vehicle Management Law	2020
45.	The Myanmar Motor-Vehicle Rules	1989
46.	The Motor Vehicle Law	2015
Other Related Law and Regulation		
47.	Myanmar Insurance Law	1993
48.	Myanmar Insurance Rule	2017
49.	Myanmar Investment Law	2016
50.	Myanmar Investment Rule	2017

No.	Name of Laws and Regulations	Year
51.	The Petroleum and Petroleum Product Law	2017
52.	The Petroleum Act	1934
53.	The Export and Import Law	2012
54.	The Fisheries Law	1989
55.	Natural Disaster Management Law	2013
56.	Climate Change Policy	2019
57.	Commercial Tax Law	2014
58.	The Union Tax Law	2019
59.	Myanmar Citizens Investment Law	2013
60.	Foreign Investment Law	2012
61.	Private Industrial Enterprise Law	1990
62.	Prevention of Hazard from Chemical and Related Substances Law	2013
63.	Law on Standardization	2014
64.	The Factories Act	1951
65.	Myanmar Engineer Council Law	2013
66.	Trademark Law	2019
67.	Industrial Design Rights Law	2019
68.	Consumer Protection Law	2014
69.	Myanmar Company Law	2017
70.	Underground Water Act	1930
71.	Value Added Tax Law	2019
International and National Standards, Conventions and Treaties		
72.	IFC Performance Standards on Environmental and Social Sustainability	2012
73.	Environmental Health, and Safety General Guidelines	2007
74.	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1992
75.	Cartagena Protocol on Biosafety Convention on Biological Diversity	2000
76.	Convention on Biological Diversity	1993
77.	ILO Forced Labor Convention	1930
78.	Kyoto Protocol to the United Nations Framework Convention on Climate Change	1997
79.	Montreal Protocol on Substances that Deplete the Ozone Layer	1987
80.	Stockholm Convention on Persistent Organic Pollutants	2001
81.	The Vienna Convention for the Protection of the Ozone Layer	1985
82.	United Nations Framework Convention on Climate Change	1994

3. PROJECT DESCRIPTION AND ALTERNATIVES

3.1. Location of the Project

The project is located at Plot No. (149,150,151,152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon Region. The project land area is 8.708 Acres (35,240.057 square meters). The location of the project is situated between Mahar Myaing Street and Wun Saung Hmu Street within Wartayar Industrial Zone. The land plot is parallelogram shape. Hlaing River is around 0.8 kilometers far away from the project site. Project location map is shown in Figure 1.

3.2. Project alternative

The project alternatives for this project are considered by location alternative, process alternative, input alternative and the no action alternative.

Regarding to location alternative, the project factory is situated in Wartayar industrial zone. Thus, relocation alternative for this project is not considered for this project.

For the process alternative, the equipment alternative is considered by including the Best Practicable Environmental Option (BPEO) which defines as the option of providing the most benefit or causing the least damage to the environment. For the cutting process of this project, hydraulic plane cutting machines are used instead of simple cutters. For the stitching process, the industrial used sewing machines, such as single needle postbed sewing machines, double needle postbed sewing machines and so on, are used instead of simple domestic sewing machines.

As for the input alternative, there are two main consideration such as raw materials and energy sources for the input alternatives. 13 types of chemical glue, which include MEK (methyl ethyl ketone) with acetone and other ingredients, are used instead of aromatic hydrocarbons such as benzene, toluene and xylene for the purpose of less toxic than pure MEK and aromatic hydrocarbons. Although the factory is currently operating with power generators for the electricity, 2000-kilo voltage-ampere (kVA) transformer are planned to install. After installing the transformer at the factory, the air emission from power generators will be reduced.

Regarding to No Action Alternative, the negative impact on job opportunities and unemployment can cause if the "No Action" alternative takes place. In addition, any irreversible negative impacts on the environment were not predicted and so the "No Action Alternative" for this project was not expected.

3.3. Description of Project

3.3.1. Site Description

ABGL is located in No. 149+150+151+152, corner of Mahar Myaing Street and Wun Saung Hmu Street, Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon. The total floor plan area is 40,664.84 square meters. Building layout plan is shown in Figure 3.

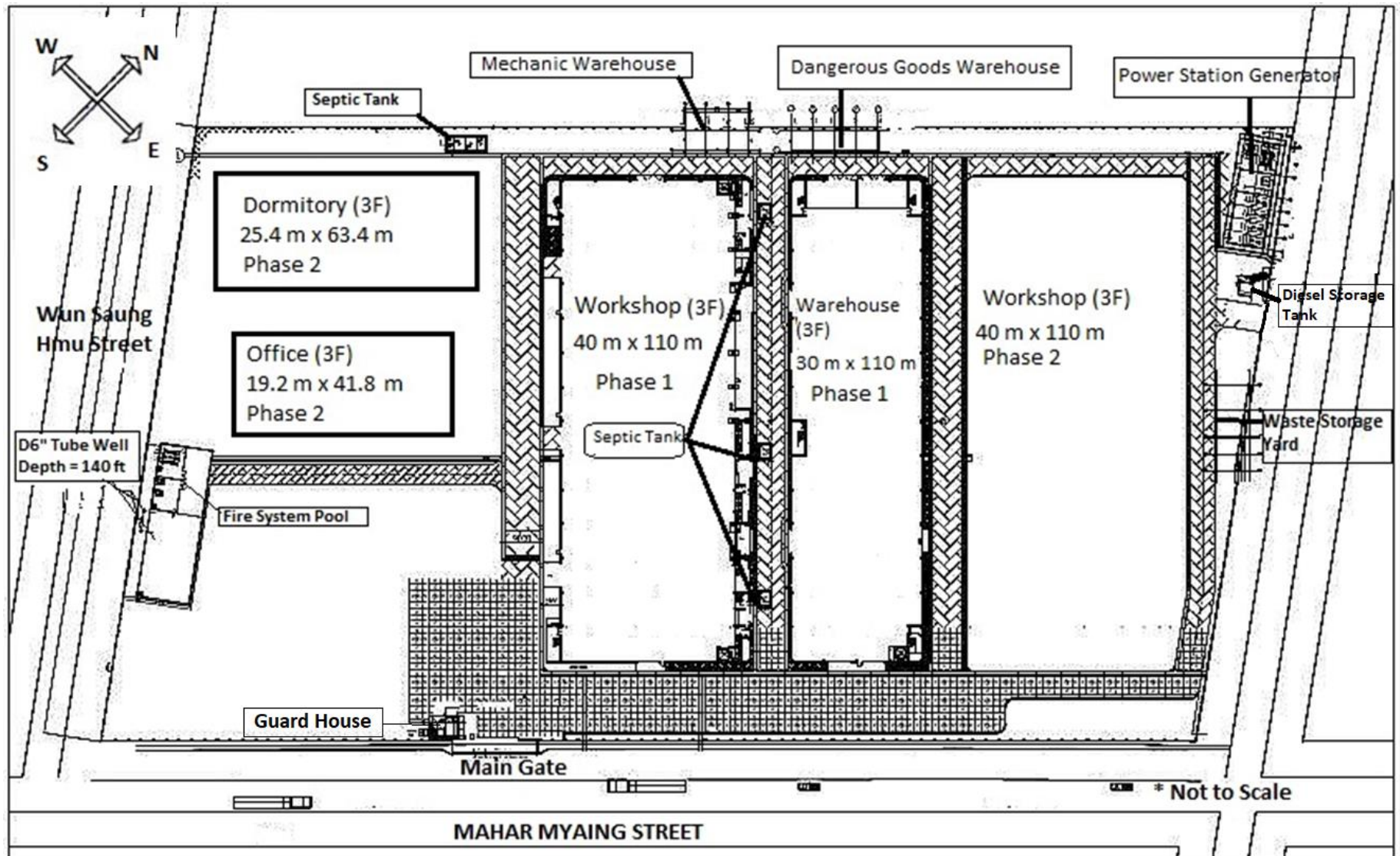


Figure 3 Master Layout Plan of Project

3.3.2. Related Projects and Developments Adjacent to Project

Several numbers of factories and Min Bandu pagoda are located in 1 km radius of the project site. The location map of compounds adjacent to project site are shown in Figure 4.

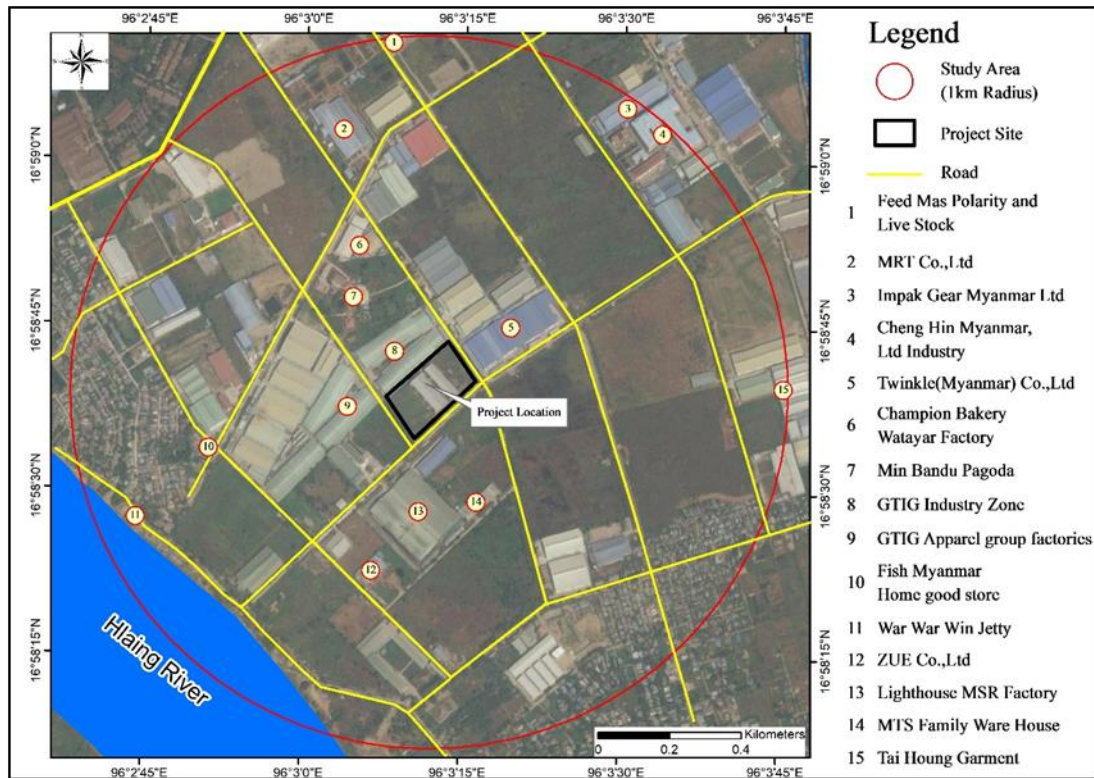


Figure 4 Related Projects and Development Adjacent to the Project Site

3.4. Description of the Project Construction

3.4.1. Type of Building and Function Area

The proposed project is planned to construct into two phases. In project phase 1, one workshop building, one warehouse building and other associated buildings such as mechanic warehouse, dangerous goods warehouse, power station generator room, guardhouse, waste storage yard, fire system pool and septic tanks will be constructed. One dormitory, one office building and one workshop building are planned to construct in project phase 2. All the major buildings such as two workshops, one warehouse, dormitory and office are planned to construct steel structure buildings. The detailed information of the buildings are shown in Table 4.

Table 4 Detailed Information of Buildings of the Project

No	Buildings	Area (m)	Quantity	Phase
1	Warehouse	30 x 110	1	1
2	Workshop	40 x 110	1	1
3	Workshop	40 x 110	1	2
4	Dormitory	25.3 x 63.4	1	2
5	Office	19.2 x 41.8	1	2
6	Mechanic Warehouse	5 x 15	1	1

No	Buildings	Area (m)	Quantity	Phase
7	Dangerous Goods Warehouse	4.1 x 20	1	1
8	Power Station Generator Room	8.2 x 24	1	1
9	Guard House	3 x 6	1	1
10	Waste Storage Yard	20 x 8.1	1	1
11	Fire System Pool	12 x 35	1	1
12	Septic Tanks between warehouse and workshop	2.5 x 3.5	3	1
13	Septic Tank near guard house	1.72 x 2.22	1	1
14	Main Septic Tank	12 x 12	1	1

3.5. Project Components

During the operation phase of the project, raw materials, machineries and equipment, chemical usage and employment are required to manufacture the various kinds of shoes and types of products. All the required raw materials will be imported from foreign countries such as Taiwan, China, Italy, Hong Kong, United Kingdom, Japan, Morocco, Thailand, Vietnam, India, Argentina and Greece. The required machineries, tools and equipment for this project will be purchased from China and local. In addition, electrical materials, accessories and office equipment will also be purchased from local. The detailed list of raw materials, machineries, tools, equipment, electrical materials, accessories and office equipment are fully described in Chapter (3), Section 3.5.

During the construction phase of the project, workshop, warehouse and other associated infrastructure and facilities are required to construct.

3.5.1. Production Process

The production process flow chart is shown in figure 5. There are five main production processes such as cutting, stitching, outsole sticking with glue, lasting and packing. The detailed production processes are shown in Chapter 3, Section (3.5.5).

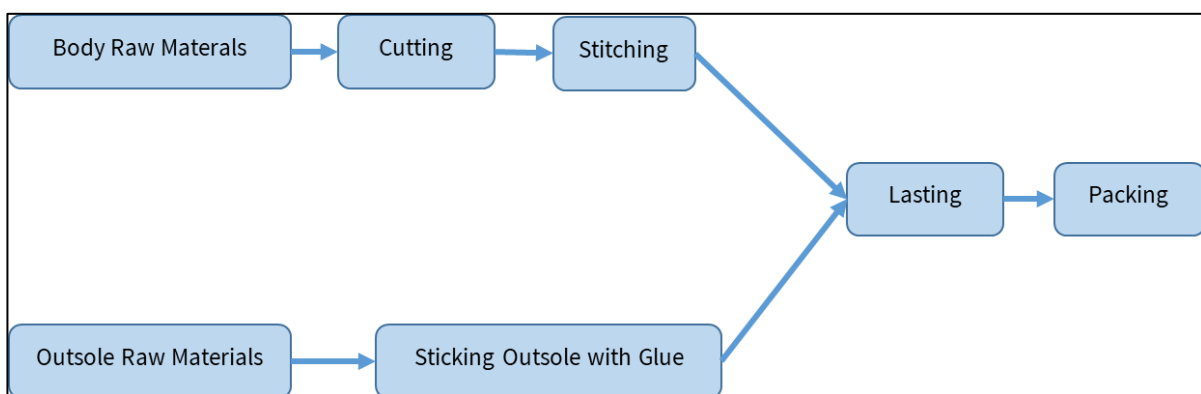


Figure 5 Production Process Flow Chart

3.5.2. Production Rate and Types of Products

There are three types of products such as sport shoes (Men and Ladies), sport shoes (Junior's) and casual shoes (Men and Ladies). ABGL will export the final products to Italy, United States, Hong Kong, China, Japan, Thailand, Vietnam and Korea. The total production rate for the first year is expected to be 520,000 Pairs and the production rate is expected to be increased to 1,058,000 Pairs on 6th year - 30th year. The detailed production rate and types of products are shown in Chapter (3), Section (3.5.6) and Section (3.5.7).

3.5.3. Infrastructure and Facilities of Proposed Project

3.5.4. Project Development

As described in Chapter (3), Section 3.6, the proposed project development will be as follows:

- Warehouse (3-storey , phase 1)
- Workshop (3-storey, phase 1)
- Workshop (3-storey, phase 2)
- Dormitory (3-storey, phase 2)
- Office (3-storey, phase 2)
- Other associated buildings (Mechanic Warehouse, Dangerous Goods Warehouse, Power Station Generator Room, Guard House, Waste Storage Yard, Fire System Pool and Septic tanks) (phase 1).

3.5.5. Land Use Prescription

The summary on land use prescription of the project site is presented in Table 5.

Table 5 Land Use Prescription

No.	Particulars	Phase	Submission (Feb, 2020)		Remark
			Area	Unit	
1.	Project Site Area		35,240.057	m ²	Not Change
2.	Project Floor Area		40,664.840	m ²	Not Change
3.	Workshop Building	1	4,692	m ²	
4.	Warehouse Building	1	3,300	m ²	
5.	Mechanic Warehouse	1	75	m ²	
6.	Dangerous Goods Warehouse	1	82	m ²	
7.	Power Station Generator Room	1	196.8	m ²	
8.	Guard House	1	18	m ²	
9.	Waste Storage Yard	1	162	m ²	
10.	Fire System Pool	1	420	m ²	

No.	Particulars	Phase	Submission (Feb, 2020)		Remark
			Area	Unit	
11.	Septic Tanks between warehouse and workshop	1	26.25	m ²	
12.	Septic Tank near guard house	1	3.82	m ²	
13.	Main Septic Tank	1	144	m ²	
Total		1	15,634.45	m ²	
14.	Workshop Building	2	4,682	m ²	
15.	Dormitory	2	1,610.36	m ²	
16.	Office	2	802.56	m ²	
Total		2	7,094.92	m ²	

3.5.6. Traffic System

There is one main entrance in the project site to access with Mahar Myaing Street. Car parking space that have capacity of twenty lots are also planned to construct in the project site.

3.5.7. Proposed Water Supply System

3.5.7.1. Water Source

Water supply for the factory and staff dormitory is mainly provided from tube well. The tube well is located near the underground fire system pool of the project site. The depth of the tube well is 42.67 meters. The water is stored in the water storage tanks and it is distributed through pipeline system to each building in the project site.

3.5.7.2. Estimated Water Demand

The estimated water demand for project phase-1 construction area is 325,196.5 cubic meters while the estimated water demand for project phase-2 construction area is 147,574.3 cubic meters. Moreover, the estimated water demand for operation phase is 331.54 cubic meters per day that is calculated based on the number of factory's employees that are 3,014 employees. However, there is no significance water demand for the operation processes since the factory manufacture various types of shoes based on CMP.

3.5.8. Wastewater Discharge

A certain amount of wastewater will be generated during construction phase and operation phase. During operation, only domestic wastewater from the factory workers will be generated since the factory operate manufacturing of shoes on CMP basis. The domestic wastewater from the project site will directly discharge to drainage channel. Sewage from buildings in the project site will be collected by sub-septic tanks and main septic tank, and will be discharged in line with the Government Rules and Regulations.

3.5.9. Drainage System

Two drainage channels are located inside of the whole project area compound. The secondary drains of workshop buildings and warehouse building are connected to main drainage (inside) of the project site. The domestic wastewater from the secondary drains will be discharged into the main drainage channel and then flow to the industrial zone drainage channel.

3.5.10. Solid Waste Management

There are 462 workers during construction phase and the waste generation is estimated approximately 184.8 kilogram per day from the construction workers. Based on the number of factory's employees, the estimated waste generation from the factory's workers is approximately 1,193.6 kilogram per day and the estimated waste generation from the operation process is 650 kilogram per month. There will be sufficient garbage bins in the project site. The solid wastes from the project site will be systematically collected at waste store yard and they will be disposed at final disposal site according to the guideline of YCDC.

3.5.11. Electricity System

Temporary diesel engine generator will be used to supply electricity during the construction phase. For operation phase, 2,000-kilo voltage-ampere (kVA) transformer from 33-kilovolt (kV) line will be set up at the project site in line with the rules and regulation of Yangon Electricity Supply Corporation to supply the electricity. In addition, three sets of 640 kVA diesel engine generators are currently set up in the project site.

3.5.12. Air Ventilation System

For the air circulation system of the building, industrial ventilation fans, 40 numbers of air conditioners and windows are installed at the project buildings. Currently, there are 15 numbers of installed air conditioners and the numbers of air conditioners will be increased to 40 units after the buildings of phase 2 are constructed. Refrigerants in air conditioners used in this project are not included in banned list of ozone depletion substances.

3.5.13. Firefighting System and Emergency Exit

The underground fire system pool is constructed in the factory compound and the capacity of underground fire system pool is 262,053 gallons. The area of fire system pool is 420 square meters and the volume of fire system pool is 1,050 cubic meters. The buildings in the project will be constructed with steel structure to prevent from fire hazard. Currently, 140 fire extinguishers, 34 fire hose reel and 34 fire alarm system are placed at the factory and the number of fire extinguishers, fire hose reel and fire alarm system will be increased when the phase 2 construction is completed. The detailed firefighting system and emergency exit are described in Chapter (3), Section (3.6.12).

4. Description of Surrounding Environment

The surrounding environment were conducted the condition of natural environment, environmental baseline survey, socio-economic and biological environment in the study area as presented in Table 6.

Table 6 Current Environmental and Social Condition in the Study Area

No.	Item	Description
Natural Environment		
1.	Climate	<p>This data was provided from General Administration Department (GAD) (2020), Shwe Pyi Thar Township. During the course of a year, the average maximum temperature is 38 °C and the average minimum temperature is 30 °C. The total yearly rainfall in 2020 is 79.79 inches and the raining days are 100-day.</p> <p>According to the data from Department of Meteorology and Hydrology (2020), the average daily humidity in the summer, rainy and winter season are about 98%, 99% and 95% at 6:30 hrs Mountain Standard Time (MST), 74%, 87% and 74% at 9:30 hrs MST, 42%, 76% and 48% at 12:30 hrs MST, 45%, 87% and 66% at 18:30 hrs MST, respectively.</p> <p>The average maximum daily temperature of project township are 38°C in summer season, 33°C in rainy season and 33 °C in winter season, respectively. The average minimum daily temperature of project township are 22°C in summer season, 24°C in rainy season and 17 °C in winter season, respectively.</p> <p>In addition, the average daily rainfall is about 0.00 inch in summer season, 11.84 inches in rainy season and 0.18 inch in winter season.</p> <p>The average daily wind speed in the summer, rainy and winter season are about 0.78 miles per hour (mph), 0.76 mph and 0.32 mph at 6:30 hrs M.S.T, 3.55 mph, 3.43 mph and 2.46 mph at 9:30 hrs MST, 5.13 mph, 4.53 mph and 4.53 mph at 12:30 hrs M.S.T, and 3.66 mph, 2.33 mph and 0.41 mph at 18:30 hrs M.S.T, respectively.</p>
2	Topography	<p>The project area is situated in Shwe Pyi Thar Township and it is surrounded by Mingalardon Township and Hlawga Lake in the East, Hlaing River or War Ta Yar River and Htantabin Township in the West, Insein Township in the South and Hmawbi Township in the North. The project area is located near the bank of Hlaing River only above the sea level of around 8 meters and Shwe Pyi Thar Township is located above the sea level 30.48 meters.</p>
3	Geology, soil and seismicity	<p>Project area of Shwe Pyi Thar Township is located in Yangon Region which geology is underlain by alluvial deposits (Pleistocene to recent), the non- marine fluvial-tile sediments of Irrawaddy formation (Pliocene) and hard, massive sandstone of Pegu series (early-late Miocene).</p> <p>Project area of Shwepyithar Township is located in Yangon Region which soil condition are meadow and meadow alluvial soils, gley and gley swampy soils, swampy soils, lateritic soils, yellow brown forest soils, dune forest and beach sand, mangrove forest soils and saline swampy meadow gley soils.</p> <p>According to the seismic zone map, the Yangon is located in the strong and moderate zone. Therefore, earthquake resistant design should be evaluated. Moreover, systematic ground improvement methods should be designed. Based on the seismicity records, Yangon can be assumed as low to medium seismicity region.</p>
4	Hydrology	<p>The main river around project site is the Hlaing River or War Ta Yar River, which is a fresh water river in the region running on the west side of War Ta Yar Industrial Zone. This river is about 0.8 kilometers distance from the project site.</p>
Environmental Baseline Survey		
5	Air Quality	<p>Air quality monitoring such as CO₂, CO, NO₂, SO₂, CH₄, VOC, O₃, PM₁₀ and PM_{2.5} Temperature, Humidity were conducted twice at 5 stations around project site of Shwe Pyi Thar Township. 1st time measurement was performed from 24th April – 5th June 2020 and 2nd time</p>

No.	Item	Description
		<p>measurement (dry season) was conducted on 8th – 12th December 2022.</p> <p>The 1st time and 2nd time air quality measurement results are within the NEQEG (2015), Minnesota Department of Health, NAAQS of US.EPA, Alberta, Agriculture, Food and Development.</p>
6	Wind speed and Direction	<p>For the first measurement, the prevailing wind direction was Southeast (SE) at Station A1 and Station A2, East South East (ESE) at A3, and South West (SW) at station A4 and station A5. The wind speed was 1.02 m/s at station A1, 1.30 m/s at station A2, 1.63 m/s at station A3, 0.66 m/s at station A4 and 1.37 m/s at station A5.</p> <p>For the second measurement, the prevailing wind direction was Northeast at all five stations. The wind speed was 1.1 m/s at station A1, 1.0 m/s at station A2, 0.8 m/s at station A3, 0.9 m/s at station A4 and 0.8 m/s at station A5.</p>
7	Noise Level	<p>The noise levels measurement was conducted at 5 stations for two times. The results were compared with NEQEG (2015). The noise levels of N1(daytime and nighttime), N2 (daytime and nighttime), N3 (daytime and nighttime) and N4 (daytime) for both 1st time and 2nd time monitoring results were within NEQEQ 2015.</p> <p>The noise levels of N4 (daytime and nighttime) and N5 (nighttime) are slightly higher than the NEQEG (2015) (residential, institutional, educational), probably due to rainfall during 1st time monitoring. In addition, N4 monitoring point is located in Lotaya Hinthada Monastery, Dhama School in which studying, teaching and worshiping activities are performed.</p>
8	Vibration	<p>The vibration measurement was conducted twice at 5 stations and the vibration results were compared with German Standard from Din 4150-3. The results of all monitoring points were within acceptable level of the German Standard from DIN 4150-3.</p>
9	Water Quality	<p>Water samples were collected and analysed twice at four stations (1st time) and five stations (2nd time). There are three surface water-sampling points that are located in Lain Gone Creek and Hlaing River, and one groundwater and one wastewater sampling point that are located in the project site. The water quality data were compared with NEQEG (2015) and Myanmar National Drinking Water Quality Guideline (NDWQS) (2019).</p> <p><u>Measurement Results during Wet Season</u></p> <p>Turbidity and iron of surface water quality in Lain Gone Creek, and turbidity and TDS of surface water quality of both downstream and upstream of Hlaing River are higher than NDWQS (2019). TSS of surface water quality in Lain Gone Creek and Hlaing River (both downstream and upstream) are higher than NEQEG 2015. The surface water quality is not suitable for drinking.</p> <p><u>Measurement Results during Dry Season</u></p> <p>The turbidity results of Lain Gone Creek and turbidity and TDS results of Hlaing River (both downstream and upstream) are higher than NDWQS (2019). In addition, TSS of Hlaing River (downstream) is higher than NEQEG (2015). According to surface water quality results, the untreated water in Lain Gone Creek and Hlaing river is not suitable for drinking. All parameters of groundwater sample are within NDWQS (2019) except turbidity result. In addition, the result of wastewater sample is within NEQEG (2015).</p>
10	Traffic Counting	<p>Traffic counting was done manually at five monitoring locations for two times. The counting was conducted 12 hours (7:00 am to 7:00 pm).</p>

No.	Item	Description
		The traffic condition at five stations are good that are free flow and reasonably free flow.
Socio-economic environment		
11	Land use	The study area consists of around 3-kilometer radius of the project. It is characterized by eleven land use types such as cemetery, recreational area, bare land, road area, religious area, government area, commercial area, water body, industrial area, agricultural area, and residential area. As a result of the study, residential area is the largest portion within 3-kilometer marginal area where cemetery area occupies the smallest portion.
12	Population and Age group	<p>The socio-economic data are collected from General Administration Department (GAD, 2020) of Shwe Pyi Tar Township, the study area of proposed project. Primary data was collected mainly from interviews with the residents near project site (household level questionnaires) and 23 ward administrator (key informant).</p> <p>The total population of Shwe Pyi Thar Township is 303,421. There are higher urban population in both under and over 18 years by age population in Shwe Pyi Thar Township. In conclusion, urban population is much higher than rural since 86% of total population is the urban population in the township.</p> <p>According to key informat interview, there are 800 Burma households, 10 Kayin households and 10 Rakhine households in 23 ward. Only Burma ethnic is found in field survey area according to household level survey.</p>
13	Ethnicity and Religious	<p>Majority are Burma followed by Rakhine and Kayin. Chin is almost equal population with Mon in the Shwe Pyi Thar Township. The rest ethnicity of Kachin, Shan and Kayah are few and distributed in the township.</p> <p>Buddhism is the dominant religion in Shwe Pyi Thar Township. Majority people in the township are Buddhists. The remaining population is composed of Christian and Muslim. In addition, most of the people in the field survey area and 23 ward are Buddhists according to household level interviews and key informant interview.</p>
14	Education	There are total 80 education centers in project Township such as 13 monastic education, 1 pre-school, 39 primary schools, 6 primary postgraduate schools, 11 middle schools, 9 high schools and 1 university.
15	Livelihood (employment, income, health, infrastructure and electricity)	<p><u>Employment</u></p> <p>Most of the people work as general workers and follow by government staff, service, and trading in Shwe Pyi Thar Township. Fishery is the least type of occupation, which is only 54 population. According to household level survey, most of the people in survey area work as industrial workers, own business, general workers, service and construction workers.</p> <p><u>Income</u></p> <p>The average in-come per capita was approximately 2.6 million in in 2017-2018, 3.0 million in 2018 - 2019 and 2.2 million in 2019-2020 fiscal years respectively. According to household level survey, the income and expenditure of most of the household in survey area are balanced.</p> <p><u>Health</u></p> <p>There are 4 hospitals (i.e. 1-government and 3-private), 20 private clinics and 11 health care departments (i.e. 2-rural and 9-sub-rural) in Shwe Pyi Thar Township. Although there are 3 cases of HIV/AIDS diseases in 2018-2019 and 5 cases in 2019-2020, no death cases are</p>

No.	Item	Description
		<p>occurred. According to key informant interview, there are 5 people who suffered from respiratory disease, 10 people who suffered from hypertension disease, 50 people who suffered from diabetes and 5 people who suffered from heart disease per year in 23 ward.</p> <p><u>Infrastructure</u> In Shwe Pyi Thar township, there are 2,964 economic infrastructures such as market, shopping mall, bank, department store, factory, domestic industry and hotel, motel and guesthouse, and 21 social infrastructures such as INGO, NGO and other social organizations.</p> <p><u>Electricity</u> There are Government electricity grids to project townships in Yangon region.</p>
16	Transportation	There is no airport in Shwe Pyi Thar Township. Hence, public transportation such as land transportation (i.e. bus and railway) and water transportation such as ship are only reliable and accessible way.
Biological Environmental		
17	Floral survey	The total of 56 species were collected regarding with habitat types of trees, shrub, herbs, climbers and bamboo while 10 species for medicinal plants had been noted in this study area. There were 42 species with their conservation status of IUCN Red List in the project area of industry and its outer boundary.
18	Fauna survey	In this ecological survey, 33 species of insects including butterflies and dragonflies, 24 species of fishes, 6 species of reptiles and amphibians (herpetofauna), 30 species of terrestrial birds, and 17 species of water birds had been recorded with their conservation status of IUCN Red List.

5. Potential Environmental Impacts Assessment and Mitigation Measures

5.1. Impact Analysis

According to National Environmental Policy Act (1969), an environmental impact analysis is generally conducted to assess the potential impact of a proposed project on the natural and social environment. This may include an assessment of both the short-term and long-term effects on the physical environment, such as air, water and noise pollution; as well as effects on local services, living and health standards, and aesthetics.

The impact analysis is the identification or assessing of potential positive and negative impacts on the environment (physical, socio-economic, biodiversity, health, etc.) based on the project activities.

5.1.1. Methodology of Significant Impact Assessment

The evaluation of significant impact assessment considers four major factors such as probability, magnitude, extent and duration of impacts on the environment with the consideration of potential positive or negative impact. The ranking scale to use in assessing of each potential impact is shown in Table 7.

Table 7 Evaluation of Impact Assessment

Probability	Duration
1. Very improbable impact 2. Improbable impact 3. Probable impact 4. Highly probable impact 5. Definitely impact	1. A very short duration (0-1 year) 2. A short duration (2-5 years) 3. Medium-term (6-15 years) 4. Long- term>15 years 5. A permanent period
Magnitude	Extent
1. Insignificant impact 2. Low impact 3. Moderate impact 4. High impact 5. Very high impact	1. Site-specific impact 2. Local impact 3. Regional impact 4. National Impact 5. International Impact

The following formula is used to assess the environmental significance of each potential impact.

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Extent} + \text{Duration}) \times \text{Probability}$$

Environmental significance of the potential environmental impacts can be differentiated based on the significance points into negligible, low, moderate, and high significance. Potential environmental impacts rating can be seen in Table 8. Evaluation and Prediction of the Significant impact for the construction, decommission and operation phase are presented in Table 9 and Table 10.

Table 8 Potential Environmental Impacts Rating

Significance Points	Environmental Significance
<15	Negligible
15 - 30	Low
31- 60	Moderate
>60	High

Table 9 Evaluation and Prediction of Significant Impacts for Construction and Decommission Phase

Potential Impact	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Air Quality	Construction and decommissioning activities, diesel generator and vehicle movement	CO ₂ , CO, SO ₂ , O ₃ , CH ₄ , NO ₂ , PM ₁₀ , PM _{2.5}	3	2	2	4	28	Low
Noise and Vibration	Emergency use of diesel generator and the operation of construction equipment and heavy vehicles	Noise and vibration	3	1	2	4	24	Low
Water Quality	Surface runoff and domestic wastewater	Organic matter in wastewater	2	2	2	3	18	Low
Land Use Change	Removal of vegetation and top soil Installation of infrastructure	Land use change	1	2	4	4	28	Low
Soil Quality	Civil work	Leakage of fuel, oil and other various wastes	3	2	3	2	16	Low
Solid Waste	Civil work and wastes from workers	Residual waste and domestic waste	3	3	3	2	18	Low
Traffic Condition	Transportation of construction materials, equipment and construction wastes	Traffic counting	1	2	2	2	10	Negligible
Occupational Health and Safety	Workers' health and accident during construction and decommission	Infectious disease; such as AIDS/HIV, Hepatitis B/C, etc. and other physical injuries	2	1	2	3	15	Low
Cultural Heritage	Civil works near cultural heritage areas	Archeological sites and traditional building	1	2	1	2	8	Negligible

Potential Impact	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Ecosystem	Civil works	Flora and Fauna	1	1	1	3	9	Negligible
Climate Change	Transportation vehicles and power generators	GHG emission	1	2	2	2	10	Negligible
Potential Positive Impacts								
Local Economy such as Employment and Means of Livelihood	Civil works, raw materials and equipment purchasing	Employment and business opportunities	3	2	2	4	28	Low

Table 10 Evaluation and Prediction of Significant Impacts for Operation Phase

Potential Impacts	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Air Quality	Use of diesel generators, vehicles movement and outsole grinding process	CO ₂ , CO, CH ₄ , O ₃ , PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , VOCs	2	2	4	3	24	Low
Noise and Vibration	Transportation vehicles, use of diesel generators and outsole grinding process	Noise and vibration	2	1	4	3	21	Low
Water Quality	Domestic wastewater	BOD, COD, Antibiotics, Oil and Grease, Total Nitrogen (TN), Total Phosphorous (TP), Total solid (TS), Total Oxygen Demand, Total coliform bacteria	3	3	4	3	30	Low
Soil Quality	Logistic transportation	Leakage of fuel, oil and other various wastes, and improper wastewater discharge	2	3	4	3	27	Low
Solid Waste	Factory operation processes, office, canteen and staff accommodation	Type and amount of waste	3	2	4	3	27	Low
Offensive Odour	Temporary solid waste disposal site, and renovation activities such as painting	Offensive Odour	2	1	4	4	28	Low
Traffic Condition	Transportation vehicles	Traffic counting	1	2	4	2	14	Negligible
Occupational health and safety	Workers' health in operation area	Infectious disease; such as AIDS/HIV, Hepatitis B/C, COVID-19 etc. and other physical injuries	3	1	4	3	24	Low

Potential Impacts	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Ecosystem	Wastewater and solid waste discharge	Impacts on aquatic ecosystem and habitats	2	2	4	3	24	Low
Climate Change	Transportation vehicles, power generators and air conditioners	GHG emission	1	2	4	2	14	Negligible
Potential Positive Impacts								
Local Economy such as Employment and Means of Livelihood	Purchasing raw materials and equipment	Job and business opportunities	3	3	4	4	40	Moderate

5.2. Risk Assessment and Risk Mitigation Measures

Risk assessment methodology is adopted by International Civil Aviation Organization-ICAO (2013). The risk assessment will be evaluated based on hazard identification, risk analysis probability, risk analysis severity, risk assessment and tolerability. The risk assessment and tolerability is evaluated as shown in Table 11. The risk assessment and mitigation measures during construction, operation and decommissioning phases are shown in Table 12.

Table 11 Risk Assessment and Tolerability

Risk Probability	Risk Severity				
	Catastrophic-A	Hazardous-B	Major-C	Minor-D	Negligible-E
Frequent-5	5A (Intolerability)	5B (Intolerability)	5C (Intolerability)	5D (Tolerable)	5E (Tolerable)
Occasional-4	4A (Intolerability)	4B (Intolerability)	4C (Tolerable)	4D (Tolerable)	4E (Tolerable)
Remote-3	3A (Intolerability)	3B (Tolerable)	3C (Tolerable)	3D (Tolerable)	3E (Acceptable)
Improbable-2	2A (Tolerable)	2B (Tolerable)	2C (Tolerable)	2D (Acceptable)	2E (Acceptable)
Extremely Improbable-1	1A (Tolerable)	1B (Acceptable)	1C (Acceptable)	1D (Acceptable)	1E (Acceptable)

Table 12 Risk Assessment and Mitigation Measures during Construction, Operation and Decommissioning Phases

Risk analysis before taking mitigation measures	Assessed Risk Index	Risk	Risk analysis after taking mitigation measures	Assessed Risk Index
<p><u>Toxic Chemical</u></p> <ul style="list-style-type: none"> - Hazards from improper storage and handling of toxic chemical such as glue which contain methyl ethyl ketone, methylcyclohexane and so on. 	3C (Tolerable)	<ul style="list-style-type: none"> - Chemicals are stored separately with other raw materials. - Hazardous chemical are stored in well-ventilated areas. - PPE such as protective gloves, clothing, eye protection are provided to the workers while handling the chemical. 	<ul style="list-style-type: none"> - Chemicals are stored separately with other raw materials. - Hazardous chemical are stored in well-ventilated areas. - PPE such as protective gloves, clothing, eye protection are provided to the workers while handling the chemical. 	2D (Acceptable)
<p><u>Flammable Materials</u></p> <ul style="list-style-type: none"> - Hazards from improper storage and handling of flammable chemical such as glue 	3C (Tolerable)	<ul style="list-style-type: none"> - Chemicals are stored separately with other raw materials. - Hazardous chemical are stored in well-ventilated areas. - Fire extinguishers, MSDS, eyewash station, "No Smoking" sign board and emergency alarm button are provided in the chemical storage room. 	<ul style="list-style-type: none"> - Chemicals are stored separately with other raw materials. - Hazardous chemical are stored in well-ventilated areas. - Fire extinguishers, MSDS, eyewash station, "No Smoking" sign board and emergency alarm button are provided in the chemical storage room. 	2D (Acceptable)
<p><u>Large Mechanical Equipment</u></p> <ul style="list-style-type: none"> - Physical injuries from the movement and use of large mechanical equipment 	3C (Tolerable)	<ul style="list-style-type: none"> - Appropriate PPE such as gloves, safety glasses and ear protection will be worn. - Skilled workers will be employed and workers who worked with large machines will be trained. - Movement of construction and shoe manufacturing machines will be performed carefully. 	<ul style="list-style-type: none"> - Appropriate PPE such as gloves, safety glasses and ear protection will be worn. - Skilled workers will be employed and workers who worked with large machines will be trained. - Movement of construction and shoe manufacturing machines will be performed carefully. 	2D (Acceptable)
<p><u>Fire Hazard</u></p> <ul style="list-style-type: none"> - Loss of people and property from fire hazard 	3C (Tolerable)	<ul style="list-style-type: none"> - Fire extinguishers, firefighting pool, fire alarm system and fire hose reel are provided in the project factory. - "No Smoking" sign board is provided near the flammable chemical storage room. - Firefighting trainings are provided to the workers every year. 	<ul style="list-style-type: none"> - Fire extinguishers, firefighting pool, fire alarm system and fire hose reel are provided in the project factory. - "No Smoking" sign board is provided near the flammable chemical storage room. - Firefighting trainings are provided to the workers every year. 	3E (Acceptable)

<p><u>Occupational Health Hazard</u></p> <ul style="list-style-type: none"> - Physical injuries and health problem from chemical exposure, machinery accidents, dust inhalation and noise exposure 	<p>4D (Tolerable)</p>	<ul style="list-style-type: none"> - Hazardous chemical are stored and handled in well-ventilated areas by trained skilled workers. - Strong dust absorption machines with six holes are installed in order to absorb/collect harmful dust from outsoles grinding process. - Personal protective equipment such as mask, glove, ear plugs and so on are provided to the workers who are working in the outsoles grinding room in order to prevent dust particles inhalation. 	<p>3E (Acceptable)</p>
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6. Cumulative Impact Assessment

6.1. Methodology

According to this EIA report, the two VECs are selected to evaluate the cumulative impacts of this project, namely air quality, water quality, solid waste and traffic safety. The three scenarios are proposed such as neutral, positive and negative. Detailed information on evaluation criteria and rating for significance of cumulative impacts is shown in Table 13 and determination of significant level is shown as follows:

- ❖ Strongly positive and significant
- ❖ Positive and significant
- ❖ Neutral
- ❖ Negative and significant
- ❖ Strongly Negative and significant

Table 13 Evaluation Criteria and Rating for Significance of Cumulative Impacts

Impact Balance	
Positive	Advantages from residual effect
Neutral	No net advantages or disadvantages from residual effect
Negative	Disadvantages from residual effect
Extent	
Site-specific	The study area directly disrupted by the project during construction, operation and decommission phase
Local	Yangon City area
Regional	Yangon Region
National	All around Myanmar
Duration	
Short-term	> 3 years
Mid-term	3 – 10 years
Long-term	< 10 years
Magnitude	
Negligible	No significant changes is discovered as per baseline conditions.
Low	Change is discovered but limited effect on the VECs.
Medium	Change is discovered but moderate effect on the VECs.
High	Change is discovered but severe effect on the VECs.
Probability	
Low	Unlikely to occur.
High	Likely to occur.
Level of Confidence	
Low	Incomplete understanding of cause-effect relationships
Moderate	Reasonable understanding of cause-effect relationships
High	Fully understanding of cause-effect relationships

6.1.1. Assessment on Air Quality

The cumulative impact evaluation on air quality is shown in Table 14.

Table 14 Cumulative Impacts on Air Quality

VEC	Rating	Rationale
Air Quality	Impact Balance : Neutral	Air quality is expected to be neutral since the project itself does not emit significant air pollution
	Extent : Site-specific	Impact is expected to occur only in the project area.
	Duration : Long term	Impact is expected to occur throughout the entire project life.
	Magnitude : Low	Although some air emission may be detected but limited impact on air quality.
	Probability : Low	Unlikely to occur
	Level of Confidence : Moderate	Confidence is based on a reasonable understanding of air quality changes due to the project
	Significance : Neutral	Air quality is expected to be neutral

6.1.2. Assessment on Water Quality

The cumulative impact evaluation on water quality is shown in Table 15.

Table 15 Cumulative Impacts on Water Quality

VEC	Rating	Rationale
Water Quality	Impact Balance : Neutral	Water quality is not expected to be impacted by construction and operation of the project by providing proper environmental management plans
	Extent : Site-specific	Impact is expected to occur only in the project area.
	Duration : Long term	Impact is expected to occur throughout the entire project life.
	Magnitude : Negligible	No significant changes on water quality as per baseline water quality result.
	Probability : Low	Unlikely to occur
	Level of Confidence : Low	Confidence is based on an incomplete understanding of water quality changes due to the project
	Significance : Neutral	Water quality is expected to be neutral

6.1.3. Assessment on Solid Waste

The cumulative impact evaluation on solid waste is shown in Table 16.

Table 16 Cumulative Impacts on Solid Waste

VEC	Rating	Rationale
Solid waste	Impact Balance : Neutral	Solid waste is not expected to be impacted by construction and operation of the project by providing proper environmental management plans
	Extent : Site-specific	Impact is expected to occur only in the project area.
	Duration : Long term	Impact is expected to occur throughout the entire project life.
	Magnitude : Low	Although some changes may be detected but limited impact on the environment.
	Probability : Low	Unlikely to occur
	Level of Confidence : Moderate	Confidence is based on a reasonable understanding of solid waste management due to the project
	Significance : Neutral	No significant impact is expected and can be neutral.

6.1.4. Assessment on Traffic Safety

The cumulative impact evaluation traffic safety is shown in Table 17.

Table 17 Cumulative Impacts on Traffic Safety

VEC	Rating	Rationale
Traffic Safety	Impact Balance : Negative	Traffic safety is expected to be impacted by construction and operation of the project
	Extent : Local	Impact is expected to occur in Yangon City area.
	Duration : Long term	Impact is expected to occur throughout the entire project life.
	Magnitude : Low	Although some changes may be detected but limited impact on on the environment.
	Probability : Low	Unlikely to occur
	Level of Confidence : Moderate	Confidence is based on a reasonable understanding of traffic safety due to the project
	Significance : Negative and significance	Traffic safety is expected to be negative and significant.

7. Environmental Management Plan

The summary of potential impacts and mitigation measures for the proposed project is shown in Table 18. Environmental monitoring plan during construction, operation and decommissioning phases are shown in Table 19 and Table 20.

Table 18 Summary of Impact and Mitigation Measures

No.	Potential Impact Assessment	Mitigation Measures	Responsible Team	Annual Cost (MMK)
During Construction/Decommissioning Phase				
1.	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> - Emission of air pollutants from the use of construction and decommissioning activities, diesel generators and vehicles movement 	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> - The transportation vehicles will be maintained regularly. - Spraying water and usage of safety nets at and around the construction areas will be performed. - Construction material such as cement and sand, etc. will be carried with covers. 	Environmental Management Team of contractor	Included in the project construction cost
2.	<p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> - Noise and vibration from the use of diesel generators and the operation of construction equipment and heavy vehicles 	<p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> - Civil work generating high noise levels will be carried out only at daytime. - Adequate earplugs or ear muffs will be provided to the workers in excessive noise areas. - Workers in excessive noise areas and on a vibrating surface will be assigned with alternative shift. - Low-noise level generators will be used in order to reduce the impact from the diesel engine generators. - Diesel generators are placed away from the residential area. - Construction equipment, truck and diesel generators will be maintained regularly in order to avoid excessive vibration and noise. 	Environmental Management Team of contractor	Included in the project construction cost
3.	<p><u>Water Quality</u></p> <ul style="list-style-type: none"> - Surface runoff through construction site and domestic wastewater from construction workers 	<p><u>Water Quality</u></p> <ul style="list-style-type: none"> - Sufficient number of toilets and bathing facilities for construction workers are provided. - Sewage will be collected into septic tanks and will be properly discharged in line with YCDC laws and regulations. 	Environmental Management Team of contractor	Included in the project construction cost

4.	<p><u>Soil Quality</u></p> <ul style="list-style-type: none"> - Soil contamination such as leakage of fuel and oil from the construction vehicles or machineries and other various wastes on the ground - The temporary solid waste disposal site can cause leakage of leachate to the surrounding soil. 	<p><u>Soil Quality</u></p> <ul style="list-style-type: none"> - The construction vehicles or machineries will be regularly maintained in order to prevent leakage of fuel and oil to the soil. - The temporary solid waste disposal site are constructed properly in order to prevent leakage of leachate to the surrounding soil. - Fuel oil will be properly stored. - Construction waste will be systematically collected and disposed according to YCDC Rules and Regulations. 	<p>Environmental Management Team of contractor</p>	<p>Included in the project construction cost</p>
5.	<p><u>Solid Waste</u></p> <ul style="list-style-type: none"> - Construction wastes from civil work and domestic wastes from construction workers. 	<p>Solid Waste</p> <ul style="list-style-type: none"> - Solid waste from the removal of top soil and old structures and faulty construction activities will be disposed at a suitable landfill site in accordance with the approval of YCDC. - Construction wastes will be classified and sorted out at sources for disposal in line with YCDC rules and regulation. - Non-hazardous wastes such as plastic, garbage, glass and food waste will be separated and managed according to YCDC rules and regulation. - Hazardous waste disposal in or off the construction site will be prohibited. - Hazardous waste will be stored, collected and disposed in compliance with the approval of YCDC. 	<p>Environmental Management Team of contractor</p>	<p>Included in the project construction cost</p>

6.	<p><u>Occupational health and safety</u></p> <ul style="list-style-type: none"> - Construction workers may slip and fall due to the careless. - Working at height of building during roofing and painting may cause accident. - Increased temperature of equipment surface may hurt due to careless. - Dusty in the ambient air of the working zone can cause side effect on respiratory system. 	<p><u>Occupational health and safety</u></p> <ul style="list-style-type: none"> - The project proponent will establish safety policy. - The contractor will prepare safety plan. - The contractor will provide PPE and first aid kit to the construction workers. - The contractor will raise awareness of safety guidelines to the construction workers. - The contractor will assign safety supervisors at the work site. - The contractor will provide incentives to workers who obey the safety practices and penalty to workers who disobey the safety practices. - The contractor will arrange morning talks and toolbox meeting. 	Environmental Management Team of contractor	Included in the project construction cost
7.	<p><u>Ecosystem</u></p> <ul style="list-style-type: none"> - Civil works from the construction and demolition activities can cause impacts on fauna and flora 	<p><u>Ecosystem</u></p> <ul style="list-style-type: none"> - Cutting tree and clearance of vegetation must be at a minimum and the trees will be planted. - Oil, grease and construction waste will be stored properly to prevent the leakage on the ground or water bodies. - Construction waste and wastewater will be properly disposed and discharged. 	Environmental Management Team of contractor	Included in the project construction cost
During Operation Phase				
1.	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> - Emission of particulate matters such as PM₁₀, PM_{2.5} and gaseous pollutants such as CO₂, NO₂, CO, CH₄, O₃, SO₂, VOCs from loading and unloading of raw materials, use of power generators, use of chemical glue and transportation activities - Harmful dust emission from outsole grinding process 	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> - Generators and vehicles will be maintained regularly. - Low Sulphur content diesel fuel are used for the operation of generators, machineries and vehicles in order to reduce gaseous emission. - Strong dust absorption machines with six holes are installed in order to absorb/collect harmful dust from outsoles grinding process. 	Environmental Management Team of ABGL	1,000,000

		<ul style="list-style-type: none"> - Personal protective equipment such as mask, glove and so on are provided to the workers who are working in the outsoles grinding room in order to prevent dust particles inhalation. 		
2.	<p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> - Noise and vibration from the use of diesel generators, sewing machine, cutting machine, outsoles grinding and transportation vehicles 	<p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> - Equipment and machines that generate low noise levels will be used. - PPE such as earplugs or earmuffs are provided to the workers who are working in the excessive noise areas. - Diesel generators are placed away from the residential area. - Operation machine, equipment, transportation vehicles and diesel generators will be maintained regularly in order to avoid excessive vibration and noise. 	Environmental Management Team of ABGL	500,000
3.	<p><u>Water Quality</u></p> <ul style="list-style-type: none"> - The domestic wastewater and sewage from workers such as wastewater from toilets or urinals, canteen and staff accommodation will be generated. 	<p><u>Water Quality</u></p> <ul style="list-style-type: none"> - The proper water drainage systems are constructed in the factory compound. - The domestic wastewater from the secondary drains will discharge into the main drainage channel and then flow to the industrial zone drainage channel. - Sufficient number of toilets and bathing facilities for the factory workers are provided. - Sewage from buildings in the project site will be collected by sub-septic tanks and main septic tank, and will be discharged in line with the YCDC Rules and Regulations. 	Environmental Management Team of ABGL	500,000
4.	<p><u>Soil Quality</u></p> <ul style="list-style-type: none"> - Soil contamination such as leakage of fuel and oil from the transportation vehicles and diesel generators/storage tanks and improper wastewater discharge 	<p><u>Soil Quality</u></p> <ul style="list-style-type: none"> - Transportation vehicles and equipment used for operation process will be examined or maintained regularly. 	Environmental Management Team of ABGL	Included in solid waste management and wastewater management

		<ul style="list-style-type: none"> - Solid waste management system will be installed properly in order to prevent improper waste disposal. - Domestic wastewater will be discharged properly in order to prevent improper wastewater discharge on the ground. 		
5.	<p><u>Solid Waste</u></p> <ul style="list-style-type: none"> - Small amount of hazardous waste such as dry cells, batteries, fluorescent lamp, paints and its container, chemicals residue and its container will be generated. - Non-hazardous waste such as paper, plastic bag and plastic bottles, glass, aluminum cans, tin cans, clothes, food wastes, rubber, etc. will be generated. 	<p>Solid Waste</p> <ul style="list-style-type: none"> - Solid waste will be separately collected with different types of waste bins and the collected waste will be kept at a temporary solid waste storage yard before collecting by YCDC. - Food waste from the factory workers will be disposed daily with the approval of YCDC. - Both hazardous waste such as residue within empty chemical containers, used batteries and incandescent light bulb, etc. and non-hazardous waste such as cutting pieces, thread and unqualified products from the temporary waste storage yard will be disposed monthly in accordance with the approval of YCDC. 	Environmental Management Team of ABGL	500,000
6.	<p><u>Offensive Odour</u></p> <ul style="list-style-type: none"> - Offensive odour from the temporary solid waste disposal site, the use of chemical glue and building renovation activities. 	<p><u>Offensive Odour</u></p> <ul style="list-style-type: none"> - Glue will be handled in well-ventilated areas. - PPE such as face shield and mask will be used in order to prevent offensive odour inhalation. - Workers in excessive offensive odour areas will be assigned with alternative shift. - Temporary solid waste yard are constructed systematically and waste from waste storage yard will be discharged in accordance with YCDC rules and regulation. 	Environmental Management Team of ABGL	Included in occupational health and safety program
7.	<p><u>Occupational health and safety</u></p> <ul style="list-style-type: none"> - Physical injuries such as fall on slippery floors, electricity shock and improper product loading and unloading in store 	<p><u>Occupational health and safety</u></p> <ul style="list-style-type: none"> - The moisture-absorbent mats with beveled edges must be used to prevent slips and falls on the slippery floor and signboard should be displayed as the caution. 	Environmental Management Team of ABGL	1,000,000

	<ul style="list-style-type: none"> - Accidents can be occurred from the factory's renovation activities. - In addition, improper chemical glue handling can harm to the workers and outsole grinding process can cause harmful dust inhalation to the workers. 	<ul style="list-style-type: none"> - Qualified forklift operators and handlers should be used during loading and unloading of materials. - It must not be overloaded than the prescribed load on loading and unloading equipment and vehicles in order to prevent accidents. - PPE will be provided to the workers during renovating the buildings. - Material safety data sheets (MSDS), eyewash station, emergency alarm button and "No Smoking" sign board are provided on the wall of chemical storage room. - In addition, PPE such as protective gloves, clothing, eye protection, ear plugs, and face shield will be provided to the workers who handled chemical glue and to the workers who worked in outsole grinding room. - First aid kit and medical clinic will be provided to the workers. - Occupational safety and emergency first aid training will be also provided to the workers. 		
8.	<p><u>Ecosystem</u></p> <ul style="list-style-type: none"> - Improper discharge and disposal of wastewater and solid waste from the project 	<p><u>Ecosystem</u></p> <ul style="list-style-type: none"> - The project proponent will systematically manage and use the natural resources such as land and water in this area. - Maintaining and replanting of certain native plant species such as trees may provide as landscaping or fencing a home for the faunal assemblages such as insects, amphibians, reptiles, and birds. - Wastewater and solid waste from the shoe production processes will be systematically managed in accordance with YCDC rules and regulations. 	Environmental Management Team of ABGL	500,000

Table 19 Environmental Monitoring Plan during Construction and Decommissioning Phases

Monitoring Item	Monitoring Parameter	Monitoring Location	Frequency	Estimated Cost (MMK)
Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , O ₃ & CO, CO ₂ , CH ₄ , VOC, Humidity, Temperature	Project site 16° 58' 37.76" N 96° 3' 14.99" E	Twice a year	2,000,000
Water Quality	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Temperature, DO, Turbidity, TDS, TSS, Iron, Lead, Free Cyanide, Arsenic	GW – Tube well within the project 16°58'37.52"N 96° 3'14.04"E WW – Wastewater discharge of project 16°58'40.31"N 96° 3'10.86"E	Twice a year	500,000
Solid Waste	Amount and type of solid waste	Temporary waste disposal site	Weekly	Included in the project construction cost
Occupational Health and Safety	Incident/accident records	Around the project site and construction site	Monthly	
Noise	Noise level (dB (A) scale)	Project site 16° 58' 37.76" N 96° 3' 14.99" E	Twice a year	1,000,000
Vibration	Radial, Transverse, Vertical			1,000,000

Table 20 Environmental Monitoring Plan during Operation Phase

Monitoring Item	Monitoring Parameter	Monitoring Location	Frequency	Estimated Annual Cost (MMK)
Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , O ₃ & CO, CO ₂ , CH ₄ , VOC, Humidity, Temperature	<u>Project site</u> 16° 58' 37.76" N 96° 3'14.99" E	Twice a year	2,000,000
Water Quality	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Temperature, DO, Turbidity, TDS, TSS, Iron, Lead, Free Cyanide, Arsenic	<u>GW – Tube well withing the project</u> 16°58'37.52"N 96° 3'14.04"E <u>WW – Wastewater discharge of project</u> 16°58'40.31"N 96° 3'10.86"E	Twice a year	500,000
Solid Waste	Amount and type of solid waste	Temporary waste disposal site	Weekly	500,000
Occupational Health and Safety	Incident/accident records and providing	Around the project site and construction site	Monthly	100,000
Noise	Noise level (dB (A) scale)	<u>Project site</u> 16° 58' 37.76" N 96° 3'14.99" E	Twice a year (Dry and Wet Seasons)	1,000,000
Vibration	Radial, Transverse, Vertical			1,000,000

8. Public Consultation and Disclosure

The main objective of public consultation is to provide project information, production procedures, waste management and potential environmental impacts to the regulators, authorities and stakeholders. During the public consultation meeting, ABGL and TBS (consultant) presented the project background, operation processes, environmental conditions, summary of impacts assessment and proposed mitigation measures. Suggestions and comments from the regulators, authorities and stakeholders were collected in the EIA report. As a part of EIA requirement, ABGL publicized about the project developments to the concerned stakeholders as follows;

- ❖ Information of the stakeholders about the project, environmental and social issues related to project operation, and mitigation measures to minimize environmental and social impacts.
- ❖ Considering the views, concerns, and perceptions of stakeholders, communities and individuals that could be affected by the project or who otherwise have an interest in the project.
- ❖ Participation and partnership where issues are needed to join for discussing and assess.

Public Consultation for EIA report (Scoping stage) was conducted on 21st December, 2022 at ABGL factory and also via zoom application by following the EIA procedure. During scoping stage public consultation, a total of 36 participants attended the public consultation. The attendance rate in percentage are 19 % government authorities, 6% of project proponent, 11 % of TBS's staffs and 64% of local residence. In addition, Public Consultation for EIA report was conducted on 21st February, 2023 by following the EIA procedure. During EIA stage public consultation, a total of 19 participants attended the public consultation. The attendance rate in percentage are 32 % government authorities, 10% of project proponent, 32 % of TBS's staffs and 26 % of local residence. The comments and suggestions by the participants are fully described in Section 8.4.1 and Section 8.5.1.

9. Conclusions and Recommendations

9.1. Conclusions

This EIA report has provided an assessment of the potential environmental, social and health impact associated with the construction, operation and decommissioning phases of the proposed project. This study was prepared on the basis of the project information, relevant information from various sources, surveys of environmental and socio-economic setting of the project area, rounds of consultations with stakeholders in the government sector and communities in and around the vicinity of the project site, and experiences of the consultant in technical and environmental aspects of the proposed projects. Based on the study results, the major factors are concluded as shown in Section 9.1.

9.2. Recommendations

This EIA study has clearly identified the environmental and social issues, mitigation measures and monitoring plan. It is recommended that the project proponent must implement all the mitigation measures, management plan and monitoring plan described in this report. In addition, the project proponent must continuously follow the requirements of the environmental guidelines, applying mitigation measures to ensure the compliance with the legal requirements and other relevant recommended criteria.

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ABBREVIATIONS

ABGL	Alpha Best Global Limited
AIDS	Acquired Immunnodeficiency Syndrome
BOD	Biological Oxygen Demand
CH ₄	Methane
COD	Chemical Oxygen Demand
°C	Degree Celsius
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CSR	Corporate Social Responsibility
dB	decibels
DD	Data Deficient
DO	Dissolved Oxygen
EIA	Environmental Impact Assessment
ECD	Environmental Conservation Department
EDC	Environmental Devices Corporation
EMS	Environmental Management System
ECC	Environmental Compliance Certificate
EMP	Environmental Management Plan
EN	Endangered
ESE	East South East
GAD	General Administration Department
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
kVA	Kilo Volt Ampere
kW	Kilowatt
LAeq	Equivalent Continuous Sound Level in Decibels
LC	Least Concern
LOS	Level of Service

m ³	cubic meter
MONREC	Ministry of Natural Resources and Environmental Conservation
mph	miles per hour
MST	Mountain Standard Time
NE	Not Evaluate
NEQEG	National Environmental Quality (Emission) Guideline
NO ₂	Nitrogen dioxide
O ₃	Ozone
PCD	Passenger Car Equivalent
PCU	Passenger Car Units
PM	Particulate Matter
ppm	Part per million
ppb	Part per billion
SE	Southeast
SO ₂	Sulfur dioxide
TBS	Total Business Solution Co., Ltd
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
TWA	Time-Weighted Average
USA	United State of America
USEPA	United State of Environmental Protection Agency
WHO	World Health Organization
VOCs	Volatile Organic Compound
VU	Vulnerable
YCDC	Yangon City Development Committee
µg	micro gram

CHAPTER 1 INTRODUCTION

Alpha Best Global Limited. (ABGL) is a 100% foreign investment project to construct and operate a cutting, making and packaging (CMP) basic factory for manufacturing various kinds of shoes. It is located at Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon, Myanmar. The total land area of the proposed project is 8.708 Acres (35,240.057 square meters). The location of the proposed project is shown in Figure 1-1. Although the construction period of factory is expect to take about 2 years, the construction period is extended to 5 years.

The final products such as sport shoes (Men and Ladies), Sport Shoes (Junior's) and Casual Shoes (Men and Ladies) from ABGL will export to foreign countries such as Italy, United States, Hong Kong, China, Japan, Thailand, Vietnam and Korea. The raw materials and required equipment will be purchased and imported from local suppliers and China. The customers of ABGL are PRADA, HELLY HANSEN, STONEFLY, MERRELL, PREMIATA, FESDA, Le Coq Sportif, DUCA DEL COSMA, ON RUNNING, ALBERTO GUARDIANI, VIKING, GEOX, MICHAEL KORS, ASTON ARTIN, Vibram Five Fingers and BIKKEMBERGS.

The purposes for the development of the proposed project are as follows:

- ❖ To join in the economic reform process of the country
- ❖ To offer comfortable life style to Myanmar people
- ❖ To create a brighter future for younger generation

The project proponent has engaged Total Business Solution Co., Ltd. (TBS) (Consulting Team) to study the Environmental Impact Assessment (EIA) for the proposed project. TBS will prepare EIA report for the manufacturing of various kinds of shoes of ABGL based on ToR which is prepared in Scoping Report. In addition, the preparation of EIA report will comply with the description of section (55), (56), (57), (58), (59), (60), (61), (62), (63), (64) and (65) of the Environmental Impact Assessment Procedure (EIA Procedure, 2015) issued by the Ministry of Natural Resources and Environmental Conservation (MONREC).

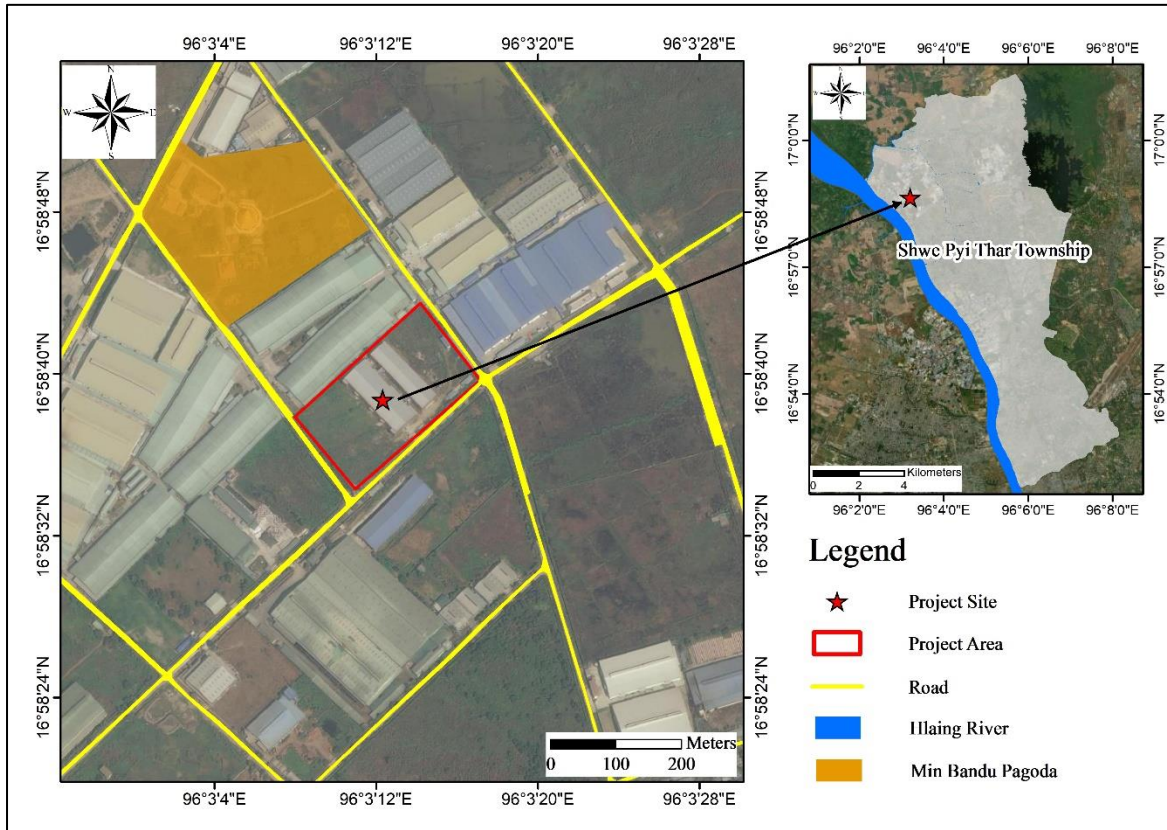


Figure 1-1 Location of the Proposed Project

1.1. PROJECT PROPONENT

The contact of representative of the proposed project proponent is given Table 1-1 and the list of executives of ABGL is shown in Table 1-2.

. In addition, the organization chart of the proposed project proponent is described in Figure 1-2. The Certificate of Incorporation from Directorate of Investment and Company Administration of ABGL is shown in **APPENDIX A**.

Table 1-1 Contact Detail of Representatives

Representative	Mr. Htun Htun Oo
Position	Human Resource Manager
Address	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon, Myanmar
Contact No.	09-797654666
Email	larrylu@china.jimbrother.com.tw

Table 1-2 List of Executives of ABGL

Sr. No.	Name	Citizenship & Passport No.	Address	Proposed Designation	Numbers of Shares Capital	Shares-holding
(A)	ABGL Represented by its Directors: -	Incorporated in Republic of Samoa Registration No.84056	2nd Floor, Building B, SNPF Plaza, Savalalo, Apia, Samoa	-	130,000 Shares	100%
1.	MR. HUANG, YU-CHIEH	Taiwan, 303562839	Sanhe St, 13F-6, No.65, Nantun Dist, Taichung City 408, Taiwan	Director	-	-
2.	MR. TSENG, YA-PO	Taiwan, 351244685	Sanhe St, 13F-6, No.65, Nantun Dist, Taichung City 408, Taiwan	Director	-	-

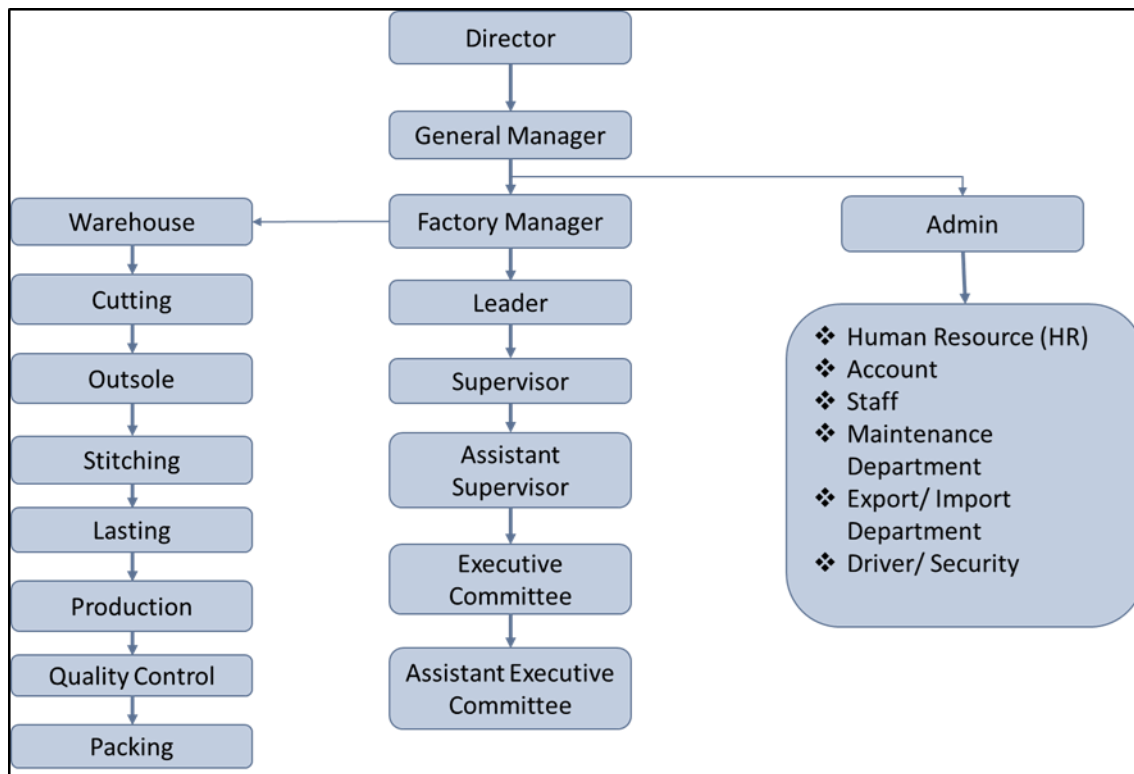


Figure 1-2 Organizational Chart of ABGL

1.2. EIA CONSULTANT

The Environmental and Social Experts are professionals provided by Total Business Solution Co., Ltd., (TBS). TBS is a Myanmar consulting firm, providing engineering and environmental services to various clients in Myanmar. TBS provides services in various sectors including industrial development, water resources management, infrastructure development, environmental assessments and socio-economic survey. The certificates for Transitional Consultant Registration is shown in **APPENDIX B**. The organizational structure of EIA study team is shown in Figure 1-3 and the summary of the EIA study team including

education and brief experiences is shown in Table 1-3. The contact of representative of TBS is described as follow.

Name	Dr. Soe Moe Kyaw Win
Position	Managing Director
Contact No.	09-401604493
Email Address	soemoe@tbs.com.mm
Address	No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Yangon.

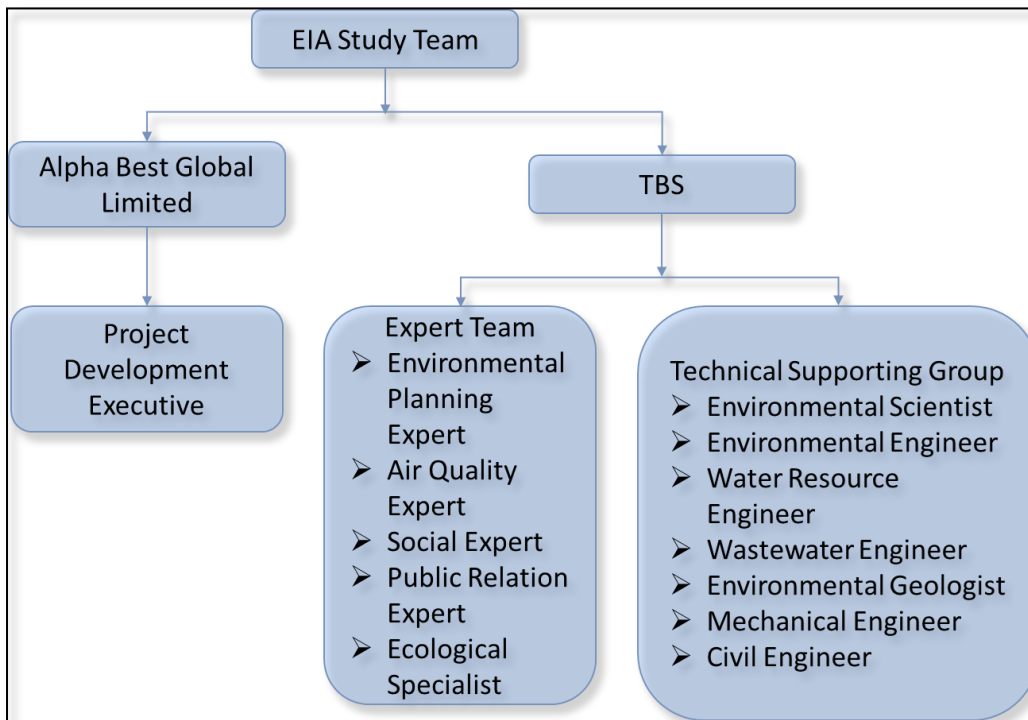


Figure 1-3 Organizational Structure of EIA Study Team

Table 1-3 List of TBS's Staff

No	Name	Education	Experience	Responsibilities	Contact Address
1.	Dr. Soe Moe Kyaw Win Managing Director Principal of Geotechnical and Geo environmental Engineer	Ph.D. (Geotechnical Engineering) M.Sc. (Geotechnical Engineering) B.Sc. (Geology)	30-year experiences in the areas of environmental assessment, geotechnical and geological engineering in Southeast Asian, U.S.A and Canada. Environmental assessments, mine waste management, site investigation, instrumentation, ground improvement, land reclamation and landslide investigation.	Final review of the report	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
2.	Mr. Myatthu Kyaw General Manager	M.Sc. (Environmental Engineering and Management) B.Sc. (Forestry)	Over 7 years' experience in environmental quality monitoring (air, noise and vibration, soil, water), environmental impact assessment industry.	Overall review the report Establish Environmental Management Plan-EMPs and Environmental Monitoring Plan-EMoP Arrange Public Consultation Meetings	Phone No. 09-420049285 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
3.	Ms. Thet Htar Myint Social Impacts Assessment Specialist	M.Sc. (Gender and Development) M.Sc. (Zoology) B.Sc. (Hons) (Zoology)	Over 20-year experiences in environmental, gender and social development fields. Experience included environmental impact assessment, gender and social development studies, social impacts assessment, safeguards and development of resettlement plans, Capacity Building of community and Administrative works.	Social Impact Assessment (Gender, Social and Economic)	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
4.	Ms. Hnin Lai Win Environmental Manager	M.Sc. (Environmental Engineering and Management) B.Pharm. (Pharmacy)	5-year experiences in management and marketing and training of junior staff in medical field Over 4-year experiences in land use planning, environmental impact	Project Description, Environmental Risk Assessment, Environmental Management Plan, Impact Mitigation Measure	Phone No. 09-421027662 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.

No	Name	Education	Experience	Responsibilities	Contact Address
			assessment and managing environmental projects. Environmental management plan, environmental monitoring, environmental risk assessment, facilitated the public consulting meetings, marketing, coordination with government organizations and local community.		
5.	Dr. Aung Aung	Ph.D. (Zoology) M.Sc. (Zoology) B.Sc. (Zoology)	Over 19-year experiences in teaching, researcher in Zoology field and biodiversity conservation.	Environmental impact assessment and Biodiversity conservation focus on mammalogy and ecology.	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
6.	Dr. Pyone Pyone Myint	Ph.D. (Zoology) M.Sc. (Zoology) B.Sc. (Zoology)	Over 19-year experiences in teaching and field research in Zoology field and Biodiversity observation.	Environmental impact assessment and biodiversity observation mainly in anatomy, behavior, ecology, evolution, physiology, conservation, or other aspects of bird biology.	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
7.	Dr. Thant Zaw Win	Ph.D. (Taxonomy) M.Sc. (Botany) B.Sc. (Botany)	Over 9-year experiences in teaching and field research in Botany field and biodiversity observation.	Environmental impact assessment and phytochemical analysis, wetland management, specialist in plant biology.	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
8.	Dr. Than Than Myint	Ph.D. (Zoology) M.Sc. (Zoology) B.Sc. (Zoology)	Over 16-year experiences in teaching and field research in Zoology field and marine biology observation.	Environmental impact assessment and marine biodiversity observation mainly in fish biology.	Phone No. 09-401604493 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
9.	Ms. Phoo Pwint Khine Environmental Engineer	M.E (Environmental Engineering and Management) B.E (Civil)	1-year experience as a site engineer in construction project. 6 months experience as a QC/QS at building estimate team. 2-year experience in environmental field	Wastewater Management Hazardous Waste Management Cumulative Impact Assessment Public Consultation Meetings	Phone No. 09 - 758009087 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.

No	Name	Education	Experience	Responsibilities	Contact Address
10.	Ms. Aye Mon Aung Environmental Engineer	M.E (Environmental Engineering and Management) B.E (Materials and Metallurgy)	10-month experience as teaching assistance 2-year experience as sale representative 2-year experience in environmental field	Project Description Environmental Impact Assessment and Mitigation Measure Environmental Risk Assessment Environmental Baseline Quality Analysis Public Consultation Meetings	Phone No. 09 - 402647881 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
11.	Mr. Htet Thiha Phone Myint Environmental Geologist	B.Sc. (Geology)	7-year experiences in geological field, soil analysis, environmental management land use observation Environmental site survey, impacts monitoring (air, noise, water sampling), coordination with government organizations and local community, socioeconomic survey and documentation in environmental management projects.	Coordination with government organizations and local community, Social Survey, Social data Analysis	Phone No. 09 - 76005603 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
12.	Mr. Phyo Thu Kyaw Auto CAD Drafter	B.E. (Mechatronic)	3-year experiences in project coordination, documentation, Auto CAD drafter and graphic design and IT technician. Over 4-year experiences in environmental monitoring such as air and noise monitoring, water sampling and installing, maintaining and repair of computer system and office equipment.	Coordinator and Drafter	Phone No. 09 - 42118199 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
13.	Mr. Wai Phyo Aung Surveyor	B.Sc. (Geology)	7-year working experiences in geological and geotechnical engineering. 5 years experiences as a team leader in survey team.	Environmental Monitoring Survey Drone Survey Quality	Phone No. 09 - 784181980 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.

No	Name	Education	Experience	Responsibilities	Contact Address
14.	Mr. Zaw Myo Hein Environmental Geologist	B.Sc. (Geology)	2-year experience in environmental monitoring processes and conducting site survey	Environmental Monitoring Survey, Drone Survey	Quality Phone No. 09 - 751363321 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
13.	Ms. Kyi Phyu Khin	MBA (YUEco Hlaing Campus) ABE (Level 6 – UK) BA (English) Diploma in English (YUFL) Diploma in Business Law (YU)	1 years' experiences in management field specialized in business law	Law and Regulation	Phone No. 09 - 43193317 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.
14.	Ms. Thin Zar Tun Environmental Scientist	B.Sc (Forestry)	2 year's experience in environmental report examination and socio survey 5 months experiences in environmental report preparation field	Environmental Quality Monitoring Survey, Project Description Public Consultation Mettings	Phone No. 09 - 264576271 Address: No. 54, Room (704), Waizayantar Road, Thingungyun, Yangon, Myanmar.

1.3. INSTITUTIONAL FRAMEWORK RELATED WITH THE PROPOSED PROJECT

The government departments that are related with ABGL are Nay Pyi Taw ECD, Yangon ECD, Industrial Supervision and Inspection Department, Yagon City Development Committee (YCDC), Fire Department, Department of Trade, Factories and General Labour Laws Inspection Department, Yangon Electricity Supply Corporation (YESC), Social Security Board, General Administration Department (Shwepyitha Township) and Industrial Cooperation Department. The ABGL's institutional framework with government departments is shown in Figure 1-4. The permits from the relevant department are shown in **APPENDIX C**.



Figure 1-4 ABGL's Institutional Framework with Government Departments

1.4. THE EIA REQUIREMENT

According to the Annex 1 of EIA Procedure (2015), the leather products manufacturing (includes synthetic leather, handbags, luggage, saddle and footwear) needs to undergo an EIA study. The project follows this EIA requirement.

In April 2, 2020, the project proponent engaged TBS Co., Ltd (the Consultant) to conduct the EIA for the project. Its contents will follow all relevant guidelines and procedures of the Government Environmental Conservation Department (ECD), particularly those prescribed in the final of EIA Procedure (2015).

With reference to Section 47 of the Myanmar EIA Procedure 2015, scoping report and the preparation of Terms of Reference (ToR) will be required for the EIA Report in accordance with EIA Procedure 2015 and any applicable guidelines issued or adopted by the Ministry. The Scoping Report had been submitted and approved by the Ministry of Natural Resources and Environmental Conservation before commencing the EIA investigation.

With reference to Section 55 of the EIA Procedure (2015), the preparation of EIA report is required to undertake in accordance with the ToR as approved by the Department. The EIA report is prepared in line with the description of section (55), (56), (57), (58), (59), (60), (61), (62), (63), (64) and (65) of the Environmental Impact Assessment Procedure (EIA Procedure, 2015) issued by the Ministry of Natural Resources and Environmental Conservation (MONREC).

1.5. THE STRUCTURE OF EIA

Based on Scoping Report and ToR, the structure of EIA report is as follow;

1. Executive Summary (Myanmar and English Version)
2. Chapter 1 : Introduction
3. Chapter 2 : Overview of the Policy, Legal and Institutional Framework
4. Chapter 3 : Project Description and Alternative Selection
5. Chapter 4 : Description of Surrounding Environment
6. Chapter 5 : Impacts and Risk Assessment and Mitigation Measures
7. Chapter 6 : Cumulative Impact Assessment
8. Chapter 7 : Environmental Management Plan
9. Chapter 8 : Public Consultation and Disclosure
10. Chapter 9 : Conclusions and Recommendations

CHAPTER 2

OVERVIEW OF THE POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

2.1. INTRODUCTION

This chapter contains the information on relevant policies, legal framework, including existing applicable laws and rules, international conventions, treaties and agreements, and national and international standards and guidelines and institutional framework of Myanmar that are relevant to the environmental, socio-economic and other related aspects of the project. The activities carried out under the project are subjected to these legal requirements.

The project proponent will formulate an environmental management policy to guide its environmental management during construction, operation and decommissioning phases of project. Such a policy will support the following activities:

- ❖ Development of a comprehensive Environmental, Health and Safety (EHS) management system for implementing the environmental management plan (EMP);
- ❖ Implementing EMP during the construction/decommissioning phase and nominate project contractors will be required to prepare and implement contract specific EHS measures for construction/decommissioning phase of the proposed factory;
- ❖ During the operation phase, EHS management will be an integral part of the operational management of the proposed factory;
- ❖ Encourage public participation in EHS management related to surrounding communities and
- ❖ Maintain information generated in EHS management and prepare EHS performance reports as required by the corporate management and the relevant authorities of the Government.

The project proponent will establish and activate EHS Management system at the commencement of construction.

2.2. RELEVANT MYANMAR LAWS AND REGULATIONS

Policy, legal framework, including existing applicable laws and rules, international conventions, treaties and agreements, and national and international standards and guidelines in Myanmar that are of relevance to the project are listed in Table 2-1. The project proponent will comply with all the following laws and regulations.

Table 2-1 Relevant Laws and Regulations

No.	Name of Laws and Regulations	Year
Environmental Conservation		
1.	Environmental Conservation Law	2012
2.	Environmental Conservation Rules	2014
3.	Environmental Impact Assessment Procedure	2015
4.	National Environmental Policy	2019
Pollution Control and Health		
5.	National Environmental Quality (Emission) Guidelines	2015
6.	National Drinking Water Quality Standards	2019
7.	Public Health Law	1972
8.	The Prevention and Control of Communicable Diseases Law	1995
9.	The Control of Smoking and Consumption of Tobacco Product	2006
10.	Occupational Safety and Health Law	2019
11.	Myanmar Fire Brigade Law	2015
Biodiversity and Resource Conservation		
12.	Conservation of Biodiversity and Natural Protected Area Law	2018
13.	The Law relating to Aquaculture	1989
14.	Conservation of Water Resource and River Law	2006
15.	Conservation of Water Resource and River Rules	2013
16.	Underground Water Act	1930
17.	Forest Law	1992
Land Acquisition		
18.	The Land Acquisition, Resettlement and Rehabilitation Law	2019
19.	Myanmar National Land Use Policy	2016
20.	State-Owned Land Leasing of Building; Instruction to be followed in Transfers and Joint Ventures	Instruction No. 3/2018
21.	Farmland Law	2012
22.	Farmland Rules	2012
23.	Vacant, Fallow and Virgin Land Management Law	2018
24.	Registration of Deeds Law	2019
25.	The Boundaries Law	2019
Urban Development and Management		
26.	Yangon City Development Committee Law	2018
27.	The Electricity Law	2014
28.	The Small and Medium Enterprises Development Law	2015
29.	The Telecommunications Law	2013
Human Rights		
30.	Protection of the Right of National Race Law	2015
31.	Rights of the Persons with Disabilities Law	2015

No.	Name of Laws and Regulations	Year
32.	Child Rights Law	2019
Cultural Heritages		
33.	The Protection and Preservation of Cultural Heritage Region Law	2019
34.	The Protection and Preservation Antique Object Law	2015
35.	The Protection and Preservation of Ancient Monument Law	2015
Labour		
36.	Labour Organization Law	2011
37.	The Employment and Skill Development Law	2013
38.	The Minimum Wage Law	2013
39.	Payment of Wage Law	2016
40.	The Workers' Compensation Act	2005
41.	The Settlement of Labour Dispute Law	2012
42.	The Leave and Holiday Act	1951
43.	Social Security Law	2012
Motor Vehicles		
44.	Vehicle Safety and Motor Vehicle Management Law	2020
45.	The Myanmar Motor-Vehicle Rules	1989
46.	The Motor Vehicle Law	2015
Other Related Law and Regulation		
47.	Myanmar Insurance Law	1993
48.	Myanmar Insurance Rule	2017
49.	Myanmar Investment Law	2016
50.	Myanmar Investment Rule	2017
51.	The Petroleum and Petroleum Product Law	2017
52.	The Petroleum Act	1934
53.	The Export and Import Law	2012
54.	The Fisheries Law	1989
55.	Natural Disaster Management Law	2013
56.	Climate Change Policy	2019
57.	Commercial Tax Law	2014
58.	The Union Tax Law	2019
59.	Myanmar Citizens Investment Law	2013
60.	Foreign Investment Law	2012
61.	Private Industrial Enterprise Law	1990
62.	Prevention of Hazard from Chemical and Related Substances Law	2013
63.	Law on Standardization	2014
64.	The Factories Act	1951
65.	Myanmar Engineer Council Law	2013

No.	Name of Laws and Regulations	Year
66.	Trademark Law	2019
67.	Industrial Design Rights Law	2019
68.	Consumer Protection Law	2014
69.	Myanmar Company Law	2017
70.	Underground Water Act	1930
71.	Value Added Tax Law	2019
International and National Standards, Conventions and Treaties		
72.	IFC Performance Standards on Environmental and Social Sustainability	2012
73.	IFC Environmental Health, and Safety General Guidelines	2007
74.	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1992
75.	Cartagena Protocol on Biosafety Convention on Biological Diversity	2000
76.	Convention on Biological Diversity	1993
77.	ILO Forced Labor Convention	1930
78.	Kyoto Protocol to the United Nations Framework Convention on Climate Change	1997
79.	Montreal Protocol on Substances that Deplete the Ozone Layer	1987
80.	Stockholm Convention on Persistent Organic Pollutants	2001
81.	The Vienna Convention for the Protection of the Ozone Layer	1985
82.	United Nations Framework Convention on Climate Change	1994

2.3. ENVIRONMENTAL CONSERVATION

2.3.1. Environmental Conservation Law (30th March, 2012)

Environmental Conservation Law was enacted by the Pyidaungsu Hluttaw on 30th March 2012. Section 7 (o) of this law states that “managing 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”. According to Section 14, “A person causing a point source of pollution shall treat, emit, discharge and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards.” Further, Section 15 described that 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. According to section 24, “The Ministry may, in issuing the prior permission, stipulate terms and conditions relating to environmental conservation. It may conduct inspection whether or not it is performed in conformity with such terms and conditions or inform the relevant Government departments, Government organizations to carry out inspections”. According to section 29, “No one shall violate any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law”.

2.3.2. Environmental Conservation Rules (5th June, 2014)

This environmental conservation rule was approved by ministry of environmental conservation and forestry on 5th June 2014. Section 69, sub-section (a) and (b) prohibit as follows;

“(a) Any person shall not emit, ask to emit, dispose, ask to dispose, pile and ask to pile, by any means, hazardous waste or hazardous substances stipulated by notification according to any rules in this rule at any place which may affect the public directly or indirectly.

(b) Nobody shall carry out any activity which can damage the ecosystem and the natural environment which is affected due to such system, except for the permission of the Ministry for the interests of the people.”

2.3.3. Environmental Impact Assessment Procedure (29 December, 2015)

This procedure was enacted by ministry of environmental conservation and forestry on 29th December 2015. Section 102 to 105 of this procedure describe the responsibility for all adverse impacts.

Section 102 of this procedure states that the Project Proponent shall bear full legal and financial responsibility for:

a) all of the Project Proponent's actions and omissions and those of its contractors, subcontractors, officers, employees, agents, representatives, and consultants employed, hired, or authorized by the Project acting for or on behalf of the Project, in carrying out work on the Project; and

b) PAPs until they have achieved socio-economic stability at a level not lower than that in effect prior to the commencement of the Project, and shall support programs for livelihood restoration and resettlement in consultation with the PAPs, related government agencies, and organizations and other concerned persons for all Adverse Impacts.

According to Section 103, the Project Proponent shall fully implement the EMP, all Project commitments, and conditions, and is liable to ensure that all contractors and subcontractors of the Project comply fully with all applicable Laws, the Rules, this Procedure, the EMP, Project commitments and conditions when providing services to the Project.

Section 104 states that the Project Proponent shall be responsible for, and shall fully and effectively implement, all requirements set forth in the Environmental Compliance Certificate (ECC), applicable Laws, the Rules, this Procedure and standards.

According to Section 105, the Project Proponent shall timely notify and identify in writing to the Ministry, providing detailed information as to the proposed Project's potential Adverse Impacts.

Section 106 to 110 of this procedure describe about monitoring sectors;

Section 106 defines that the Project Proponent shall, during all phases of the Project (pre-construction, construction, operation, decommissioning, closure and post-closure), engage in continuous, proactive and comprehensive self-monitoring of the Project

and activities related thereto, all Adverse Impacts, and compliance with applicable laws, the Rules, this Procedure, standards, the ECC, and the EMP.

Section 107 states that the Project Proponent shall notify and identify in writing to the Ministry any breaches of its obligations or other performance failures or violations of the ECC and the EMP as soon as reasonably possible and in any event, in respect of any breach which would have a serious impact or where the urgent attention of the Ministry is or may be required, within not later than twenty-four (24) hours, and in all other cases within seven (7) days of the Project Proponent becoming aware of such incident.

Section 108. The Project Proponent shall submit monitoring reports to the Ministry not less frequently than every six (6) months, as provided in a schedule in the EMP, or periodically as prescribed by the Ministry.

Section 109. The monitoring reports shall include: a) documentation of compliance with all conditions; b) progress made to date on implementation of the EMP against the submitted implementation schedule; c) difficulties encountered in implementing the EMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties; d) number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation; e) accidents or incidents relating to the occupational and community health and safety, and the environment; and f) monitoring data of environmental parameters and conditions as committed in the EMP or otherwise required.

Section 110. Within ten (10) days of completing a monitoring report as contemplated in Article 108 and Article 109 in accordance with the EMP schedule, the Project Proponent shall make such report (except as may relate to National Security concerns) publicly available on the Project's website, at public meeting places (e.g. libraries, community halls) and at the Project offices. Any organization or person may request a digital copy of a monitoring report and the Project shall, within ten (10) days of receiving such request, submit a digital copy via email or as may otherwise be agreed upon with the requestor.

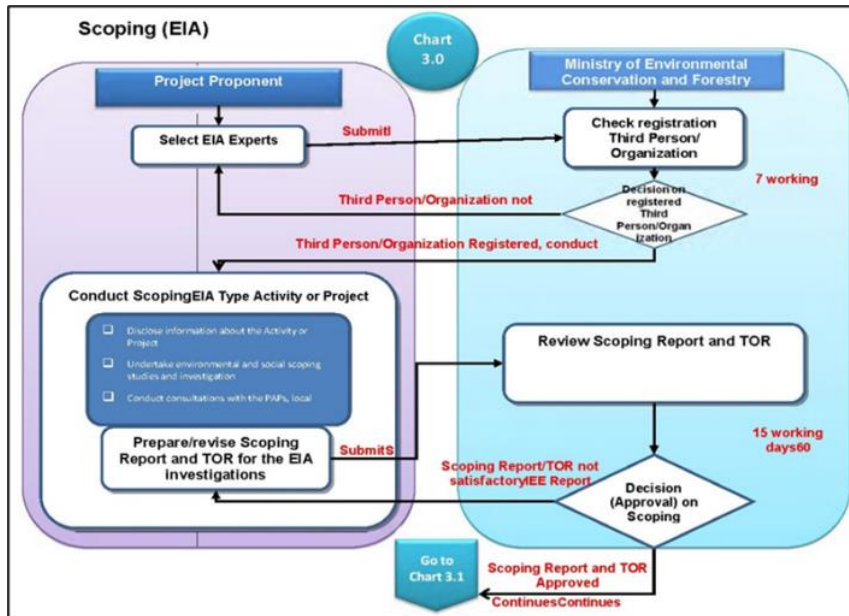
Section 115 prescribes that in the event of an emergency, or where, in the opinion of the Ministry, there is or may exist a violation or risk of violation of the compliance by the Project with all applicable environmental and social requirements, the Project shall grant full and immediate access to the Ministry at any time as may be required by the Ministry.

Section 117 state that the Project Proponent shall further ensure that the Ministry's rights of access hereunder shall extend to access by the Ministry to the Project's contractors and subcontractors.

Annex 1 of Myanmar EIA procedure (2015) provides guidance as to whether an IEE or EIA is required for any proposed project or activity. According to Annex 1 of Myanmar EIA procedure (2015), EIA is required for ABGL of the manufacturing of various kinds of shoes as shown in Table 2-2. The following figures Figure 2-1, Figure 2-2, Figure 2-3, and Figure 2-4 show the procedures for scoping, EIA investigations and review, EIA review and approval, and appeal, respectively.

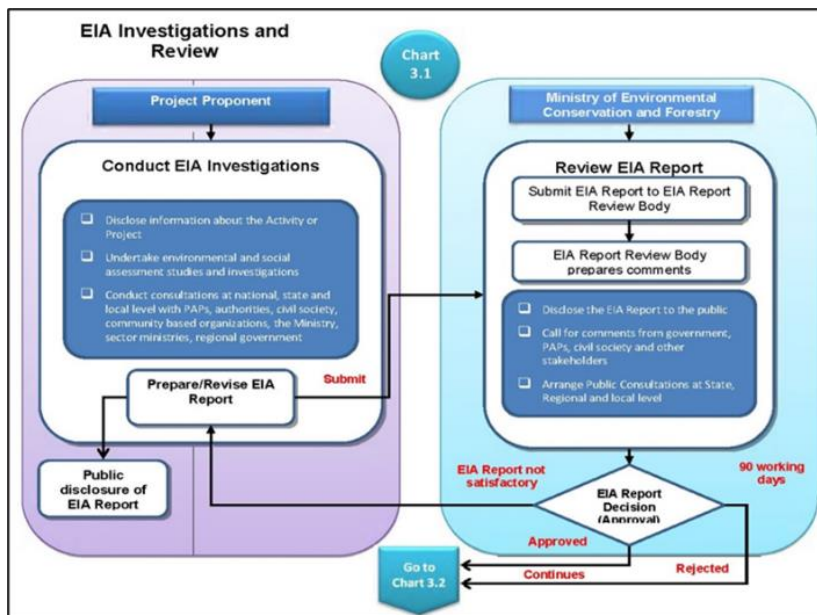
Table 2-2 Projects that Required to Perform whether IEE or EIA

No.	Type of Economic Activity	Criteria for IEE Type Economic Activities	Criteria for EIA Type Economic Activities
60	Leather Products Manufacturing (includes synthetic leather, handbags, luggage, saddle, footwear)	≥1,000 t/a	All activities where the Ministry requires that the Project shall undergo EIA



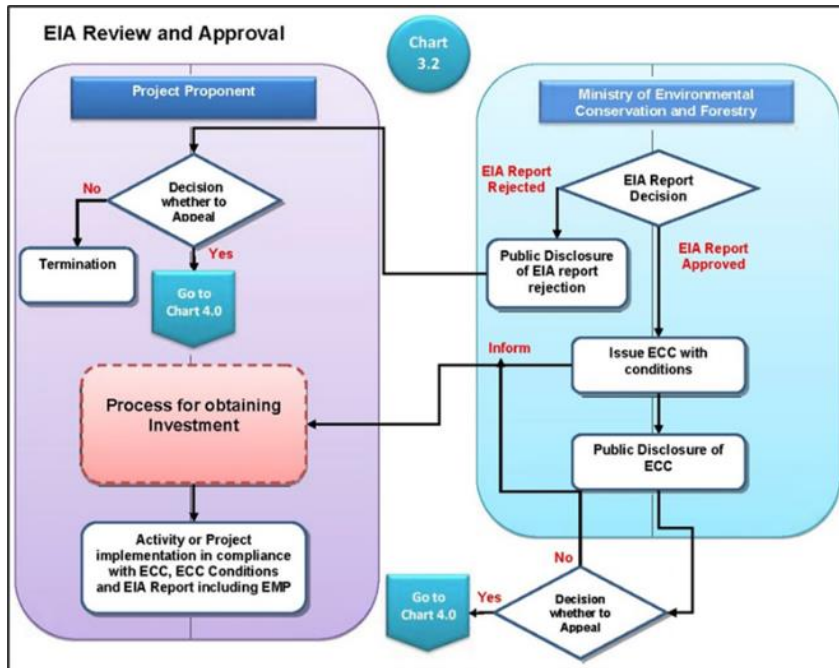
Source: EIA Procedure (2015)

Figure 2-1 EIA Process (Scoping)



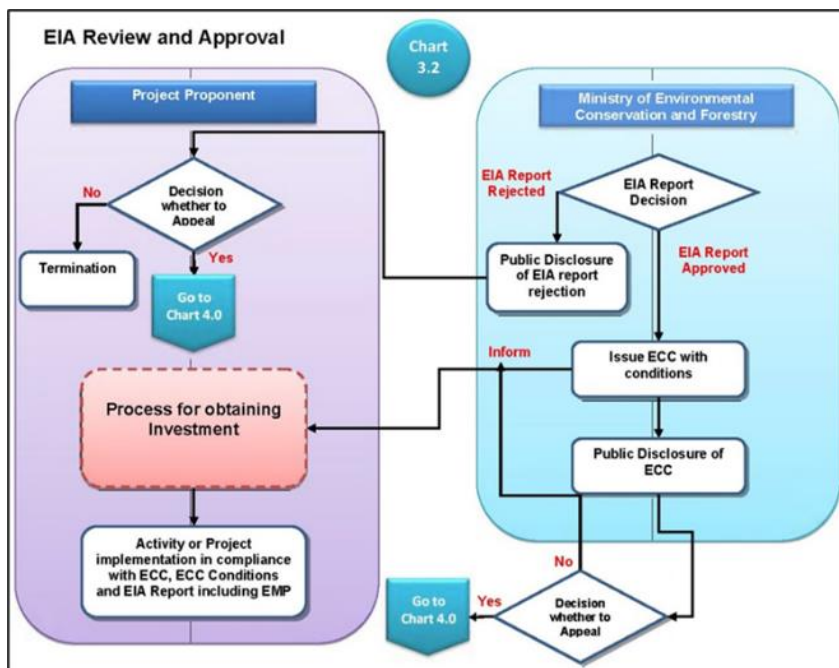
Source: EIA Procedure (2015)

Figure 2-2 EIA Process (EIA Investigation and Review)



Source: EIA Procedure (2015)

Figure 2-3 EIA Process (Review and Approval)



Source: EIA Procedure (Appeal)

Figure 2-4 EIA Process (Appeal)

2.3.4. National Environmental Policy (2019)

National Environmental Policy of Myanmar was enacted by the Republic of the Union of Myanmar in 2019. This policy was described in section 8 as implementing the national environmental policy in which The Government of the Republic of the Union of Myanmar is committed to putting this National Environmental Policy into action through a Strategic Framework and a series of master plans. The Strategic Framework applies the National Environmental Policy principles to priority thematic areas and sectors. It also provides environmental governance requirements for effective implementation, including

institutional strengthening, monitoring and enforcement, public participation, dispute resolution and financing. The Strategic Framework provides guidance for preparing master plans for States and Regions and for the priority thematic areas and sectors. The master plans will contain specific activities, timeframes, budgets and performance targets for achieving the Strategic Framework objectives and, ultimately, the National Environmental Policy vision. The linkages between the National Environmental Policy, Strategic Framework and Master Plans are depicted in the following diagram:



Figure 2-5 National Environmental Policy of Myanmar (2019)

2.4. POLLUTION CONTROL AND HEALTH

2.4.1. National Environmental Quality (Emission) Guidelines (No. 615/2015) (2015 Dec, 29)

The objectives of the guidelines are to provide the basis for regulation and control of noise and vibration, air emissions and effluent discharges from various sources in order to prevent pollution for purpose of protection of human health and ecosystem.

2.4.1.1. Guidelines application to the project

The project environmental management plan during construction and operation needs to comply with Myanmar National Environmental Quality (Emission) Guidelines (2015) and the others as appropriate. Guidelines for parameters relevant to the Project are shown in Table 2-3 to Table 2-4 as follows:

Table 2-3 National Guidelines on Noise Level

Receptor	One Hour LAeq (dBA) ^a	
	Daytime 07:00-22:00 (10:00-22:00 for Public holidays)	Night time 22:00-07:00 (22:00-10:00 for Public holidays)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

^a Equivalent continuous sound level in decibels

Table 2-4 National Guidelines for (Wastewater, Storm Water Runoff, Effluent and Sanitary Discharges (General Application))¹ Operation phase

Parameter	Unit	Guideline Value ^a
5-day Biochemical oxygen demand	mg/l	50
Ammonia	mg/l	10
Arsenic	mg /l	0.1
Cadmium	mg/l	0.1
Chemical oxygen demand	mg/l	250
Chlorine (total residual)	mg/l	0.2
Chromium (hexavalent)	mg/l	0.1
Chromium (total)	mg/l	0.5
Copper	mg/l	0.5
Cyanide (free)	mg/l	0.1
Cyanide (total)	mg/l	1
Fluoride	mg/l	20
Heavy metals (total)	mg/l	10
Iron	mg/l	3.5
Lead	mg/l	0.1
Mercury	mg/l	0.01
Nickel	mg/l	0.5
Oil and grease	mg/l	10
pH	S.U. ^a	6-9

¹ Pollution prevention and abatement handbook (1998). Toward cleaner production. World Bank Group in collaboration with United Nations Environment Programme and the United Nations Industrial Development Organization.

Parameter	Unit	Guideline Value ^a
Phenols	mg/l	0.5
Selenium	mg/l	0.1
Silver	mg/l	0.5
Sulphide	mg/l	1
Temperature increase	mg/l	<3 ^b
Total coliform bacteria	mg/l	400
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50
Zinc	mg/l	2

a Standard Unit

b At the edge of scientifically established mixing zone, which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity; when the zone is not defined, use 100 meters from the point of discharge

Table 2-5 National Environmental Quality (Air Emission) 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 PM ₁₀ ^a	1-year	20
	24-hour	50
Particulate matter PM _{2.5} ^b	1-year	10
	24-hour	25
Sulphur dioxide	24-hour	20
	10-minute	500

a Particulate matter 10 micrometers or less in diameter

b Particulate matter 2.5 micrometers or less in diameter

2.4.2. National Drinking Water Quality Standards (2019)

Myanmar National Drinking Water Quality Standards (NDWQS, 2019) is the standards for drinking water quality in Myanmar and ECD requires comparing the tested water quality results against the standard values. For this project, it is considered necessary to be applied both surface water and underground water. The standards values that described in NDWQS (2019) are shown in Table 2-6.

Table 2-6 National Drinking Water Quality Standards

Parameters	Unit	Standard Values*	WHO Guideline Values ²
Total Coliforms	Acceptable/No Objectionable	3	None specified (recommended median value – 0 per 100 ml)
Faecal Coliforms	Acceptable/No Objectionable	0	Must not be detectable in any 100 ml sample (recommended median value – 0 per 100 ml)
Taste	acceptable/no objectionable taste		Non set (recommended median value –3 DN)
Odor	acceptable/no objectionable odor		Non set (recommended median value –3 DN)
Color	True Color Unit (TCU)	15	None set (recommended median value – 15)
Turbidity	Nephelometric Turbidity Unit (NTU)	5	Non set (recommended median value – 5)
Arsenic	mg/L	0.05	0.01 mg/l
Lead	mg/L	0.01	0.01 mg/l
Nitrate	mg/L	50	50 mg/l
Manganese	mg/L	0.4	0.4 mg/l
Chloride	mg/L	250	Non set (recommended median value-250)
Hardness	mg/L as CaCO ₃	500	Non set (recommended median value-500)
Iron	mg/L	1	None set (recommended median value- 0.3)
pH	-	6.5 to 8.5	None set (recommended median value- 6.5 - 8.5)
Sulphate	mg/L	250	None set (recommended median value-250)
Total Dissolved Solids (TDS)	mg/L	1,000	None set (recommended median value-1,000)

Source: *NDWQS (2019)

² World Health Organization (WHO), 2018. A Global Overview of National Regulations and standards for Drinking-Water Quality

2.4.3. Public Health Law (1972)

This law was enacted by the Myanmar State and Revolution Council with the notification number 1/1972. Chapter 2, In Section 3 of the law describes about the protection of public health. There are six Sections under Chapter 2. Those Sections describe that the government was working to improve the public health, to protect the public health and the following devices to perform for advices, inspection, supervision, repair, prohibition.

- environmental Health Services
- about the sell and produced food of the people
- about the usage of household and cosmetic products
- about the infectious diseases
- about the private hospital
- about the usage of medicine for the people

In Section 5, organizations formed under this law, those assigned by these groups, government departments and subordinate agencies assigned under this law, issues related to environmental health, food issues, matters relating to home appliances and cosmetics for the general public, issues related to infectious diseases, matters related to private clinic. For matters relating to medicines used by the working people, factories, business departments, shops, the fronts of the building have the right to inspect and instruct the buildings at any time.

2.4.4. The Prevention and Control of Communicable Diseases Law (1995)

This law was enacted by the State Law and Order Restoration Council with the notification no. 1/95 on 20th March 1995. The main purpose of this law is to prevent the outbreak of Communicable Diseases. The Department of Health shall implement the following project activities in Section 3:

- (a) immunization of children by injection or orally;
- (b) immunization of those who have attained majority, by injection or orally, when necessary;
- (c) carrying out health educative activities relating to Communicable Disease.

In Section 4, it is stated that when a Principal Epidemic Disease or a Notifiable Disease occurs:

- immunization and other necessary measures shall be undertaken by the Department of Health, in order to control the spread thereof;
- the public shall abide by the measures undertaken by the Department of Health under sub-Section (a).

In Section 9, the head of the household or a member of the household should immediately report any of the following to the nearest health center or hospital:

- (a) rat fall;
- (b) outbreaks appear to be exacerbated during pregnancy and in children.

- (c) outbreak of a communicable disease.

Moreover, according to Section 11, in order to prevent and control the spread of a Principal Epidemic Disease, the Health Officer may undertake the following measures:

- (a) investigation of a patient or any other person required;
- (b) medical examination;
- (c) causing laboratory investigation of stool, urine, sputum and blood samples to be carried out;
- (d) causing investigation by injection to be carried out; and
- (e) carrying out other necessary investigations.

2.4.5. The Control of Smoking and Consumption of Tobacco Product (2006)

This law was enacted by the State Peace and Development Council Law with the notification No. 5/2006 on 4th May 2006. Section 9 states that, "The person-in-charge shall:

- (a) keep the caption and mark referring that it is a non-smoking area at the place mentioned in Section 6 in accordance with the stipulations;
- (b) arrange the specific place where smoking is allowed as mentioned in Section 7 and keep the caption and mark also referring that it is a specific place where smoking is allowed, in accordance with the stipulations;
- (c) supervise and carry out measures so that no one shall smoke at the non-smoking area; and;
- (d) accept inspection when the supervisory body comes to the place for which he is responsible

2.4.6. Occupational Safety and Health Law (2019)

This law was enacted by Pyidaungsu Hluttaw with the notification No. 8/2019 in the Union of Myanmar on 15th March 2019. The objectives of occupational health and safety law are:

In Section 12. (a) In accordance with the stipulations of the Ministry, the person in charge of occupational safety and health shall be appointed to closely monitor the safety and health of the workers according to the type of work. (b) the same number of employers according to the type of business in the business not less than the number of workers prescribed by the Ministry to make the workplace safe and healthy; Each occupational safety and health committee, consisting of workers' representatives, shall be formed in accordance with the provisions of the Ministry. This should take into account the occupational safety and health of women due to the nature of the workplace.

In Section 14. This law provides for occupational safety and health to ensure a safe and healthy workplace. Rules and regulations issued under this law; Order Instructions Procedures must be followed.

In Section 16. Inspection officers shall inspect the safety and health conditions of the workplaces related to this Law and instruct the relevant employer to follow the instructions and report to the Chief Inspector.

In Section 17. In accordance with the Code of Conduct, inspectors have the authority to conduct the following actions for occupational safety and health:

- (a) showing any identification card of the Inspector General of any workplace related to this Law and entering at any time without a warrant; The right to inspect and inquire;
- (b) workplace and process records; Documents Access to evidence; Copying rights; If necessary, the right to keep as evidence;
- (c) working conditions that may endanger occupational safety and health; Access to photos and video of the process;
- (d) noise; light, heat, cold, particles. The right to assess the amount and time of exposure to fumes and hazardous materials in the work environment with the assistance of an expert in the relevant field; Access to records;
- (e) the right to inquire during the working hours of any person working in the workplace with the assistance of a recognized doctor in connection with the occurrence or availability of occupational diseases;
- (f) due to work injury; Medical information about a worker receiving medical treatment or death due to occupational disease; To submit the information requested by the Department in the prescribed form from the report of the autopsy with the specified security level. Right to request from the person in charge of the clinics.

In Section 18. Inspection officers are required to report any injuries to the workplace for any of the following reasons: Occupational diseases; Dangerous event; An order to suspend the entire or part of the work site shall be issued to the employer with the approval of the Chief Inspector and if necessary, the relevant departments shall be notified:

- (a) due to unsafe working conditions, whether the workers are working safely or not. Due to the presence of hazardous materials and hazardous equipment in the workplace; Workplace, it is not appropriate to continue the work due to the placement of the machine part or the equipment.
- (b) should not continue to operate due to violation or non-compliance with any provision of this Law;
- (c) due to the actions of another person; Due to failure to act; whether due to negligence or not. It can be dangerous for those who work in the workplace due to carelessness.
- (d) the need to evacuate workers for safety reasons due to the imminent risk of occupational injury.
- (e) In Section 26.
- (f) workplace Procedures and risk assessments of the equipment and equipment used in them shall be made as necessary.
- (g) work environment needs to be measured and evaluated as necessary.
- (h) arrange for the workers to be examined by a certified physician in accordance with the requirements for occupational diseases.
- (i) sub-section (a); Based on the findings under (b) and (c), arrangements shall be made to ensure that the workplace is safe and healthy.

- (j) appropriate personal protective clothing prescribed by the Department for the workers; Provide adequate supplies and equipment free of charge.
- (k) preventive measures and measures to be taken in case of emergency.
- (l) having clinics in the business not less than the number of workers prescribed by the Ministry; Appointing registered doctors and nurses; Provide necessary medicine and supplies.
- (m) managers of the relevant type of business or department, including himself; Workers Members of the Occupational Safety and Health Committee shall attend safety and health training prescribed by the Ministry.
- (n) arrangements should be made as soon as possible to report any incident to the Occupational Safety and Health Officer or Manager if an employee encounters an occupational injury or life-threatening situation.
- (o) equipment used in the workplace or process; Care must be taken to ensure the safety and health of those in the workplace due to equipment or waste.
- (p) terminating the process immediately in the event of an imminent situation of workplace injury; relocate workers and make necessary life saving and rescue arrangements. Where possible, workers may be relocated to other suitable safe workplaces.
- (q) occupational safety and health directives; Danger warning signs; Milk Posters and directional signs must be posted in accordance with the regulations.
- (r) arrangements shall be made to comply with the advance warnings when entering or leaving the restricted work area, which may cause danger.
- (s) knowledge; technology, disseminate or disseminate the Occupational Safety and Health Handbook and Guidelines issued by the relevant Ministries for the acquisition of skills to workers as well as those related to the workplace
- (t) rehearsing a fire safety plan; Training on proper use of firefighting equipment.
- (u) the Chief Inspector and the inspection officers entered the work site; inquiry Documents Requesting evidence or confiscation of evidence must be permitted.
- (v) if he is employed in hazardous work and work place, he shall be allowed to work only within the specified working hours.
- (w) Be responsible for occupational safety and health costs.

In Section 27. An employer may not dismiss or demote an employee for any of the following reasons:

- (a) medical examination record of the registered doctor for injuries in the workplace; Prior to obtaining a medical record from a physician recognized for occupational disease;
- (b) complaining about a case that is unsafe or dangerous to health;
- (c) carrying out the duties of the Occupational Safety and Health Committee;
- (d) failure to continue working in situations where there is a risk of occupational injury or occupational disease.
- (e) In Section 34. The employer is responsible for the following matters:
- (f) occupational injury; Dangerous event; In case of serious work injury, the

Department shall be notified.

2.4.7. Myanmar Fire Brigade Law (17th March, 2015)

Myanmar fire brigade law was enacted by the Pyidaungsu Hluttaw on 17th March 2015. According to section 25, any factory, industry, bus stop, airport, port, hotels, motels, guest houses, high rise mixed used buildings, markets, offices, organizations, concerning fire risk owners or management person in accordance with fire department guidance :-

- (d) No one can default to compose reserved fire force.
- (e) No one can absence to place fire safety equipment.

2.5. BIODIVERSITY AND RESOURCE CONSERVATION

2.5.1. Conservation of Biodiversity and Natural Protected Area Law (2018)

This law designates national parks and other protected areas to be Scientific Reserve, National Park Marine National Park, Nature Reserve, Wildlife Sanctuary, Geophysically Significant Reserve, or Other Nature Reserve designated by the Minister. In Section 29, the Director General, with the approval of the Ministry:

- (a) the license shall be issued in accordance with the prescribed requirements and in accordance with the prescribed requirements in relation to the application for a zoo or botanical garden business license.
- (b) the business license may be revoked or revoked for a limited period if the business license holder violates the terms and conditions.

In Section 35. The Administrator shall be in charge of the conservation area or an administrative order may impose a fine of not less than 30,000 kyats to a maximum of 100,000 kyats on the perpetrator of any of the following acts, either in a zoo or botanical park run or managed by the government:

- (a) entering a place which is strictly prohibited;
- (b) making a film or video for commercial purposes without permission;
- (c) extracting a natural plant or a cultivated plant; Collect or destroy in any way.

In Section 39. (d) soil mass within the nature reserve; water body, deliberately polluting the air; Damage to water currents or water poisoning; Passing electricity and using chemicals or explosives;

2.5.2. The Law Relating to Aquaculture (7th September, 1989)

This law was enacted in the state law and order restoration council law notification number 24/89 on 7th September, 1989. The law was described in section 19 (b):

1. Obstructing navigation and flowing of water or pollution the water within the fisheries waters or abetting such acts.

2.5.3. Conservation of Water Resources and River Law (2006)

This law was enacted on 2nd October 2006 then amended in 2017 with Pyidaungsu Hluttaw Law No.11. Section 8 states that no person shall carry out any act or channel shifting with the aim to ruin the water resources and rivers and creeks.

Section 11 states that no person shall:

- (a) dispose of engine oil, chemical, poisonous material and other materials, which may cause environmental damage, or dispose of explosives from the bank or from a vessel, which is plying, vessel, which has berthed, anchored, stranded or sunk.
- (b) catch aquatic creatures within river-creek boundary, bank boundary or waterfront boundary with poisonous materials or explosives.
- (c) dispose of disposal soil and other materials from panning for gold, gold mineral dredging or resource production in the river and creek, into the river and creek or into the water outlet gully, which can flow into the river and creek.

Section 19 states that no one shall dispose of any substance into the river-creek that may cause damage to waterway or change of watercourse from the bank or vessel, which is plying, vessel which has berthed, anchored, stranded or sunk. Section 21 (b) states that no one shall: drill well or pond or dig earth without the permission of the Directorate.

Moreover, Section 22 states that no one shall, without the permission of the directorate, pile sand, shingle and other heavy materials for business purposes in the bank area and waterfront area. Section 24 (b) states that no one shall violate the conditions prescribed by the Directorate so as not to cause water pollution and change of watercourse in rivers and creeks.

2.5.4. Conservation of Water Resources and River Rules (2013)

Ministry of Transportation enacted Conservation of Water Resources and River Rules on 27th January 2013. The project proponent must, in accordance with the Rules:

- (a) construct the toilets far away from the river bank and sewage discharge to septic tank, under sub-rule (c) of rule 8;
- (b) avoid discharging sewage, engine oil, chemical, poisonous material, hazardous materials and other materials which may cause water pollution, under sub-rule (d) of rule 8; and
- (c) pay to prevent water pollution and to conserve the environment if water pollution and environmental impact is generated as a result of the project, under rule 9.

2.5.5. Underground Water Act (1930)

This law was enacted in Burma act notification number IV on 21st June 1930. Section 3 of the law states that no person shall sink a tube for the purpose of obtaining underground water except under and in accordance with the terms of a license granted by the water officers.

Every person owning a tube which was in existence before the extension of this act to the local area concerned shall apply to the water officer for a license for the said tube and such license shall be granted free of charge.

In Section 6, the governor may make rules:

- (a) Prescribing the conditions subject to which licenses may be granted by the water officer under Section 3;
- (b) Prescribing the form of and the procedure for granting such licenses and the fees payable for the issue thereof;
- (c) Prescribing the information to be supplied to the water officer under Section 5.

2.5.6. Forest Law (1992)

Ministry of Environmental Conservation and Forestry implements this Law on 3rd November 1992. According to the section 12, whoever, within a forest covered land at the disposal Government:

- (a) is desirous of carrying out any development work or economic scheme shall obtain the prior approval of the Forestry Ministry;
- (b) is desirous of carrying out educational or research work or conducting a training course or a study tour shall obtain the prior sanction of the Director-General or the Forest Officer empowered by him.

2.6. LAND ACQUISITION

2.6.1. Land Acquisition, Resettlement and Rehabilitation Law (24th August, 2019)

This law was enacted in Pyidaungsu Hluttaw notification number 24 at August 24th, 2019. According to section 1 (a); this law shall be called the land acquisition, resettlement and rehabilitation.

According to section 2, land is required for public purpose such as;

- (a) land required for national defense and security matters;
- (b) projects to be carried out for the development of the country in accordance with the national economic policy;
- (c) socioeconomic development projects as set out in the National Planning Law;
- (d) projects for the improvement of urban areas and villages, and infrastructure development projects;
- (e) rehabilitation and resettlement matters; and
- (f) acquisition of land in accordance with any existing law except compensation and damage for reclamation of vacant, fellow and virgin land in accordance with the Vacant, Fellow and Virgin Land Law, or acquisition of land in accordance with the Farm Land Law.

According to section 3 (s); resettlement means an arrangement to provide residential buildings and infrastructure to the Landowner relocated from the acquired land in accordance with any entitled rights voluntarily chosen to enjoy by Landowner and with the negotiated agreement with the department or organisation proposed to acquire the land.

According to section 3 (t); rehabilitation includes arrangements to restore socio-economic life of people whose interest has been negatively affected by the land acquisition through the provision of job opportunities, livelihood activities, transitional expenses and social support, in accordance with any entitled rights voluntarily chosen to enjoy by a Landowner in line with provisions contained in Chapter VII of this Law and with the

negotiated agreement with the Department or Organization that Proposes for Land Acquisition.

2.6.2. Myanmar National Land Use Policy (2016)

In Section 6, the objective of the National Land Use Policy are as follows:

- (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 right 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, participatory decision making, responsible investment 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.

In Section 7, the guiding principles of the national land use policy are as follows:

- (a) to enhance sustainable land use in development and implementation of policies and legal framework related to land and natural resource management;
- (b) to ensure transparency, responsibility and accountability in land and natural resource governance;
- (c) to promote people's participation and collaboration particularly ethnic nationalities, women and smallholder farmers in decision making related to land and natural resource management;
- (d) to recognize and protect private and communal property rights of citizens as included in the constitution;
- (e) to make effort promoting appropriate international good practices in land and natural resource governance.

In Section 8, the basic principles of the National Land Use Policy are as follows:

- (a) to legally recognize and protect legitimate land tenure rights of people, as recognized by the local community, with particular attention to vulnerable groups such as smallholder farmers, the poor, ethnic nationalities and women;
- (b) to strengthen rule of law and good governance, including simplifying procedures, ensuring transparency, and increasing accountability and responsibility;
- (c) to promote effective land information management, including easy public access to information;
- (d) to adopt international best practices such as voluntary guidelines on the responsible governance of tenure of land, fisheries and forests in the context of national food security and human rights standards;

- (e) to promote inclusive public participation and consultation in decision making processes related to land use and land resource management;
- (f) to promote effective market based solutions, such as formal recognition of land tenure rights or use of new tax mechanisms, to address land management issues such as discouraging land speculation;
- (g) to review and revise the National Land Use Policy to meet changing socioeconomic needs to the country as necessary;
- (h) to develop and implement fair procedures relating to land acquisition, compensation, relocation, rehabilitation, restitution, and reclaiming land tenure and housing rights of internal displaced persons and returning refugees caused by civil war, land confiscation, natural disasters and other causes;
- (i) to ensure easy access to judicial review or other dispute resolution mechanisms that are independent, fair, transparent and affordable;
- (j) to prioritize the interest of public citizens over private companies in land use decision making;
- (k) to ensure equal opportunities for men and women over land resources, tenure rights and participatory decision making;
- (l) to permit freedom of crop selection and adoption of cultivation technologies in a way that will not negatively affect the environment;
- (m) to develop law and procedures for addressing the issues of landlessness and affordable housing;
- (n) to decentralize decision making related to land;
- (o) to strictly and transparently enforce contracts related to land in compliance to the law;
- (p) to address the impacts of climate change and natural disasters.

In Section 37, when land acquisition is done for social and economic development, sustainable land use for the future generations shall be taken into consideration.

In Section 38, when managing the relocation, compensation, rehabilitation and restitution related activities that result from land acquisition and allocation, unfair land confiscation or displacement due to the civil war, clear international best practices and human rights standards shall be applied, and participation by township, ward or village tract level stakeholders, civil society, representatives of ethnic nationalities and experts shall be ensured.

In Section 42, the following shall be carried out when resolving land disputes:

- (a) arranging the establishment of special courts that will hear special cases related to land law with specially trained judges and law officers if necessary;
- (b) establishing independent monitoring bodies with participation of all stakeholders and appointing monitors that have no direct interest, to observe settlement of land disputes;
- (c) determining the processes to settle land disputes between businessmen and farmers, or through independent arbitration;
- (d) establishing an independent tripartite arbitration processes to settle land disputes, comprised of Government departments, organizations, farmers and private sectors;

- (e) establishing accurate and clear procedural processes in relevant departments and organizations to improve easy access to, and use of, independent arbitration tribunals, courts and other dispute resolution mechanisms by farmers and other land users in accordance with existing laws.

2.6.3. State-Owned Land Leasing Of Buildings; Instruction to Be Followed In Transfers and Joint Ventures (Instruction No.3/2018)

In Section 3, State-owned land Law as buildings; ownership changes in accordance with the rules, but due to the weakness of the various departments to transfer the property name; despite the official notification from the relevant department, due to various reasons, the remaining weaknesses in the name of Myanmar citizen or foreigner registered before Myanmar independence were found in the township land registry.

In Section 4, State-owned land Leasing of buildings by contracting between the Public-Private Partnership (PPP) and Privatization of Government Buildings; Build-Operate Transfer-BOT In the case of Joint Venture (JV) and Joint Venture, for the long-term mutual benefit of both the State and relevant departments as well as the private investors to operate. Union level organizations to develop the original production / service of the relevant Ministry; Union Ministries; Region or State level organizations shall perform the following activities:

- (a) state owned land; the buildings are owned by the Ministry. Ownership records that belong to a government department or organization; State Records; related cases for compensation must be systematically maintained after submitting to the Union Government.
- (b) land Building Apartment Shop Living room Factory Whether the workshop and warehouse are state-owned; Ministry to be operated; Government departments and organizations shall be responsible for ensuring that the owner has the right to sign and lease.
- (c) the Ministry in carrying out activities on state-owned lands; Government Department Priority should be given to activities related to the original business development of the organization.
- (d) feasibility study shall be conducted according to the type of work to be carried out and the feasibility must be calculated. In conducting such analysis, Union level organizations; Union Ministries, the potential outcomes for the region or state level organizations and the potential outcomes for the investors; Job opportunities and benefits must be fully described. Once the business is licensed, the social and environmental impact assessments that may be caused by the work to be carried out shall be carried out in accordance with the assessments obtained.
- (e) directive No. 30-11-2018 of the President's Office dated 30-11-2018 if the private businesspersons submit the project proposal submitted by the government without invitation. Must be done in accordance with 2/2018.
- (f) relevant existing laws in drafting the contract to be signed; In addition to the rules and regulations, the Notification No. dated 1-6-2018 of the President's Office; must be complied with in accordance with 41/2018.
- (g) state-owned land in determining the rent; the fixed price of the area where the buildings are located shall be determined. If it is a priority business to develop

- the investment of the State and to support the economy of the State, the rent may be considered at a fixed price.
- (h) in determining the lease term of the contract, the lease period may be set up to five years by the decision of the relevant Ministry Management Committee meeting for the remaining lease matters except for those who wish to lease for more than five years for the benefit of the State and the State.
 - (i) in case of long-term lease for more than five years, the details of the lease shall be calculated and submitted to the President's Office with detailed calculation and opinion, together with the economic and financial analysis, including the estimated investment period.
 - (j) if there is a building (warehouse) on state-owned land, the cost of that part shall be taken into account in calculating the rent.
 - (k) the investor, person, organization, or company shall pay the stamp duty and trade due to the registration in accordance with the law and the stamp duty and trade in accordance with the existing stamp duty law.
 - (l) the sub-lender or investor in the contract shall transfer to any other person; Leasing No joint venture. If there is a reason to make a sub-lease in relation to long-term investment matters, the Deed of Assignment Agreement (draft) shall be submitted to the President's Office with the opinion of the relevant Ministry together with sufficient reason as to the reason for the re-transfer.
 - (m) in the case of a large project with a large amount of investment and foreign currency and technical expertise, which may be of great benefit to the State, the relevant department / organization shall submit to the Union Government through the Economic Committee in accordance with the procedures and obtain the agreement.
 - (n) three months before the expiration of the lease term, if the relevant department is satisfied that the implementation of the lessee's business is in accordance with the original objectives of the contract; In case of long-term lease for more than five years, whether the tenant wants to renew one year before the end of the contract period or not. You must ask in writing. If the relevant department does not wish to renew, the lessee shall be notified in writing in accordance with the above stipulations.
 - (o) changing the shape of the building during the lease period. Reorganization; Expansion; In case of reduction, it must be submitted to the President's Office together with the opinion of the relevant Ministry / Organization.
 - (p) if the investor is not able to carry out the investment business specified in the contract; The contract must state that if the leased land or building and the building are not used for any other purpose, the leased department / organization shall terminate the contract without permission and have the right to reclaim the leased land or building.
 - (q) if the relevant department / organization considers that it should be changed from the original business for the benefit of the State, it shall proceed in accordance with the Directive No. 1/2017 dated 10-4-2017 of the President's Office after obtaining permission to submit to the President's Office.

2.6.4. Farmland Law (2012)

The Farmland Law was enacted by the Pyidaungsu Hluttaw on 30th March 2012 with the Pyidaungsu Hluttaw Law No. 11/2012. Section (4) of Chapter (II) states that the person who has the right to use the farmland shall apply for the right to use the farmland to the Township, Department via the relevant ward or village tract Administrative Body of the Farmland in accord with the stipulations. According to Chapter (III), Section (9), the person who has the right to use the farmland shall have the following rights:

- (a) right to have the farmland in possession, right too use the farmland, right to enjoy the benefit arises from this right;
- (b) right to sell, mortgage, lease, exchange and gift on the whole or part of the right to use the farmland in accord with the stipulated terms and conditions.

2.6.5. Farmland Rules (2012)

The Farmland Rule was enacted by the Ministry of Agriculture, Livestock and Irrigation on 31st August 2012 with the Notification No. 2/2012. In accordance with Farmland Rules (2012), Township Farmland Management Committee shall calculate the amount of grievance and compensation to be given by the State or the Public. It also states that when farmlands are converted into different forms of land based on the interest of the State or Public, the State or Public needs to make compensation to the farmers without delay.

2.6.6. Vacant, Fallow and Virgin Land Management Law (2018)

In accordance with the Vacant, Fallow and Virgin Land Management Law (2018), the Central Committee shall make the following matters.

- (a) if the person who has the right to cultivate or utilize submits that he has suffered from the dispute, obstruction, trespass or mischief by local cultivators in implementing the business, coordinate with relevant departments or organizations first. If the coordination does not lead to a settlement, the matter shall be brought up to the Court in accord with the law.
- (b) if the land has previously been cultivated by local cultivators (i.e. local farmers) within the area of permitted vacant, fallow or virgin land, even if they do not have the legal rights to cultivate, negotiate or act by their own volition, their rights to cultivate will be respected.
- (c) if there are local cultivators (i.e. local farmer) who already had the right to cultivate on the permitted vacant, fallow and virgin lands, cause to continue to carry out according to law with bilateral agreement.
- (d) by the sub sections (a), (b) and (c), Central Committee shall make a decision to amend permission or to make suitable compensation based on the agreement of the both sides.

2.6.7. Registration of Deeds Law (2019)

This law was enacted in Pyidaungsu Hluttaw notification number 9 on 20th March 2019. Section 16 of the law states that the following deeds are defined as documents for which registration is compulsory according to this law:

- (a) Deeds, which convey ownership of immovable property.
- (b) With regard to immovable property or attached items with a value of Ks 100,000 and above: their sale and [furthermore] non-testamentary documents that are made in order to create any right, title or interest by declaration, assignment, limitation, relinquishment or extinction; a judgment, decree or order made by a court with regard to the rights from such documents.
- (c) Mortgage deeds, with the exception of a mortgage by deposit of title deeds, with a value of Ks. 100,000 and above signed by the mortgagor and certified as correct by at least two witnesses; deeds that extinguish the mortgage.
- (d) Lease agreements for immovable property from year to year, or for any term exceeding one year, or reserving a yearly rent.
- (e) Deeds in which companies or organizations mortgage, transfer or convey by other means full or partial ownership of, or an interest in, immovable property to a trustee.
- (f) Kitimat adoption deeds.
- (g) Deeds specified by the Union government from time to time.

According to section 18; deeds that are submitted for registration at the Registration of Deeds Office-

- (a) Shall be written in the Myanmar language.
- (b) A translation signed by a notary public must be submitted if the deeds are not in the Myanmar language.
- (c) Shall be written and signed (as opposed to: initiated) by the parties.

Any amendment, addition, omission or deletion have been made to any contents of the deeds shall be signed or initiated by the parties.

2.6.8. The Boundaries Law (2019)

This law was enacted in Pyidaungsu Hluttaw notification number 11 on 25th March 2019. This law shall be called the boundaries law and be affected from the date of order by President of Republic of the Union of Myanmar. Aims of the law are described below.

- (a) To be carried out boundary survey, specify amendment of paddy field, plot, village, village tract, town, township, district, autonomy region, state and division of Myanmar.
- (b) To maintain and protect of survey post or boundary post from damage or change.
- (c) To amend survey post or boundary post which damage by weather, disaster or any other causes.

2.7. URBAN DEVELOPMENT AND MANAGEMENT

2.7.1. Yangon City Development Committee Law (28th June, 2018)

This law was enacted by the Yangon Parliament with the notification number 5/2018 in 28th June 2018. This law was directed in section 24 (a) in which subsection (8) the committee is responsible for inspection, allowance and sued in line with law when building. According to section 65 (d), the committee must work not to effect the health and cleaned on the public due to on the water flowing on the ground from the factory, industry, building, respected roads and effects on other materials and to maintain and prepare for good flow in the water way, pipe, drain etc.

According to section 65,

(a) construction of buildings necessary for municipal activities; preparation and maintenance; cancellation inspection and supervision.

(c) Construction of buildings; In making the preparation, the sewers are connected to the main sewer belonging to the committee in accordance with the specifications.

(d) factory; workshop To ensure that the public's health and hygiene are not affected by the water flowing from the building and the ground. Gutters to prevent damage to relevant roads and other properties and to improve water flow. drainage pipe to make or repair water drains, etc.;

2.7.2. The Electricity Law (2014)

This law was enacted by the Pyidaungsu Hluttaw with the notification No. 44 on 27th October 2014. There are 16 chapters included in this law. According to the chapter 2 – section 3, the objectives of the law are described below.

- (a) To achieve further development in the electric power sector, to meet the State electric power demand and to supervise the electrical businesses by managing the electrical matters systematically in line with the Union Government policies;
- (b) To encourage the production and distribution of large scale electric power that has the right to be managed by the Union in addition the production and distribution of both small and medium scale electric power in Regions and States;
- (c) To enable to use electric power safely and broadly;
- (d) To carry out the electrical business in accordance with the specified standards;
- (e) To encourage the local and foreign investment in the electrical business;
- (f) To enact fair, transparent and appropriate rules and regulations in order to prescribe the rates of electric power fee which are consistent with current times;
- (g) To have the right to use the electric power which has the standardized voltage, current, and frequency by the users of electric power and to protect from causing damages to the electrical equipment of users due to the electric power which is not consistent with standardization;
- (h) To adhere in accord with the international environmental protection treaties which Myanmar has ratified.

In addition to, the prohibitions of law are described in Chapter 12- Section 44 to 53 as the following:

- ❖ Section 44 states that no person shall operate the electrical business without permit.
- ❖ Section 45 states that no permit holder shall operate any other electrical business except the business contained in the permit.
- ❖ Section 46 states that no person shall operate the electrical installation and repair without obtaining the electrical professional certificate.
- ❖ Section 47 states that no person shall operate the generation, transmission, connection of electric power without obtaining the electrical safety certificate.
- ❖ Section 48 states that no person shall operate the importing, manufacturing in the country, exporting, distributing and selling of the electrical equipment which are not consistent with the prescribed norm and standard.
- ❖ Section 49 states that no permit holder shall operate the electrical business in collaboration with any other entity without the approval of the relevant department and organization.
- ❖ Section 50 states that no permit holder shall sell, mortgage, lease, exchange or transfer by any other means the permit the whole or any part of the business contained in the permit without the approval of the relevant Government department or Government organization which has issued the permit.
- ❖ Section 51 states that no person shall operate the construction of building, planting of trees or other activities within the area of the electric line.
- ❖ Section 52 states that no person shall connect, waste, utilize the electric power without the permission of the permit holder.
- ❖ Section 53 states that no person shall divert the electric current, cut-off the electric power line, destroy any equipment being used in any electrical business.

2.7.3. The Small and Medium Enterprises Development Law (2015)

This law was enacted by the Pyidaungsu Hluttaw with the notification No. 23 on 9th April 2015. The objectives of this law are as follows:

- (a) To enable to accept the information related to business, technical assistance and financial aids for the small and medium enterprises;
- (b) To reach local and international markets and enhance the competitiveness of small and medium enterprises;
- (c) To have new employment opportunities and increase income of the people through the development of small and medium enterprises;
- (d) To reduce the difficulties and obstacles in business operations of small and medium enterprises.

In Chapter 3 of this law, the basic principles are described as follows:

- (a) Tendering necessary financial assistance, tendering legal advice and laying down the administrative policy in order to thrive small and medium enterprises and to reduce the difficulties of enterprise;

- (b) Undertaking necessary measures for small and medium enterprises in order to compete not only in the local market but also in the foreign markets with the international standardized quality products and services to increase the capacity of competitiveness, and to obtain market;
- (c) Encouraging small and medium enterprises for registration which are not yet registered in accord with the law;
- (d) Supporting the availability of information, technology and financial investment to new establishing or existing small and medium enterprises;
- (e) Ensuring small and medium enterprises to manage on the availability of resources with sustainable manner which has minimum impacts on natural and socio-economic environment;
- (f) Encouraging the small and medium entrepreneurs to produce innovative products, to develop services, to increase production capacity, to use appropriate advanced technology and facilities in production and distribution;
- (g) Encouraging the development of employment opportunities and human resources and managing the development of on-job trainings;
- (h) Promoting the cooperation of Government, private and international organizations for the development of small and medium enterprises;

2.7.4. The Telecommunications Law (2013)

This law was enacted by the Pyidaungsu Hluttaw with notification No.31 on 8th October 2013. This law shall be applied to: (a) any person, department and organization within the territory which includes the land, water and airspace of the Republic of the Union of Myanmar and (b) Myanmar citizens who are anywhere beyond the limits of the Republic of the Union of Myanmar. This law is composed of 19 chapters.

The objectives of the Telecommunications Law are described below.

- (a) To enable to support the modernization and development of the nation with telecommunications technology;
- (b) To enable to bring out Telecommunications Service that will be able to provide high quality and worth services to the users by allowing fair and transparent competitions from domestic and abroad in the telecommunications sectors which are developing;
- (c) To enable to give more opportunities to the general public to use Telecommunications Services by expanding the telecommunications network in the entire country along with the telecommunications technology which is developing;
- (d) To enable to protect the telecommunications service providers and users in accord with law;
- (e) To enable to supervise telecommunications service, network facilities and telecommunications equipment that require license for national peace and tranquility and for public security.

According to this law, the holder of a license must obey the law and rules, procedures, notifications, orders and directives issued under this law. Moreover, Section 65 states that whoever provides Telecommunications Services without a service license shall, on conviction, be punished with imprisonment for a term not exceeding five years and may be liable to a fine.

