



TOTAL BUSINESS SOLUTION CO., LTD.

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

Thingangyun Township, Yangon, Myanmar

**ESUNG MYANMAR COMPANY LIMITED.**

**ENVIRONMENTAL MANAGEMENT PLAN**

**FOR**

**PROTECTED COVER AND ACCESSORIES FOR  
VEHICLES PROJECT**

**FINAL**

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## ကတိကဝတ်များ

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
၁။	မူဝါဒ၊ ဥပဒေနှင့် အဖွဲ့အစည်းဆိုင်ရာ မူဘောင်များ	သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊ ညစ်ညမ်းမှုထိန်းချုပ်ခြင်းနှင့် ကျန်းမာရေးဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊ ဇီဝမျိုးစုံမျိုးကွဲများနှင့် သဘာဝအရင်းအမြစ် ထိန်းသိမ်းရေးဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊ မြို့ပြဖွံ့ဖြိုးတိုးတက်မှုနှင့် စီမံခန့်ခွဲမှုဆိုင်ရာ ဥပဒေ နှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊ လူ့အခွင့်အရေးဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊ အလုပ်သမားဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊ နိုင်ငံခြားဆိုင်ရာ ဥပဒေနှင့် ဆက်စပ်သည့် ဥပဒေ/နည်းဥပဒေများ၊ စီမံကိန်းနှင့် ဆက်စပ်သည့် အခြားဥပဒေ/ နည်းဥပဒေများ စသဖြင့် လိုက်နာဆောင်ရွက်သွားပါမည့် မူဝါဒ၊ ဥပဒေနှင့် အဖွဲ့အစည်းဆိုင်ရာမူဘောင်များကို ကတိကဝတ်ပြုဖော်ပြထားပါသည်။	အခန်း (၂)
၂။	စီမံကိန်းအကြောင်းအရာဖော်ပြချက်	စီမံကိန်းနှင့် သက်ဆိုင်သောအချက်အလက်များကို တိကျသေချာမှန်ကန်စွာ ပြုစုရေးသားထားကြောင်း ကတိကဝတ်ပြုဖော်ပြထားပါသည်။ လေ့လာရရှိသည့်အချက်အလက်များကို အခြေခံ၍ နည်းပညာဆိုင်ရာ မြေပုံများ၊ အဆောက်အအုံဒီဇိုင်းပြ မြေပုံများ တိကျသေချာမှန်ကန်စွာ ပြုစုရေးသားထားကြောင်း ကတိကဝတ်ပြုဖော်ပြထားပါသည်။	အခန်း(၃)
၃။	ပတ်ဝန်းကျင် အရည်အသွေး တိုင်းတာမှု	အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် (၂၀၁၅) နှင့် နိုင်ငံတကာ ပတ်ဝန်းကျင်ဆိုင်ရာ စံသတ်မှတ်ချက်များနှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုဆိုင်ရာ လမ်းညွှန်ချက်များကို အခြေခံ၍လေ့လာ တိုင်းတာထားကြောင်း ကတိကဝတ်ပြုဖော်ပြထားပါသည်။	အခန်း (၄)
၃.၁။	လေအရည်အသွေး	အစီရင်ခံစာတွင် လေအရည်အသွေးအား အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် (၂၀၁၅)အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက်အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြထားပါသည်။	အခန်း (၄)၊ စာပိုဒ်ခွဲ (၄.၆.၁)

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၃.၂။	ရေအရည်အသွေး	အစီရင်ခံစာတွင် ရေအရည်အသွေးအား နမူနာကောက်ယူပြီး တိုင်းတာရရှိလာသော ရလဒ်တို့ကို အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် (၂၀၁၅)အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက်အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြထားပါသည်။	အခန်း (၄)၊ စာပိုဒ်ခွဲ (၄.၆.၃)
၃.၃။	ဆူညံသံ	အစီရင်ခံစာတွင် အသံဆူညံမှုအား အမျိုးသားပတ်ဝန်းကျင် ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် (၂၀၁၅)အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက်အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြထားပါသည်။	အခန်း (၄)၊ စာပိုဒ်ခွဲ (၄.၆.၄)
၃.၄။	တုန်ခါမှု	အစီရင်ခံစာတွင် တုန်ခါမှုအား Nomis Seismograph (Mini Super graph II)ဖြင့်တိုင်းတာ၍ ရရှိလာသော ရလဒ်တို့ကို German Standard D-4150-3 အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက်အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြထားပါသည်။	အခန်း (၄)၊ စာပိုဒ်ခွဲ (၄.၆.၅)
၃.၅။	အလင်းနှင့် အပူချိန်	အစီရင်ခံစာတွင် အလင်းနှင့် အပူချိန်အား တိုင်းတာပြီး ရရှိလာသောရလဒ်တို့ကို International Finance Corporation (Environmental Health and Safety Guideline) General အတိုင်း လေ့လာ၍ ၎င်းလမ်းညွှန်ချက်အတိုင်း လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြထားပါသည်။	အခန်း (၄)၊ စာပိုဒ်ခွဲ (၄.၆.၆) နှင့် (၄.၆.၇)
၃.၆။	ယာဉ်ကြောအခြေအနေလေ့လာမှု	အစီရင်ခံစာတွင် ယာဉ်ကြောအခြေအနေလေ့လာမှုကို IRC 106:1990 အရ လေ့လာဆောင်ရွက် တွက်ချက်၍ တိကျသေချာမှန်ကန်စွာ ပြုစုရေးသားထားကြောင်း ကတိကဝတ်ပြုဖော်ပြထားပါသည်။	အခန်း (၄)၊ စာပိုဒ်ခွဲ (၄.၆.၈)
၄။	ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်	ESung Myanmar Company Limited ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ပတ်ဝန်းကျင် အရည်အသွေး များ ထိခိုက်မှုမရှိစေရန် လျော့ချခြင်း၊ စောင့်ကြပ်ကြည့်ရှုခြင်းများတွင် တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့အစည်း ပုဂ္ဂိုလ်များ၊ တာဝန်ဝတ္တရားများ၊ အရေးပေါ်တုံ့ပြန်ရေး အစီအစဉ် များနှင့် ရန်ပုံငွေလျာ ထားချက်များကိုလည်း ပြည့်စုံစွာ ပြုစုရေးသားထားကြောင်း ကတိကဝတ်ပြု ဖော်ပြထား ပါသည်။	အခန်း (၇)
တည်ဆောက်စဉ်နှင့် ပိတ်သိမ်းစဉ်ကာလ			

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
	ပတ်ဝန်းကျင် အရည်အသွေး	စီမံကိန်းလုပ်ငန်း လုပ်ကိုင်ဆောင်ရွက်လျက်ရှိသည့် မြေနေရာနှင့် စက်ရုံအဆောက်အအုံများကို ပုဂ္ဂလိကပိုင်ရှင်ထံမှ ငါးနှစ်စာချုပ်ဖြင့် ငှားရမ်းထားပါသည်။ သို့ဖြစ်ပါ၍ စက်ရုံအဆောက်အအုံများ တည်ဆောက်စဉ်နှင့် ပတ်သိမ်းစဉ်ကာလ ဆိုင်ရာ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်များမှာ စီမံကိန်းအဆိုပြုသူ ESung မြန်မာ ကုမ္ပဏီလီမိတက်နှင့် တိုက်ရိုက်သက်ဆိုင်ခြင်းမရှိနိုင်သော်လည်း ၎င်းကာလအတွင်း ဖြစ်နိုင်ခြေရှိသော ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်နိုင်မှုများ နှင့် လျော့ချရေးဆိုင်ရာနည်းလမ်းများကို သက်ဆိုင်ရာ အခန်းများတွင် ထည့်သွင်းဖော်ပြထားပါသည်။	အခန်း (၅)၊ ဇယား (၅-၃) နှင့် အခန်း (၇)၊ ဇယား (၇-၁) နှင့် (၇-၂)
လည်ပတ်စဉ်ကာလ			
၅	လေထုညစ်ညမ်းမှုနှင့် ဖုန်မှုန့်များ	လေဝင်လေထွက်ကောင်းမွန်စေရန် အိပ်ဇောဖန်များ လုံလောက်အောင် တပ်ဆင်ခြင်း။ လုပ်ငန်းခွင်သန့်ရှင်းရေးအတွက် လုံလောက်သော ဖုန်စုပ်စက်များ အသုံးပြုခြင်း။ အသုံးမပြုသော စက်ပစ္စည်းများကို ရပ်ထားခြင်း။ မီးစက်ထားရှိသောနေရာတွင် လေဝင်လေထွက်ကောင်းမွန်စေရန်စီစဉ်ထားရှိခြင်း။ စက်ပစ္စည်းများကို ပုံမှန်ပြုပြင် ထိန်းသိမ်းခြင်း။ အလုပ်သမားများအတွက် နှာခေါင်းစည်းစသော တစ်ကိုယ်ရည်ကာကွယ်သုံးပစ္စည်း ထောက်ပံ့ပေးထားခြင်း တို့ကိုဆောင်ရွက်သွားပါမည်။	အခန်း (၇)၊ ဇယား (၇-၁) နှင့် (၇-၂)
	စွန့်ပစ်အစိုင်အခဲ	အမှိုက်များကို အမျိုးအစားအလိုက် ခွဲခြား၍ သက်ဆိုင်ရာအမှိုက်ပုံးများအတွင်းသို့စွန့်ပစ်ခြင်း။ ပတ်ဝန်းကျင်ညစ်ညမ်းမှု လျော့ချရေးအတွက် အမှိုက်များကို စနစ်တကျစွန့်ပစ်ရန် လှုံ့ဆော်မှုများလုပ်ပေးခြင်း၊ အသိပညာပေးအစီအစဉ်များ ကျင်းပပေးခြင်း။ အန္တရာယ်ရှိသော အမှိုက်များနှင့် အန္တရာယ်မရှိသော စွန့်ပစ်အမှိုက်များကို ခွဲခြားသတ်မှတ်ပြီး သတ်မှတ်ထား သော အမှိုက်ပုံးများတွင် စနစ်တကျ စွန့်ပစ်ခြင်း တို့ကိုဆောင်ရွက်သွားပါမည်။	အခန်း (၇)၊ ဇယား (၇-၁) နှင့် (၇-၂)



စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
	စွန့်ပစ်ရေ	မလိုအပ်ဘဲ ရေဆိုးထွက်ရှိမှု မဖြစ်စေအောင် ရှောင်ကြဉ်ခြင်း။ မိလ္လာပိုက်လိုင်း၊ မြေပေါ်ရေစီးဆင်းရေနှင့် သန့်စင်ပြီးသော ရေဆိုးများအတွက် ရေနုတ်မြောင်းနှင့် ပိုက်လိုင်းစနစ်ကို သီးခြားခွဲထားခြင်း။ မိလ္လာရေယိုစိမ့်ခြင်းကို ရှောင်ရှားရန်မိလ္လာကန်ကိုပုံမှန်စစ်ဆေးခြင်း တို့ကိုဆောင်ရွက်သွားပါမည်။	အခန်း (၇)၊ ဇယား (၇-၁) နှင့် (၇-၂)
	ဆူညံသံထွက်ရှိမှု	ဆူညံသံလျော့နည်းသော စက်ကိရိယာများကို ရွေးချယ် အသုံးပြုခြင်း။ ကုန်ထုတ်လုပ်ငန်းအတွက်အသုံးပြုသော စက်ပစ္စည်းများကို ချောဆီထိုး ပေးခြင်း နှင့် ပုံမှန်ပြုပြင် ထိန်းသိမ်းခြင်း လုပ်ငန်းများဆောင်ရွက်ခြင်း။ ဆူညံသံထွက်ရှိမှုများသော နေရာများတွင် အသံတားလွှာများတပ်ဆင်အသုံးပြုခြင်း။ အလုပ်သမားများအား လုံလောက်သော နားအကာကွယ်ပစ္စည်းများ ထောက်ပံ့ပေးခြင်း တို့ကိုဆောင်ရွက် သွားပါမည်။	အခန်း (၇)၊ ဇယား (၇-၁) နှင့် (၇-၂)
	မြေထုအရည်အသွေး	မြေဆီလွှာညစ်ညမ်းမှုကို ရှောင်ရှားရန်အတွက် ရေနုတ်မြောင်းစနစ်နှင့် အဆောက်အဦ ဒီဇိုင်းကို စနစ်တကျ ဆွဲခြင်း ကိုဆောင်ရွက်သွားပါမည်။	အခန်း (၇)၊ ဇယား (၇-၁) နှင့် (၇-၂)
	လုပ်ငန်းခွင်လုံခြုံမှုနှင့် ကျန်းမာရေး	စက်ရုံတွင်အရေးပေါ်ကယ်ဆယ်ရေးအဖွဲ့ကိုဖွဲ့စည်းပြီး မီးဘေးကာကွယ်ရေး၊ မီးဘေးသုံးကိရိယာများ၊ ရှေးဦးသူနာပြုစုနည်းနှင့် အရေးပေါ်ဆေးဘက်ဆိုင်ရာ ကယ်ဆယ်ရေးသင်တန်းများ သင်ကြားပို့ချ ထားပေးခြင်း။ ဝန်ထမ်းများကို မီးသတ်ဦးစီးဌာနတွင် အခြေခံ မီးငြိမ်းသတ်နည်း သင်တန်းများတက်စေခြင်း။ အရေးပေါ်အခြေအနေအတွက် ကြိုတင်ကာကွယ်ရန် အစီအစဉ်ရေးဆွဲထားခြင်း။ လိုအပ်သော တစ်ကိုယ်ရေကာကွယ်ပစ္စည်းများ၊ မီးငြိမ်းသတ်ရာတွင်လိုအပ်သော ပစ္စည်းများနှင့် မိုးကြိုးလွှဲစနစ်များ တပ်ဆင်ထားခြင်း။ အရေးပေါ်အခြေအနေတွင် ဆက်သွယ်ရမည့် လိပ်စာများ၊ ဌာနဆိုင်ရာများ၊ မြေပုံများ သတိပေး ဆိုင်းဘုတ်များ ပြုလုပ်ပြီး တပ်ဆင်ထားပေးခြင်း။	အခန်း (၇)၊ ဇယား (၇-၁) နှင့် (၇-၂)

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
		<p>လုပ်ငန်းခွင်အတွင်း အန္တရာယ်ကင်းရှင်းစွာ အလုပ်လုပ် နိုင်ရန် အလုပ်သမားများကို သင်ကြားပေးခြင်း။</p> <p>စီမံကိန်းတည်ရှိရာ နေရာသည် မုတ်သုန်ရာသီအတွင်း ရေကြီးမှုကို ကာကွယ်ရန် လုံလောက်သော အမြင့်တွင် တည်ဆောက်ထားခြင်း။</p> <p>ရေကြီးမှုအခြေအနေကို ကာကွယ်ရန်သင့်တော်သော ရေနုတ်မြောင်း စနစ်ကိုစီမံထားခြင်း။</p> <p>အရေးပေါ်ကယ်ဆယ်ရေး အဖွဲ့သည်ရေလွှမ်းမိုးမှုကဲ့သို့သော သဘာဝဘေးများ နှင့် အရေးပေါ် အခြေအနေ ဖြစ်ပေါ်လာချိန်တွင်ကယ်ဆယ် နိုင်ရန် လေ့ကျင့်ထားခြင်း။</p> <p>လုပ်ငန်းခွင်များတွင် ဘေးကင်းစွာလုပ်ကိုင်နိုင်စေရန် ဖန်တီး ပေးခြင်း။</p> <p>အလုပ်သမားများကို လုပ်ငန်းတွင် ကျွမ်းကျင်စွာ လုပ်ကိုင်နိုင်ရန်၊ ဘေးကင်းရန် နှင့် အလုပ်ခွင်တွင်း ကောင်းစွာစီမံခန့်ခွဲနိုင်ရန် လေ့ကျင့်သင်ကြားပေးခြင်း။</p> <p>အလုပ်ခွင်တွင်မတော်တဆမှုများ မဖြစ်စေရန် ကြိုတင် ကာကွယ်တားဆီး ကာကွယ်ခြင်း။</p> <p>အလုပ်သမားများကို အန္တရာယ်ရှိပစ္စည်းများကိုင်တွယ်ရာတွင် ဘေးကင်းစေရန် မျက်လုံး ကာမျက်မှန်များ ထောက်ပံ့ပေးခြင်း၊ ဓာတ်ငွေ့အရည်စိမ့်မဝင်နိုင်သော လက်အိတ်များ ထောက်ပံ့ထားရှိခြင်း။</p> <p>ရှေးဦးသူနာပြုသင်တန်း နှင့် ကျန်းမာရေးအသိပညာများ သိရှိစေရန်အတွက် အလုပ်သမားများကို သင်ကြား ပေးခြင်း။</p> <p>လုပ်ငန်းခွင်တွင် ဆေးပစ္စည်းနှင့် ဆေးသေတ္တာများ ထောက်ပံ့ပေးထားခြင်း။</p> <p>လုပ်ငန်းခွင်ဧရိယာကို ကျန်းမာရေးနှင့် ညီညွတ်စေရန် စံသတ်မှတ်ချက်များအတိုင်း သန့်ရှင်းစွာ ထားရှိပေးခြင်း။</p> <p>ကျန်မာရေးမကောင်းသူများ၊ ကူးစက်ရောဂါရှိနေသူများကို လုပ်ငန်းခွင်တွင် အလုပ်ပေးမလုပ်စေခြင်း။</p> <p>စက်ရုံတွင် ကျွမ်းကျင်လက်မှတ်ရ သူနာပြုဦးစီး ဆောင်ရွက်သော ဆေးခန်းထားရှိခြင်း။</p> <p>ဝန်ထမ်းများကို ကျန်းမာရေး စစ်ဆေးပေးခြင်းများကို ပုံမှန်ပြုလုပ်ပေးခြင်း။</p> <p>ထိခိုက်မှုဖြစ်စဉ်များကို မှတ်တမ်း မှတ်ရာထားရှိခြင်း တို့ကိုဆောင်ရွက်သွားပါမည်။</p>	

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
၆	စက်ရုံတွင်းစီမံခန့်ခွဲမှု အစီအစဉ်	စွန့်ပစ်ရေ စီမံခန့်ခွဲမှုအစီအစဉ်၊ လေထုအရည်အသွေး ညစ်ညမ်းမှုလျော့ချရေး စီမံခန့်ခွဲမှုအစီအစဉ်၊ စွန့်ပစ်အစိုင်အခဲ စီမံခန့်ခွဲမှုအစီအစဉ်၊ မီးဘေးအန္တရာယ် စီမံခန့်ခွဲမှုအစီအစဉ်၊ စက်ရုံတွင်း ဆေးပေးခန်းထားရှိမှု အစီအစဉ်၊ ကောင်းမွန်သောလုပ်ငန်းခွင် အလေ့အကျင့်နှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး အလေ့အကျင့်များ စီစဉ်ထားခြင်း၊ အရေးပေါ်တုံ့ပြန်မှုအစီအစဉ်ထားရှိခြင်း တို့ကိုဆောင်ရွက်သွားပါမည်။	အခန်း (၇)၊ စာပိုဒ် (၇.၆)
၆.၁	စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်	ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ်အသေးစိတ်ကို ဖော်ပြထား ပါသည်။	အခန်း (၇)၊ စာပိုဒ် (၇.၅)
၆.၂	စောင့်ကြပ်ကြည့်ရှုမည့်အဖွဲ့	စောင့်ကြပ်ကြည့်ရှုမည့်အဖွဲ့တွင် ပါဝင်သည့် လူပုဂ္ဂိုလ်တို့၏ ရာထူး၊ တာဝန်ယူမှု နှင့် အဖွဲ့ဝင် အရေအတွက်ကို ပြည့်စုံစွာဖော်ပြထားပါသည်။	အခန်း (၇)၊ စာပိုဒ် (၇.၉)
၆.၃	လေအရည်အသွေး	စောင့်ကြပ်ကြည့်ရှုမည့်ပါရာမီတာ- CO2, CO CH4, NO2, O3, PM10, PM2.5, SO2, VOCs လိုက်နာမည့်လမ်းညွှန်ချက်- NEQG တိုင်းတာမည့်ကြိမ်နှုန်း - တစ်နှစ်နှစ်ကြိမ် သို့မဟုတ် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ညွှန်ကြားချက်နှင့်အညီ	အခန်း (၇)၊ ဇယား (၇-၃) နှင့် (၇-၄)
၆.၄	ဆူညံသံ	စောင့်ကြပ်ကြည့်ရှုမည့်ပါရာမီတာ- Noise level (dB(A) scale) လိုက်နာမည့်လမ်းညွှန်ချက်- NEQG စောင့်ကြပ်ကြည့်ရှုမည့်နေရာ - လုပ်ငန်းခွင်ဧရိယာနှင့် မီးစက်အနီး စောင့်ကြပ်ကြည့်ရှုမည့်ကြိမ်နှုန်း- တစ်နှစ်နှစ်ကြိမ် သို့မဟုတ် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာန၏ ညွှန်ကြားချက်နှင့်အညီ	အခန်း (၇)၊ ဇယား (၇-၃) နှင့် (၇-၄)

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
၆.၅	တုန်ခါမှု	စောင့်ကြပ်ကြည့်ရှုမည့်ပါရာမီတာ- Radial, Transverse, Vertical လိုက်နာမည့်လမ်းညွှန်ချက်- NEQG စောင့်ကြပ်ကြည့်ရှုမည့်နေရာ - လုပ်ငန်းခွင်ဧရိယာနှင့် မီးစက်အနီး စောင့်ကြပ်ကြည့်ရှုမည့်ကြိမ်နှုန်း- တစ်နှစ်နှစ်ကြိမ် သို့မဟုတ် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာန၏ ညွှန်ကြားချက်နှင့်အညီ	အခန်း (၇)၊ ဇယား (၇-၃) နှင့် (၇-၄)
၆.၆	စွန့်ပစ်ရေ	စောင့်ကြပ်ကြည့်ရှုမည့်ပါရာမီတာ- မသန့်စင်မီနှင့် သန့်စင်ပြီး စွန့်ပစ်ရေများ၏အရည်အသွေး၊ ချဉ်ဖန်ကိန်း၊ အပူချိန်၊ ပျော်ဝင်အစိုင်အခဲစုစုပေါင်း၊ ဆိုင်းငံ့အစိုင်အခဲများ နှင့် ဇီဝဖြစ်စဉ်များအတွက် အောက်စီဂျင် လိုအပ်ချက်။ လိုက်နာမည့်လမ်းညွှန်ချက်- NEQG စောင့်ကြပ်ကြည့်ရှုမည့်နေရာ - စက်ရုံ၏စားသောက်ခန်းနှင့်လက်ဆေးဘေစင်မှထွက်သောရေများစွန့်ပစ်ရာနေရာ စောင့်ကြပ်ကြည့်ရှုမည့်ကြိမ်နှုန်း- တစ်နှစ်နှစ်ကြိမ် သို့မဟုတ် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာန၏ ညွှန်ကြားချက်နှင့်အညီ	အခန်း (၇)၊ ဇယား (၇-၃) နှင့် (၇-၄)
၆.၇	စွန့်ပစ်အမှိုက်(အစိုင်အခဲ)	စောင့်ကြပ်ကြည့်ရှုမည့်ပါရာမီတာ- စွန့်ပစ်အမှိုက်အမျိုးအစားနှင့် ပမာဏ လိုက်နာမည့်လမ်းညွှန်ချက်- YCDC စောင့်ကြပ်ကြည့်ရှုမည့်နေရာ - စက်ရုံဝန်းအတွင်းရှိအမှိုက်ပစ်သည့်နေရာများ စောင့်ကြပ်ကြည့်ရှုမည့်ကြိမ်နှုန်း - အပတ်စဉ်	အခန်း (၇)၊ ဇယား (၇-၃) နှင့် (၇-၄)
၈	လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးကင်းလုံခြုံရေး	စောင့်ကြပ်ကြည့်ရှုမည့်ပါရာမီတာ- မတော်တဆမှုများနှင့် ထိခိုက်မှုမှတ်တမ်းများ လိုက်နာမည့်လမ်းညွှန်ချက်- IFC စောင့်ကြပ်ကြည့်ရှုမည့်နေရာ - ထုတ်လုပ်ရေးနေရာ စောင့်ကြပ်ကြည့်ရှုမည့်ကြိမ်နှုန်း - လစဉ်	အခန်း (၇)၊ ဇယား (၇-၃) နှင့် (၇-၄)

စဉ်	အကြောင်းအရာ	ကတိကဝတ်ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းချက်
၈.၁	ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ် အတွက် အသုံးပြုမည့် လျာထား အသုံးစရိတ်	စီမံကိန်းစက်ရုံ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အတွက် အသုံးပြုမည့်လျာထား အသုံးစရိတ်မှာ တစ်နှစ်လျှင် မြန်မာကျပ်ငွေ သိန်းကိုးဆယ်ဝန်းကျင်ခန့်ရှိမည်ဖြစ်ပြီး လျာထားအသုံးစရိတ် အသေးစိတ်ကို ဇယားဖြင့် ဖော်ပြထားပါသည်။	အခန်း (၇)၊ စာပိုဒ် (၇.၁၂)
၉		စီမံကိန်းဖော်ဆောင်သူသည် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အတွက် သီးခြားငွေစာရင်း ဖွင့်လှစ် ထားမှု မရှိသော်လည်း ဆက်လက်အကောင်အထည် ဖော်ဆောင်ရွက်သွားပါမည်။	
	လူထုအကျိုးစီးပွား ပူးပေါင်းပါဝင် ဆောင်ရွက်မှု အစီအစဉ်	စီမံကိန်းလုပ်ငန်းမှ လူထုအကျိုးစီးပွား ပူးပေါင်းပါဝင် ဆောင်ရွက်မှု အတွက်အသားတင်အမြတ်ငွေ ၂ ရာခိုင်နှုန်းကို အသုံးပြုမည်ဖြစ်ပြီး လှူဒါန်းထောက်ပံ့ရန် လျာထားသည့်အချက်များနှင့် သုံးစွဲမှုရာခိုင်နှုန်းကိုလည်း ဖော်ပြ ထားသည့်အတိုင်းဆောင်ရွက်သွားပါမည်။	အခန်း (၇)၊ စာပိုဒ် (၇.၈) နှင့် ဇယား (၇-၆)

## ကတိကဝတ်များ

- (က) ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို တိကျခိုင်မာမှုများနှင့်ပြည့်စုံစွာ ဆောင်ရွက် ထားပါသည်။
- (ခ) စီမံကိန်းနှင့် သက်ဆိုင်သည့် ဥပဒေ၊ နည်းဥပဒေများ၊ လုပ်ထုံးလုပ်နည်းများနှင့် နိုင်ငံတကာ စည်းကမ်းသတ်မှတ်ချက်များကို စီမံကိန်းပိုင်ရှင်မှ လိုက်နာဆောင်ရွက်မည် ဖြစ်ပါသည်။
- (ဂ) စီမံကိန်းသည် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ပါ ကတိကဝတ်၊ ပတ်ဝန်းကျင် ထိခိုက်မှု လျှော့ချရေးလုပ်ငန်းများနှင့် အစီအစဉ်များကို အပြည့်အဝ အစဉ်အမြဲလိုက်နာ ဆောင်ရွက် သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြုပါသည်။
- (ဃ) လုပ်ငန်းလည်ပတ်ဆောင်ရွက်နေသည့် ကာလအတွင်း အတည်ပြုထားသည့် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်အား တိုးတက်နေသည့် နည်းပညာများ၊ စနစ်များနှင့် လုပ်ငန်း လိုအပ်ချက် အပေါ်မူတည်၍ ပိုမိုကောင်းမွန်သည့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် ဖြစ်စေရန်အတွက် ပြင်ဆင်ဖြည့်စွက်ရန် ညွှန်ကြားချက်ရှိလာပါက ဆောင်ရွက်မည်ဖြစ်ကြောင်း နှင့် လုပ်ငန်း ဆောင်ရွက်သူမှ ပြင်ဆင်ဖြည့်စွက်လိုပါက တင်ပြအတည်ပြုချက် ရယူ၍ ပြင်ဆင်ဆောင်ရွက် ပေးမည် ဖြစ်ပါသည်။
- (င) စီမံကိန်းပိတ်သိမ်းချိန်တွင် လူမှုဝန်းကျင်အား ထိခိုက်မှုအနည်းဆုံး ဖြစ်စေရန် စီမံဆောင်ရွက် ပေးမည်ဖြစ်ပြီး ထိခိုက်မှုများ ရှိလာပါက မူလအခြေအနေသို့ ရောက်ရှိ စေရန် ဆောင်ရွက်ပေးမည် ဖြစ်ပါသည်။

Esung Myanmar Company Limited

## အကြံပေးအဖွဲ့အစည်း၏ဝန်ခံချက်

ဤသဘာဝပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အား သက်ဆိုင်ရာပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းအပါအဝင် အကြံပေးအဖွဲ့အစည်း၏ လုပ်ငန်းဆိုင်ရာ နားလည် တတ်ကျွမ်းမှုနှင့် စုံစမ်းရရှိသော အချက်အလက်များကို အခြေခံ၍ ပြည့်စုံ မှန်ကန်မှုရှိအောင် ဆောင်ရွက် ထားပါကြောင်း ဝန်ခံပါသည်။

**Managing Director**  
Total Business Solution Co., Ltd.



**Dr. Soe Moe Kyaw Win**  
**Managing Director**  
**Total Business Solution Co., Ltd**

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



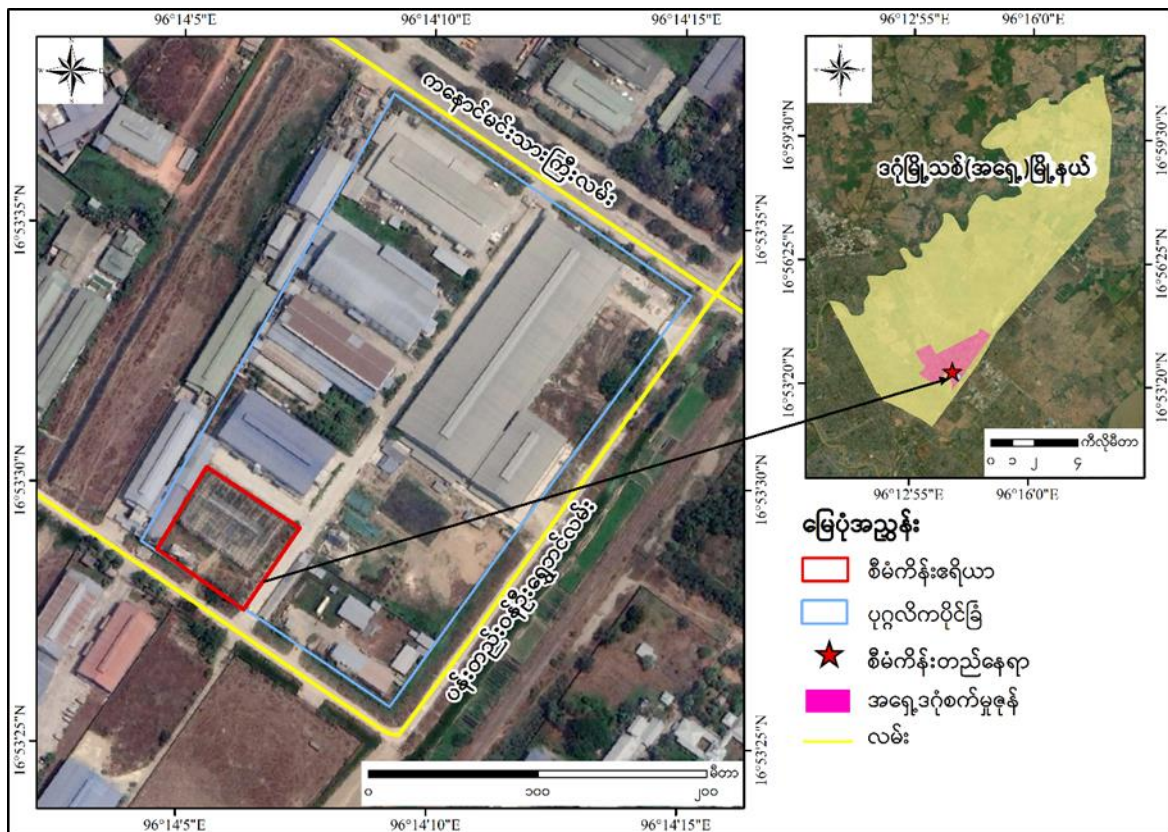
## အစီရင်ခံစာအကျဉ်းချုပ်

### ၁. စီမံကိန်းအကြောင်းအရာ

Esung Myanmar Company Limited (Esung) သည် အစုရှယ်ယာများဖြင့် ပုဂ္ဂလိက ကုမ္ပဏီအဖြစ် မေလ ၄ ရက်နေ့၊ ၂၀၁၈ ခုနှစ်တွင် ဖွဲ့စည်းတည်ထောင်ထားပါသည်။ Esung ၏ ရင်းနှီးမြှုပ်နှံမှု အမျိုးအစားမှာ ၁၀၀ ရာခိုင်နှုန်း နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှု ဖြစ်ပြီး Esung နှင့်သက်ဆိုင်သည့် လက်မှတ်များနှင့် လိုင်စင်များကို နောက်ဆက်တွဲ (က) တွင်ဖော်ပြထားပါသည်။ အဆိုပြုစီမံကိန်းသည် CMP အခြေခံစနစ်ဖြင့် အထည်အလိပ်နှင့် မော်တော်ယာဉ်သုံး အဖုံးအမျိုးမျိုးကို ထုတ်လုပ်ပါသည်။ ယခုလက်ရှိအချိန်တွင် စက်ရုံသည် မော်တော်ယာဉ်သုံး အဖုံးအမျိုးမျိုး နှင့် ကုန်ပစ္စည်းထည့်ပိုက်ကွန်များကို ထုတ်လုပ်လျက် ရှိပါသည်။ လွန်ခဲ့သော ၄ နှစ်တာကာလအတွင်း Esung စက်ရုံသည် စက်မှုဇုန် ၁၊ ဒဂုံမြို့သစ်တောင်ပိုင်း မြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီးတွင် တည်ရှိခဲ့ပါသည်။ သို့သော် ၂၀၂၂ ခုနှစ် ဧပြီလမှ စတင်၍ စက်ရုံ၏ တည်နေရာအား မြေကွက်အမှတ် (၁၄၉/၆)၊ ကနောင်မင်းသားကြီးလမ်း၊ အရှေ့ဒဂုံစက်မှုဇုန်၊ အရှေ့ဒဂုံ မြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး သို့ပြောင်းရွှေ့ခဲ့ပါသည်။ ထိုစက်ရုံ၏ စုစုပေါင်းမြေဧရိယာမှာ ၁ ဧက ခန့် ကျယ်ဝန်းသည်။ စီမံကိန်း၏ တည်နေရာကို ပုံ ၁ တွင် ဖော်ပြထားသည်။

သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန (MONREC) ၏ သဘောထား မှတ်ချက်အရ အဆိုပြုလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) အစီရင်ခံစာကို ဆောင်ရွက်ရမည် ဖြစ်သည်။ ထို့ကြောင့် စီမံကိန်းအဆိုပြုသူသည် ဤစီမံကိန်းအတွက် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ် အစီရင်ခံစာကို ရေးဆွဲရန် Total Business Solution Co., Ltd. (TBS) အား ဌာနရမ်းခွဲ ပါသည်။

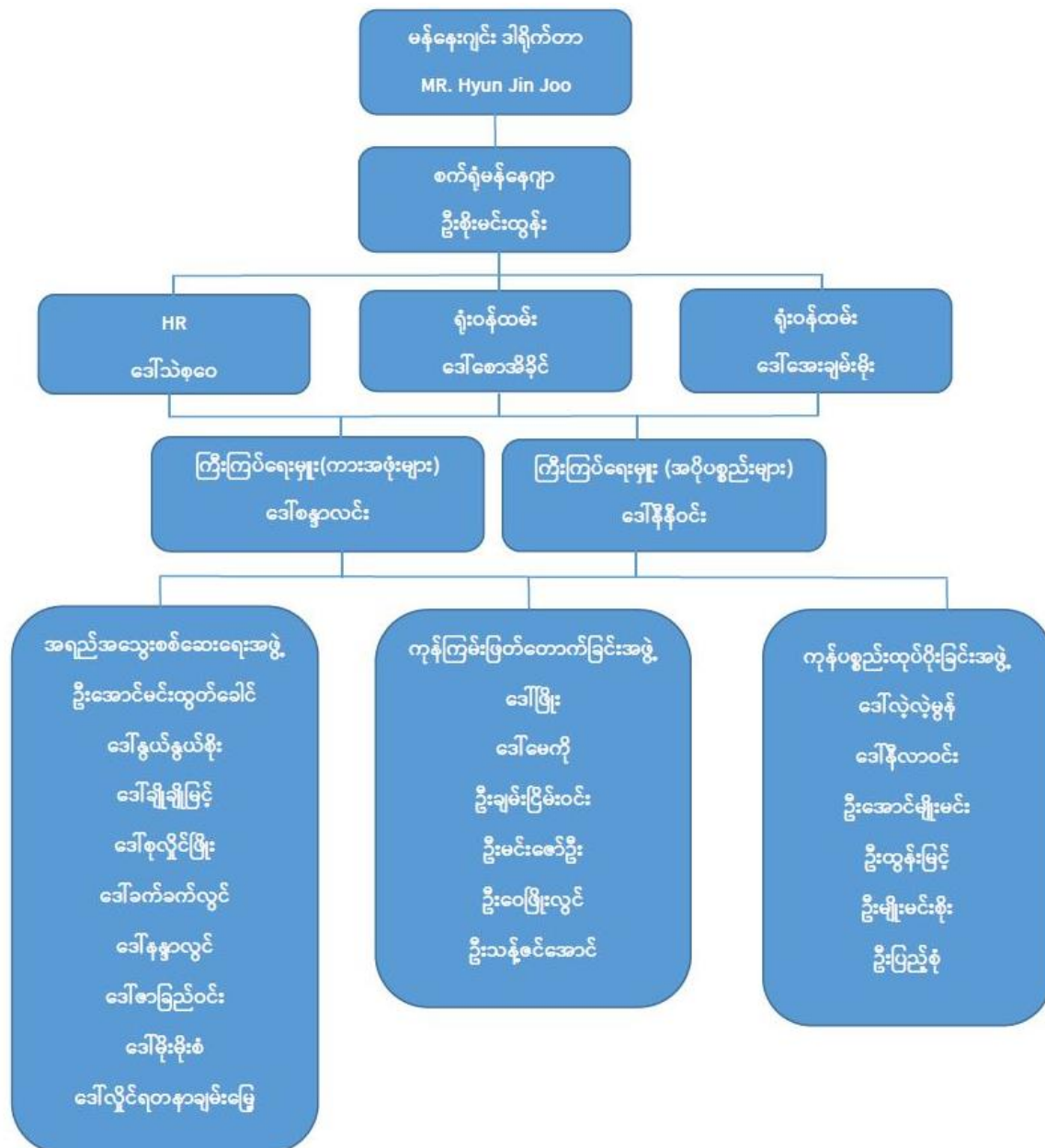




## ပုံ ၁ စီမံကိန်းတည်နေရာပြပုံ

### ၁.၁. စီမံကိန်းဖော်ဆောင်သူ

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ အတွက် စီမံကိန်းအဆိုပြုသူ၏ ဆက်သွယ်ရန် လိပ်စာကို ဇယား ၁ နှင့် စီမံကိန်းဖော်ဆောင်သည့် အဖွဲ့အစည်း၏ ဖွဲ့စည်းပုံ ဇယားကို ပုံ ၂ တွင်ဖော်ပြထားပါသည်။



ပုံ ၂ ESung မြန်မာကုမ္ပဏီ၏ ဖွဲ့စည်းပုံပြဇယား

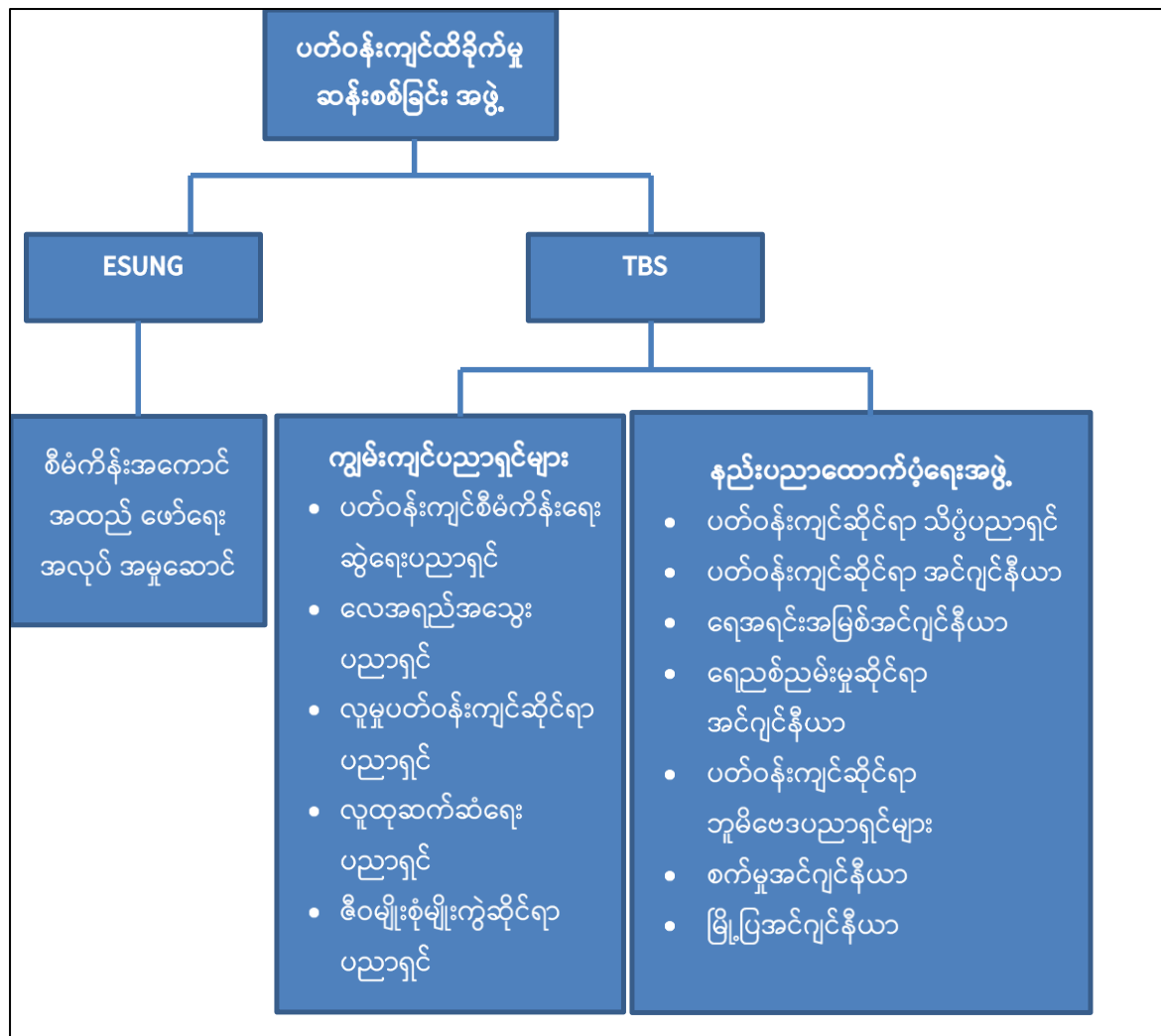
ဇယား ၁ စီမံကိန်းဖော်ဆောင်သူ၏ ဆက်သွယ်ရန်လိပ်စာ

အမည်	ဦးစိုးမင်းထွန်း
ရာထူး	ညွှန်ကြားရေးမှူး
လိပ်စာ	မြေကွက်အမှတ် (၁၄၉/၆)၊ ကနောင်မင်းသားကြီးလမ်း၊ အရှေ့ဒဂုံစက်မှုဇုန်၊ အရှေ့ဒဂုံမြို့နယ်၊ ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံ။
ဖုန်းနံပါတ်	၀၉-၅၀၆၂၆၄၆
အီးမေးလ်	kogyesmhtun@gmail.com

## ၁.၂. ပတ်ဝန်းကျင်ဆိုင်ရာအကြံပေးပုဂ္ဂိုလ်

Total Business Solution Co., Ltd. (TBS) သည် ပုဂ္ဂလိကပိုင် ပြည်တွင်းကုမ္ပဏီ တစ်ခုဖြစ်ပြီး၊ မြန်မာနိုင်ငံရှိပုဂ္ဂလိကနှင့် အများပိုင်ကဏ္ဍများအတွက်အင်ဂျင်နီယာနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ ဝန်ဆောင်မှုများ ဆောင်ရွက်ပေးလျက် ရှိပါသည်။ TBS သည် စတင်တည်ထောင်သည့် ၂၀၁၂ ခုနှစ်မှစ၍ ထိုင်းနိုင်ငံရှိ TEAM Consulting Engineering Management Co., Ltd နှင့် ပူးပေါင်း၍ ဆိပ်ကမ်းနှင့် စက်မှုဇုန်များ ဖွံ့ဖြိုးတိုးတက်ရေး၊ လျှပ်စစ်ဓာတ်အား သွယ်တန်းရေး၊ ရေလွှမ်းမိုးမှု ထိန်းချုပ်ရေး၊ ရေနုတ်မြောင်းနှင့် ရေမြောင်းစနစ်၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း၊ ကနဦးပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း နှင့် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်ကဲ့သို့သော စီမံကိန်းအမျိုးမျိုး လုပ်ကိုင်ဆောင်ရွက်လျက်ရှိပါသည်။

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း လေ့လာရေးအဖွဲ့သည် အစီရင်ခံစာတွင်ဖော်ပြထားသော စီမံကိန်း၏ အဓိကပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှုများနှင့်သက်ဆိုင်သော နည်းပညာဆိုင်ရာနယ်ပယ်အမျိုးမျိုးတွင် အရည်အချင်း ပြည့်ဝသော အတွေ့အကြုံရှိသောပညာရှင်များဖြင့် ဖွဲ့စည်းထားပါသည်။ TBS ကုမ္ပဏီ၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း လေ့လာရေးအဖွဲ့ဝင်များကို ပုံ ၃ နှင့် ဇယား ၂ တွင်ဖော်ပြထားပါသည်။



ပုံ ၃ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလေ့လာရေးအဖွဲ့၏ ဖွဲ့စည်းပုံပြဇယား

**ဇယား ၂ TBS ကုမ္ပဏီ၏ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်း လေ့လာရေးအဖွဲ့**

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်များ
၁။	ဒေါက်တာစိုးမိုးကျော်ဝင်း ဦးဆောင်ညွှန်ကြားရေးမှူး ဘူမိနည်းပညာနှင့် ဘူမိပတ်ဝန်းကျင် ဆိုင်ရာ အင်ဂျင်နီယာ	ပါရဂူဘွဲ့ (ဘူမိ အင်ဂျင်နီယာ) မဟာသိပ္ပံဘွဲ့ ( ဘူမိ အင်ဂျင်နီယာ) သိပ္ပံဘွဲ့ (ဘူမိဗေဒ)	အရှေ့တောင်အာရှနိုင်ငံများ၊ အမေရိကန်နှင့် ကနေဒါနိုင်ငံများ၌ ပတ်ဝန်းကျင်ဆိုင်ရာဆန်းစစ်ခြင်း၊ ဘူမိနည်းပညာ နှင့် ဘူမိဗေဒဆိုင်ရာ အင်ဂျင်နီယာလုပ်ငန်း နယ်ပယ်များ၊ ပတ်ဝန်းကျင်ဆိုင်ရာ ဆန်းစစ်ခြင်း၊ သတ္တုတူးဖော်ခြင်းမှ ထွက်ရှိသော စွန့်ပစ်အမှိုက်များ စီမံခန့်ခွဲခြင်း၊ ကွင်းဆင်းတိုင်းတာ ဆောင်ရွက်ခြင်းများ၊ မြေအရည်အသွေး ကောင်းမွန်အောင်ရွက်ခြင်းများ၊ မြေပြုပြင်ခြင်းများ နှင့် မြေပြိုမှုဆိုင်ရာ လေ့လာခြင်းများ တွင် ၃၀ နှစ် လုပ်ငန်းအတွေ့အကြုံ ပါသည်။	အစီရင်ခံစာအားလုံးကို ခြုံငုံသုံးသပ်ခြင်း။
၂။	ဦးဝေစိုး အထွေထွေ မန်နေဂျာ / စီမံကိန်း မန်နေဂျာ	သိပ္ပံဘွဲ့ (ဘူမိဗေဒ)	စင်ကာပူနိုင်ငံတွင် ဘူမိနည်းပညာ စက်ပစ္စည်း များနှင့် လေ့လာစောင့်ကြည့်ရေး နယ်ပယ်များ တွင် ၁၅ နှစ် လုပ်ငန်းအတွေ့အကြုံ ရှိပါသည်။  နည်းပညာအဖွဲ့ကို မြေပြိုမှုဆိုင်ရာ စက်ပစ္စည်းများနှင့် ကွင်းဆင်း လေ့လာခြင်း၊ မိုင်းဒီဇိုင်းများ ရေးဆွဲခြင်း၊ စွန့်ပစ်အမှိုက်စီမံခန့်ခွဲခြင်း၊ ဇလဗေဒပုံများရေးဆွဲခြင်း နှင့် မြေမျက်နှာသွင်ပြင် လေ့လာခြင်းများ တွင် ၅ နှစ် လုပ်ငန်းအတွေ့အကြုံ ရှိပါသည်။	ကွင်းဆင်းလေ့လာမှုများကို ကြီးကြပ်ခြင်း၊ ပတ်ဝန်းကျင် အရည်အသွေး ဆန်းစစ် လေ့လာရေး ကျွမ်းကျင်ပညာရှင်။

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်များ
၃။	ဒေါ်သက်ထားမြင့် လူမှုဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများ အကဲဖြတ်ကျွမ်းကျင် ပညာရှင်	မဟာသိပ္ပံဘွဲ့ (ကျားမရေးရာ/ဖွံ့ဖြိုးတိုးတက်ရေး) မဟာသိပ္ပံဘွဲ့ (သတ္တဗေဒ) သိပ္ပံဘွဲ့ (ဂုဏ်ထူးတန်း) (သတ္တဗေဒ)	ပတ်ဝန်းကျင်ကျားမရေးရာ/ ဖွံ့ဖြိုးတိုးတက်ရေးနယ်ပယ်၊ ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု ထိခိုက်ဆန်းစစ်ခြင်း၊ လူမှုစီးပွားသက်ရောက်မှုဆန်းစစ်ခြင်း၊ လုံခြုံရေးနှင့် ပြန်လည်နေရာချထားခြင်း အစီအစဉ်၊ လူထုစွမ်းအား လုပ်ငန်း မြှင့်တင်ရေးနှင့် စီမံခန့်ခွဲမှုများတွင် ၁၇ နှစ် အတွေ့အကြုံရှိပါသည်။	လူမှုဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများအကဲဖြတ်ခြင်း (ကျားမရေးရာ၊ လူမှုရေးနှင့် စီးပွားရေး)
၄။	ဒေါ်နှင်းလွဲဝင်း ပတ်ဝန်းကျင်ဆိုင်ရာ မန်နေဂျာ	မဟာသိပ္ပံဘွဲ့ (ပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲမှု အင်ဂျင်နီယာဘွဲ့) သိပ္ပံဘွဲ့ (ဆေးဝါးကျွမ်းကျင်)	စီမံခန့်ခွဲမှုများ၊ ဈေးကွက်ဖြန့်ဖြူးခြင်းများနှင့် အငယ်တန်း ဝန်ထမ်းများကို လေ့ကျင့် ပေးခြင်းများတွင် ၅ နှစ် အတွေ့ အကြုံရှိပါသည်။ မြေအသုံးချမှုအစီအစဉ်များ၊ ပတ်ဝန်းကျင် ဆိုင်ရာ ဆန်းစစ်ခြင်းနှင့် အစိုးရအဖွဲ့အစည်း များနှင့် ဒေသခံ ပြည်သူများနှင့် ပူးပေါင်း ဆောင်ရွက်ခြင်းများတွင် အတွေ့အကြုံ ၄ နှစ် ရှိပါသည်။ ပတ်ဝန်းကျင် ဘေးအန္တရာယ် ဆိုင်ရာဆန်းစစ်ခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ် ကြည့်ရှု တိုင်းတာမှုများနှင့် ပတ်ဝန်းကျင် ဆိုင်ရာ အစီရင်ခံစာ ပြင်ဆင်ရေးသားခြင်း များတွင် အတွေ့အကြုံ ရှိပါသည်။	စီမံကိန်းအကြောင်းအရာ၊ ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများ နှင့် လျော့ချရေး အစီအစဉ်များ၊ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်။
၅။	ဒေါ်အိန္ဒာဦး ရေအရင်းအမြစ်ဆိုင်ရာ အင်ဂျင်နီယာ	မဟာသိပ္ပံဘွဲ့ (ရေစီမံခန့်ခွဲမှု အင်ဂျင်နီယာ)	ရေအားလျှပ်စစ် အင်ဂျင်နီယာ၊ ရေဝေရေလဲနှင့် မြစ်ရေ စီမံခန့်ခွဲခြင်း၊ ရေလွှမ်းမိုးမှုဆိုင်ရာ လေ့လာ စောင့်ကြည့်ခြင်း၊ ဇလဗေဒ လေ့လာခြင်းနှင့် မိုးလေဝသ အခြေအနေ	ဇလဗေဒပညာရှင်၊ ပတ်ဝန်းကျင် အရည်အသွေး ခန့်မှန်းတွက်ချက်ရေး လက်ထောက်။



စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်များ
		သိပ္ပံဘွဲ့ (မြို့ပြနှင့် အဆောက်အအုံ အင်ဂျင်နီယာ)	လေ့လာခြင်းများ၊ ရေအားလျှပ်စစ်ဒီဇိုင်း ရေးဆွဲခြင်း၊ အစီအစဉ်ချမှတ်ခြင်း နှင့် ခန့်မှန်းခြင်း၊ ဘူမိနည်းပညာဆိုင်ရာ အချက်အလက်ပြုစုဆောင်ရွက်ခြင်း၊ အချက်အလက်များ ဆန်းစစ်ခြင်းနှင့် အစီရင်ခံစာ ရေးသားခြင်း၊ GIS နည်းပညာ ဖြင့် မြေပုံများထုတ်ခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံကိန်းများ အတွက် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်များ ရေးဆွဲခြင်း တွင် အတွေ့အကြုံ ၃ နှစ် ရှိပါသည်။	လူမှုဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများအကဲဖြတ်ခြင်း လက်ထောက်။
၆။	ဦးထက်သီဟဖုန်းမြင့် ပတ်ဝန်းကျင်ဆိုင်ရာ ဘူမိဗေဒပညာရှင်	သိပ္ပံဘွဲ့ (ဘူမိဗေဒ)	ဘူမိဗေဒဆိုင်ရာ မြေအောက်လွှာလေ့လာခြင်း၊ မြေ အသုံးချ အစီအစဉ်များဆောင်ရွက်ခြင်း၊ ပတ်ဝန်းကျင် ဆိုင်ရာ အရည်အသွေး ကွင်းဆင်းတိုင်းတာခြင်း ( လေ၊ ဆူညံသံ၊ ရေနမူနာကောက်ယူခြင်း) အစိုးရ အဖွဲ့အစည်းများ၊ ဒေသခံ ပြည်သူများနှင့် ညှိနှိုင်းတွေ့ဆုံ ဆွေးနွေးခြင်း၊ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုဆိုင်ရာ စာရွက်စာတမ်းများ ပြင်ဆင်ခြင်းများတွင် အတွေ့အကြုံ (၇)နှစ်ရှိပါသည်။	အစိုးရအဖွဲ့အစည်းများနှင့် ဒေသခံများနှင့် ညှိနှိုင်း တွေ့ဆုံဆွေးနွေးခြင်း၊ လူမှုစီးပွား စစ်တမ်း ကောက်ယူခြင်း၊ လူမှုစီးပွားအချက်အလက်များ စိစစ်ခြင်း။
၇။	ဦးဖြိုးသူကျော် အဆောက်အအုံ ဒီဇိုင်းရေးဆွဲသူ	အင်ဂျင်နီယာဘွဲ့ (စက်မှုလျှပ်စစ်)	စီမံကိန်းဆိုင်ရာ ညှိနှိုင်းဆောင်ရွက်ခြင်းများ၊ စာရွက် စာတမ်းများ ပြင်ဆင်ပေးခြင်း၊ အဆောက်အအုံ ပုံစံ ရေးဆွဲခြင်း များတွင် အတွေ့အကြုံ ၃ နှစ် ရှိပါသည်။	ပုံကြမ်းရေးဆွဲခြင်းများ။

စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်များ
			ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြည့်လေ့လာမှုများ (လေနှင့် ဆူညံသံ တိုင်းတာခြင်း၊ ရေနမူနာ ကောက်ယူခြင်း) နှင့် ကွန်ပျူတာများ ပြုပြင်ထိန်းသိမ်းခြင်းများတွင် အတွေ့အကြုံ ၄ နှစ် ရှိပါသည်။	
၈။	ဦးအောင်ချစ်မိုး ဘူမိဗေဒပညာရှင်	သိပ္ပံဘွဲ့ (ဂုဏ်ထူးတန်း) (ဘူမိဗေဒ)	ဘူမိဗေဒနှင့် ဘူမိနည်းပညာဆိုင်ရာ အင်ဂျင်နီယာ လုပ်ငန်းတွင် အတွေ့အကြုံ ၂ နှစ်နှင့် အထက်ရှိပါသည်။	ဘူမိနည်းပညာ၊ GIS၊ မြေပုံဆွဲခြင်းနှင့် Drone ဒေတာ စီမံဆောင်ရွက်ခြင်း၊ ပတ်ဝန်းကျင် အရည်အသွေး ခန့်မှန်းတွက်ချက်ရေး လက်ထောက်
၉။	ဦးဝေဖြိုးအောင် ကွင်းဆင်းလေ့လာရေး ပညာရှင်	သိပ္ပံဘွဲ့ (ဘူမိဗေဒ)	ဘူမိနည်းပညာနှင့်ဘူမိဗေဒဆိုင်ရာများတွင် အတွေ့အကြုံ ၇ နှစ် ရှိပါသည်။ ကွင်းဆင်းလေ့လာရေး အဖွဲ့ခေါင်းဆောင်အဖြစ် ၅ နှစ် ရှိပါသည်။	ပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေးစောင့်ကြည့်ခြင်းနှင့် ကွင်းဆင်း လေ့လာဆောင်ရွက်ခြင်းများ၊ ဒရုန်းဖြင့် ကွင်းဆင်းလေ့လာ ဆောင်ရွက်ခြင်းများ။
၁၀။	ဒေါ်ဖုန်းပွင့်ခိုင် ပတ်ဝန်းကျင်ဆိုင်ရာ အင်ဂျင်နီယာ	မဟာအင်ဂျင်နီယာဘွဲ့ (ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အင်ဂျင်နီယာ) အင်ဂျင်နီယာဘွဲ့ (မြို့ပြ)	ဆောက်လုပ်ရေးစီမံကိန်းများတွင် ဆိုင်အင်ဂျင်နီယာအဖြစ် အတွေ့အကြုံ ၁ နှစ် ရှိပါသည်။ အဆောက်အဦ ဆောက်လုပ် ခြင်း ဆိုင်ရာ ကုန်ကျစရိတ် ခန့်မှန်း တွက်ချက်ခြင်းအဖွဲ့တွင် အရည်အသွေး ထိန်းချုပ် အင်ဂျင်နီယာအဖြစ် အတွေ့အကြုံ ၆ လ ရှိပါသည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ အတွေ့အကြုံ ၂ နှစ် ရှိပါသည်။	စီမံကိန်းအကြောင်းအရာရေးဆွဲခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များ လေ့လာခြင်းနှင့် စောင့်ကြည့်ရေးအစီအစဉ်များ ရေးဆွဲခြင်း။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်များ ရေးဆွဲခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများ အကဲဖြတ်ခြင်း (ရေ/စွန့်ပစ်ရေညစ်ညမ်းမှု၊ ဆူညံသံ)



စဉ်	အမည်	ပညာအရည်အချင်း	အတွေ့အကြုံ	တာဝန်များ
				လျော့ချရေးနှင့် စောင့်ကြည့်ရေးအစီအစဉ်များ ရေးဆွဲခြင်း။ အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးပွဲများတွင် ပါဝင်ခြင်း။
၁၁။	ဒေါ်အေးမွန်အောင် ပတ်ဝန်းကျင်ဆိုင်ရာ အင်ဂျင်နီယာ	မဟာအင်ဂျင်နီယာဘွဲ့ (ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အင်ဂျင်နီယာ) အင်ဂျင်နီယာဘွဲ့ (ဒြပ်ပစ္စည်းနှင့် ) (သတ္တုဗေဒ	လက်ထောက်ဆရာမအဖြစ် အတွေ့အကြုံ ၁၀ လရှိပါသည်။ အရောင်ကိုယ်စားလှယ်အဖြစ် အတွေ့အကြုံ ၂ နှစ်ရှိပါသည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ အတွေ့အကြုံ ၂ နှစ် ရှိပါသည်။	စီမံကိန်းအကြောင်းအရာရေးဆွဲခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များ လေ့လာခြင်းနှင့် စောင့်ကြည့်ရေးအစီအစဉ်များ ရေးဆွဲခြင်း။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်များ ရေးဆွဲခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများ အကဲဖြတ်ခြင်း (လေထုညစ်ညမ်းမှုနှင့် စွန့်ပစ် ပစ္စည်း) လျော့ချရေးနှင့် စောင့်ကြည့်ရေး အစီအစဉ်များ ရေးဆွဲခြင်း။ အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးပွဲများတွင် ပါဝင်ခြင်း။
၁၂။	ဒေါ်ကြည်ဖြူခင်	မဟာဘွဲ့ (စီးပွားရေး စီမံခန့်ခွဲမှု) ဝိဇ္ဇာဘွဲ့ (အင်္ဂလိပ်စာ) ဒီပလိုမာ (စီးပွားရေးဆိုင်ရာ ဥပဒေ)	ပတ်ဝန်းကျင်ဆိုင်ရာ အတွေ့အကြုံ ၁ နှစ် ရှိပါသည်။	ဥပဒေနှင့် မူဝါဒများ ရေးဆွဲခြင်း။

## ၂. မူဝါဒများ၊ ဥပဒေဆိုင်ရာနှင့် ဖွဲ့စည်းဆောင်ရွက်ပုံဆိုင်ရာ လေ့လာသုံးသပ်ချက်

ဤအခန်းတွင် စီမံကိန်း၏ သဘာဝပတ်ဝန်းကျင်၊ လူမှုစီးပွားရေးနှင့် သက်ဆိုင်သော မြန်မာနိုင်ငံ၏မူဝါဒများ၊ သက်ဆိုင်သောဥပဒေများကို ဇယား ၃ တွင် အကျဉ်းချုပ်ဖော်ပြထားသည်။ စီမံကိန်းဖော်ဆောင်သူသည် ဤဥပဒေ ပြဋ္ဌာန်းချက်များ လိုက်နာရမည် ဖြစ်ပါသည်။

### ဇယား ၃ စီမံကိန်းနှင့် သက်ဆိုင်သော ဥပဒေနှင့် စည်းမျဉ်းစည်းကမ်းများ

စဉ်	ဥပဒေများနှင့် နည်းဥပဒေများ၏နာမည်များ	ခုနှစ်
<b>သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး</b>		
၁။	သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ	၂၀၁၂
၂။	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေများ	၂၀၁၄
၃။	ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများ	၂၀၁၅
၄။	အမျိုးသားပတ်ဝန်းကျင်ရေးရာမူဝါဒ	၂၀၁၉
<b>ညစ်ညမ်းမှုထိန်းချုပ်ခြင်းနှင့်ကျန်းမာရေး</b>		
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
၁၂။	ဓာတုနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီးကာကွယ်ရေး ဥပဒေ	၂၀၁၃
<b>ဇီဝမျိုးစုံမျိုးကွဲများနှင့် သဘာဝအရင်းအမြစ်ထိန်းသိမ်းရေး</b>		
၁၃။	ဇီဝမျိုးစုံမျိုးကွဲများနှင့် သဘာဝထိန်းသိမ်းရေးနယ်မြေများ ကာကွယ် စောင့်ရှောက်ခြင်းဆိုင်ရာ ဥပဒေ	၂၀၁၈
၁၄။	ငါးမွေးမြူခြင်းဆိုင်ရာဥပဒေ	၁၉၈၉
၁၅။	ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ထိန်းသိမ်းရေးဥပဒေ	၂၀၀၆
၁၆။	ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းထိန်းသိမ်းရေးနည်းဥပဒေ	၂၀၁၃
၁၇။	မြေအောက်ရေဥပဒေ	၁၉၃၀
၁၈။	သစ်တောဥပဒေ	၁၉၉၂
<b>မြေယာဥပဒေ</b>		
၁၉။	စာချုပ်စာတမ်းများမှတ်ပုံတင်ဥပဒေ	၂၀၁၉

စဉ်	ဥပဒေများနှင့် နည်းဥပဒေများ၏နာမည်များ	ခုနှစ်
၂၀။	နယ်နိမိတ်တိုင်းတာပိုင်းခြား သတ်မှတ်ရေးဥပဒေ	၂၀၁၉
၂၁။	မြေသိမ်း အက်ဥပဒေ	၁၈၉၄
၂၂။	လယ်ယာမြေ နိုင်ငံပိုင်ပြုလုပ်ရေး အက်ဥပဒေ	၁၉၅၃
၂၃။	မြန်မာနိုင်ငံ အမျိုးသားမြေအသုံးချမှု မူဝါဒ	၂၀၁၆
၂၄။	နိုင်ငံတော်ပိုင်မြေ အဆောက်အဦး ငှားရမ်းခြင်း (လွှဲပြောင်းမှုများ နှင့် ဖက်စပ်လုပ်ငန်းများ၏ လိုက်နာရမည့် ညွှန်ကြားချက်)	၂၀၁၈
၂၅။	လယ်ယာမြေဥပဒေ	၂၀၁၂
၂၆။	မြေလွတ်၊ မြေလပ်နှင့်မြေရိုင်းများစီမံခန့်ခွဲရေးဥပဒေ	၂၀၁၈
<b>မြို့ပြဖွံ့ဖြိုးတိုးတက်မှုနှင့်စီမံခန့်ခွဲမှု</b>		
၂၇။	လျှပ်စစ်ဥပဒေ	၂၀၁၄
၂၈။	ဆက်သွယ်ရေးဥပဒေ	၂၀၁၃
၂၉။	မြို့တော်စည်ပင်သာယာရေးကော်မတီ ဥပဒေ	၂၀၁၃
<b>လူ့အခွင့်အရေး</b>		
၃၀။	တိုင်းရင်းသားလူမျိုးများ၏အခွင့်အရေးကာကွယ်စောင့်ရှောက်သည့် ဥပဒေ	၂၀၁၅
၃၁။	မသန်စွမ်းသူများ၏ အခွင့်အရေးဥပဒေ	၂၀၁၅
၃၂။	ကလေးသူငယ် အခွင့်အရေးများဆိုင်ရာ ဥပဒေ	၂၀၁၉
<b>အလုပ်သမား</b>		
၃၃။	အလုပ်သမားအဖွဲ့အစည်းဥပဒေ	၂၀၁၁
၃၄။	အလုပ်အကိုင်နှင့်ကျွမ်းကျင်မှု ဖွံ့ဖြိုးတိုးတက်ရေး ဥပဒေ	၂၀၁၃
၃၅။	အနည်းဆုံးအခကြေးငွေဥပဒေ	၂၀၁၃
၃၆။	အခကြေးငွေပေးချေရေးဥပဒေ	၂၀၁၆
၃၇။	အလုပ်သမားလျှော့ကြေးအက်ဥပဒေ	၁၉၂၃
၃၈။	အလုပ်သမားရေးရာ အငြင်းပွားမှုဖြေရှင်းရေးဥပဒေ	၂၀၁၂
၃၉။	ခွင့်ရက်နှင့်အလုပ်ပိတ်ရက်အက်ဥပဒေ (ဧပြီလ ၂၀၁၄ ခုနှစ်တွင် ပြင်ဆင်သည့် ဥပဒေ)	၁၉၅၁
၄၀။	လူမှုဖူလုံရေးဥပဒေ	၂၀၁၂
<b>မော်တော်ယာဉ်များ</b>		
၄၁။	ယာဉ်အန္တရာယ်ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ်စီမံခန့်ခွဲမှုဥပဒေ	၂၀၂၀
၄၂။	မော်တော်ယာဉ်နည်းဥပဒေ	၁၉၈၉