2.8. HUMAN RIGHTS

2.8.1. Protection of the Right of National Race Law (2015)

The purpose of the law is to disclose to residents that belong to one of the national ethnic groups about the project fully and to cooperate with them. In Section 5 of the law, it is stated that the purpose is to disclose all about the project fully to the residents who belong to one of the national races and to cooperate with the residents who are national races.

2.8.2. Rights of the Persons with Disabilities Law (2015)

This law aims to protect and respect the rights of persons with disabilities in Myanmar in a way that is recognized internationally under the UN Convention.

With regards to mobility and accessibility, Article 28 stipulates that the National Committee shall carry out negotiation and implementation for easy accessibility and mobility for persons with disabilities by cooperating with relevant Union Ministries, Municipal Committee (or Township Development Committee), States and Regional Governments, NGO and Private Organizations and entities which work on disability.

2.8.3. Child Rights Law (2019)

This law was enacted by Pyidaungsu Hluttaw with Notification No. 22 on July 23, 2019. It is applicable to all the people within the country who may be citizens or foreigners who hold the permanent resident and commit crime on board with nation flag.

2.9. CULTURAL HERITAGES

2.9.1. The Protection and Preservation of Cultural Heritage Region Law (2019)

This law was enacted by Pyidaungsu Hluttaw Notification No. 6/2019 on February 28, 2019. The purpose of the law is to ensure protection of cultural heritage and the cultural heritage area from damages caused by natural and man-made disasters.

Section 22 states that no person shall construct a building, which is not in conformity with the conditions prescribed region wise by the Ministry of Culture in the cultural heritage region.

2.9.2. The Protection and Preservation Ancient Object Law (22th July, 2015)

This law was enacted by the Pyidaungsu Hluttaw with the notification number 43/2015 in 22th July, 2015. This law was prescribed in section 12 in which "The person who found an object to owner or without maintained person that things may be known or assumed an ancient object must inform early to the respective ward administrators and / or village administrator."

2.9.3. The Protection and Preservation of Ancient Monument Law (26th August, 2015)

This law was enacted by the Pyidaungsu Hluttaw with the notification number 51/2015 in 26th August, 2015. According to section 12, the person who found the ancient buildings over 100 years on the ground or under the ground or on the water or under the water to the owner or without maintained person that buildings may be known or assumed

the ancient buildings must inform early to the respective ward administrator or village administrator. This law was described in section 15,

The person who made the following things in the regarded area of the ancient buildings should apply to the department in advance allowance;

- (a) Extension of villages, wards and towns.
- (b) The new building construction or extensions or preparation or fencing or annexes including hotels, factories, residential buildings.
- (c) Oil and gas, gem or digging for mineral exploration, connecting to oil and gas pipe line, connection to grid lines, construction of communication tower, road construction, bridge construction, airport construction, dam like the construction or extension of principle buildings.
- (d) Connection of electric line in the ground, connection to communication and other underground workings
- (e) Digging or extension of well, lake, channel, husbandry pond.
- (f) Surface damaging like gold bars, excavation, making bricks, digging of well, pond, creek, drain, chasm, valley, landfills, adjusting ground, mine explosion, mining, gravel, sand extraction, demolition of hill and mountain.
- (g) Fencing or installation of the private area or community.
- (h) Construction of unfix discipline building regarded by the ministry in each regionally near the ancient buildings and environmental view.

Section 20 (b) was directed that nobody should not do without prior permission letter in the ancient building or historical heritage building to regarded area assumed to damage the ancient building due to causing vibration by using heavy machines or vehicle traffic in the regarded area near the historical ancient buildings.

2.10. LABOUR

2.10.1. Labour Organization Law (11th October 2011)

This law was enacted by the Pyidaungsu Hluttaw with the notification number in 11th October 2011. This law was described in section 3 in which “every worker, who has attained the age prescribed in respective existing law to work in any trade or activity shall have the right to:

- (a) join as a member in a labour organization and to resign from a labour organization according to their own desire;
- (b) join as a member only in a labour organization formed according to the category of trade or activity relating to them.”

Moreover, section 18 was prescribed, “the labour organization has the right to demand the relevant employer to re-appoint a worker if such worker is dismissed by the employer and if there is cause to believe that the reasons of such dismissal were based on labour organization membership or activities, or were not in conformity with the labour laws.”

2.10.2. The Employment and Skill Development Law (2013)

This law was enacted by the Pyidaungsu Hluttaw Notification No. 29/2013 on August 30, 2013. The purpose of the law is to ensure the employer provides on-the-job trainings systematically and send employees to outside training, and to develop the employment skill of the workers.

Section 5 (a) (1) - The employer shall conclude an employment agreement within thirty days after appointing a worker to do any work. However, it does not concern with appointment of permanent staff at the Government department, Government organization;
(2) If the pre-orientation period and probation period are prescribed before the appointment, such trainee shall not concern with stipulation in sub-section (1).

- (b) The employment agreement shall include the followings:
- i. category of employment;
 - ii. period of probation;
 - iii. wage, salary;
 - iv. place of employment;
 - v. term of agreement;
 - vi. working hour;
 - vii. holiday, day-off and leave;
 - viii. over-time;
 - ix. messing arrangement during working hour;
 - x. accommodation;
 - xi. medical treatment;
 - xii. arrangement for ferry and travelling;
 - xiii. terms and conditions to be abided by the workers;
 - xiv. term of period agreed by the worker to continue to work after attending the training if the worker has to attend the training sent by the employer;
 - xv. resignation from work and termination of work;
 - xvi. termination of agreement;
 - xvii. obligation from work and termination of work;
 - xviii. termination of employment agreement by mutual consent of employer and worker;
 - xix. other matters;
 - xx. prescribing, amending and adding the terms and condition of the agreement;
 - xxi. miscellaneous.

- (c) workplace terms and conditions included in the employment agreement shall be in conformity with any existing law and benefits of the worker shall not be less than benefits contained in any existing law;
- (d) the Ministry shall issue notification to pay stipulated compensation to worker by the employer if the work is completed earlier than the period concluded in the employment agreement or if all or any part of the work is terminated due to unexpected cause or if a matter to terminate the work arises for any other cause;
- (e) the employment agreement concluded under sub-section (a) shall apply to daily wage earners and piece-workers temporarily at the Government organization;
- (f) the employer and the worker or workers may amend, by mutual agreement, conditions and benefits contained in the employment agreement as may be necessary in accord with the existing law;
- (g) the copy of employment agreement concluded between the employer and worker shall be sent to the relevant labour exchange office by the employer within the stipulated time and obtain approval;
- (h) the employment agreements concluded before coming into force of this Law shall be valid until the original term terminates.

Section 14 states that the employer shall carry out training programmers for increasing employment skill of the workers who are intended to appoint or who are working presently in his work in accord with the policy of the Skill Development Body according to the requirement of the work.

Section 30 (a) states that the employer of the industry and service shall pay money not less below 0.5% of salary, total wages paid to the level of worker supervisor and the workers below such level in such work monthly without fail as the contribution to the fund. (b) The contribution paid under sub-section (a) shall not be deducted from the wage or salary of the workers.

2.10.3. The Minimum Wage Law (22nd March, 2013)

This law was enacted by the Pyidaungsu Hluttaw with the notification number 7/2013 in 22nd March 2013. Section 12 was described in the duties of the employer in which

- (a) shall not pay wage to the worker less than the minimum wage stipulated under this Law;
- (b) may pay more than the minimum wage stipulated under this Law;
- (c) shall not have the right to deduct any other wage except the wage for which it has the right to deduct as stipulated in the notification issued under this Law;
- (d) shall pay the minimum wage to the workers working in the commercial, production and service business in cash. Moreover, if the specific benefits, interests or opportunities are to be paid, it may be paid in cash or partly in cash and partly in property, with prevailing regional price, jointly according to the desire of the worker;
- (e) in paying minimum wage to the workers, working in the agricultural and livestock business, some cash and some property at prevailing regional price may be paid jointly according to local custom or desire of the majority of workers or collective agreement. Such payment shall be for any personal use

and benefit of the worker and his family and the value shall be considerable and fair.

About the rights of the workers relating to the minimum wage, section 14 (a) was issued that “a worker working in any establishment relating to this law: has the right to obtain the minimum wage stipulated under this Law or, if the employer pay more than the said wage.

2.10.4. Payment of Wage Law (2016)

This law was prescribed by Pyidaungsu Hluttaw on January 25, 2016. The purpose of the law is to improve the way of payment and avoid delay in payment to the employees.

In Chapter (2) Section 3, the employer:

- (a) shall pay in local currency or foreign currency recognized by the Central Bank of Myanmar. This may be in cash, check or deposit into the bank account of Employee.
- (b) In paying such wages:
 - i. If it is necessary to pay particular benefit, profits and opportunities for workers working in commerce, production and service businesses, it may be paid in cash or some in cash and some in things set up by local price on own volition of workers in accordance with the stipulations;
 - ii. for workers employing in agriculture and livestock breeding business, it may be paid some wage in cash and something set up by local price according to custom, or on the volition of majority of worker or by collective agreement. In paying so, it shall be for personal use and the interest of his family, and shall be appropriate and equitable.
 - iii. according to the local price to those employees working in trade, manufacturing and service sectors.
- (c) If any worker is conscripted under the Public Military Service Law, the (60) days of wages shall be paid as a special right.

In Section 4 describes that an employer must pay for-

- (a) part-time, daily, weekly or other part-time job, temporary or piecework when the work is done or at the agreed time.
- (b) according to the Article (a), the period shall not exceed one month.
- (c) wages for the permanent work must pay per monthly basis.
- (d) must pay at the end of the payment period when there are not more than 100 workers.
- (e) if there are 100 workers and above, pay must not be administered later than 5 days after the end of the payment period.
- (f) upon termination, wages must be paid within 2 days from the date of termination.
- (g) if a resignation letter is submitted, wages must be paid at the ending day of the payment period.
- (h) if an employee dies, wages must be paid to the legally recognized heir within 2 working days after the day he/she has died.
- (i) all wages must be paid during the working day.

Section 5 states that the employer may be subject to unforeseen circumstances, including natural disasters. If it is difficult to pay in accordance with the provision of sub-section (c), it shall be submitted to the Department with good reason as to when the wages will be changed with the consent of the workers.

Section 14 states that the worker has the right to enjoy overtime wages stipulated by the law if he works over time

Chapter (3) Describe the followings;

In Section 7, the employer:

- (a) can deduct from the fee for the period of non-working time except for paid leave and public holidays according to the relevant law.
- (b) accommodation and transportation expenses arranged by the employer not included in the fee; food expenses; electricity price, water tax and income tax to be paid by the worker; wrong and overpayments can be deducted.
- (c) advance payment at the request of the worker; cash out; savings or legal contributions for workers can be deducted from wages.
- (d) may deduct from the employee's wages as decided by the court or the arbitral tribunal or the arbitral tribunal.

In Section 8, the employer shall not deduct for any purpose except deduction from wages in accordance with the provisions of section 7 and section 11.

In Section 9, the employer shall not deduct more than 50% of the total wages deducted from the wages, except for deductions for the employee's failure to perform his duties when deducted from wages under section 7.

In Section 10, the employer:

- (a) before the deduction from the fee shall be determined as a fine to be paid under section 11 and the deduction shall be obtained with the prior approval of the Department.
- (b) the permission in sub-section (a) shall be given to the relevant workshop; It should be posted in a public place in the office.
- (c) the deductible indemnity shall not exceed the value of the damage or loss due to the work or failure of the worker.
- (d) in deducting from the fee under section 11:
 - (1) the wage shall not be deducted from the work without giving the worker any right to settle.
 - (2) no more than 5% per month shall be deducted from the employee's monthly salary.
- (e) the fine shall not be deducted from the worker under 16 years of age as a fine.
- (f) the period for payment of the prescribed fine may be carried out in accordance with the agreement between the employer and the employee.
- (g) the deductible for loss of property shall be deducted within the prescribed period within the prescribed period by the negotiation agreement with the township mediation body formed by law.
- (h) the money deducted from the fee shall be recorded in the record and kept systematically.

- (i) the monthly report shall be submitted to the Department in respect of the amount deducted from the fee.
- (j) Section 11; The fines deducted under sub-section (b) shall be used for the benefit of the workers in consultation with the officially registered labor organization at the factory.

In Section 11, the employer may impose a penalty for compensation for the following actions or omissions of the employee:

- (a) deliberate negligence of the worker whether due to negligence or not, damage to property or money that the employer has explicitly entrusted to the care of the worker, whether due to dishonesty or misconduct, is a direct consequence of the employee's negligence and misconduct.
- (b) violation of any of the workplace conditions prescribed by a fine in the employment contract.

In Section 12, the worker:

- (a) in case of the following circumstances; by a legally registered labor organization; you can ask the employer to resolve the matter by the factory coordination committee:
 - i. Being deducted from the receivables without good cause;
 - ii. Failure to pay fees beyond the due date.
- (b) if the request is made under sub-section (a) but the employer does not resolve it, it may submit to the inspecting officer within six months from the date of deduction or failure to pay.

Section 13. (a) states that the inspecting officer shall comply with section 12; The submission under sub-section (b) may be scrutinized and, if necessary, the relevant persons may be examined and an appropriate order may be issued.

- (a) if the employer or employee is not satisfied with the order made under sub-section (a), he may appeal to the Chief Inspector within 30 days.
- (b) the Chief Inspector may examine the appeal under sub-section (b), hear the employer and the employee and make an appropriate order.
- (c) the order issued by the Chief Inspector is final

2.10.5. The Workmen's Compensation Act (2005)

The workmen's compensation act enacted in 1923 and amended in 11th May 2005. This act was described in subsection 2 of section 3, If a workman employed in any employment Involving the handling of wool, hair, bristles, or animal carcasses or parts of such carcasses, or in the loading, unloading or transport of any merchandise, or in any work in connection with animals infected with anthrax, contracts the disease of- anthrax, shall be described in schedule (III): List of occupational diseases. After sub-section (2), following shall be inserted as subsection (3), provided that the compensation shall be recoverable from the employer who last employed the worker during the said twelve months in the employment to the nature of which the disease was due.

2.10.6. The Settlement Labour Dispute Law (28th March, 2012)

This law was enacted by the Pyidaungsu Hlututaw with the notification number 5/2012 in 28th March 2012. This law was described in section 23, "A party, employer or worker, may complain individual dispute relating to his grievance to the Conciliation Body and if he is not satisfied with the conciliation of such body in accord with stipulated manners, may apply to the competent court in person or by the legal representative." According to section 38 and 42, it was prohibited in which:

38. No employer shall fail to negotiate and coordinate in respect of the complaint within the prescribed period without sufficient cause.

42. No person shall prohibit the right to work independently of the workers who are not desirous to participate in the strike nor impede the right of a worker to strike.

2.10.7. The Leave and Holiday Act, 1951 (Law Amended July, 2014)

The Leave and Holidays Act was firstly adopted on 1st January 1952, by the International Labour Organization, Myanmar. Recently, the Act was amended in July 2014. The key objectives of this Act are to allow workers (daily wage worker/temporary worker/permanent worker) to have a leave and holiday allowances, religious or social activities with earn allowance, and health insurance allowances.

The followings describe the right of workers to leave and have a holiday:

- ❖ Causal Leave (6 days)
- ❖ Earned Leave (10 days)
- ❖ Medical Leave (30 days)
- ❖ Maternity leave
- ❖ Public Holiday (21 days)
- ❖ Penalty for Violation

2.10.8. Social Security Law (31th August, 2012)

This law was enacted by the Pyidaungsu Hluttaw with the notification number 15/2012 in 31th August 2015. This law was described in section 9 (a) The Ministry of Labour, to enable to provide health care and medical treatment under this Law:

Carrying out assigning duty jointly or transfer or appoint doctors, dental and oral surgeons, nurses, midwives, and technicians who obtain medical practitioner license or registration certificate issued by the Medical Council of the Republic of the Union of Myanmar, the Dental and Oral Medicine Council, and the Nurses and Midwives Council of the Republic of the Union of Myanmar, practitioners of traditional medicine who obtain registration certificate issued by the Indigenous Medicine Council in co-ordination with the Ministry of Health;

if it is, may appoint doctors, dental and oral surgeons, nurses, midwives, technicians and practitioners of traditional medicine who obtain medical practitioner license or registration certificate issued by the respective council by hiring for a limited period or concluding agreement and determine the functions thereof.

2.11. MOTOR VEHICLES

2.11.1. The Vehicle Safety and Motor Vehicle Management Law (2020)

This law was enacted by Pyidaungsu Hluttaw No.6/2020 on May 26, 2020. The purposes of this law are;

- (a) to inspect and register the vehicles in accordance with the law;
- (b) to check whether the drivers of each type of vehicle meet the prescribed qualifications and issue a driver's license;
- (c) to reduce air pollution, soil contamination, water contamination and noise which are caused by motor vehicles;
- (d) to manage systematically to reduce accidents caused by motor vehicles;
- (e) to be able to inspect and supervise in accordance with the stipulations for safe traffic.
- (f) to reduce traffic congestion and to effectively use advanced technology transportation system to ensure vehicle safety.
- (g) to reduce the loss of life and socio-economic loss and injuries of the people due to the risk of traffic accident and to facilitate the movement of road users.

2.11.2. The Myanmar Motor-Vehicle Rules (1989)

These rules apply only to motor vehicles as defined in the Myanmar Motor-vehicle Act, 1906, and do not apply to vehicles propelled on rails, such as tramcars or to any class of vehicle exempted by the Lieutenant Governor from that definition.

According to Section 3, every person driving a motor-vehicle shall have ready and available for immediate use a suitable horn or, in the case of a motor-cycle, a suitable horn or bell, capable of giving audible and sufficient warning of his approach and position, and shall sound the same whenever expedient to prevent danger to any of the public.

According to Section 8, the person in charge of the motor vehicle shall obey all directions of police officers posted or stationed at crossings or other places for the regulation of traffic.

According to Section 10, a motor-vehicle shall not be driven in a street or public place recklessly or negligently, or at a speed or in a manner which is likely to endanger human life, or to cause hurt or injury to any person or animal, or to damage any goods carried in any vehicle or by any person, or which would be otherwise than reasonable and proper, having regard to all the circumstances of the case including the nature, condition and use of the street or public place and to the amount of traffic which is actually on it at the time, or which may reasonably be expected to be on it.

According to Section 41, the owner of a heavy motor-vehicle or trailer shall at all times use his best endeavors to prevent the emission of smoke or any unnecessary noise or rattle on the motor-vehicle or trailer and shall take care that no burning fuel falls from the vehicle on the road.

2.11.3. The Motor Vehicle Law (2015)

This motor vehicle law was enacted by the Pyidaungsu Hluttaw with notification number 55/2015 on 7th September in 2015. The objectives of the law are described below.

- (a) To register motor vehicles which are safely accessible to the public place after inspecting in accord with the stipulations;
- (b) To issue a driving license to drivers after examining whether or not they meet the prescribed qualifications according to the types of motor vehicles;
- (c) To be easy to access road users and to protect the safety of vehicle and road;
- (d) Not to be traffic jam and to use the effective Intelligent Transportation System for the safety of vehicle;
- (e) To perform the reduction of environmental impacts arising from a motor vehicle.

Section 45 states that no one is allowed to drive, request someone to drive, or park, motor vehicles in public places under the following conditions:

- (a) The motor vehicle is not registered.
- (b) The registration has been suspended, revoked or expired; the registration card is not displayed.
- (c) The registration card has been revoked or is expired.”

2.12. OTHER RELATED LAW AND REGULATION

2.12.1. Myanmar Insurance Law (1993)

This law was enacted by the State Law and Order Restoration Council on 23rd July in 1993. The objectives of the law are described below.

- (a) To overcome financial difficulties by effecting mutual agreement of insurance against social and economic losses which the people may encounter, due to common perils;
- (b) To promote the habit of savings individually by effecting life assurance, thus contributing to the accumulation of resource, of the State;
- (c) To win the trust and confidence of the people in the insurance system by providing effective insurance safeguards which may become necessary in view of the social and economic developments.

In Section 15; owners of motor vehicles shall affect compulsory Third Party Liability Insurance with the Myanmar Insurance. An entrepreneur or an organization operating an enterprise which may cause loss to State-owned property or which may cause damage to the life and property of the public or which may cause pollution to the environment shall affect compulsory General Liability Insurance with the Myanmar Insurance under this law according to Section 16.

2.12.2. Myanmar Insurance Rule (2017)

This rule was prescribed by Ministry of Planning and Finance with notification 30/2017 in 30th Mar. 2017. In this law, the investor must comply with the conditions of the Permit and other applicable laws when making an Investment and shall fully assist while negotiating with the Authority for settling the grievances of the local community that have been affected due to Investments in Section 203.

According to Section 206, If the Investor is desirous to appoint a foreigner as senior management, technician expert or consultant according to Section 51

- (a) the investor shall submit such foreigner's passport, expertise evidence or degree and profile to the Commission Office for approval.

Section 73 was described that every Investor that holds the Permit or Tax Incentives must have taken out the relevant insurance out of the following types of insurance at any insurance business that holds the license in the Union based on the nature of the business:

- (a) Property and Business Interruption Insurance;
- (b) Engineering Insurance;
- (c) Professional Liability Insurance;
- (d) Professional Accident Insurance;
- (e) Marine Insurance; and,
- (f) Workmen Compensation Insurance

2.12.3. Myanmar Investment Law (2016)

This law was enacted by the Pyidaungsu Hluttaw with the notification number 40/2016 on 18th October in 2016. The objectives of this law are described below.

- (a) to develop responsible investment businesses which do not cause harm to the natural environment and social environment in the interest of the Union and its citizens;
- (b) to protect the investors and their investment businesses in accordance with the Law;
- (c) to create job opportunities for the people;
- (d) to develop human resources;
- (e) to develop highly functioning production, service, and trading sectors;
- (f) to develop the technology, the agriculture, livestock and industrial sectors;
- (g) to develop various professional field, including infrastructures around the Union;
- (h) to enable the citizens to be able to work alongside with the international community;
- (i) to develop businesses and investment businesses that meet international standards

In Section 50(d), the land use right is included which means the investor shall register the land lease contract at the Office of Registry of Deeds in accordance with the Registration Act. In Section 51, the investor:

- (a) may appoint of any citizen who is a qualified person as senior manager, technical and operational expert, or advisor in his investment within the Union in accordance with the laws;
- (b) shall appoint them to replace, after providing for capacity building programs in order to be able to appoint citizens to positions of management, technical and operational experts, and advisors;
- (c) shall appoint only citizens for works which does not require skill;
- (d) shall appoint skilled citizen and foreign workers, technicians, and staff by signing an employment contract between employer and employee in accordance with the labor laws and rules;
- (e) shall ensure to obtain the entitlements and rights in the labor laws and rules, including minimum wages and salaries, leave, holidays, overtime fees, damages, compensation of the workman, social welfare, and other insurance related to workers in stipulating the rights and duties of employers and employees and occupational terms and conditions in the employment contract;
- (f) shall settle disputes arising among employers, among workers, between employers and workers, and technicians or staff in the investment in accordance with the applicable laws.

According to Section 65, the more important to the projects investors' responsibilities was directed in sub-Section (f) to (q);

- (a) shall not make any significant alteration of topography or elevation of the land on which he is entitled to lease or to use, without the approval of the Commission;
- (b) shall abide by the applicable laws, rules, procedures and best standards practiced internationally for this investment so as not to cause damage, pollution, and loss to the natural and social environment and not to cause damage to cultural heritage;
- (c) shall list and keep proper records in books of accounting and annual financial statements, and necessary financial matters relating to the investments performed by a Permit or an Endorsement in accordance with internationally and locally recognized accounting standards;
- (d) shall close and discontinue the investment only after payment of compensation to employees in accordance with applicable laws for any breach of employment contracts, closure of investment, sale and transfer of investment, discontinuation of investment, or reduction of workforce;
- (e) shall pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directives and so forth during the period of suspension of investment for a credible reason;
- (f) shall pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease and death due to the work;
- (g) shall supervise foreign experts, supervisors and their families, who employ in its investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar;
- (h) shall respect and comply with the labor laws;
- (i) shall have the right to sue and to be sued in accordance with the laws;

- (j) shall pay effective compensation for loss incurred to the victim, if there is damage to the natural environment and socioeconomic losses caused by logging or extraction of natural resources, which are not related to the scope of the permissible investment, except from carrying out the activities required to conduct investment in a Permit or an Endorsement.
- (k) shall allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment;
- (l) shall take in advance a Permit or an Endorsement of the Commission for the investments, which need to obtain prior approval under the Environmental Conservation Law and the procedures of environmental impact assessment, before undertaking the assessment. Such investments shall be submitted the situation of environmental and social impact assessment to the Commission during the permitted investment period.

Moreover, this law was instructed the investor shall insure the types of insurance stipulated in the provision of the rules at any insurance enterprise, which is entitled to carry out insurance businesses within the Union in Section 73.

2.12.4. Myanmar Investment Rule (2017)

This rule was prescribed by Ministry of Planning and Finance with notification 30/2017 in 30th Mar. 2017. In this law, the investor must comply with the conditions of the Permit and other applicable laws when making an Investment and shall fully assist while negotiating with the Authority for settling the grievances of the local community that have been affected due to Investments in Section 202 and 203.

According to Section 206, If the Investor is desirous to appoint a foreigner as senior management, technician expert or consultant according to Section 51;

- (a) the investor shall submit such foreigner's passport, expertise evidence or degree and profile to the Commission Office for approval.

Section 212 was described that every Investor that holds the Permit or Tax Incentives must have taken out the relevant insurance out of the following types of insurance at any insurance business that holds the license in the Union based on the nature of the business:

- (b) property and business interruption insurance;
- (c) engineering insurance;
- (d) professional liability insurance;
- (e) professional accident insurance;
- (f) marine insurance; and,
- (g) workmen compensation insurance

2.12.5. The Petroleum and Petroleum Product Law (2017)

This law was enacted by the Pyidaungsu Hluttaw with notification number 20/2017 on 1st August in 2017. The objectives of this law are expressed below.

- (a) to carry out the petroleum and petroleum product businesses activities systematically in accordance with the provisions of the law, stipulated standards, procedures and conditions;
- (b) to enable the petroleum and petroleum product business activities to carry out safely without environmental impact;
- (c) to establish free and fair competition in carrying out petroleum and petroleum product business activities;
- (d) to secure energy requirement and energy security of the Union;
- (e) to obtain tax revenue of the Union.

Section 9 states that the Ministry of Transport and Communications shall carry out the following functions relating to the projects in which sub-Section (a) and (e) to any petroleum and petroleum product;

- (f) issuing license to vehicles, vessels and barges that carry any petroleum and petroleum product;
- (g) determining procedures and conditions to be abided by in carrying out transport business except transport by pipeline.

Moreover, in Section 10, The Ministry of Natural Resources and Environmental Conservation shall carry out the following functions relating to any petroleum and petroleum product;

- (a) issuing license for the right to store for the storage tanks and warehouses;
- (b) issuing transport permit for the vehicles, vessels and barges that shall carry any petroleum and petroleum product;
- (c) determining the period, form and terms and conditions, manners of applying license, permitting authority and fees to be assessed, for license under sub-Section (a) and permit under sub-Section (b);
- (d) if it occurs environmental impacts in carrying out petroleum and petroleum product business activities, taking action, as necessary, in accordance with the existing laws of on-site inspection;
- (e) determining, in coordination with ministries concerned, procedures and conditions relating to standard and quality of storage tanks and warehouse, and tanks of vehicles, vessels and barges that carry any petroleum and petroleum product.

Section 11 states that on all receptacles containing any dangerous petroleum and petroleum product, the warning sign of danger by stamping, embossing, painting, printing or any other means shall be expressed. If it is impossible to express as such, similar warning signs of the nature of danger of gasoline, spirit or petroleum shall be expressed in writing at the sensible place in salient words or signs near the receptacle.

2.12.6. The Petroleum Act (1934)

This act was enacted to consolidate and amend the law relating to the import, transport, storage, production, refining and blending of petroleum and other inflammable substances with the reference of India Act XXX, 1934. This act came into force on 30th March 1937.

Under Chapter III, according to Section 23, general penalty for offences under this Act,

(1) whoever-

- (a) in contravention of any of the provisions of Chapter I or of any of the rules made thereunder, imports, transports, stores, produces, refines or blends any petroleum, or
- (b) contravenes any rule made under section 4 or section 5, or
- (c) breaks the condition of any license held by him, issued under section 4, or
- (d) being for the time being in control or in charge of any place where petroleum is being imported, stored, produced, refined or blended or is under transport, refuses, or neglects to show to any officer authorized under section 13 any receptacle, plant or appliance used in such place in connection with petroleum, or in any way obstructs or fails to render reasonable assistance to such officer during an inspection, or
- (e) being for the time being in control or in charge of any place where petroleum is being imported, transported, stored, produced, refined or blended, refuses or neglects to show to any officer authorized under section 14 any petroleum in such place, or to give him such assistance as he may require for the inspection of such petroleum, or refuses to allow him to take samples of the petroleum, or
- (f) being required, under section 27, to give information of any accident, fails to give such information as so required by that section,

shall be punishable with fine, which may extend from a minimum of five hundred thousand kyats to a maximum of five million kyats.

- (2) if any person, having been convicted of an offence punishable under sub-section (1), is again guilty of any offence punishable under that sub-section, he shall be punishable for every such subsequent offence with fine, which may extend from a minimum of one million kyats to a maximum of ten million kyats.

According to Section 24, Confiscation of petroleum and receptacles. –

- (1) in any case in which an offence under clause (a) or clause (b) or clause (c) of sub-section (1) of section 23 has been committed, the convicting Magistrate may direct that-
 - (a) the petroleum in respect of which the offence has been committed, or
 - (b) where the offender is convicted of importing, transporting or storing petroleum exceeding the quantity he is permitted to import, transport or store, as the case may be, the whole of the petroleum in respect of which the offence was committed,

shall, together with the receptacles in which it is contained, be confiscated.

- (2) this power may also be exercised by the High Court in the exercise of its appellate or provisional powers.

According to Section 25, jurisdiction - offences punishable under this Act shall be triable by a Magistrate of the first class, or by a Magistrate of the second class who has been specially empowered by the President of the Union in this behalf

According to Section 26, Power of entry and search -

- (1) the President of the Union may, by notification in the Gazette, authorize any officer by name or by virtue of office to enter and search any place where he has reason to believe that any petroleum is being imported, transported, stored, produced, refined or blended otherwise than in accordance with the provisions of this Act and the rules made thereunder, and to seize, detain or remove any or all of the petroleum in respect of which in his opinion an offence under this Act has been committed.
- (2) the provisions of the Code of Criminal Procedure (V of 1898) relating to searches shall, as far as they are applicable, apply to searches by officers authorized under this section.
- (3) the Governor may make rules regulating the procedure of authorized officers in the exercise of their powers under this section subject, however, to the provisions of sub-section (2).

According to Section 27, reports of accidents with petroleum - Where any accident by explosion or fire, which is attended with loss of human life or serious injury to person or property, occurs as the result of the ignition of petroleum or petroleum vapor, or occurs in or near any place where petroleum is kept and under circumstances making it likely that it was the result of such ignition, the person for the time being in charge of the petroleum shall forthwith give information to the nearest Magistrate or to the officer-in-charge of the nearest police station.

According to Section 28, inquiries into serious accidents with petroleum –

- (1) the inquiry mentioned in section 176 of the Code of Criminal Procedure (V of 1898) shall be held in all cases where any person has been killed by an accident which the Magistrate has reason to believe was the result of the ignition of petroleum or petroleum vapour.
- (2) any Magistrate empowered to hold an inquest may also hold an inquiry under the said section into the cause of any accident which he has reason to believe was the result of the ignition of petroleum or petroleum vapour, if such accident was attended by serious injury to person of property, notwithstanding that no person was killed thereby.
- (3) repealed
- (4) the result of all inquiries held in pursuance of this section shall be submitted as soon as may be to the President of the Union.

Under Chapter IV, according to Section 29, Provisions relating to rules –

- (1) in making any rules under this Act, the President of the Union may-
 - (a) provide for any matter ancillary to such rules for which in his opinion provision is necessary to protect the public from danger arising from the import, transport, storage, production, refining or blending of petroleum, and
 - (b) make special provision for the special circumstances of any place.
- (2) every power to make rules conferred by this Act is subject to the condition of previous publication.
- (3) all rules made under this Act shall be published in the Gazette.

According to Section 30, Power to apply Act to other substances. –

- (1) the President of the Union may, by notification in the Gazette, apply any or all of the provisions of this Act and of the rules made thereunder with such modifications as he may specify, to any dangerously inflammable substance, other than an explosive, and thereupon the provisions so applied shall have effect as if such substance had been included in the definition of petroleum.
- (2) the President of the Union may make rules providing specially for the testing of any substance to which any of the provisions of this Act have been applied by notification under sub-section (1), and such rules may supplement any of the provisions of Chapter II in order to adapt them to the special needs of such tests.

According to Section 31, Power to limit powers of local authorities over petroleum.

- Where any enactment confers powers upon any local authority in respect of the transport or storage of petroleum, the President of the Union may, by notification in the Gazette-

- (a) limit the operation of such enactment, or
- (b) restrict the exercise of such powers, in any manner he deems fit.

Section 32 is omitted.

2.12.7. The Export and Import Law (2012)

This law was enacted by the Pyidaungsu Hluttaw with the notification number 17/2012 on 17th September in 2012. The main objectives of this law are to successfully implement the State economic principles, to enable to establish the policies to support the State development, to cause the State's import and export policies and activities to be in compliance with the international trade standards. According to the Section 7, No licensee shall violate the terms of permit.

2.12.8. The Fisheries Law

This law was enacted by the State Law and Order Restoration Council with the notification number 24/1989 on 7th September in 1989. According to the Section 29,

- (a) fish farming without license;
- (b) obstructing the flow of water and currents in the fishery waters or encouraging or polluting the water;
- (c) importing live fish from abroad without prior permission of the Department; Domestic and export;
- (d) raising fish prohibited by the Department

2.12.9. Natural Disaster Management Law (2013)

This law was enacted by the Pyidaungsu Hluttaw Law with the notification No. 21, 2013 in 31st July 2013. Section 13 describes that," the department, organization or person that has been assigned under this Law:

- (a) Shall undertake the following functions after laying down the plan in accord with the natural disaster management plans in order to reduce damage and losses that are likely to be caused by the natural disaster;
 - Preparatory and preventive measures for natural disaster risk reduction before the natural strikes;
 - Emergency responses including search and rescue when the natural strikes;
 - Rehabilitation and reconstruction activities for improving better living standard in past disaster period and conservation of the environment that has been affected by natural disaster;
- (b) Shall give prioritize and protect children, the elderly, the disabled and women (especially pregnant women and suckling mothers) in carrying out the functions contained in sub-section (a);
- (c) Shall refrain from the act that causes injuring human dignity in supporting the victims.

2.12.10. Climate Change Policy (2019)

The policy is adopted by the Republic of the Union of Myanmar in 2019. The purpose of the Climate Change Policy is to provide long-term direction and guidance to: (a) take and promote climate change action on adaptation and mitigation in Myanmar; (b) integrate climate change adaption and mitigation consideration into Myanmar's national priorities and across all levels and sectors in an iterative and progressive manner; and (c) take decision to create and maximize opportunities for sustainable, low carbon, climate resilient development, ensuring benefits for all.

2.12.11. Commercial Tax Law (2014)

This law was prescribed on 31st March 1990 and it was amended on 24th March 2014, March 24. According to this law, section 4(a) of chapter II was shown in which Charging Tax and Having Responsibility to Pay Tax: "The tax shall be charged on the goods produced in the country as mentioned in the Schedule." In section 5, the tax due under section 4 shall be responsible to be paid by the relevant producer, service provider or importer.

In the schedule 7, the tax percentage on the services including railways, waterway, airway, and road transport business are 5 percent based on the total receipts in respect of passenger fares.

2.12.12. The Union Tax Law (2019)

This law was enacted in Pyidaungsu Hluttaw notification number 30 on 24th September 2019. This law includes the following sectors;

(a) Changes to the income tax law

Key changes to the income tax law are as follows;

- Conditional amnesty
- Cash rewards received as a result of the seizure of unlawful property
- Powers granted to the ministry of planning and finance (ministry)

(b) Changes to the special commodity tax law

Under the Union Tax Law 2019, the special commodity list remains the same except for the following;

- Cigarettes and cheroots
- Alcoholic beverages
- Natural gas
- Gemstones

(c) Changes to the commercial tax law

(d) Gemstones tax

2.12.13. Myanmar Citizens Investment Law (2013)

This law was enacted by the Pyidaungsu Hluttaw with the notification number No. 18/2013 on 29th July 2013. The aim of the law is aimed at the people to enjoy sufficiently and to enable the surplus to export after exploiting abundant resources of the country; causing to open up of more employments for the people as the business develop and expand, causing to develop human resources; causing to develop in every region of the country including infrastructures; causing to rise economic enterprises and investment business owned by Myanmar citizens, which are able to keep abreast with other countries.

Chapter 5 of the Law, Article 5 states that any type of economic activities may be applied by the citizens for investment, except otherwise restricted or prohibited business under this law, or any existing Law.

Article 6 states the investments, which shall be stipulated as the restricted or prohibited business. These are businesses, which can;

- Affect the traditional culture and customs of the national races within the Union.

- Affect public's environment, causing noise in the residential area.
- Affect public health.
- Cause damage to the natural environment and ecosystem.
- Affect the land and marine animals, trees, flowers, crops, antique heritage, resources
- Bring the hazardous or poisonous waste into the Union.
- The factory which produce or the business which use hazardous chemicals under international agreements.

2.12.14. Foreign Investment Law (2012)

This law was enacted by the Pyidaungsu Hluttaw with the notification number No. 21/2012 on 2nd November 2012. The objectives of the law are described below.

- (1) To produce the minerals of the state for the sufficient enjoyment of the public and to export the surplus;
- (2) Job creation for the people in line with the progress and expansion of work;
- (3) To develop human resources to develop the infra-structure such as banking and finance work, highway roads, cross-country highway, national electricity and energy works;
- (4) To develop high-tech including modern data collection technology;
- (5) To develop communication network international standard railway, maritime and airway transport in the whole country;
- (6) To encourage the citizen to be able to do in competition with foreigners; and,
- (7) To develop the investment work in line with the international standard.

2.12.15. Private Industrial Enterprise Law (26th November, 1990)

This law was enacted by the State Law and Order Restoration Council in 26th November 1990. This law was described in section (4);

(a) Any person desirous of conducting any private industrial enterprise;

(b) Any person conducting any private industrial enterprise on the day this Law is enacted; by using any type of power which is three horsepower and above or manpower of ten wage-earning workers and above shall register under this Law.

According to section 13, some more important duties of the entrepreneur are as follows -

(b) shall abide by the terms and conditions of the registration certificate;

(f) shall shift the place of enterprise, change the nature of enterprise, amalgamate enterprises and split up enterprises only with the approval of the Directorate;

(g) shall abide by the orders and directives issued from time to time by the Ministry and the Directorate;

Moreover, section 15(a) and (b) was described that the entrepreneur has the right to carry out the followings:-

(a) appointing foreign experts and technicians with the approval of the Ministry;

(b) carrying out change of the name of enterprise, transfer of ownership, temporary suspension or permanent closing down of the enterprise in the manner prescribed and with the approval of the Directorate.

2.12.16. Prevention of Hazard from Chemical and Related Substances Law (26th August, 2013)

This law was enacted by Pyidaungsu Hluttaw with notification number 28/ 2013 in 26th August 2013. Section 15 was described as a person who has obtained a license, before starting the respective chemical and related substances business:-

(a) shall be inspected for the safety and the power of resistance of the machinery and equipment by the respective Supervisory Board and Board of Inspection;

(b) shall be attended the person who serve in the work to the respective foreign trainings or the trainings and the expert trainings on prevention of hazard from the chemical and related substances opened by the government department and the government organizations.

A person who has obtained a licence shall follow under section 16:

(a) shall abide the license regulations;

(b) shall perform to abide strictly the instructions for being safety in using the chemical and related substances by himself and also the persons who serve the work;

(c) shall keep the required safety equipment enough in the chemical and related substances businesses, furthermore shall grant the personal protection equipment and dresses free of charge to the working persons;

(d) shall make the course of training and study and instruction if necessary, to the working persons for using the occupational safety equipment, the personal protection equipment and the dresses systematically in the chemical and related substances business;

(e) shall be inspected by the respective Supervisory Board and Boards of Inspection in respect of whether or not the hazard may impact on the Human Being and Animals' health and the environment;

(f) shall make medical checkup the working persons who will work in the chemical and related substances business and shall permit to serve in that work after obtaining the recommendation that his health is suitable for that work. This medical checkup records shall be kept systematically;

(g) shall send the copy of informative letter of the permission to the respective Department of Township Administration, if the hazardous chemical or related substances are permitted to store;

(h) shall acquire in advance the guidance and agreement of the respective Department of Fire Brigade, if the business that is worried to fire hazard is operated by using the fire hazard substances or the explosive substances;

(i) shall transport only the permitted amount of the chemical and related substances in accordance with the prescriptive stipulations, if they are transported in local;

(j) shall take the permission from the Central Supervisory Board if the chemical and related substance is altered and transferred from one place to any other place which contained in the license;

(k) shall abide and perform in accordance with the related environmental laws not to impact and damage to the environment in operating the chemical and related substances business.

Section 17 was stated a person who has obtained a license, shall put the insurance in accordance with the prescriptive stipulations to be able to pay the compensation, if the impact and damage is occurred on the Human Being and Animals or the environment in respect of the chemical and related substances businesses. According to section 22, a person who has obtained the registration certificate shall abide the regulations consisted in the registration certificate furthermore shall also abide the order and instructions issued occasionally by the Central Supervisory Board. About the hazard control and decrease had directed in section 27 in which a person who has obtained the license to be complied the following matters to control and decrease the hazard of the chemical and related substances: -

(a) classifying the hazard level to protect in advance the hazard according to the properties of the chemical and related substances;

(b) expressing the Material Safety Data Sheet and Pictogram;

(c) providing the safety equipment, the personal protection equipment to protect and decrease the accident and attending to the training to be used systematically;

(d) performing in accordance with the stipulations in respect of transporting, possessing, storing, using, discharging the chemical and related substances;

(e) not being imported or exported the chemical and related substances banned by the Central Supervisory Board and the machinery and equipment which are used them.

2.12.17. Law on Standardization (3rd July, 2014)

This law was enacted by the Pyidaungsu Hluttaw with the notification number 28/2014 in 3rd July, 2014. According to the section 17, the person who have acquired qualified certificate shall apply to the recognized department or organization of the government department. In section 19, if the qualified person who breaking any relevant certified including rules and disciplines was inspected, the committee could decide any following action.

(a) Notification

(b) Suspension by the limited of the qualified certificate

(c) Decommission of the qualified certificates.

About the Penalties section 26 was prescribed in which any certified person was using the qualified mark on the unfixed products or services, that person should be punished not more than one-year prison or one million or both.

2.12.18. The Factories Act (1951)

This act deals with the provisions for the proper disposal of wastes and effluents in factories, treatment of wastewater, regulations for health and cleanliness in factories and prevention of hazards. First aid appliances related to factory are presented in Article 47 and described below.

1. In every factory the manager shall provide and maintain a first-aid box or a cupboard equipped with the prescribed contents in suitable place as may be directed by the Inspector so as to be readily accessible during all working hours, and where more than one maintained for every additional one hundred workers or part thereof.

2. Nothing but the prescribed contents shall be kept in the first-aid boxes or cupboards referred to in sub-section (1), and all such first-aid boxes and cupboard shall be kept in the charge of a responsible who has been trained in first-aid treatment and who shall always be available during working hours.

3. In every factory wherein more than two hundred and fifty workers are employed there shall be provided and maintained a first-aid room or dispensary of the prescribed dimension, containing the prescribed equipment, and shall be kept under the supervision of such medical officer and nursing staff as may be prescribed.

2.12.19. Myanmar Engineer Council Law (28th November, 2013)

This law was enacted by the Pyidaungsu Hluttaw with the notification number 37/2013 in 28th November, 2013. This law was taken administrative action in section 34, "If, whoever has received a registration certificate, is found to have breached any rules contained in the registration certificate or violated any prohibition contained in a rule, order or directive enacted under this law or in any stipulation of this law, the executive committee may take the following administrative actions-

- (a) giving a warning;
- (b) assessing a suitable fine;
- (c) suspending the registration certificate;
- (d) cancelling the registration certificate.

Moreover, section 37 was directed in which "No one shall perform any engineering work and technological work which are specified as being dangerous to the public by a rule enacted under this law without having received a registration certificate issued by the council, except for engineers appointed in a government department or an organization in the performance of their duties."

2.12.20. Trademark Law (30th January, 2019)

This law was prescribed by the Pyidaungsu Hluttaw Law with the notification number 3 in 30th January 2019. This law was described in section 3, the department shall perform the following functions:

- (a) make announcements on trademark rights related registration matters;
- (b) According to section 17, “ the applicant for the registration of a mark shall:
 - i. include the following in the application:
 - ii. an application for registration;
 - iii. name and address of the person or legally formed organization applying for registration;
 - iv. name citizenship scrutiny card number, and address of the agent or representative if the applicant entrusts an agent or representative with this matter;
 - v. a clear and complete description of the mark;
 - vi. name and type of goods and services for which a request for registration is made and the category of international mark classification to which it belongs;
- (c) In addition to the requirement in subsection (a) , the following must be attached to the application if necessary:
 - i. if the application is made for a legally formed organization, the registration number, type and country of said organization;
 - ii. if the applicant requests the right of priority, an application for the right of priority together with sufficient evidence proving that he has the right of priority, and description;
 - iii. if the applicant requests the right of priority for trade exhibitions, an application for the right of priority for trade exhibitions together with sufficient evidence proving he has the right of priority for trade exhibitions, and description;
 - iv. if the mark is registered at the documents registration office, documentary evidence proving such registration;
 - v. other requirements stipulated by the Agency and the Department from time to time.

2.12.21. Industrial Design Rights Law (30th January 2019)

This law was prescribed by the Pyidaungsu Hluttaw Law with the notification number 2 in 30th January 2019. This law was described in section 9, the Department’s duties and functions are as follows:

- (a) Make announcements on industrial design right related registration matters;
- (b) Maintain registration records related to industrial design right;
- (c) Supervise the work of divisions formed and established according to the different intellectual property rights fields;

- (d) carry out industrial design rights related functions assigned by the Agency from time to time.

According to section 22, The application for the registration of an industrial design:

- (a) shall include the following in the registration application:

- i. a request for registration;
- ii. name and address of the person or legally formed organization that has applied for registration;
- iii. if the applicant applies through a representative, the name, Citizenship Scrutiny Card number, and address of the representative;
- iv. clear and complete description of the industrial design;
- v. indication of products that contain the industrial design or are formed from the industrial design.

- (b) In addition to the items in subsection (a) , the following must also be submitted if necessary;

- i. if the application is for a legally formed organization, the registration number, type, and country of said organization;
- ii. if the applicant is requesting the right of priority, sufficient evidence showing that he has the right of priority as well as the request for right of priority;
- iii. if the applicant is requesting the right of priority for trade exhibitions, sufficient evidence showing that he has the right of priority for trade exhibitions as well as the request for right of priority for trade exhibitions;
- iv. other requirements stipulated as necessary by the Agency and Department.

According to section 43, If an owner of a registered industrial design wishes to extend the term of registration, he must carry out the following;

- (a) He must apply for the extension of the term of registration and pay the prescribed fee within six months before the expiration date of the term of registration.

- (b) If the application is submitted after the expiration date of the term of registration, he may do so within the grace period of six months after said expiration date and by paying the registration fees as well as overdue fees.

According to section 75 (d), providing the documents related to the application of the registration of an industrial design to an unrelated Party, disclosing to the public, or allowing the use of such documents, during the stipulated period before the announcement.

2.12.22. Consumer Protection Law (14th Mar, 2014)

This law was enacted by the Pyidaungsu Hluttaw Law with the notification number 10 in 14th March 2014. This law was described in section 7 (a); The right of the entrepreneur are as follows;

- i. receiving payment in accord with agreements, value in sale of goods or services;
- ii. having right of defense under law in consumer dispute;
- iii. enabling to make regain of goodwill if the injury and loss of the consumer is not because of this goods or services;
- iv. enabling to regain goodwill if it is provable in accord with the law that the injury and loss of the consumer is not because of goods or services that he has purchased;

This law was described in section 7 (b); he duties of the entrepreneurs are as follows:

- i. acting the business accord with business ethics;
- ii. giving clear and proper information on goods or services;
- iii. treating honestly and properly with non-discrimination to the consumers;
- iv. guaranteeing the goods or services traded or produced based on stipulated standard and quality;
- v. providing opportunity to test on goods or services which require to test quality before purchasing;
- vi. taking responsibility as guaranteed in respect of damage due to consuming goods or using services during the warranty period;
- vii. taking responsibility as agreed terms and conditions if received or used goods by consumer are inconsistent with the agreement;
- viii. complying exactly with the agreed agreement or promise in the agreement in doing service business;
- ix. avoiding the saying, writing and acting to cause detriment on the relevant consumer by means of media or by other means while relevant person is settling the consumer dispute.

2.12.23. Myanmar Company Law (Dec. 6, 2017)

This law was enacted in Pyidaungsu Hluttaw notification number 29 at December 6, 2017. In accordance with this law, section 4 was pointed in essentials requirements of companies. In this sub-section (a) has shown –

- (i) a name;
- (ii) a constitution;
- (iii) at least one share in issue (provided that a company limited by guarantee need not have a share capital);

(iv) at least one member;

(v) subject to sub-section (vi), at least one director who must be ordinarily resident in the Union;

(vi) if the company is a public company, at least three directors, at least one of whom must be ordinarily resident in the Union; and

(vii) a registered office address in the Union.

In subsection (b) has enacted –

A company may:

(i) appoint a company secretary; and

(ii) have a common seal.

2.12.24. Underground Water Act (21st June, 1930)

This law was enacted in Burma act notification number IV at 21st June 1930. The law was described in section 3: no person shall sink a tube for the purpose of obtaining underground water except under and in accordance with the terms of a licence granted by the water officers.

Every person owning a tube which was in existence before the extension of this act to the local area concerned shall apply to the water officer for a license for the said tube and such license shall be granted free of charge.

In section 6, the governor may make rules-

- (a) Prescribing the conditions subject to which licences may be granted by the water officer under section 3;
- (b) Prescribing the form of and the procedure for granting such licences and the fees payable for the issue thereof;
- (c) Prescribing the information to be supplied to the water officer under section 5.

2.12.25. Value Added Tax Law (7th June, 2019)

This law shall be called the Tax management Law and effect from 7 June 2019.

This law be concerned with following kinds of tax (a) Income Tax, (b) commercial Tax, (c) Specific goods Tax.

2.12.25.1. Income Tax

Income shall be computed under each of the following heads of income (a) salaries, (b) profession, (c) business, (d) property, (e) capital gains, (f) undisclosed sources of income and (g) other sources of income.

2.12.25.2. Commercial Tax

Commercial tax, at rates ranging from 0% to 8% is levied as a turnover tax on goods and services. Generally, commercial tax is imposed at the rate of 5%. The commercial tax that a business charges and collects is known as output tax, which has to

be paid to the Myanmar tax authorities. Commercial tax incurred on business purchases and expenses are known as input tax. Businesses that are registered for commercial tax can claim commercial input tax if certain conditions are satisfied.

Commercial tax is imposed on a wide range on specified goods and services traded, produced, or rendered within the country, based on the sales proceeds, and on imported goods. There are 42 types of goods exempted from commercial tax.

All services are subject to 5% commercial tax except for 32 types of services that are specifically exempt from commercial tax(ex, life insurance, banking and financial services that are operated with the permission of the Central Bank of Myanmar, microfinance, public transportation, publishing services).

No commercial tax is imposed if the proceeds from production and sales of goods, receipts from services, or proceeds from trading for a financial year are not more than 50 million Myanmar kyats. (MMK)

Commercial tax is zero-rated on all exports, except for electricity (8%) and crude oil (5%).

Companies registered under the MIC/SEZ committee, be granted exemption from commercial tax during certain stipulate periods.

2.12.25.3. Specific Goods Tax

The Specific Goods Tax Law replaces commercial tax on a list of specific goods that are imported into Myanmar, manufactured in Myanmar, or exported to a foreign country. The list of specific goods include cigarettes, tobacco leaves, cheroots, cigars, pipe tobaccos, and betel-chewing tobacco; beers, wine and alcoholic beverages; wood logs and wood cuttings; vans, saloons, sedans and estate wagons, and coupe cars except double cab 4- door pickups from the range of 1501 cc to 4001 cc and above; and kerosene, petrol, diesel, and aviation jet fuel, as well as natural gas. The specific goods tax rates range from 5% to 60%.

Specific goods tax is exempted on all exports, except for wood logs and woodcuttings, which are subject to tax at 10%. Under the specific Goods Tax Law, only a manufacturer of special goods can claim and offset the specific goods tax incurred on purchase of raw materials/semi-finished goods against the specific goods tax charged on sale of specific goods.

On top of specific goods tax, commercial tax of 5% will also be imposed. Companies registered under the MIC/SEZ may, at the discretion of the MIC/SEZ Committee, be granted exemption from internal taxes; which may cover specific goods tax, during certain stipulated periods.

2.13. INTERNATIONAL AND NATIONAL STANDARDS, CONVENTIONS AND TREATIES

The international and national standards, conventions and treaties which are generally relevant to this project are discussed below. The project proponent will follow the international conventions and treaties which Myanmar ratified or signed.

2.13.1. International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability

IFC Performance Standards on Environmental and Social Sustainability was established by IFC and world bank group on 1st January 2012. IFC's sustainability framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability. IFC describes eight performance standards (PS) on Environmental and Social Sustainability. The eight PS are;

PS 1: Assessment and Management of Environmental and Social Risks and Impacts

PS 2: Labor and Working Conditions

PS 3: Resource Efficiency and Pollution Prevention

PS 4: Community Health, Safety, and Security

PS 5: Land Acquisition and Involuntary Resettlement

PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

PS 7: Indigenous Peoples

PS 8: Cultural Heritage

All the environmental and social aspects of development projects will be covered by the above eight PS.

2.13.2. IFC Environmental, Health and Safety Guidelines

The Environmental, Health and Safety Guidelines was established by IFC and world bank group on 30th April 2007. The EHS Guidelines by IFC are technical reference documents with general and industry –specific examples of Good International Industry practice (GIIP), as defined in IFC's Performance Standard 3: Resources Efficiency and Pollution Prevention. The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC and that considered achievable in new facilities at reasonable costs by existing technology.

There are two kinds of guidelines, General EHS Guidelines and Industry Sector Guidelines. The General EHS Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors in the following section: (1) Environmental, (2) Occupational Health and Safety, (3) Community Health and Safety and (4) Construction and Decommissioning. Environmental guidelines describes the guidelines of air emission and ambient air quality, energy conservation, wastewater and ambient water quality, water conservation, hazardous materials management, waste management, noise and contaminated land. The guidelines of

occupational health and safety include general facility design and operation, communication and training, physical hazards, chemical hazards, biological hazards, radiological hazards, personal protective equipment (PPE), special hazard environments and monitoring. Table 2-7 shows the contents of the section of Community Health and Safety. The guidelines for construction and decommissioning activities focus on environment, occupational health and safety and community health and safety.

Table 2-7 Community Health and Safety Contents

Contents	Brief Description
Water Quality and Availability	Drinking water sources should at all times be protected so that they meet or exceed applicable national acceptability standards or in their absence the current edition of WHO Guidelines for Drinking-Water Quality. Project activities should not compromise the availability of water for personal hygiene needs and should take account of potential future increases in demand. The overall target should be the availability of 100 liters per person per day.
Structural Safety of Project Infrastructure	Reduction of potential hazards is best accomplished during the design phase when the structural design, layout and site modifications can be adapted more easily. The following issues should be considered and incorporated. As appropriate into the planning, siting, and design phases. A project of (1) inclusion of buffer strips or other methods of physical separation around project sites to protect the public from major hazards associated with hazardous materials incidents or process failure. (2) incorporation of siting and safety engineering criteria to prevent failures due to natural risks posed by earthquakes, tsunamis, wind, flooding, landslides and fire, and (3) application of locally regulated or internationally recognized building codes, standards and regulations, and mitigation measures.
Traffic Safety	All project personnel should promote traffic safety during displacement to and from the workplace, and during operation of project equipment on private or public roads. Prevention and control of traffic related injuries and fatalities should include the adoption of safety measures that are protective of project workers and of road users, including those who are most vulnerable to road traffic accidents.
Transport of Hazardous Materials	Projects should have procedures in place that ensure compliance with local laws and international requirements applicable to the transport of hazardous materials.
Disease Prevention	Recommended interventions against the communicable diseases at the project level include (1) providing surveillance and active screening and treatment of workers. (2) preventing illness among workers in local communities by undertaking health awareness and education initiatives, training health workers in disease treatment and conducting immunization programs for workers, and (3) providing treatment through standard case management in on-site or community health care facilities.
Emergency preparedness and Response	All projects should have an Emergency preparedness and Response Plan that is commensurate with the risks of the facility. In addition, that includes the following basic elements: (1) Administration (policy, purpose, distribution, definitions, etc.) (2) Organization of emergency areas (command centers, medical stations, etc., (3) Roles and responsibilities, (4) Communication systems, (5) Emergency response procedures, (6) Emergency resources, (7) Training and updating, (8) Checklists (role and action list and equipment checklist), and (9) Business Continuity and Contingency.

Source: IFC, Environmental, Health, and Safety (EHS) Guidelines, General EHS Guidelines: Community Health and Safety (April 30.2007)

2.13.3. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was signed in 1989 and entered into force on 1992. Myanmar ratified the Basel Convention on 6th January 2015 and the convention entered into force for Myanmar on 6th April 2015. The Basel Convention is an international treaty that was designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries. The main objectives of the convention are to reduce transboundary movements of hazardous wastes to a minimum consistent with their environmentally sound management; to dispose of hazardous wastes as close as possible to their source of generation; and to minimize the generation of hazardous wastes in terms of quantity and hazardousness. It does not address the movement of radioactive wastes and wastes derived from the normal operation of a ship.

2.13.4. Cartagena Protocol on Biosafety Convention on Biological Diversity

The Cartagena Protocol on Biosafety Convention on Biological Diversity was finalized and adopted at Montreal on 29th January 2000. Myanmar ratified the protocol on 13th February 2008 and signed on 11th May 2001. The objectives of this protocol is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.

2.13.5. Convention on Biological Diversity

The Convention on Biological Diversity was opened for signature at Earth Summit (also known as United Nations Conference on Environment and Development (UNCED)) on 5th June 1992 and entered into force on 29th December 1993. Myanmar ratified on 25th November 1994 and signed the convention on 11th June 1992. The objectives of this convention are the conservation of biological diversity; the sustainable use of the components of biological diversity; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

2.13.6. ILO Forced Labor Convention

The ILO Forced Labor Convention was opened for signature on 28th June 1930 and the convention was effective on 1st May 1932. Myanmar ratified the convention on 4th March 1955. The objective of this convention is to suppress the use of forced labour in all its forms irrespective of the nature of the work or the sector of activity in which it may be performed. According to article 1 of this convention, each member of the International Labour Organization which ratifies this convention undertakes to suppress the use of forced or compulsory labour in all its forms within the shortest possible period.

2.13.7. Kyoto Protocol to the United Nations Framework Convention on Climate Change

Kyoto Protocol to the United Nations Framework Convention on Climate Change was adopted on 11th December 1997 and entered into force on 16th February 2005. Myanmar accessed the protocol on 13th August 2013. The objectives of the protocol is to stabilize of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. According to Article 2 section (1), the party, in order to promote sustainable development, shall:

- (a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:
 - (i) Enhancement of energy efficiency in relevant sectors of the national economy;
 - (ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;
 - (iii) Promotion of sustainable forms of agriculture in light of climate change considerations;
 - (iv) Research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;
 - (v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments;
 - (vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol;
 - (vii) Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;
 - (viii) Limitation and/or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy.

2.13.8. Montreal Protocol on Substances that Deplete the Ozone Layer

The Montreal Protocol was opened for the signature on 16th September 1987 and the protocol entered into force on 1st January 1989. Myanmar accessed the protocol on 24th November 1993. The objectives of the protocol is to protect the ozone layer by phasing out the production of numerous substances (i.e. chlorofluorocarbons (CFCs), halons and less damaging transitional chemicals such as hydrochlorofluorocarbons (HCFCs)) believed to be responsible for ozone depletion.

2.13.9. Stockholm Convention on Persistent Organic Pollutants

The Stockholm Convention on Persistent Organic Pollutants was adopted on 22nd May 2001 and the convention entered into force on 17th May 2004. Myanmar accessed the convention on 20th April 2014. According to Article 1, the objective of the convention is to protect human health and the environment from persistent organic pollutants. According to Article 3 section 1,

- (a) each party shall prohibit and/or take the legal and administrative measures necessary to eliminate:
 - (i) Its production and use of the chemicals listed in **Annex A** subject to the provisions of that Annex; and
 - (ii) Its import and export of the chemicals listed in **Annex A** in accordance with the provisions of paragraph 2; and
- (b) Restrict its production and use of the chemicals listed in **Annex B** in accordance with the provisions of that Annex.

The chemicals listed in **Annex A** are Aldrin (CAS No: 309-00-2), Alpha hexachlorocyclohexane (CAS No: 319-84-6), Beta hexachlorocyclohexane (CAS No: 319-85-7), Chlordane (CAS No: 57-74-9), Chlordecone (CAS No: 143-50-0), Dieldrin (CAS No: 60-57-1), Endrin (CAS No: 72-20-8), Heptachlor (CAS No: 76-44-8), Hexabromobiphenyl (CAS No: 36355-01-8), Hexabromodiphenyl ether and heptabromodiphenyl ether, Hexachlorobenzene (CAS No: 118-74-1), Lindane (CAS No: 58-89-9), Mirex (CAS No: 2385-85-5), Pentachlorobenzene (CAS No: 608-93-5), Polychlorinated biphenyls (PCB), Tetrabromodiphenyl ether and pentabromodiphenyl ether and Toxaphene (CAS No: 8001-35-2).

The chemicals listed in **Annex B** are DDT (1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane) (CAS No: 50-29-3), Perfluorooctane Sulfonic Acid (CAS No: 1763-23-1), potassium perfluorooctane sulfonate (CAS No: 2795-39-3), lithium perfluorooctane sulfonate (CAS No: 29457-72-5), ammonium perfluorooctane sulfonate (CAS No: 29081-56-9), diethanolammonium perfluorooctane sulfonate (CAS No: 70225-14-8), tetraethylammonium perfluorooctane sulfonate (CAS No: 56773-42-3), didecyldimethylammonium perfluorooctane sulfonate (CAS No: 251099-16-8), and perfluorooctane sulfonyl fluoride (CAS No: 307-35-7).

2.13.10. The Vienna Convention for the Protection of the Ozone Layer

The Vienna Convention for the Protection of the Ozone Layer was opened for the signature on 22nd March 1985. Myanmar accessed the convention on 24th November 1993. The convention focuses on the ongoing scientific monitoring and observation of the ozone layer. The objective of the convention is to promote cooperation among nations by exchanging information on the effects of human activities on the ozone layer.

2.13.11. United Nations Framework Convention on Climate Change

United Nations Framework Convention on Climate Change was opened for the signature 4th June 1992 and the convention was effective on 21st March 1994. Myanmar ratified the convention on 25th November 1994 and the convention entered into force 12th June 1992 in Myanmar. The ultimate objective of this convention is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system in accordance with the relevant provisions of the convention.

2.14. INSTITUTIONAL ARRANGEMENT

On 5th March 1992, the Ministry of Agriculture and Forestry was reformed into the two ministries, namely the Ministry of Forestry and the Ministry of Agriculture, in accordance with the State Law and Order Restoration Council Law No (17/92). On September 6th 2011, the Ministry of Forestry was renamed as the Ministry of Environmental Conservation and Forestry (MOECAAF) with the Notification No. (83/2011) of the President's office. According to the announcement No. (1/2016), MOECAAF was changed to the Ministry of Natural Resources and Environmental Conservation (MONREC) on 30th March 2016 in order to undertake both environmental and natural resources conservation and management more effectively. Under Chapter 2 Section 3 of EIA procedure (2015), pursuant to section 21 of the law and Articles 52, 53 and 55 of the Environmental Conservation Rules, all projects and project expansions undertaken by any ministry, government department, organization, corporation, board, development committee and organization, local government or authority, company, cooperative, institution, enterprise, firm, partnership or individual, which may cause impact on environmental quality and are required to obtain prior permission. This is to be in accordance with section 21 of the Environmental Conservation Law, and Article 62 of the Environmental Conservation Rules, having the potential to cause adverse impacts, that are required to undertake IEE or EIA or to develop an EMP, and to obtain an Environmental Compliance Certificate (ECC) in accordance with this EIA procedure.

CHAPTER 3 PROJECT DESCRIPTION AND ALTERNATIVE SELECTION

3.1. INTRODUCTION

This chapter includes general information of manufacturing of various kinds of shoes factory project, location of project site, tentative land use plan, project facilities and implementation schedule. ABGL will develop 'Manufacturing Shoes Factory Project' to improve the economy and job opportunities for the local people in Shwe Pyi Thar Township. This project in current construction phase as well as in future is providing Corporate Social Responsibility (CSR) with miscellaneous job opportunities for local people around the project area. Most information of the project presented in this chapter is provided by ABGL.

3.2. LOCATION OF THE PROJECT SITE

The project is located at Plot No. (149,150,151,152), Myay Taing Block No (49), corner of Mahar Myaing Street and Wun Saung Hmu Street, Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon Region. The project land area is 8.708 Acres (35,240.057 square meters). The land plot is parallelogram shape. Hlaing River is around 0.8 kilometers far away from the project site and Min Bandu Pagoda is located around 0.3 kilometers far away from the project site. Project location map is shown in Figure 3-1.

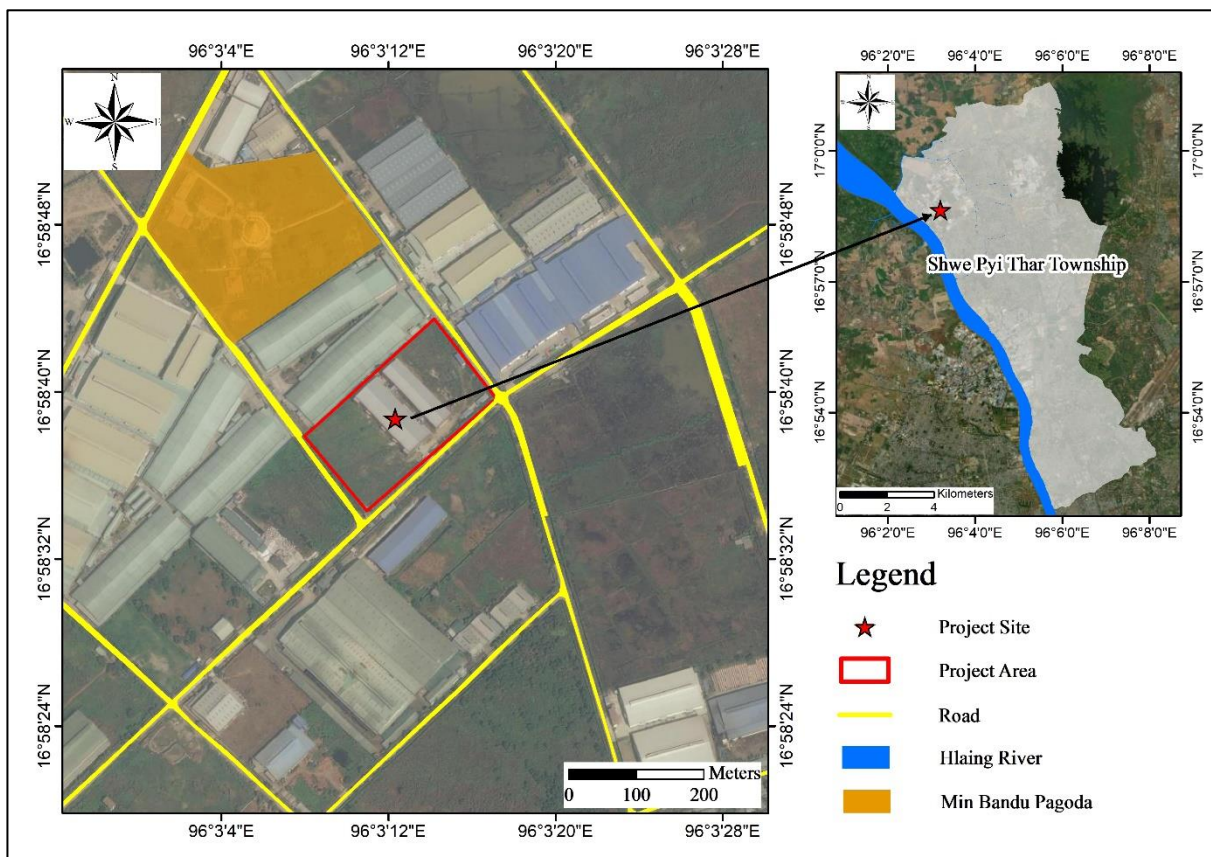


Figure 3-1 Location Map of the Project Area

3.3. PROJECT ALTERNATIVES

If the proposed project is expected to have huge irreversible negative impacts on the environment, the consideration of the project alternatives that would reach the basic objectives of the project is necessary to avoid or lessen the expected significant negative environmental impacts. The project alternatives for this project are considered by location alternative, process alternative, input alternative and the no action alternative.

3.3.1. Location Alternative

The project factory is situated in Wartayar industrial zone. It can be expected to contribute to the local economy, such as job opportunities for local people. Any irreversible negative impacts on the environment was not expected since the proposed project was located in the industrial zone. Thus, relocation alternative for this project is not considered for this project.

3.3.2. Process Alternatives

In the process alternative, the equipment alternative is considered by including the Best Practicable Environmental Option (BPEO) which defines as the option of providing the most benefit or causing the least damage to the environment. For the cutting process of this project, hydraulic plane cutting machines are used instead of simple cutters. The advantages of hydraulic plane cutting machines for shoe making are efficient operation, simple, low failure rate, safe, reliable, accurate and easy to maintain. In addition, the machines run smoothly and quietly (low noise level) with high cutting speed than the simple cutter. For the stitching process, the industrial used sewing machines, such as single needle postbed sewing machines, double needle postbed sewing machines and so on, are used instead of simple domestic sewing machines. The sewing machines used in this project have excellent visibility which can improve workability due to the high-clarity display. In addition, the industrial used sewing machines possess the needle entry in clear view and stably feeds even aterials with multi-layered parts and the machines can produces flawlessly finished seams with no slippage or irregular stiches, even when sewing slippery materials.

3.3.3. Input Alternative

There are two main consideration such as raw materials and energy sources for the input alternatives. Raw materials including chemical glue will be imported from foreign countries. In this project, 13 types of chemical glue, which include MEK (methyl ethyl ketone) with acetone and other angredients, are used instead of aromatic hydrocarbons such as benzene, toluene and xylene for the purpose of less toxic than pure MEK and aromatic hydrocarbons.

Although the factory is currently operating with power generators for the electricity, 2000-kilo voltage-ampere (kVA) transformer are planned to install. After installing the transformer at the factory, the air emission from power generators will be reduced.

3.3.4. The No Action Alternative

The “No Action” alternative can be elucidated as a decision of no undertaking the proposed project. In addition, the “No Action” alternative of the project is evaluated along with its potential negative impacts on the environment. Any irreversible negative impacts from the development of proposed project on the environment was not predicted and so “No Action” alternative is not relevant selection for this project. In addition, the negative impact on job opportunities and unemployment can casue if the “No Action” alternative takes place.

3.4. DESCRIPTION OF PROJECT

3.4.1. Site Description

ABGL is located in No. (149,150, 151, 152), corner of Mahar Myaing Street and Wun Saung Hmu Stree, Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon. The total floor plan area of the project site is 40,664.84 square meters and there are two phases for the building construction. For phase 1, two numbers of 3-storey buildings such as warehouse and workshop, and other associated buildings had been constructed and other remaning buildings such as workshop, office and dormitory buildings will be constructed in project phase 2. The project’s layout plan is shown in Figure 3-2.

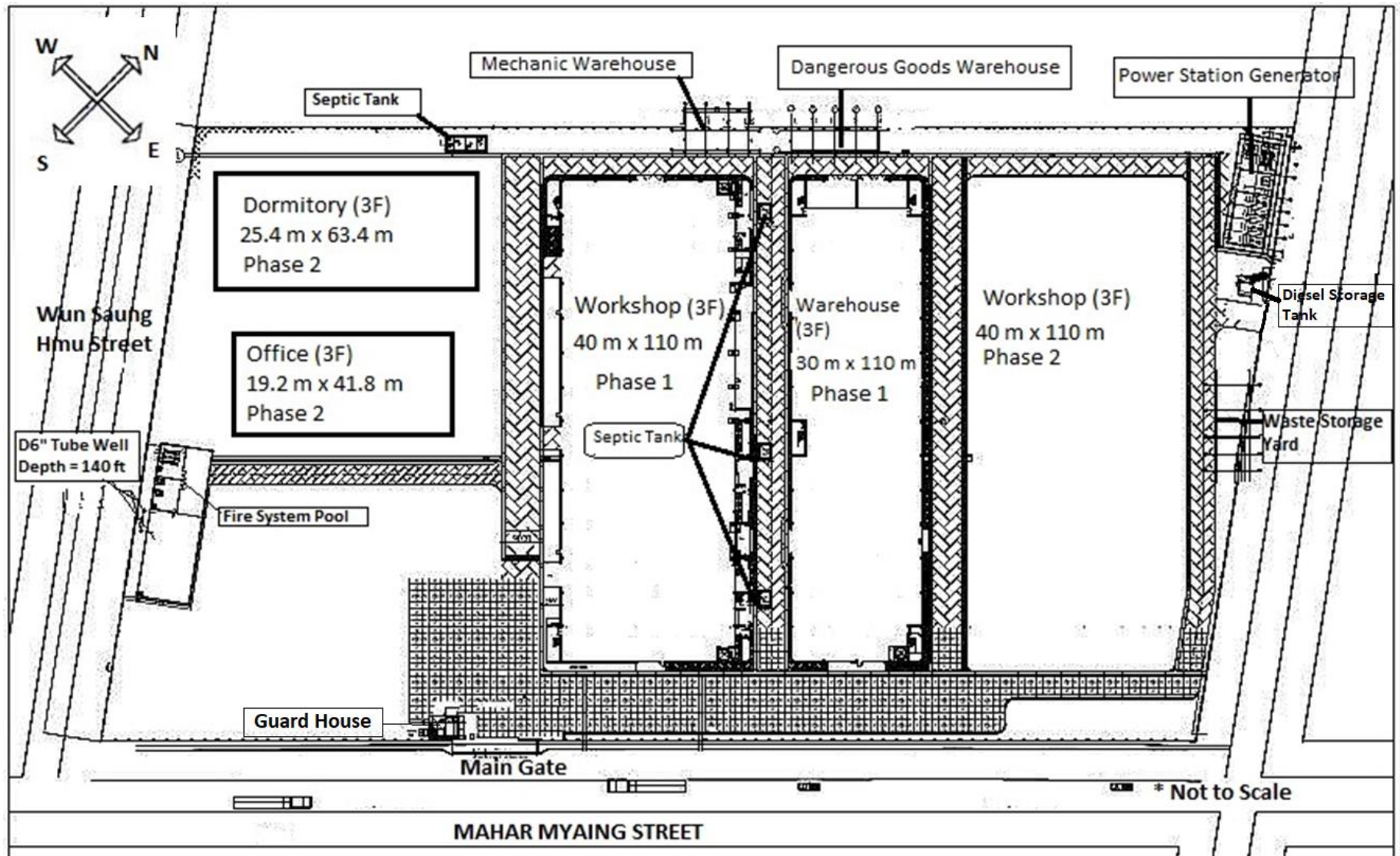


Figure 3-2 Project's Layout Plan

3.4.2. Related Projects and Developments Adjacent to the Project

The project occupies 35,240.057 square meters at No. (149,150, 151, 152), corner of Mahar Myaing Street and Wun Saung Hmu Stree, Wartayar Industrial Zone. It is necessary to consider the environmental impacts of the project site to the surrounding environment and the cumulative impacts from the surrounding factories will be considered. Several numbers of factories and Min Bandu pagoda are located in 1 km radius of the project site. The location map of compounds adjacent to project site are shown in Figure 3-3. The existing built-up areas and features of compounds adjacent to project site are shown in Table 3-1.

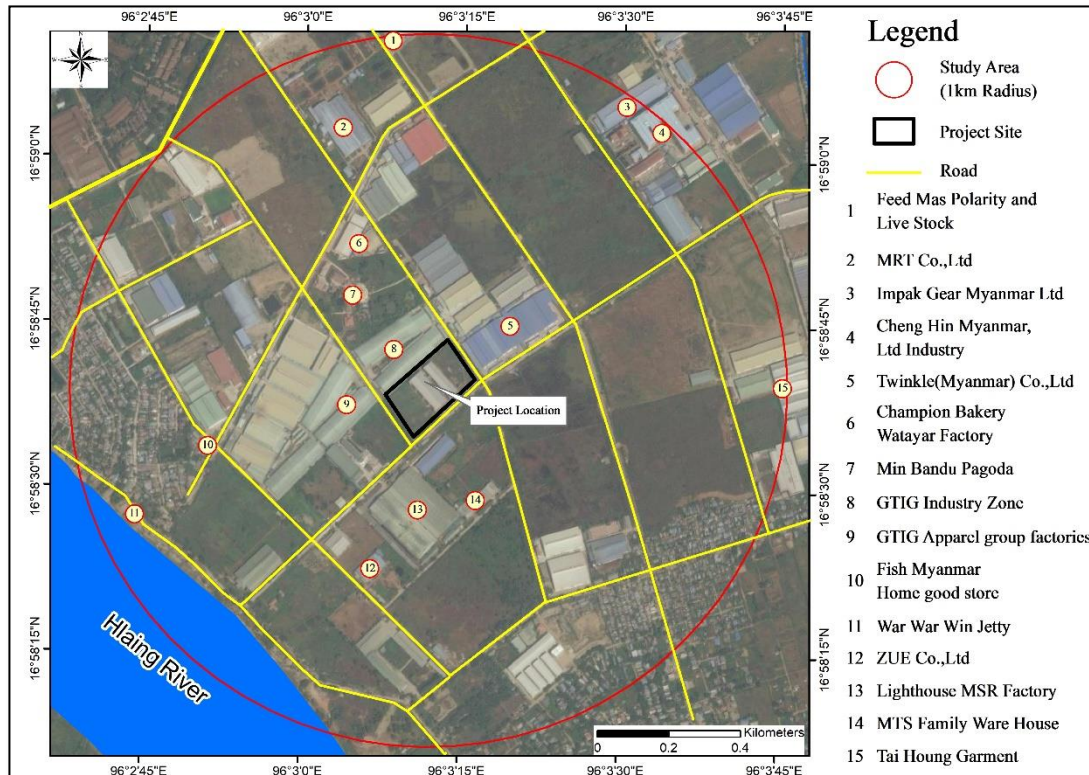


Figure 3-3 Related Projects and Developments Adjacent to the Project Site

Table 3-1 Built-up Areas and Features of Compounds Adjacent to Project Site

Adjacent Point	Geographic Location		Name	Direction	Nature
	Latitude	Longitude			
1	16° 59' 10.70" N	96° 3' 8.47" E	Feed Mas Polarity and Live Stock	North	Feed Manufacturer
2	16° 59' 2.70" N	96° 3' 4.08" E	MRT Co., Ltd	North	Construction of Buildings
3	16° 59' 4.28" N	96° 3' 29.92" E	Impak Gear Myanmar., Ltd	North-East	Bag Manufacturing
4	16° 59' 2.25" N	96° 3' 33.62" E	Cheng Hin Myanmar, Ltd Industry	North-East	Garment

Adjacent Point	Geographic Location		Name	Direction	Nature
	Latitude	Longitude			
5	16° 58' 44.11" N	96° 3' 19.75" E	Twinkle (Myanmar) Co., Ltd	North-East	Clothing/Garment/Textile
6	16° 58' 52.48" N	96° 3' 5.36" E	Champion Bakery Watayar Factory	North	Bakery
7	16° 58' 47.41" N	96° 3' 5.61" E	Min Bandu Pagoda	North	Pagoda
8	16° 58' 42.20" N	96° 3' 9.14" E	GTIG Industry Zone	North	Garment
9	16°58'37.21"N	96° 3' 3.81" E	GTIG Apparel Group Factories	West	Garment
10	16° 58' 33.46" N	96° 2' 51.46" E	Fish Myanmar Home Good Store	South-West	Home Goods Store
11	16° 58' 27.39" N	96° 2' 44.62" E	War War Win Jetty	South-West	Ferry service
12	16°58' 22.54" N	96° 3' 7.03" E	ZUE Co., Ltd	South	Home Goods Store
13	16°58' 27.56" N	96° 3' 11.34" E	Lighthouse MSR Factory	South	Cafes
14	16° 58' 28.40" N	96° 3' 17.02" E	MTS Myanmar Ware House	South	Home Goods Store
15	16° 58' 38.76" N	96° 3' 45.63" E	Tai Houng Garment	East	Garment

3.4.3. Type of Building and Function Area

The proposed project is planned to construct into two phases. For project phase 1, one workshop building, one warehouse building and other associated buildings such as mechanic warehouse, dangerous goods warehouse, power station generator room, guardhouse, waste storage yard, fire system pool and septic tanks had been constructed. One dormitory, one office building and one workshop building are planned to construct in project phase 2. All the main buildings such as two workshops, one warehouse, dormitory and office are planned to construct three-storey steel structure buildings. The detailed information of the buildings are shown in Table 3-2. The layout plans of workshop and warehouse of project phase 1 are shown in Figure 3-4 and Figure 3-5. In addition, the layout plans of other associated buildings are shown in **APPENDIX D**.

The adjacent roads near to the factory compound are Mahar Myaing Street and Wun Saung Hmu Street. Mahar Myaing Street is used as the entry road of the factory compound. Main gate is located at the front side of the proposed project that accesses with Mahar Myaing Street. The guardroom is placed near the entrance of the factory as the security of project factory.

Table 3-2 Detailed Information of Buildings of the Project

No.	Buildings	Area (m)	Level of Building	Quantity	Phase
1.	Warehouse	30 x 110	3 Floors	1	1
2.	Workshop	40 x 110	3 Floors	1	1
3.	Workshop	40 x 110	3 Floors	1	2
4.	Dormitory	25.3 x 63.4	3 Floors	1	2
5.	Office	19.2 x 41.8	3 Floors	1	2
7.	Mechanic Warehouse	5 x 15	1 Floor	1	1
8.	Dangerous Goods Warehouse	4.1 x 20	1 Floor	1	1
9.	Power Station Generator Room	8.2 x 24	1 Floor	1	1
10.	Guard House	3 x 6	1 Floor	1	1
11.	Waste Storage Yard	20 x 8.1	1 Floor	1	1
12.	Fire System Pool	12 x 35	1 Floor	1	1
13.	Septic Tanks between warehouse and workshop	2.5 x 3.5	1 Floor	3	1
14.	Septic Tank near guard house	1.72 x 2.22	1 Floor	1	1
15.	Main Septic Tank	12 x 12	1 Floor	1	1

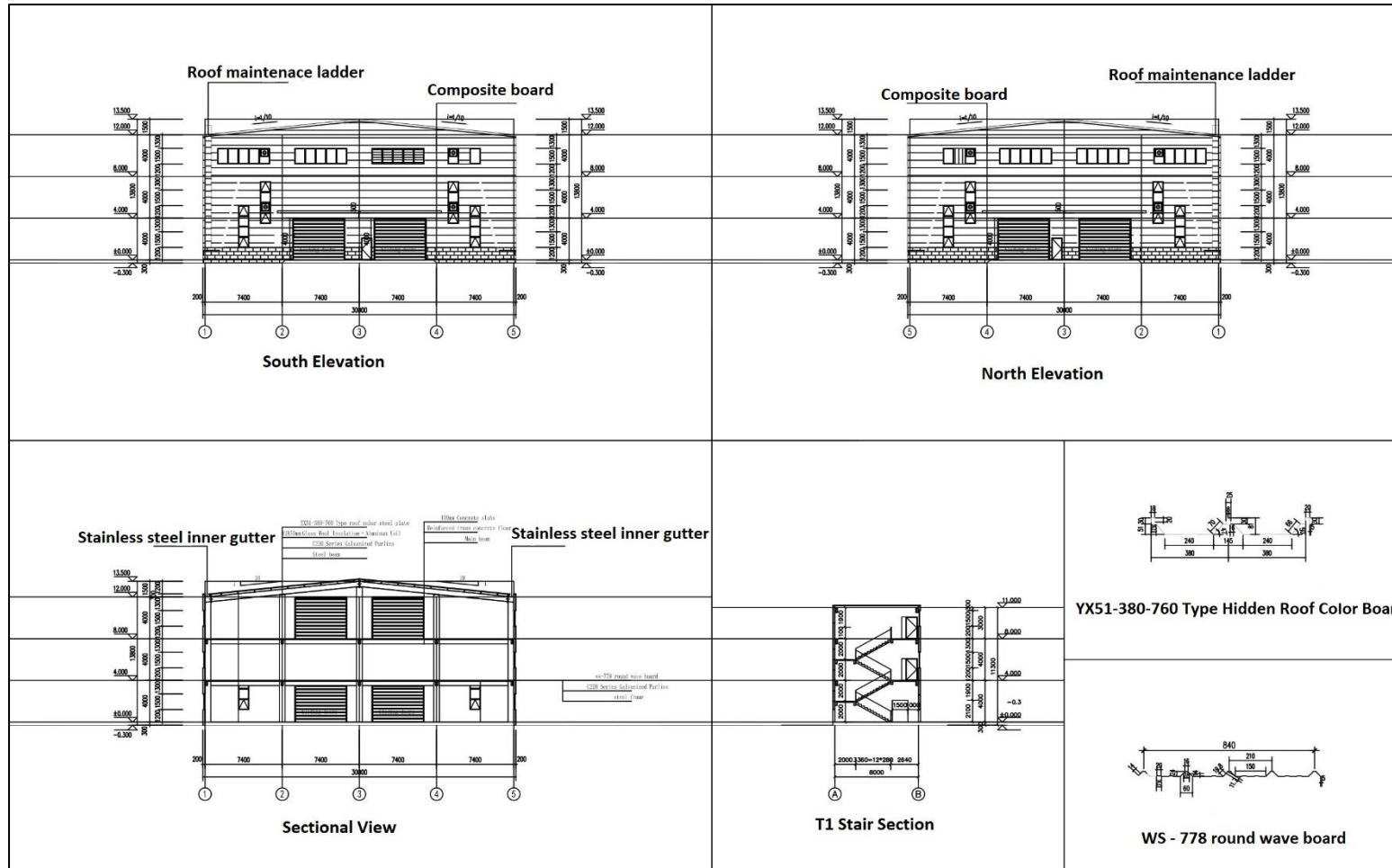


Figure 3-4 Workshop's Layout Plan

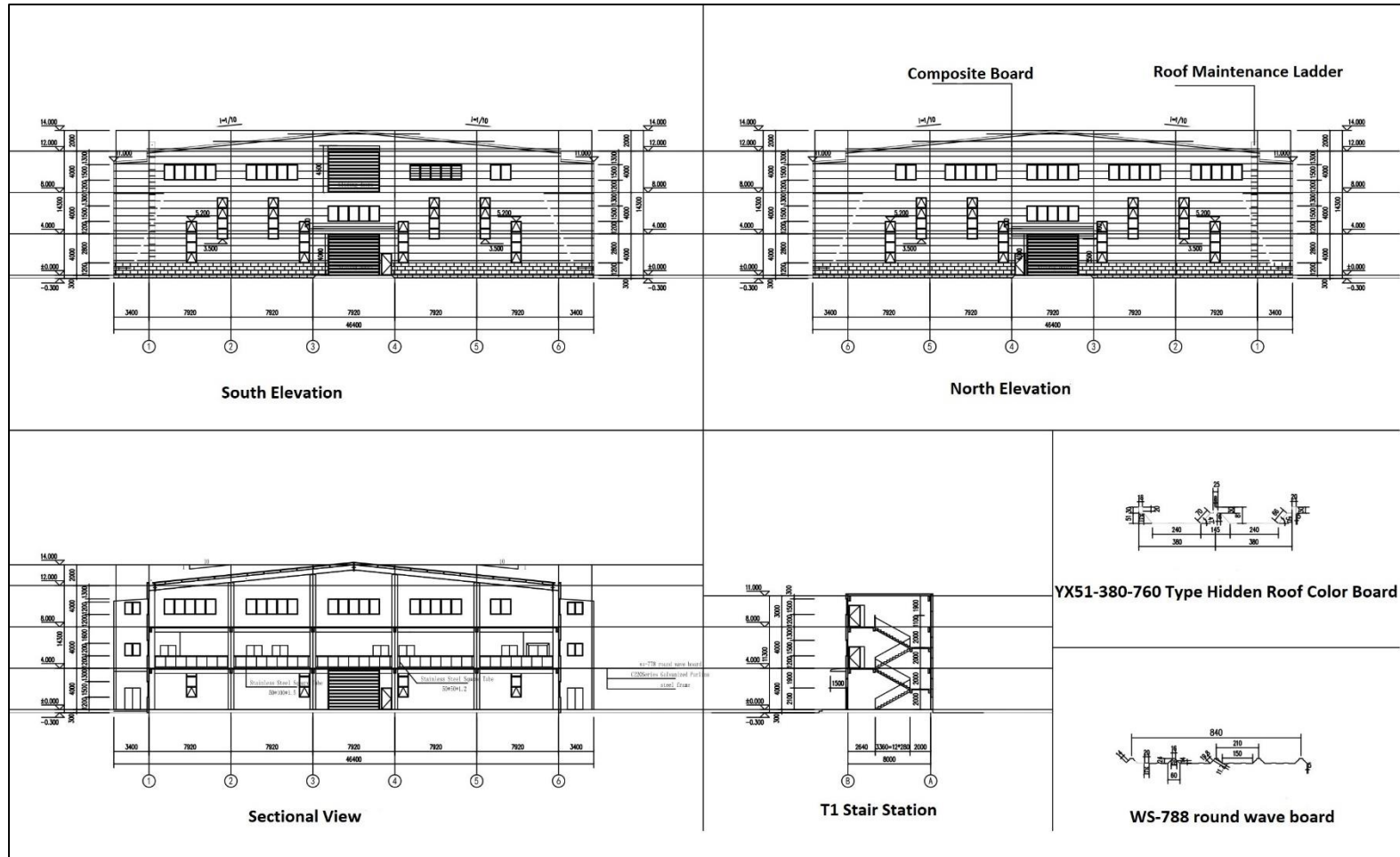


Figure 3-5 Warehouse's Layout Plan

3.4.4. Current Situation of the Project

Currently, project phase 1 buildings such as one warehouse building, one workshop building and other associated buildings (mechanic warehouse, dangerous goods warehouse, power station generator and fuel storage room, guardhouse, waste storage yard, fire system pool and septic tanks) had been constructed at the project site. The current situation of the proposed project is shown in Figure 3-6.



Current Construction Situation of the Project Phase 1 (Warehouse and Workshop)



Dangerous Goods Warehouse



Waste Storage Yard



Power Station Generator Room and Fuel Storage Room



Underground Fire System Pool and Water Storage Tank

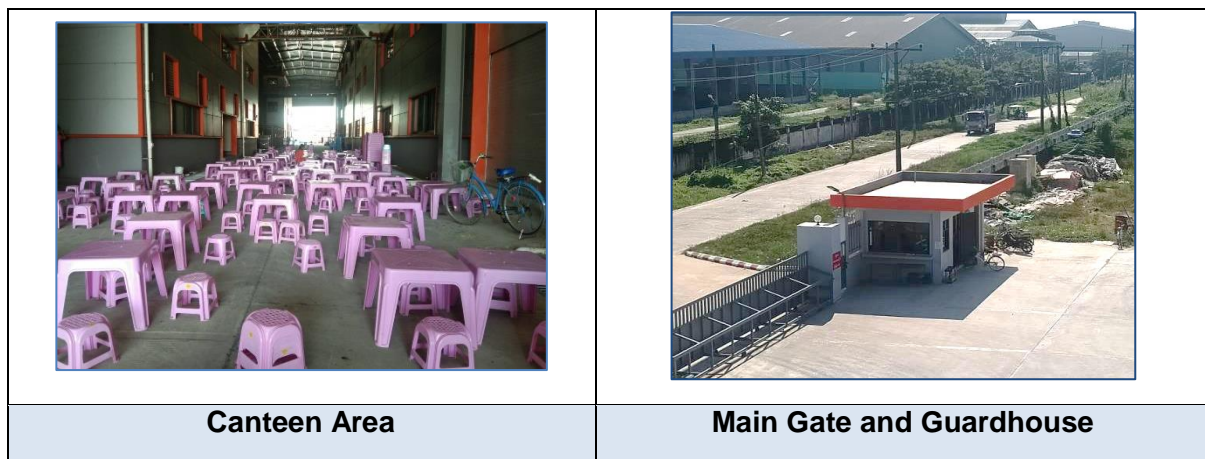


Figure 3-6 Current Situation of the Project (Phase 1)

3.5. PROJECT COMPONENT

During the operation phase of the project, the required components, such as raw materials, machineries and equipment, chemical usage, employment, production process and production rate, to manufacture the various kinds of shoes and types of products are described as follows and these data are derived from the project proponent.

During the construction phase of the project, workshop, warehouse and other associated infrastructure and facilities are required to construct.

3.5.1. Raw Materials Requirements

Raw materials are required to manufacture for each type of product. All the required raw materials will be imported from foreign countries such as Taiwan, China, Italy, Hong Kong, United Kingdom, Japan, Morocco, Thailand, Vietnam, India, Argentina and Greece. List of annual raw materials needed to manufacture various kinds of shoes is expressed in the following Table 3-3. Examples of raw materials used for shoe manufacturing are shown in Figure 3-7.

Table 3-3 List of Annual Raw Materials

Sr. No	Particulars	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6~30	H.S CODE 6~30
1.	Anti-Mildew Slice	U	520,000.00	572,000.00	692,000.00	795,800.00	920,000.00	1,058,000.00	4202290000
2.	Back Counter	U	520,000.00	572,000.00	692,000.00	795,800.00	920,000.00	1,058,000.00	9029100000
3.	Carton	U	53,665.00	59,031.50	71,403.35	82,113.85	94,913.75	109,150.81	4819100000
4.	Inner box	U	520,000.00	572,000.00	692,000.00	795,800.00	920,000.00	1,058,000.00	4817300000
5.	Printing Label	U	520,000.00	572,000.00	692,000.00	795,800.00	920,000.00	1,058,000.00	4821100000
6.	Carton Label	U	53,665.00	59,031.50	71,403.35	82,113.00	94,913.75	109,150.81	4821100000
7.	Buckle	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	8308900000
8.	Stud	U	11,880,000.00	13,068,000.00	15,814,000.00	18,186,100.00	21,030,000.00	24,184,500.00	7117110000
9.	Eyelet Button	U	11,880,000.00	13,068,000.00	15,814,000.00	18,186,100.00	21,030,000.00	24,184,500.00	9606290090
10.	Snap Fastener	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	9606100000
11.	Fiberglass	M	4,872.00	5,359.20	6,484.40	7,457.06	8,622.00	9,915.30	7019190090
12.	Foam	M	18,868.00	20,754.80	25,016.60	28,769.09	33,143.00	38,114.45	6806200000
13.	Waterproof Foam	M	18,868.00	20,754.80	25,016.60	28,769.09	33,143.00	38,114.45	6806200000
14.	EVA Sheet (Synthetic Rubber)	U	3,162.00	3,478.20	4,186.70	4,814.71	5,539.50	6,370.43	3702559000
15.	EVA Sheet (Synthetic Rubber)	M	5,096.00	5,605.60	6,781.60	7,798.84	9,016.00	10,368.40	3702559000
16.	Stitching Lines/ Thread (1U=1350Y)	U	127,819.00	140,600.90	170,466.45	196,036.42	227,095.25	261,159.54	5401100000
17.	Cotton Thread (1U=1350Y)	U	127,819.00	140,600.90	170,466.45	196,036.42	227,095.25	261,159.54	5401100000







Sr. No	Particulars	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6~30	H.S CODE 6~30
18.	Polyester Line/ (1U=1350Y)	U	127,819.00	140,600.90	170,466.45	196,036.42	227,095.25	261,159.54	5401100000
19.	Full Grain	M	424,403.00	466,843.30	565,964.65	650,859.35	753,924.25	867,012.89	3702529000
20.	Leather (Synthetic)	M	424,403.00	466,843.30	565,964.65	650,859.35	753,924.25	867,012.89	5702419000
21.	Sheepskin	M	424,403.00	466,843.30	565,964.65	650,859.35	753,924.25	867,012.89	3702529000
22.	Cow Leather	M	424,403.00	466,843.30	565,964.65	650,859.35	753,924.25	867,012.89	5702419000
23.	Suede	M	501,904.90	552,095.39	669,302.20	769,697.52	891,561.28	1,025,295.47	3702529000
24.	Insole Leather	M	242,289.00	266,517.90	322,715.95	371,123.34	429,402.75	493,813.16	5702419000
25.	Waterproof Leather	M	424,403.00	466,843.30	565,964.65	650,859.35	753,924.25	867,012.89	5702419000
26.	Glue	KG	11,874.00	13,061.40	15,816.50	18,188.98	21,046.50	24,203.48	5806209000
27.	Finish Agent	KG	1,335.00	1,468.50	1,778.25	2,044.99	2,366.25	2,721.19	5806209000
28.	Hardener	KG	1,565.00	1,721.50	2,084.55	2,397.23	2,773.75	3,189.81	5806209000
29.	GoodTex	U	16,649.00	18,313.90	22,177.95	25,504.64	29,512.75	33,939.66	4202290000
30.	Hangtag	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000
31.	Insole Sheet	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000
32.	Synthetic PVC	M	10,914.00	12,005.40	14,505.50	16,681.33	19,261.50	22,150.73	3702559000
33.	Injection (Plastic Sheet)	U	670,000.00	737,000.00	890,500.00	1,024,075.00	1,182,500.00	1,359,875.00	420290000
34.	Melt Tape Adhesive	MM	169,657.00	186,622.70	2226,224.15	260,157.77	301,325.75	346,524.61	3702529000

Sr. No	Particulars	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6~30	H.S CODE 6~30
35.	Melt Adhesive Tape	U	113,104.67	124,415.13	150,816.10	173,438.52	200,883.83	231,016.41	4202290000
36.	Membranes	M	16,553.00	18,208.30	22,032.35	25,337.20	29,296.75	33,691.26	3702529000
37.	Microfibre	M	11,392.00	12,531.20	15,174.40	17,450.56	20,192.00	23,220.80	3702529000
38.	Muslin	M	70,443.50	77,487.85	93,832.33	107,907.17	124,859.13	143,587.99	3702559000
39.	Percale Cloth	M	15,297.00	16,826.70	20,396.15	23,455.57	27,165.75	31,2440.61	3702559000
40.	Canvas	M	23,532.00	25,885.20	31,40.20	36,041.23	41,697.00	47,951.55	3702559000
41.	Nddle Cloth ASN	M	3,796.00	4,175.60	5,051.60	5,809.34	6,716.00	7,723.40	3702559000
42.	Non- Woven Cloth	M	99,,319.00	109,250.90	132,432.45	152,297.32	176,395.25	202,854.54	3702559000
43.	Nylon Cloth	M	49,973.50	54,970.85	66,565.83	76,550.70	88,576.63	101,,863.12	3702559000
44.	Middle Cloth	M	18,690.00	20,559.00	24,895.50	28,629.83	33,127.50	38,096.63	3702529000
45.	Sandwich Mesh	M	52,866.00	58,152.60	70,418.70	80,981.51	93,703.50	107,759.03	3702529000
46.	Mesh	M	22,471.00	24,718.10	29,880.85	34,362.98	39,697.25	45,651.84	3702529000
47.	Coarse Cotton Cloth	M	26,433.00	29,076.30	35,209.35	40,490.75	46,851.75	53,879.51	3702529000
48.	Canberra	M	1,468.50	1,615.35	1,956.08	2,249.49	2,602.88	2,993.31	3702529000
49.	Velvet	M	1,468.50	1,615.35	1,95608	2,249.49	2,602.88	2,993.31	3702529000
50.	Waterproof Mesh	M	52,866.00	58,152.60	70,418.70	80,981.51	93,703.50	107,759.03	3702529000
51.	Nylon Buckle Rubble	U	890,000.00	979,000.00	1,185,500.00	1,363,325.00	1,577,500.00	1,814,125.00	4202290000

Sr. No	Particulars	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6~30	H.S CODE 6~30
52.	Nylon Shank	U	370,000.00	407,000.00	493,500.00	567,525.00	657,500.00	756,125.00	4202290000
53.	Nylon Tape	M	318,264.00	3500,090.40	423,934.80	487,525.02	564,114.00	648,731.10	3702529000
54.	Oil Paper	U	3,560,000.00	3,916,000.00	4,742,000.00	5,453,300.00	6,310,000.00	7,256,500.00	4202290000
55.	Tissue Paper	U	520,000.00	572,000.00	692,000.00	795,800.00	920,000.00	1,058,000.00	420290000
56.	Wrapping Paper	U	12,990,000.00	14,289,000.00	17,294,500.00	19,888,675.00	23,002,500.00	26,452,875.00	4202290000
57.	Pictogram Label	U	890,000.00	979,000.00	1,185,500.00	1,363,325.00	1,577,500.00	1,814,125.00	4202290000
58.	Tape	M	599,593.00	659,552.30	789,671.35	918,472.05	1,062,761.75	1,222,176.01	3702529000
59.	Circle Tape	M	599,593.00	659,552.30	798,671.35	918,472.05	1,062,761.75	1,222,176.01	3702529000
60.	Synthetic Leather PU	M	51,292.00	56,421.20	68,155.20	78,378.48	90,482.00	104,054.30	3702529000
61.	PU Midsole Sheet	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	3702529000
62.	Shoe Lace	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	3702529000
63.	Elastics Band	M	599,593.00	659,552.30	798,671.35	918,472.05	1,062,761.75	1,222,176.01	3702529000
64.	Tongue Label	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000
65.	Outsole Sheet	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000
66.	Folder	U	670,000.00	737,000.00	890,500.00	1,024,075.00	1,182,500.00	1,359,875.00	420229000
67.	Velcro Hook/Loop	M	89,000.00	97,900.00	118,550.00	136,332.50	157,750.00	181,412.50	3702529000
68.	Shoes Lasting	U	26,000.00	28,600.00	34,600.00	39,790.00	46,000.00	52,900.00	420229000
69.	Plastics Chopstick	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000

Sr. No	Particulars	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6~30	H.S CODE 6~30
70.	Bamboo Chopsticks	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000
71.	Shoe Form	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000
72.	Cardboard	U	159,937.00	175,930.70	213,291.75	245,285.51	284,135.75	326,756.11	4202290000
73.	Midsole Sheet	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000
74.	Heel Cup Phylon	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	4202290000
75.	Zipper	U	1,040,000.00	1,144,000.00	1,384,000.00	1,591,600.00	1,840,000.00	2,116,000.00	3702529000
76.	Face Light	U	600,000.00	660,000.00	794,000.00	913,100.00	1,50,000.00	1,207,500.00	4202290000
77.	Bottom Light	U	300,000.00	330,000.00	397,000.00	456,550.00	525,000.00	603,50.00	4202290000
78.	Mold	U	26,000.00	28,600.00	34,600.00	39,790.00	46,000.00	52,900.00	4202290000
79.	Semi-Finished	U	52,000.00	57,200.00	69,200.00	79,580.00	92,000.00	105,800.00	4202290000

Note: U = Unit, M = Meter, Y = Yard

	
<p>Molds</p>	<p>Mesh</p>
	
<p>PU Synthesis Leather</p>	<p>Fabric</p>
	
<p>Shoe Form</p>	<p>Thread</p>






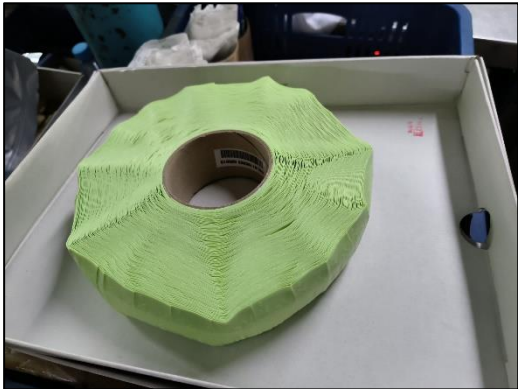
	
<p>Eyelets</p>	<p>Midsole</p>
	
<p>Glue</p>	<p>Shoelaces</p>
	
<p>Outsole</p>	<p>Anti-Mildew Slice</p>



Figure 3-7 Required Raw Materials

3.5.2. Machineries and Equipment

The required machineries, tools and equipment to manufacture various kinds of shoes will be purchased from China and local. The lists of machineries, tools and equipment are described in Table 3-4, Table 3-5 and Table 3-6. Examples of machines that will be used for shoe manufacturing process are shown in Figure 3-8. In addition, electrical materials, accessories and office equipment will also be purchased from local and their lists are shown in Table 3-7 and Table 3-8.

Table 3-4 List of Machineries and Equipment (Brand New from China)

Sr No.	Particular	A/U	QTY	H.S Code
1.	Single Needle Postbed Sewing Machine	SET	493	845229
2.	Single Needle, Needle Feed & Top/ Bottom Roller Feed, Slender Postbed Sewing Machine	SET	7	845229
3.	Double Needle Postbed Sewing Machine	SET	200	845229
4.	Single Needle, Lockstitch (3- Poing<2-Step>) Zigzag Sewing Machine (Large Hook)	SET	90	845229
5.	Punch Machine	SET	15	845229
6.	Automatic Eyelet Machine	SET	12	845229
7.	2 Cold & 2 Hot Back part Moulding Machine	SET	8	845229
8.	Double Cooling & Heating Back part Moulding	SET	1	845229
9.	Double Cooling & Heating Back part Moulding	SET	1	845229
10.	Computer Frequency Conversion Thread Dryer	SET	34	845229
11.	Computer- Controlled Cycle Machine with Input Function	SET	20	845229

Sr No.	Particular	A/U	QTY	H.S Code
12.	Non-Benzene Spraying Machine	SET	25	845229
13.	New Type Double Needle Feed Flatbed Sewing Machine Series	SET	10	845229
14.	Punch Machine	SET	14	845229
15.	Gathering (Fullness) for shoe Upper Machine	SET	8	845229
16.	Computer-Controlled Cycle Machine with Input Function	SET	32	845229
17.	Program Able Electronic Pattern Sewer	SET	4	845229
18.	Computer-Controlled Cycle Machine with Input Function	SET	1	845229
19.	Computer-Controlled Cycle Machine with Input Function	SET	2	845229
20.	Computer-Controlled Cycle Machine with Input Function	SET	1	845229
21.	Pounding Machine	SET	19	845380
22.	After-Needing Rubber Machine (Noiseless Type)	SET	3	845380
23.	After-Needing Rubber Machine (Noiseless Type)	SET	5	845380
24.	Foam Skiving Machine	SET	5	845380
25.	Micro-Computerized Belt Cutting Machine with Thermo-Melting Device (Intelligent Type)	SET	4	845380
26.	Hydraulic Plane Cutting Machine	SET	100	845380
27.	Skiving Machine	SET	50	845380
28.	Vamp Ironing Machine	SET	10	845380
29.	Air Rolling Attaching Machine	SET	4	845380
30.	Mini Fusing Press Machine	SET	1	845380
31.	Air Rolling Attaching Machine (Contains the Freezer)	SET	2	845380
32.	Waterfall Painting Machine	SET	7	845380
33.	Plc Brand Knife Splitting Machine	SET	3	845380
34.	Plc Brand Knife Splitting Machine	SET	1	845380
35.	High Speed Band Knife Splitting Machine	SET	2	845380
36.	Automatic Upper Molding Machine	SET	11	845380
37.	Automatic Upper Molding Machine	SET	1	845380

Sr No.	Particular	A/U	QTY	H.S Code
38.	Automatic Upper Molding Machine	SET	1	845380
39.	Hydraulic Sole Pressing Machine	SET	1	845380
40.	Hydraulic Sole Pressing Machine	SET	1	845380
41.	Vertical Spindle Edge Grinding Machine	SET	2	845380
42.	Gross-Type Grinding Roughing Machine	SET	18	845380
43.	Hot Melt Adhesive Coating Machine	SET	5	845380
44.	Hot Melt Adhesive Coating Machine	SET	5	845380
45.	UV Irradiation Machine	SET	5	845380
46.	Rubber Belt Conveyor	SET	5	845380
47.	Nir Infrared Hot Air Heating Oven	SET	10	845380
48.	Rubber Belt Conveyor	SET	1	845380
49.	Nir Infrared Hot Air Heating Oven	SET	1	845380
50.	Rubber Belt Conveyor	SET	3	845380
51.	Nir Infrared Hot Air Heating Oven	SET	12	845380
52.	Rubber Belt Conveyor	SET	3	845380
53.	Nir Infrared Hot Air Heating Oven	SET	12	845380
54.	Rubber Belt Conveyor	SET	5	845380
55.	Rubber Belt Conveyor	SET	5	845380
56.	Rubber Belt Conveyor	SET	5	845380
57.	Rubber Belt Conveyor	SET	5	845380
58.	Nir Infrared Hot Air Heating Oven	SET	5	845380
59.	Nir Infrared Hot Air Heating Oven	SET	5	845380
60.	Nir Infrared Hot Air Heating Oven	SET	5	845380
61.	Nir Infrared Hot Air Heating Oven	SET	10	845380
62.	Aerial Automatic Vulcanizer	SET	5	845380
63.	Nir Drying Attaching Conveyor	SET	5	845380
64.	High Effective Helical Tray Refrigerating	SET	5	845380
65.	Aerial Germicidal Heating Machine	SET	5	845380
66.	Rubber Cleaner	SET	2	845380

Sr No.	Particular	A/U	QTY	H.S Code
67.	Frequency Grinding Roughing Machine	SET	8	845380
68.	Air Inflating Scriber	SET	12	845380
69.	Heavy-Duty Walled Sole Attaching Machine	SET	14	845380
70.	Strong Dust Absorption Machine with 6 Holes	SET	10	845380
71.	Polishing Machine	SET	6	845380
72.	Hydraulic Last Slipping Machine	SET	5	845380
73.	Thermo-Plastic Rubber Box Folder	SET	5	845380
74.	Disk Feed Over seam Machine for Shoe Insole Stitchine	SET	22	845380
75.	Double Cooling & Heating Back part Moduling Machine	SET	2	845380
76.	Upper Steaming Machine with Hot Air Ironing	SET	2	845380
77.	Two-Way Eight Station Gangbao Activator	SET	14	845380
78.	Heat and Steam Leather Drying Machine	SET	2	845380
79.	Vacuum Abrasive Belt Trimming Machine	SET	3	845380
80.	Hydraulic Heel Seat Lasting Machine	SET	2	845380
81.	Wiper Type Double Action Heel-Lasting Machine	SET	4	845380
82.	Hydraulic Heel Seat Lasting Machine	SET	2	845380
83.	Noisedless Shoes Roughine & Dust Collect Machine	SET	15	845380
84.	PCB Type Automic Toe-Lasting Machine	SET	12	845380
85.	Diesel Engine Generator Set	SET	3	845380
86.	Diesel Engine Generator Set	SET	1	845380
87.	Automatic Paralleling Cabinet for Three Machines (ACB)	SET	2	845380
88.	Oil Injection Air Screw Compressor	SET	5	845380
89.	Refrigerant Air Dryer	SET	5	845380
90.	Air Receiver	SET	5	845380
91.	Air Filter	SET	5	845380
92.	Air Filter	SET	5	845380
93.	Industrial Dehumidifiers	SET	8	845380

Sr No.	Particular	A/U	QTY	H.S Code
94.	Cooling Fan	SET	80	845380
95.	Internal Combustion Counterbalanced Forklift Truck	SET	1	845380
96.	Hydraulic Hand Pallet Truck	SET	30	845380
97.	Servo Control System Universal Testing Machine	SET	1	845380
98.	Bally Leathers Flexing Tester	SET	1	845380
99.	Discoloration Meter	SET	1	845380
100.	Aging Oven	SET	1	845380
101.	Dyeing Rubbing Tester	SET	1	845380
102.	Shoe Flexing Tester	SET	1	845380
103.	Bursting Strength Tester	SET	1	845380
104.	Vertical Type Freezing Tester	SET	1	845380
105.	Light Box	SET	1	845380
106.	Vertical Computer Automatic Leather Measuring Machine	SET	1	845380
107.	Multi- Function Fabric Inspection Machine	SET	1	845380
108.	Nir Infrared Hot Air Heating Oven	SET	4	845380
109.	Nir Infrared Hot Air Heating Oven	SET	1	845380
110.	Nir Infrared Hot Air Heating Oven	SET	8	845380
111.	Laser Cutting Machine	SET	1	845380
112.	Edge Lock Machine	SET	2	845380
113.	Shoes Massage Machine	SET	3	845380
114.	Heating Back part Moulding Machine	SET	2	845380
115.	Cole Air Heating Oven	SET	1	845380

Table 3-5 List of Tools and Equipment (Brand New from China)

Sr. No	Particular	A/U	QTY	H.S Code
1.	Mold	SET	93	8480790000
2.	Cutting Knife	SET	64	8208904000
3.	Heel Shaping Mold	SET	2	8481100000
4.	Bottom Mold	SET	12	8480790000
5.	Drawing Line Mould	SET	6	8480790000
6.	Outsole Mould	SET	27	8480790000
7.	Insole Mould	SET	6	8480790000
8.	Printing Board	SET	12	7325109000
9.	Cutting Die	SET	85	8208900000
10	Shoe Mold	SET	500	8208900000

Table 3-6 List of Machineries and Equipment (Brand New from Local)

Sr No.	Particular	A/U	QTY
1.	Rubber Belt Conveyor	SET	1
2.	Heat & Steam Leather Drying Softening Machine	SET	1
3.	Counter Activation Machine	SET	1
4.	Vacuum Turo Jet	SET	1
5.	Rubber Belt Conveyor	SET	2
6.	Two-Layer N.I.R Lights Cement Drying Activating Conveyor	SET	1
7.	Single Layer N.I.R Lights Oven	SET	1
8.	Single Layer N.I.R Lights Oven	SET	2
9.	Turbo Frost	SET	1
10.	PVC Conveyor	SET	1
11.	Rubber Belt Conveyor	SET	1
12.	Ultraviolet Electric Oven	SET	1
13.	Light Stand, Trunking, Sealing Board	SET	1
14.	Suction Cover	SET	1
15.	Suction Cover	SET	1
16.	Suction Cover	SET	1
17.	Slat Conveyor	SET	1
18.	Suction Cover	SET	3
19.	Single Layer N.I.R Lights Oven	SET	1

Sr No.	Particular	A/U	QTY
20.	Single Layer N.I.R Lights Oven	SET	1
21.	UV Ultraviolet Lighting Machine	SET	1
22.	Rubber Belt Conveyor	SET	2
23.	Turbo Frost	SET	1
24.	Freezer	SET	1
25.	Sewing Machine	SET	2
26.	Activation Equipment	SET	2
27.	Heel Setting Machine	SET	4
28.	Oversea Machine for Shoes Insole Stitching	SET	12
29.	Toe Lasting Machine	SET	4
30.	Heel Seat Lasting Machine	SET	4
31.	Steaming Machine (on line)	SET	2
32.	Marking Machine	SET	6
33.	Shoe Attaching Machine (Single Station)	SET	4
34.	Shoe Attaching Machine (Double Station)	SET	4
35.	Hot Melt Adhesive Cementing Machine	SET	2
36.	Double Gantry Needle Detector	SET	2
37.	Last Slipping Machine	SET	2
38.	Cementing Machine	SET	4
39.	Hot Melt Adhesive Injecting Machine	SET	2
40.	Self-Cleaning and Roughing Machine	SET	2
41.	Seat Type Shoe Border Titcher	SET	2
42.	Cutting Machine	SET	24

	
<p>Single Needle Postbed Sewing Machine</p>	<p>Automatic Eyelet Machine</p>
	
<p>Computer Frequency Conversion Thread Dryer</p>	<p>Punch Machine</p>
	
<p>Hydraulic Plane Cutting Machine</p>	<p>Vamp Ironing Machine</p>

	
<p>Mini Fusing Press Machine</p>	<p>Plc Brand Knife Splitting Machine</p>
	
<p>Automatic Upper Molding Machine</p>	<p>Rubber Belt Conveyor</p>
	
<p>Heat and Steam Leather Drying Machine</p>	<p>Hydraulic Heel Seat Lasting Machine</p>

Figure 3-8 Required Machines for Production Process

Table 3-7 List of Electrical Materials and Accessories (Brand New from Local)

Sr No.	Particular	A/U	QTY
1.	Change Over 800 A	pcs	1
2.	Change Over 500 A	pcs	1
3.	Breaker 250 A	pcs	1
4.	Breaker 225 A	pcs	1
5.	Breaker 80 A	pcs	1
6.	C-Channel (cover) 100*500 mm	pcs	60
7.	C-Channel (cover) 120*50	pcs	50
8.	C-Channel (cover) 80*80 mm	pcs	420
9.	C-Channel (cover) 150*50	pcs	120
10.	Lighting Bridge 80*40	pcs	460
11.	Wires (BV) 300 m ²	pcs	150
12.	Wires (BV) 185 m ²	pcs	50
13.	Wires (BV) 120 m ²	pcs	380
14.	Wires (BV) 95 m ²	pcs	250
15.	Wires (BV) 50 m ²	pcs	80
16.	Wires (BV) 25 m ²	pcs	500
17.	Wire (BV) 6 m ²	pcs	10
18.	Wires (BV) 4 m ²	pcs	8
19.	Wires (BV) 2.5 m ²	pcs	14
20.	Wires (BV) 1.5 m ²	pcs	35
21.	Hollow 40*40	pcs	60
22.	Steel rope m ⁶	pcs	500
23.	PVC Pipe Ø 16 mm	pcs	400
24.	PVC C-Channel 14*24	pcs	80
25.	PVC C- Channel 19*39	pcs	80
26.	Power Socket 380 V	pcs	64
27.	Exploration Proof Lamp LED 36 W	pcs	48
28.	LED 100 w	pcs	12
29.	Switch	pcs	80

Sr No.	Particular	A/U	QTY
30.	LED Lighting Set 1200 mm/T8-18 W	pcs	380
31.	Power Supply Socket (Bottom box) 10	pcs	80
32.	PVC Hose Ø 25 mm	pcs	6
33.	Angle Iron 40*40 mm	pcs	25
34.	Copper Wire Terminal	pcs	1
35.	Hardware Accessories	pcs	1
36.	Labor Costs	pcs	1
37.	Enterprise Management Fees and Prof	pcs	1

Table 3-8 Office Equipment, Furniture and Fixtures (Brand New from local)

Sr No.	Particular	A/U	QTY
1.	Executive Table	Pcs	4
2.	Executive Chair	Pcs	4
3.	Canteen Table	Pcs	100
4.	Canteen Chair	Pcs	1000
5.	Office Table	Pcs	20
6.	Office Chair	Pcs	20
7.	Cabinet (Small)	Pcs	5
8.	Cabinet (Big)	Pcs	5
9.	Coffee Cabinet	Pcs	1
10.	Computer	Pcs	10
11.	Computer Server	Pcs	1
12.	Printer	Pcs	5
13.	Copier	Pcs	1
14.	Sofa	Pcs	1
15.	Meeting Table	Pcs	1
16.	Meeting Chair	Pcs	10
17.	Air Con	Pcs	10
18.	Water Cooler	Pcs	10
19.	Stationary	Pcs	2

3.5.3. Chemicals Usage and Storage

Chemicals such as various kinds of glue, finish agents and hardeners are required to manufacture various kinds of shoes and the chemicals will be purchased from China. The lists of chemicals used in the production process are shown in Table 3-9 and all the chemicals are stored in the dangerous goods warehouse which is located behind the workshop building (phase 1). The concrete floor of the dangerous goods warehouse is filled with sand and the chemicals are stored away from direct sunlight and sources of heat. The chemical storage room is shown in Figure 3-9 and materials safety data sheets of the chemicals are described in **APPENDIX F**.

Table 3-9 Chemicals Usage in the Production Process

No.	Description	Weight (1 unit)	Estimated Rate of 1 Day Usage	Estimated Rate of 1 Year Usage	Country	Purpose
1	Finish Agent (D-11)	15 kg	0.5	150	China	To attach the same kind of outsole / To attach the outsole and upper
2	Finish Agent (1016A)	15 kg	2	600	China	To attach the same kind of outsole
3	Hardener HA-100N	1 kg	5	1500	China	To use in the PU glue
4	Glue (86KN)	15 kg	20	6000	China	To attach the same kind of outsole / To attach the outsole and upper
5	Glue (762N)	15 kg	0.5	150	China	To adhere outsole with super clean
6	Glue (NP585)	20 kg	1	300	China	To attach the same kind of outsole
7	Glue (A409)	15 kg	0.5	150	China	To adhere the same kind of upper
8	Glue (111PD)	15 kg	2	600	China	To bond with outsole after cleaning the upper
9	Glue (P8-8N)	15 kg	0.5	150	China	To clean the outsole
10	NP8-32N	15 kg	2	600	China	To attach the same kind of outsole
11	Glue JW-043	15 kg	0.5	150	China	To attach the same kind of outsole
12	Hardener CL-80	1 kg	1	300	China	To use in water based glue
13	Hardener NB-RFE	1 kg	1	300	China	To use in glue



Figure 3-9 Chemicals Storage Room

3.5.4. Employment

Working hours of the proposed factory are between 7:00 am to 4:00 pm from Monday to Friday and between 7:00 am to 11:00 am on Saturday. The break time will be 12:00 pm to 1:00 pm on weekday. If the workers are required to work overtime, the proposed factory will pay for the overtime fee according to all relevant Labour law. Sunday and public holidays are closed. 2,984 local employees and 30 overseas employees are planned to employ in the factory. The proposed factory working time will be one shift per day. The detailed list of local and oversea employment are shown in Table 3-10 and Table 3-11.

Table 3-10 List of Local Employee

Sr. No	Designation	Number of Person
1.	HR- Manager	2
2.	SEA Supervisor	5
3.	SEA Staff	10
4.	Administrator Supervisor	2
5.	Administrator Staff	8
6.	Supervisor	5
7.	Office Staff	10
8.	Finance Supervisor	2

Sr. No	Designation	Number of Person
9.	Finance Staff	8
10.	Warehouse Supervisor	2
11.	Warehouse Staff	5
12.	Production Supervisor	5
13.	Production Staff	2
14.	Quality Control	15
15.	General Affair Supervisor	5
16.	General Affair Staff	7
17.	Security	8
18.	Mechanical Engineers	10
19.	Driver	5
20.	Cleaning Staff	15
21.	Skill Worker	2,000
22.	Un Skill Worker	850
23.	Interpreter	5
Total		2,986

Table 3-11 List of Oversea Employee

Sr. No	Designation	Number of Person
1.	General Manager	1
2.	Production Manager	2
3.	Mechanical Engineer	5
4.	Financial Officer	2
5.	Quality Control	8
6.	Technical Staff	10
7.	Politician	1
8.	Logistics, Warehousing	1
Total		30

3.5.5. Production Process

The production process for shoes is generally the same for all types of shoes and involves numerous steps to produce each type of shoe. Shoes upper part raw materials and outsole raw materials are required as described in Section 3.5.1 and the required norm for one pair of sport shoes (men and ladies), sport shoes (junior) and casual shoes (men and ladies) are shown in Table 3-12. These raw materials are processed by cutting, stitching, lasting and packaging stages. The production process flow chart is shown in Figure 3-10. They will be exported to foreign country.

Table 3-12 Norm for One Unit (One Pair)

Sr. No	Particulars	Unit	Sport Shoes (Men & Ladies)	Sport Shoes (Junior)	Casual Shoes (Men & Ladies)	H.S. CODE
1.	Anti-Mildew Slice	U	1.0000	1.0000	1.0000	42.2290000
2.	Back Counter	U	1.0000	1.0000	1.0000	9029100000
3.	Carton	U	0.1000	0.1111	0.10000	4819100000
4.	Inner Box	U	1.0000	1.0000	1.0000	4817300000
5.	Printing Label	U	1.0000	1.0000	1.0000	4821100000
6.	Carton Label	U	0.1000	0.1111	0.1000	4821100000
7.	Buckle	U	2.0000	2.0000	2.0000	8308900000
8.	Stud	U	24.0000	20.0000	24.0000	7117110000
9.	Eyelet Button	U	24.0000	20.0000	24.0000	9606290090
10.	Snap Fastener	U	2.0000	2.0000	2.0000	9606100000
11.	Fiberglass	M	0.0096	0.0088	0.0096	7019190090
12.	Foam	M	0.0124	0.0952	0.0124	6806200000
13.	Waterproof Foam	M	0.0124	0.0952	0.0124	6806200000
14.	EVA Sheet (Synthetic Rubber)	U	0.0006	0.0196	0.0006	3702559000
15.	EVA Sheet (Synthetic Rubber)	M	0.0098	0.0098	0.0098	3702559000
16.	Stitching Lines/ Thread (1U=1350Y)	U	0.3412	0.0105	0.3412	5401100000
17.	Cotton Thread (1U=1350Y)	U	0.3412	0.0105	0.3412	5401100000
18.	Polyester Line// (1U=1350Y)	U	0.3412	0.0105	0.3412	5401100000

Sr. No	Particulars	Unit	Sport Shoes (Men & Ladies)	Sport Shoes (Junior)	Casual Shoes (Men & Ladies)	H.S. CODE
19.	Full Grain	M	1.1219	0.0620	1.1219	3702529000
20.	Leather (Synthetic)	M	1.1219	0.0620	1.1219	5702419000
21.	Sheepskin	M	1.1219	0.0620	1.1219	3702529000
22.	Cow Leather	M	1.1219	0.0620	1.1219	5702419000
23.	Suede	M	1.3228	0.0832	1.3228	3702529000
24.	Insole Leather	M	0.5397	0.2840	0.5397	5702419000
25.	Waterproof Leather	M	1.1219	0.0620	1.1219	5702419000
26.	Glue	KG	0.0267	0.0133	0.0267	5806209000
27.	Finish Agent	KG	0.0030	0.0015	0.0030	5806209000
28.	Hardener	KG	0.0035	0.0018	0.0035	5806209000
29.	Good Tex	U	0.0377	0.0180	0.0377	4202290000
30.	Hang Tag	U	2.0000	2.0000	2.0000	4202290000
31.	Insole Sheet	U	2.0000	2.0000	2.0000	4202290000
32.	Synthetic PVC	M	0.01162	0.0328	0.0162	3702559000
33.	Injection (Plastic Sheet)	U	1.0000	2.0000	1.0000	4202290000
34.	Melt Adhesive Tape	M	0.4426	0.0393	0.4426	3702529000
35.	Melt Adhesive Tape	U	0.2951	0.02262	0.2951	420290000
36.	Membrane	M	0.0329	0.0292	0.0329	3702529000
37.	Microfibre	M	0.0256	0.0128	0.0256	3702529000
38.	Muslin	M	0.1583	0.0792	0.1583	3702559000
39.	Percal Cloth	M	0.0396	0.00043	0.0396	3702559000
40.	Canvas	M	0.0516	0.0296	0.0516	3702559000
41.	Niddle Cloth ASN	M	0.0073	0.0073	0.0073	3702559000
42.	Non- Woven Cloth	M	0.2587	0.0240	0.2587	3702559000
43.	Nylon Cloth	M	0.1123	0.0562	0.1123	37025590000
44.	Middle Cloth	M	0.0420	0.0210	0.0420	3702529000

Sr. No	Particulars	Unit	Sport Shoes (Men & Ladies)	Sport Shoes (Junior)	Casual Shoes (Men & Ladies)	H.S. CODE
45.	Sandwich Mesh	M	0.1188	0.0594	0.1188	3702529000
46.	Mesh	M	0.0373	0.00578	0.0373	3702529000
47.	Coarse Cotton Cloth	M	0.0594	0.0297	0.0594	3702529000
48.	Canberra	M	0.0033	0.0017	0.0033	3702529000
49.	Velvet	M	0.0033	0.0017	0.0033	3702529000
50.	Waterproof Mesh	M	0.1188	0.0594	0.1188	3702529000
51.	Nylon Rubble Buckle	U	2.0000	1.0000	2.0000	420290000
52.	Nylon Shank	U	1.0000	0.0000	1.0000	420229000
53.	Nylon Tape	M	0.7152	0.3576	0.7152	3702529000
54.	Oil Paper	U	8.0000	4.0000	8.0000	4202290000
55.	Tissue Paper	U	1.0000	1.0000	1.0000	4202290000
56.	Wrapping Paper	U	27.0000	20.0000	27.0000	4202290000
57.	Pictogram Label	U	2.0000	1.0000	2.0000	4202290000
58.	Tape	M	1.3474	0.6737	1.3474	3702529000
59.	Circle Tape	M	1.3474	0.6737	1.3474	3702529000
60.	Synthetic PU Leather	M	0.0721	0.1641	0.0721	3702529000
61.	PU Midsole Sheet	U	2.0000	2.0000	2.0000	3702529000
62.	Shoe Lace	U	2.0000	2.0000	2.0000	3702529000
63.	Elastics Band	M	1.3474	0.6737	1.3474	3702529000
64.	Tongue Label	U	2.0000	2.0000	2.0000	4202290000
65.	Outsole Sheet	U	2.0000	2.0000	2.0000	4202290000
66.	Folder	U	1.0000	2.0000	1.0000	4202290000
67.	Velcro Hook/Loop	M	0.2000	0.1000	0.2000	3702529000
68.	Shoes Lasting	U	0.0500	0.0500	0.0500	4202290000
69.	Plastics Chopstick	U	2.0000	2.0000	2.0000	4202290000

Sr. No	Particulars	Unit	Sport Shoes (Men & Ladies)	Sport Shoes (Junior)	Casual Shoes (Men & Ladies)	H.S. CODE
70.	Bamboo Chopsticks	U	2.0000	2.0000	2.0000	4202290000
71.	Shoe Form	U	2.0000	2.0000	2.0000	4202290000
72.	Cardboard	U	0.4246	0.0189	0.4246	4202290000
73.	Midsole Sheet	U	2.0000	2.0000	2.0000	4202290000
74.	Heel Cup Phylon	U	2.0000	2.0000	2.0000	4202290000
75.	Zipper	U	2.0000	2.0000	2.0000	3702529000
76.	Face Light	U	0.0000	4.0000	0.0000	4202290000
77.	Bottom Light	U	0.0000	2.0000	0.0000	4202290000
78.	Mold	U	0.0500	0.0500	0.0500	4202290000
79.	Semi-Finished	U	0.1000	0.1000	0.1000	4202290000

Note: U = Unit, M = Meter, KG = Kilogram, Y = Yard

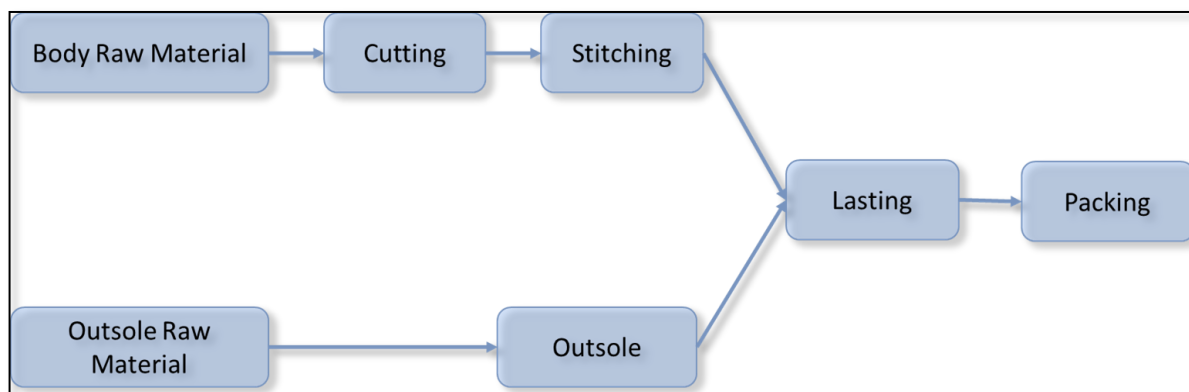


Figure 3-10 Production Process Flow Chart

3.5.5.1. Cutting Process

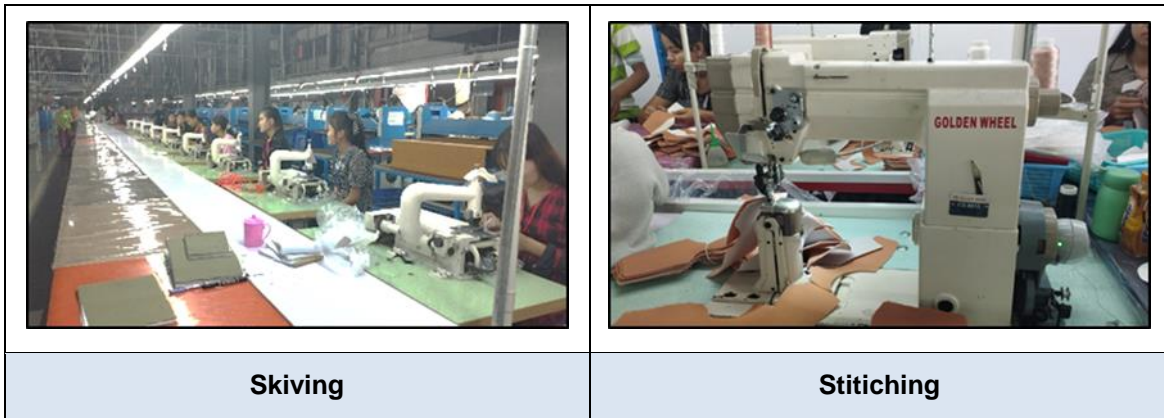
The first stage of shoe manufacturing is the cutting process of raw materials according to customer’s shoe design. In cutting process, the raw materials such as leathers, mesh, fabric and so on are cut by using steel cutting mold dies in hydraulic plane cutting machine. Every shoe part requires its own cutting mold die or shoe pattern which is sharp and different in size, shape and design. The cutting mold dies are placed on the leather or fabric materials and the hydraulic plane cutting machine are pressed to make the cuts. After shoe parts are cut according to shoes pattern, they will be sent to stitching process. The cutting process is shown in Figure 3-11.



Figure 3-11 Cutting Process

3.5.5.2. Stitching Process

Before stitching process, the thickness of some cutting shoe parts are reduced by using skiving machine according to customer's design requirement. The cutting parts from the cutting department are stitched by the stitching machines such as single needle post-bed sewing machines, double needle postbed sewing machines and so on. In this process, the upper parts of shoe are assembled and the foam for collars and tongues are inserted. The upper parts from the stitching process are sent to Quality Control (QC) department to check. Then, the qualified upper parts of shoe from QC department are sent to lasting section to attach with outsoles. The stitching process is shown in Figure 3-12.



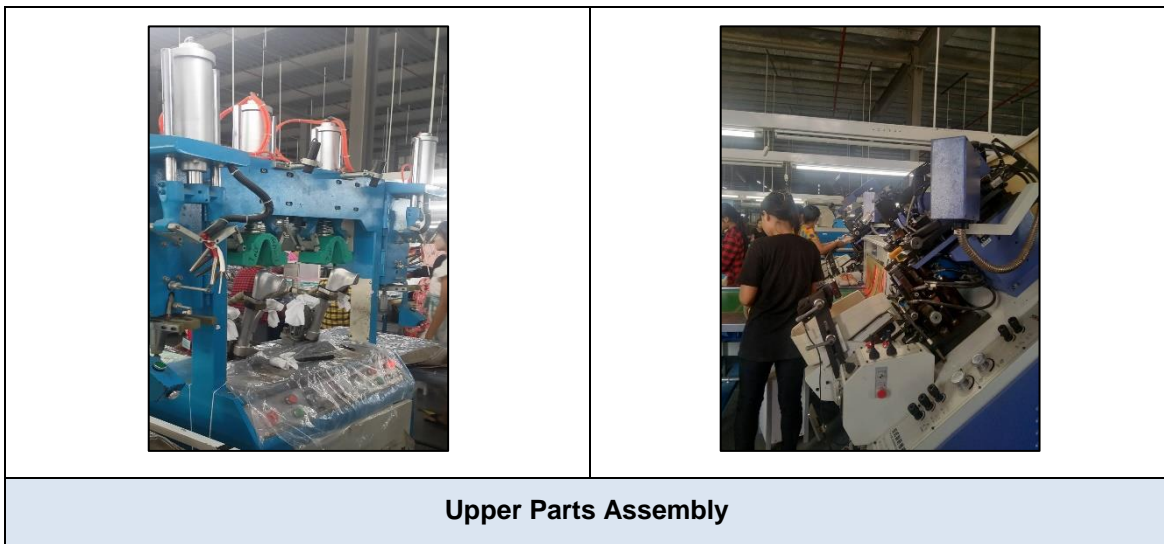


Figure 3-12 Stitching Process

3.5.5.3. Sticking Outsoles with Glue Process

Outsoles materials are directly imported from China. Before applying glue on the outsoles, the surfaces of outsoles that need to attach with the upper parts are grinded by using frequency grinding roughing machine, air inflating scribe and so on in order to strongly attach with the upper parts. After that, the glue is applied on the rough surfaces of outsoles and they are combined with the upper parts. Grinding process can produce a lot dust that can be harmful to the workers. For this process, strong dust absorption machine with 6 holes are installed in the room in order to absorb dust. Sticking outsoles with glue process is described in Figure 3-13.



Figure 3-13 Sticking Outsoles with Glue Process

3.5.5.4. Lasting and Packing Process

In the lasting process, the upper parts are bonded with the outsoles by both manual and machines. After the previous process, the production process is finished and the product is checked by QC section. The qualified products from the QC section are packed with the inner shoe box and stored at the warehouse. Once the desired amount is obtained, the products are exported to foreign countries. Lasting and packing processes are shown in Figure 3-14.



Figure 3-14 Lasting and Packing Processes

3.5.6. Production Rate

There are three types of products such as sport shoes (Men and Ladies), sport shoes (Junior’s) and casual shoes (Men and Ladies). ABGL will export the final products to Italy, United States, Hong Kong, China, Japan, Thailand, Vietnam and Korea. The total production rate for the first year is expected to be 520,000 Pairs and the production rate is expected to be increased to 1,058,000 Pairs on 6th year - 30th year. The expected annual production statement is presented in Table 3-13.

Table 3-13 Annual Production Statement for Shoes – Injection (Men/Women)

Sr. No	Particular	A/U	Year - 1	Year - 2	Year - 3	Year - 4	Year - 5	Year 6 - 30
1.	Sport Shoes	Pairs	150,000	165,000	198,500	282,275	262,500	301,875
2.	Sport Shoes (Junior’s)	-	150,000	165,000	198,500	282,275	262,500	301,875
3.	Casual Shoes (Men and Ladies)	-	220,000	242,000	295,000	339,250	395,000	454,250
Total			520,000	572,000	692,000	795,800	920,000	1,058,000

3.5.7. Types of Product

Three kinds of shoe such as sport shoes (Men and Ladies), Sport Shoes (Junior’s) and Casual Shoes (Men and Ladies) will be produced by CMP basic. The sample types of products are presented in Figure 3-15.



Figure 3-15 Types of Products

3.6. INFRASTRUCTURE AND FACILITIES OF PROPOSED PROJECT

3.6.1. Project Development

As described in Section 3.4, the ABGL project is planned to develop into two phase: phase 1 and phase 2. For project phase 1, one workshop building and one warehouse building and other associated buildings such as mechanic warehouse, dangerous goods warehouse, power station generator room, guardhouse, waste storage yard, fire system pool and septic tanks had been constructed. One dormitory, one office building and one workshop building are planned to construct in project phase 2.

3.6.2. Project Site Land Use Prescription

The total project site area is 35,240.057 square meter. The total area for construction in project phase 1 is 15634.45 square meter while the total area for the construction of project phase 2 is 7,094.92 square meter. The other associated buildings such as mold room, warehouse, generator room, garbage room, firefighting room, guardroom, car parking lots and underground fire pool will also be constructed. The summary on land use prescription of the project site is presented in Table 3-14.

Table 3-14 Land Use Prescription

No.	Particulars	Phase	Submission (Feb, 2020)		Remark
			Area	Unit	
1.	Project Site Area		35,240.057	m ²	Not Change
2.	Project Floor Area		40,664.840	m ²	Not Change
3.	Workshop Building	1	4,692	m ²	
4.	Warehouse Building	1	3,300	m ²	
5.	Mechanic Warehouse	1	75	m ²	
6.	Dangerous Goods Warehouse	1	82	m ²	
7.	Power Station Generator Room	1	196.8	m ²	
8.	Guard House	1	18	m ²	
9.	Waste Storage Yard	1	162	m ²	
10.	Fire System Pool	1	420	m ²	
11.	Septic Tanks between warehouse and workshop	1	26.25	m ²	
12.	Septic Tank near guard house	1	3.82	m ²	
13.	Main Septic Tank	1	144	m ²	
Total			1	15634.45	m²
14.	Workshop Building	2	4,682	m ²	
15.	Dormitory	2	1610.36	m ²	
16.	Office	2	802.56	m ²	
Total			2	7094.92	m²

3.6.3. Traffic System and Transportation Vehicles

3.6.3.1. Entrance, Exit, Internal Road and Packing Lots

There is one main entrance in the project site to access with Mahar Myaing Street. Car parking space that has capacity of twenty lots is also planned to construct in the project site. No traffic congestion is expected in the proposed project factory.

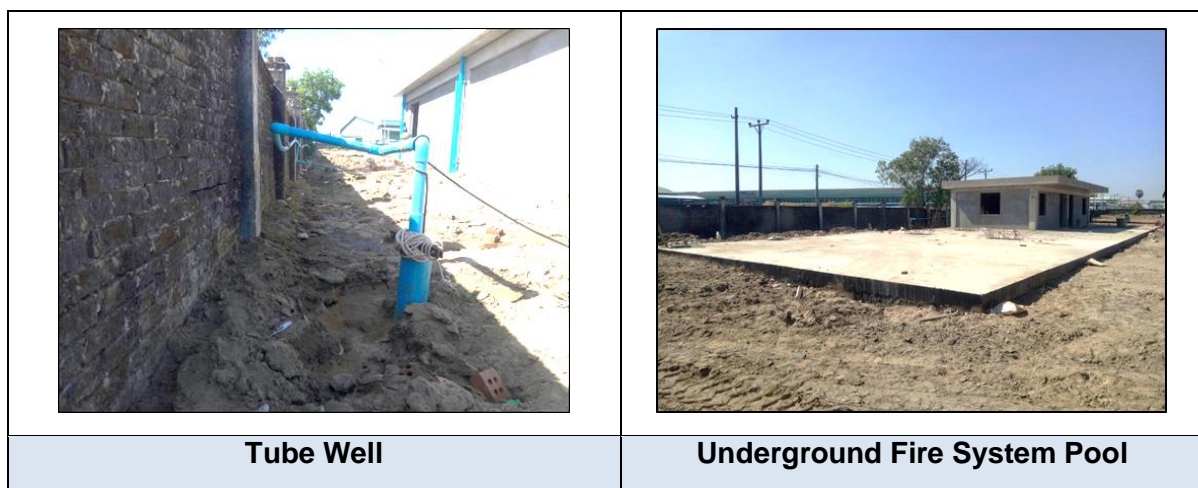
3.6.3.2. Transportation Vehicles

One unit of 5.7 ton truck, one unit of 18 ton truck, one unit of 3 ton forklift and ferry cars will be utilized for this project.

3.6.4. Water Supply System

3.6.4.1. Water Source

Water supply for the factory and staff dormitory is mainly provided from tube well. Drinking water from the drinking water treatment system is provided for the workers. The drinking water treatment system is Reverse Osmosis (R.O.) water treatment system and the equipment flow chart of R.O drinking water treatment system is shown in Figure 3-17. The production rate of drinking water treatment system is 3,000 Gallons per Day (GPD) and 0.5 m³/hr. The removal rate of drinking water treatment system is 96%±2%. The tube well is located near the underground fire system pool of the project site as shown in Figure 3-2. The depth of the tube well is 42.67 meters. The water is stored in the water storage tanks and it is distributed through pipeline system to each building in the project site. The area of underground fire system pool is 420 square meters and the volume of water storage tank is 1,050 cubic meters. 262,053 gallons of water can be stored in the underground fire system pool. The water from the water storage tank will be utilized for the emergency firefighting system and for the factory's operation. The water distribution system is shown in Figure 3-16.



	
<p>Provided Water Cooler at the Work Place</p>	<p>Water Storage Tank and Drinking Water Treatment Machine (Operation Phase)</p>

Figure 3-16 Water Supply Distribution System

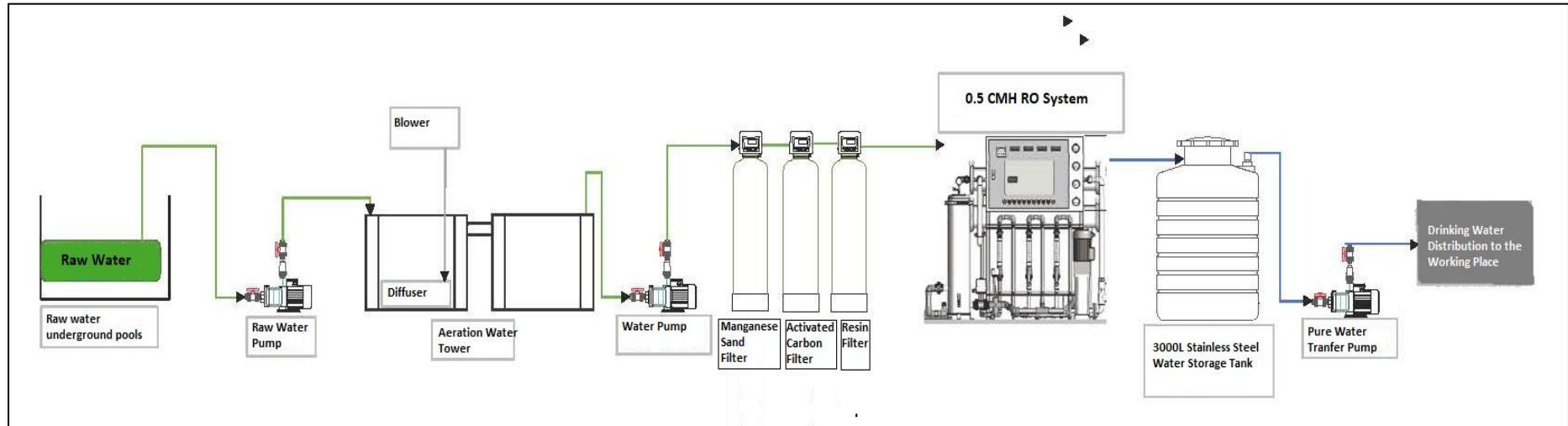


Figure 3-17 Equipment Flow Chart of R.O Drinking Water Treatment System

3.6.4.2. Estimated Water Demand

Water supply for construction stage will be mainly provided from tube well. 20.8 cubic meters/square meters will be required for construction of buildings (Heravi & Abdolvand, 2019)³ and 0.11 cubic meters per person per day of water will be required according to Yangon City Development Committee (YCDC)⁴. Therefore, the estimated water demand for project phase-1 construction area is 325,196.5 cubic meters while the estimated water demand for project phase-2 construction area is 147,574.3 cubic meters. Moreover, the estimated water demand for operation phase is 331.54 cubic meters per day that is calculated based on the number of factory's employees that are 3,014 employees. However, there is no significance water demand for the operation processes since the factory manufacture various types of shoes based on CMP.

3.6.5. Wastewater Discharge

A certain amount of wastewater will be generated during construction phase and operation phase. During operation, only domestic wastewater from the factory workers will be generated since the factory operate manufacturing of shoes on CMP basis. The domestic wastewater from the project site will directly discharge to drainage channel. There are four sub- septic tanks and one main septic tank. Three sub-septic tanks are located between workshop building and warehouse building and one sub-septic tank is located near guardhouse. The main septic tank is located near the workshop building. Sewage from buildings in the project site will be collected by sub-septic tanks and main septic tank, and will be discharged in line with the Government Rules and Regulations. The location of septic tanks is shown in Figure 3-2 and the current condition of sub-septic tanks and main septic tank construction can be seen in Figure 3-18.

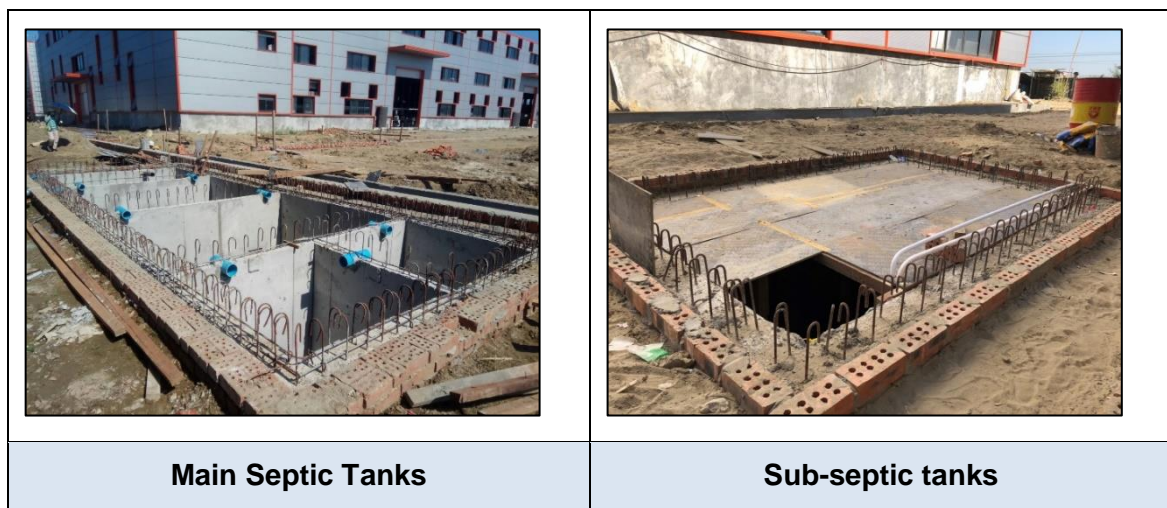


Figure 3-18 Location of the Septic Tanks

³ Gholamreza Heravi & Mohammad Mehdi Abdolvand (2019). Sustainable Cities and Society: Assessment of water consumption during production of material and construction phases of residential building projects. doi.org/10.1016/j.scs.2019.101785.

⁴ Mr. Kyaw Thar Sein (6-8 March, 2012). Water and Sanitation Requirements for Environmentally Sustainable Yangon City. 3rd High Level Seminar on Environmentally Sustainable Cities Angkor Era Hotel, Siem Reap, Cambodia.

3.6.6. Drainage System

There are two drainage channels such as main drain and secondary drain inside the whole project area compound. The secondary drains of workshop buildings and warehouse building are connected to the main drainage channel of the project site. The width and depth of main drain are 600 mm and 700 mm respectively. The dimension of secondary drain is 600 mm width and 400 mm depth. The domestic wastewater from the secondary drains will be discharged into the main drainage channel and then flow to the industrial zone drainage channel. The current situation of drainage channel construction is shown in Figure 3-19.



Figure 3-19 Current Situation of Drainage Channel Construction

3.6.7. Solid Waste Management

According to the IGES (2016)⁵, the estimated amount of waste generation from each person is 0.4 kilogram per person per day. There are 462 workers during construction phase and the waste generation is estimated approximately 184.8 kilogram per day from the construction workers.

During operation phase, there will be a certain amount waste generation from the manufacturing processes and factory's workers. Solid wastes such as cutting pieces, used chemical containers, carton box and so on will be generated from the operation processes. Food wastes will be mainly generated from the factory's workers. Based on the number of factory's employees, the estimated waste generation from the factory's workers is approximately 1,193.6 kilogram per day and the estimated waste generation from the operation process is 650 kilogram per month. There are sufficient garbage bins in the

⁵ IGES (June, 2016), Quick Study On Waste Management in Myanmar

project site. The solid wastes from the project site are systematically collected at waste store yard and they are disposed at final disposal site according to the guideline of YCDC. The waste storage yard is located near power generator room as shown in Figure 3-2 and the area of waste storage yard is 162 square meters. The solid waste bins that are provided in the project site and the current condition of waste storage yard are shown in Figure 3-20.



Figure 3-20 Solid Waste Bins and Waste Storage Yard

3.6.8. Electricity System

Temporary diesel engine generator will be used to supply electricity during the construction phase. For operation phase, 2000-kilo voltage-ampere (kVA) transformer from 33-kilovolt (kV) line will be set up at the project site in line with the rules and regulation of Yangon Electricity Supply Corporation to supply the electricity. Currently, three numbers of 640 kVA diesel engine generators are set up in the project site. After the project phase 2 is completely constructed, the number of power generators can be increased depending on the production rate and the permission of transformer installation. The transformer and generators will be placed at the power generator room that has the area of 196.8 square meters. Diesel storage tank is placed near the power generator room. The volume of diesel generator is 12,000 L and the dimension is 1.9 meters in height, 3 meters in length and 1.9 meters in width. Currently, 194 gallons of diesel during week day and 97 gallons of diesel during weekend are utilized for the factory operation. However, the fuel consumption per day will be decreased after installing the transformer in the factory compound. The electricity supply system is as shown in Figure 3-21. The annual electricity requirements for the operation of the proposed factory are described in Table 3-15.



Figure 3-21 Electricity Supply System

Table 3-15 Annual Electricity Usage

Sr. No	Particulars	A/U	Year-1	Year-2	Year-3	Year-4	Year-5	Year 6-10
1.	Electricity	kWh	873,174	2,003,502	2,166,011	2,266,662	2,289,328	2,312,222

3.6.9. Air Ventilation System

For the air circulation system of the building, industrial ventilation fans, 40 numbers of air conditioners and windows are installed at the project buildings. Currently, there are 15 numbers of installed air conditioners and the numbers of air conditioners will be increased to 40 units after the buildings of phase 2 are constructed. Air conditioners used in this project operate with refrigerants such as R32 and R410A which are not included in banned list of ozone depletion substances. The air ventilation system is shown in Figure 3-22.

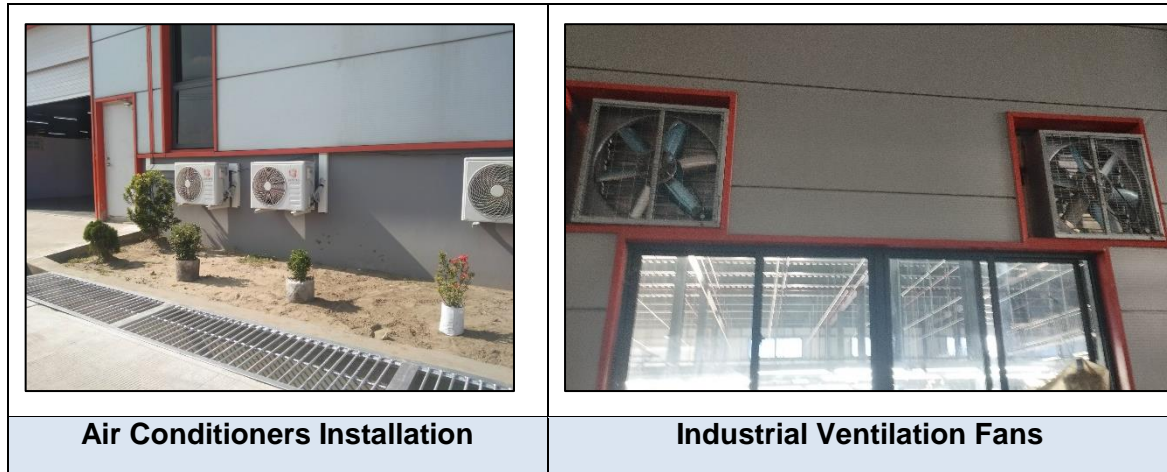


Figure 3-22 Air Ventilation System

3.6.10. Provided Facilities

Currently, facilities such as clean toilets, health care clinic, clean drinking water, PPE such as gloves and masks, canteen and ferry are provided to the factory's workers. After phase 2 construction is completed, accommodation will be also provided to the workers. The provided facilities for the workers are shown in Figure 3-23.



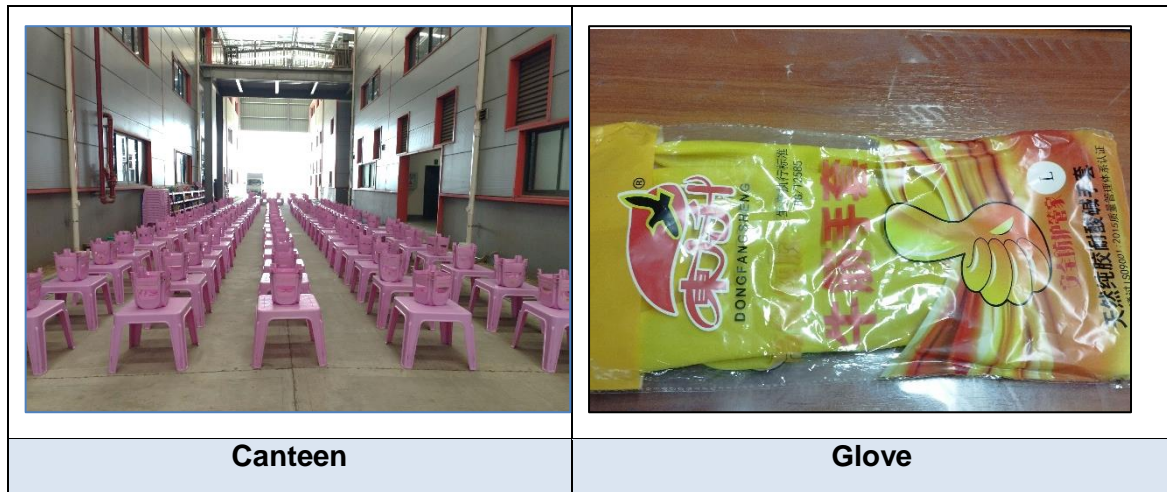


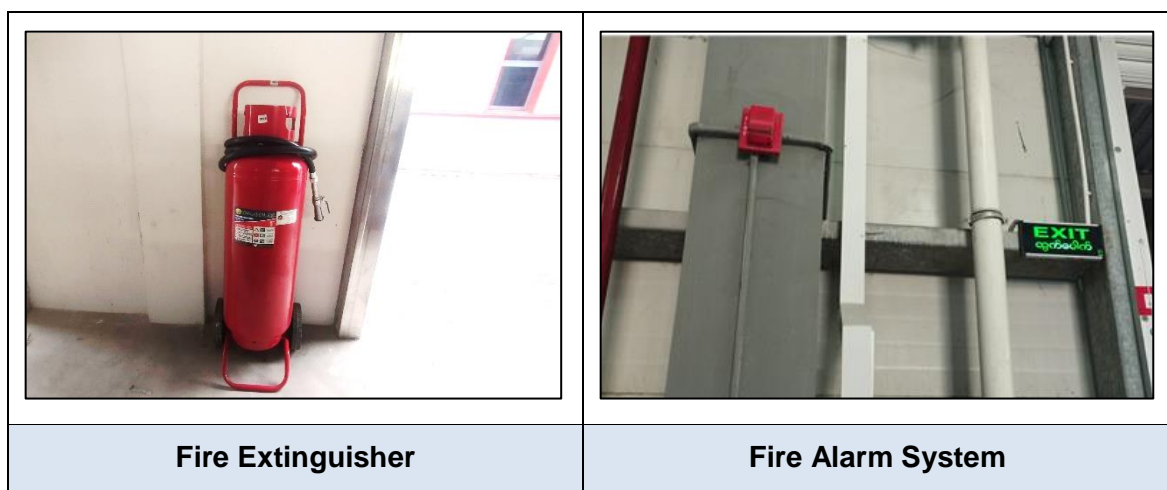
Figure 3-23 Provided Facilities

3.6.11. Landscaping

After the construction and erection works are completed, the remaining exposed surfaces of the project site will be treated to landscaping plan. Landscaping plan will be developed by the contractor to provide effective screening of the project.

3.6.12. Firefighting System and Emergency Exit

The underground fire system pool is constructed in the factory compound and the capacity of underground fire system pool is 262,053 gallons. The area of fire system pool is 420 square meters and the volume of fire system pool is 1,050 cubic meters. The buildings in the project will be constructed with steel structure to prevent from fire hazard. Currently, 140 fire extinguishers, 34 fire hose reel and 34 fire alarm system are placed at the factory as shown in Figure 3-24 and the number of fire extinguishers, fire hose reel and fire alarm system will be increased when the phase 2 construction is completed. ABGL will arrange firefighting training for the employees once a year and conduct fire drill monthly. The location maps of emergency door plan for warehouse and workshop buildings are shown in Figure 3-25 and Figure 3-26, respectively.



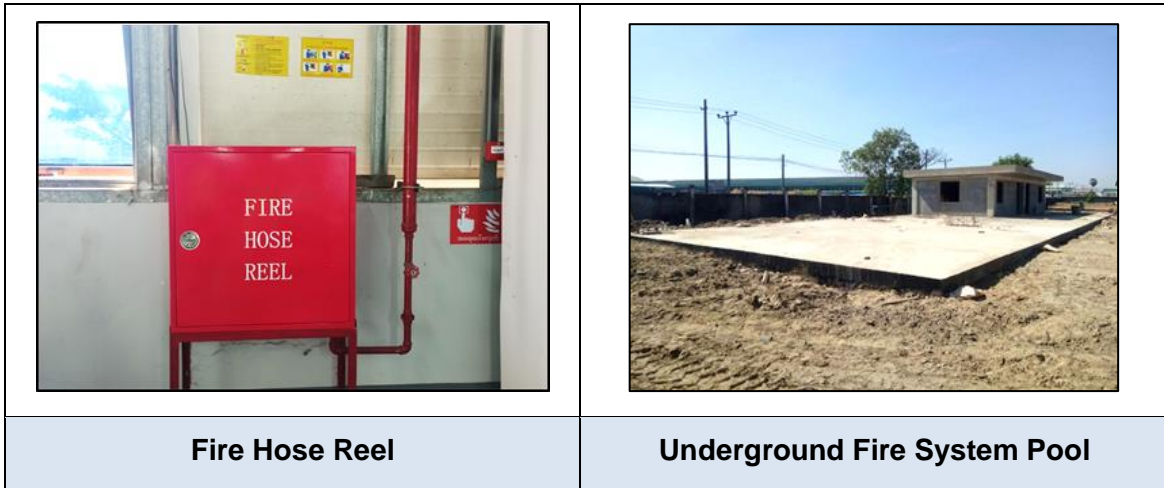


Figure 3-24 Firefighting System



Figure 3-25 Emergency Door Plan for Warehouse Building

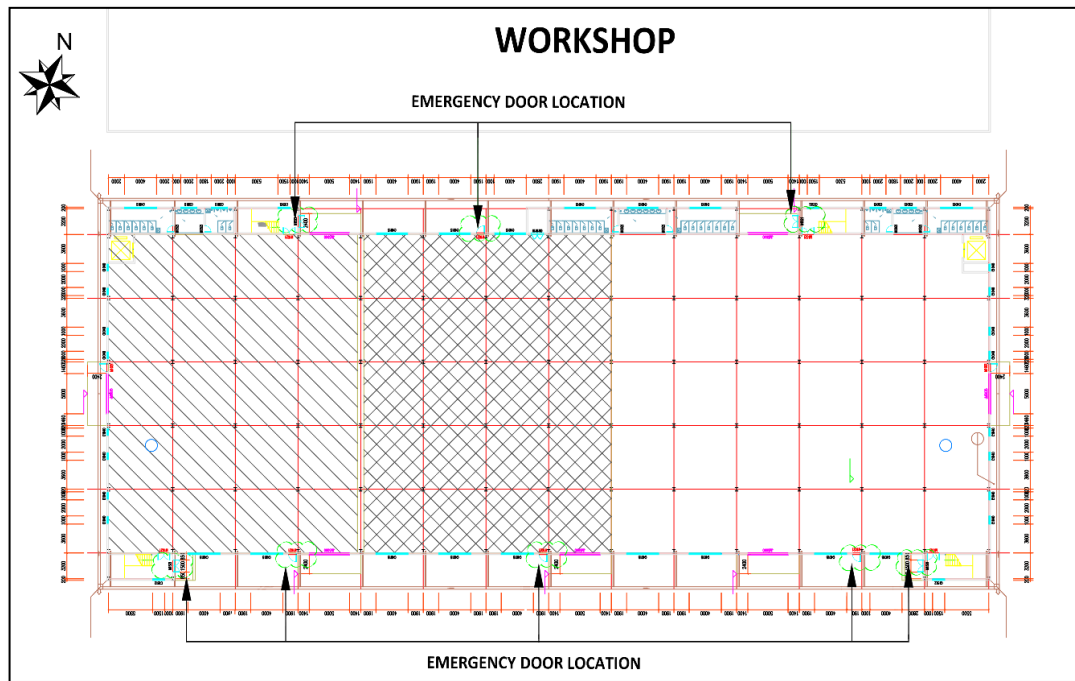


Figure 3-26 Emergency Door Plan for Workshop Building

3.7. PROJECT IMPLEMENTATION

The construction of the project was started in 2020. The factory construction is expected to be finished in 2023.

3.7.1. Number of Construction Workers

The estimated total number of construction workers for the proposed project is 462 and the list of construction workers is shown in Table 3-16.

Table 3-16 List of Construction Labors

No.	Activities	No. of workers
1.	Land filling and levelling	30
2.	Drainage system	25
3.	Road system	15
4.	Water supply system	20
5.	Wastewater collection and treatment system	25
6.	Solid waste disposal system	30
7.	Electrical system	45
8.	Civil Works	60
9.	Pile Foundation	35
10.	Steel Structure	97
11.	Interior Design	80
Total		462

3.7.2. Construction Schedule

The construction for project phase 1 is completed. Although the construction period is planned to be within 2 years, it is extended for project phase 2. The tentative construction schedules for project phase 1 and project phase 2 are presented in Table 3-17 and Table 3-18.

Table 3-17 Tentative Construction Schedule for Project Phase 1

Description	2019				2020						2021						2022				
	May-June	July – Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug	Sept - Oct
Detailed Design and Bidding																					
Topographic Survey and Soil Investigation																					
Detailed Design																					
Tender/contract Documentation and Bidding																					
Construction Phase																					
Land Filling and Levelling																					
Drainage System																					
Road System																					
Water Supply System																					
Wastewater Collection and Treatment																					
Solid Waste Disposal System																					
Electrical System																					

Description	2019				2020						2021						2022					
	May-June	July – Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug	Sept - Oct	
Civil Works and Landscape Architecture																						
Building Works																						
Factory Construction																						

Table 3-18 Tentative Construction Schedule for Project Phase 2

Description	2023	2024						2025						2026			
	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar- April	May-June	July – Aug
Office Building Construction																	
Dormitory Building Construction																	
Workshop Building Construction																	

CHAPTER 4

DESCRIPTION OF SURROUNDING ENVIRONMENT

4.1. SETTING THE STUDY LIMIT

In this EIA study, it is necessary to establish baseline information on the environmental and socio-economic settings of an area, which could receive directly, and indirectly impacts from the project construction and operation. The baseline information serves two purposes. Firstly, it is used, in conjunction with the information on the project, for identification of potential impacts of the project and assessment of their significance. Secondly, it serves as the benchmark for evaluating environmental and social management performance of the project construction and operation.

As the EIA procedure does not define the study area for EIA study, the EIA study area for this project is roughly defined to be the area within a 3 kilometers radius of the center of the project site. This study area would be large enough to cover most potential environmental and social impact issues of the project construction and operation.

This chapter describes environmental and socio-economic settings of the study area based on latest available secondary information and primary information collected from field surveys.

4.1.1. Geographical Study Limit

The geographical study limit is defined as an area surrounding the project site from which the baseline information should be collected. The total area of the site is approximately 35,240.057 square meters, located in Shwe Pyi Thar Township. This geographical study limit is about 3 kilometers radius around the project site. This area is referred to in subsequent sections of this EIA Report as the study area. The study area should cover sensitive receptors of environmental impacts of the project during construction and operation phases.

The study area is industrialized area of Shwe Pyi Thar Township. In this study area, there are mostly residential area, agricultural area, industrial area and water body.

4.1.2. Area of Influence

Figure 4-1 shows the area of influence of the proposed project. The water bodies such as Lain Gone Creek and Hlaing River are situated within 3 km radius of the project. Project site and 1 km study limit are mainly located at 23 Ward. Environmental baseline study and socio-economic study are implemented within 3 km radius of the project.

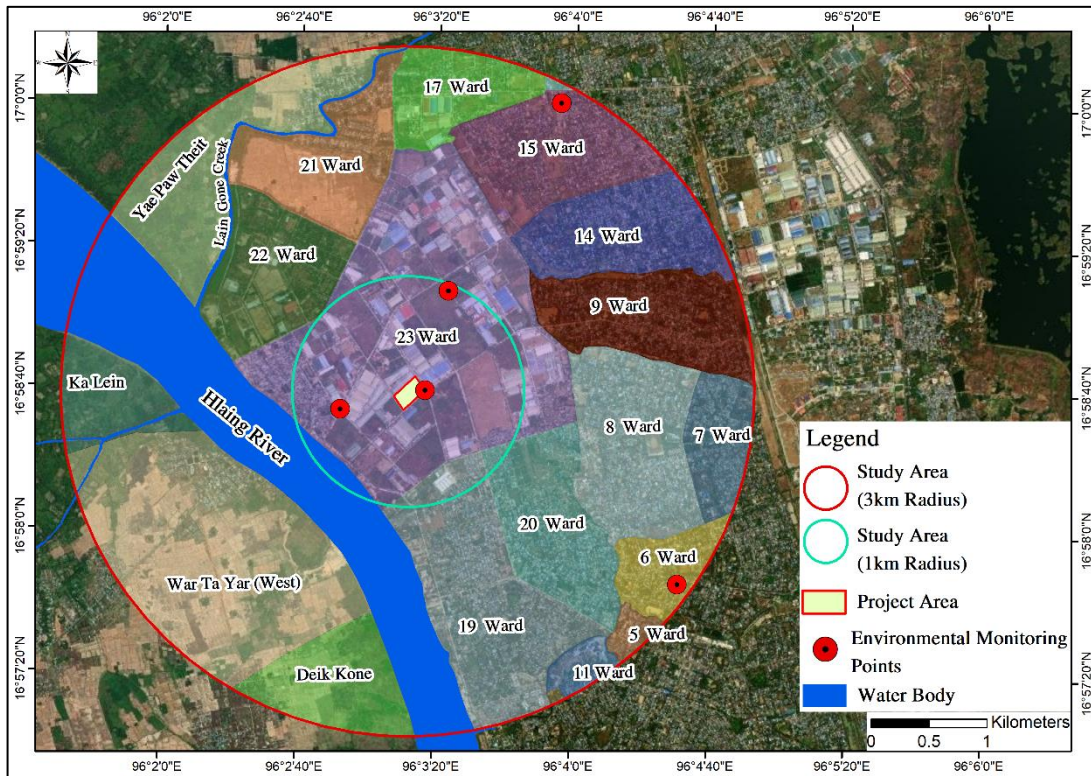


Figure 4-1 Area of Influence

4.1.3. Contextual Study Limit

The EIA guidelines have defined the contextual study limit for project surrounding environment to consist of five groups of components: (i) physical components, (ii) biological components, (iii) socio-economic components, (iv) cultural components and (v) visual characteristics.

- i. Physical Component
 - Overview of the study area
 - Climate and Meteorology
 - Topography
 - Geology
 - Soil Condition
 - Seismology
 - Hydrology
 - Air Quality
 - Wind Speed and Wind Direction
 - Noise Level
 - Vibration
 - Water Quality
 - Traffic Condition
- ii. Socio-economic components
 - Land Use
 - Population and Demography
 - Ethnicity
 - Religious Information

- Educational Information
- Main economic activities
- Employment
- Health
- Infrastructure and Services
 - Water supply
 - Electricity and energy consumption
 - Sanitary waste disposal system
 - Public transport service
 - Community and social organization
- iii. Cultural and Visual components
 - Tourist site, culture and religious properties
- iv. Biological Components
 - Terrestrial resources
 - Flora
 - Fauna
 - Aquatic organism
 - Aquatic flora
 - Plankton
 - Benthos
 - Fish

The following sections briefly describe each component with details in appendices as appropriate. The methods of information collection are also described as necessary.

4.2. DESCRIPTION OF THE PHYSICAL COMPONENT

4.2.1. Overview of the Study Area

4.2.1.1. Shwe Pyi Thar Township

The proposed project site is located in War Ta Yar Industrial Zone, Shwe Pyi Thar Township in Northwestern part of Yangon Region. Total population is 284,922 and it is surrounded by Mingalardon Township and Hlawga Lake in the East, Hlaing River or War Ta Yar River and Htantabin Township in the West, Insein Township in the South and Hmawbi Township in the North. A brief township profile is presented in Table 4-1.

Table 4-1 Shwe Pyi Thar Township

Township	Description
Number of wards	23
Total population	303,421
Area	25.76 square miles
Latitude	16° 56' 00"N and 17° 6' 00"N
Longitude	96°4' E and 96°12' E
Boundary	North : Hmawbi Township East : Mingaladon Township and Hlawga Lake South : Insein Township West : Hlaing River and Htantabin Township
Ethnicities	Kachin, Kayar, Kayin, Chin, Mon, Burma, Rakhine and Shan
Main economic activities	Factory and Trading

Source: General Administration Department, Shwe Pyi Thar Township, 2020

4.2.2. Climate and Meteorology

4.2.2.1. Methodology for Data Collection and Analysis

The description of climate conditions of the study area invariably has to be at provincial level using general climatic data recorded at Hmawbi Aviation station that is nearest station to the project area, about 13.4 kilometer. Meteorological data such as humidity, temperature, rainfall, and wind direction were collected from the Department of Meteorology and Hydrology of Myanmar (2020).

4.2.2.2. Description of Climatic Conditions

The project area has tropical monsoon climate characterized by three seasons. The summer season normally begins in March and April. During this period, the weather is relatively warm and humid. During March and April, a transition period prevails during which the northeast monsoon begins to withdraw and the air mass movements bring warm air to the country from southeast directions. Some light rainfalls, known as the pre-monsoon rain, could be expected during this period.

The rainy season follows the summer season normally from May and lasts until the end of October. Intense rainfalls can be normally occurred in June, July, August and September as clearly indicated by the number of days with rainfalls and the monthly amount of rainfalls.

The winter season follows the rainy season and normally begins in November and lasts in February. During this period, the weather is relatively cold and dry due to the northeast monsoon. There is practically very little or no rain during this period. Climate classification map of Myanmar is shown in Figure 4-2.

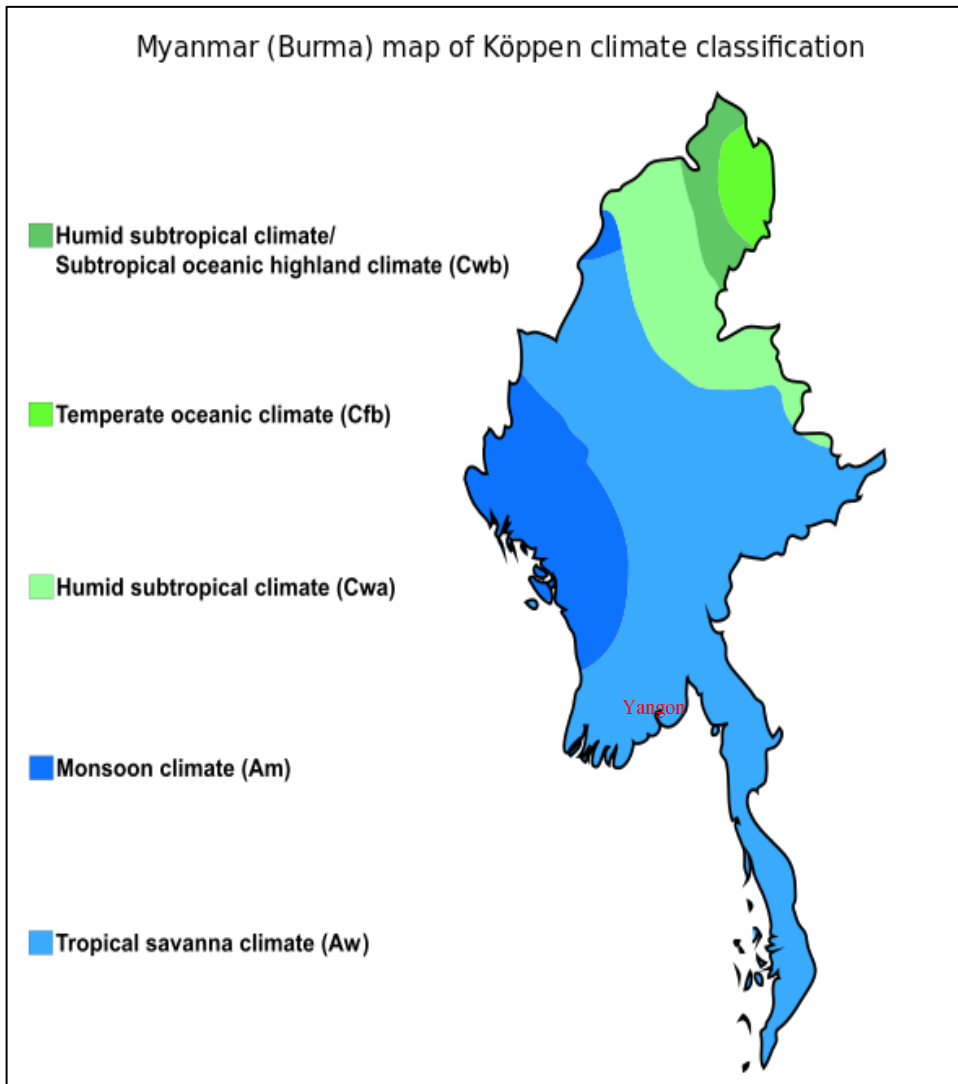


Figure 4-2 Climate Classification Map of Myanmar

4.2.2.3. Rainfall and Temperature of Shwe Pyi Thar Township

Reference from 2017 to 2020 of yearly temperature and rainfall data are presented in Table 4-2. This data was provided from General Administration Department (GAD, 2020), Shwe Pyi Thar Township. During the course of a year, the average maximum temperature is 38 °C and the average minimum temperature is 30 °C. The total yearly rainfall in 2020 is 79.79 inches and the raining days are 100-day. The yearly rainfall and temperature of the township is presented in the following Table 4-2.

Table 4-2 Yearly Rainfall and Temperature of Shwe Pyi Thar Township

No.	Year	Rainfall		Temperature	
		Raining Day	Total Rainfall (Inches)	Summer (°C)	Winter (°C)
				Maximum	Minimum
1	2017	105	84.91	34	30
2	2018	103	102.4	34	30
3	2019	97	92.8	38	30
4	2020	100	79.79	41	30

Source: General Administration Department (GAD), 2020

According to the data from Department of Meteorology and Hydrology (2020), the average daily humidity in the summer, rainy and winter season are about 98%, 99% and 95% at 6:30 hrs Mountain Standard Time (MST), 74%, 87% and 74% at 9:30 hrs MST, 42%, 76% and 48% at 12:30 hrs MST, 45%, 87% and 66% at 18:30 hrs MST, respectively. The average maximum daily temperature of project township are 38°C in summer season, 33°C in rainy season and 33 °C in winter season, respectively. The average minimum daily temperature of project township are 22°C in summer season, 24°C in rainy season and 17 °C in winter season, respectively. In addition, the average daily rainfall is about 0.00 inch in summer season, 11.84 inches in rainy season and 0.18 inch in winter season. In addition, the average daily wind speed in the summer, rainy and winter season are about 0.78 miles per hour (mph), 0.76 mph and 0.32 mph at 6:30 hrs M.S.T, 3.55 mph, 3.43 mph and 2.46 mph at 9:30 hrs MST, 5.13 mph, 4.53 mph and 4.53 mph at 12:30 hrs M.S.T, and 3.66 mph, 2.33 mph and 0.41 mph at 18:30 hrs M.S.T, respectively. The detailed data of meteorological data such as humidity, rainfall, temperature, wind speed and wind direction are also presented in **APPENDIX E**.

4.2.3. Topography

The project area is situated in Shwe Pyi Thar Township and it is surrounded by Mingalardon Township and Hlawga Lake in the East, Hlaing River or War Ta Yar River and Htantabin Township in the West, Insein Township in the South and Hmawbi Township in the North. Eleven streams flow into the Hlaing River from the hilly western area. It has hill ranges from the Hlawga wildlife park in the east and that is gradually slope down and become plains. The project area is located near the bank of Hlaing River only above the sea level of around 8 meters and Shwe Pyi Thar Township is located above the sea level 30.48 meters. Topographic map of Shwe Pyi Thar Township is shown in Figure 4-3.

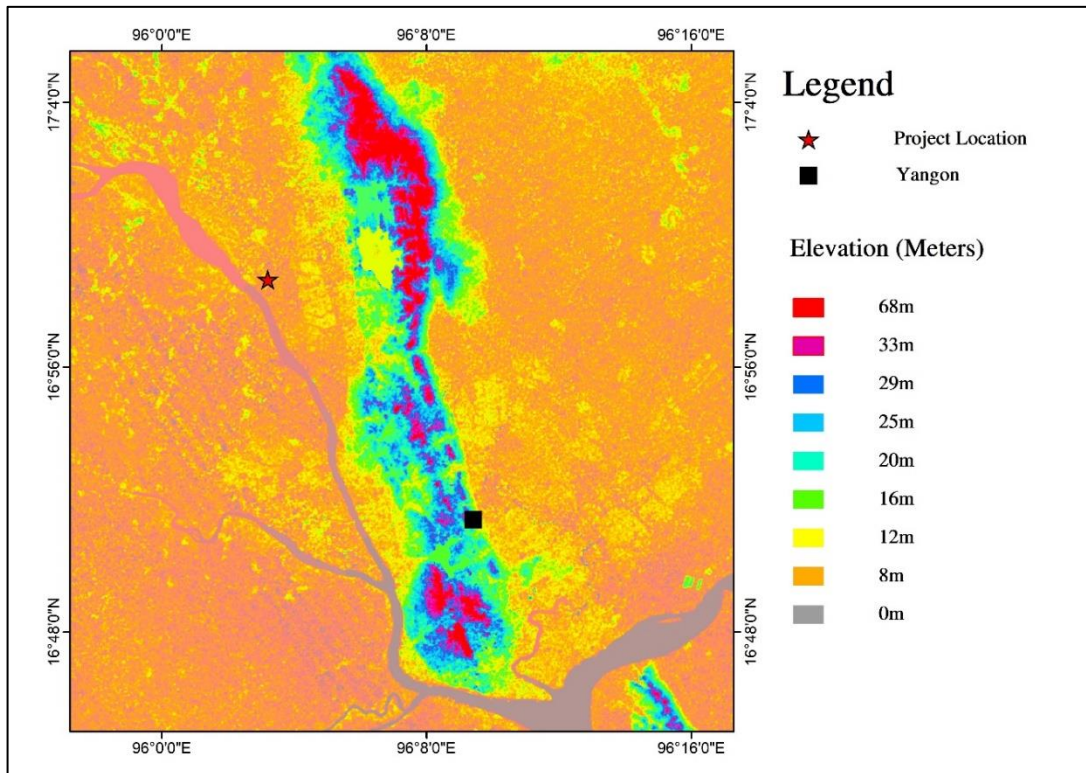


Figure 4-3 Topography Map

4.2.4. Geology

Project area of Shwe Pyi Thar Township is located in Yangon Region which geology is underlain by alluvial deposits (Pleistocene to recent), the non- marine fluvial-tile sediments of Irrawaddy formation (Pliocene) and hard, massive sandstone of Pegu series (early-late Miocene). Alluvial deposits are composed of gravel, clay, silts, sands and laterite which lie upon the eroded surface of Irrawaddy formation at 3 – 4.6 meters above sea level (Hla Hla Aung, 2010). The sandstone and shale of Pegu series can be found at the northwest corner of Hlawga Lake with NNW – SSE strike dipping to the east.

The Irrawaddy formation is composed of Danyingone clays and Arzanigon sandstones. The Danyingone clays consist mainly of clays; siltstone with interbedded sand rocks which exposed in Danyingone. The Arzanigon sand contain admixture of silt, clay and fine gravel at various percentage. These sand rocks expose along Shwedagon and on the eastern bank of Hlawgar Lake.

The proposed project site in Shwe Pyi Thar Township is alluvium deposits, which are mainly composed of fine to medium-grained sand, yellowish grey silt and clays. Alluvium is the general term for the detrital deposits made by rivers or streams or found on alluvial fans, flood plains, etc. It is including fine particles of silt and clay and larger particles of sand and gravel and often contains organic matter. The alluvial deposits are weak in strength and high permeability. Geological Map of Proposed Project Site is shown in Figure 4-4.

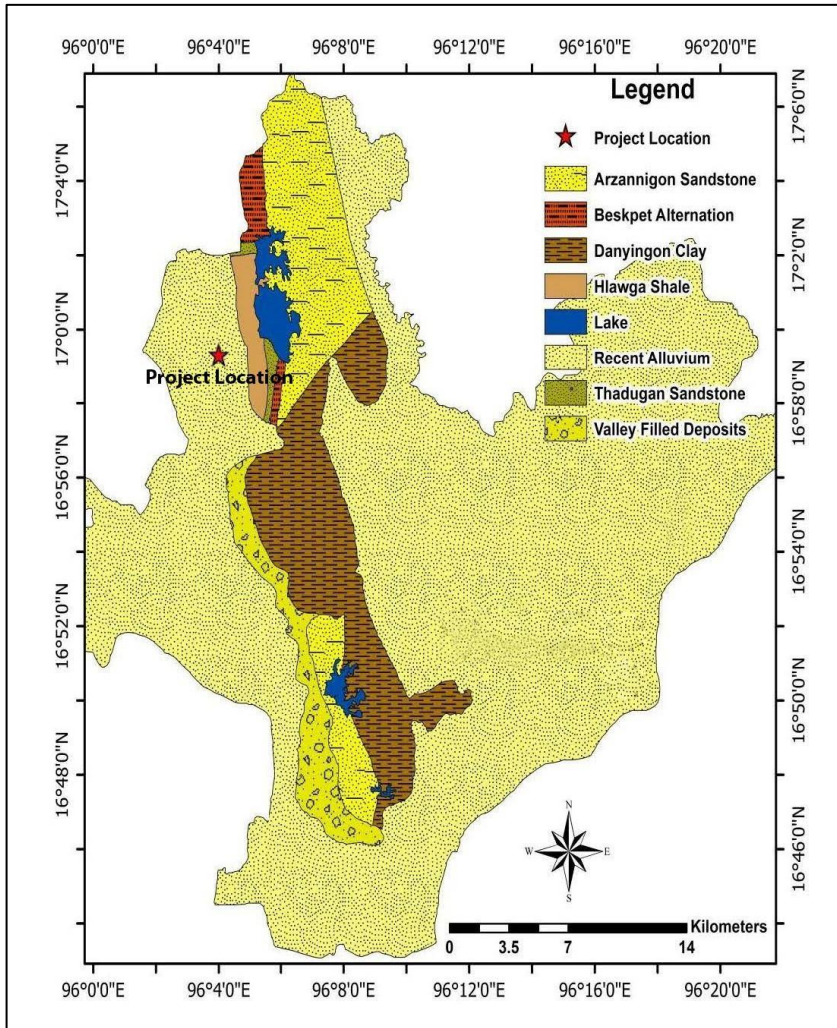
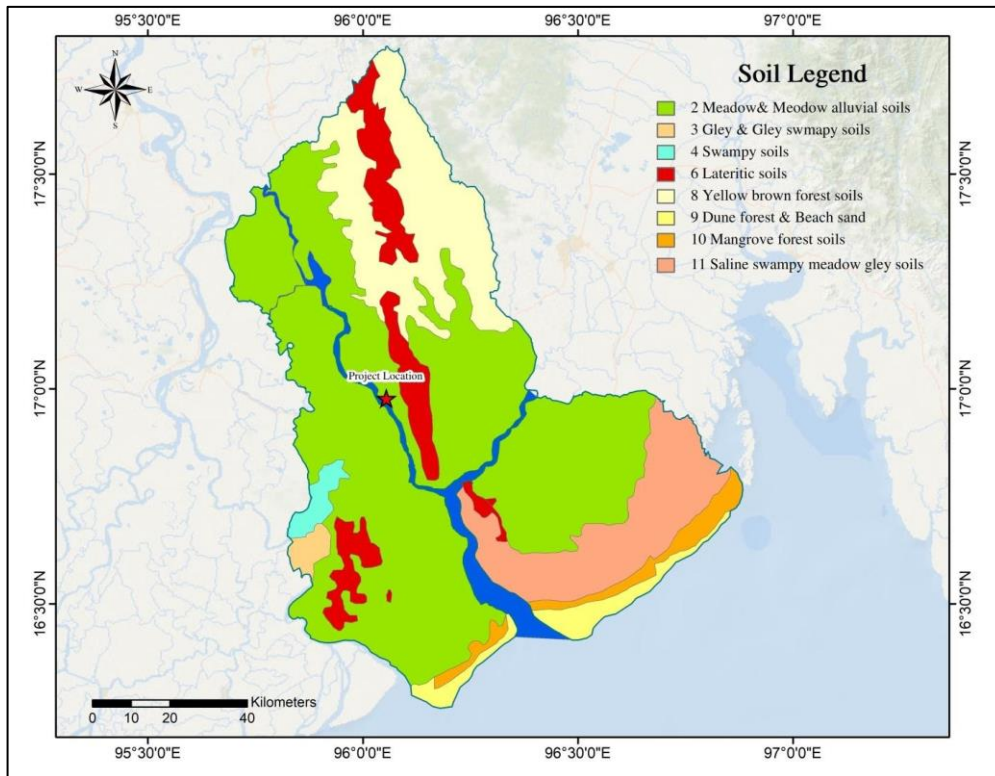


Figure 4-4 Geological Map of Proposed Project Site (Myanmar Geosciences Society, 2014)

4.2.5. Soil Condition

Project area of Shwepyithar Township is located in Yangon Region which soil condition are meadow and meadow alluvial soils, gley and gley swampy soils, swampy soils, lateritic soils, yellow brown forest soils, dune forest and beach sand, mangrove forest soils and saline swampy meadow gley soils. The soil map of the Yangon region is shown in Figure 4-5.

According to the soil Map (Aung Lwin, Myint Myint Khaing, 2012), the soil type of the proposed project site is meadow and meadow alluvial soil. The meadow soils occur near the river plains with occasional tidal floods are non-carbonate. They usually contain large amount of salts. Meadow alluvial soils (fluvic Gleysols) can be found in the flood plains. They have the texture of silty clay loam and they have the neutral soil reaction and are rich in available plant nutrients.



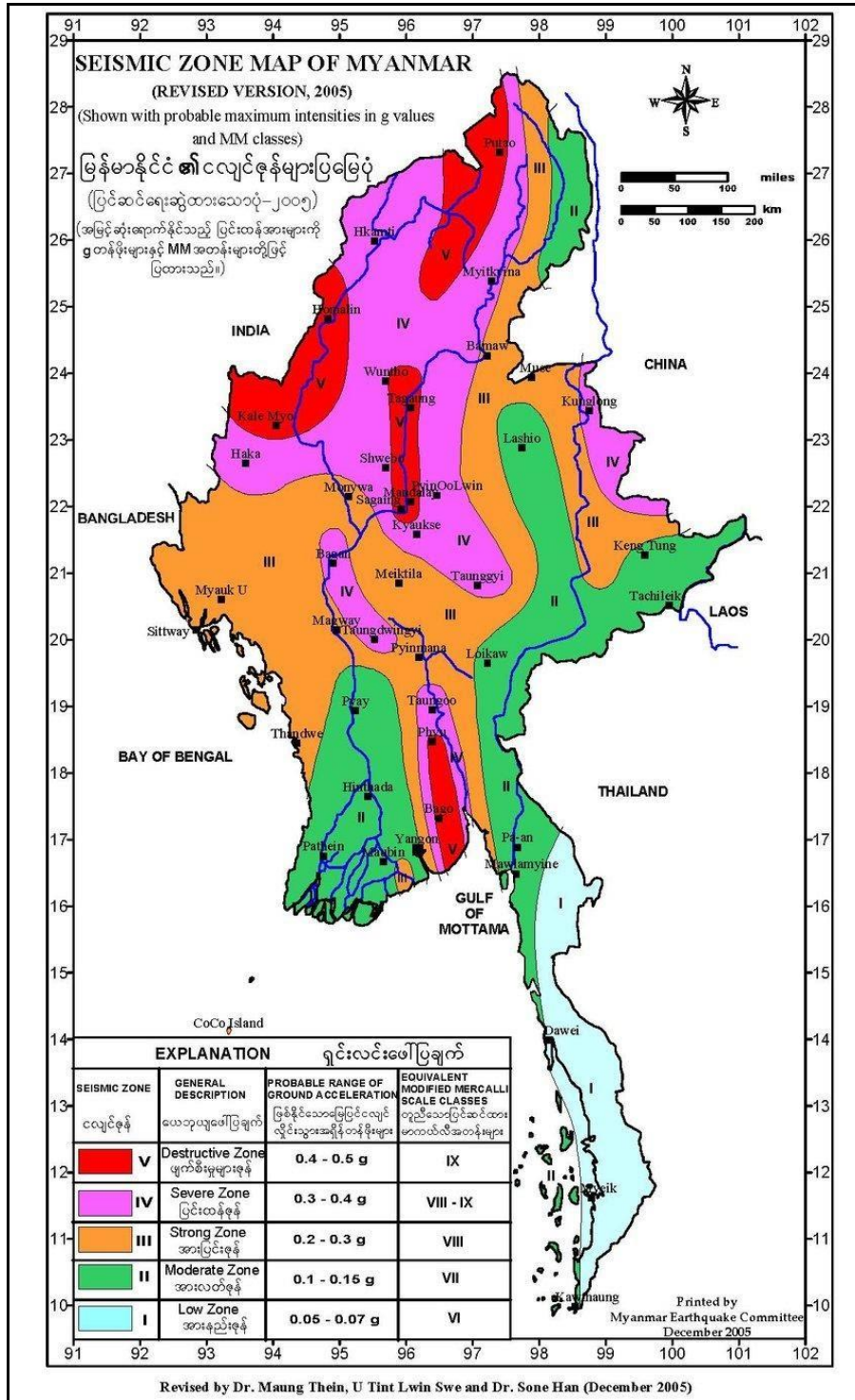
(Source: Land use division, Myanmar Agriculture Service (2002))

Figure 4-5 Soil Map of Yangon Region Seismology

4.2.6. Seismicity

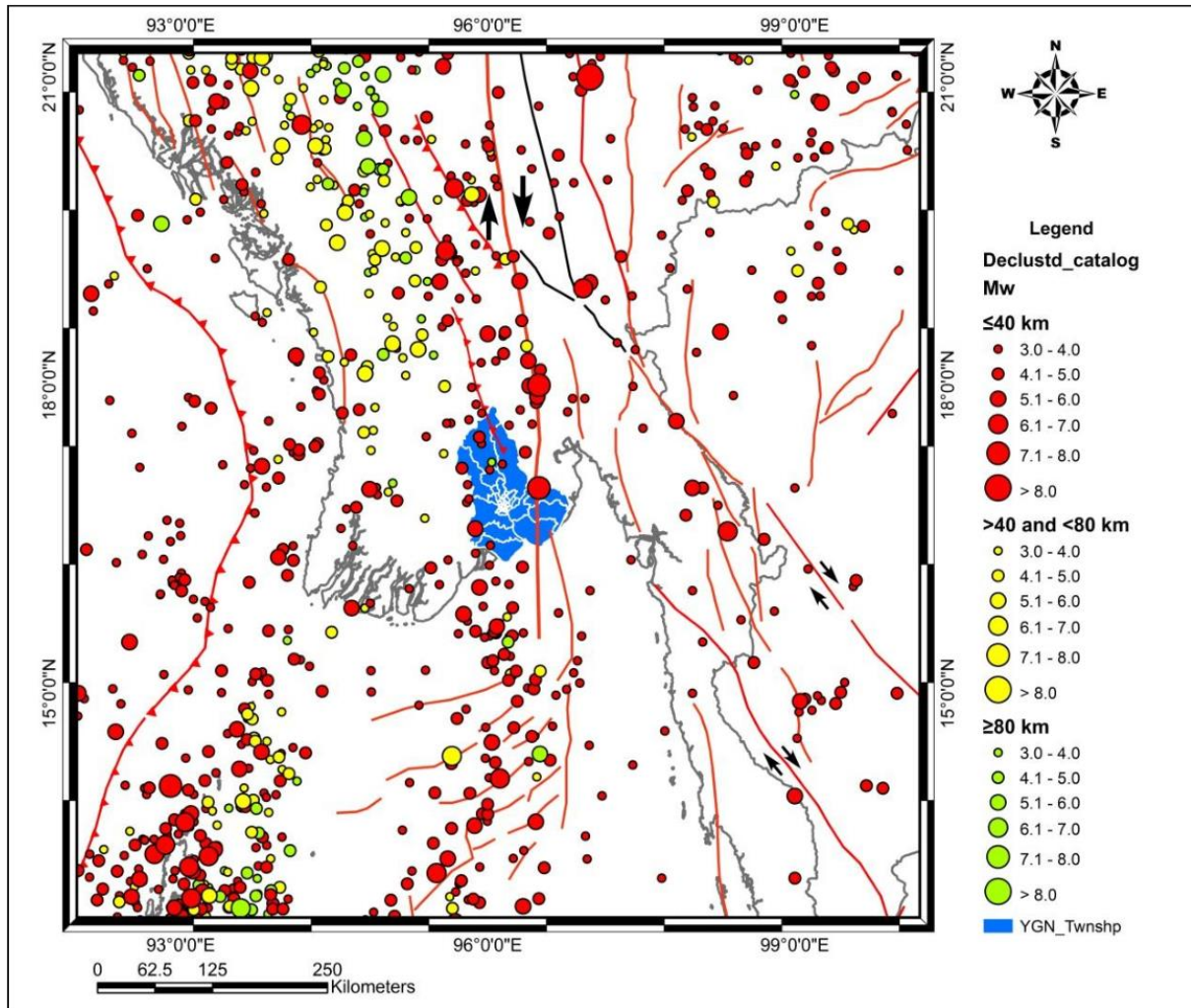
In Myanmar, five seismic zones are demarcated and named (from low to high) Zone I (Low Zone), Zone II (Moderate Zone), Zone III (Strong Zone), Zone IV (Severe Zone), and Zone V (Destructive Zone), mainly following the nomenclature of the European Macroseismic Scale (EMS) 1992 (E.M.S. – 92) (Grunthal), source from hazard profile of Myanmar, July, 2009. For each zone, a probable range of ground acceleration in g values and equivalent Modified Mercalli (MM) Scale (Harry Wood and Frank Neumann, 1931) classes are given. The highest intensity zone designated for Myanmar is the Destructive Zone (with probable intensity range of 0.4 – 0.5 g) which is equivalent to MM class IX. There are four areas in that zone; namely, Bago-Phyu, Mandalay-Sagaing-Tagaung, Putao-Tanaing, and Kale Myo - Homalin areas. The latter two, however, would not have major earthquake hazards as they are only sparsely populated. Yangon straddles the boundary between Zone II and Zone III, with the old and new satellite towns in the eastern part in Zone III, and the original city in Zone II. A probable maximum range of ground acceleration in values and equivalent Modified Mercalli Scale classes are given for each zone.

The seismic zone map of Myanmar is presented in Figure 4-6. According to the seismic zone map, the Yangon is located in the strong and moderate zone. Therefore, earthquake resistant design should be evaluated. Moreover, systematic ground improvement methods should be designed. Based on the seismicity records, Yangon can be assumed as low to medium seismicity region. The Seismicity Map of Yangon Region is described in Figure 4-7.



Source: Meteorology and Hydrology Department, Yangon, Myanmar

Figure 4-6 Seismic Zone Map of Myanmar



Source: ANSS earthquake catalog, 1963- 2009

Figure 4-7 Seismicity Map of Yangon Region

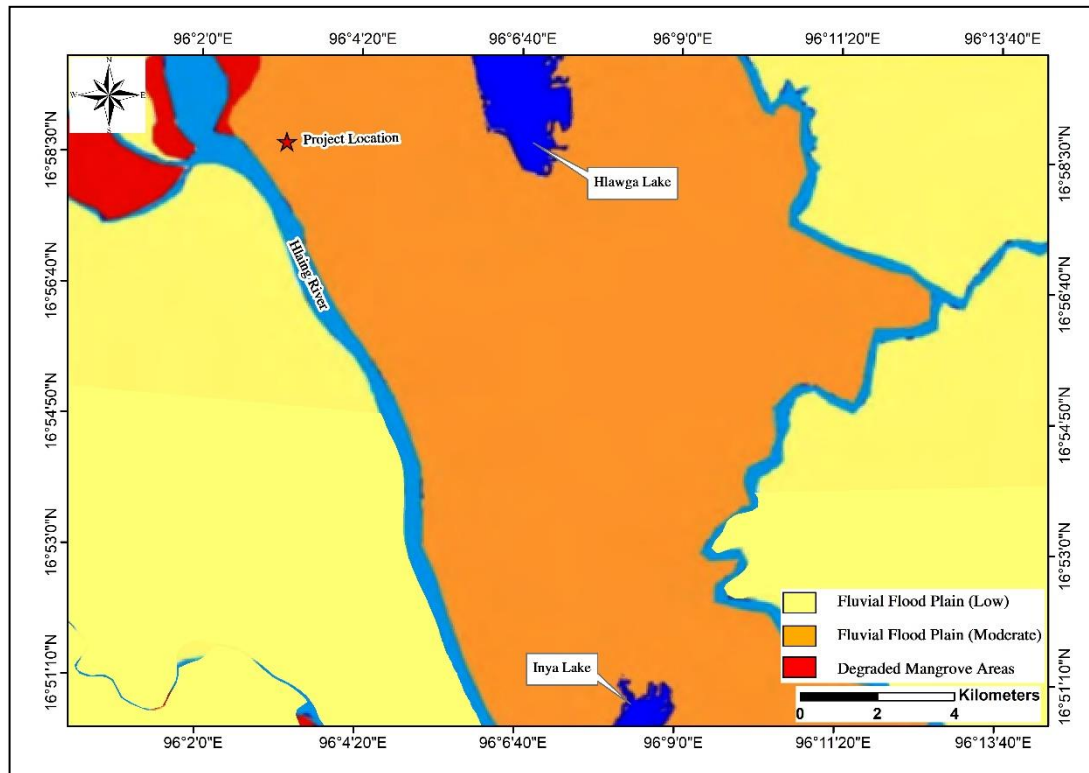
4.2.7. Hydrology

The main river around project site is the Hlaing River or War Ta Yar River, which is a fresh water river in the region running on the west side of War Ta Yar Industrial Zone. This river is about 0.8 kilometers distance from the project site. The surface water will runoff and effluent directly to the Hlaing River from the drainage system of industrial zone.

Catchment area of the study river is about 700 square kilometer and length is 12 kilometer long. There are several industrial zones developed along the bounded rivers and most of the wastewater discharge without proper treatment to the natural water body. Population density increase significantly due to the development of industrial zones and housing projects domestic wastewater and dumping of garbage into drains are also the source of pollution of it.

Freshwater and salinity water can be found in Yangon River due to freshwater from upstream rivers and seawater intrusion from lower Andaman Sea. According to the landform classification system based on geomorphologic principles by Lwin, A., & Khaing,

M.M. (2012)⁶, Shwe Pyi Thar Township area is in fluvial flood plain (moderate). Therefore, the flood occurs during rainy season and subjected to a minimum of dissection. The geomorphological map including water bodies nearby the project site is presented in Figure 4-8.

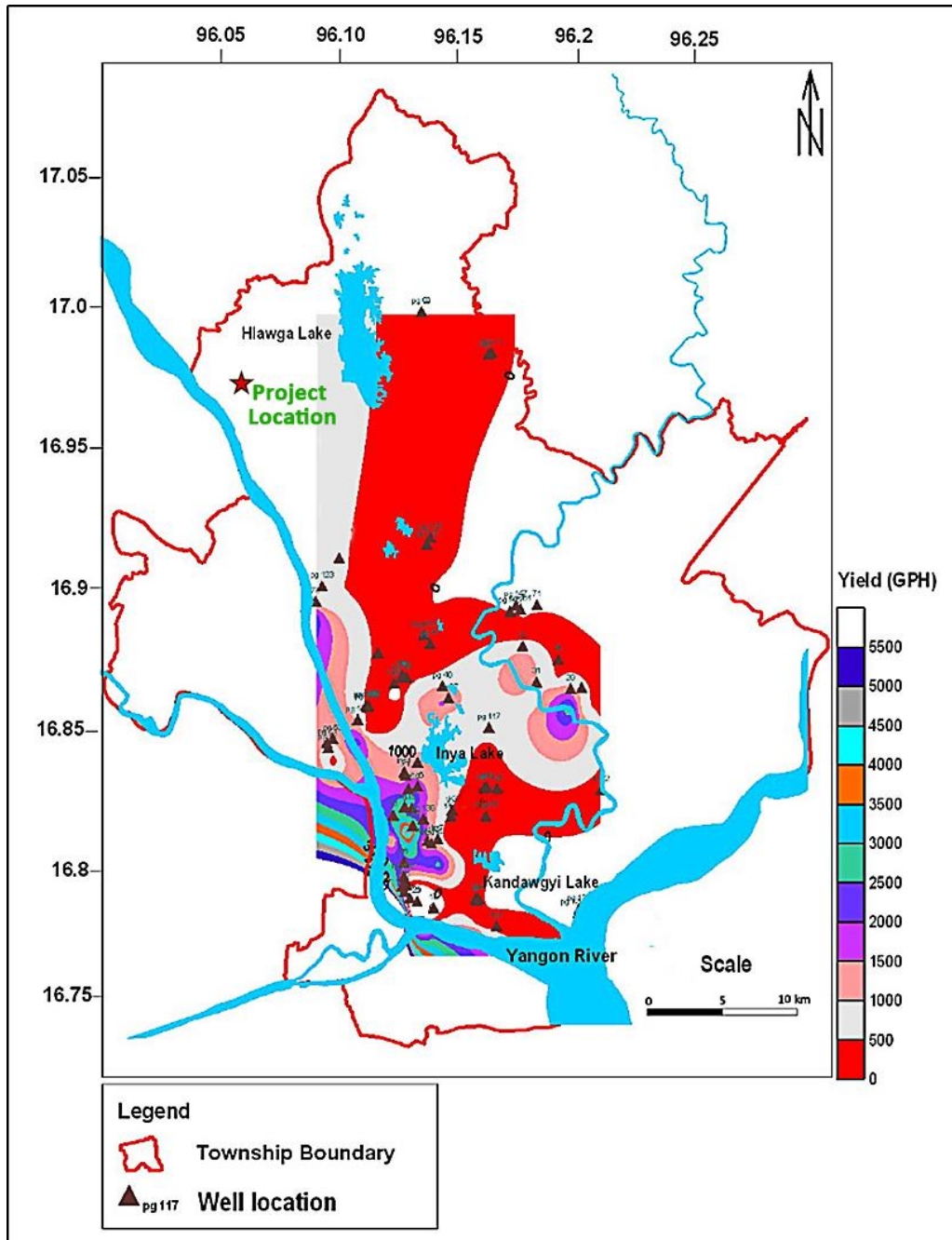


Source: Yangon river geomorphology identification and its environmental impacts analysis by optical and radar sensing technique (2012)

Figure 4-8 Geomorphological Map of Yangon City

As groundwater, Yangon is rich in groundwater resources covered by unconsolidated Tertiary - Quaternary deposits. In Yangon, groundwater is mostly extracted from Valley filled deposits and Ayeyarwaddy sandstones. Based on local geological considerations, potential groundwater source of Yangon can be roughly divided into two regions; the low potential area and high potential area. The project site is located in high potential of groundwater source and the groundwater yield is approximately 5500 Gallons Per Hour (GPH) as shown in Figure 4-9. Moreover, the surface water body map within 3 kilometers radius of the project site is shown in Figure 4-10.

6 Lwin, A., & Khaing, M. M. (2012). Yangon River Geomorphology Identification and its Environmental Impacts Analysis by Optical and Radar Sensing Techniques. ISPRS - International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XXXIX-B8, 175–179. <https://doi.org/10.5194/isprsarchives-xxxix-b8-175-2012>



Source: Assessment of Groundwater Vulnerability in Yangon City, Myanmar (2015)

Figure 4-9 Groundwater Yield Map of Yangon City⁷

7 Ref: Htun, W. W. (2015). Assessment of Groundwater Vulnerability in Yangon City, Myanmar. doi:<https://www.slideshare.net/aung3/7-assessment-of-groundwater-vulnerability-in-yangon-city-wint-wint-htun-2>

7 Lwin, A., & Khaing, M. M. (2012). Yangon River Geomorphology Identification and its Environmental Impacts Analysis by Optical and Radar Sensing Techniques. ISPRS - International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XXXIX-B8, 175–179. <https://doi.org/10.5194/isprsarchives-xxxix-b8-175-2012>.



Figure 4-10 Surface Water Body near the Project Site

4.3. ENVIRONMENTAL BASELINE SURVEY

4.3.1. Air Quality

4.3.1.1. Methodology

Air quality measurement was conducted at 5 stations twice by using Haz-Scanner United State of Environmental Protection Agency (USEPA) Method. The detailed information of air quality monitoring analysis method is described in Table 4-3. 1st time measurement (wet season) was performed from 24th April – 5th June 2020 and 2nd time measurement (dry season) was conducted on 8th – 12th December 2022.

The EPAS, manufactured by Environmental Devices Corporation (EDC) United State of America (USA) and distributed by SKC international distributors, is a light scattering photometer equipped with a filter sampling system. Single-jet impactors were used for particulate size selection and the PM₁₀ and PM_{2.5} impactors were used for air quality survey. EPAS provides real-time determinations and data recordings of airborne particle concentration in ug/m³. It also can measure minimum, maximum and Time-Weighted Average (TWA) monitoring of gases. This instrument is factory-calibrated with USEPA certified target gas and correlated with USEPA methods. (Ref: Code of Federal Regulation 40CFR part 53).

Table 4-3 Air Quality Monitoring Analysis Method

Model	Haz-Scanner EPAS	
Display	LCD real time	
Display Measurement	Max, Min, TWA, STEL	
Recording Time	1 sec to 21 weeks	
Sampling Rate	1 sec, 1 min, 10 min, 1 hr, adjustable	
Operating Temperature	-5 to 50°C	
Parameters	Sensor	Measurement/ Concentration Range
Particulate Matters (PM _{2.5} & PM ₁₀)	90° infrared light scattering	0 to 5,000 µg/m ³
VOCs	PID (10.6 eV)	0 to 50,000 ppb
Carbon Dioxide (CO ₂)	Nondispersive Infrared (NDIR)	0 to 5,000 ppm
Carbon Monoxide (CO)	Electrochemical	0 to 10,000 ppb
Ozone (O ₃)	Metal oxide semi-conductor (MOS)	0 to 150 ppb
Sulfur Dioxide (SO ₂)	Electrochemical	0 to 5,000 ppb
Nitrogen Dioxide (NO ₂)	Electrochemical	0 to 5,000 ppb
Methane (CH ₄)	NDIR	0 to 10,000 ppm
Wind speed/direction	3-cup anemometer and continuous rotation potentiometric wind direction vane	Speed: 0 to 55.9 m/s Direction: 5 to 355 degrees
Temperature	NTC	-20 to 60°C
Relative Humidity	CAP	0 to 100 %

The key air parameters concern for the project are Particulate Matters less than 10 microns meter and 2.5 microns meter (PM₁₀) and (PM_{2.5}), Carbon dioxide (CO₂), Carbon monoxide (CO), Nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), Methane (CH₄), Ozone (O₃), Volatile organic compound (VOCs), Humidity, Temperature, Wind speed and Wind direction during the construction phase of the project.

Location map of the air quality monitoring points is shown in Figure 4-11. Air quality measurement dates are shown in Table 4-4. Air monitoring activities at some monitoring points are shown in Figure 4-12.

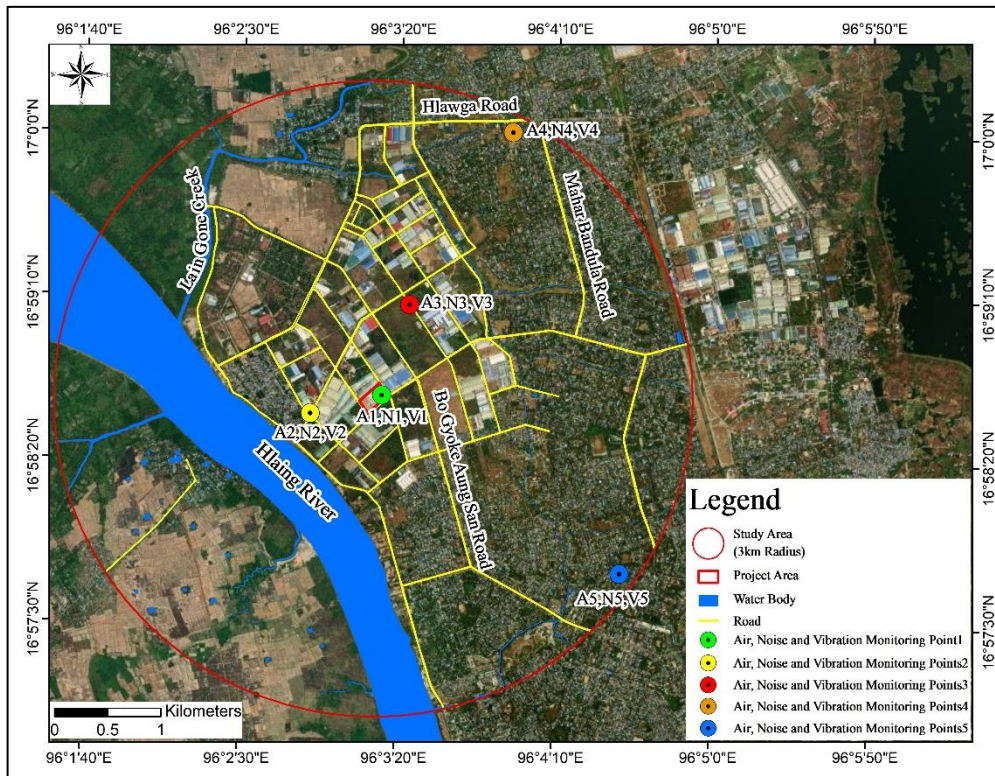


Figure 4-11 Location Map of Ambient Air Quality Measurement Stations

Table 4-4 Air Quality Measurement Date

Point	Location	Reference Coordinate	1 st Time Measurement Date	2 nd Time Measurement Date
A1	Project site	16° 58' 37.76" N 96° 3' 14.99" E	24th - 25th April, 2020	8 th – 9 th December 2022
A2	War Ta Yar industrial zone	16° 58' 34.16" N 96° 2' 52.40" E	26th - 27th April 2020	9 th – 10 th December 2022
A3	War Ta Yar industrial zone	16°59' 7.72" N 96° 3' 23.50" E	27th - 28th April 2020	10 th – 11 th December 2022
A4	Lotaya Hinthada Monastery	17° 0' 0.78" N 96° 3' 55.92" E	3rd - 4th June 2020	11 th – 12 th December 2022
A5	War Ta Yar Industrial Zone (Residential Area)	16° 57' 46.23" N 96° 4' 31.40" E	4th - 5th June 2020	12 th – 13 th December 2022



Figure 4-12 Air Quality Monitoring Activities

4.3.1.2. Result of Study

The air quality results were derived by monitoring 24-hr. The air quality of CO₂, CO, CH₄ and O₃ were calculated the highest maximum average 8-hr of maximum concentration of 24-hr monitoring data. In addition, the air quality of NO₂ was derived from highest average 1 hr of monitoring data. All air quality results at five stations are compared with Minnesota Department of Health, NAAQS of US.EPA, Alberta, Agriculture, Food and Development and NEQEQ (2015) and the results are shown in Table 4-5 and Table 4-6. Details of air quality measurement results are shown in **APPENDIX G**.

Table 4-5 Air Quality Result (1st Time Measurement)

No.	Parameters	Result					Sampling Duration	*Guideline value	Average Period
		A1	A2	A3	A4	A5			
1.	CO ₂ (ppm)	437.31	451.97	454.89	415.85	414.42	8 hr	10,000 ^a	8 hr
2.	CO (µg/m ³)	0.50	0.36	0.44	0.34	0.36	8 hr	9 ^b	8 hr
3.	CH ₄ (ppm)	2.13	1.98	1.85	1.84	2.11	8 hr	1,000 ^c	8 hr
4.	NO ₂ (µg/m ³)	145.0	105.9	131.9	102.2	106.7	1-hr	40 µg/m ³	1-yr
								200 µg/m ³	1-hr
5.	O ₃ (µg/m ³)	88.48	85.18	72.79	83.10	82.91	8-hr	100 µg/m ³	8-hr
6.	PM ₁₀ (µg/m ³)	42.71	44.15	49.24	47.11	39.94	24-hr	50 µg/m ³	24-hr
7.	PM _{2.5} (µg/m ³)	21.84	23.50	24.55	24.06	23.75	24-hr	25 µg/m ³	24-hr
8.	SO ₂ (µg/m ³)	19.29	18.28	18.76	18.19	17.38	24-hr	20 µg/m ³	24-hr
9.	VOCs (ppb)	0.00	0.00	0.00	0.00	0.00	24-hr	NG	-
10.	Humidity (%)	72.41	72.86	71.37	86.37	93.89	24-hr	NG	-
11.	Temperature (°C)	29.83	29.50	29.35	27.06	26.06	24-hr	NG	-

* National Environmental Quality (Emission) Guideline (December 29, 2015), a Minnesota Department of Health, b NAAQS of US.EPA, c Alberta, Agriculture, Food and Development, NG = No Guideline

Table 4-6 Air Quality Result (2nd Time Measurement)

No.	Parameters	Result					Sampling Duration	*Guideline value	Average Period
		A1	A2	A3	A4	A5			
1.	CO ₂ (ppm)	453.11	447.12	453.97	414.91	419.30	8 hr	10,000 ^a	8 hr
2.	CO (µg/m ³)	0.49	0.37	0.44	0.33	0.33	8 hr	9 ^b	8 hr
3.	CH ₄ (ppm)	2.13	2.03	1.90	1.91	1.93	8 hr	1,000 ^c	8 hr
4.	NO ₂ (µg/m ³)	147.00	115.40	133.60	105.8	102.6	1-hr	200 µg/m ³	1-hr
5.	O ₃ (µg/m ³)	92.51	84.44	74.60	44.43	82.51	8-hr	100 µg/m ³	8-hr
6.	PM ₁₀ (µg/m ³)	42.84	39.57	43.60	42.45	36.14	24-hr	50 µg/m ³	24-hr
7.	PM _{2.5} (µg/m ³)	21.47	20.79	21.62	21.7	23.11	24-hr	25 µg/m ³	24-hr
8.	SO ₂ (µg/m ³)	19.12	18.56	18.09	18.33	17.55	24-hr	20 µg/m ³	24-hr

No.	Parameters	Result					Sampling Duration	*Guideline value	Average Period
		A1	A2	A3	A4	A5			
9.	VOCs (ppb)	0.00	0.00	0.00	0.00	0.00	24-hr	NG	-
10.	Humidity (%)	72	74	76	75	68.2	24-hr	NG	-
11.	Temperature (°C)	28	27	26	28	30.1	24-hr	NG	-

* National Environmental Quality (Emission) Guideline (December 29, 2015), a Minnesota Department of Health, b NAAQS of US.EPA, c Alberta, Agriculture, Food and Development, NG = No Guideline

The 1st time and 2nd time air quality measurement results are shown from Figure 4-13 to Figure 4-20. According to Table 4-5, all air quality results at A1, A2, A3, A4 and A5 air monitoring stations are within NEQEG (2015), Minnesota Department of Health, NAAQS of US.EPA, Alberta, Agriculture, Food and Development. The concentration of VOCs at five stations is 0.00 ppb. The humidity at five stations are 72.41% at A1, 72.86% at A2, 71.37% at A3, 86.37% at A4 and 93.89% at A5. The temperature at five stations are 29.83°C at A1, 29.50°C at A2, 29.35°C at A3, 27.06°C at A4 and 26.06°C at A5.

According to Table 4-6, all air quality results at at A1, A2, A3, A4 and A5 air monitoring stations are within NEQEG (2015), Minnesota Department of Health, NAAQS of US.EPA, Alberta, Agriculture, Food and Development. The concentration of VOCs at five stations is 0.00 ppb. The humidity at five stations are 72% at A1, 74% at A2, 76% at A3, 75% at A4 and 68.2% at A5. The temperature at five stations are 28°C at A1, 27°C at A2, 26°C at A3, 28°C at A4 and 26.06°C at A5.

According to the comparison of 1st time and 2nd time air measurement results, most of the air quality results (1st time measurement) are more than the air quality results (2nd time measurement).

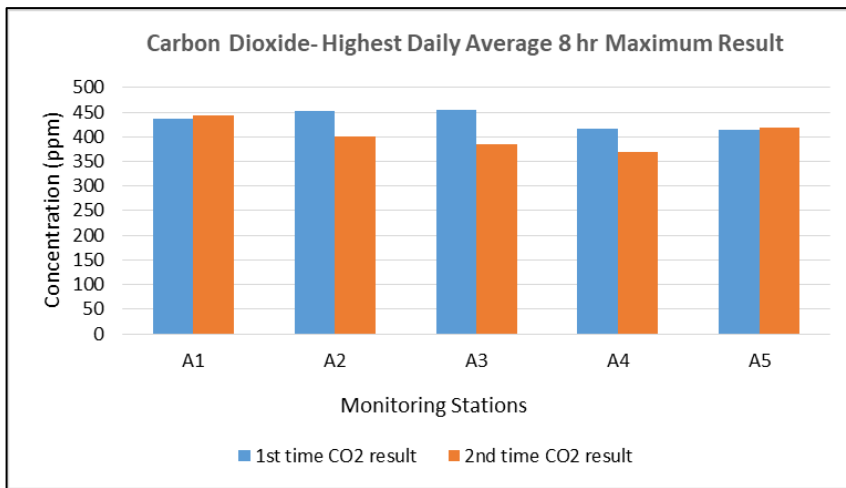


Figure 4-13 Hourly Concentration of CO₂

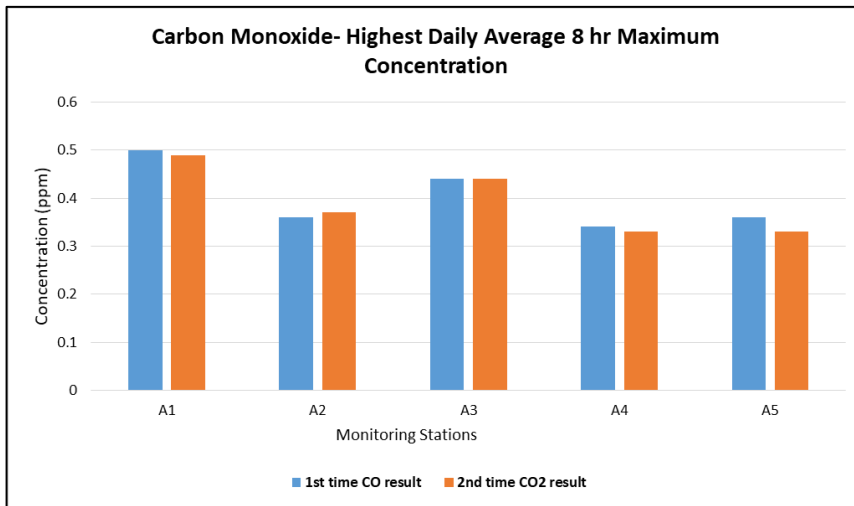


Figure 4-14 Hourly Concentration of CO

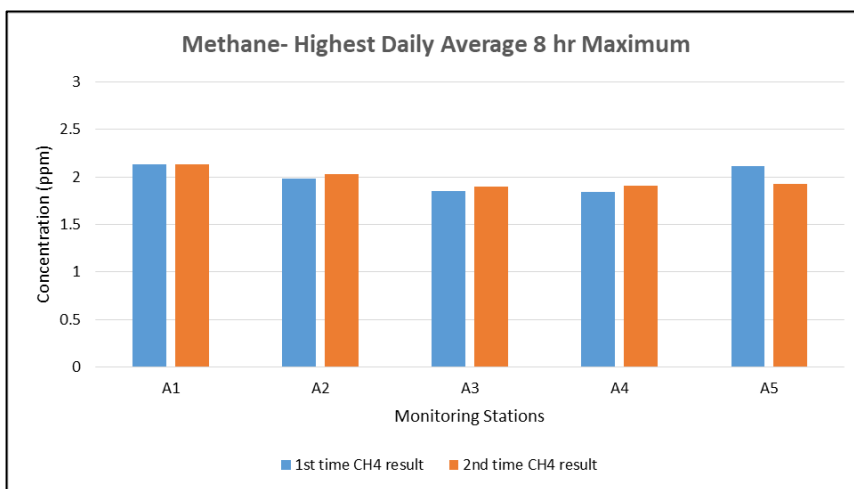


Figure 4-15 Hourly Concentration of CH₄

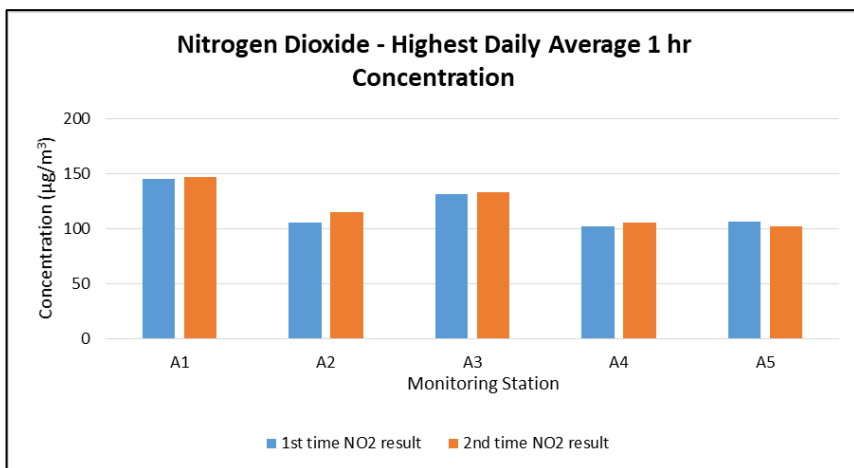


Figure 4-16 Concentration of NO₂ (1hr)

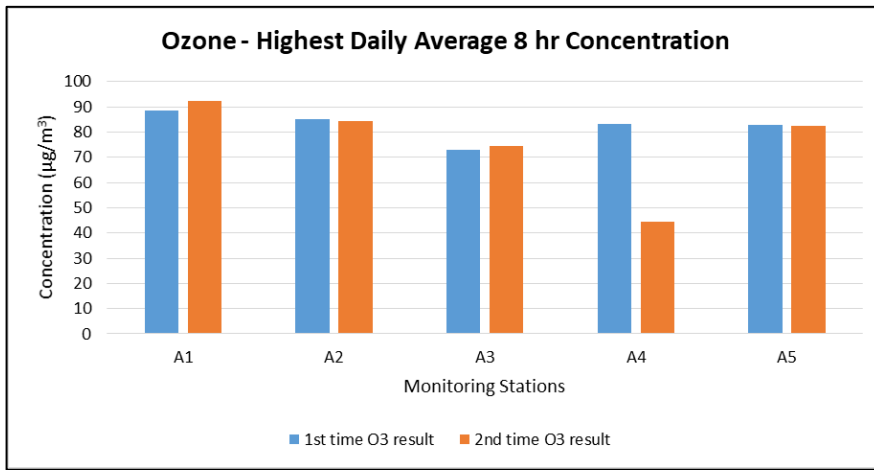


Figure 4-17 Concentration of O₂ (8hr)

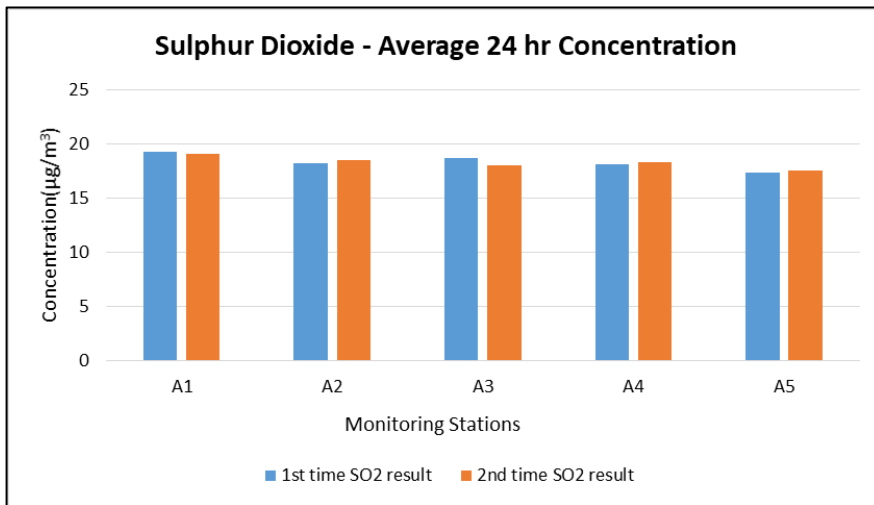


Figure 4-18 Hourly Concentration of SO₂

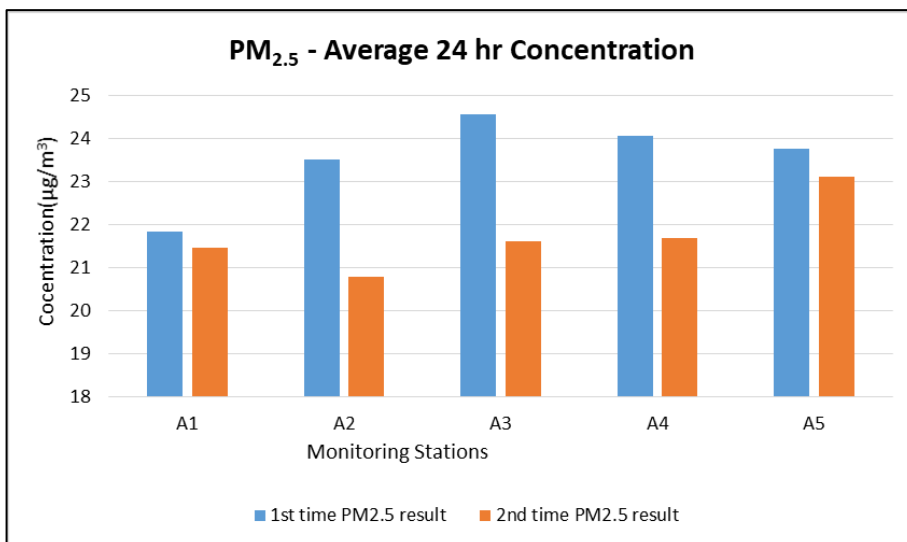


Figure 4-19 Hourly Concentration of PM_{2.5}

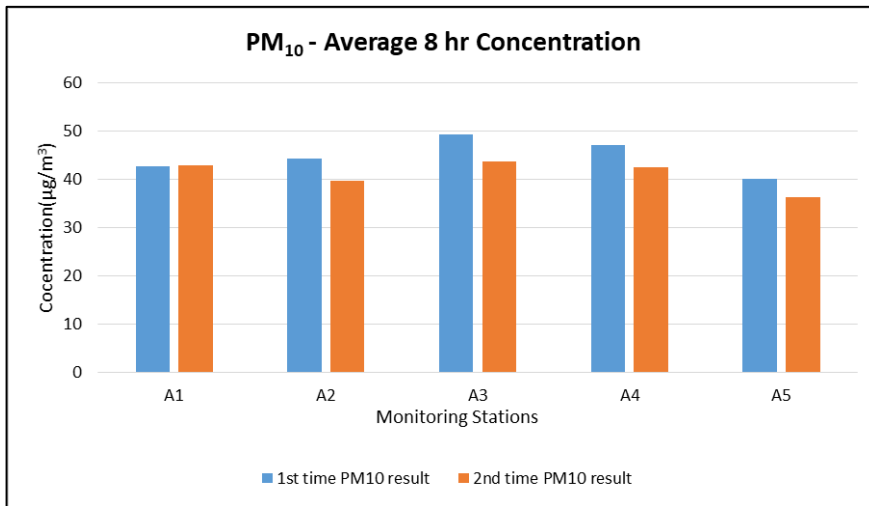


Figure 4-20 Hourly Concentration of PM₁₀

4.3.2. Wind Speed and Wind Direction

4.3.2.1. Methodology

Wind speed and wind direction were also measured twice at 2 meters above ground level at the same location as those selected for the air quality measurements using Haz-Scanner. 1st time measurement was performed from 24th April – 5th June 2020 and 2nd time measurement was conducted from 8th – 13th December 2022.

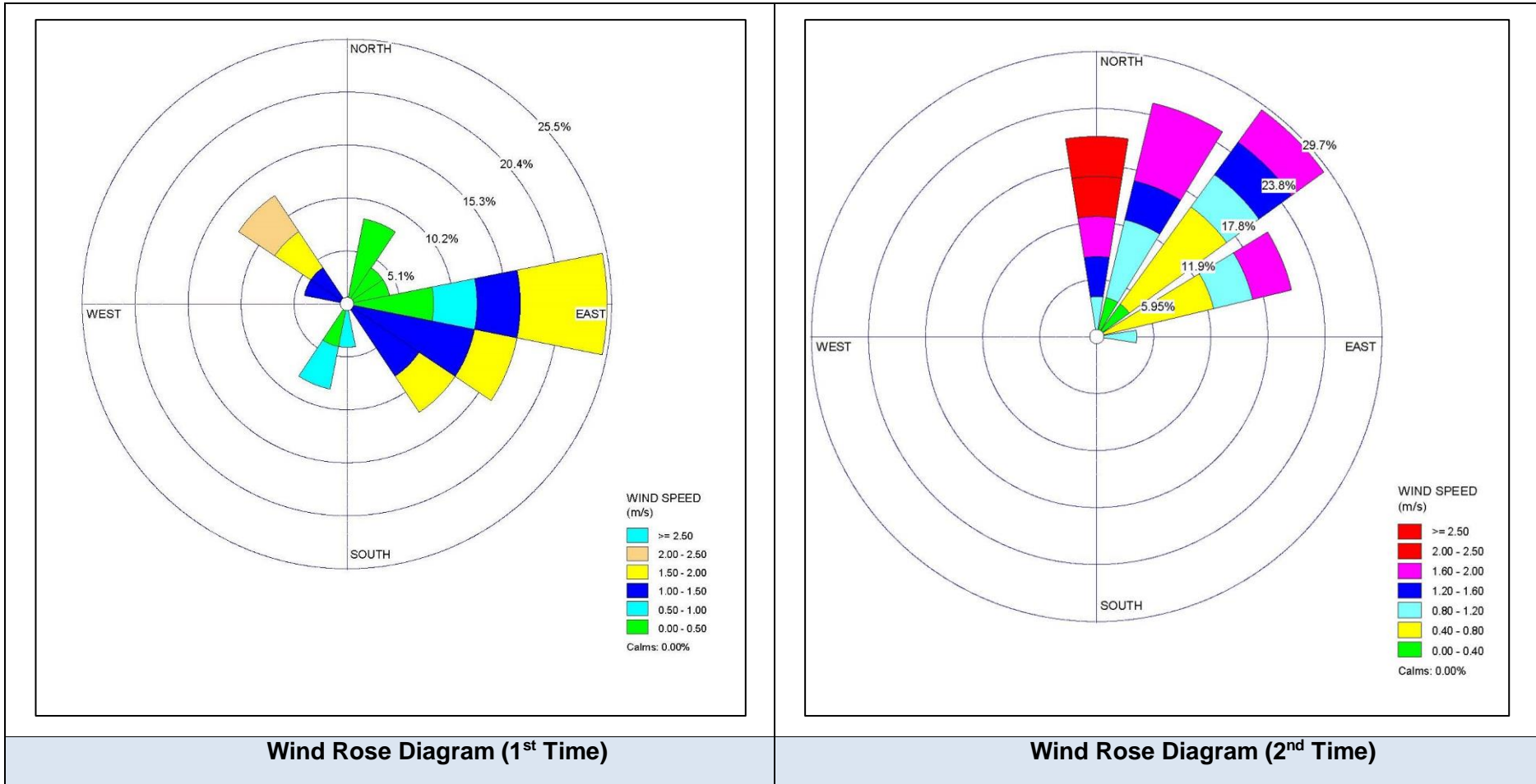
4.3.2.2. Results of the Study

According to 1st time measurement results, the prevailing wind direction was East at Station A1, East and Southwest at Station A2, East at Station A3, and South West (SW) at station A4 and station A5. The wind speed was 1.02 m/s at station A1, 1.30 m/s at station A2, 1.63 m/s at station A3, 0.66 m/s at station A4 and 1.37 m/s at station A5. The results of measurement are summarized in Table 4-7. The wind rose diagrams and wind class distribution are shown in Figure 4-21 to Figure 4-25.

According to 2nd time measurement results, the prevailing wind direction was Northeast at all five stations. The wind speed was 1.1 m/s at station A1, 1.0 m/s at station A2, 0.8 m/s at station A3, 0.9 m/s at station A4 and 0.8 m/s at station A5.

Table 4-7 Results of Wind Speed Measurement and Direction

Station	1 st Time Measurement Date	2 nd Time Measurement Date	1 st Time Measurement Result		2 nd Time Measurement Result	
			Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction
Station A1	24 th – 25 th April 2020	8 th – 9 th December 2022	1.02	East	1.1	Northeast
Station A2	26 th – 27 th April 2020	9 th – 10 th December 2022	1.30	East and Southwest	1.0	Northeast
Station A3	27 th – 28 th April 2020	10 th – 11 th December 2022	1.63	East	0.8	Northeast
Station A4	3 rd – 4 th June 2020	11 th – 12 th December 2022	0.66	Southwest	0.9	Northeast
Station A5	4 th – 5 th June 2020	12 th – 13 th December 2022	1.37	Southwest	0.8	Northeast



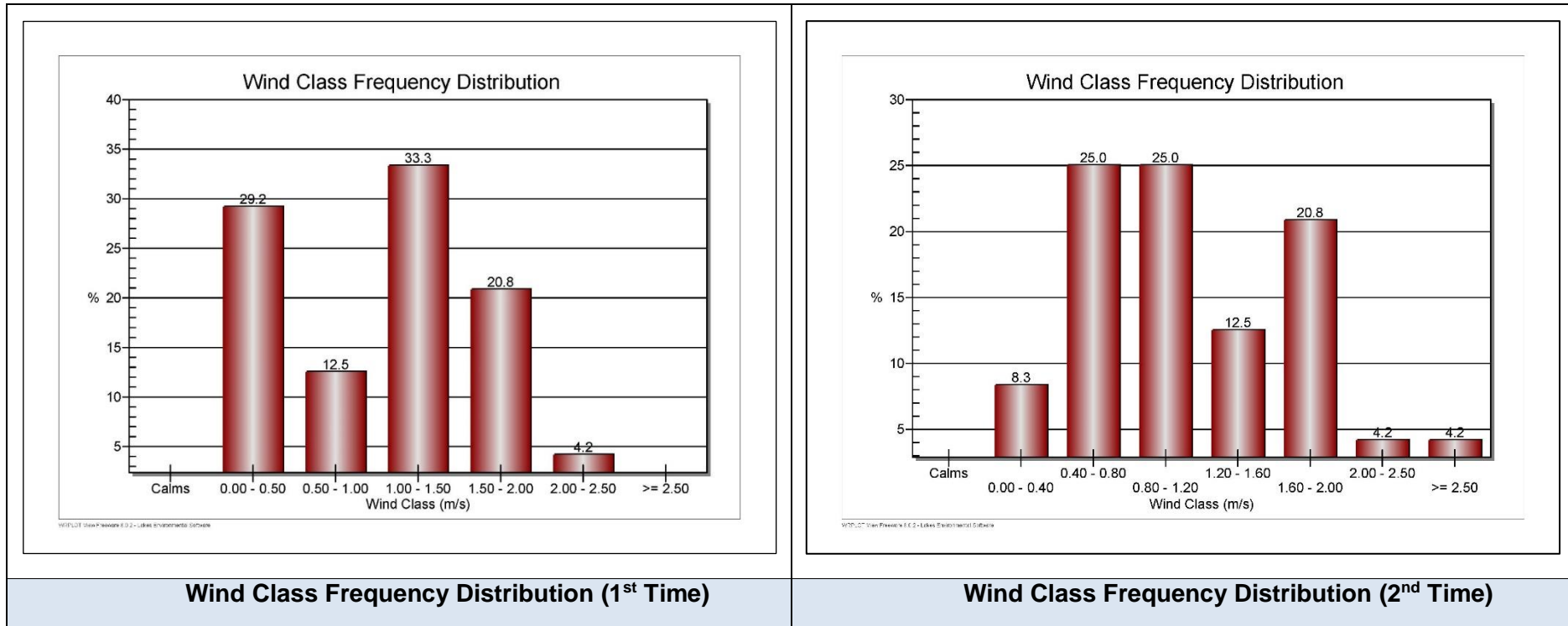
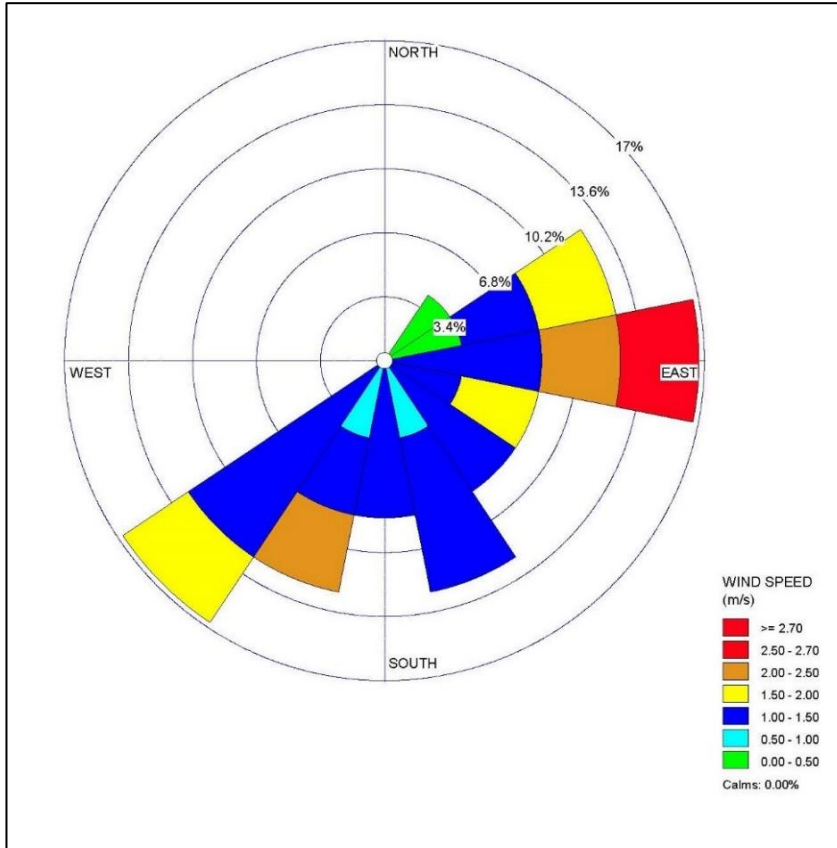
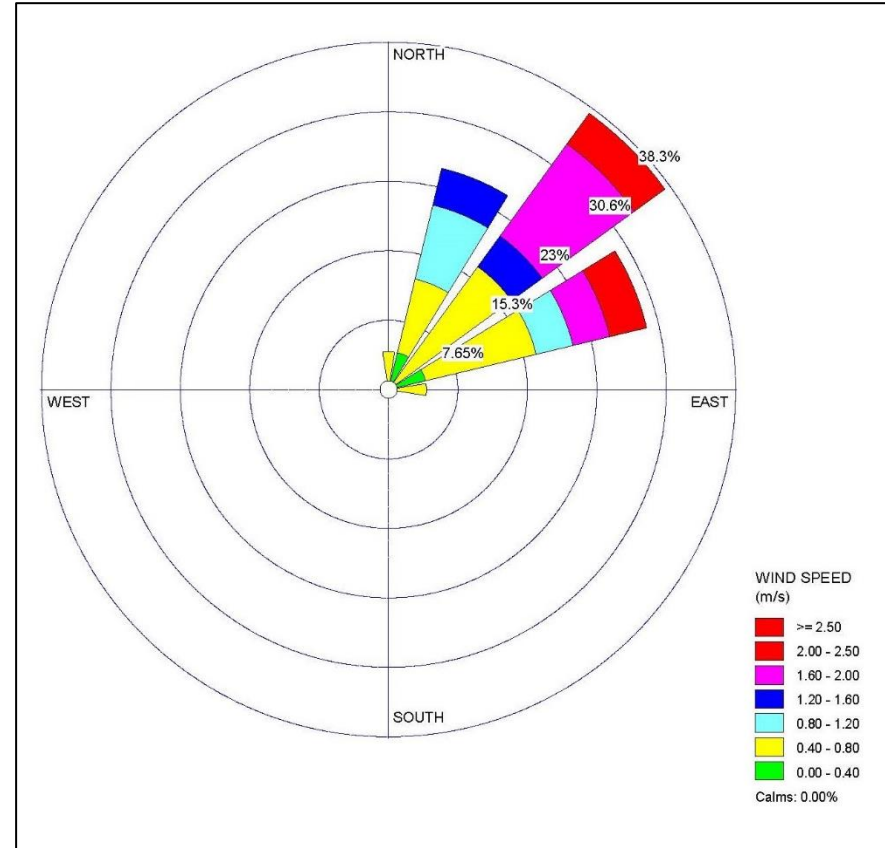


Figure 4-21 Wind Speed and Wind Direction at Station A1



Wind Rose Diagram (1st Time)



Wind Rose Diagram (2nd Time)

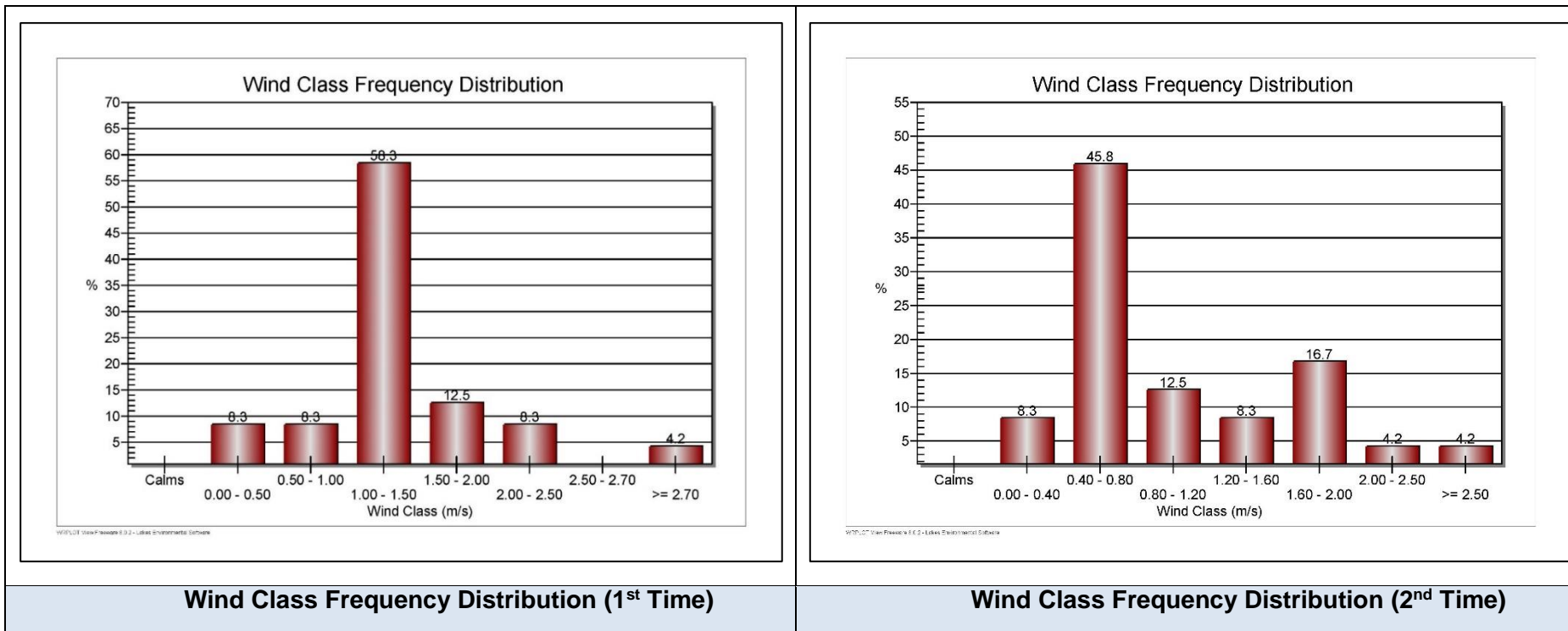
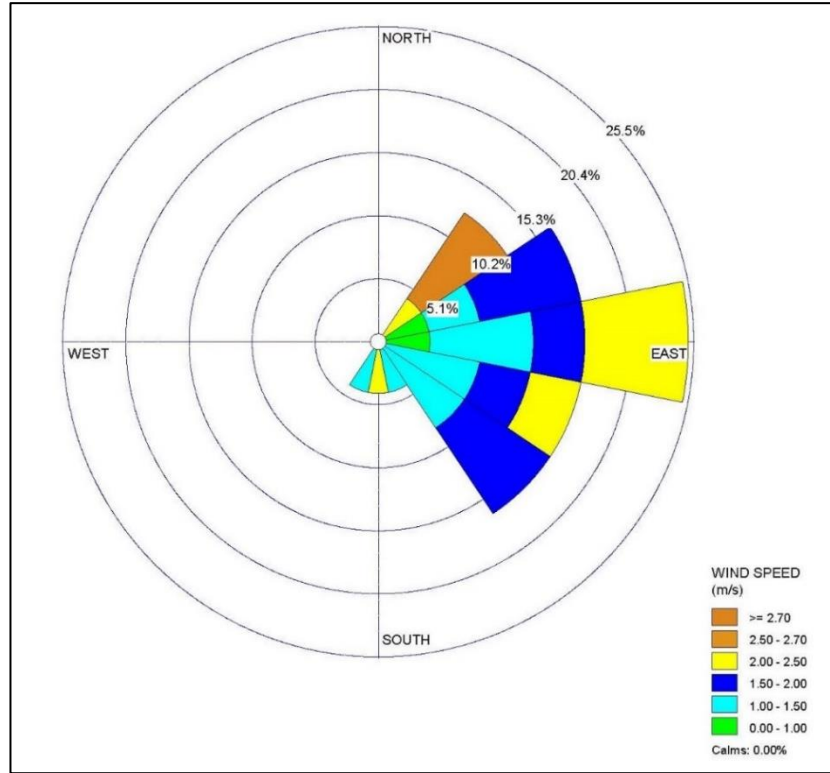
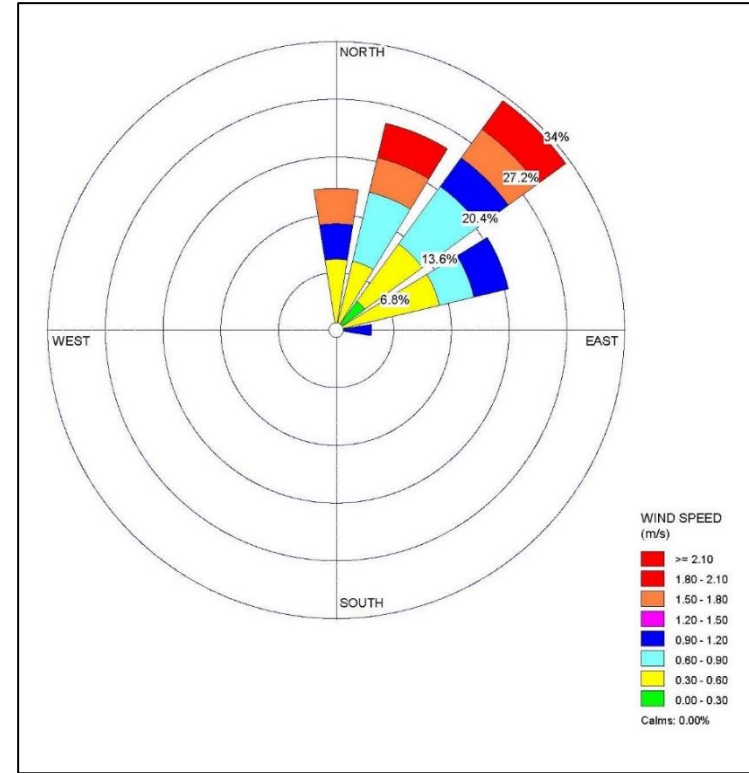


Figure 4-22 Wind Speed and Wind Direction at Station A2



Wind Rose Diagram (1st Time)



Wind Rose Diagram (2nd Time)

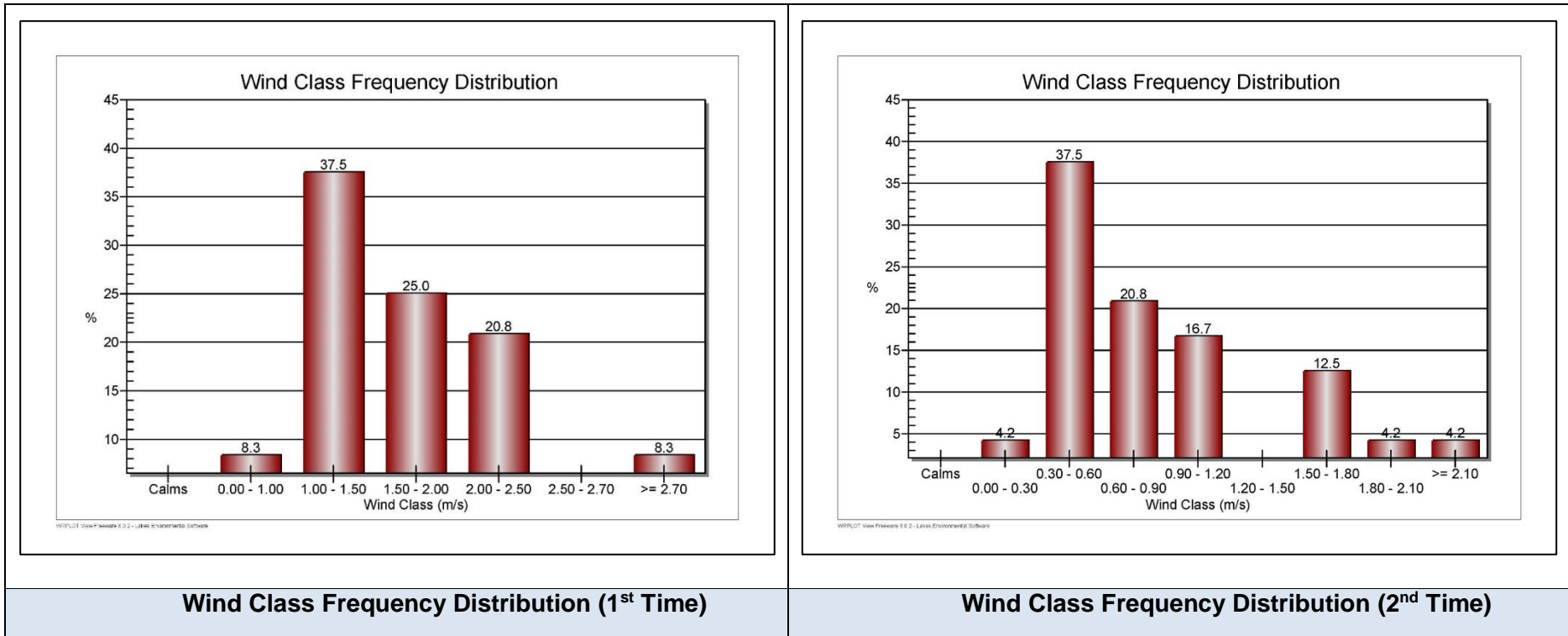
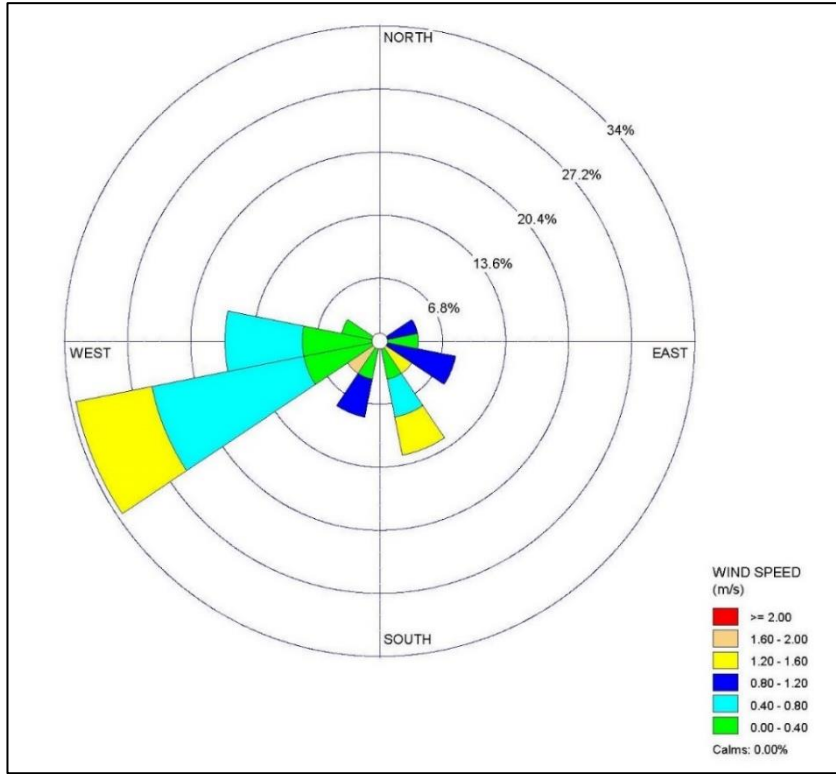
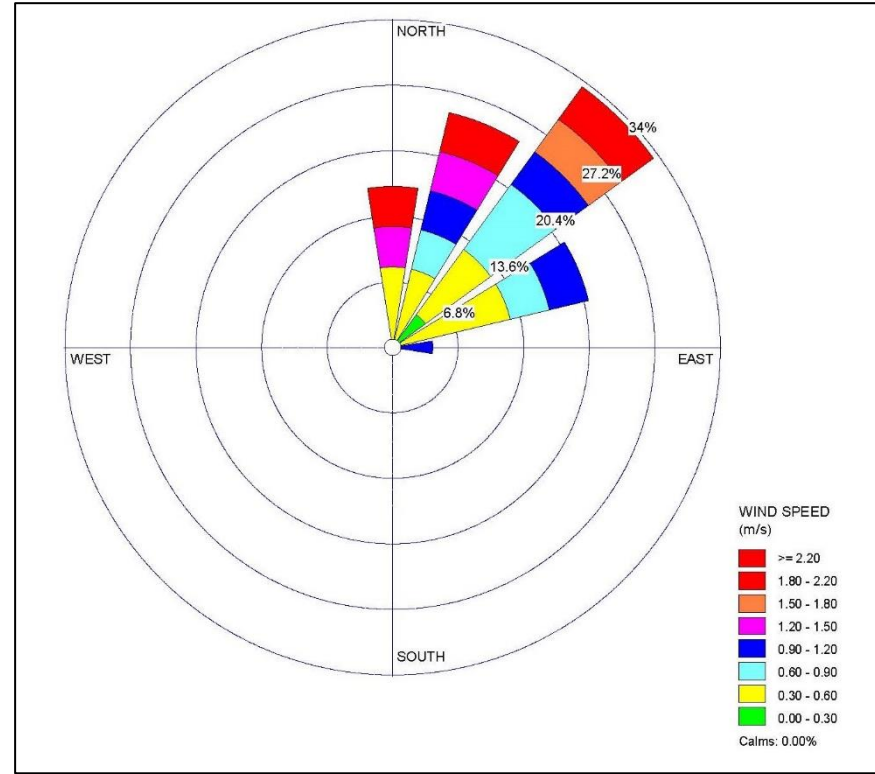


Figure 4-23 Wind Speed and Wind Direction at Station A3



Wind Rose Diagram (1st Time)



Wind Rose Diagram (2nd Time)

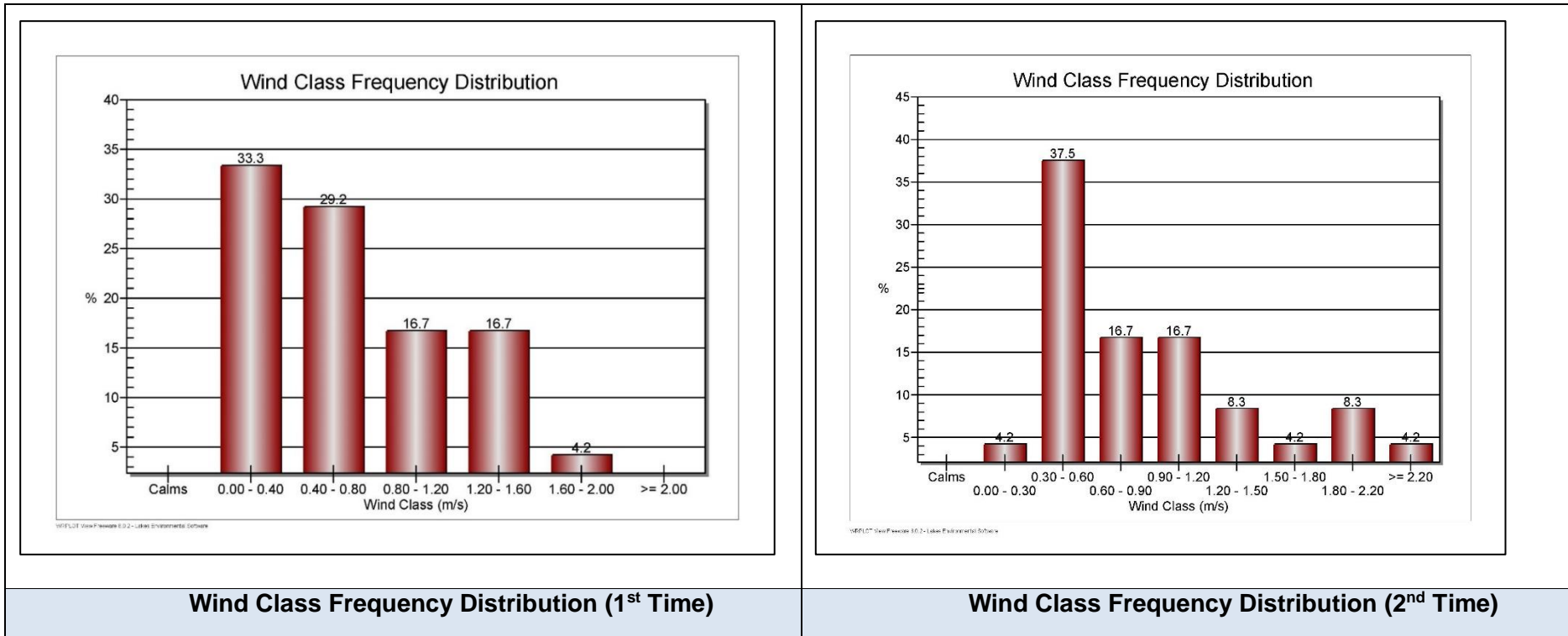
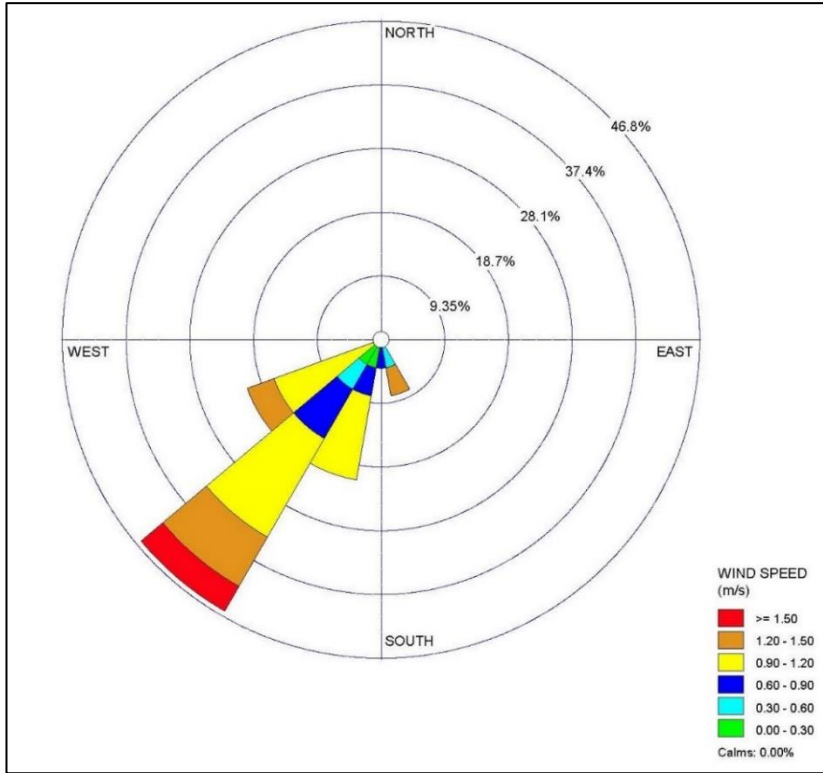
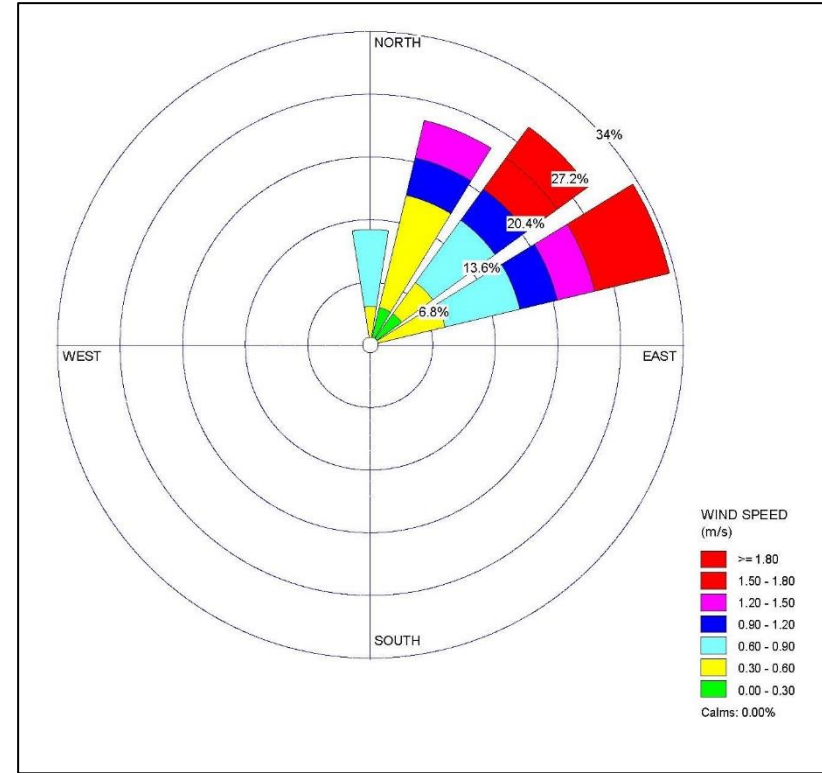


Figure 4-24 Wind Speed and Wind Direction at Station A4



Wind Rose Diagram (1st Time)



Wind Rose Diagram (2nd Time)

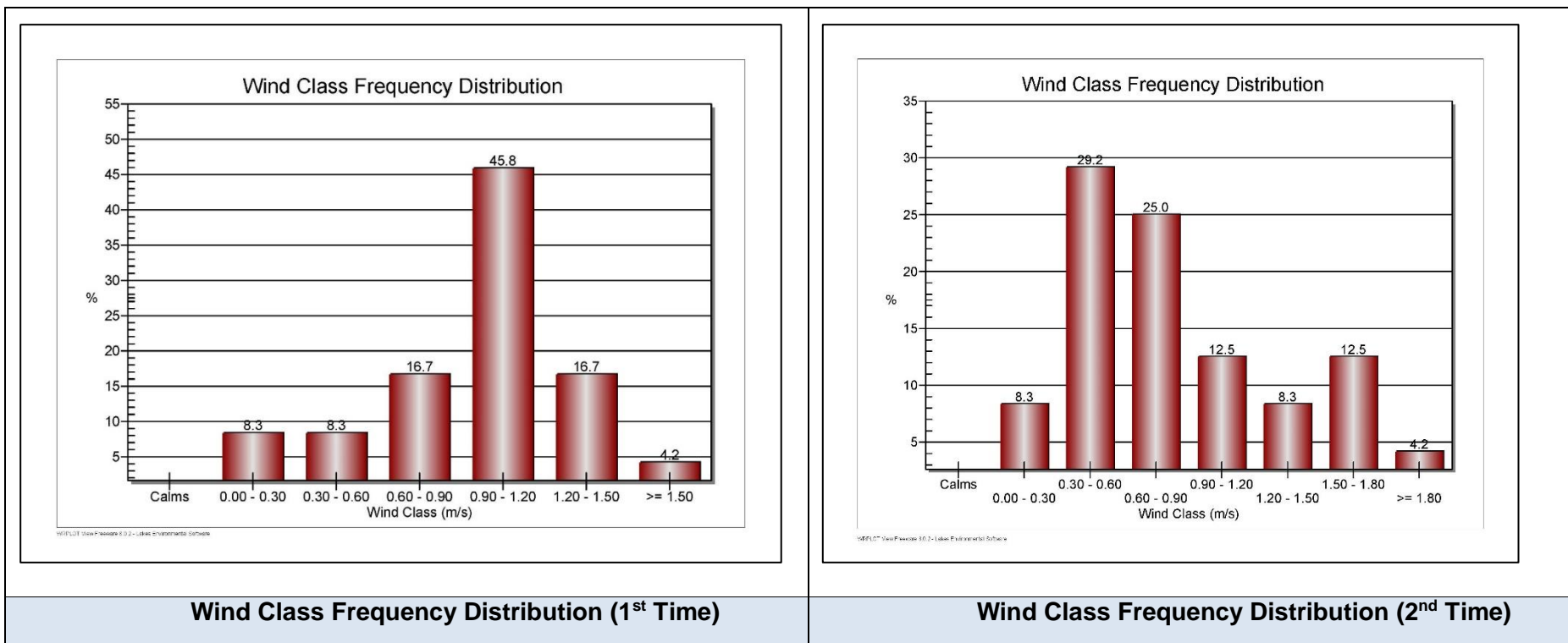


Figure 4-25 Wind Speed and Wind Direction at Station A5

4.3.3. Noise Level

The construction of the project will invariably create noise that could disturb nearby sensitive receptors. As the project area is located in industrial zone, which is away from populated areas, the negative impact of existing levels of background noise are expected to be low. Nevertheless, it would be useful to establish the baseline data on background noise levels in the project site.

4.3.3.1. Methodology

1st time noise measurements were developed at five station within 3km radius of project site during 24th April - 6th June 2020 to collect noise monitoring data with noise Bentech GM 1356 while 2nd time noise measurements were conducted at the same location of 1st time measurement during 8th – 13th December 2022. Noise monitoring result were compared with NEQEG (2015). Field measurements were carried out for 24 hours at the same location as those selected for the air quality measurements. The details of the noise level measurements are presented in **APPENDIX H**. Location map of noise monitoring points can be seen in Figure 4-11. Noise level monitoring activities at some monitoring points can be seen in Figure 4-26.



Figure 4-26 Noise Level Monitoring Activities

4.3.3.2. Results of the Study

Both 1st time and 2nd time average background noise levels expressed in daytime (minimum-maximum), nighttime (minimum-maximum) and LAeq (24 hrs) were shown in Table 4-8 and Table 4-9, respectively. The results were compared with NEQEG (2015). The noise levels of N1(daytime and nighttime), N2 (daytime and nighttime), N3 (daytime and nighttime) and N4 (daytime) for both 1st time and 2nd time monitoring results were within NEQEQ 2015.

The noise levels of N4 (daytime and nighttime) and N5 (nighttime) are slightly higher than the NEQEG (2015) (residential, institutional, educational), probably due to rainfall during 1st time monitoring. In addition, N4 monitoring point is located in Lotaya Hinhthada Monastery, Dhama School in which studying, teaching and worshipping activities are performed.

According to noise level measurement result, 2nd time noise measurement results are lower than 1st time noise monitoring results, probably due to rainfall, since 1st time measurements were performed during raining season. The noise levels of each monitoring location are shown in Figure 4-27 to Figure 4-30.