စဉ်	ဥပဒေများနှင့် နည်းဥပဒေများ၏နာမည်များ	ခုနှစ်
၄၃။	မော်တော်ယာဉ်ဥပဒေ	၂၀၁၅
<b>အခြားဆက်နွယ်နေသောဥပဒေများနှင့် စည်းမျဉ်းများ</b>		
၄၄။	မြန်မာ့အာမခံ လုပ်ငန်း ဥပဒေ	၁၉၉၃
၄၅။	မြန်မာ့အာမခံ လုပ်ငန်း နည်းဥပဒေ	၂၀၁၇
၄၆။	တိုင်းရင်းသားအခွင့်အရေး ကာကွယ်ရေး ဥပဒေ	၂၀၁၅
၄၇။	မြန်မာ့ရင်းနှီးမြှုပ်နှံမှု ဥပဒေ	၂၀၁၆
၄၈။	မြန်မာ့ရင်းနှီးမြှုပ်နှံမှု နည်းဥပဒေ	၂၀၁၇
၄၉။	ပို့ကုန်သွင်းကုန်ဥပဒေ	၂၀၁၂
၅၀။	သဘာဝဘေးအန္တရာယ်ဆိုင်ရာ စီမံခန့်ခွဲမှုဥပဒေ	၂၀၁၃
၅၁။	ရာသီဥတုပြောင်းလဲမှုဆိုင်ရာ မူဝါဒ	၂၀၁၉
၅၂။	အခွန်ဆိုင်ရာစီမံအုပ်ချုပ်မှုဥပဒေ	၂၀၁၄
၅၃။	ပြည်ထောင်စု၏အခွန်ကောက်ခံမှုဥပဒေ	၂၀၁၉
၅၄။	မြန်မာနိုင်ငံသားများရင်းနှီးမြှုပ်နှံမှုဥပဒေ	၂၀၁၃
၅၅။	နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှုဥပဒေ	၂၀၁၂

## ၃. စီမံကိန်းအကြောင်းအရာအသေးစိတ်ဖော်ပြချက်

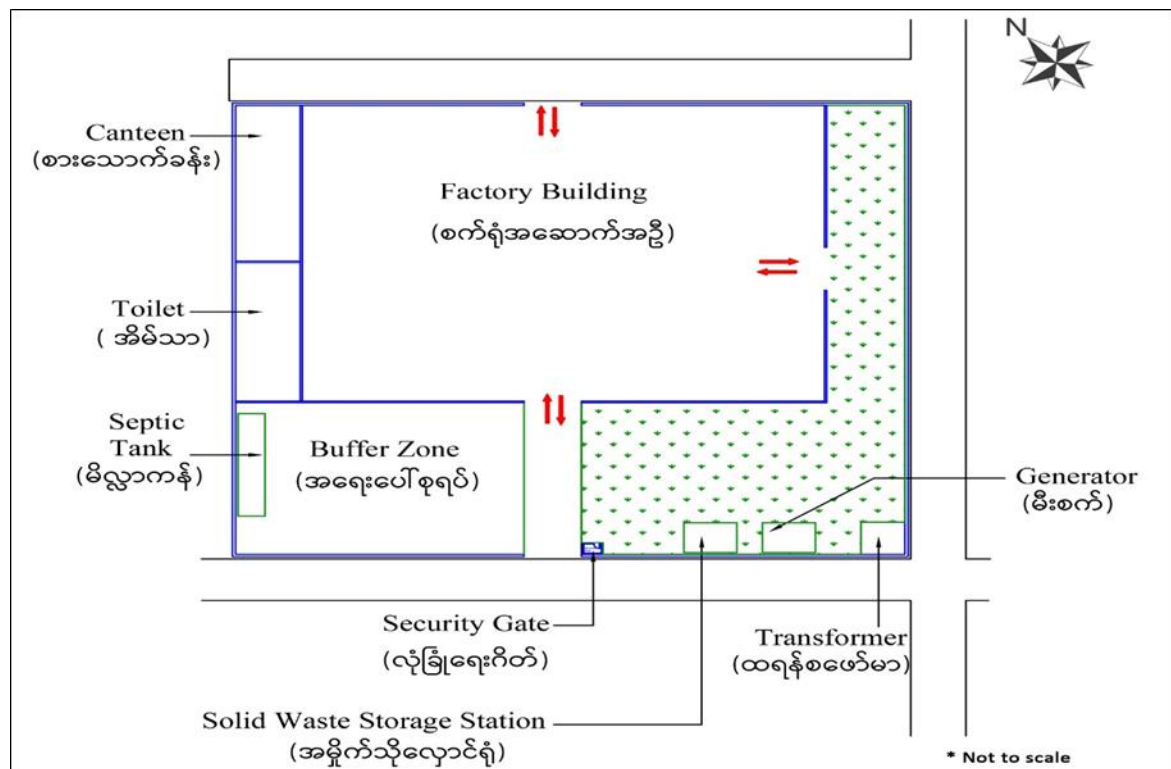
### ၃.၁. စီမံကိန်းတည်နေရာ

စီမံကိန်းစက်ရုံသည် မြေကွက်အမှတ် (၁၄၉/၆)၊ ကနောင်မင်းသားကြီးလမ်း၊ အရှေ့ဒဂုံစက်မှုဇုန်၊ အရှေ့ဒဂုံမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး၊ မြောက်လတ္တီတွဒ် ၁၆ ဒီဂရီ ၅၃ မိနစ် ၃၈.၈၈ စက္ကန့် နှင့် အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ ၁၄ မိနစ် ၂.၁၆ စက္ကန့် တွင်တည်ရှိပါသည်။ စက်ရုံ၏ စုစုပေါင်းဧရိယာမှာ တစ်ဧက ရှိပြီး အဆောက်အဦဧရိယာမှာ ၂၀,၀၀၀ စတုရန်းမီတာရှိပါသည်။ စီမံကိန်း၏ တည်နေရာပြမြေပုံကို ပုံ ၁ တွင် ဖော်ပြထားပါသည်။

### ၃.၂. စီမံကိန်းအကြောင်းအရာဖော်ပြချက်

#### ၃.၂.၁. စီမံကိန်းဖော်ပြချက်

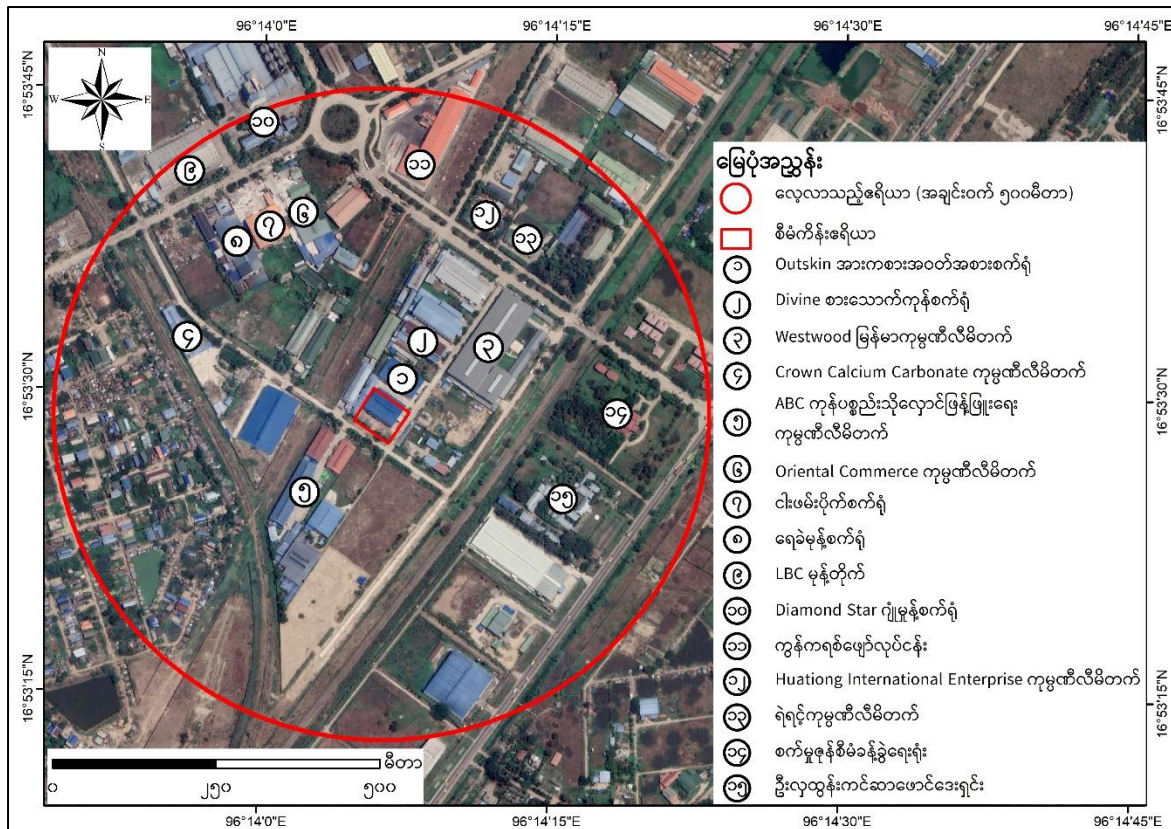
စီမံကိန်း၏ စုစုပေါင်းဧရိယာမှာ တစ်ဧကရှိပြီး နှစ်ထပ်ဆောင် အဆောက်အဦ တစ်ခု၊ စက်ရုံကန်တင်း၊ အရေးပေါ်စုရပ်နေရာနှင့် စိမ်းလမ်းစိုပြေနေရာတို့ ပါဝင်ပါသည်။ အဆောက်အဦ၏ ဧရိယာမှာ ၂၀,၀၀၀ စတုရန်းမီတာဖြစ်ပြီး အဆောက်အဦပုံစံပြမြေပုံကို ပုံ ၄ တွင် ဖော်ပြထားပါသည်။



## ပုံ ၄ စီမံကိန်း၏အဆောက်အအုံပုံစံပြပုံ

### ၃.၂.၂. စီမံကိန်း၏အနီးပတ်လည်ရှိအနေအထား

စီမံကိန်း အနီးဝန်းကျင်တွင် အခြေခံအဆောက်အအုံ ၁၅ မျိုးရှိပြီး စီမံကိန်းသည် စက်မှုဇုန်အတွင်းမှာ တည်ရှိသောကြောင့် အခြေခံအဆောက်အအုံ အများစုမှာ စက်ရုံများဖြစ်ကြသည်။ စီမံကိန်း၏ ၅၀၀ မီတာအတွင်း တည်ရှိသော အဆောက်အအုံများ၏ တည်နေရာပြမြေပုံကို ပုံ ၅ တွင် ဖော်ပြထားပါသည်။



ပုံ ၅ စီမံကိန်း၏ မီတာ ၅၀၀ အတွင်းရှိသော အဆောက်အဦတည်နေရာပြမြေပုံ

## ၃.၂.၃. ကုန်ကြမ်းပစ္စည်းလိုအပ်မှု

ထုတ်လုပ်မှု လုပ်ငန်းစဉ်တွင် လိုအပ်သော ကုန်ကြမ်း ပစ္စည်းများကို ကိုရီးယားသမ္မတနိုင်ငံမှ တင်သွင်းပြီး ကုန်ကြမ်းပစ္စည်းပေါင်း ၂၁ မျိုးကို လိုအပ်ပါသည်။ ထုတ်ကုန်များအားလုံးအတွက် နှစ်စဉ် လိုအပ်သော ကုန်ကြမ်းပစ္စည်းများကို အခန်း (၃)၊ အပိုဒ်ခွဲ ၃.၃ တွင် ဖော်ပြထားပါသည်။ ထို့အပြင် ထုတ်ပိုးရန်အတွက် လိုအပ်သော ကတ်ထုစက္ကူကဲ့သို့သော ပစ္စည်းအများကို ဝယ်လိုအားပေါ် မူတည်၍ ပြည်တွင်းဈေးကွက်မှ ဝယ်ယူမည်ဖြစ်သည်။

## ၃.၂.၄. စက်ပစ္စည်းစာရင်း

ကုန်ထုတ်လုပ်ငန်းအတွက် အသုံးပြုမည့် စက်ပစ္စည်းများအားလုံးကို ကိုရီးယားသမ္မတနိုင်ငံမှ တင်သွင်းမည်ဖြစ်သည်။ စက်ရုံ၏ ကုန်ထုတ်လုပ်ရေးလုပ်ငန်းအတွက် လိုအပ်သော စက်ပစ္စည်းများ စာရင်းနှင့် ၎င်းတို့ကို တပ်ဆင်မည့်နေရာအား အခန်း (၃)၊ အပိုဒ်ခွဲ ၃.၄ တွင် ဖော်ပြထားပါသည်။ ထို့အပြင် ပရိဘောဂနှင့် ကရိယာများကို ပြည်တွင်းမှ ဝယ်ယူမည်ဖြစ်သည်။



## ၃.၂.၅. ဝန်ထမ်းအင်အား

စက်ရုံ၏ အလုပ်ချိန်မှာ တနင်္လာနေ့မှ သောကြာနေ့အထိ ပုံမှန် မနက် ၇း၃၀ မှ ညနေ ၄း၃၀ ဖြစ်ပြီး စနေနေ့တွင် မနက် ၇း၃၀ မှ ၁၁း၃၀ ထိဖြစ်သည်။ နေ့လည်နားချိန်မှာ နေ့လည် ၁၁း၃၀ မှ ၁၂း၃၀ ထိဖြစ်ပြီး စက်ရုံသည် တနင်္ဂနွေနှင့် အခြားသော အစိုးရရုံးပိတ်ရက်များတွင် ရုံးပိတ်ပါသည်။ စက်ရုံ၏ စုစုပေါင်း အလုပ်သမားဦးရေမှာ (၁၈၁) ဦးဖြစ်ပါသည်။

## ၃.၂.၆. ထုတ်ကုန်ပစ္စည်းအမျိုးအစားနှင့် ကုန်ထုတ်လုပ်မှုနှုန်း

ယခုလက်ရှိအချိန်တွင် စက်ရုံမှ အဓိကထုတ်ကုန်ပစ္စည်း အမျိုးအစား (၂) မျိုးကို ထုတ်လုပ် လျက်ရှိသည်။ ၎င်းတို့မှာ ကားအဖုံး နှင့် ကားထိုင်ခုံဖုံး ကဲ့သို့သော မော်တော်ယာဉ်သုံးအဖုံးအမျိုးမျိုးနှင့် ပစ္စည်းထည့် ပိုက်ကွန်တို ဖြစ်ပြီး ကိုရီးယားသမ္မတနိုင်ငံနှင့် တရုတ်ပြည်သူ့သမ္မတနိုင်ငံသို့ တင်ပို့ပါသည်။ ထုတ်ကုန်ပစ္စည်းနမူနာပုံစံနှင့် နှစ်စဉ်ကုန်ထုတ်လုပ်မှုနှုန်းကို ပုံ ၆ နှင့် ဇယား ၄ တွင်ဖော်ပြထားပါသည်။

	
ပစ္စည်းထည့်ပိုက်ကွန်	
	
မော်တော်ယာဉ်သုံး အဖုံးအမျိုးမျိုး	

ပုံ ၆ ထုတ်ကုန်ပစ္စည်းနမူနာပုံစံ

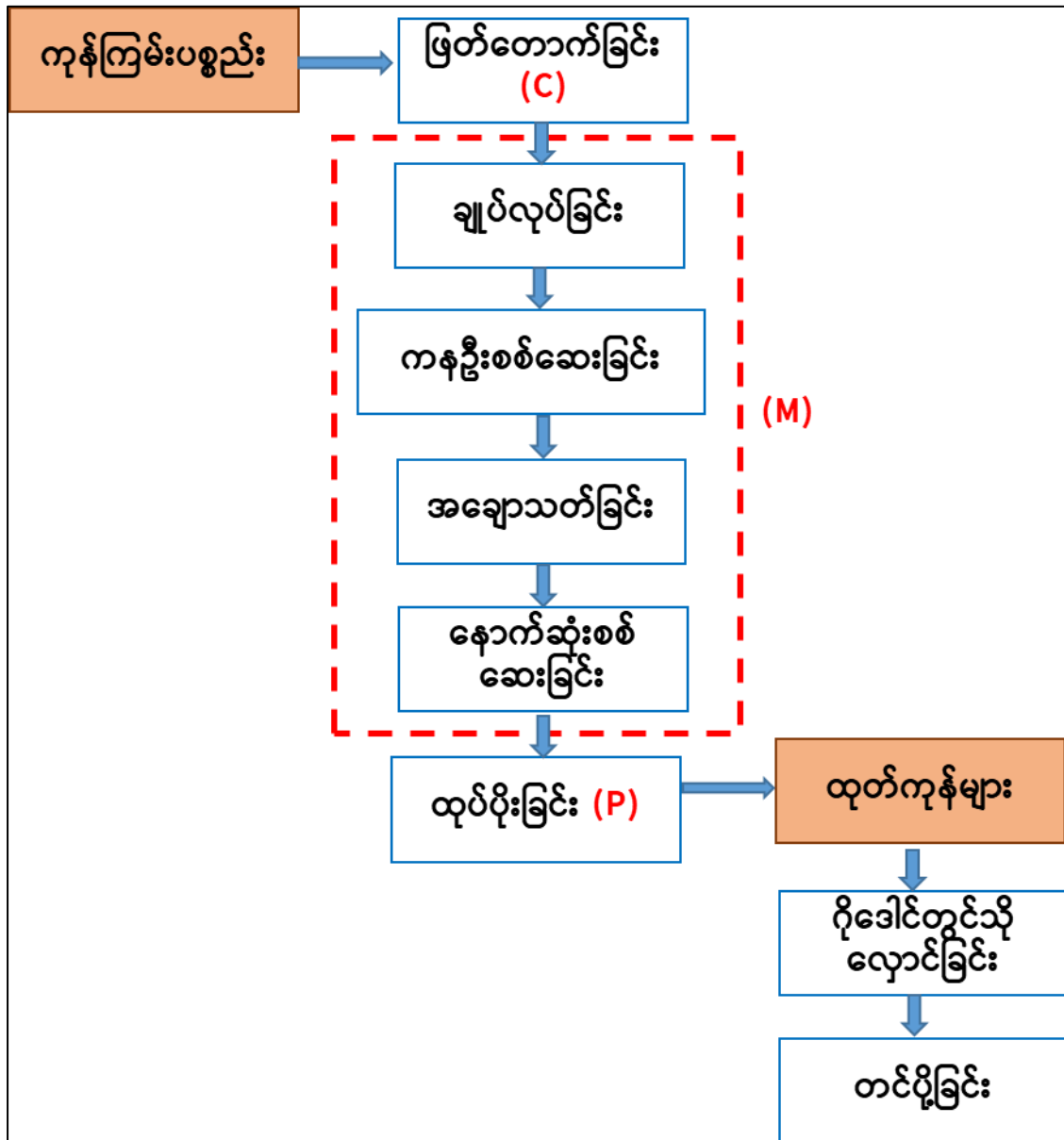
### ဇယား ၄ ထုတ်ကုန်ပစ္စည်း အမျိုးမျိုး

ထုတ်ကုန်အမျိုးအစား	ထုတ်ကုန်ပမာဏ (လစဉ်)	ထုတ်ကုန်ပမာဏ (နှစ်စဉ်)
မော်တော်ယာဉ်သုံး အပုံးအမျိုးမျိုး	၁၃၂,၀၀၀	၁,၅၈၄,၀၀၀
မော်တော်ယာဉ်သုံးဆက်စပ်ပစ္စည်းအမျိုးမျိုး	၄၆,၀၈၀	၅၅၂,၉၆၀
စုစုပေါင်း (အခုရေ)	၁၇၈,၀၈၀	၂,၁၃၆,၉၆၀

### ၃.၃. ကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်

ကုန်ထုတ်လုပ်ခြင်း လုပ်ငန်းစဉ်ဖြစ်သည့် (CMP) စနစ်ကို အဓိကအားဖြင့် ဖြတ်တောက်ခြင်း၊ ပြုလုပ်ခြင်း (ချုပ်လုပ်ခြင်း၊ အချောသတ်ခြင်းနှင့် အရည်အသွေးစစ်ဆေးခြင်း)၊ ထုတ်ပိုးခြင်းနှင့် ယာယီ သိုလှောင်ရုံတွင် သိုလှောင်ခြင်း ဟူ၍ အပိုင်းလေးပိုင်းခွဲခြားနိုင်ပါသည်။ ပထမဦးစွာ၊ ကုန်ကြမ်းပစ္စည်း များကို ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်သို့ မပို့ဆောင်မီ ဂိုဒေါင်တွင် ထားရှိပါသည်။ ပထမဆုံး ကုန်ထုတ် လုပ်ငန်းစဉ်ဖြစ်သည့် ဖြတ်တောက်ခြင်းလုပ်ငန်းစဉ်ကို လူအင်အားအသုံးပြု၍ သော်လည်းကောင်း၊ စက်များအသုံးပြု၍ အလိုအလျောက်စနစ် ဖြင့်သော်လည်းကောင်း လုပ်ဆောင် ပါသည်။ ထို့နောက် ရရှိလာသော လိုအပ်သည့် အရွယ်အစားရှိသော အပိုင်းအစများကို ချုပ်လုပ်သည့် နေရာသို့ပို့ဆောင်ကာ ချုပ်လုပ်ပါသည်။ ချုပ်လုပ် အချောသတ်ပြီး ရရှိလာသော ထုတ်ကုန်များကို အရည်အသွေးစစ်ဆေးသည့် ဌာနသို့ပို့ဆောင်ကာ စစ်ဆေးပြီး အရည်အသွေးပြည့်မှီသော ထုတ်ကုန်များကို ထုတ်ပိုးဌာနသို့ ပို့ဆောင် ထုတ်ပိုးပါသည်။ နောက်ဆုံးတွင် ပြီးစီးသောကုန်ပစ္စည်းများကို ဂိုဒေါင်တွင် သိုလှောင်၍ ပြည်ပနိုင်ငံများသို့ တင်ပို့ပါသည်။ ကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်ကို ပုံ ၇ တွင် ဖော်ပြထားပါသည်။





ပုံ ၇ ကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်

### ၃.၄. အလုပ်သမားများအတွက် အထောက်အပံ့များ

စက်ရုံအတွင်း အလုပ်သမားများအတွက် အထောက်အပံ့အမျိုးမျိုးကို ထောက်ပံ့ပေးထားပါသည်။ ၎င်းတို့မှာ သောက်ရေသန့်၊ သန့်ရှင်းသပ်ရပ်သော တစ်ကိုယ်ရေသန့်ရှင်းရေးစနစ်၊ နှစ်စဉ်အပိုဆုကြေး၊ ရှေးဦးသူနာပြုဆေးသေတ္တာနှင့် အခြားလိုအပ်သော တစ်ကိုယ်ရေကာကွယ်ရေးပစ္စည်းများဖြစ်ပါသည်။

#### ၃.၄.၁. ရှေးဦးသူနာပြုဆေးသေတ္တာ

ဌာနတစ်ခုချင်းဆီအတွက် ရှေးဦးသူနာပြုဆေးသေတ္တာ စုစုပေါင်း သုံးခု ကို ထောက်ပံ့ ပေးထားပါသည်။ ရှေးဦးသူနာပြုဆေးသေတ္တာ၏ တည်နေရာနှင့် ၎င်း၏ တွဲဖက်ပစ္စည်းများကို ဇယား ၅ နှင့် ဇယား ၆ တွင် ဖော်ပြထားသည်။

### ဇယား ၅ ရှေးဦးသူနာပြုဆေးသေတ္တာ

ဌာန	တည်နေရာ	အရေအတွက်
ထုတ်လုပ်ရေး ဌာန	စက်ချုပ်လုပ်ရာနေရာအနီး	၁
	ကုန်ကြမ်းဖြတ်တောက်ရာနေရာအနီး	၁
ရုံးခန်း	ရုံးခန်း	၁
စုစုပေါင်း		၃

### ဇယား ၆ ရှေးဦးသူနာပြုဆေးသေတ္တာ၏ တွဲဖက်ပစ္စည်းများ

စဉ်	ပစ္စည်းများ	ယူနစ်	အရေအတွက်
၁။	၂ လက်မ ပတ်တီးလိပ်	ခုရေ	၂
၂။	စက္ကူတိပ်	အလိပ်	၁
၃။	အနာကပ်ပလာစတစ်	ခုရေ	၅
၄။	အနာကျက်ဆေး	အတောင့်	၁
၅။	အရက်ပျံ	ပုလင်း	၁
၆။	ဆွဲကျုံ့လွယ်သော ပတ်တီး	ခုရေ	၂
၇။	ဂွမ်း	အထုပ်ရေ	၁
၈။	ကော်တိပ်	အလိပ်	၁
၉။	ဇာဂနာ	ခုရေ	၁
၁၀။	ကပ်ကြေးအသေး	ခုရေ	၁
၁၁။	အရေးပေါ်သုံးအသားလောင်သက်သာစေသောဆေး	ပုလင်း	၁

### ၃.၄.၂. သောက်သုံးရေထောက်ပံ့ပေးမှု

စက်ရုံ၏ သောက်သုံးရေပမာဏမှာ တစ်ရက်လျှင် ၁၆၀ လီတာ ခန့်ဖြစ်ပြီး ၂၀ လီတာ ဆန့်သော ပလပ်စတစ် သောက်ရေသန့်ဗူးများကို သောက်သုံးရေအတွက် ထောက်ပံ့ပေးမည်ဖြစ်သည်။ ထောက်ပံ့ပေးထားသော သောက်သုံးရေဗူးများ ပုံကို ပုံ ၈ တွင် ဖော်ပြထားပါသည်။



ပုံ ၈ သန့်စင်ထားသော သောက်ရေသန့်ဗူးများ

### ၃.၄.၃. စားသောက်ခန်း

စက်ရုံဝန်ထမ်းများအတွက် စားသောက်ခန်းနှင့် လက်ဆေးဘေစင် ကဲ့သို့သော အထောက်အပံ့များကို စက်ရုံဝင်းအတွင်းတွင် ထားရှိပါသည်။ စက်ရုံ၏ ဝန်ထမ်း စားသောက်ခန်း၏ လက်ရှိအနေအထားကို ပုံ ၉ တွင်ဖော်ပြထားပါသည်။



ပုံ ၉ စက်ရုံ၏ စားသောက်ခန်း လက်ရှိအနေအထား

### ၃.၄.၄. သန့်ရှင်းရေးစနစ်

သန့်ရှင်းရေးနှင့် ပတ်သက်၍ သန့်ရှင်းသပ်ရပ်သော အိမ်သာ ၁၂ လုံး ကို စက်ရုံဝန်ထမ်းများအတွက် ထောက်ပံ့ပေးထားပါသည်။ အိမ်သာမှ ထွက်ရှိသောမိလ္လာများကို မိလ္လာကန်များဖြင့် စုဆောင်းသန့်စင်ပါသည်။ မိလ္လာကန်မှ အနည်အနှစ် အညစ်အကြေးများကို ရန်ကုန်မြို့တော်စည်ပင်နှင့်ဆက်သွယ်၍ ပုံမှန် စွန့်ပစ်မည်ဖြစ်သည်။ စက်ရုံ၏လက်ရှိ သန့်ရှင်းရေးစနစ် အနေအထား ကို ပုံ ၁၀ တွင် ဖော်ပြထားပါသည်။



ပုံ ၁၀ စက်ရုံ၏သန့်ရှင်းရေးစနစ်ပြပုံ

### ၃.၄.၅. အခြားအထောက်အပံ့များ

အခြားသော အထောက်အပံ့အမျိုးမျိုးကို လည်း စက်ရုံဝန်ထမ်းများအတွက် ထောက်ပံ့ ပေးထားပါသည်။ စက်ရုံဝန်ထမ်းများ ကျန်းမာရေးမကောင်းပါက အနားယူနိုင်ရန် ဆေးခွင့်များကို လည်းခွင့်ပြုထားပါသည်။ ကုမ္ပဏီ၏ နှစ်စဉ်အမြတ်ငွေနှင့် လုပ်ဆောင်ချက်များအပေါ် အခြေခံ၍ ဝန်ထမ်းတိုင်းကို အပိုဆုကြေးများပေးပါသည်။ ထို့အပြင် တစ်ကိုယ်ရေကာကွယ်ရေးပစ္စည်းများကိုလည်း ဖြတ်တောက်ခြင်းလုပ်ငန်းတွင် လုပ်ဆောင်နေကြသော အလုပ်သမားများအတွက် ထောက်ပံ့ ပေးထားပါသည်။

### ၃.၅. စီမံကိန်းလုပ်ငန်းအတွက်အသုံးချမှုများ

#### ၃.၅.၁. ရေအရင်းအမြစ်

စီမံကိန်းအတွက် လိုအပ်သောရေကို ရေတွင်းမှထုတ်ယူပြီး ရေတိုင်ကီတွင် သိုလှောင်ပါသည်။ ထို့နောက် ရေတိုင်ကီမှ ရေများကို ၃၀၀ ဂါလံဆံ့သော စက်ရုံရေသိုလှောင်ကန်သို့ သွယ်တန်း အသုံးပြုပါသည်။

#### ၃.၅.၂. လျှပ်စစ်စွမ်းအင်အသုံးပြုမှု

စီမံကိန်း၏ ကုန်ထုတ်လုပ်ခြင်းအတွက် လိုအပ်သောလျှပ်စစ်စွမ်းအင်ကို မြို့နယ်၏ ပင်မလျှပ်စစ်လိုင်းမှ ချိတ်ဆက်အသုံးပြုပါသည်။ စက်ရုံအတွင်းတွင် ၄၀၀ ကေဗီအေ ထရန်စဖော်မာကို တပ်ဆင်ထားရှိပါသည်။

#### ၃.၅.၃. မီးစက်

အစိုးရလျှပ်စစ်ဓာတ်အားလိုင်း ပြတ်တောက်သွားပါက အရေးပေါ်အခြေနေအတွက် KOGEN ဒီဇယ်သုံးမီးစက်ကို အသုံးပြုမည်ဖြစ်သည်။ မီးစက်၏ စွမ်းဆောင်ရည်မှာ ၃၈၀ ဗို့အားအတွက် တစ်

မိနစ်တွင် ၁၅၀၀ လည်ပတ်ပါသည်။ မီးစက် အင်ဂျင်နှုန်းထားမှာ ပင်မအင်ဂျင်အတွက် ၁၀၀ ကေဗီအေ ရှိပြီး အရံအနေဖြင့် ၁၁၀ ကေဗီအေရှိသော အင်ဂျင်ကို ထားရှိပါသည်။

### ၃.၅.၄. လောင်စာဆီသိုလှောင်ကန်

လောင်စာဆီကို ဒီဇယ်သုံးမီးစက်အတွက် အဓိကထားအသုံးပြုပါသည်။ လောင်စာဆီကိုဂါလံ ၅၀ ဆုံသော ဆီတိုင်ကို နှစ်လုံးဖြင့် သိုလှောင်ထားပါသည်။ စက်ရုံတစ်ခုလုံး၏ ဒီဇယ်အသုံးပြုမှုမှာ တစ်ပတ်လျှင် ၂၂၀ လီတာခန့် (၅၇ ဂါလံ) ခန့် ရှိနိုင်ပါသည်။

### ၃.၅.၅. လေဖိအားစက်

တစ်မိနစ်လျှင် ၁,၄၅၀ လည်ပတ်သော ၂၂၀ ဗို့အား အသုံးပြုသော လျှပ်စစ်မော်တာပါဝင်သည့် လေဖိအားစက် သုံးလုံးကို PE ဖလင်ပိတ်စများ ဖြတ်တောက်ခြင်းလုပ်ငန်းစဉ်အတွက် အသုံးပြုပါသည်။ လေဖိအားစက်တစ်ခု၏ လေသိုလှောင်နိုင်စွမ်းမှာ ၂၂.၆၇ ဂါလံခန့် ဖြစ်ပါသည်။ လေဖိအား ထောက်ပံ့ပေးနိုင်မှုမှာ ၁၁၅ ပီအက်စ်အိုင် နှင့် မြင်းကောင်ရေ သုံးကောင်အား ဖြစ်ပါသည်။

### ၃.၅.၆. စွန့်ပစ်ရေ

စက်ရုံ၏ ကုန်ထုတ်လုပ်ခြင်း လုပ်ငန်းစဉ်မှာ CMP စနစ်ကို အဓိကအခြေခံ၍ ထုတ်လုပ်သောကြောင့် ကုန်ထုတ်လုပ်ခြင်း လုပ်ငန်းစဉ်မှ စွန့်ပစ်ရေထွက်ရှိမှု မရှိနိုင်ပါ။

စက်ရုံအလုပ်သမားများအတွက် အိမ်သာများကို စက်ရုံဝန်းအတွင်းဆောက်လုပ်ပေးထားပြီး ကျား/မ အချိုးကျခွဲခြားထား ပါသည်။ စက်ရုံတွင် မိလ္လာအညစ်အကြေးများ ထားရှိရန် မိလ္လာကန်များကို ဆောက်လုပ်ထားရှိပြီး မိလ္လာကန်မှထွက်ရှိလာသော စွန့်ပစ်ရေများကိုလည်း အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေးထုတ်လွှတ်မှု လမ်းညွှန်ချက်များကိုတိကျစွာလိုက်နာ၍ ရန်ကုန် မြို့တော်စည်ပင်သာယာရေး ကော်မတီနှင့် ဆက်သွယ်စွန့်ပစ်မည် ဖြစ်ပါသည်။ မိလ္လာကန်မှ ထွက်လာသော အနည်အနှစ်များကိုလည်း လိုအပ်ပါက စနစ်တကျ ထုတ်ယူစွန့်ပစ်သွားမည်ဖြစ်ပါသည်။

လက်ဆေးကန်နှင့် ကန်တင်းမှထွက်ရှိသော စွန့်ပစ်ရေများကို စက်ရုံရေနှုတ်မြောင်းထဲသို့ တိုက်ရိုက်စွန့်ပစ်မည်ဖြစ်ပါသည်။ အမေရိကန် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအေဂျင်စီ (၁၉၇၈)<sup>1</sup> အရ အလုပ်သမားတစ်ယောက်၏ ပျမ်းမျှရေအသုံးပြုမှုမှာ ၁၅၀ လီတာ ဖြစ်သည်။ ထို့ကြောင့် ဝန်ထမ်း ၁၈၁ ယောက်အတွက် ခန့်မှန်းတွက်ချက်ထားသော စွန့်ပစ်ရေမှာ ၂,၇၅၀ လီတာခန့် ဖြစ်မည်ဟု ခန့်မှန်းတွက်ချက်ထားပါသည်။

<sup>1</sup> U.S.EPA. (1978), Environmental impact statement phase II, Facility Plan Handover Country, Virginia 3rd Edition.



### ၃.၅.၇. ရေနွှတ်မြောင်း

စက်ရုံတွင် ရေနွှတ်မြောင်း အမျိုးအစား ၂ မျိုးရှိပါသည်။ ၎င်းတို့မှာ

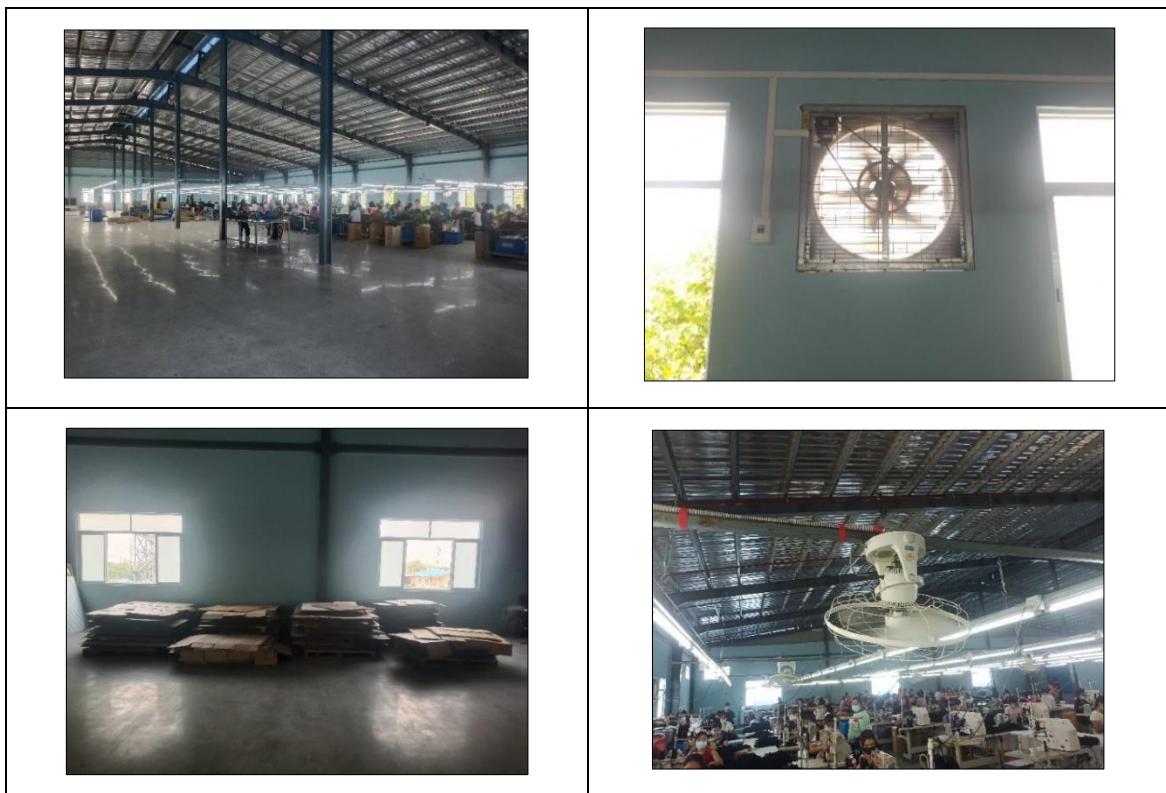
(၁) မိုးရေအတွက် ရေနွှတ်မြောင်း

(၂) အိမ်တွင်းစွန့်ပစ်ရေအတွက် ရေနွှတ်မြောင်း တို့ဖြစ်ကြသည်။

ရေနွှတ်မြောင်းစနစ်များအားလုံးကို ပိုက်လိုင်းများဖြင့် စက်ရုံ၏ ရေနွှတ်မြောင်းလိုင်းသို့ ခွဲခြား၍ သွယ်တန်းထားပါသည်။ ပုံမှန်အားဖြင့် စက်ရုံမှထွက်သော စွန့်ပစ်ရေနှင့် စက်ရုံဘေးပတ်ဝန်းကျင်နှင့် လမ်းများမှ စီးဆင်းသွားသော မိုးရေများမှာ အနီးဆုံးရှိ ရေနွှတ်မြောင်းအတွင်းသို့ စီးဝင်ပါသည်။ စက်ရုံ၏ရေနွှတ်မြောင်းမှာ ရန်ကုန်စည်ပင်သာယာရေးကော်မတီ၏ ရေနွှတ်မြောင်းနှင့် ချိတ်ဆက်ထား ပါသည်။

### ၃.၅.၈. လေဝင်လေထွက်စနစ်

ကုန်ထုတ်လုပ်သည့်နေရာတွင် အလုပ်သမားများအတွက် ကောင်းမွန်သော လေဝင်လေထွက် စနစ်ကို တပ်ဆင်ထောက်ပံ့ ပေးထားပါသည်။ စံချိန်စံညွှန်းနှင့်ကိုက်ညီသော ပြတင်းပေါက် အကျယ်အဝန်း များ၊ အိတ်ဇောဖန်များနှင့် စံချိန်မီသော ခေါင်မိုးအမြင့်များကို စက်ရုံရှိ အလုပ်သမားများ အတွက် ထောက်ပံ့ပေးထားပါသည်။ စက်ရုံ၏ လက်ရှိလေဝင်လေထွက်စနစ်ဆိုင်ရာ အခြေအနေများကို ပုံ ၁၁ တွင် ဖော်ပြထားပါသည်။



ပုံ ၁၁ စက်ရုံ၏ လေဝင်လေထွက်စနစ်

## ၃.၅.၉. မီးသတ်စနစ်

မီးငြိမ်းသတ်ရန်အတွက် အလိုအလျောက် ရေဖြန်းစနစ်ကို စက်ရုံ၏ နှစ်ထပ်အဆောက်အဦတွင် တပ်ဆင်ထားပါသည်။ အရေးပေါ်အခြေအနေတွင် မီးဘေးအန္တရာယ်ကာကွယ်ရန်အတွက် စက်ရုံမှ လုံလောက်သော မီးသတ်ကိရိယာများကို ထောက်ပံ့ပေးထားပါသည်။ မီးသတ်ကိရိယာများ စာရင်းကို ဇယား ၇ တွင် ဖော်ပြထားပါသည်။

### ဇယား ၇ မီးသတ်ကိရိယာများစာရင်း

စဉ်	ကိရိယာအမျိုးအစား	ပမာဏ
၁။	မီးသတ်ဗူး	၁၃
၂။	မီးသတ်ပိုက်ခွေ	၆
၃။	မီးအချက်ပေး	၂
၄။	မီးသတ်ပိုက်	၂

## ၃.၅.၁၀. စွန့်ပစ်အမှိုက်

PE ဖလင်ပိတ်စများ ဖြတ်တောက်ခြင်းမှ ထွက်ရှိလာသော အပိုင်းအစများနှင့် နှစ်ဖက်တိပ်မှ ထွက်ရှိလာသော စွန့်ပစ်အမှိုက်များမှာ စက်ရုံမှထွက်သော အဓိက စွန့်ပစ်အမှိုက်များဖြစ်ပါသည်။ စွန့်ပစ်အမှိုက် ထွက်ရှိမှုနှုန်းမှာ ပျမ်းမျှအားဖြင့် တစ်ရက်လျှင် ၂၅ ကီလိုဂရမ်ခန့်ထွက်ရှိနိုင်ပါသည်။ ပုံမှန်အားဖြင့် စက်ရုံ၏ ကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်မှ အန္တရာယ်ရှိသောစွန့်ပစ်အမှိုက်များ မထွက်ရှိနိုင်ပါ။ စက်ရုံ၏ အလုပ်သမားများထံမှ စွန့်ပစ်အမှိုက်အချို့သာ ထွက်ရှိနိုင်ပါသည်။ IGES (2016)<sup>2</sup> အရ လူတစ်ယောက်၏ ပျမ်းမျှတစ်ရက် အမှိုက်ထွက်ရှိနိုင်မှုမှာ ၀.၄ ကီလိုဂရမ် ဖြစ်ပါသည်။ လုပ်ငန်းလည်ပတ်စဉ်ကာလတွင် ဝန်ထမ်း ၁၈၁ ယောက်ထံမှ ထွက်ရှိနိုင်သော စွန့်ပစ်အမှိုက်ပမာဏမှာ တစ်ရက်လျှင် ၈၀ ကီလိုဂရမ်ခန့် ထွက်ရှိနိုင်ပါသည်။

### ၄. ပတ်ဝန်းကျင်ဆိုင်ရာအခြေခံအချက်အလက်များ

စီမံကိန်းလုပ်ငန်းအတွက် လေ့လာသည့် ဧရိယာအတွင်းတွင် သဘာဝပတ်ဝန်းကျင်၊ လူမှုစီးပွားပတ်ဝန်းကျင်၊ ပတ်ဝန်းကျင်အရည်အသွေးတိုင်းတာမှုနှင့် ဇီဝဗေဒဆိုင်ရာလေ့လာမှုများ စသည့် ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များကို တိုင်းတာခဲ့ပြီး အနှစ်ချုပ်ကို ဇယား ၈ တွင်ဖော်ပြထားပါသည်။

<sup>2</sup> IGES (June, 2016), Quick Study On Waste Management in Myanmar

**ဇယား ၈ ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များ ကောက်ယူခြင်း အနှစ်ချုပ်ဇယား**

စဉ်	အမျိုးအစား	အကြောင်းအရာ
သဘာဝပတ်ဝန်းကျင်		
၁။	ရာသီဥတု	ဤအချက်အလက်များကို ဒဂုံမြို့သစ် (အရှေ့ပိုင်း)မြို့နယ် အထွေထွေ အုပ်ချုပ်ရေးမှူးရုံးမှ ရယူခဲ့ပါသည်။ ၂၀၂၀ တစ်နှစ်လုံးတွင် မြို့နယ်၏ ပျမ်းမျှအမြင့်ဆုံးအပူချိန်မှာ ၃၆ ဒီဂရီစင်တီဂရိတ် နှင့် ပျမ်းမျှအနိမ့်ဆုံး အပူချိန်မှာ ၂၂ ဒီဂရီစင်တီဂရိတ် ရှိပါသည်။  မိုးလေဝသနှင့် ဇလဗေဒ ညွှန်ကြားမှုဦးစီးဌာနမှ ၂၀၂၀ ခုနှစ် စာရင်းများအရ ပျမ်းမျှစိုထိုင်းဆမှာ ၈၈၂ မီမီ နှင့် ဆောင်းရာသီများတွင် ၈၈ ရာခိုင်နှုန်း၊ ဇူလိုင်လနှင့် ၈၇ ရာခိုင်နှုန်း စသည်ဖြင့် အသီးသီးရှိပါသည်။ စီမံကိန်း မြို့နယ်၏ ပျမ်းမျှ အမြင့်ဆုံး အပူချိန်မှာ ၃၇ ဒီဂရီစင်တီဂရိတ်၊ မိုးရာသီတွင် ၃၁ ဒီဂရီစင်တီဂရိတ် နှင့် ဆောင်းရာသီတွင် ၃၃ ဒီဂရီစင်တီဂရိတ် တို့ဖြစ်ပါသည်။ ထို့အပြင် တစ်နှစ်လျှင် စုစုပေါင်း မိုးရေချိန် ၉၄.၂၅ လက်မခန့် ရှိပါသည်။
၂။	မြေမျက်နှာသွင်ပြင်	ဒဂုံမြို့သစ် (အရှေ့ပိုင်း) မြို့နယ်အတွင်း မြောက်မှ တောင်သို့ စီးဆင်းနေသော ငမိုးရိပ်ချောင်း ရှိနေခြင်းကြောင့် ရေနက်ပိုင်းနေရာများတွင် တစ်ခါတစ်ရံ ရေလွှမ်းလေ့ရှိပါသည်။ ရေနက်ကွင်းများနှင့် လယ်မြေများသည် ယခင်က လေ့လာသည့်ဧရိယာအတွင်းတွင် တည်ရှိသော်လည်း အခြေချနေထိုင်မှု ဖွံ့ဖြိုးတိုးတက်ရန်အတွက် မြေပြန့်ဒေသအဖြစ် ပြောင်းလဲခဲ့ပါသည်။ မြေမျက်နှာသွင်ပြင် မြေပုံအရ စီမံကိန်းဧရိယာ၏ ပင်လယ်ရေမျက်နှာပြင် အမြင့်မှာ ၀ မှ ၁၀ မီတာ ကြားတွင် ရှိပါသည်။
၃။	ဘူမိဗေဒ, မြေဆီလွှာနှင့် ငလျင်	စီမံကိန်းဧရိယာသည် ရန်ကုန်တိုင်းဒေသကြီး၊ ဒဂုံမြို့သစ် (အရှေ့ပိုင်း) မြို့နယ်အတွင်းတွင် တည်ရှိပြီး ပလစ်တိုဆင်းအဏုယုဂ် မှ သက်နု (Pleistocene to recent) သက်တမ်းရှိ အနည်ကျ နုန်းကျောက်လွှာ၊ ပလိုင်းယိုဆင်း အဏုယုဂ် (Pliocene) သက်တမ်းရှိ သည့် ဧရာဝတီ ကျောက်လွှာ၏ မြစ်ချောင်းမှပို့ချသော အနည်ကျ ကျောက်များ နှင့် အစောပိုင်းမှ နှောင်းပိုင်း မိုင်ယိုဆင်း အဏုယုဂ် (Early-late Miocene) သက်တမ်းရှိသည့် ပဲခူးကျောက်စဉ်တန်း၏ မာကျောပြီး ထူထည်လိုက် ပေါ်ထွက် နေသော သဲကျောက်များအပေါ်တွင် တည်ရှိနေသည်။ ဧရာဝတီမြစ် ၏ တိုက်စားခံရသော မျက်နှာပြင်ပေါ်တွင် ကျောက်စရစ်ခဲများ၊ ရွှံ့နုန်းများ၊ သဲများ နှင့် ဂဝံကျောက်များဖြင့် ဖွဲ့စည်းထားပြီး ပင်လယ်ရေ မျက်နှာပြင် အထက် ၃ မှ ၄.၆ မီတာ တွင် တည်ရှိသည်။  မြေအမျိုးအစားမှာ လယ်မြေနှင့် နံ့ပေါက်လယ်မြေ မြေဆီလွှာဖြစ်ပါသည်။ မြစ်ကမ်းအနီးတွင် ရံဖန်ရံခါ ဒီရေလွှမ်းမိုးမှုရှိသော အပင်များသည် ကာဗွန်နိတ် မဟုတ်သော အပင်များ ဖြစ်သည်။ ၎င်းတို့တွင် ဆား အမြောက်အများ ပါဝင်တတ်သည်။ နံ့ပေါက်လယ်မြေ များကို ရေလွှမ်းလွင့်ပြင်များတွင် တွေ့ရှိနိုင်သည်။ ၎င်းတို့သည် သဲဆန်သောရွှံ့ မြေသားရှိပြီး အပင်အာဟာရ များ ကြွယ်ဝပါသည်။



စဉ်	အမျိုးအစား	အကြောင်းအရာ
		<p>ငလျင်စနစ်မြေပုံအရ ရန်ကုန်မြို့သည် အားကောင်းပြီး အလယ်အလတ်စနစ်တွင် တည်ရှိသည်။ ထို့ကြောင့် ငလျင်ဒဏ်ခံနိုင်သော ဒီဇိုင်းကို ဆောက်လုပ်သင့်သည်။</p> <p>ထို့အပြင် စနစ်တကျ မြေသားပြုပြင်ထိန်းသိမ်းခြင်း လုပ်ငန်းများကို ရေးဆွဲထားသင့်သည်။ ငလျင်မှတ်တမ်းများကို အခြေခံ၍ ရန်ကုန်မြို့သည် ငလျင်ဒဏ်ခံနိုင်မှု အနည်းဆုံးမှ အလယ်အလတ်တွင်ရှိသည်ဟု ယူဆနိုင်သည်။</p>
၄။	လေဗေဒ	<p>စီမံကိန်းဧရိယာသည် ဒဂုံမြို့သစ် (အရှေ့ပိုင်း) မြို့နယ်တွင် တည်ရှိပြီး မြစ်များနှင့် ချောင်းများ အနည်းငယ် ရှိပါသည်။ စီမံကိန်းဧရိယာအနီးရှိ ချောင်းမှာ ငမိုးရိပ်ချောင်းဖြစ်ပြီး စီမံကိန်း၏အရှေ့ဘက် ၃.၆ ကီလိုမီတာခန့် တွင် တည်ရှိပါသည်။</p>
<b>လူမှုစီးပွားဆိုင်ရာ ပတ်ဝန်းကျင်</b>		
၅။	မြေအသုံးပြုမှု	<p>မြေအသုံးချမှုကို စီမံကိန်းပတ်လည် ၅၀၀ မီတာ အတွင်းတွင် လေ့လာခဲ့ပါသည်။ ၎င်းကို မြေအသုံးချမှု အမျိုးအစား ၈ မျိုး ဖြင့် လေ့လာ တွေ့ရှိရပါသည်။ လေ့လာတွေ့ရှိချက်အရ စက်မှုဇုန်ဧရိယာသည် စီမံကိန်းပတ်လည် ၅၀၀ မီတာ အတွင်းတွင် အကြီးဆုံးအပိုင်းဖြစ်ပြီး ရေထုထည် ဧရိယာသည် အသေးဆုံးအပိုင်း ဖြစ်သည်။</p>
၆။	လူဦးရေနှင့် အသက်အုပ်စု	<p>စီမံကိန်းတည်ရှိရာ ဒဂုံမြို့သစ် (အရှေ့ပိုင်း) မြို့နယ်တွင် ရပ်ကွက် ၆၃ ခု နှင့် အိမ်ခြေ ၃၇,၁၂၃ ကျော် ရှိပြီး လူဦးရေ စုစုပေါင်းမှာ ၁၈၂,၀၈၁ ဦး ရှိပါသည်။</p> <p>အမျိုးသမီးဦးရေသည် အသက် ၁၈ နှစ် အောက်နှင့် အထက် အားလုံးတွင် အနည်းငယ် များသည်ကို တွေ့ရှိရပါသည်။ တွေ့ရှိချက်များ အရ လေ့လာသည့် ဧရိယာတွင် ကျားမ အချိုးသည် ၁ : ၁.၁၂ ရှိပါသည်။</p>
၇။	လူမျိုးများနှင့် ကိုးကွယ်မှု	<p>စီမံကိန်းဧရိယာတွင် ဗမာလူမျိုးများ (၁၇၁,၁၃၆ ဦး) အဓိကနေထိုင်ကြပြီး ရခိုင်လူမျိုးများကို ဒုတိယအများဆုံး (၃,၁၂၁ ဦး) အဖြစ် တွေ့ရှိသည်။ ကရင်လူမျိုးသည် အခြားလူမျိုးများထက် အနည်းငယ်ပိုများပြီး ၂,၂၀၈ ဦး အထိ ရှိပါသည်။</p> <p>စီမံကိန်းဧရိယာတွင် လူဦးရေအများဆုံး ကိုးကွယ်သော ဘာသာမှာ ဗုဒ္ဓဘာသာ ဖြစ်ပြီး ကျန်သော လူများမှာ ခရစ်ယာန်၊ ဟိန္ဒူ နှင့် မူဆလင် ဘာသာကို ကိုးကွယ် ကြပါသည်။</p>
၈။	ပညာရေး	<p>စီမံကိန်းမြို့နယ်များတွင် ပညာရေးကျောင်းများ များစွာရှိပြီး ဘုန်းတော်ကြီး သင်ပညာရေးကျောင်း ၁၁ ကျောင်း၊ မူလတန်းကျောင်း ၁၆ ကျောင်း၊ မူလတန်းလွန်ကျောင်း ၇ ကျောင်း၊ အလယ်တန်းကျောင်း ၃ ကျောင်း နှင့် အထက်တန်းကျောင်း ၅ ကျောင်း ရှိပါသည်။</p>
၉။	အသက်မွေးမှု (အလုပ်အကိုင်၊ ဝင်ငွေ၊ ကျန်းမာရေး)	<p>ဒေသခံပြည်သူများသည် ကုန်သွယ်ရေး၊ စက်မှုလက်မှုလုပ်ငန်း၊ စိုက်ပျိုးရေး၊ ဝန်ဆောင်မှုလုပ်ငန်း စသည်ဖြင့် လုပ်ကိုင်ကြပါသည်။ စီမံကိန်းမြို့နယ်သည် စက်မှုဇုန်အတွင်းရှိသောကြောင့် ပြည်သူများသည် လူသုံးများသည့် လူသုံးကုန် ပစ္စည်းများ၊ အဝတ်အထည်နှင့် အစားအစာများကိုတင်ပို့ခြင်း နှင့် တင်သွင်း</p>

စဉ်	အမျိုးအစား	အကြောင်းအရာ
	အခြေခံအဆောက်အအုံ နှင့် လျှပ်စစ် အသုံးပြုမှု)	ခြင်း လုပ်ငန်းများဖြင့် အဓိက အသက်မွေးဝမ်းကျောင်း ပြုကြပါသည်။ မြို့နယ်တွင် လုပ်သားအင်အားမှာ အရေအတွက်မှာ ၁၃၄,၀၈၀ ဦး ရှိပြီး လုပ်ငန်းခွင်တွင် အလုပ်သမား အရေအတွက်မှာ ၁၂၈,၉၀၀ ဦး ရှိသည်။ ထို့ကြောင့် အလုပ်လက်မဲ့နှုန်းမှာ ၃.၈၆ ရာခိုင်နှုန်းသာ ရှိပါသည်။ စီမံကိန်းဧရိယာတွင် တိဘီရောဂါဖြစ်ပွားမှုအများဆုံးဖြစ်ပြီး HIV/AIDS ရောဂါ ဖြစ်ပွားမှုသည် ဒုတိယအများဆုံး ဖြစ်ပါသည်။ ဝမ်းလျှောရောဂါကြောင့် သေဆုံးမှုနှုန်းသည် အနည်းဆုံးဖြစ်ပါသည်။ စီမံကိန်းမြို့နယ်များတွင် ဈေးများ၊ ကုန်စုံဆိုင်ကဲ့သို့အခြေခံ အဆောက်အအုံ များ ရှိပါသည်။ ထို့အပြင် လူမှုရေးအသင်းအဖွဲ့များ ကဲ့သို့သော လူမှု အဖွဲ့အစည်း များလည်း ရှိပါသည်။ ဘုန်းကြီးကျောင်း၊ သီလရှင်ကျောင်း နှင့် ဓမ္မာရုံကဲ့သို့ သာသနာ့နယ်မြေများစွာကိုလည်း တွေ့ရှိပါသည်။ ရန်ကုန်တိုင်းဒေသကြီး ဒဂုံမြို့သစ် အရှေ့ပိုင်းမြို့နယ်တွင် ၂၅.၂၈၂ ဧက ကျယ်ဝန်းသော ပင်မဓာတ်အားခွဲရုံ ရှိပါသည်။ ၆၆ ကီလိုဗို့ ဓာတ်အားလိုင်းဖြင့် စီမံကိန်းအတွက် လေ့လာသည့် ဧရိယာသို့ ဖြန့်ဝေပေးပါသည်။
၁၀။	သယ်ယူပို့ဆောင်ရေး	လမ်းမကြီး ၅ လမ်းနှင့် တံတား ၂ ခု တို့ရှိပြီး မြို့နယ် တစ်ခုမှ အခြားမြို့နယ် များသို့ လွယ်ကူစွာ သွားလာနိုင်ပါသည်။ လေ့လာသည့်ဧရိယာ အတွင်းတွင် အရှည် ၅ မိုင် ရှိသော တိုးကြောင်းကလေး မှ ဒဂုံတက္ကသိုလ် အထိ ရထားလမ်း ရှိပါသည်။ ထို့အပြင် သယ်ယူပို့ဆောင်ရေးကားလိုင်း အမျိုးအစား ၁၇ မျိုးရှိပြီး မော်တော်ကား ၈၅၆ စီးခန့် ဖြင့် အခြားမြို့နယ်များသို့ သွားလာနိုင်ပါသည်။
<b>ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအရည်အသွေး တိုင်းတာမှု</b>		
၁၁။	လေထုအရည်အသွေး	ကာဗွန်ဒိုင်အောက်ဆိုဒ်၊ ကာဗွန်မိုနောက်ဆိုဒ်၊ မီသိန်း၊ နိုက်ထရိုဂျင်ဒိုင် အောက်ဆိုဒ်၊ အိုဇုန်း၊ လေထုထဲရှိအမှုန်အမွှားများ၊ ဆာလဖာဒိုင်အောက်ဆိုဒ်၊ အငွေ့ပြန်လွယ်သော အော်ဂဲနစ် ခြပ်ပေါင်းများ ၊ စိုထိုင်းစ နှင့် အပူချိန် ကဲ့သို့သော လေထုအရည်အသွေးများကို အဆိုပြုစီမံကိန်းဧရိယာ အတွင်းတွင် တိုင်းတာခဲ့ ပါသည်။ AQM-09 ဖြင့် တိုင်းတာရရှိခဲ့သော လေထုအရည်အသွေးရလဒ်များကို အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး(ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် များ (၂၀၁၅) နှင့် နှိုင်းယှဉ်ခဲ့ပြီး လေထု အရည်အသွေးရလဒ်များအားလုံးမှာ အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် များ (၂၀၁၅) အတွင်းတွင် ရှိပါသည်။
၁၂။	လေတိုက်နှုန်းနှင့် လေတိုက်ရာအရပ်	ကွင်းဆင်းလေ့လာချက်များအရ စီမံကိန်းဧရိယာ အနီးတွင် လူနေဧရိယာမရှိ သော်လည်း လေတိုက်နှုန်းမှာ တစ်စက္ကန့်လျှင် ၁.၂ မီတာ ဝန်းကျင် ရှိပြီး အနောက်တောင် အရပ်မှ (၂၂၈ ဒီဂရီလားရာ) တိုက်ခတ်ပါသည်။
၁၃။	ရေအရည်အသွေး	ရေအရည်အသွေး စောင့်ကြည့်ခြင်းနှင့် ပတ်သက်၍ အဆိုပြုစီမံကိန်း စက်ရုံ၏ ဝန်ထမ်းသုံး ဘေစင်မှ ထွက်ရှိသော စွန့်ပစ်ရေများမှ ရေနမူနာများကို ကောက်ယူ ပါသည်။

စဉ်	အမျိုးအစား	အကြောင်းအရာ
		စွန့်ပစ်ရေနမူနာရလဒ်များအရ စက်ရုံနှင့် ဓာတ်ခွဲခန်းစမ်းသပ်မှုရလဒ် နှစ်ခုလုံးအတွက် စွန့်ပစ်ရေအရည်အသွေးရလဒ်များ အားလုံးသည် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေးထုတ်လွှတ်မှု လမ်းညွှန်ချက် (၂၀၁၅) အတွင်းတွင်ရှိပါသည်။
၁၄။	ဆူညံသံ	ဆူညံသံကို စီမံကိန်းဧရိယာ အတွင်းတွင် တိုင်းတာခဲ့ပါသည်။ ရလဒ်များကို စက်မှုနှင့်ဆိုင်ရာ (သို့မဟုတ်) စီးပွားရေးဆိုင်ရာ ဆူညံသံအဆင့်၏ အမျိုးသားပတ်ဝန်းကျင် ဆိုင်ရာ အရည်အသွေးထုတ်လွှတ်မှု လမ်းညွှန်ချက် (၂၀၁၅) နှင့် နှိုင်းယှဉ် ထားပါသည်။ တိုင်းတာချက်များအရ နေအချိန်နှင့် ညအချိန်အတွက် ပျမ်းမျှ ဆူညံသံအဆင့် နှစ်ခုလုံး၏ရလဒ်များမှာ လမ်းညွှန်ချက် အတွင်းတွင် ရှိနေပါသည်။
၁၅။	တုန်ခါမှု	စီမံကိန်းဧရိယာအတွင်းတွင် တုန်ခါမှုကို တိုင်းတာခဲ့ပါသည်။ ရလဒ်များကို ဂျာမန် တုန်ခါမှု စံသတ်မှတ်ချက် DIN 4150-3 နှင့် နှိုင်းယှဉ်ထားပါသည်။ ကွင်းဆင်း တိုင်းတာချက်များအရ နေရာအားလုံးရှိ အရည်အသွေးရလဒ်များမှာ စံသတ်မှတ်ချက်အတွင်းတွင် ရှိပါသည်။
၁၆။	အလင်းရောင်	အလင်းရောင်တိုင်းတာမှုကို စီမံကိန်းဧရိယာတွင် ကိုး နေရာခွဲ၍ တိုင်းတာခဲ့ပါသည်။ ရလဒ်များကို လုပ်ငန်းဆောင်ရွက်မှုများအပေါ်တွင် အခြေခံ၍ နိုင်ငံတကာဘဏ္ဍာရေးကော်ပိုရေးရှင်း (IFC) ၏ ပတ်ဝန်းကျင် ဆိုင်ရာ ကျန်းမာရေးနှင့် ဘေးကင်းလုံခြုံမှု (EHS) လမ်းညွှန်ချက်များ နှင့် နှိုင်းယှဉ်ထားပါသည်။ ကွင်းဆင်းတိုင်းတာချက်များအရ အလင်းတိုင်းတာသည့်နေရာများမှ အလင်းရလဒ်အများစုမှာ လမ်းညွှန်ချက်နှင့် ကိုက်ညီရန် လိုအပ်နေသည်ကို တွေ့ရပါသည်။
၁၇။	အပူချိန်	အပူချိန်တိုင်းတာမှုကို စီမံကိန်းဧရိယာတွင် အလင်းရောင်တိုင်းတာမှုနေရာများအတိုင်း ကိုး နေရာခွဲ၍ တိုင်းတာ ခဲ့ပါသည်။ ရလဒ်များကို နိုင်ငံတကာဘဏ္ဍာရေး ကော်ပိုရေးရှင်း လမ်းညွှန်ချက် များ နှင့် နှိုင်းယှဉ်ထားပါသည်။ လေ့လာချက်များအရ ရလဒ်အားလုံးသည် နိုင်ငံတကာဘဏ္ဍာရေး ကော်ပိုရေးရှင်း လမ်းညွှန်ချက်များထက် ကျော်လွန်နေသည်ကို တွေ့ရ ပါသည်။ အဓိက ဖြစ်နိုင်ချေရှိသော အကြောင်းအရင်းမှာ ၂၀၂၂ ခုနှစ် ဧပြီလ အတွင်း ရန်ကုန်မြို့တွင် အပူချိန် ၄၃ ဒီဂရီ စင်တီဂရိတ်ဝန်းကျင်ထိ သိသိသာသာ တိုးလာခြင်းကြောင့် ဖြစ်နိုင်ပါသည်။
၁၈။	ယာဉ်သွားလာမှု ကောက်ယူခြင်း	ယာဉ်သွားလာမှုများကို လေ့လာသည့် ဧရိယာ၌ နှစ်နေရာ ကောက်ယူခဲ့ပါသည်။ ယာဉ်အသွားအလာစစ်တမ်းများအရ ရလဒ်များမှာ TC-A နှင့် TC-B နှစ်နေရာလုံးတွင် ပုံမှန်ယာဉ်သွားလာမှုအခြေအနေ (A) တွင်ရှိပါသည်။

## ၅. ဖြစ်နိုင်ချေရှိသော ပတ်ဝန်းကျင်အပေါ်အကျိုးသက်ရောက်နိုင်မှုနှင့်ထိခိုက်မှုလျော့ချရေးအစီအစဉ်များ

### ၅.၁. အန္တရာယ်ရှိသောထိခိုက်မှုဆန်းစစ်ခြင်း

အမျိုးသား သဘာဝပတ်ဝန်းကျင်မူဝါဒ (၁၉၆၉) အရ ဖြစ်နိုင်ခြေရှိသော ပတ်ဝန်းကျင်ထိခိုက်မှု အန္တရာယ်ကို ဆန်းစစ်လေ့လာရာတွင် ယေဘုယျအားဖြင့် အဆိုပြုထားသော စီမံကိန်း၏ ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားအပေါ်အခြေခံ၍ ဆန်းစစ်တွက်ချက်ရပါမည်။ အဆိုပါလေ့လာဆန်းစစ်မှုတွင် ကာလတို၊ ကာလရှည် ဖြစ်နိုင်ချေရှိသော လေထုညစ်ညမ်းမှု၊ ရေထုညစ်ညမ်းမှုနှင့် အသံဆူညံမှု စသော အချက်များ၊ ဒေသခံပြည်သူများအပေါ် သက်ရောက်မှု၊ အသက်ရှင်နေထိုင်မှုနှင့် ကျန်းမာရေး စံချိန်စံညွှန်း များအပြင် အခြားသောစိတ်ပိုင်းဆိုင်ရာအပေါ် သက်ရောက်မှုအချက်အလက်များ ပါဝင်ပါသည်။

စီမံကိန်းဖော်ဆောင်မှုများကြောင့် သဘာဝပတ်ဝန်းကျင်အပေါ် ကောင်းကျိုးသက်ရောက်မှုနှင့် ဆိုးကျိုး သက်ရောက်မှုများတွက်ချက်ရာတွင် ရုပ်ပိုင်းဆိုင်ရာ၊ လူမှုစီးပွား၊ ဇီဝမျိုးစုံမျိုးကွဲ၊ ကျန်းမာရေး စသည်တို့အပေါ်အခြေခံပါသည်။

#### ၅.၁.၁. သိသာသောသက်ရောက်မှုအကဲဖြတ်ခြင်း

စီမံကိန်းကြောင့် ဖြစ်ပေါ်လာသော ပတ်ဝန်းကျင်ဆိုင်ရာ သိသာသော ဆိုးကျိုး သို့မဟုတ် ကောင်းကျိုး သက်ရောက်မှုများကို ဖြစ်ပွားမှုနှင့် ပြင်းထန်မှုစသည့် အဆင့်သတ်မှတ်ချက် အတိုင်းအတာကို အသုံးပြုခြင်းအားဖြင့် ခွဲခြားထားပါသည်။ ဖြစ်ပွားမှုတွင် ဖြစ်နိုင်ခြေနှင့် ကြာချိန်တို့ ပါဝင်ပြီး ပြင်းထန်မှုမှာ သက်ရောက်မည့် ပြင်းအားပမာဏနှင့် သက်ရောက်မည့်နေရာ အတိုင်းအတာကို ဆိုလိုပါသည်။ ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှုတစ်ခုချင်းစီကို အကဲဖြတ်ရာတွင်အသုံးပြုရန် အဆင့်သတ်မှတ်ချက်များ ကို ဇယား ၉ တွင် ဖော်ပြထားပါသည်။

**ဇယား ၉ အန္တရာယ်ထိခိုက်နိုင်မှုဆန်းစစ်တွက်ထုတ်ခြင်း**

ဖြစ်နိုင်ခြေ	အချိန်ကာလ
ဖြစ်နိုင်ခြေအလွန်နည်းပါး ဖြစ်နိုင်ခြေအနည်းငယ် ဖြစ်နိုင်ခြေရှိ အသင့်အတင့် ဖြစ်နိုင်ခြေရှိ အလွန်များ ဖြစ်ရန်သေချာ	အလွန်တိုတောင်းသောအချိန်ကာလ(၁နှစ်အတွင်း) တိုတောင်းသောအချိန်ကာလ (၂-၅ နှစ်အတွင်း) အလယ်အလတ်အချိန်ကာလ(၆-၁၅နှစ်အတွင်း) အချိန်ကာလကြာမြင့်စွာ (၁၅ နှစ်) အစဉ်အမြဲ
သက်ရောက်မှု ပမာဏ	သက်ရောက်နိုင်မည့် နေရာ
ပတ်ဝန်းကျင်အပေါ် သိသာသောထိခိုက်မှုမရှိ ပတ်ဝန်းကျင်အပေါ် ထိခိုက်မှုအနည်းငယ်ရှိ ပတ်ဝန်းကျင်အပေါ် ထိခိုက်မှု အသင့်အတင့် ရှိ ပတ်ဝန်းကျင်အပေါ် ဆိုးရွားစွာ ထိခိုက်မှုရှိ ပတ်ဝန်းကျင်အပေါ် ရှေ့ညှင်အလွန်ဆိုးရွားစွာ ထိခိုက်မှုရှိ	စီမံကိန်းဧရိယာအတွင်းသက်ရောက်မှု စီမံကိန်းအနီးဒေသခံပြည်သူအဆင့် သက်ရောက်မှု ဒေသတွင်းသက်ရောက်မှု နိုင်ငံအဆင့်သက်ရောက်မှု 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 အဆင့် ၄ ဆင့်ဖြင့် ခွဲခြားနိုင်သည်။ ဖြစ်နိုင်ချေရှိသော ပတ်ဝန်းကျင် ထိခိုက်မှု အဆင့်များကို ဇယား ၁၀ တွင် တွေ့နိုင်ပါသည်။ တည်ဆောက်ချိန်၊ ပိတ်သိမ်းချိန် နှင့် လုပ်ငန်းဆောင်ရွက်စဉ်ကာလများတွင် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု ဖြစ်နိုင်ခြေများအား ဆန်းစစ်ခန့်မှန်းခြင်းများကို ဇယား ၁၁ နှင့် ဇယား ၁၂ တွင် ဖော်ပြထားပါသည်။

**ဇယား ၁၀ ဖြစ်နိုင်ခြေ ရှိသော ပတ်ဝန်းကျင်ထိခိုက်မှု အဆင့်**

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

**ဇယား ၁၁ တည်ဆောက်ချိန်နှင့် ပိတ်သိမ်းချိန်ကာလတွင် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်အပေါ်ထိခိုက်မှု ဖြစ်နိုင်ခြေများအားဆန်းစစ်ခန့်မှန်းခြင်း**

ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှု	သက်ရောက်နိုင်သောအရင်းအမြစ်	စောင့်ကြည့်ရမည့် အချက်များ	ပမာဏ	နယ်ပယ်အတိုင်း အတာ	အချိန်ကာလ	ဖြစ်နိုင်ခြေ	အရင်းအမြစ်	အကဲဖြတ်မှုရလဒ်
<b>ဖြစ်နိုင်ခြေရှိသော ဆိုးကျိုးသက်ရောက်မှု</b>								
လေထုအရည်အသွေး	စီမံကိန်းတည်ဆောက်ခြင်းနှင့် ပိတ်သိမ်းခြင်း လုပ်ငန်းများ၊ ဒီဇယ်မီးစက်များ၊ စက်ယန္တရားတပ်မော်တော်ယာဉ်များ မောင်းနှင်မှု။	PM <sub>10</sub> , PM <sub>2.5</sub> , CO, NO <sub>2</sub> , O <sub>3</sub> , SO <sub>2</sub>	၂	၁	၁	၃	၁၂	ထိခိုက်မှုမရှိ
ဆူညံသံနှင့် တုန်ခါမှု	အရေးပေါ် ဒီဇယ်မီးစက် အသုံးပြုမှု၊ တည်ဆောက်ခြင်းဆိုင်ရာ ကိရိယာများ အသုံးပြုမှုနှင့် ဝန်ချိစက်၊ မော်တော်ယာဉ် များ သုံးစွဲမှု	ဆူညံသံနှင့် တုန်ခါမှု	၂	၁	၁	၃	၁၂	ထိခိုက်မှုမရှိ
ရေထုအရည်အသွေး	မြေပေါ်ရေစီးဆင်းခြင်းနှင့် အိမ်သုံးစွန့်ပစ်ရေ	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorous, Total Suspended Solids	၂	၁	၁	၃	၁၂	ထိခိုက်မှုမရှိ
မြေထုအရည်အသွေး	တည်ဆောက်မှုလုပ်ငန်း	လောင်စာဆီ၊ ရေနံနှင့် အခြားအညစ်အ ကြေးများ ယိုစိမ့်မှု	၃	၁	၁	၃	၁၂	ထိခိုက်မှုမရှိ
စွန့်ပစ်အစိုင်အခဲ	တည်ဆောက်မှုလုပ်ငန်းနှင့် အလုပ်သမားများမှ စွန့်ပစ်အစိုင်အခဲ	အညစ်အကြေးစွန့်ပစ်ပစ္စည်းများနှင့် အိမ်သုံးစွန့်ပစ်ပစ္စည်းများ	၃	၁	၁	၃	၁၂	ထိခိုက်မှုမရှိ

ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှု	သက်ရောက်နိုင်သောအရင်းအမြစ်	စောင့်ကြည့်ရမည့် အချက်များ	ပမာဏ	နယ်ပယ်အတိုင်း အတော	အချိန်ကာလ	ဖြစ်နိုင်ခြေ	အရင်းအမြစ်	အကဲဖြတ်မှုရလဒ်
မြေအသုံးချမှု	ဆောက်လုပ်ရေး လုပ်ငန်းများ ဆောင်ရွက်ရန် အပေါ်ယံ မြေဆီလွှာများ ဖယ်ရှားခြင်း နှင့် အဆောက်အဦများ ဆောက်လုပ်ခြင်း။	မြေအသုံးချမှုပြောင်းလဲခြင်း	၂	၁	၄	၃	၂၁	အနည်းငယ်
ဂေဟစနစ်	တည်ဆောက်မှုလုပ်ငန်း	အပင်နှင့် သတ္တဝါ	၂	၁	၄	၃	၂၁	အနည်းငယ်
ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းမှု	ဆောက်လုပ်ရေးလုပ်သားများ၏ ပေါ့လျော့မှုနှင့် ကျွမ်းကျင်မှုမရှိသော လုပ်သားများကြောင့် မတော်တဆမှုများဖြစ်ပွားခြင်း။	AIDS/HIV, အသဲရောင်အသားဝါ ဘီ/စီ ကဲ့သို့သော ရောဂါဖြစ်ပွားမှုနှင့် အခြားရုပ်ပိုင်းဆိုင်ရာထိခိုက်မှု	၂	၁	၁	၃	၁၂	ထိခိုက်မှုမရှိ
ဖြစ်နိုင်ခြေရှိသော ကောင်းကျိုးသက်ရောက်မှု								
အလုပ်အကိုင်နှင့် အသက်မွေးဝမ်းကျောင်းမှု ကဲ့သို့သော ဒေသတွင်း စီးပွားရေး	တည်ဆောက်မှုလုပ်ငန်း၊ ကုန်ကြမ်းများနှင့် ကိရိယာများဝယ်ယူမှု	အလုပ်အကိုင်နှင့် စီးပွားရေးဆိုင်ရာ အခွင့်အလမ်းများ	၂	၂	၁	၃	၁၅	အနည်းငယ်



**ဇယား ၁၂ စီမံကိန်းလည်ပတ်ချိန်ကာလတွင် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်အပေါ်ထိခိုက်မှု ဖြစ်နိုင်ခြေများအား ဆန်းစစ်ခန့်မှန်းခြင်း**

ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှု	သက်ရောက်နိုင်သောအရင်းအမြစ်	စောင့်ကြည့်ရမည့် အချက်များ	ပမာဏ	နယ်ပယ်အတိုင်း အတာ	အချိန်ကာလ	ဖြစ်နိုင်ခြေ	အရင်းအမြစ်	အကဲဖြတ်မှုရလဒ်
ဖြစ်နိုင်ခြေရှိသော ဆိုးကျိုးသက်ရောက်မှု								
လေထုအရည်အသွေး	ဒီဇယ်မီးစက်နှင့် မော်တော်ယာဉ်အသုံးပြုမှု	PM10, PM2.5, SO2, NO2, CO, O3,	၂	၂	၂	၃	၁၈	အနည်းငယ်
ဆူညံသံနှင့် တုန်ခါမှု	သယ်ယူပို့ဆောင်ရေး မော်တော်ယာဉ်များ၊ အသံကျယ်သော စက်ကိရိယာများ နှင့် အရေးပေါ် ဒီဇယ်မီးစက် အသုံးပြုမှု	ဆူညံသံနှင့် တုန်ခါမှု	၂	၂	၂	၃	၁၈	အနည်းငယ်
ရေထုအရည်အသွေး	မသန့်စင်ရသေးသော စွန့်ပစ်ရေ စွန့်ထုတ်မှု	BOD, COD, Oil and Grease, Total Nitrogen (TN), Total Phosphorous (TP), Total Suspended Solids (TSS)	၂	၂	၂	၃	၁၈	အနည်းငယ်
မြေထုအရည်အသွေး	သယ်ယူပို့ဆောင်မှုများ	လောင်စာဆီ၊ ဆီ နှင့် အခြား အညစ်အကြေးများ ယိုစိမ့်မှု နှင့် ရေဆိုးစွန့်ပစ်မှု	၂	၂	၃	၃	၂၁	အနည်းငယ်
စွန့်ပစ်အစိုင်အခဲ	ရုံးခန်း နှင့် လုပ်ငန်းခွင် မှ စွန့်ပစ်အမှိုက်များ	စွန့်ပစ်အမှိုက်ပမာဏ နှင့် အမျိုးအစား	၂	၂	၂	၃	၁၈	အနည်းငယ်
အနံ့	ယာယီအမှိုက်စွန့်ပစ်သည့်နေရာ၊ ကုန်ကြမ်း ဖြတ်တောက်ခြင်း စသည့် လုပ်ငန်း	အနံ့	၂	၂	၂	၃	၁၈	အနည်းငယ်

ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှု	သက်ရောက်နိုင်သောအရင်းအမြစ်	စောင့်ကြည့်ရမည့် အချက်များ	ပမာဏ	နယ်ပယ်အတိုင်း အတာ	အချိန်ကာလ	ဖြစ်နိုင်ခြေ	အရင်းအမြစ်	အကဲဖြတ်မှုရလဒ်
	လည်ပတ်ခြင်း နှင့် ဆေးသုတ်ခြင်း ကဲ့သို့သော ပြုပြင်မွန်းမံခြင်းများ							
ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းမှု	အလုပ်သမားများ၏ ကျန်းမာရေး	COVID-19, AIDS/HIV နှင့် အသံရောင်အသားဝါ ဘီ/စီ ကဲ့သို့သော ရောဂါဖြစ်ပွားမှုနှင့် အခြားရုပ်ပိုင်းဆိုင်ရာ ထိခိုက်မှု	၂	၂	၂	၃	၁၈	အနည်းငယ်
ဂေဟစနစ်	စွန့်ပစ်ရေ နှင့် စွန့်ပစ်အစိုင်အခဲ	ရေနေဂေဟစနစ် နှင့် နေထိုင်မှု အပေါ်သက်ရောက်မှု	၂	၂	၃	၃	၂၁	ထိခိုက်မှုမရှိ
ဖြစ်နိုင်ခြေရှိသော ကောင်းကျိုးသက်ရောက်မှု								
အလုပ်အကိုင်နှင့် အသက်မွေးဝမ်းကျောင်းမှု ကဲ့သို့သော ဒေသတွင်း စီးပွားရေး	အလုပ်အကိုင် အခွင့်အလမ်းများ	အလုပ်အကိုင် နှင့် စီးပွားရေးဆိုင်ရာ အခွင့်အလမ်းများ	၃	၄	၂	၄	၃၂	အသင့်အတင့်

## ၆. အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း

### ၆.၁. အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း၏ ရည်ရွယ်ချက်များ

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အစီရင်ခံစာ၏ တစ်စိတ်တစ်ပိုင်းအနေဖြင့် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးမှုများ ပြုလုပ်ရန် လိုအပ်ပါသည်။ ထို့ကြောင့်စီမံကိန်းအဆိုပြုသူနှင့် ၎င်း၏အတိုင်ပင်ခံများသည် စီမံကိန်း ဖွံ့ဖြိုးတိုးတက်မှု အစီအစဉ်များနှင့် ပတ်သက်၍ တာဝန်ရှိသူများ၊ ဒေသခံပြည်သူများနှင့် အာဏာပိုင် အဖွဲ့အစည်းများကြားတွင် တိုင်ပင်ဆွေးနွေးပွဲများ ပြုလုပ်ခဲ့ပါသည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် လိုအပ်ချက်၏ တစ်စိတ်တစ်ပိုင်းအနေဖြင့် စီမံကိန်းအဆိုပြုသူသည် စီမံကိန်းဖွံ့ဖြိုးတိုးတက်မှုများအကြောင်း သက်ဆိုင်သူများအား အောက်ပါအတိုင်း တိုင်ပင်ဆွေးနွေး တင်ပြခဲ့ပါသည်။

၁။စီမံကိန်းနှင့် သက်ဆိုင်သော ဒေသခံပြည်သူများ၏ အချက်အလက်များ၊ လုပ်ငန်းဆောင်ရွက်ခြင်းနှင့် သက်ဆိုင်သော ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားဆိုင်ရာ သက်ရောက်မှုများ နှင့် ၎င်းတို့ကို လျော့နည်းသွားစေရန် လျော့ချရမည့်အချက်များ။

၂။ စီမံကိန်းလုပ်ငန်းကြောင့် ထိခိုက်နိုင်သည့် ဒေသခံပြည်သူများ၊ အဖွဲ့အစည်းများ နှင့် တစ်ဦးချင်းစီ၏ အမြင်များ၊ စိုးရိမ်မှုများနှင့် သဘောထားများကို ထည့်သွင်းစဉ်းစားခြင်းနှင့် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်အစီရင်ခံစာတွင် အသေးစိတ်ပြန်လည်ထည့်သွင်းမည်ဖြစ်ကြောင်း ပြောကြားခြင်း။

၃။ လိုအပ်သည့် ကိစ္စရပ်များအတွက် သက်ဆိုင်ရာ အစိုးရဌာနများ၏ ဆွေးနွေးခြင်း နှင့် အကဲဖြတ်ခြင်းဆိုင်ရာ အကြံပြုချက်များကို စနစ်တကျ လိုက်နာဆောင်ရွက်မည်ဖြစ်ကြောင်း ပြောကြားခြင်း။

ESung မြန်မာ၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အတွက် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးမှုများနှင့် သက်ဆိုင်သည့် အချက်အလက်များကို အခန်း (၆) အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း အခန်းတွင် အသေးစိတ် ဖော်ပြထားပါသည်။

## ၇။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်များ

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်ရေးဆွဲခြင်း၏ ရည်ရွယ်ချက်မှာ စီမံကိန်း အကောင်အထည် ဖော်ဆောင်မှုကြောင့် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှုများ နှင့် လျော့ချရေး အစီအစဉ်များကို လေ့လာသည့် အဓိကအခန်းကဏ္ဍ ဖြစ်ပါသည်။ လေ့လာမှုမှ တွေ့ရှိသော အကျိုးဆက် များကို ကောင်းကျိုး၊ ဆိုးကျိုးများ ခွဲခြားပြီး ကောင်းကျိုးများကို ပိုမိုကောင်းမွန်အောင် ဆောင်ရွက်ရန်နှင့် ဆိုးကျိုးများကို လျော့ချနိုင်ရန် အစီအစဉ်များ ရေးဆွဲခြင်းဖြစ်ပါသည်။

### Plan (P) - အစီအစဉ်ရေးဆွဲခြင်း

စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်အပေါ်ထိခိုက်မှု ဖြစ်စေနိုင်သော လေထုညစ်ညမ်းမှု၊ အသံ ဆူညံမှု၊ ရေဆိုးစွန့်ပစ်မှု၊ အမှိုက်စွန့်ပစ်မှု၊ ကျန်းမာရေး နှင့် ဘေးအန္တရာယ်ကင်းရှင်းမှု စသော ထိခိုက်မှု များ လျော့ပါးရေး အတွက် အချိန်ဇယား အစီအစဉ်များ ရေးဆွဲရပါမည်။

### Do (D) - အကောင်အထည်ဖော်ဆောင်ခြင်း

ပတ်ဝန်းကျင်ထိခိုက်မှု အတွက် ရေးဆွဲထားသော လျော့ချရေး အစီအစဉ်များကို စီမံကိန်းမှ တာဝန်ရှိသူများက အကောင်အထည်ဖော် ဆောင်ရွက်ပါမည်။

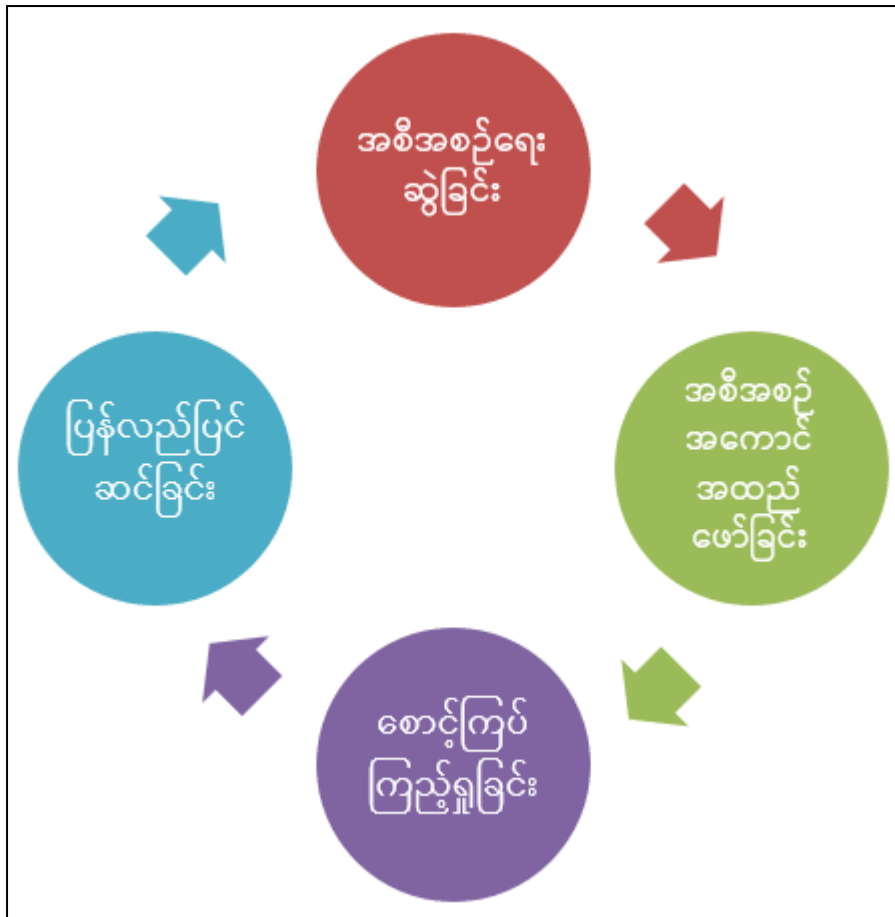
### Check (C) - စောင့်ကြပ်ကြည့်ရှုခြင်း နှင့် စစ်ဆေးခြင်း

လျော့ချရေးအစီအစဉ်များ အကျိုးသက်ရောက်မှု ရှိ၊ မရှိကို စောင့်ကြပ်ကြည့်ရှုခြင်း နှင့် စစ်ဆေးခြင်းများ ပြုလုပ်ရပါမည်။ စောင့်ကြည့်မှုအတွက် စီမံကိန်းဖော်ဆောင်သူ အပါအဝင် သက်ဆိုင်ရာ အနီးပတ်ဝန်းကျင်ရှိ ပုဂ္ဂိုလ်များ၊ အုပ်ချုပ်ရေးပိုင်းဆိုင်ရာ တာဝန်ရှိပုဂ္ဂိုလ်များ အစရှိသော သက်ဆိုင်ရာ အဖွဲ့အစည်းများ စုပေါင်း၍ လေ့လာစောင့်ကြည့်မှု ပြုလုပ်ရပါမည်။ ၎င်းစောင့်ကြည့်မှုကိုလည်း အစီရင်ခံစာ ပြုစုပြီး သက်ဆိုင်ရာ ဝန်ကြီးဌာနသို့ တင်ပြရမည်ဖြစ်သည်။

### Act (A) - ပြန်လည်ပြင်ဆင်ခြင်း

စောင့်ကြပ်ကြည့်ရှုခြင်း အစီအစဉ်တွင် လက်ရှိဖြစ်ပေါ်သော ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု များနှင့် ကိုက်ညီမှုမရှိခဲ့လျှင် လျော့ချရေး အစီအစဉ်များကို ပြန်လည်ပြင်ဆင်ခြင်းများ ပြုလုပ်ရပါမည်။

စီမံကိန်းလုပ်ငန်းများကြောင့် ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု မရှိစေရန် သက်ဆိုင်ရာ အာဏာပိုင် အဖွဲ့အစည်းများ၏ ချမှတ်ထားသော သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ဥပဒေ၊ စည်းမျဉ်းများ နှင့်အညီ သင့်လျော်သော လျော့ချရေးအစီအစဉ်များကို အကောင်အထည်ဖော် ဆောင်ရွက်ခြင်း ဖြစ်ပါသည်။ ထိုသို့ အကောင်အထည်ဖော် ဆောင်ရွက်ရာ၌ အောက်တွင် ဖော်ပြထားသော စက်ဝိုင်းပုံအတိုင်း စီမံခန့်ခွဲမှုအစီအစဉ် Plan-Do-Check-Act (P.D.C.A) အချက်လေးချက်ပေါ် မူတည်ပြီးပြုလုပ်ရပါမည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်ပြစက်ဝိုင်းကို ပုံ ၁၂ တွင်ဖော်ပြထားပါသည်။



## ပုံ ၁၂ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ပြစက်ဝိုင်း

### ၇.၁ ပတ်ဝန်းကျင် နှင့် လူမှုစီးပွားဆိုင်ရာ ထိခိုက်မှုများ

ဤအပိုင်းတွင် စီမံကိန်းလုပ်ငန်းများကြောင့် ဆက်စပ်ဖြစ်ပေါ်လာနိုင်သော ဆိုးကျိုးများကို စီမံခန့်ခွဲရန်နှင့် ထိန်းချုပ်ရာတွင် လွယ်ကူချောမွေ့စေရန် Esung မှချမှတ်မည့် အဆိုပြု လျော့ပါးရေး အစီအမံများကို တင်ပြထားသည်။ Esung သည်လက်ရှိစက်ရုံမြေနှင့် စက်ရုံအဆောက်အအုံကို ငါးနှစ် အငှားစာချုပ်ဖြင့် ငှားရမ်းထားသောကြောင့်၊ စက်ရုံဆောက်လုပ်ရေးနှင့် ဖျက်သိမ်းရေး လုပ်ငန်းစဉ်များနှင့် ပတ်သက်သည့် လုပ်ဆောင်ချက်များသည် စီမံကိန်း အဆိုပြုသူနှင့် မသက်ဆိုင်ပါ။ သို့ရာတွင် လုပ်ငန်းလည်ပတ်ချိန်ကာလများအတွက်သာမက လုပ်ငန်းတည်ဆောက်စဉ်နှင့် ဖျက်သိမ်းစဉ်ဆိုင်ရာ အဆင့်များ အတွက်ပါ ထိခိုက်မှုလျော့ပါးစေရေး အစီအမံများအပါအဝင် သဘာဝပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်၊ ခန့်မှန်းကုန်ကျစရိတ်နှင့် တာဝန်ရှိအဖွဲ့အစည်းဆိုင်ရာ အချက်အလက်များကို ဇယား ၁၃ နှင့် ဇယား ၁၄ တွင် ဖော်ပြထားပါသည်။

ဇယား ၁၃ စီမံကိန်းတည်ဆောက်စဉ်နှင့် ဖျက်သိမ်းစဉ်ကာလအတွင်း ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

အမျိုးအစား	ဖြစ်နိုင်ခြေရှိသောဆိုးကျိုးများ	လျော့ချရေးနည်းလမ်းများ	တာဝန်ရှိအဖွဲ့အစည်း
လေထုအရည်အသွေး	<ul style="list-style-type: none"> <li>စီမံကိန်းလုပ်ငန်းတည်ဆောက်ခြင်းနှင့် ဖျက်သိမ်းခြင်းဆိုင်ရာ လုပ်ငန်းများမှထွက်ရှိသော PM10 ၊ PM2.5 စသော အမှုန်များ နှင့် NO2, CO, O3 နှင့် SO2 စသောဓာတ်ငွေ့များ</li> </ul>	<ul style="list-style-type: none"> <li>ဆောက်လုပ်ရေး လုပ်ငန်းသုံးယာဉ်များနှင့် စက်များကို ပုံမှန်စစ်ဆေး ထိန်းသိမ်းမှုများ ပြုလုပ် ရပါမည်။</li> <li>ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း ဖုန်မှုန့်များ ထွက်ရှိမှု လျော့ကျစေရန် ခြောက်သွေ့သော ရာသီများတွင် လိုအပ်သည့်နေရာများကို မကြာခဏ ရေဖြန်းခြင်းကို လုပ်ဆောင်ရပါမည်။</li> <li>လေထုညစ်ညမ်းစေသော ဓာတ်ငွေ့အထွက်နည်းသောမီးစက်များ နှင့် အခြား စက်ပစ္စည်းများကို အသုံးပြုခြင်း</li> </ul>	ဆောက်လုပ်ရေးကန်ထရိုက်
ဆူညံသံ နှင့် တုန်ခါမှု	<ul style="list-style-type: none"> <li>အရေးပေါ်သုံး ဒီဇယ်မီးစက်၊ ဆောက်လုပ်ရေးသုံးပစ္စည်းများ နှင့် ကြီးမားသော စက်ယန္တရားများမှထွက်သော ဆူညံသံနှင့် တုန်ခါမှု</li> </ul>	<ul style="list-style-type: none"> <li>ဆူညံသံ ထွက်ရှိနိုင်သော ဆောက်လုပ်ရေး လုပ်ငန်းများ လုပ်ဆောင်ခြင်းကို တတ်နိုင်သမျှ နေ့အချိန်တွင်သာ လုပ်ဆောင် ရပါမည်။</li> <li>ဆူညံသံ ထွက်ရှိနိုင်သော နေရာများတွင် လုပ်ကိုင်သော ဝန်ထမ်းများအတွက် လုံလောက်သော PPE များကိုထောက်ပံ့ပေးရမည်။</li> <li>ဆူညံသံ ထွက်ရှိမှုနည်းသော မီးစက်များကို ရွေးချယ်အသုံးပြုခြင်း။</li> </ul>	ဆောက်လုပ်ရေးကန်ထရိုက်
စွန့်ပစ်ရေ	<ul style="list-style-type: none"> <li>မြေပေါ်ရေစီးဆင်းမှု နှင့် အိမ်သုံးစွန့်ပစ်ရေဆိုးများ စွန့်ပစ်ခြင်း။</li> </ul>	<ul style="list-style-type: none"> <li>ဆောက်လုပ်ရေးလုပ်သားများ ရေအသုံးပြုရာမှထွက်ရှိသော ရေဆိုးများကိုစနစ်တကျစွန့်ပစ်ခြင်း။</li> </ul>	ဆောက်လုပ်ရေးကန်ထရိုက်

အမျိုးအစား	ဖြစ်နိုင်ခြေရှိသောဆိုးကျိုးများ	လျော့ချရေးနည်းလမ်းများ	တာဝန်ရှိအဖွဲ့အစည်း
		<ul style="list-style-type: none"> <li>ဆောက်လုပ်ရေးလုပ်သားများ အသုံးပြုရန် အတွက် ယာယီအိမ်သာများ ဆောက်လုပ်ပေးရပါမည်။</li> <li>ဆောက်လုပ်ရေးအလုပ်သမားများအတွက် မိလ္လာကန် နှင့် ယာယီအိမ်သာများ ဆောက်လုပ်ပေးခြင်း စသည့် ရေဆိုးသန့်စင် စနစ်များကို တပ်ဆင်ပါမည်။</li> </ul>	
စွန့်ပစ်အမှိုက်	<ul style="list-style-type: none"> <li>ဆောက်လုပ်ရေးသုံးစွန့်ပစ်အမှိုက်များ နှင့် အိမ်သုံးစွန့်ပစ်အမှိုက်များ</li> </ul>	<ul style="list-style-type: none"> <li>အဆောက်အအုံအဟောင်းများ ဖျက်သိမ်းခြင်းနှင့် မြေတူးခြင်းလုပ်ငန်းများမှထွက်ရှိသော မြေစာများနှင့် အမှိုက်များ</li> <li>ကောင်းမွန်သော စွန့်ပစ်အမှိုက် စီမံခန့်ခွဲမှု စနစ်ကိုစီစဉ်ဆောင်ရွက်ခြင်း</li> <li>အမှိုက်များကို အမျိုးအစားအလိုက် စနစ်တကျ ခွဲခြားသတ်မှတ်၍စွန့်ပစ်ခြင်း။</li> </ul>	ဆောက်လုပ်ရေးကန်ထရိုက်
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	<ul style="list-style-type: none"> <li>ဆောက်လုပ်ရေးလုပ်သားများ၏ ပေါ့လျော့မှုနှင့် ကျွမ်းကျင်မှုမရှိသော အလုပ်သမားများကြောင့် မတော်တဆ ထိခိုက်မှုများ</li> </ul>	<ul style="list-style-type: none"> <li>စီမံကိန်းလုပ်ငန်းခွင်အတွင်း အဆိုပြုသူ မှဘေးအန္တရာယ်ကင်းရှင်းရေးမူဝါဒများချမှတ်ခြင်း</li> <li>ကန်ထရိုက်တာမှဘေးအန္တရာယ်ကင်းရှင်းရေးအစီအစဉ်များချမှတ်ခြင်း</li> <li>အလုပ်သမားများအား ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာ ပစ္စည်းများ လုံလောက်စွာထောက်ပံ့ခြင်း။</li> <li>အလုပ်သမားများအား ဘေးကင်းရေးဆိုင်ရာ လမ်းညွှန်ချက်များကို အသိပညာပေးခြင်း။</li> </ul>	ဆောက်လုပ်ရေးကန်ထရိုက်



အမျိုးအစား	ဖြစ်နိုင်ခြေရှိသောဆိုးကျိုးများ	လျော့ချရေးနည်းလမ်းများ	တာဝန်ရှိအဖွဲ့အစည်း
		<ul style="list-style-type: none"> <li>စီမံကိန်းလုပ်ငန်းခွင်အတွင်း ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာများကို လုံခြုံရေးအရာရှိမှ ပုံမှန် ကြီးကြပ်ခြင်း။</li> <li>ဘေးကင်းရေး အလေ့အကျင့်များကို အလုပ်သမားများပိုမို လိုက်နာစေရန် ဆုပေး၊ ဒဏ်ပေး အစီအစဉ်များပြုလုပ်ခြင်း။</li> <li>လုပ်ငန်းခွင်ဆိုင်ရာ ပုံမှန်အစည်းအဝေးများ စီစဉ်ထားရှိခြင်း။</li> <li>ကျန်းမာရေးနှင့် ဘေးကင်းရေး matrix များ ပြင်ဆင်ခြင်း။</li> </ul>	

**ဇယား (၁၄) စီမံကိန်းလည်ပတ်စဉ်ကာလအတွင်း ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်**

အမျိုးအစား	ဖြစ်နိုင်ခြေရှိသောဆိုးကျိုးများ	လျော့ချရေးနည်းလမ်းများ	တာဝန်ရှိအဖွဲ့အစည်း
လေထုအရည်အသွေး	<ul style="list-style-type: none"> <li>စီမံကိန်းလုပ်ငန်း လည်ပတ်ခြင်း ဆိုင်ရာ လုပ်ငန်းများဖြစ်သည့် ကုန်ကြမ်းပစ္စည်းများဖြတ်တောက်ခြင်း၊ မီးစက်အသုံးပြုခြင်း စသော လုပ်ငန်းများမှထွက်ရှိသော PM10 ၊ PM2.5 စသော အမှုန်များ နှင့် NO2, CO, O3 နှင့် SO2 စသောဓာတ်ငွေ့များ</li> </ul>	<ul style="list-style-type: none"> <li>စက်ရုံဝင်းအတွင်းရှိ ဖုန်ထူသောနေရာများကို ရေဖျန်းပေးပါမည်။</li> <li>မီးစက်များနှင့် မော်တော်ယာဉ်များကို ပုံမှန် ထိန်းသိမ်း ရမည်။</li> <li>ဆာလဖာပါဝင်မှုနည်းသော ဒီဇယ်ဆီကို အသုံးပြု သင့်သည်။</li> <li>သင့်လျော်သော လေဝင်လေထွက်စနစ် ထားရှိ ရမည်။</li> </ul>	စီမံကိန်းအဆိုပြုသူ ( ESung)

အမျိုးအစား	ဖြစ်နိုင်ခြေရှိသောဆိုးကျိုးများ	လျော့ချရေးနည်းလမ်းများ	တာဝန်ရှိအဖွဲ့အစည်း
ဆူညံသံ နှင့် တုန်ခါမှု	<ul style="list-style-type: none"> <li>ဒီဇယ်မီးစက် ကဲ့သို့သော အရေးပေါ် အသုံးပြုမှုမှ ထွက်ရှိလာသော ဆူညံသံနှင့် တုန်ခါမှု</li> </ul>	<ul style="list-style-type: none"> <li>စက်ကိရိယာများ၊ မော်တော်ယာဉ်များနှင့် စက်ယန္တရားများ အားလုံးကို ပုံမှန်ထိန်းသိမ်း ထားရမည်။</li> <li>ဒီဇယ်မီးစက်များကို လူနေရပ်ကွက်များ၊ စက်ရုံ အလုပ်သမား များ နှင့် ဝေးကွာစွာ ထားရှိရမည်။</li> <li>ဆူညံသံကျယ်လောင်သော နေရာများတွင် အလုပ် လုပ်သော စက်ရုံအလုပ်သမားများအတွက် နားကြပ် များ ထောက်ပံ့ ပေးရမည်။</li> </ul>	စီမံကိန်းအဆိုပြုသူ ( ESung)
စွန့်ပစ်ရေ	<ul style="list-style-type: none"> <li>စက်ရုံအလုပ်သမားများမှ စွန့်ထုတ်သော မိလ္လာနှင့် အိမ်သုံးစွန့်ပစ်ရေ</li> </ul>	<ul style="list-style-type: none"> <li>YCDC ၏ လမ်းညွှန်ချက်များနှင့်အညီ မိလ္လာနှင့် အိမ်သုံးစွန့်ပစ်ရေ များကို စွန့်ထုတ်ရမည်။</li> </ul>	စီမံကိန်းအဆိုပြုသူ ( ESung)
စွန့်ပစ်အမှိုက်	<ul style="list-style-type: none"> <li>စက်ရုံအလုပ်သမားများနှင့် လုပ်ငန်းစဉ်များမှ ထွက်ရှိသော စက္ကူ၊ ပလတ်စတစ်အိတ်၊ ပလတ်စတစ်ဘူး၊ စားကြွင်းစားကျန်များ နှင့် ရာဘာ ကဲ့သို့သော အန္တရာယ်မရှိသော စွန့်ပစ် ပစ္စည်းများ။</li> <li>လုပ်ငန်းလည်ပတ်စဉ်မှ ထွက်ရှိလာသော PE ဖလင်အဖုံးစာရွက် နှင့် စွန့်ပစ်တိတ် စက္ကူများ။</li> <li>CMP စနစ်ကို အခြေခံသည့် စက်ရုံမှ ထုတ်လုပ်မှု လုပ်ငန်းစဉ် အနေဖြင့် အဆိုပြု စီမံကိန်းမှ အန္တရာယ်ရှိသော</li> </ul>	<ul style="list-style-type: none"> <li>စွန့်ပစ်အမှိုက်စီမံခန့်ခွဲမှုစနစ်ကို ထိရောက်စွာ ဆောင်ရွက်ရမည်။</li> <li>ပလတ်စတစ်၊ အမှိုက်၊ ဖန်ခွက်နှင့် စားကြွင်း စားကျန်များ ကဲ့သို့သော အန္တရာယ်မရှိသော စွန့်ပစ်ပစ္စည်းများကို သီးခြား စုဆောင်းပြီး လိုအပ်ပါက ပြန်လည် အသုံးပြုနိုင်ရန် ဆောင်ရွက် ရမည်။</li> </ul>	စီမံကိန်းအဆိုပြုသူ ( ESung)

အမျိုးအစား	ဖြစ်နိုင်ခြေရှိသောဆိုးကျိုးများ	လျော့ချရေးနည်းလမ်းများ	တာဝန်ရှိအဖွဲ့အစည်း
	စွန့်ပစ်ပစ္စည်းများကို ထုတ်လုပ်မည် မဟုတ်ပါ။		
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	<ul style="list-style-type: none"> <li>အလုပ်သမားများ၏ ပေါ့လျော့မှုနှင့် ကျွမ်းကျင်မှု မရှိသော အလုပ်သမားများကြောင့် ရုပ်ပိုင်းဆိုင်ရာ ထိခိုက်ဒဏ်ရာရခြင်း။</li> </ul>	<ul style="list-style-type: none"> <li>အလုပ်သမားများအတွက် အကာအကွယ်သုံး ပစ္စည်း (PPE) များ ထောက်ပံ့ပေးခြင်း။</li> <li>အလုပ်သမားများအား ဘေးအန္တရာယ် ကင်းရှင်းရေးဆိုင်ရာ သင်တန်းများ ထောက်ပံ့ပေးခြင်း။</li> <li>စိုစွတ်သောကြမ်းပြင်များရှိပါက ချော်မလဲစေရန် သတိပေးဆိုင်းဘုတ်များ တပ်ဆင်ပေးခြင်း။</li> <li>လုပ်ငန်းခွင်အတွင်း မတော်တဆဖြစ်မှုများ အတွက် ရှေးဦးသူနာပြု ကိရိယာများ လုံလောက်စွာ ထားရှိပေးခြင်း။</li> <li>အလုပ်ချိန်အတွင်း တရားမဝင် မူးယစ်ဆေးဝါး သို့မဟုတ် အရက်သေစာ သောက်စားခြင်းကို လုံးဝတားမြစ်ထားခြင်း။</li> </ul>	စီမံကိန်းအဆိုပြုသူ ( ESung)

## ၇.၂ သဘာဝပတ်ဝန်းကျင် စောင့်ကြည့်လေ့လာရေး အကောင်အထည်ဖော်မှု အစီအစဉ်ခွဲ



EMP ကို ထိရောက် အောင်မြင်စွာ အကောင်အထည်ဖော်ရန်အတွက် ပတ်ဝန်းကျင် စောင့်ကြည့်ရေး အစီအစဉ်သည် အရေးကြီးပါသည်။ သဘာဝပတ်ဝန်းကျင် အရည်အသွေး တိုင်းတာခြင်းသည် အဆိုပြုထားသော စီမံကိန်း၏ အကောင်အထည်ဖော်မှုကို ပံ့ပိုးပေးသည့် ကိရိယာတစ်ခုဖြစ်သည်။



EIA လုပ်ထုံးလုပ်နည်း (၂၀၁၅) ၏ ပုဒ်မ ၈၊ ပုဒ်မခွဲ ၈.၆ အရ၊ ပတ်ဝန်းကျင် စောင့်ကြည့်ရေး အစီအစဉ်ခွဲကို EMP အစီရင်ခံစာတွင် ထည့်သွင်းရန် လိုအပ်ပါသည်။ စောင့်ကြည့်ရေး အစီအစဉ်ခွဲ တစ်ခုစီတွင် ရည်မှန်းချက်များ၊ ဥပဒေ လိုအပ်ချက်၊ ခြုံငုံသုံးသပ်ချက် မြေပုံများ၊ အကောင်အထည်ဖော်မှု အချိန်ဇယား၊ စီမံခန့်ခွဲမှု လုပ်ဆောင်ချက်များ၊ စောင့်ကြည့်ရေး အစီအစဉ်များ၊ စီမံကိန်း ဘတ်ဂျက်များနှင့် တာဝန်များ ပါဝင်ရမည်။ စီမံကိန်း တည်ဆောက်ချိန်၊ လည်ပတ်ချိန်နှင့် ပိတ်သိမ်းချိန်ကာလများအတွက် ပတ်ဝန်းကျင် စောင့်ကြည့်ရေး အစီအစဉ်ခွဲကို ဇယား ၁၅ နှင့် ဇယား ၁၆ တွင် ဖော်ပြထားသည်။

ဇယား ၁၅ စီမံကိန်း တည်ဆောက်ချိန် နှင့် ပိတ်သိမ်းချိန်ကာလများအတွက် ပတ်ဝန်းကျင် အရည်အသွေးတိုင်းတာခြင်း အစီအစဉ်ခွဲ

တိုင်းတာမည့်နယ်ပယ်	အမျိုးအစား	တည်နေရာ	အကြိမ်အရေအတွက်	တာဝန်ရှိအဖွဲ့အစည်း
လေထုအရည်အသွေး	CO <sub>2</sub> , CO, CH <sub>4</sub> , NO <sub>2</sub> , O <sub>3</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , VOCs	စီမံကိန်း ဧရိယာအတွင်း	တစ်နှစ်လျှင်နှစ်ကြိမ်	ဆောက်လုပ်ရေးကန်ထရိုက်
ဆူညံသံ	ဆူညံမှု (dB(A) scale)	စီမံကိန်း ဧရိယာအတွင်း	တစ်နှစ်လျှင်နှစ်ကြိမ်	ဆောက်လုပ်ရေးကန်ထရိုက်
တုန်ခါမှု	Radial, Transverse, Vertical	စီမံကိန်း ဧရိယာအတွင်း	တစ်နှစ်လျှင်နှစ်ကြိမ်	ဆောက်လုပ်ရေးကန်ထရိုက်
စွန့်ပစ်ရေ	BOD, COD, Oil & grease, pH, Total coliform bacteria, Total nitrogen, Total phosphorus, Total suspended solids	စီမံကိန်း ဧရိယာအတွင်း	လစဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်
စွန့်ပစ်အမှိုက်	လုပ်ငန်းခွင်မှ ထွက်ရှိသော အမှိုက်အမျိုးအစားနှင့် ပမာဏ၊	ယာယီအမှိုက်သိုလှောင်ကန်နှင့် ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း	အပတ်စဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	မတော်တဆ ထိခိုက်မှု မှတ်တမ်းများ	စီမံကိန်း ဧရိယာအနီးဝန်းကျင် ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း	လစဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်

ဇယား ၁၆ စီမံကိန်း လည်ပတ်ချိန်ကာလအတွက် ပတ်ဝန်းကျင် အရည်အသွေးတိုင်းတာခြင်း အစီအစဉ်ခွဲ

တိုင်းတာမည့်နယ်ပယ်	အမျိုးအစား	တည်နေရာ	အကြိမ်အရေအတွက်	ရန်ပုံငွေ	တာဝန်ရှိအဖွဲ့အစည်း
လေထုအရည်အသွေး	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> & CO	စီမံကိန်း ဧရိယာအတွင်း (16°53'27.95" N and 96° 14' 6.6" E) 	တစ်နှစ်လျှင်နှစ်ကြိမ်	၁,၀၀၀,၀၀၀	စီမံကိန်းအဆိုပြုသူ ( ESung)
ဆူညံသံ	ဆူညံမှု (dB(A) scale)	စီမံကိန်း ဧရိယာအတွင်း (16°53'28.26" N and 96° 14' 6.67" E) 	တစ်နှစ်လျှင်နှစ်ကြိမ်	၅၀၀,၀၀၀	စီမံကိန်းအဆိုပြုသူ ( ESung)

တိုင်းတာမည့်နယ်ပယ်	အမျိုးအစား	တည်နေရာ	အကြိမ်အရေအတွက်	ရန်ပုံငွေ	တာဝန်ရှိအဖွဲ့အစည်း
တုန်ခါမှု	Radial, Transverse, Vertical	စီမံကိန်း ဧရိယာအတွင်း (16°53'28.39" N and 96° 14' 6.43" E) 	တစ်နှစ်လျှင်နှစ်ကြိမ်	၅၀၀,၀၀၀	စီမံကိန်းအဆိုပြုသူ (ESung)
စွန့်ပစ်ရေ	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Total suspended solids	စီမံကိန်း ဧရိယာအတွင်း (16°53'5.1" N and 94° 52' 39.57" E) 	တစ်နှစ်လျှင်နှစ်ကြိမ်	၃၀၀,၀၀၀	စီမံကိန်းအဆိုပြုသူ (ESung)
စွန့်ပစ်အမှိုက်	လုပ်ငန်းခွင်မှ ထွက်ရှိသော	ယာယီအမှိုက်သိုလှောင်ကန်	အပတ်စဉ်	၃၀၀,၀၀၀	စီမံကိန်းအဆိုပြုသူ (ESung)



တိုင်းတာမည့်နယ်ပယ်	အမျိုးအစား	တည်နေရာ	အကြိမ်အရေအတွက်	ရန်ပုံငွေ	တာဝန်ရှိအဖွဲ့အစည်း
	အမှိုက်အမျိုးအစားနှင့် ပမာဏ၊				
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	မတော်တဆ ထိခိုက်မှု မှတ်တမ်းများ	စီမံကိန်း ဧရိယာအတွင်း	လစဉ်	၃၀၀,၀၀၀	စီမံကိန်းအဆိုပြုသူ ( ESung)

## ၇.၃ ရံပုံငွေလျာထားခြင်း

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်တွင် ပတ်ဝန်းကျင် စောင့်ကြပ်ကြည့်ရှုမှု၊ ကျန်းမာရေး နှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာအစီအစဉ်များအတွက် သုံးစွဲမည့် တစ်နှစ်တာအတွက် ခန့်မှန်း စရိတ်များကို ဇယား ၁၇ တွင် ဖော်ပြထားပါသည်။

**ဇယား ၁၇ ပတ်ဝန်းကျင်ဆိုင်ရာ အစီအစဉ်များအတွက် နှစ်စဉ် ခန့်မှန်းအသုံး စရိတ်များ**

စဉ်	ပတ်ဝန်းကျင်လျှော့ချရေးအတွက်ပြုလုပ်မည့်အစီအစဉ်များ	ခန့်မှန်းအသုံးစရိတ် (ကျပ်)
<b>ပတ်ဝန်းကျင်ဆိုင်ရာလုပ်ငန်းများ</b>		
၁	ပတ်ဝန်းကျင်အရည်အသွေးတိုင်းတာခြင်း၊ စောင့်ကြပ်ကြည့်ရှုခြင်း	၄,၂၀၀,၀၀၀
၂	အရေးပေါ်အခြေအနေ	၅၀၀,၀၀၀
၃	သက်ဆိုင်ရာသင်တန်းများပို့ချခြင်း	၅၀၀,၀၀၀
<b>ကျန်းမာရေးနှင့်ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာလုပ်ငန်းများ</b>		
၄	လုပ်ငန်းခွင်သုံး ကာကွယ်ရေးပစ္စည်း	၃,၀၀၀,၀၀၀
၅	ကျန်းမာရေး အထောက်အပံ့ပစ္စည်းများ	၅၀၀,၀၀၀
၆	မီးသတ်ပစ္စည်းများ	၅၀၀,၀၀၀

## ၈. နိဂုံးချုပ်

ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အစီရင်ခံစာအား စီမံကိန်းအဆိုပြုသူ၏ စီမံကိန်းဆိုင်ရာ အချက်အလက်များ သက်ဆိုင်ရာလေ့လာမှုများနှင့် အစီရင်ခံစာများ၊ ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံ အချက်များ လေ့လာခြင်း နှင့် လူထုတွေ့ဆုံဆွေးနွေးခြင်း စသော အချက်အလက်များပေါ်မူတည်၍ ပြင်ဆင်ထားပါသည်။

စီမံကိန်းသည် သိသာထင်ရှားသော သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ကိစ္စရပ်များအပေါ် ထိခိုက်မှု ဖြစ်ပေါ်နိုင်ခြေ နည်းပါးသည်။ ထိခိုက်မှုအများစုသည် သဘာဝပတ်ဝန်းကျင်အပေါ် ယာယီမျှသာ ဖြစ်ပြီး ၎င်းတို့ကို လက်ခံနိုင်သော အဆင့်ထိ လျှော့ချနိုင်သည်။

စီမံကိန်းဖော်ဆောင်သူသည် စွန့်ပစ်အမှိုက်နှင့် ရေဆိုးစွန့်ထုတ်မှုများကို စီမံခန့်ခွဲရန် လိုအပ်သော အထောက်အပံ့များနှင့် ဝန်ထမ်းများထားရှိပါသည်။ ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အစီရင်ခံစာသည် စက်ရုံ၏ လုပ်ငန်းလည်ပတ်မှု အဆင့်အတွင်း ဖြစ်နိုင်ချေရှိသော သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှု များကို အဓိကဖော်ပြထားပါသည်။

ESung မြန်မာသည် စီမံကိန်းဧရိယာနှင့် အနီးတစ်ဝိုက် ပတ်ဝန်းကျင် ထိန်းသိမ်းစောင့်ရှောက်ရေး အတွက် တာဝန်ရှိပါသည်။ ထို့အပြင် MONREC မှ ထုတ်ပြန်သော ညွှန်ကြားချက်တစ်ခုစီကို အကောင်အထည်ဖော်ဆောင်ရွက်ရမည်။ ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် နှင့်အညီ သဘာဝ

ပတ်ဝန်းကျင် မူဝါဒကို လိုက်နာရန် ESung မြန်မာသည် စက်ရုံ၏ ပတ်ဝန်းကျင်ဆိုင်ရာ အကဲဖြတ်မှုအတွက် အောက်ပါအတိုင်း တာဝန်ယူရမည်ဖြစ်ပါသည်။

- ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို ကောင်းမွန်စွာ ရေးသားပြင်ဆင်ပြီးတိကျစွာလိုက်နာ ဆောင်ရွက်ပါမည်။
- ညွှန်ကြားထားသည့် လုပ်ထုံးလုပ်နည်းနှင့် သက်ဆိုင်ရာ စည်းမျဉ်းစည်းကမ်းများကို တင်းတင်းကျပ်ကျပ် လိုက်နာခြင်းဖြင့် အစီအစဉ်ကို ဆောင်ရွက်ပါမည်။
- ESung Myanmar သည် သဘာဝပတ်ဝန်းကျင် ထိခိုက်မှု လျှော့ချရေး လှုပ်ရှားမှုများ ဖြစ်သည့် ကတိကဝတ်များကို အပြည့်အဝနှင့် စဉ်ဆက်မပြတ် လိုက်နာဆောင်ရွက် သွားမည်ဖြစ်ပါသည်။
- လုပ်ငန်းလည်ပတ်မှုကာလအတွင်း ကုမ္ပဏီသည် ECD ၏ မှတ်ချက်များနှင့်အညီ အဆင့်မြှင့်တင်ထားသော နည်းပညာများနှင့် စနစ်များကို အသုံးပြုခြင်းဖြင့် ပိုမိုကောင်းမွန် လာစေရန် အဆိုပြုထားသည့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။
- စက်ရုံပိတ်သိမ်းခြင်းမပြုမီ ဒေသအတွင်းထိခိုက်မှု မဖြစ်စေရန် ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ်ကို ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။

## EXECUTIVE SUMMARY

### 1. Context of the Project

Esung Myanmar Company Limited (Esung) has established on 4<sup>th</sup> May, 2018 as a private company limited by shares. Type of investment of Esung is 100% Foreign Investment. The certificates and license related to Esung are described in Appendix A. The proposed project is the manufacturing of garments and protected cover for vehicles on CMP basis. Currently, the factory is manufacturing various types of protected cover for vehicles and cargo nets only. During the last four years, the ESung was located at the Industrial Zone -1, Dagon Myothit (south) Township, Yangon, Myanmar. From April, 2022 onward, the factory changes the location to Plot No. (149/6), Kanaung Minthargyi Road, East Dagon Industrial Zone, East Dagon Township, Yangon Region, Myanmar. The total land area of the factory is approximately one acre. The location of project site is shown in Figure 1.

According to the decision of Ministry of Natural Resources and Environmental Conservation (MONREC), Esung has to conduct Environmental Management Plan (EMP) for the proposed factory. Therefore, the project proponent has engaged Total Business Solution Co., Ltd. (TBS) to study the EMP of the project.

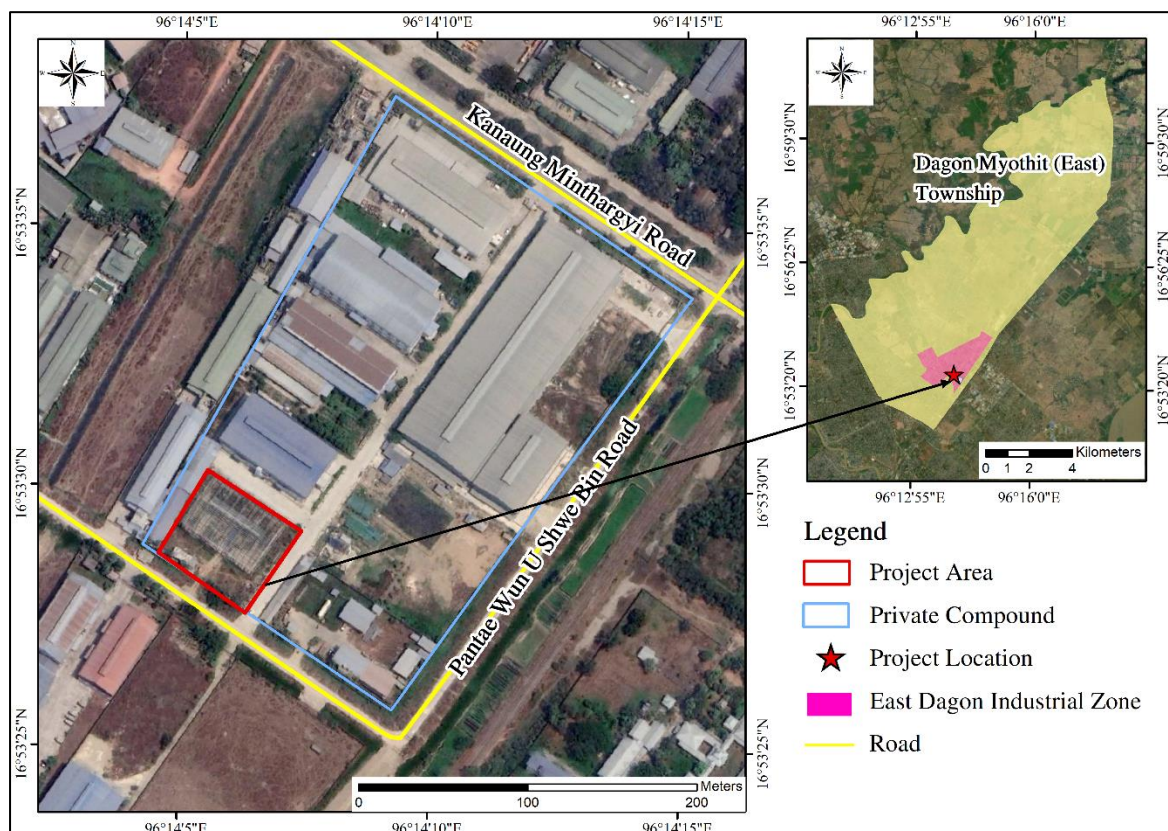


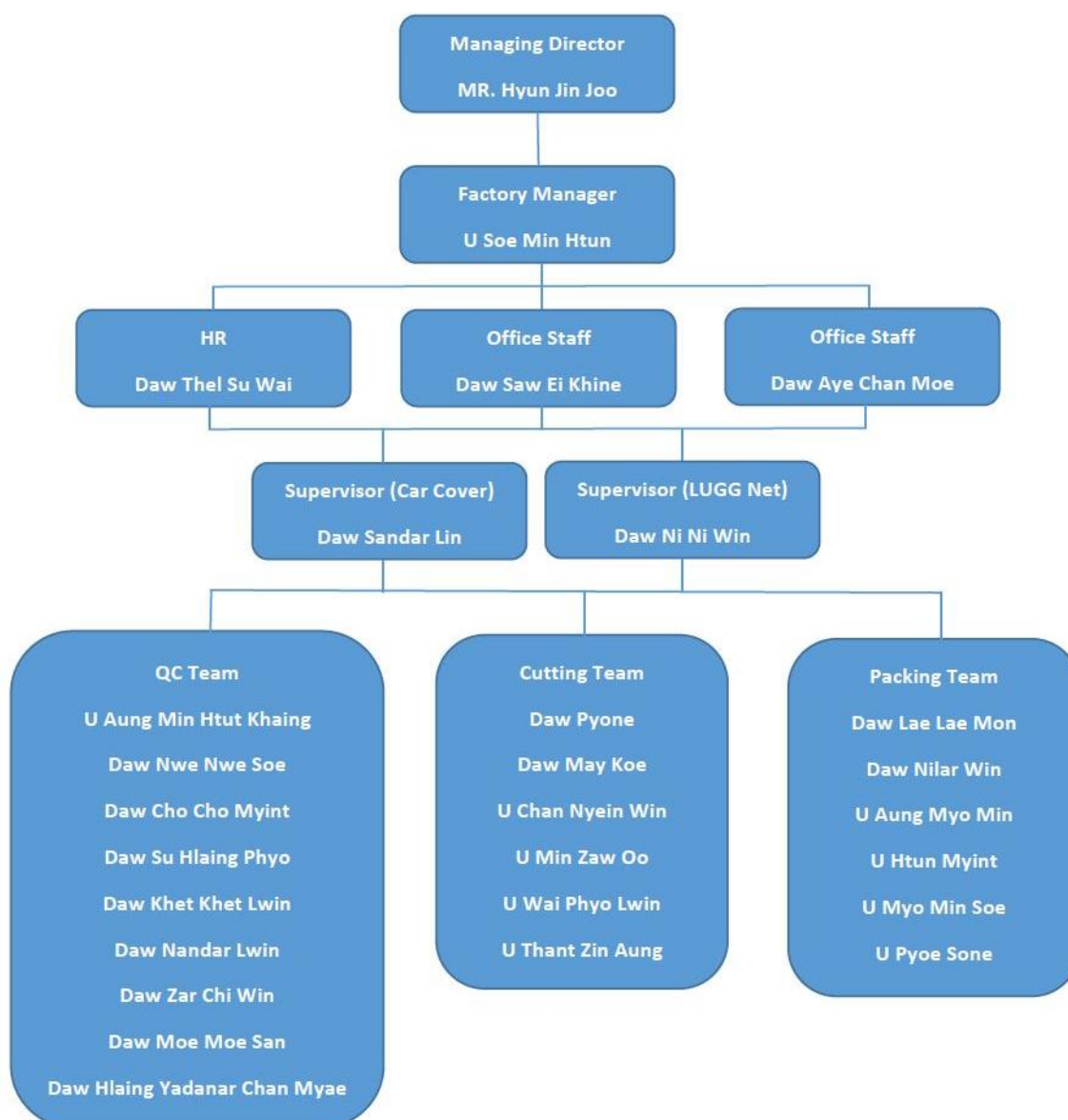
Figure 1 Location Map of the Project Area

## 1.1. Project Proponent

The contact of the representative of the proponent regarding this EMP 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**

Name	Mr. Soe Min Htun
Designation	Director
Address	Plot No. (149/6), Kanaung Minthargyi Road, East Dagon Industrial Zone, East Dagon Township, Yangon Region, Myanmar.
Tel	09-5062646
e-mail	kogyesmhtun@gmail.com

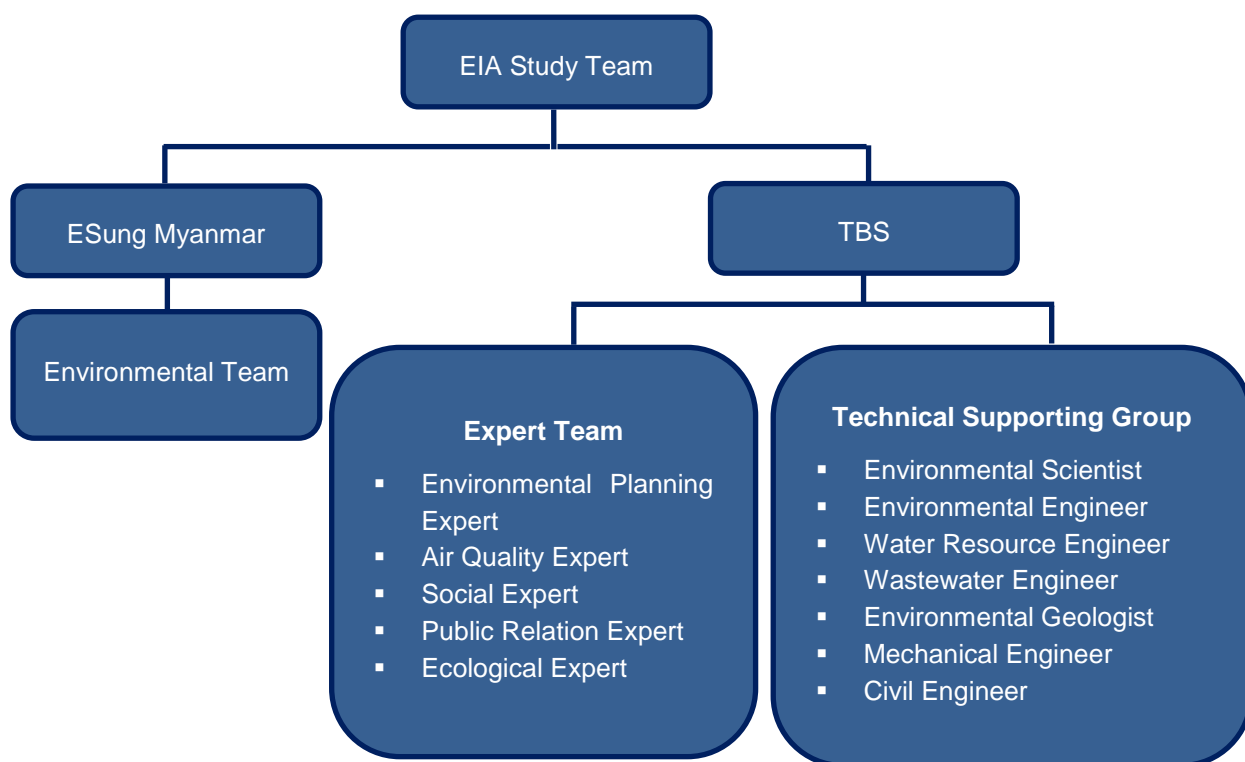


**Figure 2 Organization Structure of ESung**

## 1.2. EIA Consultant

Total Business Solution Co., Ltd. (TBS) is a locally own company which provides engineering and environmental services to private and public sectors in Myanmar. Since its inception in 2012, TBS, in collaboration with TEAM Consulting Engineering Management Co., Ltd of Thailand, has worked on various projects such as port and industrial estate development, power transmission, flood control, drainage and sewerage system, Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE) and Environmental Management Plan (EMP).

The EIA study team consists of qualified and experienced professionals in various technical areas relevant to major environmental and social impacts of the project identified in the report. The organizational structure for conducting and managing the EIA study team is shown in Figure 3 and Table 2.



**Figure 3 Organization Structure of EIA Study Team**



**Table 2 EIA Study Team**

No.	Name	Education	Experience	Responsibility
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
2.	Mr. Wai Soe General Manager/ Project Manager	B.Sc. (Geology)	15-year experiences in the areas of geotechnical instrumentation and monitoring in Singapore. 5 years' experiences in managing technical teams for site investigation and instrumentation in landslide investigation, mine design, mine waste management, hydrographic and topographic survey	Coach of Monitoring Site Survey, Environmental Quality Analysis and Modelling Expert
3.	Ms. Thet Htar Myint Social Impacts Assessment Specialist	M.Sc. (Gender and Development) M.Sc. (Zoology) B.Sc. (Hons) (Zoology)	Over 14 years' 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)
4.	Ms. Hnin Lai Win Environmental Manager	M.Sc. (Environmental Engineering and Management) B.Pharm. (Pharmacy)	5 years experiences in management and marketing and training of junior staff in medical field	Environmental Risk Assessment, Environmental Management Plan, Impact Mitigation Measure



No.	Name	Education	Experience	Responsibility
			Over 2 years experiences in land use planning, environmental impact 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.	Ms. Eaindra Oo Water Resources Engineer	M.Sc. (Water Engineering and Management) B.Sc. (Civil and Infrastructure Engineering)	3 years' experience in Hydropower engineering, catchment and river management, flood monitoring, hydrology survey and modeling and climate condition study. Hydropower designing, planning and estimation. Geotechnical data processing, data analysis and report preparation. GIS mapping and reporting environmental management plan for environmental projects.	Hydrology Specialist Environmental Quality Modeling Assistant Social Impact Assessment Assistant
6.	Mr. Htet Thiha Phone Myint Environmental Geologist	B.Sc. (Geology)	7 years' 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

No.	Name	Education	Experience	Responsibility
7.	Mr. Phyo Thu Kyaw Auto CAD Drafter	B.E. (Mechatronic)	3 years' experiences in project coordination, documentation, Auto CAD drafter and graphic design and IT technician.  Over 2 years 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
8.	Mr. Aung Chit Moe Geologist	B.Sc (Hons) Geology	Over 2 years' working experience in geological and geotechnical engineering.	Geotechnical, GIS, Mapping and Drone Data Processing Environmental Quality Modeling Assistant
9.	Mr. Wai Phyo Aung Surveyor	B.Sc (Geology)	7 years' working experiences in geological and geotechnical engineering. 4 years' as a team leader in survey team.	Environmental Quality Monitoring Survey Drone Survey
10.	Ms. May Khaing Zin Hein Junior Engineer	B.E (Civil)	GIS Mapping, report comment editing	Social data entry, Mapping and Data Processing
11.	Mr. Chan Nyein Aung Environmental Geologist	B.Sc (Geology)	1 year's experience in environmental monitoring processes and conducting site survey	Environmental Quality Monitoring Survey, Drone Survey
12.	Mr. Zaw Myo Hein Environmental Geologist	B.Sc (Geology)	1 year's experience in environmental monitoring processes and conducting site survey	Environmental Quality Monitoring Survey, Drone Survey
13.	Ms. Phoo Pwint Khine Environmental Engineer	M.E (Environmental Engineering and Management) B.E (Civil)	1 year 'sexperience as a site engineer in construction project.	Project Description Environmental Base Line Study and Monitoring Plan

No.	Name	Education	Experience	Responsibility
			6 months' experience as a QC/QS at building estimate team. 2 years' experiences in environmental field	Environmental Management Plan Environmental Impact Assessment (Water/Wastewater Pollution, Noise pollution) Mitigation and Monitoring Measurement Plan Public Consultation Meeting
14.	Ms. Aye Mon Aung Environmental Engineer	M.E (Environmental Engineering and Management) B.E (Materials and Metallurgy)	10 months' experience as teaching assistant 2 years' experiences in sale representative 2 years' experiences in environmental field	Project Description Environmental Base Line Study and Monitoring Plan Environmental Management Plan Environmental Impact Assessment (Air pollution and Solid Waste) Mitigation and Monitoring Measurement Plan Public Consultation Meeting
15.	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

## 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 all the following laws and regulations.

**Table 3 Relevant Laws and Regulations**

No.	Name of Laws and Regulations	Year
<b>Environmental Conservation</b>		
1.	Environmental Conservation Law	2012
2.	Environmental Conservation Rules	2014
3.	Environmental Impact Assessment Procedure	2015
4.	National Environmental Policy	2019
<b>Pollution Control and Health</b>		
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
12.	Prevention of Hazard from Chemical and Related Substances Law	2013
<b>Biodiversity and Resource Conservation</b>		
13.	Conservation of Biodiversity and Natural Protected Area Law	2018
14.	The Law relating to Aquaculture	1989
15.	Conservation of Water Resource and River Law	2006
16.	Conservation of Water Resource and River Rules	2013
17.	Underground Water Act	1930
18.	Forest Law	1992
<b>Land Acquisition</b>		
19.	Registration of Deeds Law	2019
20.	The Boundaries Law	2019
21.	The Land Acquisition Act	1894
22.	Land Nationalization Act	1953
23.	Myanmar National Land Use Policy	2016
24.	State-owned land leasing of buildings; Instruction to be followed in transfers and joint ventures	2018
25.	Farmland Rules	2012
26.	Vacant, Fallow and Virgin Land Management Law	2018
<b>Urban Development and Management</b>		
27.	The Electricity Law	2014
28.	The Telecommunications Law	2013

No.	Name of Laws and Regulations	Year
29.	Development Committee Law	2013
<b>Human Rights</b>		
30.	Protection of the Right of National Race Law	2015
31.	Rights of the Persons with Disabilities Law	2015
32.	Child Rights Law	2019
<b>Labour</b>		
33.	Labour Organization Law	2011
34.	The Employment and Skill Development Law	2013
35.	The Minimum Wage Law	2013
36.	Payment of Wage Law	2016
37.	Workers' Compensation Act	1923
38.	The Settlement of Labour Dispute Law	2012
39.	The Leave and Holiday Act (law amended July 2014)	1951
40.	Social Security Law	2012
<b>Motor Vehicles</b>		
41.	Vehicle Safety and Motor Vehicle Management Law	2020
42.	The Myanmar Motor Vehicle Rules	1989
43.	The Motor Vehicle Law	2015
<b>Other Related Law and Regulation</b>		
44.	Myanmar Insurance Law	1993
45.	Myanmar Insurance Rule	2017
46.	The Ethnic Right Protection Law	2015
47.	Myanmar Investment Law	2016
48.	Myanmar Investment Rule	2017
49.	The Export and Import Law	2012
50.	Natural Disaster Managemnet Law	2013
51.	Climate Change Policy	2019
52.	Commercial Tax Law	2014
53.	The Union Tax Law	2019
54.	Myanmar Citizens Investment Law	2013
55.	Foreign Investment Law	2012

### 3. PROJECT DESCRIPTION

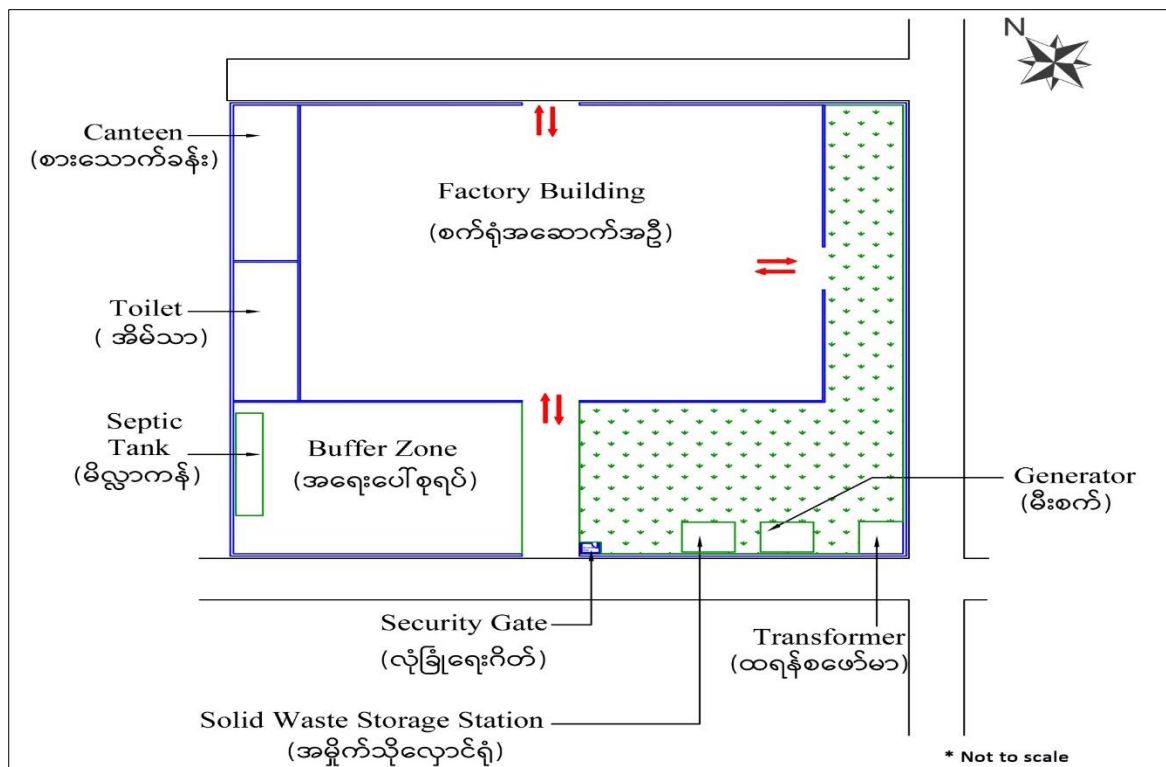
#### 3.1. Location of the Project

The proposed factory is located at Plot No. (149/6), Kanaung Minthargyi Road, East Dagon Industrial Zone, East Dagon Township, Yangon Region, Myanmar and latitude 16°53'38.88" N and longitude 96° 14' 2.16" E. The total land area of the factory is one acre with the building area of around 20,000 square meters .The location map of the project site is presented in Figure 4. The location map of the factory is shown in Figure 1.