Table 4-8 Result of the 1st Time Noise Level Measurement

Station	Sampling Date	One Hour LAeq (dBA) ^a		24 Hours LAeq
		Daytime (7:00 – 22:00) (10:00 – 22:00 for public holidays)	Nighttime (7:00 – 22:00) (10:00 – 22:00 for public holidays)	
N1	24 th – 25 th April 2020 (week days)	50.9 – 61.3	54.2 – 62.0	56.98
N2	26 th – 27 th April 2020 (public holiday)	56.7 – 64.3	50.5 – 63.6	57.96
N3	28 th – 29 th April 2020 (week days)	49.4 – 57.4	46.8 – 50.7	51.95
N4	3 rd – 4 th June 2020 (week days)	54.4 - 68.0	50.7 – 57.3	58.3
N5	4 th – 5 th June 2020 (week days)	52.58 – 54.94	52.29 – 54.28	53.53
NEQEG 2015	Residential, institutional, educational	55	45	-
	Industrial, commercial	70	70	

^a Equivalent continuous sound level in decibels

Table 4-9 Result of the 2nd Time Noise Level Measurement

Station	Sampling Date	One Hour LAeq (dBA) ^a		24 Hours LAeq
		Daytime (7:00 – 22:00) (10:00 – 22:00 for public holidays)	Nighttime (7:00 – 22:00) (10:00 – 22:00 for public holidays)	
N1	8 th – 9 th December 2022 (week days)	50.7 – 61.8	54.0 – 62.6	57.58
N2	9 th – 10 th December 2022 (public holiday)	55.2 – 64.0	50.0 – 57.7	57.16
N3	10 th – 11 th December 2022 (public holiday)	51.4 – 56.3	46.9 – 50.2	51.93
N4	11 th – 12 th December 2022 (public holiday)	54.1 – 62.4	45.3 – 53.8	55.26
N5	12 th – 13 th June 2020 (week days)	45.4 – 54.9	44.8 – 51.2	50.12
NEQEG 2015	Residential, institutional, educational	55	45	-
	Industrial, commercial	70	70	

^a Equivalent continuous sound level in decibels

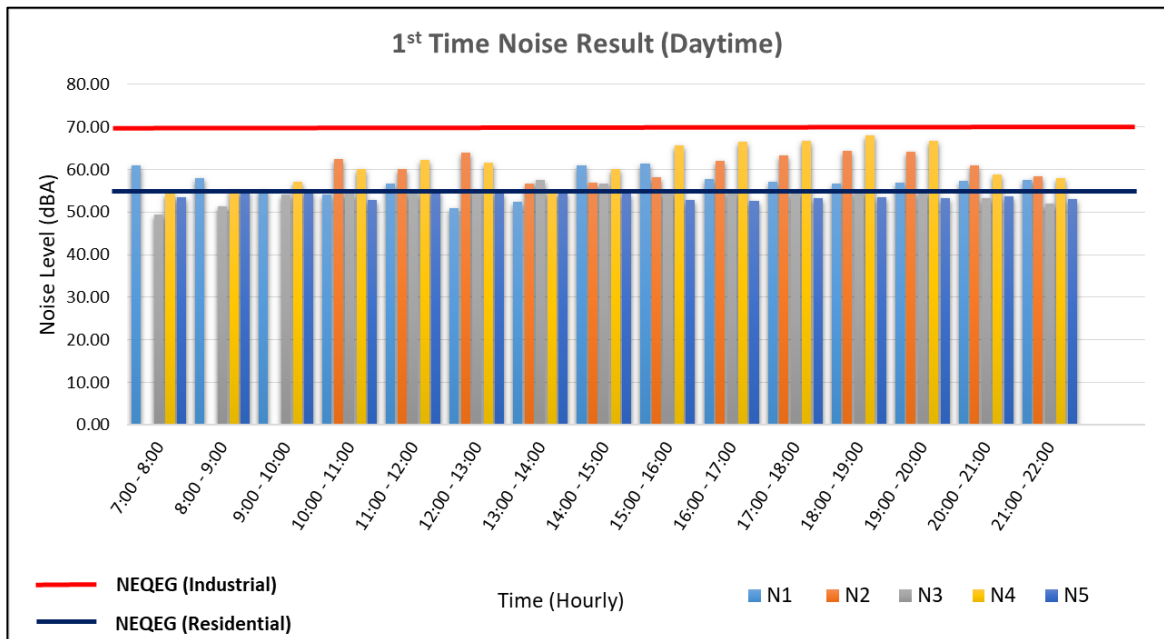


Figure 4-27 1st Time Noise Measurement Results (Daytime)

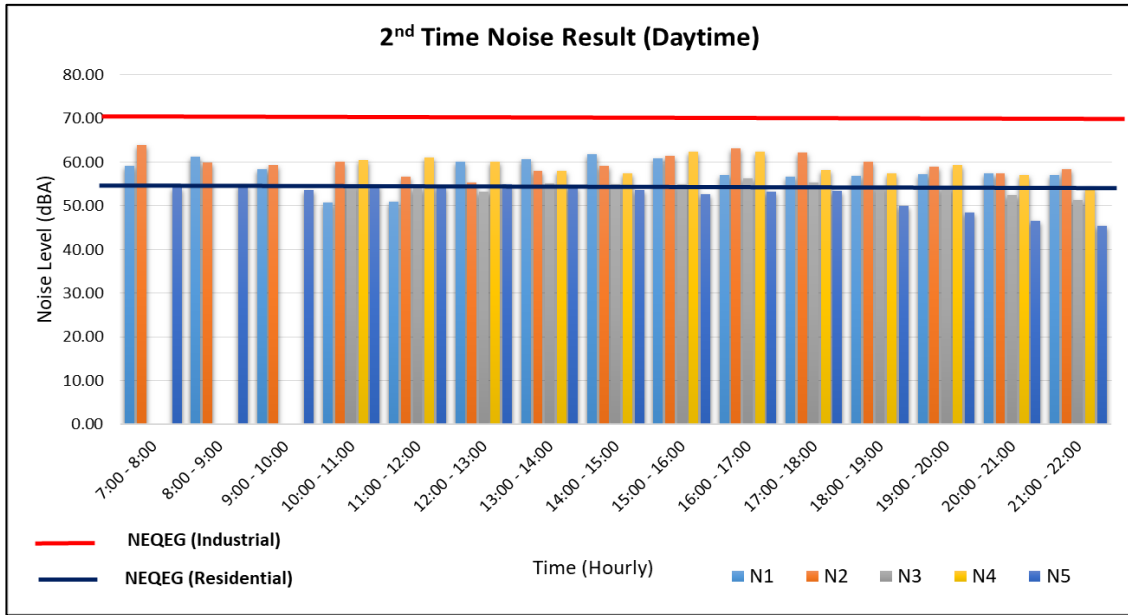


Figure 4-28 2nd Time Noise Measurement Results (Daytime)

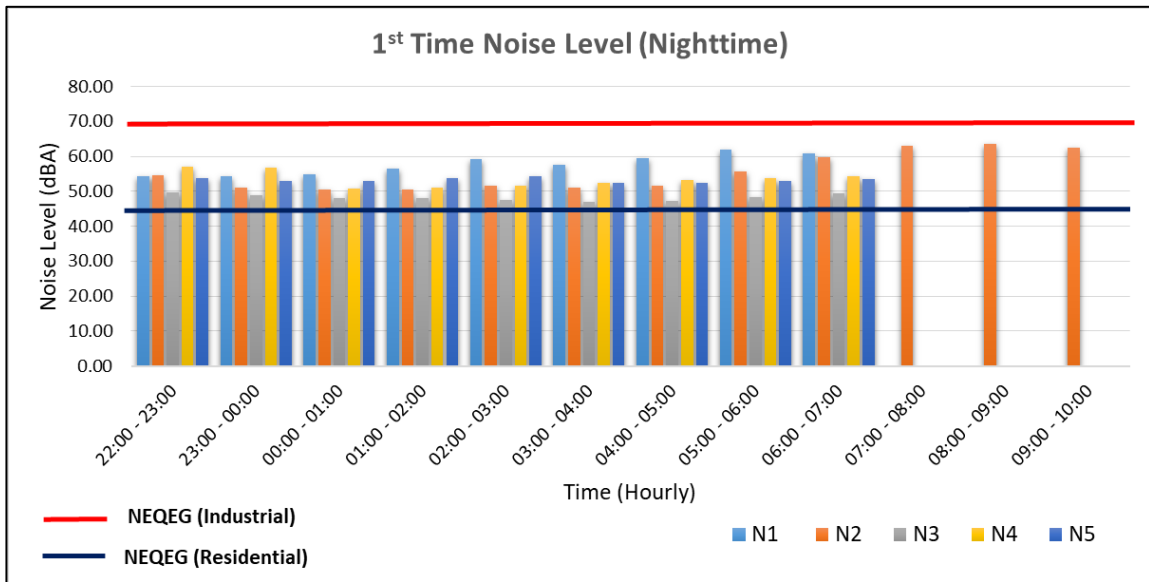


Figure 4-29 1st Time Noise Measurement Results (Nighttime)

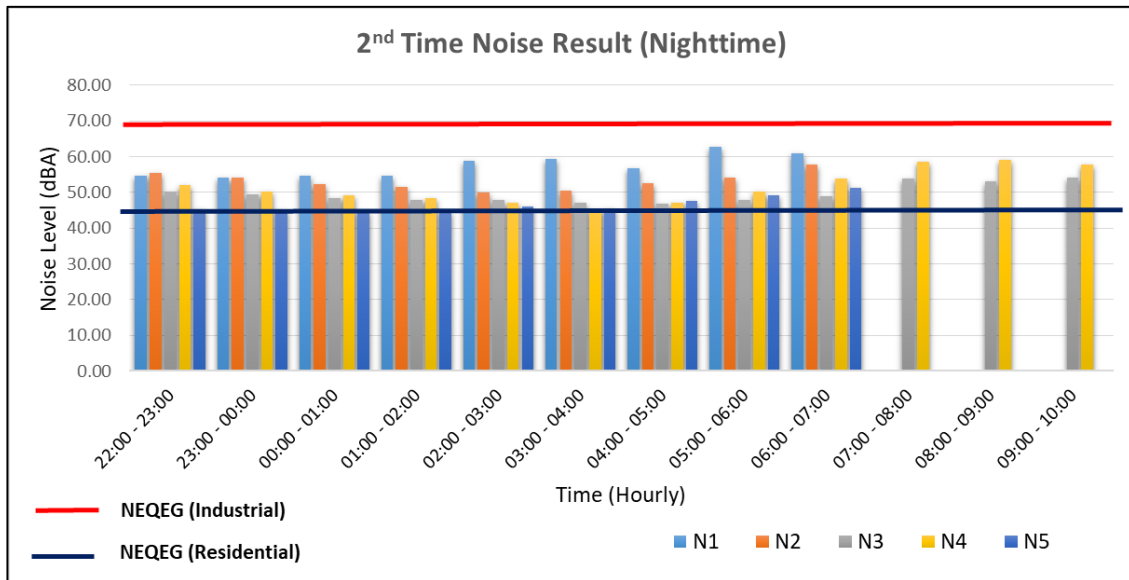


Figure 4-30 2nd Time Noise Measurement Results (Nighttime)

4.3.4. Vibration

4.3.4.1. Methodology

Background vibration measurements for both 1st time and 2nd time monitorings were carried out on the same date and at the same location as air and noise monitoring by using Normis Seismograph (Mini Supergraph II). At each station, the ground vibration was recorded over a 24-hours period. Monitoring locations can be seen in Figure 4-11 and vibration monitoring activities of some monitoring points are shown in Figure 4-31. The details of the vibration measurements are presented in **APPENDIX I**.



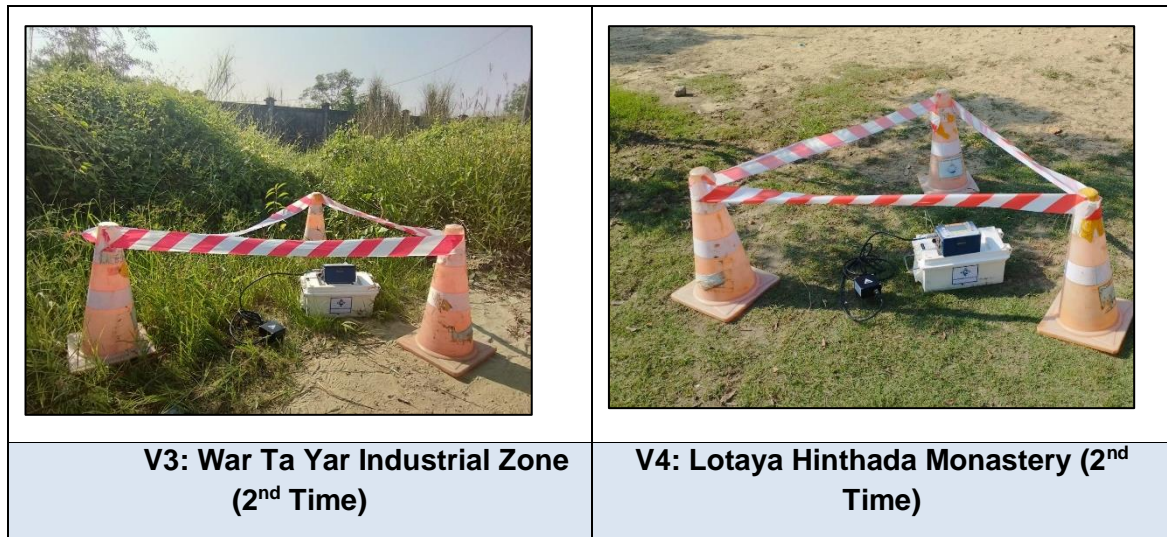


Figure 4-31 Vibration Monitoring Activities

4.3.4.2. Result of the Study

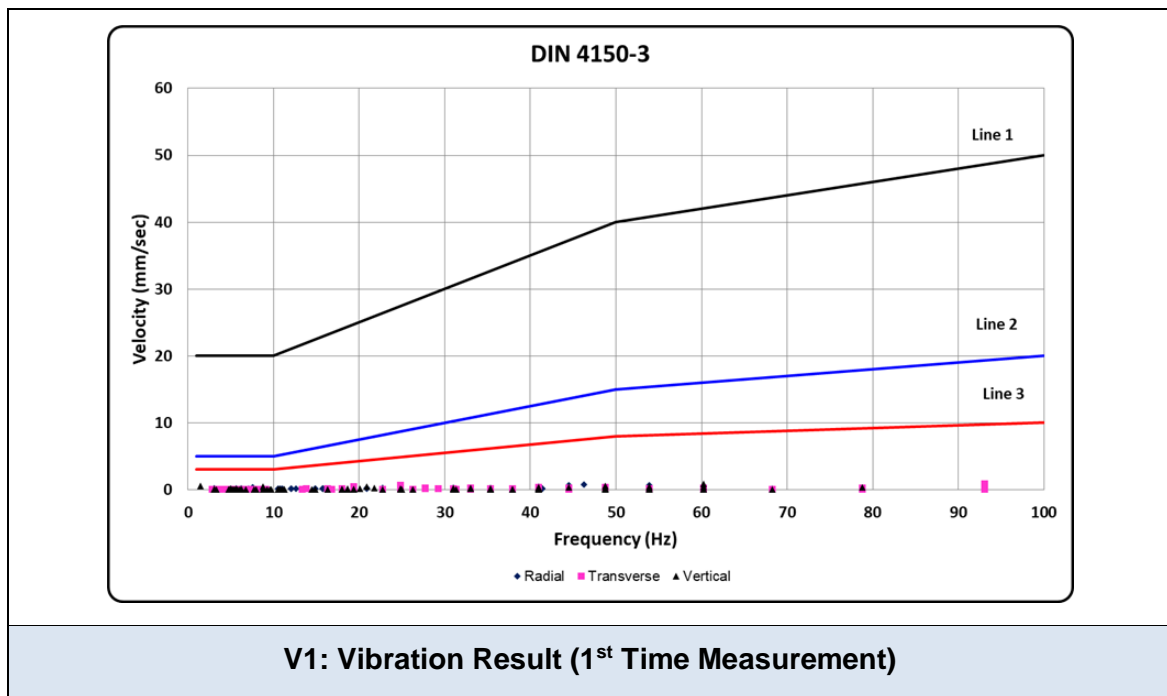
The vibration results for both 1st time and 2nd time monitoring were compared with German Standard from Din 4150-3 that is shown in Table 4-10. V1, V2 and V3 are located in Wartayar Industrial zone and they were compared with Line 1 standard (commercial and industrial building). V4 which is located near Lotaya Hinthada monastery and it was compared with Line 3 standard (sensitive building) while V5, which is located in residential area, was compared with Line 2 standard (residential area). The results of all monitoring points are within acceptable level of the German Standard from DIN 4150-3. The results of each monitoring points are shown in Table 4-11 to Table 4-15 and Figure 4-32 to Figure 4-36.

Table 4-10 German Standard Guideline

Structure Type	German Standards from DIN 4150-3 Peak particle velocity (mm/s)		
	1 – 10 Hz	10 – 50 Hz	50 – 100 Hz
Commercial and Industrial Building (Line1)	20	20 – 40	40 – 50
Residential Building (Line2)	5	5 – 15	15 – 20
Sensitive Building (Line3)	3	3 – 8	8 – 10

Table 4-11 Vibration Result for V1 (Project Site)

Station	Sampling Date	Result			German Standards DIN 4150-3	Sources of Vibration
		Direction	Frequency (Hz)	Peak Particle Velocity (PPV) (mm/s)	PPV for Commercial and industrial area (mm/s)	
V1 (1 st Time)	24 th - 25 th April 2020	Radial	26.81	0.29	20 - 40	Site activities Vehicles activities and construction equipment
		Transverse	22.15	0.23	20 - 40	
		Vertical	11.80	0.37	20 - 40	
V1 (2 nd Time)	8 th - 9 th October, 2022	Radial	63.18	0.26	40 - 50	
		Transverse	22.35	0.22	20 - 40	
		Vertical	24.54	0.33	20 - 40	



V1: Vibration Result (1st Time Measurement)

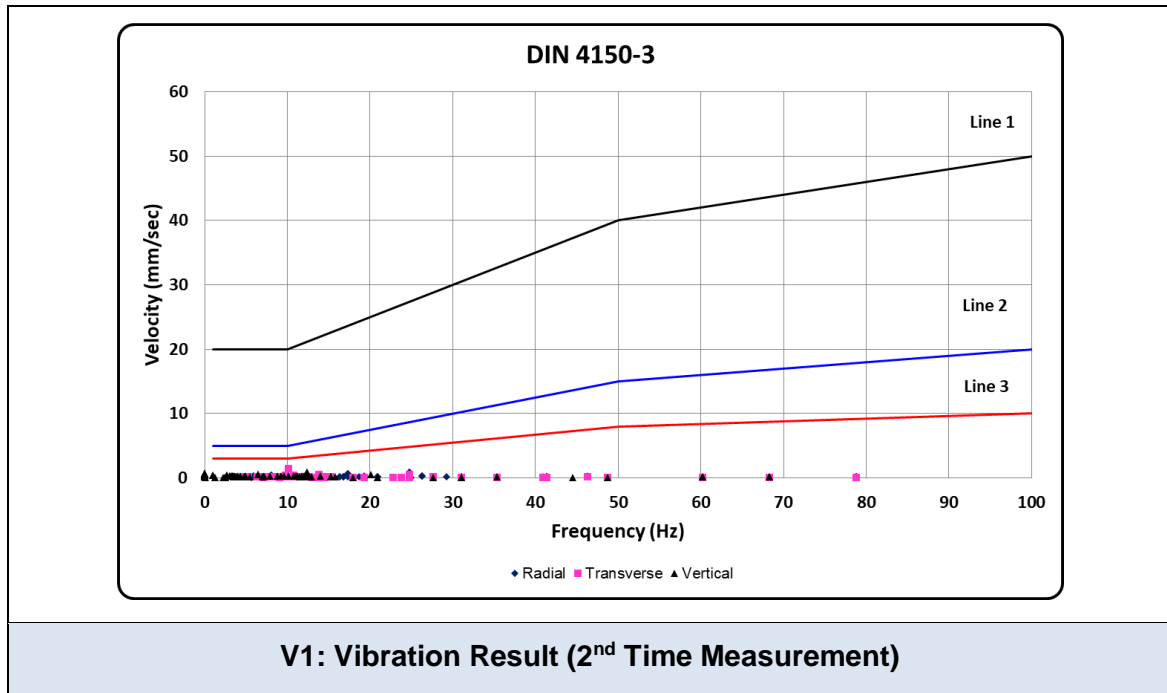
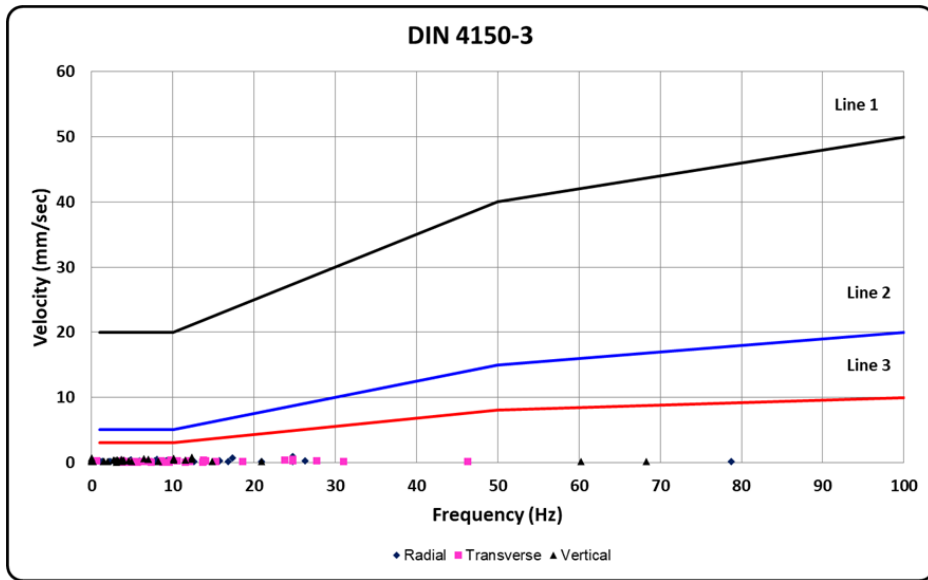


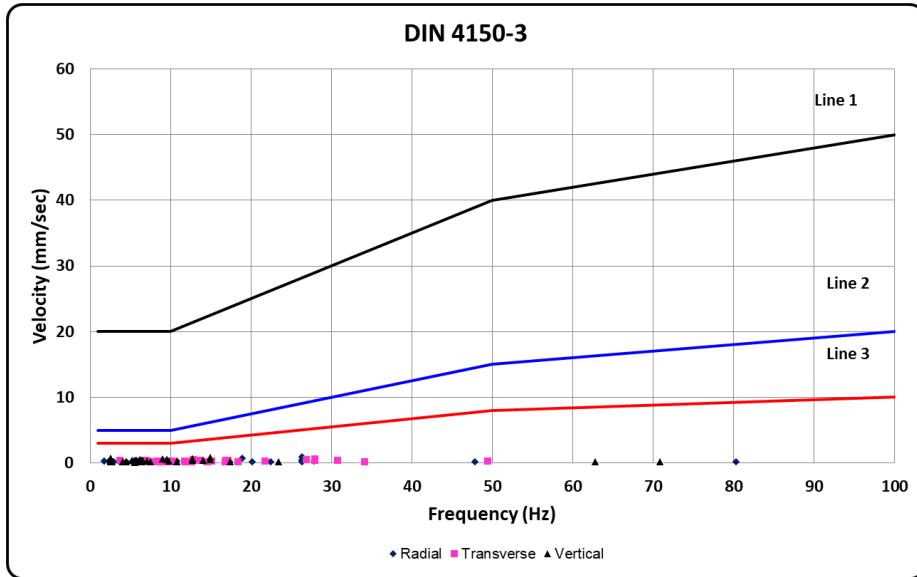
Figure 4-32 Vibration Result for V1 (Project Site)

Table 4-12 Vibration Result for V2 (War Ta Yar Industrial Zone)

Station	Sampling Date	Result			German Standards DIN 4150-3	Sources of Vibration
		Direction	Frequency (Hz)	Peak Particle Velocity (PPV) (mm/s)	PPV for Commercial and industrial area (mm/s)	
V2 (1 st Time)	26 th - 27 th April 2020	Radial	10.85	0.24	20 - 40	Vehicles movement around the monitoring station
		Transverse	11.88	0.17	20 - 40	
		Vertical	7.25	0.28	20	
V2 (2 nd Time)	9 th - 10 th October, 2022	Radial	12.40	0.25	20 - 40	
		Transverse	14.96	0.30	20 - 40	
		Vertical	9.8	0.32	20	



V2: Vibration Result (1st Time Measurement)

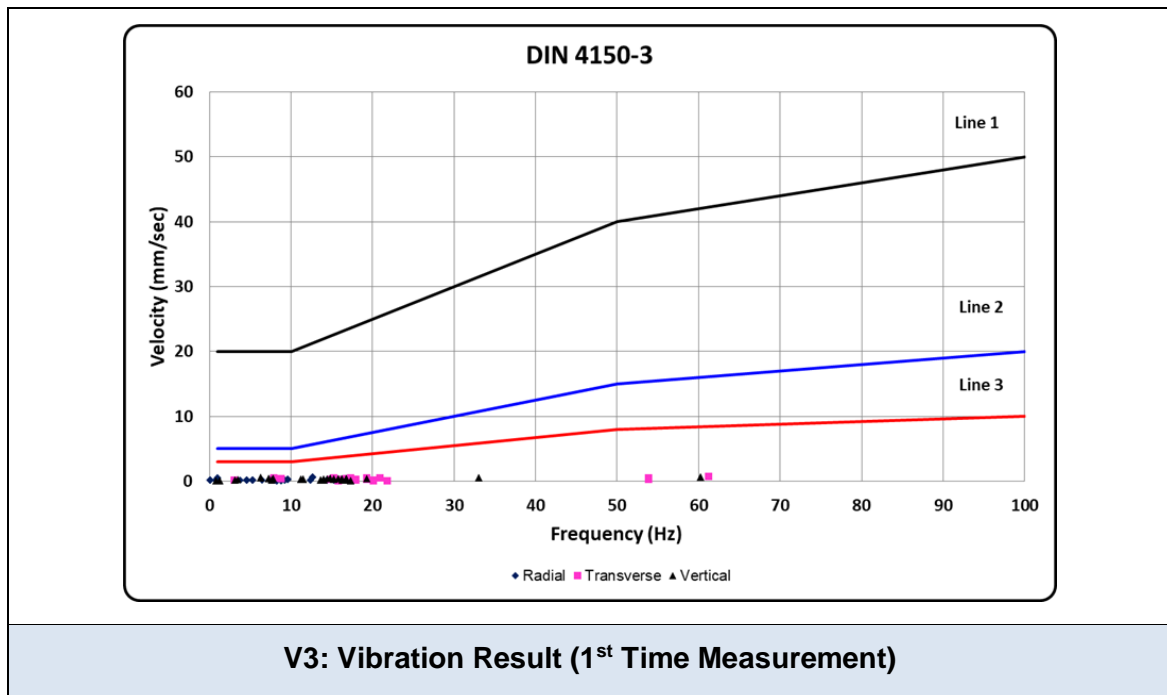


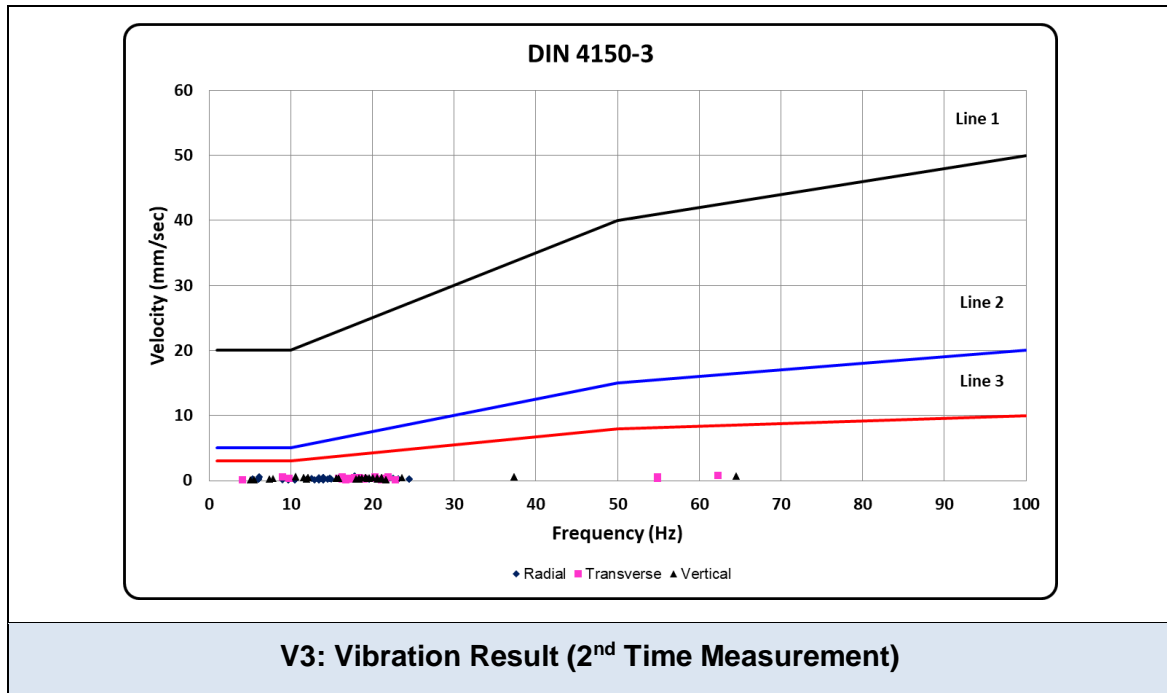
V2: Vibration Result (2nd Time Measurement)

Figure 4-33 Vibration Result for V2 (War Ta Yar Industrial Zone)

Table 4-13 Vibration Result for V3 (War Ta Yar Industrial Zone)

Station	Sampling Date	Result			German Standards DIN 4150-3	Sources of Vibration
		Direction	Frequency (Hz)	Peak Particle Velocity (PPV) (mm/s)	PPV for Commercial and industrial area (mm/s)	
V3 (1 st Time)	28 th - 29 th April 2020	Radial	9.74	0.25	20	Vehicles movement around the monitoring station
		Transverse	20.63	0.32	20 - 40	
		Vertical	15.00	0.32	20 - 40	
V3 (2 nd Time)	10 th – 11 th October, 2022	Radial	14.95	0.28	20 - 40	
		Transverse	21.65	0.34	20 - 40	
		Vertical	19.30	0.36	20 - 40	



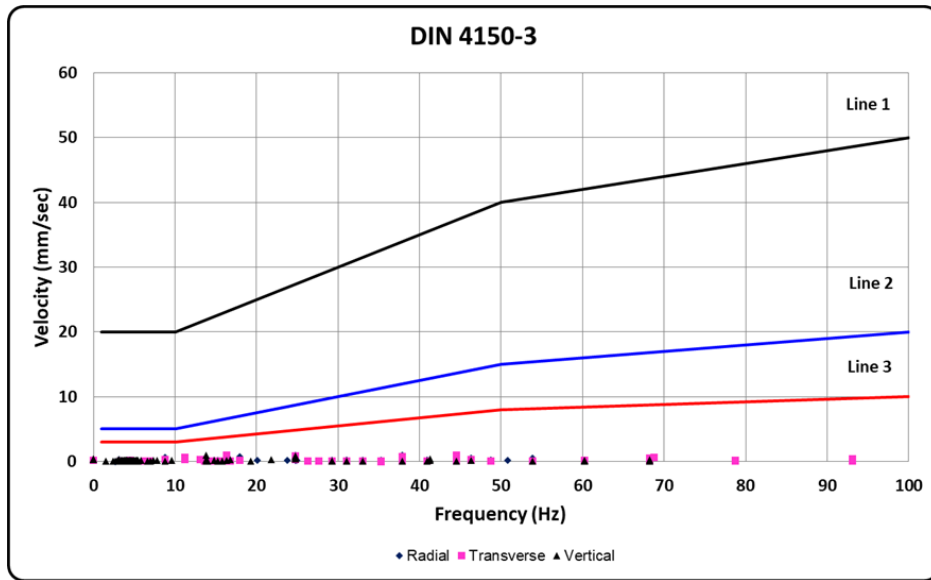


V3: Vibration Result (2nd Time Measurement)

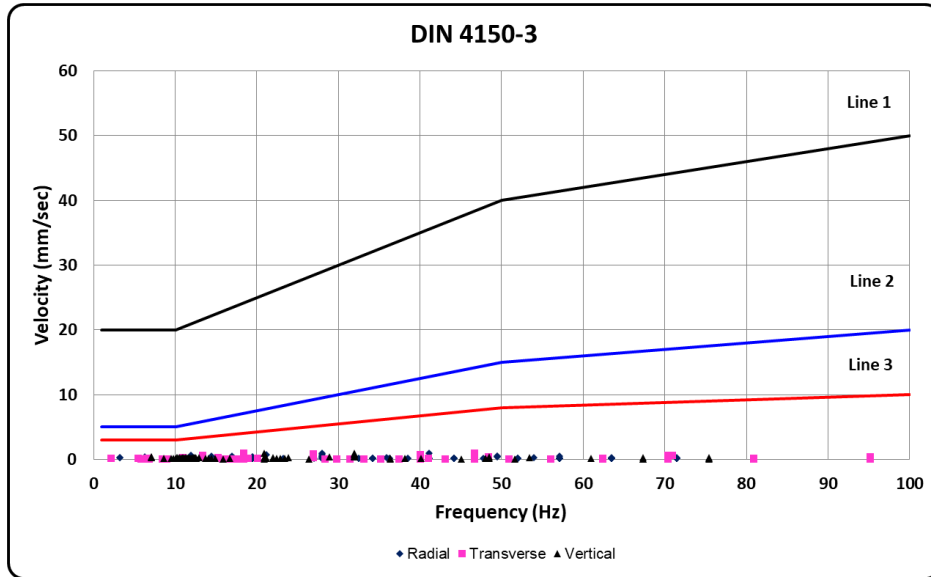
Figure 4-34 Vibration Result for V3 (War Ta Yar Industrial Zone)

Table 4-14 Vibration Result for V4 (Lotaya Hinthada Monastery)

Station	Sampling Date	Result			German Standards DIN 4150-3	Sources of Vibration
		Direction	Frequency (Hz)	Peak Particle Velocity (PPV) (mm/s)	PPV for Residential area (mm/s)	
V4 (1 st Time)	3 th - 4 th June 2020	Radial	32.70	0.24	3 - 8	Vehicles movement around the monitoring station
		Transverse	38.86	0.21	3 - 8	
		Vertical	14.85	0.20	3 - 8	
V4 (2 nd Time)	11 th - 12 th October 2022	Radial	35.90	0.29	3 - 8	
		Transverse	40.99	0.23	3 - 8	
		Vertical	21.96	0.25	3 - 8	



V4: Vibration Result (1st Time Measurement)

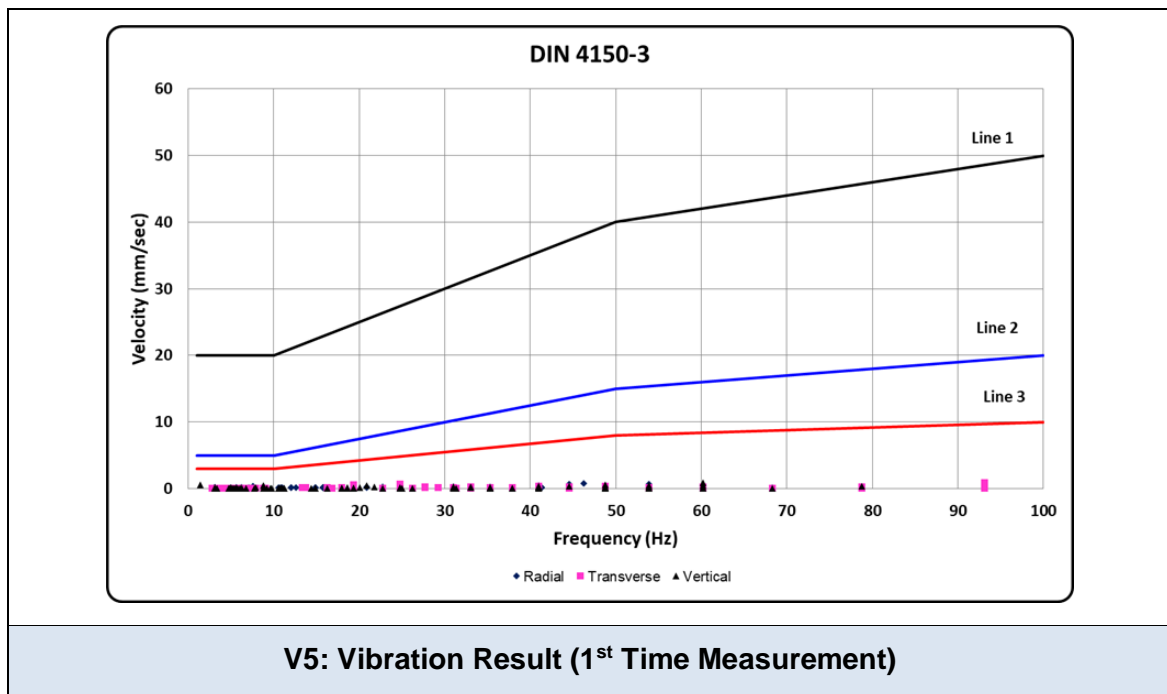


V4: Vibration Result (2nd Time Measurement)

Figure 4-35 Vibration Result for V4 (Lotaya Hinthada Monastery)

Table 4-15 Vibration Result for V5 (Residential Area)

Station	Sampling Date	Result			German Standards DIN 4150-3	Sources of Vibration
		Direction	Frequency (Hz)	Peak Particle Velocity (PPV) (mm/s)	PPV for Residential area (mm/s)	
V5 (1 st Time)	4 th - 5 th June 2020	Radial	24.48	0.19	5 - 15	Vehicles movement around the monitoring station
		Transverse	65.52	0.13	15	
		Vertical	26.07	0.15	5 - 15	
V5 (2 nd Time)	12 th - 13 th October 2022	Radial	23.25	0.17	5 - 15	
		Transverse	59.62	0.16	15	
		Vertical	29.18	0.14	5 - 15	



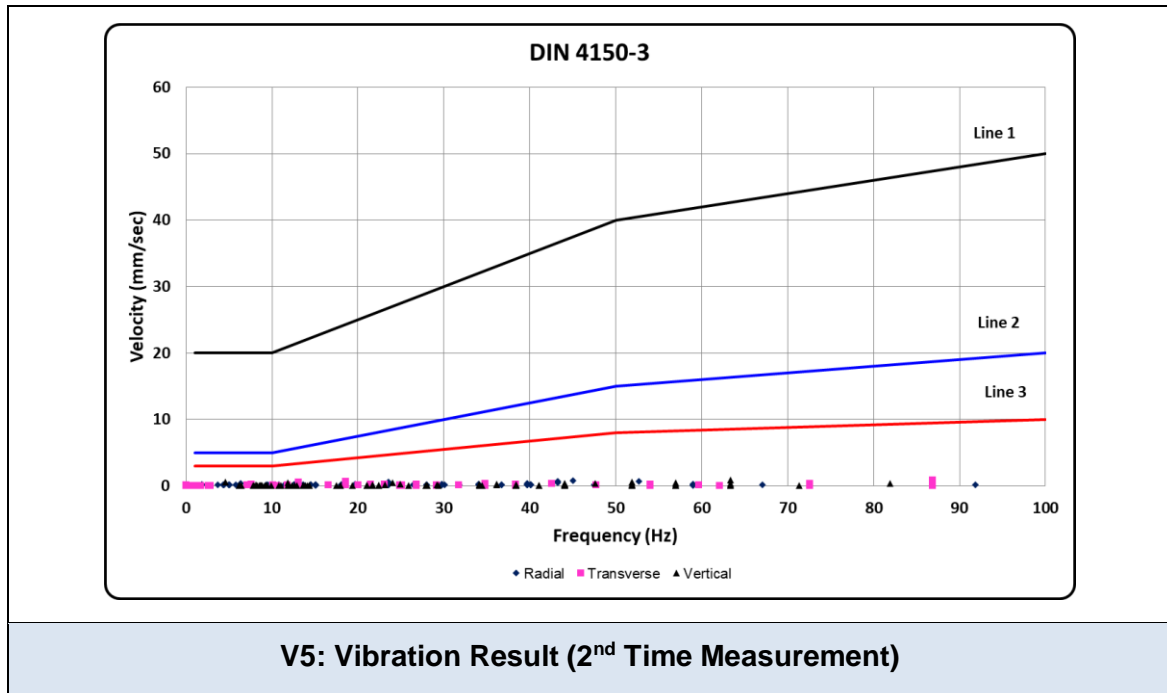


Figure 4-36 Vibration Result for V5 (Residential Area)

4.3.5. Water Quality

Water samples were collected and analysed twice at four stations (1st time) and five stations (2nd time). There are three surface water-sampling points that are located in Lain Gone Creek and Hlaing River, and one groundwater and one wastewater sampling point that are located in the project site. The detailed summary of water quality sampling points are summarized in Table 4-16.

Table 4-16 Detailed Summary of Water Sampling Points

No.	Station	1 st Time Sampling Duration (wet season)	2 nd Time Sampling Duration (dry season)	Type of sample	1 st Time Sampling Coordinate	2 nd Time Sampling Coordinate	Location
1.	SW-1	27 th May 2020	29 th December 2022	Surface Water	17° 00'03.96"N 96° 02'57.40"E	17° 00'03.57"N 96° 02'57.04"E	Lain Gone Creek
2.	SW-2	29 th May 2020	29 th December 2022	Surface Water	16°59'12.96"N 96° 1'38.47"E	16°59'10.76"N 96° 1'44.73"E	Hlaing River (upstream)
3.	SW-3	29 th May 2020	29 th December 2022	Surface Water	16°57'29.30"N 96° 3'16.62"E	16°57'29.96"N 96° 3'16.02"E	Hlaing River (downstream)
4.	GW-1	27 th May 2020	29 th December 2022	Ground Water	16°58'37.52"N 96° 3'14.04"E	16°58'35.68"N 96° 3'9.94"E	Project Site
5.	WW-1	-	29 th December 2022	Wastewater	-	16°58'40.31"N 96° 3'10.86"E	Project Site

4.3.5.1. Methodology

The methods for sample collection and treatment follow the accreditation for laboratory to ensure that the water samples are free from contamination. The sample collectors have to wear starch-free rubber gloves at all time while collecting water samples. The bottles for keeping the water samples must be rinsed with the sampling water before use. The water quality is tested by both Insitu measurement and laboratory experiment. Details of the sample analytical methods and references for each parameter at ALARM Ecological laboratory are shown in Table 4-17. The water quality parameters such as pH, temperature and Total Dissolved Solids (TDS) for 2nd time are measured using Insitu method. The water quality Insitu testing method is shown in Table 4-18. The location map of surface water sampling points and water sampling activities are shown in Figure 4-37 and Figure 4-38 respectively. The details of the water quality measurement results are presented in **APPENDIX J**.

Table 4-17 Laboratory Testing Methods in ALARM Ecological Laboratory

No.	Parameter	Instruments/ Methods	References/ Description
1.	pH	pH Meter	Electrode method (Approved by EPA, ISO, ASTM), Hanna electrode meter Certified by 2014 EMS, Certified by QMS
2.	Temperature, DO	DO Meter	Electrochemical probe method, Dissolved Oxygen Probe Measurement (Approved by EPA, ISO, ASTM) Horiba DO electrode certified with IP67 standards and measures
3.	All others parameters	SpectroDirect Methods	Lovibond brand reagent testing methods, precision of the methods are identical to the precision specified in the standard literature of AWWA and ISO
4.	TDS	TDS Meter	Electrode method (Approved by EPA, ISO, ASTM), Hanna electrode meter Certified by 2014 EMS, Certified by QMS
5.	Conductivity	Conductivity Meter	Electrode method, conductivity cell (Approved by EPA, ISO, ASTM), Hanna electrode meter Certified by 2014 EMS, Certified by QMS
6.	Biological Oxygen Demand (BOD)	BOD Testing Method	Method 405.1, USEPA Method for Chemical Analysis of Water and Wastewater.
7.	Lead, Copper, Cadmium, Sodium	Atomic Adsorption Spectrophotometer	Shimadzu AA-6200, which is based on the Japan Water Standard Testing Method also approved by EPA and ASTM
8.	Arsenic	Arsenic Test Kit	Lovibond brand Arsenic Test Kit certified by DIN ISO 1997/ Follow Procedure: Meets WHO requirements:

Table 4-18 Water Quality Insitu Testing Method

Parameter	Instruments/ Methods	References/ Description	Remark
pH, Conductivity, TDS, Salinity	Oakton PCTSTestr™ 50 Waterproof Pocket	Waterproof Pocket pH/ Cond/ TDS/ Salinity Tester, Premium 50 Series	<ul style="list-style-type: none"> - pH accuracy (± 0.01) - Conductivity accuracy ($\pm 1\%$ FS) - TDS (min 0ppm – max 10.0 ppt) - Salinity (min 0 ppt – max 10.0 ppt) - Salinity accuracy ($\pm 1\%$ FS) - Temperature (min 0°C - 60°C) - Temperature accuracy 0°C to 50°C ($\pm 0.5^\circ\text{C}$); from 50°C to 60°C ($\pm 1.0^\circ\text{C}$)

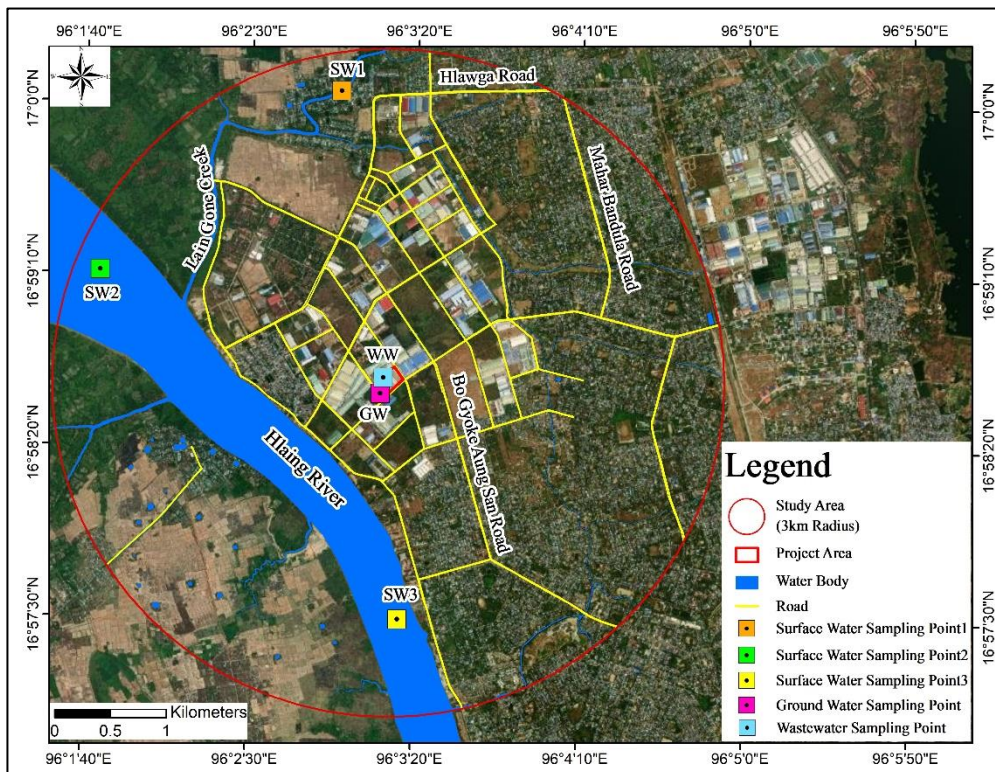
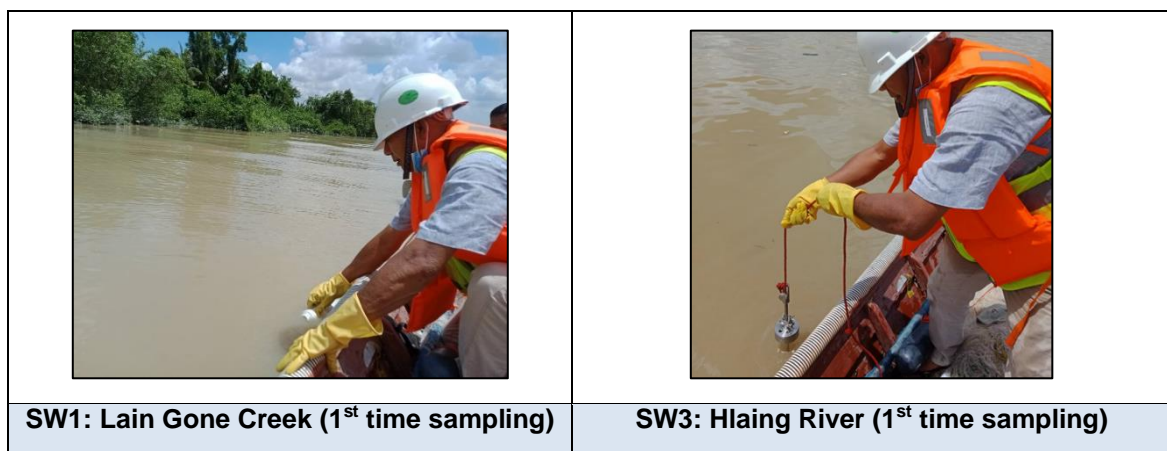


Figure 4-37 Location Map of Water Sampling Points



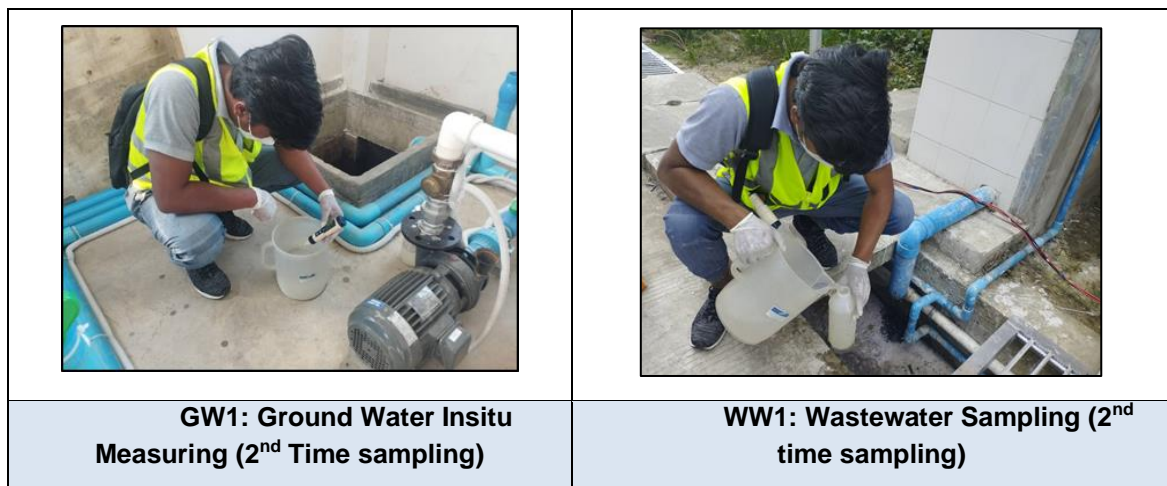


Figure 4-38 Water Samples Collection Activities

4.3.5.2. Surface Water Quality Results

Measurement Results during Wet Season

The results of surface water samples measured during wet season are compared with Myanmar National Drinking Water Quality Standard (NDWQS), 2019 and NEQEG 2015. The detailed results are shown in Table 4-19. As shown in table, turbidity and iron of surface water quality in Lain Gone Creek, and turbidity and TDS of surface water quality of both downstream and upstream of Hlaing River are higher than NDWQS (2019). TSS of surface water quality in Lain Gone Creek and Hlaing River (both downstream and upstream) are higher than NEQEG 2015. The surface water quality is not suitable for drinking.

Measurement Results during Dry Season

The results of surface water samples measured during dry season are also compared with Myanmar National Drinking Water Quality Standard (NDWQS), 2019 and NEQEG 2015. The turbidity results of Lain Gone Creek and turbidity and TDS results of Hlaing River (both downstream and upstream) are higher than NDWQS (2019). In addition, TSS of Hlaing River (downstream) is higher than NEQEG (2015). According to surface water quality results, the untreated water in Lain Gone Creek and Hlaing river is not suitable for drinking.

Table 4-19 Surface Water Quality Results

No.	Parameter	Unit	1 st Time (Wet Season)			2 nd Time (Dry Season)			NDWQS (2019)	NEQEG (2015)
			SW1	SW2	SW3	SW1	SW2	SW3		
1.	Temperature	°C	25	25	24	27.3	27.4	27.6	NG	NG
2.	pH	-	7.2	8	8.2	7.16	7.85	7.93	6.5 - 8.5	6-9
3.	DO	mg/l	0.97	4	5.89	5.6	5.8	3.7	NG	NG
4.	Turbidity	NTU/ FAU	64	144	250	20	20	3,840	5	NG
5.	Chemical Oxygen Demand (COD)	mg/l	46	<30	<30	<30	<30	<30	NG	250
6.	BOD5	mg/l	27	4.3	4.9	5.2	4.2	4.5	NG	50
7.	TDS	mg/l	449	1,418	1,655	321	1,214	1,488	1,000	NG
8.	Total Suspended Solids (TSS)	mg/l	515	147	233	21	23	743	NG	50
9.	Iron	mg/l	3.2	<0.1	<0.1	0.4	0.3	0.5	1	3.5
10.	Lead	mg/l	ND	ND	ND	ND	ND	0.1	0.01	0.1
11.	Free Cyanide	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.07	0.1
12.	Arsenic	mg/l	0.01	0.005	0.005	0.005	0.005	0.005	0.05	0.1
13.	Total Phosphorous	mg/l	<0.02	<0.02	<0.02	0.3	0.12	0.46	NG	2
14.	Total Nitrogen	mg/l	13	13	<5	2.4	1.2	3.2	NG	NG

NDWQS = National Drinking Water Quality Standard

NEQEG = National Environmental Quality (Emission) Guideline

ND= Not Detected

NG= No Guideline

4.3.5.3. Groundwater Quality Results

The results of groundwater (raw) samples are compared with NDWQS (2019). The details of results are shown in Table 4-20. As shown in table, all parameters of groundwater sample for both wet and dry seasons measurement are within NDWQS (2019) except turbidity result measured in dry season. The ground water is treated with Reverse Osmosis (RO) water treatment system. The treated ground water quality result is presented in **APPENDIX J**. The treated ground water is suitable for drinking.

Table 4-20 Groundwater Quality Results (Raw)

No.	Parameter	Unit	GW1 (1 st Time)	GW1 (2 nd Time)	NDWQS (2019)
1.	Temperature	°C	26	29.1	NG
2.	pH	-	7.4	7.22	6.5 - 8.5
3.	DO	mg/l	2.36	5.6	NG
4.	Turbidity	NTU/ FAU	<5	8	5
5.	COD	mg/l	<30	<30	NG
6.	BOD	mg/l	12	3	NG
7.	TDS	mg/l	457	372	1000
8.	TSS	mg/l	2	10	NG
9.	Iron	mg/l	<0.1	0.4	1
10.	Lead	mg/l	ND	ND	0.01
11.	Free Cyanide	mg/l	<0.01	<0.01	0.07
12.	Arsenic	mg/l	0.01	0.005	0.05
13.	Total Phosphorous	mg/l	<0.02	0.05	NG
14.	Total Nitrogen	mg/l	<5	2.1	NG

NDWQS = National Drinking Water Quality Standard

NEQEG = National Environmental Quality (Emission) Guideline

ND= Not Detected

NG= No Guideline

4.3.5.4. Wastewater Quality Result

The result of wastewater sample is compared with NEQEG (2015) and the detailed results are shown in Table 4-21. As shown in table, all parameters of wastewater sample are within NEQEG (2015).

Table 4-21 Wastewater Quality Results

No.	Parameter	Unit	WW-1	NEQEG (2015)
1.	Temperature	°C	26.8	NG
2.	pH	-	7.86	6-9
3.	DO	mg/l	2.16	NG
4.	Oil & Grease	NTU/ FAU	5	≤ 10

No.	Parameter	Unit	WW-1	NEQEG (2015)
5.	COD	mg/l	32	250
6.	BOD	mg/l	14	50
7.	TDS	mg/l	376	NG
8.	Iron	mg/l	0.6	3.5
9.	Lead	mg/l	ND	0.1
10.	Free Cyanide	mg/l	<0.01	0.1
11.	Arsenic	mg/l	0.005	0.1
12.	Total Phosphorous	mg/l	0.36	2
13.	Total Nitrogen	mg/l	3.4	NG

NEQEG = National Environmental Quality (Emission) Guideline

ND= Not Detected

NG= No Guideline

4.3.5.5. Drinking Water Quality Results

Drinking water quality generated from R.O drinking water machine was analysed by ABGL and the results are shown in Table 4-22 and the laboratory test result form is shown in **APPENDIX J**. The drinking water quality results are compared with NDWQS (2019) and all drinking water quality results are within NDWQS (2019).

Table 4-22 Drinking Water Quality Results

No.	Parameter	Unit	Drinking Water Results	NDWQS (2019)
1.	pH	-	7.1	6.5 - 8.5
2.	Colour (True)	TCU	Nil	15
3.	Turbidity	NTU/ FAU	Nil	5
4.	Conductivity	µS/cm	16	
5.	Total Hardness	mg/l as CaCO ₃	2	500
6.	Calcium Hardness	mg/l as CaCO ₃	1	NG
7.	Magnesium Hardness	mg/l as CaCO ₃	1	NG
8.	Total Alkalinity	mg/l as CaCO ₃	3	NG
9.	Phenolphthalein Alkalinity	mg/l as CaCO ₃	Nil	NG
10.	Carbonate (CaCO ₃)	mg/l as CaCO ₃	Nil	NG
11.	Bicarbonate (HCO ₃)	mg/l as CaCO ₃	3	NG
12.	Iron	mg/l	0.05	1
13.	Chloride (as CL)	mg/l	4	250
14.	Sodium Chloride (as NaCL)	mg/l	7	NG

No.	Parameter	Unit	Drinking Water Results	NDWQS (2019)
15.	Sulphate (as SO ₄)	mg/l	Nil	250
16.	Total Solids	mg/l	8	NG
17.	Total Suspended Solids	mg/l	Nil	NG
18.	Total Dissolved Solids	mg/l	8	1,000
19.	Manganese	mg/l	Nil	0.4
20.	Phosphate	mg/l	Nil	NG
21.	Phenolphthalein Acidity	mg/l	2	NG
22.	Methyl Orange Acidity	mg/l	Nil	NG
23.	Salinity	ppt	0.1	NG

NG = No Guideline

Nil = Nothing

4.3.6. Traffic Condition

4.3.6.1. Methodology

Traffic counting was done manually at five monitoring locations by two observers and by using digital video cameras. The number and types of vehicles passing the stations were recorded. The traffic counting data were used to calculate the V/C ratios.

Traffic condition is normally assessed in terms of traffic volume relative to road capacity, V/C ratio is commonly used for this purpose. This ratio is considered as a baseline traffic flow condition and will be further utilized to evaluate the consequences of the Project's impact on local traffic.

The V/C ratios is calculated as per following procedures:

Convert the number of vehicles from observation to Passenger car Unit (PCU) by using Passenger Car Equivalent (PCD) factors specified for each type of vehicles as described in Table 4-23.

- (1) . This is used as "Traffic Volume" or "V"
- (2) Choose an applicable carrying capacity of "C" for the road (as in Table 4-24).
- (3) V/C ratio can be calculated using the following formula.

$$V/C = \frac{\text{Traffic Volume}}{\text{Carrying Capacity of Respective Road}}$$

V/C ratio can be used to compare with the values defined by the Department of Highways, Thailand as shown in Table 4-25 for indication of current traffic condition.

Table 4-23 Passenger Car Equivalent Factor of each Vehicle

No.	Types of Vehicles	Passenger Car Equivalents Factor (PCD)
1.	Bicycle/Tricycle	0.20
2.	Motorcycle	0.33
3.	Motor-tricycle	1.00
4.	Passenger Car/Taxi	1.00
5.	Light Truck	1.00
6.	Light Bus	1.50
7.	Medium Bus	1.50
8.	Medium Truck	2.10
9.	Heavy Bus	2.10
10.	Heavy Truck	2.50

Source: Department of Highways, Thailand

Table 4-24 Design Service Value

No.	Types of Carriageway	Total Design Service Volumes for Different Categories of Urban Roads		
		Arterial*	Sub-Arterial**	Collector***
1.	2-Lane (One way)	2,400	1,900	1,400
2.	2-Lane (Two way)	1,500	1,200	900
3.	3-Lane (One way)	3,600	2,900	2,200
4.	4-Lane Undivided (Two way)	3,000	2,400	1,800
5.	4-Lane Divided (Two way)	3,600	2,900	-
6.	6-Lane Undivided (Two way)	4,800	3,800	-
7.	6-Lane Divided (Two way)	5,400	4,300	-
8.	8-Lane Divided (Two way)	7,200	-	-

* No frontage access, no standing vehicles and very little cross traffic.

** Frontage development, side roads, bus stops, no standing vehicles, waiting restrictions

*** Roads with free frontage access, parked vehicles and cross traffic

Source: IRC 106:1990

Table 4-25 Range of V/C Ratio for Traffic Condition Classification

Level of Service (LOS)	Volume/Capacity Ratio (V/C)	Nature of flow
A	<0.30	Free Flow
B	0.30-0.50	Reasonably free flow
C	0.50-0.70	Stable flow
D	0.70-0.90	Approaching unstable flow
E	1.00	Unstable flow
F	>1.00	Forced flow

Source: Gajjar R., and Mohandas D. (2016)

4.3.6.2. Traffic Counting Stations

To establish baseline data on traffic conditions, traffic counting was carried out at five stations within the project study area. The counting was conducted 12 hours (7:00 am to 7:00 pm). Details of traffic counting stations, location map of traffic survey points and traffic survey activities are shown in Table 4-26, Figure 4-39 and Figure 4-40, respectively. The detail of traffic counting survey report is shown in **APPENDIX K**.

Table 4-26 Detail of Traffic Counting Stations

No	Station	Location	Coordinates	Weekday	Weekend
1.	TC-1	Wun Saung Hmu Street to Mahar Myaing Street (in front of project site)	16°58' 36.42" N 96° 3' 13.40" E	24 th April, 2020 (1 st time counting) 28 th December, 2022 (2 nd time counting)	-
2.	TC-2	War Ta Yar Street to War Ta Yar Industrial Zone	16°58' 32.00" N 96° 2' 53.47" E	27 th April, 2020 (1 st time counting) 29 th December, 2022 (2 nd time counting)	-
3.	TC-3	Bo Tike Chun Street to War Ta Yar Industrial Zone	16° 59' 7.33" N 96° 3' 15.88" E	29 th April, 2020 (1 st time counting) 30 th December, 2022 (2 nd time counting)	-
4.	TC-4 (A)	Bo Gyoke Aung San Road to War Ta Yar Industrial Zone	16° 57' 54.12" N 96° 3' 42.44" E	26 th June, 2020 (1 st time counting) 3 rd January, 2023 (2 nd time counting)	27 th June, 2020 (1 st time counting) 31 st December, 2022 (2 nd time counting)
5.	TC-4 (B)	War Ta Yar Industrial Zone to Bo Gyoke Aung San Road	16° 57' 53.08" N 96° 3' 42.17" E	26 th June, 2020 (1 st time counting) 3 rd January, 2023 (2 nd time counting)	
6.	TC-5 (A)	Hlawga Road to War Ta Yar Industrial Zone	17° 0' 2.60" N 96° 3' 12.51" E	25 th June, 2020 (1 st time counting) 4 th January, 2023 (2 nd time counting)	
7.	TC-5 (B)	War Ta Yar Industrial Zone to Hlawga Road to	17° 0' 2.02" N 96° 3' 14.53" E	25 th June, 2020 (1 st time counting) 4 th January, 2023 (2 nd time counting)	

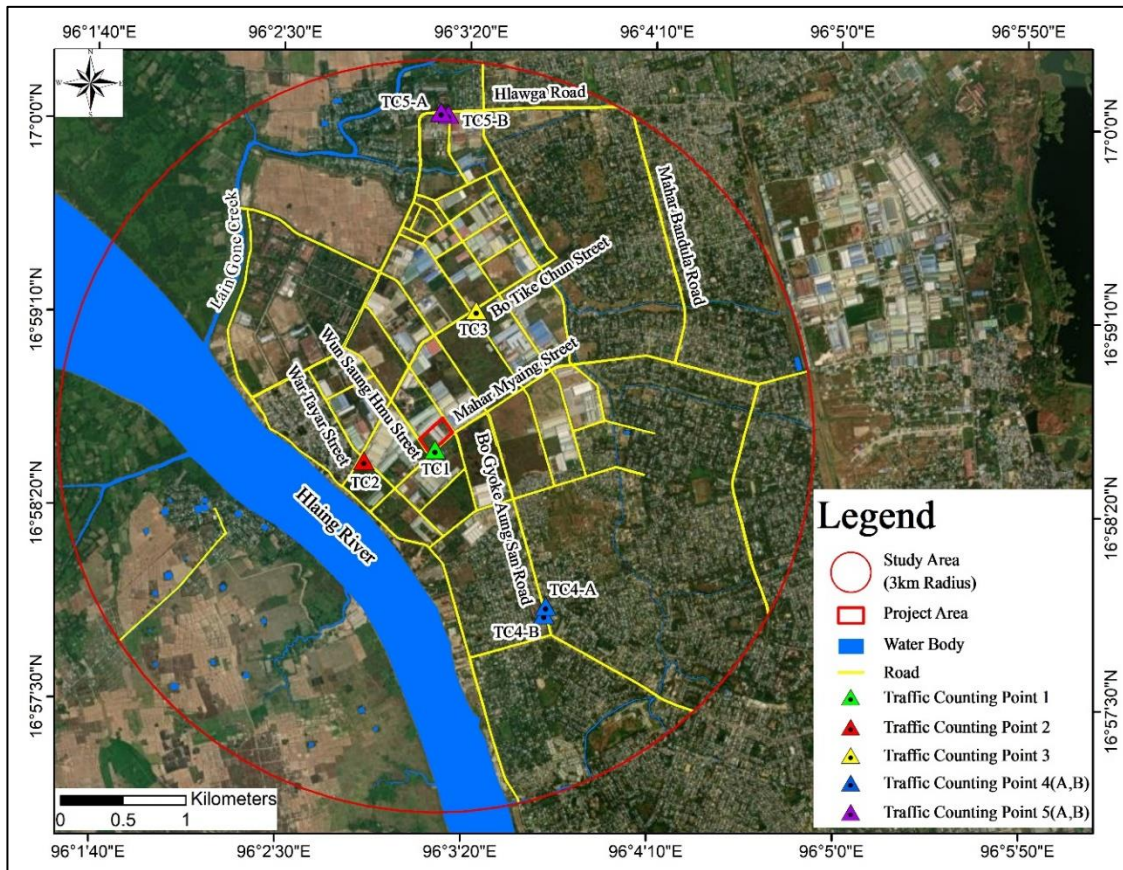


Figure 4-39 Location Map of Traffic Counting

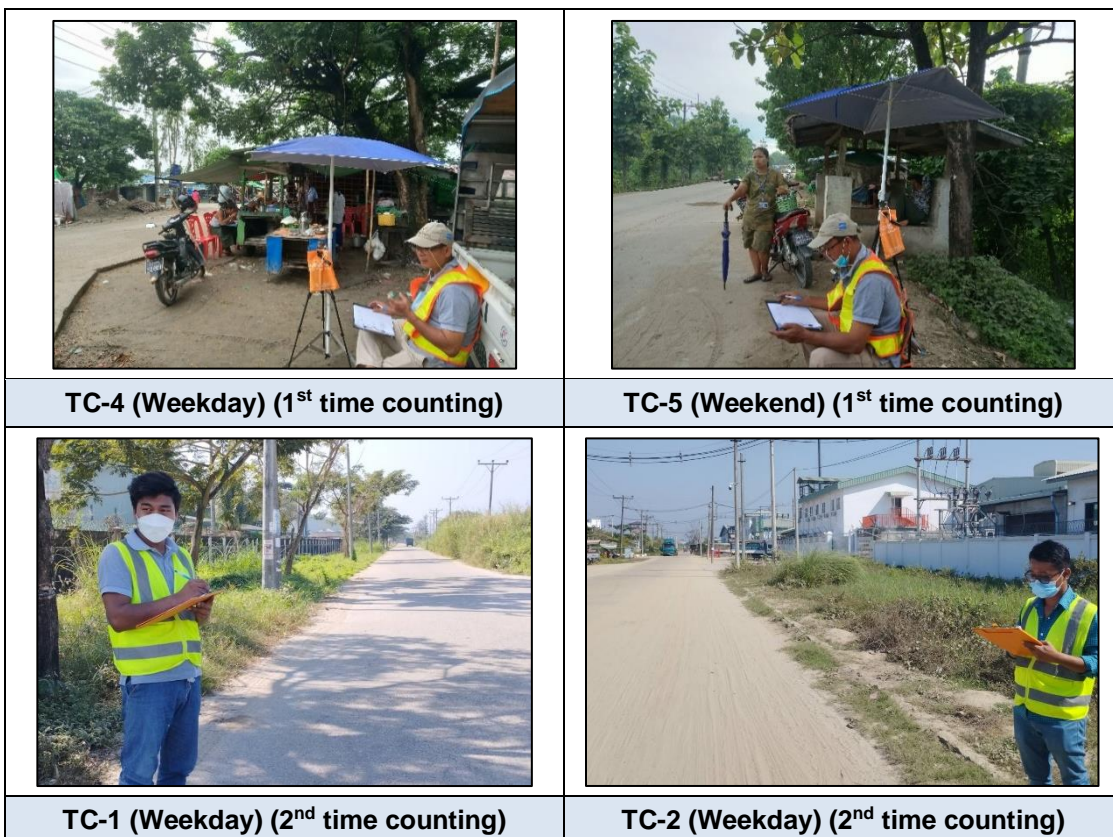


Figure 4-40 Traffic Survey Activities

4.3.6.3. Results

The results of traffic counting are presented in Table 4-27 and based on the data from Department of Highway, Thailand, there were 10 categories of vehicles such as (i) bicycle/tricycle, (ii) motorcycle, (iii) motor-tricycle, (iv) passenger car/taxi, (v) light truck, (vi) light bus, (vii) medium bus, (viii) medium truck, (ix) heavy bus and (x) heavy truck.

Table 4-27 Existing Traffic Condition near Proposed Project Site (Weekday)

Description	TC-1	TC-2	TC-3
1st Time Counting Result			
Traffic volume: 12-hr of working hour (PCU/hour)	26	33	8
Carrying capacity (C) (PCU/hour)	1500	1500	1500
Average V/C ratio	0.02	0.02	0.01
Traffic condition	Free Flow (A)	Free Flow (A)	Free Flow (A)
2nd Time Counting Result			
Traffic volume: 12-hr of working hour (PCU/hour)	27	44	18
Carrying capacity (C) (PCU/hour)	1500	1500	1500
Average V/C ratio	0.02	0.03	0.01
Traffic condition	Free Flow (A)	Free Flow (A)	Free Flow (A)

Table 4-28 Existing Traffic Condition near Proposed Project Site (Weekday and Weekend)

Description	Results	
1st Time Counting Result		
Weekday	TC-4A	TC-4B
Traffic volume: 12-hr of working hour (PCU/hour)	316	377
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.26	0.31
Traffic condition	Free Flow (A)	Reasonable free flow (B)
Weekend	TC-4A	TC-4B
Traffic volume: 12-hr of working hour (PCU/hour)	461	469
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.38	0.39
Traffic condition	Reasonable free flow (B)	Reasonable free flow (B)
Weekday	TC-5A	TC-5B
Traffic volume: 12-hr of working hour (PCU/hour)	341	336
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.28	0.28
Traffic condition	Free Flow (A)	

Weekend	TC-5A	TC-5B
Traffic volume: 12-hr of working hour (PCU/hour)	385	308
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.32	0.26
Traffic condition	Reasonable free flow (B)	Free Flow (A)
2nd Time Counting Result		
Weekday	TC-4A	TC-4B
Traffic volume: 12-hr of working hour (PCU/hour)	326	345
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.27	0.29
Traffic condition	Free Flow (A)	Free Flow (A)
Weekend	TC-4A	TC-4B
Traffic volume: 12-hr of working hour (PCU/hour)	448	474
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.37	0.39
Traffic condition	Reasonable free flow (B)	Reasonable free flow (B)
Weekday	TC-5A	TC-5B
Traffic volume: 12-hr of working hour (PCU/hour)	339	336
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.28	0.28
Traffic condition	Free Flow (A)	
Weekend	TC-5A	TC-5B
Traffic volume: 12-hr of working hour (PCU/hour)	392	355
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.33	0.30
Traffic condition	Reasonable free flow (B)	Reasonable free flow (B)

4.3.6.4. Traffic Conditions

4.3.6.4.1 TC-1

1st Time Counting Result

According to Table 4-27, the total volume of traffic at TC-1 was recorded about 26 PCU per hour and the average V/C ratio at that period was 0.02. The result shows that TC-1 had free flow traffic condition on 24th April 2020. The total number of vehicles passing were around 247 units. The majority of vehicles were motor cycles and bicycles/tricycle.

2nd Time Counting Result

As shown in Table 4-27, the total volume of traffic at TC-1 was noted about 27 PCU per hour and the average V/C ratio at that period was 0.02. The result shows that TC-1 had free flow traffic condition on 28th December 2022. The total number of vehicles passing were around 302 units. The majority of vehicles were motorcycles and bicycles/tricycle.

4.3.6.4.2 TC-2

1st Time Counting Result

As described in Table 4-27, the total volume of traffic at TC-2 was about 33 PCU per hour and the average V/C ratio at that period was 0.02. The result shows that TC-2 had free flow traffic condition on 27th April 2020. The total number of vehicles passing were around 174 units. The majority of vehicles were motorcycles, passenger cars and taxi and bicycle/tricycle.

2nd Time Counting Result

According to Table 4-27, the total volume of traffic at TC-2 was about 44 PCU per hour and the average V/C ratio at that period was 0.02. The result states that TC-2 had free flow traffic condition on 29th December 2022. The total number of vehicles passing were around 275 units. The majority of vehicles were motorcycles, bicycle/tricycles, passenger cars and taxi.

4.3.6.4.3 TC-3

1st Time Counting Result

As shown in Table 4-27, the total volume of traffic was noted 8 PCU per hour and the average V/C ratio at that period was 0.01. The result describes that TC-3 had free flow traffic condition on 29th April 2020. The total number of vehicles passing were 39 units. The majority of vehicles were motorcycles and medium trucks.

2nd Time Counting Result

As described in Table 4-27, the total volume of traffic was noted 18 PCU per hour and the average V/C ratio at that period was 0.01. The result describes that TC-3 had free flow traffic condition on 30th December 2022. The total number of vehicles passing were 82 units. The majority of vehicles were motorcycles and medium trucks.

4.3.6.4.4 TC-4

1st Time Counting Result

According to Table 4-28, the total volume of traffic was recorded about 316 PCU per hour for TC-4A (weekday) and 377 PCU per hour for TC-4B (weekday), and 461 PCU per hour for TC-4A (weekend) and 469 PCU per hour for TC-4B (weekend). The average V/C ratios at that period were 0.26, 0.31, 0.38 and 0.39 for TC-4A (weekday), TC-4B (weekday), TC-4A (weekend) and TC-4B (weekend), respectively. The results show that TC-4B (weekday), TC-4A (weekend) and TC-4B (weekend) had reasonable free flow traffic condition while TC-4A (weekday) is free flow traffic condition. The total number of vehicles passing were 4,539 units for TC-4A (weekday), 5,199 units for TC-4B (weekday), 4,330

units for TC-4A (weekend) and 5,022 units for TC-4B (weekend). The majority of vehicles were motorcycles and bicycles/tricycles.

2nd Time Counting Result

As shown in Table 4-28, the total volume of traffic was recorded about 326 PCU per hour for TC-4A (weekday) and 345 PCU per hour for TC-4B (weekday), and 448 PCU per hour for TC-4A (weekend) and 474 PCU per hour for TC-4B (weekend). The average V/C ratios at that period were 0.27, 0.29, 0.37 and 0.39 for TC-4A (weekday), TC-4B (weekday), TC-4A (weekend) and TC-4B (weekend), respectively. The results show that TC-4A (weekend) and TC-4B (weekend) had reasonable free flow traffic condition while TC-4A (weekday) and TC-4B (weekday) had free flow traffic condition. The total number of vehicles passing were 4,539 units for TC-4A (weekday), 4,983 units for TC-4B (weekday), 4,235 units for TC-4A (weekend) and 5,053 units for TC-4B (weekend). The majority of vehicles were motorcycles and bicycles/tricycles.

4.3.6.4.5 TC-5

1st Time Counting Result

As shown in Table 4-28, the total volume of traffic was recorded about 341 PCU per hour for TC-5A (weekday) and 336 PCU per hour for TC-5B (weekday), and 385 PCU per hour for TC-5A (weekend) and 308 PCU per hour for TC-5B (weekend). The average V/C ratio at that period was 0.28, 0.28, 0.32 and 0.26 for TC-5A (weekday), TC-5B (weekday), TC-5A (weekend) and TC-5B (weekend), respectively. The results show that TC-5A (weekday), TC-5B (weekday), and TC-5B (weekend) are free flow traffic condition while TC-5A (weekend) is reasonable free flow traffic condition. The total number of vehicles passing were 3,030 units for TC-5A (weekday) and 3216 units for TC-5B (weekday) and 2,346 units for TC-5A (weekend) and 2719 units for TC-5B (weekend). The majority of vehicles were motorcycles and bicycles/tricycles.

2nd Time Counting Result

As shown in Table 4-28, the total volume of traffic was recorded about 339 PCU per hour for TC-5A (weekday) and 336 PCU per hour for TC-5B (weekday), and 392 PCU per hour for TC-5A (weekend) and 355 PCU per hour for TC-5B (weekend). The average V/C ratio at that period was 0.28, 0.28, 0.33 and 0.30 for TC-5A (weekday), TC-5B (weekday), TC-5A (weekend) and TC-5B (weekend), respectively. The results show that TC-5A (weekday) and TC-5B (weekday) had free flow traffic condition while TC-5A (weekend) and TC-5B (weekend) had reasonable free flow traffic condition. The total number of vehicles passing were 3,068 units for TC-5A (weekday) and 3,229 units for TC-5B (weekday) and 2,378 units for TC-5A (weekend) and 2,952 units for TC-5B (weekend). The majority of vehicles were motorcycles and medium truck.

4.3.7. Lighting

Light measurement is conducted at nine locations in the factory compound with Victor 1010 A Digital Lux Meter on 8th December 2022 during site visit. The light and temperature measurement points are shown in Figure 4-41 and the light measurement activity is shown in Figure 4-42. It is compulsory to measure the lighting level inside factory compound for the convenience of the guests and employees working at the factory. It is said that the lighting may influence the mode of the workers. Therefore, light measurement is performed in different locations of the factory. The results are compared with IFC Environmental, Health and Safety (EHS) Guidelines for illumination and the standard is shown in Table 4-29. Light measurement results are shown in Table 4-30. The lighting results office room, warehouse, lasting, outsole grinding, packing and chemical warehouse were exceeded than the minimum limits of IFC standard while the lighting results at cutting line and sewing line are lower than the minimum limits of IFC standard. The onsite measurement results of lighting are fully described in **APPENDIX L**.

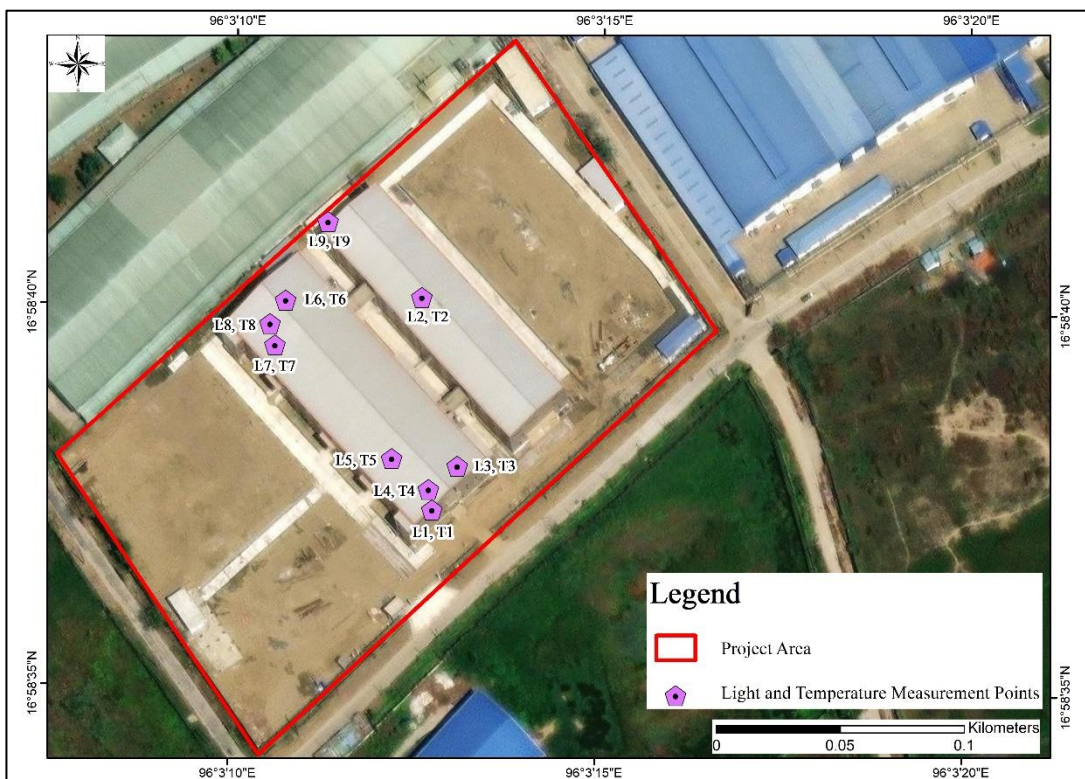


Figure 4-41 Light and Temperature Measurement Point

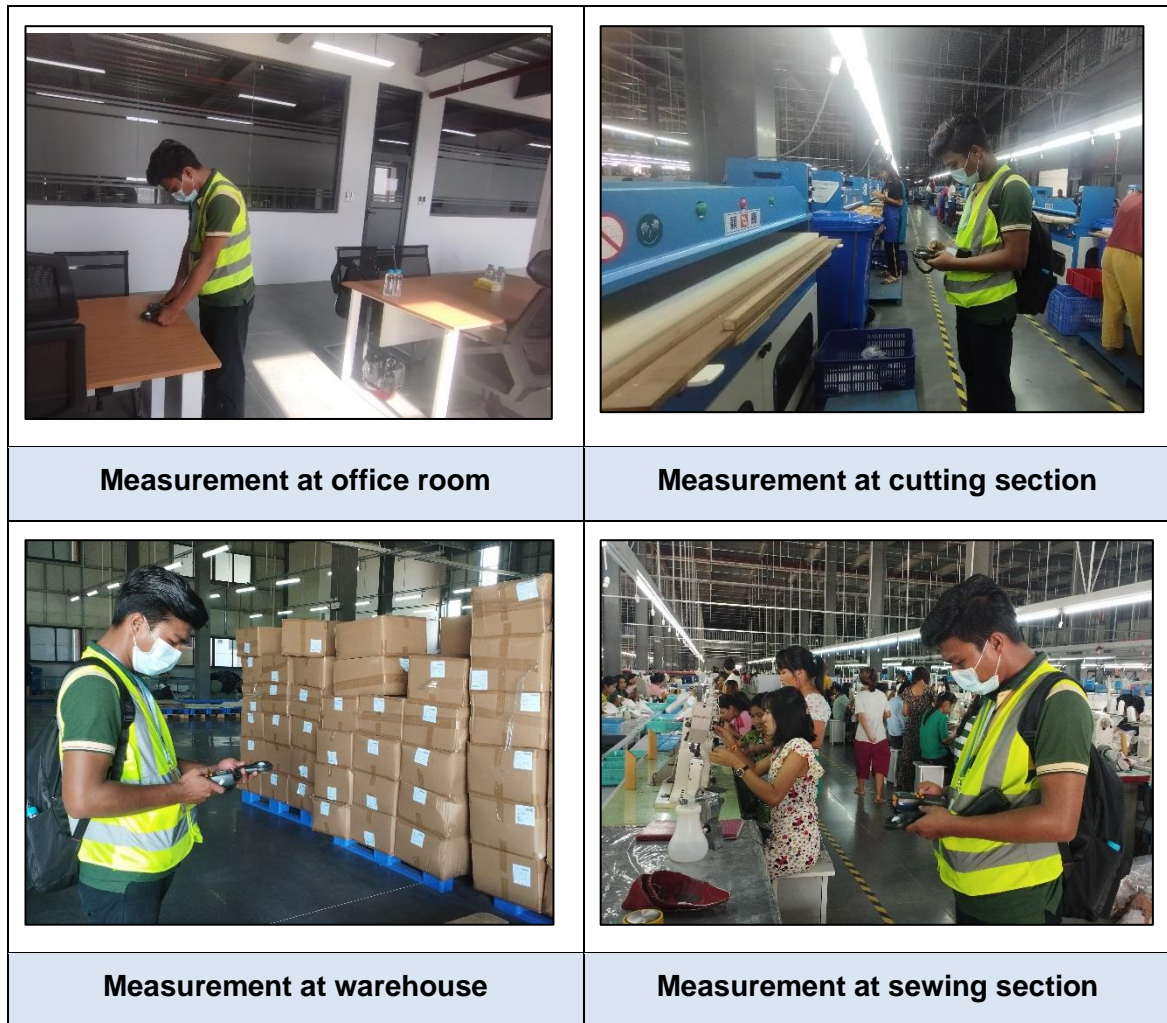


Figure 4-42 Lighting Measurement Activity

Table 4-29 IFC Standard of Minimum Limits for Workplace Illumination Intensity

No.	Locations	Light Intensity (Lux)
1.	Emergency Light	10
2.	Outdoor Non-Working Areas	20
3.	Simple Orientation and Temporary Visits (Machine Storage, Garage, Warehouse)	50
4.	Workspace With Occasional Visual Tasks only (Corridors, Stairways, Lobby, Elevator, Auditorium, etc.)	100
5.	Medium Precision Work (Simple Assembly, Rough Machine Works, Welding, Packing etc.)	200
6.	Precision Work (Reading, Moderately Difficult Assembly, Sorting, Check)	500
7.	High Precision Work (Difficult Assembly, Sewing, Color Inspection, Fine Sorting etc.)	1,000~3,000

Source: IFC, World Bank Group, EHS Guideline

Table 4-30 Light Measurement Result

No	Site Description	Location		Measured Result	IFC Standard	Unit (Lux)
		Latitude	Longitude			
1.	Office	16° 58' 37.35" N	96° 3' 13.13" E	1005	500	Lux
2.	Warehouse	16° 58' 40.13"N	96° 3' 12.95"E	325	50	Lux
3.	Cutting Line	16° 58' 37.93"N	96° 3' 13.47"E	873	1,000 ~ 3,000	Lux
4.	Sewing Line	16° 58' 37.66"N	96° 3' 12.97"E	426	1,000 ~ 3,000	Lux
5.	Lasting	16° 58' 38.01"N	96° 3' 12.57"E	426	200	Lux
6.	Outsole Grinding	16° 58' 40.07"N	96° 3' 11.10"E	547	500	Lux
7.	Packing	16° 58' 39.48"N	96° 3' 10.96"E	238	200	Lux
8.	Clinic	16° 58' 39.76"N	96° 3' 10.89"E	210	200	Lux
9.	Chemical Warehouse	16° 58' 41.11"N	96° 3' 11.66"E	596	50	Lux

4.3.8. Temperature

Temperature is measured at points with AR862D + Smart Sensor Model Infrared Thermometer in the factory compound. The temperature measurement activity is shown in Figure 4-43. When the results are compared with IFC standard value, all results are within the standard. Measurement data for temperature are described in Table 4-31 and Figure 4-44. The onsite measurement results of temperature are fully described in **APPENDIX M**.





Figure 4-43 Temperature Measurement Activity

Table 4-31 Temperature Measurement Result

No	Site Description	Location		Measured Value (°C)	(IFC) Standard Value* (°C)
		Latitude	Longitude		
1.	Office	16° 58' 37.35"N	96° 3' 13.13"E	30.2	32
2.	Warehouse	16° 58' 40.13"N	96° 3' 12.95"E	31.7	
3.	Cutting Line	16° 58' 37.93"N	96° 3' 13.47"E	31.9	
4.	Sewing Line	16° 58' 37.66"N	96° 3' 12.97"E	31.6	
5.	Lasting	16° 58' 38.01"N	96° 3' 12.57"E	31.8	
6.	Outsole Grinding	16° 58' 40.07"N	96° 3' 11.10"E	31.5	
7.	Packing	16° 58' 39.48"N	96° 3' 10.96"E	31.7	
8.	Clinic	16° 58' 39.76"N	96° 3' 10.89"E	31.4	
9.	Chemical Warehouse	16° 58' 41.11"N	96° 3' 11.66"E	30.8	

*International Finance Corporation (Environmental Health and Safety Guideline) General

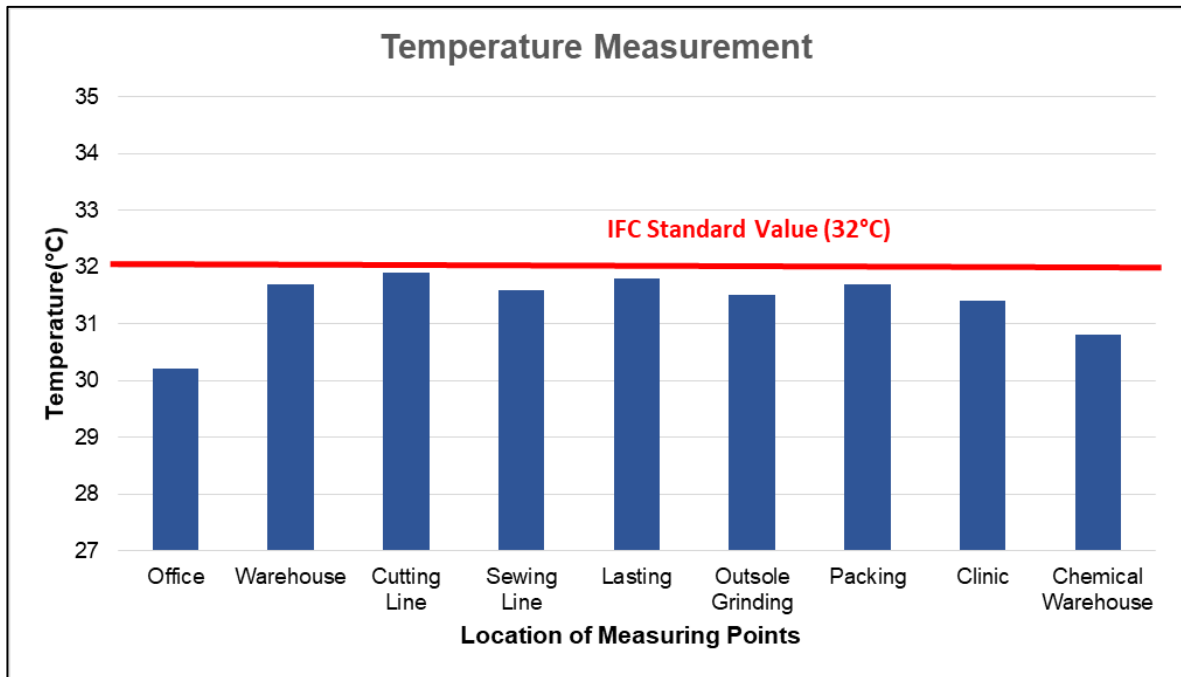


Figure 4-44 Temperature Measurement

4.4. SOCIO-ECONOMIC ENVIRONMENT

4.4.1. Land Use

4.4.1.1. Methodology

According to USEPA, land use is the determination of human activity on the land and it characterizes the economics and cultural activities such as agricultural, residential, industrial, mining, and recreational uses that are occupied at a given place. In order to classify the land use characteristics of the study area, the land use information is analyzed within 3 km radius from the project site by using Geographic Information System (ArcGIS 10.8), Google Earth Pro and primary data collection. The primary data collection helps to verify and fill gaps of the spatial analysis. TBS’s expert survey team conducted the primary data collection about land use survey within 3-kilometer radius of the study area on 2nd June 2022. This data was used to verify, recheck, revise and modify the accuracy of each type of land use on the initial land use maps.

4.4.1.2. Result of the Study

The final land use map was generated as shown in Figure 4-45. The study area of the proposed project site is about 8.633 acres and 3 kilometers marginal area. According to land use classification, the study area of the proposed project consists of eleven types of land use such as bare land, commercial area, government area, recreational area, religious area, residential area, road area, agricultural area, industrial area, water body, and cemetery area. Among the eleven types of land use characteristics, residential area is the largest portion, which is 1,036.00 Hecta (Ha) of the total 2,826 Ha. Agricultural land is the second land use portion and the cemetery area occupies the smallest portion. The classification of land use and existing land use photos within the study area are shown in Table 4-32 and Figure 4-46.

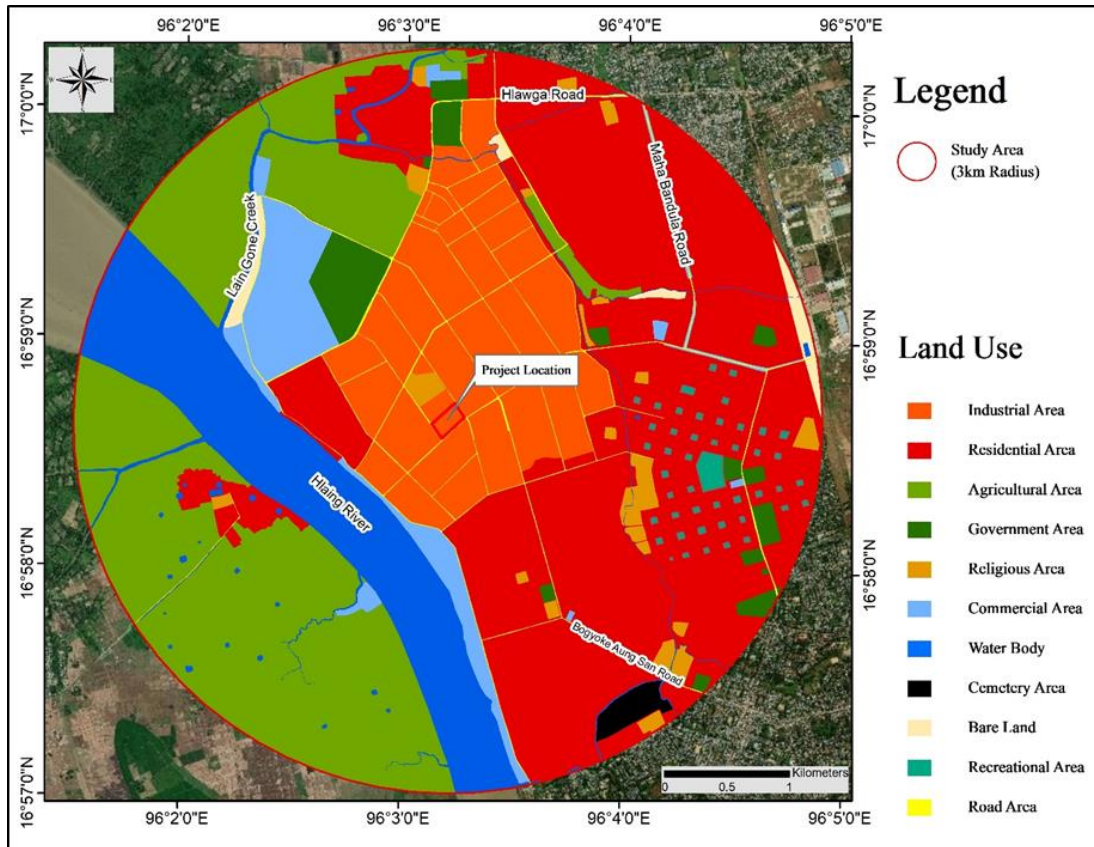


Figure 4-45 Land Use Map

Table 4-32 Land Use Types of the Study Area

No.	Name	Area (Hectare)	Percentage (100 %)
1.	Cemetery	13.94	0.49
2.	Recreational Area	15.00	0.53
3.	Bare land	22.47	0.80
4.	Road Area	35.79	1.27
5.	Religious Area	50.16	1.77
6.	Government Area	71.67	2.54
7.	Commercial Area	128.70	4.55
8.	Water Body	338.32	11.97
9.	Industrial Area	408.70	14.46
10.	Agricultural Area	705.23	24.96
11.	Residential Area	1036.00	36.66
Total		2826	100

	
<p>Cemetery Area</p>	<p>Road Area</p>
	
<p>Religious Area</p>	<p>Government Area</p>
	
<p>Commercial Area</p>	<p>Water Body</p>



Figure 4-46 Existing Land Use Photos

4.4.2. Socio-Economic Survey Approach

Socio-economic information for this project’s baseline study is based on various approaches of data collection from primary and secondary sources. Primary data was collected mainly from interviews with the residents near project site (household level questionnaires) and 23 ward administrator (key informant). The household level survey area covers (14) ward, (15) ward, (16) ward, (19) ward, (20) ward and (23) ward which are located within 3 km of project site. Primary data collection was performed on 21st December 2022 and 19th January 2023. The summary of survey interview information is shown in Table 4-33. Secondary data was collected from General Administration Department (GAD, 2020) of Shwe Pyi Tar Township.

Table 4-33 Summary of Survey Interview Information

No.	Ward Name	Interviewed Household Numbers	Interviewed Households's Population	Key Informat Interview
1	14 Ward	1	1	-
2	15 Ward	1	1	-
3	16 Ward	1	3	-
4	19 Ward	8	20	-
5	20 Ward	2	5	*
6	23 Ward	4	14	-

4.4.3. Demography

Shwe Pyi Thar Township is bordered by Mingaladon Township and Hlawgar Lake in the East, Hlaing River/War Ta Yar River and Htantabin Township in the West, Insein Township in the South and Hmawbi Township in the North. Shwe Pyi Thar Township is located between latitudes 16° 56' and 17° 6' North and longitudes 66° 4' and 96° 12' East. It is 3.142 miles long from East to West and 8.2 miles long from South to North.

4.4.3.1. Population

The number of house/household is mainly divided into two parts as rural and urban areas dwellers. Table 4-34 shows that the number of house/household of Shwe Pyi Thar Township. The number of house/household in rural area (5 villages) is approximately one-fifth of house/household in urban area (23 wards) of Shwe Pyi Thar Township. In addition, the number of population, houses and household numbers of 23 ward, in which the project is located, are shown in Table 4-35.

Table 4-34 House/Household in Shwe Pyi Thar Township

No	Township	Rural/Urban	House	Household	Ward	Village tract	Village
1	Shwe Pyi Thar	Urban	45,413	51,247	23	-	-
2		Rural	8,499	10,498	-	4	5
Overall Township			53,912	61,745	23	4	5

Source: General Administration Department GAD, 2020

Table 4-35 Population, House and Household of 23 Ward

Ward Name	Population	House	Household
23 ward	7,500	1,000	820

Note: Based on Key Informant Interview

The total population of Shwe Pyi Thar Township is 303,420. There are higher urban population in both under and over 18 years by age in Shwe Pyi Thar Township. In conclusion, urban population is much higher than rural since 86% of total population is the urban population in the township. It is presented in Table 4-36.

Table 4-36 Population by Age in Shwe Pyi Thar Township

No.	Township	Title	> 18 Years		<18 Years		Total Population	
1	Shwe Pyi Thar	Urban	184,203	83.7%	72,343	86.9%	256,546	86.9%
		Rural	35,993	16.3%	10,882	13.1%	46,875	13.1%
		Total	220,196	100%	83,225	27%	303,421	100%

Source: General Administration Department GAD, 2020

4.4.3.2. Age group and Gender Issues

In Myanmar, population is disaggregated by age for election purposes (i.e. under and over 18 years old). Based on the data provided by GAD (2020), the population is separated into two age group as under 18 years, above 18 years including over 85 years old in both urban and rural area of Shwe Pyi Thar Township. Population by age group in Shwe Pyi Thar Township is shown in Table 4-37. The urban population under 18 is approximately 5 times higher than the population in rural. In addition, the urban population above 18 is approximately 6 times greater than the population in rural.

For the gender issues, Myanmar has equal gender rights for all of female and male, there may be no gender inequality. Female has the right for heading the economics, social and political administration. In household levels, female and male can make equal decisions in children education, health and even cultural and religious practices. Male heads can make some important decisions but they respect to females. However, in some cases, women's rights are violence and they are allowed only in cooking, housekeeping and babysitting while men can lead in family business and governance.

Table 4-37 Population by Age Group and Gender Disaggregation in Study Area

No.	Title	>18 Years			<18 Years			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Urban	84,940	99,263	184,203	35,693	36,650	72,343	120,633	135,913	256,546
2	Rural	16,010	19,983	35,993	5,193	5,689	10,882	21,203	25,672	46,875
Overall Township		100,950	119,246	220,196	40,886	42,339	83,225	141,836	161,585	303,421

Source: General Administration Department GAD, 2020

4.4.4. Ethnicity

According to secondary data from GAD (2020), majority are Burma and followed by Rakhine and Kayin. Chin is almost equal population with Mon in the Shwe Pyi Thar Township. The rest ethnicity of Kachin, Shan and Kayah are few and distributed in the township. It was shown in Table 4-38. There are 800 Burma households, 10 Kayin households and 10 Rakhine households in 23 ward and the ethnicity of 23 ward is shown in Table 4-39. However, only Burma ethnic is found in field survey area according to household level survey. Ethnicity in the survey field area is shown in Table 4-40. A number of other ethnic minorities like the Chinese, India, Pakistan, Bangladesh and other are also distributed in the township as shown in Table 4-41.

Table 4-38 Ethnicity in Shwe Pyi Thar Township

No.	Ethnic	Population	Township Population	Percentage of Township Population (%)
1	Kachin	388	303,421	0.13
2	Kayah	114	303,421	0.04
3	Kayin	5,687	303,421	1.87
4	Chin	1,783	303,421	0.59
5	Mon	1,600	303,421	0.53
6	Burma	285,757	303,421	94.18
7	Rakhine	5,792	303,421	1.91
8	Shan	548	303,421	0.18
Grand Total		301,669	303,421	99.42

Source: General Administration Department, 2020

Table 4-39 Household and Ethnicity in 23 Ward

23 Ward	Kachin	Kayah	Kayin	Chin	Mon	Burma	Rakhine	Shan
Households	-	-	10	-	-	800	10	-

Note: Based on Key Informant Interview

Table 4-40 Ethnicity in Survey Area

No.	Ethnic	14 Ward	15 Ward	16 Ward	19 Ward	20 Ward	23 Ward
1	Kachin	x	x	x	x	x	x
2	Kayah	x	x	x	x	x	x
3	Kayin	x	x	x	x	x	x
4	Chin	x	x	x	x	x	x
5	Mon	x	x	x	x	x	x
6	Burma	✓	✓	✓	✓	✓	✓
7	Rakhine	x	x	x	x	x	x
8	Shan	x	x	x	x	x	x

Note: Based on Household Level Interviews

Table 4-41 Foreigner Population in Shwe Pyi Thar Township

No.	Ethnic	Population	Township Population	%
1.	Chinese	66	303,421	0.02
2.	India	379	303,421	0.12
3.	Pakistan	20	303,421	0.01
4.	Bangladesh	34	303,421	0.01
5.	Other	1253	303,421	0.41
Grand Total		1,752	303,421	0.58

Source: General Administration Department, 2020

4.4.5. Religious Information

Buddhism is the dominant religion in Shwe Pyi Thar Township. Majority people in the township are Buddhists. The remaining population is composed of Christian and Muslim. It presented in Table 4-42. In addition, most of the people in the field survey area and 23 ward are Buddhists according to household level interviews and key informant interview. Religious information in survey area is shown in Table 4-43 and Table 4-44.

Table 4-42 Population by Religion in the Project Township, Shwe Pyi Thar

No.	Township	Buddhism	Christian	Hindu	Muslim	Others	Total
1	Shwe Pyi Thar	288,099	7,501	2,752	4,869	200	303,421

Source: General Administration Department GAD, 2020

Table 4-43 Religious Information in 23 Ward

23 Ward	Buddhism	Christian	Hindu	Muslim	Other
Households	820	-	-	-	-

Note: Based on Key Informant Interview

Table 4-44 Religious Information in Survey Area

No.	Religious	14 Ward	15 Ward	16 Ward	19 Ward	20 Ward	23 Ward
1	Buddhism	✓	✓	✓	✓	✓	✓
2	Christian	×	×	×	×	×	×
3	Hindu	×	×	×	×	×	×
4	Muslim	×	×	×	×	×	×
5	Other	×	×	×	×	×	×

Note: Based on Household Level Interviews

4.4.6. Educational Information

4.4.6.1. Enrollment

According to GAD (2020), the total primary school enrollment of children (male and female) of the township is presented in Table 4-45. Currently, there are 1,200 students in high school and 12 student who are attending university in 23 ward according to key informant interview. The current student numbers of different education level in 23 ward is shown in Table 4-46.

Table 4-45 Primary School Enrolment in Shwe Pyi Thar Township

No.	Township	5 Years old Children			School Enrollment			Percentage
		Male	Female	Total	Male	Female	Total	
1	Shwe Pyi Thar	2,558	2,582	5,140	2,209	2,282	4,491	100%

Source: General Administration Department GAD, 2020

Table 4-46 Current Student Numbers of Different Education Level in 23 Ward

No.	Education Level	Student Numbers
1	Monastic School	N/A
2	Post Primary School	N/A
3	Primary School	N/A
4	Middle School	N/A
5	High School	1,200
6	University	12

Note: Based on Key Informant Interview

Note: N/A = Not Available

4.4.6.2. Completion of Basic Education

In Shwe Pyi Thar Township, the completion percentage of basic education (2018-2019 year) is almost equal to the completion percentage of basic education (2019-2020 year). The detailed information of completion of basic education in Shwe Pyi Thar Township is shown in Table 4-47. As shown in table, there are some absent students to take the exam.

Table 4-47 Completion of Basic Education in Shwe Pyi Thar Township

No	Township	2018 – 2019 year				2019 - 2020			
		Register	Attendance	Passed	Percentage	Register	Attendance	Passed	Percentage
1.	Shwe Pyi Thar	6,458	5,969	1,739	29.13%	6,674	6,037	1,809	29.97%

Source: General Administration Department GAD, 2020

4.4.6.3. Ratio

According to GAD 2020, there are 136 university teachers, 343 basic education high school teachers, 77 basic education high school branch teachers, 290 basic education middle school teachers, 24 basic education middle school branch teacher, 100 basic education post primar school teacher, 401 basic education primary school teacher, 2 pre school teacher and 200 monastic education teachers in Shwe Pyi Thar Township. The ratio of teachers and students in different education level of Shwe Pyi Thar Township is described in Table 4-48.

Table 4-48 Ratio of Teacher and Student of Shwe Pyi Thar Township

No.	Education Level	Total no. of Teachers	Total no. of Students	Ratio
1	University	136	2,422	1:17
2	B.E.H.S	343	16,958	1:39
3	B.E.H.S Branch	77	2,702	1:35
4	B.E.M.S	290	11,590	1:39
5	B.E.M.S Branch	24	1,520	1:63
6	B.E.P.P.S	100	3,926	1:39
7	B.E.P.S	401	15,943	1:39
8	Pre School	2	20	1:10
9	Monastic Education	200	7,238	1:36

Note: B.E.H.S: Basic Education High School, B.E.M.S: Basic Education Middle School, B.E.P.P.S: Basic Education Primary Postgraduate School, B.E.P.S: Basic Education Primary School

Source: General Administration Department, 2020

4.4.6.4. Education Infrastructure

There are total 80 education centers in Shwe Pyi Thar Township based on GAD (2020). Education centers in the Shwe Pyi Thar Township can be seen in Table 4-49. As per key informant interview, there are one basic education high school, one basic education middle school, one basic education post primary school, one basic education primary school and one monastic education in 23 ward. The education centers information of 23 ward is shown in Table 4-50.

Table 4-49 Education Centers in Shwe Pyi Thar Township

No	Township	University	B.E.H.S	B.E.H.S Branch	B.E.M.S	B.E.M.S Branch	B.E.P.P.S	B.E.P.S	Pre School	Monastic Education	Total
1	Shwe Pyi Thar	1	7	2	9	2	6	39	1	13	80

Source: General Administration Department GAD, 2020

Table 4-50 Education Centers in 23 Ward

No	Ward	B.E.H.S	B.E.M.S	B.E.P.P.S	B.E.P.S	Monastic Education
1	23 Ward	1	1	1	1	1

Note: Based on Key Informant Interview

4.4.7. Main Economic Activities

Shwe Pyi Thar Township is located in the Northern District of Yangon and it is one of economically developed townships. Industrial economy and trading are main business of local people. Shwe Pyi Thar Township is a good transportation township and it can access to other townships by land and water transportation. The main product of township

is consumer goods and they are exported to other regions. The products from the markets of Yangon Downtown are imported to Shwe Pyi Thar Township.

4.4.7.1. Employment

Based on GAD (2020), the occupations of the employees of Shwe Pyi Thar Township are government staff, service, agriculture, livestock, trading, industrial and handicraft, fishery, general workers and other which are described in Table 4-51. Most of the people work as general workers and follow by government staff, service, and trading. Fishery is the least type of occupation, which is only 54 population. According to household level survey, most of the people in survey area work as industrial workers, own business, general workers, service and construction workers. The occupational information field survey area are shown in Table 4-52.

Table 4-51 Occupations in the Project Township

No	Township	Government Staff	Service	Agriculture	Livestock	Trading	Industrial and Handicraft	Fishery	General Workers	Other	Total
1.	Shwe Pyi Thar	26,743	25,664	993	3,448	25,627	800	54	41,515	46,197	171,041

Source: General Administration Department GAD, 2020

Table 4-52 Occupations in Survey Area

No.	Ethnic	14 Ward	15 Ward	16 Ward	19 Ward	20 Ward	23 Ward
1	Service	x	x	x	x	x	✓
2	Agriculture	x	x	x	x	x	x
3	Livestock	x	x	x	x	x	x
4	Trading	x	x	x	x	x	x
5	Industrial Workers	✓	✓	✓	✓	✓	✓
6	Construction Workers	x	x	x	✓	x	x
7	General Workers	x	x	x	x	✓	✓
8	Own Business	x	x	x	x	x	✓

Note: Based on Household Level Interviews

Based on GAD (2020) information, people who are able to work are 220,196 and people who are working are 201,331 while unemployment people count 18,865 in Shwe Pyi Thar Township. Unemployment percentage is 8.57% as shown in Table 4-53.

Table 4-53 Work Force and Unemployment Population in Shwe Pyi Thar Township

No	Township	People able to Work	Working People	Unemployment People	Unemployment Percentage
1.	Shwe Pyi Thar	220,196	201,331	18,865	8.57%

Source: General Administration Department GAD, 2020

4.4.7.2. Income and Poverty

According to GAD (2020), average in-come per capita was approximately 2.6 million in in 2017-2018, 3.0 million in 2018 - 2019 and 2.2 million in 2019-2020 fiscal years respectively. It is shown in Table 4-54. The income per month of the people in the survey area is shown in Table 4-55. According to household level survey, the income and expenditure of most of the household in survey area are balanced. In addition, the average daily income of skilled workers and unskilled workers of 23 wards are shown in Table 4-56.

Table 4-54 Annual In-come per Capita in Shwe Pyi Thar Township

No	Township	2017 – 2018	2018 - 2019	2019 - 2020
1.	Shwe Pyi Thar	2,645,597	3,044,673	2,190,000

Source: General Administration Department GAD, 2020

Table 4-55 Average Income per Month in Survey Area

No.	Income per month (MMK)	14 Ward	15 Ward	16 Ward	19 Ward	20 Ward	23 Ward
1	0-100,000	x	x	x	x	x	x
2	100,000 – 150,000	x	✓	x	x	x	x
3	160,000 – 200,000	✓	x	x	x	x	x
4	210,000 – 250,000	x	x	x	x	x	x
5	260,000-300,000	x	x	x	✓	x	x
6	310,000-350,000	x	x	x	x	x	x
7	360,000 – 400,000	x	x	x	x	x	✓
8	410,000 – 450,000	x	x	✓	x	✓	x

Note: Based on Household Level Interviews

Table 4-56 Average Daily Income of Skilled and Unskilled Workers in 23 Ward

No.	Gender	Age	Average daily income	
			Skilled workers	Unskilled workers
1	Man	20 – 50	12,000	10,000
2	Female	20 – 50	12,000	10,000
3	Man	Older than 50	12,000	10,000
4	Female	Older than 50	12,000	10,000
5	Man	Younger than 18	12,000	8,000
6	Female	Younger than 18	12,000	8,000

Note: Based on Key Informant Interview

4.4.8. Health

Public health facilities such as hospital, clinic and health care department are shown in Table 4-57. There are 4 hospitals (i.e. 1-government and 3-private), 20 private clinics and 11 health care departments (i.e. 2-rural and 9-sub-rural) in Shwe Pyi Thar Township. Although there are 3 cases of HIV/AIDS (Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome) diseases in 2018-2019 and 5 cases in 2019-2020, no death cases are occurred as shown in Table 4-58. Table 4-59 describes the detailed information of common disease cases that have been happened in Shwe Pyi Thar Township. The most common disease is Hepatitis disease, which is found 392 cases. Tuberculosis is the second common disease that happened in Shwe Pyi Thar Township. There is no one who suffered Malaria disease in the township and no death cases are occurred in all common diseases such as Malaria, Diarrhea, Tuberculosis, Dysentery, and Hepatitis.

According to key informant interview, there are 5 people who suffered from respiratory disease, 10 people who suffered from hyper tension disease, 50 people who suffered from diabetes and 5 people who suffered from heart disease per year in 23 ward. In addition, there are one private medical clinic, one public clinic and four pharmacy centers in 23 ward.

Table 4-57 Public Health Facility in Shwe Pyi Thar Township

No.	Township	Hospital		clinic		Health Care Department	
		Government	Private	Government	Private	Rural	Sub Rural
1	Shwe Pyi Thar	1	3	0	20	2	9
Total		4		20		11	

Source: General Administration Department GAD, 2020

Table 4-58 Population by HIV/AIDS Diseases

No.	2018 – 2019		2019 – 2020	
	Occurrence	Mortality	Occurrence	Mortality
1	3	-	5	-

Source: General Administration Department GAD, 2020

Table 4-59 Common Diseases

No	Township	Malaria		Diarrhea		Tuberculosis		Dysentery		Hepatitis	
		Occurrence	Mortality	Occurrence	Mortality	Occurrence	Mortality	Occurrence	Mortality	Occurrence	Mortality
1	Shwe Pyi Thar	-	-	76	-	192	-	6	-	392	0

Source: General Administration Department GAD, 2020

4.4.9. Vulnerable Population

According to key informant interview with 23 ward administrator, there are 15 disabled people, 50 female household heads and 4 live alone persons. The parents are the guardians of the disabled people and social relief organization provide allowance to the disabled people. The information of vulnerable population is shown in Table 4-60.

Table 4-60 Vulnerable Population in 23 Ward

No.	Vulnerable Type	Household	Population
1	Disabled people	15	15
2	Household head over 65 years	-	-
3	Female household head	50	50
4	Live alone persons	4	4
5	Homeless	N/A	N/A
6	Below poverty line	N/A	N/A
Total		69	69

Source: Key Informant Interview

4.4.10. Infrastructure and Services

4.4.10.1. Public Infrastructures

According to the information of GAD (2020), the economic and social infrastructures of Shwe Pyi Thar Township are shown in Table 4-61. The economic infrastructures include market, shopping mall, bank, department store, factory, domestic industry and hotel, motel and guesthouse. The social infrastructures include INGO, NGO and other social organizations.

Religious places such as pagoda, stupa, monastery, nunnery, religious hall, mandir, church and mosque in Shwe Pyi Thar Township are also described in Table 4-61. In addition, there are one pagoda and two monasteries in 23 ward according to key informant survey.

Table 4-61 Economic and Social Infrastructure in Shwe Pyi Thar Township

No.	Township	Market	Shopping Mall	Bank	Department Store	Factory	Domestic Industry	Gas Station	Hotel, Motel and Guest House	INGO	NGO	Social Organization
1	Shwe Pyi Thar	11	2	6	1577	368	956	8	36	3	1	17

Source: General Administration Department GAD, 2020

Table 4-62 Religious Places in Shwe Pyi Thar Township

No.	Village	Pagoda	Stupa	Monastery	Nunnery	Religious Hall	Mandir	Church	Mosque
1	Shwe Pyi Thar	1	2	294	93	27	1	3	1

Source: General Administration Department GAD, 2020

4.4.10.2. Electricity and Energy Consumption

There are Government electricity grids to project townships in Yangon region. According to GAD (2020), there are five private fuel stations and two natural gas stations (state property) in Shwe Pyi Thar township as shown in Table 4-63. According to household level interviews, government grid is mainly used for cooking and lighting in survey area as shown in Table 4-64. In addition, firewood, coal, battery, solar and candle are used in case of emergency electricity shortage.

Table 4-63 Electricity and Energy Consumption

No.	Name	Item	State Property	Private
1	Max Energy Myanmar	Petrol/Diesel	x	✓
2	Myawaddy	Petrol/Diesel	x	✓
3	Denko	Petrol/Diesel	x	✓
4	Thiha Yar Zar	Petrol/Diesel	x	✓
5	Moon Star	Petrol/Diesel	x	✓
6	(2) Ward	Natural Gas	✓	x
7	Kyaung Kone	Natural Gas	✓	x

Source: General Administration Department GAD, 2020

Table 4-64 Energy Consumption in Survey Area

No.	Energy for Lightning	14 Ward	15 Ward	16 Ward	19 Ward	20 Ward	23 Ward
Energy for light							
1	Government Grid	✓	✓	✓	✓	✓	✓
2	Battery	x	✓	✓	✓	x	✓
3	Solar	x	x	x	✓	x	x
4	Candle	✓	✓	✓	✓	x	✓
Energy for cooking							
5	Government Grid	✓	✓	✓	✓	✓	✓
6	Battery	x	x	x	x	x	x
7	Solar	x	x	x	x	x	x
8	Fire Wood	✓	x	x	x	x	✓
9	Coal	✓	x	x	x	x	✓

Note: Based on Household Level Interviews

4.4.11. Transportation

There is no airport in Shwe Pyi Thar Township. Hence, public transportation such as land transportation (i.e. bus and railway) and water transportation such as ship are only reliable and accessible way. Those transportations are used not only to travel within the region but also to connect Yangon and other regions. According to GAD (2020), there is 36.6 meters long one concrete bridge in Shwe Pyi Thar Township. In addition, bicycles, motorcycles, bus and ferry are mainly used in survey area according to household level interviews.

4.5. CULTURAL AND VISUAL CHARACTERISTICS

4.5.1. Tourist Site and Attractive Places

According to GAD (2020), there are two famous stupas, one famous pagoda and two monasteries in Shwe Pyi Thar Township. The name and location of famous religious places in Shwe Pyi Thar Township are shown in Table 4-65.

In addition, the religious places within 2 kilometers of the project site are also surveyed using GIS mapping. There are five pagodas and twenty-one monasteries in the study area. The lists and location maps of pagodas and monasteries are shown in Table 4-66, Figure 4-47, Table 4-67 and Figure 4-48.

Table 4-65 Famous Religious Places in Shwe Pyi Thar Township

No.	Name	Location
1.	Myo U Stupa	No. 6 ward
2.	Thar Du Kan Stupa	Oak Pho Village Tract
3.	Min Vandu Pagoda	No. 23 Ward
4.	Yangon Monastery	No. 6 Ward
5.	Shwe Pyi Thar Payiyatti Monastery	No. 6 Ward

Source: General Administration Department GAD, 2020

Table 4-66 List of Pagodas in the Study Area

No	Pagoda	Latitude	Longitude
1.	Aungtawmu Ahbaya Larbamuni	16°58'45.50"N	96° 3'6.51"E
2.	Min Ban Nu	16°58'47.95"N	96° 3'5.51"E
3.	Aye Nyein Chan Thar	16°57'59.28"N	96° 3'33.45"E
4.	Botree	16°58'8.89"N	96° 4'10.72"E
5.	Tharyar Shwe Pyi	16°57'47.64"N	96° 3'29.97"E

Source: TBS EIA Study Team, 2020

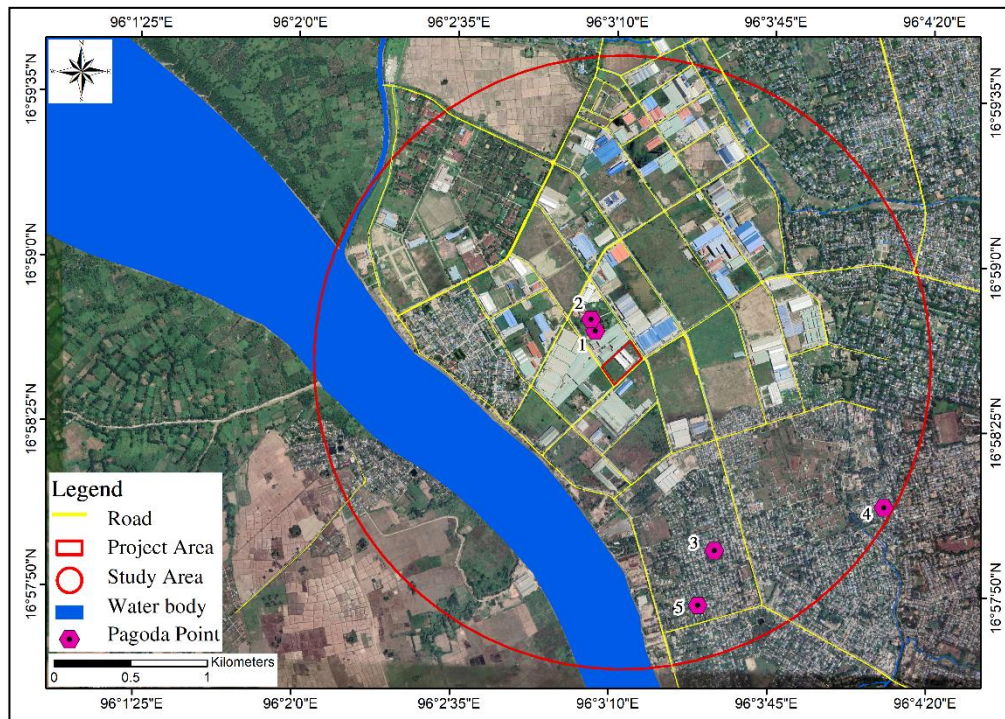


Figure 4-47 Location Map of Pagodas in the Study Area

Table 4-67 List of Monastery in the Study Area

No	Monastery	Latitude	Longitude
1.	Khmer Wudarama (Nyaung Oo)	16° 59' 35.32" N	96° 3' 40.12" E
2.	Thadama Ahlinyaung Nyeinchanye	16° 59' 38.57" N	96° 3' 32.81" E
3.	WarTitYar Ywar Ma Pareyatte Sar Thin Tike	16° 58' 39.38" N	96° 2' 34.51" E
4.	Pathein	16° 57' 58.98" N	96° 3' 32.25" E
5.	Sein Yaung Chi	16° 58' 3.30" N	96° 4' 5.42" E
6.	Aung Myitta	16° 58' 8.10" N	96° 4' 6.65" E
7.	Aung Myay Tawya Dhamma Yeik Thar	16° 58' 10.38" N	96° 4' 4.88" E
8.	Yangon Buddhist University (Shwe Pyi Thar)	16° 58' 12.82" N	96° 4' 0.32" E
9.	Nawarat	16° 58' 20.86" N	96° 4' 8.11" E
10.	Myint Zi Mar Yone Kayan	16° 58' 21.94" N	96° 4' 4.97" E
11.	Shwepyin Yein	16° 58' 24.27" N	96° 4' 2.82" E
12.	Sagawa Shwe Pyi Buddhist	16° 58' 27.75" N	96° 4' 5.01" E
13.	Pahtan Ahlinyaung	16° 58' 27.66" N	96° 4' 6.75" E
14.	Yadanar Shwepyi	16° 58' 29.43" N	96° 4' 5.34" E
15.	Mahar Bawdi Yeik Thar	16° 58' 28.15" N	96° 4' 1.42" E
16.	Thitsar Parami	16° 58' 35.33" N	96° 3' 58.35" E
17.	Thukha Myitta Shwe Mandalar	16° 59' 10.78" N	96° 3' 51.32" E
18.	Nandawan Tayar Yeik Thar	16° 59' 7.93" N	96° 3' 48.44" E
19.	ManYadanar Pareyatte Sar Thin Tike	16° 59' 5.85" N	96° 3' 48.70" E

No	Monastery	Latitude	Longitude
20.	Shwe Pyi Thar Ba Da Myar	16° 59' 0.00" N	96° 3' 49.58" E
21	Maniyadana Dhama Yake Thar	16° 58' 51.71" N	96° 4' 4.44" E

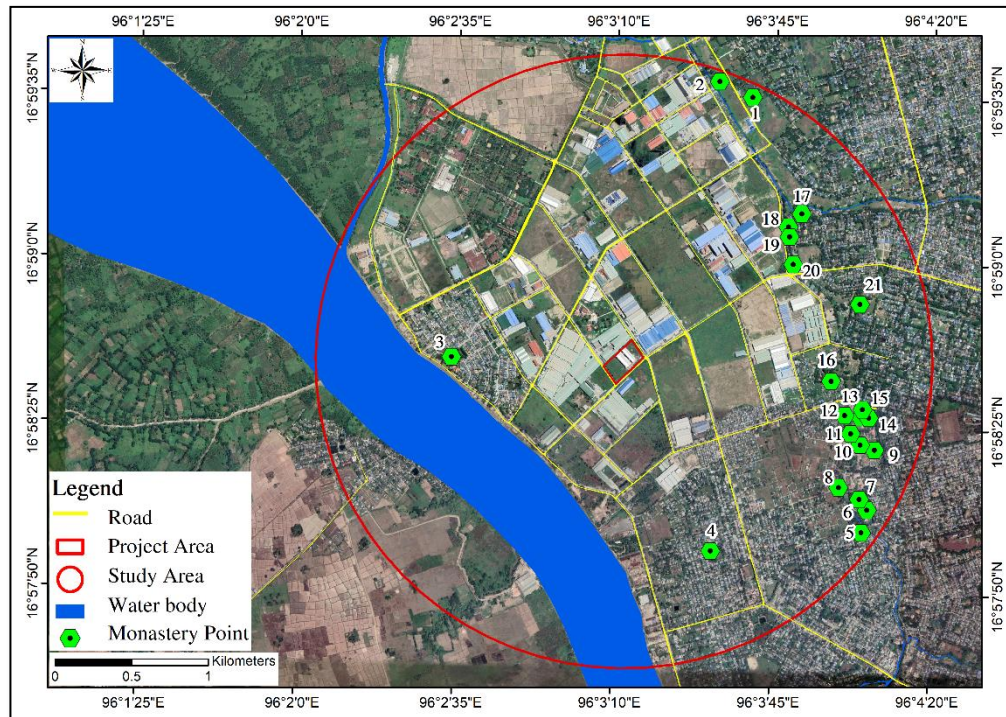


Figure 4-48 Location Map of Monasteries in the Study Area

4.6. BIOLOGICAL CHARACTERISTICS

The factory of ABGL occupied at Plot No. (149,150,151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon Region. It lies between the residential area of eastern and Hlaing River where is western. The survey team had been carried out the two field trips of study for data collection of ecological receptors those are flora and fauna at the core zone, direct impact area and that of indirect impact area 3 km apart from core zone during study period. The scope of the survey team focused;

- To undertake the field survey in representative habitats of direct and indirect impact areas
- To identify the recorded flora and fauna with systematic position
- To reveal the concerning species (Threatened Level) in the study area regarding with the significance of conservation aspect International Union for Conservation of Nature (IUCN)
- To describe the key species for ecosystem services such as garden plantation, vegetation or medicinal purposes
- To designate and recommend the threats and mitigation measures if the degradation and fragmentation of the natural ecosystem



Figure 4-49 Map of Ecological Survey (Core Zone and Outer Boundary)

4.6.1. Survey Methods (point count, line transects, capture and mark)

Surveys and investigations to be conducting for EIA with the aid of topographic maps, compass and field equipment such as Global Positioning System (GPS) to assess the spatial location of surveyed point, digital camera, binoculars and references. Depending on the types of fauna, signs and tracks of the animals are to be assessing using the random point count method.

Recorded specimens are to be taxonomically identify within the survey area by using field guides, photographs and prepare for desk study analysis. Some doubt specimens to be identified in the field had to carry to Department of Zoology and Botany for confirmation of their systematic positions.

4.6.2. Flora Survey

4.6.2.1. Methodology

The floral communities were studied in the core zone and the outer boundary of the project including the roadside of public area. The morphological characters of plant species have been studied and recorded in field notebook. These were also taken with photographs and some specimens had been carried for further identification. The scientific names of recorded plant species were arranged in alphabetical order. The identification was undertaken with the aid of Backer and Bakhuizen⁸ (1963,1965, 1968), Hooker⁹ (1875-1897), Hu Qi-ming et al.,¹⁰ (2007-2009) and Kress¹¹ (2003).

4.6.2.2. Results

The total of 56 species were collected regarding with habitat types of trees, shrub, herbs, climbers and bamboo which include 10 species for medicinal plants in this study area. There were 42 species with their conservation status of IUCN Red List in the project area of industry and its outer boundary. The lists of recorded plant species, medicinal plant species and IUCN Red list species are presented in Table 4-68, Table 4-69 and Table 4-70 respectively. All the figures of the recorded plant species with different categories were described in Figure 4-50 and Figure 4-51.

Table 4-68 List of Recorded Plant Species

No	Scientific name	Family	Common name	Habit
1.	<i>Acanthus ilicifolius</i>	Acanthaceae	Kha-yar	Shrub
2.	<i>Hygrophila phlomoides</i>	Acanthaceae	Mi-chaung-kun-phet	Shrub
3.	<i>Madhuca Longifolia</i>	Aegicerataceae	Meze	Tree
4.	<i>Cocos nucifera</i>		Ohn	Tree
5.	<i>Mangifera indica</i>	Anacardiaceae	Tha-yet	Tree
6.	<i>Polyalthia longifolia</i>	Annonaceae	Ye tamar, Arthaw ka	Tree
7.	<i>Polyalthia simiarum</i>	Annonaceae	Thabut	Tree
8.	<i>Uvaria macrophylla</i>		Thabut-new	Herb
9.	<i>Colocasia antiquorum</i>	Araceae	Pein	Herb
10	<i>Nypa fruticans</i>	Arecaceae	Dani	Small tree
11.	<i>Chromolaena odorata</i>	Asteraceae	Bezat	Shrub

⁸ Backer, C. A. and R.C. Bakhuizen. 1963, 1965, 1968. Flora of Java (Spermatophytes only). Vol. I, II & III. N.V.P. Noordhoff-Groningen. The Netherlands: Wolters-Noordhoff N.V.-Groningen

⁹ Hooker, J. D. 1875-1897. The Flora of British India. Vol. I-VII. London: L. Reeve & Co., Ltd.

¹⁰ HU Qi - ming, WU De-Lin & X JA Nian-he. 2007, 2008, 2009. Flora of Hong Kong. Vol-1, 2 and 3. Edited by Hong Kong Herbarium, Agriculture, Fisheries and Conservation Department (AFCD), South China Botanical Garden (SCBG), Chinese Academy of Sciences Published by Agriculture, Fisheries and Conservation Department, Government of the Hong Kong Special Administrative Region

¹¹ Kress, J. W., Robert, A. D., Farr, E. & Yin Yin Kyi. 2003. A Checklist of the trees, shrubs, herbs, and climbers of Myanmar. Vol 45: 1-590. Department of Systematic Biology-Botany, National, Museum of Natural History, Washington, DC, USA

No	Scientific name	Family	Common name	Habit
12.	<i>Ageratum canyroides</i>		Khwe-thay-pan	Herb
13.	<i>Enhydra fluctuans</i>		Kana-hpaw	Herb
14.	<i>Avicennia alba</i>	Avicenniaceae	Lame	Small tree
15.	<i>Oroxylum indicum</i>	Bignoniaceae	Kyaung -sha	Tree
16.	<i>Bombax ceiba</i>	Bombacaceae	Letpan	Tree
17.	<i>Cordia myxa</i>	Boraginaceae	Thanat	Tree
18.	<i>Acrocarpus fraxinifolius</i>	Caeasalpiniaceae	Ye-ta-ma	Tree
19.	<i>Bauhinia pottsii</i>	Caeasalpiniaceae	Swe-daw	Small Tree
20.	<i>Cassia angustifolia</i>		Pwegaing	Shrub
21.	<i>Cassia mimosoides</i>		Mezali	Shrub
22.	<i>Mesua ferrea</i>	Calophyllaceae	Gan gaw	Tree
23..	<i>Carica papaya</i>	Caricaceae	Thin-baw	Small tree
24.	<i>Terminalia catappa</i>		Banda	Tree
25.	<i>Ipomoea batatas</i>	Convolvulaceae	Kazun	Climber/ Creeper
26.	<i>Momordica dioica</i>	Cucurbitaceae	Kyet-hni-ga	Climber/ Creeper
27.	<i>Albizia lebbeck</i>	Fabaceae	Kokko	Tree
28	<i>Butea frondosa</i>	Fabaceae	Pauk	Tree
29.	<i>Mimosa pudica</i>		Ti ka yon	Herb
30.	<i>Pterocarpus macrocarpus</i>		Padauk	Tree
31.	<i>Pithecellobium dulce</i>		Kala magyi	Tree
32.	<i>Tectona grandis</i>	Lamiaceae	Kyun	Tree
33.	<i>Arytera littoralis</i>	Lecaceae	Lamu	
34.	<i>Lagerstroemia floribunda</i>	Lythraceae	Pyinma	Tree
35.	<i>Abelmoschus esculentus</i>	Malvaceae	Yonbade	Shrubs
36.	<i>Ceiba pentandra</i>	Malvaceae	Le moh pin	Tree
37.	<i>Swietenia mahagany</i>	Meliaceae	Mahogany	Tree
38.	<i>Acacia auriculiformis</i>	Mimosaceae	Ma-Lay-Sha padaduk	Tree
39.	<i>Leucaena glauca</i> Benth	Mimosaceae	Baw-za-gaing	Small tree
40.	<i>Ficus obtusifolia</i>	Moraceae	Nyaung	Tree
41.	<i>Moringa oleifera</i>	Moringaceae	Dan-da-lum	Tree
42.	<i>Musa sp</i>	Musaceae	Nget pyaw	Herb
43.	<i>Eucalyptus comaldulensis</i>	Myrtaceae	U-ca-lit	Tree
44.	<i>Syzygium attenuatum</i>		Thabye	Tree
45..	<i>Psidium guajava</i>		Malaka	Small tree
46.	<i>Bambusa polymorpha</i>	Poaceae	Kyathaung-wa	Bamboo
47.	<i>Gigantochloa nigrociliata</i>		Wa-ya	Bamboo

No	Scientific name	Family	Common name	Habit
48.	<i>Gigantochloa wanat</i>		Wa-net	Bamboo
49.	<i>Eichhornia crassipes</i>	Pontederiaceae	Be-da	Aquatic
50.	<i>Piper bettle</i>	Piperaceae	Kun	Climber/ Creeper
51.	<i>Ziziphus jujuba</i>	Rhamnaceae	Zi	Tree
52.	<i>Anthocephalus morindaefolius</i>	Rubiaceae	Ma-u	Tree
53.	<i>Morinda angustifolia</i>	Rubiaceae	Yeyo	Small tree
54.	<i>Arytera littoralis</i>	Sapindaceae	La-mu	Tree
55.	<i>Physalis minima</i>	Solanaceae	Bauk thi	Shrub
56.	<i>Vitex trifolia</i>	Vitaceae	Kyaung- ban	Small tree

Table 4-69 List of Medicinal Plant Species

No	Scientific name	Family	Common name
1.	<i>Hygrophila phlomoides</i>	Acanthaceae	Mi-chaung-kun-phet
2.	<i>Cocos nucifera</i>	Aegicerataceae	Ohn
3.	<i>Chromolaena odorata</i>	Asteraceae	Bezat
4.	<i>Ageratum canyzoides</i>	Asteraceae	Khwe-thay-pan
5.	<i>Enhydra fluctuans</i>	Asteraceae	Kana-hpaw
6.	<i>Oroxylum indicum</i>	Asteraceae	Kyaung -sha
7.	<i>Cassia angustifolia</i>	Caesalpiniaceae	Pwegaing
8.	<i>Cassia mimosoides</i>	Caesalpiniaceae	Mezali
9.	<i>Moringa oleifer</i>	Moringaceae	Dan-da-lum
10.	<i>Morinda angustifolia</i>	Rubiaceae	Yeyo

Table 4-70 List of IUCN Red List Species

No	Scientific name	Family	Common name	Category
1	<i>Pterocarpus macrocarpus</i>	Fabaceae	Padauk	EN
2	<i>Swietenia macrophylla</i>	Meliaceae	Mahogany	VU
3	<i>Acanthus ilicifolius</i>	Acanthaceae	Kha-yar	LC
4	<i>Hygrophila phlomoides</i>	Acanthaceae	Mi-chaung-kun-phet	NE
5.	<i>Madhuca longifolia</i>	Aegicerataceae	Meze	NE
6.	<i>Cocos nucifera</i>	Aegicerataceae	Ohn	DD
7.	<i>Mangifera indica</i>	Anacardiaceae	Tha-yet	DD
8.	<i>Polyalthia longifolia</i>	Annonaceae	Arthaw ka	NE
9.	<i>Polyalthia simiarum</i>	Annonaceae	Thabut	NE
10.	<i>Colocasia antiquorum</i>	Araceae	Pein	LC
11.	<i>Nypa fruticans</i>	Arecaceae	Dani	LC
12.	<i>Chromolaena odorata</i>	Asteraceae	Bezat	NE
13.	<i>Ageratum canyzoides</i>	Asteraceae	Khwe-thay-pan	NE

No	Scientific name	Family	Common name	Category
14.	<i>Enhydra fluctuans</i>		Kana-hpaw	LC
15.	<i>Avicennia alba</i>	<i>Avicenniaceae</i>	Lame	LC
16.	<i>Oroxylum indicum</i>	<i>Bignoniaceae</i>	Kyaung -sha	NE
17.	<i>Bombax ceiba</i>	<i>Bombacaceae</i>	Letpan	LC
18.	<i>Cordia myxa</i>	<i>Boraginaceae</i>	Thanat	NE
19.	<i>Cassia mimosoides</i>		Mezali	NE
20.	<i>Mesua ferrea</i>	<i>Calophyllaceae</i>	Gan gaw	LC
21.	<i>Carica papaya</i>	<i>Caricaceae</i>	Thin-baw	DD
22.	<i>Terminalia catappa</i>		Banda	LC
23.	<i>Ipomoea batata</i>	<i>Convolvulaceae</i>	Kazun	DD
24.	<i>Momordica dioica</i>	<i>Cucurbitaceae</i>	Kyet-hni-ga	NE
25.	<i>Albizia lebbeck</i>	<i>Fabaceae</i>	Kokko	NE
26.	<i>Butea frondosa</i>	<i>Fabaceae</i>	Pauk	NE
27.	<i>Mimosa pudica</i>		Ti ka yon	LC
28.	<i>Pithecellobium dulce</i>		Kala magyi	LC
39.	<i>Tectona grandis</i>	<i>Lamiaceae</i>	Kyun	NE
30.	<i>Arytera littoralis</i>	<i>Lecaceae</i>	Lamu	LC
31.	<i>Ceiba pentandra</i>	<i>Malvaceae</i>	Le moh pin	LC
32.	<i>Leucaena glauca</i>	<i>Mimosaceae</i>	Baw-za-gaing	NE
33.	<i>Ficus obtusifolia</i>	<i>Moraceae</i>	Nyaung	LC
34.	<i>Moringa oleifera</i>	<i>Moringaceae</i>	Dan-da-lum	NE
35.	<i>Musa sp</i>	<i>Musaceae</i>	Nget pyaw	NE
36.	<i>Psidium guajava</i>		Malaka	LC
37.	<i>Eichhornia crassipes</i>	<i>Pontederiaceae</i>	Be-da	NE
38.	<i>Piper bettle</i>	<i>Piperaceae</i>	Kun	NE
39.	<i>Ziziphus jujuba</i>	<i>Rhamnaceae</i>	Zi	LC
40.	<i>Morinda angustifolia</i>	<i>Rubiaceae</i>	Yeyo	NE
41.	<i>Arytera littoralis</i>	<i>Sapindaceae</i>	La-mu	LC
42.	<i>Vitex trifolia</i>	<i>Vitaceae</i>	Kyaung- ban	NE

LC = Least Concern, NE = Not Evaluate, DD = Data deficient, VU = Vulnerable, En = Endangered










		
<p><i>Hygrophila phlomoides</i></p>	<p><i>Coccoloba</i></p>	<p><i>Chromolaena odorata</i></p>
		
<p><i>Ageratum canyzooides</i></p>	<p><i>Enhydra fluctuans</i></p>	<p><i>Oroxylum indicum</i></p>
		
<p><i>Cassia angustifolia</i></p>	<p><i>Morinda angustifolia</i></p>	<p><i>Moringa oleifera</i></p>

Figure 4-50 Medicinal Plant Species

		
<p><i>Pterocarpus macrocarpus</i></p>	<p><i>Swietenia macrophylla</i></p>	<p><i>Eucalyptus comaldulensis</i></p>
		
<p><i>Bombax ceiba</i></p>	<p><i>Tectona grandis</i></p>	<p><i>Lagerstroemia floribunda</i></p>
		
<p><i>Acacia auriculiformis</i></p>	<p><i>Albizia lebbek</i></p>	<p><i>Swietenia macrophylla</i></p>

Figure 4-51 IUCN Red List of Plant Species

4.6.3. Fauna Survey

4.6.3.1. Methodology

The faunal study of the core zone where the ABGL and the outer boundary had been carried out to record the diversity of fauna by five participants of ecologists and local helpers. Survey methods applied in this study are point count and line transects for different faunal assemblages. Surveys and investigations have been conducting for EIA with the aid of topographic maps, compass and field equipment such as GPS to be assessed the spatial location of surveyed point, digital camera, binoculars and references. Signs and tracks of the animals are to be assessing using the random point count method. Fishery study of Hlaing River has been carried out by with the help of local fishers and recorded the list of species. Recorded specimens are to be taxonomically identified within the survey area by using field guides, photographs and prepare for desk study analysis.

4.6.3.2. Birds

Avian fauna was identified and enumerated according to the Fixed Radius Point Count Census Method based on counting individuals from a defined location and estimating the distance to the individual contact. A point was selected from where all birds contact recorded and the distance estimated about 25 m for each contact. The producer was repeated three times for every 10 minutes (Bibby et al., 1998), before moving to 100 m radius.

4.6.3.3. Other Fauna

The most obvious others group of animals studied on the project area were insects (butterflies, dragonflies and damselfly), fishes, amphibians and reptiles. Surveying the occurrence of insects, amphibians and reptiles was conducted through the use of stationary observation sites and walking transects on the property for identification and utilizing the point count method. Some herpetofauna had been studied and recorded with the help of local people. The project area of core zone and public area of the outer boundary are not favorable habitat for mammal and other wildlife.

4.6.3.4. Results

In this ecological survey, 33 species of insects including butterflies and dragonflies, 24 species of fishes, 6 species of reptiles and amphibians (herpetofauna), 30 species of terrestrial birds, and 17 species of water birds had been recorded with their conservation status of IUCN Red List as shown in Table 4-71 to Table 4-77 and Figure 4-52 to Figure 4-55.

4.6.3.4.1 Insects

Total of 6 species of damselfly, 12 species of dragonflies and 15 species of butterflies had been recorded in this survey.