#### 3.2. Description of Project

##### 3.2.1. Site Description

The total land area of project site is one acre that includes two-story factory building, factory canteen, buffer zone and green area. The gross area of building is around 20,000 square meters. The master layout plan of the project is shown in Figure 4.

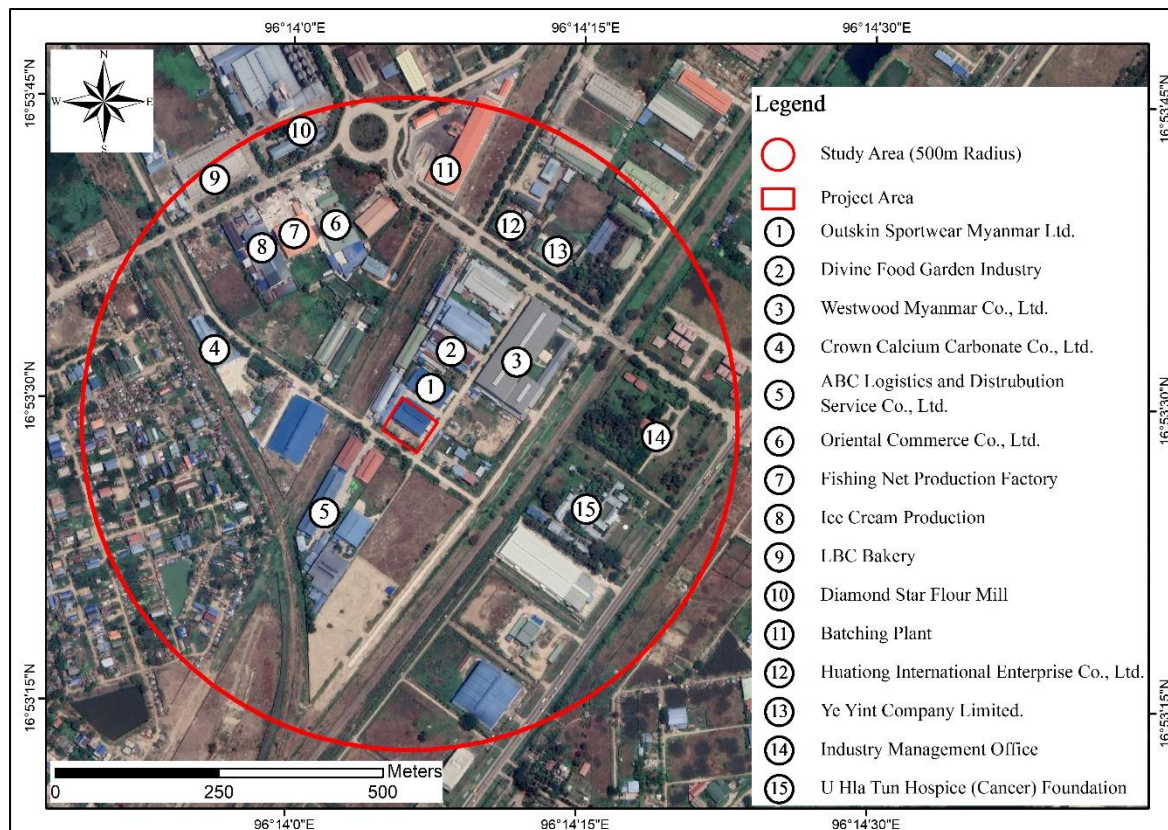


**Figure 4 Master Layout Plan of Project**

##### 3.2.2. Compounds Adjacent to Project

There are fifteen types of infrastructures near the project site. Among them, the factories are most common feature in the study area since the project site is within the industrial zone. Location map of buildings, houses, roads, and offices adjacent to 500 meters of the project site is presented in Figure 5.





**Figure 5 Location of Adjacent Features within 500 meter of the Project Site**

### 3.2.3. Raw Material Requirement

In the production process, all raw materials are imported from Korea and there are altogether 21 items of raw materials. Annual raw materials requirement for all products are expressed detail in the section 3.3, Chapter 3. At the same time, the amount of packaging materials requirement is mainly depended on the market demand and all packaging materials such as paper cardboard sheet are purchased from local market.

### 3.2.4. Equipment Lists

All the machines which are used in the production process are imported from Korea. The lists of machineries and the area where they installed in operation process of the factory are described in section 3.4, Chapter 3. Meanwhile, office equipment such as furniture and fixture are also purchased from local.

### 3.2.5. Employment

Generally, working hours of the factory is from 7:30 am to 4:30 pm for every weekday and 7:30 am to 11:30 am for every Saturday. The break time is from 11:30 am to 12:30 pm. Sunday and other gazette holidays are closed. There are all together 181 staff in the factory.

### 3.2.6. Type of Products and Production Rate

Currently, two main types of products are produced from the factory; namely, protected cover of vehicles, car seat protection products as well as webbing products such as car wastebasket and cargo net. The final products are exported to Korea and China. Various types of product samples and the annual production rate of the factory are shown in Figure 6 and Table 4.





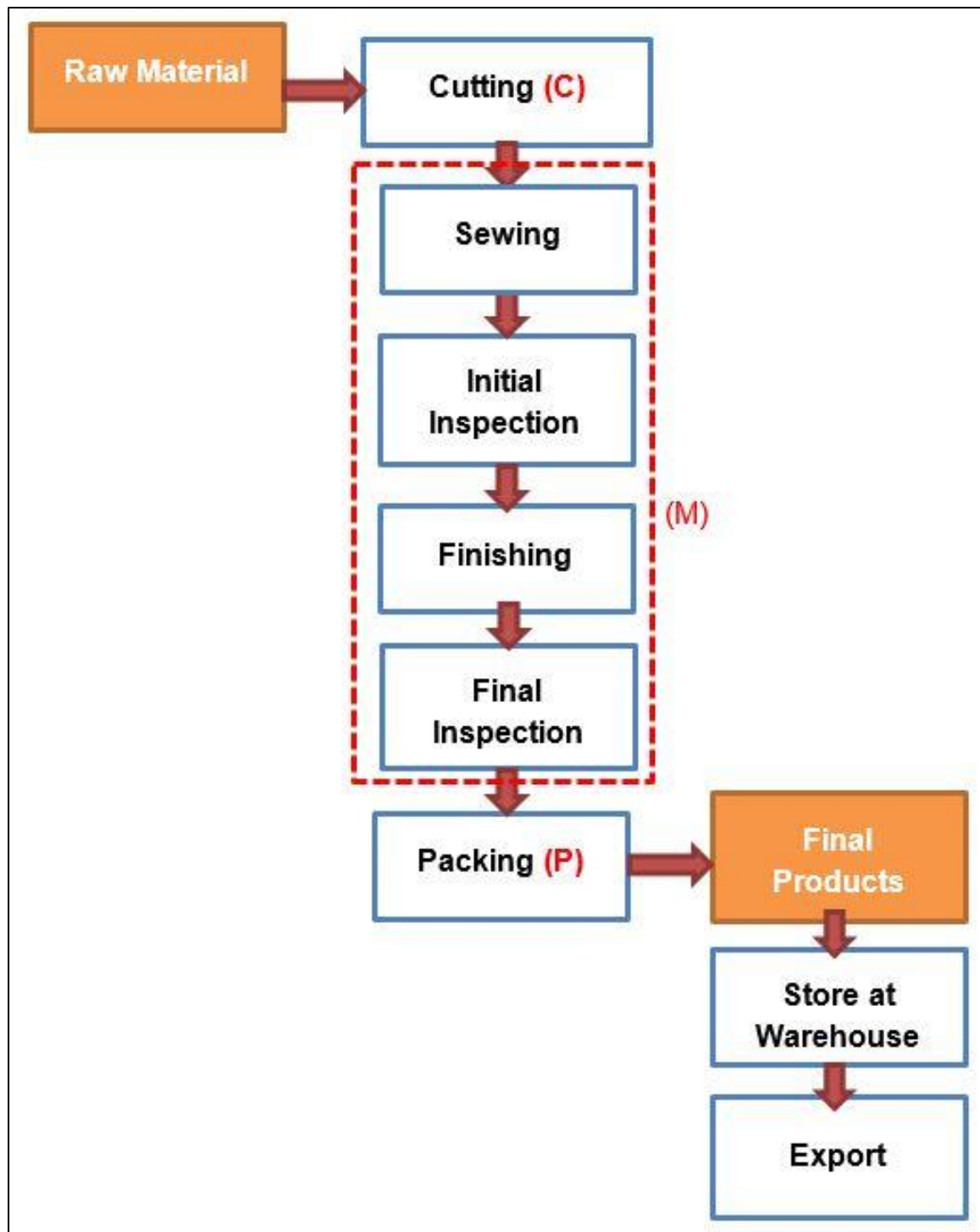
**Figure 6 Products Samples**

**Table 4 Type of Products**

Type of Products	Monthly Production Rate (Numbers)	Annual Production Rate (Numbers)
Car Protection Covers	132,000	1,584,000
Webbing Products (Cargo Net)	46,080	552,960
Total numbers	178,080	2,136,960

### 3.3. Production Process

The main production process, Cut-Make-Pack (CMP) system can be classified into four main section, namely, cutting, making (sewing, finishing and final inspection), packing and temporary storage before export. Firstly, raw materials are stored at the warehouse before sending to the CMP manufacturing process. The first step of the CMP process is the cutting process done by both manual and automatic system. After that, the desire size of cutting pieces are sent to sewing line, made hand sewing, followed by finishing process which is the last step of making process. After the finishing step, the products are inspected for quality control, and then the qualified products are packaged at packing department. Finally, the completed products are stored in the warehouse and exported to the foreign countries. Production process flow diagram is shown Figure 7.



**Figure 7 Production Process Flow Chart**

### **3.4. Support Facilities for Workers**

There are several types of supporting facilities for workers within the factory. They are drinking water supply, providing clean and hygienic sanitation system, annual bonus, first aid boxes and other necessary personal protective equipment.

### 3.4.1.1. First Aid Box

There are total of three first aid boxes provided at each department. The location of first aid boxes and its accessories are shown in Table 5 and Table 6.

**Table 5 List of First Aid Box**

Department	Location	Quantity
Manufacturing sector	Near sewing lines	1
	Near cutting section	1
Office	Main Office	1
<b>Total</b>		<b>3</b>

Source ESung Company Limited

**Table 6 Accessories of First Aid Boxes**

No.	Item	Unit	Qty
1.	Roller Bandages 2"	pcs	2
2.	Paper Tape	roll	1
3.	Handy Plats	pcs	5
4.	Betadine/Sept dine	tube	1
5.	Spirit	bottle	1
6.	Elastic Bandage	pcs	2
7.	Cotton Wool	pack	1
8.	Adhesive Tape	roll	1
9.	Forceps	pcs	1
10.	Small Scissors	pcs	1
11.	Emergency Burn Gel	bottle	1

### 3.4.1.2. Drinking Water Supply

Daily drinking water demand of the factory is around 160 liters per day. 20 liters plastic drinking water bottles are provided for drinking purpose daily. Photos of drinking water bottles are shown Figure 8.



**Figure 8 Purified Drinking Water Bottles**

#### **3.4.1.3. Canteen**

For employees, there are facilities such as canteen and washing basin to wash their lunch boxes in the factory compound. Current condition of factory's canteen is shown in Figure 9.



**Figure 9 Current Condition of Factory's Canteen**

#### **3.4.1.4. Sanitary**

Regarding sanitation, twelve numbers of clean and hygienic toilets are provided for workers. The sewage from the toilets is treated by septic tanks and the sludge from the septic tank has been removed every two years. Current condition of sanitary facilities is shown in Figure 10.



**Figure 10 Current Condition of Sanitary Facilities**

#### **3.4.1.5. Other Facilities**

It is also providing several types of facilities for the employees. The employees are allowed medical leaves when they suffer from personal health diseases. Based on the performance and the yearly profit of the company, the annual bonus will be announced and paid to each employee every year. Besides, it is provided the personal protective equipment (PPE) especially for the worker from cutting sector.

### **3.5. Project Utilities**

#### **3.5.1. Water Source**

Water is pumped from the main tube well and stored at water tower. Then, raw water from the water tower is transferred to the factory storage tanks with the capacity of three hundred gallons.

#### **3.5.2. Electricity Power Supply**

Electricity used in operation process is from township main grid line. There is a transformer with the capacities of 400 KVA is situated within the factory compound.

#### **3.5.3. Generator**

KOGEN diesel generator set is installed for emergency use in case the grid electricity is off. The capacity of the generator is 1,500 revolution per minute for 380 volts (1,500rpm/380V). Engine rating of the generator is 100 kVA for prime and 110 kVA for stand-by.

#### **3.5.4. Fuel Storage Tank**

The fuel is mainly used for diesel generator. The capacity of the fuel storage tanks is around 100 gallons. Diesel consumption of the whole factory is approximately 220 liters (57 gallons) per week.

#### **3.5.5. Air Compressor**

Three numbers of air compressor that includes electric motors (1,450 rpm and 220 V) are used for PE film cutting process. The capacity of air tank for each compressor is around 22.67 gallons. The pressure supply of each air compressor is 115 psi with 3 hp.

#### **3.5.6. Wastewater**

Regarding the production, as the factory manufacturing process is mainly based on the CMP system, there is no wastewater discharge from the production process.



Toilets for workers are constructed within the factory compound and it separates into equal numbers for male and female. Factory has its own septic tanks for sewage storage. Generally, the sludge from the septic tank has been removed whenever it is necessary.

Regarding the domestic wastewater from canteen and washing basins, it is directly discharged into the factory drainage channel. Based on the U.S EPA (1978)<sup>3</sup>, the average daily water usage for a worker is 150 liters for one person. Therefore, the estimated wastewater discharge from the 181 office staff will be around 2,750 liters per day.

### 3.5.7. Drainage Channels

There are two types of drainage systems in the factory. They are -

- 1) Drainage for rain water
- 2) Drainage for domestic wastewater

All drainage systems are installed by pipes and each drainage line is connected separately to the factory drainage channel. Generally, domestic water from factory as well as the rainwater from road and around the factory compound is flowed into the nearest drainage channel. In which, factory drainage channel is directly connected to the YCDC drainage system.

### 3.5.8. Ventilation System

Ventilation system is provided for workers at operation places. Mobile fans, large windows, exhaust fans and standard size of roof high are provided for workers in the factory. The current condition of factory's ventilation system is shown in Figure 11.



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<sup>3</sup> U.S.EPA. (1978), Environmental impact statement phase II, Facility Plan Handover Country, Virginia 3<sup>rd</sup> Edition.



**Figure 11 Current Condition of the Factory's Ventilation System**

### 3.5.9. Firefighting System

Regarding the firefighting system, automatic ceiling water sprinkler system is installed within the two-story factory building. The factory provided sufficient firefighting equipment around the factory to prevent fire in case of emergency. The list of firefighting equipment is described in Table 7.

**Table 7 List of Firefighting Equipment**

No	Type of Equipment	Quantity
1.	Fire extinguisher	13
2.	Fire hose reel	6
3.	Fire alarm	2
4.	Fire hydrant pipe	2

Source ESung Myanmar Company Limited

### 3.5.10. Solid Waste

Cutting pieces of PE film cover sheet and wastes paper of double tape are the main solid wastes of the factory. In general, daily solid waste generation is about 25 kilogram per day from the production process of the factory. Normally, there is no hazardous waste from the factory production process. Normally, it is also expected to have some general waste from the factory workers. According to the IGES (2016)<sup>4</sup>, the estimated amount of waste generation from each person is 0.4 kilogram per person for one day. During operation phase, the waste generation rate of 181 workers is approximately 80 kilogram per day.

## 4. Description of Surrounding Environment

The surrounding environment were conducted the condition of natural environment, socio-economic environment, environmental baseline survey and biological environment in the study area as presented in Table 8.

<sup>4</sup> IGES (June, 2016), Quick Study On Waste Management in Myanmar



**Table 8 Current Environmental and Social Condition in the Study Area**

No.	Item	Description
<b>Natural Environment</b>		
1.	Climate	<p>This data was provided from GAD (2020) of Dagon Myothic (East) Township. During the course of a year, the average maximum temperature is 36 °C and the average minimum temperature is 22 °C.</p> <p>According to the data from Department of Meteorology and Hydrology (2020), the average of humidity in the summer, rainy and winter season are about 88%, 93% and 87% respectively. Moreover, the average maximum temperature of project township are 37°C, 31°C and 33 °C in summer, rainy and winter season. In addition to, the total annual rainfall is about 94.25 inches in a year.</p>
2.	Topography	<p>Due to the presence of Name Yei Creek, which flows from north to south in Dagon Myothic (East) Township, the wetland areas are sometimes flooded. Deepwater fields and farmland are located in the study area in the past, but has emerged as a land plain for the development of settlements. According to the topographic map, the elevation of the study area is between 0 and 10 meter high.</p>
3.	Geology, soil and seismicity	<p>Project area of Dagon Myothic (East) 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 Peg 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 meter above sea level.</p> <p>The soil type of the proposed project site is meadow and meadow alluvial soils. The meadow soils which occur near the river plants with occasional tidal floods are non-carbonate. They usually contain large amount of salts. Meadow alluvial soils (fluid Glycols) 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.</p>
4.	Hydrology	<p>Project site is located in Dagon Myothic (East) Township in which a few rivers and creeks are existing. The creek near the project site is the Nga Moe Niki creek which is located approximately 3.61 kilometer east of the project site.</p>
<b>Socio-economic environment</b>		
5.	Land use	<p>The study area consists of around five hundred kilometers radius of the project. It is characterized by eight types of land use. As a result of the study, industrial area is the largest portion within the study area where water body occupies the smallest portion.</p>
6.	Population and Age group	<p>The study area have 63 wards from Dagon Myothic East belong to over 37,123 houses and the total population of the project townships is 182,081.</p> <p>The female group is slightly higher for all of under 18 years and above 18 years. As a result, it mentioned that male to female proportion is 1 to 1.12 for the entire study area.</p>
7.	Ethnicity and Religious	<p>Bamar is the largest population in the area about 171,136 people. The second largest group is Rakine, with 3,121 people. The third largest group is Ka Yin people, with the population of 2,208 people.</p> <p>The majority of people in project Township are Buddhist. The remaining population is composed of Christian, Hindu and Muslim.</p>

No.	Item	Description
8.	Education	There are many education centers such as 11 monastic schools, 16 primary schools, 7 post primary schools, 3 middle schools and 5 high schools in project Township.
9.	Livelihood (employment, income, health, infrastructure and electricity)	<p>Local people work formally in trading, industrial/handicraft, agriculture, service industry and so on. As the township is in the industrialized zone, civilians make their main careers in exporting and importing of fast moving consumer goods, clothing, and food. The workforce in township is 134,080 and workers in working spaces are 128,900. Therefore, unemployment rate is only 3.86%.</p> <p>The common case is tuberculosis and, followed by HIV/AIDS where diarrhea is very rare of mortality in the study area.</p> <p>There are some social infrastructures especially many shops and grocery stores in study township. In addition, societies such as social organizations are found within the study township. Various religious places such as monastery, nunnery and religious temple are situated in the study township.</p> <p>There is 25.282 Acre of primary substation in Dagon Myothic (East) Township, Yangon Division. The 66 kV power transmission line is distributed to the study area.</p>
10.	Transportation	Five highway roads and two bridges are accessible to connect one township to another. There is only one 5 miles Dagon University Railway from Toe Gang Kaley to Dagon University in the study area. Moreover, there are 17 kinds of bus lines and 856 buses to go smoothly to go to other townships
<b>Environmental Baseline Survey</b>		
11.	Air Quality	<p>Air quality monitoring such as CO<sub>2</sub>, CO, CH<sub>4</sub>, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, VOC, Humidity and Temperature, were conducted within the proposed project site.</p> <p>Results of air measured by AQM-09 were compared with guideline values of NEQEG (2015) and all air quality results were within the NEQEG (2015).</p>
12.	Wind speed and Direction	According to the field survey results, there is no residential area near the project while the wind speed within the project site is around 1.2 meter per second with Southwest (SW) prevailing wind direction of 228 degree.
13.	Water Quality	<p>It is collected the single grab water samples from the domestic washing process of proposed project site.</p> <p>According to the monitoring results, all wastewater parameters for both inside and laboratory experiment results are within the NEQEG (2015).</p>
14.	Noise Level	<p>Noise level were conducted within the project area. The results were compared with NEQEG (2015) of industrial or commercial noise level.</p> <p>According to the monitoring results, both average noise levels for day and night times are within the standard guideline values.</p>
15.	Vibration	Vibration measurement was conducted within the project area. The results are compared with the German Standard DIN 4150-3. According to the field survey results, evaluation results of vibration level for all stations are within the standard values.
16.	Light	Light measurement were conducted at nine locations in the project site. The results were compared with International Finance

No.	Item	Description
		Corporation (IFC) Environmental Health and Safety (EHS) guideline. According to the field survey results, most light results from measured locations need to adjust with the IFC guideline.
17.	Temperature	Temperature were measured at nine points in the same location of light measuring points within the project area. The results were compared with IFC guideline value. According to the survey result, all measured results from nine locations are merely higher than the IFC guideline. The main possible reason is that a significant incensement in ambient temperature (around 43 ° C) was recorded in Yangon during the April 2022.
18.	Traffic Counting	Traffic counting were collected at two stations in the study area. According to the survey results, traffic survey for both TC-A and TC-B have free flow (A) traffic condition.

## 5. Potential Environmental Impact and Mitigation Measurement

### 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. 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 scales use in assessing of each potential impact is shown in Table 9.

**Table 9 Evaluation of Impact Assessment**

Probability	Duration
Very improbable impact	A very short duration (0-1 year)
Improbable impact	A short duration (2-5 years)
Probable impact	Medium-term (6-15 years)
Highly probable impact	Long- term>15 years
Definitely impact	A permanent period
Magnitude	Extent
Insignificant impact	Site-specific impact
Low impact	Local impact
Moderate impact	Regional impact
High impact	National Impact
Very high impact	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 10. Evaluation and prediction of the significant impact for construction, decommission and operation phases are presented in Table 11 and Table 12.

**Table 10 Potential Environmental Impacts Rating**

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

**Table 11 Evaluation and Prediction of Significant Impact for Construction and Decommission Phase**

Potential Impact	Activities and Sources	Components	Magnitude	Extent	Duration	Probability	Score	Significant
<b>Potential Negative Impacts</b>								
Air Quality	Construction and decommission activities, diesel generator and vehicle movement	PM <sub>10</sub> , PM <sub>2.5</sub> , CO, NO <sub>2</sub> , O <sub>3</sub> , SO <sub>2</sub>	2	1	1	3	12	Negligible
Noise and Vibration	Emergency use of diesel generator and the operation of construction equipment and heavy vehicles	Noise and vibration	2	1	1	3	12	Negligible
Water Quality	Surface runoff, domestic wastewater	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorous, Total Suspended Solids	2	1	1	3	12	Negligible
Soil Quality	Civil work	Leakage of fuel, oil and other various wastes	3	1	1	3	12	Negligible
Solid Waste	Civil work and wastes from workers	Residue waste and domestic waste	3	1	1	3	12	Negligible
Land	Removal of vegetation and top soil Installation of infrastructure	Land use change	2	1	4	3	21	Low
Ecosystem	Civil works	Flora and Fauna	2	1	4	3	21	Low
Occupational Health and Safety	Accidents due to construction workers' careless and unskilled workers	Infectious disease; such as AIDS/HIV, Hepatitis B/C, etc. and other physical injuries	2	1	1	3	12	Negligible

Potential Impact	Activities and Sources	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Potential Positive Impacts								
Local Economy such as Employment and Means of Livelihood	Civil works, raw materials and equipment purchasing	Employment and business opportunities	2	2	1	3	15	Low

**Table 12 Evaluation and Prediction of Significant Impact for Operation Phase**

Potential Impacts	Activities and Source	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Air Quality	Use of diesel generators and vehicles movement	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , CO, O <sub>3</sub> ,	2	2	2	3	18	Low
Noise and Vibration	Transportation vehicles, high volume speaker and emergency used diesel generator	Noise and vibration	2	2	2	3	18	Low
Water Quality	Discharge of untreated wastewater and improper wastewater treatment system	BOD, COD, Oil and Grease, Total Nitrogen (TN), Total Phosphorous (TP), Total Suspended Solids (TSS)	2	2	2	3	18	Low
Soil Quality	Logistic transportation	Leakage of fuel, oil and other various wastes, and improper wastewater discharge	2	2	3	3	21	Low
Solid Waste	Office waste and operation waste	Type and amount of waste	2	2	2	3	18	Low
Offensive Odour	Temporary solid waste disposal site, factory operation process such as raw materials cutting process and renovation activities such as colour painting	Offensive Odour	2	2	2	3	18	Low
Occupational health and safety	Workers' health in operation area	Infectious disease; such as COVID-19, AIDS/HIV, Hepatitis B/C, etc. and other physical injuries	2	2	2	3	18	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	3	3	21	Negligible
Potential Positive Impacts								
Local Economy such as Employment and Means of Livelihood	Employment opportunity	Job and business opportunities	3	4	2	4	32	Moderate

## **6. Public Consultation and Disclosure**

### **6.1. Purposes of the consultation during the Preparation of the EMP Report**

Public consultation meeting is regarded as a necessary part of the EMP study. ESung Myanmar 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 EMP requirement, ESung Myanmar publicized about the project developments to the concerned stakeholders as follows;

1. Information of the stakeholders about the project, environmental and social issues related to project operation, and mitigation measures to minimize environmental and social impacts.
2. 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.
3. Participation and partnership where issues are needed to join for discussing and assess.

Detailed information related to public consultation meeting for the EMP study of ESung Myanmar is described in public consultation section, chapter 6.

## **7. Environmental Management Plan**

The objective of the environmental management is to ensure potential environmental issues managed by proper mitigation measures in compliance with the relevant laws and regulations stipulated by national authorities. Environmental management based on the basic principles of management is known as the P.D.C.A cycle (see Figure 12). Environmental management 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 and designing effective programs of proper environmental management plan.

- **Do (D) - Implement the plan**

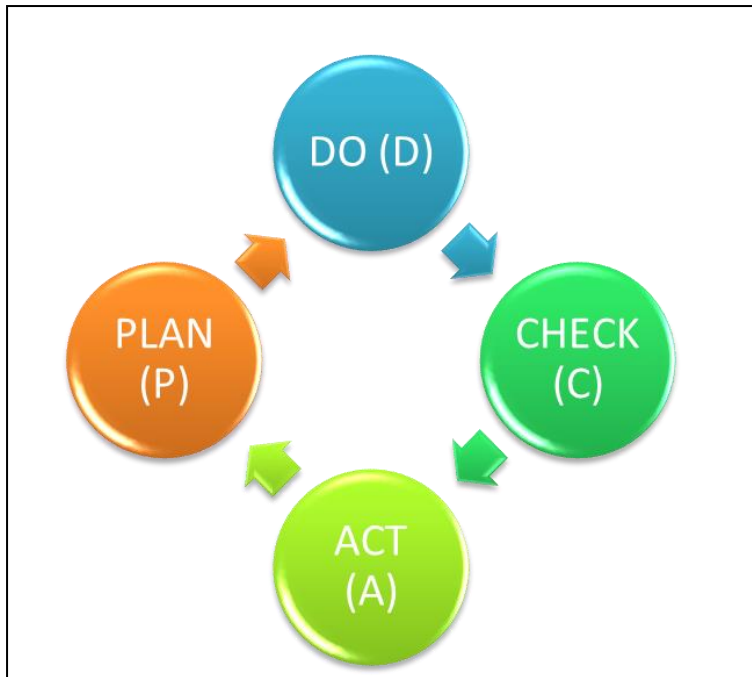
The Project proponent as described in this chapter will implement the mitigation measures for the potential environmental impacts appropriately.

- **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 are noted with reference to the environmental monitoring benchmarks, corrective actions are needed to plan to mitigate the existing environmental impacts.



**Figure 12 P. D. C. A Cycle**

## **7.1 Environmental Mitigation and Management Plan**

This section presents the proposed mitigation measures that Esung will adopt to facilitate the management and control of potential adverse impacts associated with the project activities, which are described in Chapter 5. As the current land area and factory building are leased with 5 years lease contract, activities related to the construction and decommission processes are not related to the project proponent. However, not only the environmental management plan including mitigation measures, estimated cost and responsible organization are presented in Table 13 for construction and decommission phases but also for operation phase in Table 14 **(See detail in CHAPTER 7)**

**Table 13 Environmental Management Plan during Construction and Decommissioning Phase**

Item	Potential Negative Impacts	Mitigation Measures	Responsible Team
Air Quality	❖ Particulate matters (PM <sub>10</sub> & PM <sub>2.5</sub> ) and gaseous pollutants (NO <sub>2</sub> , CO, O <sub>3</sub> & SO <sub>2</sub> ) emission from construction and decommission activities, diesel generator and vehicle movement.	<ul style="list-style-type: none"> <li>❖ Regular maintenance of transportation vehicles must be performed.</li> <li>❖ Spraying water and usage of safety nets should be prepared at and around the construction areas.</li> <li>❖ Diesel fuel with lower sulfur content should be utilized.</li> </ul>	Construction contractors
Noise and Vibration	❖ Noise and vibration from the emergency use diesel generator and operation of construction equipment and heavy vehicles.	<ul style="list-style-type: none"> <li>❖ Civil work generating high noise level should be carried out only at daytime.</li> <li>❖ Workers in excessive noise areas are needed to be provided adequate earplugs or earmuffs.</li> <li>❖ Low-noise level generator should be selected.</li> </ul>	Construction contractors
Water Quality	❖ Surface runoff and domestic wastewater discharge	<ul style="list-style-type: none"> <li>❖ Domestic wastewater from the construction worker camp should be discharged properly.</li> <li>❖ Sufficient number of toilets and bathing facilities for the construction workers should be provided.</li> <li>❖ Sewage and grey water should be collected into the septic tanks and discharged properly.</li> </ul>	Construction contractors
Solid Waste	❖ Construction residual wastes and domestic wastes	<ul style="list-style-type: none"> <li>❖ Solid waste from the removal of top soil and old structures.</li> <li>❖ Establish and operate an efficient waste management system.</li> <li>❖ Non-hazardous wastes such as plastic, garbage, glass and food waste should be collected separately and managed.</li> </ul>	Construction contractors
Occupational Health and Safety	❖ Accidents due to construction workers' careless and unskilled workers	<ul style="list-style-type: none"> <li>❖ Safety policy of the project proponent</li> <li>❖ Safety plan of the contractor</li> <li>❖ Provision of safety gadgets to the workers</li> </ul>	Construction contractors

Item	Potential Negative Impacts	Mitigation Measures	Responsible Team
		<ul style="list-style-type: none"><li>❖ Raising awareness of safety guidelines to the workers</li><li>❖ Assignment of safety supervisors at the work site</li><li>❖ Incentives to workers who obey the safety practices</li><li>❖ Penalty to workers who disobey the safety practices</li><li>❖ Arrangement of morning talks and toolbox meeting</li><li>❖ Preparation of health and safety matrix</li></ul>	

**Table 14 Environmental Management Plan during Operation Phase**

Item	Potential Negative Impacts	Mitigation Measures	Responsible Team
Air Quality	❖ Particulate matters (PM <sub>10</sub> & PM <sub>2.5</sub> ) and gaseous pollutants (NO <sub>2</sub> , CO, O <sub>3</sub> & SO <sub>2</sub> ) emission from the use of diesel generator and transportation vehicles, and raw materials cutting process.	❖ Water will be sprayed on the dusty areas within the factory compound. ❖ Generators and vehicles will be maintained regularly. ❖ Low sulfur content diesel should be used. ❖ Proper ventilation system will be implemented.	Project proponent
Noise and Vibration	❖ Noise and vibration from the emergency used diesel generator and sewing process	❖ All equipment, vehicles and machinery must be maintained regularly. ❖ Diesel generators must be set up away from the residential areas and factory workers. ❖ Earplugs must be provided to the factory workers who worked near the high noise generation areas.	Project proponent
Water Quality	❖ Sewage and domestic wastewater discharge from the factory workers	❖ Sewage and domestic wastewater must be discharged in line with the regulation of YCDC.	Project proponent
Solid Waste	❖ Non-hazardous waste such as paper, plastic bag and plastic bottles, food wastes, rubber, etc. will be generated from the factory's office and factory's workers. ❖ PE film cover sheet and waste tape paper will be generated from production process. ❖ As the factory production process based on CMP system, it is not expected to generate hazardous wastes from the proposed project.	❖ Establish and operate an efficient waste management system. ❖ Non-hazardous wastes such as plastic, garbage, glass and food waste should be collected separately and managed to recycle if possible.	Project proponent
Occupational Health and Safety	❖ Physical injuries due to workers' careless and unskilled workers	❖ Personal Protective Equipment (PPE) should be provided to the workers.	Project proponent

Item	Potential Negative Impacts	Mitigation Measures	Responsible Team
		<ul style="list-style-type: none"><li>❖ Training related to best safety practice must be provided to the workers.</li><li>❖ Warning signs should be set around spills or wet floors and avoid walking on slippery floors.</li><li>❖ Provide First Aid Kits sufficiently at the work place in case of occupational incidents.</li><li>❖ Illegal drugs or alcohol must be prohibited at any time on working hours.</li></ul>	



## **7.2 Sub Plan for Environmental Monitoring Implementation**



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 Section 8, Sub-section 8.6 of EIA Procedure (2015), the environmental monitoring Sub-Plan is required to include in EMP report. 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 construction, operation and decommissioning phases is shown in Table 15 and Table 16.

**Table 15 Environmental Monitoring Sub-Plan during Construction and Decommissioning Phases**

Monitoring Item	Monitoring Parameter	Monitoring Location	Implementation Schedule	Estimated Budgets (MMK)	Responsibilities
Air Quality	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> & CO	One point at the project site	Twice a year	Included in the project cost	Construction Contractor
Noise	Noise level (dB (A) scale)	One point at the project site	Twice a year	Included in the project cost	Construction Contractor
Vibration	Radial, Transverse, Vertical	One point at the project site	Twice a year	Included in the project cost	Construction Contractor
Water Quality	BOD, COD, Oil & grease, pH, Total coliform bacteria, Total nitrogen, Total phosphorus, Total suspended solids	One point at the project site	Monthly	Included in the project cost	Construction Contractor
Solid Waste	Amount and type of solid waste	Temporary waste disposal site construction site	Weekly	Included in the project cost	Construction Contractor
Occupational Health and Safety	Incident/accident records	Around the project site and construction site	Monthly	Included in the project cost	Construction Contractor

**Table 16 Environmental Monitoring Sub-Plan during Operation Phase**

Monitoring Item	Monitoring Parameter	Monitoring Location	Implementation Schedule	Estimated Budgets (MMK)	Responsibilities
Air Quality	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> & CO	<p>One point at the project site (16°53'27.95" N and 96° 14' 6.6" E)</p> 	Twice a year	1,000,000	Project Proponent
Noise	Noise level (dB (A) scale)	<p>One point at the project site (16°53'28.26" N and 96° 14' 6.67" E)</p> 	Twice a year	500,000	Project Proponent
Vibration	Radial, Transverse, Vertical	<p>One point at the project site (16°53'28.39" N and 96° 14' 6.43" E)</p>	Twice a year	500,000	Project Proponent

Monitoring Item	Monitoring Parameter	Monitoring Location	Implementation Schedule	Estimated Budgets (MMK)	Responsibilities
					
Water Quality	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Total suspended solids	<p>One point at the project site (16°53'5.1" N and 94° 52' 39.57" E)</p> 	Twice a year	300,000	Project Proponent
Solid Waste	Amount and type of solid waste	Temporary waste disposal site	Weekly	30,000	Project Proponent
Occupational Health and Safety	Incident/accident records	Within the project site	Monthly	30,000	Project Proponent

### 7.3 Fund for EMP

The budget for EMP fund will cover the initial cost and recurring expenses for implementation EMP. Table 17 shows annual budget allocation for proposed environmental, health and safety mitigation measures.

**Table 17 Estimated Budget for Environmental, Health and Safety Mitigation Measurement**

No	Proposed Environmental Mitigation Measures	Estimated Budget (MMK)
<b>Environmental Work</b>		
1	Monitoring program	4,200,000
2	Capacity building and training	500,000
3	Emergency case	500,000
<b>Health and Safety Work</b>		
4	Personal protective equipment	3,000,000
5	Medical for Clinic	500,000
6	Fire Fighting Equipment	500,000

### 8. Conclusions

This EMP report has been prepared based on the provided information by project proponent, relevant studies and reports, baseline environmental monitoring and the public consultation.

The project is less likely to cause significant environmental and social impacts. Most of the impacts are temporary on the environment and these impacts can be mitigated to reduce to acceptable levels.

The project proponent has facilities and staffs to train and manage solid and liquid wastewater. This EMP report outlined potential environmental impacts during the operational phase of the factory. Those potential impacts could be mitigated if the above recommended mitigation measures are taken. The environmental monitoring team organized by the factory should take the responsibility of regular monitoring.

ESung Myanmar shall be responsible for the preservation of the environment at and around the area of the project site. In addition to this, it shall carry out each instruction made by MONREC. In which to conduct an EMP that describes the measure to be taken for preventing, mitigation and monitoring significant environment impacts resulting from the implementation and operation of proposed project or business or activity has to be prepared and submitted to perform activities. In accordance with this EMP and be abided by the environment policy, ESung Myanmar shall be responsible for environmental assessment of the factory as follows:

- Environmental management plan is well accomplished and strongly conducted.
- The plan is conducted by strictly following the instructed procedure and relevant rules and regulations.

- ESung Myanmar will be complied completely and continuously the commitment in which the activities to reduce the environmental impact.
- During the operating period, the company will be carrying out the proposed environmental management plan to be better by applying updated technologies and system as well as depend on the workplace requirement according to the comments from ECD.

The factory will conduct environmental and social management plan to avoid the impact to the local area before the closure.

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## ABBREVIATIONS

ADB	Asia Development Bank
AQM	Air quality monitoring
BOD	Biochemical Oxygen Demand
CH <sub>4</sub>	Methane
CMP	Cut Make Pack
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
COD	Chemical Oxygen Demand
COVID-19	Coronavirus Disease 2019
CSR	Corporate Social Responsibility
dB	Decibels
DO	Dissolved Oxygen
ECC	Environmental Compliance Certificate
ECD	Environmental Conservation Department
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
ESung	ESung Myanmar Company Limited
GIS	Geographic Information System
GPH	Gallons per hour
GPS	Global Positioning System
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IGES	Institute of Global Environmental Strategies
IUCN	International Union for Conservation of Nature
Lux	Light Intensity
MIMU	Myanmar Information Management Unit
MMK	Myanmar Kyats
MNDWQS	Myanmar National Drinking Water Quality Standards
MOECF	Ministry of Environmental Conservation and Forestry
MONREC	Ministry of Natural Resources and Environmental Conservation
MSL	Mean Sea Level
NEQEG	National Environmental Quality (Emission) Guideline
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxide

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OHS	Occupational Health and Safety
PAPs	Project Affected Persons
PCD	Passenger Car Equivalents Factor
PCU	Passenger Car Unit
PDCA	Plan-Do-Check-Act
PM	Particulate Matter
PPAH	Pollution Prevention and Abatement Handbook
PPE	Personal Protective Equipment
PPP	Public Private Partnership
PPV	Peak Particle Velocity
PS	Performance Standards
QC	Quality Control
Qty	Quantity
SO <sub>2</sub>	Sulfur Dioxide
SW	Southwest
TBS	Total Business Solution Company Limited
TC	Traffic counting
TDS	Total Dissolved Solids
TN	Total Nitrogen
TSS	Total Suspended Solid
USEPA	United States Environmental Protection Agency
V	Traffic Volume
VOC	Volatile Organic Compound
WB	World Bank
WHO	World Health Organization
YCDC	Yangon City Development Committee



## CHAPTER 1 INTRODUCTION

### 1.1. PROJECT BACKGROUND

The project proponent of the proposed project is Esung Myanmar Company Limited (Esung), which was established on 4<sup>th</sup> May, 2018 according to the Certificate of Incorporation. The type of investment of the proponent is a 100 percent owned foreign company established under the Myanmar Companies Act. The company type is private Company Limited by shares. The project proponent requested Total Business Solution Co., Ltd. (TBS) (the Consultant) to complete the Environmental Management Plan (EMP) for the proposed project.

The proposed project is the manufacturing of garments and protected cover for vehicles on CMP basis. Currently, the factory is manufacturing various types of protected covers for vehicles and cargo nets only. During the last four years, the ESung was located at the Industrial Zone -1, Dagon Myothit (south) Township, and Yangon, Myanmar. From April, 2022 onward, the factory changed the location to Plot No. (149/6), Kanaan Minthargyi Road, East Dagon Industrial Zone, East Dagon Township, Yangon Region, Myanmar. The coordinate of project site is 16°53'38.88" N and 96° 14' 2.16" E. The location map of the project is shown in Figure 1-1.

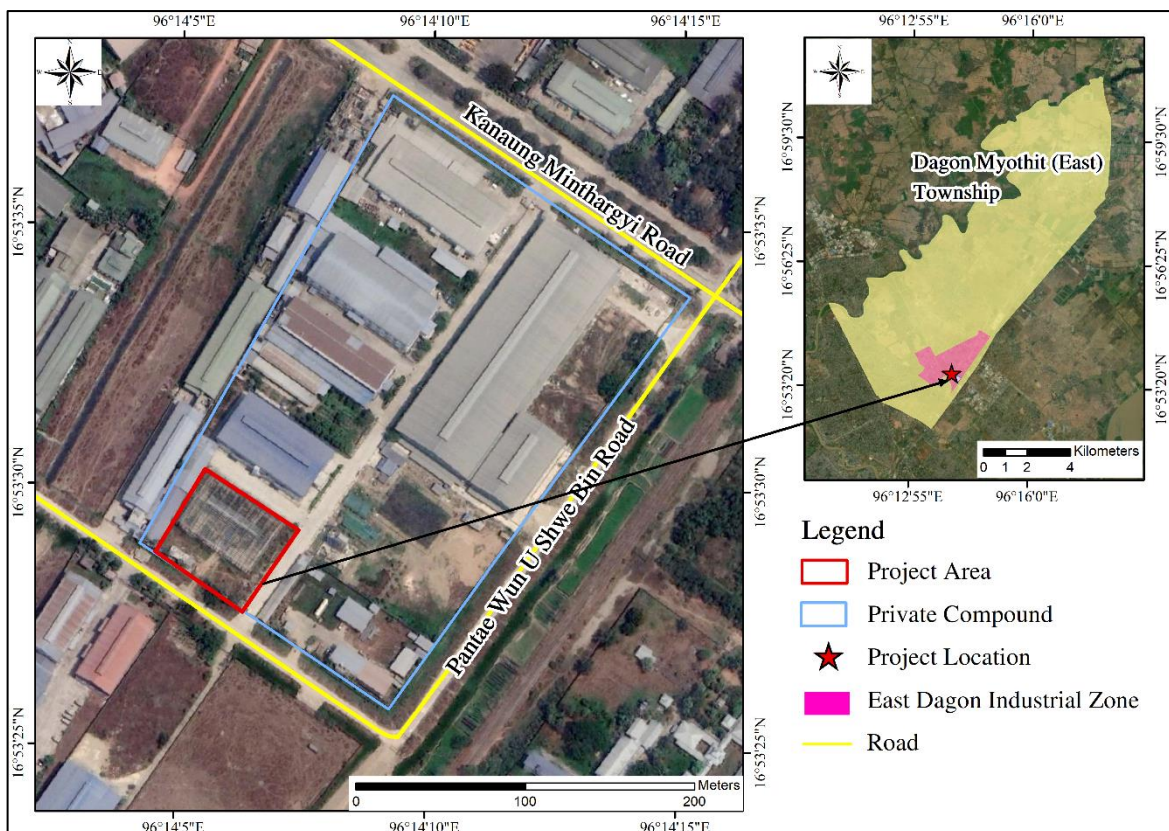


Figure 1-1 Location Map of the Project Site

## 1.1. OBJECTIVE OF THE PROJECT

The main objective of the EMP are (a) to identify environmental and social impact, (b) to define details of who, what, where and when environmental management and mitigation measure to be implemented and (c) to ensure that the environmental quality of the area is not affected due to the project implementation.

## 1.2. PROJECT PROPONENT PROFILE

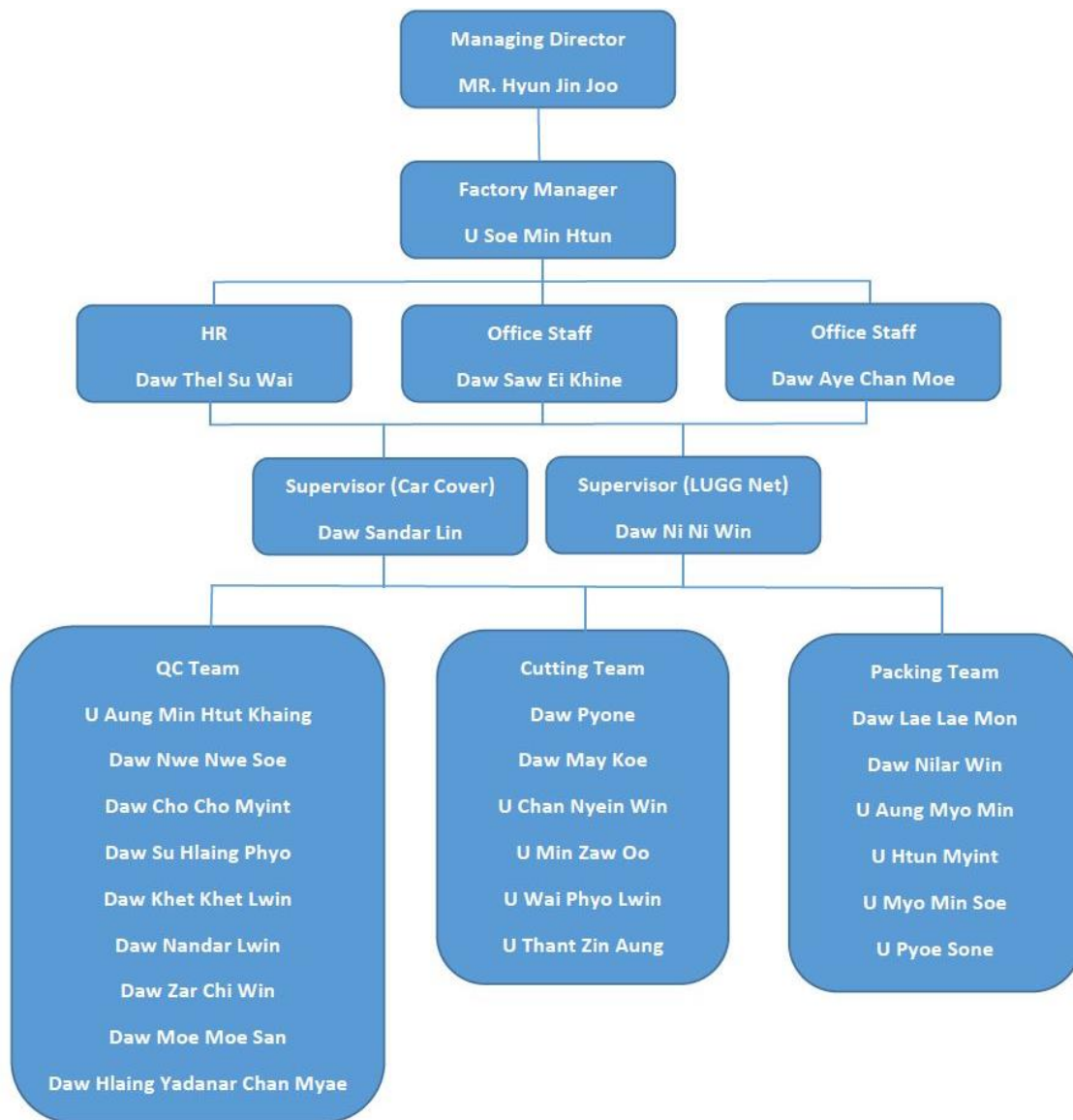
Representative's name and contact of the project proponent is given in Table 1-1. The list of directors is shown in Table 1-2. The company organization chart is described in Figure 1-2. The license and certificate related to ESung are described in Appendix A.

**Table 1-1 Contact Detail of Representative**

<b>Representative</b>	Mr. Sue Min Hun
<b>Position</b>	Director
<b>Phone Number</b>	09-5062646
<b>Email Address</b>	kogyesmhtun@gmail.com
<b>Address</b>	Plot No. (149/6), Kanaan Minthargyi Road, East Dagon Industrial Zone, East Dagon Township, Yangon Region, Myanmar

**Table 1-2 List of Directors**

No.	Name	Nationality/ P P. No.	Position	Address
1	Mr. Chi Minkoo	Korean P.P. No.M72957781	Director	207-2302 (Central Xi 2 Block) 13, sangseojae-ro, 4-gil, Pyeongtaek-Si, Gyeonggi-do, Korea.
2	Mr. Hong Byung Jun	Korean P.P. No.M67891566	Director	-
3	Mr. Hyun Jinjoo	Korean P.P. No.M38781112	Director	-
4	U Soe Min Htun	Myanmar 12/ Ou Ka Ta (Naing) 194518	Director	Room No.(306), Building (A), Maykha Lane (2), Malikha Housing, Bawamyint, Thingangyun Township, Yangon Region, Myanmar.



**Figure 1-2 Organization Chart of Esung Myanmar Company Limited**

### 1.3. THE ENVIRONMENTAL CONSULTING ORGANIZATION

#### 1.3.1. Background Information of TBS

TBS registered with Myanmar Investment Commission (MIC) since 2012. Its office is located in No. 54, Room No. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Yangon, Myanmar. Since its inception, TBS, in collaboration with TEAM Group of Companies at Thailand, has been providing consulting services to the private and public sectors in Myanmar. The two partners have gained recognition from Myanmar and foreign investors involved in development projects including port, industrial estate, power transmission, flood control, drainage and sewerage system, environmental impact assessment, initial environmental examination and environmental management plan.

TBS provides services in various sectors including water resources engineering, geotechnical engineering, and topographic survey, environmental assessments including Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Initial

Environmental Examination (IEE) and Environment Management Plans (EMP). Following are the specializations which TBS can provide services.

- Geotechnical investigation and design
- Topographic Survey with RTK GPS, Total Station, Drone
- Environmental assessments (EIA, IEE, EMP)
- Mine Planning and mine waste design

#### 1.3.2. Profile of TBS

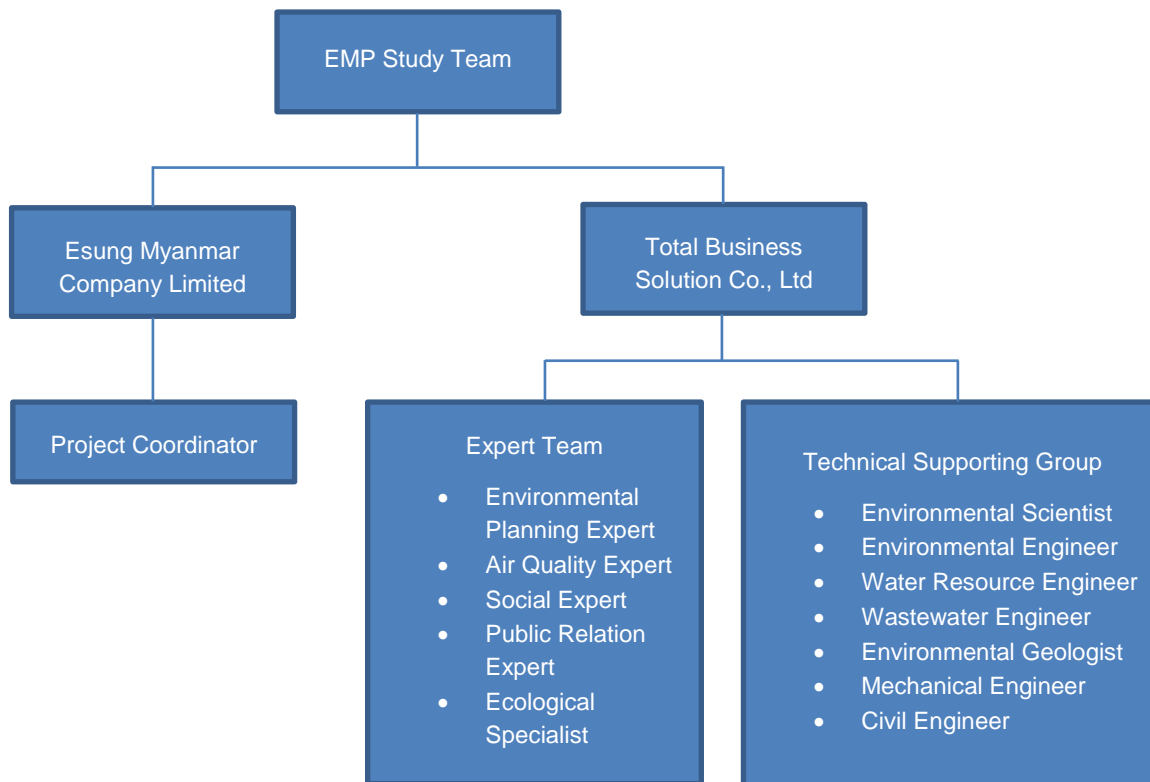
TBS is a third-party organization, which conducted the EMP of this project. The contact name and address of the Environmental Consulting Organization described in Table 1-3. The license and certificate related to TBS are described in Appendix B.

**Table 1-3 Contact Detail of TBS**

<b>Representative</b>	Dr. Soe Moe Kyaw Win, Ph.D., P.Eng. P.Geo.
<b>Position</b>	Managing Director
<b>Office Phone</b>	09-401604493
<b>Email</b>	drsoemoe@outlook.com
<b>Address</b>	No.54, Room no. 704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Yangon, Myanmar

#### 1.4. THE ENVIRONMENTAL CONSULTANTS

TBS has been engaged to prepare the EMP for the project of Esung Myanmar Company Limited. The EMP study team consists of qualified and experienced professionals in various technical areas relevant to major environmental and social impacts of the project identified in the report. The organizational structure for conducting and managing the EMP study is shown in Figure 1-3 and the summary of the EMP study team including education and brief experience is shown in Table 1-4.



**Figure 1-3 Organization structure of EMP Study Team**

**Table 1-4 TBS Staff List**

No.	Name	Education	Experience	Responsibility
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
2.	Mr. Wai Soe General Manager/ Project Manager	B.Sc. (Geology)	10-year experiences in the areas of geotechnical instrumentation and monitoring in Singapore.  5 years' experiences in managing technical teams for site investigation and instrumentation in landslide investigation, mine design, mine waste management, hydrographic and topographic survey	Coach of Monitoring Site Survey, Environmental Quality Analysis and Modelling Expert
3.	Ms. Thet Htar Myint Social Impacts Assessment Specialist	M.Sc. (Gender and Development) M.Sc. (Zoology) B.Sc. (Hons) (Zoology)	Over 14 years' 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)
4.	Ms. Hnin Lai Win Environmental Manager	M.Sc. (Environmental Engineering and Management) B.Pharm. (Pharmacy)	5 years experiences in management and marketing and training of junior staff in medical field  Over 2 years experiences in land use planning, environmental impact	Environmental Risk Assessment, Environmental Management Plan, Impact Mitigation Measure



No.	Name	Education	Experience	Responsibility
			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.	Ms. Eaindra Oo Water Resources Engineer	M.Sc. (Water Engineering and Management) B.Sc. (Civil and Infrastructure Engineering)	2 years' experience in Hydropower engineering, catchment and river management, flood monitoring, hydrology survey and modeling and climate condition study.  Hydropower designing, planning and estimation.  Geotechnical data processing, data analysis and report preparation.  GIS mapping and reporting environmental management plan for environmental projects.	Hydrology Management Environmental Quality Modeling Assistant Social Impact Assessment Assistant
6.	Mr. Htet Thiha Phone Myint Environmental Geologist	B.Sc. (Geology)	7 years' 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 Environmental Quality Monitoring Survey
7.	Mr. Phyo Thu Kyaw Auto CAD Drafter	B.E. (Mechatronic)	3 years' experiences in project coordination, documentation, Auto CAD drafter and graphic design and IT technician.	Coordinator and Drafter



No.	Name	Education	Experience	Responsibility
			Over 2 years experiences in environmental monitoring such as air and noise monitoring, water sampling and installing, maintaining and repair of computer system and office equipment.	
8.	Mr. Aung Chit Moe Geologist	B.Sc (Hons) Geology	Over 2 years' working experience in geological and geotechnical engineering.	Geotechnical, GIS, Mapping and Drone Data Processing Environmental Quality Modeling Assistant
9.	Mr. Wai Phyo Aung Surveyor	B.Sc (Geology)	8 years' working experiences in geological and geotechnical engineering. 4 years' as a team leader in survey team.	Environmental Quality Monitoring Survey Drone Survey
10.	Ms. May Khaing Zin Hein Junior Engineer	B.E (Civil)	GIS Mapping, report comment editing	Social data entry, Mapping and Data Processing
11.	Mr. Chan Nyein Aung Environmental Geologist	B.Sc (Geology)	3 year's experience in environmental monitoring processes and conducting site survey	Environmental Quality Monitoring Survey, Drone Survey
12.	Mr. Zaw Myo Hein Environmental Geologist	B.Sc (Geology)	3 year's experience in environmental monitoring processes and conducting site survey	Environmental Quality Monitoring Survey, Drone Survey
13.	Ms. Phoo Pwint Khine Environmental Engineer	M.E (Environmental Engineering and Management) B.E (Civil)	1 year 'sexperience as a site engineer in construction project. 6 months' experience as a QC/QS at building estimate team. 2 years' experiences in environmental field	Project Description Environmental Base Line Study and Monitoring Plan Environmental Management Plan Environmental Impact Assessment (Water/Wastewater Pollution, Noise pollution) Mitigation and Monitoring Measurement Plan

No.	Name	Education	Experience	Responsibility
				Public Consultation Meeting
14.	Ms. Aye Mon Aung Environmental Engineer	M.E (Environmental Engineering and Management) B.E (Materials and Metallurgy)	2 years' experiences in environmental field	Project Description Environmental Base Line Study and Monitoring Plan Environmental Management Plan Environmental Impact Assessment (Air pollution and Solid Waste) Mitigation and Monitoring Measurement Plan Public Consultation Meeting
15.	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

## **CHAPTER 2**

# **OVERVIEW OF THE POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK**

### **2.1. INTRODUCTION**

Esung has environmental policy of doing environmentally and socially responsible with minimal impact on the environment. It must follow all laws and regulations prescribed by the Republic of the Union of Myanmar over specified in environmental policy, laws, rules, regulations and other international guidelines.

The company is working with the local committees and government agencies, such as MONREC integrating the environment into its planning, operations and policy decisions. The first and foremost policy is to comply with laws, rules and regulations relating to the physical and social environment. Most of all, it will follow the rules and regulations set up by the ECD, the main agency responsible for environmental management of regional level. The company pledges to do the business that will be environmentally as practical as possible.

Environmental management of the project needs to comply with legal requirements of the Environmental Management Plan prescribed in the Environmental Conservation Rules, Notification No. 50/2014 and the EIA Procedure, Notification No. 616/2015.

An EMP is a project document to be prepared according to the requirements and guidance of the Ministry of Natural Resources (MONREC) and Environmental Conservation Department. In order to refrain from, protect against, mitigate and monitor adverse impacts caused by the design, construction, implementation, operation, maintenance, termination, or closure of a project or business or activity; or after its closure, or by any other related cause [Environmental Conservation Rules, 50/ 2014, Chapter I, Article(s) 2g)]. An EMP should include programs to manage, implement activities, and monitor changes to the environmental context.

### **2.2. ENVIRONMENTAL POLICY AND LEGAL FRAMEWORK IN MYANMAR**

This section provides a brief summary of relevant national environmental legislations established by the MONREC and overview of current local and international environmental and social policies including related international or regional convention for the proposed project.

### **2.3. MYANMAR REGULATORY FRAMEWORK**

Myanmar has 25 ministries under the Office of the President as of February 2019. The leading ministries in-charge of environmental and social considerations are the Environmental Conservation Department (ECD) of the MONREC that was reorganized Ministry of Environmental Conservation and Forestry (MOECF) in April 2016.

## 2.4. RELEVANT MYANMAR LAWS AND REGULATIONS

The existing Myanmar laws and regulations relevant to environmental, health and safety issues for this project are listed below.

**Table 2-1 Myanmar Law and Regulation**

No.	Name of Laws and Regulations	Year
<b>Environmental Conservation</b>		
1.	Environmental Conservation Law	2012
2.	Environmental Conservation Rules	2014
3.	Environmental Impact Assessment Procedure	2015
4.	National Environmental Policy	2019
<b>Pollution Control and Health</b>		
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
12.	Prevention of Hazard from Chemical and Related Substances Law	2013
<b>Biodiversity and Resource Conservation</b>		
13.	Conservation of Biodiversity and Natural Protected Area Law	2018
14.	The Law relating to Aquaculture	1989
15.	Conservation of Water Resource and River Law	2006
16.	Conservation of Water Resource and River Rules	2013
17.	Underground Water Act	1930
18.	Forest Law	1992
<b>Land Acquisition</b>		
19.	Registration of Deeds Law	2019
20.	The Boundaries Law	2019
21.	The Land Acquisition Act	1894
22.	Land Nationalization Act	1953
23.	Myanmar National Land Use Policy	2016
24.	State-owned land leasing of buildings; Instruction to be followed in transfers and joint ventures	2018
25.	Farmland Rules	2012
26.	Vacant, Fallow and Virgin Land Management Law	2018
<b>Urban Development and Management</b>		
27.	The Electricity Law	2014

No.	Name of Laws and Regulations	Year
28.	The Telecommunications Law	2013
29.	Development Committee 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
Labour		
33.	Labour Organization Law	2011
34.	The Employment and Skill Development Law	2013
35.	The Minimum Wage Law	2013
36.	Payment of Wage Law	2016
37.	Workers' Compensation Act	1923
38.	The Settlement of Labour Dispute Law	2012
39.	The Leave and Holiday Act (law amended July 2014)	1951
40.	Social Security Law	2012
Motor Vehicles		
41.	Vehicle Safety and Motor Vehicle Management Law	2020
42.	The Myanmar Motor Vehicle Rules	1989
43.	The Motor Vehicle Law	2015
Other Related Law and Regulation		
44.	Myanmar Insurance Law	1993
45.	Myanmar Insurance Rule	2017
46.	The Ethnic Right Protection Law	2015
47.	Myanmar Investment Law	2016
48.	Myanmar Investment Rule	2017
49.	The Export and Import Law	2012
50.	Natural Disaster Management Law	2013
51.	Climate Change Policy	2019
52.	Commercial Tax Law	2014
53.	The Union Tax Law	2019
54.	Myanmar Citizens Investment Law	2013
55.	Foreign Investment Law	2012
International and National Policies Guidelines and Standards		
56.	IFC's Standards and Guidelines	2012
57.	World Bank Pollution Prevention and Abatement Handbook	1998

## **2.5. ENVIRONMENTAL CONSERVATION**

### **2.5.1. Environmental Conservation Law (2012)**

Environmental Conservation Law was enacted by the Pyidaungsu Hluttaw in 30<sup>th</sup> March, 2012.

Section 7 (o) 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.

Section 14 states that “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.”

Section 15 describes 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.

Section 29 stipulates that “No one shall violate any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law”.

### **2.5.2. Environmental Conservation Rules (2014)**

This environmental conservation rule was approved by Ministry of Environmental Conservation and Forestry on 5<sup>th</sup> June in 2014.

Under Section 69, sub-Section (a) states that 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. Sub-Section (b) states that 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.

### **2.5.3. Environmental Impact Assessment Procedure (2015)**

This procedure was enacted by Ministry of Environmental Conservation and Forestry on 29 December in 2015. This procedure assigns in responsibility to Project Proponent for all adverse impacts in Section 102 to 105;

Section 102 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) Project Affected Persons (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.

Section 103 states that the Project Proponent shall fully implement the Environmental Management Plan (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.