Table 4-71 Recorded List of Damselfly (Order Odonata)

No.	Family	Scientific Name	Common name	Status
1.	Coenagrionidae	<i>Agriocnemis pygmaea</i>	Pigmy dartlcy	very common
2.		<i>Ceragrion coramandeliamum</i>	Coromandel marsh dart	very common
3.		<i>Enallagma parvum</i>	Azure dartlet	uncommon
4.		<i>Ischnura senegalensis</i> (male)	Senegal golden dartley	Locally common
5.		<i>Ischnura senegalensis</i> (female)	Senegal golden dartley	Locally common
6.	Lestidae	<i>Lestes praemorsus</i>	Sapphire-eyed spreadwing	Locally common





Table 4-72 Recorded List of Dragonflies (Order Odonata)

No.	Family	Scientific Name	Common name	Status	
1.	Libellulidae	<i>Brachythemis contaminata</i> (Male)	Little blue marsh hawks	Locally common	
2.		<i>Brachythemis contaminata</i> (Female)	Little blue marsh hawks	Locally common	
3.		<i>Crocothemis servilia</i> (Male)	Ditch jewel	common	
4.		<i>Crocothemis servilia</i> (Female)	Ruddy marsh skimmer	common	
5.		<i>Diplacodes trivialis</i> (Male)	Ground skimmer	very common	
6.		<i>Diplacodes trivialis</i> (Female)	Ground skimmer	very common	
7.		<i>Neurothemis tullia</i> (Male)	Pied paddy skimmer	locally common	
8.		<i>Neurothemis tullia</i> (Female)	Pied paddy skimmer	locally common	
9.		<i>Orthetrum sabina</i> (Male)	Green marsh hawk	very common	
10.		<i>Orthetrum sabina</i> (Female)	Green marsh hawk	common	
11.			<i>Orthetrum pruinosum</i> (Female)	Crimson tailed marsh hawk	common
12.			<i>Potamarcha congener</i> (Male)	Yellow-tailed ashy skimmer	common

Table 4-73 Recorded List of Butterfly Species (order *Lepidoptera*)

No.	Family	Scientific Name	Status
1.		<i>Papilio demoleus demoleus</i>	C
2.	Pieridae	<i>Catopsilia pomona</i>	C
3.		<i>Catopsilia pyranthe pyranthe</i>	C
4.		<i>Eurema hecabe</i>	C
5.		<i>Leptosia nina nina</i>	C
6.		<i>Ixias pyrene</i>	C
7.		<i>Appias lycida</i>	C
8.		<i>Appias libythea</i>	C
9.		<i>Danaus chrysippus</i>	C
10.		<i>Danaus limniace</i>	C
11.		<i>Euploea core</i>	C
12.	Nymphalidae	<i>Junonia almana</i>	C
13.		<i>Junonia lemonias</i>	C
14.		<i>Hypolimnas bolinna</i>	C
15.		<i>Phalanta phalanta</i>	C

C = Common, VC = Very Common, UC = Uncommon, R = Rare

	
<i>Agriocnemis pygmaea</i>	<i>Ceragrion coramandeliamum</i>
	
<i>Enallagma parvum</i>	<i>Ischnura senegalensis</i> (male)



	
<p><i>Ischnura senegalensis</i> (female)</p>	<p><i>Lestes praemorsus</i></p>

Figure 4-52 Recorded Damselfly Species















	
<p><i>Brachythemis contaminata</i> (Male)</p>	<p><i>Brachythemis contaminata</i> (Female)</p>
	
<p><i>Crocothemis servilia</i> (Male)</p>	<p><i>Crocothemis servilia</i> (Female)</p>
	
<p><i>Diplacodes trivialis</i> (Male)</p>	<p><i>Diplacodes trivialis</i> (Female)</p>

Figure 4-53 Recorded Drogonfly Species

	
<i>Papilio demoleus demoleus</i>	<i>Catopsilia pomona</i>
	
<i>Castopsilia Pyanthe pyanthe</i>	<i>Eurema hecabe</i>
	
<i>Leptosia nina nina</i>	<i>Ixias pyrene</i>
	
<i>Appias lyncida</i>	<i>Appias libythea</i>







	
<p><i>Danaus chrysippus</i></p>	<p><i>Danaus limniace</i></p>
	
<p><i>Euploea core</i></p>	<p><i>Junonia almana</i></p>
	
<p><i>Junonia lemonias</i></p>	<p><i>Hypolimnas bolinna</i></p>

Figure 4-54 Recorded Butterfly Species

4.6.3.4.2 Fishes

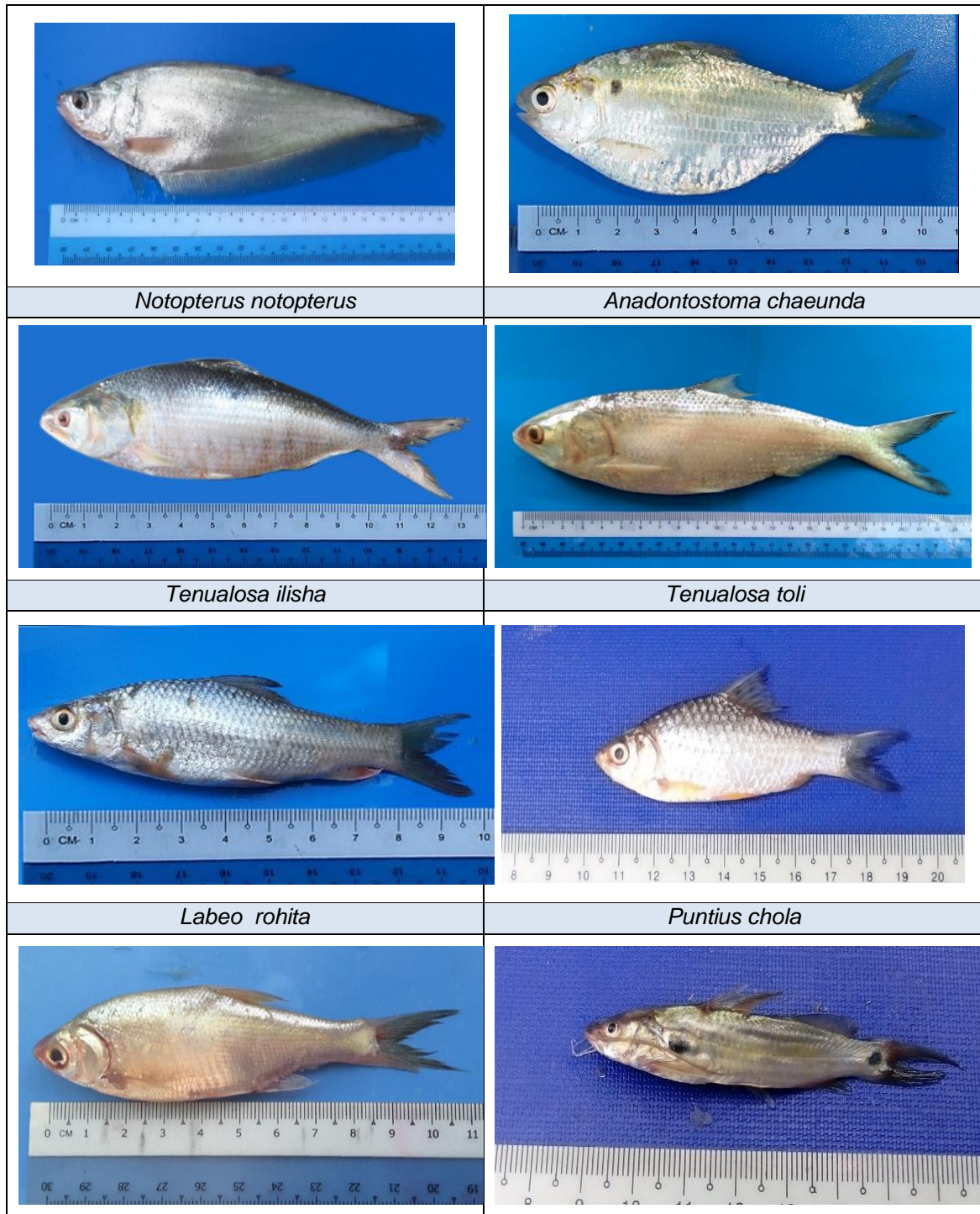
Total of 24 fish species of freshwater and brackish had been recorded in Hlaing River and Lainkone Creek.



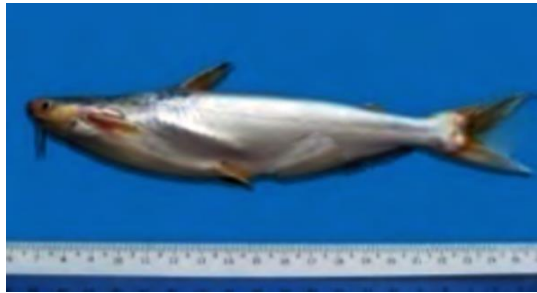
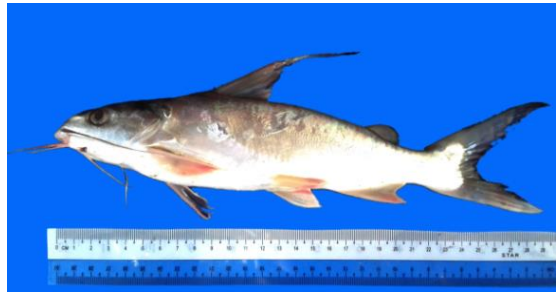








Table 4-74 List of Recorded Freshwater Fish Species

No.	Order	Family	Scientific Name	Common Name	Vernacular Name	IUCN
1	<i>Osteoglossiformes</i>	<i>Notopteridae</i>	<i>Notopterus notopterus</i>	Grey feather back	Nga-phe	LC
2.	<i>Clupeiformes</i>	<i>Clupeidae</i>	<i>Anadontoma chaeunda</i>	Gizzard shad	Nga-wun-puu	LC
3.			<i>Tenualosa ilisha</i>	Hilia shad	Nga-tha-lauk	LC
4.			<i>Tenualosa toli</i>	Toli shad	Nga-tha-lauk-yauk-pha	LC
5.	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Labeo rohita</i>	Roho labeo	Nga-myit-chin	LC
6.			<i>Puntius chola</i>	Chola barb	Nga-khone-ma	LC
7.			<i>Amblypharyngodon mola</i>	Mola carplet	Nga-bel-phyu	LC
8	<i>Siluriformes</i>	<i>Bagaridae</i>	<i>Mystus bleekeri</i>	Day's mystus	Nga-zin-yine	LC
9.			<i>Mystus gulio</i>	Long whiskers catfish	Nga-zin-yine	LC
10		<i>Siluridae</i>	<i>Ompok bimaculatus</i>	Indian butter catfish	Nga-nu-than	NT
11		<i>Pangasiidae</i>	<i>Pangasius pangasius</i>	Pangas catfish	Nga-dan	LC
12		<i>Arridae</i>	<i>Arius maculatus</i>	Spotted catfish	Nga-yaung	LC
13	<i>Cyprinodontiformes</i>	<i>Belonidae</i>	<i>Xenentodon cancila</i>	Gar fish	Nga-phaung-yoe	LC
14	<i>Scopaeniformes</i>	<i>Platycephalidae</i>	<i>Platycephalus indicus</i>	Bartail flathead	Nga-sin-nin	DD
15		<i>Sciaenidae</i>	<i>Johnius belangerii</i>	Tigertooth croaker	Thin-phyu	NE
16			<i>Otolithoides pama</i>	Pama croaker	Nat-ka-daw	NE
17		<i>Polynemidae</i>	<i>Polynemus paradiseus</i>	Paradise threadfin	Nga-pon-nar	LC
18		<i>Gobiidae</i>	<i>Glossogobius giuris</i>	Tank goby	Ka-tha-bore	LC
19			<i>Hypsypops rubicundus</i>	Garibaldi damselfish	Nga-pyat	LC
20			<i>Pseudopocryptes elongates</i>		Nga-yet-phyu	LC
21		<i>Anabantidae</i>	<i>Anabas testudineus</i>	Nga-pyay-ma	Climbing perch	LC

No.	Order	Family	Scientific Name	Common Name	Vernacular Name	IUCN
22		<i>Channidae</i>	<i>Channa punctatus</i>	Spotted snakehead	Nga-pa-naw	LC
23			<i>Channa striata</i>	Striped banded snakehead or	Nga-yant	LC
24	<i>Mastacembeliforme</i>	<i>Mastacembelidae</i>	<i>Macrognathus</i>	Zebra spiny eel	Nga-mway-doe- kyan-sit	LC

LC = Least Concern, NE = Not Evaluate, NT = Nearly Threatened



<p><i>Amblypharyngodon mola</i></p> 	<p><i>Mystus bleekeri</i></p> 
<p><i>Mystus gulio</i></p> 	<p><i>Ompok bimaculatus</i></p> 
<p><i>Pangasius pangasius</i></p> 	<p><i>Arius maculatus</i></p> 
<p><i>Xenentodon cancila</i></p> 	<p><i>Platycephalus indicus</i></p> 
<p><i>Johnius belangerii</i></p> 	<p><i>Otolithoides. pama</i></p> 
<p><i>Polynemus paradiseus</i></p> 	<p><i>Glossogobius giuris</i></p> 

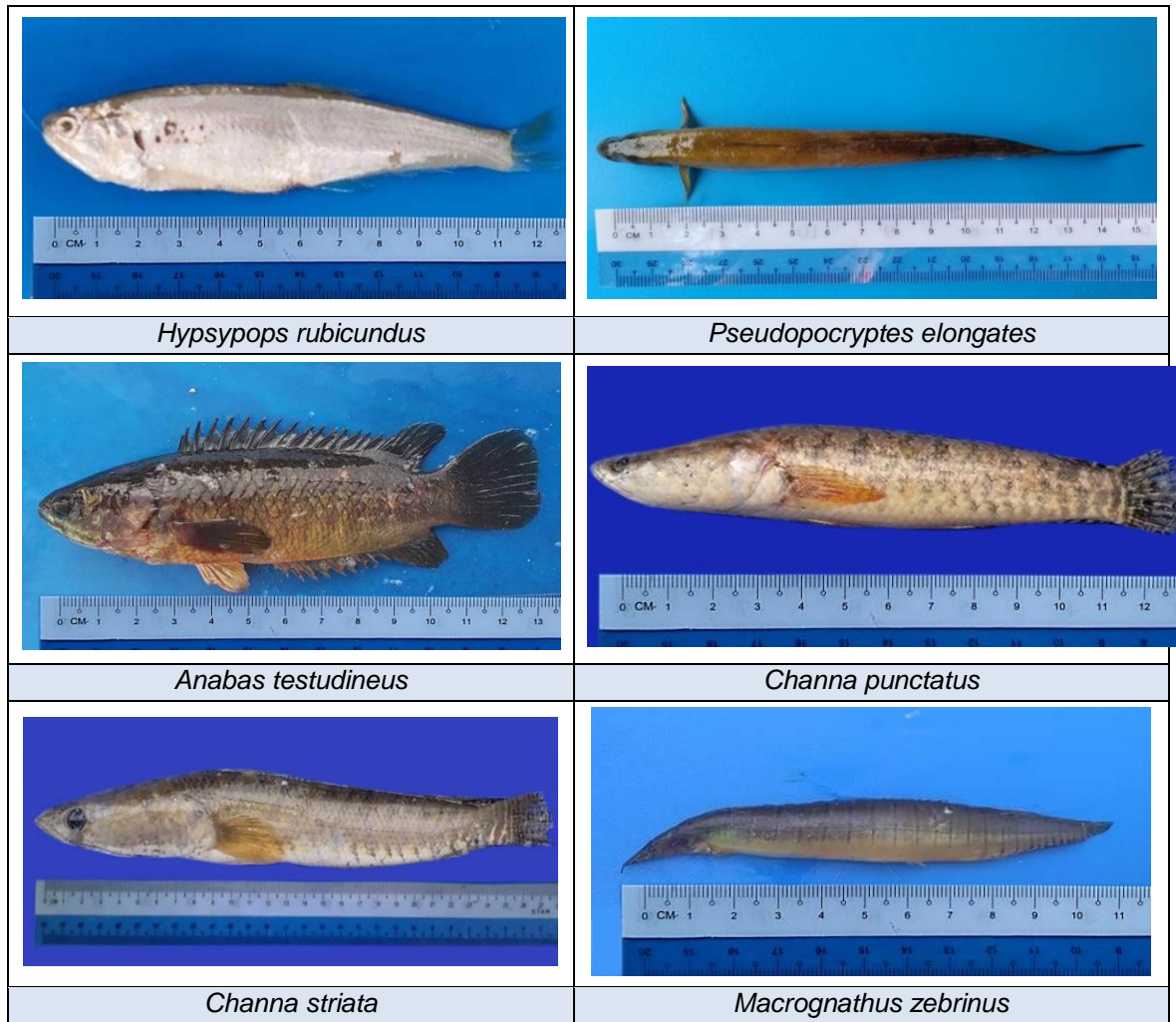


Figure 4-55 Recorded Fish Species

4.6.3.4.3 Amphibians and Reptiles

There were recorded 6 species of reptiles and amphibians as below table.

Table 4-75 Recorded Systematic Position of Herptofauna

No.	Family	Scientific Name	Common Name	Vernacular Name	Habitat	IUCN
1.	Dicroglossidae	<i>Fejervarya Greenii</i>	Paddy Field Frog	Paddy Field Frog	Near the paddy field	LC
2.		<i>Fejervarya limnocharis</i>	Asian Grass Frog	Kyaw san kay	Near the paddy field	LC
3.	Dicroglossidae	<i>Hoplobatrachus tigrina</i>	Indian Bull Frog	Sar-phar	Marshes	LC
4.	Ranidae	<i>Hylarana erythraea</i>	Common Green Frog	Phar sein	Marshes	LC
5.	Agamidae	<i>Calotes versicolor</i>	Oriental garden lizard	Poat nyo thin	On the trunk	NE
6.	Scincidae	<i>Mabuya multifasciata</i>	Common sun stink	Kyal-pyar-kinlate-shaw	Marshes	NE

4.6.3.4.4 Avian Fauna (Terrestrial and Aquatic Birds)

Terrestrial birds of 30 species and 17 species of water birds under only one family had been recorded and already mentioned with their conservation status of IUCN Red List.

Table 4-76 Recorded Terrestrial Birds

No	Order name	Family name	Common name	Scientific name	IUCN status
1.	<i>Falconiformes</i>	<i>Falconidae</i>	Black-Shouldered Kite	<i>Elanus caeruleus</i>	LC
2.			Brahminy Kite	<i>Haliastur indus</i>	LC
3.	<i>Columbiformes</i>	<i>Columbidae</i>	Rock Pigeon	<i>Columba livia</i>	LC
4.			Red Collared-Dove	<i>Streptopelia tranquebarica</i>	LC
5.			Spotted Dove	<i>Streptopelia chinensis</i>	LC
6.	<i>Cuculiformes</i>	<i>Cuculidae</i>	Asian Koel	<i>Eudynamys scolopaceus</i>	LC
7.			Greater Coucal	<i>Centropus sinensis</i>	LC
8.	<i>Apodiformes</i>	<i>Apodidae</i>	Asian Palm-Swift	<i>Cypsiurus balasiensis</i>	LC
9.	<i>Coraciformes</i>	<i>Alcedinidae</i>	White-Throated Kingfisher	<i>Hlacyon smyrnensis</i>	LC
10.		<i>Meropidae</i>	Little Green Bee-Eater	<i>Merops orientalis</i>	LC
11.			Blue Tailed Bee-Eater	<i>Merops philippinus</i>	LC
12.		<i>Coraciidae</i>	Indian Roller	<i>Coracias benghalensis</i>	LC
13.	<i>Piciformes</i>	<i>Ramphastidae</i>	Coppersmith Barbet	<i>Megalaima haemacephala</i>	LC
14.	<i>Passeriformes</i>	<i>Dicruridae</i>	Black Drongo	<i>Dicrurus macrocercus</i>	LC
15.		<i>Corvidae</i>	House Crow	<i>Corvus splendens</i>	LC
16.		<i>Aegithinidae</i>	Common Iora	<i>Aegithina tiphia</i>	LC
17.		<i>Passeridae</i>	House Sparrow	<i>Passer domesticus</i>	LC
18.			Eurasian Tree-Sparrow	<i>Passer montanus</i>	LC
19.		<i>Sturnidae</i>	Jungle Myna	<i>Acridotheres fuscus</i>	LC
20.			Common Myna	<i>Acridotheres tristis</i>	LC

No	Order name	Family name	Common name	Scientific name	IUCN status
21.		<i>Nectariniidae</i>	Van Hasselt's Sunbird	<i>Leptocoma brasiliana</i>	LC
22.			Olive-backed Sunbird	<i>Cinnyris jugularis</i>	LC
23.		<i>Muscicapidae</i>	Oriental Magpie-Robin	<i>Copsychus saularis</i>	LC
24.		<i>Pycnonotidae</i>	Red-Vented Bulbul	<i>Pycnonotus cafer</i>	LC
25.			Streak-Eared Bulbul	<i>Pycnonotus blanfordi</i>	LC
26.		<i>Hirundinidae</i>	Barn Swallow	<i>Hirundo rustica</i>	LC
27.		<i>Cisticolidae</i>	Common Tailorbird	<i>Orthotomus sutorius</i>	LC
28.			Plain Prinia	<i>Prinia inornata</i>	LC
29.		<i>Estrildidae</i>	White-Rumped Munia	<i>Lonchura striata</i>	LC
30.			Scaly-Breasted Munia	<i>Lonchura punctulata</i>	LC

Table 4-77 Recorded Water Birds

No	Order name	Family name	Common name	Scientific name	IUCN status
1.	<i>Anseriformes</i>	<i>Anatidae</i>	Lesser Whistling Duck	<i>Dendrocygna javanica</i>	LC
2.	<i>Suliformes</i>	<i>Phalacrocoracidae</i>	Little Cormorant	<i>Phalacrocorax niger</i>	LC
3.	<i>Pelecaniformes</i>	<i>Ardeidae</i>	Yellow Bittern	<i>Ixobrychus sinensis</i>	LC
4.			Cinnamon Bittern	<i>Ixobrychus cinamomeus</i>	LC
5.			Black Bittern	<i>Dupetor flavicollis</i>	LC
6.			Purple Heron	<i>Ardea purpurea</i>	LC
7.			Indian Pond-Heron	<i>Ardeola grayii</i>	LC
8.			Eastern Cattle Egret	<i>Bubulcus coromandus</i>	LC
9.			Little Egret	<i>Egretta garzetta</i>	LC
10.			Great Egret	<i>Ardea alba</i>	LC
11.			Intermediate Egret	<i>Mesophoyx intermedia</i>	LC
12.	<i>Gruiformes</i>	<i>Rallidae</i>	Watercock	<i>Gallicrex cinerea</i>	LC
13.	<i>Charadriiformes</i>	<i>Charadriidae</i>	Common Ringed plover	<i>Charadrius hiaticula</i>	LC
14.		<i>Vanellidae</i>	Grey-Headed Lapwing	<i>Vanellus cinereus</i>	LC
15.		<i>Scolopacidae</i>	Common Sandpiper	<i>Actitis hypoleucos</i>	LC
16.			Marsh Sandpiper	<i>Tringa stagnatilis</i>	LC
17.			Sharp-Tailed Sandpiper	<i>Calidris acuminata</i>	LC

4.6.4. Threats and Mitigation Measures of the Project

The factory of ABGL occupied at Plot No. (149,150,151,152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon Region. No more major threats of the project because the site clearance had been already carried out as the practice of industrial zone. The habitats of bird community and insect including butterflies, dragonflies may be disturbance by the site clearance. The composition of some fish fauna will be negatively impact by the destructive action of their habitat that is riverbank erosion at Hlaing River where the outer boundary of project activities. Noise and dust emissions generated by heavy vehicles and machineries are inevitable in this industrial zone. Anthropogenic wastes such as trash including plastics and certain chemicals released from the industries may impact and lead to environmental pollution and concern for long term in water bodies such as the Hlaing River and downstream.

Protecting and restoring as much of the original condition on the project site as possible may provide a home for the faunal assemblages such as insects, amphibians, reptiles and birds those will inhabit in this area. Fencing plants of native species and landscape vegetation and some woody types of vegetative coverage in the indirect impact area of roadside may provide the habitat sustainability of this project. Fishing activities of driftnet was being concerned for the fish fauna inhabited in Hlaing River and other fishing practice of small scale fishery with net occurring in Lainkone Creek where northern boundary of the study area. The mass production of sand and gravel mine at the upstream of the Industrial Zone, Shwe Pyi Thar may be the main impact, which leads to riverbank erosion and sustainability of riverine ecosystem. The mesh size of trammel net (two/ three layers net) should be standardized for escaping smaller size of fishes in the fishery of this area. Regarding with practice of industrial zone, all the industries including ABGL should be careful for waste treatment management to reduce the environmental pollution.

4.6.5. General Discussion

The ABGL may affect the ecosystem of direct impact areas leading to habitat degradation of insect species. Noise pollution of the industry and the vehicles of transportation may also get stress for bird species of the vicinity of the core area. It would also affect the habitat fragmentation of fish species because those areas are interconnecting with Hlaing River and some fish species climbing up of those areas in flooding.

One plant species of Endangered (EN), Padauk and one Vulnerable (VU) species that is Mahogany while others are Least Concern (LC) and Data Deficient (DD) (Table 1) had been identified in this study. The most distributed flora with their systematic position in this area were described under IUCN Red List of Threatened Species (ver. 2020-2). Most of flora are cultivation and no more affected by land use of this industry and the industrial zone had been fragmented by site clearance. Vegetation of roadside in public area can support food, shelter, pollination for insects, birds and animals, shading, medicine, edible and ornament, and spiritual values for human being.

Very common mammal species such as squirrels, mouse, rat and mongoose were sometimes occurred at the core zone and outer boundary (Interview Survey). The diversity of avianfauna with 47 bird species, 6 species of herpetofauna, 24 species of freshwater and brackish fish and 33 species of insect including butterflies, dragonflies and damselflies those from study area including Hlaing River and Lainkone Creek had been recorded. No other hunting pressure of different fauna in this industrial zone apart from fishing with trammel net in Hlaing River and small fishing gears in Lainkone Creek. Seasonal fluctuation of faunal diversity will be more than the description of this report in the study area.

The roadside vegetation has patches of rain forest type of trees and those are no other exploitation by public, so it may be no more threatened for animal species. The industrial zone including this project should make landscape plantation and shelterbelt those serve as the urban forest for the faunal assemblages and controlling the climatic condition. Mangroves forest alongside of Lainkone Creek connecting to Hlaing River is the critical one acting as the corridor for the brackish herpetofauna (amphians and lizards) and the waterway of some fish species.

CHAPTER 5

IMPACTS AND RISK ASSESSMENT AND MITIGATION MEASURES

5.1. IMPACT ASSESSMENT METHODOLOGY

5.1.1. Scope of EIA

According to EIA Procedure (2015) by MOECAP, EIA reports requires to include impact and risk assessment and mitigation measures covering each project phase such as construction, operation and decommissioning phases. In addition, the identification and assessment of potential environmental impacts should include potential impacts on physical, biological, social, socio-economic, health, cultural, and visual impacts. The EMP will be implemented to ensure that the project will have minimum and acceptable environmental impacts during its construction, decommissioning and operation phases.

It should be noted that the term environmental impact is now generally used to cover not only natural environmental but also social environment or social impacts as well as occupational health and safety. This scope of environmental impacts is adopted from EIA procedure (2015).

Environmental impact means the probable effects or consequence on the natural and built environment, and people and communities of a proposed project or businesses or activities or undertaking. Impacts can be direct or indirect, cumulative, and positive or adverse or both. For purposes of this procedure, environmental impacts include occupational, social, cultural, socio-economical, public and community health, and safety issues.

5.1.2. Impact Analysis

According to National Environmental Policy Act (1969), an environmental impact analysis is generally conducted to assess the potential impact of a proposed project on the natural and social environment. This may include an assessment of both the short-term and long-term effects on the physical environment, such as air, water and noise pollution; as well as effects on local services, living and health standards, and aesthetics.

The impact analysis is the identification or assessing of potential positive and negative impacts on the environment (physical, socio-economic, biodiversity, health, etc.) based on the project activities. Project activities and requirements consume environmental resources and produce nuisances to the surrounding environment. They are the sources, or root causes of environmental impacts, if adequately not controlled or managed, certainly cause significant changes of the environmental components.

5.1.3. Summary of Environmental, Social and Health Impact Assessment

This chapter provides an assessment of potential impacts arising from the project. The methodological approach used for the project impact assessment is adopted from Department of Environmental Affairs, Republic of South Africa (September 2012) and Impact Assessment Agency of Canada (November 1994).

5.1.4. Methodology of Significant Impact Assessment

The project activities are considered as sources capable of changing one or more environmental or social components. The assessment of impacts from the project activities includes the identification of the potential significant environmental impacts from the project. The evaluation of significant impact assessment considers four major factors such as probability, magnitude, extent, and duration of impacts on the environment with the consideration of potential positive or negative impact.

5.1.4.1. Probability of the Impact

The probability of the impact is the likelihood of impact occurrence from the development project to the environment. If there is a high probability that the identified significant adverse environmental effects will occur, obviously they are possible to cause significant impact. Conversely, if there is a low probability of occurrence, the significant adverse environmental effects are improbable. Five levels of probabilities of impact occurrence are considered to calculate significance points as follows:

- very improbable (probably will not happen)
- improbable (some possibility, but low likelihood)
- probable (distinct possibility)
- highly probable (most likely)
- definite (impact will occur regardless of any prevention measures)

5.1.4.2. Magnitude of the Impact

Magnitude of the impact is determined based on severity of impact. In case of very high magnitude, the situation turns to be irreversible. High, moderate, low magnitude and insignificant impacts are thus considered to be reversible and acceptable by the public with proper mitigation plan. In addition, the insignificant impact will have no effects on the environment. There are five levels of magnitude to determine significant points are as follows:

- Insignificant impact (the severity of impact is insignificant and will have no effect on the environment)
- Low impact (the severity of impact is low and will have small effect on the environment)
- Moderate impact (the severity of impact is moderate that cause some impacts on the environment)
- High impact (the severity of impact is significantly high but the impact can be reversible)
- Very high impact (the severity of impact is very high and that impact result into irreversible)

5.1.4.3. Extent of the Impact

The extent of the impact expresses the spatial influence of the effects produced by an intervention on the environment. This refers to either a distance or an area over which a component will undergo changes. The five levels of extent of the impact due to the project are:

- Site-specific (the impact affects only a very restricted area in the proximity of the project site)
- Local (the impact affects a relatively restricted area located within, near or at a limited distance from the project site)
- Regional (the impact affects a region of area or small number of components located a significant distance from the project site)
- National (the impact affects a large geographic area or some of components located a significant distance from the project area)
- International (the impact affects to international level on the environment)

5.1.4.4. Duration of the Impact

The duration of the impact describes the period of time during which a component undergoes changes due to the impact. It is not necessarily equivalent to the period of time during which the direct source of impact is active. It must also take into consideration the frequency when the impact is intermittent. It will be characterized as follow:

- A very short duration (the impacts on the environment are occurred within 0-1 year)
- A short duration (the environmental impacts are occurred within 2-5 years)
- Medium-term (the environmental impacts are occurred within 6-15 years)
- Long- term >15 years (the environmental impacts are happened over 15 years)
- A permanent period (the impacts are experienced continuously for the life of the facility or even beyond if the effect is irreversible)

5.1.4.5. Significance of the impact

The potential significant negative or positive environmental impacts caused by the project are identified by using a ranking scale such as occurrence and severity. Occurrence includes probability and duration of occurrence while severity means magnitude and extent of impacts. The ranking scale to use in assessing of each potential impact is shown in Table 5-1.

Table 5-1 Evaluation of Impact Assessment

Probability	Duration
1. Very improbable impact	1. A very short duration (0-1 year)
2. Improbable impact	2. A short duration (2-5 years)
3. Probable impact	3. Medium-term (6-15 years)
4. Highly probable impact	4. Long- term >15 years
5. Definitely impact	5. A permanent period
Magnitude	Extent
1. Insignificant impact	1. Site-specific impact
2. Low impact	2. Local impact
3. Moderate impact	3. Regional impact
4. High impact	4. National Impact
5. Very high impact	5. International Impact

The following formula is used to assess the environmental significance of each potential impact.

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Extent} + \text{Duration}) \times \text{Probability}$$

Environmental significance of the potential environmental impacts can be differentiated based on the significance points into negligible, low, moderate, and high significance. Potential environmental impacts rating can be seen in Table 5-2.

Table 5-2 Potential Environmental Impacts Rating

Significance Points	Environmental Significance
<15	Negligible
15 - 30	Low
31- 60	Moderate
>60	High

5.2. POTENTIAL ENVIRONMENTAL IMPACT DURING CONSTRUCTION AND DECOMMISSIONING PHASE

Decommissioning Phase

There are four possible scenarios when the permission for factory operation is due-

- ❖ Scenario i: If the project proponent extent/renew the permission to continue the manufacturing of various kinds of shoes, the environmental impact evaluation and management plan would be identical to the operation phase.
- ❖ Scenario ii: The project proponent would not extent/renew the permission. The new proponent would apply for permission and resume the factory operation. For this case, the environmental impact evaluation and management plan would be identical to the operation phase.
- ❖ Scenario iii: If the project proponent doesn't extent/renew the permission, the structures of the ABGL's buildings would be left in its original form and no business activities would be performed. For this case, the proponent is recommended to follow the procedures guided by the relevant authority. Moreover, the proponent needs to inform the factory workers about the decommission plan, clear all the payment payable to workers, and compensate them-if necessary.
- ❖ Scenario iv: The project proponent would not extent/renew the permission. The structures of the ABGL's buildings would be partially or wholly demolished for new business activity. For this case, the environmental impact evaluation would be identical to construction phase and the demolition contractor is advised to follow the management plan described in construction phase.

For this project, scenario iv is assumed and the following key impacts are predicted during construction and decommissioning phases of ABGL project;

- Air Quality
- Noise and Vibration

- Water Quality
- Land Use Change
- Soil Quality
- Solid Waste
- Occupational Health and Safety
- Cultural Heritage
- Ecosystem
- Local Economy such as Employment and Means of Livelihood

The project construction stage can produce a considerable amount of potential environmental related issues, but most of the impacts on the local community will be transient since the impacts will be occurred only during construction or decommissioning phase.

Majority of the impacts created in construction phase will be transient in nature. However, proper planning on construction site, waste disposal, and health and safety procedures should be effectively managed.

The construction activities would consist of installation of necessary machinery, building construction, and alternative activities of M & E processes. Therefore, the potential negative impacts on environment would be at the minimum level. In Table 5-3, it shows the evaluation and prediction of potential environmental impacts' significance during construction phase and decommission phase. The summary of potential environmental and social impacts during construction phase is shown in Figure 5-1.

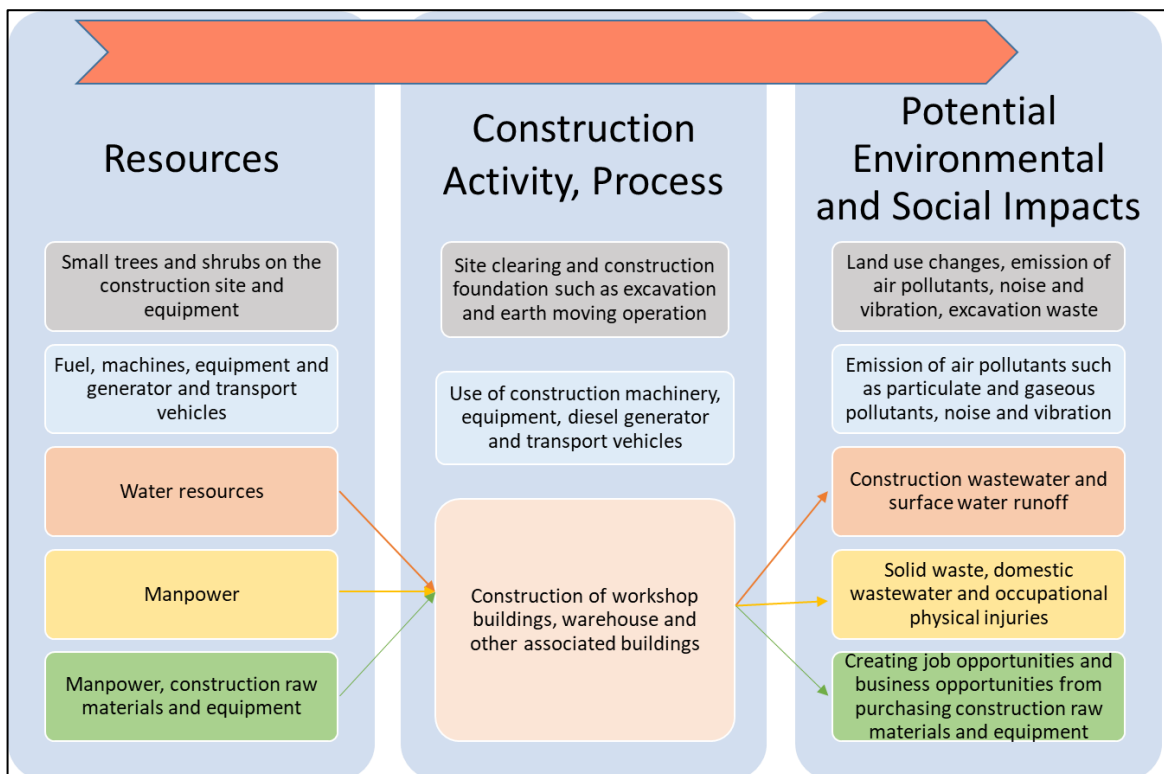


Figure 5-1 Summary of Potential Environmental and Social Impacts during Construction Phase

5.2.1. Air Quality

ABGL will construct two phases: Phase 1 includes one warehouse and one workshop buildings and Phase 2 includes one dormitory, one office building and one workshop building. In addition, other project-associated buildings such as mold room, warehouse, generator room, garbage room, firefighting room, guardroom, car parking lots and underground fire pool will be also constructed in project phase 1.

The transportation of construction materials can cause air pollutants emission (NO_2 , SO_2 , CO_2 , $\text{PM}_{2.5}$, PM_{10} , etc.) from heavy-duty vehicles during the construction phase. In addition, the dusty construction activities (soil excavation work, movement of vehicles, drilling for installation piping of mechanical, electrical, etc.) can cause emission of fugitive dust to the ambient air during construction stage. Moreover, the diesel generator for emergency use can emit air pollutants (NO_2 , SO_2 , CO_2 , etc.) to the surrounding environment.

During decommission stage, the civil work such as demolition of the buildings can emit fugitive dust and the transportation of demolished materials can also cause air emission near surrounding area of the project. However, the potential negative impact on air quality will be low.

5.2.2. Noise and Vibration

During construction phase, the operation of heavy equipment, earth moving machinery for site clearing, pile driver operation, excavation equipment, cranes, operation of concrete mixer, equipment transportation, emergency generator and other related construction work can cause noise and vibration disturbance to the surrounding community.

During decommission phase, the operation of heavy equipment, earth moving machinery for site clearing, cranes, equipment transportation, emergency generator and other civil work can cause noise and vibration disturbance to the surrounding community. These nuisance noise and vibration will be low at a limited distance from the project site.

5.2.3. Water Quality

During construction and decommission phase, water required for all construction and decommission activities and domestic purpose will be used mainly from tube wells. Polluted storm water runoff from the construction site and improper discharge of domestic wastewater from the worker camp can deteriorate the surrounding water bodies such as surface water and ground water. The amount of water usage and wastewater generation was depended on the number of construction workers during day shift. The domestic wastewater generated from the construction site was from toilet and washing activities of the employees. However, the impact on water quality will be low since the domestic wastewater from the worker camp will be properly discharged and good housekeeping and proper equipment usage will be practiced to prevent leakage of chemical and oil in storm water runoff.

5.2.4. Land Use Change

During construction, the site clearing was carried out at the project site to implement the installation of infrastructure. During decommissioning phase, demolition of infrastructure and site clearing will be carried out at the project site. However, these land use changes due to the project activities can be assumed as low impact to the surrounding environment since the land use of the project site is the industrial zone type.

5.2.5. Soil Quality

Construction and decommissioning activities can create soil contamination such as leakage of fuel and oil from the construction vehicles or machineries and other various wastes on the ground. In addition, the temporary solid waste disposal site can cause leakage of leachate to the surrounding soil at the project site. In addition, improper discharge of construction waste can cause soil contamination. However, the potential impact on soil quality will be low since the probability to cause soil contamination is low.

5.2.6. Solid Waste

➤ Non-Hazardous Waste

Residual wastes were generated during the buildings construction and decommissioning phase. Source of solid waste will be from the removal of top soil and old structures, faulty construction activities and other construction and decommission wastes such as small concrete spills, scrap wood and metals. Other non-hazardous wastes consist of domestic solid waste discharged from workers such as plastic, garbage, glass and food waste.

➤ Hazardous Waste

Hazardous wastes from the construction and decommission stages such as treated timber, concrete additives, asbestos, contaminated soils, preservative, adhesives, paint, fluorescent light tubes, and lead-acid batteries can cause potential negative environmental impacts due to improper management of solid waste.

However, the construction project team will manage solid wastes properly during construction and decommission stage in accordance with the approval of YCDC. Therefore, the potential negative impacts will be low during construction and decommission stages.

5.2.7. Traffic Condition

During the construction period, the construction of workshop buildings, warehouse, office building, dormitory and other associated buildings will necessitate to transport the construction materials, equipment and construction wastes. Consequently, the traffic loads will be slightly increased on the existing roads (Mahar Myaing street, Wartayar street, Hlawga road, Bo Tike Chun street and Bo Gyoke Aung San road) within the study area, particularly Mahar Myaing street which is the access road to project site. According to traffic surveys, the traffic condition of existing roads are as follows:

Mahar Myaing Street: Mahar Myaing street is the access road to project site and the traffic condition of this street is free flow. The majority of the vehicles are motorcycles and bicycles/tricycle.

Wartayar Street: The traffic condition of Wartayar street is free flow and the majority of the vehicles are motorcycles, cars and taxi.

Bo Tike Chun Street: The traffic condition of Bo Tike Chun street is free flow and the majority of the vehicles are motorcycles and medium trucks.

Bo Gyoke Aung San Road: The traffic condition of Bo Gyoke Aung Sand road is free flow and reasonable free flow traffic. The majority of vehicles were motorcycles and bicycles/tricycles.

Hlawga Road: The traffic condition of Hlawga road is free flow and reasonable free flow traffic. The majority of vehicles were motorcycles and bicycles/tricycles.

The construction period is expected to be around 5 years and the magnitude of impact on traffic condition is predicted to be low. Therefore, the significance of negative impact on traffic condition during construction period is negligible.

5.2.8. Occupational Health and Safety

The potential impacts on health and safety during construction and decommission phase are listed below:

- ❖ Construction workers may slip and fall due to the careless.
- ❖ Working at height of building during roofing and painting may cause accident.
- ❖ Increased temperature of equipment surface may hurt due to careless.
- ❖ Dusty in the ambient air of the working zone can cause side effect on respiratory system.
- ❖ Moving machinery can cause temporary hazards such as vehicle traffic and accident in moving and lifting equipment.

However, the impact on occupational health and safety of the project will be low since the project will manage properly associated with the occupational health and safety of workers. The potential activities to cause infectious disease are not expected since construction workers will be hired mostly from the local community.

5.2.9. Cultural Heritage

The project is located at Shwe Pyi Thar Township that is the industrial zone area. According to survey, there is no historical building in Shwe Pyi Thar Township. Although Min Bandu pagoda is located within 300 m from the project site, it is not expected to cause any visual impact on the pagoda since the building is not skyscraper and the maximum floor number of all buildings is three. In addition, the structures of project's buildings are steel structure, so no vibration impact to the pagoda is expected. The construction activities that can cause potential negative impacts on cultural heritage are not expected during construction and decommission stages.

5.2.10. Ecosystem

The total of 56 species of trees, shrub, herbs, climbers, bamboo and medicinal plants and 33 species of insects, 24 species of fishes, 6 species of reptiles and amphibians, 30 species of terrestrial birds and 17 species of water birds were found within 3 km radius of project study area. In addition, only one endangered species called “Padauk” and only one nearly threatened species called “Nga nu than” were found within the study area. The major threats of the project may be the habitats of insect including butterflies, dragonflies and damselflies because of the clearance of weeds and small vegetation such as shrubs and herbs.

The use of heavy construction equipment during transportation of the building materials and site clearance will make noise and dust that can lead to the disturbance to the nearby faunal assemblages. Noise and dust emission made by heavy vehicles and machinery are inevitable both during the site clearance and construction phases. Hlaing River is situated 0.8 km far away from the project site that provides the aquatic habitat for some indigenous fish species and amphibians but it is threatened by so many exotic species, plastic, and trash pollution. Improper wastewater discharge and solid waste management system can cause negative impact on ecosystem.

However, there may be no significant impacts on surrounding ecosystem since the project is located in the industrial zone area and there are no protected areas, reserved forests and wetlands, threatened species and national parks within 3 kilometer of the project area. Although civil works from the construction and demolition activities of the project may generate impacts on fauna and flora, the scale of impact is expected to be negligible.

5.2.11. Climate Change

Emission of greenhouse gas (GHG), such as CO₂ and CH₄, from the construction materials, equipment and construction wastes transportation vehicles and diesel power generators is the contributing factor of climate change. The construction period is limited to five years and the negative impact on climate change during construction period is expected to be negligible.

5.2.12. Local Economy such as Employment and Means of Livelihood

There will be positive impacts on local economy due to getting job opportunities and necessary materials and equipment may be purchased from local shops during construction and decommission stages of the project. Therefore, potential positive impacts on their job opportunities and livelihood are expected.

Table 5-3 Evaluation and Prediction of Significant Impacts for Construction and Decommission Phase

Potential Impact	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Air Quality	Construction and decommissioning activities, diesel generator and vehicle movement	CO ₂ , CO, SO ₂ , O ₃ , CH ₄ , NO ₂ , PM ₁₀ , PM _{2.5}	3	2	2	4	28	Low
Noise and Vibration	Emergency use of diesel generator and the operation of construction equipment and heavy vehicles	Noise and vibration	3	1	2	4	24	Low
Water Quality	Surface runoff and domestic wastewater	Organic matter in wastewater	2	2	2	3	18	Low
Land Use Change	Removal of vegetation and top soil Installation of infrastructure	Land use change	1	2	4	4	28	Low
Soil Quality	Civil work	Leakage of fuel, oil and other various wastes	3	2	3	2	16	Low
Solid Waste	Civil work and wastes from workers	Residual waste and domestic waste	3	3	3	2	18	Low
Traffic Condition	Transportation of construction materials, equipment and construction wastes	Traffic counting	1	2	2	2	10	Negligible
Occupational Health and Safety	Workers' health and accident during construction and decommission	Infectious disease; such as AIDS/HIV, Hepatitis B/C, etc. and other physical injuries	2	1	2	3	15	Low

Potential Impact	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Cultural Heritage	Civil works near cultural heritage areas	Archeological sites and traditional building	1	2	1	2	8	Negligible
Ecosystem	Civil works	Flora and Fauna	1	2	1	3	12	Negligible
Climate Change	Transportation vehicles and power generators	GHG emission	1	2	2	2	10	Negligible
Potential Positive Impacts								
Local Economy such as Employment and Means of Livelihood	Civil works, raw materials and equipment purchasing	Employment and business opportunities	3	2	2	4	28	Low

5.3. POTENTIAL ENVIRONMENTAL IMPACTS DURING OPEARATION PHASE

The following are predicted impacts during operation phase of manufacturing of various kinds of shoes;

- Air Quality
- Noise and Vibration
- Water Quality
- Soil Quality
- Solid Waste
- Offensive Odour
- Occupational Health and Safety
- Ecosystem
- Local Economy such as Employment and Means of Livelihood

Not all of the impacts during operation phase are affected directly to local communities. All of the impacts' significance during operation phase is presented in Table 5-4. Summary of potential environmental and social impact during operation phase is shown in Figure 5-2.

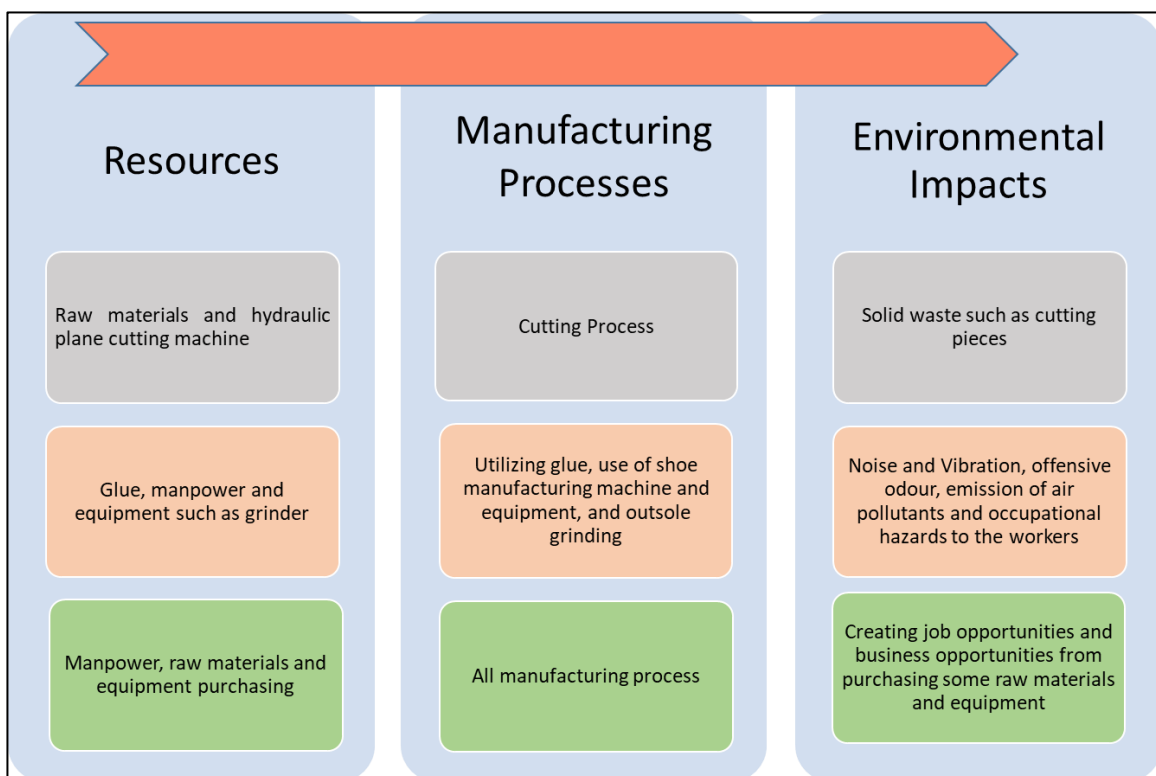


Figure 5-2 Summary of Potential Environmental and Social Impacts during Operation Phase

5.3.1. Air Quality

During the operation phase, loading and unloading of raw materials and cleaning floor can cause air pollutant emission such as fugitive dust. In addition, use of power generators, use of chemical glue and vehicle movements and transportation of raw materials can generate particulate matters such as PM₁₀, PM_{2.5} and gaseous pollutants such as CO₂, NO₂, CO, CH₄, O₃, SO₂, VOCs. In addition, outsoles grinding process can emit harmful dust. Outsole grinding process can emit harmful dust.

5.3.2. Noise and Vibration

During the operation phase, the sources of noise and vibration are from the operation of various machineries and equipment for production process especially sewing machine, cutting machine, outsoles grinding process, moving final products by forklifts, water cooler, and the emergency used generators, transportation vehicles and automobile movements (short term noise).

5.3.3. Water Quality

During the operation phase, the proposed factory does not produce wastewater from the operation process. However, the domestic wastewater will be generated from workers such as wastewater from toilets or urinals, canteen and staff accommodation. The potential impact on water quality will be low significant.

5.3.4. Soil Quality

During the operation phase, the transportation vehicles and equipment used for operation process can cause leakage of fuel and oil and other various wastes on the ground that lead to soil contamination. In addition, the improper discharge of wastewater will lead to soil contamination. However, the potential impact on soil contamination will be insignificant.

5.3.5. Solid Waste

Solid wastes from the operation process are used glue containers, byproducts such as cutting pieces, thread and unqualified products from operation process. Both hazardous waste and non-hazardous waste will be generated mainly from the office, operation room, canteen and staff accommodation. Small amount of hazardous waste such as dry cells, batteries, fluorescent lamp, paints and its container, chemicals residue and its container will be generated. Non-hazardous waste such as paper, plastic bag and plastic bottles, glass, aluminum cans, tin cans, clothes, food wastes, rubber, etc. will be generated. Improper disposal of the solid wastes can cause negative impact on the environment.

5.3.6. Offensive Odour

Offensive odour can cause from temporary solid waste disposal site. During operation phase, offensive odour can cause from the use of chemical glue and the building renovation activities such as painting.

5.3.7. Traffic Condition

During the operation period, the production and operation process will necessitate to transport the raw materials, equipment and final products. Consequently, the traffic loads will be slightly increased on the existing roads (Mahar Myaing street, Wartayar street, Hlawga road, Bo Tike Chun street and Bo Gyoke Aung San road) within the study area, particularly Mahar Myaing street which is the access road to project site. According to traffic surveys, the traffic condition of existing roads are as follows:

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Bo Tike Chun Street: The traffic condition of Bo Tike Chun street is free flow and the majority of the vehicles are motorcycles and medium trucks.

Bo Gyoke Aung San Road: The traffic condition of Bo Gyoke Aung Sand road is free flow and reasonable free flow traffic. The majority of vehicles were motorcycles and bicycles/tricycles.

Hlawga Road: The traffic condition of Hlawga road is free flow and reasonable free flow traffic. The majority of vehicles were motorcycles and bicycles/tricycles.

The magnitude of impact on traffic condition is predicted to be low and the significance of negative impact on traffic condition during operation period is expected to be negligible.

5.3.8. Occupational Health and Safety

Physical injuries such as fall on slippery floors, electricity shock and improper product loading and unloading in store may occur in the proposed project's factory. In addition, accidents can be occurred from the factory's renovation activities. In addition, improper chemical glue handling can harm to the workers and outsole grinding process can cause harmful dust inhalation to the workers. However, the potential negative impact on occupational health and safety can be low.

5.3.9. Ecosystem

Improper discharge and disposal of wastewater and solid waste from the project can cause certain adverse impact on nearby aquatic ecosystem and habitats of flora and fauna. However, the possibility is unlikely since wastewater and solid waste of the factory will be managed properly.

5.3.10. Climate Change

Emission of GHG, such as CO₂ and CH₄, from the raw materials and final products transportation vehicles and diesel power generators is one of the contributing factor of climate change during operation phase. In addition, usage of installed air conditioners can also emit GHG such as hydrofluorocarbon (HFC) refrigerant gases. However, the negative impact on climate change during operation period is expected to be negligible since the project proponent will install the air conditioners which have lower global warming potential

(GWP) refrigerants such as R32 and R410a and transformer will be set at project site with the approval of government instead of power generators.

5.3.11. Local Economy such as Employment and Means of Livelihood

The socio-economic impacts are considered as positive because more jobs opportunities are created during operation phases of the project. The employees for the process comprising both skilled and unskilled will be recruited from the local community. The project proponent will implement the following practices during operation phase:

- ❖ Promote the fair treatment, non-discrimination and equal opportunity for workers;
- ❖ The project proponent plans to increase the production capacity and nearby communities will get benefit by being the source of work force for the project;
- ❖ Ensure total compliance with national labor and employment laws;
- ❖ To avoid exploitation of child labor by contractor, sub-contractor and supply chain;
- ❖ Promote safe and healthy working conditions;
- ❖ Project proponent should try to mitigate or minimize negative impacts while enhancing and maximizing the positive impacts to their optimum.

Table 5-4 Evaluation and Prediction of Significant Impacts for Operation Phase

Potential Impacts	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Air Quality	Use of diesel generators, vehicles movement and outsole grinding process	CO2, CO, CH4, O3, PM10, PM2.5, SO2, NO2, VOCs	2	2	4	3	24	Low
Noise and Vibration	Transportation vehicles, use of diesel generators and outsole grinding process	Noise and vibration	2	1	4	3	21	Low
Water Quality	Domestic wastewater	BOD, COD, Antibiotics, Oil and Grease, Total Nitrogen (TN), Total Phosphorous (TP), Total solid (TS), Total Oxygen Demand, Total coliform bacteria	3	3	4	3	30	Low
Soil Quality	Logistic transportation	Leakage of fuel, oil and other various wastes, and improper wastewater discharge	2	3	4	3	27	Low
Solid Waste	Factory operation processes, office, canteen and staff accommodation	Type and amount of waste	3	2	4	3	27	Low
Offensive Odour	Temporary solid waste disposal site, and renovation activities such as colour painting	Offensive Odour	2	1	4	4	28	Low
Traffic Condition	Transportation vehicles	Traffic counting	1	2	4	2	14	Negligible
Occupational health and safety	Workers' health in operation area	Infectious disease; such as AIDS/HIV, Hepatitis B/C, COVID-19 etc. and other physical injuries	3	1	4	3	24	Low

Potential Impacts	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Ecosystem	Wastewater and solid waste discharge	Impacts on aquatic ecosystem and habitats	2	2	4	3	24	Low
Climate Change	Transportation vehicles, power generators and air conditioners	GHG emission	1	2	4	2	14	Negligible
Potential Positive Impacts								
Local Economy such as Employment and Means of Livelihood	Purchasing raw materials and equipment	Job and business opportunities	3	3	4	4	40	Moderate

5.4. MITIGATION MEASURES DURING CONSTRUCTION, OPERATION AND DECOMMISSIONING PHASES

5.4.1. Air Quality

5.4.1.1. Mitigation of Air Pollution during Construction/Decommissioning Phase

- ❖ To mitigate air pollutants emission from the transportation vehicles, the vehicle will be maintained regularly.
- ❖ In order to reduce fugitive dust emission from the civil work activities, spraying water and usage of safety nets at and around the construction areas will be performed.
- ❖ Instead of using pure diesel generators, retrofit emission devices or diesel fuel with lower sulfur content will be utilized in order to reduce emission of air pollutants from the diesel generators.
- ❖ Construction material such as cement and sand, etc. will be carried with covers.
- ❖ Burning construction wastes will be strictly prohibited.

5.4.1.2. Mitigation of Air Pollution during Operation Phase

- ❖ Generators and vehicles will be maintained regularly.
- ❖ Low Sulphur content diesel fuel are used for the operation of generators, machineries and vehicles in order to reduce gaseous emission.
- ❖ Strong dust absorption machines with six holes are installed in order to absorb/collect harmful dust from outsoles grinding process.
- ❖ Personal protective equipment such as mask, glove and so on are provided to the workers who are working in the outsoles grinding room in order to prevent dust particles inhalation.
- ❖ Air quality around the project site will be monitored regularly.

5.4.2. Noise and Vibration

5.4.2.1. Mitigation of Noise and Vibration during Construction/Decommissioning Phase

- ❖ Civil work generating high noise levels will be carried out only at daytime.
- ❖ Adequate earplugs or ear muffs will be provided to the workers in excessive noise areas.
- ❖ Workers in excessive noise areas and on a vibrating surface will be assigned with alternative shift.
- ❖ Low-noise level generators will be used in order to reduce the impact from the diesel engine generators.
- ❖ Diesel generators are placed away from the residential area.
- ❖ Construction equipment, truck and diesel generators will be maintained regularly in order to avoid excessive vibration and noise.

The proposed mitigation measures will be needed to be included as conditions in the construction contracts for implementation by the contractors.

5.4.2.2. Mitigation of Noise and Vibration during Operation Phase

- ❖ Equipment and machines that generate low noise levels will be used.
- ❖ PPE such as earplugs or earmuffs are provided to the workers who are working in the excessive noise areas.
- ❖ Diesel generators are placed away from the residential area.
- ❖ Operation machine, equipment, transportation vehicles and diesel generators will be maintained regularly in order to avoid excessive vibration and noise.

5.4.3. Water Quality

5.4.3.1. Mitigation of Water Pollution during Construction/Decommissioning Phase

- ❖ Sufficient number of toilets and bathing facilities for construction workers are provided.
- ❖ Sewage will be collected into septic tanks and will be properly discharged in line with YCDC laws and regulations.
- ❖ Domestic wastewater from worker camps will be properly discharged according to YCDC laws and regulations.

5.4.3.2. Mitigation of Water Pollution during Operation Phase

- ❖ The proper water drainage systems are constructed in the factory compound.
- ❖ The domestic wastewater from the secondary drains will discharge into the main drainage channel and then flow to the industrial zone drainage channel.
- ❖ Sufficient number of toilets and bathing facilities for the factory workers are provided.
- ❖ Sewage from buildings in the project site will be collected by sub-septic tanks and main septic tank, and will be discharged in line with the YCDC Rules and Regulations.
- ❖ The discharged wastewater will be monitored regularly at the effluent point.

5.4.4. Land Use Change during Construction/Decommissioning Phase

- ❖ Since the proposed project area was industrial area, there may be not much change in land use and so, mitigation measures may not be necessary.

5.4.5. Soil Quality

5.4.5.1. Mitigation of Soil Contamination during Construction/Decommissioning Phase

- ❖ The construction vehicles or machineries will be regularly maintained in order to prevent leakage of fuel and oil to the soil.
- ❖ The temporary solid waste disposal site are constructed properly in order to prevent leakage of leachate to the surrounding soil.
- ❖ Fuel oil will be properly stored.

- ❖ Construction waste will be systematically collected and disposed according to YCDC Rules and Regulations.

5.4.5.2. Mitigation of Soil Contamination during Operation Phase

- ❖ Transportation vehicles and equipment used for operation process will be examined or maintained regularly.
- ❖ Solid waste management system will be installed properly in order to prevent improper waste disposal.
- ❖ Domestic wastewater will be discharged properly in order to prevent improper wastewater discharge on the ground.

5.4.6. Solid Waste

5.4.6.1. Solid Waste Management during Construction/Decommissioning Phase

- ❖ Solid waste from the removal of top soil and old structures and faulty construction activities will be disposed at a suitable landfill site in accordance with the approval of YCDC.
- ❖ An efficient waste management system will be established and operated.
- ❖ Construction wastes will be classified and sorted out at sources for disposal in line with YCDC rules and regulation.
- ❖ Non-hazardous wastes such as plastic, garbage, glass and food waste will be separated and managed according to YCDC rules and regulation.
- ❖ Hazardous waste disposal in or off the construction site will be prohibited.
- ❖ Hazardous waste will be stored, collected and disposed in compliance with the approval of YCDC.

5.4.6.2. Solid Waste Management during Operation Phase

- ❖ Solid waste will be separately collected with different types of waste bins and the collected waste will be kept at a temporary solid waste storage yard before collecting by YCDC.
- ❖ Food waste from the factory workers will be disposed daily with the approval of YCDC.
- ❖ Both hazardous waste such as residue within empty chemical containers, used batteries and incandescent light bulb, etc. and non-hazardous waste such as cutting pieces, thread and unqualified products from the temporary waste storage yard will be disposed monthly in accordance with the approval of YCDC.
- ❖ The amount and type of waste will be monitored regularly.

5.4.7. Traffic Condition

Since the potential negative impacts on traffic condition from the project are expected to be negligible during construction/decommission and operation stages, the mitigation measures for traffic condition are not considered.

5.4.7.1. Mitigation of Traffic Condition during Construction/Decommissioning Phase

Since the traffic condition on the existing roads are free flow and reasonable free flow condition and the negative impact on traffic condition is negligible, the mitigation on traffic condition is not necessary.

5.4.7.2. Mitigation of Traffic Condition during Operation Phase

5.4.8. Offensive Odour during Operation Phase

- ❖ Glue will be handled in well-ventilated areas.
- ❖ PPE such as face shield and mask will be used in order to prevent offensive odour inhalation.
- ❖ Workers in excessive offensive odour areas will be assigned with alternative shift.
- ❖ Temporary solid waste yard are constructed systematically and waste from waste storage yard will be discharged in accordance with YCDC rules and regulation.

5.4.9. Occupational Health and Safety

5.4.9.1. Mitigation of Occupational Hazards during Construction/Decommissioning Phase

- ❖ The project proponent will establish safety policy.
- ❖ The contractor will prepare safety plan.
- ❖ The contractor will provide PPE and first aid kit to the construction workers.
- ❖ The contractor will raise awareness of safety guidelines to the construction workers.
- ❖ The contractor will assign safety supervisors at the work site.
- ❖ The contractor will provide incentives to workers who obey the safety practices and penalty to workers who disobey the safety practices.
- ❖ The contractor will arrange morning talks and toolbox meeting.

5.4.9.2. Mitigation of Occupational Hazards during Operation Phase

- ❖ The moisture-absorbent mats with beveled edges should be used to prevent slips and falls on the slippery floor and signboard should be displayed as the caution.
- ❖ Qualified forklift operators and handlers should be used during loading and unloading of materials.
- ❖ It should not be overloaded than the prescribed load on loading and unloading equipment and vehicles in order to prevent accidents.
- ❖ PPE will be provided to the workers during renovating the buildings.

- ❖ Material safety data sheets (MSDS), eyewash station, emergency alarm button and “No Smoking” sign board are provided on the wall of chemical storage room.
- ❖ In addition, PPE such as protective gloves, clothing, eye protection, ear plugs, and face shield will be provided to the workers who handled chemical glue and to the workers who worked in outsole grinding room.
- ❖ First aid kit and medical clinic will be provided to the workers.
- ❖ Occupational safety and emergency first aid training will be also provided to the workers.

5.4.10. Cultural Heritage during Construction/Decommissioning Phase

Since the construction activities that can cause potential negative impacts on cultural heritage are not expected during construction and decommission stages, the mitigation measures for cultural heritage are not considered.

5.4.11. Ecosystem

5.4.11.1. Mitigation of Potential Impact on Ecosystem during Construction/Decommissioning Phase

- ❖ Cutting tree and clearance of vegetation must be at a minimum and the trees will be planted.
- ❖ Oil, grease and construction waste will be stored properly to prevent the leakage on the ground or water bodies.
- ❖ Construction waste and wastewater will be properly disposed and discharged.

5.4.11.2. Mitigation of Potential Impact on Ecosystem during Operation Phase

- ❖ The project proponent will systematically manage and use the natural resources such as land and water in this area.
- ❖ Maintaining and replanting of certain native plant species such as trees as landscaping or fencing may provide a home for the faunal assemblages such as insects, amphibians, reptiles, and birds.
- ❖ Wastewater and solid waste from the shoe production processes will be systematically managed in accordance with YCDC rules and regulations.

5.4.12. Climate Change

Since the potential negative impacts on climate change are expected to be negligible during construction/decommissioning and operation phases, the mitigation measures for climate change are not considered.

5.5. RISK ASSESSMENT AND RISK MITIGATION PLAN

5.5.1. Methodology

Risk assessment methodology is adopted by International Civil Aviation Organization-ICAO (2013)¹². Environmental risk assessment is the process of evaluating the likelihood of adverse effects in, or transmitted by, natural environment and hazards that accompany human activities. The risk assessment will be evaluated based on hazard identification, risk analysis probability, risk analysis severity, risk assessment and tolerability. The risk management process will be performed as shown in Figure 5-3.

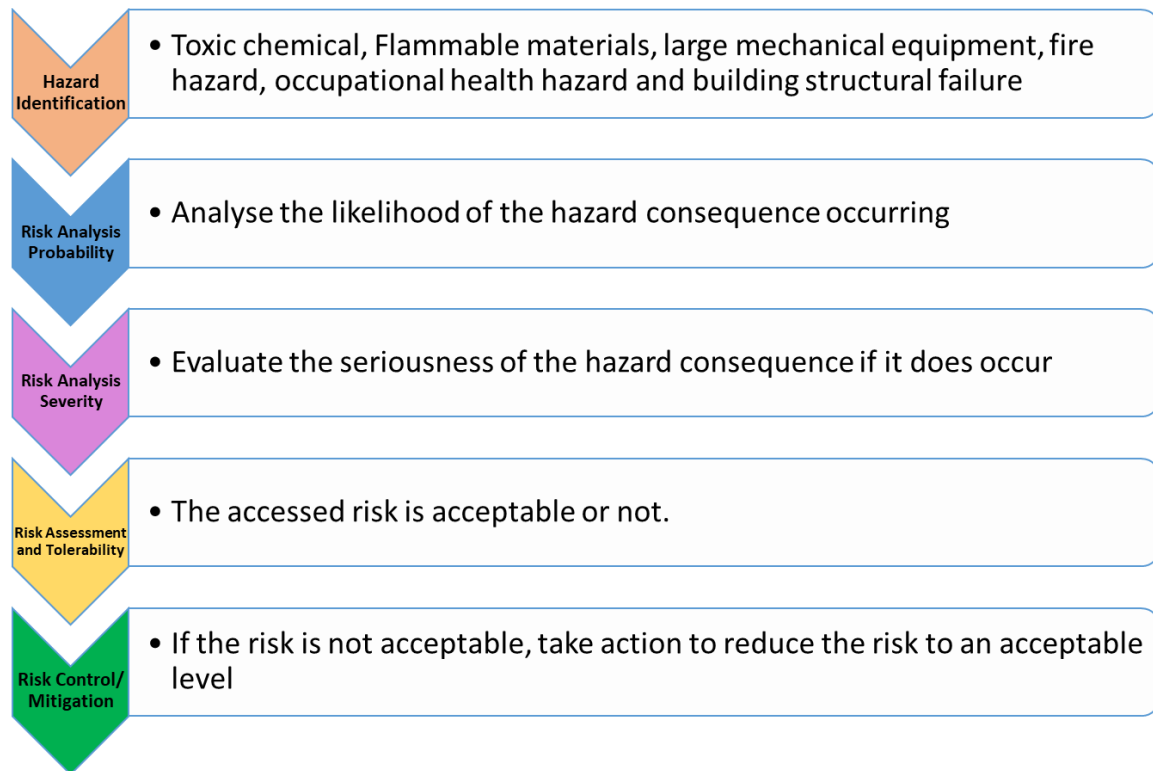


Figure 5-3 Risk Assessment and Management Process

5.5.1.1. Hazard Identification

Major anthropogenic hazards such as toxic chemical, flammable materials, large mechanical equipment, fire hazard, occupational health hazard and building structural failure are considered for this project.

5.5.1.2. Risk Analysis Probability

ICAO states that the risk probability is the likelihood or frequency that a hazard may exist. The risk probability range is defined by five level of likelihood such as frequent, occasional, remote, improbable and extremely improbable. The risk probability range is shown in Table 5-5.

¹² International Civil Aviation Organization (ICAO) (3rd edition, 2013), Safety Management Manual

Table 5-5 Risk Probability Range

Likelihood	Meaning	Value
Frequent	The hazard is likely to occur many times.	5
Occasional	The hazard is likely to occur sometimes.	4
Remote	The hazard is unlikely to occur, but possible.	3
Improbable	The hazard is very unlikely to occur.	2
Extremely improbable	The hazard is almost inconceivable that the event will occur.	1

5.5.1.3. Risk Analysis Severity

According to ICAO, the risk severity is the extent of harm that might reasonably occur as a consequence of the identified hazard. The risk severity range is defined by five level such as catastrophic, hazardous, major, minor and negligible and the risk analysis severity table is shown in Table 5-6

Table 5-6 Risk Analysis Severity Table

Severity	Meaning	Value
Catastrophic	Equipment destroyed and multiple deaths	A
Hazardous	Serious injury and major equipment damage	B
Major	Serious incident and injury to persons	C
Minor	Nuisance and minor incident	D
Negligible	Few consequences	E

5.5.1.4. Risk Assessment and Tolerability

The risk assessment is performed based on the risk analysis probability and risk analysis severity. The risk assessment and tolerability is evaluated as shown in Table 5-7. If the assessed risk index is in intolerable region, the risk is unacceptable under the existing circumstance and it need to perform priority risk mitigation. In addition, the kind of risk should be ceased or cut back If necessary. If the assessed risk is in the tolerable region, the risk is acceptable based on the risk mitigation and it may require management decision. If the risk is acceptable region, the risk is acceptable and no further risk mitigation might not required. Risk assessment and mitigation measures during construction, operation and decommissioning phases is shown in Table 5-8.

Table 5-7 Risk Assessment and Tolerability

Risk Probability	Risk Severity				
	Catastrophic-A	Hazardous-B	Major-C	Minor-D	Negligible-E
Frequent-5	5A (Intolerability)	5B (Intolerability)	5C (Intolerability)	5D (Tolerable)	5E (Tolerable)
Occasional-4	4A (Intolerability)	4B (Intolerability)	4C (Tolerable)	4D (Tolerable)	4E (Tolerable)
Remote-3	3A (Intolerability)	3B (Tolerable)	3C (Tolerable)	3D (Tolerable)	3E (Acceptable)
Improbable-2	2A (Tolerable)	2B (Tolerable)	2C (Tolerable)	2D (Acceptable)	2E (Acceptable)
Extremely Improbable-1	1A (Tolerable)	1B (Acceptable)	1C (Acceptable)	1D (Acceptable)	1E (Acceptable)

Table 5-8 Risk Assessment and Mitigation Measures during Construction, Operation and Decommissioning Phases

Risk analysis before taking mitigation measures	Assessed Index	Risk	Risk analysis after taking mitigation measures	Assessed Index	Risk
<p><u>Toxic Chemical</u></p> <ul style="list-style-type: none"> - Hazards from improper storage and handling of toxic chemical such as glue which contain methyl ethyl ketone, methylcyclohexane and so on. 	3C (Tolerable)	<ul style="list-style-type: none"> - Chemicals are stored separately with other raw materials. - Hazardous chemical are stored in well-ventilated areas. - PPE such as protective gloves, clothing, eye protection are provided to the workers while handling the chemical. 	<ul style="list-style-type: none"> - Chemicals are stored separately with other raw materials. - Hazardous chemical are stored in well-ventilated areas. - PPE such as protective gloves, clothing, eye protection are provided to the workers while handling the chemical. 	2D (Acceptable)	
<p><u>Flammable Materials</u></p> <ul style="list-style-type: none"> - Hazards from improper storage and handling of flammable chemical such as glue 	3C (Tolerable)	<ul style="list-style-type: none"> - Chemicals are stored separately with other raw materials. - Hazardous chemical are stored in well-ventilated areas. - Fire extinguishers, MSDS, eyewash station, "No Smoking" sign board and emergency alarm button are provided in the chemical storage room. 	<ul style="list-style-type: none"> - Chemicals are stored separately with other raw materials. - Hazardous chemical are stored in well-ventilated areas. - Fire extinguishers, MSDS, eyewash station, "No Smoking" sign board and emergency alarm button are provided in the chemical storage room. 	2D (Acceptable)	
<p><u>Large Mechanical Equipment</u></p> <ul style="list-style-type: none"> - Physical injuries from the movement and use of large mechanical equipment 	3C (Tolerable)	<ul style="list-style-type: none"> - Appropriate PPE such as gloves, safety glasses and ear protection will be worn. - Skilled workers will be employed and workers who worked with large machines will be trained. - Movement of construction and shoe manufacturing machines will be performed carefully. 	<ul style="list-style-type: none"> - Appropriate PPE such as gloves, safety glasses and ear protection will be worn. - Skilled workers will be employed and workers who worked with large machines will be trained. - Movement of construction and shoe manufacturing machines will be performed carefully. 	2D (Acceptable)	
<p><u>Fire Hazard</u></p> <ul style="list-style-type: none"> - Loss of people and property from fire hazard 	3C (Tolerable)	<ul style="list-style-type: none"> - Fire extinguishers, firefighting pool, fire alarm system and fire hose reel are provided in the project factory. - "No Smoking" sign board is provided near the flammable chemical storage room. - Firefighting trainings are provided to the workers every year. 	<ul style="list-style-type: none"> - Fire extinguishers, firefighting pool, fire alarm system and fire hose reel are provided in the project factory. - "No Smoking" sign board is provided near the flammable chemical storage room. - Firefighting trainings are provided to the workers every year. 	3E (Acceptable)	

<p><u>Occupational Health Hazard</u></p> <ul style="list-style-type: none"> - Physical injuries and health problem from chemical exposure, machinery accidents, dust inhalation and noise exposure 	<p>4D (Tolerable)</p>	<ul style="list-style-type: none"> - Hazardous chemical are stored and handled in well-ventilated areas by trained skilled workers. - Strong dust absorption machines with six holes are installed in order to absorb/collect harmful dust from outsoles grinding process. - Personal protective equipment such as mask, glove, ear plugs and so on are provided to the workers who are working in the outsoles grinding room in order to prevent dust particles inhalation. 	<p>3E (Acceptable)</p>
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CHAPTER 6

CUMULATIVE IMPACT ASSESSMENT

According to the EIA Procedure (2015), the Cumulative Impact Assessment (CIA) is one of the main components in the Final EIA Report. It consists of two main sections, namely methodology and approach and cumulative impact assessment.

The Canadian Environmental Assessment Agency (CEAA) defined CIA as “cumulative effects are changes to the environment that are caused by an action in combination with other past, present, and future human action” (Hegmann et al, 1993:3)¹³. Since the project is already in operation phase, the baseline environmental quality in an area presented in Chapter 4 and other existing activities can be considered in cumulative impact of the project

6.1. METHODOLOGY AND APPROACH

6.1.1. Scope of the CIA

The ABGL is developed to produce sport shoes (men and ladies), sport shoes (junior’s) and casual shoes (men and ladies) on CMP basis and export to foreign countries. The ABGL is situated in the Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon. Currently, the project is partially operated its functions and some of the construction activities such as office building and dormitory will be constructed in 2023-2024 and the workshop will be built in 2025-2026.

However, the project is run on CMP basis and based on the impact assessment (**Chapter 5**), it can be noticed that the project will have less negative impacts on the environment. Hence it can be assumed that the cumulative impacts of the the ABGL will be mainly on ambient air quality and traffic safety.

The followings are crucial when preparing the CIA of the project:

- ❖ Information of future projects such as types, nature and capacity in the vicinity of the study area
- ❖ Identify environmental impacts of the project and other future projects that can be cumulative.

6.1.2. Specific Methodology

6.1.2.1. Selection of Boundaries

Since 3 km is defined as AOI, the boundary is considered same as AOI.

¹³ Hegmann, G, C Cocklin, R Creasey, S Dupuis, A Kennedy, L Kingsley, W Ross, H Spaling and D Stalker 1999. Cumulative Effects Assessment Practitioner’s Guide. Hull, Quebec: Canadian Environmental Assessment Agency.

6.1.2.2. Selection of Valued Environmental Components (VECs)

According to this EIA report, the two VECs are selected to evaluate the cumulative impacts of this project, namely air quality, water quality and traffic safety. The three scenarios are proposed such as neutral, positive and negative.

6.1.2.3. CIA on Individual VEC

CIA is performed based on the following criteria:

- ❖ Impact Balance
- ❖ Extent
- ❖ Duration
- ❖ Magnitude
- ❖ Probability
- ❖ Level of Confidence

6.1.2.4. Determination of the Significant Level

The significant level can be differentiated into five categories as follows:

- ❖ Strongly positive and significant
- ❖ Positive and significant
- ❖ Neutral
- ❖ Negative and significant
- ❖ Strongly Negative and significant

Detailed information on evaluation criteria and rating for significance of cumulative impacts is shown in Table 6-1.

Table 6-1 Evaluation Criteria and Rating for Significance of Cumulative Impacts

Impact Balance	
Positive	Advantages from residual effect
Neutral	No net advantages or disadvantages from residual effect
Negative	Disadvantages from residual effect
Extent	
Site-specific	The study area directly disrupted by the project during construction, operation and decommission phase
Local	Yangon City area
Regional	Yangon Region
National	All around Myanmar
Duration	
Short-term	> 3 years
Mid-term	3 – 10 years
Long-term	< 10 years

Magnitude	
Negligible	Change is discovered but limited effect on the VECs.
Low	No significant changes is discovered as per baseline conditions.
Medium	Change is discovered but moderate effect on the VECs.
High	Change is discovered but severe effect on the VECs.
Probability	
Low	Unlikely to occur.
High	Likely to occur.
Level of Confidence	
Low	Incomplete understanding of cause-effect relationships
Moderate	Reasonable understanding of cause-effect relationships
High	Fully understanding of cause-effect relationships

6.1.3. Assumptions

The CIA has to assume the following scenarios:

1. Construction Phase

New factories will not be allowed in the study area due to their potential emission of pollution.

2. Operation Phase

One more project that is identical to this project will only be allowed to develop near the project site.

6.1.4. Impact Assessment

6.1.4.1. Construction Phase

The impact on the ambient air quality and traffic safety are assessed on basis of construction of the ABGL and no new implementation is allowed.

6.1.4.2. Operation Phase

The impacts on ambient air quality are assessed on the basis of the identical project near AGBL.

6.2. CUMULATIVE IMPACT ASSESSMENT

6.2.1. Assessment on Air Quality

The project operates only on CMP basis and there is no significant source of emission such as boiler that can be harmful to the environment. According to the baseline survey result of air quality, all the parameters are within NEQEG (2015), NAAQS, AAFRD, MDH.

However, the project cannot access the government transmission line currently and the generator will run during the operation hours. Even so, the fuel for generator is high quality diesel that can emit low Sulphur content.

Therefore, the cumulative impact during construction and operation are expected to be neutral on impact on air quality. The cumulative impact evaluation on air quality is shown in Table 6-2.

Table 6-2 Cumulative Impacts on Air Quality

VEC	Rating	Rationale
Air Quality	Impact Balance : Neutral	Air quality is expected to be neutral since the project itself does not emit significant air pollution
	Extent : Site-specific	Impact is expected to occur only in the project area.
	Duration : Long term	Impact is expected to occur throughout the entire project life.
	Magnitude : Low	Although some air emission may be detected but limited impact on air quality.
	Probability : Low	Unlikely to occur
	Level of Confidence : Moderate	Confidence is based on a reasonable understanding of air quality changes due to the project
	Significance : Neutral	Air quality is expected to be neutral

6.2.2. Assessment on Water Quality

Based on the baseline water quality result from the tube well and domestic wastewater from the project site were within the respective guidelines and standards. Moreover, the operation processes do not use water, therefore, the project does not generate any industrial wastewater.

Water quality is expected to be no impact on both construction and operation of the project. The environmental management plans will be implemented to water quality prevent impacts.

Cumulative impacts on water quality are expected to be neutral by providing mitigation measures to minimize the impacts during construction and operation. The cumulative impact evaluation on water quality is shown in Table 6-3.

Table 6-3 Cumulative Impacts on Water Quality

VEC	Rating	Rationale
Water Quality	Impact Balance : Neutral	Water quality is not expected to be impacted by construction and operation of the project by providing proper environmental management plans
	Extent : Site-specific	Impact is expected to occur only in the project area.
	Duration : Long term	Impact is expected to occur throughout the entire project life.
	Magnitude : Negligible	No significant changes on water quality as per baseline water quality result.
	Probability : Low	Unlikely to occur

	Level of Confidence : Low	Confidence is based on an incomplete understanding of water quality changes due to the project
	Significance : Neutral	Water quality is expected to be neutral

6.2.3. Assessment on Solid Waste

The cumulative impacts of the project during construction are expected to slightly increase due to the construction wastes but the construction period is short-period.

Additionally, the project operates on the CMP basis and can only generate domestic solid waste from the workers. All the solid wastes during operation phase will be systematically collected and disposed in accordance with the YCDC.

The cumulative impacts of the project’s construction and operation are expected to be neutral by practicing proper environmental management plan and mitigation measures. The cumulative impact evaluation on solid waste is shown in Table 6-4.

Table 6-4 Cumulative Impacts on Solid Waste

VEC	Rating	Rationale
Solid waste	Impact Balance : Neutral	Solid waste is not expected to be impacted by construction and operation of the project by providing proper environmental management plans
	Extent : Site-specific	Impact is expected to occur only in the project area.
	Duration : Long term	Impact is expected to occur throughout the entire project life.
	Magnitude : Low	Although some changes may be detected but limited impact on the environment.
	Probability : Low	Unlikely to occur
	Level of Confidence : Moderate	Confidence is based on a reasonable understanding of solid waste management due to the project
	Significance : Neutral	No significant impact is expected and can be neutral.

6.2.4. Assessment on Traffic Safety

Traffic congestion is likely to be increased because of the construction heavy vehicles in the construction phase and ferries for the workers in the operation phase. More traffic congestion and accidents on the road due to traffic is expected.

The cumulative impacts of the project’s construction and operation are expected to be negative, however, it can be minimized by implementing proper environmental management plan and mitigation measures. The cumulative impact evaluation traffic safety is shown in Table 6-5.

Table 6-5 Cumulative Impacts on Traffic Safety

VEC	Rating	Rationale
Traffic Safety	Impact Balance : Negative	Traffic safety is expected to be impacted by construction and operation of the project
	Extent : Local	Impact is expected to occur in Yangon City area.
	Duration : Long term	Impact is expected to occur throughout the entire project life.
	Magnitude : Low	Although some changes may be detected but limited impact on on the environment.
	Probability : Low	Unlikely to occur
	Level of Confidence : Moderate	Confidence is based on a reasonable understanding of traffic safety due to the project
	Significance : Negative and significant	Traffic safety is expected to be negative and significant.

CHAPTER 7

ENVIRONMENTAL MANAGEMENT PLAN

7.1. INTRODUCTION

This chapter presents the Environmental Management Plan (EMP) of manufacturing of various kinds of shoes factory. The EMP will be implemented during the construction phase and operation phase to ensure that the environmental condition is acceptable during construction and operation phases. This EMP provides the procedures and processes, which will apply to the project production activities to check and monitor compliance and effectiveness of the mitigation measure to ABGL has committed. In addition, this EMP was prepared in line with applicable environmental laws and regulations.

7.2. SCOPE OF THE ENVIRONMENTAL MANAGEMENT PLAN

The objective of the environmental management plan is to manage potential environmental issues by implementing proper mitigation measures and monitoring plan in compliance with the relevant laws and regulations stipulated by national authorities. Environmental management plan based on the basic principles of management is known as the P.D.C.A cycle (see Figure 7-1). Environmental management plan consists of four related tasks as described below:

❖ **Plan (P):What need to be done**

The planning phase includes reviewing applicable environmental policies (see Chapter 2), identifying the project activities that can cause adverse effects on the environment (see Chapter 5), implementing mitigation measures to manage the impacts of those activities (see Chapter 5), and designing effective programs of proper environmental management plan.

❖ **Do (D):Implement the plan**

ABGL as described in this chapter will implement the monitoring measures based on the mitigation plan and environmental management plan for the potential environmental impacts appropriately.

❖ **Check (C):Monitor and evaluate the results of implementation**

The effectiveness of the mitigation measures will be monitored, evaluated and documented.

❖ **Act (A):Taking corrective actions to improve the results, if found inadequate**

If nonconformities or weakness in the environmental management plan were benchmarked, corrective actions are needed to plan for mitigating the existing environmental impacts.

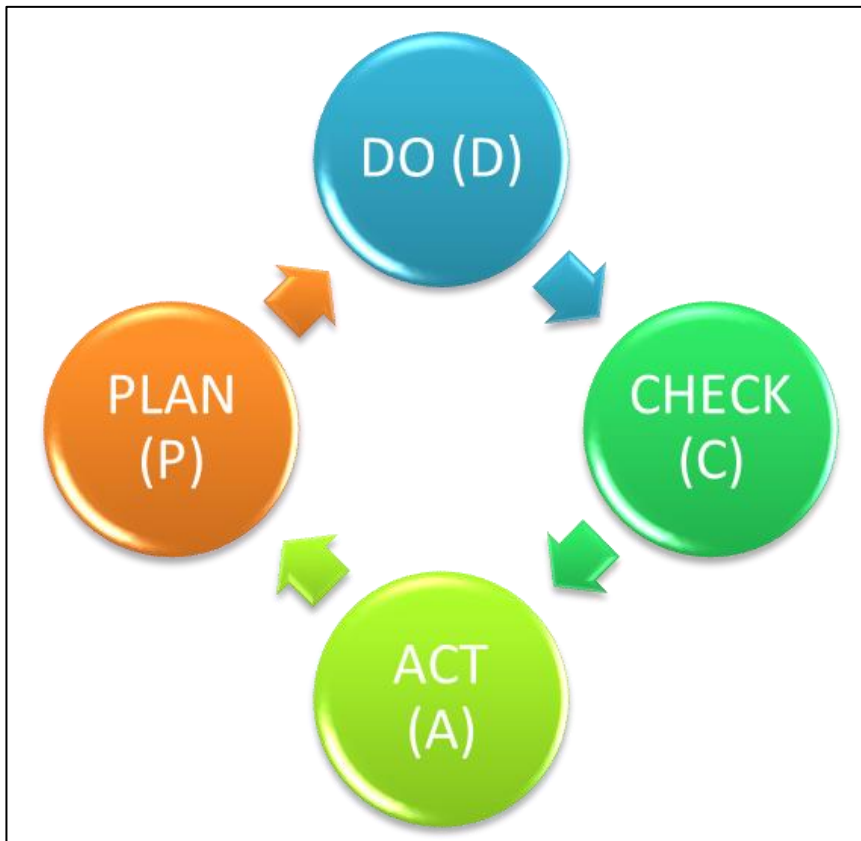


Figure 7-1 P.D.C.A. Cycle

7.3. LEGAL REQUIREMENTS AND INSTITUTIONAL REQUIREMENT

TBS will prepare the EMP for the proposed project in line with Environmental Conservation Law (2012), Environmental Conservation Rule (2014), Myanmar National Environmental Policy (2019) and EIA procedure (2015). The project proponent will follow and implement the prepared EMP.

The project proponent will manage the development of the proposed project. The project proponent should appoint Health, Safety and Environment (HSE) team throughout the duration of the project phases. HSE team is responsible for implementation and monitoring of EMP and monitoring plan as well as coordination with local authorities and the nearby communities.

Project proponent has the main responsibility to implement the EMP. A small EMP cell consisting of 6 members has been formed; the factory manager should be an EMP cell leader. Other cell member will be consisting into technicians together with employees. If possible, some of these cell members should deploy for doing monitoring and inspection works effectively. Organization structure of EMP implementation team and list of team members are shown in Figure 7-2 and Table 7-1.

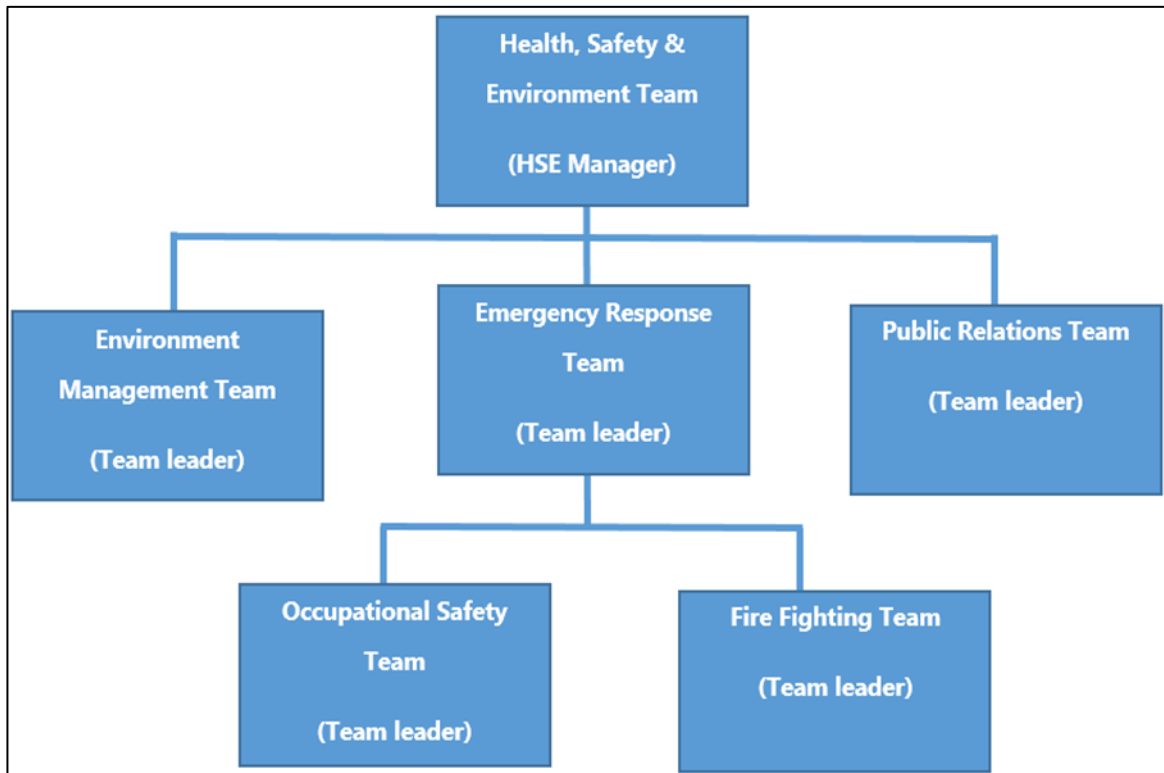


Figure 7-2 Organization Structure of the EMP Team

Table 7-1 List of EMP Team Members

No.	Name	Position	Phone No.	Responsibility
1	Mr. Htun Htun Oo	HSE Manager	09-79765466	Supervise the overall environmental management system of the factory including finance, health and safety. Government office and legal resolution of the factory.
2	Mr. Aung Soe Min	Environmental Management Team Leader	09-771919823	Conduct systematic environmental management plan including regular environmental monitoring and maintenance of the factory.
3	Mr. Naing Naing Aung	Public Relations Team Leader	09-683317999	Address the public relation issues including receiving suggestions and complaints from workers, local people, and complaints regarding the proposed project.
4	Ms. Baby San	Emergency Response Team Leader	09-740846277	Provide updated emergency response plan and awareness trainings program to staff.
5	Ms. May Thet Khaing	Fire Fighting Team Leader	09-763513379	Make regular inspection for fire hazard material and participate in firefighting awareness trainings.
6	Ms. May Thinzar	Occupational Safety Team Leader	09-795849560	Check and submit occupational safety and accident report regularly.

7.4. SUMMARY OF PROJECT DESCRIPTION

Detailed project description is described in Chapter 3. The summary of project description by project phase (construction, operation and decommissioning) is shown in Table 7-2.

Table 7-2 Summary of Project Description

No.	Project Phase	Project Activities
1	Construction Phase	❖ Three-storey buildings such as two number of workshop, warehouse, dormitory and office and other associated buildings such as mechanic warehouse, dangerous goods warehouse, power station generator room, guard house, waste storage yard, fire system pool and septic tanks will be constructed.
2	Operation Phase	❖ During operation phase, the various types of shoes will be manufactured by CMP basic. The production processes are cutting, stitching, sticking outsole with glue, lasting and packing processes.
3	Decommissioning Phase	<p>❖ Scenario i: If the project proponent extent/renew the permission to continue the manufacturing of various kinds of shoes, the environmental impact evaluation and management plan would be identical to the operation phase.</p> <p>❖ Scenario ii: The project proponent would not extent/renew the permission. The new proponent would apply for permission and resume the factory operation. For this case, the environmental impact evaluation and management plan would be identical to the operation phase.</p> <p>❖ Scenario iii: If the project proponent doesn't extent/renew the permission, the structures of the ABGL's buildings would be left in its original form and no business activities would be performed. For this case, the proponent is recommended to follow the procedures guided by the relevant authority. Moreover, the proponent needs to inform the factory workers about the decommission plan, clear all the payment payable to workers, and compensate them-if necessary.</p> <p>❖ Scenario iv: The project proponent would not extent/renew the permission. The structures of the ABGL's buildings would be partially or wholly demolished for new business activity. For this</p>

		case, the environmental impact evaluation would be identical to construction phase and the demolition contractor is advised to follow the management plan described in construction phase.
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7.5. SUMMARY OF IMPACTS AND MITIGATION MEASURES

The detail of potential impact assessment and mitigation measurements are described in Chapter 5 and the summary of potential impacts and mitigation measures for the proposed project is shown in Table 7-3.

Table 7-3 Summary of Impacts and Mitigation Measures

No.	Potential Impact Assessment	Mitigation Measures	Responsible Team	Annual Cost (MMK)
During Construction/Decommissioning Phase				
1.	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> - Emission of air pollutants from the use of construction and decommissioning activities, diesel generators and vehicles movement 	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> - The transportation vehicles will be maintained regularly. - Spraying water and usage of safety nets at and around the construction areas will be performed. - Construction material such as cement and sand, etc. will be carried with covers. - Burning construction waste will be strictly prohibited. 	Environmental Management Team of contractor	Included in the project construction cost
2.	<p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> - Noise and vibration from the use of diesel generators and the operation of construction equipment and heavy vehicles 	<p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> - Civil work generating high noise levels will be carried out only at daytime. - Adequate earplugs or ear muffs will be provided to the workers in excessive noise areas. - Workers in excessive noise areas and on a vibrating surface will be assigned with alternative shift. - Low-noise level generators will be used in order to reduce the impact from the diesel engine generators. - Diesel generators are placed away from the residential area. - Construction equipment, truck and diesel generators will be maintained regularly in order to avoid excessive vibration and noise. 	Environmental Management Team of contractor	Included in the project construction cost
3.	<p><u>Water Quality</u></p> <ul style="list-style-type: none"> - Surface runoff through construction site and domestic wastewater from construction workers 	<p><u>Water Quality</u></p> <ul style="list-style-type: none"> - Sufficient number of toilets and bathing facilities for construction workers are provided. 	Environmental Management Team of contractor	Included in the project construction cost

		<ul style="list-style-type: none"> - Sewage will be collected into septic tanks and will be properly discharged in line with YCDC laws and regulations. 		
4.	<p><u>Soil Quality</u></p> <ul style="list-style-type: none"> - Soil contamination such as leakage of fuel and oil from the construction vehicles or machineries and other various wastes on the ground - The temporary solid waste disposal site can cause leakage of leachate to the surrounding soil. 	<p><u>Soil Quality</u></p> <ul style="list-style-type: none"> - The construction vehicles or machineries will be regularly maintained in order to prevent leakage of fuel and oil to the soil. - The temporary solid waste disposal site are constructed properly in order to prevent leakage of leachate to the surrounding soil. - Fuel oil will be properly stored. - Construction waste will be systematically collected and disposed according to YCDC Rules and Regulations. 	Environmental Management Team of contractor	Included in the project construction cost
5.	<p><u>Solid Waste</u></p> <ul style="list-style-type: none"> - Construction wastes from civil work and domestic wastes from construction workers. 	<p><u>Solid Waste</u></p> <ul style="list-style-type: none"> - Solid waste from the removal of top soil and old structures and faulty construction activities will be disposed at a suitable landfill site in accordance with the approval of YCDC. - Construction wastes will be classified and sorted out at sources for disposal in line with YCDC rules and regulation. - Non-hazardous wastes such as plastic, garbage, glass and food waste will be separated and managed according to YCDC rules and regulation. - Hazardous waste disposal in or off the construction site will be prohibited. - Hazardous waste will be stored, collected and disposed in compliance with the approval of YCDC. 	Environmental Management Team of contractor	Included in the project construction cost

6.	<p><u>Occupational health and safety</u></p> <ul style="list-style-type: none"> - Construction workers may slip and fall due to the careless. - Working at height of building during roofing and painting may cause accident. - Increased temperature of equipment surface may hurt due to careless. - Dusty in the ambient air of the working zone can cause side effect on respiratory system. 	<p><u>Occupational health and safety</u></p> <ul style="list-style-type: none"> - The project proponent will establish safety policy. - The contractor will prepare safety plan. - The contractor will provide PPE and first aid kit to the construction workers. - The contractor will raise awareness of safety guidelines to the construction workers. - The contractor will assign safety supervisors at the work site. - The contractor will provide incentives to workers who obey the safety practices and penalty to workers who disobey the safety practices. - The contractor will arrange morning talks and toolbox meeting. 	<p>Environmental Management Team of contractor</p>	<p>Included in the project construction cost</p>
7.	<p><u>Ecosystem</u></p> <ul style="list-style-type: none"> - Civil works from the construction and demolition activities can cause impacts on fauna and flora 	<p><u>Ecosystem</u></p> <ul style="list-style-type: none"> - Cutting tree and clearance of vegetation must be at a minimum and the trees will be planted. - Oil, grease and construction waste will be stored properly to prevent the leakage on the ground or water bodies. - Construction waste and wastewater will be properly disposed and discharged. 	<p>Environmental Management Team of contractor</p>	<p>Included in the project construction cost</p>
During Operation Phase				
1.	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> - Emission of particulate matters such as PM₁₀, PM_{2.5} and gaseous pollutants such as CO₂, NO₂, CO, CH₄, O₃, SO₂, VOCs from loading and unloading of raw materials, use of power generators, use of chemical glue and transportation activities - Harmful dust emission from outsole grinding process 	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> - Generators and vehicles will be maintained regularly. - Low Sulphur content diesel fuel are used for the operation of generators, machineries and vehicles in order to reduce gaseous emission. - Strong dust absorption machines with six holes are installed in order to absorb/collect harmful dust from outsoles grinding process. 	<p>Environmental Management Team of ABGL</p>	<p>1,000,000</p>

		<ul style="list-style-type: none"> - Personal protective equipment such as mask, glove and so on are provided to the workers who are working in the outsoles grinding room in order to prevent dust particles inhalation. 		
2.	<p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> - Noise and vibration from the use of diesel generators, sewing machine, cutting machine, outsoles grinding and transportation vehicles 	<p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> - Equipment and machines that generate low noise levels will be used. - PPE such as earplugs or earmuffs are provided to the workers who are working in the excessive noise areas. - Diesel generators are placed away from the residential area. - Operation machine, equipment, transportation vehicles and diesel generators will be maintained regularly in order to avoid excessive vibration and noise. 	Environmental Management Team of ABGL	500,000
3.	<p><u>Water Quality</u></p> <ul style="list-style-type: none"> - The domestic wastewater and sewage from workers such as wastewater from toilets or urinals, canteen and staff accommodation will be generated. 	<p><u>Water Quality</u></p> <ul style="list-style-type: none"> - The proper water drainage systems are constructed in the factory compound. - The domestic wastewater from the secondary drains will discharge into the main drainage channel and then flow to the industrial zone drainage channel. - Sufficient number of toilets and bathing facilities for the factory workers are provided. - Sewage from buildings in the project site will be collected by sub-septic tanks and main septic tank, and will be discharged in line with the YCDC Rules and Regulations. 	Environmental Management Team of ABGL	500,000
4.	<p><u>Soil Quality</u></p> <ul style="list-style-type: none"> - Soil contamination such as leakage of fuel and oil from the transportation vehicles and diesel generators/storage tanks and improper wastewater discharge 	<p><u>Soil Quality</u></p> <ul style="list-style-type: none"> - Transportation vehicles and equipment used for operation process will be examined or maintained regularly. 	Environmental Management Team of ABGL	Included in solid waste management and wastewater management

		<ul style="list-style-type: none"> - Solid waste management system will be installed properly in order to prevent improper waste disposal. - Domestic wastewater will be discharged properly in order to prevent improper wastewater discharge on the ground. 		
5.	<p><u>Solid Waste</u></p> <ul style="list-style-type: none"> - Small amount of hazardous waste such as dry cells, batteries, fluorescent lamp, paints and its container, chemicals residue and its container will be generated. - Non-hazardous waste such as paper, plastic bag and plastic bottles, glass, aluminum cans, tin cans, clothes, food wastes, rubber, etc. will be generated. 	<p><u>Solid Waste</u></p> <ul style="list-style-type: none"> - Solid waste will be separately collected with different types of waste bins and the collected waste will be kept at a temporary solid waste storage yard before collecting by YCDC. - Food waste from the factory workers will be disposed daily with the approval of YCDC. - Both hazardous waste such as residue within empty chemical containers, used batteries and incandescent light bulb, etc. and non-hazardous waste such as cutting pieces, thread and unqualified products from the temporary waste storage yard will be disposed monthly in accordance with the approval of YCDC. 	Environmental Management Team of ABGL	500,000
6.	<p><u>Offensive Odour</u></p> <ul style="list-style-type: none"> - Offensive odour from the temporary solid waste disposal site, the use of chemical glue and building renovation activities. 	<p><u>Offensive Odour</u></p> <ul style="list-style-type: none"> - Glue will be handled in well-ventilated areas. - PPE such as face shield and mask will be used in order to prevent offensive odour inhalation. - Workers in excessive offensive odour areas will be assigned with alternative shift. - Temporary solid waste yard are constructed systematically and waste from waste storage yard will be discharged in accordance with YCDC rules and regulation. 	Environmental Management Team of ABGL	Included in occupational health and safety program
7.	<p><u>Occupational health and safety</u></p> <ul style="list-style-type: none"> - Physical injuries such as fall on slippery floors, electricity shock and improper product loading and unloading in store 	<p><u>Occupational health and safety</u></p> <ul style="list-style-type: none"> - The moisture-absorbent mats with beveled edges should be used to prevent slips and falls on the slippery floor and signboard should be displayed as the caution. 	Environmental Management Team of ABGL	1,000,000

	<ul style="list-style-type: none"> - Accidents can be occurred from the factory's renovation activities. - In addition, improper chemical glue handling can harm to the workers and outsole grinding process can cause harmful dust inhalation to the workers. 	<ul style="list-style-type: none"> - Qualified forklift operators and handlers should be used during loading and unloading of materials. - It should not be overloaded than the prescribed load on loading and unloading equipment and vehicles in order to prevent accidents. - PPE will be provided to the workers during renovating the buildings. - Material safety data sheets (MSDS), eyewash station, emergency alarm button and "No Smoking" sign board are provided on the wall of chemical storage room. - In addition, PPE such as protective gloves, clothing, eye protection, ear plugs, and face shield will be provided to the workers who handled chemical glue and to the workers who worked in outsole grinding room. - First aid kit and medical clinic will be provided to the workers. - Occupational safety and emergency first aid training will be also provided to the workers. 		
8.	<p><u>Ecosystem</u></p> <ul style="list-style-type: none"> - Improper discharge and disposal of wastewater and solid waste from the project 	<p><u>Ecosystem</u></p> <ul style="list-style-type: none"> - The project proponent will systematically manage and use the natural resources such as land and water in this area. - Maintaining and replanting of certain native plant species such as trees as landscaping or fencing may provide a home for the faunal assemblages such as insects, amphibians, reptiles, and birds. - Wastewater and solid waste from the shoe production processes will be systematically managed in accordance with YCDC rules and regulations. 	Environmental Management Team of ABGL	500,000

7.6. ENVIRONMENTAL MONITORING PLAN

Environmental monitoring plan is important for the effective execution and successful implementation of EMP. Environmental monitoring is a tool to judge environmental conditions and trends which support the proposed project's implementation, and develop information for reporting to national policymakers and the public. According to article 108 of EIA procedure (2015), the project proponent shall submit monitoring reports to the Ministry not less frequently than every six months, as provided in a schedule in the EMP.

Regarding the construction and decommission phases of the project, all the monitoring measures was carried out by the project proponent. In addition, project contractor especially the construction contractor also has the responsibility to incorporate the monitoring activities with the project proponents. Detailed environmental monitoring plan including the location of monitoring points with map, frequency of measurements and monitoring parameters for construction and decommission phases are shown in Table 7-4.

When it comes to the operation phase, project proponent established the EMP Team of the factory and also assigned the specific duties for each team members to conduct the environmental monitoring activities. Organization structure of EMP implementation team and list of team members are shown in Figure 7-2 and Table 7-1, Article (7.3), Chapter 7. During the operation stage, Environmental Monitoring Team will take all the responsibility to conduct the monitoring activities under the control of HSE Manager. However, for the occupational health and safety concern, Occupational Safety Team will take the responsibility to implement the plan by cooperating with the Emergency Response Team. Detailed environmental monitoring plan including the location of monitoring points with map, frequency of measurements and monitoring parameters for operation stage of the factory are shown in Table 7-5.

Table 7-4 Environmental Monitoring Plan during Construction and Decommissioning Phases

Monitoring Item	Monitoring Parameter	Monitoring Location	Frequency	Estimated Cost (MMK)
Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , O ₃ & CO, CO ₂ , CH ₄ , VOC, Humidity, Temperature	Project site 16° 58' 37.76" N 96° 3'14.99" E	Twice a year	2,000,000
Water Quality	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Temperature, DO, Turbidity, TDS, TSS, Iron, Lead, Free Cyanide, Arsenic	GW – Tube well withing the project 16°58'37.52"N 96° 3'14.04"E SW1 – Lain Gone Creek 17° 00'03.96"N 96° 02'57.40"E	Twice a year	500,000
Solid Waste	Amount and type of solid waste	Temporary waste disposal site	Weekly	Included in the project construction cost
Occupational Health and Safety	Incident/accident records	Around the project site and construction site	Monthly	
Noise	Noise level (dB (A) scale)	Project site 16° 58' 37.76" N 96° 3'14.99" E	Twice a year	1,000,000
Vibration	Radial, Transverse, Vertical	96° 4' 31.40" E		1,000,000

Table 7-5 Environmental Monitoring Plan during Operation Phase

Monitoring Item	Monitoring Parameter	Monitoring Location	Frequency	Estimated Annual Cost (MMK)
Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , O ₃ & CO, CO ₂ , CH ₄ , VOC, Humidity, Temperature	Project site 16° 58' 37.76" N 96° 3'14.99" E	Twice a year	2,000,000
Water Quality	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Temperature, DO, Turbidity,	GW – Tube well withing the project 16°58'37.52"N 96° 3'14.04"E	Twice a year	500,000

Monitoring Item	Monitoring Parameter	Monitoring Location	Frequency	Estimated Annual Cost (MMK)
	TDS, TSS, Iron, Lead, Free Cyanide, Arsenic	WW – Wastewater discharge of project 16°58'40.31"N 96° 3'10.86"E		
Solid Waste	Amount and type of solid waste	Temporary waste disposal site	Weekly	500,000
Occupational Health and Safety	Incident/accident records and providing	Around the project site and construction site	Monthly	100,000
Noise	Noise level (dB (A) scale)	Project site 16° 58' 37.76" N 96° 3'14.99" E	Twice a year (Dry and Wet Seasons)	1,000,000
Vibration	Radial, Transverse, Vertical			1,000,000

7.7. SUB PLAN FOR ENVIRONMENTAL MONITORING IMPLEMENTATION

According to Article 63, Section 8, Sub-section 8.6 of EIA Procedure (2015), the environmental monitoring Sub-Plan is required to include in EMP implementation. Each monitoring Sub-Plan shall include objectives, legal requirement, overview maps, implementation schedule, management actions, monitoring plans, projected budgets and responsibilities. The environmental monitoring Sub-Plan for air quality, water quality, noise and vibration, solid waste management as well as occupational health and safety are as follows.

7.7.1. Sub Plan for Air Quality Management

1) Summary of Monitoring Sub Plan

Monitoring Parameter	Particulate Matters (PM ₁₀) and (PM _{2.5}), Carbon dioxide (CO ₂), Carbon monoxide (CO), Nitrogen dioxide (NO ₂), Sulphur dioxide (SO ₂), Methane (CH ₄), Ozone (O ₃), Volatile organic compound (VOCs), Humidity, Temperature, Wind speed and Wind direction
Methodology	Haz-Scanner EPAS with LCD real time display
Monitoring Frequency	Twice a year (dry and wet seasons)
Estimated Annual Budgets	2,000,000 MMK
Responsibility	Environmental Management Team of the Factory
Relevant Law and Regulation	National Environmental Quality (Emission) Guidelines (2015)
Monitoring Location	Project site: 16° 58' 37.76" N and 96° 3'14.99" E

2) Location

Location map of planned air quality monitoring stations are presented in Figure 7-3.

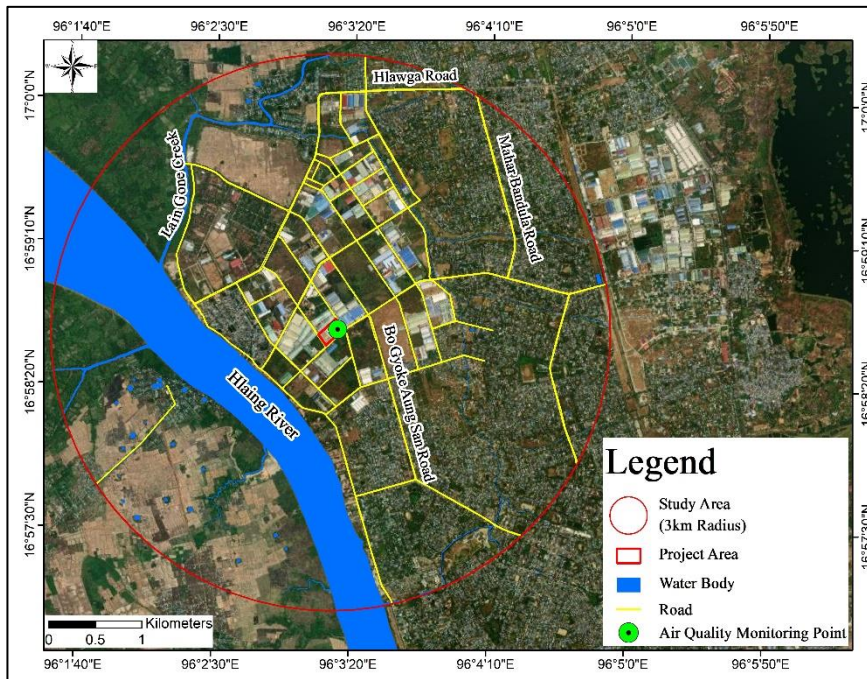


Figure 7-3 Location Map of Planned Air Quality Monitoring Stations

7.7.2. Sub Plan for Water Quality Management

1) Summary of Monitoring Sub Plan

Monitoring Parameter	pH, Temperature, DO, Turbidity, BOD5, COD, TDS, TSS, Iron, Lead, Free Cyanide, Arsenic, Total Phosphorus, Total Nitrogen,
Methodology	USEPA Method for Chemical Analysis of Water and Wastewater In Situ Measurement
Monitoring Frequency	Twice a year (dry and wet seasons)
Estimated Annual Budgets	500,000 MMK
Responsibility	Environmental Management Team of the Factory
Relevant Law and Regulation	National Environmental Quality (Emission) Guidelines (2015) National Drinking Water Quality Standard (2019-Draft)
Monitoring Location	Wastewater : 16° 58' 37.76" N and 96° 3' 14.99" E Ground Water : 16° 58' 34.16" N and 96° 2' 52.40" E

2) Location

Location map of planned water quality sampling and monitoring points are presented in Figure 7-4.

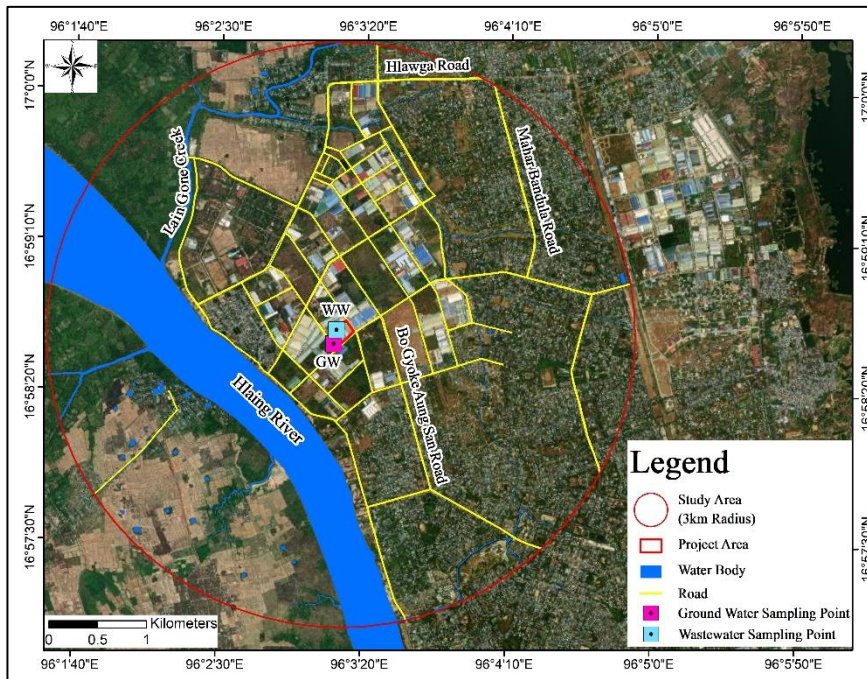


Figure 7-4 Location Map of Planned Water Quality Sampling and Monitoring Points

7.7.3. Sub Plan for Vibration Control and Management

1) Summary of Monitoring Sub Plan

Monitoring Parameter	Radial, Transverse and Vertical Particle Velocity in millimeter per second and frequency
Methodology	Nomis Seismograph (Mini Super graph II) for ground vibration measurements
Monitoring Frequency	Twice a year (dry and wet seasons)
Estimated Budgets	500,000 MMK
Responsibility	Environmental Management Team of the Factory
Relevant Law and Regulation	German Standards from DIN 4150-3
Monitoring Location	Project site: 16° 58' 37.76" N and 96° 3'14.99" E

2) Location

Location map of planned vibration level monitoring points are presented in Figure 7-5.

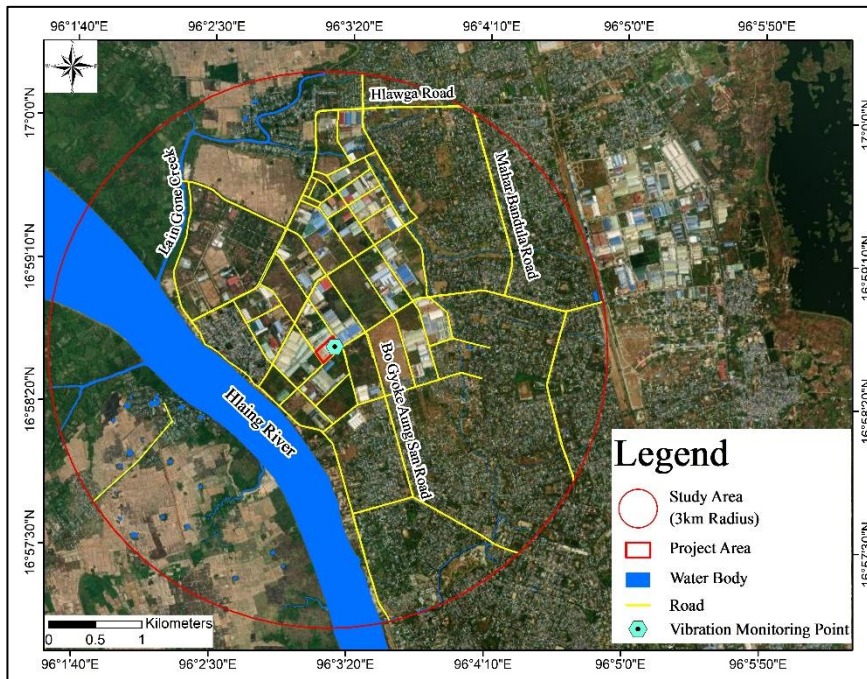


Figure 7-5 Location Map of Planned Vibration Level Monitoring Points

7.7.4. Sub Plan for Noise Level Management

1) Summary of Monitoring Sub Plan

Monitoring Parameter	Day and night time noise level
Methodology	ISO approved noise level measuring meter for noise level monitoring
Monitoring Frequency	Twice a year (dry and wet seasons)
Estimated Budgets	500,000 MMK
Responsibility	Environmental Management Team of the Factory
Relevant Law and Regulation	National Environmental Quality (Emission) Guidelines (2015)
Monitoring Location	Project site: 16° 58' 37.76" N and 96° 3'14.99" E

2) Location

Location map of planned noise level monitoring points are presented in Figure 7-6.

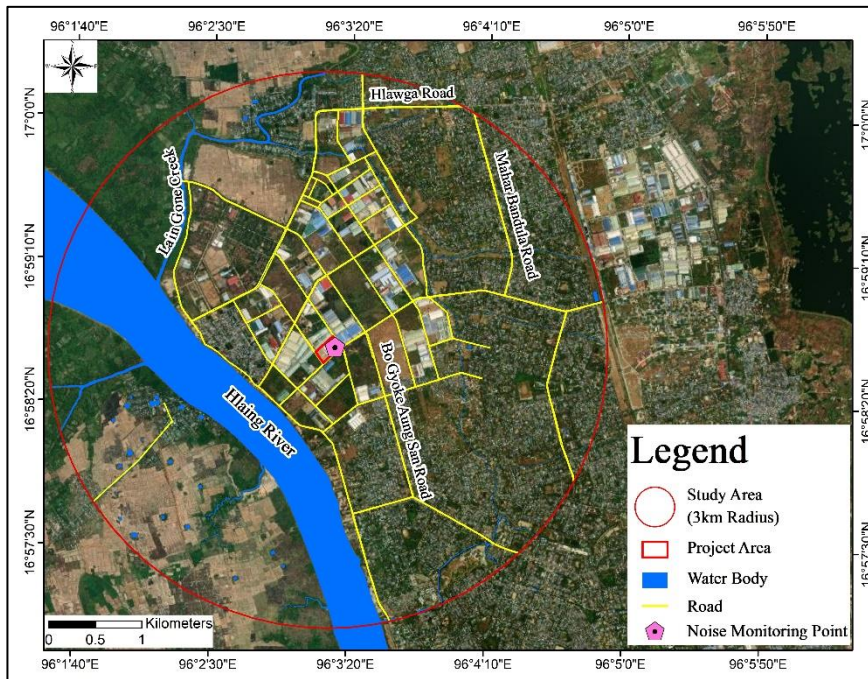


Figure 7-6 Location Map of Planned Noise Level Monitoring Points

7.7.5. Sub Plan for Solid Waste Management

1) Summary of Monitoring Sub Plan

Monitoring Parameter	Regular records on the following parameters Volume of solid wastes from factory Type of solid wastes form factory
Methodology	Direct measure the volume of solid after classifying different types of solid wastes
Monitoring Frequency	Weekly
Estimated Budgets	100,000 MMK
Responsibility	Environmental Management Team of the Factory
Relevant Law and Regulation	Environmental Conservation Law and Rules
Mornitoring Location	Temporary solid wastes station within the project site

7.7.6. Sub Plan for Occupational Health and Safety Management

1) Summary of Monitoring Sub Plan

Monitoring Parameter	All accident cases related to the factory Health condition of communities in the factory All sickness related to work in the factory
Methodology	Collect records and evaluate health condition of the communities in the factory to prevent diseases or virous spreading and careless accidents
Monitoring Frequency	Monthly
Estimated Budgets	500,000 MMK
Responsibility	Occupational Health and Safety Team of the factory
Relevant Law and Regulation	Occupational Safety and Health Law (2019) Public Health Law (1972)
Monitoring Location	Within the project site

7.8. FACTORY MANAGEMENT PLAN

7.8.1. Air Pollution Management

Regarding the air pollution management system, regular monitoring of environmental quality including air quality of the project is also conducted to control emission of the factory.

In addition to this, systematic ventilation system is provided for workers at operation area. Large windows, exhaust fans and air-conditioner are provided for workers in the factory. It is also provided both N 95 masks for cutting workers to reduce expiratory air flow and qualified masks for all workers to prevent pandemic. The current condition of air pollution management system is shown in Figure 7-7.



Figure 7-7 Air Pollution Management of the Project

7.8.2. Wastewater management

The manufacturing process of the shoe production is mainly based on the CMP system, there is no wastewater discharged from the operation process.

Clean toilets for workers are provided within the factory compound. Factory has four sub-septic tanks and one main septic tank septic tanks for sewage storage. Generally, the sludge from the septic tank has been removed whenever it is necessary.

In terms of the domestic wastewater from canteen and washing basins, it is directly discharged into the factory drainage channel. Based on the U.S EPA (1978)¹⁴. The current wastewater discharge and management system of the factory is shown in Figure 7-8.



Figure 7-8 Factory Wastewater Discharge and Management System

7.8.3. Noise and Vibration Management System

Most of the production process except outsoles grinding process produce insignificant level of noise and vibration. The workers who are likely to be exposed to noise and vibration are provided PPE including gloves and safety shoes and subjected to medical examination periodically. The duration and magnitude of exposure to noise and vibration are limited by providing appropriate work schedules with adequate rest periods.

7.8.4. Solid Waste Management System

Regarding the factory solid waste management system, domestic wastes from workers, cutting pieces, thread and no QC passed products from production process are the main solid waste items of the factory. Within the factory compound, there will be sufficient garbage bins and the solid wastes will be systematically collected and stored in the temporary solid waste storage station of the factory. Then, domestic wastes and solid waste from production process will be collected by YCDC trucks regularly. The current condition of solid waste management system is shown in Figure 3-20.

¹⁴ U.S.EPA. (1978), Environmental impact statement phase II, Facility Plan Handover Country, Virginia 3rd Edition.

Regarding the prevention measures, the following actions will be implement to prevent environmental pollution due to the disposal of factory’s solid waste.

- Solid waste will be collected separately with different types of waste bins and the collected waste will be kept at temporary solid waste disposal site before collecting by YCDC municipal truck.
- Some wastes such as plastic bottles, papers etc. should be recycled or reused for the same purpose or in different ways to reduce the amount of waste.
- The amount and type of waste will be monitored regularly.
- Temporary solid waste station with proper roof, wall and floor system will be constructed within the factory compound.

7.8.5. Occupational Health and Safety

7.8.5.1. Medical Facilities

Workers can injure due to falling on slippery floors and improper use of machine and tools. Food-borne diseases like diarrhea, food poisoning and seasonal diseases such as influenza (Flu) and dengue fever may be occurred among the workers. The crowded conditions in the factory create ideal conditions for transmission of infectious diseases.

Clean and healthy facilities such as hygienic eating areas, ventilated working areas and clean toilets, etc will be provided for the workers in the factory. First aid service under the medical officer or trained staff will also be provided. Yearly medical check-up should provide for the workers to ensure the health and safety of the workers. The notice paper which includes number, contact person and address of nearest hospital, and temporary clinic are provided as shown in Figure 7-9.



Figure 7-9 Medical Facilities

7.8.5.2. Firefighting Plan

In order to prevent fire, the factory installed fire detectors, alarm systems, sprinkler systems and provision of fire-fighting equipment based on the requirements of Myanmar’s fire codes. Safety manager will arrange fire-fighting training once a year and conduct fire drill monthly. Safety manager has to establish emergency exit ways and muster points in the factory compound with clear marking. In addition, safety manager has to provide access

to emergency services of the nearby hospitals and direct communication link with local fire brigades and other relevant government authorities.

Regarding the fire safety plan, ABGL will implement the following activities.

- ❖ Install the automatic ceiling water springler system in the factory building.
- ❖ Provide sufficient firefighting equipment around and within the factory to prevent fire in case of emergency. Especially, sufficient amount of fire extinguishers is installed in the factory building according to the instruction from the Fire Department.
- ❖ Construct the common water storage tank for the factory within the project compound.
- ❖ Monitor strictly to follow the defined fire safety rules for all employees. For example, designate the smoking area and make the rules for prevention of fire problems due to misuse of electricity.

The current condition of fire management system of ABGL is shown in Figure 7-10.

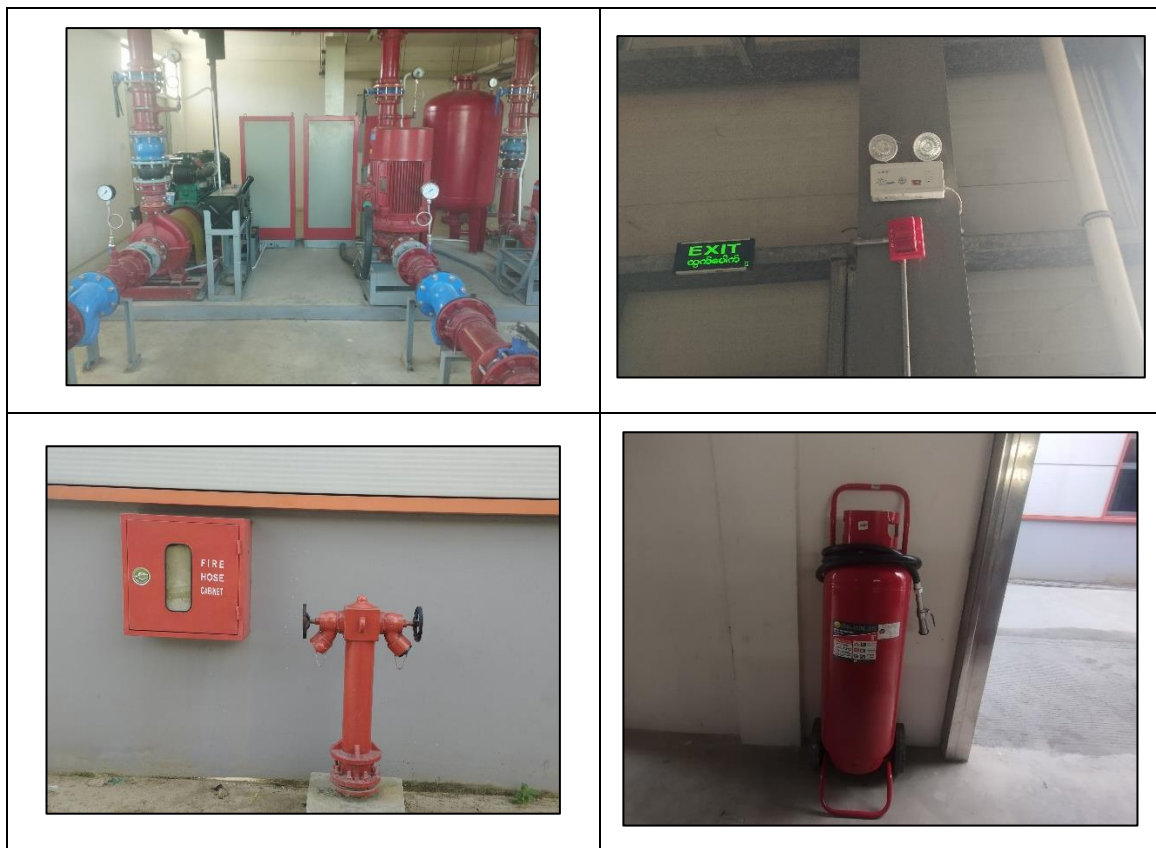


Figure 7-10 Fire Management System

7.8.6. Emergency Response Plan

The HR Department responsible person may control the emergency response plan, which will be a part of the factory Occupational Health, Safety and Environmental program (OHSE). Factory emergency response plan will include the following facts:

- Fully equipped first aid facilities
- Fire-fighting equipment
- Access to emergency services of the nearby hospital
- Direct communication link with industrial or township fire brigades and other relevant government authorities
- Training all staff for workplace safety.

Health and environmental management also play a major role in emergency response plan. The emergency escape plan of each building in the factory compound are shown in Section 3.6.12. In each floor of the building, emergency exits, fire extinguishers, fire hydrants, emergency alarms and medical kits are provided.

Under the emergency response plan, it is also provided emergency contact list. In which, the list of people to contact in the event of emergency, phone numbers of responsible person and responsible organization will be included. The emergency contact list of the factory is shown in Table 7-6. In addition, the emergency contact numbers display boards which include ambulance contact, NGOs, fire department, hospital, general administration department and industrial zone committee are placed at the place that is visible to the public. The displaying condition of emergency contact numbers notice boards are shown in Figure 7-11.

Table 7-6 Emergency Contact List of the Factory

No.	Name	Phone nos.	Responsible Team
1	Mr. Htun Htun Oo	09-79765466	HSE Manager
2	Mr. Naing Naing Aung	09-683317999	Public Relations Team Leader
3	Ms. Baby San	09-740846277	Emergency Response Team Leader

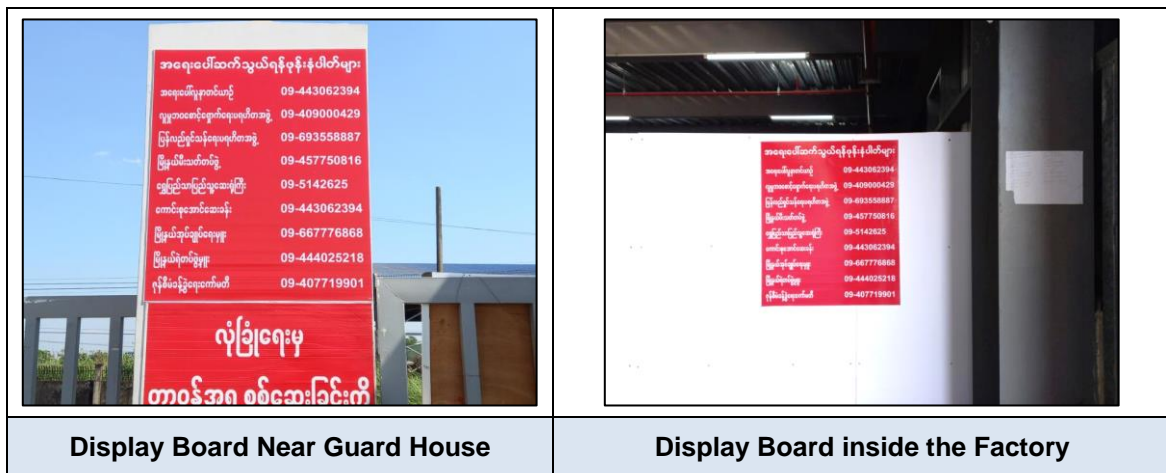


Figure 7-11 Emergency Contact Numbers Notice Boards

7.8.7. Disaster Management Plan

The assembly points will be identified well in advance before encountering any disasters. This points will be in big open spaces as the workers will be displaced for a short term. During the disaster, the necessary arrangement will be provided such as water, first aid, food, lighting, etc.

7.8.8. Training Programs

ABGL provides firefighting training and occupational safety & emergency first aid training to the workers annually. The examples of firefighting training and occupational safety and emergency first aid training achieved by the workers are shown in Figure 7-12.



Figure 7-12 Examples Certificates of Training Programs

7.8.9. Future Plan of Factory Related to Sustainability

Regarding sustainability energy consumption and management, it is also planned to optimize on resource use of the proposed project. Especially the use of ground water consumption by implementing the following activities.

- ❖ Installing the automatic water sensor to avoid the overflow of water from pumping
- ❖ Creating green spaces for rainwater penetration area within the factory compound to recharge the ground water level

- ❖ Planting small trees and shrubs for both recreation and sustainable purposes
- ❖ Providing awareness trainings about sustainable energy consumption to staff

7.9. RECORDING AND REPORTING

Keeping records and reporting are important management tools for ensuring sustainable operation.

There will be two types of monitoring reports after environmental monitoring and site inspection. The first type is for internal use to provide feedback to the Environmental Management system. Finally, annual review should be prepared and an environmental monitoring report should be submitted to the MONREC/ECD every 6 month under the EIA Procedure (2015).

7.9.1. Internal Monitoring and Inspection Report

The EMP responsible cell members may conduct daily, weekly or monthly general inspections of the project area and facilities. The objectives are to identify non-compliances to EMP.

7.9.2. Incident, Accident and Emergency Report

In cases of incident and accident, prompt reporting has been carried out. This must be in the form of verbal reporting followed by written statement, after emergency and contingency procedures have been undertaken. The written statement should be more comprehensive and should be included the location and cause of accident, the time, extent and intensity and how actions for emergency and contingency procedures taken. Reporting on incidents may not be necessary; it is actually the duty of the security staff to take action.

7.9.3. Reporting on Training Program

There must be a regular monitoring and inspection of all training programs provided such as firefighting training, first aid training and training for quick response and preparedness such as drills and mock drills.

EMP cell members conducting monitoring and inspection works must be able to interpret and assess the overall condition of the training processes especially assessment of the effectiveness and applicability of each training.

A report on the training program including assessment on its effectiveness must submit at the end of each training program.

7.9.4. EMP for Good Working Practices and Good Safety Practices

The factory shall follow, as practical as possible environmental health and safety standard and guidelines. The factory has own program for capacity building and training covering good working practices and good safety practices. The factory shall also follow EHS guidelines and international standards for the ecofriendly operation of the factory as already mentioned earlier.

7.10. GRIEVANCE REDRESS MECHANISM

The purpose of a Grievance Redress Mechanism (GRM) is to provide a forum to the internal and external stakeholders to voice their concerns, queries and issues with AGBL project. Grievance mechanism would provide the stakeholders with project personnel or channel through which their queries will be channeled as well as ensure timely responses to each query. The main objectives of the GRM are as follows:

- To allow stakeholders the opportunity to raise comments/concerns;
- To structure and manage the handling of comments, responses and grievances, and allow monitoring of the effectiveness of the mechanism; and
- To ensure that comments, responses, and grievances are handled in a fair and transparent manner, in line with the applicable reference framework.

Grievance Redress Committee (GRC) will be established for AGBL development and operation. Structure of GRC will include various levels to assure accessibility for PAPs. GRC will include following representatives.

- Representative of ABGL
- Public relation manager assigned by ABGL
- Government administrative department
- Social welfare officer
- Community leader
- Women representative
- Member of a recognized non-governmental organization

Representatives from Townships and from Complainants' wards will be called to participate in the GRC meetings for review of cases pertaining to their jurisdictions. Depending on the type of complaint, GRC may also ask representatives of the relevant technical department to be present for the meeting.

Additionally, complainants or their representatives will be informed in advance of the review meeting and requested to be present, or send their representatives, for the same.

7.10.1.1. Grievance Redress Procedure

Consultation and participation of the PAPs should serve to minimize the occurrence of major grievances. The PAP may request the village leader or the independent monitoring agency (NGO or university) to assist in processing his complaint. Project staff will make efforts to address all complaints on site as they arise to preclude their elevation to higher level.

There are different options to raise grievance such as:

- Option 1: Filling the grievance form and submit to mailbox which is located in front of the factory
- Option 2: Email to the provided address
- Option 3: Direct call to contact number
- Option 4: Social Media

The condition of comments mailbox of ABGL is shown in Figure 7-13.



Figure 7-13 Comments Mailbox of ABGL

However, in order to ensure that the affected people have avenues for redressing their grievances, a three stepped procedure has been established for the Project.

- (1) As a first step, all complaints and grievances by the PAPs would be addressed through consultation and in participatory manner at the first instance they are brought to the notice of ward head or township administration. The ward head or township administration, in consultation with the project staff, will try to address complaints within 15 days.
- (2) If the complaint is not resolved within 15 days from the date it is brought to the ward head or township administration or if the PAPs is not satisfied with the response, he/she can bring the complaints to the head of the ABGL. The head of ABGL will address the complaint in 15 days from the time it is received.
- (3) However, if the complaint is not resolved within 15 days from the date it is brought to the head of the ABGL or if the PAPs is not satisfied with the response, he/she can bring the complaints to the notice of the GRC. The GRC will address the grievances within 3 weeks from the date they are received.

In case the grievances could not be resolved at the GRC level within 3 weeks from the date they are brought to its notice, or if the PAP is not satisfied with the decision of the GRC he or she can seek legal recourse in the court of law at any time on their own will.

The GRC and the procedures for resolving complaints and grievances will be made public through an effective public information campaign. The grievance redress procedure shall also be explained in the project's Public Information Booklet.

One of its roles and responsibilities of the ward heads, township administration and GRC is to ensure that any queries, or concerns made by the affected households and local communities are properly heard, logged (regardless of whether it was lodged verbally or in writing), and resolved in a transparent and timely manner. Complaints received at the ward and township levels will be documented and conveyed to the GRC in their monthly

reports for their information. Documentation of grievances and complaints at the township administration level will record the date they are received, action taken to resolve the complaint with date, and how and when the decision is conveyed to the complainant.

GRC will set up a database to manage and monitor grievances which will show name and contact details of the complainant, date and nature of complaint, any follow up actions, resolutions and how and where resolutions were communicated to the complainant, and status of actions.

This set-up aims to address any concerns promptly, effectively, and transparently and at no cost and retribution, to the affected households. All costs incurred in grievance resolution will be covered out of the project funds.

The ABGL will provide the necessary training and guidance in setting up the GRC and grievance mechanism to GRC members. The formalized GRC composition with clear roles and responsibilities; procedure and process will be reflected in the Implementation Plan. Grievance redress flowchart is shown in Figure 7-14.

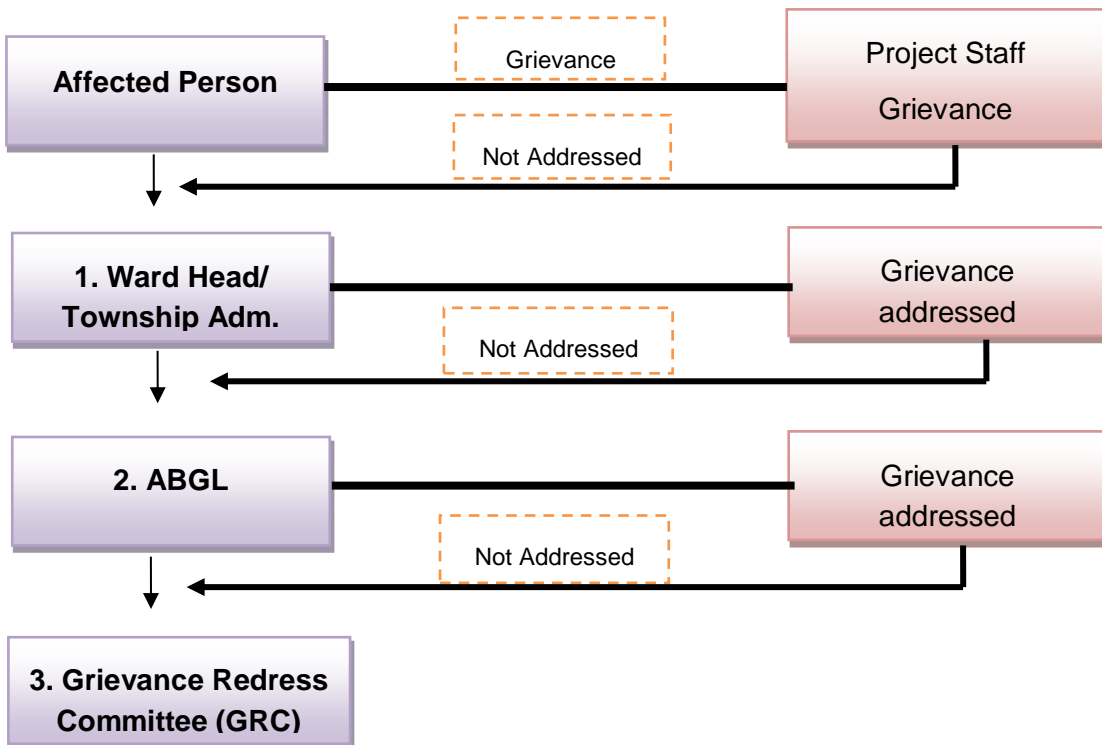


Figure 7-14 Grievance Redress Flowchart

Main contact personnel for Grievance Redress

Alpha Best Global Limited

Mr. Htun Htun Oo

Phone: 09-797654666

Email: larrylu@china.jimbrother.com.tw

7.11. CORPORATE SOCIAL RESPONSIBILITY PROGRAM

The purposes of implementing CSR program are to develop good relations between the public and project proponents as well as to promote high standard of living

near the project area. ABGL will provide CSR fund which is (2%) of the net profit to following sections. The detailed contribution for CSR fund is shown in Table 7-7.

Table 7-7 CSR Fund Contribution

No	Partial	Contribution%
1.	Education	0.5%
2.	Health	1%
3.	Regional Development	0.5%

7.11.1. CSR Implementation Team

There are three main components in the CSR Implementation Team. They are financial support team, management team and CSR program implementation team members. Propose CSR Implementation Team Structure is shown in Figure 7-15.

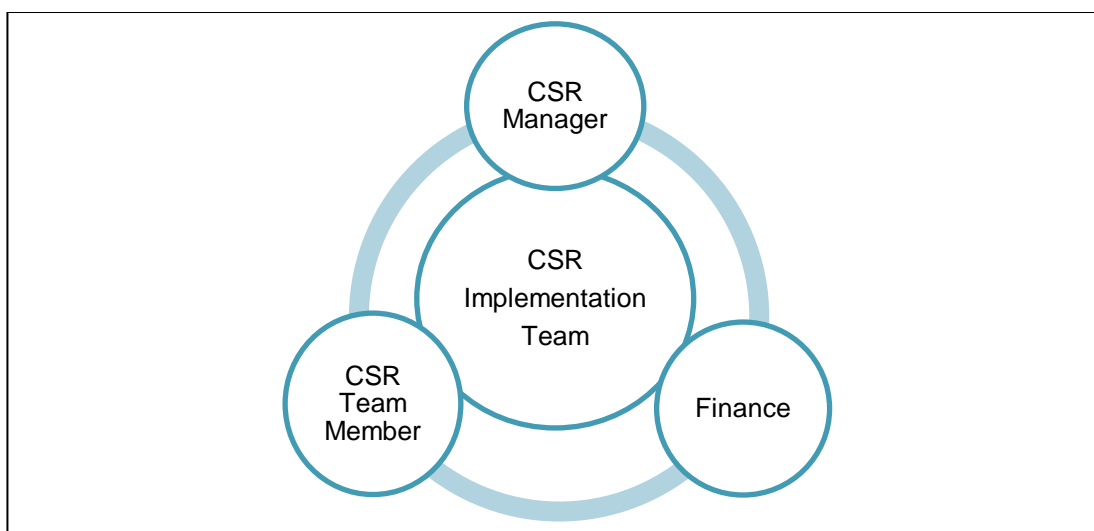


Figure 7-15 Propose CSR Implementation Team

7.11.1.1. CSR Manager

To become more efficient and affective CRS program, CSR Manager is required. The manager can be arranging the CSR program and can suggest to donate in required places. He may be checked out the amount of using CSR fund that the factory really follows as their commitment.

7.11.1.2. Finance

Finance department require to management the fund of CSR.

7.11.1.3. CSR Team Member

All employees from the factory can be the member of CSR Team. Members can be participated in every CSR activity and can give advices to improve CSR activities. CSR Program of the Proposed Project is shown in Table 7-8.

Table 7-8 CSR Program of the Proposed Project

Item	Activities	Expected Budget	Objectives
Health	<ul style="list-style-type: none"> ◆ Providing medical supplement for staff and their families ◆ Providing the employees' health examination ◆ To support the protection of the environment as well as from the fire around the Factory 	1 %	<ul style="list-style-type: none"> ◆ To ensure that workers working in the workplace and their families are in good health
Education	<ul style="list-style-type: none"> ◆ Promoting the awareness of education and human right ◆ Providing educational grand for the employee's children ◆ Providing the support in education sector around the project area 	0.5 %	<ul style="list-style-type: none"> ◆ To become a better society ◆ To improve the education level of the workers' families ◆ To develop the skill of the employees
Regional Development	<ul style="list-style-type: none"> ◆ donation clothes Doing and money to local organizations and poor people nearby project area 	0.5 %	<ul style="list-style-type: none"> ◆ To enable local charitable organizations to operate well, ◆ To enable employees to cooperate actively in the common work that is being done in the region, ◆ To avoid and understand human rights among workers ◆ To prevent sexual harassment and oppression in the workplaces

7.12. PENALTIES

If the factory is not complied or not carried out the Environmental Monitoring Program or emission parameters are exceeding the standard of NEQG (2015), WB and IFC Guideline, the factory will get penalties according to EIA Procedure (2015). Penalties and punishment that stated in EIA Procedure (2015) are described in below Table 7-9.

Table 7-9 Penalties and Punishment According to Myanmar Environmental Impact Assessment Procedure

No.	Non-Compliance	Penalties	Specific Administrative Punishment of the Ministry
1	Failure or delay in timely submission of reports within period prescribed by Ministry.	100 to 500 US\$ or equivalent Myanmar Kyat + 10-25 US\$ / day until cured or equivalent Myanmar Kyat	Issue Enforcement Notice
2	Obstruction or interference with an official in the course of their duties	duties 250 to 5,000 US\$ or equivalent Myanmar Kyat	Issue Enforcement Notice – Criminal prosecution
3	Failure to provide information to the Ministry or any representative	1,000 to 5,000 US\$ or equivalent Myanmar Kyat	Suspension of Approval of EMP, EMP-CP, EMP-OP in whole or in part – Revocation of Approval of EMP, EMP-CP, EMP-OP in whole or in part – Criminal prosecution
4	Failure to provide information to Ministry Inspector or any representative when requested in regard to inspection and monitoring	250 to 5,000 US\$ or equivalent Myanmar Kyat	– Issue Enforcement Notice
5	Undertaking or allowing any preparatory or other construction works without the prior approval by the Ministry of a revised EMP or EMP-CP	1,000 to 5,000 US\$ or equivalent Myanmar Kyat + 50 to 500 US\$ / day until cured or equivalent Myanmar Kyat	Criminal prosecution
6	Operating/implementing without a permit, or approval by the Ministry of an EMP or EMP-OP	1,000 to 5,000 US\$ or equivalent Myanmar Kyat + 50 to 500 US\$ / day until cured or equivalent Myanmar Kyat	Criminal prosecution
7	Non-compliance with an Enforcement Notice or Suspension Notice issued by the Ministry	2,000 to 10,000 US\$ or equivalent Myanmar Kyat + 100-500 US\$ / day until cured or equivalent Myanmar Kyat	Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part – Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
8	Failure to notify to the Ministry of any knowledge of any event of an imminent threat of environmental damage	1,000 to 5,000 US\$ or equivalent Myanmar Kyat	Issue Enforcement Notice – Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part – Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
9	Failure to take reasonable steps to prevent an imminent threat of damage to the environment, social, human health,	2,500 to 10,000 US\$ or equivalent Myanmar Kyat	Issue Enforcement Notice – Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part – Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part

No.	Non-Compliance	Penalties	Specific Administrative Punishment of the Ministry
	livelihoods, or property, where applicable based on the EMP, EMP-CP or EMP-OP		
10	Failure to comply with conditions in the ECC and allowable Emission Limit Values	1,000 to 10,000 US\$ or equivalent Myanmar Kyat	Issue Enforcement Notice – Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part – Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
11	Failure to pay compensation amounts required in respect of social impacts	1,000 to 10,000 US\$ or equivalent Myanmar Kyat	Issue Enforcement Notice – Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part – Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
12	Failure to fully restore social conditions upon resettlement	1,000 to 10,000 US\$ or equivalent Myanmar Kyat	Issue Enforcement Notice – Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part – Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part

Notes: 1. All penalty amounts set forth in this Annex are denominated in United States Dollars (US\$) and are subject to annual inflation adjustment

2. Abbreviations are as follows:

EMP = Environmental Management Plan

EMP-CP = Environmental Management Plan - Construction Phase

EMP-OP = Environmental Management Plan - Operation Phase

7.13. OVERALL BUDGET FOR IMPLEMENTATION OF THE EMP

The budget for EMP fund will cover the initial cost and recurring expenses for implementation of EMP. Table 7-10 shows annual budget allocation for proposed environmental, health and safety management plan.

Table 7-10 Overall Budget for Implementation of the EMP

No	Proposed EMP	Estimated Annual Budget (MMK)
Environmental Work		
1	Environmental mitigation measures	4,000,000
2	Environmental monitoring program during construction/decommissioning phase	4,500,000
3	Environmental monitoring program during operation phase	5,100,000
4	Capacity building and training	1,000,000
5	Emergency case	1,000,000
Health and Safety Work		

6	Personal protective equipment	700,000
7	Medical for clinic and other medical facilities	1,500,000
8	Fire Fighting Equipment	1,000,000
Training Program to the Workers		
9	Firefighting Training	500,000
10	Occupational Safety and Emergency First Aid Training	500,000

CHAPTER 8

PUBLIC CONSULTATION AND DISCLOSURE

The main objective of public consultation is to provide project information, production procedures, waste management and potential environmental impacts to the regulators, authorities and stakeholders. During the public consultation meeting, ABGL and TBS (consultant) presented the project background, operation processes, environmental conditions, summary of impacts assessment and proposed mitigation measures. Suggestions and comments from the regulators, authorities and stakeholders were collected in the EIA report. The public consultation meeting for scoping stage was held on 21st December, 2022 at ABGL Factory and also via zoom application, online platform and the public consultation for EIA report was conducted on 21st February, 2023 by following the EIA procedure. The details of public consultation meeting was presented below.

8.1. OBJECTIVE OF PUBLIC CONSULTATION

Public consultation meeting is regarded as a necessary part of the EIA study. ABGL and its consultants have to organize a public consultation meeting among regulators, local community, local authority and other relevant organizations on the project development and plans. As a part of EIA requirement, ABGL publicized about the project developments to the concerned stakeholders as follows;

- ❖ Information of the stakeholders about the project, environmental and social issues related to project operation, and mitigation measures to minimize environmental and social impacts.
- ❖ Considering the views, concerns, and perceptions of stakeholders, communities and individuals that could be affected by the project or who otherwise have an interest in the project.
- ❖ Participation and partnership where issues are needed to join for discussing and assess.

8.2. METHODOLOGY AND APPROACH TO PUBLIC CONSULTATION MEETING

8.2.1. Methodology and Approach to Public Consultation Meeting (Scoping stage)

The approach to the public meeting was adopted as below:

- ❖ TBS coordinated with ABGL to inform and consult about the date and venue of the public consultation meeting.
- ❖ TBS prepared and issued the invitation letters for the online public consultation meeting.
- ❖ ABGL sent the invitation letters to the relevant government sectors, identified stakeholders and nearby factories on the second week of December, 2022.
- ❖ Informed to all of the concerned stakeholders 7 days prior to EIA study of public consultation meeting.
- ❖ Public Consultation for EIA report (Scoping stage) was conducted on 21st December, 2022 at ABGL factory and also via zoom applicaton by following the EIA procedure.

- ❖ The Power Point presentation slides for EIA study (Scoping stage) of ABGL project 'Manufacturing of Various Kinds of Shoes' are written in Myanmar language.
- ❖ The meeting was opened for discussion regarding to the participants' opinions/concerns of the project development plan and ABGL and TBS consultants were responsible for answering/recording the participants' questions/comments.
- ❖ The questions/comments from the participants were recorded and described as below Section 8.4.1.

8.2.2. Methodology and Approach to Public Consultation Meeting (EIA Stage)

The approach to the public meeting was adopted as below:

- ❖ TBS coordinated with ABGL to inform and consult about the date and venue of the public consultation meeting.
- ❖ TBS prepared and issued the invitation letter for the online public consultation meeting.
- ❖ ABGL sent the invitation letter to the relevant government sectors, identified stakeholders and nearby factories on the third week of February, 2023.
- ❖ Informed to all of the concerned stakeholders 7 days prior to EIA study of public consultation meeting.
- ❖ Public Consultation for EIA report was conducted on 21st February, 2023 by following the EIA procedure.
- ❖ The Power Point presentation slides for EIA study of ABGL factory 'Manufacturing of Various Kinds of Shoes' are written in Myanmar language.
- ❖ The meeting was opened for discussion of ABGL and TBS consultants were responsible for answering questions from the participants and addressing public concern raised in the meeting regarding the project development plan.
- ❖ The questions/comments from the participants were recorded and described as below Section 8.5.1.

8.3. PUBLIC ANNOUNCEMENT

Regarding to the public announcement, all the information related to the public consultation and public disclosure of the proposed EIA project was announced on the official notice board of the ABGL. In addition, the public disclosure of the proposed EIA project was also notified to the 23rd ward GAD office. It is also planned to access the full EIA documentation to the public through TBS' website pages.

8.4. SUMMARY OF PUBLIC CONSULTATION (SCOPING STAGE)

Public consultation was conducted on 21st December, 2022 at ABGL Factory and also via zoom application from 10:00 AM to 12:00 PM. The participants in the public consultation were ABGL's staffs, TBS's EIA consultants, Officers from Environmental Conservation Department (Yangon), Medical Officer from Township Public Health Department, Officers from City Development Committee, Officers from Fire Services Department and nearby community. Agenda of the public consultation meeting is shown in Table 8-1.

Table 8-1 Agenda of the Public Consultation Meeting

No	Activity	Time
1	Registration	10:00 AM - 10:15 AM
2	Opening Speech from ABGL	10:15 AM - 10:20 AM
3	Power Point Presentation of Project description and existing environmental conditions	10:20 AM - 11:00 AM
4	Power Point Presentation of potential impacts, mitigation measures and environmental management plan	11:00 AM - 11:30 AM
5	Discussion time – comments and suggestion by the concerned stakeholders	11:30 AM - 12:00 PM

Public consultation was started with the presentation about the project, followed by questions, answers and discussion. Mr. Htet Thiha Phone Myint from TBS performed as a master of ceremonies (MC) at public consultation. Furthermore, introduction speech was opened by Mr. Aung Soe Min (Human Resource Deputy Manager) from ABGL explained about their company profile. ABGL requested TBS (Consulting Firms) for the EIA for its factory.

Ms. Aye Mon Aung (Environmental Engineer) of TBS presented about the project description and studied existing environmental condition. Ms. Phoo Pwint Khine (Environmental Engineer) of TBS explained about the potential impacts, mitigation measures and environmental management plan. Questions and answers section followed after the TBS presentation. The details of the meeting including the meeting time, date, name of participants who attended the meeting are shown in Table 8-2 and the attendance list and presentation slides are also attached in **APPENDIX N**.

Table 8-2 Meeting Context

Meeting Date	21.12.2022		
Meeting Time	10:00 AM – 12:00 PM		
Place	ABGL Factory and Online platform (Zoom Application)		
Government authorities (Total of 7 People)			
No	Name	Position	Organization
1	Mr. Than Zin Hmue	Deputy Staff Officer	Environmental Conservation Department
2	Ms. Myat Su Mon	Deputy Staff Officer	
3	Dr. Myat Myat Hnin	Medical Officer	Township Public Health Department
4	Mr. Nyunt Win	Administrator	City Development Committee
5	Mr. Thein Ko	Upper Divisional Clerk UD	
6	Mr. San Nyein	Assistant Station Officer	Fire Services Department
7	Mr. Ye Naung	Sergeant	
Project Proponent and Stakeholders (Total of 29 Persons)			
1	Mr. Tun Tun Oo	Human Resource Manager	ABGL
2	Mr. Aung Soe Min	Human Resource Deputy Manager	

3	Ms. Thandar	Associate Officer	Wartayar Industrial Zone and Shwe Pyi Thar Industrial Zone Committee Office
4	Ms. Hnin Lae Lae Khine	Manager	Twinkle Myanmar Co., Ltd
6	Mr. Kyaw Zin Min	Manager	Guo Tai Garment Industrial Co., Ltd
7	Ms. Naw Thin Thazin	Office Staff	True Green City
8	Ms Kay Khine Oo	Office Staff	Light House Enterprises Limited
9	Mr. Myatthu Kyaw	General Manager	TBS
10	Mr. Htet Thiha Hpone Myint	Environmental Geologist	
11	Ms. Phoo Pwint Khine	Environmental Engineer	
12	Ms. Aye Mon Aung	Environmental Engineer	
13	Mr. Thant Zaw	Local Residents	Shwe Pyi Thar Township
14	Mr. Tint		
15	Mr. Kyaw Soe Naing		
16	Ms. Khin Win		
17	Mr. Aung Khine		
18	Ms. Myo Myo Aye		
19	Ms. Khin Wai Lwin		
20	Ms. Myint Myint Khine		
21	Ms. Khine Hnin Wai		
22	Ms. Aye Myat Nyein		
23	Ms. Myat Mar Lar		
24	Ms. Khine Khine Oo		
25	Ms. Pan Wut Hmone		
26	Ms. Tin Nilar Win		
27	Ms. Hnin Ei Zin		
28	Ms. Wah Wah Khine		
29	Mr. Myo Paing		

8.4.1. Discussion and Feedbacks Received from Scoping Stage Public Consultation Meeting

After the presentation, discussion section was started for questions and answers. Most of questions were about project planning and environmental issues. Photos of PCM activities are shown in Figure 8-1. Table 8-3 shows all detailed discussion and feedbacks received from scoping stage public consultation meeting.



Figure 8-1 Photos of PCM Activities for Proposed Project

Table 8-3 Discussion and Feedbacks Received from Scoping Stage Public Consultation Meeting

Suggestion	Photo
<p>By Ms. Thandar (Associate Officer): Wartayar Industrial Zone and Shwe Pyi Thar Industrial Zone Committee Office</p> <p>Suggestions: Presenting and performing environmental monitoring, CSR plan and environmental impact assessment is good and conducting public consultation meeting like this is a good opportunity to hear about the project development.</p> <p>By Mr. Than Zin Hmue (Deputy Staff Officer): Environmental Conservation Department, Yangon</p> <p>Questions: How do you manage and maintain the types of glue used in the project? How to dispose the waste? Do you use a boiler? Do you use any fuel other than diesel?</p> <p>Answer by Mr. Aung Soe Min (Human Resource Deputy Manager) from ABGL</p>	<p style="text-align: center;">Ms. Thandar (Associate Officer): Wartayar Industrial Zone and Shwe Pyi Thar Industrial Zone Committee Office</p>

We maintain the types of glue in the private chemical storage place that is covered with sand on concrete floor and wooden pallet on top of it. Chemicals are stored by category on the wooden pallet. The wastes are disposed according to YCDC guidelines.

Boiler and other fuels are not used in our project.

By Ms. Myat Su Mon (Deputy Staff Officer): Environmental Conservation Department, Yangon

Questions:

How do you collect data for social survey? Do you think a scoping report is sufficient without a social survey?

Is there any impact on Hlaing river? Is there any vibration effect on Min Bandu Pagoda which is 1km away from the project site? Is there any alternative way for the project? If the above questions cannot be answered immediately, they need to be included in the EIA report.

Whether the shoe foam is manufactured or imported?

Is the factory commercially run?

Answer by Ms. Aye Mon Aung (Environmental Engineer) from TBS

The socio-economic data from Shwe Pyi Thar Township GAD data is used in scoping report but a social survey within a 3km radius will be conducted and included in the EIA report.

In addition, we will follow ECD's comments and add these necessary data in the EIA report.

All the raw material like shoe foam is only imported.

The factory is not commercially run, only a training period for workers.

By Ms. Myat Su Mon (Deputy Staff Officer): Environmental Conservation Department, Yangon

Suggestions: Ms. Myat Su Mon suggested the following comments.

Local people should be discussed about the impact from the project site.

It is needed to add all the necessary data and license in the report.

It is needed to describe health and safety plans for workers and to add these plans in the report.

It is needed to find and add the updated GAD data in the report.

To add the grievance redress mechanism control system.




Mr. Than Zin Hmue & Ms. Myat Su Mon (Deputy Staff Officer): Environmental Conservation Department, Yangon



Mr. Aung Soe Min (Human Resource Deputy Manager) from ABGL



Ms. Aye Mon Aung (Environmental Engineer) from TBS

<p>TBS is required to consider whether the project proponent is following TBS guidelines.</p> <p>The Project Proponent shall be responsible for the Project in accordance with EIA procedure.</p> <p>Need to plant trees for green environment.</p> <p>Answer by Ms. Aye Mon Aung (Environmental Engineer) from TBS</p> <p>Yes, our consulting team will incorporate ECD's comments and recommendations that will be included in the report.</p>	 <p>Mr. Htet Thiha Phone Myint (Environmental Geologist) from TBS</p>
<p>By local people Shwe Pyi Thar Township Suggestions:</p> <p>Although local people haven't provide any suggestion, most of them appreciate that they got many job opportunities because of the proposed project.</p>	 <p>By local people Shwe Pyi Thar Township, Yangon</p>

A total of 36 participants attended the public consultation. The attendance rate in percentage are 19 % government authorities, 6% of project proponent, 11 % of TBS's staffs and 64% of local residence. The numbers of participants and percentage are shown in Table 8-4.

Table 8-4 Percentage of Participants and Attendance of Public Consultation

Community	Number of participants	Percentage
Government authorities	7	19 %
Project proponent (ABGL)	2	6 %
TBS's staffs	4	11 %
Local residents	23	64%
Total	36	100 %

8.5. SUMMARY OF PUBLIC CONSULTATION (FINAL EIA STAGE)

Public consultation was conducted on 21st February, 2023 via zoom application from 10:00 AM to 11:45 AM. The participants in the public consultation were ABGL, TBS (consultants who perform the EIA study), Officers from Environmental Conservation Department (Yangon), Medical Officer from Township Public Health Department, Officers from City Development Committee, Officers from Fire Services Department and nearby community. Agenda of the public consultation meeting is shown in Table 8-5.

Table 8-5 Agenda of the Public Consultation Meeting

No	Activity	Time
1	Registration	10:00 AM - 10:20 AM
2	Opening Speech from ABGL	10:20 AM - 10:25 AM
3	Power Point Presentation of Project description, summary of the company profile	10:25 AM - 11:00 AM
4	Power Point Presentation of existing environmental conditions, potential impacts, mitigation measures and environmental management plan	11:00 AM - 11:30 AM
5	Discussion time – comments and suggestion by the concerned stakeholders	11:30 AM - 11:45 AM

Public consultation was started with the presentation about the project, followed by questions, answers and discussion. Ms. Kyi Phyu Khin from TBS performed as a master of ceremonies (MC) at public consultation. Furthermore, introduction speech was opened by Mr. Aung Soe Min (Human Resource Deputy Manager) from ABGL explained about their company profile. ABGL requested TBS (Consulting Firms) for the EIA for its factory.

Ms. Aye Mon Aung (Environmental Engineer) of TBS explained about the project description for the project. She explained about the project description and summary of the company profile. Ms. Hnin Lai Win (Environmental Manager) of TBS explained about the Environmental Impact Assessment of the project. She explained the existing environmental conditions, potential impacts, mitigation measures and environmental management plan. Questions and answers section followed after the TBS presentation. The details of the meeting including the meeting time, date, name of participants who attended the meeting are shown in Table 8-6 and the attendance list and presentation slides are also attached in **APPENDIX O**.

Table 8-6 Meeting Context

Meeting Date	21.2.2023		
Meeting Time	10:00 AM – 11:45 AM		
Place	Online platform (Zoom Application)		
Government authorities (Total of 6 People)			
No	Name	Position	Organization
1	Ms. Khine Pwint Phyu	Deputy Staff Officer	Environmental Conservation Department
2	Ms. Myat Su Mon	Deputy Staff Officer	
3	Mr. Htay Lwin	Assistant Administrator	City Development Committee
4	Mr. Thein Ko	Upper Divisional Clerk UD	
5	Mr. Kyaw Myint	Administrator	Ward 23, Shwe Pyi Thar Township
6	Mr. San Ngwe	100 Houses Group Elder	
Project Proponent and Stakeholders (Total of 13 Persons)			
1	Mr. Tun Tun Oo	Human Resource Manager	ABGL
2	Mr. Aung Soe Min	Human Resource Deputy Manager	

3	Mr. Zaw Myo Thein	Factory Manager	Light House Co., Ltd
4	Mr. Myatthu Kyaw	General Manager	TBS
5	Ms. Hnin Lai Win	Environmental Manager	
6	Mr. Htet Thiha Hpone Myint	Environmental Geologist	
7	Ms. Aye Mon Aung	Environmental Engineer	
8	Ms. Kyi Phyu Khin	Business & Marketing Associate	
9	Ms. Thinzar Htun	Environmental Scientist	Shwe Pyi Thar Township
10	Mr. Kyaw Soe Naing	Local Resident	
11	Ms. Khin Win		
12	Mr. Nyein Chan		
13	Mr. Myo Paing		

8.5.1. Discussing and Feedbacks Received From Meeting

After the presentation, discussion section was started for questions and answers. Most of questions were about project planning and environmental issues. Photos of PCM activities are shown in Figure 8-2. Table 8-7 shows all detailed discussion and feedbacks received from public consultation meeting.




Participants at ABGL Factory's Meeting

PCM Activities for Proposed Project

Figure 8-2 Photos of Participants from PCM Activities

Table 8-7 Discussion and Feedbacks Received from Meeting

Suggestion	Photo
<p>By Mr. Kyaw Myint (Administrator): Ward 23, Shwe Pyi Thar Township Suggestions: The PowerPoint presentation is perfect and there is not really a suggestion to add on.</p>	 <p>Mr. Aung Soe Min (Human Resource Deputy Manager) from ABGL</p>
<p>Answer by Ms. Aye Mon Aung (Environmental Engineer) from TBS Thank you so much.</p>	
<p>By Ms. Myat Su Mon (Deputy Staff Officer): Environmental Conservation Department Suggestions: It is necessary to get permission from relevant department for storing and using the special glue in manufacturing of shoes. Need to attach that permission in the report as an appendix. It is suggested that Chemicals Management System for storing, using, disposing and washing of chemicals should be added in this report. It is essential to follow the rules of “Prevention of Hazard from Chemical and Related Substances Law” (2013) and “The Occupational Safety and Health Law” (2019). It is needed to add the kinds of chemical usage, the amount of usage per day or month, the usage system, MSDS of chemicals and the amount of waste disposal. Need to assess that whether there is any environmental impact on the place where waste is stored before disposal with YCDC. It is necessary to describe the odor measurement and Odor control system for using the special glue. It is needed to follow the emergency response plan in emergency case link with fire, occupational accident, exploration, leaking and natural disease. The EIA report must be prepared in accordance with EIAP Article (55, 56, 57, 58, 59, 60, 61, 62, 63). The project proponent have fully responsible for all the negative impacts according to EIA procedure 102(a). Need to make environmental monitoring regularly in operation phase before the duration of EIA approval period. It is necessary to inform and submit the report relating with the relocation, expanding and decommissioning or closure of the project to ECD, relevant department, businesses, zone management committee.</p>	 <p>Ms. Aye Mon Aung (Environmental Engineer) from TBS</p>

<p>Response: TBS will prepare EIA report according to government regulations, guidelines, procedures, rules and laws. The odor measurement will be conducted and included in the monitoring report. In addition, ABGL is applying for the permission for storing and using chemical such as special glue. The permission is planed to get after starting commercial operation. MSDS of the chemicals used in this project are attached in this report.</p>	
<p>By local people Shwe Pyi Thar Township Suggestions: Although local people haven't provide any suggestion, most of them appreciate that they got many job opportunities because of the proposed project.</p>	<p style="text-align: center;">By local people Shwe Pyi Thar Township, Yangon</p>

A total of 19 participants attended the public consultation. The attendance rate in percentage are 32 % government authorities, 10% of project proponent, 32 % of TBS's staffs and 26 % of local residence. The numbers of participants and percentage are shown in Table 8-8.

Table 8-8 Percentage of Participants and Attendance of Public Consultation

Community	Number of participants	Total percentage
Government authorities	6	32%
Project proponent (ABGL)	2	10%
TBS's staffs	6	32%
Local residents	5	26%
Total	19	100%

8.6. ACTION TAKEN BY FACTORY AND FUTURE PLANS

Proposed project proponent will take the action for the suggestions and comments from the public consultation meeting. Moreover, the project proponent will duly implement all the mitigation measures described in this EIA report.

CHAPTER 9

CONCLUSIONS AND RECOMMENDATIONS

9.1. CONCLUSIONS

This EIA report has provided an assessment of the potential environmental, social and health impact associated with the construction, operation and decommissioning phases of the proposed project. This study was prepared on the basis of the project information, relevant information from various sources, surveys of environmental and socio-economic setting of the project area, rounds of consultations with stakeholders in the government sector and communities in and around the vicinity of the project site, and experiences of the consultant in technical and environmental aspects of the proposed projects. Based on the results, the following major factors are concluded as follows;

- ❖ Regarding to environmental baseline studies, all air quality results at A1, A2, A3, A4 and A5 air monitoring stations are within NEQEG (2015). The concentration of VOCs at five stations is 0.00 ppb. According to the comparison of 1st time and 2nd time air measurement results, most of the air quality results (1st time measurement) are more than the air quality results (2nd time measurement). The noise levels of N1 (daytime and nighttime), N2 (daytime and nighttime), N3 (daytime and nighttime) and N4 (daytime) for both 1st time and 2nd time monitoring results were within NEQEG 2015. The noise levels of N4 (daytime and nighttime) and N5 (nighttime) are slightly higher than the NEQEG (2015) (residential, institutional, educational), probably due to rainfall during 1st time monitoring. The vibration results were compared with German Standard from Din 4150-3. According to water quality measurement results, the surface water quality is not suitable for drinking. All parameters of groundwater sample are within NDWQS (2019) except turbidity result. In addition, the result of wastewater sample is within NEQEG (2015).
- ❖ For the living environment, the major impact on the environmental will be controlled or take mitigation measures around the project site. Although the key environmental issues such as generation air pollutants, noise and vibration, deterioration of water quality and road traffic can cause during construction, operation and decommissioning phases, the significant of the impacts on the living environment will be low. In addition, the appropriate mitigation measures, environmental management plan and environmental monitoring plan will be properly implemented. For the social environment, there will be positive impacts on local economy due to getting job opportunities and necessary materials and equipment may be purchased from local shops.
- ❖ Environmental monitoring on air quality, water quality, solid waste, occupational health and safety, noise and vibration will be performed and the monitoring reports will be submitted to the Ministry not less frequently than every six month.

9.2. RECOMMENDATIONS

This EIA study has clearly identified the environmental and social issues, mitigation measures and monitoring plan. It is recommended that the project proponent must implement and follow all the mitigation measures, management plan and monitoring plan described in this report. In addition, the project proponent must continuously follow the requirements of the environmental guidelines, applying mitigation measures to ensure the compliance with the legal requirements and other relevant recommended criteria.

APPENDIX A
ALPHA BEST GLOBAL LIMITED CERTIFICATES



ပြည်ထောင်စုအမှတ်

ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်
Certificate of Incorporation

ALPHA BEST GLOBAL LIMITED
Company Registration No. 120466232

မြန်မာနိုင်ငံကုမ္ပဏီများဥပဒေ ၂၀၁၇ အရ
ALPHA BEST GLOBAL LIMITED
အား ၂၀၁၉ ခုနှစ် မေ ၂၄ ရက်နေ့တွင်
အစုရှယ်ယာအားဖြင့် တာဝန်ကန့်သတ်ထား သည့် အများနှင့်မသက်ဆိုင်သောကုမ္ပဏီ
အဖြစ် ဖွဲ့စည်းမှတ်ပုံတင်ခွင့်ပြုလိုက်သည်။

This is to certify that
ALPHA BEST GLOBAL LIMITED
was incorporated under the Myanmar Companies Law 2017 on 24 May
2019 as a Private Company Limited by Shares.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ
Registrar of Companies

ရင်းနှီးမြုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန
Directorate of Investment and Company Administration



APPENDIX B
Certificate for Transitional Consultant Registration



REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation
CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)



No. 0010 Date 10th Jul 2018

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၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို အဖွဲ့အစည်းအား ထုတ်ပေးလိုက်သည်။)

- (a) Name of Organization Total Business Solution Co., Ltd.
(အဖွဲ့အစည်းအမည်)
- (b) Name of the representative in the organization Dr. Soe Moe Kyaw Win
(အဖွဲ့အစည်းကိုယ်စားလှယ်၏ အမည်)
- (c) Citizenship of the representative in the organization MYANMAR
(အဖွဲ့အစည်းကိုယ်စားလှယ်၏ နိုင်ငံသား)
- (d) Identity Card /Passport Number of the representative person in the organization 12/SaKhaNa(N)057507
(အဖွဲ့အစည်းကိုယ်စားလှယ်၏ မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်)
- (e) Address of organization No.54, Room No.704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Yangon. tbs.myanmar@gmail.com praneet.tbs@gmail.com , 09253556719
(ဆက်သွယ်ရန်လိပ်စာ)
- (f) Type of Consultancy Organization
(အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)
- (g) Duration of validity 31 March 2018
(သက်တမ်းကုန်ဆုံးရက်)



EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်အား (၀-၄-၂၀၁၈) ရက်နေ့မှ (၃၁-၃-၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။
For Director General (Soe Naing, Director) Environmental Conservation Department

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

Areas of Expertise Permitted
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Air Pollution Control
2. Geology and Soil
3. Risk Assessment and Hazard Management
4. Socio-Economy
5. Water Pollution Control
6. Public Health
7. Safety and Health in Construction

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား (၁-၁-၂၀၂၀) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၀) ရက်နေ့အထိ တစ်နှစ်သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၉) ရက်နေ့မှ (၃၁.၁၂.၂၀၁၉) ရက်နေ့အထိ (၉)လသက်တမ်း တိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six month from (1.1.2021) to (30.6.2021)
ဤလက်မှတ်အား (၁-၁-၂၀၂၁) ရက်နေ့မှ (၃၁-၆-၂၀၂၁) ရက်နေ့အထိ (၆)လသက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၇-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လသက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ်သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား (၁-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၆-၂၀၂၃) ရက်နေ့အထိ (၆)လသက်တမ်းတိုးမြှင့်သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

APPENDIX C

Permits from Relevant Departments

Certificate of Exporter/Importer Registration

048837

**The Government of The Republic of the Union of Myanmar**
Ministry of Commerce
Department of Trade

CERTIFICATE OF EXPORTER/IMPORTER REGISTRATION

1. Enterprise Name ALPHA BEST GLOBAL LIMITED. 2. Registration No: 120466232 (06-07-20)
(မြန်မာ/အင်္ဂလိပ်) -----

3. Registration Term: FIVE YEAR

4. Start Date : 06-07-2020

5. End Date : 05-07-2025

6. Address : No.149+150+151+152, Corner of Mahar Myaing Street & Wun Saung Hmu Street,
(မြန်မာ/အင်္ဂလိပ်) Wartayar Industrial Zone, Shwe Pyi Thar Township,
Yangon Region, Myanmar

7. Business Registration No : 120466232

8. Type of Business : Sole Proprietorship (တစ်ဦးတည်းပိုင်) Partnership (အစုအဝတ်)
(မြန်မာ/အင်္ဂလိပ်) Limited Company (လိမိတက်ကုမ္ပဏီ) (Myanmar/Foreign)
 Co-operative Society (သမဝါယမအသင်း)
 Others (Please specify) အခြား (ဖော်ပြရန်) သင်း၊ ဦးစွာ တစ်ဦးပါလုပ်ငန်း () နှိုင်း ဆောင်ရွက်ခွင့်ရှိသည်။

9. Type of Service : New Extension

10. Contact No : 09797654666, 09420005662 larrylutun@gmail.com
Telephone No. Fax No. e-mail

11. Remarks :
MIC Permit No.257/2020 Date (29-5-2020)

12. Terms and Conditions : စည်းကမ်းချက်များ
I hereby register the above mentioned enterprise as Exporter/Importer subject to the following terms and conditions: (အောက်ဖော်ပြပါစည်းကမ်းချက်များဖြင့် မှီကုန်သွင်းကုန် လုပ်ငန်းရှင်အဖြစ် မှတ်တမ်းတင်ခွင့်ပြုသည်)
(a) Line of goods permitted - all items except prohibited and restricted items.
ခွင့်ပြုသည်ကုန်ပစ္စည်းအမျိုးအမည် - တားမြစ်ကုန်သတ်တားသော ကုန်ပစ္စည်းအမယ်များမှလွဲ၍ ကျန်ကုန်ပစ္စည်းများအားလုံး
(b) The enterprise must abide by the Export/Import rules and Regulations prescribed for the registered Exporters/Importers. (လုပ်ငန်းရှင်သည် မှတ်ပုံတင် မှီကုန်သွင်းကုန်လုပ်ငန်းလုပ်ကိုင်သူများ လိုက်နာရမည့်စည်းကမ်းချက်များကို လိုက်နာရမည်။)



For Director General
(စိုးနိုင်၊ ဦးစီးအရာရှိ)
C.J. 2020

EIREG07203EIREGEX12130012

DOT, TRADE POLICY

Fire Safety Inspection Recommendation

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
ပြည်ထဲရေးဝန်ကြီးဌာန
မီးသတ်ဦးစီးဌာန




မီးဘေးလုံခြုံရေးစစ်ဆေးထောက်ခံချက်

အမှတ်စဉ်(၁၈၄)

၁။ ရန်ကင်း တိုင်းဒေသကြီး/ပြည်နယ်၊ ရွှေပြည်သာ မြို့နယ်၊ ဝါးတစ်ရာစက်မှုဇုန် ရပ်ကွက်/ ကျေးရွာ၊ မဟာမြိုင်လမ်းနှင့်ဝန်ဆောင်မှုလမ်းထောင့် လမ်း၊ အမှတ် (၁၄၉ + ၁၅၀ + ၁၅၁ + ၁၅၂) ရှိ ပိုင်ရှင် ဦး/ဒေါ် ALPHA BEST GLOBAL LIMITED ၏ Steel Structure (၂)ထပ် + Mezzanine (၂)လုံး (မိနပ်ချုပ်စက်ရုံ + ဝိုဒေါင်) ၊ RCC (၁)ထပ် (၂)လုံး(Mechanic Room & Store Room)၊ Steel Structure(၁)ထပ်(၁)လုံး(Power Station) အဆောက်အဦအတွက် ဤဌာန၏ (၂-၁၂-၂၀၂၁) ရက်စွဲပါ စာအမှတ်၊ ၂၄၈၊ ၂၄၉/၁၀၀/၅၂/ဦး ၁ ဖြင့် သတ်မှတ်ပေးထားသည့် မီးဘေးလုံခြုံရေးဆိုင်ရာပြဌာန်းချက်များအား (၄-၄-၂၀၂၂) ရက်နေ့တွင် စစ်ဆေးသည့်အခါ ပြည့်စုံစွာဆောင်ရွက်ထားကြောင်း စစ်ဆေးတွေ့ရှိရသည်။

၂။ ဤထောက်ခံချက်သည် စစ်ဆေးသည့်နေ့မှစ၍ (၃)နှစ်အထိသာ အကျုံးဝင်သည်။

၃။ ထို့ပြင် မီးသတ်ဦးစီးဌာနမှ အခါအားလျော်စွာ ထပ်မံစစ်ဆေးချိန်တွင် မီးဘေးလုံခြုံရေးဆိုင်ရာ ပြဌာန်းချက်များကို လိုက်နာဆောင်ရွက်ခြင်းမရှိပါက ဤထောက်ခံချက်ကို ပြန်လည်ရုတ်သိမ်းသွားမည်ဖြစ်ပြီး အဆောက်အဦအားအသုံးပြုသူ(သို့မဟုတ်)ပိုင်ရှင်သည် မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ဥပဒေအရအရေးယူခြင်းခံရမည်။

မှတ်ချက်။ ဤထောက်ခံချက်အား လွှဲပြောင်းသုံးစွဲခြင်းမပြုရ။ အဆောက်အဦအား မူလရည်ရွယ်ချက်မှ ပြောင်းလဲအသုံးပြုပါက ထောက်ခံချက်အသစ် ထပ်မံလျှောက်ထားရမည်။



ညွှန်ကြားရေးမှူးချုပ်(ကိုယ်စား)
(သိန်းထွန်းဦး၊ ညွှန်ကြားရေးမှူး)

F.S.C (Wayin)

Factories and General Labour Laws Inspection Department



MINISTRY OF LABOUR

Factories and General Labour Laws Inspection Department



Working Environment Measurement (WEM)

No.47/2022/SPT

Date: 12.12.2022

Factory Name : Alpha Best Global Limited (Shoe Factory)

Address : No(149, 150, 151, 152), Mahar Myaing Street, Wartayar Industrial Zone,
Shwe Pyi Thar Township, Yangon Region.

Tested Equipment : Sound Level Meter (AS 834+)
Digital Light Meter (LX 1330B)
Digital Anemometer & Temperature Meter (UT 363S)

Type of Test : Personal Sampling

No.	Tested Area	Ventilation (m/s)	Lighting (Lux)	Noise (dBA)	Heat (°C)	Recommendation
1	Lasting Line 1	0.35	625	73.7	31.3	Acceptable Condition
2	Outsole Line	0.62	682	75.6	30.5	Acceptable Condition
3	Lasting Line 2	0.36	679	74.1	30.1	Acceptable Condition
4	Stitching Line 1	0.41	1810	75.3	30.9	Acceptable Condition
5	Stitching Line 2	0.36	1031	76.3	30.8	Acceptable Condition
6	Cutting Line 1	0.44	2056	80.5	30.5	Acceptable Condition
7	Cutting Line 2	0.35	2009	81.3	30.7	Acceptable Condition
8	Warehouse	0.37	312	60.7	30.9	Acceptable Condition

Tested By;

Witnessed By;

12.12.2022
(ဝင်းသူ၊ ဦးစီးအရာရှိ)
အလုပ်ရုံစစ်ဆေးရေး



Yangon City Development Committee License

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
ရန်ကုန်တိုင်းဒေသကြီးအစိုးရ
ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ
စီမံရေးရာဌာန



(၂၀၂၂/၂၀၂၃) ဘဏ္ဍာနှစ်
လုပ်ငန်းလိုင်စင်

(စက်ရုံ၊ အလုပ်ရုံ၊ သိုလှောင်ရုံသုံးစွဲရန် အထောက်အကူပစ္စည်းထုတ်လုပ်ခြင်း၊
ရောင်းချခြင်း၊ တည်ခင်းခြင်း၊ ဖြန့်ဖြူးခြင်း၊ ဝန်ဆောင်မှုလုပ်ငန်း၊ အခြားလုပ်ငန်း)

ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ၊ စီမံခန့်ခွဲရေးဆိုင်ရာ နည်းဥပဒေ၊ အခန်း (၂)
နည်းဥပဒေ ၃(ဈ)အရ အောက်အမည်ပါသူတို့အား လိုင်စင်နှုန်း ၁၀၀၀၀၀/- ကျပ် (စာဖြင့်၊ ကျပ်
တစ်ဆယ်သိန်းတိတိ) ပေးသွင်းစေပြီး **ရွှေပြည်သာ** မြို့နယ်၊ **ဝါးတစ်ရာစက်မှုဇုန်**ရပ်ကွက် ၊ **မဟာဗြိုင်**
လမ်း ၊ အမှတ် ၁၄၉၊ ၁၅၀၊ ၁၅၁၊ ၁၅၂၊ အခန်းအမှတ် - တွင် **Alpha Best Global Limited** အမည်ပါ
ဖိနပ်အမျိုးမျိုးထုတ် ဆိုင်/လုပ်ငန်းအား လုပ်ကိုင်ခွင့်ပြု၍ ဤလုပ်ငန်းလိုင်စင်ကို ထုတ်ပေးလိုက်သည်။

မည်	အမည်	နိုင်ငံသားစိစစ်ရေး ကတ်ပြားအမှတ်	လိပ်စာ
၁။	Mr. Tseng Ya-Po	351244685	၁၄၉၊ ၁၅၀၊ ၁၅၁၊ ၁၅၂၊ မဟာဗြိုင်လမ်း၊ ဝါးတစ်ရာစက်မှုဇုန်၊ ရွှေပြည်သာ

ဤလုပ်ငန်းလိုင်စင်သည် ၂၀၂၃ခုနှစ် မတ်လ ၃၀ ရက်နေ့တွင် သက်တမ်းကုန်ဆုံးသည်။

ဤလုပ်ငန်းလိုင်စင်အား မြင်သာသောနေရာတွင် မှန်ဘောင်ဖြင့် ချိတ်ဆွဲထားရမည်။



(Handwritten signature and stamp)
ဌာနမှူး (ကိုယ်စား)
၂၅-၃-၂၀၂၃

*ပူးတွဲပါလိုင်စင်စည်းကမ်းများအား လိုက်နာဆောင်ရွက်ရမည်။

လုပ်ငန်းလုပ်ကိုင်ခွင့်ရရှိသူလိုက်နာရန် စည်းကမ်းချက်-ညွှန်ကြားချက်များ

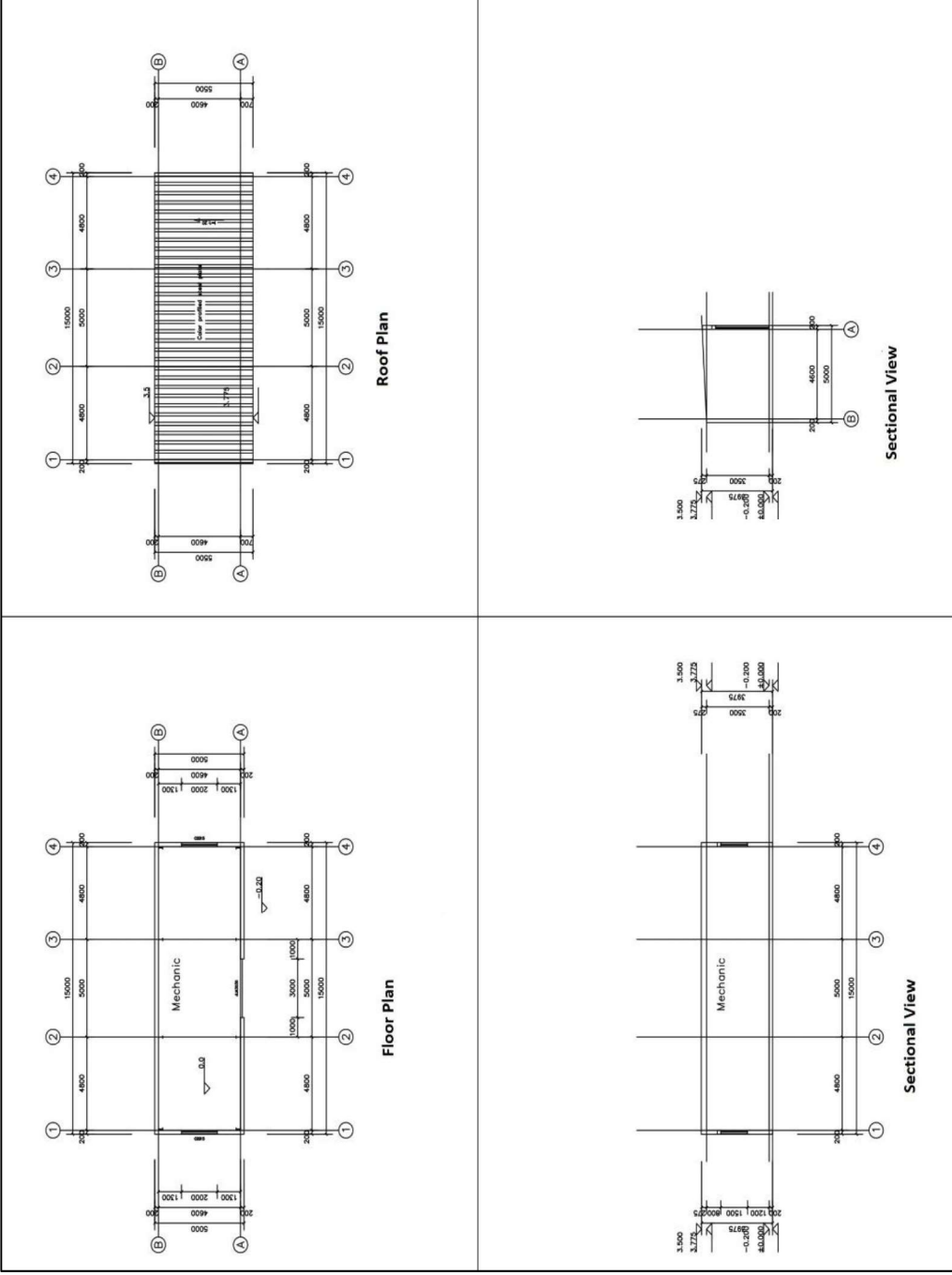
- ၁။ လုပ်ငန်းလုပ်ကိုင်ခွင့်ရရှိသူသည် လုပ်ငန်းတည်နေရာ ပတ်ဝန်းကျင်ရှိ အများပြည်သူအား လုပ်ငန်းနှင့် ပတ်သက်၍ အနှောင့်အယှက်တစ်စုံတစ်ရာ မဖြစ်ပေါ်စေရ။ လုပ်ငန်းကို ခွင့်ပြုသည့် ဥပစာအတွင်း၌သာ ဆောင်ရွက်ရမည်။
- ၂။ လုပ်ငန်းလုပ်ကိုင်ခွင့်ရရှိသူသည် ပိုင်ဆိုင်မှု အရှုပ်အရှင်း ပုဂ္ဂိုလ်ရေးအရ ကန့်ကွက်မှုများနှင့် မသက်ဆိုင်စေရ။
- ၃။ လုပ်ငန်းလုပ်ကိုင်ခွင့်ရရှိသူသည် ပြဋ္ဌာန်းထားသော တည်ဆဲဥပဒေ၊ နည်းဥပဒေ၊ အမိန့်၊ ညွှန်ကြားချက်များ အုပ်ချုပ်ရေးအဖွဲ့အစည်းများ၏ အခါအားလျော်စွာ ထုတ်ပြန်သည့် အမိန့်ညွှန်ကြားချက်များနှင့် ဝန်ကြီးဌာန အသီးသီးက ထုတ်ပြန်သည့် အမိန့်ညွှန်ကြားချက်များ၊ စည်းမျဉ်းစည်းကမ်း လုပ်ထုံးလုပ်နည်းများကို တိကျစွာ လိုက်နာရမည်။
- ၄။ ဝန်ကြီးဌာနနှင့် အုပ်ချုပ်ရေးအဖွဲ့အစည်းအသီးသီး၏ ဥပဒေပြဋ္ဌာန်းချက်များနှင့် အကျုံးဝင်သည့် လုပ်ငန်းများ လုပ်ကိုင်ခြင်းအတွက် ယင်းဌာနနှင့် အဖွဲ့အစည်းများ၏ မှတ်ပုံတင်/ ခွင့်ပြုချက်ကို လက်ဝယ်ရယူထားရမည်။
- ၅။ လုပ်ငန်းလုပ်ကိုင်ခွင့်ရရှိသူသည် ကော်မတီက ညွှန်ကြားသည့် သောက်/သုံးရေထားရှိမှု အစီအမံများ၊ သန့်ရှင်းရေးဆောင်ရွက်ရန်အတွက် အစီအမံများ၊ အညစ်အကြေးစွန့်ပစ်မှုနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုမဖြစ်စေရေး အစီအမံများ၊ မြို့တော်သာယာလှပရေးနှင့် လုံခြုံရေးအတွက် အစီအမံများ အလုပ်သမားများ/လာရောက် ရောင်းဝယ်သူများအတွက် ကျန်းမာမှုနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး အစီအမံများ၊ ယာဉ်/လူသွားလမ်းပိတ်ဆို့မှု မရှိစေရေးအစီ အမံများ၊ မီးဘေးကြိုတင်ကာကွယ်ရေး အစီအမံများကို ထားရှိ၍ တိကျစွာလိုက်နာရမည်။
- ၆။ ကုန်ကြမ်းအဖြစ်အသုံးပြုသော ထုတ်လုပ်သော၊ သိုလှောင်သော၊ တည်ခင်းဖြန့်ဖြူးသော၊ ပစ္စည်းသည် သက်ဆိုင်ရာ ဝန်ကြီးဌာန/အဖွဲ့အစည်းများက သတ်မှတ်ထားသည့် စံချိန် စံညွှန်းနှင့် ကိုက်ညီသည့် ပစ္စည်းများဖြစ်ရမည့်အပြင် ကိုင်တွယ်အသုံးပြု စားသုံးသူများအတွက် ကျန်းမာရေးနှင့်ညီညွတ်ရမည့် သို့မဟုတ် ဘေးအန္တရာယ်ကင်းရှင်းရေး အစီအမံများဖြင့် စီစဉ် ဆောင်ရွက်ပြီးဖြစ်ရမည်။
- ၇။ လိုင်စင်ခွင့်ပြုထားသော လုပ်ငန်းကို လိုအပ်သည့်အခါ အချိန်နှင့်တစ်ပြေးညီဝင်ရောက် စစ်ဆေးခြင်းကို လက်ခံရမည်။ ယင်းအပြင် လုပ်ငန်းတာဝန်ခံကိုယ်တိုင်က လုပ်ငန်း ဆောင်ရွက်ထားရှိမှုကို ရှင်းပြရမည်။
- ၈။ လိုင်စင်ခွင့်ပြုထားသော လုပ်ငန်းအား လိုအပ်ချက်အရ ပြောင်းရွှေ့ဖယ်ရှားပေးရန် ညွှန်ကြားပါက သတ်မှတ် ညွှန်ကြားချက်အတိုင်း တိကျစွာလိုက်နာရမည်။
- ၉။ လုပ်ငန်းများ ပိတ်သိမ်းခြင်း၊ ယာယီပိတ်သိမ်းခြင်း၊ အမြဲတမ်းပိတ်သိမ်း ဆောင်ရွက်မည်ဆိုပါက သက်ဆိုင်ရာ မြို့နယ်စည်ပင်သာယာအုပ်ချုပ်ရေးမှူးရုံးသို့ ကြိုတင်၍ မပျက်မကွက်စာဖြင့် အကြောင်းကြားသွားရမည်။
- ၁၀။ အထက်ပါ သတ်မှတ်ချက်တစ်စုံတစ်ရာကို ဖောက်ဖျက်ကျူးလွန်ပါက သို့မဟုတ် လိုက်နာရန် ပျက်ကွက်ပါက ဒဏ်ကြေးငွေတပ်ရိုက်ခြင်း၊ လုပ်ငန်းလိုင်စင်အား ကာလအကန့် အသတ်ဖြင့် ရုပ်သိမ်းခြင်း၊ ပိတ်သိမ်းခြင်း၊ ပယ်ဖျက်ခြင်းစသည့် စီမံခန့်ခွဲမှုပြစ်ဒဏ်ကို ခံရမည်။ လိုအပ်ပါက ဥပဒေအရ အရေးယူခြင်းခံရမည်။ လုပ်ငန်း ပိတ်သိမ်းသည့် ပြစ်ဒဏ်ခံယူစဉ် ကာလအတွင်း အလုပ်သမားများအတွက် ကိစ္စအဝဝသည် လုပ်ငန်းလုပ်ကိုင်ခွင့် ရရှိသူနှင့်သာ သက်ဆိုင်စေရမည်။

တည်ဆဲကလေးသူငယ်ဥပဒေ၊ ၁၉၅၁-ခုနှစ်၊ အလုပ်ရုံများ အက်ဥပဒေ၊ ဆိုင်များနှင့် အလုပ်သမားများ အက်ဥပဒေ၊ နှင့်ရက်နှင့် အလုပ်ပိတ်ရက် အက်ဥပဒေ၊ ပြဋ္ဌာန်းချက်များ ကိုတိကျစွာ လိုက်နာရမည်။

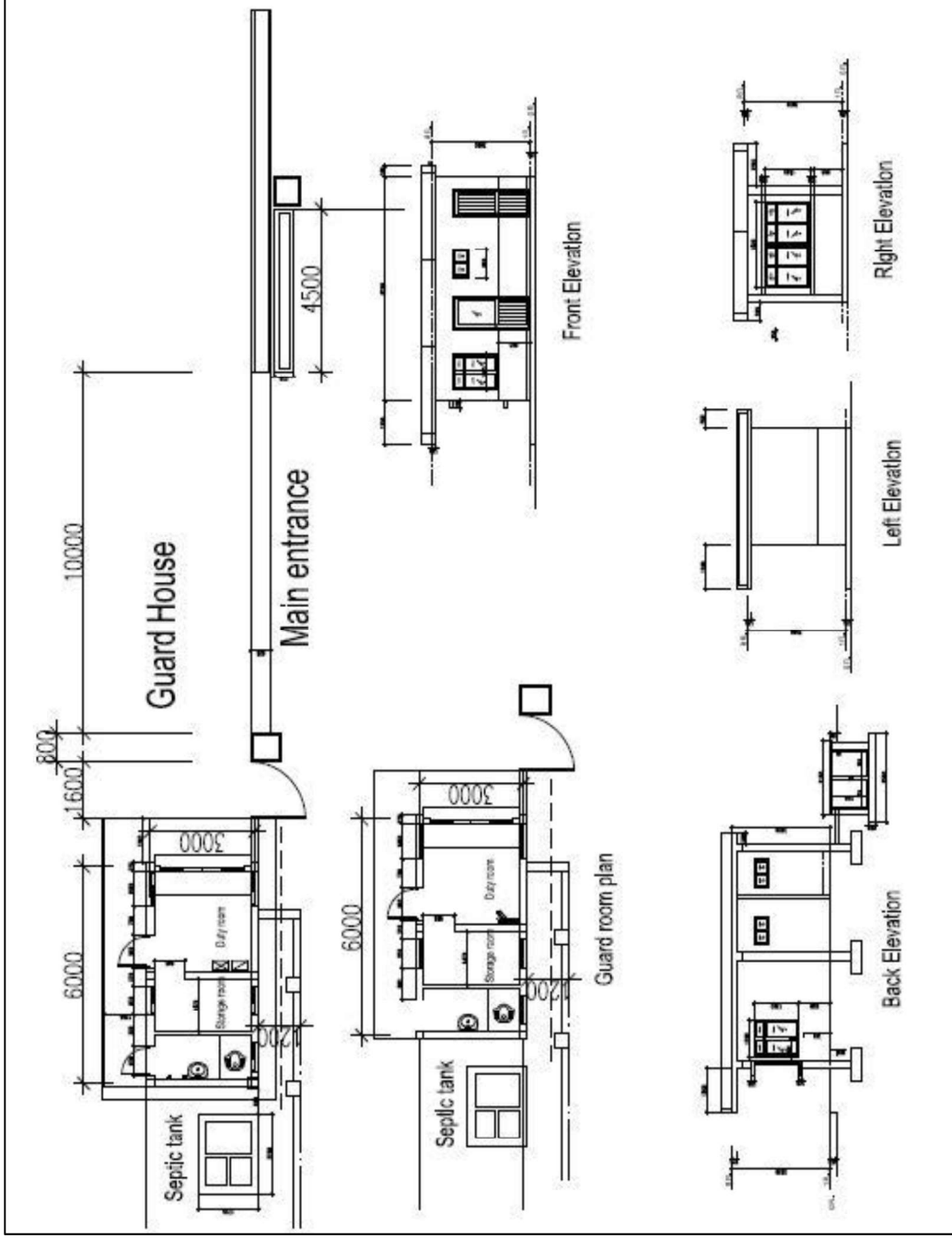
APPENDIX D

Layout Plans of Project's Associated Buildings (Phase 1)

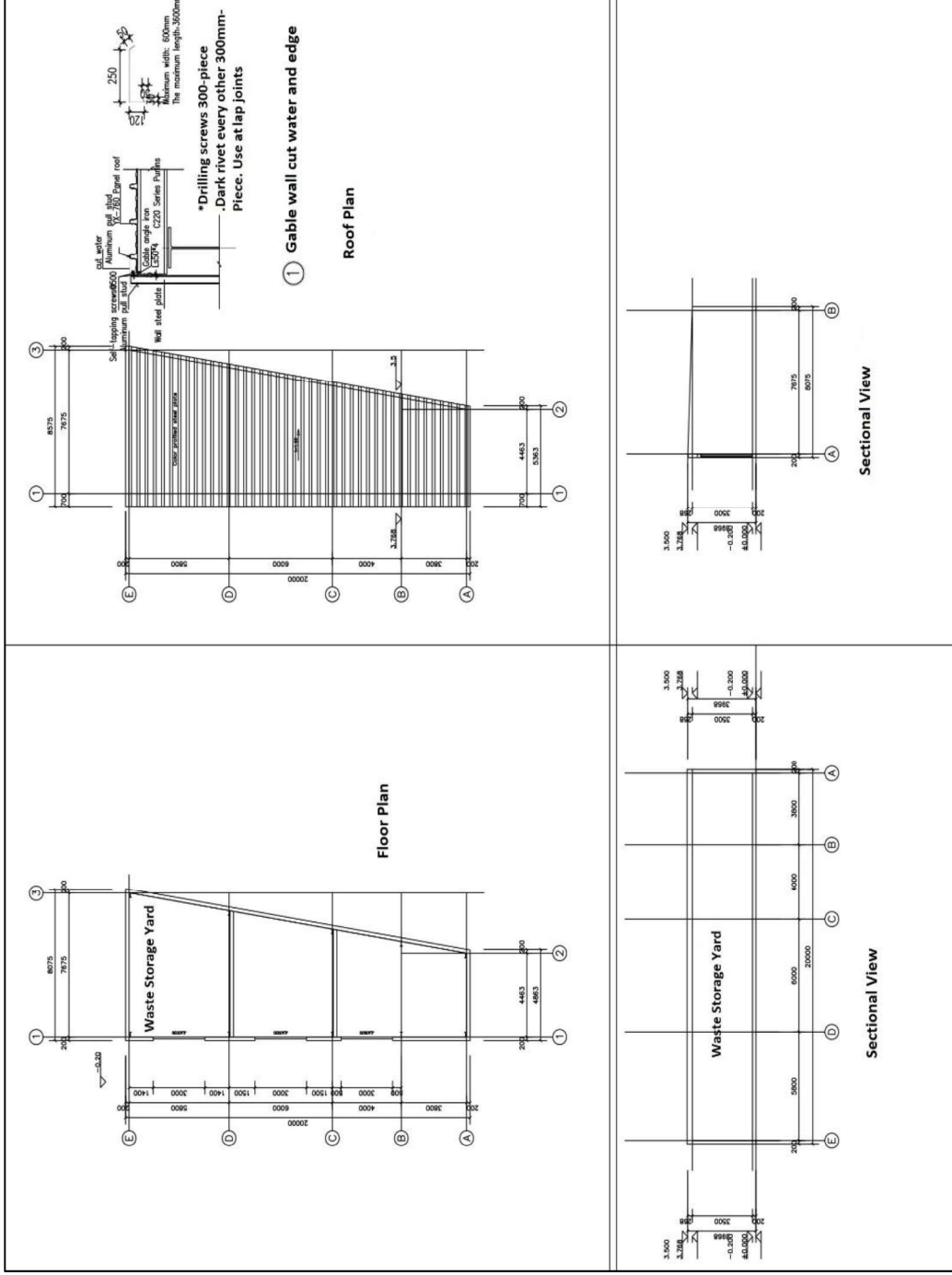
Mechanic Warehouse



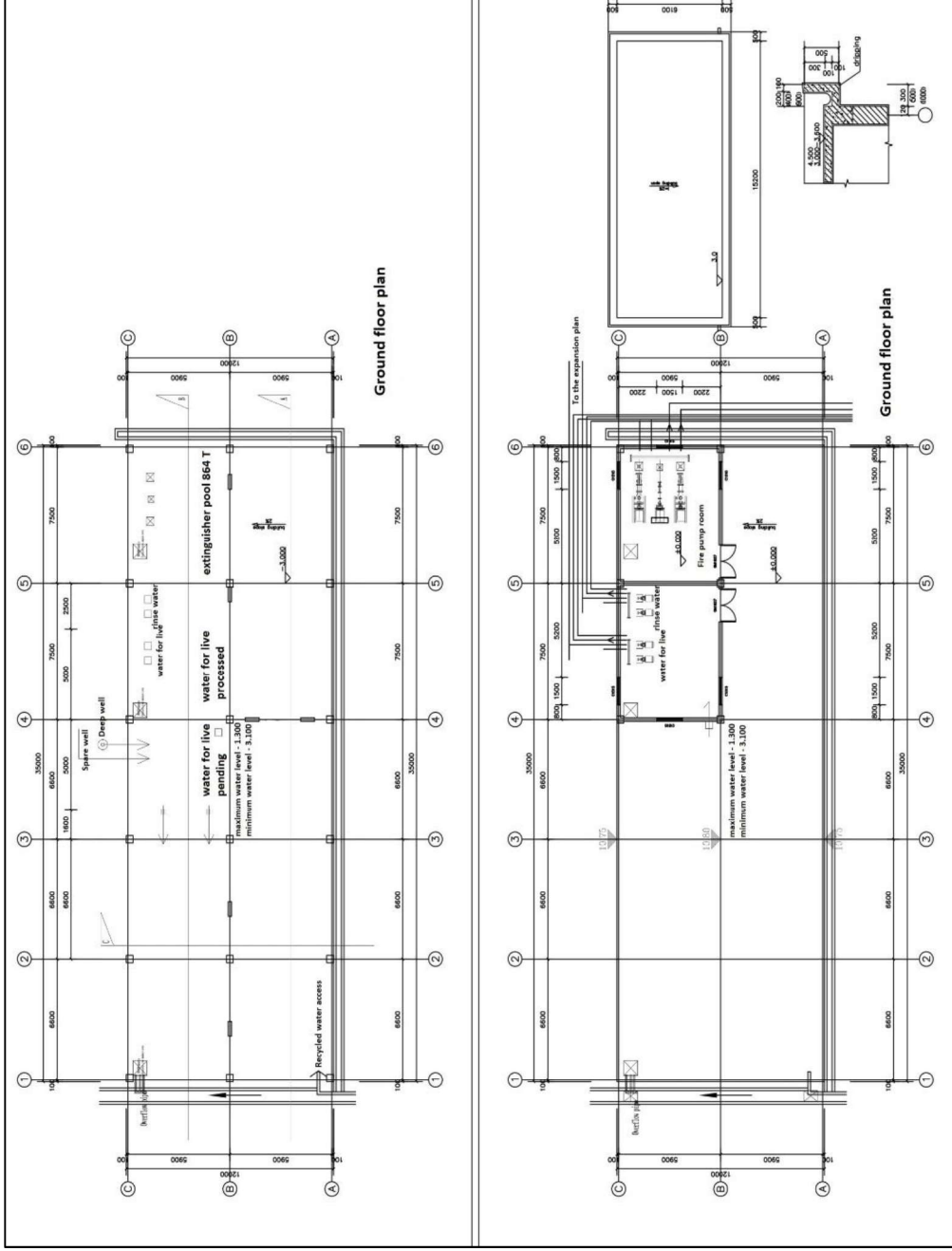
Guard House



Waste Storage Yard



Fire System Pool



APPENDIX E

Data from Department of Meteorology and Hydrology (2020)

DAILY RELAVTIVE HUMIDITY (%) at (06:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	91	100	91	100	96	100	100	100	100	100	100	91
2	91	100	91	100	92	100	100	100	100	100	100	96
3	86	90	86	100	92	100	100	100	100	100	100	96
4	100	90	91	96	92	100	100	100	100	100	100	71
5	96	100	100	100	92	100	100	100	96	100	100	87
6	100	100	100	100	92	100	100	100	100	100	100	87
7	91	100	100	96	92	100	100	100	100	100	100	96
8	91	100	96	100	92	100	100	100	100	92	100	100
9	91	95	100	100	92	100	100	100	100	100	100	100
10	100	91	100	96	92	100	100	100	100	100	100	96
11	100	91	100	100	92	100	100	100	100	100	100	91
12	100	72	100	100	92	100	100	92	100	92	100	97
13	100	91	100	100	93	100	100	100	100	92	96	91
14	100	90	100	100	92	100	100	100	100	92	100	91
15	91	100	100	100	92	100	100	100	100	100	100	91
16	91	100	100	100	92	100	95	100	100	100	100	96
17	100	100	100	100	92	100	100	100	100	100	100	96
18	100	100	100	100	96	100	100	100	100	100	100	96
19	95	100	100	100	100	100	100	100	100	100	100	91
20	100	82	100	100	100	100	100	92	100	100	100	91
21	91	91	100	100	100	100	100	100	100	100	100	91
22	91	91	100	100	100	100	100	100	100	100	100	100
23	90	100	100	100	92	100	100	100	100	100	100	95
24	100	91	91	100	92	100	100	100	100	100	91	95
25	100	91	100	92	92	100	100	100	100	100	92	82
26	100	86	100	96	92	100	100	100	100	100	91	96
27	100	82	100	92	92	100	100	100	100	100	91	96
28	100	91	100	100	92	100	100	100	100	100	91	96
29	100	91	100	96	100	100	100	92	100	100	91	96
30	90		100	96	100	100	100	92	100	100	100	95
31	100		100		92		100	92	100	100		100

Source: Department of Meteorology and Hydrology (2020)

DAILY RELAVTIVE HUMIDITY (%) at (09:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	74	79	68	94	66	93	93	85	82	93	93	76
2	65	74	50	77	65	82	88	93	92	93	93	80
3	70	53	61	74	61	82	89	92	79	92	85	81
4	74	56	64	70	50	89	100	100	85	92	92	70
5	79	73	100	71	55	93	88	92	96	92	82	66
6	76	82	76	79	66	89	92	96	93	85	79	73
7	74	82	83	70	66	85	85	92	89	85	82	79
8	74	74	76	74	61	96	96	93	93	79	84	79
9	66	60	69	65	71	89	85	85	79	92	79	71
10	78	61	76	71	66	100	85	93	82	84	77	72
11	65	58	76	70	66	92	93	92	100	79	73	74
12	65	50	76	77	61	84	93	93	82	83	67	72
13	62	59	83	70	45	82	100	92	84	92	81	76
14	74	74	74	71	61	82	92	96	85	92	74	72
15	67	100	83	79	45	93	89	96	85	92	77	70
16	74	100	84	70	50	100	89	100	85	100	79	79
17	74	86	83	78	66	96	92	96	85	85	77	80
18	59	96	80	79	64	96	92	92	85	79	88	77
19	59	75	70	70	100	92	93	96	100	84	65	83
20	62	54	92	71	96	92	100	100	100	84	83	70
21	71	54	77	49	93	85	93	92	92	88	74	69
22	82	68	87	66	85	96	93	92	100	81	76	87
23	82	62	76	71	78	89	84	96	88	82	83	82
24	82	62	50	71	71	89	100	92	88	88	83	70
25	61	60	68	50	71	85	79	100	85	85	84	70
26	65	54	76	65	72	96	85	93	84	79	76	69
27	95	61	83	68	66	100	93	96	93	92	76	80
28	77	67	92	65	78	96	96	93	93	92	76	76
29	82	54	84	59	79	89	100	85	93	71	77	69
30	65		81	71	85	85	93	93	100	84	83	69
31	74		79		85		85	85		84		70

Source: Department of Meteorology and Hydrology (2020)

DAILY RELATIVE HUMIDITY (%) at (12:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	53	36	35	46	43	66	100	72	78	100	71	50
2	53	39	32	42	43	66	85	81	82	92	66	58
3	59	28	35	46	43	64	85	85	72	78	78	52
4	59	27	38	42	39	66	100	93	70	92	65	70
5	54	25	38	38	36	78	75	92	78	92	66	50
6	52	46	35	50	33	96	85	74	66	79	63	53
7	57	33	47	40	48	100	85	85	79	78	72	56
8	53	43	49	42	48	89	79	78	100	85	78	54
9	43	33	38	42	48	75	81	85	71	79	71	46
10	45	43	41	52	40	78	71	85	69	61	53	53
11	46	31	42	47	45	79	72	92	85	72	57	46
12	46	22	41	46	49	96	74	100	71	71	53	46
13	46	26	41	45	37	75	88	85	82	79	61	53
14	43	50	42	44	37	72	93	88	100	79	61	53
15	38	50	42	43	40	100	79	82	74	72	65	43
16	42	58	46	40	33	82	79	85	68	79	63	46
17	41	40	42	46	48	88	85	78	72	81	61	50
18	36	41	37	46	96	85	79	85	72	65	54	50
19	34	40	45	38	93	89	71	84	100	77	56	54
20	42	31	50	36	96	75	78	92	100	77	56	50
21	41	34	44	30	85	82	85	79	93	71	53	60
22	49	34	39	26	62	89	93	92	85	71	53	41
23	42	35	39	33	52	71	79	84	78	66	59	42
24	38	31	23	38	61	71	71	84	79	71	65	42
25	27	30	41	32	46	72	44	84	79	63	59	34
26	34	28	31	41	52	75	76	78	71	65	65	54
27	50	34	28	45	52	96	72	79	71	79	49	54
28	40	39	45	51	62	100	71	71	71	71	53	56
29	38	39	50	55	61	71	100	72	85	71	59	43
30	35		61	49	72	66	72	85	92	71	53	42
31	36		46		79		71	78		100		44

Source: Department of Meteorology and Hydrology (2020)

DAILY RELATIVE HUMIDITY (%) at (18:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	70	56	43	34	77	88	100	85	96	92	89	79
2	80	46	42	41	70	81	100	85	75	92	85	79
3	77	44	46	41	71	89	100	100	82	100	85	71
4	80	30	47	46	43	100	100	100	78	100	93	70
5	67	30	47	47	35	80	92	88	85	92	93	75
6	70	39	53	42	39	96	85	96	89	92	85	67
7	69	46	48	34	40	96	92	85	82	85	84	77
8	69	42	49	43	39	92	75	93	100	92	100	77
9	69	47	41	55	48	96	71	93	96	93	84	73
10	65	51	44	45	35	100	85	100	84	84	92	70
11	76	36	38	42	48	96	100	92	84	85	84	69
12	54	36	39	42	48	89	100	100	96	85	80	73
13	61	32	43	43	52	100	100	100	89	79	81	70
14	69	39	34	45	46	100	88	92	92	84	89	77
15	62	55	39	42	43	100	100	92	79	82	84	72
16	69	56	50	42	56	89	100	100	84	93	84	74
17	58	55	43	44	66	96	100	100	100	93	88	70
18	56	40	35	34	82	96	93	100	85	92	84	75
19	69	53	49	39	85	100	71	100	92	88	83	65
20	57	42	49	43	100	92	84	92	100	100	83	74
21	53	43	54	38	100	100	82	100	100	77	83	77
22	70	53	38	36	66	96	93	100	100	84	83	62
23	57	53	40	36	66	89	100	100	100	100	92	54
24	70	42	34	42	61	89	66	100	100	84	83	63
25	40	42	39	40	56	84	66	84	100	100	84	59
26	58	41	40	47	61	100	79	96	100	84	84	75
27	48	46	43	70	84	100	85	85	79	96	77	75
28	57	46	52	65	100	100	79	79	85	84	92	70
29	48	38	58	68	93	100	92	78	92	85	92	67
30	53		58	62	85	96	100	85	92	100	84	63
31	60		50		92		85	89		100		64

Source: Department of Meteorology and Hydrology (2020)

DAILY RAINFALL (mm)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0	0	0	0	Trace	43	10	0	Trace	1	3	0
2	0	0	0	0	0	0	9	0	5	3	0	0
3	0	0	0	0	Trace	4	0	3	0	Trace	0	0
4	0	0	0	0	Trace	3	43	103	0	17	1	0
5	0	0	0	0	0	12	40	8	0	16	0	0
6	0	0	0	0	0	0	3	3	0	0	0	0
7	0	0	0	0	0	48	0	12	Trace	Trace	0	0
8	0	0	0	0	0	30	22	4	12	0	16	0
9	0	0	0	0	0	0	1	Trace	42	6	1	0
10	0	0	0	0	0	57	8	9	2	0	0	0
11	0	0	0	0	0	55	13	17	0	0	0	0
12	0	0	0	0	0	8	26	29	0	0	0	0
13	0	0	0	0	0	Trace	55	13	9	0	0	0
14	0	0	0	0	0	3	10	32	2	2	0	0
15	0	0	0	0	0	105	3	6	31	0	0	0
16	0	0	0	0	0	41	8	9	0	1	0	0
17	0	0	0	0	0	8	10	1	0	14	0	0
18	0	0	0	0	Trace	6	7	6	33	14	0	0
19	0	0	0	0	35	52	0	34	42	2	0	0
20	0	0	0	0	20	1	4	13	35	0	0	0
21	0	0	0	0	29	1	0	Trace	8	11	0	0
22	0	0	0	0	8	13	11	15	8	0	0	0
23	0	0	0	0	0	27	Trace	5	41	0	0	0
24	0	0	0	0	0	0	9	7	10	39	0	0
25	0	0	0	0	0	4	0	11	13	9	0	0
26	0	0	0	0	0	23	2	16	6	22	0	0
27	0	0	0	0	0	50	Trace	18	36	Trace	0	0
28	0	0	0	0	0	20	0	25	7	1	0	0
29	0	0	0	0	15	31	9	0	4	0	0	0
30	0		0	0	2	0	5	0	51	Trace	0	0
31	0		0		0		4	0		Trace		0

"Trace" : The amounts of rainfall which cannot be measured

"1mm" = 0.04 inch

Source: Department of Meteorology and Hydrology

DAILY MAXIMUM TEMPERATURE (°C)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	33.6	34.4	38.0	38.8	38.8	34.2	29.5	32.8	33.0	29.5	33.5	32.9
2	33.0	35.5	37.5	39.0	38.5	35.5	32.0	31.8	32.0	30.0	33.6	33.3
3	35.0	34.0	36.3	40.0	39.0	35.5	31.2	31.0	34.0	32.0	34.0	33.7
4	34.0	32.5	35.5	40.0	40.0	34.5	28.0	29.7	34.5	28.5	33.2	32.8
5	34.8	33.5	36.0	39.5	41.2	33.5	31.5	29.5	32.7	24.6	33.0	32.3
6	34.0	34.2	35.7	38.5	41.0	32.0	30.5	32.5	33.8	32.0	34.2	32.0
7	32.5	35.7	35.0	39.8	41.0	31.5	31.7	31.0	33.3	33.5	34.3	32.4
8	34.0	35.5	36.0	37.5	39.5	30.7	32.6	32.2	33.5	31.5	34.0	31.8
9	35.0	35.5	37.5	38.0	40.0	32.8	32.8	31.5	33.6	31.5	32.8	31.3
10	33.5	5.0	36.0	38.2	41.5	32.5	33.5	32.0	32.8	33.0	32.5	32.2
11	33.2	36.5	37.0	39.5	41.0	30.5	33.5	31.0	31.5	33.7	33.0	31.8
12	32.5	36.0	37.5	39.0	41.0	32.0	33.0	29.0	33.7	33.0	33.0	31.8
13	32.7	34.0	38.0	38.0	41.2	33.7	29.5	30.0	32.0	32.0	33.5	32.0
14	34.0	32.0	39.5	39.5	39.5	33.0	29.2	29.0	31.5	31.5	34.0	32.6
15	34.0	33.0	39.5	39.0	41.0	29.5	32.0	30.2	33.0	34.5	34.0	33.4
16	34.3	33.8	39.0	40.0	40.7	31.0	32.5	31.0	34.0	32.5	34.0	34.2
17	35.2	34.0	38.5	38.0	40.0	29.7	32.2	32.0	34.2	33.0	34.0	33.3
18	35.0	35.2	38.5	39.0	34.3	30.5	32.0	30.5	33.5	33.2	34.5	33.4
19	34.8	35.2	37.3	40.0	29.8	29.7	33.0	31.0	31.0	30.0	34.0	33.3
20	35.0	35.6	36.5	40.8	31.0	31.0	33.5	29.0	27.5	30.0	32.5	32.8
21	35.5	36.0	36.4	40.5	32.0	32.3	32.0	32.0	29.0	32.2	33.2	30.5
22	34.5	35.6	37.0	40.8	35.5	32.0	30.5	30.0	31.4	33.3	33.0	30.5
23	35.0	36.3	38.5	41.0	36.5	32.8	33.0	29.5	33.2	33.5	33.5	30.8
24	34.5	36.4	37.3	39.5	35.0	33.7	34.0	30.6	30.6	31.5	33.0	31.4
25	30.5	36.6	38.0	40.2	37.0	33.0	34.7	30.5	32.0	34.0	33.5	33.8
26	30.0	35.2	36.5	39.4	37.5	32.5	34.0	32.5	33.0	34.5	33.5	34.2
27	30.0	34.0	36.5	36.2	38.0	30.0	32.8	32.0	32.5	33.0	34.0	34.0
28	30.5	35.6	36.0	37.0	35.5	27.0	32.0	32.0	33.2	32.0	33.5	33.2
29	32.5	37.0	36.0	33.0	34.5	32.0	30.6	33.5	29.5	33.5	33.0	33.4
30	34.6		35.8	37.0	33.5	33.0	32.2	33.5	29.3	31.3	33.0	33.2
31	34.2		37.0		34.0		33.0	33.0		29.0		32.5

Source: Department of Meteorology and Hydrology (2020)

DAILY MINIMUM TEMPERATURE (°C)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	17.0	16.5	18.0	22.0	23.8	24.0	24.5	23.8	24.0	23.7	23.5	20.5
2	16.2	17.0	16.5	22.8	22.6	24.0	23.0	25.8	24.8	23.5	24.0	20.5
3	17.6	15.2	19.0	23.0	24.4	24.8	24.0	24.5	23.0	23.5	23.7	20.4
4	17.0	14.2	19.5	23.0	23.8	24.0	22.5	24.0	23.8	24.0	24.3	21.4
5	17.0	10.4	20.2	22.0	24.0	23.8	23.5	24.0	25.3	23.0	22.5	19.5
6	17.8	12.6	20.5	22.1	25.0	23.0	22.0	23.8	24.7	23.0	23.7	19.3
7	16.7	13.0	20.5	23.5	24.0	24.5	23.5	23.5	25.0	22.9	23.5	19.0
8	15.4	16.0	20.8	24.0	25.2	23.5	24.5	24.0	23.3	24.3	22.5	17.2
9	16.2	16.5	19.5	23.5	24.3	23.5	24.0	24.0	23.2	23.5	22.5	17.2
10	14.5	17.9	19.0	24.0	25.2	23.5	24.0	24.0	23.3	23.5	22.0	16.3
11	13.0	18.0	17.0	22.0	25.2	23.0	25.0	23.7	24.0	24.0	21.1	17.3
12	14.5	17.2	19.3	22.5	25.0	23.5	24.0	24.0	24.0	23.4	20.5	15.5
13	13.0	16.2	19.7	23.5	25.8	24.2	24.0	23.6	23.5	24.0	23.5	15.8
14	13.3	14.2	20.0	24.0	23.8	23.7	23.0	22.8	24.2	23.4	24.0	16.0
15	16.5	13.0	19.5	24.0	24.8	23.5	23.8	23.0	23.6	22.9	21.5	15.5
16	16.0	16.5	23.8	23.0	25.3	23.5	24.2	22.6	24.0	25.0	21.7	18.3
17	12.6	14.0	22.3	24.2	26.0	23.0	24.2	22.8	24.5	23.5	21.5	18.0
18	11.6	14.0	22.5	23.0	25.0	23.0	23.5	24.0	25.5	23.5	21.2	18.5
19	13.0	17.5	19.4	21.5	23.5	22.5	25.0	22.2	23.5	22.5	18.2	19.0
20	14.2	16.4	22.2	23.0	23.2	23.0	24.6	22.0	23.8	22.5	18.5	20.5
21	16.7	16.4	22.0	23.5	23.5	23.5	25.0	23.5	23.5	23.0	16.0	19.0
22	13.0	17.5	19.4	24.0	22.6	23.5	23.7	23.6	23.7	23.5	18.0	16.5
23	14.0	17.5	19.5	24.0	25.2	24.0	23.9	23.5	22.8	23.0	19.0	15.5
24	13.0	18.5	17.0	22.0	24.7	24.8	23.8	23.5	23.8	23.3	21.4	13.8
25	11.0	17.0	17.2	23.0	24.0	24.7	25.0	23.0	24.0	23.5	21.8	14.8
26	10.0	18.0	19.4	24.5	25.4	24.5	25.8	22.4	23.8	24.8	20.4	16.4
27	10.0	17.0	18.0	23.0	25.4	23.3	25.0	23.6	23.7	23.3	20.5	18.8
28	9.3	17.0	19.5	23.0	25.0	22.5	24.6	23.8	23.9	23.5	20.5	18.5
29	10.4	17.0	19.0	23.0	24.2	23.0	23.2	24.6	23.6	24.0	20.6	18.0
30	13.4		23.0	24.2	23.8	24.0	23.5	25.0	23.5	23.8	20.3	14.8
31	16.4		22.8		24.0		24.0	24.0		23.0		16.0

Source: Department of Meteorology and Hydrology (2020)

DAILY WIND SPEED (mph) at (06:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	1.2
2	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	3.6	0.0	0.0
4	0.0	2.4	0.0	0.0	0.0	2.4	0.0	3.6	2.4	0.0	4.8	2.4
5	0.0	0.0	2.4	3.6	0.0	0.0	0.0	3.6	0.0	0.0	0.0	2.4
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
7	3.6	0.0	2.4	3.6	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	1.2
10	0.0	0.0	0.0	2.4	0.0	2.4	0.0	0.0	0.0	0.0	0.0	1.2
11	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	2.4	0.0	0.0	0.0	3.6	0.0	0.0	2.4	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	2.4	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0
15	0.0	0.0	2.4	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	1.2
16	0.0	0.0	3.6	0.0	0.0	2.4	0.0	2.4	0.0	0.0	0.0	0.0
17	0.0	2.4	2.4	0.0	0.0	4.8	0.0	0.0	0.0	3.6	0.0	0.0
18	0.0	0.0	6.0	0.0	0.0	2.4	0.0	3.6	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	3.6	0.0	0.0	3.6	0.0	2.4	0.0	0.0
20	0.0	0.0	0.0	0.0	4.8	2.4	0.0	0.0	3.6	6.0	0.0	2.4
21	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0	3.6	4.8	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	1.2
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	2.4	0.0	0.0
24	0.0	2.4	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0
25	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	3.6	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	2.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0		4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
31	0.0		2.4		0.0		0.0	0.0		0.0	0.0	0.0

Source: Department of Meteorology and Hydrology (2020)

DAILY WIND SPEED (mph) at (09:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	4.8	0.0	3.6	2.4	3.6	3.6	3.6	3.6	8.4	3.6	1.2
2	6.0	3.6	0.0	2.4	6.0	3.6	2.4	3.6	0.0	0.0	0.0	3.6
3	2.4	3.6	2.4	3.6	0.0	3.6	4.8	8.4	3.6	6.0	3.6	1.2
4	0.0	4.8	2.4	2.4	3.6	3.6	3.6	3.6	3.6	6.0	6.0	3.6
5	1.2	2.4	0.0	6.0	2.4	2.4	3.6	3.6	0.0	0.0	3.6	2.4
6	0.0	2.4	6.0	6.0	2.4	2.4	2.4	3.6	2.4	0.0	2.4	2.4
7	6.0	6.0	3.6	2.4	2.4	3.6	3.6	6.0	3.6	0.0	2.4	2.4
8	0.0	3.6	6.0	4.8	2.4	3.6	0.0	0.0	3.6	2.4	2.4	1.2
9	2.4	2.4	2.4	6.0	6.0	6.0	3.6	3.6	6.0	2.4	2.4	2.4
10	2.4	2.4	3.6	6.0	3.6	7.2	4.8	3.6	3.6	3.6	3.6	1.2
11	2.4	2.4	3.6	6.0	6.0	4.8	2.4	0.0	3.6	3.6	2.4	1.2
12	2.4	2.4	6.0	4.8	3.6	4.8	3.6	4.8	3.6	3.6	2.4	1.2
13	2.4	6.0	6.0	4.8	7.2	2.4	2.4	6.0	3.6	6.0	2.4	1.2
14	2.4	9.6	2.4	3.6	3.6	3.6	4.8	6.0	3.6	6.0	3.6	1.2
15	0.0	2.4	2.4	4.8	4.8	3.6	3.6	3.6	3.6	3.6	2.4	2.4
16	2.4	3.6	0.0	3.6	4.8	2.4	2.4	3.6	3.6	3.6	2.4	2.4
17	2.4	4.8	3.6	4.8	2.4	3.6	3.6	6.0	2.4	0.0	2.4	2.4
18	2.4	2.4	2.4	3.6	6.0	3.6	2.4	3.6	2.4	4.8	2.4	1.2
19	2.4	3.6	0.0	2.4	6.0	3.6	3.6	6.0	3.6	6.0	3.6	0.0
20	2.4	3.6	6.0	4.8	7.2	2.4	0.0	0.0	2.4	4.8	2.4	1.2
21	4.8	2.4	3.6	2.4	3.6	3.6	0.0	0.0	3.6	7.2	2.4	1.2
22	6.0	4.8	2.4	6.0	3.6	3.6	2.4	6.0	0.0	6.0	0.0	2.4
23	0.0	2.4	3.6	2.4	6.0	3.6	2.4	6.0	0.0	8.4	0.0	1.2
24	6.0	0.0	2.4	3.6	6.0	2.4	0.0	9.6	0.0	6.0	0.0	1.2
25	2.4	4.8	0.0	3.6	3.6	3.6	0.0	0.0	3.0	3.6	0.0	1.2
26	2.4	3.6	3.6	6.0	6.0	3.6	2.4	6.0	2.4	3.6	0.0	1.2
27	1.2	0.0	2.4	3.6	6.0	2.4	2.4	2.4	0.0	0.0	0.0	2.4
28	4.8	3.6	2.4	2.4	6.0	3.6	2.4	7.2	0.0	3.6	3.6	1.2
29	0.0	3.6	2.4	4.8	3.6	2.1	4.8	3.6	2.4	0.0	3.6	2.4
30	0.0		4.8	3.6	6.0	3.6	3.6	0.0	0.0	0.0	0.0	3.6
31	2.4		4.8		0.0		0.0	3.6		3.6		1.2

Source: Department of Meteorology and Hydrology (2020)

DAILY WIND SPEED (mph) at (12:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	0.0	3.6	2.4	3.6	3.6	2.4	6.0	7.2	0.0	4.8	2.4
2	3.6	2.4	3.6	4.8	8.4	3.6	3.6	6.0	6.0	0.0	3.6	1.2
3	4.8	6.0	3.6	4.8	6.0	2.4	6.0	6.0	4.8	6.0	3.6	1.2
4	2.4	3.6	4.8	4.8	6.0	2.4	2.4	8.4	3.6	4.8	3.6	4.8
5	3.6	6.0	6.0	2.4	4.8	2.4	6.0	4.8	2.4	3.6	2.4	3.6
6	3.6	3.6	9.6	6.0	6.0	3.6	6.0	6.0	6.0	3.6	3.6	1.2
7	4.8	4.8	3.6	2.4	6.0	3.6	2.4	3.6	2.4	0.0	3.6	2.4
8	0.0	2.4	6.0	4.8	2.4	6.0	3.6	3.6	6.0	0.0	2.4	1.2
9	3.6	3.6	3.6	6.0	3.6	8.4	6.0	0.0	7.2	3.6	7.2	1.2
10	2.4	6.0	4.8	7.2	9.6	6.0	6.0	7.2	3.6	9.6	6.0	2.4
11	3.6	4.8	3.6	7.2	8.4	4.8	0.0	8.4	7.2	6.0	3.6	1.2
12	2.4	6.0	7.2	6.0	3.6	6.0	4.8	0.0	3.6	6.0	4.8	1.2
13	2.4	6.0	3.6	3.6	7.2	1.2	3.6	6.0	4.8	6.0	3.6	1.2
14	7.2	10.2	2.4	6.0	6.0	3.6	3.6	8.4	3.6	9.6	3.6	3.6
15	2.4	3.6	4.8	6.0	6.0	3.6	4.8	7.2	3.6	6.0	3.6	1.2
16	2.4	6.0	3.6	6.0	6.0	3.6	4.8	6.0	4.8	3.6	2.4	3.6
17	2.4	6.0	3.6	4.8	6.0	3.6	4.8	9.6	4.8	2.4	3.6	1.2
18	3.6	4.8	3.6	3.6	4.8	4.8	3.6	6.0	3.6	3.6	3.6	1.2
19	3.6	4.8	9.6	6.0	6.0	2.4	3.6	4.8	3.6	7.2	3.6	2.4
20	3.6	3.6	6.0	6.0	2.4	2.4	2.4	0.0	0.0	7.2	3.6	1.2
21	4.8	6.0	4.8	6.0	6.0	2.4	3.6	0.0	4.8	8.4	2.4	1.2
22	3.6	6.0	3.6	4.8	6.0	2.4	3.6	6.0	2.4	8.4	0.0	3.6
23	2.4	6.0	6.0	4.8	3.6	3.6	3.6	7.2	4.8	7.2	4.8	1.2
24	4.8	4.8	6.0	4.8	3.6	3.6	3.6	4.8	6.0	7.2	3.6	1.2
25	4.8	3.6	4.8	4.8	6.0	3.6	3.6	6.0	7.2	3.6	2.4	3.6
26	3.6	4.8	9.6	4.8	9.6	3.6	3.6	6.0	4.8	4.8	3.6	1.2
27	2.4	4.8	7.2	2.4	3.6	2.4	3.6	6.0	2.4	2.4	6.0	2.4
28	6.0	2.4	8.4	6.0	6.0	2.4	3.6	8.4	2.4	3.6	6.0	1.2
29	2.4	2.4	3.6	7.2	0.0	3.6	0.0	6.0	3.6	4.8	3.6	2.4
30	2.4		4.8	4.8	6.0	3.6	2.4	2.4	3.6	4.8	3.6	3.6
31	3.6		6.0		9.6		0.0	6.0		0.0		4.8

Source: Department of Meteorology and Hydrology (2020)

DAILY WIND SPEED (mph) at (18:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	0.0	0.0	7.2	3.6	0.0	0.0	3.6	0.0	0.0	0.0	0.0
2	0.0	0.0	3.6	2.4	6.0	2.4	0.0	6.0	3.6	0.0	0.0	0.0
3	0.0	0.0	4.8	7.2	6.0	0.0	2.4	3.6	2.4	0.0	0.0	0.0
4	0.0	0.0	4.8	7.2	8.6	0.0	0.0	4.8	0.0	0.0	0.0	0.0
5	0.0	0.0	3.6	3.6	6.0	3.6	0.0	4.8	2.4	0.0	0.0	1.2
6	0.0	0.0	3.6	2.4	9.6	0.0	0.0	3.6	3.6	0.0	0.0	0.0
7	0.0	0.0	2.4	0.0	6.0	2.4	0.0	2.4	12.0	0.0	0.0	0.0
8	0.0	0.0	3.6	2.4	3.6	0.0	0.0	0.0	3.6	0.0	0.0	1.2
9	0.0	0.0	4.8	3.6	6.0	2.4	3.6	0.0	3.6	0.0	0.0	0.0
10	0.0	0.0	0.0	4.8	7.2	6.0	0.0	0.0	0.0	0.0	0.0	2.4
11	0.0	2.4	3.6	4.8	6.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	3.6	0.0	4.8	9.6	2.4	0.0	0.0	0.0	0.0	0.0	1.2
13	0.0	6.0	3.6	0.0	8.4	3.6	0.0	3.6	0.0	0.0	0.0	1.2
14	0.0	3.6	2.4	0.0	9.6	6.0	0.0	8.4	0.0	0.0	0.0	1.2
15	0.0	0.0	3.6	3.6	3.6	3.6	0.0	3.6	3.6	0.0	0.0	0.0
16	0.0	0.0	8.4	0.0	8.4	3.6	0.0	3.6	3.6	4.8	0.0	0.0
17	0.0	3.6	6.0	0.0	6.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0
18	0.0	3.6	6.0	3.6	4.8	2.4	0.0	3.6	7.2	0.0	0.0	0.0
19	0.0	0.0	6.0	3.6	6.0	7.2	0.0	0.0	0.0	6.0	0.0	1.2
20	2.4	0.0	3.6	2.4	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0
21	0.0	0.0	0.0	2.4	2.4	4.8	0.0	0.0	0.0	2.4	0.0	0.0
22	0.0	0.0	4.8	3.6	0.0	2.4	0.0	0.0	0.0	3.6	0.0	0.0
23	0.0	0.0	3.6	2.4	3.6	0.0	6.0	3.6	0.0	3.6	0.0	0.0
24	0.0	0.0	3.6	3.6	0.0	2.4	3.6	0.0	4.8	0.0	0.0	1.2
25	0.0	0.0	0.0	9.6	3.6	3.6	4.8	2.4	0.0	0.0	0.0	0.0
26	2.4	0.0	4.8	7.2	6.0	2.4	2.4	0.0	0.0	3.6	0.0	1.2
27	2.4	0.0	3.6	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
28	0.0	0.0	3.6	2.4	0.0	3.6	4.8	6.0	0.0	0.0	0.0	2.4
29	0.0	2.4	6.0	2.4	7.2	4.8	0.0	0.0	3.6	0.0	0.0	1.2
30	0.0		4.8	9.6	3.6	7.2	2.4	0.0	0.0	0.0	0.0	0.0
31	0.0		4.8		0.0		4.8	2.4		0.0		0.0

Source: Department of Meteorology and Hydrology (2020)

DAILY WIND DIRECTION at (06:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	SE	Calm	NW
2	Calm	Calm	Calm	SW	Calm	Calm	Calm	Calm	E	Calm	Calm	Calm
3	Calm	Calm	Calm	Calm	Calm	Calm	Calm	SW	Calm	E	Calm	Calm
4	Calm	NW	Calm	Calm	Calm	SE	Calm	SE	E	Calm	E	N
5	Calm	Calm	W	E	Calm	Calm	Calm	SW	Calm	Calm	Calm	NE
6	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	NE
7	E	Calm	SW	SW	Calm	Calm	Calm	SW	Calm	Calm	Calm	Calm
8	Calm	Calm	Calm	Calm	Calm	WSW	Calm	Calm	Calm	Calm	Calm	Calm
9	Calm	Calm	Calm	Calm	Calm	E	Calm	Calm	Calm	Calm	Calm	N
10	Calm	Calm	Calm	SE	Calm	SE	Calm	Calm	Calm	Calm	Calm	NW
11	Calm	Calm	Calm	Calm	Calm	SW	Calm	Calm	Calm	Calm	Calm	Calm
12	Calm	NW	Calm	Calm	Calm	SE	Calm	Calm	NE	Calm	Calm	Calm
13	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm
14	Calm	SW	Calm	Calm	Calm	Calm	Calm	SE	Calm	Calm	Calm	Calm
15	Calm	Calm	E	Calm	Calm	Calm	Calm	SE	Calm	Calm	Calm	NW
16	Calm	Calm	SW	Calm	Calm	SE	Calm	SE	Calm	Calm	Calm	Calm
17	Calm	E	E	Calm	Calm	SW	Calm	Calm	Calm	SW	Calm	Calm
18	Calm	Calm	W	Calm	Calm	SE	Calm	SE	Calm	Calm	Calm	Calm
19	Calm	Calm	Calm	Calm	SE	Calm	Calm	E	Calm	E	Calm	Calm
20	Calm	Calm	Calm	Calm	E	SE	Calm	Calm	E	E	Calm	N
21	Calm	Calm	Calm	Calm	E	Calm	Calm	Calm	E	SE	Calm	Calm
22	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	SE	Calm	E
23	Calm	Calm	Calm	Calm	Calm	Calm	Calm	SW	Calm	E	Calm	Calm
24	Calm	E	Calm	Calm	Calm	Calm	Calm	SW	Calm	Calm	Calm	Calm
25	Calm	E	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm
26	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm
27	Calm	Calm	Calm	WNW	Calm	WSW	Calm	Calm	Calm	Calm	Calm	Calm
28	Calm	Calm	SW	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm
29	Calm	Calm	Calm	E	E	Calm	Calm	Calm	Calm	Calm	Calm	Calm
30	Calm		SE	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	W
31	Calm		S		Calm		Calm	Calm		Calm		Calm

Source: Department of Meteorology and Hydrology (2020)

DAILY WIND DIRECTION at (09:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	Calm	SE	Calm	SW	SW	SW	SE	SW	SE	SE	SE	NW
2	NW	E	Calm	SW	SW	SW	SE	SW	Calm	Calm	Calm	N
3	N	NE	NW	SE	Calm	SW	SE	SW	E	E	SE	NW
4	Calm	W	SW	SE	W	SW	SE	SW	E	E	SE	E
5	NE	E	Calm	SE	SW	SW	SW	SW	Calm	Calm	SE	NE
6	Calm	E	SW	S	S	WSW	E	E	SW	Calm	NE	E
7	NW	E	W	SW	S	W	SE	SW	W	Calm	N	NE
8	Calm	SE	SE	SE	SE	E	Calm	Calm	E	N	S	NW
9	N	NE	E	SE	SE	SE	W	SE	SW	N	NE	NW
10	NW	NW	SW	SE	SE	E	SW	SE	E	E	E	NW
11	N	N	SE	SE	S	SE	SW	Calm	E	E	NE	N
12	NW	NW	E	SW	E	SE	SW	E	SE	E	NE	W
13	SE	SW	E	SW	S	SW	SE	S	SE	E	NW	NW
14	SE	W	SE	SE	SW	SW	SE	SW	SE	E	NE	N
15	Calm	E	SE	SW	SW	SW	SE	SE	SE	E	NE	NW
16	E	E	Calm	W	W	SE	W	SE	S	NE	NW	NW
17	SE	SE	E	SE	SW	W	SW	SW	NW	Calm	NE	NW
18	E	E	W	SW	SE	SW	SW	SE	W	NE	NE	NW
19	NW	E	Calm	SW	E	SW	W	SE	W	NE	N	Calm
20	NE	E	S	E	E	W	Calm	Calm	SE	SE	NE	NW
21	E	N	SE	SE	E	SE	Calm	Calm	SE	E	N	N
22	E	E	SE	SE	E	E	SW	W	Calm	SE	Calm	N
23	Calm	E	SE	W	W	SW	W	W	Calm	SE	Calm	NW
24	E	Calm	NW	W	W	SW	Calm	SW	Calm	SE	Calm	NW
25	W	E	Calm	W	W	SW	Calm	Calm	SW	SE	Calm	NW
26	SE	NE	SW	E	W	E	E	SW	SE	SW	Calm	NE
27	W	Calm	SW	E	S	SW	SE	SW	Calm	Calm	Calm	NE
28	E	NW	SW	E	S	E	SE	W	Calm	NE	E	SE
29	Calm	E	SE	SE	E	SW	SE	W	SE	Calm	NE	W
30	Calm		SW	SE	E	SW	SE	Calm	Calm	Calm	Calm	NW
31	SE		SE		Calm		Calm	E		SE		NW

Source: Department of Meteorology and Hydrology (2020)

DAILY WIND DIRECTION at (12:30) hrs MST

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	Calm	Calm	E	SE	E	S	SE	SW	E	Calm	SE	N
2	N	NW	W	SW	SW	W	SW	SW	SE	Calm	SE	NE
3	E	NW	NW	SW	W	W	SW	W	E	E	SW	N
4	NW	SW	SW	SW	NW	SW	E	SW	SE	E	SE	E
5	E	S	SW	E	SW	SW	SW	SE	W	E	SW	E
6	N	SE	SW	SE	S	SE	E	SW	SW	SW	NE	NE
7	NE	SE	SW	NNW	SE	E	SE	SW	W	Calm	SE	E
8	Calm	NE	SE	SW	SE	SE	SW	SW	SE	Calm	NE	N
9	N	NW	NW	SW	SW	SE	SW	Calm	SW	N	E	NW
10	N	N	SE	W	SE	E	SW	SW	SW	E	E	NW
11	N	NW	SE	SW	SE	SE	Calm	SW	SE	E	NE	W
12	W	W	E	SW	S	SE	SW	Calm	NE	E	N	NW
13	W	W	SE	W	W	W	SE	SE	E	E	N	N
14	SW	W	W	SW	SW	SW	SE	SW	NE	E	E	N
15	N	N	SW	W	SW	W	SE	SW	SW	E	NE	NW
16	N	E	S	SW	W	SW	SE	SW	W	NE	NW	N
17	W	SE	SE	S	SW	S	W	SW	W	NE	NE	NW
18	NE	SW	E	SW	SE	SW	SW	SW	NW	E	NE	NW
19	NE	NW	E	SW	E	SW	SW	S	W	E	NW	E
20	NW	W	SW	SW	E	SE	SW	Calm	Calm	SE	NW	NW
21	N	E	SE	SW	E	SE	W	Calm	SE	SE	N	NW
22	NW	SE	S	W	SW	SW	SW	W	SW	E	Calm	NE
23	W	SE	SE	SE	W	SW	SE	W	W	SE	N	N
24	NE	E	W	SE	W	SW	W	SW	SW	SE	E	NW
25	NW	SW	E	SW	W	SW	SW	SW	SW	SE	E	E
26	W	NW	SW	SW	W	SW	E	SW	SW	SW	N	E
27	N	N	SW	E	S	SW	SW	W	N	E	E	W
28	E	SE	S	SE	S	W	SW	WSW	NW	E	E	NW
29	E	SE	W	SW	Calm	SW	Calm	SW	E	SW	NE	E
30	E		SW	SW	E	W	N	W	SE	E	N	NW
31	SSW		S		E		Calm	E		Calm		E

Source: Department of Meteorology and Hydrology (2020)

DAILY WIND DIRECTION at (18:30) hrs MST




DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	Calm	Calm	Calm	SW	SW	Calm	Calm	SW	Calm	Calm	Calm	Calm
2	Calm	Calm	W	SW	SW	SW	Calm	SW	SW	Calm	Calm	Calm
3	Calm	Calm	W	SW	SW	Calm	SW	SE	SW	Calm	Calm	Calm
4	Calm	Calm	S	SW	W	Calm	Calm	S	Calm	Calm	Calm	Calm
5	Calm	Calm	SW	SW	SW	SW	Calm	SE	SW	Calm	Calm	W
6	Calm	Calm	SW	SW	SW	Calm	Calm	SW	SW	Calm	Calm	Calm
7	Calm	Calm	SW	Calm	SW	S	Calm	W	SW	Calm	Calm	Calm
8	Calm	Calm	SW	SW	S	Calm	Calm	Calm	SW	Calm	Calm	NW
9	Calm	Calm	W	W	SE	SE	SW	Calm	W	Calm	Calm	Calm
10	Calm	Calm	Calm	SW	SW	SW	Calm	Calm	Calm	Calm	Calm	W
11	Calm	W	SW	SW	SW	E	Calm	Calm	Calm	Calm	Calm	Calm
12	Calm	SW	Calm	SW	SW	SW	Calm	Calm	Calm	Calm	Calm	NW
13	Calm	W	S	Calm	S	SW	Calm	SW	Calm	Calm	Calm	W
14	Calm	W	SW	Calm	SW	W	Calm	SW	Calm	Calm	Calm	NW
15	Calm	Calm	SW	SW	SW	W	Calm	S	SW	Calm	Calm	Calm
16	Calm	Calm	S	Calm	SW	SW	Calm	SE	W	SW	Calm	Calm
17	Calm	SW	SW	Calm	SW	SW	Calm	SE	Calm	Calm	Calm	Calm
18	Calm	SW	SW	SW	E	SW	Calm	E	W	Calm	Calm	Calm
19	Calm	Calm	S	SW	S	SW	Calm	Calm	Calm	SE	Calm	NW
20	W	Calm	S	SW	Calm	Calm	Calm	Calm	SW	Calm	Calm	Calm
21	Calm	Calm	Calm	SW	E	SW	Calm	Calm	Calm	SE	Calm	Calm
22	Calm	Calm	SW	SW	Calm	E	Calm	Calm	Calm	SE	Calm	Calm
23	Calm	Calm	SW	SW	SW	Calm	W	W	Calm	SW	Calm	Calm
24	Calm	Calm	SW	SSW	Calm	SW	W	Calm	SW	Calm	Calm	NW
25	Calm	Calm	Calm	WSW	W	SW	SW	SW	Calm	Calm	Calm	Calm
26	W	Calm	SW	SW	W	SW	SW	Calm	Calm	SW	Calm	W
27	W	Calm	S	SW	Calm	Calm	Calm	Calm	Calm	Calm	Calm	W
28	Calm	Calm	SW	SW	Calm	SW	S	SW	Calm	Calm	Calm	W
29	Calm	W	SW	W	S	W	Calm	Calm	SE	Calm	Calm	W
30	Calm		SW	SW	SW	SW	W	Calm	Calm	Calm	Calm	Calm
31	Calm		SW		Calm		SE	SW		Calm		Calm

Source: Department of Meteorology and Hydrology (2020)

APPENDIX F

Materials Safety Data Sheets

Chemical Name : 111PD

	<p>化学品安全技术说明书 Safety Data Sheet</p>																		
<p>1: 化学品及企业标识Chemical Product and Company Identification</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 40%;"> 化学品名称Chemical Name: </td> <td style="width: 30%; text-align: center;"> 111PD </td> <td style="width: 30%; text-align: center;"> 鞋用处理剂 </td> </tr> <tr> <td colspan="3"> 公司信息company information: </td> </tr> <tr> <td colspan="3"> 名称Name: 南宝国际NanPao International </td> </tr> <tr> <td colspan="3"> 地址Address: 广东省东莞市黄江镇Huangjiang town, Dongguan city, Guangdong Province 广东省佛山市三水区乐平镇Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇Yangxia town, Fuqing city, Fujian Province </td> </tr> <tr> <td colspan="3"> 电话TEL: 0769-83364815 (东莞DongGuan) 传真Fax: 0769-83662303 (东莞DongGuan) 0757-87393000 (佛山FoShan) 0757-87393009 (佛山FoShan) 0591-85291391 (福清Fuqing) 0591-85291570 (福清Fuqing) </td> </tr> <tr> <td colspan="3"> 国家应急咨询电话National Consulting hotline for Chemical Accidents & Emergencies: 0532-83889090 </td> </tr> </table>		化学品名称Chemical Name:	111PD	鞋用处理剂	公司信息company information:			名称Name: 南宝国际NanPao International			地址Address: 广东省东莞市黄江镇Huangjiang town, Dongguan city, Guangdong Province 广东省佛山市三水区乐平镇Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇Yangxia town, Fuqing city, Fujian Province			电话TEL: 0769-83364815 (东莞DongGuan) 传真Fax: 0769-83662303 (东莞DongGuan) 0757-87393000 (佛山FoShan) 0757-87393009 (佛山FoShan) 0591-85291391 (福清Fuqing) 0591-85291570 (福清Fuqing)			国家应急咨询电话National Consulting hotline for Chemical Accidents & Emergencies: 0532-83889090		
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<p>2: 危险性概述Hazards Summarizing</p> <p>应急综述Emergency Overview: 高度易燃Highly flammable</p> <p>危险性类别Product Hazard Class: 易燃液体级别Flammable liquid class : 2 严重损伤/刺激眼睛级别Serious injury/irritate eyes class : 2 特异性靶器官毒性—一次接触Specific target organ toxicity - a contact class: 3(麻醉效应anesthesia effect)</p> <p>象形图Pictograms: 火焰 Fire 惊叹号 Exclamation mark</p> <div style="text-align: center;">   </div> <p>警示词Warning label: 危险Danger</p> <p>危险信息Warning For Hazard: H225 易燃液体和蒸气 Flammable liquid and vapour H319 造成严重眼刺激 Causes serious eye irritation H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness</p> <p>防范措施Prevention Measures: P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking P233 保持容器密封 Keep container tightly closed P264 作业后彻底清洗双手 Wash hands thoroughly after handling P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product P280 戴防护手套/戴防护眼罩/戴防护面具。Wear protective gloves/protective clothing/eye protection /face protection</p> <p>事故响应Response: P301 + P312 + P330+P331 如果吞咽: 漱口。不要催吐。如果感觉不适: 立即呼叫解毒中心或就医。If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell. P303 + P361 + P353 如果皮肤(或头发)接触: 立即除去/脱掉所有沾污的衣物。用水清洗皮肤/淋浴。 If on skin(or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower. P332+P313 如果发生皮肤刺激: 获取医疗咨询/就医。IF SKIN irritation occurs: Get medical advice/attention. P304 + P340+P312 如误吸入: 转移到空气新鲜处, 休息, 保持一个适合呼吸的姿势。如果感觉不适: 立即呼叫解毒中心或就医。 If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. P305 + P351 + P338 + P310 如溅入眼睛: 用水小心冲洗几分钟。如戴隐形眼镜且便于取出, 取出隐形眼镜, 继续冲洗。如果感觉不适, 立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell.</p>																			
111PD.xls 7-																			



化学品安全技术说明书
Safety Data Sheet

3: 成分/组成信息Composition /Information On Ingredients

混合物Mixture 纯净物Pure substance

危险组分Dangerous Ingredient	浓度范围Concentration range	化学文摘号CAS No.
丁酮Methyl Ethyl Ketone	28-38%	78-93-3
乙酸乙酯Ethyl acetate	22-37%	141-78-6
醋酸甲酯Methyl acetate	20-30%	79-20-9
二甲基亚砜Dimethyl sulfoxide	5-15%	67-68-5
聚氨酯树脂Polyurethane resin	1-4%	52270-22-1

4: 急救措施First Aid Measures

皮肤接触 Skin Contact:	脱去污染衣物, 以肥皂水及清水彻底冲洗皮肤. Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact:	用大量清水冲洗, Rinse with a lot of water
吸入Inhalation:	迅速撤离现场到空气新鲜处, 保持呼吸道通畅, 如呼吸停止, 进行人工呼吸. 如呼吸困难, 经输氧等支持疗法, 就医. Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen. If breathing has stopped, give artificial respiration. Get medical attention.
食入Ingestion:	避免催吐, 如患者清醒, 给予牛奶或水以稀释胃液, 保持休息, 并送医院治疗. Avoid vomiting .if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示Notes to Physician: 误食时, 考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护The protection of first-aiders: 应穿着C 级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应The most important symptoms and hazardous effects: 毒性极低, 主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施Fire Fighting Measures

危险特性Specific Hazards:	其蒸汽与空气形成爆炸性混合物遇明火、高热能引起燃烧、爆炸, 与氧化剂可发生反应. 其蒸汽比重比空气重, 能在较低处扩散到相当远的地方, 遇火源引着回燃. 遇高热, 容器内压增大时有开裂和爆炸的危险, 流速过快易产生和积聚静电The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物Harmful burning waste:	一氧化碳, 二氧化碳, 有机物分解气体等carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂Extinguishing media:	合适的Suitable: 泡沫, 二氧化碳, 干粉, 砂土Foam, CO2, dry power or soil 不合适的Not suitable: 水Water jet



化学品安全技术说明书

Safety Data Sheet

P304 + P340+P312 如误吸入：转移到空气新鲜处，休息，保持一个适合呼吸的姿势。如果感觉不适：立即呼叫解毒中心或就医。 If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell.

3: 成分/组成信息 Composition /Information On Ingredients

混合物 Mixture 纯净物 Pure substance

危险组分 Dangerous Ingredient	浓度范围 concentration range	化学文摘号 CAS No.
丁酮 Methyl ethyl ketone	5-15%	78-93-3
甲基环己烷 Methylcyclohexane	20-30%	108-87-2
乙酸丁酯 n-Butyl acetate	3-9%	123-86-4
乙酸乙酯 Ethyl acetate	5-15%	141-78-6
醋酸甲酯 Methyl acetate	12-22%	79-20-9
氯丁橡胶 Chloroprene rubber	29-35%	9010-98-4

4: 急救措施 First Aid Measures

皮肤接触 Skin Contact :	脱去污染衣物，以肥皂水及清水彻底冲洗皮肤。 Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact :	用大量清水冲洗。 Rinse with a lot of water.
吸入 Inhalation :	迅速撤离现场到空气新鲜处，保持呼吸道通畅，如呼吸停止，进行人工呼吸。如呼吸困难，经输氧等支持疗法，就医。 Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入 Ingestion :	避免催吐，如患者清醒，给予牛奶或水以稀释胃液，保持休息，并送医院治疗。 Avoid vomiting. If individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示 Notes to Physician : 误食时，考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护 The protection of first-aiders : 应穿着C级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应 The most important symptoms and hazardous effects : 毒性极低，主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施 Fire Fighting Measures

危险特性 Specific Hazards :	其蒸汽与空气形成爆炸性混合物遇明火、高热可引起燃烧、爆炸，与氧化剂可发生反应。其蒸汽比重比空气重，能在较低处扩散到相当远的地方，遇火源引着回燃。遇高热，容器内压增大时有开裂和爆炸的危险，流速过快易产生和积聚静电。 The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物 Harmful burning waste :	一氧化碳，二氧化碳，有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂 Extinguishing media :	合适的 Suitable : 泡沫，二氧化碳，干粉，砂土 Foam, CO2, dry power or soil 不合适的 Not suitable : 水 Water jet

762N

7-2

Chemical Name : 1016A

	<p>化学品安全技术说明书 Safety Data Sheet</p>
<p>1: 化学品及企业标识Chemical Product and Company Identification</p>	
<p>化学品名称Chemical Name:</p>	<p>1016A 鞋用处理剂</p>
<p>公司信息company information:</p>	
<p>名称Name: 南宝国际NanPao International</p>	
<p>地址Address: 广东省东莞市黄江镇Huangjiang town, Dongguan city, Guangdong Province</p>	
<p>广东省佛山市三水区乐平镇Leping Town, Sanshui District, Foshan City, Guangdong Province</p>	
<p>福建省福清市阳下镇Yangxia town, Fuqing city, Fujian Province</p>	
<p>电话TEL: 0769-83364815 (东莞DongGuan)</p>	<p>传真Fax: 0769-83662303 (东莞DongGuan)</p>
<p>0757-87393000 (佛山FoShan)</p>	<p>0757-87393009 (佛山FoShan)</p>
<p>0591-85291391 (福清Fuqing)</p>	<p>0591-85291570 (福清Fuqing)</p>
<p>国家应急咨询电话National Consulting hotline for Chemical Accidents & Emergencies: 0532-83889090</p>	
<p>2: 危险性概述Hazards Summarizing</p>	
<p>应急综述Emergency Overview: 高度易燃Highly flammable</p>	
<p>危险性类别Product Hazard Class:</p>	
<p>易燃液体级别Flammable liquid class : 2</p>	<p>严重损伤/刺激眼睛级别Serious injury/irritate eyes class : 2</p>
<p>特异性靶器官毒性-一次接触Specific target organ toxicity - a contact class: 3(麻醉效应anesthesia effect)</p>	
<p>象形图Pictograms: 火焰 Fire 惊叹号 Exclamation mark</p>	
 	
<p>警示词Warning label: 危险Danger</p>	
<p>危险信息Warning For Hazard:</p>	
<p>H225 易燃液体和蒸气 Flammable liquid and vapour</p>	
<p>H319 造成严重眼刺激 Causes serious eye irritation</p>	
<p>H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness</p>	
<p>防范措施Prevention Measures:</p>	
<p>P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking</p>	
<p>P233 保持容器密封 Keep container tightly closed</p>	
<p>P264 作业后彻底清洗双手 Wash hands thoroughly after handling</p>	
<p>P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product</p>	
<p>P280 戴防护手套/戴防护眼罩/戴防护面具。Wear protective gloves/protective clothing/eye protection /face protection</p>	
<p>事故响应Response:</p>	
<p>P301 + P312 + P330+P331 如果吞咽: 漱口。不要催吐。如果感觉不适: 立即呼叫解毒中心或就医。 If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell.</p>	
<p>P303 + P361 + P353 如果皮肤 (或头发) 接触: 立即除去 / 脱掉所有沾污的衣物。用水清洗皮肤 / 淋浴。 If on skin (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.</p>	
<p>P332+P313 如果发生皮肤刺激: 获取医疗咨询/就医。 IF SKIN irritation occurs: Get medical advice/attention.</p>	
<p>P304 + P340+P312 如误吸入: 转移到空气新鲜处, 休息, 保持一个适合呼吸的姿势。如果感觉不适: 立即呼叫解毒中心或就医。 If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.</p>	
<p>P305 + P351 + P338 + P310 如溅入眼睛: 用水小心冲洗几分钟。如戴隐形眼镜且便于取出, 取出隐形眼镜, 继续冲洗。如果感觉不适, 立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell.</p>	



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3: 成分/组成信息Composition /Information On Ingredients

混合物Mixture

纯净物Pure substance

危险组分Dangerous Ingredient	浓度范围concentration range	化学文摘号CAS No.
乙酸乙酯Ethyl acetate	65-75%	141-78-6
丙酮Acetone	25-35%	67-64-1

4: 急救措施First Aid Measures

皮肤接触 Skin Contact:	脱去污染衣物, 以肥皂水及清水彻底冲洗皮肤. Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact:	用大量清水冲洗, Rinse with a lot of water
吸入Inhalation:	迅速撤离现场到空气新鲜处, 保持呼吸道通畅, 如呼吸停止, 进行人工呼吸. 如呼吸困难, 经输氧等支持疗法, 就医. Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入Ingestion:	避免催吐, 如患者清醒, 给予牛奶或水以稀释胃液, 保持休息, 并送医院治疗. Avoid vomiting .if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示Notes to Physician: 误食时, 考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护The protection of first-aiders: 应穿着C 级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应The most important symptoms and hazardous effects: 毒性极低, 主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施Fire Fighting Measures

危险特性Specific Hazards: 其蒸汽与空气形成爆炸性混合物遇明火、高热能引起燃烧、爆炸, 与氧化剂可发生反应. 其蒸汽比重比空气重, 能在较低处扩散到相当远的地方, 遇火源引着回燃. 遇高热, 容器内压增大时有开裂和爆炸的危险, 流速过快易产生和积聚静电. The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物Harmful burning waste: 一氧化碳, 二氧化碳, 有机物分解气体等carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂Extinguishing media: 合适的Suitable: 泡沫, 二氧化碳, 干粉, 砂土Foam, CO ₂ , dry power or soil 不合适的Not suitable: 水Water jet

Chemical Name : A409

 NanPao Resin	化学品安全技术说明书 Safety Data Sheet
1: 化学品及企业标识 Chemical Product and Company Identification	
化学品名称 Chemical Name :	A409 氯丁酚醛胶粘剂 Chloroprene phenolic adhesive
公司信息 company information :	
名称 Name : 南宝国际 NanPao International	
地址 Address : 广东省东莞市黄江镇 Huangjiang town, Dongguan city, Guangdong Province 广东省佛山市三水区乐平镇 Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇 Yangxia Town, Fuqing City, Fujian Province	
电话 TEL : 0769-83364815 (东莞 DongGuan) 传真 Fax : 0769-83662303 (东莞 DongGuan) 0757-87393000 (佛山 FoShan) 0757-87393009 (佛山 FoShan) 0591-85291391 (福清 Fuqing) 0591-85291570 (福清 Fuqing)	
国家应急咨询电话 National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090	
2: 危险性概述 Hazards Summarizing	
应急综述 Emergency Overview : 高度易燃 Highly flammable	
危险性类别 Product Hazard Class :	
吸入危害级别 inhalation hazards class : 1 皮肤腐蚀/刺激级别 skin corrosion/irritation class : 2 易燃液体级别 Flammable liquid class : 2 严重损伤/刺激眼睛级别 Serious injury/irritate eyes class : 2 特异性靶器官毒性-一次接触 Specific target organ toxicity - a contact class : 3 (麻醉效应 anesthesia effect) 危害水生环境 (长期危害) Harm aquatic environment (long-term harm) class : 2	
象形图 Pictograms : 火焰 Fire 健康危害 Health hazard 惊叹号 Exclamation mark 环境 Environment	
	
警示词 Warning label : 危险 Danger	
危险信息 Warming For Hazard :	
H225 高度易燃液体和蒸气 Highly flammable liquid and vapour H304 若吞咽并进入呼吸道可能致命。 May be fatal if swallowed and enters airways H316 造成皮肤刺激 Irritation to skin H319 造成严重眼刺激 Causes serious eye irritation H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness H411 可能对水生生物造成长期有害影响 May cause long lasting harmful effects to aquatic organisms.	
防范措施 Prevention Measures :	
P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking P233 保持容器密封 Keep container tightly closed P264 作业后彻底清洗双手 Wash hands thoroughly after handling P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product P280 戴防护手套/戴防护眼镜/戴防护面具。 Wear protective gloves/protective clothing/eye protection/face protection	
事故响应 Response :	
P301 + P312 + P330+P331 如果吞咽：漱口。不要催吐。如果感觉不适：立即呼叫解毒中心或就医。 If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell. P303 + P361 + P353 如果皮肤 (或头发) 接触：立即除去脱掉所有沾污的衣物。用水清洗皮肤/淋浴。 If on skin (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower. P332+P313 如果发生皮肤刺激：获取医疗咨询/就医。 IF SKIN irritation occurs: Get medical advice/attention. P304 + P340+P312 如误吸入：转移到空气新鲜处，休息，保持一个适合呼吸的姿势。如果感觉不适：立即呼叫解毒中心或就医。 If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.	
A409.xls 6-1	



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P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。 **If in eyes:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell.

3: 成分/组成信息Composition /Information On Ingredients

混合物Mixture 纯净物Pure substance

危险组分 Dangerous Ingredient	浓度范围 concentration range	化学文摘号 CAS No.
甲基环己烷 Methylcyclohexane	30-40%	108-87-2
乙酸乙酯 Ethyl acetate	5-15%	141-78-6
乙酸甲酯 Methyl acetate	10-20%	79-20-9
改性SBS橡胶 Modified SBS Rubber	36-44%	26471-45-4

4: 急救措施 First Aid Measures

皮肤接触 Skin Contact :	脱去污染衣物，以肥皂水及清水彻底冲洗皮肤。Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact :	用大量清水冲洗。Rinse with a lot of water.
吸入 Inhalation :	迅速撤离现场到空气新鲜处，保持呼吸道通畅，如呼吸停止，进行人工呼吸。如呼吸困难，经输氧等支持疗法，就医。Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入 Ingestion :	避免催吐，如患者清醒，给予牛奶或水以稀释胃液，保持休息，并送医院治疗。Avoid vomiting, if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示 Notes to Physician : 误食时，考虑有机溶剂中毒 To eat by mistake, considering the organic solvent poisoning.	
对急救人员之防护 The protection of first-aiders : 应穿着C级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应 The most important symptoms and hazardous effects : 毒性极低，主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施 Fire Fighting Measures

危险特性 Specific Hazards :	其蒸汽与空气形成爆炸性混合物遇明火、高热可引起燃烧、爆炸，与氧化剂可发生反应。其蒸汽比重比空气重，能在较低处扩散到相当远的地方，遇火源引着回燃。遇高热，容器内压增大时有开裂和爆炸的危险，流速过快易产生和积聚静电。The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物 Harmful burning waste :	一氧化碳，二氧化碳，有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂 Extinguishing media :	合适的 Suitable : 泡沫，二氧化碳，干粉，砂土 Foam, CO2, dry power or soil 不合适的 Not suitable : 水 Water jet

Chemical Name : CL – 80

	<p>NanPao Resin</p>	<p>化学品安全技术说明书</p> <p>Safety Data Sheet</p>
<p>1: 化学品及企业标识Chemical Product and Company Identification</p>		
<p>化学品名称Chemical Name :</p>	<p>CL-80</p>	<p>7110甲聚氨酯固化剂7110 a polyurethane curing agent</p>
<p>公司信息company information :</p>		
<p>名称Name : 南宝国际NanPao International</p>		
<p>地址Address : 广东省东莞市黄江镇Huangjiang town,Dongguan city,Guangdong Province 广东省佛山市三水区乐平镇Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇Yangxia town,Fuqing city,Fujian Province</p>		
<p>电话TEL : 0769-83364815(东莞DongGuan) 传真Fax : 0769-83662303(东莞DongGuan) 0757-87393000(佛山FoShan) 0757-87393009(佛山FoShan) 0591-85291391(福清Fuqing) 0591-85291570(福清Fuqing)</p>		
<p>国家应急咨询电话National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090</p>		
<p>2: 危险性概述Hazards Summarizing</p>		
<p>应急综述Emergency Overview : 高度易燃Highly flammable</p>		
<p>严重损伤/刺激眼睛级别Serious injury/irritate eyes class : 2 ;</p>		
<p>易燃液体级别Flammable liquid class : 2</p>		
<p>特异性靶器官毒性-一次接触Specific target organ toxicity - a contact : 3(麻醉效应anesthesia effect)</p>		
<p>象形图Pictograms : 火焰 Fire 惊叹号 Exclamation mark</p>		
		
<p>警示词Warning label : 危险Danger</p>		
<p>危险信息Warning For Hazard :</p>		
<p>H225 易燃液体和蒸气 Flammable liquid and vapour</p>		
<p>H319 造成严重眼刺激 Causes serious eye irritation</p>		
<p>H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness</p>		
<p>防范措施Prevention Measures :</p>		
<p>P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking</p>		
<p>P233 保持容器密封 Keep container tightly closed</p>		
<p>P264 作业后彻底清洗双手 Wash hands thoroughly after handling</p>		
<p>P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product</p>		
<p>P280 戴防护手套/戴防护眼镜/戴防护面具。 Wear protective gloves/protective clothing/eye protection/face protection</p>		
<p>事故响应Response :</p>		
<p>P301 + P312 + P330+P331 如果吞咽 : 漱口。不要催吐。如果感觉不适: 立即呼叫解毒中心或就医。 If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell.</p>		
<p>P303 + P361 + P353 如果皮肤 (或头发) 接触 : 立即除去/脱掉所有沾污的衣物。用水清洗皮肤/淋浴。 If on skin(or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.</p>		
<p>P332+P313 如果发生皮肤刺激 : 获取医疗咨询/就医。IF SKIN irritation occurs: Get medical advice/attention.</p>		
<p>P304 + P340+P312 如误吸入 : 转移到空气新鲜处, 休息, 保持一个适合呼吸的姿势。如果感觉不适: 立即呼叫解毒中心或就医。 If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing.Call a POISON CENTER or doctor/physician if you feel unwell.</p>		
<p>P305 + P351 + P338 + P310 如溅入眼睛 : 用水小心冲洗几分钟。如戴隐形眼镜且便于取出, 取出隐形眼镜, 继续冲洗。如果感觉不适, 立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rinsing.Call a POISON CENTER or doctor/physician if you feel unwell.</p>		
<p>CL-80 6-1</p>		



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3: 成分/组成信息Composition /Information On Ingredients

混合物Mixture		纯净物Pure substance	化学文摘号CAS No.
危险组分Dangerous Ingredient	浓度范围concentration range		
乙酸乙酯Ethyl acetate	19-23%		141-78-6
聚异氰酸酯Poly isocyanate	77-81%		

4: 急救措施First Aid Measures

皮肤接触 Skin Contact :	脱去污染衣物, 以肥皂水及清水彻底冲洗皮肤. Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact :	用大量清水冲洗. Rinse with a lot of water.
吸入Inhalation :	迅速撤离现场到空气新鲜处, 保持呼吸道通畅, 如呼吸停止, 进行人工呼吸. 如呼吸困难, 经输氧等支持疗法, 就医. Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入Ingestion :	避免催吐, 如患者清醒, 给予牛奶或水以稀释胃液, 保持休息, 并送医院治疗. Avoid vomiting, if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示Notes to Physician : 误食时, 考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护The protection of first-aiders : 应穿着C 级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应The most important symptoms and hazardous effects : 毒性极低, 主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施Fire Fighting Measures

危险特性Specific Hazards :	其蒸汽与空气形成爆炸性混合物遇明火、高热能引起燃烧、爆炸, 与氧化剂可发生反应. 其蒸汽比重比空气重, 能在较低处扩散到相当远的地方, 遇火源引着回燃. 遇高热, 容器内压增大时有开裂和爆炸的危险, 流速过快易产生和积聚静电. The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物Harmful burning waste :	一氧化碳, 二氧化碳, 有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂Extinguishing media :	合适的 Suitable : 泡沫, 二氧化碳, 干粉, 砂土 Foam, CO2, dry power or soil 不合适的 Not suitable : 水 Water jet
灭火程序Specific fire-fighting methods:	1. 不宜用水雾灭火, 但可喷水雾吸热冷却容器及保护暴露于火场的物质. 2. 如外泄物未着火, 可喷水雾驱散蒸气, 保护人员并将外泄物冲离. 3. 撤退并自安全距离或受保护的地点灭火. 4. 位于上风处以避免危险的蒸气和有毒的分解物. 5. 灭火前先阻止溢漏, 如果不能阻止溢漏且周围无任何危险, 让火烧完, 若没有阻止溢漏而先行灭火, 蒸气会与空气形成爆炸性混合物而再引燃. 6. 隔离未着火物质且保护人员. 7. 安全情况下将容器搬离火场. 8. 以水雾冷却火场的贮槽或容器. 9. 以水雾灭火可能无效, 除非消防人员受过各种易燃液体之灭火训练. 10. 如果溢漏未引燃, 喷水雾以分散蒸气并保护试图止漏的人员. 11. 以水柱灭火无效. 12. 大区域之大型火灾, 使用无人操作之水雾控制架或自动摇摆消防水瞄. 13. 尽可能撤离火场并允许火烧完. 14. 远离贮槽. 15. 贮槽安全阀已响起或因着火而变色时立即撤离. 1. The fire is not suitable to use water, but it can use the water to cool down the containers and protect the materials in the fire scene. 2. If the leak material isn't on fire, it can use the water to cool down, and wash away the leak material to protect the people. 3. Moving to the safety area to put out a fire. 4. Moving to windward place to avoid the damage steam and poison material. 5. To stop leak before putting out a fire. Let the fire burn down, if it can't stop leaking and there are no damage things surrounding. Because the steam will mix the air to be the explode material and burn again. 6. To close off the material without fire and protect the staffs. 7. To move the container out the fire scene in safe situation. 8. Using the water to cool down the tank or container in the fire scene. 9. It might be ineffective to use water to put out the fire, only when the fireguards who had trained to put out the fire in every liquid. 10. If the leak material without fire, immediately using water to scatter the steam and protecting the people who try to stop leak. 11. It's ineffectively to use water to put out the fire. 12. In big area fire, using self-motion sprinkle water spray machine. 13. As far as moving out the fire scene and let the fire burn

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P304 + P340+P312 如误吸入：转移到空气新鲜处，休息，保持一个适合呼吸的姿势。如果感觉不适：立即呼叫解毒中心或就医。If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing.Call a POISON CENTER or doctor/physician if you feel unwell.

P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。If in eyes: Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rinsing.Call a POISON CENTER or doctor/physician if you feel unwell.

3: 成分/组成信息Composition /Information On Ingredients

混合物Mixture 纯净物Pure substance

危险组分 Dangerous Ingredient	浓度范围 concentration range	化学文摘号 CAS No.
甲基环己烷 Methylcyclohexane	35-45%	108-87-2
丙酮 Acetone	25-35%	67-64-1
乙酸乙酯 Ethyl acetate	10-20%	141-78-6
醋酸甲酯 Methyl acetate	10-20%	79-20-9

4: 急救措施 First Aid Measures

皮肤接触 Contact:	Skin 脱去污染衣物，以肥皂水及清水彻底冲洗皮肤。Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact:	用大量清水冲洗。Rinse with a lot of water.
吸入 Inhalation:	迅速撤离现场到空气新鲜处，保持呼吸道通畅，如呼吸停止，进行人工呼吸。如呼吸困难，经输氧等支持疗法，就医。Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入 Ingestion:	避免催吐，如患者清醒，给予牛奶或水以稀释胃液，保持休息，并送医院治疗。Avoid vomiting, if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示 Notes to Physician: 误食时，考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护 The protection of first-aiders: 应穿着C级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应 The most important symptoms and hazardous effects: 毒性极低，主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施 Fire Fighting Measures

危险特性 Specific Hazards: 其蒸汽与空气形成爆炸性混合物遇明火、高热可引起燃烧、爆炸，与氧化剂可发生反应。其蒸汽比重比空气重，能在较低处扩散到相当远的地方，遇火源引着回燃。遇高热，容器内压增大时有开裂和爆炸的危险，流速过快易产生和积聚静电。The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物 Harmful burning waste: 一氧化碳，二氧化碳，有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂 Extinguishing media: 合适的 Suitable: 泡沫，二氧化碳，干粉，砂土 Foam, CO2, dry power or soil 不合适的 Not suitable: 水 Water jet 灭火注意事项及措施 Fire fighting precautions and measures: 消防人员须佩戴空气呼吸器、穿全身防火防毒服，在上风向灭火。The firefighters must wear the oxygen mask and protective suit, and fight fire in the windward area.

Chemical Name : HA100N



NanPao Resin

化学品安全技术说明书 Safety Data Sheet

1: 化学品及企业标识 Chemical Product and Company Identification

化学品名称 Chemical Name :	HA100N	7110 甲苯胺醚固化剂 7110 a polyurethane curing agent
公司信息 company information :		
名称 Name :	南宝国际 NanPao International	
地址 Address :	广东省东莞市黄江镇 Huangjiang town, Dongguan city, Guangdong Province 广东省佛山市三水区乐平镇 Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇 Yangxia town, Fuqing city, Fujian Province	
电话 TEL :	0769-83364815 (东莞 DongGuan)	传真 Fax : 0769-83662303 (东莞 DongGuan)
	0757-87393000 (佛山 FoShan)	0757-87393009 (佛山 FoShan)
	0591-85291391 (福清 Fuqing)	0591-85291570 (福清 Fuqing)
国家应急咨询电话 National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090		

2: 危险性概述 Hazards Summarizing

应急综述 Emergency Overview : 高度易燃 Highly flammable
严重损伤/刺激眼睛级别 Serious injury/irritate eyes class : 2 ;
易燃液体级别 Flammable liquid class : 2
特异性靶器官毒性-一次接触 Specific target organ toxicity - a contact : 3 (麻醉效应 anesthesia effect)
象形图 Pictograms : 火焰 Fire 惊叹号 Exclamation mark
 
警示词 Warning label : 危险 Danger
危险信息 Warning For Hazard :
H225 易燃液体和蒸气 Flammable liquid and vapour
H319 造成严重眼刺激 Causes serious eye irritation
H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness
防范措施 Prevention Measures :
P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking
P233 保持容器密封 Keep container tightly closed
P264 作业后彻底清洗双手 Wash hands thoroughly after handling
P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product
P280 戴防护手套/戴防护眼罩/戴防护面具。 Wear protective gloves/protective clothing/eye protection/face protection
事故响应 Response :
P301 + P312 + P330+P331 如果吞咽：漱口。不要催吐。如果感觉不适：立即呼叫解毒中心或就医。 If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell.
P303 + P361 + P353 如果皮肤（或头发）接触：立即除去/脱掉所有沾污的衣物。用水清洗皮肤/淋浴。 If on skin(or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.
P332+P313 如果发生皮肤刺激：获取医疗咨询/就医。 IF SKIN irritation occurs: Get medical advice/attention.
P304 + P340+P312 如误吸入：转移到空气新鲜处，休息，保持一个适合呼吸的姿势。如果感觉不适：立即呼叫解毒中心或就医。 If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell.