Section 105 states that 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.

Monitoring process is described from Section 106 to 110. Section 106 states 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 states that 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 states that 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 states that 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 113 states that for purposes of monitoring and inspection, the Project Proponent: (a) shall grant to the Ministry and/or its representatives, at any time during normal working hours, access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed; and (b) from time to time as and when the Ministry may reasonably require, shall grant the Ministry access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed.

Section 115 states 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.

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.

#### **2.5.4. National Environmental Policy (2019)**

National Environmental Policy of Myanmar was enacted by the Republic of the Union of Myanmar in 2019. In this policy, Section 8 states that 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 Figure 2-1.



**Figure 2-1 National Environmental Policy Myanmar**

(Source: EIA Procedure (2015))

## 2.6. POLLUTION CONTROL AND HEALTH

### 2.6.1. National Environmental Quality (Emission) Guidelines (2015)

In Myanmar, the NEQEG was established in December 2015 with financial and technical assistance from the Asian Development Bank (ADB). It provides the basis for regulation and control of noise and vibration, air emissions, and liquid discharges from various sources in order to prevent pollution for purposes of protection of human and ecosystem health.

According to the NEQEG (2015), all projects subject to the EIA Procedure (2015) have to comply with and refer to applicable national guidelines/standards or international

standards adopted by MONREC. In addition, project proponents shall be responsible for monitoring their compliance with general and applicable industry-specific guidelines as specified in the EMP and ECC. In addition, the project proponent is responsible for monitoring the environmental quality based on developed EMP as specified in the following sections.

The national and international guideline values that are considered relevant to this project are presented below.

#### 2.6.1.1. Air Quality

##### 2.6.1.1.1 Ambient Standards

The NEQEG requires that “emissions do not result in concentrations that reach or exceed national ambient quality guidelines and standards, or in their absence current World Health Organization (WHO) Air Quality Guidelines”. As national ambient quality guidelines and standards have not been established as of November 2016, the standards required to be met in Myanmar is equivalent to the values set in WHO Air Quality Guidelines. NEQEG also require that contribution concentration of emissions from each project does not exceed 25 percent of the applicable air quality standards. Table 2-2 shows the ambient standards concerning air quality applicable to the project and specific guideline values for glass bottles production process.

**Table 2-2 General and Specific Guideline Values for Air Quality**

Parameters	Unit	Averaging Period	NEQEG
General Guideline Values for all Projects			
Nitrogen dioxide	µg/m³	1-year	40
		1-hour	200
Ozone	µg/m³	8-hour daily maximum	100
Particulate Matter PM <sub>10</sub>	µg/m³	1-year	20
		24-hour	50
Particulate Matter PM <sub>2.5</sub>	µg/m³	1-year	10
		24-hour	25
Sulfur dioxide	µg/m³	24-hour	20
		10-minute	500
Specific Guideline Values for Manufacture of Glass & Ceramics Projects and Glass, Glass & Mineral Fiber Manufacturing Projects			
Parameters		Unit	NEQEG Guideline Values
Arsenic		mg/Nm³	1
Cadmium		mg/Nm³	0.2
Fluorides		mg/Nm³	5

Parameters	Unit	Averaging Period	NEQEG
Hydrogen chloride		mg/Nm <sup>3</sup>	30
Lead		mg/Nm <sup>3</sup>	5
Nitrogen dioxide		mg/Nm <sup>3</sup>	1,000
Other heavy metals (total)		mg/Nm <sup>3</sup>	5 <sup>b</sup>
Particulates	Natural gas	mg/Nm <sup>3</sup>	100 <sup>c</sup>
	Other fuels		50 <sup>c</sup>
Sulfur dioxide		mg/Nm <sup>3</sup>	700-1,500 <sup>d</sup>

a Milligrams per normal cubic meter at specified temperature and pressure

b 1 mg/Nm<sup>3</sup> for Selenium

c Where toxic metals are present, not to exceed 20 mg/Nm<sup>3</sup> ; to achieve dust emissions of 50 mg/Nm<sup>3</sup> installation of secondary treatments (bag fillers or electrostatic precipitators) is necessary

d 700 mg/Nm<sup>3</sup> for natural gas firing, 1,500 mg/Nm<sup>3</sup> for oil firing

Source: NEQEG (2015)

### 2.6.1.2. Water Quality

The site runoff and wastewater discharges during construction phase is shown in Table 2-3. Both general guideline values and specific guideline values for glass production process of operation phase are shown in Table 2-4.

**Table 2-3 Site Runoff and Wastewater Discharges (Construction Phase)**

Parameter	Unit	Guideline Value <sup>a</sup>
Biological oxygen demand	mg / L	30
Chemical oxygen demand	mg / L	125
Oil and grease	mg / L	10
pH	S.U. <sup>a</sup>	6-9
Total coliform bacteria <sup>5</sup>	100 mL	400
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50

Source: NEQEG (2015)

<sup>5</sup> Coliforms refer to a group of bacteria which are found in the intestines of warm blooded animals and therefore are present in sewage, and on/in soils, surface waters and vegetation. Total coliforms is an indicator organism which, although by itself is not considered to cause disease in man or animals, usually indicates the presence of pathogenic or disease-causing organisms. By measuring the number of total coliforms present in a sample a judgment can be made as to the water's usability for a given purpose.

**Table 2-4 General and Specific Wastewater Effluent Guidelines for Operation phase**

Parameter	Unit	Guideline Value <sup>a</sup>
<b>General National Guidelines for (Wastewater, Storm Water Runoff, Effluent and Sanitary Discharges (General Application))<sup>6</sup></b>		
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. <sup>a</sup>	6-9
Phenols	mg/l	0.5
Selenium	mg/l	0.1
Silver	mg/l	0.5
Sulphide	mg/l	1
Temperature increase	mg/l	<3 <sup>b</sup>
Total coliform bacteria	mg/l	400
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50
Zinc	mg/l	2
<b>Specific Effluent Level for Manufacture of Glass &amp; Ceramics Projects and Glass, Glass &amp; Mineral Fiber Manufacturing Projects</b>		

<sup>6</sup> 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 <sup>a</sup>
Antimony	mg/L	0.3
Arsenic	mg/L	0.1
Boric acid	mg/L	2
Chemical oxygen demand	mg/L	130
Fluorides	mg/L	5
Lead	mg/L	0.1
Oil and grease	mg/L	10
pH	S.U. <sup>a</sup>	6-9
Temperature increase	°C	<3 <sup>b</sup>
Total suspended solids	mg/L	30

Source: NEQEG (2015)

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

### 2.6.1.3. Solid Waste Management Facilities

The leachate generated from landfill of general waste and industrial waste is regulated by the effluent standards shown in Table 2-5.

**Table 2-5 Effluent Standard for Leachate from Landfill of General Waste**

Parameter	Unit	Hazardous Waste Landfills		Municipal Solid Waste Landfills	
		Daily max	Monthly average	Daily max.	Monthly average
5-day Biochemical oxygen demand	mg/l	220	56	140	37
Ammonia	mg/l	10	4.9	10	4.9
Aniline	mg/l	0.024	0.015	-	-
Arsenic	mg/l	1.1	0.54	-	-
α-Terpineol	mg/l	0.042	0.019	0.033	0.016
Benzoic acid	mg/l	0.119	0.073	0.12	0.071
Chromium (total)	mg/l	1.1	0.46	-	-
Naphthalene	mg/l	0.059	0.022	-	-
p-Cresol	mg/l	0.024	0.015	0.025	0.014
pH	-	6-9	6-9	6-9	6-9
Phenol	mg/l	0.048	0.029	0.026	0.015
Pyridine	mg/l	0.072	0.025	-	-
Total suspended solids	mg/l	88	27	88	27
Zinc	mg/l	0.535	0.296	0.2	0.11

\* NEQEG (2015)

#### 2.6.1.4. Waste (Wastewater Treatment Facility)

Sludge generated at the wastewater treatment facility is dehydrated and landfilled or incinerated. Sludge is regulated by the effluent standards shown in Table 2-6.

**Table 2-6 Effluent Standards for Sludge**

Parameter	Unit	National standard*
Arsenic	mg/kg	75
Cadmium	mg/kg	85
Chromium (total)	mg/kg	3,000
Copper	mg/kg	4,300
Lead	mg/kg	840
Mercury	mg/kg	57
Molybdenum	mg/kg	75
Nickel	mg/kg	420
Selenium	mg/kg	100
Total coliform bacteria	G	1,000
Zinc	mg/l	7,500

\* NEQEG (2015) (Refer to "Use and disposal of sewage sludge. 2006. 40CFR Part 503, USEPA")

#### 2.6.1.5. Noise and Vibration

The noise level is regulated by the NEQEG for each receptor as shown Table 2-7.

The vibration result is compared with German Standard from DIN 4150. The German Standard Guidelines are shown in Table 2-8.

**Table 2-7 General Guideline Values for Noise Level**

Receptor	Unit	National Guideline Values (NEQEG)		IFC/WB EHS Guidelines	
		Daytime 7:00-22:00 (10:00-22:00 for Public holidays)	Nighttime 22:00-7:00 (10:00-22:00 for public holidays)	Daytime 7:00-22:00	Night time 22:00- 7:00
Residential/ Institutional/ Educational	dBA	55	45	55	45
Industrial/ Commercial	dBA	70	70	70	70

Source: NEQEG (2015), IFC General EHS Guidelines (2007)



**Table 2-8 Guideline Value for Vibration (German standard DIN 4150-3)**

Structure Type	Peak Particle Velocity (mm/s)		
	4-8 Hz	8-30 Hz	30-100 Hz
Commercial	20	20-40	40-50
Residential	5	5-15	15-20
Very sensitive	3	3-8	8-10

#### 2.6.1.6. Odor

General guideline values for odor are described in Table 2-9. According to NEQEG, odor level in the populated areas should not exceed 5 to 10 odorant units.

**Table 2-9 General Guideline Values for Odor**

Parameter	National Guideline Values (NEQEG)
Odor Level	should not exceed 5 to 10 odorant units at the edge of populated areas in the vicinity of a project

Source: NEQEG (2015), IFC General EHS Guidelines (2007)

#### 2.6.2. National Drinking Water Quality Standards (2019)

Myanmar National Drinking Water Quality Standards (2019/MNDWQS) is 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 values required under MNDWQS (2019) are shown below Table 2-10. In addition to the 16 items presented below, E. coli and Cadmium are normally required by ECD to be measured for underground water.

**Table 2-10 National Drinking Water Quality Standards**

Parameters	Unit	Standard Values*	WHO Guideline Values <sup>7</sup>
Total Coliforms	Acceptable/No Objectionable	3	None specified (recommended median value – 0 per 100 ml)
Fecal 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)

<sup>7</sup> World Health Organization (WHO), 2018. A Global Overview of National Regulations and standards for Drinking-Water Quality

Parameters	Unit	Standard Values*	WHO Guideline Values <sup>7</sup>
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 <sub>3</sub>	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: \*MNDWQS (2019)

### 2.6.3. Public Health Law (1972)

This law was enacted by the Myanmar State and Revolution Council with the notification number 1/1972. Chapter 2 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

### 2.6.4. 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:

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

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.

#### **2.6.5. 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 4<sup>th</sup> 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

#### **2.6.6. 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 15<sup>th</sup> March, 2019. The objectives of occupational health and safety law are:

- To implement the safety and health effectively in each sector;
- To reduce and mitigate suffering from injuries, diseases related to workplaces;
- To prevent from workplaces hazards, not encouraging workplaces diseases by employer, employee;
- To promote the productivity and to prevent occupational injuries and hazard following by occupational safety and health law;
- To create safety and health workplace through regard to suitable our national norm compared with international norm; and,

- To support the research for occupational health and safety development.

The occupational health and safety law prescribed in chapter (6), sub-Section (a), “Safety officer should appoint about the workplaces safety and health as a responsible person for safety workers by industry.

Section 26 (a) of chapter (8) states that “the employer should manage and evaluate the necessary things in which machinery equipment hazards and dangerous measures,”. Further, Section 30 (a) states that “the employee should be used to right the personal protected equipment and its wearing according to regard of department for occupational safety and health by employer”.

#### **2.6.7. Myanmar Fire Brigade Law (2015)**

Myanmar Fire Brigade Law was enacted by the Pyidaungsu Hluttaw on 17<sup>th</sup> March, 2015. The objectives of this law are described below.

- To prevent destruction of State-owned property, private property, cultural heritage and the lives and property of the public by fire and other natural disaster;
- To organize the Fire brigade systematically and to train members of the fire brigade;
- To carry out extinguishing fire, prevention and search and rescue when fire, other natural disaster, epidemic disease or any kind of sudden disaster occurs;
- To educate, organize and incite extensively so as to achieve public cooperation when any disaster occurs;
- To participate and help, if necessary, for the State safety, peace of the public and the rule of law.

Section 25 states that 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:

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

#### **2.6.8. Prevention of Hazard from Chemical and Related Substances Law (2013)**

This law was enacted by Pyidaungsu Hluttaw with notification number 28/ 2013 on 26<sup>th</sup> August, 2013. The objectives of this law are expressed below.

- To protect from being damaged the natural environment resources and being hazardous any living beings by chemical and related substances;
- To supervise systematically in performing the chemical and related substances business with permission for being safety;
- To perform the system of obtaining information and to perform widely educative and research for using the chemical and related substance systematically;
- To perform the sustainable development for the occupational safety, health and environmental conservation.

Section 15 states that a person has to obtain a license before starting the respective chemical and related substances business. The followings are listed under Section 15.

- (a) Workplace 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) Workplace shall be attended by 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.

Section 17 states that a person who has obtained a licence, 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.

## **2.7. BIODIVERSITY AND RESOURCES CONSERVATION**

### **2.7.1. 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, Geo-physically 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;

### **2.7.2. The Law relating to Aquaculture (1989)**

This law was enacted in the state law and order restoration council law Notification No. 24/89 on September 7, 1989. According to Section (29b) of this law, project proponents

shall not obstruct navigation and water flow or polluted water within fisheries waters or abet such acts. In Section 29 (b), no person shall do the following: -

- obstructing navigation and flowing of water or polluting the water within the fisheries waters or abetting such acts;

### **2.7.3. Conservation of Water Resources and River Law (2006)**

This law was enacted on 2<sup>nd</sup> 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.

### **2.7.4. Conservation of Water Resources and River Rules (2013)**

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

- construct the toilets far away from the river bank and sewage discharge to septic tank, under sub-rule (c) of rule 8;
- 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
- 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.

### **2.7.5. Underground Water Act (1930)**

This law was enacted in Burma act notification number IV on 21<sup>st</sup> June 1930. Section 3 of the law states that no person shall sink a tube for the purpose of obtaining

underground water expect 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.

#### **2.7.6. Forest Law (1992)**

Ministry of Environmental Conservation and Forestry implements this Law on 3<sup>rd</sup> November 1992. The objectives of this law are described below. According to the sub-section 12 (a) anyone within the jurisdiction of the forest area and government-administered land:

- if he wants to carry out any development business or business project, he must obtain the prior approval of the Ministry

### **2.8. LAND ACQUISITION AND RESETTLEMENT**

#### **2.8.1. Registration of Deeds Law (2019)**

This law was enacted in Pyidaungsu Hluttaw notification number 9 on 20<sup>th</sup> 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 having been made to any contents of the deeds shall be signed or initiated by the parties.

#### **2.8.2. The Boundaries Law (2019)**

This law was enacted in Pyidaungsu Hluttaw notification number 11 on 25<sup>th</sup> 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.

#### **2.8.3. The Land Acquisition Act (1894)**

In accordance with this law, the government holds rights to take over the land provided that compensation is made to the original land owner. No private ownership of land is permitted and all land must be leased from the Union State. Nevertheless, Article 3 of the Act also stipulates that a person who has right over land would be entitled to claim compensation if the land was acquired under this Act and that: market value of the land; damage caused to the trees and crops; movable/immovable properties lost; inconvenience due to change in residence or business; and any diminution of profits of the land; shall be considered in determining the amount of compensation to be made.

#### **2.8.4. Land Nationalization Act (1953)**

This Act stipulates that the government holds rights to take over land provided that compensation is made to the original land owner. There is no private ownership of land and that all land must be leased from the Union State, according to the law.

#### **2.8.5. 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 privates 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.

#### **2.8.6. 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.

#### **2.8.7. Farmland Rules (2012)**

The most relevant clauses under Farmland Rules (2012) are the ones below.

- If the farm land is requisitioned under Farmland Law for the interest of the state or the public the grievance and compensation for improving the farm land with buildings on the said farm land by the person who get the right to work farm land in the improvement made by the original person who get the right to work farm land, without delay from the concern, the central farm land management committee shall conduct as necessary (Section 64).
- Township Farmland Management Committee shall calculate the amount of grievance and compensation to be given by the State or the Public and submit the statement of their amount to the Central Farmland Management Committee as follows (Section 67).

#### **2.8.8. 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.

- 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.
- 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.
- 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.
- 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.

## **2.9. URBAN DEVELOPMENT AND MANAGEMENT**

### **2.9.1. The Electricity Law (2014)**

This law was enacted by the Pyidaungsu Hluttaw with the notification No.44 on 27<sup>th</sup> 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.

### **2.9.2. The Telecommunications Law (2013)**

This law was enacted by the Pyidaungsu Hluttaw with notification No.31 on 8<sup>th</sup> 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 which require licence for national peace and tranquility and for public security.

According to this law, the holder of a licence 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 also be liable to a fine.

### **2.9.3. Development Committee Law (2013)**

Development Committees of the major cities mean the organizations formed to carry out development works within a specified time limit in respective regions and states except for Yangon City and Mandalay City where specific laws exist. That includes



development committees either for a township or for additional townships collectively for the purpose of development works. Development Committees' duties and functions include among others:

- Carrying out works for disposal of sewage;
- Carrying out precautionary measures against fire, flood, storm and natural disasters;
- Administration of slow-moving vehicles;
- Construction and maintenance of roads and bridges;
- Demolition of squatter buildings;
- Executing other development works in the public interest; and
- Carrying out other duties assigned by the regional government from time to time

## **2.10. HUMAN RIGHTS**

### **2.10.1. 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.

### **2.10.2. The Rights of the Persons with Disabilities Law (2015)**

This law was enacted by the Pyithu Hluttaw with the notification No.30/2015 in 9<sup>th</sup> June, 2015. The objective of the law is to protect and respect the rights of persons with disabilities in Myanmar in a way that is recognized internationally under the UN Convention. According to Article 14 of the law, the persons with disabilities shall:

- (a) Have the rights to access education, attain and use the information, and receive medical care;
- (b) Have the human rights and other fundamental freedoms such as freedom of speech, freedom to survive, and to worship on an equal basis with others;
- (c) Have the rights to own the legal money, properties and housing, buildings, right to inherit, and live in the housing of the public housing projects;
- (d) Have the right to request for the necessary arrangements for the rights to sue, to be sued, to defend, and to be investigated as a witness at the court;
- (e) Have the right to exemption from the office tax in suing for the rights and entitlement; and
- (f) Have the right to services and protection from the torture, discrimination, negligence, and bullying in prison due to the disability

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, as follows:

- (a) Laying down the directives on the production and renovation for easy access to public buildings and environments/surroundings for the persons with disabilities with physical and mental security;
- (b) Drawing models/structures and carrying out construction with the mobility aids and devices for easy access to public places without barriers for person with disabilities;
- (c) Arranging necessary measures for easy access to public transportation for the persons with disabilities;
- (d) Installing signs, symbols, sound devices, and other necessary devices at the traffic lights, pedestrian crossing, and roads with curves, ascending and descending points to provide easy access for the persons with disabilities; and
- (e) Making arrangements for the persons with disabilities to be able to easily access physical surroundings such as public housing, hospital and schools and communication, information and public communication sectors

In terms of job opportunities, Article 36 states that the employer shall:

- (a) Obey and implement the policies and plans set up by the National Committee regarding job opportunities of persons with disabilities;
- (b) Employ the persons with disabilities with employability for appropriate word depending on the type of employment in accordance with the quota for the number of people with disabilities specified by the National Committee;
- (c) Choose and employ the persons with disabilities registered at Employment Exchange Offices in relevant townships and departments in accordance with sub-Section (b);
- (d) Make appropriate arrangements including interviewing, the equal rights for salaries and opportunities, promotion, job security, access to free vocational education and training based on employability of the persons with disabilities;
- (e) Pay the amount of money to the funds related to the rights of the persons with disabilities when impossible to employ in accordance with the quota for the number of people with disabilities as specified in sub-Section (b); and
- (f) Submit the list of the employed staff or workers with disabilities and the vacant positions to the Department and the Employment Exchange Offices in the relevant township in accordance with sub-Section (b).

### **2.10.3. Child Rights Law (2019)**

This law was enacted by the Pyidaungsu Hluttaw with the notification number 22 in 23<sup>rd</sup> July, 2019. The main purposes are to develop the child's health, nutrition, education opportunities, and to protect from abandonment and abuse, and neglect by the State, volunteers, NGOs.

## **2.11. LABOUR LAWS**

### **2.11.1. Labour Organization Law (2011)**

This law was enacted by the Pyidaungsu Hluttaw with the notification No. 7 in 11<sup>th</sup> October, 2011. Section 3 describes that “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 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.”

The duties of employer are described in the following Sections.

- According to Section 29, the employer shall recognize the labour organizations of his trade as the organizations representing the workers.
- According to Section 30, the employer shall allow the worker who is assigned any duty on the recommendation of the relevant executive committee to perform such duty not exceeding two days per month unless they have agreed otherwise. Such period shall be deemed as if he is performing the original duty of his work.
- According to Section 31, the employer shall assist as much as possible if the labour organizations request for help for the interest of his workers. However, the employer shall not exercise any acts designed to promote the establishment or functioning of labour organizations under his domination or control by financial or other means.

### **2.11.2. The Employment and Skill Development Law (2013)**

This law was enacted by the Pyidaungsu Hluttaw with the notification No.29/2013 on 30<sup>th</sup> August in 2013. Section 15 describes that “Employer may:

- (a) In implementing programs of training to enhance the skills of workers, conduct in- house/ in-plant training, systematic on-the-job training, send his workers to outside training courses, conduct training by means of information technology either individually or in groups of employers for individual or groups of workers.
- (b) Employ young persons who have completed (16) years of age as apprentices in accordance with the regulations made by the Skills Development Agency and train them in the various skilled occupations.”

According to Section 25, the worker who has skills recognition certificate is eligible for participation in the relevant local and international skills competitions.

### **2.11.3. The Minimum Wage Law (2013)**

This law was enacted by the Pyidaungsu Hluttaw with the notification No. 7/2013 in 22<sup>nd</sup> March, 2013. The purpose of the law is to meet with the essential needs of the workers, and their families who are working at the commercial, production and service, agricultural and livestock breeding businesses and with the purpose of increasing the capacity of the workers and for the development of competitiveness.

Section 12 describes 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 also 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.

### **2.11.4. Payment of Wage Law (2016)**

This law was prescribed by the Pyidaungsu Hluttaw with the notification number in 25<sup>th</sup> January, 2016. Section 3 and 4 describe the methods of payment and time-frame. According to the Section 3,

The employer must:

- (a) 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) Moreover, pay can be in the means of:
- (c) Totally in cash OR half the cash and half in things set according to the local price to those employees working in trade, manufacturing and service sectors.
- (d) Totally in cash OR half the cash and half in things set as local price according to local traditions or common agreement to those working in agriculture and livestock sectors.

- (e) An employee shall receive the payment for 60 days when he/she is in Alternative Civil Service.

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

#### **2.11.5. Workers' Compensation Act (1923)**

Workers' Compensation Act was enacted by 1923. Under Chapter (2), followings are stated.

Section 3 (1) - If personal injury is caused to a workman by accident arising out of and in the course of his employment, his employer shall be liable to pay compensation in accordance with the provisions of this Chapter.

Section 4 (1) - Subject to the provisions of this Act, the amount of compensation shall be as follows;

A. where death results from the injury-

- (i) in the case of an adult, a sum equal to 36 times the worker's monthly wages calculated in accordance with this Act:

Provided that the minimum and the maximum payment in such a case shall be the amount of compensation prescribed by notification made by the Ministry of Labour with the approval of the Government respectively, and

- (ii) in the case of a minor- the amount of compensation prescribed by notification made by the Ministry of Labour with the approval of the Government;

B. where permanent total disablement results from the injury-

- (i) in the case of an adult, a sum equal to 36 times 140 per cent of the worker's monthly wages calculated in accordance with this Act:

Provided that the minimum and the maximum payment in such a case shall be the amount of compensation prescribed by notification made by the Ministry of Labour with the approval of the Government respectively, and

(ii) in the case of a minor- the amount of compensation prescribed by notification made by the Ministry of Labour with the approval of the Government;

C. where permanent partial disablement results from the injury-

(i) in the case of an injury specified in Schedule I, such percentage of the compensation which would have been payable in the case of permanent total disablement as is specified therein as being the percentage of the loss of earning capacity caused by that injury, and

(ii) in the case of an injury not specified in Schedule I, such percentage of the compensation payable in the case of permanent total disablement as is proportionate to the loss of earning capacity permanently caused by the injury;

#### **2.11.6. The Settlement of Labour Dispute Law (2012)**

This law was enacted by the Pyidaungsu Hluttaw with the notification No.5/2012 in 28th March, 2012. The purpose of the law is to safeguard the right of workers or to have good relationship between employer and workers and to make peaceful workplace or to obtain the rights fairly, rightfully and quickly by settling the dispute of employer and worker justly.

- 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.” The prohibitions of the law are described in the following.
- According to Section 38, no employer shall fail to negotiate and coordinate in respect of the complaint within the prescribed period without sufficient cause.
- According to Section 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.

#### **2.11.7. The Leave and Holiday Act, 1951 (Law Amended on July, 2014)**

The Leave and Holidays Act was firstly adopted on 1st January in 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 rights of workers to leave and have a holiday are described below.

- Causal Leave (6 days)
- Earned Leave (10 days)
- Medical Leave (30 days)
- Maternity leave

- Public Holiday (21 days)
- Penalty for Violation

#### **2.11.8. Social Security Law (2012)**

This law was enacted by the Pyidaungsu Hluttaw with the notification No.15/2012 in 31<sup>st</sup> August, 2012. The purpose of the Social Security Law is to ensure the project proponent supports development of workers' social security and to enable them to fulfill their health needs. According to Section 15 (a), the following are included in the Social Security Funds:

- Health and social fund;
- Family assistance fund;
- Invalidity benefits, superannuation benefit, and survivors' benefit fund;
- Unemployment benefit fund;
- Other social security fund for social security system of compulsory registration and contribution stipulated by the Ministry of Labour in co-ordination with the Social Security Board, under Clause (ii) of Sub-Section (e) of Section 13;
- Other social security fund stipulated that contribution may be paid after voluntary registration under clause (ii) of sub-Section (e) of Section 13; and
- Social Security Housing Plan Fund
- According to Section 18 (b), the employer shall deduct contributions to be paid by workers from his wages together with contributions to be paid by him and pay to the social security fund. The employer shall also cover the expense for such contributions.
- According to Section 48 (a), the employer shall effect insurance by registering at relevant township social security offices in order to get employment injury benefit of the workers applied to provisions of compulsory registration for employment injury benefit insurance system contained in Section 45 and by paying contributions to employment injury benefit fund in accord with the stipulations.
- According to Section 48 (b), the employers may affect insurance by registering voluntarily for the workers who are not applied to provisions of compulsory registration for employment injury benefit insurance system and by paying stipulated contribution to employment injury benefit insurance fund.

### **2.12. MOTOR VEHICLES**

#### **2.12.1. 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;

- to inspect and register the vehicles in accordance with the law;
- to check whether the drivers of each type of vehicle meet the prescribed qualifications and issue a driver's license;



- to reduce air pollution, soil contamination, water contamination and noise which are caused by motor vehicles;
- to manage systematically to reduce accidents caused by motor vehicles;
- to be able to inspect and supervise in accordance with the stipulations for safe traffic.
- to reduce traffic congestion and to effectively use advanced technology transportation system to ensure vehicle safety.
- 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.

### **2.12.2. 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.

### **2.12.3. The Motor Vehicle Law (2015)**

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

- To register motor vehicles which are safely accessible to the public place after inspecting in accord with the stipulations;
- To issue a driving licence to drivers after examining whether or not they meet the prescribed qualifications according to the types of motor vehicles;
- To be easy to access road users and to protect the safety of vehicle and road;

- Not to be traffic jam and to use the effective Intelligent Transportation System for the safety of vehicle;
- 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.”

## **2.13. OTHER RELATED LAWS AND REGULATIONS**

### **2.13.1. Myanmar Insurance Law (1993)**

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

- To overcome financial difficulties by effecting mutual agreement of insurance against social and economic losses which the people may encounter, due to common perils;
- To promote the habit of savings individually by effecting life assurance, thus contributing to the accumulation of resource, of the State;
- 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.

### **2.13.2. Myanmar Insurance Rule (2017)**

This rule was prescribed by Ministry of Planning and Finance with notification 30/ 2017 in 30<sup>th</sup> 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

### **2.13.3. The Ethnic Right Protection Law (2015)**

This law was enacted by the Pyidaungsu Hluttaw with notification number 8/2015 on 24<sup>th</sup> February in 2015. The objectives of this law are described below.

- To obtain equal citizen's rights for all ethnic groups;
- To live eternally together with amicable relations among ethnic groups on the basic of genuine Union Spirit;
- To preserve and develop language, literature, fine art, culture, custom, national character and historical heritage of ethnic groups;
- To promote solidarity, mutual amity and respect, and mutual assistance among ethnic groups;
- To promote socio-economic development including education, health, economy, transport and communication, so forth, of less-developed ethnic groups; and,
- To fully obtain the rights prescribed in the Constitution by ethnic groups.

This law was enacted to be informed, coordinated and performed with the relevant local ethnic groups in the case of development works, major projects, businesses and extraction of natural resources will be implemented within the area of ethnic groups according to the Section 5.

### **2.13.4. Myanmar Investment Law (2016)**

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

- 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;
- To protect the investors and their investment businesses in accordance with the Law;
- To create job opportunities for the people;
- To develop human resources;
- To develop highly functioning production, service, and trading sectors;
- To develop the technology, the agriculture, livestock and industrial sectors;
- To develop various professional field, including infrastructures around the Union;

- To enable the citizens to be able to work alongside with the international community;
- 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.

#### **2.13.5. Myanmar Investment Rule (2017)**

This rule was prescribed by Ministry of Planning and Finance with notification 30/2017 in 30<sup>th</sup> 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:

- (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

#### **2.13.6. The Export and Import Law (2012)**

This law was enacted by the Pyidaungsu Hluttaw with the notification number 17/2012 in 17<sup>th</sup> September, 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.

#### **2.13.7. Natural Disaster Management Law (2013)**

This law was enacted by the Pyidaungsu Hluttaw Law with the notification No. 21, 2013 in 31<sup>st</sup> 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.

#### **2.13.8. 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.

#### **2.13.9. Commercial Tax Law (2014)**

This law was prescribed in 31 March 1990 and its amended in 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.

#### **2.13.10. The Union Tax Law (2019)**

This law was enacted in Pyidaungsu Hluttaw notification number 30 at September 24, 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

#### **2.13.11. Myanmar Citizens Investment Law (2013)**

This law was enacted by the Pyidaungsu Hluttaw with the notification number No. 18/2013 on 29<sup>th</sup> 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.

#### **2.13.12. Foreign Investment Law (2012)**

This law was enacted by the Pyidaungsu Hluttaw with the notification number No. 21/2012 on 2<sup>nd</sup> 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.

#### **2.14. INTERNATIONAL GUIDELINES AND STANDARDS**

##### **2.14.1. IFC's Standards and Guidelines**

IFC's standards and guidelines relevant to this project are described as follows;

- Performance Standards on Environmental and Social Sustainability (January 1, 2012)
- Environmental, Health and Safety-General Guidelines (April 30, 2007)
- Environmental, Health and Safety Guidelines for Airport (April 30, 2007)

IFC describes eight Performance Standards (PS) on Environmental and Social Sustainability which Project proponent needs to comply throughout the IFC investment life. 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.

#### **2.14.2. World Bank's Pollution Prevention and Abatement Handbook (1988)**

The World Bank's Pollution Prevention and Abatement Handbook (PPAH) is a comprehensive document providing guidelines for industrial pollution control, and it recommends emission and ambient quality standards to be applied in environmental management. These recommends standards have taken into account the standards enforced by U.S.EPA and those recommended by World Health Organization (WHO). They are referred to in the International Finance Cooperation's (IFC) Environmental Health and Safety (EHS) Guidelines.

#### **2.15. INSTITUTIONAL ARRANGEMENT**

The Ministry of Environmental Conservation and Forestry (MOECF) was reformed as the Ministry of Natural Resources and Environmental Conservation (MONREC) on 30<sup>th</sup> March, 2016 in order to undertake both environmental and natural resources conservation and management more effectively. Under Section 3 of the Environmental Impact Assessment 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 organization, which may cause impact on environmental quality that, 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

This chapter includes general information of exported recycle protected cover for vehicles and accessories, location of project site, layout plans of the whole project, project facilities and implementation schedule. The proposed factory provides most of the information related to the project presented in this chapter.

### 3.1. LOCATION OF THE PROJECT

The proposed project is the manufacturing of garments and protected cover for vehicles on CMP basis. At first, the proposed project was operated at Plot No. (520), Moegoke Street, Myay Taing Quarter No.23, Industrial Zone, Dagon Myothit (South) Township, Yangon Region, Myanmar with 4 years land lease contract. Then, the location of the project is changed to at Plot No. (149/6), Kanaung Minthargyi Road, East Dagon Industrial Zone, East Dagon Township, Yangon Region, Myanmar. At the moment, it is also leased the current land area and factory building with 5 years lease contract. The total land area of the factory is approximately one acre. The location map of the project is shown in Figure 3-1.

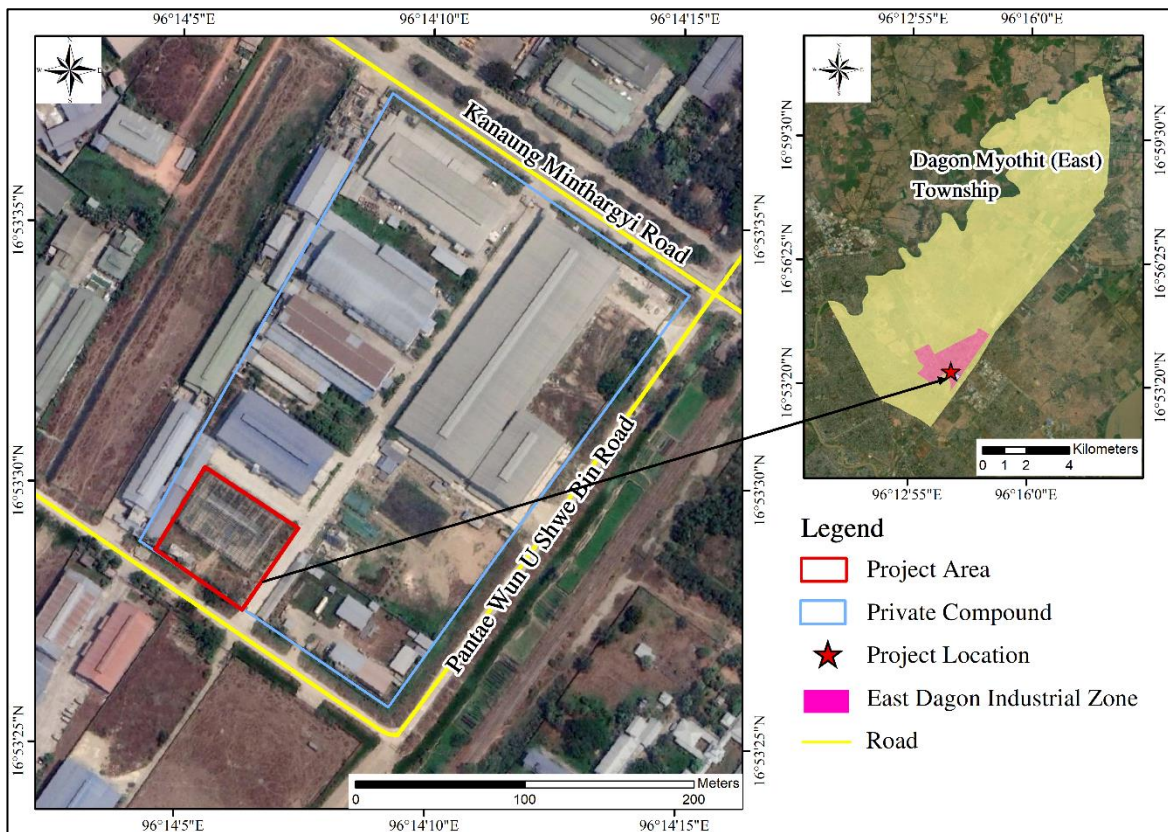
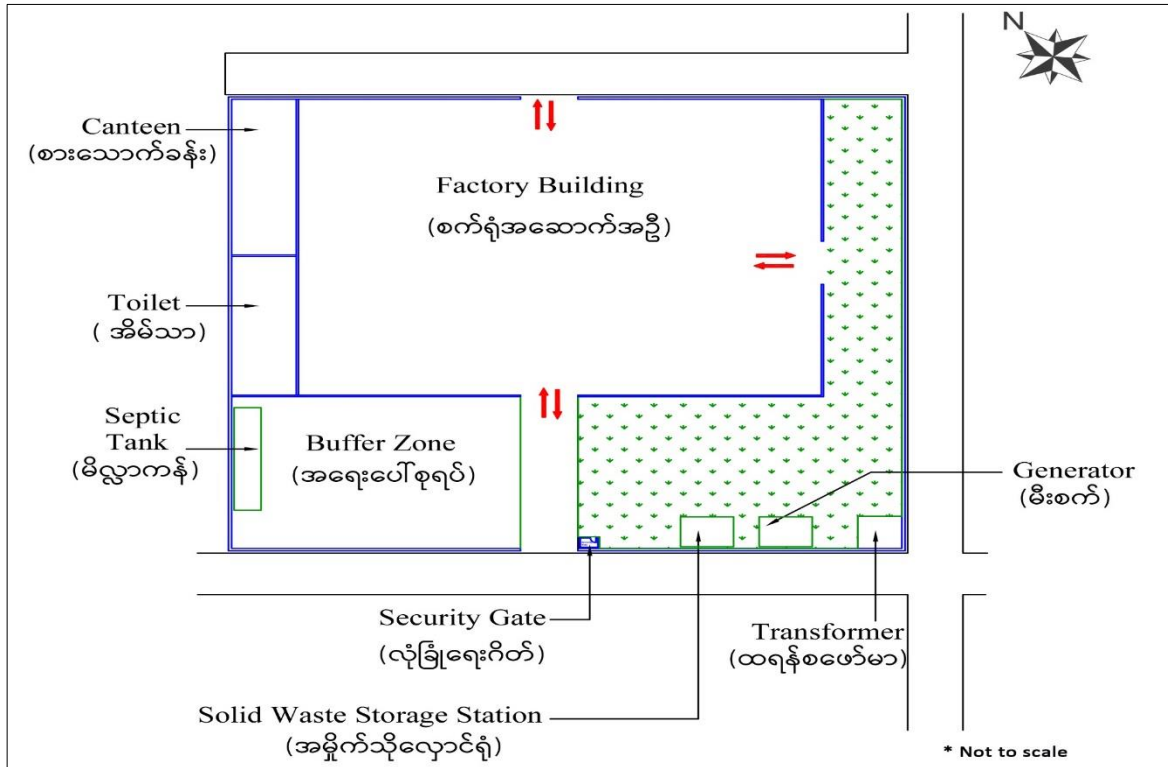


Figure 3-1 Location Map of the Project Site

## 3.2. DESCRIPTION OF PROJECT

### 3.2.1. Site Description

The total land area of project site is one acre that includes two-story factory building, factory canteen, buffer zone and green area. The gross area of building is around 20,000 square meters. The master layout plan of the project is shown in Figure 3-2.

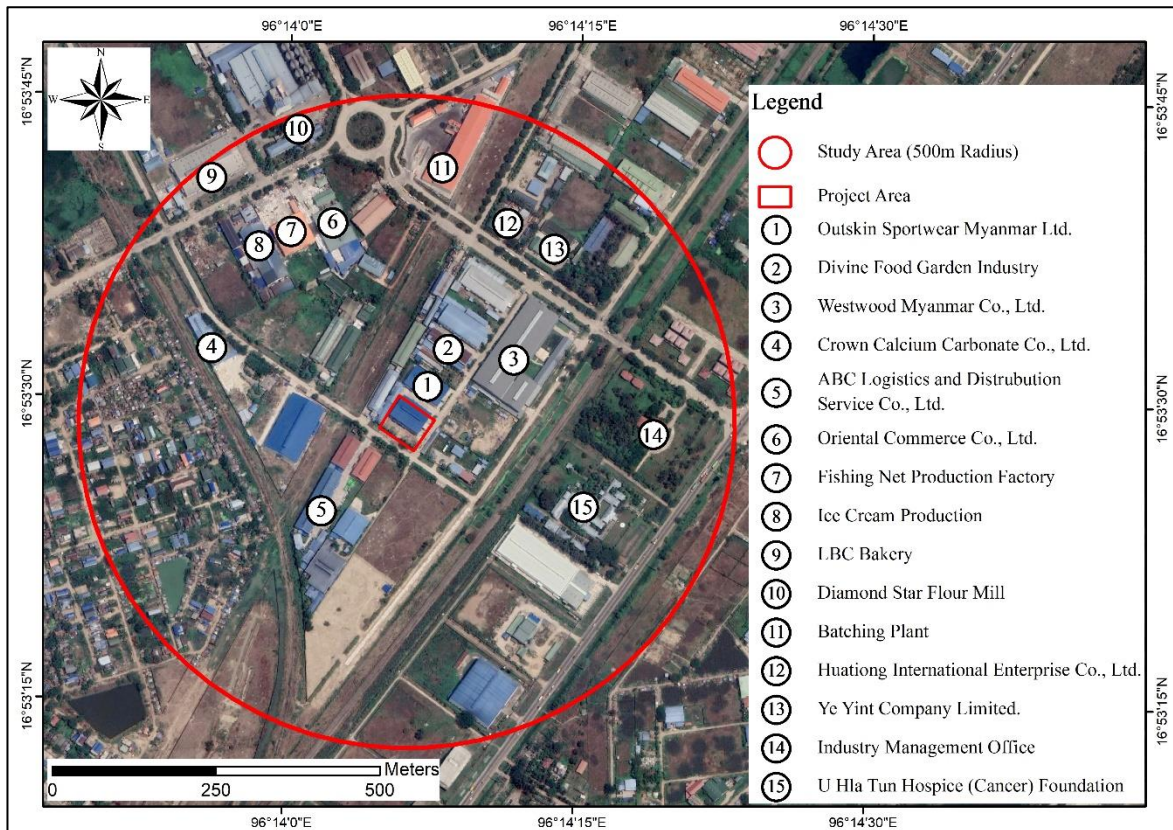


**Figure 3-2 Master Layout Plan of Project**

### 3.2.2. Compound nearby Adjacent Project Site

There are fifteen types of infrastructures near the project site. Among them, the factories are most common feature in the study area since the project site is within the industrial zone. Location map of buildings, houses, roads, and offices adjacent to 500 meters of the project site is presented in Figure 3-3. The existing features of adjacent areas to the project site are also shown in Table 3-1.





**Figure 3-3 Location of Adjacent Features within 500 meter of the Project Site**

**Table 3-1 Features of Adjacent Area to the Project Site**

Geographic Location	No.	Name	Nature
North	1	Out skin Sportswear Myanmar Co., Ltd.	Commercial Area
	2	Divine Food Garden Industry	Commercial Area
	11	Batching Plant	Commercial Area
North East	3	Westwood Myanmar Co., Ltd.	Commercial Area
	12	Huatong International Enterprise Co., Ltd.	Commercial Area
	13	Ye Yint Company Limited	Commercial Area
East	14	Industry Management Office	Commercial Area
	15	U Hla Tun Hospital (Cancer) Foundation	Commercial Area
South West	5	ABC Logistics and Distribution Service Co., Ltd.	Commercial Area
West	4	Crown Calcium Carbonate Co.,Ltd.	Commercial Area
North West	6	Oriental Commerce Co.,Ltd.	Commercial Area
	7	Fishing Net Production Factory	Commercial Area
	8	Ice Cream Production	Commercial Area
	9	LBC Bakery	Commercial Area
	10	Diamond Star Flour Mill	Commercial Area

### 3.3. RAW MATERIAL REQUIREMENTS

In the production process, all raw materials are imported from Korea and there are altogether 21 items of raw materials. Annual raw materials requirement for all products are expressed in the following Table 3-2. At the same time, the amount of packaging materials requirement is mainly depended on the market demand and all packaging materials such as paper cardboard sheet are purchased from local market.

**Table 3-2 List of Annual Raw Materials to be Imported**

No	Particular	Unit	Yr1	Yr2	Yr3	Yr4	Yr5	Yr.6 To Yr.10
1	MPF 1620	Meter	1,224	1,224	1,275	1,275	1,275	1,275
2	MPF 1680	Meter	50.40	50.40	51.24	51.24	51.24	51.24
3	MPF 1780	Meter	1,248.00	1,248.00	1,279.20	1,279.20	1,279.20	1,279.20
4	P.E Film 1200	Meter	16.80	16.80	17.50	17.50	17.50	17.50
5	2 Side Tape 20	Meter	8,460.00	8,460.00	8,745.50	8,745.50	8,745.50	8,745.50
6	2 Side Tape 25	Meter	8,460.00	8,460.00	8,745.50	8,745.50	8,745.50	8,745.50
7	N	Meter	900.00	900.00	932.50	932.50	932.50	932.50
8	MPF Tape 20	Meter	168.00	168.00	172.20	172.20	172.20	172.20
9	110P 2Side 10	Meter	948.00	948.00	975.10	975.10	975.10	975.10
10	Silicon Tape 10	Meter	384.00	384.00	398.40	398.40	398.40	398.40
11	PP Band 20	Meter	900.00	900.00	905.00	905.00	905.00	905.00
12	Woven	Meter	96.00	96.00	98.00	98.00	98.00	98.00
13	PVC 0.5	Meter	96.00	96.00	98.00	98.00	98.00	98.00
14	Vinyl	Meter	28,800.00	28,800.00	28,860.00	28,860.00	28,860.00	28,860.00
15	Rubber Band	Meter	23,040.00	23,040.00	23,088.00	23,088.00	23,088.00	23,088.00
16	Knit (or) Woven Fabric	Yard	988.80	988.80	1,070.80	1,070.80	1,070.80	1,070.80
17	Interlining	Yard	204.00	204.00	226.00	226.00	226.00	226.00
18	Button	Pcs	1,032.00	1,032.00	1,132.00	1,132.00	1,132.00	1,132.00
19	Zipper	Pcs	372.00	372.00	407.00	407.00	407.00	407.00
20	Threads	Yard	73,800.00	73,800.00	80,000.00	80,000.00	80,000.00	80,000.00
21	Label	Pcs	624.00	624.00	669.00	669.00	669.00	669.00

### 3.4. EQUIPMENT LISTS

All the machines which are used in the production process are imported from Korea. The lists of machineries and the area where they installed in operation process of the factory are shown in the following Table 3-3. Meanwhile, office equipment such as furniture and fixture are also purchased from local and the lists of equipment are shown in the Table 3-4.

**Table 3-3 Imported Machinery List**

No	Particulars	Qty (No)	Operation Process
1.	Single Needle High Speed Machine	71	Sewing Process
2.	Twin Needle Feed Lockstitch Sewing Machine	8	Sewing Process
3.	2-Needle Direct Drive High Speed Overlock Stitch Sewing Machine	6	Sewing Process
4.	3-Needle Direct Drive High Speed Interlock Stitch Sewing Machine	3	Sewing Process
5.	High Speed Double Needle Chain Stich Sewing Machine	3	Sewing Process
6.	4 Needle Flatbed Double Chain Stitch Machine	3	Sewing Process
7.	Direct Drive Electronic Lock Stitch Button Sewer	1	Sewing Process
8.	High Speed Lockstitch Button Holing Sewing Machine	1	Sewing Process
9.	Sewing Machine With Thread Trimmer Direct Drive Electronic Lockstitch Bar Tacker	2	Sewing Process
10.	Roll Press	1	Finishing Process
11.	Press(s)	1	Finishing Process
12.	Sealing Machine	1	Sewing Process
13.	Auto Cutter	1	Cutting Process
14.	High Frequency M/C	2	Cutting Process
15.	Wooden Mold	1	Cutting Process
16.	Plastic Box	200	Packing Process

**Table 3-4 Office Equipment List**

No	Particulars	Qty	Unit	Operation Process
1.	Computer	4	Set	Administration Sector
2.	Printer	1	Set	Administration Sector
3.	Office Table	8	Set	Administration Sector
4.	Office Chair	10	Set	Administration Sector
5.	Document Folder	30	Set	Administration Sector
6.	Exhaust Fun	15	No	Production Sector
7.	Sewing Chair	200	No	Production Sector

### 3.5. EMPLOYMENT

Generally, working hours of the factory is from 7:30 am to 4:30 pm for every weekday and 7:30 am to 11:30 am for every Saturday. The break time is from 11:30 am to 12:30 pm. Sunday and other gazette holidays are closed. There are all together 181 staff in the factory. The detail list of employees is shown in Table 3-5.



**Table 3-5 List of Employees**

No	Description	Nos
1.	Director (Foreigner)	1
2.	Director	1
3.	Chief	1
4.	Manager	1
5.	Office Staff	2
6.	Account Staff	1
7.	Admin Staff	1
8.	Security	2
9.	Driver	1
10.	Cleaner	2
11.	Skilled Worker	50
12.	Unskilled Worker	118
Total		181

### 3.6. TYPE OF PRODUCTS AND PRODUCTION RATE

Currently, two main types of products are produced from the factory; namely, cover of car and car seat protection products as well as webbing products such as car wastebasket and cargo net. The final products are exported to Korea and China. Various types of product samples and the annual production rate of the factory are shown in Figure 3-4 and Table 3-6.





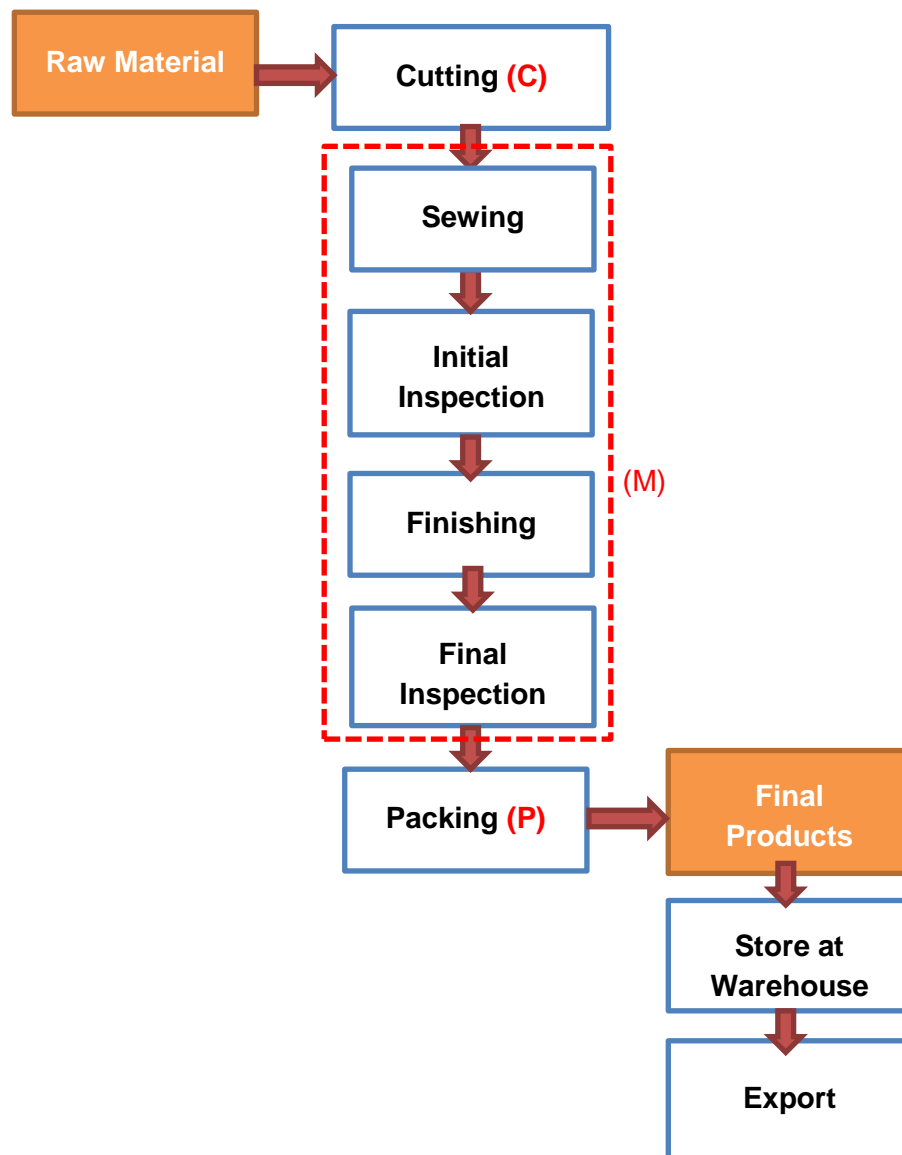
**Figure 3-4 Products Samples**

**Table 3-6 Type of Products**

Type of Products	Monthly Production Rate	Annual Production Rate
Car Protection Covers	132,000	1,584,000
Webbing Products (Cargo Net)	46,080	552,960
Total numbers	178,080	2,136,960

### 3.7. PRODUCTION PROCESS

The main production process, Cut-Make-Pack (CMP) system can be classified into four main section, namely, cutting, making (sewing, finishing and final inspection), packing and temporary storage before export. Firstly, raw materials are stored at the warehouse before sending to the CMP manufacturing process. The first step of the CMP process is the cutting process done by both manual and automatic system. After that, the desired size of cut pieces are sent to the sewing line, made hand sewing, followed by finishing process which is the last step of the making process. After the finishing step, the products are inspected for quality control, and then the qualified products are packaged at packing department. Finally, the completed products are stored in the warehouse and exported to the foreign countries. Production process flow diagram is shown in Figure 3-5.



**Figure 3-5 Production Process Flow Diagram**

### **3.7.1. Operation of Car Covering Products Production Process**

#### **3.7.1.1. Raw Materials**

The main raw materials for car covering products like rolls of car wrap PE film and other materials are directly imported from Korea. At the same time, paper cardboard for packaging purposes are purchased from local market. Raw materials are ensured to choose the right quantity and quality, and then stored in a warehouse in the proper condition before sending to manufacturing section. Some raw materials in warehouse are shown in Figure 3-6.



**Figure 3-6 Raw Material in Warehouse**

### 3.7.1.2. Cutting

In this cutting section, several rolls of car wrap film are fixed on the rollers and spread. Then the spread films are cut to achieve the required sheets sizes. After that, the sheets are cut according to specific designs and patterns. The whole car wrap film cutting process is carried out by manually. At the same time, two side tapes used as the sticker for car covering products are also cut by using automatic cutting machines. Activities of car wrap film cutting and designing patterns as well as two side tapes cutting process of the cutting section is shown in Figure 3-7.





**Figure 3-7 Cutting Activities for Protective Covers for Vehicles**

#### 3.7.1.3. Initial Inspection

After the cutton process, it is followed by the initial inspection for car covers. When it passed the quality control (QC) section to check for the quality standard of each product, the QC passed products are sent to the finishing department.

#### 3.7.1.4. Finishing

In the process, two side tapes are stuck on the sheets of patterned car wrap film and pressed by both manual and automatic method. The operation of finishing process for car covering is shown in Figure 3-8.





**Figure 3-8 Sticking Two Side Tapes on Car Cover**

#### 3.7.1.5. Final Inspection

The products are sent to quality control (QC) section to check for the quality standard of each product. The products are checked by the QC operator at various completion levels during production and upon final completion of the product. The QC passed products are sent to the packing department.

#### 3.7.1.6. Packing and Final Products

The qualified products from finishing section are sent to packing department. In this stage, every completed product is sorted and labeled first. Then, packaging is done by using paper cardboards. The packaging section can be seen in Figure 3-9.



**Cover for car and car seat protection**

**Figure 3-9 Packaging Section**

#### 3.7.1.7. Store and Ready to Export

After packing, the final packaged products are stored in the warehouse before it is exported to the respective country. The completed products can be seen in Figure 3-10.



**Figure 3-10 Completed Products**

### 3.7.2. Operation of Webbing Product Production Process

#### 3.7.2.1. Raw Materials

The main raw materials for webbing products like webbing net, strap, rope and other accessories are directly imported from Korea. At the same time, paper cardboard for packaging purposes are purchased from local market. Raw materials are ensured to choose the right quantity and quality, and then stored in a warehouse in the proper condition before sending to manufacturing section. Some raw materials in warehouse are shown in



Raw material for webbing products

Figure 3-11.



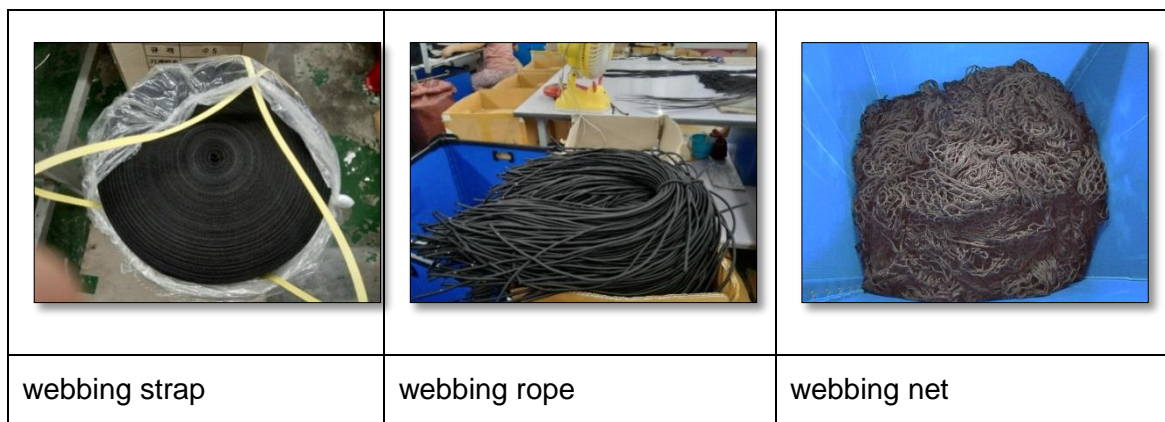


**Figure 3-11 Raw Material in Warehouse**

### 3.7.2.2. Cutting

For webbing materials, raw material cutting process is done by using the thermal cutting activities. The average temperature required for this cutting process is around 350 degree Fahrenheit. In this process, webbing strap, webbing rope and webbing net are cut with the heat cutters by both manual and automatic methods.

After the cutting process, the desired sizes of webbing pieces are sent to the sewing process. Several types of webbing materials and cutting activities are shown in Figure 3-12.





**Figure 3-12 Cutting Activities for Webbing Products**

### 3.7.2.3. Sewing

In this process, sewing machines are used for sewing the small pieces of webbing to form the desire shape only. Sewing process is done by manually and sewing section is shown inFigure 3-13. After completing the sewing process, the products will send to the finishing section.



**Figure 3-13 Sewing Section**



#### 3.7.2.4. Initial Inspection

After the sewing process, it is followed by the initial inspection for the sewn products. When it passed the quality control (QC) section to check for the quality standard of each product, the QC passed products are sent to the finishing department.

#### 3.7.2.5. Finishing

In this stage, unnecessary parts of the webbing products are cut with scissors to provide a neat finish. Then, certain accessories like plastic hooks are fixed in the completed products from sewing process. The operation of finishing process for webbing products is shown in Figure 3-14.

	
Accessories for webbing products	Fixing Accessories
	
Fixing Accessories	

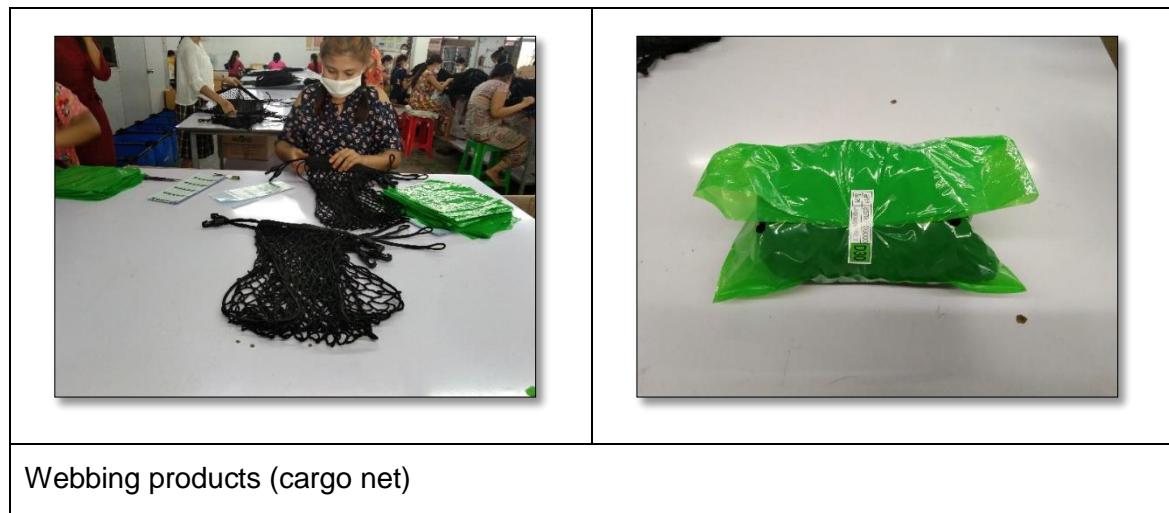
**Figure 3-14 Activities related to Finishing Process for Webbing Products**

#### 3.7.2.6. Final Inspection

The products are sent to quality control (QC) section to check for the quality standard of each product. The products are checked by the QC operator at various completion levels during production and upon final completion of the product. The QC passed products are sent to the packing department.

### 3.7.2.7. Packing and Final Products

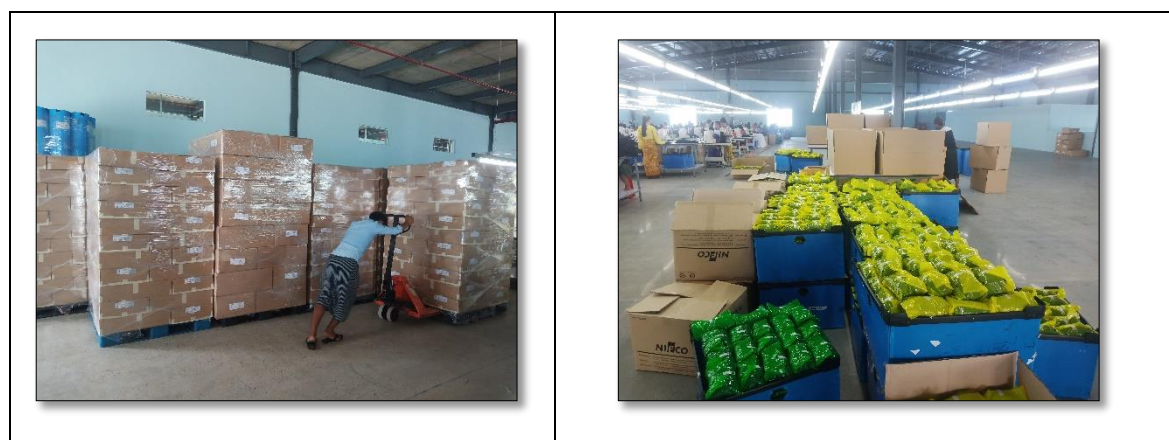
The qualified products from finishing section are sent to packing department. In this stage, every completed product is sorted and labeled first. Then, packaging is done by using paper cardboards. The packaging section can be seen in Figure 3-15.



**Figure 3-15 Packaging Section**

### 3.7.2.8. Store and Ready to Export

After packing, the final packaged products are stored in the warehouse before it is exported to the respective country. The completed products can be seen in Figure 3-16.



**Figure 3-16 Completed Products**

## 3.8. PROJECT COMPONENTS

### 3.8.1. Support Facilities for Workers

There are several types of supporting facilities for workers within the factory. They are drinking water supply, providing clean and hygienic sanitation system, annual bonus, first aid boxes and other necessary personal protective equipment.

#### 3.8.1.1. First Aid Box

There are total of three first aid boxes provided at each department. The location of first aid boxes and its accessories are shown in Table 3-7 and Table 3-8.

**Table 3-7 List of First Aid Box**

Department	Location	Quantity
Manufacturing sector	Near sewing lines	1
	Near cutting section	1
Office	Main Office	1
<b>Total</b>		<b>3</b>

Source ESung Company Limited

**Table 3-8 Accessories of First Aid Boxes**

No.	Item	Unit	Qty
1.	Roller Bandages 2"	pcs	2
2.	Paper Tape	roll	1
3.	Handy Plats	pcs	5
4.	Betadine/Sept dine	tube	1
5.	Spirit	bottle	1
6.	Elastic Bandage	pcs	2
7.	Cotton Wool	pack	1
8.	Adhesive Tape	roll	1
9.	Forceps	pcs	1
10.	Small Scissors	pcs	1
11.	Emergency Burn Gel	bottle	1

#### 3.8.1.2. Drinking Water Supply

Daily drinking water demand of the factory is around 160 liters per day. 20 liters plastic drinking water bottles are provided for drinking purpose daily. Photos of drinking water bottles are shown in Figure 3-17.



**Figure 3-17 Purified Drinking Water Bottles**



#### 3.8.1.3. Canteen

For employees, there are facilities such as canteen and washing basin to wash their lunch boxes in the factory compound. Current condition of factory's canteen is shown in Figure 3-18.



**Figure 3-18 Current Condition of Factory's Canteen**

#### 3.8.1.4. Sanitary

Regarding sanitation, twelve numbers of clean and hygienic toilets are provided for workers. The sewage from the toilets is treated by septic tanks and the sludge from the septic tank has been removed every two years. Current condition of sanitary facilities is shown in Figure 3-19.



**Figure 3-19 Current Condition of Sanitary Facilities**

#### 3.8.1.5. Other Facilities

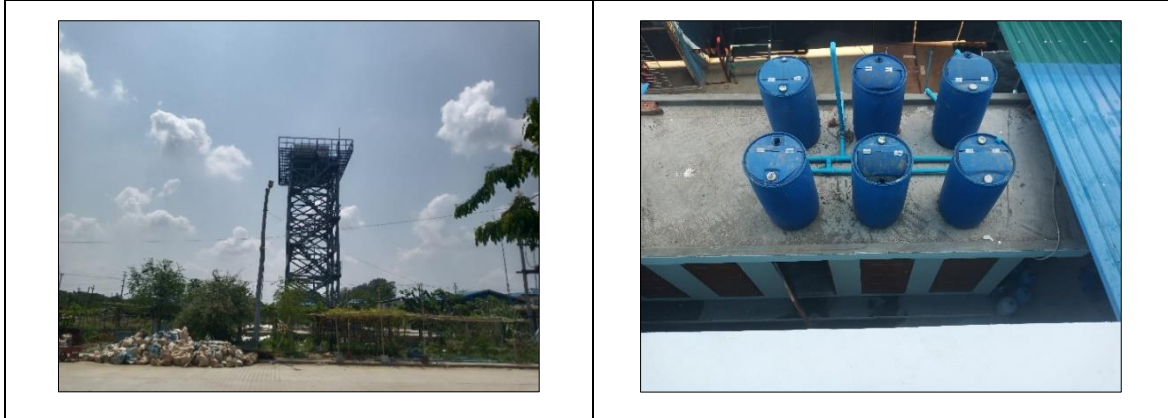
It is also providing several types of facilities for the employees. The employees are allowed medical leaves when they suffer from personal health diseases. Based on the performance and the yearly profit of the company, the annual bonus will be announced and paid to each employee every year. Besides, it is provided the personal protective equipment (PPE) especially for the worker from cutting sector.

### 3.9. PROJECT UTILITIES

The main utilities for the factory are water supply, generators, and drainage channels.

### 3.9.1. Water Supply

Water is pumped from the main tube well and stored at water tower. Then, raw water from the water tower is transferred to the factory storage tanks with the capacity of three hundred gallons. Current condition of water tower and water storage tanks are described in Figure 3-20.



**Figure 3-20 Current Condition of Water Tower and Water Storage Tanks**

### 3.9.2. Power Supply

#### 3.9.2.1. Electricity

Electricity used in operation process is from township main grid line. There is a transformer with the capacities of 400 KVA is situated within the factory compound. A photo of transformer is shown in Figure 3-21.



**Figure 3-21 400 KVA Transformer**

#### 3.9.2.2. Generator

KOGEN diesel generator set is installed for emergency use in case the grid electricity is off. The capacity of the generator is 1,500 revolution per minute for 380 volts (1,500rpm/380V). Engine rating of the generator is 100 kVA for prime and 110 kVA for stand-by. The photos of the diesel generators and its location are shown in Figure 3-22.





**Figure 3-22 Generator**

### 3.9.3. Fuel Storage Tank

The fuel is mainly used for diesel generator. The capacity of the fuel storage tanks is around 100 gallons. Diesel consumption of the whole factory is approximately 220 liters (57 gallons) per week. The photos of fuel storage tanks are shown in Figure 3-23.



**Figure 3-23 Fuel Storage System of the factory**

### 3.9.4. Air Compressor

Three numbers of air compressor that includes electric motors (1,450 rpm and 220 V) are used for PE film cutting process. The capacity of air tank for each compressor is around 22.67 gallons. The pressure supply of each air compressor is 115 psi with 3 hp. The air compressors used in factory are shown in Figure 3-24.



**Figure 3-24 Air Compressors**

### 3.9.5. Wastewater Discharge

Regarding the production, as the factory manufacturing process is mainly based on the CMP system, there is no wastewater discharge from the operation process.

Toilets for workers are constructed within the factory compound and it separates into equal numbers for male and female. Factory has its own septic tanks for sewage storage. Generally, the sludge from the septic tank has been removed whenever it is necessary.

Regarding the domestic wastewater from canteen and washing basins, it is directly discharged into the factory drainage channel. Based on the U.S EPA (1978)<sup>8</sup>, the average daily water usage for a worker is 150 liters/day/person. Therefore, the estimated wastewater discharge from the 181 office staff will be around 2,750 liters per day.

### 3.9.6. Drainage Channels

There are two types of drainage systems in the factory. They are -

- 3) Drainage for rain water
- 4) Drainage for domestic wastewater

All drainage systems are installed by pipes and each drainage line is connected separately to the factory drainage channel. Generally, domestic water from factory as well as the rainwater from road and around the factory compound is flowed into the nearest drainage channel. In which, factory drainage channel is directly connected to the YCDC drainage system. Current condition of factory drainage system is shown in Figure 3-25.

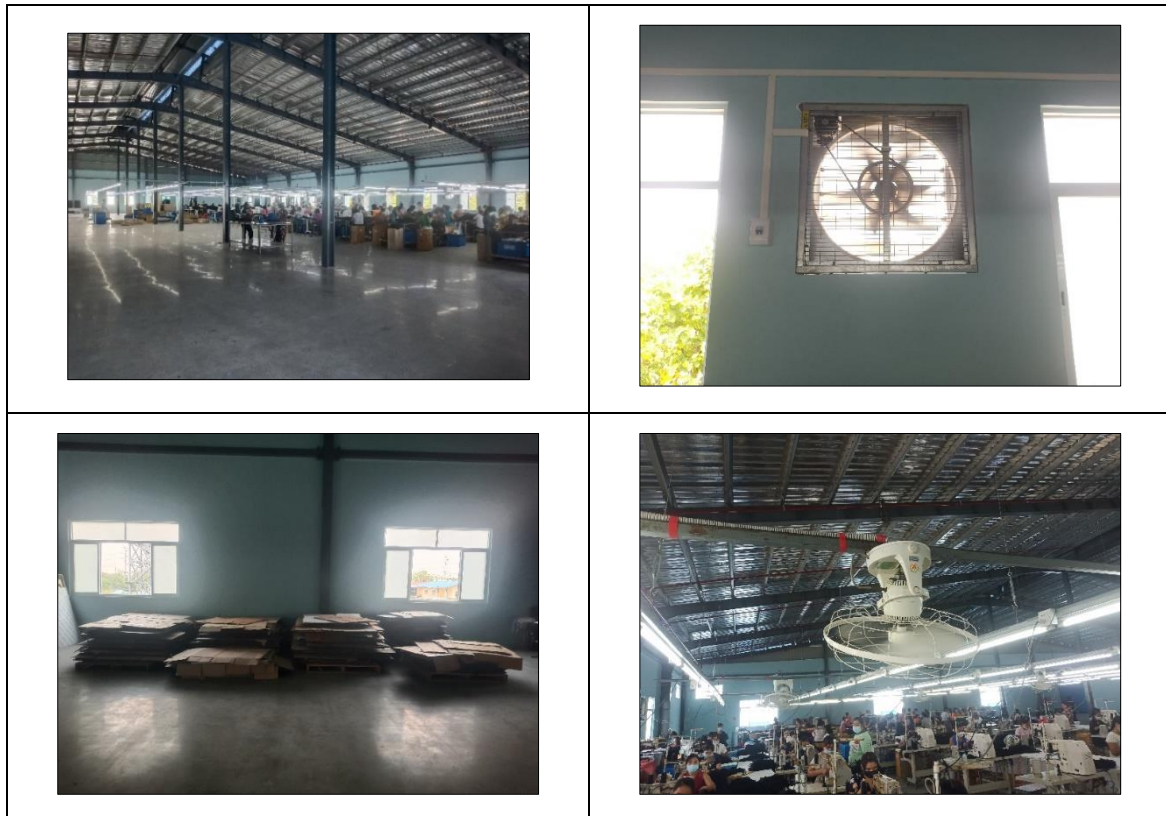


**Figure 3-25 Current Condition of Factory Drainage System and Septic Tank**

### 3.9.7. Ventilation System

Ventilation system is provided for workers at operation places. Mobile fans, large windows, exhaust fans and standard size of roof high are provided for workers in the factory. The current condition of factory's ventilation system is shown in Figure 3-26.

<sup>8</sup> U.S.EPA. (1978), Environmental impact statement phase II, Facility Plan Handover Country, Virginia 3<sup>rd</sup> Edition.



**Figure 3-26 Current Condition of the Factory's Ventilation System**

### 3.9.8. Firefighting System

Regarding the firefighting system, automatic ceiling water sprinkler system is installed within the two-story factory building. The factory provided sufficient firefighting equipment around the factory to prevent fire in case of emergency. The list of firefighting equipment is described in Table 3-9. Firefighting equipment is shown in Figure 3-27.

**Table 3-9 List of Firefighting Equipment**

No	Type of Equipment	Quantity
1.	Fire extinguisher	13
2.	Fire hose reel	6
3.	Fire alarm	2
4.	Fire hydrant pipe	2





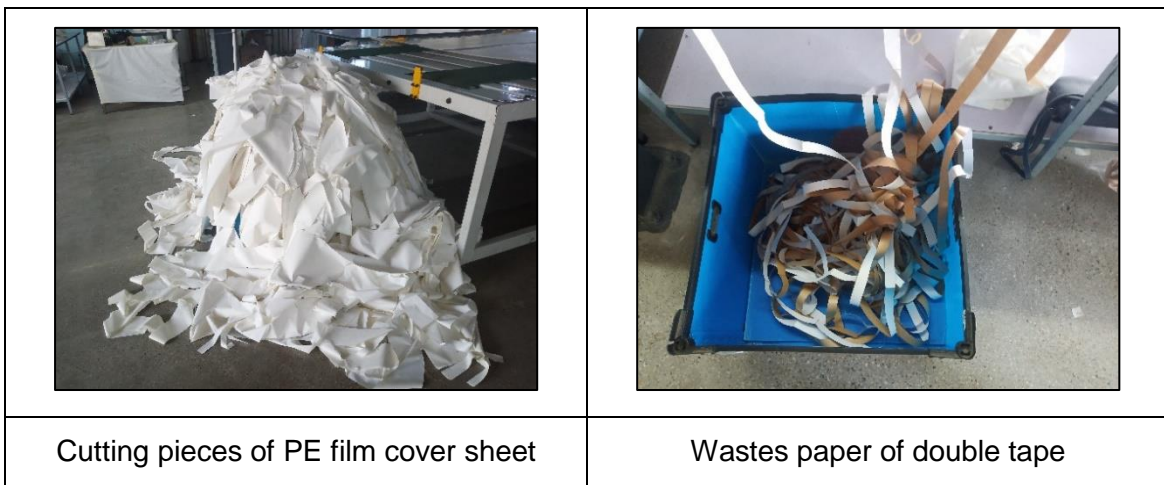


**Figure 3-27 Fire Fighting Equipment**

### 3.10. AMOUNT AND TYPES OF SOLID WASTE

#### 3.10.1. Solid Waste

Cutting pieces of PE film cover sheet and wastes paper of double tape, shown in Figure 3-26, are the main solid wastes of the factory. Generally, daily solid waste production from the production process of the factory is about 25 kilogram. Normally, there is no hazardous waste from the factory production process. Normally, it is also expected to have some general waste from the factory workers. According to the IGES (2016)<sup>9</sup>, the estimated amount of waste generation from each person is 0.4 kilogram per person for one day. During operation phase, the waste generation rate of 181 workers is approximately 80 kilogram per day.



**Figure 3-28 Factory Solid Waste**

<sup>9</sup> IGES (June, 2016), Quick Study On Waste Management in Myanmar

## **CHAPTER 4**

### **DESCRIPTION OF SURROUNDING ENVIRONMENT**

#### **4.1. SETTING THE STUDY LIMIT**

In the EMP study, it is necessary to establish baseline information on the environmental and socio-economic settings of an area, which could receive directly, and/or indirectly impacts from the project construction and operation. The baseline information serves two purposes. Firstly, it uses 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's construction and operation.

As the EIA Procedure (2015) does not define the study area for EMP study, the EMP study area for this project is roughly defined to be the area within a 500-meter radius of the center of the project site. This study area would be large enough to cover most potential environmental and social impact of the project's construction and operation.

This chapter describes environmental and socio-economic settings of the study area based on available information collected during field survey and secondary data from Township General Administration Department (GAD, 2020).

#### **4.2. 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 one acre, located in Dagon Myothit (East) Township. This scoping geographical study limit is about 500-meter radius around the project site. This area is referred to in subsequent sections of this scoping report as the study area. The study area should cover sensitive receptors of environmental impacts of the project during construction and operation phases. At the same time, as the proposed project leased the current land area and factory building with 5 years lease contract, activities related to construction phase may not related to the proposed project.

##### **4.2.1. 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) socio-economic components, (iii) cultural components and (iv) visual characteristics.

- i. Physical Component
  - Overview of the study area
  - Meteorology
  - Topography
  - Geology
  - Soil Condition
  - Seismology
  - Hydrology
  - Surface water quality

- Groundwater quality
- Air quality
- Noise and Vibration
- Water Quality
- Traffic Survey
- ii. Socio-economic components
  - Land use
  - Population and Demography
  - Ethnicity
  - Religions
  - Level of education
  - Main economic activities
  - Employment
  - Health condition
  - Infrastructure
    - Electricity and energy consumption
    - Public transport service
    - Community and social organization
- iii. Cultural Components
  - Tourist site, culture and religious properties
- iv. Virtual Characteristics
  - Attractive Places

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

#### **4.3. DESCRIPTION OF THE PHYSICAL COMPONENT**

##### **4.3.1. Overview of the Study Area**

###### **4.3.1.1. Dagon Myothit (East) Township**

The proposed project site is located in Dagon Myothit (East) Township. The total area of the study Township is about 91,038,082.1 square meters. Total population is 182,081 and it is bounded by North Oakkalapa Township in the north, Hlegu Township in the east, Dagon Myothit (South) Township in the south, Dagon Myothit (North) Township in the west. A brief regional profile is presented Table 4-1.



**Table 4-1 Dagon Myothit (East) Township Brief Regional Data**

Township	Quarter
Number of wards	63
Total population	182,081
Area	91038082.1 square meters
Latitude	Between 16° 46' 00" and 16° 55' 00" N
Longitude	Between 96° 10' 00" and 96° 12' 00" E
Ethnicities	Kachin, Kayar, Kayin, Chin, Mon, Burma, Rakhine, Shan
Main economic activities	Industrial/Handicraft

Source: General Administration Department, Dagon Myothit (East) Township, 2020

### 4.3.2. Climate and Meteorology

#### 4.3.2.1. Methodology for data Collection and Analysis

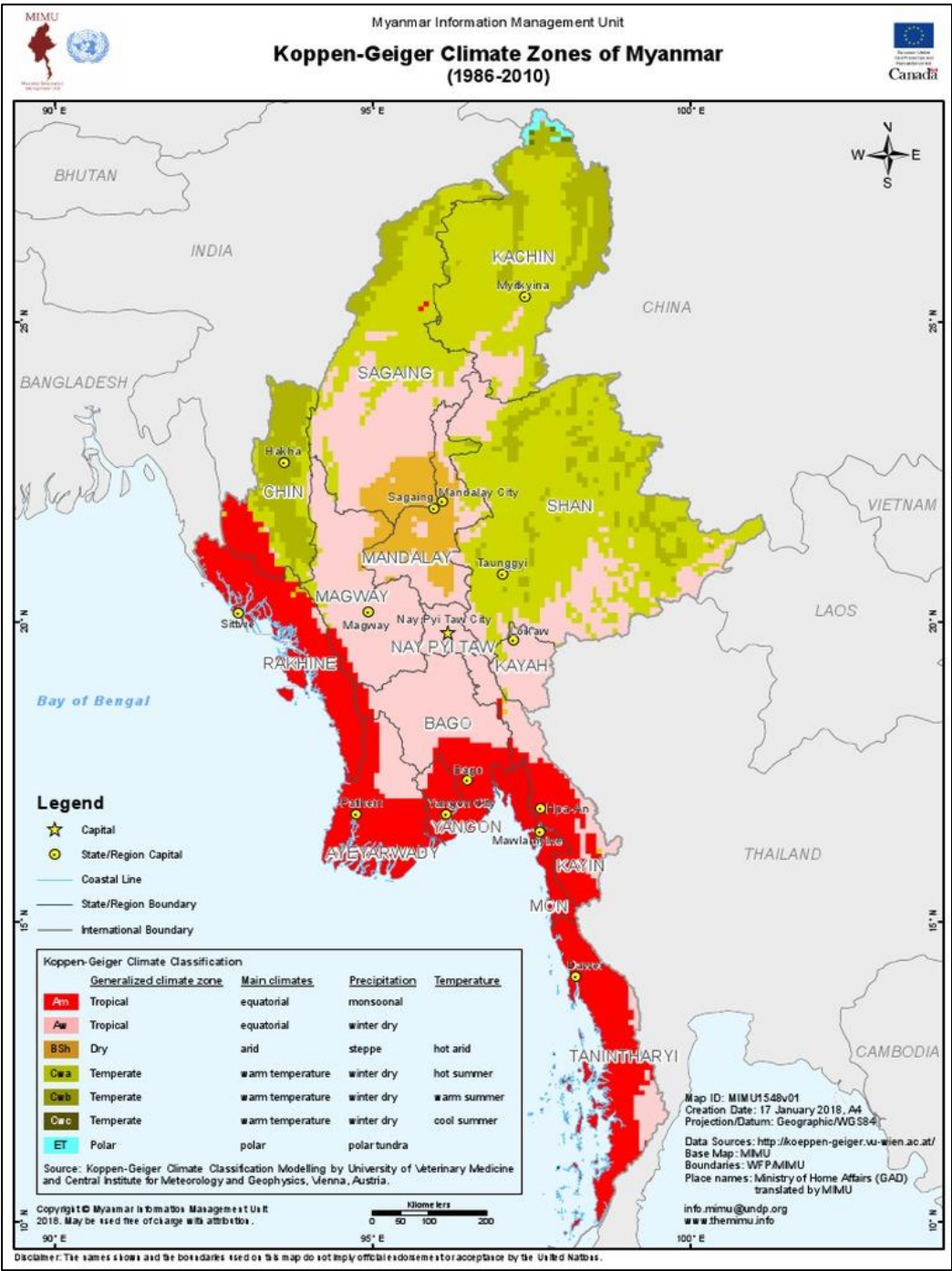
The description of climate conditions of the study area invariably has to be at provincial level using general climatic data recorded at Kabaraye meteorological station, which is nearest station to the project area, about 16 kilometer. Meteorological data such as humidity, temperature, rainfall and wind direction were collected from the Department of Meteorology and Hydrology of Myanmar (2020).

#### 4.3.2.2. 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 zones map of Myanmar is shown in Figure 4-1.



Source: MIMU

**Figure 4-1 Climate Zones Map of Myanmar**

#### 4.3.2.3. Climatic Conditions in the Project Township

The study area has a warm moist climate characterized by three seasons. The summer season normally begins in March to May. The rainy season normally begins in June to October. The winter season follows the rainy season, normally from November to February. Reference from 2020 of yearly temperature and rainfall data are presented in Table 4-2. This data was provided from GAD (2020), Dagon Myothit (East) Township. During the course of a year, the average maximum temperature is 36 °C and the average minimum temperature is 22 °C.

According to the data from Department of Meteorology and Hydrology (2020), the average of humidity in the summer, rainy and winter season are about 88%, 93% and 87% respectively. Moreover, the average maximum temperature of project township are 37°C, 31°C and 33 °C in summer, rainy and winter season. In addition to this, the total annual rainfall is about 94.25 inches in a year. The wind direction was collected at 6:30 hrs. M.S.T from Kaba Aye Station.

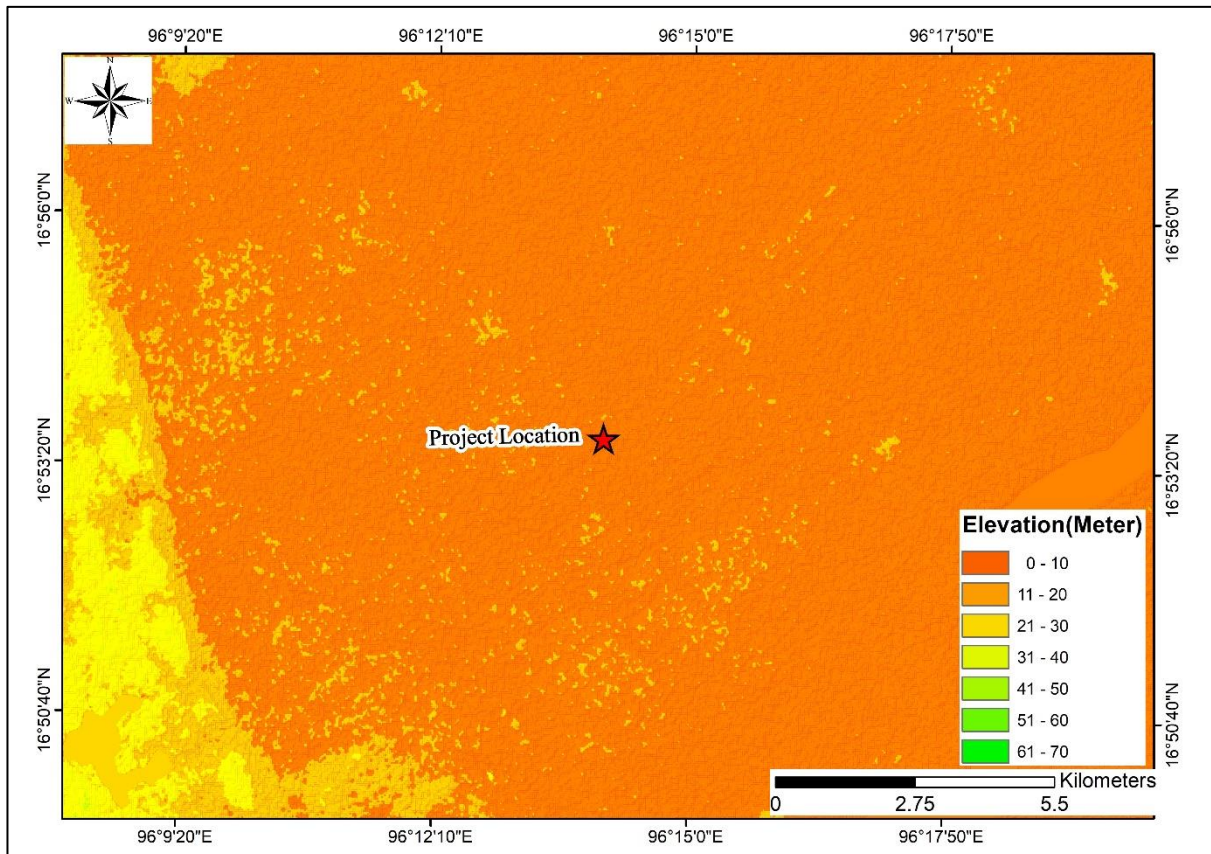
**Table 4-2 2017-2020 Temperature and Rainfall Data in Dagon Myothit (East) Township**

No.	Year	Rainfall		Temperature	
		Raining day	Total rainfall (Inches)	Summer season (Mix °C)	Winter season (Min °C)
1	2017	113	134.35	30	24
2	2018	115	125.24	34	26
3	2019	74	108.21	33	26
4	2020	67	91.65	34	25

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.3.3. Topography

Due to the presence of Ngamoe Yeik Creek, which flows from north to south in Dagon Myothit (East) Township, the wetland areas are sometimes flooded. Wetland and farmland are located in the study area in the past, but has emerged as a land plain for the development of settlements. The topography map of Dagon Myothit (East) Township is shown in Figure 4-2. According to the topographic map, the elevation of the study area is between 0 and 10 meter high.



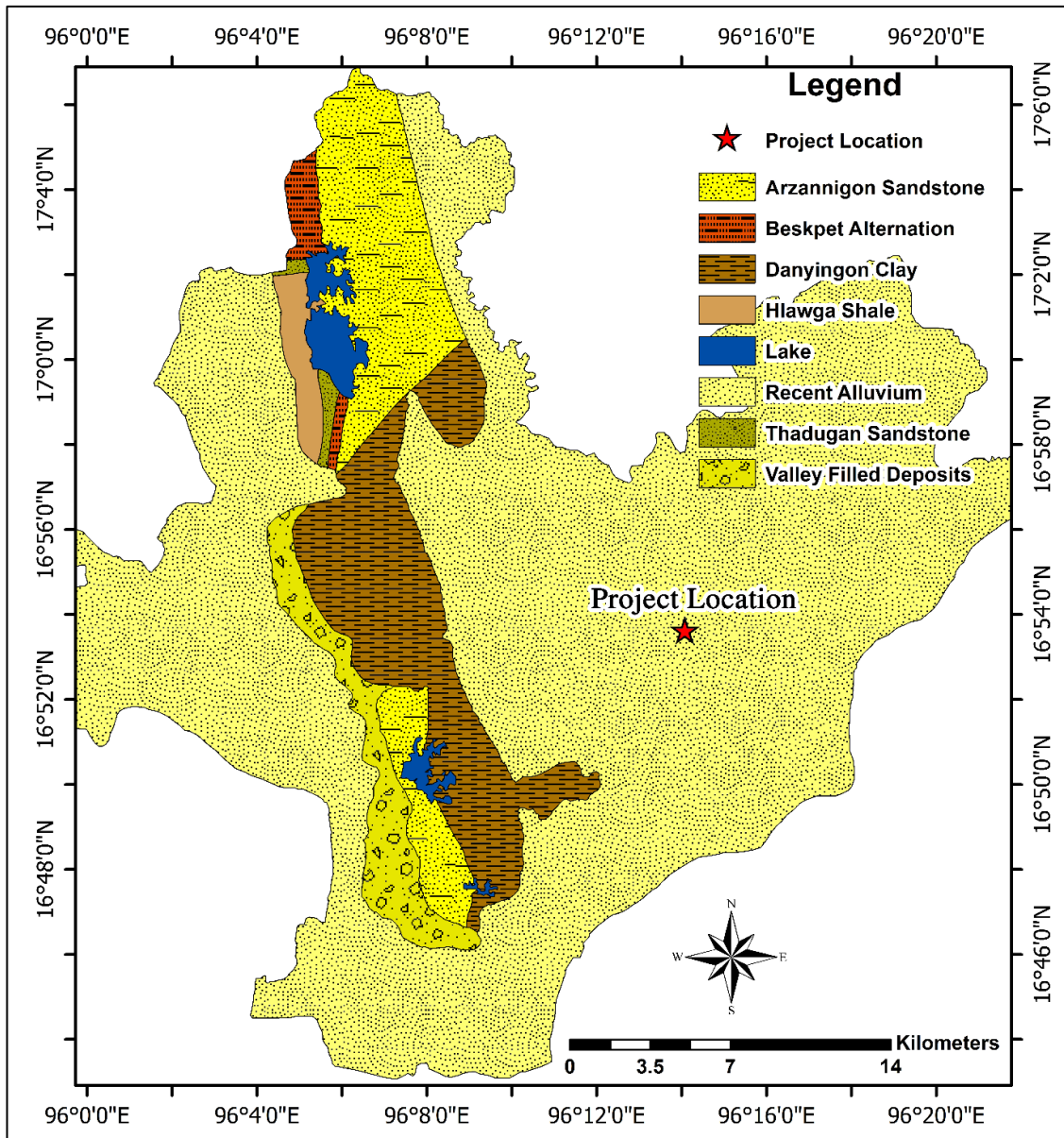
**Figure 4-2 Topography Map**

#### 4.3.4. Geology

Project area of Dagon Myothit (East) 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 to 4.6 meter above sea level (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 Arazanigon 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. Geological map of proposed project site is shown in Figure 4-3.





Source: Soe Thura Tun, Maung Thein, Nyunt Htay and Kyaing Sein, (2014). Geological Map of Myanmar, Myanmar Geosciences Society (MGS)

**Figure 4-3 Geological Map of Proposed Project Site**

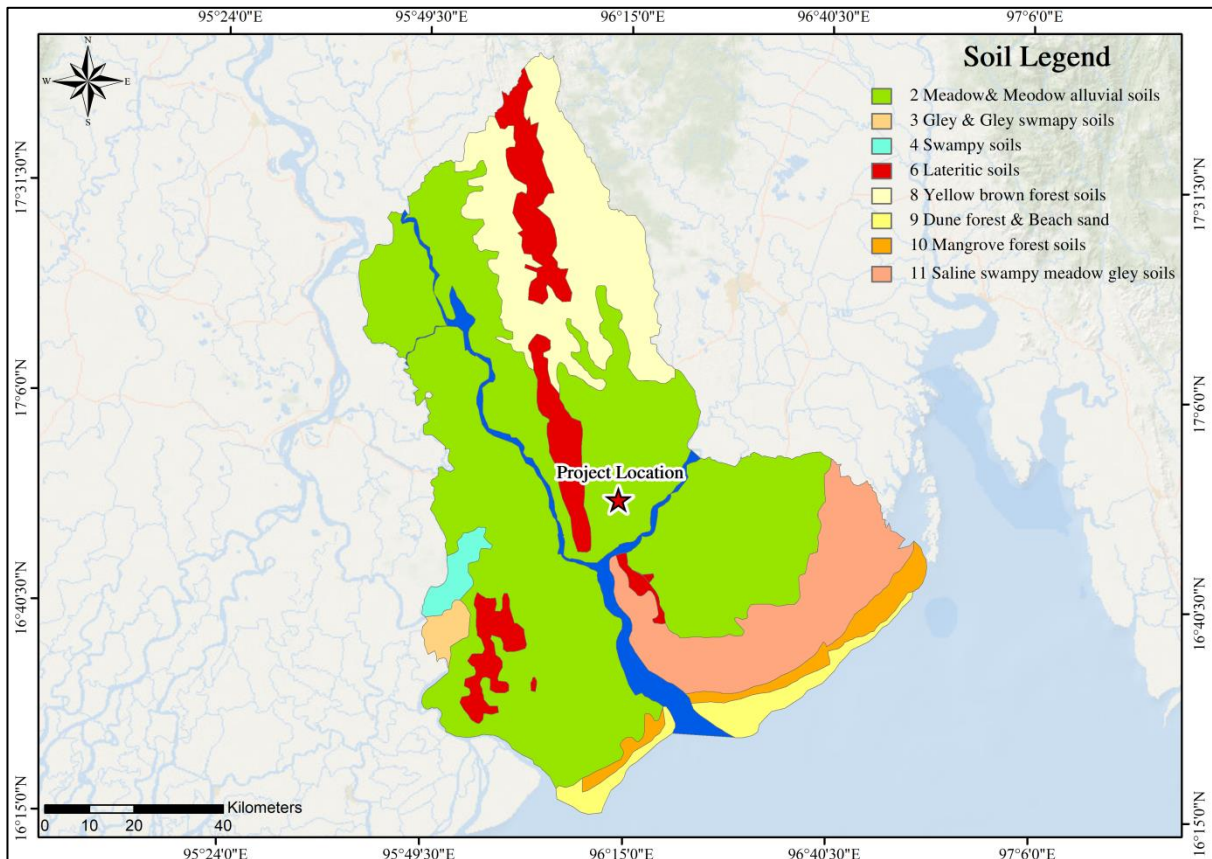
#### 4.3.5. Soil Condition

Project area of Dagon Myothit (East) Township is located in Yangon Region. According to the information from Lwin, A., & Khaing, M.M. (2012)<sup>10</sup> soil condition of Yangon 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

<sup>10</sup> 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>

and saline swampy meadow gley soils. The soil map of the Yangon region is shown in Figure 4-4.

According to the soil Map (Aung Lwin, Myint Myint Khaing, 2012), the soil type of the proposed project site is meadow and meadow alluvial soils. The meadow soils, which occur near the river plants 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 4-4 Soil Map of Yangon Region**

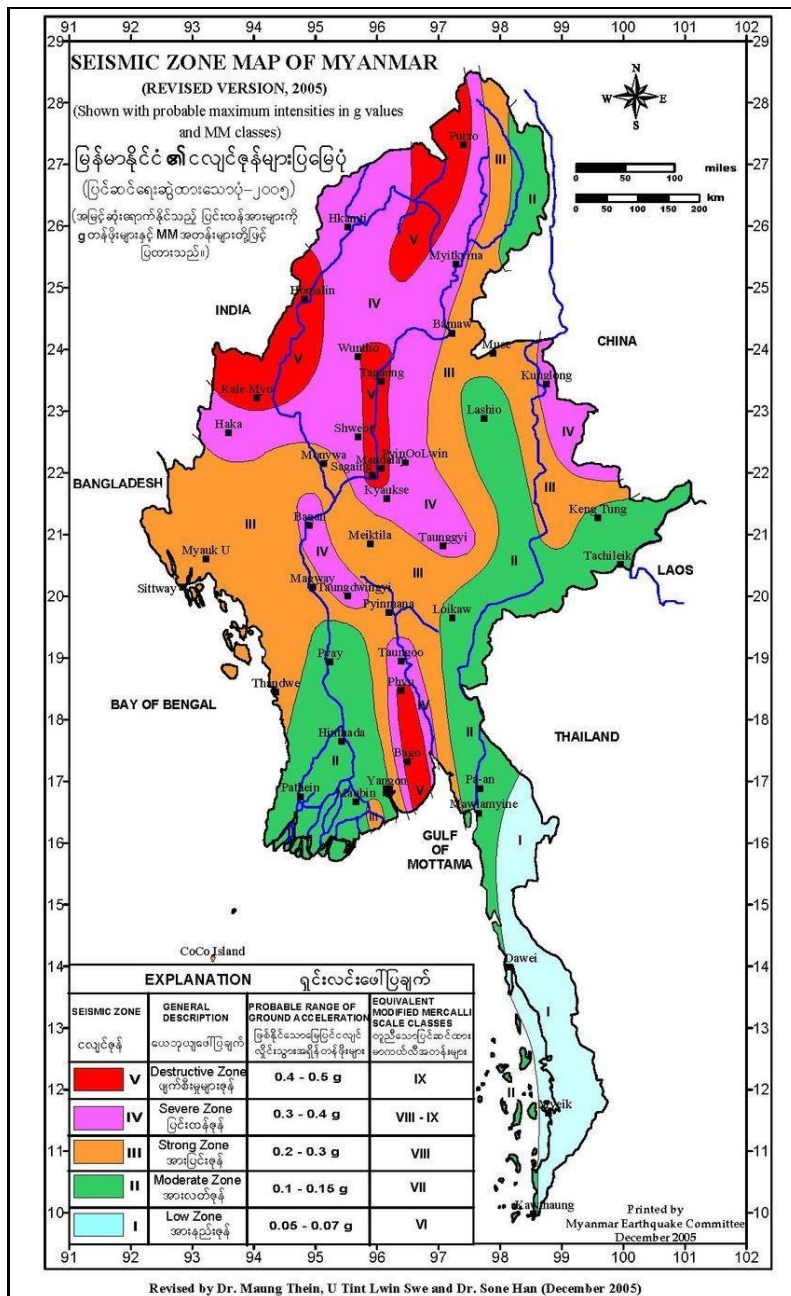
#### 4.3.6. Seismology

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 Macro seismic 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



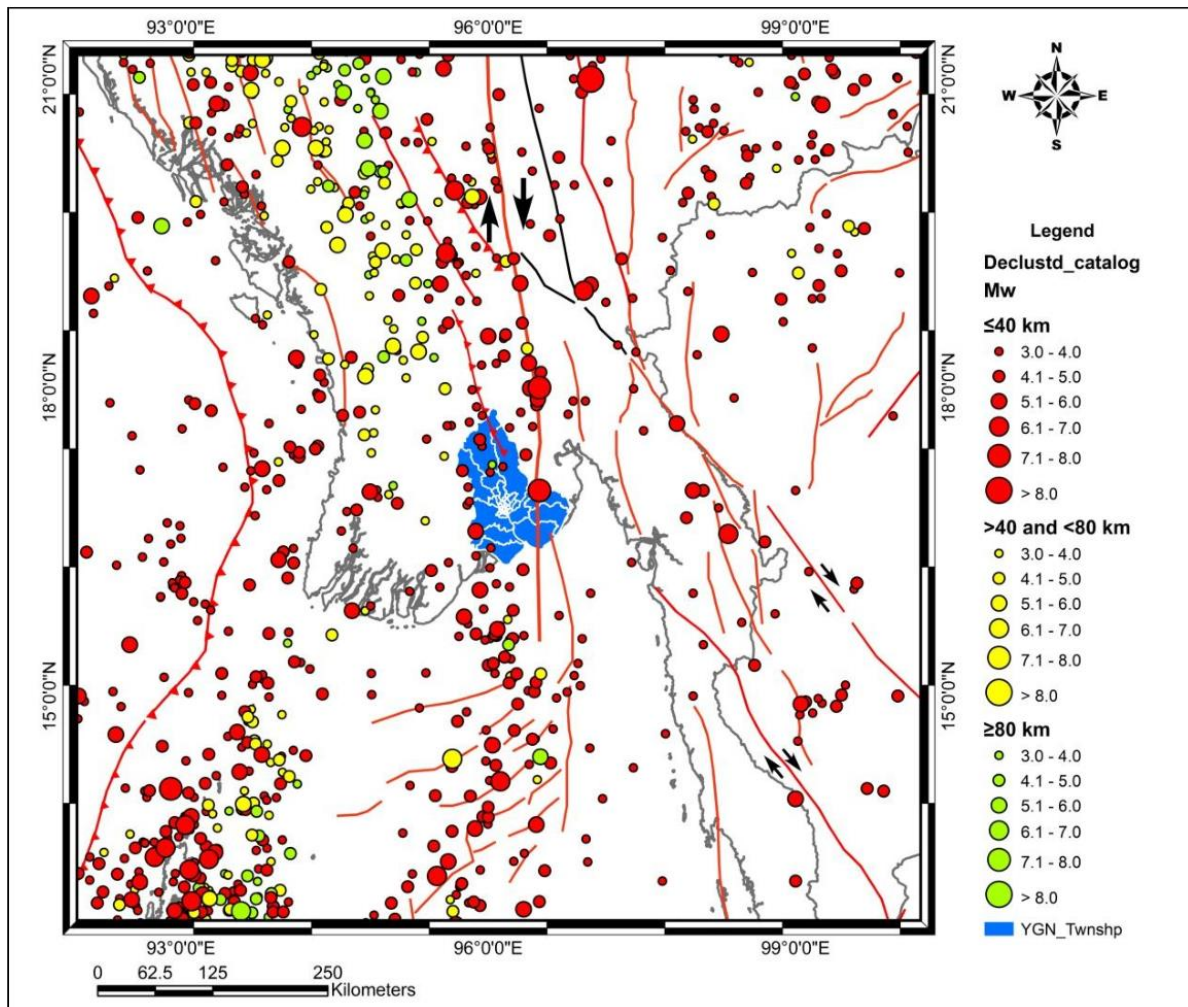
part in Zone III, and the original city in Zone II. A probable maximum range of ground acceleration in values and equivalent Modified Mercalli Scale classes are given for each zone.

The seismic zone map of Myanmar is presented in Figure 4-5. 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 4-6.



Source: Meteorology and Hydrology Department, Yangon, Myanmar

**Figure 4-5 Seismic Zone Map of Myanmar**



Source: ANSS earthquake catalog, 1963- 2009

**Figure 4-6 Seismicity Map of Yangon Region**

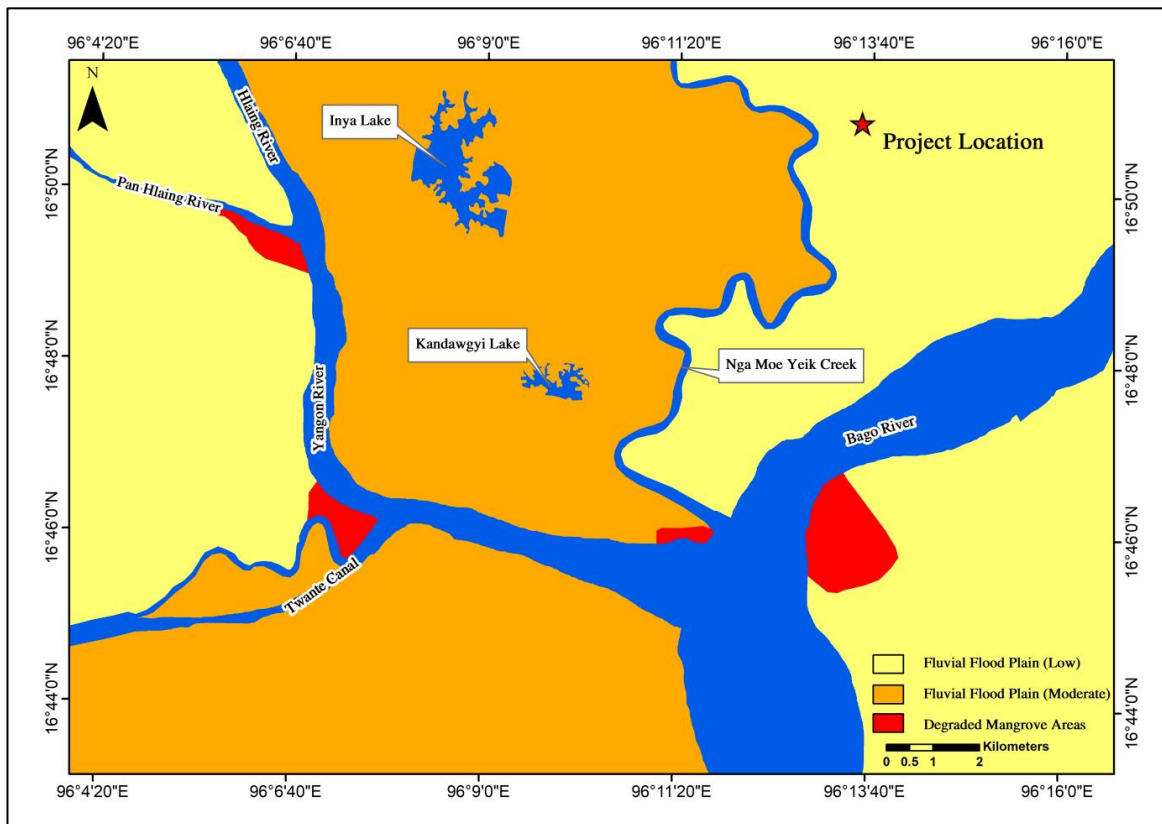
#### 4.3.7. Hydrology

The project site is located in Dagon Myothit (East) Township in which a few rivers and creeks are existing. The creek near the project site is the Nga Moe Nyeik creek which is located approximately 3.6 kilometers east of the project site. The Yangon River (also known as the Rangoon River) arises by the confluence of the Hlaing and Pan Hlaing Rivers in Yangon region. It is about 40 kilometers long and runs from Yangon to the Gulf of Martaban of the Andaman Sea after joining with Bago River. The river plays a critical role for the economy of Myanmar since it is a navigable channel for ocean-going vessels. Water from Yangon River is also essential for agricultural and navigation purposes in Yangon region. There are Nga Moe Yeik creek and drainage canals flowing from north to south.

The catchment area of the study river is about 700 square kilometers and its length is 12 kilometers 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. The domestic wastewater and dumping of garbage into drains are also the sources 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)<sup>11</sup>, Dagon Myothit (East) Township is in lowery fluvial flood plain. 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 4-7.



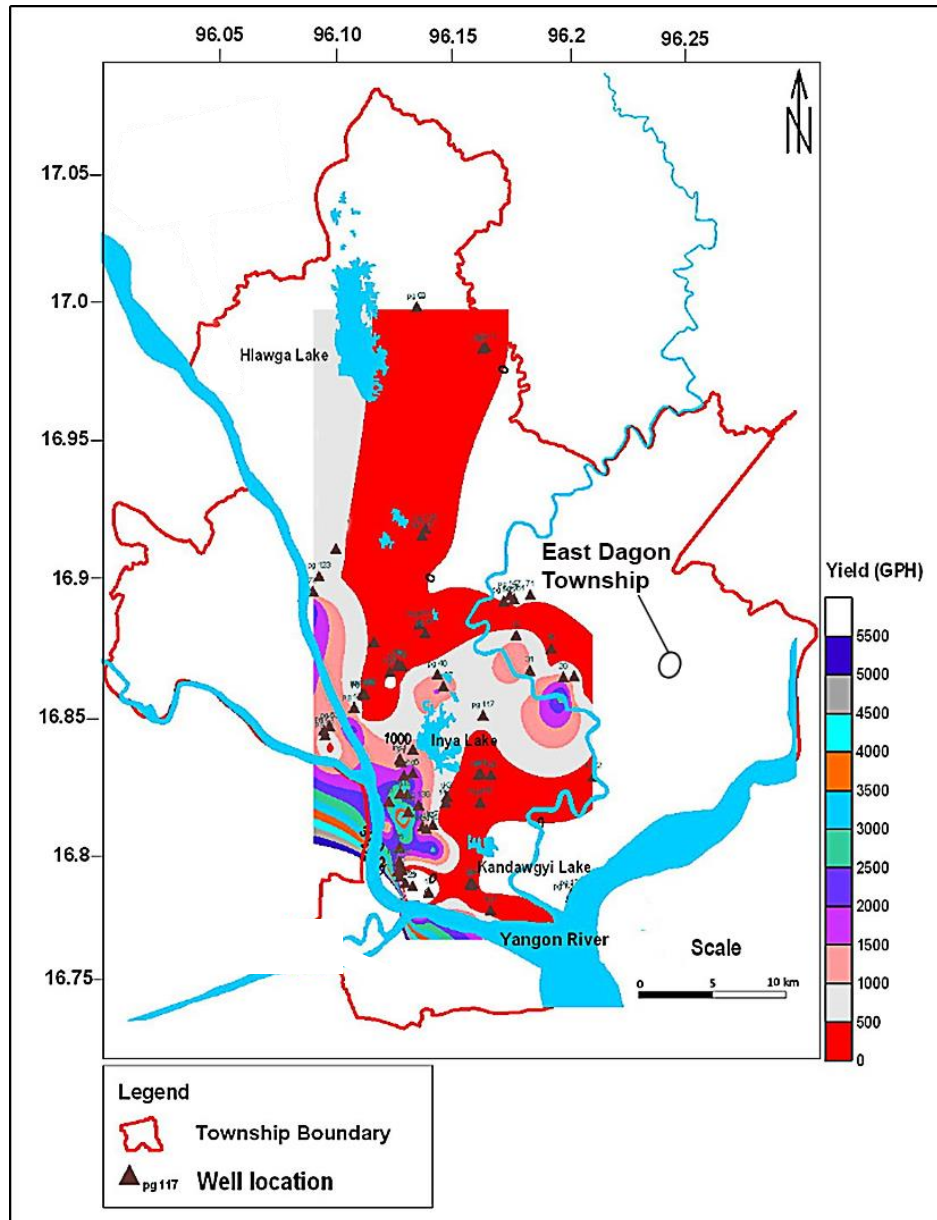
Source: Yangon river geomorphology identification and its environmental impacts analysis by optical and radar sensing technique (2012)

**Figure 4-7 Geomorphological Map of Study Area**

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 1,000 Gallons per Hour (GPH) as shown in Figure 4-8.

<sup>11</sup> 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)

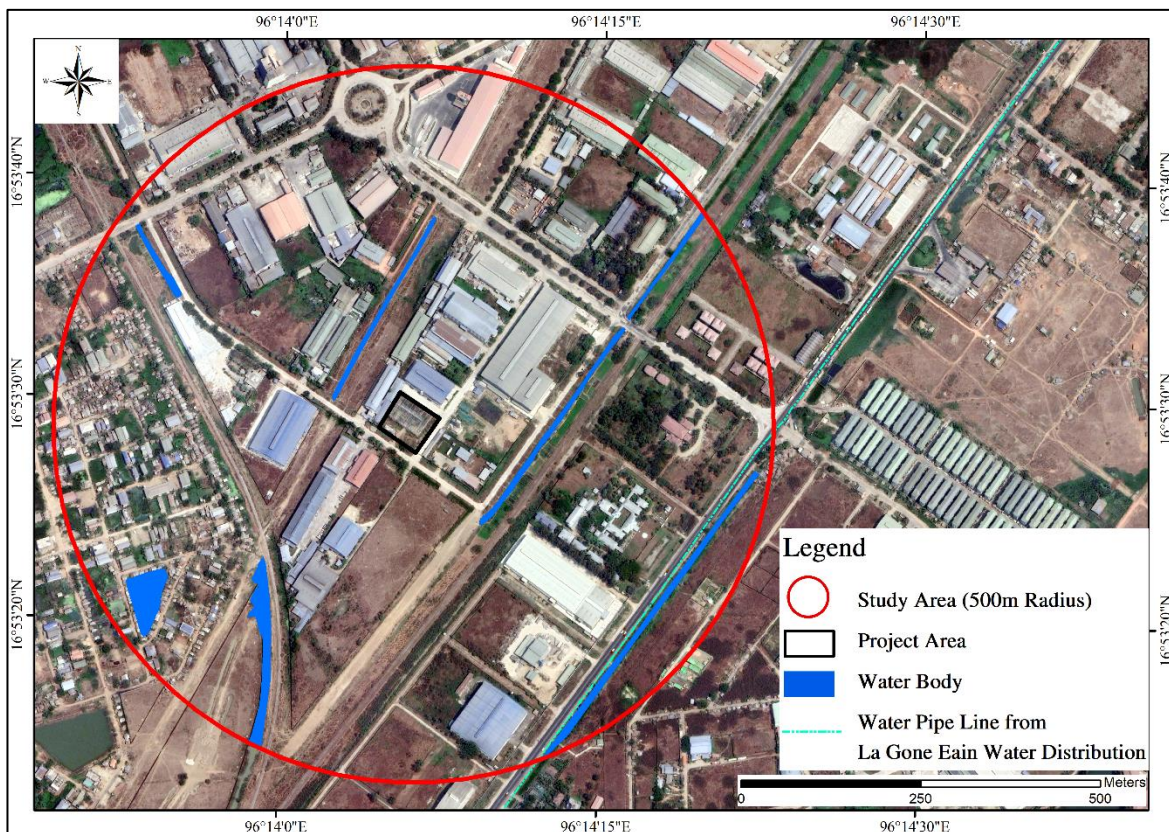
**Figure 4-8 Groundwater Yield Map of Study Area<sup>12</sup>**

Yangon is rich in groundwater resources conserved by unconsolidated Tertiary Quaternary deposits. In Yangon, groundwater is mostly extracted from valley filled deposits and Ayeyarwaddy sandstones. According to the map of hydrological condition in the study area, although there are many water bodies within the 500-meter radius from the project

<sup>12</sup> 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>

<sup>12</sup> 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>.

site, no water source is significant. The hydrological condition of the study area can be seen in Figure 4-9.



**Figure 4-9 Hydrological Condition of Study Area**

#### **4.4. SOCIO-ECONOMIC ENVIRONMENT**

##### **4.4.1. Land use**

###### **4.4.1.1. Methodology**

Information about land use was collected from secondary sources in combination with primary data collection. The primary data collection helps to verify and fill gaps of the secondary information.

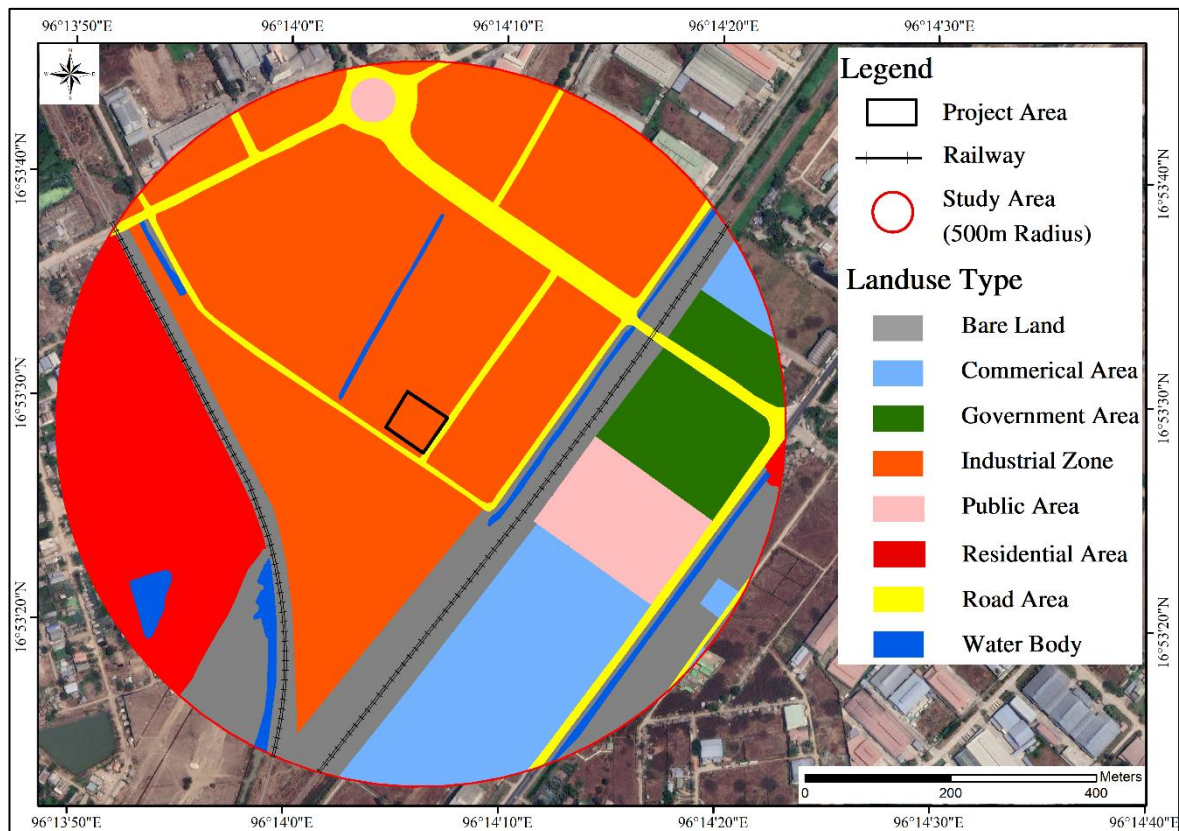
###### **4.4.1.2. Secondary Data Collection**

Secondary data on land use was compiled from the following sources.

- Satellite image of Google earth Pro (<http://earth.google.com>)
- Geographic Information System (GIS) of Dagon Myothit (East) Township

###### **4.4.1.3. Primary Data Collection**

Primary data collection for the land use survey was conducted on 17<sup>th</sup> March, 2022 and 22<sup>nd</sup> April, 2022 in a 500-meter radius of the study area. This was used to verify the land use information on the initial land use maps. The results were used to recheck, revise, and modify the accuracy of each type of land use on initial map. The final land use map was then generated which is shown in Figure 4-10.



**Figure 4-10 Land Use Map**

#### 4.4.1.4. Result of the Study

The study area consists of around 500-meter radius of the project. It is characterized by eight types of land use. As a result of the study, industrial area is the largest portion within 500-meter marginal area where water body occupies the smallest portion. The summary table for land use percentage and existing land use photos within the study area are shown in Table 4-3 and Figure 4-11.



**Table 4-3 Types and Percentages of Land Use**

No.	Name	Area (Ha)	Percentage (%)
1.	Bare Land	11.76	14.94
2.	Commercial Area	8.15	10.35
3.	Government Area	4.28	5.43
4.	Industrial Zone	34.18	43.40
5.	Public Area	3.15	4.00
6.	Residential Area	10.07	12.79
7.	Road Area	5.18	6.57
8.	Water Body	1.98	2.52
Total		78.75	100

	
Water Body	Industrial Zone
	
Government Area	Bare land



**Figure 4-11 Existing Land Use Photos within Study Area**

#### 4.4.2. Field Survey Approach

Desktop review and most of secondary data were collected since March 2022 in order to get the general information on township level and socio-economic situation of the household level of the study area. The study area consists within 1-kilometer radius of project site. It includes Dagon Myothit (East) Township. The social data are collected from GAD (2020).

##### 1) Limitation

Due to the COVID-19 restrictions, political situation and security of the field, survey team could not do face-to-face interview with ward heads. Therefore, secondary data from GAD (2020) and Myanmar Information Management Unit (MIMU) data were collected to organize for the report.

#### 4.4.3. Demography

Project area is bordered by Dagon Myothit (South) Township in South, Hlegu Township in East, Dagon Myothit (North) Township in West and North Okkalapa Township in North.

##### 4.4.3.1. Population

Population is mainly divided into two parts as rural and urban areas dwellers. However, this project is within the downtown of Yangon Region and all people are from urban civilization. Table 4-4 shows that the population in the project study township. It can be clearly seen that 63 wards from Dagon Myothit East belong to over 37,000 houses.

**Table 4-4 Population in the Project Township**

No.	Type	House	Household	Ward	Village Tract	Village
1.	Urban	34,986	38,572	63	-	-
	Rural	2,137	2,413	-	3	6
Total		37,123	40,985	63	3	6

Source: General Administration Department, Dagon Myothit (East) Township, 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), there are two age groups such as under 18 years, above 18 years including over 85 years old. Population by age group in study area townships are shown in Table 4-5. The female group is slightly higher for all of under 18 years and above 18 years. As a result, it mentioned that female to male proportion is 1.12 to 1 for the entire study area.

For the gender issues, our Myanmar nation has equal gender rights for all of female and male, there may be no gender problems. 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 4-5 Population by Age Group and Gender Disaggregation in the Project Township**

No.	Type	<18 Years		>18 Years		Population		Grand Total
		Male	Female	Male	Female	Male	Female	
1.	Urban	20,089	20,116	60,959	71,388	81,048	91,504	172,552
	Rural	1,562	1,433	3,156	3,378	4,718	4,811	9,529
Total		21,651	21,549	64,115	74,766	85,766	96,315	182,081

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.4. Ethnicity

According to secondary data from Township GAD, Bamar people mainly live in project townships. As Yangon Region is a place where varieties people meet, different ethnicities can be found in project Townships. Bamar is the largest population in the area about 171,136 people. The second largest group is Rakine, with 3,121 people. The third largest group is Ka Yin people, with the population of 2,208 people. Although Burmese is the most widely spoken language in project townships, ethnic groups have managed to retain individual languages. It was shown in Table 4-6 and Table 4-7.

**Table 4-6 Ethnicity in the Project Township**

No.	Ka Chin	Ka Yah	Ka Yin	Chin	Mon	Bamar	Rakhine	Shan	Total
1.	119	18	2,208	1,388	402	171,136	3,121	355	178,747

Source: General Administration Department, Dagon Myothit (East) Township, 2020

**Table 4-7 Foreigner Population in the Project Township**

No.	Chinese	India	Bangladesh	Pakistan	Others	Total
1.	250	3,084	-	-	-	3,334

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.5. Religious Information

Buddhism is the dominant religion in project study area. The majority of people in project Township are Buddhist. The remaining population is composed of Christian, Hindu, and Muslim. The rest are other religions. It is presented in Table 4-8.

**Table 4-8 Population by Religion in the Project Township**

No.	Buddhism	Christian	Hindu	Muslim	Nat	Others	Total
1.	176,308	2,701	1,741	1,295	-	36	182,081

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.6. Education Information

##### 4.4.6.1. Enrollment

According to township GAD (2020) information, in project Township, the primary school enrollment rate of 5 years old children is average in 0%. It means all the students cannot access to education in 2020 due to Covid19 pandemic.

##### 4.4.6.2. Completion of Basic Education

In project Township, for 2019-2020, high school of basic education level which is equivalence with matriculation examination completion percentage in average is about 26.38% in Dagon Myothit (East) Township. Therefore, the rest about 73.62% of students are not completed yet their schooling. It was shown in Table 4-9. On the other hand, students dropped out after primary and during middle school education.

**Table 4-9 Completion of Basic Education in the Project Township**

No.	2018 – 2019 year				2019 - 2020			
	Sitting Exam	Student	Passed	Percentage (%)	Sitting Exam	Student	Passed	Percentage (%)
1.	3,084	3,342	771	25.01	3,271	3,639	863	26.38

Source: General Administration Department, Dagon Myothit (East) Township, 2020

##### 4.4.6.3. Teacher and Student Ratio

A few of them have higher education at the college and university level. Some elderly people received only informal rudimentary education from the monks at temples.

Almost all residents have received basic education and literate. Manpower of education sector of the project township as described in Table 4-10. The average ratio of teacher and students is 1:48.

**Table 4-10 Ratio of Teacher and Student in the Project Township**

No	Level of Education	Total Number of Teachers	Total Number of Students	Teacher to Student Ratio
1.	University	942	55,890	1:59
2.	B,E.H.S	270	9,440	1:34
3.	B,E.H.S (branch)	33	1,321	1:40
4.	B.E.M.S	107	3,905	1:36
5.	B.E.M.S (branch)	25	1,036	1:41
6.	Post B.E.P.S	89	3,125	1:35
7.	B.E.P.S	148	5,389	1:36
8.	Monastic School	124	3,487	1:28
Total		1,738	83,593	1:48

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.6.4. Education Infrastructure

There are many education centers in project Township such as 11 monastic schools, 5 high schools, and 3 middle schools. The rest are one each in Dagon Myothit (East) Township. There is no college but one big university called “Dagon University” in the study area. Students who want to attend university (i.e. Technological university and Medical University and so on.) have to go to other townships of Yangon Region. Education centers cover in the project Townships can be seen in Table 4-11.

**Table 4-11 Education Centers in the Project Township**

No	Monastic School	Pre - B.E.P.S	B.E.P.S	Post B.E.P.S	B.E.M.S	B.E.M.S (Branch)	B.E.H.S	B.E.H.S (Branch)	University
1.	11	-	16	7	3	1	5	1	1

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.7. Main Economic Activities

Dagon Myothit (East) Township is one of the industrialized zones in Yangon Region. The township is still a developing township but there is a potential economic growth in the future. Local people work formally in trading, industrial/handicraft, agriculture, service industry and so on. The transportation is convenient because it is on the side of the No. 2 Highway Road. As the township is in the industrialized zone, civilians make their main careers in exporting and importing of fast moving consumer goods, clothing, and food. Employment

Based on the information from GAD (2020), there are many occupations in Study Township. Trading workers are highest population followed by industrial/ handicraft in Project Township. Wage Worker and government staffs are almost the same in the list. It presented in Table 4-12.



**Table 4-12 Occupations in the Project Township**

No	Government Staff	Service	Agriculture	Livestock	Trading	Industrial/Handicraft	Fishery	Wage Worker	Other	Total
1.	21,955	16,830	5,381	5,994	30,328	26,040	-	22,372	-	128,900

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.7.1. Income and poverty

According to information from GAD (2020), average in-come per capita of Dagon Myothit (East) Township was about 1,051,173 in 2017-2018 and 1,128,123 in 2018-2019. As the result, the annual income per capita in the project township was improved in 2019. It was shown in Table 4-13. Main source of in-come was from the trading company.

**Table 4-13 Annual In-come per Capita in the Project Township**

No	2017 - 2018	2018 - 2019	2019 - 2020
1.	1,051,173	1,128,123	-

Source: General Administration Department, Dagon Myothit (East) Township, 2020

Based on GAD information, when compare with their in-come and employment workforce, the rate of working people is higher than unemployment people. The average unemployment percentage in the project area is about 3.86% in Table 4-14.

**Table 4-14 Work Force and Unemployment Population in the Project Township**

No	People able to Work	Working People	Unemployment People	Unemployment Percentage%
1.	134,080	128,900	5,180	3.86%

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.8. Health

The latest data are provided by the GAD (2020) showing in Table 4-15, there are many public health facilities in the project area including two healthcare centers by government. Table 4-16 presents the detail cases of information on the common disease that have been happened within the project area including updated pandemic COVID-19 information. The common case is tuberculosis and, followed by HIV/AIDS where diarrhea is very rare of mortality. The pandemic COVID-19 has been happened about 2,083 case in the Dagon Myothit (East) Township by Ministry of Health and Sport information from 23<sup>th</sup> March 2020 to 2<sup>nd</sup> February 2021.

**Table 4-15 Public Health Facility in the Project Township**

No.	Hospital		Clinic		Health Care Department		Total
	Government	Private	Government	Private	Rural	Sub-Rural	
1.	2	-	-	48	4	4	58

Source: General Administration Department, Dagon Myothit (East) Township, 2020



**Table 4-16 Common Diseases in the Project Township**

No.	Malaria		Diarrhea		Tuberculosis		Dysentery		Hepatitis		HIV/AIDS (2018-2019)	
	Occurrence	Mortality	Occurrence	Mortality	Occurrence	Mortality	Occurrence	Mortality	Occurrence	Mortality	Occurrence	Mortality
1.	-	-	232	-	-	-	52	-	-	-	210	-

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.9. Infrastructure and Services

##### 4.4.9.1. Public Infrastructures

As this study area is in the industrialized zone, there are so many industries and factories than other areas. Many grocery stores, domestic industries and social organizations are found within the study townships. Monasteries are the main religious places to visit in the study township because majority of people are Buddhist. Detail list of these social infrastructures and religious places in study townships were shown from Table 4-17 to Table 4-20.

**Table 4-17 Social Infrastructure in the Project Township**

No.	Bazaar	Grocery Store	Shopping Mall and commercial building	Company	Factory	Domestic Industry	Industrial	Bank	Motel and Guess House
1.	2	461	-	-	105	53	109	-	15

Source: General Administration Department, Dagon Myothit (East) Township, 2020

**Table 4-18 Social Organizations in the Project Township**

No.	Reserved Fire Brigade	Mother and Child Welfare Association	Red Cross	Retired Military	Myanmar Women Affair
1.	155	25,457	110	474	8,208

Source: General Administration Department, Dagon Myothit (East) Township, 2020

**Table 4-19 Religious Places in the Project Township**

No.	Pagoda	Stupa	Monastery	Nunnery	Religious Hall
1.	-	1	230	19	-

Source: General Administration Department, Dagon Myothit (East) Township, 2020

**Table 4-20 Other Religious Places in the Project Township**

No.	Church	Mosque	Hindu Temple	Chinese Temple
1.	-	1	1	-

Source: General Administration Department, Dagon Myothit (East) Township, 2020

#### 4.4.9.2. Electricity and Energy Consumption

There is 25.282 acre of primary substation in Dagon Myothit (East) Township, Yangon Division. The 66 kV power transmission line is distributed to the study area.

#### 4.4.10. Transportation

Five highway roads and two bridges are accessible to connect one township to another. There is a five miles Dagon University Railway from Toe Gyaung Kalay to Dagon University in the study area. Moreover, there are 17 kinds of bus lines and 856 buses to go smoothly to go to other townships.

### 4.5. CULTURAL AND VISUAL CHARACTERISTICS

#### 4.5.1. Tourist Site and Attractive Places

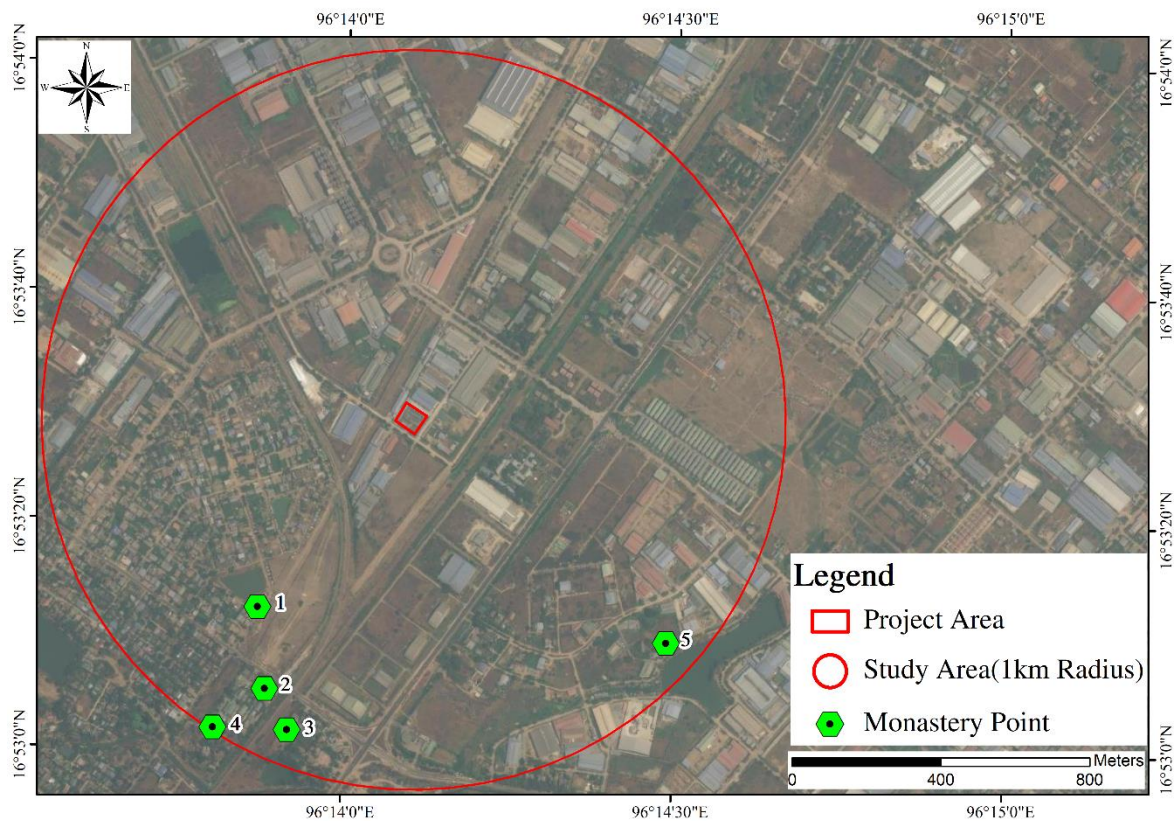
Dagon Myothit (East) Township does not have several places of tourist interest but there are many religious places for Buddhism. According to GAD (2020), Lay Kyun Set Kyar Pagoda and Saidawmu Pagoda are the most famous Pagodas in East Dagon Township.

Tipitaka Maharghanhtavamsa Nikaya is one of the famous religious places in Dagon Myothit (East) Township. Although there is no special tourist site in the study area, there are many religious places are shown in the following table.

There is no religious places within the 500- meter of the study area, therefore, the religious places are collected within the 1-kilometer radius of the project site. The lists and map of monasteries are shown in Table 4-21 and Figure 4-12.

**Table 4-21 List of Monasteries in the Study Area**

No	Name (Monastery)	Latitude	Longitude
1.	Kan Oo	16°53'12.30"N	96°13'52.66"E
2.	Tipitaka Maharghanhtavamsa Nikaya	16°53'5.14"N	96°13'53.40"E
3.	Thirinaryarma Pareyatte Sar Thin Tike	16°53'1.58"N	96°13'55.46"E
4.	Aung Mingalar	16°53'1.72"N	96°13'48.75"E
5.	Bagan Nyaung Oo	16°53'9.56"N	96°14'29.79"E



**Figure 4-12 Location Map of Monasteries in the Study Area**

## 4.6. ENVIRONMENTAL BASELINE SURVEY

### 4.6.1. Air Quality

#### 4.6.1.1. Methodology

Air quality monitoring were conducted within the project site of Dagon Myothit (East) Township on 22<sup>nd</sup> April, 2022. The air monitoring data was collected with Air Quality Monitor (AQM-09). Air quality monitoring method and parameters conducted by AQM-09 are shown in Table 4-22. To reveal the existing status of baseline air quality, the average air quality was compared with the emission values from NEQEG (2015) of Textiles Manufacturing.