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化学品安全技术说明书 Safety Data Sheet

3: 成分/组成信息Composition /Information On Ingredients

混合物Mixture 纯净物Pure substance

危险组分 Dangerous Ingredient	浓度范围 concentration range	化学文摘号 CAS No.
乙酸乙酯 Ethyl acetate	65-73%	141-78-6
聚异氰酸酯 Poly isocyanate	25-37%	

4: 急救措施 First Aid Measures

皮肤接触 Skin Contact :	脱去污染衣物, 以肥皂水及清水彻底冲洗皮肤. Remove immediately any soiled or soaked clothing. Wash skin with plenty of water and soap.
眼睛接触 Eye contact :	用大量清水冲洗. Rinse with a lot of water.
吸入 Inhalation :	迅速撤离现场到空气新鲜处, 保持呼吸道通畅, 如呼吸停止, 进行人工呼吸. 如呼吸困难, 经输氧等支持疗法, 就医. Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入 Ingestion :	避免催吐, 如患者清醒, 给予牛奶或水以稀释胃液, 保持休息, 并送医院治疗. Avoid vomiting .if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示 Notes to Physician : 误食时, 考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护 The protection of first-aiders : 应穿着 C 级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应 The most important symptoms and hazardous effects : 毒性极低, 主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施 Fire Fighting Measures

危险特性 Specific Hazards : 其蒸汽与空气形成爆炸性混合物遇明火、高热可引起燃烧、爆炸, 与氧化剂可发生反应. 其蒸汽比重比空气重, 能在较低处扩散到相当远的地方, 遇火源引着回燃. 遇高热, 容器内压增大时有开裂和爆炸的危险, 流速过快易产生和积聚静电. The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.

有害燃烧产物 Harmful burning waste : 一氧化碳, 二氧化碳, 有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.

灭火剂 Extinguishing media :

合适的 Suitable : 泡沫, 二氧化碳, 干粉, 砂土 Foam, CO₂, dry power or soil

不合适的 Not suitable : 水 Water jet

灭火程序 Specific fire-fighting methods: 1. 不宜用水雾灭火, 但可喷水雾吸热冷却容器及保护暴露于火场的物质. 2. 如外泄物未着火, 可喷水雾驱散蒸气、保护人员并将外泄物冲离. 3. 撤退并自安全距离或受保护的地点灭火. 4. 位于上风处以避免危险的蒸气和有毒的分解物. 5. 灭火前先阻止溢漏, 如果不能阻止溢漏且周围无任何危险, 让火烧完, 若没有阻止溢漏而先行灭火, 蒸气会与空气形成爆炸性混合物而再引燃. 6. 隔离未着火物质且保护人员. 7. 安全情况下将容器搬离火场. 8. 以水雾冷却火场的贮槽或容器. 9. 以水雾灭火可能无效, 除非消防人员受过各种易燃液体之灭火训练. 10. 如果溢漏未引燃, 喷水雾以分散蒸气并保护试图止漏的人员. 11. 以水柱灭火无效. 12. 大区域之大型火灾, 使用无人操作之水雾控制架或自动摇摆消防水瞄. 13. 尽可能撤离火场并允许火烧完. 14. 远离贮槽. 15. 贮槽安全阀已响起或因着火而变色时立即撤离. 1. The fire is not suitable to use water, but it can use water to cool down the containers and protect the materials in the fire scene. 2. If the leak material isn't on fire, it can use the water to cool down, and wash away the leak material to protect the people. 3. Moving to the safety area to put out a fire. 4. Moving to windward place to avoid the damage steam and poison material. 5. To stop leak before putting out a fire. Let the fire burn down, if it can't stop leaking and there are no damage things surrounding. Because the steam will mix the air to be the explode material and burn again. 6. To close off the material without fire and protect the staffs. 7. To move the container out the fire scene in safe situation. 8. Using the water to cool down the tank or container in the fire scene. 9. It might be ineffective to use water to put out the fire, only when the fireguards who had trained to put out the fire in every liquid. 10. If the leak material without fire, immediately using water to scatter the steam and protecting the people who try to stop leak. 11. It's ineffectively to use water to put out the fire. 12. In big area fire, using self-motion sprinkle water spray machine. 13. As far as moving out the fire scene and let the fire burn

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Chemical Name : JW – 043

 NanPao Resin		化学品安全技术说明书 Safety Data Sheet	
1: 化学品及企业标识 Chemical Product and Company Identification			
化学品名称 Chemical Name :		JW-043	
公司信息 company information :		鞋用处理剂	
名称 Name : 南宝国际 NanPao International 地址 Address : 广东省东莞市黄江镇 Huangjiang town, Dongguan city, Guangdong Province 广东省佛山市三水区乐平镇 Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇 Yangxia town, Fuqing city, Fujian Province 电话 TEL : 0769-83364815 (东莞 DongGuan) 传真 Fax : 0769-83662303 (东莞 DongGuan) 0757-87393000 (佛山 FoShan) 0757-87393009 (佛山 FoShan) 0591-85291391 (福清 Fuqing) 0591-85291570 (福清 Fuqing)			
国家应急咨询电话 National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090			
2: 危险性概述 Hazards Summarizing			
应急综述 Emergency Overview : 高度易燃 Highly flammable			
危险性类别 Product Hazard Class : 易燃液体级别 Flammable liquid class : 2 严重损伤/刺激眼睛级别 Serious injury/irritate eyes class : 2 特异性靶器官毒性-一次接触 Specific target organ toxicity - a contact class : 3 (麻醉效应 anesthesia effect)			
象形图 Pictograms : 火焰 Fire 惊叹号 Exclamation mark			
 			
警示词 Warning label : 危险 Danger			
危险信息 Warning For Hazard : H225 高度易燃液体和蒸气, Highly flammable liquid and vapor H319 造成严重眼刺激 Causes serious eye irritation H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness			
防范措施 Prevention Measures : P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking P233 保持容器密封 Keep container tightly closed P264 作业后彻底清洗双手 Wash hands thoroughly after handling P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product P280 戴防护手套/戴防护眼镜/戴防护面具。 Wear protective gloves/protective clothing/eye protection /face protection			
事故响应 Response : P301 + P312 + P330+P331 如果吞咽：漱口。不要催吐。如果感觉不适：立即呼叫解毒中心或就医。 If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell. P303 + P361 + P353 如果皮肤（或头发）接触：立即除去/脱掉所有沾污的衣物。用水清洗皮肤/淋浴。 If on skin(or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower. P332+P313 如果发生皮肤刺激：获取医疗咨询/就医。 IF SKIN irritation occurs: Get medical advice/attention. P304 + P340+P312 如误吸入：转移到空气新鲜处，休息，保持一个适合呼吸的姿势。如果感觉不适：立即呼叫解毒中心或就医。 If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel			
3: 成分/组成信息 Composition /Information On Ingredients			
		JW-043.xls 6-1	



化学品安全技术说明书

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混合物Mixture 纯净物Pure substance

危险组分Dangerous Ingredient	浓度范围concentration range	化学文摘号CAS No.
丁酮Methyl Ethyl Ketone	25-35%	78-93-3
乙酸乙酯Ethyl acetate	25-41%	141-78-6
醋酸甲酯Methyl acetate	20-38%	79-20-9
聚氨酯树脂Polyurethane resin	6-10%	52270-22-1

4: 急救措施First Aid Measures

皮肤接触 Skin Contact :	脱去污染衣物, 以肥皂水及清水彻底冲洗皮肤. Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact :	用大量清水冲洗, Rinse with a lot of water
吸入Inhalation :	迅速撤离现场到空气新鲜处, 保持呼吸道通畅, 如呼吸停止, 进行人工呼吸. 如呼吸困难, 经输氧等支持疗法, 就医. Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入Ingestion :	避免催吐, 如患者清醒, 给予牛奶或水以稀释胃液, 保持休息, 并送医院治疗. Avoid vomiting, if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示Notes to Physician : 误食时, 考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护The protection of first-aiders : 应穿着C 级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应The most important symptoms and hazardous effects : 毒性极低, 主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施Fire Fighting Measures

危险特性Specific Hazards :	其蒸汽与空气形成爆炸性混合物遇明火、高热能引起燃烧、爆炸, 与氧化剂可发生反应. 其蒸汽比重比空气重, 能在较低处扩散到相当远的地方, 遇火源引着回燃. 遇高热, 容器内压增大时有开裂和爆炸的危险, 流速过快易产生和积聚静电. The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物Harmful burning waste :	一氧化碳, 二氧化碳, 有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂Extinguishing media :	合适的Suitable : 泡沫, 二氧化碳, 干粉, 砂土 Foam, CO2, dry power or soil 不合适的Not suitable : 水 Water jet

Chemical Name : NB – RFE

 NanPao Resin		化学品安全技术说明书 Safety Data Sheet	
1: 化学品及企业标识 Chemical Product and Company Identification			
化学品名称 Chemical Name :		NB-RFE	
		7110 甲氧基醚固化剂 7110 a polyurethane curing agent	
公司信息 company information :			
名称 Name : 南宝国际 NanPao International			
地址 Address : 广东省东莞市黄江镇 Huangjiang town, Dongguan city, Guangdong Province 广东省佛山市三水区乐平镇 Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇 Yangxia town, Fuqing city, Fujian Province			
电话 TEL : 0769-83364815 (东莞 DongGuan) 传真 Fax : 0769-83662303 (东莞 DongGuan)			
0757-87393000 (佛山 FoShan) 0757-87393009 (佛山 FoShan)			
0591-85291391 (福清 Fuqing) 0591-85291570 (福清 Fuqing)			
国家应急咨询电话 National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090			
2: 危险性概述 Hazards Summarizing			
应急综述 Emergency Overview : 高度易燃 Highly flammable			
严重损伤/刺激眼睛级别 Serious injury/irritate eyes class : 2 ;			
易燃液体级别 Flammable liquid class : 2			
特异性靶器官毒性-一次接触 Specific target organ toxicity - a contact class : 3 (麻醉效应 anesthesia effect)			
象形图 Pictograms : 火焰 Fire 惊叹号 Exclamation mark			
			
警示词 Warning label : 危险 Danger			
危险信息 Warning For Hazard :			
H225 易燃液体和蒸气 Flammable liquid and vapour			
H319 造成严重眼刺激 Causes serious eye irritation			
H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness			
防范措施 Prevention Measures :			
P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking			
P233 保持容器密封 Keep container tightly closed			
P264 作业后彻底清洗双手 Wash hands thoroughly after handling			
P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product			
P280 戴防护手套/戴防护眼罩/戴防护面具。Wear protective gloves/protective clothing/eye protection/face protection			
事故响应 Response :			
P301 + P312 + P330+P331 如果吞咽 : 漱口。不要催吐。如果感觉不适: 立即呼叫解毒中心或就医。If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell.			
P303 + P361 + P353 如果皮肤 (或头发) 接触 : 立即除去/脱掉所有沾污的衣物。用水清洗皮肤/淋浴。If on skin(or hair): Remove/ Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.			
P332+P313 如果发生皮肤刺激 : 获取医疗咨询/就医。IF SKIN irritation occurs: Get medical advice/attention.			
P304 + P340+P312 如误吸入 : 转移到空气新鲜处, 休息, 保持一个适合呼吸的姿势。如果感觉不适: 立即呼叫解毒中心或就医。If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.			
P305 + P351 + P338 + P310 如溅入眼睛 : 用水小心冲洗几分钟。如戴隐形眼镜且便于取出, 取出隐形眼镜, 继续冲洗。如果感觉不适, 立即呼叫解毒中心或就医。If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell.			
NB-RFE 6-1			



化学品安全技术说明书

Safety Data Sheet

3: 成分/组成信息 Composition /Information On Ingredients

危险组分 Dangerous Ingredient	浓度范围 concentration range	化学文摘号 CAS No.
乙酸乙酯 Ethyl acetate	71-77%	141-78-6
聚异氰酸酯 Poly isocyanate	23-29%	

4: 急救措施 First Aid Measures

皮肤接触 Skin Contact :	脱去污染衣物, 以肥皂水及清水彻底冲洗皮肤. Remove immediately any soiled or soaked clothing. Wash skin with plenty of water and soap.
眼睛接触 Eye contact :	用大量清水冲洗. Rinse with a lot of water.
吸入 Inhalation :	迅速撤离现场到空气新鲜处, 保持呼吸道通畅, 如呼吸停止, 进行人工呼吸. 如呼吸困难, 经输氧等支持疗法, 就医. Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入 Ingestion :	避免催吐, 如患者清醒, 给予牛奶或水以稀释胃液, 保持休息, 并送医院治疗. Avoid vomiting, if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示 Notes to Physician : 误食时, 考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护 The protection of first-aiders : 应穿着C级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应 The most important symptoms and hazardous effects : 毒性极低, 主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施 Fire Fighting Measures

危险特性 Specific Hazards :	其蒸汽与空气形成爆炸性混合物遇明火、高热可引起燃烧、爆炸, 与氧化剂可发生反应. 其蒸汽比重比空气重, 能在较低处扩散到相当远的地方, 遇火源引着回燃. 遇高热, 容器内压增大时有开裂和爆炸的危险, 流速过快易产生和积聚静电. The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物 Harmful burning waste :	一氧化碳, 二氧化碳, 有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂 Extinguishing media :	合适的 Suitable : 泡沫, 二氧化碳, 干粉, 砂土 Foam, CO2, dry power or soil 不合适的 Not suitable : 水 Water jet
灭火程序 Specific fire-fighting methods:	1. 不宜用水雾灭火, 但可喷水雾吸热冷却容器及保护暴露于火场的物质. 2. 如外泄物未着火, 可喷水雾驱散蒸气, 保护人员并将外泄物冲离. 3. 撤退并自安全距离或受保护的地点灭火. 4. 位于上风处以避免危险的蒸气和有毒的分解物. 5. 灭火前先阻止溢漏, 如果不能阻止溢漏且周围无任何危险, 让火烧完, 若没有阻止溢漏而先行灭火, 蒸气会与空气形成爆炸性混合物而再引燃. 6. 隔离未着火物质且保护人员. 7. 安全情况下将容器搬离火场. 8. 以水雾冷却火场的贮槽或容器. 9. 以水雾灭火可能无效, 除非消防人员受过各种易燃液体之灭火训练. 10. 如果溢漏未引燃, 喷水雾以分散蒸气并保护试图止漏的人员. 11. 以水柱灭火无效. 12. 大区域之大型火灾, 使用无人操作之水雾控制架或自动摇摆消防水瞄. 13. 尽可能撤离火场并允许火烧完. 14. 远离贮槽. 15. 贮槽安全阀已响起或因着火而变色时立即撤离. 1. The fire is not suitable to use water, but it can use the water to cool down the containers and protect the materials in the fire scene. 2. If the leak material isn't on fire, it can use the water to cool down, and wash away the leak material to protect the people. 3. Moving to the safety area to put out a fire. 4. Moving to windward place to avoid the damage steam and poison material. 5. To stop leak before putting out a fire. Let the fire burn down, if it can't stop leaking and there are no damage things surrounding. Because the steam will mix the air to be the explode material and burn again. 6. To close off the material without fire and protect the staffs. 7. To move the container out the fire scene in safe situation. 8. Using the water to cool down the tank or container in the fire scene. 9. It might be ineffective to use water to put out the fire, only when the fireguards who had trained to put out the fire in every liquid. 10. If the leak material without fire, immediately using water to scatter the steam and protecting the people who try to stop leak. 11. It's ineffectively to use water to put out the fire. 12. In big area fire, using self-motion sprinkle water spray machine. 13. As far as moving out the fire scene and let the fire burn

NB-RFE 6-2

Chemical Name : NP8 – 32N

	<p><i>NanPao Resin</i></p>	<p>化学品安全技术说明书</p> <p>Safety Data Sheet</p>
<p>1: 化学品及企业标识Chemical Product and Company Identification</p>		
<p>化学品名称Chemical Name : NP8-32N</p>		<p>鞋用处理剂</p>
<p>公司信息company information :</p>		
<p>名称Name : 南宝国际NanPao International</p>		
<p>地址Address : 广东省东莞市黄江镇Huangjiang town,Dongguan city,Guangdong Province 广东省佛山市三水区乐平镇Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇Yangxia town,Fuqing city,Fujian Province</p>		
<p>电话TEL : 0769-83364815(东莞DongGuan) 传真Fax : 0769-83662303(东莞DongGuan) 0757-87393000(佛山FoShan) 0757-87393009(佛山FoShan) 0591-85291391(福清Fuqing) 0591-85291570(福清Fuqing)</p>		
<p>国家应急咨询电话National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090</p>		
<p>2: 危险性概述Hazards Summarizing</p>		
<p>应急综述Emergency Overview : 高度易燃Highly flammable</p>		
<p>危险性类别Product Hazard Class :</p>		
<p>吸入危害级别 inhalation hazards class : 1 皮肤腐蚀/刺激级别skin corrosion/irritation class : 2 易燃液体级别Flammable liquid class : 2 严重损伤/刺激眼睛级别Serious injury/irritate eyes class : 2 危害水生环境 (长期危害) Harm aquatic environment (long-term harm) class : 2 特异性靶器官毒性-一次接触Specific target organ toxicity - a contact class : 3(麻醉效应anesthesia effect)</p>		
<p>象形图Pictograms : 火焰 Fire 健康危害 Health hazard 惊叹号 Exclamation mark 环境 Environment</p>		
		
<p>警示词Warning label : 危险Danger</p>		
<p>危险信息Warning For Hazard :</p>		
<p>H225 易燃液体和蒸气 Flammable liquid and vapour H304 若吞咽并进入呼吸道可能致命。 May be fatal if swallowed and enters airways H315 造成皮肤刺激 Irritation to skin. H319 造成严重眼刺激 Causes serious eye irritation H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness H411 可能对水生生物造成长期有害影响 May cause long-term harmful effects on aquatic organisms</p>		
<p>防范措施Prevention Measures :</p>		
<p>P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking P233 保持容器密封 Keep container tightly closed P264 作业后彻底清洗双手 Wash hands thoroughly after handling P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product P273 避免释放到环境中 Avoid release to the environment P280 戴防护手套/戴防护眼罩/戴防护面具。 Wear protective gloves/protective clothing/eye protection/face protection</p>		
<p>事故响应Response :</p>		
<p>P301 + P312 + P330+P331 如果吞咽：漱口。不要催吐。如果感觉不适：立即呼叫解毒中心或就医。 If swallowed:Rinse mouth. Do NOT induce vomiting.Call a POISON CENTER or doctor/physician if you feel unwell. P303 + P361 + P353 如果皮肤 (或头发) 接触：立即除去/脱掉所有沾污的衣物。用水清洗皮肤/淋浴。 If on skin(or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower. P332+P313 如果发生皮肤刺激：获取医疗咨询/就医。IF SKIN irritation occurs: Get medical advice/attention.</p>		
<p>NP8-32N</p>		<p>7-1</p>



化学品安全技术说明书

Safety Data Sheet

P304 + P340+P312 如误吸入：转移到空气新鲜处，休息，保持一个适合呼吸的姿势。如果感觉不适：立即呼叫解毒中心或就医。
If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell.

3: 成分/组成信息 Composition / Information On Ingredients

混合物 Mixture 纯净物 Pure substance

危险组分 Dangerous Ingredient	浓度范围 concentration range	化学文摘号 CAS No.
丁酮 Methyl Ethyl Ketone	25-35%	78-93-3
乙酸丁酯 n-Butyl acetate	5-10%	123-86-4
甲基环己烷 Methylcyclohexane	55-65%	108-87-2
EVA树脂 EVA Resin	1-4%	24937-78-8

4: 急救措施 First Aid Measures

皮肤接触 Contact:	Skin 脱去污染衣物，以肥皂水及清水彻底冲洗皮肤。Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact:	用大量清水冲洗。Rinse with a lot of water.
吸入 Inhalation :	迅速撤离现场到空气新鲜处，保持呼吸道通畅，如呼吸停止，进行人工呼吸。如呼吸困难，经输氧等支持疗法，就医。Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入 Ingestion :	避免催吐，如患者清醒，给予牛奶或水以稀释胃液，保持休息，并送医院治疗。Avoid vomiting, if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示 Notes to Physician : 误食时，考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护 The protection of first-aiders : 应穿着C级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应 The most important symptoms and hazardous effects : 毒性极低，主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施 Fire Fighting Measures

危险性 Specific Hazards : 其蒸汽与空气形成爆炸性混合物遇明火、高热可引起燃烧、爆炸，与氧化剂可发生反应。其蒸汽比重比空气重，能在较低处扩散到相当远的地方，遇火源引着回燃。遇高热，容器内压增大时有开裂和爆炸的危险，流速过快易产生和积聚静电 The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物 Harmful burning waste : 一氧化碳，二氧化碳，有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂 Extinguishing media : 合适的 Suitable : 泡沫，二氧化碳，干粉，砂土 Foam, CO ₂ , dry power or soil 不合适的 Not suitable : 水 Water jet 灭火注意事项及措施 Fire fighting precautions and measures : 消防人员须佩戴空气呼吸器、穿全身防火防毒服，在上风向灭火 The firefighters must wear the oxygen mask and protective suit, and fight fire in the windward area.

Chemical Name : NP – 86KN

	化学品安全技术说明书 Safety Data Sheet
1: 化学品及企业标识Chemical Product and Company Identification	
化学品名称Chemical Name :	NP-86KN 聚氨酯粘合剂Polyurethane adhesive
公司信息company information :	
名称Name :	南宝国际NanPao International
地址Address :	广东省东莞市黄江镇Huangjiang town,Dongguan city,Guangdong Province 广东省佛山市三水区乐平镇Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇Yangxia Town, Fuqing City, Fujian Province
电话TEL :	0769-83364815(东莞DongGuan) 传真Fax : 0769-83662303(东莞DongGuan) 0757-87393000(佛山FoShan) 0757-87393009(佛山FoShan) 0591-85291391(福清Fuqing) 0591-85291570(福清Fuqing)
国家应急咨询电话National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090	
2: 危险性概述Hazards Summarizing	
应急综述Emergency Overview : 高度易燃Highly flammable	
危险性类别Product Hazard Class :	
易燃液体级别Flammable liquid class :	2 严重损伤/刺激眼睛级别Serious injury/irritate eyes class : 2
特异性靶器官毒性-一次接触Specific target organ toxicity - a contact class : 3(麻醉效应anesthesia effect)	
象形图Pictograms : 火焰 Fire 惊叹号 Exclamation mark	
 	
警示词Warning label : 危险Danger	
危险信息Warning For Hazard :	
H225 易燃液体和蒸气 Flammable liquid and vapour	
H319 造成严重眼刺激 Causes serious eye irritation	
H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness	
防范措施Prevention Measures :	
P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking	
P233 保持容器密封 Keep container tightly closed	
P264 作业后彻底清洗双手 Wash hands thoroughly after handling	
P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product	
P280 戴防护手套/戴防护眼罩/戴防护面具。Wear protective gloves/protective clothing/eye protection/face protection	
事故响应Response :	
P301 + P312 + P330+P331 如果吞咽 : 漱口。不要催吐。如果感觉不适: 立即呼叫解毒中心或就医。If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell.	
P303 + P361 + P353 如果皮肤 (或头发) 接触 : 立即除去/脱掉所有沾污的衣物。用水清洗皮肤淋浴。If on skin(or hair): Remove/ Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.	
P332+P313 如果发生皮肤刺激 : 获取医疗咨询/就医。IF SKIN irritation occurs: Get medical advice/attention.	
P304 + P340+P312 如误吸入 : 转移到空气新鲜处, 休息, 保持一个适合呼吸的姿势。如果感觉不适: 立即呼叫解毒中心或就医。If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.	
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P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell.

3: 成分/组成信息 Composition / Information On Ingredients

混合物 Mixture 纯净物 Pure substance

危险组分 Dangerous Ingredient	浓度范围 concentration range	化学文摘号 CAS No.
丁酮 Methyl ethyl ketone	2-10%	78-93-3
乙酸乙酯 Ethyl acetate	75-85%	141-78-6
聚氨酯树脂 Polyurethane resin	12-16%	52270-22-1

4: 急救措施 First Aid Measures

皮肤接触 Skin Contact :	脱去污染衣物，以肥皂水及清水彻底冲洗皮肤。 Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact :	用大量清水冲洗， Rinse with a lot of water
吸入 Inhalation :	迅速撤离现场到空气新鲜处，保持呼吸道通畅，如呼吸停止，进行人工呼吸。如呼吸困难，经输氧等支持疗法，就医。 Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入 Ingestion :	避免催吐，如患者清醒，给予牛奶或水以稀释胃液，保持休息，并送医院治疗。 Avoid vomiting, if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示 Notes to Physician : 误食时，考虑有机溶剂中毒 To eat by mistake, Considering the organic solvent poisoning.	
对急救人员之防护 The protection of first-aiders : 应穿着C级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应 The most important symptoms and hazardous effects : 毒性极低，主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施 Fire Fighting Measures

危险特性 Specific Hazards : 其蒸汽与空气形成爆炸性混合物遇明火、高热可引起燃烧、爆炸，与氧化剂可发生反应。其蒸汽比重比空气重，能在较低处扩散到相当远的地方，遇火源引着回燃。遇高热，容器内压增大时有开裂和爆炸的危险，流速过快易产生和积聚静电。 The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物 Harmful burning waste : 一氧化碳，二氧化碳，有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂 Extinguishing media : 合适的 Suitable : 泡沫，二氧化碳，干粉，砂土 Foam, CO2, dry power or soil 不合适的 Not suitable : 水 Water jet

Chemical Name : NP – 585



化学品安全技术说明书
Safety Data Sheet

1: 化学品及企业标识 Chemical Product and Company Identification

化学品名称 Chemical Name :	NP-585	水基型粘合剂
公司信息 company information :		
名称 Name :	南宝国际 NanPao International	
地址 Address :	广东省东莞市黄江镇 Huangjiang town, Dongguan city, Guangdong Province 广东省佛山市三水区乐平镇 Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇 Yang Town, Fuqing City, Fujian Province	
电话 TEL :	0769-83364815(东莞 DongGuan) 0757-87393000(佛山 FoShan) 0591-85291391(福清 Fuqing)	传真 Fax : 0769-83662303(东莞 DongGuan) 0757-87393009(佛山 FoShan) 0591-85291570(福清 Fuqing)
国家应急咨询电话 National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090		

2: 危险性概述 Hazards Summarizing

<p>应急综述 Emergency Overview : This product is not applicable for the harmful GB(13690-2009) and GHS graphical representation classification. 本产品不适用有害物 GB(13690-2009) 及 GHS 图示分类</p>
<p>危险信息 Warning For Hazard : H304 若吞咽并进入呼吸道可能致命。 May be fatal if swallowed and enters airways H316 造成皮肤刺激 Irritation to skin</p>
<p>防范措施 Prevention Measures : P264 作业后彻底清洗双手 Wash hands thoroughly after handling P280 戴防护手套/戴防护眼镜/戴防护面具。 Wear protective gloves/protective clothing/eye protection/face protection</p>
<p>事故响应 Response : P301 + P312 + P330+P331 如果吞咽：漱口。不要催吐。如果感觉不适：立即呼叫解毒中心或就医。 If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell. P303 + P361 + P353 如果皮肤 (或头发) 接触：立即除去脱掉所有沾污的衣物。用水清洗皮肤/淋浴。 If on skin(or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower. P332+P313 如果发生皮肤刺激：获取医疗咨询/就医。 IF SKIN irritation occurs: Get medical advice/attention. P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel</p>

3: 成分/组成信息 Composition /Information On Ingredients

混合物 Mixture <input checked="" type="checkbox"/>	纯净物 Pure substance <input type="checkbox"/>	
危险组分 Dangerous Ingredient	浓度范围 concentration range	化学文摘号 CAS No.
水 water	47-55%	7732-18-5
聚氨酯树脂 Polyurethane resin	47-51%	52270-22-1

4: 急救措施 First Aid Measures

皮肤接触 Skin Contact :	脱去污染衣物，以肥皂水及清水彻底冲洗皮肤。 Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 Eye contact :	用大量清水冲洗。 Rinse with a lot of water.
吸入 Inhalation :	将患者移至空气清新处。如果呼吸困难，立即供氧；如果呼吸停止，立即施予人工呼吸并送医治疗。 Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention.
食入 Ingestion :	避免催吐，如患者清醒，给予牛奶或水以稀释胃液，保持休息，并送医院治疗。 Avoid vomiting .if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.

最重要症状及危害效应 The most important symptoms and hazardous effects : --
对医生之提示 Notes to Physician : 若是吸入，请考虑输氧，若是食入，应考虑胃的伤害， For inhalation, consider oxygen. For ingestion, consider gastric ravage.

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化学品安全技术说明书

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5: 消防措施 Fire Fighting Measures

灭火剂 Extinguishing media :

合适的 Suitable : 使用水雾, 泡沫, 化学干粉或二氧化碳灭火剂. Use water spray, foam, dry chemical or carbon dioxide.

灭火注意事项及措施 Fire fighting precautions and measures : 消防人员须佩戴便携式呼吸器以防止有毒或刺激性气体. Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.

消防人员之特殊防护装备 Special equipment for the protection of firefighters : 消防人员必须配戴空气呼吸器、防护手套、消防衣. The firefighters must wear the oxygen mask, protective gloves, and protective suit.

6: 泄漏应急处理 Accidental Release Measures

泄漏处理程序 Spill and leak procedure: 防止进入下水道, 以防聚合物沉积阻塞下水道. 溢出物用吸附性较强的物质吸收. Prevent entry into the sewage system, risk of blockage due to polymer deposits. Take up spilt material with absorbent material.

个人注意事项 Personal precautions : 1. 限制人员进入, 直至外溢区完全清理干净为止. 2. 确定是由受过训之人员负责清理之工作. 3. 穿戴适当的个人防护装备. 1. Limit the staffs entry until the leak area complete clean. 2. Ensuring that the people who bear the clean job are trained. 3. To wear the personal equipment for protection.

环境保护 Environmental protection : --

为了安全和环境的预防, 请参考完整的 SDS 资料. For safety and environmental precautions please review entire SAFETY DATA SHEET, for necessary information.

7: 操作处置与储存 Handling and Storage

操作处置 Handling Notice: 工作区域保持通风良好. Ensure efficient exhaust ventilation in the working area.

储存 Storage Notice : 储存在阴凉干燥的地方, 参照技术数据以获取具体的储存方法. Store in a cool, dry place. Consult the technical data sheet for specific storage instructions.

8: 接触控制/个人防护 Contact control and personal protection

成分 component	八小时日时量平均容许浓度 TWA	短时间时量平均容许浓度	最高容许浓度 CEILING	生物指标 BEIs
聚氨酯树脂 Polyurethane resin	不适合 unsuitable	不适合 unsuitable	--	--

工程控制 Engineering Control : 保持工作场所通风良好, 提供安全淋浴和洗眼设备. Ensure efficient exhaust ventilation in the working area, Supply with emergency shower and eye wash facility.

个人防护设备 Personal Protection Equipment :

呼吸防护 Respirator protection: /

眼部防护 Eye Protection : 当有溅出或需要喷涂时, 佩戴具有侧防的眼镜, 防溅的眼罩或面罩. 冲眼站应可用. Wear safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Have an eye wash station available.

手部防护 Hand Protection : 手直接接触时佩戴防护手套. Wear protective gloves when hand in direct contact.

衣服防护 Clothing Protection : 使用符合工业卫生标准的衣服. Standard industrial hygiene procedures should be practiced.

其它防护 Other Protection: : 工作现场禁止吸烟, 进食和饮水. 工作完毕, 淋浴更衣. 注意个人清洁卫生. To prohibit smoking, eating and drinking water. Take a shower and change clothes after finishing work. Pay attention to personal hygiene.

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Chemical Name : P8 – 8N



NanPao Resin

化学品安全技术说明书
Safety Data Sheet

1: 化学品及企业标识 Chemical Product and Company Identification

化学品名称 Chemical Name :	P8-8N	鞋用处理剂
公司信息 company information :		
名称 Name :	南宝国际 NanPao International	
地址 Address :	广东省东莞市黄江镇 Huangjiang town, Dongguan city, Guangdong Province 广东省佛山市三水区乐平镇 Leping Town, Sanshui District, Foshan City, Guangdong Province 福建省福清市阳下镇 Yangxia town, Fuqing city, Fujian Province	
电话 TEL :	0769-83364815 (东莞 DongGuan)	传真 Fax : 0769-83662303 (东莞 DongGuan)
	0757-87393000 (佛山 FoShan)	0757-87393009 (佛山 FoShan)
	0591-85291391 (福清 Fuqing)	0591-85291570 (福清 Fuqing)
国家应急咨询电话 National Consulting hotline for Chemical Accidents & Emergencies : 0532-83889090		

2: 危险性概述 Hazards Summarizing

应急综述 Emergency Overview : 高度易燃 Highly flammable	
危险性类别 Product Hazard Class :	
吸入危害级别 inhalation hazards class : 1	皮肤腐蚀/刺激级别 skin corrosion/irritation class : 2
易燃液体级别 Flammable liquid class : 2	严重损伤/刺激眼睛级别 Serious injury/irritate eyes class : 2
危害水生环境 (长期危害) Harm aquatic environment (long-term harm) class : 2	
特异性靶器官毒性-一次接触 Specific target organ toxicity - a contact class : 3 (麻醉效应 anesthesia effect)	
象形图 Pictograms :	火焰 Fire 健康危害 Health hazard 惊叹号 Exclamation mark 环境 Environment
警示词 Warning label : 危险 Danger	
危险信息 Warning For Hazard :	
H225 易燃液体和蒸气 Flammable liquid and vapour	
H304 若吞咽并进入呼吸道可能致命。 May be fatal if swallowed and enters airways	
H315 造成皮肤刺激 Irritation to skin	
H319 造成严重眼刺激 Causes serious eye irritation	
H336 可能引起昏昏欲睡或眩晕 May cause drowsiness or dizziness	
H411 可能对水生生物造成长期有害影响 May cause long-term harmful effects on aquatic organisms	
防范措施 Prevention Measures :	
P210 远离热源/火花/明火/热的表面—禁止吸烟 Keep away from heat/sparks/open flames/hot surfaces— No smoking	
P233 保持容器密封 Keep container tightly closed	
P264 作业后彻底清洗双手 Wash hands thoroughly after handling	
P270 使用本产品时不要进食、饮水或吸烟 Do not eat, drink or smoke when using this product	
P273 避免释放到环境中 Avoid release to the environment	
P280 戴防护手套/戴防护眼镜/戴防护面具。 Wear protective gloves/protective clothing/eye protection/face protection	
事故响应 Response :	
P301 + P312 + P330+P331 如果吞咽：漱口。不要催吐。如果感觉不适：立即呼叫解毒中心或就医。 If swallowed: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell.	
P303 + P361 + P353 如果皮肤 (或头发) 接触：立即除去脱掉所有沾污的衣物。用水清洗皮肤淋浴。 If on skin (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.	
P332+P313 如果发生皮肤刺激：获取医疗咨询/就医。 IF SKIN irritation occurs: Get medical advice/attention.	



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P304 + P340+P312 如误吸入：转移到空气新鲜处，休息，保持一个适合呼吸的姿势。如果感觉不适：立即呼叫解毒中心或就医。 If inhaled: Remove victim to fresh air and Keep at rest in a position comfortable for breathing.Call a POISON CENTER or doctor/physician if you feel unwell.

P305 + P351 + P338 + P310 如溅入眼睛：用水小心冲洗几分钟。如戴隐形眼镜且便于取出，取出隐形眼镜，继续冲洗。如果感觉不适，立即呼叫解毒中心或就医。 If in eyes: Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rinsing.Call a POISON CENTER or doctor/physician if you feel unwell.

3: 成分/组成信息Composition /Information On Ingredients

混合物Mixture 纯净物Pure substance

危险组分Dangerous Ingredient	浓度范围concentration range	化学文摘号CAS No.
丁酮Methyl Ethyl Ketone	25-35%	78-93-3
甲基环己烷Methylcyclohexane	25-45%	108-87-2
乙酸乙酯Ethyl acetate	25-40%	141-78-6
改质压克力树脂 Modified Acrylate Resin	0-5%	9003-01-4

4: 急救措施First Aid Measures

皮肤接触 Contact:	Skin 脱去污染衣物，以肥皂水及清水彻底冲洗皮肤。Remove immediately any soiled or soaked clothing. Wash Skin with plenty of water and soap.
眼睛接触 contact:	Eye 用大量清水冲洗。Rinse with a lot of water.
吸入Inhalation :	迅速撤离现场到空气新鲜处，保持呼吸道通畅，如呼吸停止，进行人工呼吸。如呼吸困难，经输氧等支持疗法。就医。Move patient from contaminated area to fresh air. If breathing is difficult, Give oxygen, If breathing has stopped, give artificial respiration. Get medical attention.
食入Ingestion :	避免催吐，如患者清醒，给予牛奶或水以稀释胃液，保持休息，并送医院治疗。Avoid vomiting .if individual is conscious, give milk or water to dilute stomach contents. Keep warm and quite. Get prompt medical attention.
对医生之提示Notes to Physician : 误食时，考虑有机溶剂中毒 To eat by mistake,Considering the organic solvent poisoning.	
对急救人员之防护The protection of first-aiders : 应穿着C 级防护装备在安全区实施急救 The person who should wear C class protect suit and carry out first-aid in safety area.	
最重要症状及危害效应The most important symptoms and hazardous effects : 毒性极低，主要是抑制中枢神经 Lower poison, and it mainly effects on central nervous system.	

5: 消防措施Fire Fighting Measures

危险特性Specific Hazards :	其蒸汽与空气形成爆炸性混合物遇明火、高热能引起燃烧、爆炸，与氧化剂可发生反应。其蒸汽比重比空气重，能在较低处扩散到相当远的地方，遇火源引着回燃。遇高热，容器内压增大时有开裂和爆炸的危险，流速过快易产生和积聚静电。The vapors and air may form of volatile mixture which may burn or blast when it exposes in sources of ignition or high temperature. The vapors are heavier than air, so they could widely spread. Static discharges may create and accumulate when the fluid of the product is too fast.
有害燃烧产物Harmful burning waste :	一氧化碳，二氧化碳，有机物分解气体等 carbon monoxide, carbon dioxide and organic decomposition gas and so on.
灭火剂Extinguishing media :	合适的Suitable : 泡沫，二氧化碳，干粉，砂土Foam, CO2, dry power or soil 不合适的Not suitable : 水Water jet
灭火注意事项及措施Fire fighting precautions and measures :	消防人员须佩戴空气呼吸器、穿全身防火防毒服，在上风向灭火The firefighters must wear the oxygen mask and protective suit , and fight fire in the windward area.

APPENDIX G

Air Quality

A1 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Report

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16° 58' 37.76" N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 3' 11.44" E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Project Number စီမံကိန်းအမှတ်	TBS-173	Station Height (from ground) မြေပြင်မှ စက်တင်အမြင့်	5 ft / 1.5 m
		Sampling I.D လေ့ကျင့်မှုအမှတ်စဉ်	TBS-026/20

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရာအသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	*Guideline value ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	437.31	ppm	24 hours	10,000 ppm ^a	8-hour
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.50	ppm	24 hours	9 ppm ^b	8-hour
3.	Methane (CH ₄) မီသိန်း	2.13	ppm	24 hours	1,000 ppm ^c	8-hour
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	- 145.0	μg/m ³	1 hours	40 μg/m ³ 200 μg/m ³	1-year 1-hour
5.	Ozone (O ₃) အိုဇုန်း	88.48	μg/m ³	8 hours	100 μg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	42.71	μg/m ³	24 hours	50 μg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	21.84	μg/m ³	24 hours	25 μg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	19.29	μg/m ³	24 hours	20 μg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.00	ppb	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	72.41	%	24 hours	-	-
11.	Temperature (အပူချိန်)	29.83	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	1.02	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	East	-	24 hours	-	-

^aNational Environmental Quality Emission Guideline (2015), ^b Minnesota Department of Health, ^c NAQGS of US EPA, ^d Alberta, Agriculture, Food and Development, NG, No Guideline
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Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

A2 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Report

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16°58'34.16"N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 2'52.40"E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Project Number စီမံကိန်းအမှတ်	TBS-173	Station Height (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
		Sampling I.D စေ့ကုန်အမှတ်စဉ်	TBS-026/20

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရည်အသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	*Guideline value ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	451.97	ppm	24 hours	10,000 ppm ^a	8-hour
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.36	ppm	24 hours	9 ppm ^b	8-hour
3.	Methane (CH ₄) မီသိန်း	1.98	ppm	24 hours	1,000 ppm ^c	8-hour
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	- 105.9	μg/m ³	1 hours	40 μg/m ³ 200 μg/m ³	1-year 1-hour
5.	Ozone (O ₃) အိုဇုန်း	85.18	μg/m ³	8 hours	100 μg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	44.15	μg/m ³	24 hours	50 μg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	23.50	μg/m ³	24 hours	25 μg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	18.28	μg/m ³	24 hours	20 μg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.00	ppb	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	72.86	%	24 hours	-	-
11.	Temperature (အပူချိန်)	29.50	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	1.30	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	East and Southwest	-	24 hours	-	-

^aNational Environmental Quality Emission Guideline (2015), ^b Minnesota Department of Health, ^c NAQGS of US EPA, ^d Alberta, Agriculture, Food and Development, NG, No Guideline
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Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

A3 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Report

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16°59'7.72"N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 3'23.50"E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Project Number စီမံကိန်းအမှတ်	TBS-173	Station Height (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
		Sampling I.D စေ့ကမ္ဘာအမှတ်စဉ်	TBS-026/20

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရာအသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	*Guideline value ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	454.89	ppm	24 hours	10,000 ppm ^a	8-hour
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.44	μg/m ³	24 hours	9 ppm ^b	8-hour
3.	Methane (CH ₄) မီသိန်း	1.85	ppm	24 hours	1,000 ppm ^c	8-hour
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	- 131.9	μg/m ³	1 hours	40 μg/m ³ 200 μg/m ³	1-year 1-hour
5.	Ozone (O ₃) အိုဇွန်	72.79	μg/m ³	8 hours	100 μg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	49.24	μg/m ³	24 hours	50 μg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	24.55	μg/m ³	24 hours	25 μg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	18.76	μg/m ³	24 hours	20 μg/m ^d	24-hour
9.	Volatile Organic Compound (VOCs)	0.00	ppb	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	71.37	%	24 hours	-	-
11.	Temperature (အပူချိန်)	29.35	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	1.63	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	East	-	24 hours	-	-

^aNational Environmental Quality Emission Guideline (2015), ^b Minnesota Department of Health, ^c NAQGS of US.EPA, ^d Alberta, Agriculture, Food and Development, NG, No Guideline
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Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

A4 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Report

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16° 58'37.76"N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 4'31.40"E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Project Number စီမံကိန်းအမှတ်	TBS-173	Station Height (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
		Sampling I.D စေ့ကုန်အမှတ်စဉ်	TBS-026/20

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရည်အသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	*Guideline value ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	415.85	ppm	24 hours	10,000 ^a	8 hr
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.34	μg/m ³	24 hours	9 ^b	8 hr
3.	Methane (CH ₄) မီသိန်း	1.84	ppm	24 hours	1,000 ^c	8 hr
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	- 102.2	μg/m ³	1 hours	40 μg/m ³ 200 μg/m ³	1-year 1-hour
5.	Ozone (O ₃) အိုဇုန်း	83.10	μg/m ³	8 hours	100 μg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	47.11	μg/m ³	24 hours	50 μg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	24.06	μg/m ³	24 hours	25 μg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	18.19	μg/m ³	24 hours	20 μg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.00	ppb	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	86.37	%	24 hours	-	-
11.	Temperature (အပူချိန်)	27.06	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	0.66	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	Southwest	-	24 hours	-	-

^aNational Environmental Quality Emission Guideline (2015), ^b Minnesota Department of Health, ^c NAQGS of US EPA, ^d Alberta, Agriculture, Food and Development, NG, No Guideline
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Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

A5 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Report

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16°57'49.59"N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Ther Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 5'29.67"E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Project Number စီမံကိန်းအမှတ်	TBS-173	Station Height (from ground) မြေပြင်မှ စက်တင်အမြင့်	5 ft / 1.5 m
		Sampling I.D လေ့ကမ္မဇာအမှတ်စဉ်	TBS-026/20

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရည်အသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	*Guideline value ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	414.42	ppm	24 hours	10,000 ^a	8 hr
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.36	μg/m ³	24 hours	9 ^b	8 hr
3.	Methane (CH ₄) မီသိန်း	2.11	ppm	24 hours	1,000 ^c	8 hr
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	- 106.7	μg/m ³	1 hours	40 μg/m ³ 200 μg/m ³	1-year 1-hour
5.	Ozone (O ₃) အိုဇုန်း	82.91	μg/m ³	8 hours	100 μg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	39.94	μg/m ³	24 hours	50 μg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	23.75	μg/m ³	24 hours	25 μg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	17.38	μg/m ³	24 hours	20 μg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.00	ppb	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	93.89	%	24 hours	-	-
11.	Temperature (အပူချိန်)	26.06	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	1.37	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	Southwest	-	24 hours	-	-

^aNational Environmental Quality Emission Guideline (2015), ^b Minnesota Department of Health, ^c NAQGS of US EPA, ^d Alberta, Agriculture, Food and Development, NG, No Guideline

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Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

A1 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16° 58' 39.95" N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 3' 14.99" E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့်တည်နေရာ	At Project Site	Station Height (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling I.D လေ့ကျင့်မှုအမှတ်စဉ်	TBS- 070/1
		Measurement Date တိုင်းတာသည့်နေ့ရက်	8 th – 9 th December, 2022

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရည်အသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	Guideline Limit ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	453.11	ppm	8 hours	10,000 ppm ^a	8-hour
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.49	ppm	8 hours	9 ppm ^b	8-hour
3.	Methane (CH ₄) မီသိန်း	2.13	ppm	8 hours	1,000 ppm ^c	8-hour
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	147.00	µg/m ³	1 hour	*200 µg/m ³	1-hour
5.	Ozone (O ₃) အိုဇွန်	92.51	µg/m ³	8 hours	*100 µg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	42.84	µg/m ³	24 hours	*50 µg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	21.47	µg/m ³	24 hours	*25 µg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	19.12	µg/m ³	24 hours	*20 µg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.0	µg/m ³	24 hours	NG	-
		0.0	ppb			
10.	Humidity (စိုထိုင်းစ)	72	%	24 hours	-	-
11.	Temperature (အပူချိန်)	28	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	1.1	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	Northeast	-	24 hours	-	-

*National Environmental Quality Emission Guideline (2015), ^a Minnesota Department of Health, ^b NAQGS of US.EPA, ^c Alberta, Agriculture, Food and Development, NG, No Guideline

Remark: This air quality report cannot be edited without the permission of TBS.

Analyzed by

U Wai Phyto Aung
Environmental Geologist

Wai Phyto Aung
Environmental Geologist
TOTAL BUSINESS SOLUTION CO., LTD.

Reviewed by

U Myatthu Kyaw
General Manager

MYATTHU KYAW
GENERAL MANAGER
TOTAL BUSINESS SOLUTION CO., LTD.

Approved by

Dr. Soe Moe Kyaw Win
Managing Director

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

A2 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited	Latitude လတ္တီတွဒ်	16° 58' 34 16" N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 2' 52.40" E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့်တည်နေရာ	Wartayar Industrial Zone	Station Height (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling I.D လေ့ကျင့်မှုအမှတ်စဉ်	TBS- 070/2
		Measurement Date တိုင်းတာသည့်နေ့ရက်	9 th – 10 th December, 2022

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရာညီအသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	Guideline Limit ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	447.12	ppm	8 hours	10,000 ppm ^a	8-hour
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.37	ppm	8 hours	9 ppm ^a	8-hour
3.	Methane (CH ₄) မီသိန်း	2.03	ppm	8 hours	1,000 ppm ^a	8-hour
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	115.40	µg/m ³	1 hour	*200 µg/m ³	1-hour
5.	Ozone (O ₃) အိုဇုန်း	84.44	µg/m ³	8 hours	*100 µg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	39.57	µg/m ³	24 hours	*50 µg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	20.79	µg/m ³	24 hours	*25 µg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	18.56	µg/m ³	24 hours	*20 µg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.0	µg/m ³	24 hours	NG	-
		0.0	ppb			
10.	Humidity (စိုထိုင်းစ)	74	%	24 hours	-	-
11.	Temperature (အပူချိန်)	27	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	1.0	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	Northeast	-	24 hours	-	-

*National Environmental Quality Emission Guideline (2015), ^a Minnesota Department of Health, ^b NAQQS of US.EPA, ^c Alberta, Agriculture, Food and Development, NG, No Guideline

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Analyzed by

U Wai Phyto Aung
Environmental Geologist

Wai Phyto Aung
Environmental Geologist
TOTAL BUSINESS SOLUTION CO., LTD.

Reviewed by

U Myatthu Kyaw
General Manager

MYATTHU KYAW
GENERAL MANAGER
TOTAL BUSINESS SOLUTION CO.,LTD.

Approved by

Dr. Soe Moe Kyaw Win
Managing Director

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

A3 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited	Latitude လတ္တီတွဒ်	16° 59' 7.72" N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 3' 23.50" E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့်တည်နေရာ	War Ta Yar Industrial Zone	Station Height (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling I.D လေ့ကျင့်မှုအမှတ်စဉ်	TBS- 070/3
		Measurement Date တိုင်းတာသည့်နေ့ရက်	10 th – 11 th December, 2022

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရည်အသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	Guideline Limit ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	453.97	ppm	8 hours	10,000 ppm ^a	8-hour
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.44	ppm	8 hours	9 ppm ^a	8-hour
3.	Methane (CH ₄) မီသိန်း	1.90	ppm	8 hours	1,000 ppm ^a	8-hour
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	133.60	µg/m ³	1 hour	*200 µg/m ³	1-hour
5.	Ozone (O ₃) အိုဇုန်း	74.60	µg/m ³	8 hours	*100 µg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	43.60	µg/m ³	24 hours	*50 µg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	21.62	µg/m ³	24 hours	*25 µg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	18.33	µg/m ³	24 hours	*20 µg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.0	µg/m ³	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	76	%	24 hours	-	-
11.	Temperature (အပူချိန်)	26	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	0.8	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	Northeast	-	24 hours	-	-

*National Environmental Quality Emission Guideline (2015), ^a Minnesota Department of Health, ^b NAAQS of US.EPA, ^c Alberta, Agriculture, Food and Development, NG, No Guideline

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<p>Analyzed by</p>  <p>U Wai Phyto Aung Environmental Geologist</p> <p>Wai Phyto Aung Environmental Geologist TOTAL BUSINESS SOLUTION CO., LTD.</p>	<p>Reviewed by</p>  <p>U Myatthu Kyaw General Manager</p> <p>MYATTHU KYAW GENERAL MANAGER TOTAL BUSINESS SOLUTION CO.,LTD.</p>	<p>Approved by</p>  <p>Dr. Soe Moe Kyaw Win Managing Director</p> <p>Dr. Soe Moe Kyaw Win MANAGING DIRECTOR TOTAL BUSINESS SOLUTION CO., LTD.</p>
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A4 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited	Latitude လတ္တီတွဒ်	17° 0' 0.78" N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 3' 14.99" E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့်တည်နေရာ	Residential Area	Station Height (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling I.D လေ့ကျင့်မှုအမှတ်စဉ်	TBS- 070/4
		Measurement Date တိုင်းတာသည့်နေ့ရက်	11 th – 12 th December, 2022

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရာညီအသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	Guideline Limit ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	414.91	ppm	8 hours	10,000 ppm ^a	8-hour
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.33	ppm	8 hours	9 ppm ^a	8-hour
3.	Methane (CH ₄) မီသိန်း	1.91	ppm	8 hours	1,000 ppm ^a	8-hour
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	105.8	µg/m ³	1 hour	*200 µg/m ³	1-hour
5.	Ozone (O ₃) အိုဇုန်း	44.43	µg/m ³	8 hours	*100 µg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	42.45	µg/m ³	24 hours	*50 µg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	21.70	µg/m ³	24 hours	*25 µg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	18.33	µg/m ³	24 hours	*20 µg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.0	µg/m ³	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	75	%	24 hours	-	-
11.	Temperature (အပူချိန်)	28	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	0.9	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	Northeast	-	24 hours	-	-

*National Environmental Quality Emission Guideline (2015), ^a Minnesota Department of Health, ^b NAAQS of US.EPA, ^c Alberta, Agriculture, Food and Development, NG, No Guideline

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<p>Analyzed by</p>  <p>U Wai Phyto Aung Environmental Geologist</p> <p>Wai Phyto Aung Environmental Geologist TOTAL BUSINESS SOLUTION CO., LTD.</p>	<p>Reviewed by</p>  <p>U Myatthu Kyaw General Manager</p> <p>MYATTHU KYAW GENERAL MANAGER TOTAL BUSINESS SOLUTION CO.,LTD.</p>	<p>Approved by</p>  <p>Dr. Soe Moe Kyaw Win Managing Director</p> <p>Dr. Soe Moe Kyaw Win MANAGING DIRECTOR TOTAL BUSINESS SOLUTION CO., LTD.</p>
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A5 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Air Quality Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited	Latitude လတ္တီတွဒ်	16° 57' 46.23" N
Project Location စီမံကိန်းတည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 4' 31.40" E
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Haz-Scanner™ Model-EPAS	Sampling Duration တိုင်းတာသည့် ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့်တည်နေရာ	Residential Area	Station Height (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling I.D လေ့ကျင့်မှုအမှတ်စဉ်	TBS- 070/5
		Measurement Date တိုင်းတာသည့်နေ့ရက်	12 th – 13 th December, 2022

Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရာအသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ပျမ်းမျှကာလ	Guideline Limit ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO ₂) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	419.30	ppm	8 hours	10,000 ppm ^a	8-hour
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	0.33	ppm	8 hours	9 ppm ^a	8-hour
3.	Methane (CH ₄) မီသိန်း	1.93	ppm	8 hours	1,000 ppm ^a	8-hour
4.	Nitrogen dioxide (NO ₂) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	102.6	µg/m ³	1 hour	*200 µg/m ³	1-hour
5.	Ozone (O ₃) အိုဇုန်း	82.51	µg/m ³	8 hours	*100 µg/m ³	8-hour daily maximum
6.	Particulate Matter (PM ₁₀) လေထုထဲရှိ အမှုန်အမွှား	36.14	µg/m ³	24 hours	*50 µg/m ³	24-hour
7.	Particulate Matter (PM _{2.5}) လေထုထဲရှိ အမှုန်အမွှား	23.11	µg/m ³	24 hours	*25 µg/m ³	24-hour
8.	Sulphur dioxide (SO ₂) ဆာလဖာဒိုင်အောက်ဆိုဒ်	17.55	µg/m ³	24 hours	*20 µg/m ³	24-hour
9.	Volatile Organic Compound (VOCs)	0.0	µg/m ³	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	68.2	%	24 hours	-	-
11.	Temperature (အပူချိန်)	30.1	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	0.8	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	Northeast	-	24 hours	-	-

*National Environmental Quality Emission Guideline (2015), ^a Minnesota Department of Health, ^b NAAQS of US.EPA, ^c Alberta, Agriculture, Food and Development, NG, No Guideline

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Analyzed by

U Wai Phyto Aung
Environmental Geologist

Wai Phyto Aung
Environmental Geologist
TOTAL BUSINESS SOLUTION CO., LTD.

Reviewed by

U Myatthu Kyaw
General Manager

MYATTHU KYAW
GENERAL MANAGER
TOTAL BUSINESS SOLUTION CO.,LTD.

Approved by

Dr. Soe Moe Kyaw Win
Managing Director

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

APPENDIX H

Noise Level Results

N1 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16° 58' 37.76" N
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 3' 11.44" E
		Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356	Project Number စီမံကိန်းအမှတ်	TBS 173
Start Date တိုင်းတာသည့်နေ့စွဲ	24.4.2020	End Date ပြီးစီးသည့်နေ့စွဲ	25.4.2020

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1 Hour
7:00	60.95	22:00	55.55
8:00	57.89	23:00	54.36
9:00	55.17	00:00	54.19
10:0	54.01	01:00	54.97
11:00	56.77	02:00	56.35
12:00	50.92	03:00	59.27
13:00	52.34	04:00	57.59
14:00	60.92	05:00	59.53
15:00	61.34	06:00	62.04
16:00	57.73	07:00	60.95
17:00	57.03		
18:00	56.73		
19:00	56.96		
20:00	57.33		
21:00	57.54		
22:00	55.55		
Day Time (AVG)	56.82	Night Time (AVG)	57.5
National Environmental Quality (Emission) Guidelines			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

*Myanmar Environmental Quality Emission Guideline (2015)

Remark: This noise quality result cannot be edited without the permission of TBS.

Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

N2 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16° 58' 34.16" N
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 2' 52.40" E
		Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356	Project Number စီမံကိန်းအမှတ်	TBS 173
Start Date တိုင်းတာသည့်နေ့စွဲ	26.4.2020	End Date ပြီးစီးသည့်နေ့စွဲ	27.4.2020

Noise Results (dBA) per Hour			
Day Time (10:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-10:00Hr)	Leq 1 Hour
10:00	62.50	22:00	56.73
11:00	60.00	23:00	54.67
12:00	63.93	00:00	51.09
13:00	56.74	01:00	50.50
14:00	56.99	02:00	50.52
15:00	58.25	03:00	51.56
16:00	62.06	04:00	50.93
17:00	63.41	05:00	51.66
18:00	64.33	06:00	55.61
19:00	64.08	07:00	59.76
20:00	60.87	08:00	63.02
21:00	58.32	09:00	63.59
22:00	56.73	10:00	62.50
Day Time (AVG)	60.63	Night Time (AVG)	55.55
National Environmental Quality (Emission) Guidelines			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

*Myanmar Environmental Quality Emission Guideline (2015)

Remark: This noise quality result cannot be edited without the permission of TBS.

Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager
HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director
Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

N3 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16° 59' 7.72" N
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 3' 23.50" E
		Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356	Project Number စီမံကိန်းအမှတ်	TBS 173
Start Date တိုင်းတာသည့်နေ့စွဲ	27.4.2020	End Date ပြီးစီးသည့်နေ့စွဲ	28.4.2020

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1 Hour
7:00	49.37	22:00	50.75
8:00	51.26	23:00	49.78
9:00	54.08	00:00	48.94
10:00	54.42	01:00	48.07
11:00	54.62	02:00	47.92
12:00	55.09	03:00	47.50
13:00	57.44	04:00	46.85
14:00	56.61	05:00	47.27
15:00	54.81	06:00	48.20
16:00	54.74	07:00	49.37
17:00	54.68		
18:00	54.67		
19:00	54.62		
20:00	53.34		
21:00	51.93		
22:00	50.75		
Day Time (AVG)	53.90	Night Time (AVG)	51.95
National Environmental Quality (Emission) Guidelines			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

*Myanmar Environmental Quality Emission Guideline (2015)

Remark: This noise quality result cannot be edited without the permission of TBS.

Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

N4 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	17° 0' 0.78" N
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 3' 55.92" E
		Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356	Project Number စီမံကိန်းအမှတ်	TBS-173
Start Date တိုင်းတာသည့်နေ့စွဲ	3.6.2020	End Date ပြီးစီးသည့်နေ့စွဲ	4.6.2020

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1 Hour
7:00	54.39	22:00	57.33
8:00	55.29	23:00	57.15
9:00	57.20	00:00	56.65
10:0	60.10	01:00	50.69
11:00	62.23	02:00	50.98
12:00	61.58	03:00	51.59
13:00	54.75	04:00	52.48
14:00	60.04	05:00	53.08
15:00	65.61	06:00	53.68
16:00	66.56	07:00	54.39
17:00	66.67		
18:00	67.99		
19:00	66.75		
20:00	58.83		
21:00	57.88		
22:00	57.33		
Day Time (AVG)	60.80	Night Time (AVG)	53.80
National Environmental Quality (Emission) Guidelines			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

*Myanmar Environmental Quality Emission Guideline (2015)
Remark: This noise quality result cannot be edited without the permission of TBS.

Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager
HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director
Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

N5 (1st Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Latitude လတ္တီတွဒ်	16° 57' 49.59" N
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Longitude လောင်ဂျီတွဒ်	96° 5' 29.67" E
		Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356	Project Number စီမံကိန်းအမှတ်	TBS-173
Start Date တိုင်းတာသည့်နေ့စွဲ	4.6.2020	End Date ပြီးစီးသည့်နေ့စွဲ	5.6.2020

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1 Hour
7:00	53.49	22:00	52.81
8:00	54.94	23:00	53.71
9:00	54.71	00:00	52.97
10:0	52.89	01:00	52.94
11:00	54.90	02:00	53.71
12:00	54.58	03:00	54.28
13:00	54.79	04:00	52.29
14:00	54.36	05:00	52.39
15:00	52.92	06:00	52.91
16:00	52.58	07:00	53.49
17:00	53.18		
18:00	53.54		
19:00	53.29		
20:00	53.66		
21:00	52.98		
22:00	52.81		
Day Time (AVG)	53.73	Night Time (AVG)	53.15
National Environmental Quality (Emission) Guidelines			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

*Myanmar Environmental Quality Emission Guideline (2015)

Remark: This noise quality result cannot be edited without the permission of TBS.

Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

Reviewed by

Dr. Soe Moe Kyaw Win
Managing Director

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Dr. Soe Moe Kyaw Win
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

N1 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Level Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Co., Ltd.	Start Date တိုင်းတာသည့်နေ့ရက်	8 th – 9 th December, 2022
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
	Measurement Location တိုင်းတာသည့် တည်နေရာ	At Project Site	Sampling Type တိုင်းတာသည့် အမျိုးအစား
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356
		Latitude/ လတ္တီကျု	16° 58' 39.95"N
		Longitude/ လောင်ဂျီကျု	96° 3' 14.99"E

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1(Hour)
07:00-08:00	59.2	22:00-23:00	54.6
08:00-09:00	61.1	23:00-00:00	54.0
09:00-10:00	58.4	00:00-01:00	54.7
10:00-11:00	50.7	01:00-02:00	54.6
11:00-12:00	50.9	02:00-03:00	58.9
12:00-13:00	60.1	03:00-04:00	59.3
13:00-14:00	60.6	04:00-05:00	56.6
14:00-15:00	61.8	05:00-06:00	62.6
15:00-16:00	60.8	06:00-07:00	60.8
16:00-17:00	57.0	-	-
17:00-18:00	56.6	-	-
18:00-19:00	56.9	-	-
19:00-20:00	57.1	-	-
20:00-21:00	57.5	-	-
21:00-22:00	57.1	-	-
Day Time (AVG)	57.7	Night Time (AVG)	57.3
National Environmental Quality (Emission) Guidelines, 2015			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

Remark: This noise quality result cannot be edited without the permission of TBS.

Analyzed by	Reviewed by	Approved by
U Wai Phyo Aung Environmental Geologist Wai Phyo Aung Environmental Geologist TOTAL BUSINESS SOLUTION CO., LTD.	U Myatthu Kyaw General Manager MYATTHU KYAW GENERAL MANAGER TOTAL BUSINESS SOLUTION CO., LTD.	Dr. Soe Moe Kyaw Win Managing Director Dr. Soe Moe Kyaw Win MANAGING DIRECTOR TOTAL BUSINESS SOLUTION CO., LTD.

N2 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Level Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Co., Ltd.	Start Date တိုင်းတာသည့်နေ့ရက်	9 th – 10 th December, 2022
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့် တည်နေရာ	War Ta Yar Industrial Zone	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Noise Level
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356
		Latitude/ လတ္တီကျု	16° 58' 34.16"N
		Longitude/ လောင်ဂီကျု	96° 2' 52.40"E

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1(Hour)
07:00-08:00	64.0	22:00-23:00	55.3
08:00-09:00	59.9	23:00-00:00	54.1
09:00-10:00	59.3	00:00-01:00	52.4
10:00-11:00	60.0	01:00-02:00	51.6
11:00-12:00	56.7	02:00-03:00	50.0
12:00-13:00	55.2	03:00-04:00	50.4
13:00-14:00	57.9	04:00-05:00	52.5
14:00-15:00	59.2	05:00-06:00	54.1
15:00-16:00	61.4	06:00-07:00	57.7
16:00-17:00	63.2	-	-
17:00-18:00	62.2	-	-
18:00-19:00	60.1	-	-
19:00-20:00	58.9	-	-
20:00-21:00	57.4	-	-
21:00-22:00	58.3	-	-
Day Time (AVG)	59.6	Night Time (AVG)	53.1
National Environmental Quality (Emission) Guidelines, 2015			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

Remark: This noise quality result cannot be edited without the permission of TBS.

Analyzed by	Reviewed by	Approved by
U Wai Phyo Aung Environmental Geologist Wai Phyo Aung Environmental Geologist TOTAL BUSINESS SOLUTION CO., LTD.	U Myatthu Kyaw General Manager MYATTHU KYAW GENERAL MANAGER TOTAL BUSINESS SOLUTION CO.,LTD.	Dr. Soe Moe Kyaw Win Managing Director Dr. Soe Moe Kyaw Win MANAGING DIRECTOR TOTAL BUSINESS SOLUTION CO., LTD.

N3 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Level Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Co., Ltd.	Start Date တိုင်းတာသည့်နေ့ရက်	10 th – 11 th December, 2022
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့် တည်နေရာ	War Ta Yar Industrial Zone	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Noise Level
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356
		Latitude/ လတ္တီကျု	16° 59' 7.72"N
		Longitude/ လောင်ဂျီကျု	96° 3' 23.50"E

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1(Hour)
07:00-08:00	53.7	22:00-23:00	50.2
08:00-09:00	53.0	23:00-00:00	49.3
09:00-10:00	54.1	00:00-01:00	48.4
10:00-11:00	54.9	01:00-02:00	47.8
11:00-12:00	54.0	02:00-03:00	47.8
12:00-13:00	53.3	03:00-04:00	47.1
13:00-14:00	55.1	04:00-05:00	46.9
14:00-15:00	54.9	05:00-06:00	47.9
15:00-16:00	54.9	06:00-07:00	48.8
16:00-17:00	56.3	-	-
17:00-18:00	55.4	-	-
18:00-19:00	54.6	-	-
19:00-20:00	54.2	-	-
20:00-21:00	52.5	-	-
21:00-22:00	51.4	-	-
Day Time (AVG)	54.1	Night Time (AVG)	48.3
National Environmental Quality (Emission) Guidelines, 2015			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

Remark: This noise quality result cannot be edited without the permission of TBS.

Analyzed by	Reviewed by	Approved by
U Wai Phyo Aung Environmental Geologist Wai Phyo Aung Environmental Geologist TOTAL BUSINESS SOLUTION CO., LTD.	U Myatthu Kyaw General Manager MYATTHU KYAW GENERAL MANAGER TOTAL BUSINESS SOLUTION CO.,LTD.	Dr. Soe Moe Kyaw Win Managing Director Dr. Soe Moe Kyaw Win MANAGING DIRECTOR TOTAL BUSINESS SOLUTION CO., LTD.

N4 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Level Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Co., Ltd.	Start Date တိုင်းတာသည့်နေ့ရက်	11 th – 12 th December, 2022
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့် တည်နေရာ		Sampling Type တိုင်းတာသည့် အမျိုးအစား	Noise Level
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356
		Latitude/ လတ္တီကျု	17° 0' 0.82"N
		Longitude/ လောင်ဂျီကျု	96° 3' 55.76"E

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1(Hour)
07:00-08:00	58.6	22:00-23:00	52.1
08:00-09:00	59.0	23:00-00:00	50.1
09:00-10:00	57.8	00:00-01:00	49.2
10:00-11:00	60.5	01:00-02:00	48.4
11:00-12:00	61.0	02:00-03:00	47.0
12:00-13:00	60.1	03:00-04:00	45.3
13:00-14:00	58.0	04:00-05:00	47.2
14:00-15:00	57.4	05:00-06:00	50.2
15:00-16:00	62.3	06:00-07:00	53.8
16:00-17:00	62.4	-	-
17:00-18:00	58.1	-	-
18:00-19:00	57.4	-	-
19:00-20:00	59.3	-	-
20:00-21:00	57.1	-	-
21:00-22:00	54.1	-	-
Day Time (AVG)	58.9	Night Time (AVG)	49.2
National Environmental Quality (Emission) Guidelines, 2015			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

Remark: This noise quality result cannot be edited without the permission of TBS.

Analyzed by	Reviewed by	Approved by
U Wai Phyo Aung Environmental Geologist Wai Phyo Aung Environmental Geologist TOTAL BUSINESS SOLUTION CO., LTD.	U Myatthu Kyaw General Manager MYATTHU KYAW GENERAL MANAGER TOTAL BUSINESS SOLUTION CO.,LTD.	Dr. Soe Moe Kyaw Win Managing Director Dr. Soe Moe Kyaw Win MANAGING DIRECTOR TOTAL BUSINESS SOLUTION CO., LTD.

N5 (2nd Time Measurement)



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Noise Level Measurement Result

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Co., Ltd.	Start Date တိုင်းတာသည့်နေ့ရက်	12 th – 13 th December, 2022
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon.	Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့် တည်နေရာ		Sampling Type တိုင်းတာသည့် အမျိုးအစား	Noise Level
Project Number စီမံကိန်းအမှတ်	TBS-173	Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356
		Latitude/ လတ္တီကျု	16° 57' 49.59"N
		Longitude/ လောင်ဂျီကျု	96° 5' 29.67"E

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1(Hour)
07:00-08:00	54.1	22:00-23:00	45.2
08:00-09:00	54.7	23:00-00:00	45.0
09:00-10:00	53.7	00:00-01:00	44.8
10:00-11:00	54.6	01:00-02:00	44.8
11:00-12:00	54.3	02:00-03:00	45.9
12:00-13:00	54.9	03:00-04:00	45.5
13:00-14:00	54.3	04:00-05:00	47.7
14:00-15:00	53.5	05:00-06:00	49.0
15:00-16:00	52.6	06:00-07:00	51.2
16:00-17:00	53.1	-	-
17:00-18:00	53.4	-	-
18:00-19:00	50.1	-	-
19:00-20:00	48.4	-	-
20:00-21:00	46.5	-	-
21:00-22:00	45.4	-	-
Day Time (AVG)	52.2	Night Time (AVG)	46.6
National Environmental Quality (Emission) Guidelines, 2015			
Residential, institutional, educational	55	Residential, institutional, educational	45
Industrial Commercial	70	Industrial Commercial	70

Remark: This noise quality result cannot be edited without the permission of TBS.

Analyzed by  U Wai Phyo Aung Environmental Geologist Wai Phyo Aung Environmental Geologist TOTAL BUSINESS SOLUTION CO., LTD.	Reviewed by  U Myatthu Kyaw General Manager MYATTHU KYAW GENERAL MANAGER TOTAL BUSINESS SOLUTION CO., LTD.	Approved by  Dr. Soe Moe Kyaw Win Managing Director Dr. Soe Moe Kyaw Win MANAGING DIRECTOR TOTAL BUSINESS SOLUTION CO., LTD.
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APPENDIX I

Vibration Results

1st Time Vibration Measurement Results



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Date တိုင်းတာသည့် နေ့ရက်	24 th April – 5 th June, 2020
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyl Thar Township, Yangon.	Start Time/ End Time စတင်သည့်အချိန်/ ပြီးစီးသည့်အချိန်	24 hours
Project Number စီမံကိန်းအမှတ်	173	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Vibration Level
		Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Nomis Seismograph (Mini Supergraph II)

No စဉ်	Site Description တိုင်းတာသည့် နေရာ	Result ရလဒ်		
		Direction ဦးတည်ချက်	Frequency ကြိမ်နှုန်း (Hz)	Peak particle velocity (mm/s)
V1	16° 58' 37.76" N 96° 3' 14.99" E	Radial	26.81	0.29
		Transverse	22.15	0.23
		Vertical	11.80	0.37
V2	16°58'34.16"N 96° 2'52.40"E	Radial	10.85	0.24
		Transverse	11.88	0.17
		Vertical	7.25	0.28
V3	16°59'7.72"N 96° 3'23.50"E	Radial	9.74	0.25
		Transverse	20.63	0.32
		Vertical	15.00	0.32
V4	17° 0'0.78"N 96° 3'55.92"E	Radial	32.70	0.24
		Transverse	38.86	0.21
		Vertical	14.85	0.20
V5	16°57'49.59"N 96° 5'29.67"E	Radial	24.48	0.19
		Transverse	65.52	0.13
		Vertical	26.07	0.15

Remark: This quality report cannot be edited without the permission of TBS.

Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager

HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Reviewed by

DR. Soe Moe Kyaw Win
Managing Director

DR. SOE MOE KYAW WIN
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

2nd Time Vibration Measurement Results



TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

Client တိုင်းတာလိုသူ အမည်	Alpha Best Global Limited.	Date တိုင်းတာသည့် နေ့ရက်	8 th - 13 th December, 2022
Project Location စီမံကိန်း တည်နေရာ	Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyl Thar Township, Yangon.	Start Time/ End Time စတင်သည့်အချိန်/ ပြီးစီးသည့်အချိန်	24 hours
Project Number စီမံကိန်းအမှတ်	173	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Vibration Level
		Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Nomis Seismograph (Mini Supergraph II)

No စဉ်	Site Description တိုင်းတာသည့် နေရာ	Result ရလဒ်		
		Direction ဦးတည်ချက်	Frequency ကြိမ်နှုန်း (Hz)	Peak particle velocity (mm/s)
V1	16° 58' 37.76" N 96° 3' 14.99" E	Radial	63.18	0.26
		Transverse	22.35	0.22
		Vertical	24.54	0.33
V2	16°58'34.16"N 96° 2'52.40"E	Radial	12.40	0.25
		Transverse	14.96	0.30
		Vertical	9.8	0.32
V3	16°59'7.72"N 96° 3'23.50"E	Radial	14.95	0.28
		Transverse	21.65	0.34
		Vertical	19.30	0.36
V4	17° 0'0.78"N 96° 3'55.92"E	Radial	35.90	0.29
		Transverse	40.99	0.23
		Vertical	21.96	0.25
V5	16°57'49.59"N 96° 5'29.67"E	Radial	23.75	0.17
		Transverse	59.62	0.16
		Vertical	29.18	0.14

Remark: This quality report cannot be edited without the permission of TBS.

Field Technician

U Htet Thiha Phone Myint
Environmental Geologist

Analyzed by

Daw Hnin Lai Win
Environmental Manager
HNIN LAI WIN
Environmental Manager
Total Business Solution Co., Ltd.

Reviewed by

DR. Soe Moe Kyaw Win
Managing Director
DR. SOE MOE KYAW WIN
MANAGING DIRECTOR
TOTAL BUSINESS SOLUTION CO., LTD.

APPENDIX J

Water Quality Results



ALARM Ecological Laboratory

Water Testing Result Report



Laboratory Testing Methods		
Parameters	Instruments / Methods	References / Descriptions
pH	pH Meter	Electrode method (Approved by EPA, ISO, ASTM), Hanna electrode meter Certified by 2014 EMS, Certified by QMS
Temperature, DO	DO Meter	Electrochemical probe method, Dissolved Oxygen Probe Measurement (Approved by EPA, ISO, ASTM) Horiba DO electrode certified with IP67 standards and measures
All Others parameters	SpectroDirect Methods	Lovibond brand reagent testing methods, precision of the methods are identical to the precision specified in the standard literature of AWWA and ISO
TDS	TDS Meter	Electrode method (Approved by EPA, ISO, ASTM), Hanna electrode meter Certified by 2014 EMS, Certified by QMS
Conductivity	Conductivity Meter	Electrode method, conductivity cell (Approved by EPA, ISO, ASTM), Hanna electrode meter Certified by 2014 EMS, Certified by QMS
BOD	BOD Testing Method	Method 405.1, USEPA Method for Chemical Analysis of Water and Waste water
Lead, Copper, Cadmium, Sodium	Atomic Adsorption Spectrophotometer	Shimadzu AA-6200, which is based on the Japan Water Standard Testing Method also approved by EPA and ASTM
Arsenic	Arsenic Test Kit	Lovibond brand Arsenic Test kit certified by DIN ISO 1997/ Follow Procedure: Meets WHO requirements:

Standards References		
Index	Standard Names	References
a	WHO Standard for Drinking Water (2011)	Guidelines for Drinking-water Quality 4rd edition, World Health Organization, 2011.
b	US EPA Drinking Water Standard 2018	2018 Edition of the Drinking Water Standards and Health Advisories, EPA 822-F-18-001, Office of Water, USEPA, Washington, DC, March 2018
c	Available Myanmar Drinking Water Standard	Proposed National Drinking Water Standards, Ministry of Health, September 2014
d	Myanmar Emission Guideline (2015)	National Environmental Quality (Emission) Guidelines, Order No. (615/2015) MOECAF, 2015, December 29.
*	At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity; when the zone is not defined, use 100 meters from the point of discharge.	

Quality Parameters Descriptions

pH: Although pH usually has no direct impact on consumers, it is one of the most important operational water quality parameters. Water generally becomes more corrosive with decreasing pH; however, excessively alkaline water also may be corrosive.

Temperature: will have an impact on the acceptability of a number of other inorganic constituents and chemical contaminants that may affect taste. High water temperature enhances the growth of microorganisms and may increase problems related to taste, odor, color and corrosion.

Color: Drinking-water should ideally have no visible color. Color in drinking-water is usually due to the presence of colored organic matter (primarily humic and fulvic acids) associated with the humus fraction of soil. Color is also strongly influenced by the presence of iron and other metals, either as natural impurities or as corrosion products. It may also result from the contamination of the water source with industrial effluents and may be the first indication of a hazardous situation.

Turbidity: Turbidity in water is caused by suspended particles or colloidal matter that obstructs light transmission through the water. It may be caused by inorganic or organic matter or a combination of the two. Microorganisms (bacteria, viruses and protozoa) are typically attached to particulates, and removal of turbidity by filtration will significantly reduce microbial contamination in treated water.

Total Dissolved Solid (TDS): The total of all dissolved mineral constituents, usually expressed in milligrams per liter. The concentration of dissolved solids may affect the taste of water. Water that contains more than 1,000 mg/L is unsuitable for many industrial uses. Some dissolved mineral matter is desirable, otherwise the water would have no taste. The dissolved solids concentration commonly is called the water's salinity and is classified as follows: fresh, 0-1,000 mg/L; slightly saline, 1,000-3,000 mg/L; moderately saline, 3,000-10,000 mg/L; very saline, 10,000-35,000 mg/L; and briny, more than 35,000 mg/L.

Total Suspended Solid (TSS): Both organic and inorganic particles of all sizes can contribute to the suspended solids concentration. These solids include anything drifting or floating in the water, from sediment, silt and sand to plankton and algae. TSS are particles that are larger than 2 microns found in the water column. Anything smaller than 2 microns (average filter size) is considered a dissolved solid.

Total Solid: Total solids are dissolved solids plus suspended solids in water.

Conductivity: is nothing but the measure of the capability of water to pass the flow of electric current. This ability of conductance is said to be directly proportional to the concentration of the ions present in the water.

Chloride: Large concentrations increase the corrosiveness of water and, in combination with sodium, give water a salty taste.

Hardness: Related to the soap-consuming characteristics of water; results in formation of scum when soap is added. May cause deposition of scale in boilers, water heaters, and pipes. Hardness contributed by calcium and magnesium, bicarbonate and carbonate mineral species in water is called carbonate hardness; hardness in excess of this concentration is called noncarbonate hardness. Water that has a hardness less than 61 mg/L is considered soft; 61-120 mg/L, moderately hard; 121-180 mg/L, hard; and more than 180 mg/L, very hard.

Dissolved Oxygen: is required by higher forms of aquatic life for survival. Depletion of dissolved oxygen in water supplies can

encourage the microbial reduction of nitrate to nitrite and sulfate to sulfide. It can also cause an increase in the concentration of ferrous iron in solution.

Biological/Chemical Oxygen Demand (BOD&COD): BOD is similar in function to chemical oxygen demand (COD), in that both measure the amount of organic compounds in water. However, COD is less specific, since it measures everything that can be chemically oxidized, rather than just levels of biologically active organic matter.

Aluminum: No known necessary role in human or animal diet. Nontoxic in the concentrations normally found in natural water supplies. Elevated dissolved aluminum concentrations in some low pH waters can be toxic to some types of fish.

Manganese: Causes gray or black stains on porcelain, enamel, and fabrics. Can promote growth of certain kinds of bacteria that clog pipes and wells.

Sodium & Potassium: Large concentrations may limit use of water for irrigation and industrial use and, in combination with chloride, give water a salty taste. Abnormally large concentrations may indicate natural brines, industrial brines, or sewage.

Zinc: Essential and beneficial in metabolism; its deficiency in young children or animals will retard growth and may decrease general body resistance to disease. Seems to have no ill effects even in fairly large concentrations (20,000-40,000 mg/L), but can impart a metallic taste or milky appearance to water. Zinc in drinking water commonly is derived from galvanized coatings of piping.

Iron: Forms rust-colored sediment; stains laundry, utensils, and fixtures reddish brown. Objectionable for food and beverage processing. Can promote growth of certain kinds of bacteria that clog pipes and well openings.

Arsenic: is toxic. A cumulative poison that is slowly excreted. Can cause nasal ulcers; damage to the kidneys, liver, and intestinal walls; and death. Recently suspected to be a carcinogen.

Chlorine: is added to water supplies to kill bacteria. Short term exposure to chlorine comes primarily from bathing and other activities that use hot water rather than from drinking. Short term exposure irritates the eyes and lungs, and within 15 minutes of exposure victims experience coughing, shortness of breath and headaches. Regular exposure to chlorine in the home has been associated with asthma and other respiratory diseases.

Cyanide: is highly acutely toxic. It is detoxified in the liver by first-pass metabolism following oral exposure. As a consequence, exposure to a dose spread over a longer period, through a day, for example, will result in lower toxicity, or higher tolerance, than the same dose given in a single bolus dose.

Nitrite: Commonly formed as an intermediate product in bacterially mediated nitrification and denitrification of ammonia and other organic nitrogen compounds. An acute health concern at certain levels of exposure. Nitrite typically occurs in water from fertilizers and is found in sewage and wastes from humans and farm animals. Concentrations greater than 1.0 mg/L, as nitrogen, may be injurious when used in feeding infants.

Nitrate & Nitrate-N: Concentrations greater than local background levels may indicate pollution by feedlot runoff, sewage, or fertilizers. Concentrations greater than 10 mg/L, as nitrogen, may be injurious when used in feeding infants.

Phosphorus & ortho-phosphate: Dense algal blooms or rapid plant growth can occur in waters rich in phosphorus. A limiting nutrient for eutrophication since it is typically in shortest supply. Sources are human and animal wastes and fertilizers.

Ammonia: Plant nutrient that can cause unwanted algal blooms and excessive plant growth when present at elevated levels in water bodies. Sources include decomposition of animal and plant proteins, agricultural and urban runoff, and effluent from wastewater treatment plants.

Lead: A cumulative poison, toxic in small concentrations. Can cause lethargy, loss of appetite, constipation, anemia, abdominal pain, gradual paralysis in the muscles, and death.

Copper: Essential to metabolism; copper deficiency in infants and young animals results in nutritional anemia. Large concentrations of copper are toxic and may cause liver damage. Moderate levels of copper (near the action level) can cause gastro-intestinal distress.

Cadmium: A cumulative poison; very toxic. Not known to be either biologically essential or beneficial. Believed to promote renal arterial hypertension. Elevated concentrations may cause liver and kidney damage, or even anemia, retarded growth, and death.

Nickel: Very toxic to some plants and animals. Toxicity for humans is believed to be very minimal.

Sulfide: The "rotten egg" odor of hydrogen sulfide is particularly noticeable in some ground waters and in stagnant drinking-water in the distribution system, as a result of oxygen depletion and the subsequent reduction of sulfate by bacterial activity. Sulfide is oxidized rapidly to sulfate in well-aerated or chlorinated water, and hydrogen sulfide levels in oxygenated water supplies are normally very low.

Sulfate: Sulfates of calcium and magnesium form hard scale. Large concentrations of sulfate have a laxative effect on some people and, in combination with other ions, give water a bitter taste.

Alkalinity: A measure of the capacity of unfiltered water to neutralize acid. In almost all natural waters alkalinity is produced by the dissolved carbon dioxide species, bicarbonate and carbonate.

Phenol: The presence of phenol in drinking water probably results from using contaminated surface water or groundwater as a source. Its presence in groundwater is probably the result of release to soil, often industrial releases or leachate from waste dumps, and the subsequent leaching of phenol through the soil to the groundwater. Chlorophenols are present in drinking-water as a result of the chlorination of phenols, as by-products of the reaction of hypochlorite with phenolic acids, as biocides or as degradation products of phenoxy herbicides. IARC has classified 2,4,6-trichlorophenol in Group 2B (possibly carcinogenic to humans).

Boron: Essential to plant growth, but may be toxic to crops when present in excessive concentrations in irrigation water. Sensitive plants show damage when irrigation water contains more than 570 µg/L and even tolerant plants may be damaged when boron exceeds 2,000 µg/L. The recommended limit is 750 µg/L for long-term irrigation on sensitive crops.