**Table 4-22 Description of Air Quality Monitoring Parameters**

Item	Description	Specification
Particle Modules	Monitor Method	Continuously, automatically and real-time
	Working Principle	Light scattering technique
	Measurement Data	PM <sub>2.5</sub> and PM <sub>10</sub>
	Measuring Range	0 -10 mg/m <sup>3</sup>
Gas modules	Monitor Method	Continuously, automatically and real-time
	Working Principle	High precision electrochemical sensor
	Gas Monitor	CO <sub>2</sub> , CO, NO <sub>2</sub> , SO <sub>2</sub> , CH <sub>4</sub> , VOC, O <sub>3</sub>
Meteorological parameters	Measuring Range	Temperature: -40°C to 60°C Precision: ±0.3°C
		Humidity: 0 to 100% RH

Item	Description	Specification
		Precision: $\pm 2\%$
		Wind Direction: 0 – 360° Precision: $\pm 5^\circ$
		Wind Speed: 0 – 30 m/s Precision: $\pm 0.3$ m/s

#### 4.6.1.2. Location of Air Monitoring Point

Air monitoring station was conducted within the project area at the coordinate of 16°53'27.95" N and 96° 14' 6.6" E. Location map of the air monitoring points is shown in Figure 4-13 and air-monitoring activities are shown in Figure 4-14.



**Figure 4-13 Location Map of Air Monitoring Station**



**Figure 4-14 Information of Air Quality Measurement Station**

#### 4.6.1.3. Air Quality Results

Results of air measured by AQM-09 were compared with guideline values of NEQEG (2015) and the results are shown in Table 4-23. It is also illustrated the graphs for



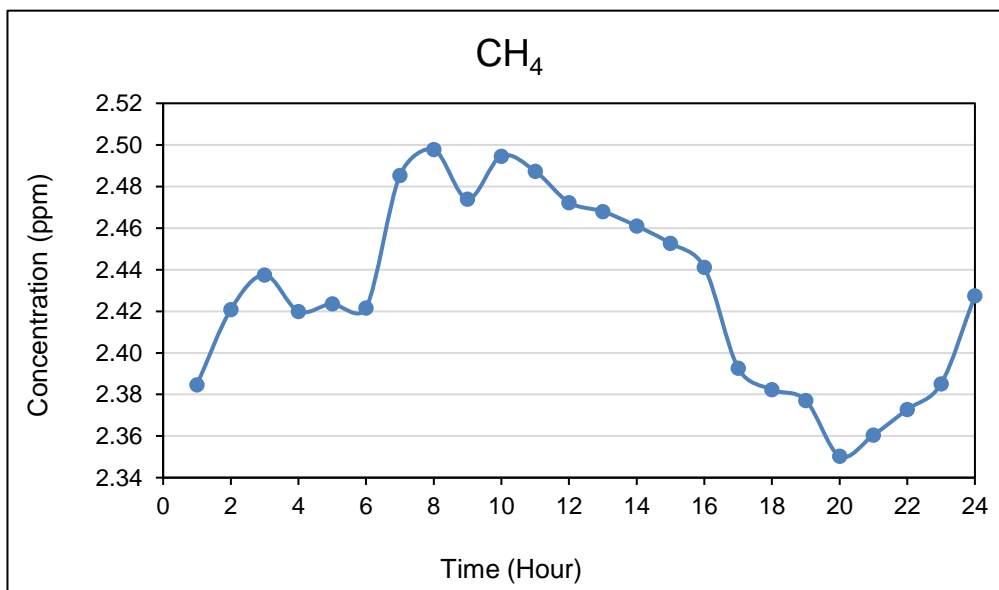
all air monitoring results from Figure 4-15 to Figure 4-21. According to the monitoring results, all air quality results are within the NEQEG (2015). Details of measurements results by TBS are shown in Appendix C.

**Table 4-23 Air Quality Results from AQM-09**

No	Parameters	Result	Unit	Sampling Duration (hours)	NEQEG (2015)	Avg.Period	Remark
1.	Carbon dioxide (CO <sub>2</sub> )	391	ppm	24	NG	-	-
2.	Carbon monoxide (CO)	254	µg/m <sup>3</sup>	24	NG	-	
3.	Methane (CH <sub>4</sub> )	2.34	ppm	24	NG	-	
4.	Nitrogen dioxide (NO <sub>2</sub> )	81.9	-	1	40 µg/m <sup>3</sup>	1-year	Within the NEQEG (2015)
5.	Ozone (O <sub>3</sub> )	24	µg/m <sup>3</sup>	8	100 µg/m <sup>3</sup>	8-hour daily maximum	
6.	Particulate Matter (PM <sub>10</sub> )	29	µg/m <sup>3</sup>	24	50 µg/m <sup>3</sup>	24-hour	
7.	Particulate Matter (PM <sub>2.5</sub> )	23	µg/m <sup>3</sup>	24	25 µg/m <sup>3</sup>	24-hour	
8.	Sulphur dioxide (SO <sub>2</sub> )	17	µg/m <sup>3</sup>	24	20 µg/m <sup>3</sup>	24-hour	-
9.	Volatile Organic Compound (VOCs)	0	ppb	24	NG	-	
10.	Humidity	64	%	24	NG	-	
11.	Temperature	32	°C	24	NG	-	

Note: NEQEG = National Environmental Quality Emission Guideline (2015)

NG = No Guideline



**Figure 4-15 CH<sub>4</sub> Measurement Results**

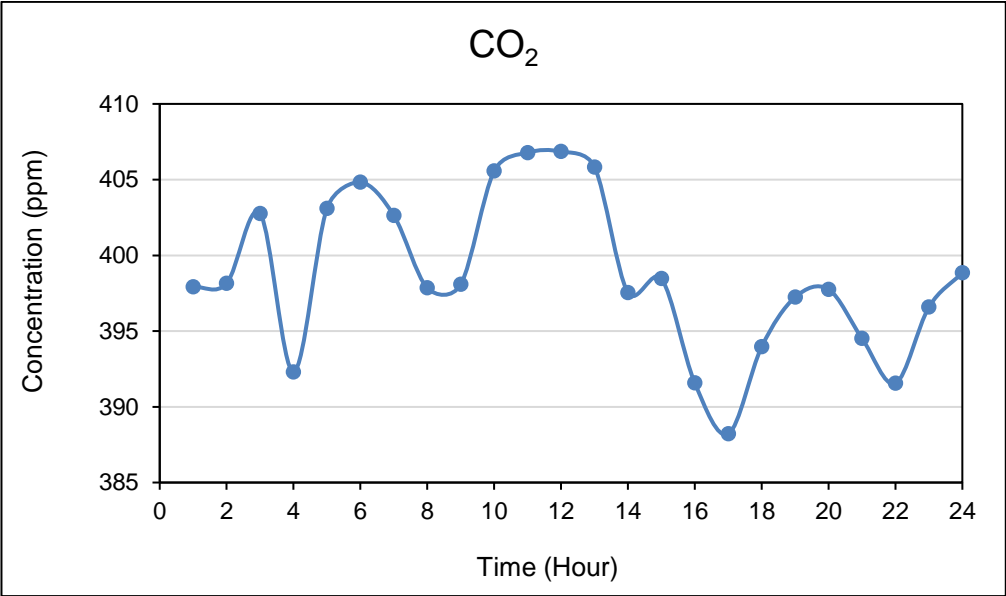


Figure 4-16 CO<sub>2</sub> Measurement Results

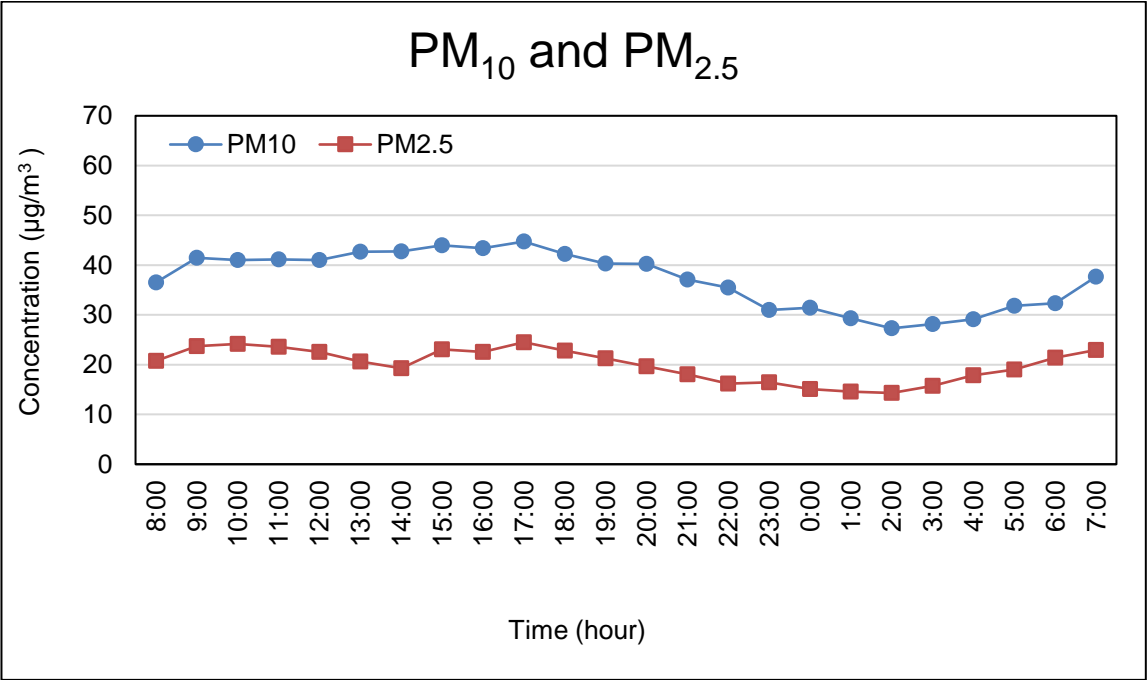


Figure 4-17 PM<sub>10</sub> and PM<sub>2.5</sub> Measurement Results



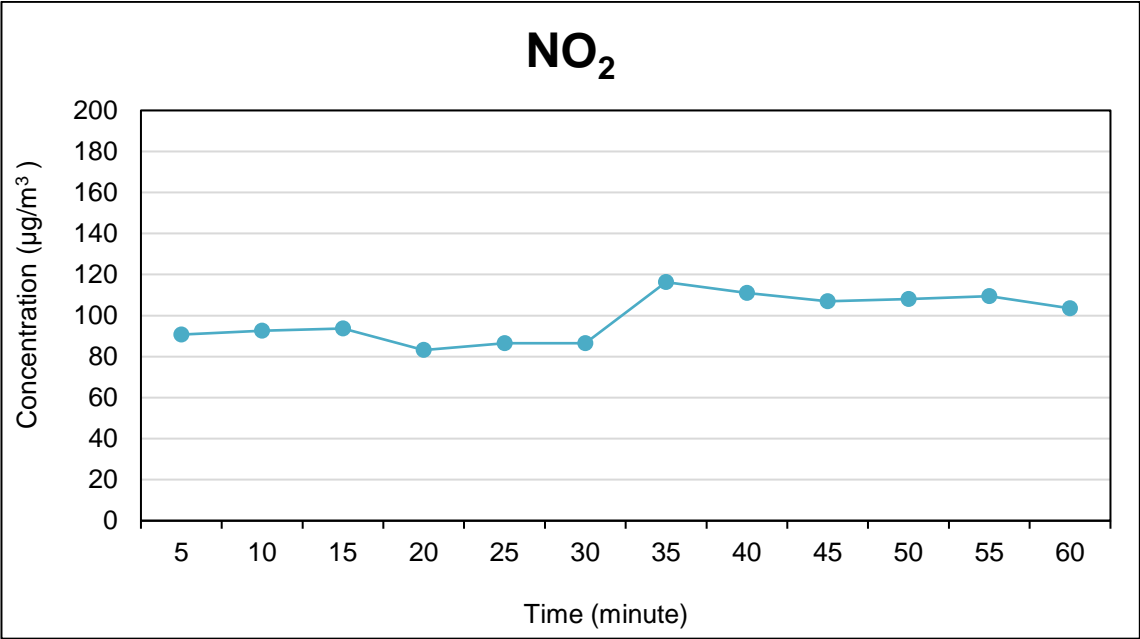


Figure 4-18 NO<sub>2</sub> Measurement Results

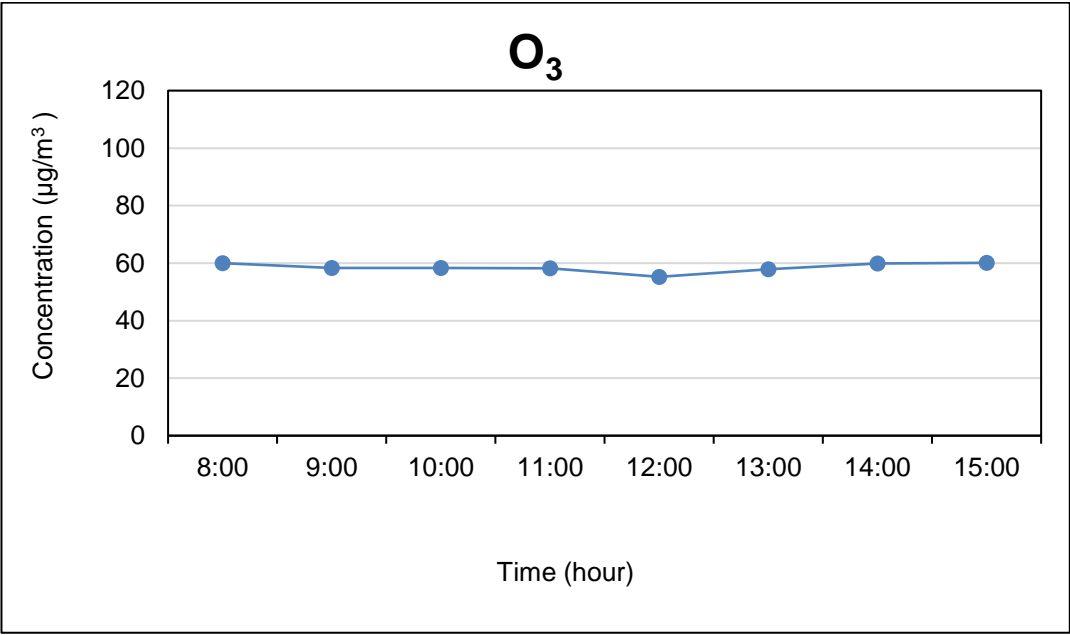
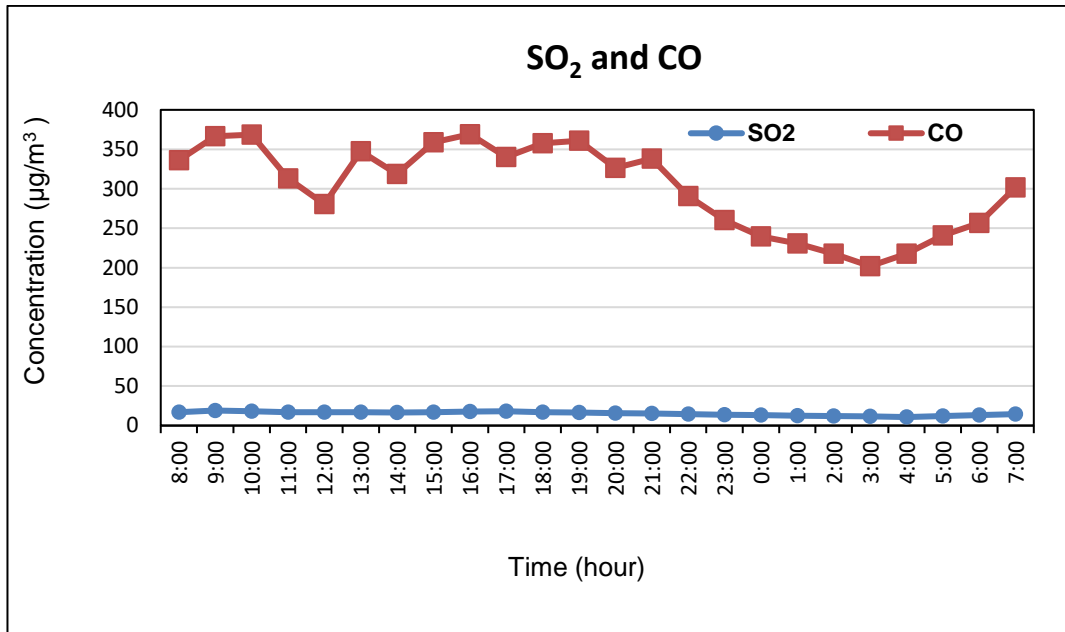
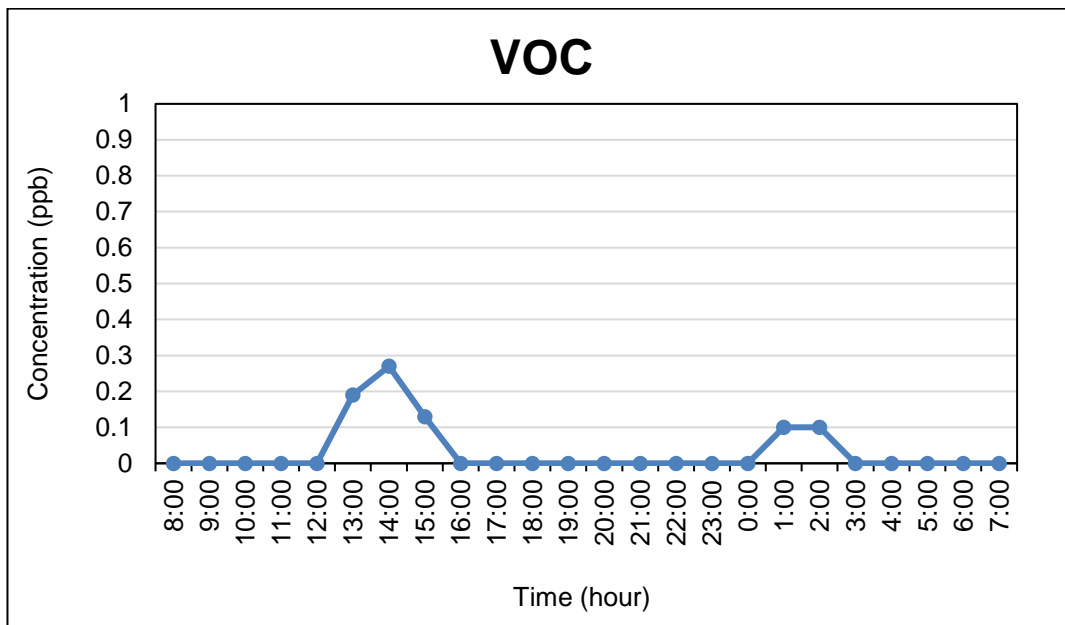


Figure 4-19 O<sub>3</sub> Measurement Results



**Figure 4-20 SO<sub>2</sub> and CO Measurement Results**



**Figure 4-21 VOC Measurement Results for Station A1**

#### 4.6.2. Wind Speed and Direction

##### 4.6.2.1. Survey Method and Location of Monitoring Stations

Wind speed and direction were measured at 1.5 meter above the ground level with the same dates and locations for the air quality monitoring stations with AQM-09, which is the same instrument for air quality monitoring process. Location map of wind speed and direction monitoring stations is shown in Figure 4-13 and monitoring activities are shown in Figure 4-14 respectively.

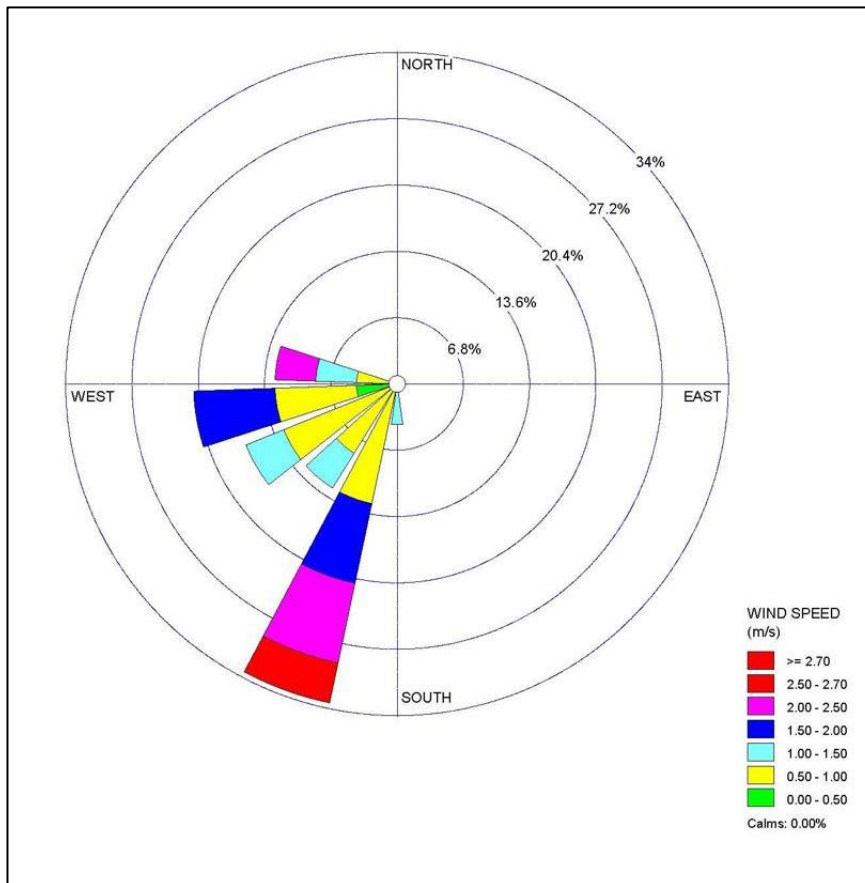
#### 4.6.2.2. Survey Results

According to the field survey results, there is no residential area near the project while the wind speed within the project site is around 1.2 meter per second with Southwest (SW) prevailing wind direction of 228 degree.

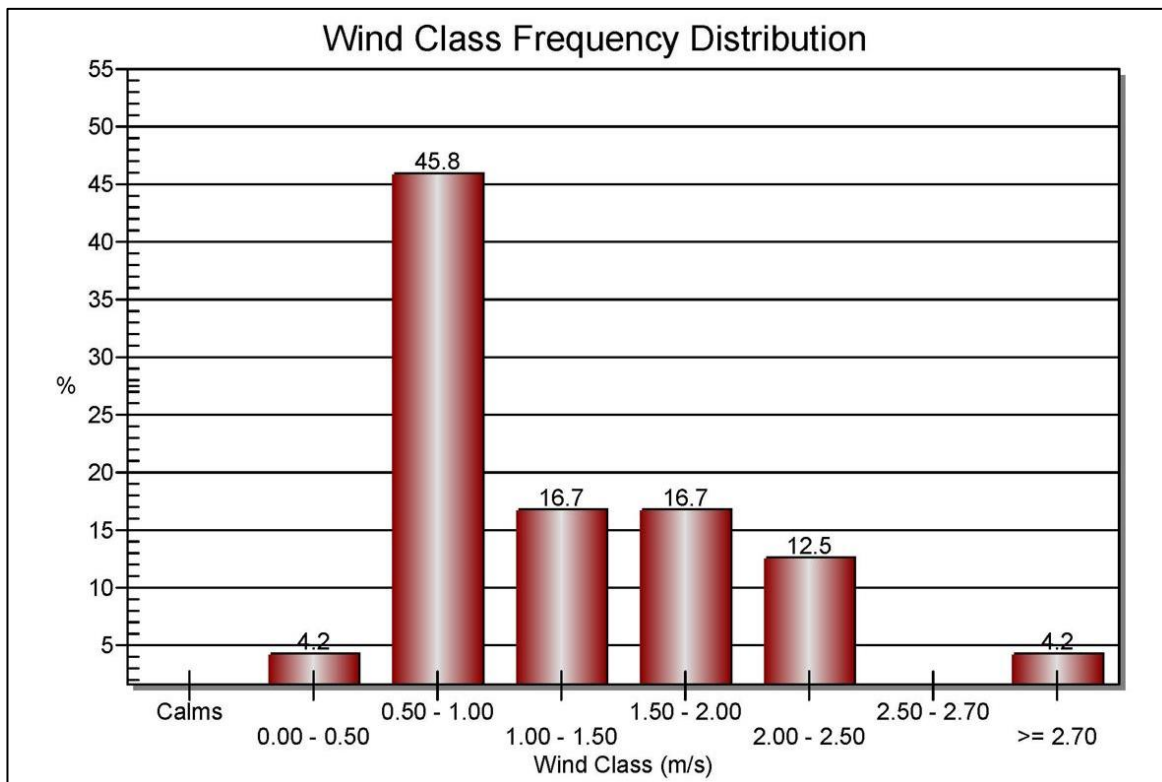
The results of wind speed and wind direction are described in Table 4-24. The wind rose diagram and wind class frequency distribution are shown in Figure 4-22 and Figure 4-23. Details of measurements results are shown in Appendix C.

**Table 4-24 Station A1 Wind Speed and Wind Quality Results from AQM-09**

No.	Parameters	Result	Unit	Sampling Duration	
1.	Wind Speed	1.2	m/s	24	hours
2.	Wind Direction	228	SW	24	hours



**Figure 4-22 Diagram of Wind Speed and Direction Measurements**



**Figure 4-23 Diagram of Wind Class Frequency Distribution Measurements**

#### 4.6.3. Water Quality

##### 4.6.3.1. Methodology

The method for sample collection and treatment follows the quality assurance and quality control of International Organization for Standardization and International Electro technical Commission (ISO/IEC) 17025:2005 accreditation for laboratory to ensure that the water samples are free from contamination. The sample collectors have to wear starch-free rubber gloves all the time while collecting the water samples. The water samples bottles must be rinsed with the sampling water before use.

In this study, some water quality parameters such as pH, temperature, total dissolved solids (TDS), conductivity, and salinity are measured insitu using TM Waterproof Pocket tester as presented in Table 4-25.

For other essential parameters, the samples are sent to the ALARM Ecological Laboratory and biological oxygen demand (BOD<sub>5</sub>), chemical oxygen demand (COD), free cyanide, total phosphorous, iron, lead, total nitrogen and arsenic are tested as presented in Table 4-26. In this report, water quality result is compared with the effluent level from National Environmental Quality Emission Guideline (NEQEG) (2015).

**Table 4-25 Water Quality Parameters Tested by TM Waterproof Pocket tester**

No.	Parameter	Description	Remark
1.	pH	A measure of how acidic/basic water is. The range goes from 0 to 14, with 7 being neutral.	<7 indicate acidity >7 indicates a base
2.	TDS	A measure of amount of dissolved mineral constituents in water.	High TDS may affect the taste of water.

No.	Parameter	Description	Remark
3.	Temperature	An impact on inorganic constituents and chemical contaminants in water.	High temperature influence taste, odor, color, and corrosion.
4.	Conductivity	Conductivity is a measure of the ability of water to pass an electrical current. Conductivity in water is affected by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, and phosphate anions (ions that carry a negative charge) or sodium, magnesium, calcium, iron, and aluminum cations (ions that carry a positive charge)	Purified water is said to have low conductivity/high resistivity.
5.	Salinity	The saltiness or amount of salt dissolved in a body of water	Brackish water can cause negative impact on production process

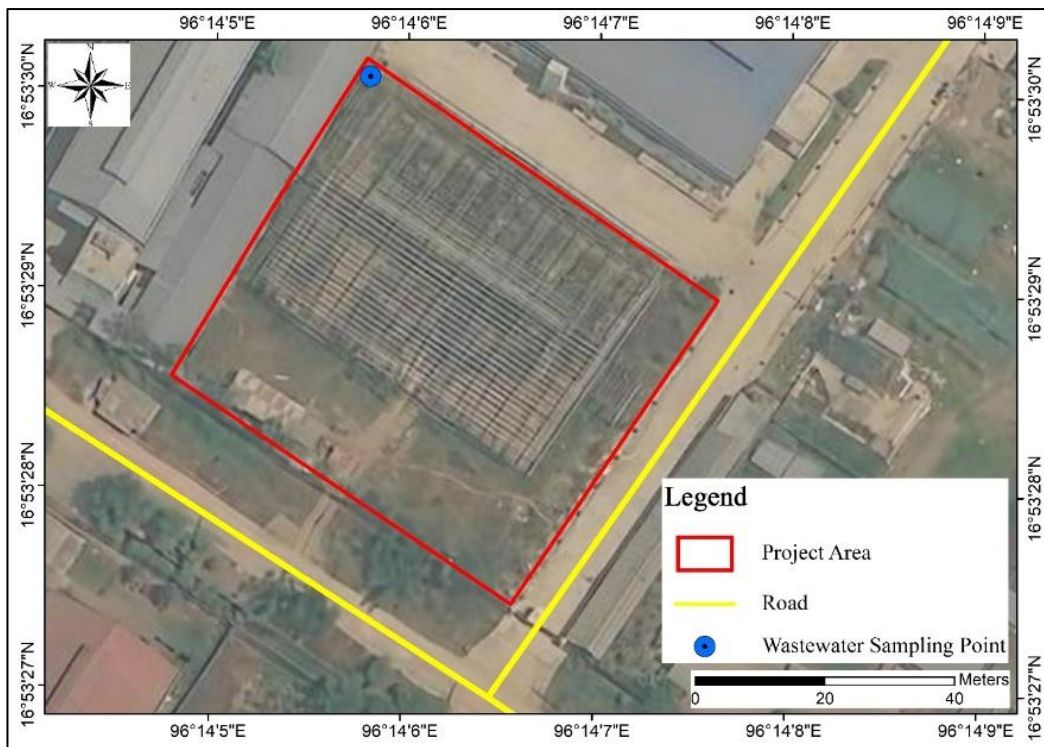
**Table 4-26 Water Quality Parameters Tested in ALARM Ecological Laboratory**

No.	Parameter	Description	Remark
1.	BOD <sub>5</sub>	A measure of amount of oxygen required to remove waste organic matter from water under decomposition by aerobic bacteria that live only in oxygen present environment.	High BOD leads low Dissolved Oxygen (DO).
2.	COD	A measure of amount of oxygen required during the decomposition of organic matter and the oxidation of inorganic chemicals.	High BOD leads low DO
3.	Free Cyanide	Cyanide is toxic. Free cyanide is the most toxic form as it is the sum of the cyanide present as either hydrogen cyanide (HCN) or cyanide (CN) <sup>-</sup> .	Maximum contaminant level goal (MCLG) of 0.2 mg/L.
4.	Total Phosphorous (P)	Phosphorus is an essential element for plant life, but too much of it can reduce DO in water by an increase of mineral and organic nutrients.	High concentration leads to hypoxic zone or dead zone.
5.	Iron	A measure of amount of dissolved iron in water. High concentration of iron will cause metallic taste and metallic odor.	> 3ppm can affect color and odor of water.
6.	Lead	A measure of amount of dissolved iron in water. A cumulative poison, toxic in small concentration.	Loss of appetite, anemia, abdominal pain, and death.
7.	Total Nitrogen	Total Nitrogen is an essential nutrient for plants and animals but an excess amount of it may reduce DO.	High concentration leads to hypoxic zone or dead zone.
8.	Arsenic	Arsenic is a highly toxic in its inorganic form.	Acute and long-term effects on human

#### 4.6.3.2. Location of Water Sampling Point

Regarding water quality monitoring, it was collected by single grab wastewater samples from discharge point of factory canteen at the coordinate of 16°53'5.1" N and 94° 52' 39.57" E. The locations of water-sampling station is shown in Figure 4-24. A photo of water sampling activity within the project area is shown in Figure 4-25.





**Figure 4-24 Location Map of Water Sampling Point**



**Figure 4-25 Information of Wastewater Quality Sampling and Monitoring**

#### 4.6.3.3. Wastewater Quality Result

The wastewater quality results were compared with the effluent level from NEQEG (2015). The result of wastewater is shown in Table 4-27 and Table 4-28. According to the wastewater sample results, all wastewater quality parameters are lower than the NEQEG (2015) and the wastewater sample is collected from the effluent point of general cleaning process from factory canteen. The details of the results are presented in Appendix D-1 and D-2.

**Table 4-27 Result of Wastewater Analysis Tested by TM Waterproof Pocket Tester**

No.	Parameters	Results	Units	NEQEG (2015)	Water Testing Instrument	Remark
1.	pH	6.66	S.U	6.0-9.0	TM Waterproof Pocket Tester	Within the NEQEG (2015)
2.	Temperature	2.5	°C	(<3°C)*		
3.	TDS	200	mg/L	≤ 2,000		
4.	Conductivity	400	µs/cm	NG		
5.	Salinity	0.02	ppt	NG		

Note: NEQEG = National Environmental Quality Emission Guideline (2015), NG= No Guideline,

**Table 4-28 Result of Domestic Wastewater Analysis Tested by ALARM Ecological Laboratory**

No	Parameters	Results	Units	NEQEG (2015)	Remarks
1.	Turbidity	6	FAU	-	Within the NEQEG (2015)
2.	TSS	8	mg/l	< 50	
3.	Dissolved Oxygen (DO)	4.5	mg/l		
4.	COD	42	mg/l	250	
5.	BOD5	35	mg/l	0.2	
6.	Total Phosphorous	2.92	mg/l	5	
7.	Free Cyanide	0.01	mg/l	3	
8.	Arsenic	0.005	mg/l	0.1	
9.	Cadmium	ND	mg/l	0.1	
10.	Copper	ND	mg/l	0.5	
11.	Iron	0.78	mg/l	3	
12.	Lead	ND	mg/l	0.2	
13.	Total Nitrogen	0.5	mg/l	2	

Note: NEQEG = National Environmental Quality Emission Guideline (2015), NG= No Guideline, ND= Not Detected, LOD= Lower Limit of Detection

\* 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 m from the discharge point

#### 4.6.4. Noise Level

##### 4.6.4.1. Methodology

The construction phase of the project will invariably create noise, which could disturb nearby sensitive receptors. The noise level will be expected to be high due to the noise impacts of current construction and partial operation activities and traffic vehicles. Nevertheless, it would be useful to establish the baseline data on background noise levels in the project site.

Noise level on the receptors mainly depends on the wind speed and direction. Naturally wind blowing from the noise source towards the noise sensitive location will increase levels and the stronger the wind, the greater the effect. Therefore, in order to reduce the noise pollution to the nearby receptors, it is required to install the noise barriers at this direction.

The data was recorded every one minute using the Digital Sound Level Meter (Benetech, GM1356), which complies with standard of IEC PUB 651 Type 2 and ANSI S1.4 Type 2. Equivalent Continuous Sound Level ( $L_{eq}/L_{Aeq}$ ) is calculated for daytime and nighttime 24-hr average from the measured data.

#### 4.6.4.2. Location of Noise Monitoring Station

The noise measurement was conducted on 22<sup>nd</sup> April, 2022 around 500-meter radius of the project area. Location and coordinate of noise level measurement is at the coordinate of 16°53'28.26" N and 96° 14' 6.67" E. The location map for noise monitoring station is described in Figure 4-26 and detail information of noise level measurement is described in Figure 4-27. The details of the measurements are presented in Appendix E.



**Figure 4-26 Location Map of Noise Level Monitoring Station**





**Figure 4-27 Noise Level Monitoring Station**

#### 4.6.4.3. Noise Level Monitoring Results

The average noise levels expressed in LAeq (1 hr.) were compared with NEQEG (2015) as shown in Table 4-29. According to the monitoring results, both average noise levels for day and night times in the project area are within the acceptable limit of the industrial or commercial noise level. The results in daytime and nighttime at the monitoring station are shown in Figure 4-28 and Figure 4-29.

**Table 4-29 Result of Noise Level Measurement**

Station	Sampling Date	One Hour LAeq (dBA)	
		Day Time	Night Time
		7:00 to 22:00	22:00 to 7:00
N1	22 <sup>nd</sup> April, 2022	59.5	43.7
NEQEG (2015)	Residential, institutional, education	55	45
	Industrial, commercial	70	70

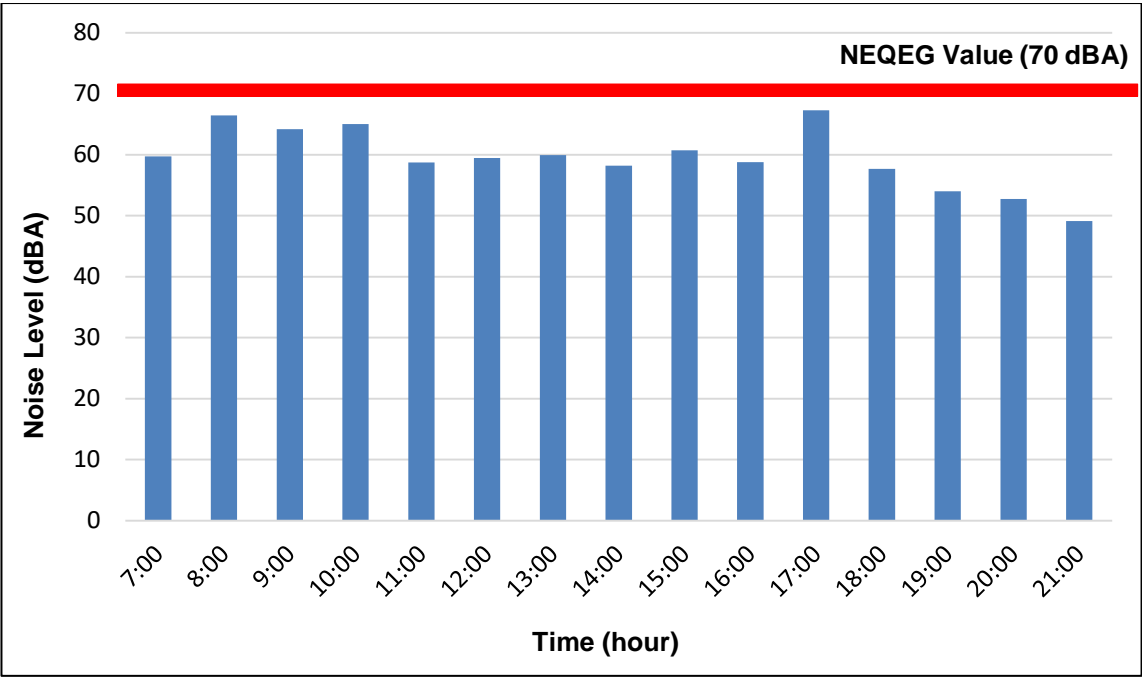


Figure 4-28 Noise Measurement Results in Day Time

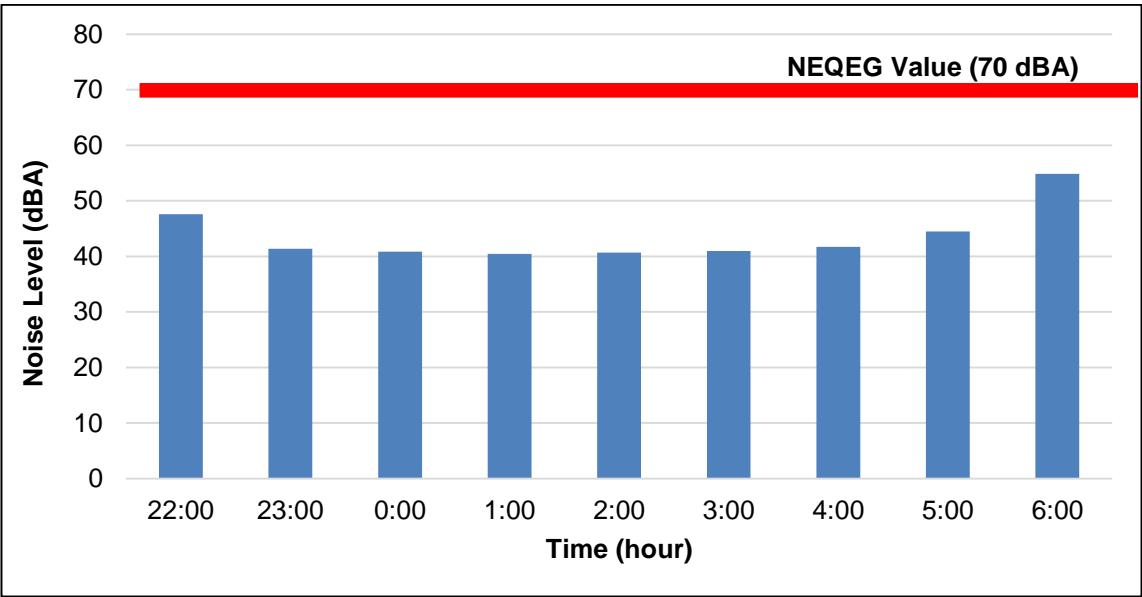


Figure 4-29 Noise Measurement Results in Night Time

4.6.5. Vibration Level

4.6.5.1. Methodology

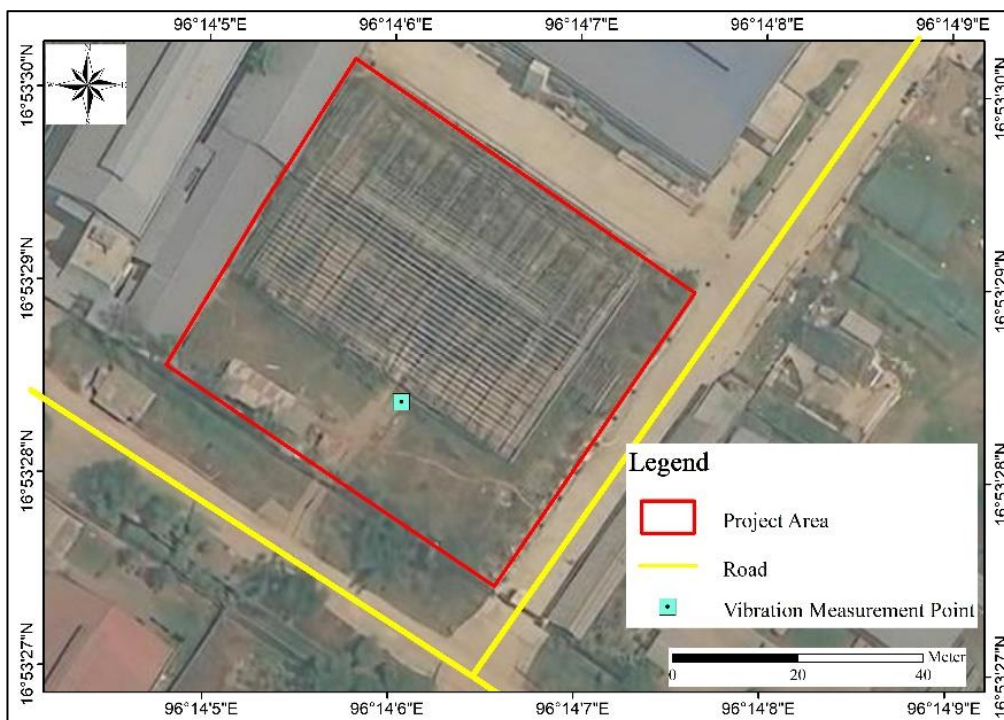
Vibration measurements were conducted within the project area. Nomis Seismograph (Mini Super graph II) was used for ground vibration measurements. The seismograph monitors vertical, transverse, and radial particle velocity in millimeter per second and frequency. The measured results were compared with German standard DIN 4150-3, which adopts frequency versus Peak Particle Velocity (PPV) plot to determine vibration effects on the structures such as sensitive building, residential and commercial buildings are shown in Table 4-30.

**Table 4-30 German Standards DIN 4150-3 for Vibration**

Structure Type	Peak Particle Velocity (mm/s)		
	1-10 Hz	10-50 Hz	50-100 Hz
Commercial	20	20-40	40-50
Residential	5	5-15	15-20
Very sensitive	3	3-8	8-10

#### 4.6.5.2. Location of Vibration Level Measuring Stations

Vibration measurement was conducted at the study area on 22<sup>nd</sup> April, 2022 around the 500-meters radius of project area. For vibration level measuring, it is conducted at the coordinate of 16°53'28.39" N and 96° 14' 6.43" E. Location map of the vibration level measuring stations is shown in Figure 4-30 and vibration level measuring activities is shown in Figure 4-31. The details of the measurements are presented in Appendix F.



**Figure 4-30 Location Map of Vibration Measurement Stations**





**Figure 4-31 Information of Vibration Level Measurement**

#### 4.6.5.3. Vibration Result

The results are compared with the German Standard D-4150-3. According to the field survey results, evaluation results of vibration level are within the standard. Vibration level results are shown in Table 4-31. The graph of vibration measurement is presented in Figure 4-32.

**Table 4-31 Result of the Vibration Level Measurement for V1**

Station	Sampling Date	Result			German Standards DIN 4150-3	Sources of Vibration
		Direction	Frequency (Hz)	Peak Particle Velocity (PPV) (mm/s)	PPV for Commercial area (mm/s)	
V	22 <sup>nd</sup> April 2022	Radial	41.23	0.42	40-50	Site activities
		Transverse	24.95	0.21	40-50	Vehicles activities and construction equipment
		Vertical	7.97	0.47	20-40	

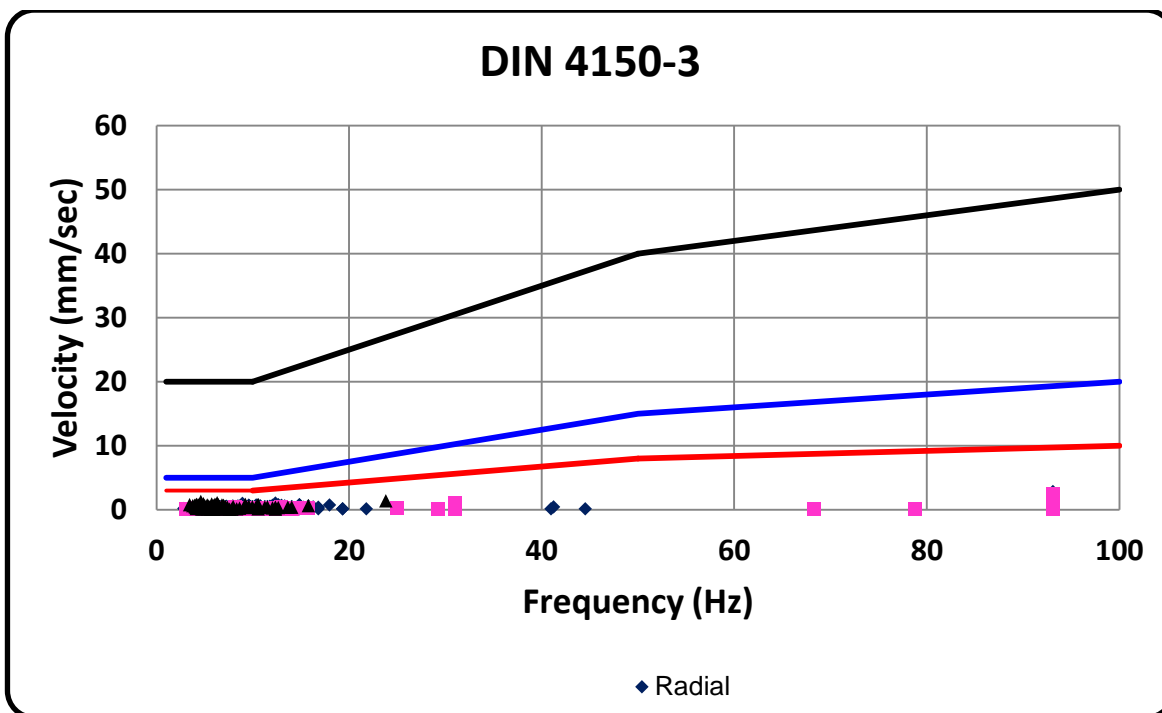


Figure 4-32 Vibration Measurement Result

#### 4.6.6. Light

##### 4.6.6.1. Methodology

Light measurement was conducted at nine locations in the project site with Victor 1010 A Digital Lux Meter. The results are compared with International Finance Corporation (IFC) Environmental Health and Safety (EHS) guideline as shown in Table 4-32.

Table 4-32 IFC Illuminance Standard<sup>13</sup>

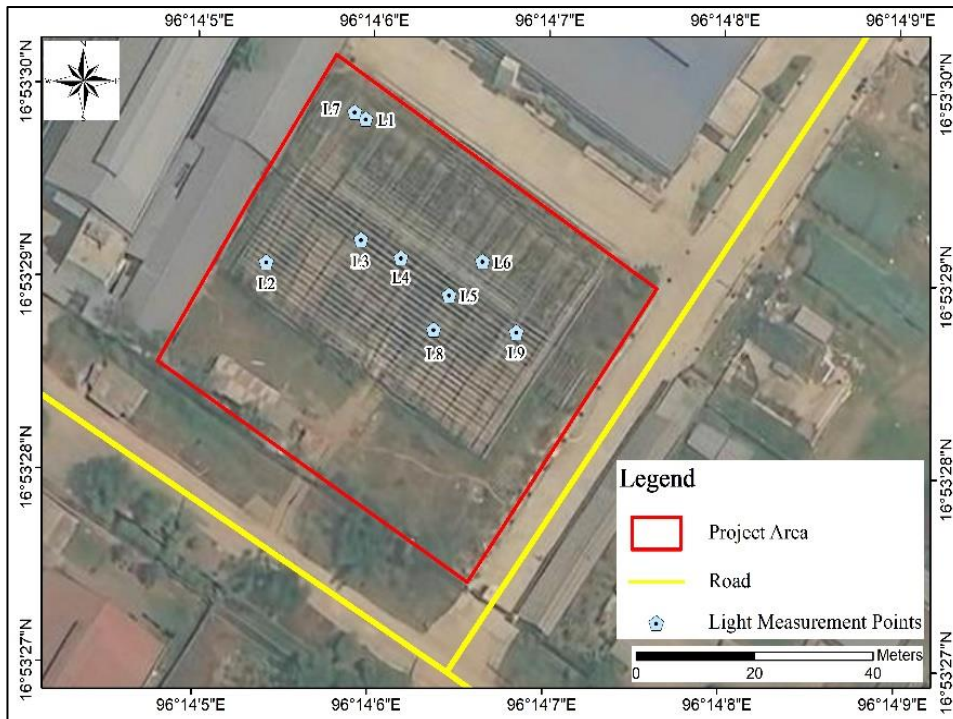
No.	Locations	Light Intensity (Lux)
1.	Emergency light	10
2.	Outdoor non-working areas	20
3.	Simple orientation and temporary visits (machine storage, garage, warehouse)	50
4.	Workspace with occasional visual tasks only (corridors, stairways, lobby, elevator, auditorium, etc.)	100
5.	Medium precision work (simple assembly, rough machine works, welding, packing, etc.)	200
6.	Precision work (reading, moderately difficult assembly, sorting, checking, medium bench and machine works, etc.), offices	500
7.	High precision work (difficult assembly, sewing, color inspection, fine sorting, etc.)	1,000 – 3,000

##### 4.6.6.2. Location of Light Measuring Stations

Light measurement was conducted at nine locations in the project area with Victor 1010 A Digital Lux Meter namely; ground floor and first floor warehouses, pattern cutting, finishing sections 1 and 3, ground floor and first floor quality control (QC) rooms, packing,

<sup>13</sup> \*International Finance Corporation (Environmental Health and Safety Guideline) General

as well as office on 22<sup>nd</sup> April, 2022. Location map of the light measuring stations is shown in Figure 4-33. Summarized dates of light measuring process are shown in Table 4-33. Photo of light measuring activities is also shown in Figure 4-34. The details of the light measuring results are presented in Appendix G.



**Figure 4-33 Location Map of Light Measurement Stations**

**Table 4-33 Light Measurement Data**

No	Site Description	Location		Measurement Date
		Latitude	28 <sup>th</sup> December, 2021	
1.	Warehouse (Ground Floor)	16°53'29.83"N	96°14'6.33"E	22 <sup>nd</sup> April, 2022
2.	Pattern Cutting	16°53'29.08"N	96°14'5.77"E	
3.	Finishing Section 1	16°53'29.21"N	96°14'6.31"E	
4.	Finishing Section 3	16°53'29.11"N	96°14'6.54"E	
5.	QC Room (Ground Floor)	16°53'28.92"N	96°14'6.82"E	
6.	Packing	16°53'29.10"N	96°14'7.01"E	
7.	Warehouse (1st Floor)	16°53'29.87"N	96°14'6.26"E	
8.	QC Room (1st Floor)	16°53'28.74"N	96°14'6.73"E	
9.	Office	16°53'28.74"N	96°14'7.20"E	



**Figure 4-34 Light Measurement Activities**

#### 4.6.6.3. Survey Result

The results are compared with IFC guideline based on their activities. According to the field survey results, most light results from measured locations need to adjust with the IFC guideline. The results of lightening in nine location are shown in Table 4-34 and that of bar chart is shown in Figure 4-35.

**Table 4-34 Light Measurement Results**

No.	Site Description	Unit	Measurement Data	IFC EHS Guideline
1.	Warehouse (Ground Floor)	Lux	135	50
2.	Pattern Cutting	Lux	293	200
3.	Finishing Section 1 (FS-1)	Lux	207	200
4.	Finishing Section 3 (FS-3)	Lux	150	200
5.	QC Room (Ground Floor)	Lux	185	200
6.	Packing	Lux	425	200
7.	Warehouse (1st Floor)	Lux	260	50
8.	QC Room (1st Floor)	Lux	285	200
9.	Office	Lux	286	200



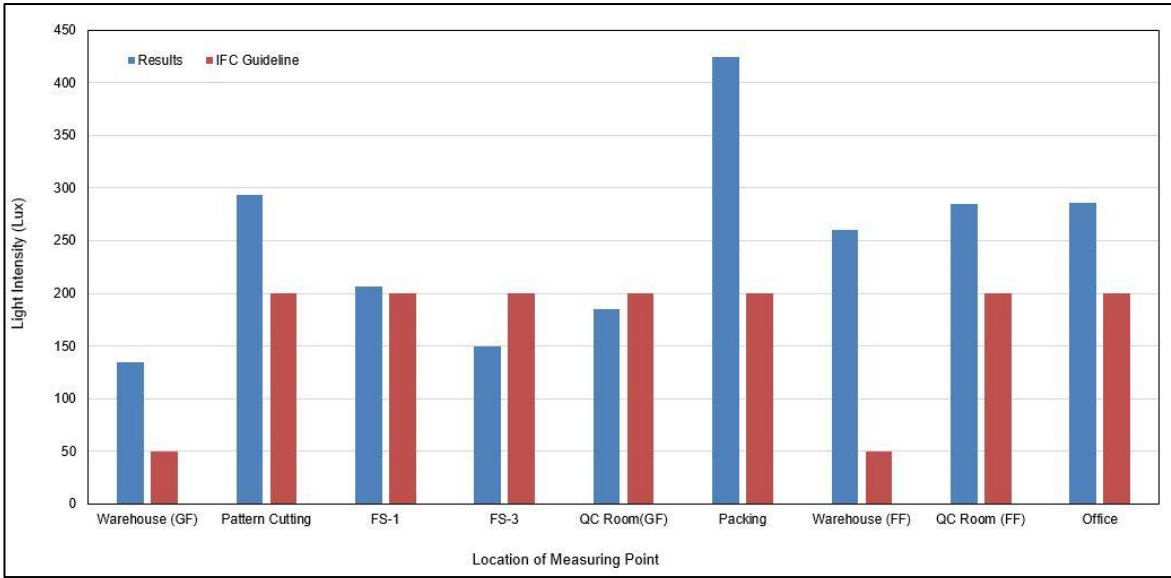


Figure 4-35 Light Measurement Result in Bar Chart

4.6.7. Temperature

4.6.7.1. Survey Method and Location of Monitoring Stations

Temperature is measured at nine points in the project area with AR862D + Smart Sensor Model Infrared Thermometer. All locations for the temperature measuring stations are same as the light measuring activities. Summarized dates of light and temperature measuring process are shown in Table 4-33. The details of the temperature measuring results are presented in Appendix H.

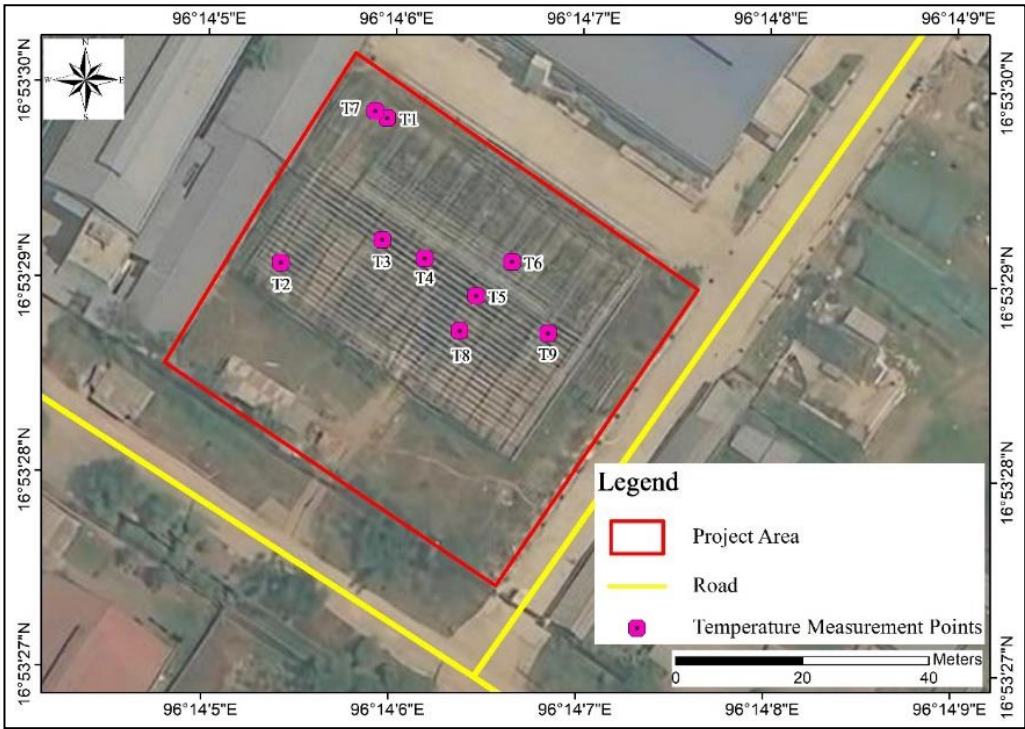


Figure 4-36 Location Map of Temperature Measurement Stations



**Figure 4-37 Temperature Measurement Activities**

#### 4.6.7.2. Survey Result

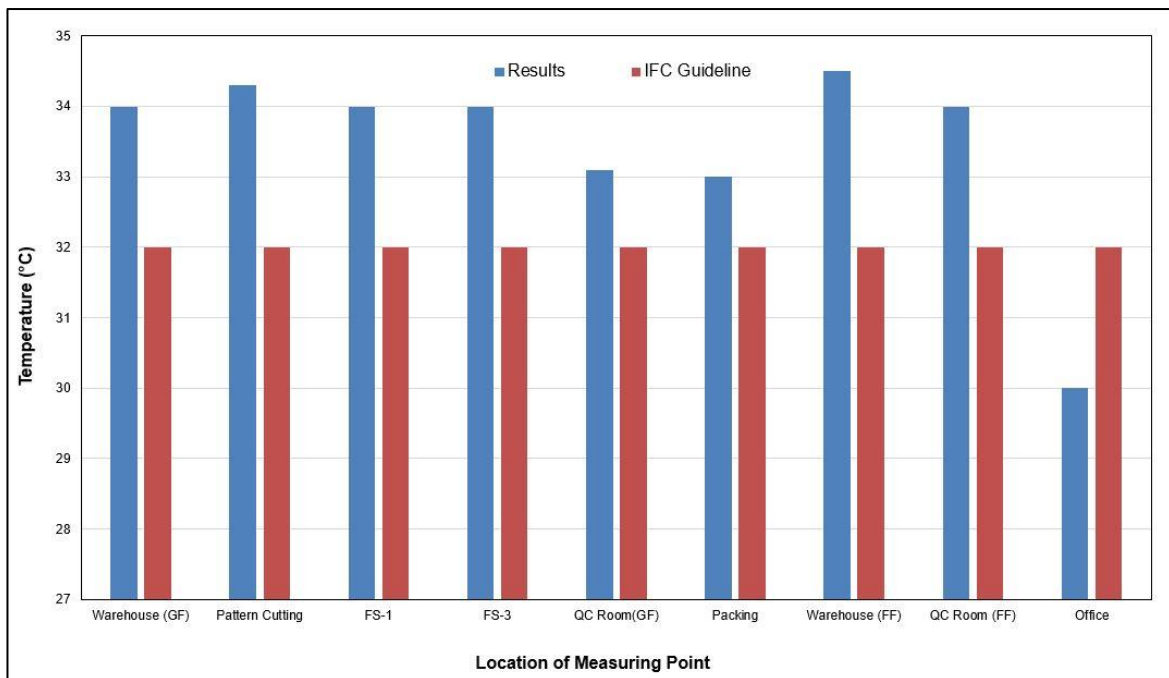
When the results are compared with IFC guideline value, all results are merely higher than the IFC guideline. The main possible reason is that a significant increasement in ambient temperature (around 43 ° C) in Yangon during the April 2022. The results are described in Table 4-35 and that of bar chart is shown in Figure 4-38.

**Table 4-35 Temperature Measurement Result**

No	Site Description	Measured Value (°C)	IFC Guideline Value*
1.	Warehouse (Ground Floor)	34	32 °C
2.	Pattern Cutting	34.3	
3.	Finishing Section 1	34	
4.	Finishing Section 3	34	
5.	QC Room (Ground Floor)	33.1	
6.	Packing	33	
7.	Warehouse (1st Floor)	34.5	
8.	QC Room (1st Floor)	34	
9.	Office	30	

\*IFC (Environmental Health and Safety Guideline General)





**Figure 4-38 Temperature Measurement Results in Bar Chart**

#### 4.6.8. Traffic Counting

##### 4.6.8.1. Methodology

Traffic Counting (TC) was done both manually by several surveyors during 7:00 am to 7:00 pm at two points. During the survey, 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 road capacity relative to traffic volume. The V/C ratio is commonly used to consider as a baseline traffic flow condition and will be further utilized to evaluate the consequences of the impact of the project on local transportation.

The V/C ratio is calculated as per following procedures:

- (1) Convert the number of vehicles from observation to Passenger Car Unit (PCU) by using Passenger Car Equivalents (PCD) factors specified for each type of vehicles as described in Table 4-36. This is used as "Traffic Volume" or "V"
- (2) Choose an applicable carrying capacity of "C" for the road (as in Table 4-37).
- (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 4-38 for indication of current traffic condition.

**Table 4-36 Passenger Car Equivalents Factor (PCD)**

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 4-37 Design Service Volume**

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 4-38 Level of Service**

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)

#### 4.6.8.2. Location of Traffic Counting Stations

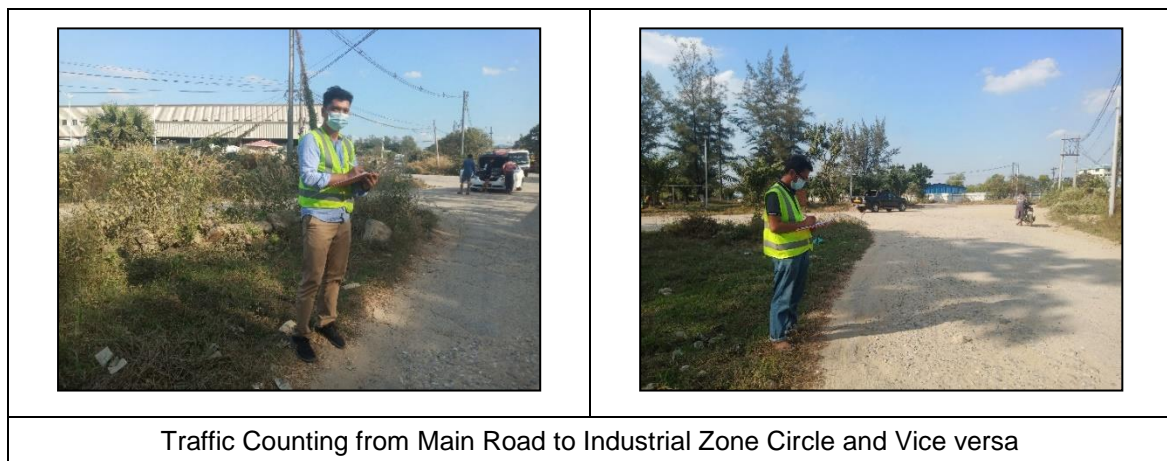
The traffic conditions were analyzed to establish as a baseline data. Traffic counting were carried out at two stations within the study area on 28<sup>th</sup> April, 2022 for TC-A and TC-B from 7:00 am to 7:00 pm. Results for all traffic counting stations are calculated based on the maximum hourly values of PCU. The details of two TC stations are shown in Table 4-39. The locations map of these two TC stations are described in Figure 4-39 and the detail of traffic counting survey report is shown in Appendix I.



**Figure 4-39 Location Map of Traffic Counting**

**Table 4-39 Detail of Two TC Stations**

No	Station	Location	Coordinates
1	TC- (A)	No 2. Main Road to Industrial Zone Circle	16° 53' 33.57" N 96° 14' 16.77" E
2	TC- (B)	Industrial Zone Circle to No 2. Main Road	16° 53' 33.95" N 96° 14' 15.18" E



**Figure 4-40 Traffic Survey Collection Activities**

#### 4.6.8.3. Survey Results

The results of traffic counting are presented in Table 4-40. 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 4-40 Existing Traffic Counting Condition near Proposed Project Site**

Description	Results	
28 <sup>th</sup> April, 2022	TC-(A)	TC-(B)
Traffic volume: 12 hrs. of working hour (PCU/hour)	312.9	268.8
Carrying capacity (C) (PCU/hour)	1,200	1,200
Average V/C ratio	0.22	0.22
Traffic condition	Free flow (A)	

##### 4.6.8.3.1 Traffic Conditions TC

Traffic survey for TC A and B are conducted in front of the project site on 28<sup>th</sup> April 2022 during 7:00 am to 7:00 pm of 12-hour period. Table 4-40 shows the traffic condition of No 2. Main Road to Industrial Zone Circle. The total numbers of vehicles passing were around 1,257 and 1,153 for TC- (A) and TC- (B) respectively. The majority of vehicles were motorcycles as well as passenger cars, taxi, light truck and medium bus. The total volume of traffic was recorded about 312.9 and 268.8 PCU per hour (peak volume). The average V/C ratios at that period were 0.19 for both A and B. The results show that both TC- (A) and TC- (B) have free flow (A) traffic condition.

## **CHAPTER 5**

### **POTENTIAL ENVIRONMENTAL IMPACT AND MITIGATION MEASUREMENT**

#### **5.1. INTRODUCTION**

This chapter presents the impact assessment and mitigation measures based on the results of environmental, socio-economic and biodiversity field surveys and desktop surveys. The impact and assessment are performed by considering potential positive and negative impacts during pre-construction, construction, and operation periods.

#### **5.2. IMPACT ASSESSMENT METHODOLOGY**

An environmental impact is an estimate or judgement of the significance and value of environmental effects on physical, biological, social or economic environment. Checklist method is used to identify the significant value of environmental impacts. The methodological approach used for the project impact assessment is adopted from Department of Environmental Affairs, Republic of South Africa (Sep. 2012), the Environmental Impact Assessment Regulation and the Federal Environmental Assessment Review Office (Nov. 1994), Reference Guide for the Canadian Environmental Assessment Act.

##### **5.2.1. 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.

###### **5.2.1.1. 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)



#### 5.2.1.2. 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)

#### 5.2.1.3. 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)

#### 5.2.1.4. 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)

#### 5.2.1.5. 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

### **5.3. POTENTIAL ENVIRONMENTAL, SOCIAL AND HEALTH IMPACT DURING CONSTRUCTION AND DECOMMISSION PHASE**

The environmental impact from the development of the proposed factory during construction and decommission phases can be neglect since the proposed factory was rented from private owner for 5 years and Esung will not demolish the proposed factory. However, the impacts on the following sectors are considered and predicted during the proposed factory's construction and decommission periods;

- Air Quality
- Noise and Vibration
- Water Quality
- Solid Waste
- Soil Quality
- Land
- Ecosystem
- Occupational Health and Safety
- Local Economy such as Employment and Means of Livelihood

The evaluation and prediction of potential environmental impacts' significance during construction phase and decommission phase is shown in Table 5-3.

#### **5.3.1. Air Quality**

##### **5.3.1.1. Impact Assessment**

The transportation of construction materials such as heavy-dusty vehicles can elevate air emission (NO<sub>2</sub>, SO<sub>2</sub>, O<sub>3</sub>, CO, PM<sub>2.5</sub>, PM<sub>10</sub>, etc.) during the construction phase. In addition, the dusty construction activities (soil excavation work, movement of vehicles, blasting of rocks, 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<sub>2</sub>, SO<sub>2</sub>, CO & O<sub>3</sub>, 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 cause air emission near surrounding area of project. However, the potential negative impact on air quality will be low.

Since the construction and decommission phases are a short-term, the overall extent and duration of the impact would be low. Therefore, the significance is considered to be low with the proper mitigation measures.