Fluoride: To produce signs of acute fluoride intoxication, minimum oral doses of about 1 mg of fluoride per kilogram of body weight were required. Concentrations above this guideline value (1.5mg/L) carry an increasing risk of dental fluorosis and that progressively higher concentrations lead to increasing risks of skeletal fluorosis.

~~~ Thank you so much for using our testing services ~~~

Building A-2, Kan Street, Hlaing Tsp., Yangon. Tel: 01-503301, 01-503302, 09-407496078  
Email: aelab@alarmmyanmar.org, websites: www.alarmmyanmar.org

**SW2 (1<sup>st</sup> Time Measurement)**



**ALARM Ecological Laboratory  
Water Testing Result Report**



|                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                     |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Report Number : EL-WR-20-00705</b>                                                                                                                                                                                    |  | <b>Date : 08-06-20</b>                                                                                                                                                                                                                                                                              |  |
| <b>Client Information</b><br>Client Name :<br>Organization : ALPHA BEST GLOBAL LTD<br>Client ID : LC-10-003<br>Registration Date & Time : 29-05-20 2:48 PM<br>Contact : +95 9401604493<br>Testing Purpose : For Standard |  | <b>Sample Information</b><br>Sample ID : WS-20-00682<br>Sample Name : SW - 2 (3m Depth)<br>Sample Type / Source : Surface Water (Raw)<br>Sampling Date & Time : 29-05-20 11:10 AM<br>Sample Location : Hlaing River, Shwe Pyi Thar Tsp<br>Latitude : 16° 59' 12.95 N<br>Longitude : 96° 01' 44.91 E |  |

**Testing Results**

*This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.  
This report shall not be reproduced except in full, without written approval of the laboratory*

| Sr. | Quality Parameters | Results | Units | Drinking Standards | Remarks         |
|-----|--------------------|---------|-------|--------------------|-----------------|
| 1   | pH                 | 8       | S.U   | 6.5 - 8.5 (b)      | Normal          |
| 2   | Temperature        | 25      | °C    | -                  | -               |
| 3   | Turbidity          | 144     | FAU   | ≤5 (b)             | Above the limit |
| 4   | TDS                | 1418    | mg/L  | ≤500 (b)           | Above the limit |
| 5   | TSS                | 147     | mg/L  | -                  | -               |
| 6   | Dissolved Oxygen   | 4       | mg/L  | -                  | -               |
| 7   | BOD5               | 4.3     | mg/L  | -                  | -               |
| 8   | COD                | <30     | mg/L  | -                  | -               |
| 9   | Free Cyanide       | <0.01   | mg/L  | -                  | -               |
| 10  | Total Phosphorous  | <0.02   | mg/L  | -                  | -               |
| 11  | Arsenic            | 0.005   | mg/L  | ≤0.01 (a)          | Normal          |
| 12  | Iron               | <0.1    | mg/L  | ≤0.3 (b)           | Normal          |
| 13  | Lead               | ND      | mg/L  | ≤0.01 (a)          | LOD=0.1         |
| 14  | Total Nitrogen     | 13      | mg/L  | -                  | -               |

"ND"= Not Detected

"LOD"= Lower limit of detection


"-" = No Reference Standard

|                                                                               |                                                                                   |                                                                                |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Tested by                                                                     | Checked by                                                                        | Approved by                                                                    |
| <br>Daw May Myat Aung<br>Lab. Technician II<br>Ecological Laboratory<br>ALARM | <br>Daw Lin Myat Myat Aung<br>Lab. Technician I<br>Ecological Laboratory<br>ALARM | <br>Dr Aye Aye Win<br>Laboratory In-Charge<br>Ecological Laboratory<br>(ALARM) |

Building A-2, Kan Street, Hlaing Township, Yangon, Myanmar.Tel: 01-503301, 01-503302, 09 407496078  
Email: aelab@alarmmyanmar.org| website: www.alarmmyanmar.org




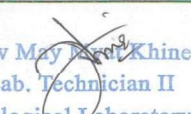


**SW3 (1<sup>st</sup> Time Measurement)**



## ALARM Ecological Laboratory

### Water Testing Result Report




| <b>Report Number : EL-WR-20-00724</b>                                                                                                                                                                                                                                               |                    | <b>Date : 08-06-20</b>                                                                                                                                                                                                                                                                                                                                     |       |                                                                                                                                                                  |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Client Information</b><br>Client Name :<br>Organization : <b>ALPHA BEST GLOBAL LTD</b><br>Client ID : <b>LC-10-003</b><br>Registration Date & Time : <b>29-05-20</b> <b>2:48 PM</b><br>Contact : <b>+95 9401604493</b><br>Testing Purpose : <b>For Standard</b>                  |                    | <b>Sample Information</b><br>Sample ID : <b>WS-20-00683</b><br>Sample Name : <b>SW - 3(3m Depth)</b><br>Sample Type / Source : <b>Surface Water (Raw)</b><br>Sampling Date & Time : <b>29-05-20</b> <b>11:50 AM</b><br>Sample Location : <b>Hlaing River, Shwe Pyi Thar Tsp</b><br>Latitude : <b>16° 57'29.30" N</b><br>Longitude : <b>96° 03'16.62" E</b> |       |                                                                                                                                                                  |                 |
| <b>Testing Results</b><br><i>This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.<br/>                 This report shall not be reproduced except in full, without written approval of the laboratory</i> |                    |                                                                                                                                                                                                                                                                                                                                                            |       |                                                                                                                                                                  |                 |
| Sr.                                                                                                                                                                                                                                                                                 | Quality Parameters | Results                                                                                                                                                                                                                                                                                                                                                    | Units | Drinking Standards                                                                                                                                               | Remarks         |
| 1                                                                                                                                                                                                                                                                                   | pH                 | 8.2                                                                                                                                                                                                                                                                                                                                                        | S.U   | 6.5 - 8.5 (b)                                                                                                                                                    | Normal          |
| 2                                                                                                                                                                                                                                                                                   | Temperature        | 24                                                                                                                                                                                                                                                                                                                                                         | °C    | -                                                                                                                                                                | -               |
| 3                                                                                                                                                                                                                                                                                   | Turbidity          | 250                                                                                                                                                                                                                                                                                                                                                        | FAU   | ≤5 (b)                                                                                                                                                           | Turbid          |
| 4                                                                                                                                                                                                                                                                                   | TDS                | 1655                                                                                                                                                                                                                                                                                                                                                       | mg/L  | ≤500 (b)                                                                                                                                                         | Above the limit |
| 5                                                                                                                                                                                                                                                                                   | TSS                | 233                                                                                                                                                                                                                                                                                                                                                        | mg/L  | -                                                                                                                                                                | -               |
| 6                                                                                                                                                                                                                                                                                   | Dissolved Oxygen   | 5.89                                                                                                                                                                                                                                                                                                                                                       | mg/L  | -                                                                                                                                                                | -               |
| 7                                                                                                                                                                                                                                                                                   | BOD5               | 4.9                                                                                                                                                                                                                                                                                                                                                        | mg/L  | -                                                                                                                                                                | -               |
| 8                                                                                                                                                                                                                                                                                   | COD                | <30                                                                                                                                                                                                                                                                                                                                                        | mg/L  | -                                                                                                                                                                | -               |
| 9                                                                                                                                                                                                                                                                                   | Free Cyanide       | <0.01                                                                                                                                                                                                                                                                                                                                                      | mg/L  | -                                                                                                                                                                | -               |
| 10                                                                                                                                                                                                                                                                                  | Total Phosphorous  | <0.02                                                                                                                                                                                                                                                                                                                                                      | mg/L  | -                                                                                                                                                                | -               |
| 11                                                                                                                                                                                                                                                                                  | Arsenic            | 0.005                                                                                                                                                                                                                                                                                                                                                      | mg/L  | ≤0.01 (a)                                                                                                                                                        | Normal          |
| 12                                                                                                                                                                                                                                                                                  | Iron               | <0.1                                                                                                                                                                                                                                                                                                                                                       | mg/L  | ≤0.3 (b)                                                                                                                                                         | Normal          |
| 13                                                                                                                                                                                                                                                                                  | Lead               | ND                                                                                                                                                                                                                                                                                                                                                         | mg/L  | ≤0.01 (a)                                                                                                                                                        | LOD=0.1         |
| 14                                                                                                                                                                                                                                                                                  | Total Nitrogen     | <5                                                                                                                                                                                                                                                                                                                                                         | mg/L  | -                                                                                                                                                                | -               |
| "ND"= Not Detected      "LOD"= Lower limit of detection      "-" = No Reference Standard                                                                                                                                                                                            |                    |                                                                                                                                                                                                                                                                                                                                                            |       |                                                                                                                                                                  |                 |
| Tested by                                                                                                                                                                                                                                                                           |                    | Checked by                                                                                                                                                                                                                                                                                                                                                 |       | Approved by                                                                                                                                                      |                 |
| <br>Daw May Myat Khine<br>Lab. Technician II<br>Ecological Laboratory<br>ALARM                                                                                                                   |                    | <br>Daw Lin Myat Myat Aung<br>Lab. Technician I<br>Ecological Laboratory<br>ALARM                                                                                                                                                                                       |       | <br>Dr. Aye Win<br>Laboratory In-Charge<br>Ecological Laboratory<br>(ALARM) |                 |
| Building A-2, Kan Street, Hlaing Township, Yangon, Myanmar.Tel: 01-503301, 01-503302, 09 407496078<br>Email: aelab@alarmmyanmar.org  website: www.alarmmyanmar.org                                                                                                                  |                    |                                                                                                                                                                                                                                                                                                                                                            |       |                                                                                                                                                                  |                 |



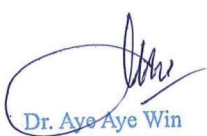


## SW1 (2<sup>nd</sup> Time Measurement)

### ALARM Ecological Laboratory

#### Water Testing Result Report



| Report Number: EL-WR-22-00999                                                                                                                                                                                                                                                             |                                | Date : January 10, 2023                                                                                                                                                                                                                                    |       |                                                                                                                                                                      |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Client Information</b><br>Client Name : Alpha Best Globle Co., Ltd<br>Organization : Total Business Solution Co., Ltd<br>Client ID : -<br>Registration Date & Time : 29.12.2022 ; 3:55 PM<br>Contact : 09-401604493<br>Email : myatthu.tbs@gmail.com<br>Testing Purpose : For Standard |                                | <b>Sample Information</b><br>Sample ID : 8960<br>Sample Name : Surface Water 1<br>Sample Type / Source : Raw<br>Sampling Date & Time : 29.12.2022 ; 1:05 PM<br>Sample Location : Shwe Pyi Thar<br>Latitude : 17° 0' 3.57" N<br>Longitude : 96° 2' 57.04" E |       |                                                                                                                                                                      |                |
| <b>Testing Results</b><br><i>This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.<br/>This report shall not be reproduced except in full, without written approval of the laboratory</i>                        |                                |                                                                                                                                                                                                                                                            |       |                                                                                                                                                                      |                |
| Sr.                                                                                                                                                                                                                                                                                       | Quality Parameters             | Results                                                                                                                                                                                                                                                    | Units | Surface Standards                                                                                                                                                    | Remarks        |
| 1                                                                                                                                                                                                                                                                                         | Turbidity <sup>3</sup>         | 20                                                                                                                                                                                                                                                         | FAU   | < 5                                                                                                                                                                  | Turbid         |
| 2                                                                                                                                                                                                                                                                                         | TSS <sup>3</sup>               | 21                                                                                                                                                                                                                                                         | mg/L  | -                                                                                                                                                                    | -              |
| 3                                                                                                                                                                                                                                                                                         | Dissolved Oxygen <sup>2</sup>  | 5.6                                                                                                                                                                                                                                                        | mg/L  | -                                                                                                                                                                    | -              |
| 4                                                                                                                                                                                                                                                                                         | BOD <sub>5</sub> <sup>6</sup>  | 5.2                                                                                                                                                                                                                                                        | mg/L  | -                                                                                                                                                                    | -              |
| 5                                                                                                                                                                                                                                                                                         | COD <sup>3</sup>               | <30                                                                                                                                                                                                                                                        | mg/L  | -                                                                                                                                                                    | -              |
| 6                                                                                                                                                                                                                                                                                         | Free Cyanide <sup>3</sup>      | <0.01                                                                                                                                                                                                                                                      | mg/L  | -                                                                                                                                                                    | -              |
| 7                                                                                                                                                                                                                                                                                         | Total Phosphorous <sup>3</sup> | 0.3                                                                                                                                                                                                                                                        | mg/L  | -                                                                                                                                                                    | -              |
| 8                                                                                                                                                                                                                                                                                         | Arsenic <sup>8</sup>           | 0.005                                                                                                                                                                                                                                                      | ppb   | < 10                                                                                                                                                                 | Normal         |
| 9                                                                                                                                                                                                                                                                                         | Iron <sup>7</sup>              | 0.4                                                                                                                                                                                                                                                        | mg/L  | < 3                                                                                                                                                                  | Normal         |
| 10                                                                                                                                                                                                                                                                                        | Lead <sup>7</sup>              | ND                                                                                                                                                                                                                                                         | mg/L  | < 0.01                                                                                                                                                               | LOD = 0.1 mg/L |
| 11                                                                                                                                                                                                                                                                                        | Total Nitrogen <sup>3</sup>    | 2.4                                                                                                                                                                                                                                                        | mg/L  | -                                                                                                                                                                    | -              |
| "ND" = Not Detected                                                                                                                                                                                                                                                                       |                                | "LOD" = Lower limit of detection                                                                                                                                                                                                                           |       | " - " = No Reference Standard                                                                                                                                        |                |
| Tested by                                                                                                                                                                                                                                                                                 |                                | Checked by                                                                                                                                                                                                                                                 |       | Approved by                                                                                                                                                          |                |
| <br>Daw May Myat Khine<br>Lab. Technician II<br>Ecological Laboratory<br>ALARM                                                                                                                         |                                | <br>Daw Lin Myat Myat Aung<br>Lab. Technician I<br>Ecological Laboratory<br>ALARM                                                                                       |       | <br>Dr. Aye Aye Win<br>Laboratory In-Charge<br>Ecological Laboratory<br>(ALARM) |                |

No.237, Corner of Shu Khin Thar Street & 7 Street, (3) Block, South Oakkalapa Township, Yangon.  
 Tel: 09-407496078, Email: [aelab.2022@gmail.com](mailto:aelab.2022@gmail.com)





# TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

## Water Testing Result Form

ရေနမူနာစမ်းသပ်သည့်ရလဒ်

|                                                     |                                                                                                                                           |                                                      |                                       |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------|
| <b>Client</b><br>တိုင်းတာလိုသူ အမည်                 | <b>Alpha Best Global Co., Ltd.</b>                                                                                                        | <b>Testing Date/Time</b><br>စမ်းသပ်သည့် နေ့ရက်       | <b>29.12.2022</b>                     |
| <b>Project Location</b><br>စီမံကိန်း တည်နေရာ        | <b>Plot No. (149, 150, 151, 152),<br/>Myay Taing Block No (49),<br/>Wartayar Industrial Zone,<br/>Shwe Fyi Thar Township,<br/>Yangon.</b> | <b>Testing Time</b><br>စမ်းသပ်သည့် အချိန်            | <b>1:05 pm</b>                        |
| <b>Measurement Location</b><br>တိုင်းတာသည့် တည်နေရာ | <b>Lain Gone Creek</b>                                                                                                                    | <b>Testing ID</b><br>စမ်းသပ်သည့် နံပါတ်              | <b>TBS - 015/2022</b>                 |
| <b>Testing Name</b><br>စမ်းသပ်သည့်အမည်              | <b>SW-1</b>                                                                                                                               | <b>Testing Type</b><br>စမ်းသပ်သည့် အမျိုးအစား        | <b>Surface Water</b>                  |
|                                                     |                                                                                                                                           | <b>Latitude/ Longitude</b><br>လတ္တီကျု / လောင်ဂျီကျု | <b>17° 0'3.57"N<br/>96° 2'57.04"E</b> |

| Sr.<br>စဉ် | Parameters<br>တိုင်းတာသည့် နေရာ | Unit<br>ယူနစ် | Result<br>ရလဒ် | NEQEG<br>Guideline | National Drinking Water<br>Guideline |       | Water Testing<br>Instrument | Remark |
|------------|---------------------------------|---------------|----------------|--------------------|--------------------------------------|-------|-----------------------------|--------|
|            |                                 |               |                |                    | Value                                | Units |                             |        |
| 1.         | pH                              | S.U           | 7.16           | 6.0-9.0            | 6.5-8.5                              | mg/L  | Oakton PCTS<br>Tester™      |        |
| 2.         | Temperature                     | °C            | 27.3           | -                  | -                                    |       | Waterproof<br>Pocket Tester |        |
| 3.         | TDS                             | ppm           | 321            | -                  | 1000                                 | mg/L  |                             |        |

Remark: This quality report cannot be edited without the permission of TBS.

“ND”= Not Detected  
Tested by

“LOD”= Lower limit of detection  
Check by

“\_” No Reference Standard  
Approved by

Field Technician

**U Wai Phy Aung**  
Environmental Geologist

Wai Phy Aung  
Environmental Geologist  
TOTAL BUSINESS SOLUTION CO., LTD.

Analyzed by

**U Myatthu Kyaw**  
General Manager

MYATTHU KYAW  
GENERAL MANAGER  
TOTAL BUSINESS SOLUTION CO.,LTD.

Reviewed by


**Dr. Soe Moe Kyaw Win**  
Managing Director




Dr. Soe Moe Kyaw Win  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.

## SW2 (2<sup>nd</sup> Time Measurement)

# ALARM Ecological Laboratory

## Water Testing Result Report



| Report Number: EL-WR-22-01000                                                                                                                                                                                                                                                            |                                | Date : January 10, 2023                                                                                                                                                                                                                                      |                                  |                                                                                                                                                                      |                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Client Information</b><br>Client Name : Alpha Best Globe Co., Ltd<br>Organization : Total Business Solution Co., Ltd<br>Client ID : -<br>Registration Date & Time : 29.12.2022 ; 3:55 PM<br>Contact : 09-401604493<br>Email : myatthu.tbs@gmail.com<br>Testing Purpose : For Standard |                                | <b>Sample Information</b><br>Sample ID : 8961<br>Sample Name : Surface Water 2<br>Sample Type / Source : Raw<br>Sampling Date & Time : 29.12.2022 ; 1:30 PM<br>Sample Location : Shwe Pyi Thar<br>Latitude : 16° 59' 10.76" N<br>Longitude : 96° 1' 44.73" E |                                  |                                                                                                                                                                      |                               |
| <b>Testing Results</b><br><i>This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.<br/>This report shall not be reproduced except in full, without written approval of the laboratory</i>                       |                                |                                                                                                                                                                                                                                                              |                                  |                                                                                                                                                                      |                               |
| Sr.                                                                                                                                                                                                                                                                                      | Quality Parameters             | Results                                                                                                                                                                                                                                                      | Units                            | Surface Standards                                                                                                                                                    | Remarks                       |
| 1                                                                                                                                                                                                                                                                                        | Turbidity <sup>3</sup>         | 20                                                                                                                                                                                                                                                           | FAU                              | < 5                                                                                                                                                                  | Turbid                        |
| 2                                                                                                                                                                                                                                                                                        | TSS <sup>3</sup>               | 23                                                                                                                                                                                                                                                           | mg/L                             | -                                                                                                                                                                    | -                             |
| 3                                                                                                                                                                                                                                                                                        | Dissolved Oxygen <sup>2</sup>  | 5.8                                                                                                                                                                                                                                                          | mg/L                             | -                                                                                                                                                                    | -                             |
| 4                                                                                                                                                                                                                                                                                        | BOD <sub>5</sub> <sup>6</sup>  | 4.2                                                                                                                                                                                                                                                          | mg/L                             | -                                                                                                                                                                    | -                             |
| 5                                                                                                                                                                                                                                                                                        | COD <sup>3</sup>               | <30                                                                                                                                                                                                                                                          | mg/L                             | -                                                                                                                                                                    | -                             |
| 6                                                                                                                                                                                                                                                                                        | Free Cyanide <sup>3</sup>      | <0.01                                                                                                                                                                                                                                                        | mg/L                             | -                                                                                                                                                                    | -                             |
| 7                                                                                                                                                                                                                                                                                        | Total Phosphorous <sup>3</sup> | 0.12                                                                                                                                                                                                                                                         | mg/L                             | -                                                                                                                                                                    | -                             |
| 8                                                                                                                                                                                                                                                                                        | Arsenic <sup>5</sup>           | 0.005                                                                                                                                                                                                                                                        | ppb                              | < 10                                                                                                                                                                 | Normal                        |
| 9                                                                                                                                                                                                                                                                                        | Iron <sup>7</sup>              | 0.3                                                                                                                                                                                                                                                          | mg/L                             | < 3                                                                                                                                                                  | Normal                        |
| 10                                                                                                                                                                                                                                                                                       | Lead <sup>7</sup>              | ND                                                                                                                                                                                                                                                           | mg/L                             | < 0.01                                                                                                                                                               | LOD = 0.1 mg/L                |
| 11                                                                                                                                                                                                                                                                                       | Total Nitrogen <sup>3</sup>    | 1.2                                                                                                                                                                                                                                                          | mg/L                             | -                                                                                                                                                                    | -                             |
| "ND" = Not Detected                                                                                                                                                                                                                                                                      |                                |                                                                                                                                                                                                                                                              | "LOD" = Lower limit of detection |                                                                                                                                                                      | " - " = No Reference Standard |
| Tested by                                                                                                                                                                                                                                                                                |                                | Checked by                                                                                                                                                                                                                                                   |                                  | Approved by                                                                                                                                                          |                               |
| <br>Daw Myat Myat Aung<br>Lab. Technician II<br>Ecological Laboratory<br>ALARM                                                                                                                        |                                | <br>Daw Lin Myat Myat Aung<br>Lab. Technician I<br>Ecological Laboratory<br>ALARM                                                                                         |                                  | <br>Dr. Aye Aye Win<br>Laboratory In-Charge<br>Ecological Laboratory<br>(ALARM) |                               |

No.237, Corner of Shu Khin Thar Street & 7 Street, (3) Block, South Oakkalapa Township, Yangon.  
 Tel: 09-407496078, Email: aelab.2022@gmail.com



# TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

## Water Testing Result Form

ရေနမူနာစမ်းသပ်သည့်ရလဒ်

|                                                     |                                                                                                                                           |                                                      |                                         |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------|
| <b>Client</b><br>တိုင်းတာလိုသူ အမည်                 | <b>Alpha Best Global Co., Ltd.</b>                                                                                                        | <b>Testing Date/Time</b><br>စမ်းသပ်သည့် နေ့ရက်       | <b>29.12.2022</b>                       |
| <b>Project Location</b><br>စီမံကိန်း တည်နေရာ        | <b>Plot No. (149, 150, 151, 152),<br/>Myay Taing Block No (49),<br/>Wartayar Industrial Zone,<br/>Shwe Fyi Thar Township,<br/>Yangon.</b> | <b>Testing Time</b><br>စမ်းသပ်သည့် အချိန်            | <b>1:30 pm</b>                          |
| <b>Measurement Location</b><br>တိုင်းတာသည့် တည်နေရာ | <b>Upstream of Hlaing River</b>                                                                                                           | <b>Testing ID</b><br>စမ်းသပ်သည့် နံပါတ်              | <b>TBS - 016/2022</b>                   |
| <b>Testing Name</b><br>စမ်းသပ်သည့်အမည်              | <b>SW-2</b>                                                                                                                               | <b>Testing Type</b><br>စမ်းသပ်သည့် အမျိုးအစား        | <b>Surface Water</b>                    |
|                                                     |                                                                                                                                           | <b>Latitude/ Longitude</b><br>လတ္တီကျု / လောင်ဂျီကျု | <b>16° 59'10.76"N<br/>96° 1'44.73"E</b> |

| Sr.<br>စဉ် | Parameters<br>တိုင်းတာသည့် နေရာ | Unit<br>ယူနစ် | Result<br>ရလဒ် | NEQEG<br>Guideline | National Drinking Water<br>Guideline |       | Water Testing<br>Instrument | Remark |
|------------|---------------------------------|---------------|----------------|--------------------|--------------------------------------|-------|-----------------------------|--------|
|            |                                 |               |                |                    | Value                                | Units |                             |        |
| 1.         | pH                              | S.U           | 7.85           | 6.0-9.0            | 6.5-8.5                              | mg/L  | Oakton PCTS<br>Tester™      |        |
| 2.         | Temperature                     | °C            | 27.4           | -                  | -                                    |       | Waterproof<br>Pocket Tester |        |
| 3.         | TDS                             | ppm           | 1214           | -                  | 1000                                 | mg/L  |                             |        |

Remark: This quality report cannot be edited without the permission of TBS.

“ND”= Not Detected  
Tested by

“LOD”= Lower limit of detection  
Check by

“\_” No Reference Standard  
Approved by

Field Technician

**U Wai Phyto Aung**  
Environmental Geologist

Wai Phyto Aung  
Environmental Geologist  
TOTAL BUSINESS SOLUTION CO., LTD.

Analyzed by

**U Myatthu Kyaw**  
General Manager

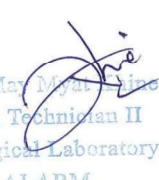

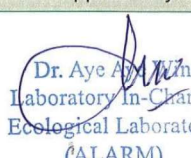
MYATTHU KYAW  
GENERAL MANAGER  
TOTAL BUSINESS SOLUTION CO.,LTD.

Reviewed by

**Dr. Soe Moe Kyaw Win**  
Managing Director

Dr. Soe Moe Kyaw Win  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.

## SW3 (2<sup>nd</sup> Time Measurement)

| ALARM Ecological Laboratory                                                                                                                                                                                                                                   |                                |                                                                                                                                                                      |                                                                                                                                                                                                                                |                                                                                                                                                                      |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Water Testing Result Report                                                                                                                                                                                                                                   |                                |                                                                                                                                                                      |                                                                                                                                                                                                                                |                                                                                                                                                                      |                 |
| Report Number: EL-WR-22-01001                                                                                                                                                                                                                                 |                                |                                                                                                                                                                      |                                                                                                                                                                                                                                | Date : January 10, 2023                                                                                                                                              |                 |
| <b>Client Information</b>                                                                                                                                                                                                                                     |                                |                                                                                                                                                                      | <b>Sample Information</b>                                                                                                                                                                                                      |                                                                                                                                                                      |                 |
| Client Name : Alpha Best Globle Co., Ltd<br>Organization : Total Business Solution Co., Ltd<br>Client ID : -<br>Registration Date & Time : 29.12.2022 ; 3:55 PM<br>Contact : 09-401604493<br>Email : myatthu.tbs@gmail.com<br>Testing Purpose : For Standard  |                                |                                                                                                                                                                      | Sample ID : 8962<br>Sample Name : Surface Water 3<br>Sample Type / Source : Raw<br>Sampling Date & Time : 29.12.2022 ; 1:50 PM<br>Sample Location : Shwe Pyi Thar<br>Latitude : 16° 58' 35.68" N<br>Longitude : 96° 3' 9.94" E |                                                                                                                                                                      |                 |
| Testing Results                                                                                                                                                                                                                                               |                                |                                                                                                                                                                      |                                                                                                                                                                                                                                |                                                                                                                                                                      |                 |
| <i>This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.<br/>                     This report shall not be reproduced except in full, without written approval of the laboratory</i> |                                |                                                                                                                                                                      |                                                                                                                                                                                                                                |                                                                                                                                                                      |                 |
| Sr.                                                                                                                                                                                                                                                           | Quality Parameters             | Results                                                                                                                                                              | Units                                                                                                                                                                                                                          | Surface Standards                                                                                                                                                    | Remarks         |
| 1                                                                                                                                                                                                                                                             | Turbidity <sup>3</sup>         | 3840                                                                                                                                                                 | FAU                                                                                                                                                                                                                            | < 5                                                                                                                                                                  | Turbid          |
| 2                                                                                                                                                                                                                                                             | TSS <sup>3</sup>               | 743                                                                                                                                                                  | mg/L                                                                                                                                                                                                                           | -                                                                                                                                                                    | -               |
| 3                                                                                                                                                                                                                                                             | Dissolved Oxygen <sup>2</sup>  | 3.7                                                                                                                                                                  | mg/L                                                                                                                                                                                                                           | -                                                                                                                                                                    | -               |
| 4                                                                                                                                                                                                                                                             | BOD <sub>5</sub> <sup>6</sup>  | 4.5                                                                                                                                                                  | mg/L                                                                                                                                                                                                                           | -                                                                                                                                                                    | -               |
| 5                                                                                                                                                                                                                                                             | COD <sup>3</sup>               | <30                                                                                                                                                                  | mg/L                                                                                                                                                                                                                           | -                                                                                                                                                                    | -               |
| 6                                                                                                                                                                                                                                                             | Free Cyanide <sup>3</sup>      | 0.01                                                                                                                                                                 | mg/L                                                                                                                                                                                                                           | -                                                                                                                                                                    | -               |
| 7                                                                                                                                                                                                                                                             | Total Phosphorous <sup>3</sup> | 0.46                                                                                                                                                                 | mg/L                                                                                                                                                                                                                           | -                                                                                                                                                                    | -               |
| 8                                                                                                                                                                                                                                                             | Arsenic <sup>5</sup>           | 0.005                                                                                                                                                                | ppb                                                                                                                                                                                                                            | < 10                                                                                                                                                                 | Normal          |
| 9                                                                                                                                                                                                                                                             | Iron <sup>7</sup>              | 0.5                                                                                                                                                                  | mg/L                                                                                                                                                                                                                           | < 3                                                                                                                                                                  | Normal          |
| 10                                                                                                                                                                                                                                                            | Lead <sup>7</sup>              | 0.1                                                                                                                                                                  | mg/L                                                                                                                                                                                                                           | < 0.01                                                                                                                                                               | Above the limit |
| 11                                                                                                                                                                                                                                                            | Total Nitrogen <sup>3</sup>    | 3.2                                                                                                                                                                  | mg/L                                                                                                                                                                                                                           | -                                                                                                                                                                    | -               |
| "ND" = Not Detected                                                                                                                                                                                                                                           |                                | "LOD" = Lower limit of detection                                                                                                                                     |                                                                                                                                                                                                                                | " - " = No Reference Standard                                                                                                                                        |                 |
| Tested by                                                                                                                                                                                                                                                     |                                | Checked by                                                                                                                                                           |                                                                                                                                                                                                                                | Approved by                                                                                                                                                          |                 |
| <br>Daw May Myat Aung<br>Lab. Technician II<br>Ecological Laboratory<br>ALARM                                                                                              |                                | <br>Daw Lin Myat Myat Aung<br>Lab. Technician I<br>Ecological Laboratory<br>ALARM |                                                                                                                                                                                                                                | <br>Dr. Aye Aye Win<br>Laboratory In-Charge<br>Ecological Laboratory<br>(ALARM) |                 |
| No.237, Corner of Shu Khin Thar Street & 7 Street, (3) Block, South Oakkalapa Township, Yangon.<br>Tel: 09-407496078, Email: aelab.2022@gmail.com                                                                                                             |                                |                                                                                                                                                                      |                                                                                                                                                                                                                                |                                                                                                                                                                      |                 |



# TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

## Water Testing Result Form

ရေနမူနာစမ်းသပ်သည့်ရလဒ်

|                                                     |                                                                                                                                           |                                                      |                                         |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------|
| <b>Client</b><br>တိုင်းတာလိုသူ အမည်                 | <b>Alpha Best Global Co., Ltd.</b>                                                                                                        | <b>Testing Date/Time</b><br>စမ်းသပ်သည့် နေ့ရက်       | <b>29.12.2022</b>                       |
| <b>Project Location</b><br>စီမံကိန်း တည်နေရာ        | <b>Plot No. (149, 150, 151, 152),<br/>Myay Taing Block No (49),<br/>Wartayar Industrial Zone,<br/>Shwe Fyi Thar Township,<br/>Yangon.</b> | <b>Testing Time</b><br>စမ်းသပ်သည့် အချိန်            | <b>1:50 pm</b>                          |
| <b>Measurement Location</b><br>တိုင်းတာသည့် တည်နေရာ | <b>Downstream of Hlaing River</b>                                                                                                         | <b>Testing ID</b><br>စမ်းသပ်သည့် နံပါတ်              | <b>TBS - 017/2022</b>                   |
| <b>Testing Name</b><br>စမ်းသပ်သည့်အမည်              | <b>SW-3</b>                                                                                                                               | <b>Testing Type</b><br>စမ်းသပ်သည့် အမျိုးအစား        | <b>Surface Water</b>                    |
|                                                     |                                                                                                                                           | <b>Latitude/ Longitude</b><br>လတ္တီကျု / လောင်ဂျီကျု | <b>16° 57'29.96"N<br/>96° 3'16.02"E</b> |

| Sr.<br>စဉ် | Parameters<br>တိုင်းတာသည့် နေရာ | Unit<br>ယူနစ် | Result<br>ရလဒ် | NEQEG<br>Guideline | National Drinking Water<br>Guideline |       | Water Testing<br>Instrument | Remark |
|------------|---------------------------------|---------------|----------------|--------------------|--------------------------------------|-------|-----------------------------|--------|
|            |                                 |               |                |                    | Value                                | Units |                             |        |
| 1.         | pH                              | S.U           | 7.93           | 6.0-9.0            | 6.5-8.5                              | mg/L  | Oakton PCTS<br>Tester™      |        |
| 2.         | Temperature                     | °C            | 27.6           | -                  | -                                    |       | Waterproof<br>Pocket Tester |        |
| 3.         | TDS                             | ppm           | 1488           | -                  | 1000                                 | mg/L  |                             |        |

Remark: This quality report cannot be edited without the permission of TBS.

“ND”= Not Detected  
Tested by

“LOD”= Lower limit of detection  
Check by

“\_” No Reference Standard  
Approved by

Field Technician

Analyzed by

Reviewed by

**U Wai Phy Aung**  
Environmental Geologist

**U Myatthu Kyaw**  
General Manager

**Dr. Soe Moe Kyaw Win**  
Managing Director

Wai Phy Aung  
Environmental Geologist  
TOTAL BUSINESS SOLUTION CO., LTD.

MYATTHU KYAW  
GENERAL MANAGER  
TOTAL BUSINESS SOLUTION CO.,LTD.

Dr. Soe Moe Kyaw Win  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.



## GW (2<sup>nd</sup> Time Measurement)

### ALARM Ecological Laboratory

#### Water Testing Result Report



Report Number: EL-WR-22-01002

Date : January 10, 2023

#### Client Information

Client Name : Alpha Best Globle Co., Ltd  
Organization : Total Business Solution Co., Ltd  
Client ID : -  
Registration Date & Time : 29.12.2022 ; 3:55 PM  
Contact : 09-401604493  
Email : myatthu.tbs@gmail.com  
Testing Purpose : For Standard

#### Sample Information

Sample ID : 8963  
Sample Name : Ground Water  
Sample Type / Source : Ground  
Sampling Date & Time : 29.12.2022 ; 2:15 PM  
Sample Location : Shwe Pyi Thar  
Latitude : 16° 58' 35.68" N  
Longitude : 96° 3' 9.94" E

#### Testing Results

*This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.  
This report shall not be reproduced except in full, without written approval of the laboratory*

| Sr. | Quality Parameters             | Results | Units | Surface Standards | Remarks        |
|-----|--------------------------------|---------|-------|-------------------|----------------|
| 1   | Turbidity <sup>3</sup>         | 8       | FAU   | < 5               | Turbid         |
| 2   | TSS <sup>3</sup>               | 10      | mg/L  | -                 | -              |
| 3   | Dissolved Oxygen <sup>2</sup>  | 1.6     | mg/L  | -                 | -              |
| 4   | BOD <sub>5</sub> <sup>6</sup>  | 3       | mg/L  | -                 | -              |
| 5   | COD <sup>3</sup>               | <30     | mg/L  | -                 | -              |
| 6   | Free Cyanide <sup>3</sup>      | <0.01   | mg/L  | -                 | -              |
| 7   | Total Phosphorous <sup>3</sup> | 0.05    | mg/L  | -                 | -              |
| 8   | Arsenic <sup>8</sup>           | 0.005   | ppb   | < 10              | Normal         |
| 9   | Iron <sup>7</sup>              | 0.4     | mg/L  | < 3               | Normal         |
| 10  | Lead <sup>7</sup>              | ND      | mg/L  | < 0.01            | LOD = 0.1 mg/L |
| 11  | Total Nitrogen <sup>3</sup>    | 2.1     | mg/L  | -                 | -              |

"ND" = Not Detected

"LOD" = Lower limit of detection

" - " = No Reference Standard

Tested by

Checked by

Approved by

*Daw My Myat Aung*  
Lab. Technician II  
Ecological Laboratory  
ALARM

*Myat*  
Daw Lin Myat Myat Aung  
Lab. Technician I  
Ecological Laboratory  
ALARM

*Dr. Aye Aye Win*  
Laboratory In-Charge  
Ecological Laboratory  
(ALARM)

No.237, Corner of Shu Khin Thar Street & 7 Street, (3) Block, South Oakkalapa Township, Yangon.  
Tel: 09-407496078, Email: aelab.2022@gmail.com





# TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

## Water Testing Result Form

ရေနမူနာစမ်းသပ်သည့်ရလဒ်

|                                                     |                                                                                                                                           |                                                      |                                        |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------|
| <b>Client</b><br>တိုင်းတာလိုသူ အမည်                 | <b>Alpha Best Globle Co., Ltd.</b>                                                                                                        | <b>Testing Date/Time</b><br>စမ်းသပ်သည့် နေ့ရက်       | <b>29.12.2022</b>                      |
| <b>Project Location</b><br>စီမံကိန်း တည်နေရာ        | <b>Plot No. (149, 150, 151, 152),<br/>Myay Taing Block No (49),<br/>Wartayar Industrial Zone,<br/>Shwe Fyi Thar Township,<br/>Yangon.</b> | <b>Testing Time</b><br>စမ်းသပ်သည့် အချိန်            | <b>2:15 pm</b>                         |
| <b>Measurement Location</b><br>တိုင်းတာသည့် တည်နေရာ | <b>Ground Water Storage Tank</b>                                                                                                          | <b>Testing ID</b><br>စမ်းသပ်သည့် နံပါတ်              | <b>TBS - 018/2022</b>                  |
| <b>Testing Name</b><br>စမ်းသပ်သည့်အမည်              | <b>GW</b>                                                                                                                                 | <b>Testing Type</b><br>စမ်းသပ်သည့် အမျိုးအစား        | <b>Ground Water</b>                    |
|                                                     |                                                                                                                                           | <b>Latitude/ Longitude</b><br>လတ္တီကျု / လောင်ဂျီကျု | <b>16° 58'35.68"N<br/>96° 3'9.94"E</b> |

| Sr.<br>စဉ် | Parameters<br>တိုင်းတာသည့် နေရာ | Unit<br>ယူနစ် | Result<br>ရလဒ် | NEQEG<br>Guideline | National Drinking Water<br>Guideline |       | Water Testing<br>Instrument | Remark |
|------------|---------------------------------|---------------|----------------|--------------------|--------------------------------------|-------|-----------------------------|--------|
|            |                                 |               |                |                    | Value                                | Units |                             |        |
| 1.         | pH                              | S.U           | 7.22           | 6.0-9.0            | 6.5-8.5                              | mg/L  | Oakton PCTS<br>Tester™      |        |
| 2.         | Temperature                     | °C            | 29.1           | -                  | -                                    |       | Waterproof<br>Pocket Tester |        |
| 3.         | TDS                             | ppm           | 372            | -                  | 1000                                 | mg/L  |                             |        |

Remark: This quality report cannot be edited without the permission of TBS.

“ND”= Not Detected  
Tested by

“LOD”= Lower limit of detection  
Check by

“\_” No Reference Standard  
Approved by

Field Technician

**U Wai Phy Aung**  
Environmental Geologist

Wai Phy Aung  
Environmental Geologist  
TOTAL BUSINESS SOLUTION CO., LTD.

Analyzed by

**U Myatthu Kyaw**  
General Manager

MYATTHU KYAW  
GENERAL MANAGER  
TOTAL BUSINESS SOLUTION CO.,LTD.

Reviewed by

**Dr. Soe Moe Kyaw Win**  
Managing Director

Dr. Soe Moe Kyaw Win  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.

**WW (2<sup>nd</sup> Time Measurement)**

## ALARM Ecological Laboratory

### Water Testing Result Report

| Report Number: EL-WR-23-01020                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           | Date : January 10, 2023                                                           |                                  |                                                                                 |                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------|-------------------------------|
| <b>Client Information</b><br>Client Name : Alpha Best Globle Co., Ltd<br>Organization : Total Business Solution Co., Ltd<br>Client ID : -<br>Registration Date & Time : 29.12.2022 ; 3:55 PM<br>Contact : 09-401604493<br>Email : myatthu.tbs@gmail.com<br>Testing Purpose : For Standard | <b>Sample Information</b><br>Sample ID : 8964<br>Sample Name : Wastewater<br>Sample Type / Source : Waste<br>Sampling Date & Time : 29.12.2022 ; 2:40 PM<br>Sample Location : Shwe Pyi Thar<br>Latitude : 16° 58' 40.31" N<br>Longitude : 96° 3' 10.86" E |                                                                                   |                                  |                                                                                 |                               |
| <b>Testing Results</b><br><i>This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.<br/>This report shall not be reproduced except in full, without written approval of the laboratory</i>                        |                                                                                                                                                                                                                                                           |                                                                                   |                                  |                                                                                 |                               |
| Sr.                                                                                                                                                                                                                                                                                       | Quality Parameters                                                                                                                                                                                                                                        | Results                                                                           | Units                            | Emission Standards                                                              | Remarks                       |
| 1                                                                                                                                                                                                                                                                                         | TSS <sup>3</sup>                                                                                                                                                                                                                                          | 5.2                                                                               | mg/L                             | ≤50 <sup>d</sup>                                                                | Normal                        |
| 2                                                                                                                                                                                                                                                                                         | Dissolved Oxygen <sup>2</sup>                                                                                                                                                                                                                             | 2.16                                                                              | mg/L                             | -                                                                               | -                             |
| 3                                                                                                                                                                                                                                                                                         | BOD <sub>5</sub> <sup>6</sup>                                                                                                                                                                                                                             | 14                                                                                | mg/L                             | ≤ 50 <sup>d</sup>                                                               | Normal                        |
| 4                                                                                                                                                                                                                                                                                         | COD <sup>3</sup>                                                                                                                                                                                                                                          | 32                                                                                | mg/L                             | ≤ 250 <sup>d</sup>                                                              | Normal                        |
| 5                                                                                                                                                                                                                                                                                         | Free Cyanide <sup>3</sup>                                                                                                                                                                                                                                 | <0.01                                                                             | mg/L                             | ≤ 0.1 <sup>d</sup>                                                              | Normal                        |
| 6                                                                                                                                                                                                                                                                                         | Total Phosphorous <sup>3</sup>                                                                                                                                                                                                                            | 0.36                                                                              | mg/L                             | ≤2 <sup>d</sup>                                                                 | Normal                        |
| 7                                                                                                                                                                                                                                                                                         | Arsenic <sup>8</sup>                                                                                                                                                                                                                                      | 0.005                                                                             | mg/L                             | ≤ 0.1 <sup>d</sup>                                                              | Normal                        |
| 8                                                                                                                                                                                                                                                                                         | Iron <sup>7</sup>                                                                                                                                                                                                                                         | 0.6                                                                               | mg/L                             | ≤ 3.5 <sup>d</sup>                                                              | Normal                        |
| 9                                                                                                                                                                                                                                                                                         | Lead <sup>7</sup>                                                                                                                                                                                                                                         | ND                                                                                | mg/L                             | ≤ 0.1 <sup>d</sup>                                                              | LOD = 0.1 mg/L                |
| 10                                                                                                                                                                                                                                                                                        | Total Nitrogen <sup>3</sup>                                                                                                                                                                                                                               | 3.4                                                                               | mg/L                             | -                                                                               | -                             |
| 11                                                                                                                                                                                                                                                                                        | Oil & Grease <sup>9</sup>                                                                                                                                                                                                                                 | 5                                                                                 | mg/L                             | ≤ 10 <sup>d</sup>                                                               | Normal                        |
| "ND" = Not Detected                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                           |                                                                                   | "LOD" = Lower limit of detection |                                                                                 | " - " = No Reference Standard |
| Tested by                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                           | Checked by                                                                        |                                  | Approved by                                                                     |                               |
| <br>Daw Myat Myat Aung<br>Lab. Technician II<br>Ecological Laboratory<br>ALARM                                                                                                                                                                                                            |                                                                                                                                                                                                                                                           | <br>Daw Lin Myat Myat Aung<br>Lab. Technician I<br>Ecological Laboratory<br>ALARM |                                  | <br>Dr. Aye Aye Win<br>Laboratory in-Charge<br>Ecological Laboratory<br>(ALARM) |                               |

No.237, Corner of Shu Khin Thar Street & 7 Street, (3) Block, South Oakkalapa Township, Yangon.  
 Tel: 09-407496078, Email: aelab.2022@gmail.com



# TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: tbs.myanmar@gmail.com

## Water Testing Result Form

ရေနမူနာစမ်းသပ်သည့်ရလဒ်

|                                                     |                                                                                                                                           |                                                      |                                         |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------|
| <b>Client</b><br>တိုင်းတာလိုသူ အမည်                 | <b>Alpha Best Globle Co., Ltd.</b>                                                                                                        | <b>Testing Date/Time</b><br>စမ်းသပ်သည့် နေ့ရက်       | <b>29.12.2022</b>                       |
| <b>Project Location</b><br>စီမံကိန်း တည်နေရာ        | <b>Plot No. (149, 150, 151, 152),<br/>Myay Taing Block No (49),<br/>Wartayar Industrial Zone,<br/>Shwe Fyi Thar Township,<br/>Yangon.</b> | <b>Testing Time</b><br>စမ်းသပ်သည့် အချိန်            | <b>2:40 pm</b>                          |
| <b>Measurement Location</b><br>တိုင်းတာသည့် တည်နေရာ | <b>Washing Basin Outlet</b>                                                                                                               | <b>Testing ID</b><br>စမ်းသပ်သည့် နံပါတ်              | <b>TBS - 019/2022</b>                   |
| <b>Testing Name</b><br>စမ်းသပ်သည့်အမည်              | <b>WW</b>                                                                                                                                 | <b>Testing Type</b><br>စမ်းသပ်သည့် အမျိုးအစား        | <b>Wastewater</b>                       |
|                                                     |                                                                                                                                           | <b>Latitude/ Longitude</b><br>လတ္တီကျု / လောင်ဂျီကျု | <b>16° 58'40.31"N<br/>96° 3'10.86"E</b> |

| Sr.<br>စဉ် | Parameters<br>တိုင်းတာသည့် နေရာ | Unit<br>ယူနစ် | Result<br>ရလဒ် | NEQEG<br>Guideline | National Drinking Water<br>Guideline |       | Water Testing<br>Instrument | Remark |
|------------|---------------------------------|---------------|----------------|--------------------|--------------------------------------|-------|-----------------------------|--------|
|            |                                 |               |                |                    | Value                                | Units |                             |        |
| 1.         | pH                              | S.U           | 7.86           | 6.0-9.0            | 6.5-8.5                              | mg/L  | Oakton PCTS<br>Tester™      |        |
| 2.         | Temperature                     | °C            | 26.8           | -                  | -                                    |       | Waterproof<br>Pocket Tester |        |
| 3.         | TDS                             | ppm           | 376            | -                  | 1000                                 | mg/L  |                             |        |

Remark: This quality report cannot be edited without the permission of TBS.

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Check by

“\_” No Reference Standard  
Approved by

Field Technician

**U Wai Phy Aung**  
Environmental Geologist

Wai Phy Aung  
Environmental Geologist  
TOTAL BUSINESS SOLUTION CO., LTD.

Analyzed by

**U Myatthu Kyaw**  
General Manager

MYATTHU KYAW  
GENERAL MANAGER  
TOTAL BUSINESS SOLUTION CO.,LTD.

Reviewed by

**Dr. Soe Moe Kyaw Win**  
Managing Director

Dr. Soe Moe Kyaw Win  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.

## Drinking Water Quality Results



Laboratory Technical Consultant: U Saw Christopher Maung  
B.Sc Engg: (Civil), Dip S.E(DelR) 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 1

**W1122 421**

### WATER QUALITY TEST RESULTS FORM

Client ALPHA BEST GLOBAL LIMITED  
Nature of Water Drinking Water  
Location No.149+150+151+152, Corner of Mahar Myaing Street & Wun Saung Hmu Street, Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon Region.  
Date and Time of collection 16.11.2022  
Date and Time of arrival at Laboratory 16.11.2022  
Date and Time of commencing examination 17.11.2022  
Date and Time of completing 19.11.2022

### Results of Water Analysis

### WHO Drinking Water Guideline (Geneva - 1993)

|                                 |      |                           |                               |
|---------------------------------|------|---------------------------|-------------------------------|
| pH                              | 7.1  |                           | 6.5 - 8.5                     |
| Colour (True)                   | Nil  | TCU                       | 15 TCU                        |
| Turbidity                       | Nil  | NTU                       | 5 NTU                         |
| Conductivity                    | 16   | micro S/cm                |                               |
| Total Hardness                  | 2    | mg/l as CaCO <sub>3</sub> | 500 mg/l as CaCO <sub>3</sub> |
| Calcium Hardness                | 1    | mg/l as CaCO <sub>3</sub> |                               |
| Magnesium Hardness              | 1    | mg/l as CaCO <sub>3</sub> |                               |
| Total Alkalinity                | 3    | mg/l as CaCO <sub>3</sub> |                               |
| Phenolphthalein Alkalinity      | Nil  | mg/l as CaCO <sub>3</sub> |                               |
| Carbonate (CaCO <sub>3</sub> )  | Nil  | mg/l as CaCO <sub>3</sub> |                               |
| Bicarbonate (HCO <sub>3</sub> ) | 3    | mg/l as CaCO <sub>3</sub> |                               |
| Iron                            | 0.05 | mg/l                      | 0.3 mg/l                      |
| Chloride (as CL)                | 4    | mg/l                      | 250 mg/l                      |
| Sodium Chloride (as NaCL)       | 7    | mg/l                      |                               |
| Sulphate (as SO <sub>4</sub> )  | Nil  | mg/l                      | 500 mg/l                      |
| Total Solids                    | 8    | mg/l                      | 1500 mg/l                     |
| Total Suspended Solids          | Nil  | mg/l                      |                               |
| Total Dissolved Solids          | 8    | mg/l                      | 1000 mg/l                     |
| Manganese                       | Nil  | mg/l                      | 0.05 mg/l                     |
| Phosphate                       | Nil  | mg/l                      |                               |
| Phenolphthalein Acidity         | 2    | mg/l                      |                               |
| Methyl Orange Acidity           | Nil  | mg/l                      |                               |
| Salinity                        | 0.1  | ppt                       |                               |

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

**Tested by**  
Signature: Hein  
Zaw Hein Oo  
Name: B.Sc (Chemistry)  
Sr.Chemist

**Approved by**  
Signature: Soe Thit  
Soe Thit  
Name: B.E (Civil) 1980  
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, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

## **APPENDIX K**

### **Traffic Counting Results**



### Traffic Counting (1<sup>st</sup> Time Recording)



## TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: [tbs.myanmar@gmail.com](mailto:tbs.myanmar@gmail.com)

|                                              |                                                                                                                    |                                                                  |                                        |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------|
| <b>Client</b><br>တိုင်းတာလိုသူ အမည်          | Alpha Best Global Limited.                                                                                         | <b>Date</b><br>တိုင်းတာသည့် နေ့ရက်                               | 24 <sup>th</sup> April – 25 June, 2020 |
| <b>Project Location</b><br>စီမံကိန်း တည်နေရာ | Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon. | <b>Start Time/ End Time</b><br>စတင်သည့်အချိန်/ ပြီးစီးသည့်အချိန် | 7:00AM to 7:00PM                       |
|                                              |                                                                                                                    | <b>Sampling Type</b><br>တိုင်းတာသည့် အမျိုးအစား                  | Traffic Counting                       |
| <b>Project Number</b><br>စီမံကိန်းအမှတ်      | 173                                                                                                                | <b>Sampling Equipment</b><br>တိုင်းတာသည့် စက်ပစ္စည်း             | Manually                               |

| No.<br>စဉ် | Site Description<br>တိုင်းတာသည့် နေရာ | Location/တည်နေရာ     |                          | Total Vehicles Results | Total Traffic Volume Result | Average Traffic Capacity Ratio (V/C) | Nature of Flow<br>လမ်းအခြေအနေ |
|------------|---------------------------------------|----------------------|--------------------------|------------------------|-----------------------------|--------------------------------------|-------------------------------|
|            |                                       | Latitude<br>လတ္တီကျု | Longitude<br>လောင်ဂျီကျု |                        |                             |                                      |                               |
| Weekday    |                                       |                      |                          |                        |                             |                                      |                               |
| 1.         | TC1                                   | 16° 58' 36.42" N     | 96° 3' 13.40" E          | 247                    | 26                          | 0.02                                 | Free Flow (A)                 |
| 2.         | TC2                                   | 16° 58' 32.00" N     | 96° 2' 53.47" E          | 174                    | 33                          | 0.02                                 | Free Flow (A)                 |
| 3.         | TC3                                   | 16° 59' 7.33" N      | 96° 3' 15.88" E          | 39                     | 8                           | 0.01                                 | Free Flow (A)                 |
| 4.         | TC-4A                                 | 16° 57' 54.12" N     | 96° 3' 42.44" E          | 4539                   | 316                         | 0.26                                 | Free Flow (A)                 |
| 5.         | TC-4B                                 | 16° 57' 53.08" N     | 96° 3' 42.17" E          | 5199                   | 377                         | 0.31                                 | Reasonably free flow (B)      |
| 6.         | TC5-A                                 | 17° 0' 2.60" N       | 96° 3' 12.51" E          | 3030                   | 341                         | 0.28                                 | Free Flow (A)                 |
| 7.         | TC-5B                                 | 17° 0' 2.02" N       | 96° 3' 14.53" E          | 3216                   | 336                         | 0.28                                 | Free Flow (A)                 |
| Weekend    |                                       |                      |                          |                        |                             |                                      |                               |
| 1.         | TC-4A                                 | 16° 57' 54.12" N     | 96° 3' 42.44" E          | 4330                   | 461                         | 0.38                                 | Reasonably free flow (B)      |
| 2.         | TC-4B                                 | 16° 57' 53.08" N     | 96° 3' 42.17" E          | 5022                   | 469                         | 0.19                                 | Free Flow (A)                 |
| 3.         | TC5-A                                 | 17° 0' 2.60" N       | 96° 3' 12.51" E          | 2346                   | 385                         | 0.32                                 | Reasonably free flow (B)      |
| 4.         | TC-5B                                 | 17° 0' 2.02" N       | 96° 3' 14.53" E          | 2719                   | 308                         | 0.26                                 | Free Flow (A)                 |

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Field Technician

**U Htet Thiha Phone Myint**  
Environmental Geologist

Analyzed by

**Daw Hnin Lai Win**  
Environmental Manager

**HNIN LAI WIN**  
Environmental Manager  
Total Business Solution Co., Ltd.

Reviewed by

**DR. Soe Moe Kyaw Win**  
Managing Director

**DR. SOE MOE KYAW WIN**  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.



### Traffic Counting (2<sup>nd</sup> Time Recording)



## TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: [tbs.myanmar@gmail.com](mailto:tbs.myanmar@gmail.com)

|                                              |                                                                                                                    |                                                                  |                                                   |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------|
| <b>Client</b><br>တိုင်းတာလိုသူ အမည်          | Alpha Best Global Limited.                                                                                         | <b>Date</b><br>တိုင်းတာသည့် နေ့ရက်                               | 28 <sup>th</sup> - 31 <sup>st</sup> December 2022 |
| <b>Project Location</b><br>စီမံကိန်း တည်နေရာ | Plot No. (149, 150, 151, 152), Myay Taing Block No (49), Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon. | <b>Start Time/ End Time</b><br>စတင်သည့်အချိန်/ ပြီးစီးသည့်အချိန် | 7:00AM to 7:00PM                                  |
|                                              |                                                                                                                    | <b>Sampling Type</b><br>တိုင်းတာသည့် အမျိုးအစား                  | Traffic Counting                                  |
| <b>Project Number</b><br>စီမံကိန်းအမှတ်      | 173                                                                                                                | <b>Sampling Equipment</b><br>တိုင်းတာသည့် စက်ပစ္စည်း             | Manually                                          |

| No.<br>စဉ် | Site Description<br>တိုင်းတာသည့် နေရာ | Location/တည်နေရာ     |                          | Total Traffic Volume Result | Total Traffic Volume Result | Average Traffic Capacity Ratio (V/C) | Nature of Flow<br>လမ်းအခြေအနေ |
|------------|---------------------------------------|----------------------|--------------------------|-----------------------------|-----------------------------|--------------------------------------|-------------------------------|
|            |                                       | Latitude<br>လတ္တီကျု | Longitude<br>လောင်ဂျီကျု |                             |                             |                                      |                               |
| Weekday    |                                       |                      |                          |                             |                             |                                      |                               |
| 1.         | TC1                                   | 16° 58' 36.42" N     | 96° 3' 13.40" E          | 302                         | 27                          | 0.02                                 | Free Flow (A)                 |
| 2.         | TC2                                   | 16° 58' 32.00" N     | 96° 2' 53.47" E          | 275                         | 44                          | 0.03                                 | Free Flow (A)                 |
| 3.         | TC3                                   | 16° 59' 7.33" N      | 96° 3' 15.88" E          | 82                          | 18                          | 0.01                                 | Free Flow (A)                 |
| 4.         | TC-4A                                 | 16° 57' 54.12" N     | 96° 3' 42.44" E          | 4666                        | 326                         | 0.27                                 | Free Flow (A)                 |
| 5.         | TC-4B                                 | 16° 57' 53.08" N     | 96° 3' 42.17" E          | 4983                        | 345                         | 0.29                                 | Free Flow (A)                 |
| 6.         | TC5-A                                 | 17° 0' 2.60" N       | 96° 3' 12.51" E          | 3068                        | 339                         | 0.28                                 | Free Flow (A)                 |
| 7.         | TC-5B                                 | 17° 0' 2.02" N       | 96° 3' 14.53" E          | 3229                        | 336                         | 0.28                                 | Free Flow (A)                 |
| Weekend    |                                       |                      |                          |                             |                             |                                      |                               |
| 1.         | TC-4A                                 | 16° 57' 54.12" N     | 96° 3' 42.44" E          | 4235                        | 448                         | 0.37                                 | Reasonably free flow (B)      |
| 2.         | TC-4B                                 | 16° 57' 53.08" N     | 96° 3' 42.17" E          | 5053                        | 474                         | 0.39                                 | Reasonably free flow (B)      |
| 3.         | TC5-A                                 | 17° 0' 2.60" N       | 96° 3' 12.51" E          | 2378                        | 392                         | 0.33                                 | Reasonably free flow (B)      |
| 4.         | TC-5B                                 | 17° 0' 2.02" N       | 96° 3' 14.53" E          | 2952                        | 355                         | 0.30                                 | Reasonably free flow (B)      |

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Field Technician

**U Htet Thiha Phone Myint**  
Environmental Geologist

Analyzed by

**Daw Hnin Lai Win**  
Environmental Manager

**HNIN LAI WIN**  
Environmental Manager  
Total Business Solution Co., Ltd.

Reviewed by

**DR. Soe Moe Kyaw Win**  
Managing Director

**DR. SOE MOE KYAW WIN**  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.

## **APPENDIX L**

### **Lighting Results**



# TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: [tbs.myanmar@gmail.com](mailto:tbs.myanmar@gmail.com)

## Light Level Measurement Result

|                                              |                                                                                                                             |                                               |              |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------|
| Client<br>တိုင်းတာလိုသူ အမည်                 | Alpha Best Global Co., Ltd.                                                                                                 | Date<br>တိုင်းတာသည့် နေ့ရက်                   | 8.12.2022    |
| Project Location<br>စီမံကိန်း တည်နေရာ        | Plot No. (149, 150, 151, 152),<br>Myay Taing Block No (49),<br>Wartayar Industrial Zone, Shwe<br>Pyi Thar Township, Yangon. | Start Time/ စတင်သည့်အချိန်                    | 9:30 AM      |
| Measurement Location<br>တိုင်းတာသည့် တည်နေရာ | Inside the Factory                                                                                                          | End Time/ ပြီးစီးသည့်အချိန်                   | 10:50 AM     |
| Project Number<br>စီမံကိန်းအမှတ်             | TBS-173                                                                                                                     | Sampling Type<br>တိုင်းတာသည့် အမျိုးအစား      | Light        |
|                                              |                                                                                                                             | Sampling Equipment<br>တိုင်းတာသည့် စက်ပစ္စည်း | Victor 1010A |

| No.<br>စဉ် | Site Description<br>တိုင်းတာသည့် နေရာ | Location/တည်နေရာ    |                         | Result<br>ရလဒ် | Unit<br>ယူနစ် |
|------------|---------------------------------------|---------------------|-------------------------|----------------|---------------|
|            |                                       | Latitude/ လတ္တီတွဒ် | Longitude/ လောင်ဂျီတွဒ် |                |               |
| 1.         | Office                                | 16° 58' 37.35"N     | 96° 3' 13.13"E          | 1005           | Lux           |
| 2.         | Warehouse                             | 16° 58' 40.13"N     | 96° 3' 12.95"E          | 325            | Lux           |
| 3.         | Cutting Line                          | 16° 58' 37.93"N     | 96° 3' 13.47"E          | 873            | Lux           |
| 4.         | Sewing Line                           | 16° 58' 37.66"N     | 96° 3' 12.97"E          | 426            | Lux           |
| 5.         | Lasting                               | 16° 58' 38.01"N     | 96° 3' 12.57"E          | 426            | Lux           |
| 6.         | Outsole Grinding                      | 16° 58' 40.07"N     | 96° 3' 11.10"E          | 547            | Lux           |
| 7.         | Packing                               | 16° 58' 39.48"N     | 96° 3' 10.96"E          | 238            | Lux           |
| 8.         | Clinic                                | 16° 58' 39.76"N     | 96° 3' 10.89"E          | 210            | Lux           |
| 9.         | Chemical Warehouse                    | 16° 58' 41.11"N     | 96° 3' 11.66"E          | 596            | Lux           |

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Analyzed by

Reviewed by

Approved by

**U Wai Phyo Aung**  
Environmental Geologist

**U Myatthu Kyaw**  
General Manager

**Dr. Soe Moe Kyaw Win**  
Managing Director

Wai Phyo Aung  
Environmental Geologist  
TOTAL BUSINESS SOLUTION CO., LTD.

MYATTHU KYAW  
GENERAL MANAGER  
TOTAL BUSINESS SOLUTION CO., LTD.

Dr. Soe Moe Kyaw Win  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.

## **APPENDIX M**

### **Temperature Results**



# TOTAL BUSINESS SOLUTION CO., LTD.

No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Myanmar Tel: + 959 401 604 493, E-mail: [tbs.myanmar@gmail.com](mailto:tbs.myanmar@gmail.com)

## Temperature Measurement Result

|                                              |                                                                                                                          |                                               |                         |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------|
| Client<br>တိုင်းတာလိုသူ အမည်                 | Alpha Best Global Co., Ltd.                                                                                              | Date<br>တိုင်းတာသည့် နေ့ရက်                   | 8.12.2022               |
| Project Location<br>စီမံကိန်း တည်နေရာ        | Plot No. (149, 150, 151, 152),<br>Myay Taing Block No (49),<br>Wartayar Industrial Zone, Shwe Pyi Thar Township, Yangon. | Start Time/ စတင်သည့်အချိန်                    | 9:30 AM                 |
|                                              |                                                                                                                          | End Time/ ပြီးစီးသည့်အချိန်                   | 10:50 AM                |
| Measurement Location<br>တိုင်းတာသည့် တည်နေရာ | Inside the Factory                                                                                                       | Sampling Type<br>တိုင်းတာသည့် အမျိုးအစား      | Temperature             |
| Project Number<br>စီမံကိန်းအမှတ်             | TBS-173                                                                                                                  | Sampling Equipment<br>တိုင်းတာသည့် စက်ပစ္စည်း | Infrared<br>Thermometer |

| No.<br>စဉ် | Site Description<br>တိုင်းတာသည့် နေရာ | Location/တည်နေရာ    |                         | Result<br>ရလဒ် | Unit<br>ယူနစ် |
|------------|---------------------------------------|---------------------|-------------------------|----------------|---------------|
|            |                                       | Latitude/ လတ္တီတွဒ် | Longitude/ လောင်ဂျီတွဒ် |                |               |
| 1.         | Office                                | 16° 58' 37.35"N     | 96° 3' 13.13"E          | 30.2           | °C            |
| 2.         | Warehouse                             | 16° 58' 40.13"N     | 96° 3' 12.95"E          | 31.7           | °C            |
| 3.         | Cutting Line                          | 16° 58' 37.93"N     | 96° 3' 13.47"E          | 31.9           | °C            |
| 4.         | Sewing Line                           | 16° 58' 37.66"N     | 96° 3' 12.97"E          | 31.6           | °C            |
| 5.         | Lasting                               | 16° 58' 38.01"N     | 96° 3' 12.57"E          | 31.8           | °C            |
| 6.         | Outsole Grinding                      | 16° 58' 40.07"N     | 96° 3' 11.10"E          | 31.5           | °C            |
| 7.         | Packing                               | 16° 58' 39.48"N     | 96° 3' 10.96"E          | 31.7           | °C            |
| 8.         | Clinic                                | 16° 58' 39.76"N     | 96° 3' 10.89"E          | 31.4           | °C            |
| 9.         | Chemical Warehouse                    | 16° 58' 41.11"N     | 96° 3' 11.66"E          | 30.8           | °C            |

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Analyzed by

**U Wai Phyo Aung**  
Environmental Geologist

Wai Phyo Aung  
Environmental Geologist  
TOTAL BUSINESS SOLUTION CO., LTD.

Reviewed by

**U Myatthu Kyaw**  
General Manager

MYATTHU KYAW  
GENERAL MANAGER  
TOTAL BUSINESS SOLUTION CO., LTD.

Approved by

**Dr. Soe Moe Kyaw Win**  
Managing Director

Dr. Soe Moe Kyaw Win  
MANAGING DIRECTOR  
TOTAL BUSINESS SOLUTION CO., LTD.

**APPENDIX N**  
**Scoping Stage Public Consultation Attendance List and**  
**Presentation Slides**



**Attendance List – Local People**

Alpha Best Global Limited (CMP စနစ်ဖြင့်စီမံခန့်ခွဲမှုအမျိုးမျိုးထုတ်လုပ်ခြင်း) ၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာ  
 (နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအဆင့်) အတွက် အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးပွဲ တက်ရောက်သူစာရင်း

သေချာပြည်သူ

| စဉ် | အမည်         | နေရပ်လိပ်စာ         | အလုပ်အကိုင် | ဖုန်းနံပါတ်   | လက်မှတ် |
|-----|--------------|---------------------|-------------|---------------|---------|
|     | စာအုပ်စာ     | ဝါးတကျ/၂၃-၇၆၇၆၈     | ကျ.က.ခ      | ၀၉/၄၈၄၈၂၂၂၂၄၄ |         |
|     | ခိုင်စွန်း   | ခံဒင်/၁၇-၇၆၇၆၈      | ဆက်         | ၀၉/၆၆၆၆၁၁၁၁   |         |
|     | ဒေါ်ခင်မာမာ  | မောင်မောင်/၂၃-၇၆၇၆၈ | ကျ.က.ခ      | ၀၉/၆၆၆၆၀၀၀၀   |         |
|     | ဒေါ်ခင်မာမာ  | မောင်မောင်/၂၃-၇၆၇၆၈ | ဆက်         | ၀၉/၆၆၆၆၀၀၀၀   |         |
|     | ဒေါ်ခင်မာမာ  | ခံဒင်/၁၇-၇၆၇၆၈      | ဆက်         | ၀၉/၆၆၆၆၀၀၀၀   |         |
|     | မိုးမိုးစန်း | ခံဒင်/၁၇-၇၆၇၆၈      | ရုပ်ရှင်    | ၀၉/၆၆၆၆၀၀၀၀   |         |
|     | မိုးမိုးစန်း | ခံဒင်/၁၇-၇၆၇၆၈      | ဆက်         | ၀၉/၆၆၆၆၀၀၀၀   |         |
|     | မိုးမိုးစန်း | ခံဒင်/၁၇-၇၆၇၆၈      | ရုပ်ရှင်    | ၀၉/၆၆၆၆၀၀၀၀   |         |
|     | မိုးမိုးစန်း | ခံဒင်/၁၇-၇၆၇၆၈      | ဆက်         | ၀၉/၆၆၆၆၀၀၀၀   |         |
|     | မိုးမိုးစန်း | ခံဒင်/၁၇-၇၆၇၆၈      | ရုပ်ရှင်    | ၀၉/၆၆၆၆၀၀၀၀   |         |
|     | မိုးမိုးစန်း | ခံဒင်/၁၇-၇၆၇၆၈      | ဆက်         | ၀၉/၆၆၆၆၀၀၀၀   |         |

Alpha Best Global Limited (CMP စနစ်ဖြင့်ပိနပ်အမျိုးမျိုးထုတ်လုပ်ခြင်း) ၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာ  
 (နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအဆင့်) အတွက် အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးပွဲ တက်ရောက်သူစာရင်း

ဒေသခံပြည်သူ

| စဉ် | အမည်           | နေရပ်လိပ်စာ      | အလုပ်အကိုင် | ဖုန်းနံပါတ်   | လက်မှတ်   |
|-----|----------------|------------------|-------------|---------------|-----------|
|     | မာခွဲလှိုင် ၆၀ | ရွှေပြည်သာ/၁၉/၅၅ | ရုပ်စိရုပ်  | ၀၉-၉၅၅၇၈၅၀၅၅၈ | ခွဲလှိုင် |
|     | မအေးအောင်မြင်း | ရွှေပြည်သာ/၁၉/၅၈ | ရုပ်စိရုပ်  | ၀၅-၇၅၅၇၇၇၂၃၃၅ | မအေး      |
|     | မမြတ်စေတနာ     | ရွှေပြည်သာ/၁၉/၄၈ | ရုပ်စိရုပ်  | ၀၅-၇၅၅၇၇၇၂၃၃၅ | မြတ်စေတနာ |
|     | မခွဲလှိုင်     | ရွှေပြည်သာ/၁၉/၅၈ | ရုပ်စိရုပ်  | ၀၅-၇၆၀၆၇၇၇၇၅  | ခွဲလှိုင် |
|     | မပန်းထွန်း     | ရွှေပြည်သာ/၁၉/၅၅ | ရုပ်စိရုပ်  | ၀၅-၇၇၆၇၇၇၅၅၅  | ပန်းထွန်း |
|     | မတင်အောင်      | ရွှေပြည်သာ/၁၉/၅၅ | ရုပ်စိရုပ်  | ၀၅-၇၅၅၅၅၅၅၅၅  | အောင်     |
|     | မအေးအောင်      | ရွှေပြည်သာ/၁၉/၅၅ | ရုပ်စိရုပ်  | ၀၅-၆၆၆၆၆၆၆၆၆  | အောင်     |
|     | မအေးအောင်      | ရွှေပြည်သာ/၁၉/၅၅ | ရုပ်စိရုပ်  | ၀၅-၆၆၆၆၆၆၆၆၆  | အောင်     |

Alpha Best Global Limited (CMP စနစ်ဖြင့်စီမံခန့်ခွဲမှုအမျိုးမျိုးထုတ်လုပ်ခြင်း) ၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာ  
 (နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအဆင့်) အတွက် အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးပွဲ တက်ရောက်သူစာရင်း

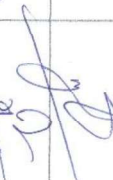



ဒေသခံပြည်သူ

| စဉ် | အမည်         | နေရပ်လိပ်စာ           | အလုပ်အကိုင် | ဖုန်းနံပါတ်    | လက်မှတ်                                                                           |
|-----|--------------|-----------------------|-------------|----------------|-----------------------------------------------------------------------------------|
|     | မောင်မျိုးဦး | ပုသိမ်ကမ်း 10 ရပ်ကွက် |             | ၀၇-၆၅၅ ၄၇၃ ၄၄၅ |  |
|     |              |                       |             |                |                                                                                   |
|     |              |                       |             |                |                                                                                   |
|     |              |                       |             |                |                                                                                   |
|     |              |                       |             |                |                                                                                   |
|     |              |                       |             |                |                                                                                   |
|     |              |                       |             |                |                                                                                   |
|     |              |                       |             |                |                                                                                   |
|     |              |                       |             |                |                                                                                   |

**Attendance List – Government**

Alpha Best Global Limited (CMA စနစ်ဖြင့်စီမံခန့်ခွဲမှုအမျိုးမျိုးထုတ်လုပ်ခြင်း) ၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာ  
 (နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအဆင့်) အတွက် အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးပွဲ တက်ရောက်သူစာရင်း

**ဌာနဆိုင်ရာ**

| စဉ် | အမည်             | ရာထူး            | ဌာန     | ဖုန်းနံပါတ်   | လက်မှတ်                                                                             |
|-----|------------------|------------------|---------|---------------|-------------------------------------------------------------------------------------|
| ၁။  | Dr. P. P. F. Oei | အုပ်ချုပ်ရေးဌာန  | စတင်    | ၀၉၇၇၇၂၃၆၂၅၂   |  |
| ၂။  | Dr. P. P. F. Oei | အများပြည်သူရေးရာ | အထွေထွေ | ၀၉-၂၅၂၄၀၀၀၂၅၂ |  |
| ၃။  | Dr. P. P. F. Oei | အထွေထွေရေးရာ     | အထွေထွေ | ၀၉-၂၅၂၄၀၀၀၂၅၂ |  |
| ၄။  | Dr. P. P. F. Oei | အထွေထွေရေးရာ     | အထွေထွေ | ၀၉-၂၅၂၄၀၀၀၂၅၂ |  |
|     |                  |                  |         |               |                                                                                     |
|     |                  |                  |         |               |                                                                                     |
|     |                  |                  |         |               |                                                                                     |
|     |                  |                  |         |               |                                                                                     |



Presentation Slides



**TOTAL BUSINESS SOLUTION CO., LTD.**

- ❖ ၂၀၁၂ ခုနှစ်တွင် စတင်တည်ထောင်ခဲ့ပါသည်။
- ❖ TBS မှ တာဝန်ယူဆောင်ရွက် ပေးနေသော လုပ်ငန်းများ မှာ
  - ✓ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းများ
  - ✓ ဘူမိအင်ဂျင်နီယာဆိုင်ရာ လုပ်ငန်းများ
  - ✓ ဆောက်လုပ်ရေးလုပ်ငန်းဆိုင်ရာ စီမံခန့်ခွဲမှု နှင့် စစ်ဆေးရေးလုပ်ငန်းများ
  - ✓ သတ္တုတူးဖော်ရေး အစီအစဉ် နှင့် သတ္တုတွင်းမိတ်သိမ်းရေး လုပ်ငန်းများ

**ကြားကာလအကြံပေးလုပ်ကိုင်ရန်အဖွဲ့အစည်းမှတ်ပုံတင်ခြင်း**  
အထောက်အထားလက်မှတ်


**ကြားကာလအကြံပေးလုပ်ကိုင်ရန်အဖွဲ့အစည်းမှတ်ပုံတင်ခြင်း**  
အထောက်အထားလက်မှတ်



### ဆွေးနွေးတင်ပြမည့် အကြောင်းအရာများ

- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း အစီရင်ခံစာ Scoping Report) ပြုလုပ်ရခြင်း၏ ရည်ရွယ်ချက်ကိုတင်ပြခြင်း။
- စီမံကိန်းနှင့် အဓိကသက်ဆိုင်သောဥပဒေ ဖွဲ့စည်းမှုများ တင်ပြခြင်း။
- စီမံကိန်းအကြောင်းအရာကို တင်ပြခြင်း။
- ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များ လေ့လာခြင်းနှင့် တွေ့ရှိချက်များကို တင်ပြခြင်း။
- စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်အပေါ်အကျိုးသက်ရောက်မှုများအား အကဲဖြတ်ဆန်းစစ်ခြင်းနှင့် သက်ရောက်မှု လျှော့ချခြင်း အစီအစဉ်များကို တင်ပြခြင်း။
- EIA အစီရင်ခံစာအတွက်ဆောင်ရွက်ရမည့် လုပ်ငန်းတာဝန်များ (TOR)ကို တင်ပြခြင်း။
- လူမှုအကျိုးတူပူးပေါင်းပါဝင်မှု (CSR) အစီအစဉ်များကို တင်ပြခြင်း။


၅



### ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ (နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း) အစီရင်ခံစာရေးဆွဲခြင်း၏ ရည်ရွယ်ချက်များ

- အဆိုပြုစီမံကိန်းကြောင့် ပြင်ပပေါ်နိုင်သော ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှုများကို ကြိုတင်သတ်မှတ်၍ ခန့်မှန်းအကဲဖြတ်နိုင်ခြင်း။
- ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ကိစ္စရပ်များအပေါ် သက်ရောက်နိုင်မည့် ဆိုးကျိုးများလျှော့ချနိုင်ရန် အစီအစဉ်များ ရေးဆွဲနိုင်ခြင်း။
- စီမံကိန်းဧရိယာနှင့် စီမံကိန်းအနှံ့အဝန်းကျင်တွင် ပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေးတိုင်းတာမှုများ ပြုလုပ်ပြီး ရရှိလာသည့် ရလဒ်များကို အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု)လမ်းညွှန်ချက်များ (၂၀၁၅) ဖြင့် နှိုင်းယှဉ်၍ လိုအပ်သော ပတ်ဝန်းကျင်ထိခိုက်မှု လျှော့ပါးရေးအစီအစဉ်များ စီမံဆောင်ရွက်နိုင်ခြင်း။
- အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းများ ပြုလုပ်ပြီး အကြံပြုချက်သဘောထားများကို ရယူနိုင်ခြင်း။


6



### စီမံကိန်းနှင့် အဓိကသက်ဆိုင်သောဥပဒေမူဘောင်များ

- မြန်မာနိုင်ငံ အမျိုးသားပတ်ဝန်းကျင်ရေးရာ ဗဟိုဥပဒေ (၅ ရက်၊ ဇူလိုင်လ၊ ၂၀၁၅ ခုနှစ်)
- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဥပဒေ (၂၀၁၂ ခုနှစ်)
- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅ ခုနှစ်)
- အမျိုးသားသောသက်သုံးရေး အရည်အသွေးချိန်ညွှန် (၂၀၁၉)
- အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး ထုတ်လွှတ်မှု လမ်းညွှန်ချက်များ (၂၀၁၅ ခုနှစ်)

၇



### စီမံကိန်းနှင့် အဓိကသက်ဆိုင်သောဥပဒေမူဘောင်များ

- မြန်မာနိုင်ငံ အမျိုးသားပတ်ဝန်းကျင်ရေးရာ ဗဟိုဥပဒေ (၅ ရက်၊ ဇူလိုင်လ၊ ၂၀၁၅ ခုနှစ်)
- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဥပဒေ (၂၀၁၂ ခုနှစ်)
- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅ ခုနှစ်)
- အမျိုးသားသောသက်သုံးရေး အရည်အသွေးချိန်ညွှန် (၂၀၁၉)
- အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး ထုတ်လွှတ်မှု လမ်းညွှန်ချက်များ (၂၀၁၅ ခုနှစ်)

၈





**IBS** **ဖိနပ်ထုတ်လုပ်ရာတွင် အသုံးပြုမည့် ကုန်ကြမ်းပစ္စည်းများ**

**IBS** **ဖိနပ်ထုတ်လုပ်ရာတွင် အသုံးပြုမည့် စက်ပစ္စည်းများ**

**IBS** **ဖိနပ်ထုတ်လုပ်အဆင့်ဆင့်နှင့် ထုတ်လုပ်မှုနှုန်း**

**IBS** **ဖိနပ်ထုတ်လုပ်မှုနှုန်း**

| စဉ်        | ဖိနပ်အမျိုးအစား       | လျှက် | ထုတ်လုပ်မှုနှုန်း |           |          |            |
|------------|-----------------------|-------|-------------------|-----------|----------|------------|
|            |                       |       | ပထမနှစ်           | ဒုတိယနှစ် | တတိယနှစ် | စတုတ္ထနှစ် |
| ၁          | အသားစားဖိနပ် (လူကြီး) | အစုံ  | ၁၅၀,၀၀၀           | ၁၆၅,၀၀၀   | ၂၀၂,၂၇၅  | ၂၆၂,၅၀၀    |
| ၂          | အသားစားဖိနပ် (ကလေး)   | အစုံ  | ၁၅၀,၀၀၀           | ၁၆၅,၀၀၀   | ၂၀၂,၂၇၅  | ၂၆၂,၅၀၀    |
| ၃          | Casual shoes (လူကြီး) | အစုံ  | ၂၂၀,၀၀၀           | ၂၃၅,၀၀၀   | ၂၈၂,၅၀၀  | ၃၆၅,၀၀၀    |
| စုစုပေါင်း |                       |       | ၅၂၀,၀၀၀           | ၅၆၅,၀၀၀   | ၆၈၆,၃၅၀  | ၈၉၀,၀၀၀    |





### စိမ့်ကိန်းစက်ရုံ၏ ထုတ်ကုန်ဖိနပ်များ



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### စွမ်းအင်ရရှိမှု

- လျှပ်စစ်ဓာတ်အား ရရှိရန် အတွက် ၃၃ ကီလိုဝိတ် လျှပ်စွမ်းအင် အားရှိသော တရုတ်စွမ်းအင် ၁ လုံးကို ရန်ကုန်ပြိုထော် လျှပ်စစ်ဓာတ်အားပေးရေး ကော်ပိုရေးရှင်း၏ စည်းမျဉ်း၊ စည်းကမ်း၊ ဥပဒေများနှင့် အညီတပ်ဆင်ရန် စီစဉ်ထားပါသည်။
- အရေအသွယ်လျှပ်စစ်ဓာတ်အား ပြတ်တောက်ပါက အသုံးပြုနိုင်ရန် ၆၄၀ ကေဂျီအားအရှိသော ဒီဇယ်ဆီသုံးစက်နှစ်လုံးကို အသုံးပြုသွားမည် ဖြစ်ပါသည်။
- အသုံးပြုသော ဒီဇယ်ဆီပမာဏမှာ စုံစုံဖွင့်ရက်များတွင် တစ်နေ့လျှင် ၁၅၄ ဂါလန်ခန့် နှင့် နေ့နေ့တွင် ၉၇၇ ဂါလန်ခန့် အသုံးပြုပါသည်။



တရုတ်စွမ်းအင်


မီးခက်

မီးခက်တားသည့်အခန်း




### ရေအရင်းအမြစ်၊ လိုအပ်ချက်နှင့် သုံးစွဲမှု

- စိမ့်ကိန်းအတွက် လိုအပ်သော ရေကို ၁၄၀ ပေနက်သော ရေတွင်းမှ ထုတ်ယူသုံးစွဲမည် ဖြစ်ပါသည်။
- စိမ့်ကိန်းအတွက် အသုံးပြုရန် ၁,၀၅၀ ကုဗမီတာ ထုထည်ရှိသော ရေလိုလှောင်ကန်ကို တည်ဆောက်မည်ဖြစ်ပြီး ရေ ဂါလန်ပေါင်း ၂၆၂,၀၀၀ ဂါလန်ကို သိုလှောင်နိုင်မည်ဖြစ်ပါသည်။
- ရေလိုလှောင်ကန်မှ ရေကို စိမ့်ကိန်းဖက်ရှိလည်ပတ်ရန်နှင့် အရေးပေါ် မီဇာတရန်အတွက် အသုံးပြုသွားမည်ဖြစ်ပါသည်။
- ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီအရ လူတစ်ယောက် အတွက် ခန့်မှန်းရေလိုအပ်ချက်မှာ တစ်ရက်လျှင် ၀.၁၁ ကုဗမီတာ (၃၀၀လီတာ) ခန့်ဖြစ်ပါသည်။
- စက်ရုံရန်ကမ်းအရေအတွက် ၃,၀၁၄ ဧကရှိ အခြေခံ၍ ခန့်မှန်းထွက်ချက်ထားသော တစ်နေ့အတွက် ရေလိုအပ်ချက်မှာ ၃၃၀ ကုဗမီတာခန့် (၉၀,၀၀၀ ဂါလန်ခန့်) ဖြစ်ပါသည်။




ရေလိုလှောင်ကန်

သောက်ရေသန့်စက်



### စွန့်ပစ်ရေပမာဏနှင့် ရေစီးဆင်းမှုစနစ်

- ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီအရ လူတစ်ယောက် အတွက် ခန့်မှန်းစွန့်ပစ်ရေပမာဏမှာ တစ်ရက်လျှင် ၀.၀၄ ကုဗမီတာ (၁၀၀လီတာ) ခန့်ဖြစ်ပါသည်။
- ဝန်ထမ်း ၁,၀၁၄ ဦးကို အခြေခံ၍ ခန့်မှန်းထွက်ချက်ထားသော စွန့်ပစ်ရေပမာဏမှာ တစ်ရက်လျှင် ၁၂၀ ကုဗမီတာခန့် (၃၀,၀၀၀ ဂါလန်ခန့်) ရှိနိုင်ပါသည်။
- စိမ့်ကိန်းအကုန်မှ ထွက်ရှိသော မိလ္လာကန် ၁၂ မီတာ x ၁၂ မီတာအရွယ်အရှိသော အဓိကမိလ္လာကန်ဖြင့် တစ်ရက်လျှင် ၂၇ မီတာ x ၃၇ မီတာ အရွယ်အရှိသော မိလ္လာကန်အသေး (၄) လုံးဖြင့် စုဆောင်း၍ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီမှ ဖျက်ထားသော လမ်းညွှန်ချက်နှင့် နည်းလမ်းများနှင့် အညီ စွန့်ပစ်သွားမည်ဖြစ်ပါသည်။
- စိမ့်ကိန်းအကုန်ထွက်ရှိသော စွန့်ပစ်ရေအား အကျယ် ၀.၆ မီတာ နှင့် အနက် ၀.၄ မီတာရှိသော အလုံအကုံပြင်ပမှတစ်ဆင့် ကော်မတီပြင်ပသို့ထွက်ရှိသော အကျယ် ၀.၆ မီတာ နှင့် အနက် ၀.၇ မီတာရှိသော အဓိကပံး ရေဖုတ်ဖြင့်ပေး၍ ပို့ဆောင် စွန့်ပစ်သွားမည်ဖြစ်ပါသည်။



စိမ့်ကိန်း၏ အဓိကမိလ္လာကန်

အဆောက်အဦ တော့၍ မိလ္လာကန်အသေး

စိမ့်ကိန်း၏ရေဆင်းစနစ်ပြပုံ



### အစိုင်အခဲစွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု

#### ❖ ဖွန့်ပစ်အမှိုက်ပမာဏ

IGES (၂၀၁၆) အရ လူတစ်ယောက်၏ အမှိုက်ဖွန့်ပစ်မှုမှာ တစ်နေ့လျှင် ၀.၄ ကီလိုဂရမ်ခန့် ရှိနိုင်ပါသည်။ စက်ရုံဝန်ထမ်း ၇,၀၀၄ ဦးကို အခြေခံ၍ တွက်ချက်ထားသော အမှိုက်ထုတ်ရှိမည့် ပမာဏမှာ တစ်နေ့လျှင် ၁,၂၀၅ ကီလိုဂရမ် ခန့် ထွက်ရှိနိုင်ပါသည်။ ထို့အပြင် ဖြန့်ချိပုံစံဖြင့် လုပ်ငန်းစဉ်များလည်း အမှိုက်များထွက်ရှိနိုင်ပါသည်။

#### ❖ အစိုင်အခဲစွန့်ပစ်ဖူစုမှု

စီမံကိန်းနေရာတွင် အမှိုက်ပုံများ လုံလောက်စွာထားရှိမည် ဖြစ်ပြီး အမှိုက်များကို အမှိုက်ဖွန့်ပစ်သည့်နေရာ၌ နေ့စဉ်တကျ စုဆောင်းထားပြီး ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်များ အတိုင်း ဖွန့်ပစ်မည်ဖြစ်သည်။



အမှိုက်ပုံများထားရှိသည့်ပုံစံ



အမှိုက်ဖွန့်ပစ်သည့်နေရာပြပုံ



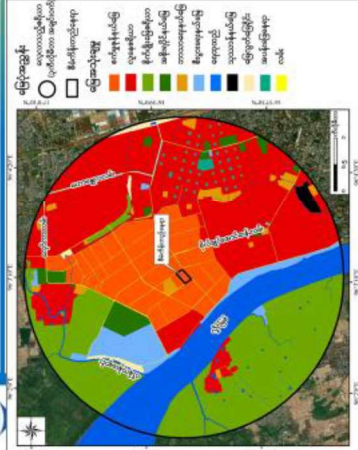
### ပတ်ဝန်းကျင်အရည်အသွေးတိုင်းတာသည့်နယ်ပယ်များ

- ❖ မြေအသုံးချမှုအခြေအနေလေ့လာခြင်း
- ❖ လူနီးဖွားဆိုင်ရာ အချက်အလက်များ လေ့လာခြင်း
- ❖ လေထုအရည်အသွေး တိုင်းတာခြင်း
- ❖ ရေထုအရည်အသွေး တိုင်းတာခြင်း
- ❖ ဆူညံသံ တိုင်းတာခြင်း
- ❖ တုန်ခါမှု တိုင်းတာခြင်း
- ❖ ယာဉ်သွားလာမှုအခြေအနေလေ့လာခြင်း
- ❖ စီမံချိုးဖျက်မှုများကိုလေ့လာခြင်း

## ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များကို တင်ပြခြင်း



### စီမံကိန်းပတ်ဝန်းကျင်ရှိမြေအသုံးချမှုလေ့လာခြင်း

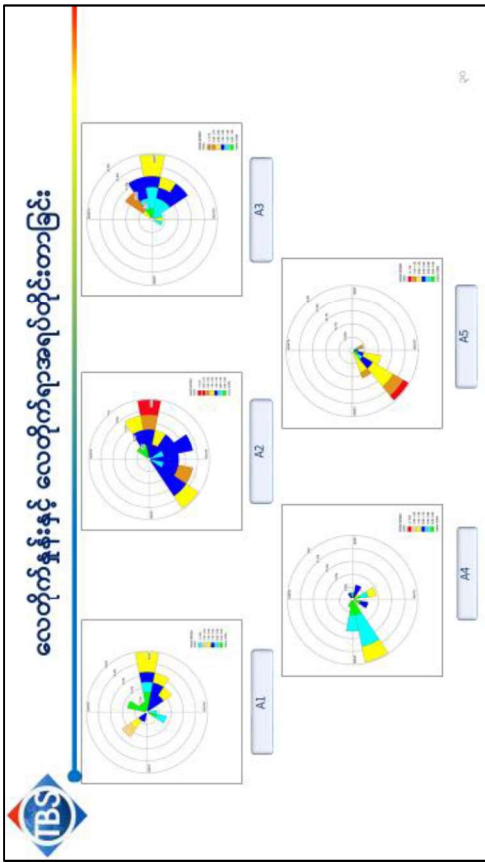


| မြေအသုံးအမျိုးအစား | ဧရိယာ (ဧက) | ရာခိုင်နှုန်း |
|--------------------|------------|---------------|
| မြေအသုံးအမျိုးအစား | ၁,၀၆၆.၀၀   | ၃၆.၆၆         |
| မြေအသုံးအမျိုးအစား | ၇၁.၆၇      | ၂.၀၅          |
| မြေအသုံးအမျိုးအစား | ၁၂၈.၇၀     | ၄.၀၅          |
| မြေအသုံးအမျိုးအစား | ၃၃၈.၃၂     | ၁၀.၆၇         |
| မြေအသုံးအမျိုးအစား | ၅၀၁.၁၆     | ၁၅.၇၆         |
| မြေအသုံးအမျိုးအစား | ၇၀၅.၂၃     | ၂၄.၆၆         |
| မြေအသုံးအမျိုးအစား | ၂၂၄.၇၇     | ၇.၀၀          |
| မြေအသုံးအမျိုးအစား | ၄၈၈.၇၀     | ၁၄.၄၆         |
| မြေအသုံးအမျိုးအစား | ၁၃.၆၄      | ၀.၄၆          |
| မြေအသုံးအမျိုးအစား | ၁၅.၀၀      | ၀.၄၆          |
| မြေအသုံးအမျိုးအစား | ၂၈၂.၆၀     | ၈.၈၀          |
| မြေအသုံးအမျိုးအစား | ၁၀၀        | ၃.၀၀          |

စီမံကိန်းအနီးပတ်ဝန်းကျင်ရှိ မြေအသုံးချမှု အခြေအနေပြ မြေပုံ







### မြေပေါ်ရေ ရေအရည်အသွေးတိုင်းတာခြင်းရလဒ်များ (စာတိုစွဲခန်း)

| စဉ် | တိုင်းတာသည့် ဓါတ်အား         | Unit | SW1  | SW2  | SW3  | SW4  | SW5  | Standard (BWS) |
|-----|------------------------------|------|------|------|------|------|------|----------------|
| ၁   | Temperature                  | °C   | ၂၅.၂ | ၂၅.၂ | ၂၅.၂ | ၂၅.၂ | ၂၅.၂ | ၂၅.၂           |
| ၂   | pH                           | -    | ၇.၂  | ၇.၂  | ၇.၂  | ၇.၂  | ၇.၂  | ၆.၅ - ၈.၅      |
| ၃   | Dissolved Oxygen (DO)        | mg/l | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅            |
| ၄   | Turbidity                    | NTU  | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅              |
| ၅   | Chemical Oxygen Demand (COD) | mg/l | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၂၀             |
| ၆   | BOD5                         | mg/l | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅              |
| ၇   | Total Dissolved Solids (TDS) | mg/l | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅၀၀၀           |
| ၈   | Total Suspended Solids (TSS) | mg/l | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅၀             |
| ၉   | Iron                         | mg/l | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅.၅  | ၅              |
| ၁၀  | Lead                         | mg/l | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၀.၀၅           |
| ၁၁  | Free Cyanide                 | mg/l | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၀.၀၅           |
| ၁၂  | Ammonia                      | mg/l | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၀.၀၅           |
| ၁၃  | Total Phosphorus             | mg/l | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၀.၀၅           |
| ၁၄  | Total Nitrogen               | mg/l | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၈.၅  | ၀.၀၅           |

၄၂



**မြေအောက်ရေ ရေအရည်အသွေးတိုင်းတာခြင်းရလဒ်များ (ခေတ်ခွဲခန်း)**

| မူဒ် | တိုင်းတာသည့် ညစ်ညမ်းမှု       | ယူစီ | GM1   | ဆောင်ရွက်ရန် လိုအပ်သည့် အခြေအနေအထား (ပုံစံ) | အရည်အသွေး စံနှုန်း (ပုံစံ) | ရလဒ်  |
|------|-------------------------------|------|-------|---------------------------------------------|----------------------------|-------|
| ၁    | Temperature                   | °C   | ၂၆    | ၂၆                                          | ၂၆                         | ၂၆    |
| ၂    | pH                            | -    | ၇.၅   | ၆.၅ - ၈.၅                                   | ၆ - ၉                      | ၇.၅   |
| ၃    | Dissolved Oxygen (DO)         | mg/l | ၂.၃၆  | ၂.၀                                         | ၂.၀                        | ၂.၃၆  |
| ၄    | Turbidity                     | NTU  | ၅     | ၅                                           | ၅                          | ၅     |
| ၅    | Dissolved Oxygen Demand (COD) | mg/l | ၅၀    | ၅၀                                          | ၅၀                         | ၅၀    |
| ၆    | BOD                           | mg/l | ၃.၂   | ၅                                           | ၅                          | ၃.၂   |
| ၇    | Total Dissolved Solids (TDS)  | mg/l | ၅၀၇   | ၅၀၀                                         | ၅၀၀                        | ၅၀၇   |
| ၈    | Total Suspended Solids (TSS)  | mg/l | ၂     | ၅                                           | ၅                          | ၂     |
| ၉    | Iron                          | mg/l | ၀.၁၁  | ၀.၁                                         | ၀.၁                        | ၀.၁၁  |
| ၁၀   | Lead                          | mg/l | ၀.၀၁  | ၀.၀၁                                        | ၀.၀၁                       | ၀.၀၁  |
| ၁၁   | Free Cyanide                  | mg/l | ၀.၀၁  | ၀.၀၅                                        | ၀.၀၅                       | ၀.၀၁  |
| ၁၂   | Asenic                        | mg/l | ၀.၀၁  | ၀.၀၅                                        | ၀.၀၅                       | ၀.၀၁  |
| ၁၃   | Total Phosphorus              | mg/l | ၀.၀၁၅ | ၀.၀၅                                        | ၀.၀၅                       | ၀.၀၁၅ |
| ၁၄   | Total Nitrogen                | mg/l | ၅     | ၅                                           | ၅                          | ၅     |

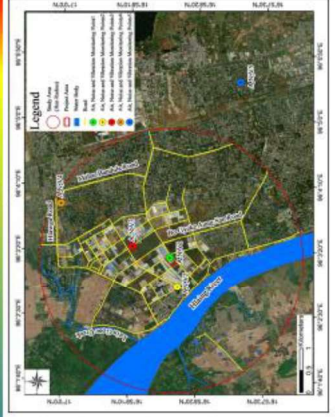
MS- No Guideline, MS- Not Detected

**ရည်သံတိုင်းတာခြင်း**

| တိုင်းတာသည့် မျက်နှာ | တိုင်းတာသည့် နေရာ | တိုင်းတာသည့် ငါးပေ | တိုင်းတာသည့် စက်      |
|----------------------|-------------------|--------------------|-----------------------|
| N1 - နေရာအမှတ် ၁     | ၂၆ - ၅၀ ပေ အကြား  | ၂၄ နှစ်            | noise Barrier GM 1356 |
| N2 - နေရာအမှတ် ၂     | ၂၆ - ၅၀ ပေ အကြား  | ၂၄ နှစ်            | noise Barrier GM 1356 |
| N3 - နေရာအမှတ် ၃     | ၂၆ - ၅၀ ပေ အကြား  | ၂၄ နှစ်            | noise Barrier GM 1356 |
| N4 - နေရာအမှတ် ၄     | ၅ - ၉ ပေ အကြား    | ၂၄ နှစ်            | noise Barrier GM 1356 |
| N5 - နေရာအမှတ် ၅     | ၅ - ၉ ပေ အကြား    | ၂၄ နှစ်            | noise Barrier GM 1356 |



ရည်သံတိုင်းတာသည့် နေရာ



ရည်သံတိုင်းတာခြင်း မြေပုံ

**ရည်သံတိုင်းတာခြင်း**

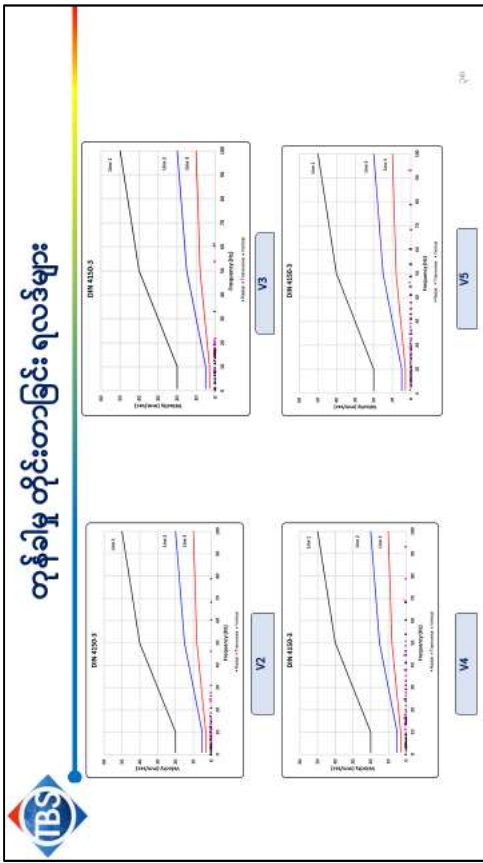
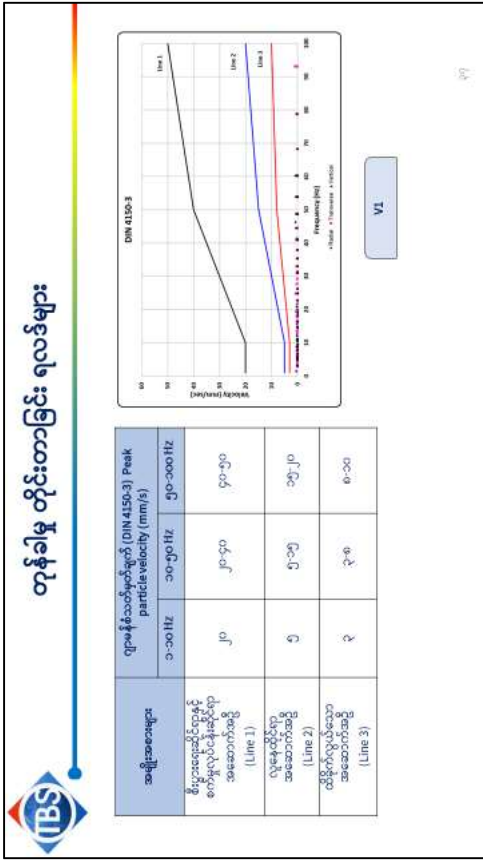
| တိုင်းတာသည့် မျက်နှာ | One Hour Leq (dB(A)) |           | အချိန်    | အချိန်    | အချိန်    |
|----------------------|----------------------|-----------|-----------|-----------|-----------|
|                      | ရက်စွဲ               | နံနက်     |           |           |           |
| N1                   | ၅၀၆ - ၆၁၃            | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ |
| N2                   | ၅၀၆ - ၆၁၃            | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ |
| N3                   | ၅၀၆ - ၆၁၃            | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ |
| N4                   | ၅၀၆ - ၆၁၃            | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ |
| N5                   | ၅၀၆ - ၆၁၃            | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ | ၅၅၂ - ၆၂၀ | ၅၀၆ - ၆၁၃ |
| NEQEG 2015           | ၅၀                   | ၅၀        | ၅၀        | ၅၀        | ၅၀        |

**တုန်ခါမှုတိုင်းတာခြင်း**

| တိုင်းတာသည့် မျက်နှာ | တိုင်းတာသည့် နေရာ | ရုတ်တရက်   | ရုတ်တရက်                      | ရုတ်တရက်       |
|----------------------|-------------------|------------|-------------------------------|----------------|
|                      |                   | Direction  | Peak particle velocity (mm/s) | Frequency (Hz) |
| V1                   | ၂၆ - ၅၀ ပေ အကြား  | Radial     | ၀.၆၆                          | ၆.၆၀           |
|                      |                   | Transverse | ၀.၃၇                          | ၂.၂ - ၅.၅      |
|                      |                   | Vertical   | ၀.၇၇                          | ၁၁.၀၀          |
| V2                   | ၂၆ - ၅၀ ပေ အကြား  | Radial     | ၀.၃၅                          | ၁၁.၀၅          |
|                      |                   | Transverse | ၀.၅၇                          | ၁၁.၀၀          |
|                      |                   | Vertical   | ၀.၂၈                          | ၇.၂၅           |
| V3                   | ၅ - ၉ ပေ အကြား    | Radial     | ၀.၂၀                          | ၆.၇၅           |
|                      |                   | Transverse | ၀.၃၂                          | ၂.၀၀           |
|                      |                   | Vertical   | ၀.၇၀                          | ၅၀.၆၂          |
| V4                   | ၅ - ၉ ပေ အကြား    | Radial     | ၀.၃၅                          | ၄၀.၆၂          |
|                      |                   | Transverse | ၀.၃၅                          | ၂.၆၅           |
|                      |                   | Vertical   | ၀.၃၅                          | ၂.၆၅           |
| V5                   | ၅ - ၉ ပေ အကြား    | Radial     | ၀.၆၅                          | ၆၀.၇၅          |
|                      |                   | Transverse | ၀.၂၅                          | ၆၀.၇၅          |
|                      |                   | Vertical   | ၀.၃၅                          | ၄၂.၂၅          |



တုန်ခါမှုတိုင်းတာသည့် နေရာ






















### ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာတွင် ဆက်လက် ဆောင်ရွက်မည့် အချက်များ


- စီမံကိန်း ဆိုင်ရာ ကတိကဝတ်များ၊ မူဝါဒ၊ ဥပဒေနှင့် မှုဘောင်ဆိုင်ရာ လိုအပ်ချက်များ
- စီမံကိန်းအကြောင်းအရာဖော်ပြချက်နှင့် အခြားရွေးချယ်ခြင်း
- စီမံကိန်း အနီးပတ်ဝန်းကျင်အခြေအနေဖော်ပြခြင်း  
(ရှုထောင့်ဆိုင်ရာ ၊ စီမံကိန်းဆိုင်ရာ ၊ လူမှုစီးပွားပိုင်းဆိုင်ရာ ၊ ယဉ်ကျေးမှုနှင့် အခြေခံအဆောက်အအုံဆိုင်ရာများ)
- စီမံကိန်း လုပ်ငန်းကြောင့်ထိခိုက်မှု နှင့်အန္တရာယ်ရှိမှုဆန်းစစ်ခြင်း နှင့် လျော့ချမှုမည်လမ်းများ
- ဆက်စပ်ထက်ရောက်မှုများကို အကဲဖြတ်ခြင်း
- တည်ဆောက်ချိန်၊ လည်ပတ်ချိန်နှင့် ပိတ်သိမ်းချိန်အတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်
  - ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုစနစ်
  - သင့်လျော်သော စီမံခန့်ခွဲမှုနှင့် လမ်းညွှန်ချက်
  - စောင့်ကြည့်ကြည့်ရှုခြင်း၊ အကဲဖြတ်ခြင်းနှင့် အစီရင်ခံစာ ရေးဆွဲခြင်း
  - ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုစနစ်လည်ပတ်လုပ်ငန်းအတွက်အစီအစဉ်များထုတ်ဖန်လက်ကျင့်ဆောင်ရွက်ခြင်း
  - အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးခြင်း
  - စစ်ဆေးခြင်း



### လူမှုအကျိုးတူပူးပေါင်းပါဝင်မှု (CSR) အစီအစဉ်များ



### လူမှုအကျိုးတူပူးပေါင်းပါဝင်မှု (CSR) အစီအစဉ်



> မြန်မာ့ရင်းနှီးမြှုပ်နှံမှု ကော်မတီ၏ မျှတတားသော နည်းလမ်းများအတိုင်း အမြတ်ဝင်မှု ၂% ကို (CSR) အတွက် အသုံးပြုခြင်း။

### လူမှုအကျိုးတူ ပူးပေါင်းပါဝင်မှု နှင့် ဒေသဖွံ့ဖြိုးရေးအတွက် ပါဝင်မည့် အစီအစဉ်များ

| လူမှုအကျိုးတူပူး ပါဝင်မည့် အကြောင်းအရာများ | ဆောင်ရွက် မည့်အရာများ                                                                                                  | ရည်ရွယ်ချက်                                                                                                                                                                                                   |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ကျန်းမာရေး                                 | <ul style="list-style-type: none"> <li>• အလုပ်သမားများနှင့် မိသားစုများအတွက် ကျန်းမာရေး စောင့်ရှောက်မှုများ</li> </ul> | <ul style="list-style-type: none"> <li>• လုပ်ငန်းလည်ပတ်ရာတွင် လုပ်ကိုင်သော အလုပ်သမားများနှင့် သေသံများ၊ ကျန်းမာရေးကင်းရှင်းစေရန်</li> </ul>                                                                   |
| ပညာရေး                                     | <ul style="list-style-type: none"> <li>• ပညာရေးဆောင်အောင်းနှင့် လူမှုအကျိုးတူ အသိပညာများ ပြုတ်ပေးခြင်း</li> </ul>      | <ul style="list-style-type: none"> <li>• ပိုမိုကောင်းမွန်သော လူမှုအသိပညာဖြန့်ဝေရန်</li> <li>• လူပေတိုင်း ပညာသင်ကြားနိုင်စေရန်</li> </ul>                                                                      |
| သဘာဝဘေးအန္တရာယ် ကာကွယ်ရေး                  | <ul style="list-style-type: none"> <li>• မီးဘေး၊ ရေဘေး၊ ငလျင်၊ မြေပြိုခြင်း အခြေခံအဆောက်အအုံ</li> </ul>                | <ul style="list-style-type: none"> <li>• သဘာဝဘေးအန္တရာယ်များကြောင့် ပြင်ပေါ် လာနိုင်သော ဆုံးရှုံးမှုများကို ကာကွယ်ရန် လေ့ကျင့်ရန်</li> <li>• မြန်မာ့လူမှုအသိပညာလုပ်ငန်းများကို လှည့်ဖြန့်ဖြူးစေရန်</li> </ul> |

• ကမ္ဘာ့စီမံကိန်းဦးစီးဌာနမှ လူမှုအကျိုးပြုလုပ်ငန်းများ (ကျန်းမာရေး၊ ပညာရေးနှင့် သဘာဝဘေးအန္တရာယ် ကာကွယ်ရေးများတွင် အသုံးပြုရန် ရည်ရွယ်ထားပါသည်။)



**APPENDIX O**  
**EIA Stage Public Consultation Attendance List and Presentation**  
**Slides**

**Attendance List – Government**

Alpha Best Global Limited (CMP စနစ်ဖြင့် မိနစ်ဖြင့် မိနစ်အမျိုးမျိုးတတ်လုပ်ခြင်း)၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာအတွက် အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးပွဲ တက်ရောက်လာသူစာရင်း

ဌာနဆိုင်ရာ

| စဉ် | အမည်       | လိပ်စာ     | ဖုန်းနံပါတ် | လက်မှတ် |
|-----|------------|------------|-------------|---------|
| ၁။  | ဦးကျော်စွာ | 12/12/2023 | 09420016848 |         |
| ၂။  | ဦးစံဇွဲ    | 12/12/2023 | 09264909375 |         |
| ၃။  | ဦးအိမ်စိန် | 12/12/2023 | 431706885   |         |
| ၄။  | ဦးအိမ်စိန် | 12/12/2023 | 09977725225 |         |
|     |            |            |             |         |
|     |            |            |             |         |
|     |            |            |             |         |



**Attendance List – Local People**

Alpha Best Global Limited (CMP စနစ်ဖြင့် ပီနပ်အမျိုးမျိုးထုတ်လုပ်ခြင်း)၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာအတွက်  
 အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးပွဲ တက်ရောက်လာသူစာရင်း  
 ဒေသခံပြည်သူ

| စဉ် | အမည်              | နေရပ်လိပ်စာ                             | အလုပ်အကိုင် | ဖုန်းနံပါတ် | လက်မှတ် |
|-----|-------------------|-----------------------------------------|-------------|-------------|---------|
| ၀၁  | ဦးကျော်စွမ်းနိုင် | ပိတောက်မြို့နယ် (၄)လမ်း<br>(၁၆)ဂရပ်ကွက် | ဆက်ရုံ      | ၀၉၆၈၄၃၄၀၂၃၅ | G.ကျော် |
| ၀၂  | ဦးစိန်ဝင်း        | ပိတောက်မြို့နယ် (၄)လမ်း<br>(၁၆)ဂရပ်ကွက် | ဆက်ရုံ      | ၀၉၆၈၃၅၂၅၀၆၅ | ၀၆      |
| ၀၃  | ဦးမြတ်ကျော်       | ပိတောက်မြို့နယ် (၄)လမ်း<br>(၁၆)ဂရပ်ကွက် | ဆက်ရုံ      | ၀၉၄၂၃၅၆၇၈၉  | Chen    |
| ၀၄  | ဦးကျော်စွမ်းနိုင် | ပိတောက်မြို့နယ် (၄)လမ်း<br>(၁၆)ဂရပ်ကွက် | ဆက်ရုံ      | ၀၉၆၇၈၉၀၁၂   | ကျော်   |
|     |                   |                                         |             |             |         |
|     |                   |                                         |             |             |         |
|     |                   |                                         |             |             |         |

**EIA Stage Public Consultation Meeting Presentation Slides**



**TOTAL BUSINESS SOLUTION CO., LTD.**

- ❖ ၂၀၁၂ ခုနှစ်တွင် စတင်တည်ထောင်ခဲ့ပါသည်။
- ❖ TBS မှ တာဝန်ယူဆောင်ရွက် ပေးနေသော လုပ်ငန်းများမှာ
  - ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းများ
  - တူမီအင်ဂျင်နီယာဆိုင်ရာ လုပ်ငန်းများ
  - ဆောက်လုပ်ရေးပိုင်းဆိုင်ရာ စီမံခန့်ခွဲမှု နှင့် စစ်ဆေးရေးလုပ်ငန်းများ
  - သတ္တုတူးဖော်ရေး အစီအစဉ် နှင့် သတ္တုတွင်းပိတ်သိမ်းရေး လုပ်ငန်းများ

**ကြားကာလအကြံပေးလုပ်ကိုင်ရန်အဖွဲ့အစည်းမှတပ်တင်ခြင်း**  
အထောက်အထားလက်မှတ်

**ကြားကာလအကြံပေးလုပ်ကိုင်ရန်အဖွဲ့အစည်းမှတပ်တင်ခြင်း**  
အထောက်အထားလက်မှတ်



### ဆွေးနွေးတင်ပြမည့် အကြောင်းအရာများ

- ❖ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းပြုလုပ်ခြင်း၏ ရည်ရွယ်ချက်ကိုတင်ပြခြင်း။
- ❖ စီမံကိန်းနှင့် အဓိကသက်ဆိုင်သောဥပဒေ နှစ်ဘောင်များ တင်ပြခြင်း။
- ❖ စီမံကိန်းအကြောင်းအရာကို တင်ပြခြင်း။
- ❖ ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များ လေ့လာခြင်းနှင့် ဓမ္မတရားများကို တင်ပြခြင်း။
- ❖ စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်အပေါ်အကျိုးသက်ရောက်မှုများအား အကဲဖြတ်ဆန်းစစ်ခြင်းနှင့် သက်ရောက်မှု လေ့လာချက်များ အစီအစဉ်များကို တင်ပြခြင်း။
- ❖ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်များနှင့် ပတ်ဝန်းကျင် စောင့်ကြပ်ကြည့်ရှုခြင်းအစီအစဉ်များကို တင်ပြခြင်း။
- ❖ လူမှုအကျိုးတူပူးပေါင်းပါဝင်မှု (CSR) အစီအစဉ်များကို တင်ပြခြင်း။



### ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းစီရင်ခံစာရေးဆွဲရခြင်း၏ရည်ရွယ်ချက်များ

- ❖ အဆိုပြုစီမံကိန်းကြောင့် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှုများကို ကြိုတင်သတ်မှတ်၍ ခန့်မှန်းအကဲဖြတ်နိုင်ခြင်း။
- ❖ ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ကိစ္စရပ်များအပေါ် သက်ရောက်နိုင်မည့် ဆိုးကျိုးများလျော့ချနိုင်ရန် အစီအစဉ်များ ရေးဆွဲနိုင်ခြင်း။
- ❖ စီမံကိန်းဧရိယာနှင့် စီမံကိန်းအနီးဝန်းကျင်တွင် ပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေးတိုင်းတာမှုများ ပြုလုပ်ပြီး ရရှိလာသည့် ရလဒ်များကို အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု)လမ်းညွှန်ချက်များ (၂၀၁၅) ဖြင့် နှိုင်းယှဉ်၍ လိုအပ်သော ပတ်ဝန်းကျင်ထိခိုက်မှု လေ့လာပါးရေးအစီအစဉ်များ စီမံဆောင်ရွက်နိုင်ခြင်း။
- ❖ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းများ ပြုလုပ်ပြီး အကြံပြုချက်သဘောထားများကို ရယူနိုင်ခြင်း။



### စီမံကိန်းနှင့်အဓိကသက်ဆိုင်သောဥပဒေမူဘောင်များ

- ❖ မြန်မာနိုင်ငံ အမျိုးသားပတ်ဝန်းကျင်ရေးရာ ဖူဝါဒ (၅ ရက်၊ ဇူလိုင်လ၊ ၂၀၁၉ ခုနှစ်)
- ❖ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဥပဒေ (၃၀ ရက်၊ မတ်လ၊ ၂၀၁၂ ခုနှစ်)
- ❖ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းမူဘောင်နှင့်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၄ ခုနှစ်)
- ❖ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅ ခုနှစ်)
- ❖ အမျိုးသားသဘာဝသယံဇာတ အရည်အသွေးစံချိန်စံညွှန်း (၂၀၁၉)
- ❖ အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး ထုတ်လွှတ်မှု လမ်းညွှန်ချက်များ (၂၀၁၅ ခုနှစ်)

စီမံကိန်းနှင့် အဓိကသက်ဆိုင်သော ဥပဒေမူဝါဒများ









### စိမ့်ကိန်းစက်ရုံ၏ ထုတ်ကုန်ပစ္စည်းများ











၁၇

### စွမ်းအင်ရရှိမှု

- ❖ လျှပ်စစ်ဓာတ်အား ရရှိရန် အတွက် ၃၃ ကီလိုဝိတ်လိုင်းမှ ၂,၀၀၀ ကေရီအေ အားရှိသော ထရပ်စပယ် ၁ လုံးကို ရန်ကုန်မြို့တော် လျှပ်စစ်ဓာတ်အားပေးရေး ကော်ပိုရေးရှင်း၏ စည်းမျဉ်း၊ စည်းကမ်း ဥပဒေများနှင့် အညီ တပ်ဆင်ရန် စီမံထားပါသည်။
- ❖ အပူပေးပိုလျှပ်စစ်ဓာတ်အား ပြတ်တောက်ပါက အသုံးပြုနိုင်ရန် ၆၄၀ ကေရီအေအားရှိသော ဒီဇယ်ဆီသုံးမီအက်သုံးလုံးကို အသုံးပြုသွားမည် ဖြစ်ပါသည်။
- ❖ အသုံးပြုသော ဒီဇယ်ဆီပမာဏမှာ မိုးဖွင့်ရက်များတွင် တစ်နေ့လျှင် ၁၅၄ ဂါလန်ခန့် နှင့် စနေနေ့တွင် ၉၇ ဂါလန်ခန့် အသုံးပြုပါသည်။



ထရပ်စပယ် ၁




မီအက်




မီအက်တားသည့်အခန်း

### ရေအရင်းအမြစ်၊ လိုအပ်ချက်နှင့် သုံးစွဲမှု

- ❖ စိမ့်ကိန်းအတွက် လိုအပ်သော ရေကို ၁၄၀ ပေနက်သော ရေတွင်းမှ ထုတ်ယူသုံးစွဲမည် ဖြစ်ပါသည်။
- ❖ စိမ့်ကိန်းအတွက် အသုံးပြုရန် ၁,၀၅၀ ကုမီတာ ထုထည်ရှိသော ရေလိုလှောင်ကန်ကို တည်ဆောက်မည်ဖြစ်ပြီး ရေဂါလန်ပေါင်း ၂၆,၂၀၅၃ ဂါလန်ကို သိုလှောင်နိုင်မည် ဖြစ်ပါသည်။
- ❖ ရေလိုလှောင်ကန်မှရေကို စိမ့်ကိန်းစက်ရုံ လည်ပတ်ရန်နှင့် အရေပေါ် မီးငြိမ်းသတ်ရန်အတွက် အသုံးပြုသွားမည် ဖြစ်ပါသည်။
- ❖ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ၏ ဖော်ပြချက်အရ လူတစ်ယောက်အတွက် ခန့်မှန်းရေလိုအပ်ချက်မှာ တစ်ရက်လျှင် ၀.၁၁ ကုမီတာ (၃၀ဂါလန်) ခန့်ဖြစ်ပါသည်။
- ❖ ဆို့ကြောင့် စက်ရုံဝန်ထမ်းအရေအတွက် ၃,၀၁၄ ဦးကို အခြေခံ၍ ခန့်မှန်းတွက်ချက်ထားသော ရေလိုအပ်ချက်မှာ တစ်ရက်လျှင် ၃၃၀ ကုမီတာခန့် (၉၀,၀၀၀ ဂါလန်ခန့်) ဖြစ်ပါသည်။



ရေလိုလှောင်ကန်



သောက်ရေသန့်စက်

၁၈

### စွန့်ပစ်ရေပမာဏနှင့် ရေစီးဆင်းမှုစနစ်

- ❖ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ၏ ဖော်ပြချက်အရ လူတစ်ယောက် အတွက် ခန့်မှန်းစွန့်ပစ်ရေပမာဏမှာ တစ်ရက်လျှင် ၀.၀၄ ကုမီတာ (၁၀ဂါလန်) ခန့်ဖြစ်ပါသည်။
- ❖ ဝန်ထမ်း ၃,၀၁၄ ဦးကို အခြေခံ၍ ခန့်မှန်းတွက်ချက်ထားသော စွန့်ပစ်ရေပမာဏမှာ တစ်ရက်လျှင် ၁၂၀ ကုမီတာခန့် (၃၀,၀၀၀ ဂါလန်ခန့်) ရှိမည်ပါသည်။
- ❖ စိမ့်ကိန်းစက်ရုံမှ ထွက်ရှိသော မိလ္လာများကို ၁၂ မီတာ x ၁၂ မီတာအရွယ်အစားရှိသော အဓိကမိလ္လာကန်အကြီး တစ်လုံးနှင့် ၂၂ မီတာ x ၃၂ မီတာ အရွယ်အစားရှိသော မိလ္လာကန်အသေး (၄) လုံးဖြင့် စုဆောင်း၍ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီမှ ချမှတ်ထားသော လမ်းညွှန်ချက်နှင့် နည်းလမ်းများနှင့်အညီ စွန့်ပစ်သွားမည်ဖြစ်ပါသည်။
- ❖ စိမ့်ကိန်းစက်ရုံမှထွက်ရှိသော စွန့်ပစ်ရေများကို အကျယ် ၀.၆ မီတာ နှင့် အနက် ၀.၄ မီတာရှိသော အနိမ့်စက်မြောင်းတစ်ဆင့် အကျယ် ၀.၆ မီတာ နှင့် အနက် ၀.၇ မီတာရှိသော အဓိကပင်မရေစက်မြောင်းသို့ ပို့ဆောင် စက်အပြင်ဘက်တွင်ရှိသော စက်ရုံခန့်ရှေ့တွင်မြောင်းသို့ စွန့်ပစ်သွားမည်ဖြစ်ပါသည်။




မီမက်နီ၏အဓိကမိလ္လာကန်



အဆောက်အဦဘက်ရှိ မိလ္လာကန်အသေး



မီမက်နီ၏ရေစင်းစနစ်ပြပုံ




### အစိုင်အခဲစွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု

❖ **စွန့်ပစ်အမှိုက်ပမာဏ**


IGES (၂၀၁၆) အရ လူတစ်ယောက်၏ အမှိုက်စွန့်ပစ်မှုမှာ တစ်နေ့လျှင် ၀.၄ ကီလိုဂရမ်ခန့် ရှိနိုင်ပါသည်။ စက်ဝန်ထမ်း ၃၀၁၄ ဦးကို အခြေခံ၍ ထွက်ချက်တေးသော အမှိုက်ထွက်ပစ္စည်း ပမာဏမှာ တစ်နေ့လျှင် ၁၂၀၂ ကီလိုဂရမ်ခန့် ထွက်ရှိနိုင်ပါသည်။ ထို့အပြင် မိနပ်ချပ်လုပ်ငြင်း လုပ်ငန်းစဉ်များမှလည်း ပြတ်တောက်အတိစေမှုနှင့် ကော်ပုံးအဖွဲ့များအစရှိသည့် အမှိုက်များထွက်ရှိနိုင်ပါသည်။ ယခုလက်ရှိကာလတွင် စက်ရုံလည်ပတ်ငြင်းမှ ၁ လလျှင် ၃၅၀ ကီလိုဂရမ်ခန့်ထွက်ရှိပြီး စီးပွားဖြစ်လည်ပတ်ပတ်ဝင် ၁ လလျှင် ၆၅၀ ကီလိုဂရမ်ခန့် ထွက်ရှိနိုင်ပါသည်။

❖ **အစိုင်အခဲစွန့်ပစ်မှုစနစ်**

စီမံကိန်းနေရာတွင် အမှိုက်ပုံးများ လုံးလောက်စွာထားရှိမည် ဖြစ်ပြီး အမှိုက်များကို အမှိုက်စွန့်ပစ်သည့်နေရာသို့ စနစ်တကျ ရေဆောင်ထားပြီး ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ၏ လမ်းညွှန်ချက်များ အတိုင်း စွန့်ပစ်မည်ဖြစ်သည်။



အမှိုက်ပုံးများထားရှိသည့်ပုံစံ



အမှိုက်စွန့်ပစ်သည့်နေရာပြပုံ



### မီးဘေးအန္တရာယ်ကာကွယ်ရေးအစီအစဉ်များ



မီးသတ်ဆေးပုံး



မီးသတ်ပိုက်



မီးသတ်ပိုက်

| စဉ် | အမျိုးအမည်    | လက်ရှိ အရေအတွက် |
|-----|---------------|-----------------|
| ၁   | မီးသတ်ဆေးပုံး | ၀၅၀             |
| ၂   | မီးသတ်ပိုက်   | ၃၄              |
| ၃   | မီးသတ်ပေးစနစ် | ၃၄              |







### လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေးအစီအစဉ်များ







စောတုစွယ်သိမ်းအညွှန်နေရာတွင် ထားရှိသော ဆိုင်ဘုတ်များ



အရေးပေါ်အခြေအနေ ဝန်ထမ်းများအတွက် ထားရှိသော ကျွမ်းကျင်စွမ်းရည်နှင့် ဆေးပေးစနစ်



ဘေးအန္တရာယ် သတိပေးဆိုင်ဘုတ်



ကော်အသုံးပြုရာတွင် အသုံးပြုသည့်လက်စိတ်

## ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များကို တင်ပြခြင်း







**ပထမအကြိမ် တိုင်းတာသည့် လေအရည်အသွေးရလဒ်**

| စဉ် | တိုင်းတာသည့် အရည်အသွေး             | ယူနစ် | တိုင်းတာသည့်ရလဒ် |        |        |        |        | နမူနာအမှတ် | အချိုးအစား                                                               |
|-----|------------------------------------|-------|------------------|--------|--------|--------|--------|------------|--------------------------------------------------------------------------|
|     |                                    |       | A1               | A2     | A3     | A4     | A5     |            |                                                                          |
| ၁.  | ကာဗွန်ဒိုင်အောက်ဆိုဒ် (CO2)        | ppm   | ၄၇၃.၁၁           | ၄၇၃.၅၇ | ၄၇၃.၅၉ | ၄၇၃.၅၉ | ၄၇၃.၅၉ | ၁၀,၀၀၀ ppm | Minnesota Department of Health                                           |
| ၂.  | ကာဗွန်မိုနောက်ဆိုဒ် (CO)           | ppm   | ၀.၅၅             | ၀.၅၆   | ၀.၅၅   | ၀.၅၇   | ၀.၅၆   | ၉ ppm      | National Ambient Air Quality Standard (NAAQS)                            |
| ၃.  | မီသိန်း (CH4)                      | ppm   | ၂.၁၃             | ၁.၉၈   | ၁.၈၅   | ၁.၈၅   | ၂.၁၁   | ၁,၀၀၀ ppm  | Alberta, Agriculture, Food and Development                               |
| ၄.  | မိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် (NO2) | µg/m3 | -                | -      | -      | -      | -      | ၅၀ µg/m3   | ၁-နှစ်                                                                   |
| ၅.  | အိုဇွန် (O3)                       | µg/m3 | ၁၅၅.၀            | ၁၅၅.၉  | ၁၅၅.၉  | ၁၅၅.၉  | ၁၅၆.၇  | ၂၀၀ µg/m3  | ၁-နှစ်                                                                   |
| ၆.  | လေထုထွက် အမှုန်အမွှား (PM10)       | µg/m3 | ၅၂.၈၅            | ၅၅.၁၈  | ၅၅.၁၈  | ၅၅.၁၈  | ၅၅.၁၈  | ၁၀၀ µg/m3  | အချို့သော ဖတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ဥပမာ) နှင့် နှိုင်းယှဉ်ခဲ့ပါသည်။ |
| ၇.  | လေထုထွက် အမှုန်အမွှား (PM2.5)      | µg/m3 | ၂၁.၈၅            | ၂၃.၅၇  | ၂၃.၅၇  | ၂၃.၅၇  | ၂၃.၅၇  | ၅၀ µg/m3   | ၂၄-နှစ်                                                                  |
| ၈.  | အာလယ်ဒိုင်အောက်ဆိုဒ် (SO2)         | µg/m3 | ၁၅.၂၆            | ၁၅.၂၈  | ၁၅.၂၈  | ၁၅.၂၈  | ၁၅.၂၈  | ၂၀ µg/m3   | ၂၄-နှစ်                                                                  |
| ၉.  | Volatile Organic Compound (VOC)    | ppb   | ၀.၀၀             | ၀.၀၀   | ၀.၀၀   | ၀.၀၀   | ၀.၀၀   | NG         | -                                                                        |
| ၁၀. | နိုဗိုင်ဇ                          | %     | ၇၂.၄၁            | ၇၂.၆၆  | ၇၃.၃၇  | ၇၃.၃၇  | ၇၃.၃၇  | ၆၅.၂၆      | ၇၀                                                                       |
| ၁၁. | အပူချိန်                           | °C    | ၂၉.၈၃            | ၂၉.၅၇  | ၂၉.၅၇  | ၂၉.၅၆  | ၂၉.၅၆  | ၂၅.၀၀      | ၇၀                                                                       |

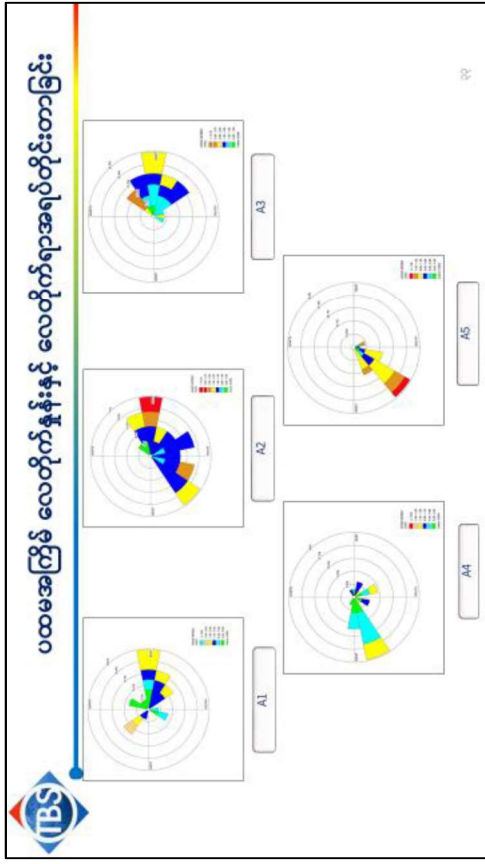
**ဒုတိယအကြိမ် တိုင်းတာသည့် လေအရည်အသွေးရလဒ်**

| စဉ် | တိုင်းတာသည့် အရည်အသွေး             | ယူနစ် | တိုင်းတာသည့်ရလဒ် |        |        |        |        | နမူနာအမှတ် | အချိုးအစား                                                               |
|-----|------------------------------------|-------|------------------|--------|--------|--------|--------|------------|--------------------------------------------------------------------------|
|     |                                    |       | A1               | A2     | A3     | A4     | A5     |            |                                                                          |
| ၁.  | ကာဗွန်ဒိုင်အောက်ဆိုဒ် (CO2)        | ppm   | ၄၇၃.၁၁           | ၄၇၃.၅၇ | ၄၇၃.၅၉ | ၄၇၃.၅၉ | ၄၇၃.၅၉ | ၁၀,၀၀၀ ppm | Minnesota Department of Health                                           |
| ၂.  | ကာဗွန်မိုနောက်ဆိုဒ် (CO)           | ppm   | ၀.၅၅             | ၀.၅၇   | ၀.၅၅   | ၀.၅၇   | ၀.၅၆   | ၉ ppm      | National Ambient Air Quality Standard (NAAQS)                            |
| ၃.  | မီသိန်း (CH4)                      | ppm   | ၂.၁၃             | ၁.၉၈   | ၁.၈၅   | ၁.၈၅   | ၂.၁၁   | ၁,၀၀၀ ppm  | Alberta, Agriculture, Food and Development                               |
| ၄.  | မိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် (NO2) | µg/m3 | -                | -      | -      | -      | -      | ၅၀ µg/m3   | ၁-နှစ်                                                                   |
| ၅.  | အိုဇွန် (O3)                       | µg/m3 | ၁၅၅.၀၀           | ၁၅၅.၉၀ | ၁၅၅.၉၀ | ၁၅၅.၉၀ | ၁၅၆.၇၀ | ၂၀၀ µg/m3  | ၁-နှစ်                                                                   |
| ၆.  | လေထုထွက် အမှုန်အမွှား (PM10)       | µg/m3 | ၅၂.၈၅            | ၅၅.၁၈  | ၅၅.၁၈  | ၅၅.၁၈  | ၅၅.၁၈  | ၁၀၀ µg/m3  | အချို့သော ဖတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ဥပမာ) နှင့် နှိုင်းယှဉ်ခဲ့ပါသည်။ |
| ၇.  | လေထုထွက် အမှုန်အမွှား (PM2.5)      | µg/m3 | ၂၁.၈၅            | ၂၃.၅၇  | ၂၃.၅၇  | ၂၃.၅၇  | ၂၃.၅၇  | ၅၀ µg/m3   | ၂၄-နှစ်                                                                  |
| ၈.  | အာလယ်ဒိုင်အောက်ဆိုဒ် (SO2)         | µg/m3 | ၁၅.၂၆            | ၁၅.၂၈  | ၁၅.၂၈  | ၁၅.၂၈  | ၁၅.၂၈  | ၂၀ µg/m3   | ၂၄-နှစ်                                                                  |
| ၉.  | Volatile Organic Compound (VOC)    | ppb   | ၀.၀၀             | ၀.၀၀   | ၀.၀၀   | ၀.၀၀   | ၀.၀၀   | NG         | -                                                                        |
| ၁၀. | နိုဗိုင်ဇ                          | %     | ၇၂.၄၁            | ၇၂.၆၆  | ၇၃.၃၇  | ၇၃.၃၇  | ၇၃.၃၇  | ၆၅.၂၆      | ၇၀                                                                       |
| ၁၁. | အပူချိန်                           | °C    | ၂၉.၈၃            | ၂၉.၅၇  | ၂၉.၅၇  | ၂၉.၅၆  | ၂၉.၅၆  | ၂၅.၀၀      | ၇၀                                                                       |

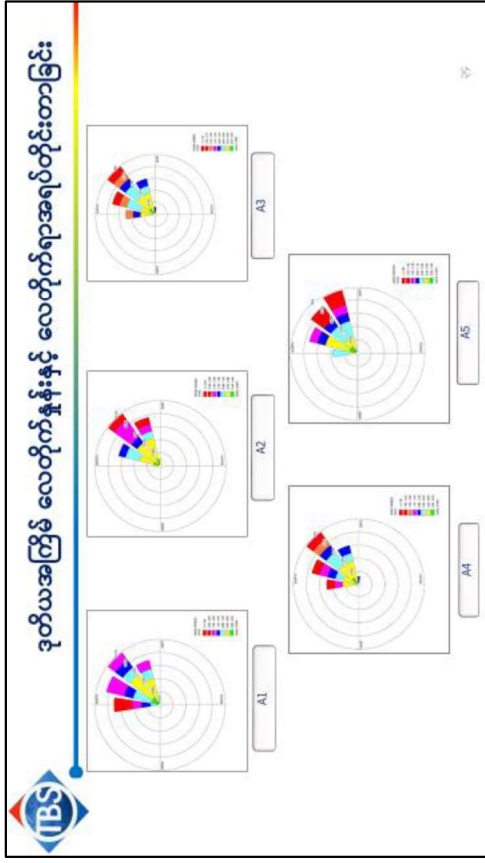
**လေတိုက်နှုန်းနှင့် လေတိုက်ရာအရပ်တိုင်းတာခြင်း**

| စဉ် | တိုင်းတာသည့် နေရာများ    | ပထမအကြိမ်တိုင်းတာသည့် ရလဒ်   |                                | ဒုတိယအကြိမ်တိုင်းတာသည့် ရလဒ် |                 |
|-----|--------------------------|------------------------------|--------------------------------|------------------------------|-----------------|
|     |                          | ပျမ်းမျှ လေတိုက်နှုန်း (m/s) | လေတိုက်ရာအရပ်                  | ပျမ်းမျှ လေတိုက်နှုန်း (m/s) | လေတိုက်ရာအရပ်   |
| ၁   | A1 - အိုဇွန်နမူနာ အတွင်း | ၁.၀၂                         | အရှေ့အရပ်                      | ၁.၁၁                         | အရှေ့မြောက်အရပ် |
| ၂   | A2 - ဝါတက်ရက်စွန်အတွင်း  | ၁.၃၀                         | အရှေ့အရပ်နှင့် အနောက်တောင်အရပ် | ၁.၀                          | အရှေ့မြောက်အရပ် |
| ၃   | A3 - ဝါတက်ရက်စွန်အတွင်း  | ၁.၆၃                         | အရှေ့အရပ်                      | ၀.၈                          | အရှေ့မြောက်အရပ် |
| ၄   | A4 - ဝါတက်ရက်စွန်အတွင်း  | ၀.၆၆                         | အနောက်တောင်အရပ်                | ၀.၉                          | အရှေ့မြောက်အရပ် |
| ၅   | A5 - လူနေစရိယာ           | ၁.၃၇                         | အနောက်တောင်အရပ်                | ၀.၈                          | အရှေ့မြောက်အရပ် |

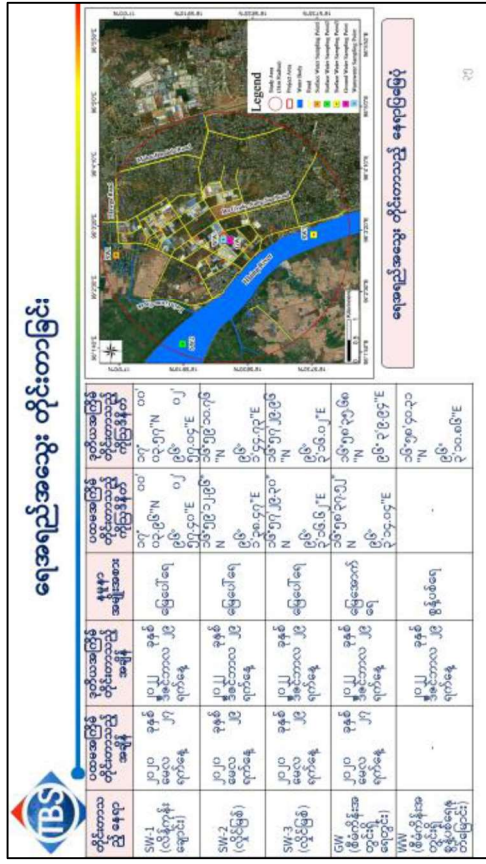




ပထမအကြိမ် လေတိုက်နှုန်းနှင့် လေတိုက်ရာအရပ်တိုင်းတာခြင်း



ဒုတိယအကြိမ် လေတိုက်နှုန်းနှင့် လေတိုက်ရာအရပ်တိုင်းတာခြင်း



ရေအရည်အသွေး တိုင်းတာခြင်း

| စဉ် | ဝါးအမည်                      | Unit    | ထိန်းသိမ်းရေးတိုင်းတာရန် ရလဒ် | နယ်စပ်ထိန်းသိမ်းရေးတိုင်းတာရန် ရလဒ် | နယ်စပ်ထိန်းသိမ်းရေးတိုင်းတာရန် ရလဒ် | နယ်စပ်ထိန်းသိမ်းရေးတိုင်းတာရန် ရလဒ် | နယ်စပ်ထိန်းသိမ်းရေးတိုင်းတာရန် ရလဒ် |
|-----|------------------------------|---------|-------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| ၁.  | Temperature                  | °C      | ၂၅                            | ၂၅                                  | ၂၅                                  | ၂၅                                  | ၂၅                                  |
| ၂.  | pH                           | -       | ၇.၂                           | ၈                                   | ၈.၂                                 | ၇.၅                                 | ၇.၅                                 |
| ၃.  | DO                           | mg/l    | ၈.၆၅                          | ၅                                   | ၅.၈၅                                | ၅.၈                                 | ၅.၈                                 |
| ၄.  | Turbidity                    | NTU/FAU | ၈၅                            | ၅၅                                  | ၅၅                                  | ၅၅                                  | ၅၅                                  |
| ၅.  | Chemical Oxygen Demand (COD) | mg/l    | ၅၆                            | ၅၅                                  | ၅၅                                  | ၅၅                                  | ၅၅                                  |
| ၆.  | BOD5                         | mg/l    | ၂၇                            | ၅၃                                  | ၅၃                                  | ၅၃                                  | ၅၃                                  |
| ၇.  | TDS                          | mg/l    | ၅၅၈                           | ၅၅၈                                 | ၅၅၈                                 | ၅၅၈                                 | ၅၅၈                                 |
| ၈.  | Total Suspended Solids (TSS) | mg/l    | ၅၅                            | ၅၅                                  | ၅၅                                  | ၅၅                                  | ၅၅                                  |
| ၉.  | Iron                         | mg/l    | ၅.၂                           | ၅.၃                                 | ၅.၃                                 | ၅.၃                                 | ၅.၃                                 |
| ၁၀. | Lead                         | mg/l    | ၈၀                            | ၈၀                                  | ၈၀                                  | ၈၀                                  | ၈၀                                  |
| ၁၁. | Free Cyanide                 | mg/l    | ၅.၀၀၃                         | ၅.၀၀၃                               | ၅.၀၀၃                               | ၅.၀၀၃                               | ၅.၀၀၃                               |
| ၁၂. | Arsenic                      | mg/l    | ၅.၀၀၅                         | ၅.၀၀၅                               | ၅.၀၀၅                               | ၅.၀၀၅                               | ၅.၀၀၅                               |
| ၁၃. | Total Phosphorous            | mg/l    | ၅.၀၀၂                         | ၅.၀၀၂                               | ၅.၀၀၂                               | ၅.၀၀၂                               | ၅.၀၀၂                               |
| ၁၄. | Total Nitrogen               | mg/l    | ၃၃                            | ၃၃                                  | ၃၃                                  | ၃၃                                  | ၃၃                                  |

မြေပေါ်ရေ ရေအရည်အသွေးတိုင်းတာခြင်းရလဒ်များ



**မြေအောက်ရေ ရေအရည်အသွေးတိုင်းတာခြင်းရလဒ်များ**

| စဉ် | တိုင်းတာသည့် ပါရာမီတာ        | Unit | 1 <sup>st</sup> Time Result_GW<br>(စိမ်းခန်းအတွင်းရှိ ရေတွင်း) | 2 <sup>nd</sup> Time Result_GW<br>(စိမ်းခန်းအတွင်းရှိ ရေတွင်း) | သောက်သုံးရန်<br>အရည်အသွေးစံပြု<br>ပြန်လှည့်ရေးဥပဒေ (၂၀၁၅) |
|-----|------------------------------|------|----------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------|
| ၁   | Temperature                  | °C   | ၂၆                                                             | ၂၆.၁                                                           | NG                                                        |
| ၂   | pH                           | -    | ၇.၂                                                            | ၇.၂                                                            | ၆.၅ - ၈.၅                                                 |
| ၃   | Dissolved Oxygen (DO)        | mg/l | ၂.၃၆                                                           | ၅.၆                                                            | NG                                                        |
| ၄   | Turbidity                    | NTU  | ၅                                                              | ၅                                                              | ၅                                                         |
| ၅   | Chemical Oxygen Demand (COD) | mg/l | ၃၀                                                             | ၃၀                                                             | NG                                                        |
| ၆   | BOD5                         | mg/l | ၁၂                                                             | ၃                                                              | NG                                                        |
| ၇   | Total Dissolved Solids (TDS) | mg/l | ၃၇၂                                                            | ၃၇၂                                                            | ၁,၀၀၀                                                     |
| ၈   | Total Suspended Solids (TSS) | mg/l | ၂                                                              | ၁၀                                                             | NG                                                        |
| ၉   | Iron                         | mg/l | <၀.၁                                                           | ၀.၄                                                            | ၁                                                         |
| ၁၀  | Lead                         | mg/l | ND                                                             | ND                                                             | ၀.၀၅                                                      |
| ၁၁  | Free Cyanide                 | mg/l | <၀.၀၁                                                          | <၀.၀၁                                                          | ၀.၀၅                                                      |
| ၁၂  | Arsenic                      | mg/l | ၀.၀၁                                                           | ၀.၀၀၅                                                          | ၀.၀၅                                                      |
| ၁၃  | Total Phosphorous            | mg/l | <၀.၀၂                                                          | ၀.၀၅                                                           | NG                                                        |
| ၁၄  | Total Nitrogen               | mg/l | ၅                                                              | ၂.၁                                                            | NG                                                        |

ND= No. Guidelines, NG= Not Detected

**စွန့်ပစ်ရေ ရေအရည်အသွေးတိုင်းတာခြင်းရလဒ်များ**

| စဉ် | တိုင်းတာသည့် ပါရာမီတာ | Unit    | WW (စိမ်းခန်းအတွင်းရှိ ရေကန်-မြင်း) | အမျိုးသမားတိုင်းကွင်းတွင်<br>(ထုတ်လွှမ်းမှု) လမ်းညွှန်ရလဒ်များ (၂၀၁၅) |
|-----|-----------------------|---------|-------------------------------------|-----------------------------------------------------------------------|
| 1.  | Temperature           | °C      | ၂၆.၈                                | NG                                                                    |
| 2.  | pH                    | -       | ၇.၈၆                                | ၆-၉                                                                   |
| 3.  | DO                    | mg/l    | ၂.၁၆                                | NG                                                                    |
| 4.  | Oil & Grease          | NTU/FAU | ၅                                   | ၅                                                                     |
| 5.  | COD                   | mg/l    | ၃၂                                  | ၂၅၀                                                                   |
| 6.  | BOD                   | mg/l    | ၁၄                                  | ၅၀                                                                    |
| 7.  | TDS                   | mg/l    | ၃၇၆                                 | NG                                                                    |
| 8.  | Iron                  | mg/l    | ၀.၆                                 | ၃၅                                                                    |
| 9.  | Lead                  | mg/l    | ND                                  | ၀.၁                                                                   |
| 10. | Free Cyanide          | mg/l    | <၀.၀၁                               | ၀.၁                                                                   |
| 11. | Arsenic               | mg/l    | ၀.၀၀၅                               | ၀.၁                                                                   |
| 12. | Total Phosphorous     | mg/l    | ၀.၃၆                                | J                                                                     |
| 13. | Total Nitrogen        | mg/l    | ၃.၄                                 | NG                                                                    |


ND= No. Guidelines, NG= Not Detected

**ဆူညံသံတိုင်းတာခြင်း**

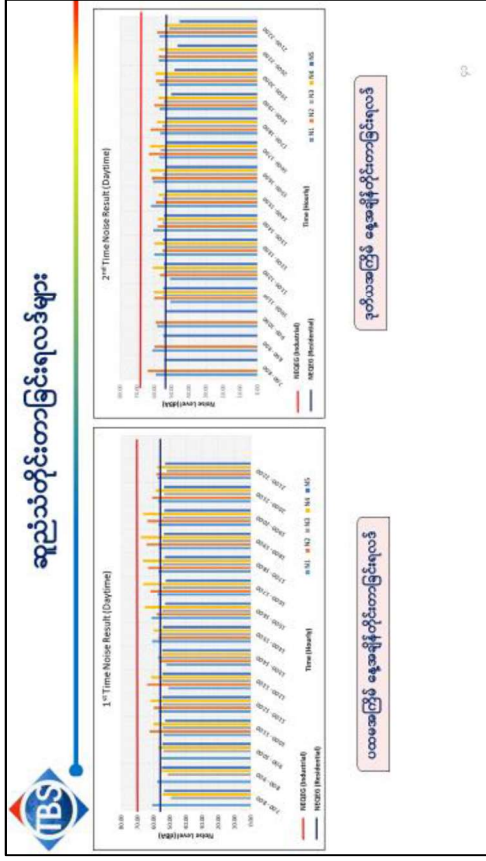
| တိုင်းတာသည့် နေရာ                          | ပထမအကြိမ်တိုင်းတာသည့်နေ့ရက်    | ဒုတိယအကြိမ်တိုင်းတာသည့်နေ့ရက်များ | တိုင်းတာသည့် ကြားနာချိန် | တိုင်းတာသည့် စက်       |
|--------------------------------------------|--------------------------------|-----------------------------------|--------------------------|------------------------|
| N1 - စိမ်းခန်းနံရံအတွင်း                   | ၂၄ - ၂၅ ရက်၊ ဧပြီလ ၂၀၂၀ ခုနှစ် | ၈ - ၉ ရက်နေ့၊ ဇွန်လ ၂၀၂၂ ခုနှစ်   | ၂၄ နာရီ                  |                        |
| N2 - ပါတာရုံရောက်ရှိ အတွင်း                | ၂၅ - ၂၆ ရက်၊ ဧပြီလ ၂၀၂၀ ခုနှစ် | ၉ - ၁၀ ရက်နေ့၊ ဇွန်လ ၂၀၂၂ ခုနှစ်  | ၂၄ နာရီ                  |                        |
| N3 - ပါတာရုံရောက်ရှိ အတွင်း                | ၂၇ - ၂၈ ရက်၊ ဧပြီလ ၂၀၂၀ ခုနှစ် | ၁၁ - ၁၂ ရက်နေ့၊ ဇွန်လ ၂၀၂၂ ခုနှစ် | ၂၄ နာရီ                  | Noise Benetech GM 1356 |
| N4 - လိပ်တူ ယာဉ်ကား<br>အနီးရှိကြေးရင်းအနီး | ၃ - ၄ ရက်၊ ဧပြီလ ၂၀၂၀ ခုနှစ်   | ၁၁ - ၁၂ ရက်နေ့၊ ဇွန်လ ၂၀၂၂ ခုနှစ် | ၂၄ နာရီ                  |                        |
| N5 - လူနေရပ်ကွက်                           | ၄ - ၅ ရက်၊ ဧပြီလ ၂၀၂၀ ခုနှစ်   | ၁၂ - ၁၃ ရက်နေ့၊ ဇွန်လ ၂၀၂၂ ခုနှစ် | ၂၄ နာရီ                  |                        |

**ဆူညံသံတိုင်းတာခြင်း**

| အမျိုးသမားတိုင်းကွင်း<br>ဆီလီကွတ် အရည်အသွေး<br>လမ်းညွှန်ရလဒ်များ<br>(၂၀၁၅) | One Hour LAeq (dBA)a | ညာဖျိ<br>(၂၅၀၀ - ၅၀၀၀)<br>(၂၅၀၀ - ၅၀၀၀)<br>အနီးရှိပတ်ဝန်းကျင် |
|----------------------------------------------------------------------------|----------------------|---------------------------------------------------------------|
| လူနေရပ်ကွက်                                                                | ၅၅                   | ၅၅                                                            |
| စက်မှုဇုန်                                                                 | ၇၀                   | ၇၀                                                            |



ဆူညံသံတိုင်းတာခြင်းလုပ်ဆောင်ပုံ



### တုန်ခါမှုတိုင်းတာခြင်း

| တိုင်းတာသည့် အမှတ်            | ပထမအကြိမ်တိုင်းတာသည့် နေ့ရက်များ   | ဒုတိယအကြိမ် တိုင်းတာသည့် နေ့ရက်များ   | တုန်ခါမှုပုံစံပေါ်မူတည် အကြောင်းအရာ |
|-------------------------------|------------------------------------|---------------------------------------|-------------------------------------|
| V1 - မိမိတို့နေရာ အတွင်း      | ၂၄ - ၂၅ ရက်နေ့၊ ဧပြီလ၊ ၂၀၂၁ ခုနှစ် | ၈ - ၉ ရက်နေ့၊ ဇူလိုင်လ၊ ၂၀၂၂ ခုနှစ်   | ခန့်သတ်လုပ်ငန်း လုပ်ငန်းများ        |
| V2 - ဝါဟင်ရက်ကန် အတွင်း       | ၂၆ - ၂၇ ရက်နေ့၊ ဧပြီလ၊ ၂၀၂၁ ခုနှစ် | ၉ - ၁၀ ရက်နေ့၊ ဇူလိုင်လ၊ ၂၀၂၂ ခုနှစ်  | ယာဉ်သွားလာမှုများ                   |
| V3 - ဝါဟင်ရက်ကန် အတွင်း       | ၂၈ - ၂၉ ရက်နေ့၊ ဧပြီလ၊ ၂၀၂၁ ခုနှစ် | ၁၀ - ၁၁ ရက်နေ့၊ ဇူလိုင်လ၊ ၂၀၂၂ ခုနှစ် | ယာဉ်သွားလာမှုများ                   |
| V4 - လိုဘဂျာသံတုန်ခါမှုအတွင်း | ၃ - ၄ ရက်နေ့၊ ဧပြီလ၊ ၂၀၂၁ ခုနှစ်   | ၁၁ - ၁၂ ရက်နေ့၊ ဇူလိုင်လ၊ ၂၀၂၂ ခုနှစ် | ယာဉ်သွားလာမှုများ                   |
| V5 - လူနေစုရိယာ               | ၄ - ၅ ရက်နေ့၊ ဧပြီလ၊ ၂၀၂၁ ခုနှစ်   | ၁၂ - ၁၃ ရက်နေ့၊ ဇူလိုင်လ၊ ၂၀၂၂ ခုနှစ် | ယာဉ်သွားလာမှုများ                   |

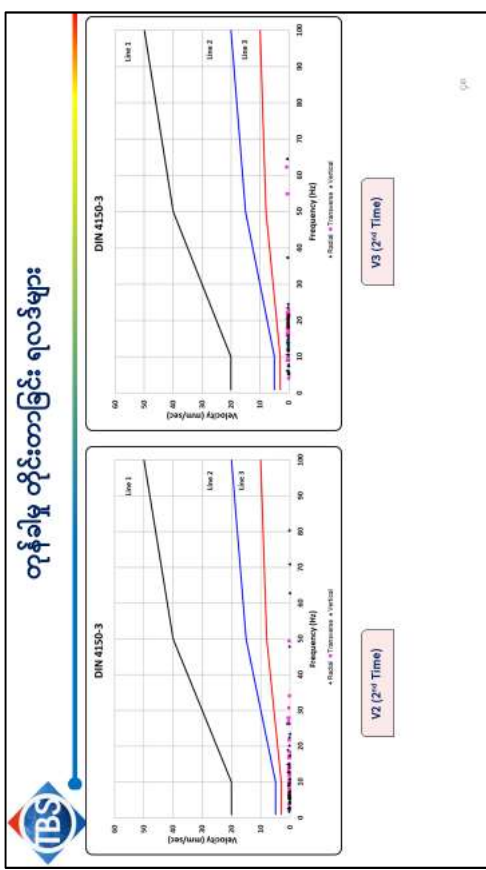
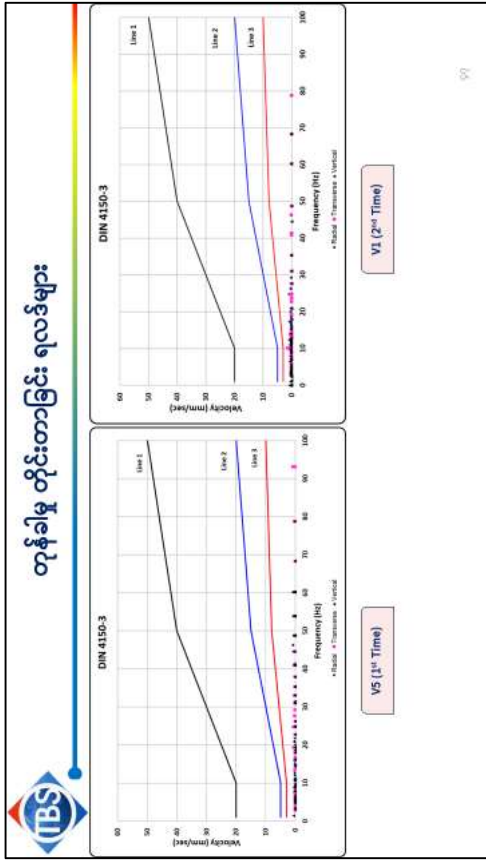
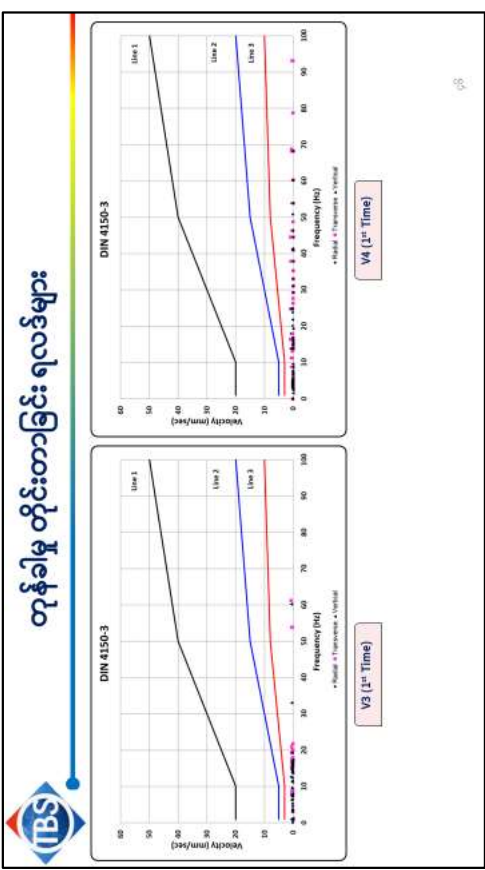
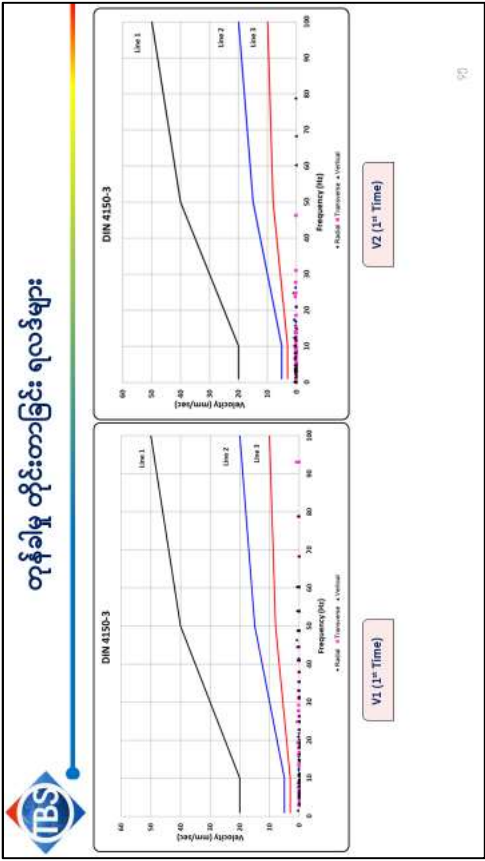
၄၃

### တုန်ခါမှု တိုင်းတာခြင်း ရလဒ်များ

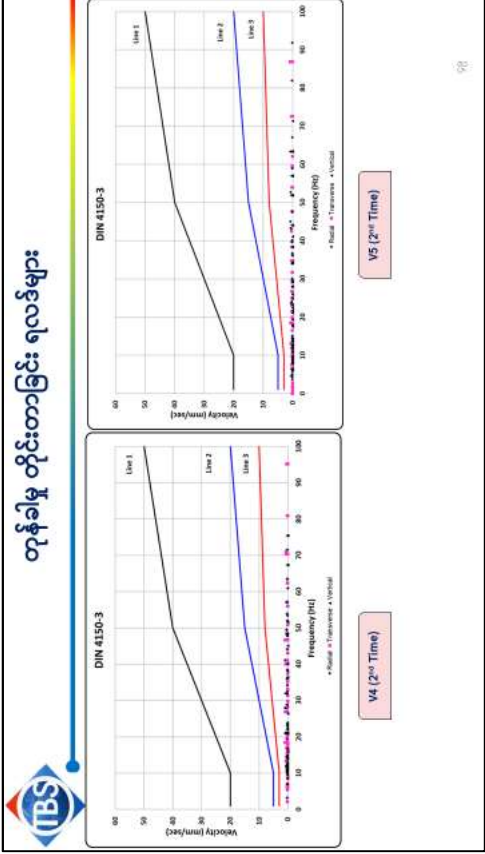
တုန်ခါမှု တိုင်းတာခြင်းလုပ်ဆောင်ပုံ

| အမျိုးအစားများ                                    | ဂျာမန်စီစဉ်မှုစံနှုန်း (DIN 4150-3) Peak particle velocity (mm/s) |          |
|---------------------------------------------------|-------------------------------------------------------------------|----------|
|                                                   | ၁-၁၀ Hz                                                           | ၁၀-၅၀ Hz |
| မီးယားအောက်တွင် စက်လုပ်ငန်းများ အဆောက်အဦ (Line 1) | ၂၀                                                                | ၅၀-၅၀    |
| လူနေထိုင်ရာ အဆောက်အဦ (Line 2)                     | ၅                                                                 | ၅-၅      |
| ထိန်းသိမ်းရေး အဆောက်အဦ (Line 3)                   | ၃                                                                 | ၃-၃      |

၄၄







### ယာဉ်သွားလာမှုအခြေအနေလေ့လာခြင်း

| စဉ် | တိုင်းတာသည့် အမှတ် | တိုင်းတာသည့် နေရာ                       | ကိုဩဒိနိတ်အမှတ်များ           | ယထာဝရတိုင်းတာသည့် ရက်       | နယ်ပယ်အကြမ်း တိုင်းတာသည့် ရက်   |
|-----|--------------------|-----------------------------------------|-------------------------------|-----------------------------|---------------------------------|
| ၁.  | TC-1               | ဝန်ဆောင်ခန်းမ (စီမံကိန်းအဖွဲ့)          | ၁၆° ၅၈' ၃၆" N<br>၉၆° ၃' ၃၅" E | ၂၀၂၁ ခုနှစ် ဧပြီလ ၂၄ ရက်နေ့ | ၂၀ ရက်နေ့၊ ဒီဇင်ဘာလ ၂၀၂၂ ခုနှစ် |
| ၂.  | TC-2               | ဝါတန်ရောင်းခန်း ဝါတန်ရောင်းခန်းကန်      | ၁၆° ၅၈' ၃၂" N<br>၉၆° ၂' ၅၅" E | ၂၀၂၁ ခုနှစ် ဧပြီလ ၂၇ ရက်နေ့ | ၂၉ ရက်နေ့၊ ဒီဇင်ဘာလ ၂၀၂၂ ခုနှစ် |
| ၃.  | TC-3               | ပိုင်တိုက်ရောင်းခန်း ဝါတန်ရောင်းခန်းကန် | ၁၆° ၅၆' ၅၃" N<br>၉၆° ၃' ၅၀" E | ၂၀၂၁ ခုနှစ် ဧပြီလ ၂၉ ရက်နေ့ | ၃၀ ရက်နေ့၊ ဒီဇင်ဘာလ ၂၀၂၂ ခုနှစ် |
| ၄.  | TC-4 (A)           | ပိုင်တိုက်ရောင်းခန်း ဝါတန်ရောင်းခန်းကန် | ၁၆° ၅၇' ၅၅" N<br>၉၆° ၃' ၅၂" E | ၂၀၂၁ ခုနှစ် ဧပြီလ ၂၆ ရက်နေ့ | ၃ ရက်နေ့၊ ဇန်နဝါရီလ ၂၀၂၃ ခုနှစ် |
| ၅.  | TC-4 (B)           | ဝါတန်ရောင်းခန်း ဝါတန်ရောင်းခန်းကန်      | ၁၆° ၅၇' ၅၅" N<br>၉၆° ၃' ၅၂" E | ၂၀၂၁ ခုနှစ် ဧပြီလ ၂၆ ရက်နေ့ | ၃ ရက်နေ့၊ ဇန်နဝါရီလ ၂၀၂၃ ခုနှစ် |
| ၆.  | TC-5 (A)           | လှော်ကားလမ်း ဝါတန်ရောင်းခန်းကန်         | ၁၇° ၀' ၂၆" N<br>၉၆° ၃' ၅၂" E  | ၂၀၂၁ ခုနှစ် ဧပြီလ ၂၇ ရက်နေ့ | ၄ ရက်နေ့၊ ဇန်နဝါရီလ ၂၀၂၃ ခုနှစ် |
| ၇.  | TC-5 (B)           | ဝါတန်ရောင်းခန်းကန် လှော်ကားလမ်း         | ၁၇° ၀' ၂၀" N<br>၉၆° ၃' ၃၅" E  | ၂၀၂၁ ခုနှစ် ဧပြီလ ၂၇ ရက်နေ့ | ၄ ရက်နေ့၊ ဇန်နဝါရီလ ၂၀၂၃ ခုနှစ် |

### ယာဉ်သွားလာမှုအခြေအနေလေ့လာခြင်းရလဒ်

- ❖ ယာဉ်သွားလာမှုများကို ရုပ်ပုံဖော်ရာတွင် လေ့လာသည့် ဧရိယာ ၃ နေရာ ကောက်ယူခဲ့ပါသည်။
- ❖ အဓိကသွားလာမှုများသာ ယာဉ်များသာ စက်ဘီး၊ သုံးဘီးဆိုင်ကယ်၊ မော်တော်ဆိုင်ကယ်၊ ကား၊ တက္ကစီကားနှင့် ကုန်တင်ကားများဖြစ်ပြီး ဂရုလီများမှာ အလွန်ကောင်းမွန်သော ယာဉ်သွားလာမှု နှင့် အသင့်အတင့်ကောင်းမွန်သော ယာဉ်သွားလာမှု အခြေအနေတွင်ရှိပါသည်။
- ❖ ရှမ်းပြည်နယ်အတွင်း ရုပ်ပုံဖော်ရာများတွင် သွားလာမှု ပိုများသည်ကို တွေ့ရှိရပါသည်။

ယာဉ်သွားလာမှုလေ့လာသည့် နေရာပြပုံ

### အလင်းတိုင်းတာခြင်း

အလင်းရောင်တိုင်းတာခြင်းပြပုံ

အပူဖိုနိုတိုင်းတာခြင်းပြပုံ

အလင်းနှင့် အပူဖိုနို တိုင်းတာသည့် နေရာပြပုံ





**အပင်မျိုးစိတ်များ**

ဆေးကုတ်ပင် အပင်မျိုးစိတ်များ

အခြားသော အပင်မျိုးစိတ်များ

**တိရစ္ဆာန် မျိုးစိတ်များ**

လိပ်ပြာ နှင့် ပုစဏ် မျိုးစိတ်များ

ငါးမျိုးစိတ်များ

**စီမံကိန်းကြောင့် ပတ်ဝန်းကျင် ထိခိုက်မှု အကျဉ်းချုပ်ဆန်းစစ်ခြင်း**

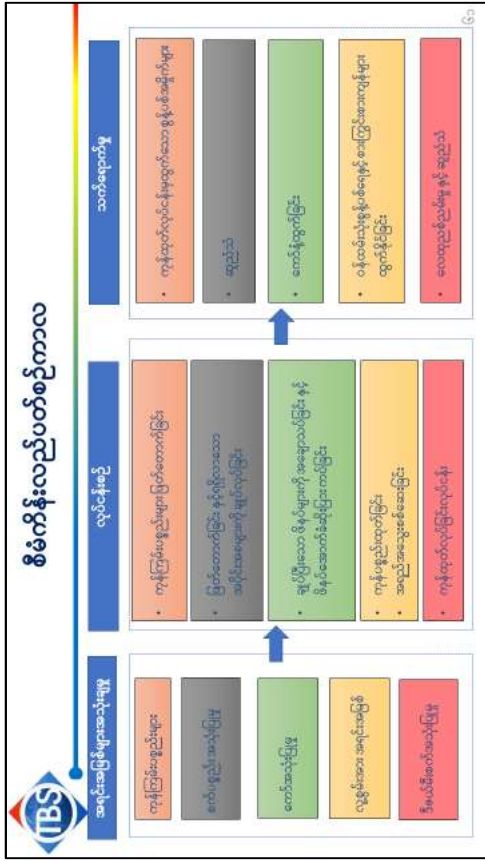
**စီမံကိန်းတည်ဆောက်စဉ်ကာလ**

အစဉ်အမြစ်များအသုံးပြုမှု

လုပ်ငန်းစဉ်

သစ်တောပျက်စီးမှု

- ဆောက်လုပ်ရေးလုပ်ငန်းစဉ်များ စတင်ပြီးနောက် နှင့် ခြေသစ် ယာယီများ
- လူမှုစွန့်ခွဲမှုများ ဖြစ်ပေါ်နိုင်ခြင်း
- အခြားသော အပင်မျိုးစိတ်များ တည်ဆောက်ခြင်း
- လုပ်ငန်းစဉ်များ
- အခြားသော အပင်မျိုးစိတ်များ တည်ဆောက်ခြင်း
- ဆောက်လုပ်ရေးလုပ်ငန်းစဉ်များ စတင်ပြီးနောက် နှင့် ခြေသစ် ယာယီများ
- လူမှုစွန့်ခွဲမှုများ ဖြစ်ပေါ်နိုင်ခြင်း
- အခြားသော အပင်မျိုးစိတ်များ တည်ဆောက်ခြင်း
- ဆောက်လုပ်ရေးလုပ်ငန်းစဉ်များ စတင်ပြီးနောက် နှင့် ခြေသစ် ယာယီများ
- လူမှုစွန့်ခွဲမှုများ ဖြစ်ပေါ်နိုင်ခြင်း
- အခြားသော အပင်မျိုးစိတ်များ တည်ဆောက်ခြင်း



| စီမံကိန်းပတ်သက်စဉ်ကာလ                                                                                                                                                                                                                                               |                                                                                                                                                                            |                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| အရင်းအမြစ်များအသုံးပြုမှု                                                                                                                                                                                                                                           | လုပ်ငန်းစဉ်                                                                                                                                                                | သက်ရောက်မှု                                                                                                                                                                                                                              |
| <p><b>ပြင်ဆင် -&gt; (စီမံကိန်းလုပ်ငန်းစဉ်အား လွှဲပြောင်းပေးခြင်း)</b></p> <p>စီမံကိန်းလုပ်ငန်းစဉ်ကာလအတွင်းတွင် အရင်းအမြစ်များ အသုံးပြုမှု ရှိနိုင်ပါသည်။</p> <p>ပြင်ဆင် -&gt; (စီမံကိန်းလုပ်ငန်းစဉ်အား ဖျက်သိမ်းခြင်းဖြင့် အခြားလုပ်ငန်းအတွက် ဖြေရှင်းပေးခြင်း)</p> | <p>လုပ်ငန်းစဉ်</p> <p>စီမံကိန်းလုပ်ငန်းစဉ်ကာလအတွင်းတွင် စီမံကိန်းလုပ်ငန်းစဉ်အား လွှဲပြောင်းပေးခြင်း ဖြစ်ပေါ်စေနိုင်ပါသည်။</p> <p>အဆောက်အအုံများ ပြုပြင်ထိန်းသိမ်းခြင်း</p> | <p>သက်ရောက်မှု</p> <p>စီမံကိန်းလုပ်ငန်းစဉ်ကာလအတွင်းတွင် စီမံကိန်းလုပ်ငန်းစဉ်အား လွှဲပြောင်းပေးခြင်း ဖြစ်ပေါ်စေနိုင်ပါသည်။</p> <p>စီမံကိန်းလုပ်ငန်းစဉ်ကာလအတွင်းတွင် စီမံကိန်းလုပ်ငန်းစဉ်အား လွှဲပြောင်းပေးခြင်း ဖြစ်ပေါ်စေနိုင်ပါသည်။</p> |
| <p><b>ပြင်ဆင် -&gt; (စီမံကိန်းလုပ်ငန်းစဉ်အား ဖျက်သိမ်းခြင်းဖြင့် အခြားလုပ်ငန်းအတွက် ဖြေရှင်းပေးခြင်း)</b></p> <p>စီမံကိန်းလုပ်ငန်းစဉ်ကာလအတွင်းတွင် စီမံကိန်းလုပ်ငန်းစဉ်အား လွှဲပြောင်းပေးခြင်း ဖြစ်ပေါ်စေနိုင်ပါသည်။</p>                                            | <p>စီမံကိန်းလုပ်ငန်းစဉ်ကာလအတွင်းတွင် စီမံကိန်းလုပ်ငန်းစဉ်အား လွှဲပြောင်းပေးခြင်း ဖြစ်ပေါ်စေနိုင်ပါသည်။</p>                                                                 | <p>ပတ်ဝန်းကျင်ဆိုင်ရာ ဆိုးရွားသောပတ်ဝန်းကျင်ပေးစွမ်းရည်များ ကျန်ရှိနေစေနိုင်ပါသည်။</p>                                                                                                                                                   |

### သက်ရောက်မှုအဆင့်သတ်မှတ်ခြင်း

| ထိခိုက်မှုအဆင့်အောက်ခြေ                                                                                                                                                                              | အဆင့်                                                                                                                                                                                                            | အဆင့်အောက်ခြေ                                                                                                                                                    | အဆင့်အောက်ခြေ                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>ပြန်လှမ်းခြင်း</b></p> <p>၁. ပြန်လှမ်းခြင်းမရှိသော</p> <p>၂. ပြန်လှမ်းခြင်းမရှိသော</p> <p>၃. ပြန်လှမ်းခြင်းမရှိသော</p> <p>၄. အထူးပြန်လှမ်းခြင်းမရှိသော</p> <p>၅. အထူးပြန်လှမ်းခြင်းမရှိသော</p> | <p><b>ပြန်လှမ်းခြင်း</b></p> <p>၁. အထူးပြန်လှမ်းခြင်းမရှိသော</p> <p>၂. အထူးပြန်လှမ်းခြင်းမရှိသော</p> <p>၃. အထူးပြန်လှမ်းခြင်းမရှိသော</p> <p>၄. အထူးပြန်လှမ်းခြင်းမရှိသော</p> <p>၅. အထူးပြန်လှမ်းခြင်းမရှိသော</p> | <p><b>အဆင့်အောက်ခြေ</b></p> <p>၁. လုပ်ငန်းစဉ်အတွင်း</p> <p>၂. စီမံကိန်းအဆင့်အောက်ခြေ</p> <p>၃. အဆင့်အောက်ခြေ</p> <p>၄. အဆင့်အောက်ခြေ</p> <p>၅. အဆင့်အောက်ခြေ</p> | <p><b>အဆင့်အောက်ခြေ</b></p> <p>၁. လုပ်ငန်းစဉ်အတွင်း</p> <p>၂. စီမံကိန်းအဆင့်အောက်ခြေ</p> <p>၃. အဆင့်အောက်ခြေ</p> <p>၄. အဆင့်အောက်ခြေ</p> <p>၅. အဆင့်အောက်ခြေ</p> |

$$\text{သိသာထင်ရှားသောထိခိုက်မှုအဆင့် (SF)} = (\text{ပမာဏ} + \text{ပုံစံပုံသဏ္ဍာန်} + \text{ကြာရှည်ခံမှု}) \times \text{ပြန်လှမ်းခြင်း}$$

### စီမံကိန်းတည်ဆောက်စဉ်နှင့် ပတ်သက်စဉ်ကာလ သက်ရောက်မှုအဆင့်သတ်မှတ်ခြင်း

| ပြန်လှမ်းခြင်း အဆင့် | သက်ရောက်မှုအဆင့် | အဆင့်အောက်ခြေ | အဆင့်အောက်ခြေ | ပမာဏ | ပုံစံပုံသဏ္ဍာန် | ကြာရှည်ခံမှု | အဆင့်အောက်ခြေ | အဆင့်အောက်ခြေ |
|----------------------|------------------|---------------|---------------|------|-----------------|--------------|---------------|---------------|
| ၁                    | ၁                | ၁             | ၁             | ၁    | ၁               | ၁            | ၁             | ၁             |
| ၂                    | ၂                | ၂             | ၂             | ၂    | ၂               | ၂            | ၂             | ၂             |
| ၃                    | ၃                | ၃             | ၃             | ၃    | ၃               | ၃            | ၃             | ၃             |
| ၄                    | ၄                | ၄             | ၄             | ၄    | ၄               | ၄            | ၄             | ၄             |
| ၅                    | ၅                | ၅             | ၅             | ၅    | ၅               | ၅            | ၅             | ၅             |







**လုပ်ငန်းခွင်တားအန္တရာယ်နှင့် ကျန်းမာရေး**

| သက်ရောက်မှုကာလ                   | သက်ရောက်မှုဖြစ်နိုင်သော အကြောင်းအရာများ                                                                                                                                                                                                        | လျော့ချပေးမည့်လမ်းများ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| တည်ဆောက်ရေးနှင့် ပြတ်သိမ်းရေးကာလ | <ul style="list-style-type: none"> <li>လည်ပတ်/ရွေ့လျားနေသော စက်ကိရိယာများ အသုံးပြုခြင်း</li> <li>ရောင်ခြင်း၊ စပတ်တိုက်ခြင်း နှင့် အငြိုးသော မော်တော်ဆော်ဘိုများ</li> <li>ဆောက်လုပ်နေစဉ် စက်ပစ္စည်းများစား ထိန်းသိမ်းမှု အားပေးခြင်း</li> </ul> | <ul style="list-style-type: none"> <li>အန္တရာယ်ရှိသောနေရာများတွင် အမှတ်အသားများ ဆိုင်းဘုတ်များ ပြသထားခြင်း။</li> <li>ကျန်းမာရေးစောင့်ရှောက်ရေးအဖွဲ့အစည်းများ ခန့်အပ်ပေးခြင်း။</li> <li>ရေခဲအိတ်များ၊ ဖိနပ်များ၊ လက်ကိုင်အိတ်များ၊ လက်ကိုင်အိတ်များ နှင့် ရေခဲအိတ်များ တွေ့ရှိရပါက အသုံးပြုခြင်း ရှောင်ကြဉ်ရန် ပြောဆိုခြင်း။</li> <li>စက်ပစ္စည်းများစားလျက် ပုံမှန်ပြုပြင် ထိန်းသိမ်းခြင်း။</li> <li>အရေးပေါ်ပုံမှန်ပုံစံများကို</li> <li>ပြင်းသားစောင့်ရှောက်ရေးအဖွဲ့အစည်း ပြုသတ်ခြင်း။</li> <li>တစ်စုံတစ်ရာလည်း အကာအရံပေးမည့်အဖွဲ့များကို လုပ်ငန်းခွင်တွင် ထားရှိခြင်း။</li> </ul> |
| လုပ်ငန်းလည်ပတ်စဉ် ကာလ            | <ul style="list-style-type: none"> <li>ရောင်ခြင်း၊ စပတ်တိုက်ခြင်း နှင့် အငြိုးသော မော်တော်ဆော်ဘိုများ</li> <li>အစားအသောက်၊ လျှစ်စေ့အန္တရာယ် နှင့် ကုန်ပစ္စည်းများ တင်-ချင်ခြင်းပေါ်သော စောက်စားများ</li> </ul>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**ဓာတ်စွန့်ထုတ်မှု**

| သက်ရောက်မှုကာလ                   | သက်ရောက်မှု ဖြစ်ပေါ်စေသည့် အကြောင်းအရာများ                                             | လျော့ချပေးမည့်အစီအစဉ်                                                                                                                                                                                                                                                                           |
|----------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| တည်ဆောက်ရေးနှင့် ပြတ်သိမ်းရေးကာလ | <ul style="list-style-type: none"> <li>တည်ဆောက်ရေးလုပ်ငန်းများ</li> </ul>              | <ul style="list-style-type: none"> <li>အပင်ပေါက်ရောက်ရာနေရာများကို အနည်းဆုံးဖြန့်ဖြူးစေကာ နှုတ်ထွက်နိုင်စေရန် သစ်ပင်များ ထပ်ပေါင်းစိုက်ပျိုးခြင်း။</li> <li>ဆီ နှင့် အန္တရာယ်ရှိသော ဖွန့်ပစ္စည်းများကို ခြေပြီး သုံးပျက် ရေစာသုံး ပိုမိုမိမိမှု ကာကွယ်ရန် စနစ်တကျ သိမ်းဆည်းထားခြင်း။</li> </ul> |
| လုပ်ငန်းလည်ပတ်စဉ် ကာလ            | <ul style="list-style-type: none"> <li>ရေညိုနှင့် အမှိုက်များ ဖွန့်ပေးခြင်း</li> </ul> | <ul style="list-style-type: none"> <li>ဓာတ်စွန့်ထုတ်မှု လျော့ချရန် သင့်လျော်သော ဖြည့်စွက်မှုများ ထားရှိခြင်း။</li> <li>စီမံကိန်းအကျိုးရှိ ခြေစနစ်ဖြင့် ကိုယ်စားပြုသော သဘာဝ အရင်းအမြစ်များကို စနစ်တကျ စီမံခန့်ခွဲပြီး ဆည်းပူးခြင်း။</li> </ul>                                                   |

**သဘာဝတားအန္တရာယ်များနှင့် မီးဘေးအန္တရာယ်**

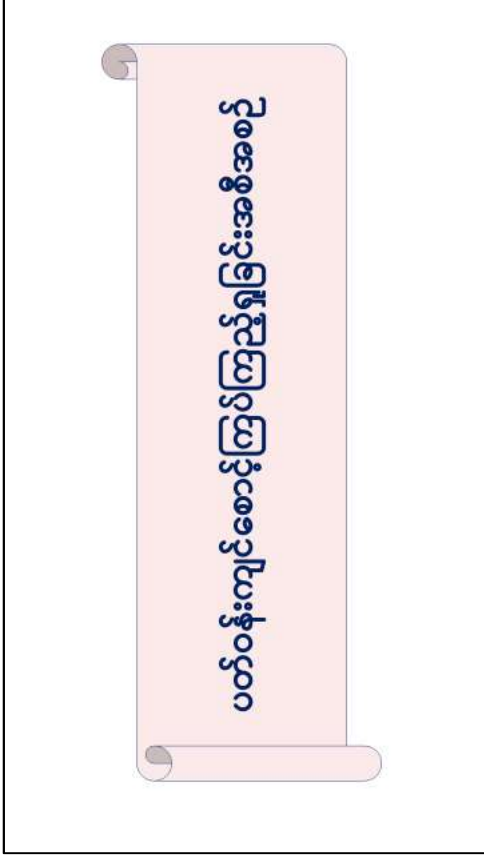
| သက်ရောက်မှုကာလ                   | သက်ရောက်မှု                                                                                                | လျော့ချပေးမည့်လမ်းများ                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| တည်ဆောက်ရေးနှင့် ပြတ်သိမ်းရေးကာလ | <ul style="list-style-type: none"> <li>ငလျင်၊ မြေကြီးရေလျှံစေ့၊ မြေဆီလျှော်မှု၊ မော်တော်ဆော်ဘို</li> </ul> | <ul style="list-style-type: none"> <li>အဆောက်အအုံများကို ငလျင်ဒဏ်ခံနိုင်သည့် နည်းဖြင့် ဆောက်လုပ်ခြင်း။</li> <li>အရေးပေါ်လမ်းအသုံးပြု၊ မီးသတ်ပစ္စည်းများ နှင့် အရေးပေါ် ဆေးဘက်ဆိုင်ရာ ကုသရေးအဖွဲ့အစည်းများ ထားရှိခြင်း။</li> <li>လုပ်ငန်းခွင်နေရာကို မြေကြီးမှုထပ် ခံနိုင်သည့်အခြေခံ ပြုပြင်ထားခြင်း။</li> <li>ရေကြောင်းများ ရေစိုစေရန် အကာအရံပေးရန် စီမံထားခြင်း။</li> </ul> |
| လုပ်ငန်းလည်ပတ်စဉ် ကာလ            |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                              |

**လူမှုစီးပွားအပေါ် ကောင်းကျိုးသက်ရောက်မှု**

- စီမံကိန်းစတင် အကောင်အထည်ဖော်ပေးသည့် တည်ဆောက်ရေး ကာလနှင့် ပြတ်သိမ်းရေး ကာလတို့တွင် ယာယီ အလုပ်အကိုင် အခွင့်အလမ်းများ ဖန်တီးပေးနိုင်မည် ဖြစ်ပြီး လုပ်ငန်းလည်ပတ်စဉ် ကာလတွင်လည်း အစဉ်အမြဲ အလုပ်အကိုင်များ ရရှိနိုင်မည် ဖြစ်ပါသည်။
- ပတ်ဝန်းကျင် ပြည့်လုံလှအထွက် ဒေသအတွင်း လူမှုစီးပွား အခြေအနေများ တိုးတက်လာ နိုင်ပါသည်။
- စီမံကိန်းလုပ်ငန်းမှ နိုင်ငံတော်သို့ ပုံမှန်အခွန်ပေးဆောင်ခြင်းဖြင့် နိုင်ငံပိုင်ငွေ တိုးတက်စေနိုင်ခြင်း။
- အရည်အချင်းရှိသော ဝန်ထမ်းများ လေ့ကျင့်ပို့ချပေးဆောင်ပေးနိုင်ခြင်း။
- လူမှုအကျိုးစီးပွား ပေးပို့ခြင်းဖြင့် (CSR) အစီအစဉ်များ ပြုလုပ်ခြင်းဖြင့် ဒေသဆိုင်ရာ လူမှုစီးပွားကျင့်အပေါ် ကောင်းကျိုးများ ရရှိစေခြင်း။



# ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုခြင်းအစီအစဉ်




| စောင့်ကြည့်ခြင်းအမျိုးအစား | စောင့်ကြည့်ကြည့်ရှုမည့်ပစ္စည်း                                                                                                                       | စောင့်ကြည့်ကြည့်ရှုမည့်အချိန်  | စောင့်ကြည့်ကြည့်ရှုမည့်နေရာ                                          | စောင့်ကြည့်ကြည့်ရှုမည့်အချိန်                                    | နမူနာယူခြင်းအမျိုးအစား |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------|------------------------|
| လေထုအညွှန်း                | PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> , CO, CO <sub>2</sub> , CH <sub>4</sub> , VOC, Temperature | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | A1 - စီမံကိန်းဧရိယာအတွင်း<br>A2 - ပတ်ဝန်းကျင်အနီးအနား<br>A3 - လူနေရာ | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E<br>၀၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | တစ်နှစ်လျှင်နှစ်ကြိမ်  |
| ရေထုအညွှန်း                | BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Temperature, DO, Turbidity, TDS, Iron, Lead, Free Cyanide, Arsenic                     | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | GW - စီမံကိန်းဧရိယာအတွင်းရှိ ရေတွင်းများ                             | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E                                   | တစ်နှစ်လျှင်နှစ်ကြိမ်  |
| ရုန်းကန်မှုအစီအစဉ်         | ရုန်းကန်မှုအစီအစဉ်                                                                                                                                   | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | စီမံကိန်းဧရိယာအတွင်းရှိ ဝယ်ယူမှုနေရာ                                 | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E                                   | လေနှင့်                |
| အညွှန်း                    | Noise level (dB (A) scale)                                                                                                                           | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | N1 and N2 - Project site                                             | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E                                   | တစ်နှစ်လျှင်နှစ်ကြိမ်  |
| တုန်ခါမှု                  | Radial, Transverse, Vertical                                                                                                                         | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | N1 and V1 - War Ta Yar Residential Area                              | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E                                   | တစ်နှစ်လျှင်နှစ်ကြိမ်  |

| စောင့်ကြည့်ခြင်းအမျိုးအစား | စောင့်ကြည့်ကြည့်ရှုမည့်ပစ္စည်း                                                                                                                       | စောင့်ကြည့်ကြည့်ရှုမည့်အချိန်  | စောင့်ကြည့်ကြည့်ရှုမည့်နေရာ              | စောင့်ကြည့်ကြည့်ရှုမည့်အချိန်  | နမူနာယူခြင်းအမျိုးအစား |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------|--------------------------------|------------------------|
| လေထုအညွှန်း                | PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> , CO, CO <sub>2</sub> , CH <sub>4</sub> , VOC, Temperature | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | စီမံကိန်းဧရိယာအတွင်း                     | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | ၂,၀၀၀,၀၀၀              |
| ရေထုအညွှန်း                | BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Temperature, DO, Turbidity, TDS, Iron, Lead, Free Cyanide, Arsenic                     | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | GW - စီမံကိန်းဧရိယာအတွင်းရှိ ရေတွင်းများ | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | ၅၀၀,၀၀၀                |
| ရုန်းကန်မှုအစီအစဉ်         | ရုန်းကန်မှုအစီအစဉ်                                                                                                                                   | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | စီမံကိန်းဧရိယာအတွင်းရှိ ဝယ်ယူမှုနေရာ     | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | ၅၀၀,၀၀၀                |
| အညွှန်း                    | Noise level (dB (A) scale)                                                                                                                           | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | N1 and N2 - Project site                 | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | ၅,၀၀၀,၀၀၀              |
| တုန်ခါမှု                  | Radial, Transverse, Vertical                                                                                                                         | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | N1 and V1 - War Ta Yar Residential Area  | ၁၆:၀၀-၁၇:၀၀ N<br>၀၆:၀၀-၁၇:၀၀ E | ၅,၀၀၀,၀၀၀              |

| စဉ် | ဖော်ပြချက်                     | နည်းလမ်း                       |
|-----|--------------------------------|--------------------------------|
| ၁   | ပတ်ဝန်းကျင်ဆိုင်ရာ လေထုအညွှန်း | ပတ်ဝန်းကျင်ဆိုင်ရာ လေထုအညွှန်း |
| ၂   | ပတ်ဝန်းကျင်ဆိုင်ရာ ရေထုအညွှန်း | ပတ်ဝန်းကျင်ဆိုင်ရာ ရေထုအညွှန်း |
| ၃   | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     |
| ၄   | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     |
| ၅   | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     |
| ၆   | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     |
| ၇   | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     |
| ၈   | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     |
| ၉   | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     | ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်း     |

# လူမှုအကျိုးတူပူးပေါင်းပါဝင်မှု (CSR) အစီအစဉ်များ




**လူမှုအကျိုးတူပူးပေါင်းပါဝင်မှု (CSR) အစီအစဉ်**

> မြန်မာ့ရင်းနှီးမြှုပ်နှံမှု ကော်မတီ၏ ဖျာဉ်စာတမ်းသော စည်းလမ်းများအတိုင်း အမြတ်ပေး ၂ % ကို (CSR) အတွက် အသုံးပြုခြင်း။

**လူမှုအကျိုးတူ ပူးပေါင်းပါဝင်မှု နှင့် ဒေသဖွံ့ဖြိုးရေးအတွက် ပါဝင်မည့် အစီအစဉ်များ**

| လူမှုအကျိုးတူပူး ပါဝင်မည့် အကြောင်းအရာများ | ဆောင်ရွက် မည့်အရာများ                                                                                                  | ရည်ရွယ်ချက်                                                                                                                                                                                                                            |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ကျွန်းမာရေး                                | <ul style="list-style-type: none"> <li>အလုပ်သမားများနှင့် မိသားစုများအတွက် ကျန်းမာရေး စောင့်ရှောက်မှုများ</li> </ul>   | <ul style="list-style-type: none"> <li>လုပ်ငန်းလည်ပတ်ရာတွင် လုပ်ကိုင်သော အလုပ်သမားများနှင့် မိသားစုများ ကျန်းမာရေးကောင်းမွန်စွာ ရေပိုင်နိုင်ရန်</li> </ul>                                                                             |
| ပညာရေး                                     | <ul style="list-style-type: none"> <li>ပညာရေးအဆင့်အတန်းနှင့် လူ့အဖွဲ့အစည်းတို့ အသိပညာများ မြှင့်တင်ပေးခြင်း</li> </ul> | <ul style="list-style-type: none"> <li>ပိုမိုကောင်းမွန်သော လူမှုအသိုက်အဝိုင်း ပြန်လှူရန်</li> <li>ကျောင်းနေအရွယ်ကလေးများ ပညာသင်ကြားနိုင်ရေး</li> </ul>                                                                                 |
| သဘာဝဘေးအန္တရာယ် ကာကွယ်ရေး                  | <ul style="list-style-type: none"> <li>မီဆေး ရောဂါအား ငလျင် ဖြေဖြိုခြင်း အစရှိသည်</li> </ul>                           | <ul style="list-style-type: none"> <li>သဘာဝဘေးအန္တရာယ်များကြားမှ မြန်မာ့ လူမျိုးစုများကို ကာကွယ်နိုင်သော နည်းလမ်းများကို ကာကွယ်နိုင်ရန် လေ့လာရေး</li> <li>မြန်မာ့လူ့စောင့်ရှောက်ရေးလုပ်ငန်းများကို လှူဒါန်းစွာ ဆောင်ရွက်ရန်</li> </ul> |

❖ ကုမ္ပဏီအမြတ်ပေးမှု၊ ရင်းနှီးမြှုပ်နှံမှုကို လူမှုအကျိုးပြုလုပ်ငန်းများ၊ ကျန်းမာရေး ပညာရေးနှင့် သဘာဝဘေးအန္တရာယ် ကာကွယ်ရေးများတွင် အသုံးပြုရန် ရည်ရွယ်ထားပါသည်။



# ကျေးဇူးတင်ပါသည်။

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