##### **5.3.1.2. Mitigation Measures**

- To mitigate air pollutants emission from the transportation vehicles, a regular maintenance is needed.
- 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 are recommended.

- Instead of using pure diesel generators, retrofit emission devices or diesel fuel with lower sulfur content should be utilized in order to reduce emission of air pollutants from the diesel generators.

### **5.3.2. Noise and Vibration**

#### **5.3.2.1. Impact Assessment**

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.

#### **5.3.2.2. Mitigation Measures**

- Civil work generating high noise levels should be carried out only at daytime.
- Civil work that is necessary to be carried out at nighttime need to have proper noise control equipment or facilities.
- Workers in excessive noise areas are needed to be provided with adequate earplugs or earmuffs.
- Low-noise level generator should be selected in order to reduce impact from the diesel engine generators.

### **5.3.3. Water Quality**

#### **5.3.3.1. Impact Assessment**

During construction and decommission phases, polluted storm water runoff from the construction site and improper discharge of domestic wastewater from the worker camp can deteriorate 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.

#### **5.3.3.2. Mitigation Measures**

- Domestic wastewater from the construction worker camp should be discharged properly in line with the guideline of Yangon City Development Committee.
- Sufficient number of toilets and bathing facilities for construction workers should be provided.
- Sewage and grey water should be collected into septic tanks and discharged properly in line with the guideline of Yangon City Development Committee.
- Regular monitoring of wastewater discharge system is recommended.

#### **5.3.4. Soil Quality**

##### **5.3.4.1. Impact Assessment**

Construction and decommissioning activities such as leakage of fuel and oil from the construction vehicles or machineries and discharging of wastewater and other various wastes on the ground can create soil contamination. In addition, the temporary solid waste disposal site can cause leakage of leachate to the surrounding soil at the project site. However, the potential impact on soil quality will be low since the probability to cause soil contamination is low.

##### **5.3.4.2. Mitigation Measures**

- The construction vehicles or machineries should be maintained in order to prevent leakage of fuel and oil to the soil.
- The temporary solid waste disposal site should be constructed properly in order to prevent leakage of leachate to the surrounding soil.
- Wastewater and various types of wastes should be discharged/disposed properly in line with the guidelines and regulations of YCDC.

#### **5.3.5. Solid Waste**

##### **5.3.5.1. Impact Assessment**

###### **· Non-Hazardous Waste**

Residual wastes were generated during the building's 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 such as domestic solid waste from workers such as plastic, garbage, glass and food waste can be generated.

###### **· Hazardous Waste**

Construction and decommission activities can generate hazardous wastes such as paint, fluorescent light bulbs, and lead-acid batteries. Improper management of solid wastes and hazardous wastes cause potential negative environmental impacts.

##### **5.3.5.2. Mitigation Measures**

- Solid waste from the removal of top soil and old structures and faulty construction activities should be disposed at a suitable landfill site in accordance with the approval of YCDC.
- Establish and operate an efficient waste management system.
- Non-hazardous wastes such as plastic, garbage, glass and food waste should be separated and managed according to guidelines and regulations of YCDC.

- Hazardous wastes should be disposed systematically at a designated site. The method of disposal needs to follow the best international practices and guidelines and regulation of YCDC.

### **5.3.6. Land Use**

#### **5.3.6.1. Impact Assessment**

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 were 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 project is developed within the industrial zone.

#### **5.3.6.2. Mitigation Measures**

Since the factory area was located within the industrial zone area, there may be not much change in land use and so, mitigation measures may not be necessary.

### **5.3.7. Ecosystem**

#### **5.3.7.1. Impact Assessment**

There may be no significant impacts on surrounding ecosystem since the project is located in industrial zone and there are no protected areas, reserved forests, and wetlands, threatened species and national parks near 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 low.

The use of heavy construction equipment during transportation of the building materials and site clearance will make noise and dust those leading to the disturbance of surrounding ecosystem. Noise and dust emission made by heavy vehicles and machinery are inevitable both during the site clearance and construction phases. In addition, improper management of wastewater and solid wastes can cause impacts on fauna and flora.

#### **5.3.7.2. Mitigation Measures**

- Cutting tree and clearance of vegetation must be at a minimum and the trees should be planted.
- Oil, grease, and hazardous waste must be stored properly to prevent the leakage on the ground or water bodies.
- Domestic wastewater and solid wastes should be managed properly.

### **5.3.8. Occupational Health and Safety**

#### **5.3.8.1. Impact Assessment**

The potential impacts on health and safety during construction and decommission phase are listed below.

- Slips and falls due to the careless workers.

- Working at height of building during roofing and painting.
- Increased temperature of equipment surface.
- Dusty in the ambient air of the working zone.
- Moving machinery can cause temporary hazards such as vehicle traffic and accident in moving and lifting equipment.
- Risk from handling or being exposed to hazardous materials that will be used at the construction site.

The potential activities to cause infectious disease are also not expected since construction workers will be hired mostly from the local community.

#### 5.3.8.2. Mitigation Measures

- Safety policy of the project proponent
- Safety plan of the contractor
- Provision of safety gadgets to the workers
- Raising awareness of safety guidelines to the workers
- Assignment of safety supervisors at the work site
- Incentives to workers who obey the safety practices
- Penalty to workers who disobey the safety practices
- Arrangement of morning talks and toolbox meeting
- Preparation of health and safety matrix

#### 5.3.9. Local Economy such as Employment and Means of Livelihood

There will be positive impacts on local economy due to getting job opportunities. Moreover, the 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 Sources	Components	Magnitude	Extent	Duration	Probability	Score	Significant
<b>Potential Negative Impacts</b>								
Air Quality	Construction and decommission activities, diesel generator and vehicle movement	PM <sub>10</sub> , PM <sub>2.5</sub> , CO, NO <sub>2</sub> , O <sub>3</sub> , SO <sub>2</sub>	2	1	1	3	12	Negligible
Noise and Vibration	Emergency use of diesel generator and the operation of construction equipment and heavy vehicles	Noise and vibration	2	1	1	3	12	Negligible
Water Quality	Surface runoff, domestic wastewater	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorous, Total Suspended Solids	2	1	1	3	12	Negligible
Soil Quality	Civil work	Leakage of fuel, oil and other various wastes	3	1	1	3	12	Negligible
Solid Waste	Civil work and wastes from workers	Residue waste and domestic waste	3	1	1	3	12	Negligible
Land	Removal of vegetation and top soil Installation of infrastructure	Land use change	2	1	4	3	21	Low
Ecosystem	Civil works	Flora and Fauna	2	1	4	3	21	Low
Occupational Health and Safety	Accidents due to construction workers' careless and unskilled workers	Infectious disease; such as AIDS/HIV, Hepatitis B/C, etc. and other physical injuries	2	1	1	3	12	Negligible

Potential Impact	Activities and Sources	Components	Magnitude	Extent	Duration	Probability	Score	Significant
Potential Negative Impacts								
Potential Positive Impacts								
Local Economy such as Employment and Means of Livelihood	Civil works, raw materials and equipment purchasing	Employment and business opportunities	2	2	1	3	15	Low

## **5.4. POTENTIAL ENVIRONMENTAL, SOCIAL AND HEALTH IMPACTS DURING OPEARATION PHASE**

The following impacts are predicted during operation phase of accessories and protected cover for vehicles projects;

- Air Quality
- Noise and Vibration
- Water Quality
- Soil Quality
- Solid Waste
- Offensive Odour
- Ecosystem
- Occupational Health and Safety
- 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.

### **5.4.1. Air Quality**

#### **5.4.1.1. Impact Assessment**

During the operation phase, air pollutants such as particulate matter (PM<sub>10</sub> & PM<sub>2.5</sub>) and gaseous pollutants (NO<sub>2</sub>, SO<sub>2</sub>, CO and O<sub>3</sub>) may be emitted from the transportation vehicle engines, fuel combustion of the generators and raw materials cutting process. These all activities would be created throughout the life of the factory. The impact on air quality is considered to be low significant due to low magnitude.

#### **5.4.1.2. Mitigation Measures**

- Water will be sprayed on the dusty areas within the factory compound.
- Generators and vehicles will be maintained regularly.
- Low Sulphur content diesel fuel should be used for the operation of generators, stoves, and vehicles in order to reduce gaseous emission.
- Air quality around the project site should be monitored regularly.
- Proper ventilation system will be implemented.

### **5.4.2. Noise and Vibration**

#### **5.4.2.1. Impact Assessment**

During the operation phase, workers may be experienced to noise and vibration that are generated from the sewing process, diesel generators, materials handling, and transportation vehicles movement on site. However, the magnitude will be at a low range.

#### **5.4.2.2. Mitigation Measures**

- All equipment, vehicles and machinery must be maintained regularly.
- In case of emergency electricity shortage, diesel generators must be set up away from the residential areas and factory workers.
- Earplugs must be provided to the factory workers who worked near the high noise generation areas.

### **5.4.3. Water Quality**

#### **5.4.3.1. Impact Assessment**

Industrial wastewater from the factory's production process will not be generated since the production processes based on CMP system. However, domestic wastewater generated from the factory's workers will be discharged to factory's drainage channel. Sewage will be collected with the septic tank.

#### **5.4.3.2. Mitigation Measures**

- Sewage must be discharged in line with the regulations of YCDC.
- The discharged domestic wastewater must be monitored regularly at the effluent point according to the EMP report approved by ECD, MONREC.

### **5.4.4. Soil Quality**

#### **5.4.4.1. Impact Assessment**

During the operation phase, the transportation vehicles can cause leakage of fuel and oil on the ground. In addition, improper waste management system can cause other various wastes pollution on the ground and which lead to soil contamination. In addition, the improper discharge of wastewater can contaminate the soil. However, the potential impact on soil contamination will be insignificant.

#### **5.4.4.2. Mitigation Measures**

- Transportation vehicles should be examined or maintained regularly.
- Solid waste management system should be installed properly in order to prevent improper waste disposal.
- Proper wastewater treatment systems should be installed in order to prevent improper wastewater discharge on the ground.

#### **5.4.5. Solid Waste**

##### **5.4.5.1. Impact Assessment**

Non-hazardous waste such as paper, plastic bag and plastic bottles, food wastes, rubber, etc. will be generated from the factory's office and factory's workers. At the same time, PE film cover sheet and waste tape paper will be generated from production process.

As the factory production process based on CMP system, it is not expected to generate hazardous wastes from the proposed project. Improper disposal of the solid wastes can cause negative impact on the environment.

##### **5.4.5.2. Mitigation Measures**

- Solid waste will be collected separately with different types of waste bins and the collected waste will be kept at temporary solid waste disposal room before collecting by YCDC.
- 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 should be monitored regularly.

#### **5.4.6. Offensive Odour**

##### **5.4.6.1. Impact Assessment**

During operation phase, offensive odour can cause from the temporary solid waste disposal site. In addition, offensive odour can cause from the building renovation activities such as painting and factory operation process such as raw materials cutting process by heating. However, these negative impacts on offensive odour can be negligible since the temporary solid waste disposal site, and washing tank will be installed systematically and the building renovation activities will be limited.

##### **5.4.6.2. Mitigation Measures**

- Temporary solid waste disposal site should be kept away from the workers.
- Waste from the temporary solid disposal site should be discharged regularly.
- Good ventilation system should be installed.
- PPE such as N-95 mask should be provided to the workers who worked near the offensive odour generated places.

#### **5.4.7. Occupational Health and Safety**

##### **5.4.7.1.1 Impact Assessment**

During operation phase, physical injuries such as slips and falls especially from the loading and unloading of materials can be occurred. In addition, occupational accidents can be caused due to workers' careless and unskilled workers.

#### 5.4.7.2. Mitigation Measures

- Warning signs should be set around the wet floors and avoid walking on slippery floors.
- It should not be overloaded than the prescribed load on loading and unloading equipment and vehicles in order to prevent accidents.
- Personal Protective Equipment (PPE) should be provided to the workers during handling the materials.
- Training related to best safety practice must be provided to the workers.
- First aid kits must be provided sufficiently at the work place.

#### 5.4.8. Ecosystem

##### 5.4.8.1. Impact Assessment

Improper discharge of untreated 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 discharge will be managed properly.

##### 5.4.8.2. Mitigation Measures

Solid waste and wastewater discharge will be managed properly in line with YCDC guidelines. Since possibility of adverse impact on ecosystem from the project is unlikely to be happened, the mitigation measures on ecosystem are not required to be taken.

#### 5.4.9. 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 of both skilled and unskilled sectors for this project will be mostly recruited from the local community. Diesel, stationery for office, and other factory's facilities. 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 and vehicles movement	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , CO, O <sub>3</sub> ,	2	2	2	3	18	Low
Noise and Vibration	Transportation vehicles, high volume speaker and emergency used diesel generator	Noise and vibration	2	2	2	3	18	Low
Water Quality	Discharge of untreated wastewater and improper wastewater treatment system	BOD, COD, Oil and Grease, Total Nitrogen (TN), Total Phosphorous (TP), Total Suspended Solids (TSS)	2	2	2	3	18	Low
Soil Quality	Logistic transportation	Leakage of fuel, oil and other various wastes, and improper wastewater discharge	2	2	3	3	21	Low
Solid Waste	Office waste and operation waste	Type and amount of waste	2	2	2	3	18	Low
Offensive Odour	Temporary solid waste disposal site, factory operation process such as raw materials cutting process and renovation activities such as colour painting	Offensive Odour	2	2	2	3	18	Low
Occupational health and safety	Workers' health in operation area	Infectious disease; such as COVID-19, AIDS/HIV, Hepatitis B/C, etc. and other physical injuries	2	2	2	3	18	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	3	3	21	Low
Potential Positive Impacts								
Local Economy such as Employment and Means of Livelihood	Employment opportunity	Job and business opportunities	3	4	2	4	32	Moderate

## **CHAPTER 6**

### **PUBLIC CONSULTATION**

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, for ESung 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 EMP report. The public consultation meeting was held on 11, May, 2022 by applying online platform, zoom application. The details of public consultation meeting was presented below.

#### **6.1. OBJECTIVE OF PUBLIC CONSULTATION**

Public consultation meeting is regarded as a necessary part of the EMP study. ESung Myanmar 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 EMP requirement, ESung 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.

#### **6.2. APPROACH TO PUBLIC MEETING**

The approach to the public meeting was adopted as below:

- TBS coordinated with ESung 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.
- ESung sent the invitation letter to the relevant government sectors, identified stakeholders and nearby factories on the first week of May, 2022; from 4<sup>th</sup> May, 2022 to 6<sup>th</sup> May, 2022.
- Informed to all of the concerned stakeholders 7 days prior to EMP study of public consultation meeting.
- The Power Point presentation for EMP study of ESung presentation slides of the garments and protected cover for vehicles on CMP basis factory are written in Myanmar language. Further elaboration are focused on environmental monitoring and mitigation measures.

- The meeting was opened for discussion of ESung and TBS consultants were responsible for answering questions from the participants and addressing public concern raised in the meeting regarding the project development plan.

Public Consultation for EMP report was conducted on 11, May, 2022 via zoom application, by following the EMP procedure. The methodology and approach of public consultation meeting is presented below.

### 6.3. PUBLIC ANNOUNCE

Regarding the public announcement, all the information related to the public consultation and public disclosure of the proposed EMP project is announced on the official notice board of the ESung. In addition, all information related to the project is also updated on the private social media pages of the company. Finally, it is also planned to access the full EMP documentation to the public through company social media pages.

### 6.4. SUMMARY OF PUBLIC CONSULTATION

Public consultation was conducted on 11, May, 2022 via zoom application from 10:00 am to 11:30 am. The participants in the public consultation were ESung Myanmar, TBS (consultants who perform the EMP study), officers from Environmental Conservation Department (Yangon), staff from adjacent factories such as Outskin Sportswear Myanmar, Divine Food Garden Industry (El Dorado). Meanwhile, as the firefighting department (East Dagon) were not able to attend the PCM on 11, May 2022, relevant officers from East Dagon fire station visited to the project area for initial field survey and provided necessary comments for the PCM on 5<sup>th</sup> May, 2022. Agenda of the public consultation meeting is shown in Table 6-1.

**Table 6-1 Agenda of the Public Consultation Meeting**

No	Activity	Time
1	Registration	10:00-10:10
2	Opening Speech	10:10-10:15
3	Introduction Speech from ESung Myanmar Co., Ltd	10:15-10:30
4	Power Point Presentation of project description, existing environmental conditions, potential impacts, mitigation measures and environmental management plan	10:30-11:00
5	Discussion time – comments and suggestion by the concerned stakeholders	11:00-11:30

Public consultation was started with the presentation about the project, followed by questions, answers and discussion. Ms. Aye Mon Aung (Environmental Engineer) from TBS performed as a master of ceremonies (MC) at public consultation. Furthermore, introduction speech was opened by Mr. Soe Min Htun (Director) from ESung Myanmar Co., Ltd explained about their company profile. He explained how their factory manufactures the products, which countries they export, how they manage 180 employees of the factory under labor law and their operation procedure of the factory. The factory is currently manufacturing protected cover sheet for vehicles and other accessory like cargo net. Products are exported to the foreign countries such as China and Korea. ESung requested TBS (Consulting Firms) for the EMP for its factory.

Ms. Phoo Pwint Khine (Environmental Engineer) of TBS explained about the EMP requirements for the project. 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 and presentation slides are shown in Table 6-2 and also attached in Appendix J.

**Table 6-2 Meeting Context**

Meeting Date	11.5.2022			
Meeting Time	10:00 AM – 11:30 PM			
Place	Online platform (Zoom Application)			
Government authorities ( Total of 3 People)				
No	Name	Position	Organization	
1	Ms. Aye Khine Kyaw	Staff Officer	Environmental Department	Conservation
2	Ms. Myat Su Mon	Deputy Staff Officer	Environmental Department	Conservation
3	Mr.Than Sin Hmue	Deputy Staff Officer	Environmental Department	Conservation
Project Proponent and Stakeholders (Total of 7 Persons)				
1	Mr.Soe Min Htun	Director	ESung Myanmar	
2	Ms. Saw Ei Khine	Office Staff	ESung Myanmar	
3	Ms. Hnin Lai Win	Environmental Manager	TBS	
4	Ms. Aye Mon Aung	Environmental Engineer	TBS	
5	Ms. Phoo Pwint Khine	Environmental Engineer	TBS	
6	Ms. Soe Sandar Kyaw	HR	Outskin Sportwear Myanmar	
7	Ms. Mee	Manager	EI Dorado	

#### 6.5. 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 6-1 and Figure 6-2. Table 6-3 shows all detailed discussion and feedbacks received from public consultation meeting.

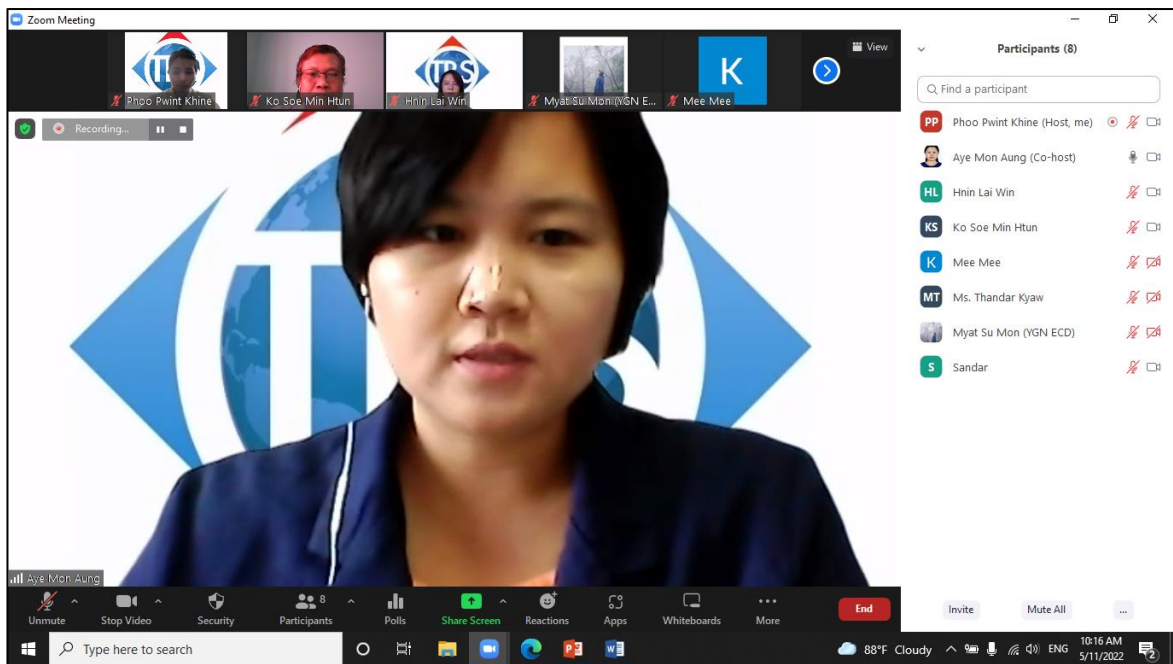


Figure 6-1 Photos of Participants from PCM Activities



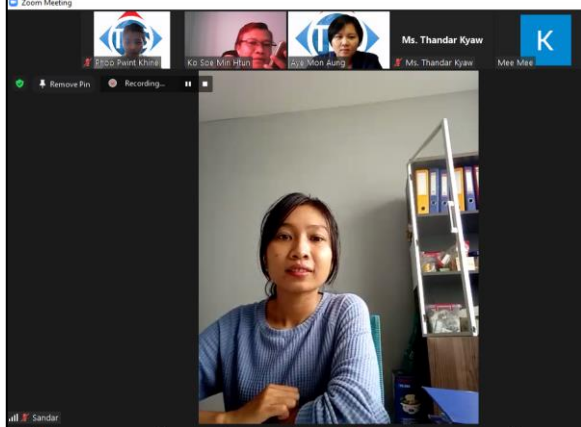
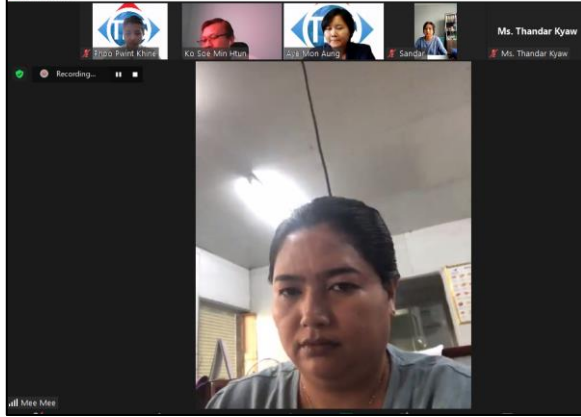
Figure 6-2 Photos of PCM Activities for Proposed Project

Table 6-3 Discussion and Feedbacks Received from Meeting

Suggestion	Photo
<p><b>By Ms. Myat Su Mon (Deputy Staff Officer): Environmental Conservation Department, Yangon</b></p> <p><b>Suggestions-1:</b></p> <p>Add commitment table including management plan, monitoring plan and mitigation measurements in EMP report.</p> <p>Add both previous and current addresses of the factory in project description section.</p>	



Suggestion	Photo
<p><b>Questions-1:</b></p> <p>Where is the air monitoring station location? Is boiler used in the production process for ironing?</p> <p><b>Answer by Ms. Phoo Pwint Khine (Environmental Engineer) from Total Business Solution Co., Ltd (TBS)</b></p> <p>Air monitoring activity is conducted within the project compound. Boiler is not used for the proposed project.</p> <p><b>Suggestions-2:</b></p> <p>Compare all the different activities of ESung factory before and after the location has changed especially for production process and raw materials.</p> <p><b>Questions-2:</b></p> <p>How long is the operation period in previous location? Did ESung Myanmar prepare any EMP during previous operation period? Is the documental process proceeded with MIC or YRIC? Is there any requestment to ECD for decision letter after submitting the endorsement letter to YRIC?</p> <p><b>Answer by Mr. Soe Min Htun (Director) from ESung Myanmar Co., Ltd</b></p> <p>The total operation period is 4 years in the previous place. At that time, ESung start planning to prepare the EMP, and it is just under the decision making stage. Documental process is proceeded with YRIC. Regarding the decision letter, I will check the document and reply it to ECD as soon as possible.</p>	 <p><b>Ms. Myat Su Mon (Deputy Staff Officer):</b> Environmental Conservation Department, Yangon</p>  <p><b>Mr. Soe Min Htun (Director) from ESung Myanmar Co., Ltd</b></p>  <p><b>Ms. Phoo Pwint Khine (Environmental Engineer) from Total Business Solution Co., Ltd (TBS)</b></p>
<p><b>Suggestions-3:</b></p> <p>Add detail information such as date, location and time of monitoring process in the environmental quality monitoring section. Use the updated references for GAD data. Add environmental and social management sub plan including detail management activities and expected budget. Add original measured parameters and location (latitude and longitude) in the monitoring table. Add occupational argument solving plan in main EMP report.</p>	

Suggestion	Photo
<p>Regarding the presentation, add slides of law and regulation section for next projects.</p> <p>Describe specific emission guideline values for relevant project rather than that of general guideline.</p> <p>It is also essential to submit the amendment letter together with decision letter form.</p> <p><b>Questions-3:</b></p> <p>Is the proposed project finished the construction stage or not?</p> <p>Is it received the Amendment letter of YRIC?</p> <p><b>Answer by Ms. Phoo Pwint Khine (Environmental Engineer) from Total Business Solution Co., Ltd (TBS)</b></p> <p>Only foreign staff live in the dormitories of the factory compound.</p> <p>Actually, the proposed project area and factory building are leased with 5 year land lease contract from the owner. Therefore, there are no construction and decommission processes for the proposed project.</p> <p>Yes, the amendment letter for location changes has been received on 29 April, 2022.</p>	
<p><b>By Ms. Soe Sandar Kyaw (HR): Outskin Sportswear Myanmar Co., Ltd</b></p> <p><b>Suggestions:</b></p> <p>There is no suggestion for ESung Company at the moment. In addition, we, Outskin Sportswear Myanmar, satisfied all the activities that ESung has done during these days. For example, following all guidelines of east dagon industrial zone committee strictly and so on.</p> <p><b>Answer by Mr. Soe Min Htun (Director) from ESung Myanmar Co., Ltd</b></p> <p>Thank you very much for your kind participation.</p>	 <p><b>By Ms. Soe Sandar Kyaw (HR): Outskin Sportswear Myanmar Co., Ltd</b></p>
<p><b>By Ms. Mee (Manager): El Dorado Co., Ltd</b></p> <p><b>Suggestions:</b></p> <p>Currently, I haven't got any suggestion.</p>	

Suggestion	Photo
	By Ms. Mee (Manager): El Dorado Co., Ltd
<p><b>By Fire Fighting Field Survey Team from East Dagon Fire Station</b></p> <p><b>Suggestions:</b></p> <p>Install "Exit Sign" within the factory building.</p> <p>Install emergency lighting system.</p> <p>Draw emergency exit line within the factory building.</p> <p>Draw the yellow line near the ladder.</p> <p>Employ the fire safety manager.</p> <p>Prepare the fire drill procedure.</p> <p>Install additional fire extinguishers on both floors (altogether sixty numbers).</p> <p>Construct assembly area (buffer zone) for emergency cases.</p> <p><b>Answer by Mr. Aung Min Htut Khaung (Cutting Leader) from ESung Myanmar Co., Ltd</b></p> <p>We, ESung Myanmar Co., Ltd will strictly follow all provided comments and adapt all the necessary firefighting equipment as soon as possible and inform it.</p>	

Total 10 participants attended the public consultation followed by describing in percentage, 30 % which represented the government authorities and 70 % which represented ESung Myanmar as shown in Table 6-4.

**Table 6-4 Percentage of Participants and Attendance of Public Consultation**

Community	Number of participants	Total percentage
Government authorities	3	30 %
Project proponent	7	70 %
<b>Total</b>	<b>10</b>	<b>100 %</b>

## 6.6. ACTION TAKEN BY FACTORY AND FUTURE PLANS

Proposed project will take the action for most of the suggestions and comments from the public consultation meeting. Moreover, all the mitigation measures described earlier will duly implement by the factory.

## CHAPTER 7

### ENVIRONMENTAL MANGEMENT ACTION

#### 7.1. INTRODUCTION

This chapter presents the Environmental Management Plan (EMP) of manufacturing of garments and protected cover for vehicles on CMP basis 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 Esung 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 and designing effective programs of proper environmental management plan.

❖ **Do (D):Implement the plan**

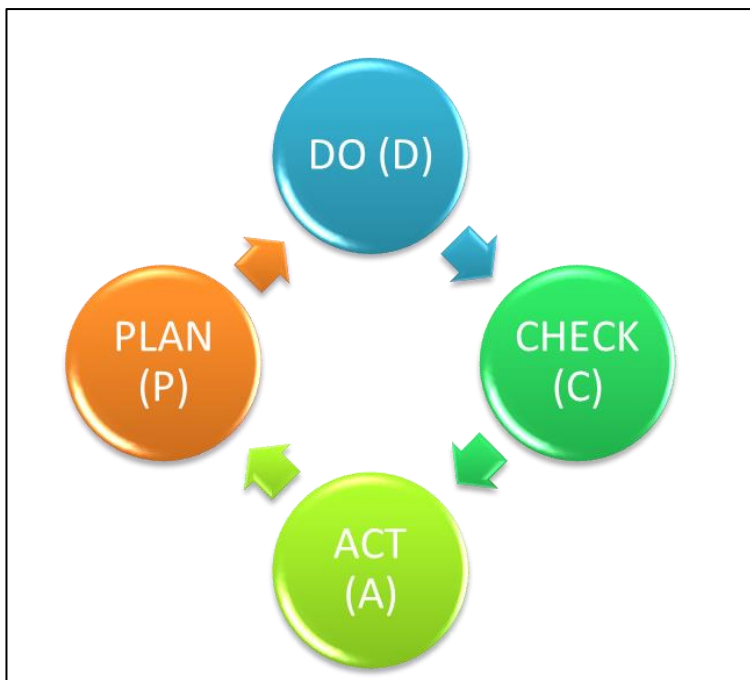
Esung as described in this chapter will implement the mitigation measures for the potential environmental impacts appropriately.

❖ **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. INSTITUTIONAL REQUIREMENT**

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.

### **7.4. ENVIRONMENTAL MITIGATION AND MANAGEMENT PLAN**

This section presents the proposed mitigation measures that Esung will adopt to facilitate the management and control of potential adverse impacts associated with the project activities, which are described in Chapter 5. As the current land area and factory building are leased with 5 years lease contract, activities related to the construction and decommission processes are not related to the project proponent. However, not only the environmental management plan including mitigation measures, estimated cost and responsible organization are presented in Table 7-1 for construction and decommission phases but also for operation phase in Table 7-2..

**Table 7-1 Environmental Management Plan during Construction and Decommissioning Phase**

Item	Potential Negative Impacts	Mitigation Measures	Responsible Team
Air Quality	❖ Particulate matters (PM <sub>10</sub> & PM <sub>2.5</sub> ) and gaseous pollutants (NO <sub>2</sub> , CO, O <sub>3</sub> & SO <sub>2</sub> ) emission from construction and decommission activities, diesel generator and vehicle movement.	<ul style="list-style-type: none"> <li>❖ Regular maintenance of transportation vehicles must be performed.</li> <li>❖ Spraying water and usage of safety nets should be prepared at and around the construction areas.</li> <li>❖ Diesel fuel with lower sulfur content should be utilized.</li> </ul>	Construction contractors
Noise and Vibration	❖ Noise and vibration from the emergency use diesel generator and operation of construction equipment and heavy vehicles.	<ul style="list-style-type: none"> <li>❖ Civil work generating high noise level should be carried out only at daytime.</li> <li>❖ Workers in excessive noise areas are needed to be provided adequate earplugs or earmuffs.</li> <li>❖ Low-noise level generator should be selected.</li> </ul>	Construction contractors
Water Quality	❖ Surface runoff and domestic wastewater discharge	<ul style="list-style-type: none"> <li>❖ Domestic wastewater from the construction worker camp should be discharged properly.</li> <li>❖ Sufficient number of toilets and bathing facilities for the construction workers should be provided.</li> <li>❖ Sewage and grey water should be collected into the septic tanks and discharged properly.</li> </ul>	Construction contractors
Solid Waste	❖ Construction residual wastes and domestic wastes	<ul style="list-style-type: none"> <li>❖ Solid waste from the removal of top soil and old structures.</li> <li>❖ Establish and operate an efficient waste management system.</li> <li>❖ Non-hazardous wastes such as plastic, garbage, glass and food waste should be collected separately and managed.</li> </ul>	Construction contractors
Occupational Health and Safety	❖ Accidents due to construction workers' careless and unskilled workers	<ul style="list-style-type: none"> <li>❖ Safety policy of the project proponent</li> <li>❖ Safety plan of the contractor</li> <li>❖ Provision of safety gadgets to the workers</li> <li>❖ Raising awareness of safety guidelines to the workers</li> </ul>	Construction contractors



Item	Potential Negative Impacts	Mitigation Measures	Responsible Team
		<ul style="list-style-type: none"> <li>❖ Assignment of safety supervisors at the work site</li> <li>❖ Incentives to workers who obey the safety practices</li> <li>❖ Penalty to workers who disobey the safety practices</li> <li>❖ Arrangement of morning talks and toolbox meeting</li> <li>❖ Preparation of health and safety matrix</li> </ul>	

**Table 7-2 Environmental Management Plan during Operation Phase**

Item	Potential Negative Impacts	Mitigation Measures	Responsible Team
Air Quality	❖ Particulate matters (PM <sub>10</sub> & PM <sub>2.5</sub> ) and gaseous pollutants (NO <sub>2</sub> , CO, O <sub>3</sub> & SO <sub>2</sub> ) emission from the use of diesel generator and transportation vehicles, and raw materials cutting process.	❖ Water will be sprayed on the dusty areas within the factory compound. ❖ Generators and vehicles will be maintained regularly. ❖ Low sulfur content diesel should be used. ❖ Proper ventilation system will be implemented.	Project proponent
Noise and Vibration	❖ Noise and vibration from the emergency used diesel generator and sewing process	❖ All equipment, vehicles and machinery must be maintained regularly. ❖ Diesel generators must be set up away from the residential areas and factory workers. ❖ Earplugs must be provided to the factory workers who worked near the high noise generation areas.	Project proponent
Water Quality	❖ Sewage and domestic wastewater discharge from the factory workers	❖ Sewage and domestic wastewater must be discharged in line with the regulation of YCDC.	Project proponent
Solid Waste	❖ Non-hazardous waste such as paper, plastic bag and plastic bottles, food wastes, rubber, etc. will be generated from the factory's office and factory's workers. ❖ PE film cover sheet and waste tape paper will be generated from production process. ❖ As the factory production process based on CMP system, it is not expected to generate hazardous wastes from the proposed project.	❖ Establish and operate an efficient waste management system. ❖ Non-hazardous wastes such as plastic, garbage, glass and food waste should be collected separately and managed to recycle if possible.	Project proponent
Occupational Health and Safety	❖ Physical injuries due to workers' careless and unskilled workers	❖ Personal Protective Equipment (PPE) should be provided to the workers. ❖ Training related to best safety practice must be provided to the workers.	Project proponent

Item	Potential Negative Impacts	Mitigation Measures	Responsible Team
		<ul style="list-style-type: none"><li>❖ Warning signs should be set around spills or wet floors and avoid walking on slippery floors.</li><li>❖ Provide First Aid Kits sufficiently at the work place in case of occupational incidents.</li><li>❖ Illegal drugs or alcohol must be prohibited at any time on working hours.</li></ul>	

## **7.5. SUB PLAN FOR ENVIRONMENTAL MONITORING IMPLEMENTATION**



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 Section 8, Sub-section 8.6 of EIA Procedure (2015), the environmental monitoring Sub-Plan is required to include in EMP report. 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 construction, operation and decommissioning phases is shown in Table 7-3 and Table 7-4.



**Table 7-3 Environmental Monitoring Sub-Plan during Construction and Decommissioning Phases**

Monitoring Item	Monitoring Parameter	Monitoring Location	Implementation Schedule	Estimated Budgets (MMK)	Responsibilities
Air Quality	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> & CO	One point at the project site	Twice a year	Included in the project cost	Construction Contractor
Noise	Noise level (dB (A) scale)	One point at the project site	Twice a year	Included in the project cost	Construction Contractor
Vibration	Radial, Transverse, Vertical	One point at the project site	Twice a year	Included in the project cost	Construction Contractor
Water Quality	BOD, COD, Oil & grease, pH, Total coliform bacteria, Total nitrogen, Total phosphorus, Total suspended solids	One point at the project site	Monthly	Included in the project cost	Construction Contractor
Solid Waste	Amount and type of solid waste	Temporary waste disposal site construction site	Weekly	Included in the project cost	Construction Contractor
Occupational Health and Safety	Incident/accident records	Around the project site and construction site	Monthly	Included in the project cost	Construction Contractor

**Table 7-4 Environmental Monitoring Sub-Plan during Operation Phase**

Monitoring Item	Monitoring Parameter	Monitoring Location	Implementation Schedule	Estimated Budgets (MMK)	Responsibilities
Air Quality	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> & CO	<p>One point at the project site (16°53'27.95" N and 96° 14' 6.6" E)</p> 	Twice a year	1,000,000	Project Proponent
Noise	Noise level (dB (A) scale)	<p>One point at the project site (16°53'28.26" N and 96° 14' 6.67" E)</p> 	Twice a year	500,000	Project Proponent
Vibration	Radial, Transverse, Vertical	<p>One point at the project site (16°53'28.39" N and 96° 14' 6.43" E)</p>	Twice a year	500,000	Project Proponent



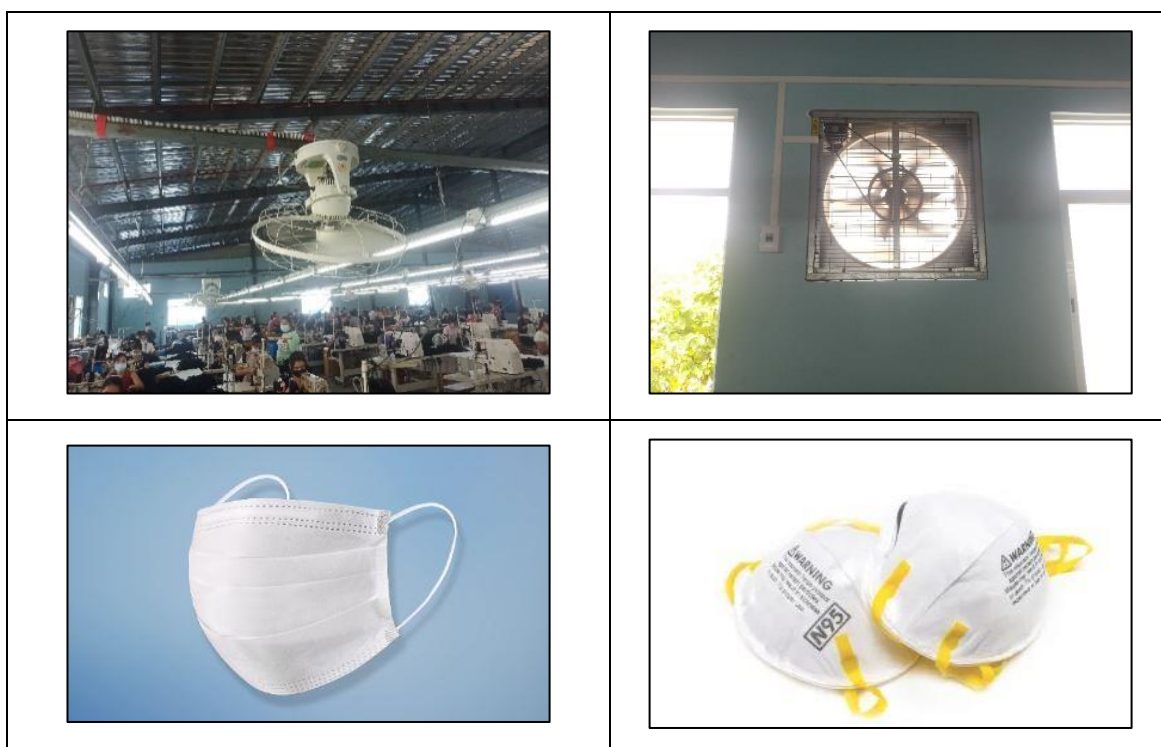
Monitoring Item	Monitoring Parameter	Monitoring Location	Implementation Schedule	Estimated Budgets (MMK)	Responsibilities
					
Water Quality	BOD, COD, Oil & grease, pH, Total nitrogen, Total phosphorus, Total suspended solids	<p>One point at the project site (16°53'5.1" N and 94° 52' 39.57" E)</p> 	Twice a year	300,000	Project Proponent
Solid Waste	Amount and type of solid waste	Temporary waste disposal site	Weekly	30,000	Project Proponent
Occupational Health and Safety	Incident/accident records	Within the project site	Monthly	30,000	Project Proponent

## 7.6. FACTORY MANAGEMENT PLAN

### 7.6.1. 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 places. Mobile fans, large windows, exhaust fans and standard size of roof high 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 7-2.



**Figure 7-2 Current Condition of Air Pollution Management**

### 7.6.2. Wastewater management

Regarding the production, as the factory manufacturing process is mainly based on the CMP system, there is no wastewater discharge from the operation process.

Toilets for workers are constructed within the factory compound and it separates into equal numbers for male and female. Factory has its own septic tanks for sewage storage. Generally, the sludge from the septic tank has been removed whenever it is necessary. Regarding the domestic wastewater from canteen and washing basins, it is directly discharged into the factory drainage channel. Based on the U.S EPA (1978)<sup>14</sup>. The current wastewater discharge and management system of the factory is shown in Figure 7-3..

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<sup>14</sup> U.S.EPA. (1978), Environmental impact statement phase II, Facility Plan Handover Country, Virginia 3<sup>rd</sup> Edition.



**Figure 7-3 Factory Wastewater Discharge and Management System**

### **7.6.3. Solid waste management**

#### **7.6.4. Solid Waste Management System**

Regarding the factory solid waste management system, domestic wastes from workers, PE film cover sheet and wastes paper of double tape from production process are the main solid wastes of the factory. Within the factory compound, there will be sufficient garbage bins in the project site and these solid wastes will be systematically collected and stored in the temporary solid waste management station of the factory. Then, it will be disposed to the final disposal site according to the guideline of YCDC. The solid waste will be collected by YCDC regularly. The current condition of solid waste management system is shown in Figure 7-4.



**Figure 7-4 Waste Storage Station**



### **7.6.5. Fire Management**

In order to prevent fire, the ESung factory has to install fire detectors, alarm systems, sprinkler systems and provision of fire-fighting equipment based on the requirements of Myanmar's fire codes. Safety manager has to 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.

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.

ESung Company also installed automatic ceiling water springler system with the two story factory building. The factory provided sufficient firefighting equipment around the factory to prevent fire in case of emergency. In addition, it is also constructed the common water storage tank for the factory within the project compound.

### **7.6.6. Future Plan of Factory Related to Sustainability**

Regarding sustainability energy consumption and management, it is also planned to optimize on resource use of the propose 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

### **7.6.7. 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 garment industry create ideal conditions for transmission of infectious diseases.

It is required to provide clean and healthy facilities such as hygienic eating areas, ventilated working areas and clean latrines etc. Provide first aid service under the medical officer or trained staff. Yearly medical check-up should provide for the workers for their health and safety. It is also required to draw up emergency response plan, nearest hospital location maps and phone numbers of fire department, administrative offices and nearby hospitals and clinics.

### **7.6.8. EMP for Good Working Practices and Good Safety Practices**

The garment 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 garment factory as already mentioned earlier.

## **7.7. 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 annual environmental management report should be submitted to the MONREC/ECD every 6 month under the EIA procedure.

### **7.7.1. 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.

### **7.7.2. 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.

### **7.7.3. 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 respond plan will included 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 Figure 7-5 and Figure 7-6. In each floor of the building, emergency exits, fire extinguishers, fire hydrants, emergency alarms and medical kits are provided.

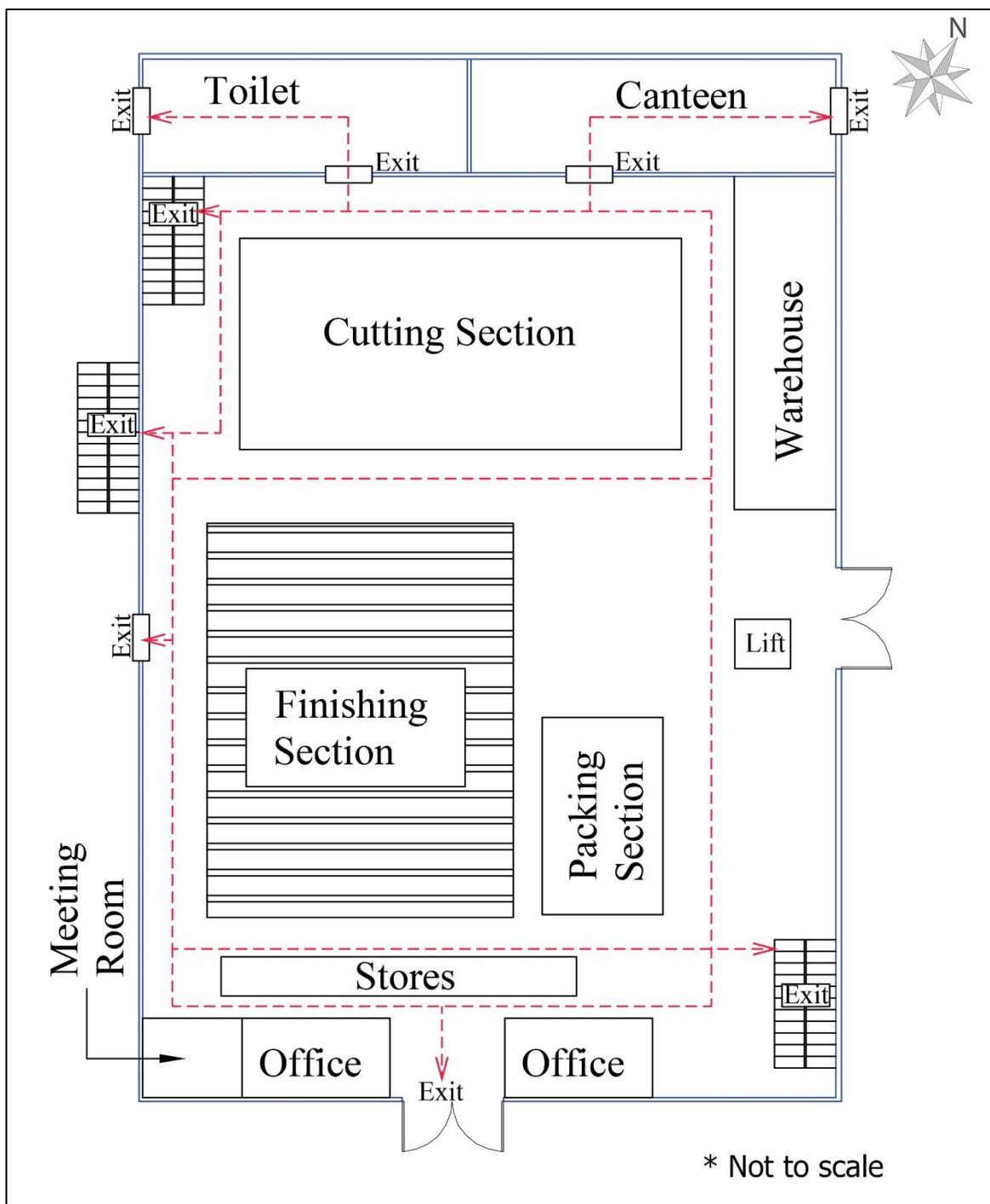
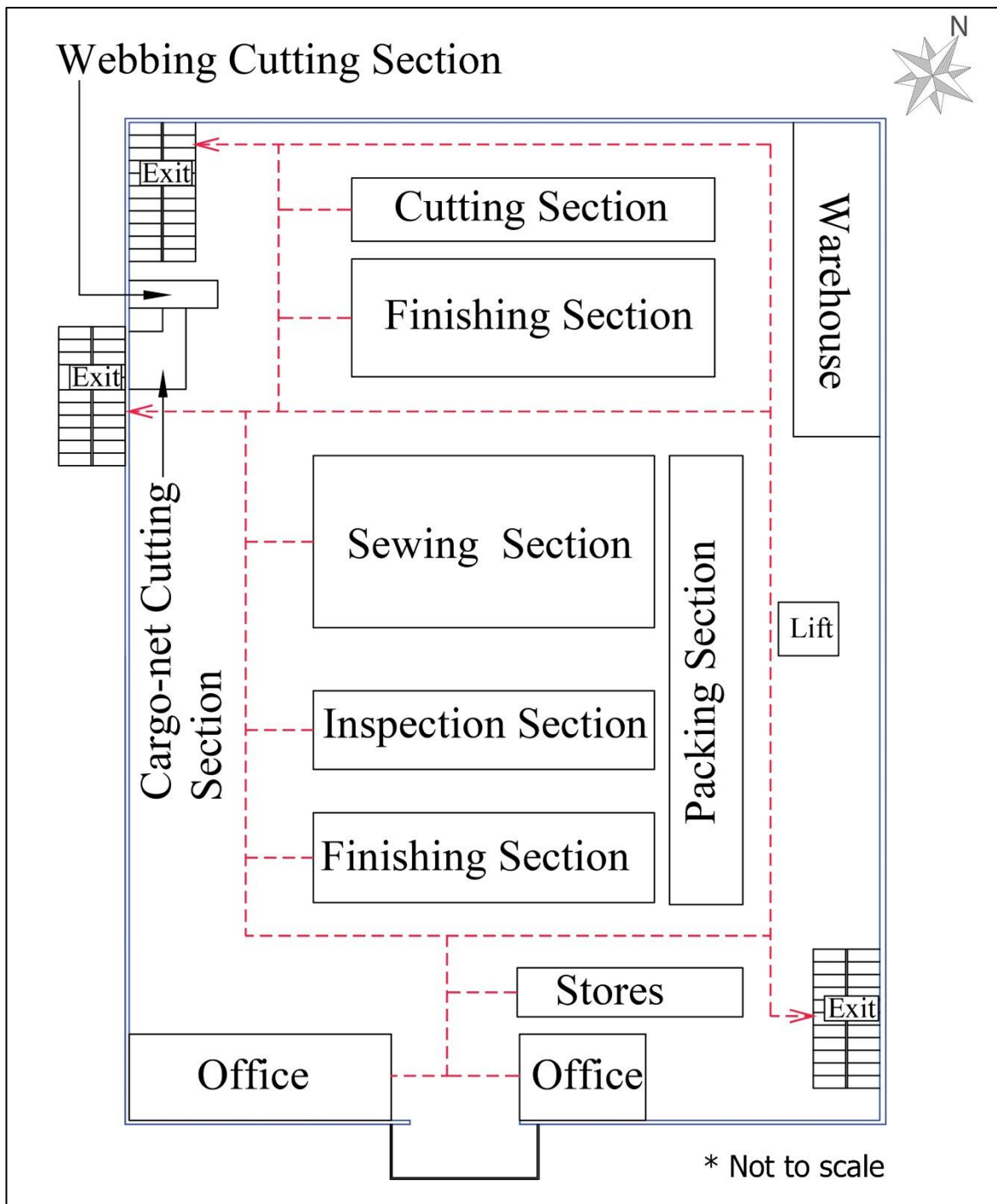


Figure 7-5 Emergency Escape Plan of Ground Floor





**Figure 7-6 Emergency Escape Plan of First Floor**

#### **7.7.4. 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.

## 7.8. CORPORATE SOCIAL RESPONSIBILITY PROGRAM

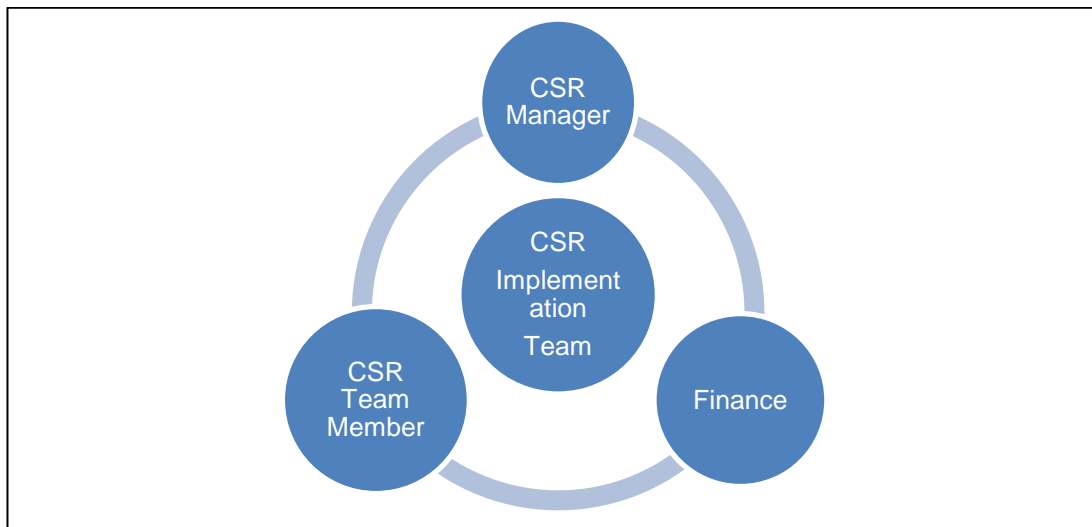
The purposes of implementing CSR program are to develop good relations between the public and project proponents as well as to promote high standard of living near the project area. ESung will provide CSR fund which is (2%) of the net profit to following sections. The detailed contribution for CSR fund is shown in Table 7-5.

**Table 7-5 CSR Fund Contribution**

No	Partial	Contribution%
1.	Education	0.5%
2.	Health	1%
3.	Regional Development	0.5%

### 7.8.1. 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 7-7.



**Figure 7-7 Propose CSR Implementation Team**

#### 7.8.1.1. 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 check out the amount of using CSR fund that the factory really follows as their commitment.

#### 7.8.1.2. Finance

Finance department require to management the fund of CSR.

#### 7.8.1.3. CSR Team Member

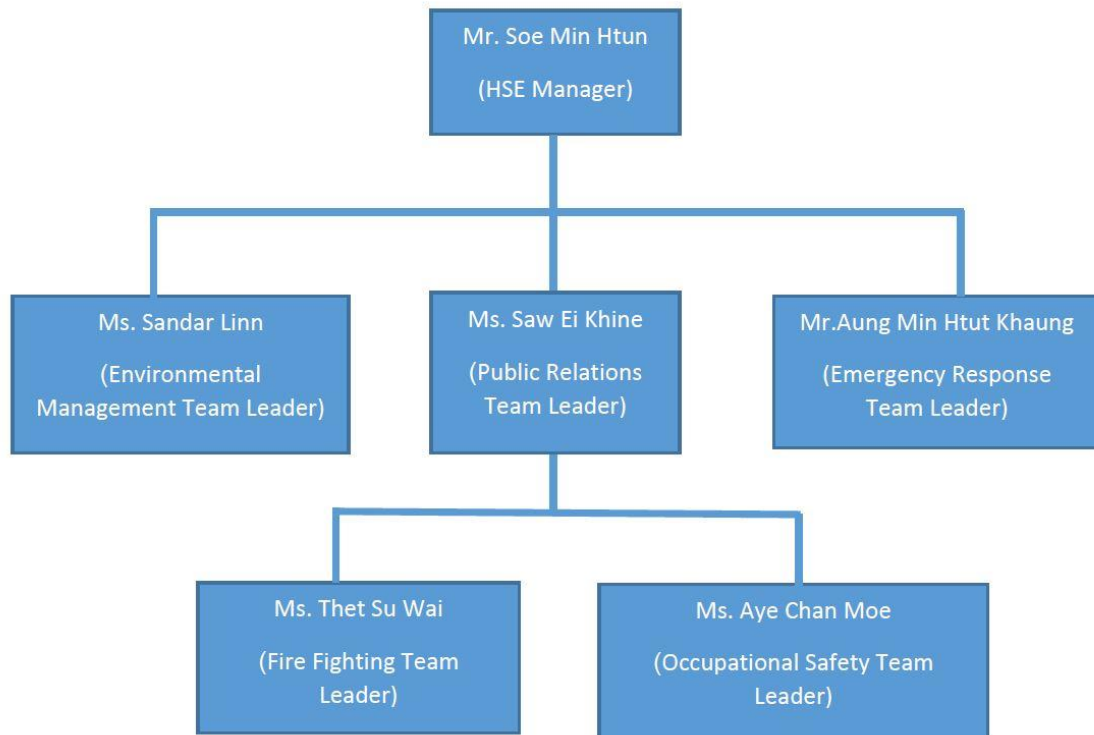
All employees from the factory can be the member of CSR Team. Members can be participated in every CSR activity and can give advices to improve CSR activities. CSR Program of the Proposed Project is shown in Table 7-6.

**Table 7-6 CSR Program of the Proposed Project**

Item	Activities	Expected Budget	Objectives
Health	<p>Providing medical supplyment for staff and their families</p> <p>Providing the employees' health examination</p> <p>To support the protection of the environment as well as from the fire around the Factory</p>	1 %	To ensure that workers working in the workplace and their families are in good health
Education	<p>Promoting the awareness of education and human right</p> <p>Providing educational grand for the employee's children</p> <p>Providing the support in education sector around the project area</p>	0.5 %	<p>To become a better society</p> <p>To improve the education level of the workers' families</p> <p>To develop the skill of the employees</p>
Regional Development	<p>Doing donation clothes and money to local organizations and poor people nearby project area</p>	0.5 %	<p>To enable local charitable organizations to operate well,</p> <p>To enable employees to cooperate actively in the common work that is being done in the region,</p> <p>To avoid and understand human rights among workers</p> <p>To prevent sexual harassment and oppression in the workplaces</p>

## 7.9. ORGANIZATION STRUCTURE FOR EMP

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 7-8 and Table 7-7.



**Figure 7-8 Organization Structure of the EMP Team**

**Table 7-7 List of EMP Team Members**

No.	Name	Position	Responsibility
1	Mr. Soe Min Htun	HSE Manager	Supervise the overall environmental management system of the factory including finance, health and safety. Government office and legal resolution of the factory.
2	Ms. Sandar Linn	Environmental Management Team Leader	Conduct systematic environmental management plan including regular environmental monitoring and maintenance of the factory.
3	Ms. Saw Ei Khine	Public Relations Team Leader	Address the public relation issues including receiving suggestions and complaints from workers, local people, and complaints regarding the proposed project.
4	Mr. Aung Min Htut Khaung	Emergency Response Team Leader	Provide updated emergency response plan and awareness trainings program to staff.
5	Ms. Thet Su Wai	Fire Fighting Team Leader	Make regular inspection for fire hazard material and participate in firefighting awareness trainings.
6	Ms. Aye Chan Moe	Occupational Safety Team Leader	Check and submit occupational safety and accident report regularly.

#### 7.9.1. Emergency Contact List

In addition to 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 Fu Yuen Garment factory is shown in Table 7-8.

**Table 7-8 Emergency Contact List of the Factory**

No.	Name	Phone nos.	Responsible Team
1	Mr. Soe Min Htun	09-5062646	HSE Manager
2	Ms. Saw Ei Khine	09978851695	Public Relations Team Leader
3	Mr. Aung Min Htut Khaung	09666660450	Emergency Response Team Leader

## 7.10. PENALTIES

If the factory is not complied or not carry 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 Myanmar Environmental Impact Assessment Procedure (2015). Penalties and punishment that stated in Myanmar Environmental Impact Assessment Procedure 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

No.	Non-Compliance	Penalties	Specific Administrative Punishment of the Ministry
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, livelihoods, or property, where applicable based on the EMP, EMP-CP or EMP-OP	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
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



## 7.11. BUDGET FOR EMP FUND

The budget for EMP fund will cover the initial cost and recurring expenses for implementation EMP. Table 7-10 shows annual budget allocation for proposed environmental, health and safety mitigation measures.

The budget for EMP fund will cover the initial cost and recurring expenses for implementation EMP. Table 7-10 shows annual budget allocation for proposed environmental, health and safety mitigation measures.

**Table 7-10 Estimated Annual Budget for Environmental, Health and Safety Mitigation Measurement**

No	Proposed Environmental Mitigation Measures	Estimated Budget (MMK)
<b>Environmental Work</b>		
1	Monitoring program	4,200,000
2	Capacity building and training	500,000
3	Emergency case	500,000
<b>Health and Safety Work</b>		
4	Personal protective equipment	3,000,000
5	Medical for Clinic	500,000
6	Fire Fighting Equipment	500,000

## **CHAPTER 8**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **8.1. CONCLUSION**

This EMP report has been prepared based on the provided information by project proponent, relevant studies and reports, baseline environmental monitoring and the public consultation.

The project is less likely to cause significant environmental and social impacts. Most of the impacts are temporary on the environment and these impacts can be mitigated to reduce to acceptable levels.

The project proponent has facilities and staffs to train and manage solid and liquid wastewater. This EMP report outlined potential environmental impacts during the operational phase of the factory. Those potential impacts could be mitigated if the above recommended mitigation measures are taken. The environmental monitoring team organized by the factory should take the responsibility of regular monitoring.

ESung Myanmar shall be responsible for the preservation of the environment at and around the area of the project site. In addition to this, it shall carry out each instruction made by MONREC. In which to conduct an EMP that describes the measure to be taken for preventing, mitigation and monitoring significant environment impacts resulting from the implementation and operation of proposed project or business or activity has to be prepared and submitted to perform activities. In accordance with this EMP and be abided by the environment policy, ESung Myanmar shall be responsible for environmental assessment of the factory as follows:

- Environmental management plan is well accomplished and strongly conducted.
- The plan is conducted by strictly following the instructed procedure and relevant rules and regulations.
- ESung Myanmar will be complied completely and continuously the commitment in which the activities to reduce the environmental impact.
- During the operating period, the company will be carrying out the proposed environmental management plan to be better by applying updated technologies and system as well as depend on the workplace requirement according to the comments from ECD.

The factory will conduct environmental and social management plan to avoid the impact to the local area before the closure.

#### **8.2. RECOMMENDATIONS**

To implement the results of EMP investigation, the followings are recommended;

- It is recommended that the environmental, social and health impacts of the project should be correctively assessed and the EMP should be formulated properly.

- It is suggested that the project proponent should continuously follow to the requirement of the environmental guidelines, employing mitigation measures to ensure compliance with legal requirements and recommended criteria.
- It is recommended that this EMP report should be accomplished in line with the EIA Procedure (2015).

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## **APPENDIX A**

### **ESung Myanmar Co., Ltd Certificates**







Form (5-8)

**THE REPUBLIC OF THE UNION OF MYANMAR**  
**YANGON REGION INVESTMENT COMMITTEE**  
**ENDORSEMENT**

Endorsement No. YGN - 072 /2018

Date 25 July 2018

This endorsement is issued by Yangon Region Investment Committee according to the section 25, sub-section (d) of the Myanmar Investment Law-

(1) Name of Investor MR. CHI MINKOO

(2) Citizenship KOREAN

(3) Residence Address 207-2302 (CENTRAL XI 2 BLOCK) 13, SANGSEOJAE-RO, 4-GIL, PYEONGTAEK-SI, GYEONGGI-DO, REPUBLIC OF KOREA

(4) Name and Address of Principal Organization \_\_\_\_\_

(5) Place of Incorporation \_\_\_\_\_

(6) Type of business MANUFACTURING OF GARMENTS AND PROTECTED COVER FOR VEHICLES ON CMP BASIS

(7) Place(s) of investment Project PLOT NO. 520, MYAY TAING BLOCK NO. 23, INDUSTRIAL ZONE, SOUTH DAGON TOWNSHIP, YANGON REGION

(8) Amount of Foreign Capital US\$ 0.411 MILLION

(9) Period for Foreign Capital to be brought in WITHIN ONE YEAR FROM THE DATE OF ISSUANCE OF ENDORSEMENT


(10) Total Amount of Capital (Kyat) EQUIVALENT IN KYAT OF US\$ 0.411 MILLION

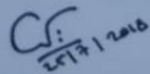
(11) Construction/ Preparation Period 18 MONTHS

(12) Validity of Endorsement 30 YEARS

(13) Form of Investment WHOLLY FOREIGN OWNED



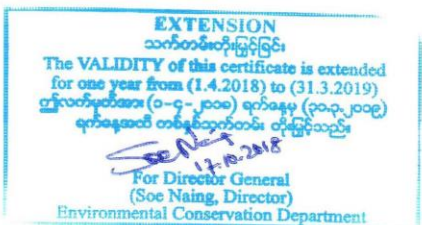

(14) Name of Company Incorporated in Myanmar ESUNG MYANMAR COMPANY LIMITED



  
Chairman  
Yangon Region Investment Committee

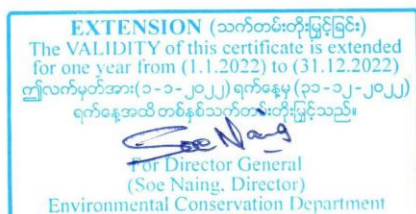
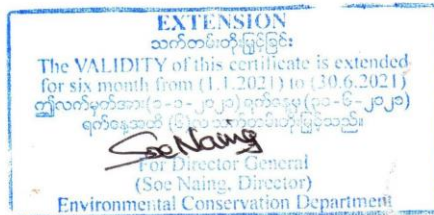
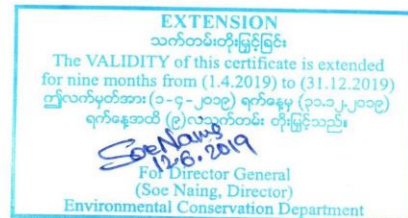
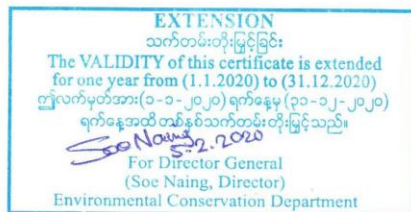
## **APPENDIX B**

### **Certificate for Transitional Consultant Registration**

 <b>REPUBLIC OF THE UNION OF MYANMAR</b> <b>Ministry of Natural Resources and Environmental Conservation</b> <b>CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION</b> (ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)			
No.	0010	Date	04 JUL 2018
<p>The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the organization under Environmental Impact Assessment Procedure, Notification No. 616/2015.</p> <p>(ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို အဖွဲ့အစည်းအား ထုတ်ပေးလိုက်သည်။)</p>			
(a)	Name of Organization (အဖွဲ့အစည်းအမည်)	Total Business Solution Co., Ltd.	
(b)	Name of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ အမည်)	Mr. Praneet Prasongnitjakit	
(c)	Citizenship of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ နိုင်ငံသား)	Thai	
(d)	Identity Card /Passport Number of the representative person in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်)	Z 322340	
(e)	Address of organization (ဆက်သွယ်ရန်လိပ်စာ)	No.54, Room No.704, Waizayantar Tower, Waizayantar Road, Thingangyun Township, Yangon. <a href="mailto:tbs.myanmar@gmail.com">tbs.myanmar@gmail.com</a> <a href="mailto:praneet.tbs@gmail.com">praneet.tbs@gmail.com</a> , 09253556719	
(f)	Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)	Organization	
(g)	Duration of validity (သက်တမ်းကုန်ဆုံးရက်)	31 March 2018	
 <p><b>EXTENSION</b> 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</p>		 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







THE REPUBLIC OF THE UNION OF MYANMAR  
Ministry of Natural Resources and Environmental Conservation  
Environmental Conservation Department



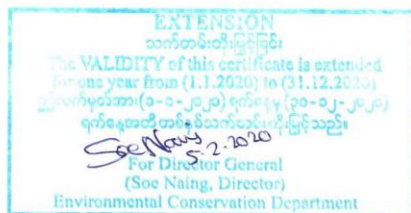
CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION  
(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 0217 Date 24 MAY 2019

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို ထုတ်ပေးလိုက်သည်။)

- |  |   |
|--|---|
| (a) Name of Consultant<br>(အကြံပေးပုဂ္ဂိုလ်အမည်)                             | Dr. Soe Moe Kyaw Win  |
| (b) Citizenship<br>(နိုင်ငံသား)  | Myanmar   |
| (c) Identity Card / Passport Number<br>(မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်) | 12/Sa Kha Na (Naing) 057507   |
| (d) Address<br>(ဆက်သွယ်ရန်လိပ်စာ)  | No.27, Kyuntaw Street, Sanchaung Township, Yangon.<br>Mobile phone: 09455309359<br>E mail: <a href="mailto:drsoemoe@outlook.com">drsoemoe@outlook.com</a> |
| (e) Organization<br>(အဖွဲ့အစည်း)   | Total Business Solution Co., Ltd.   |
| (f) Type of Consultancy<br>(အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)                   | Person  |
| (g) Duration of validity<br>(သက်တမ်းကုန်ဆုံးရက်)                             | 31 December 2019  |

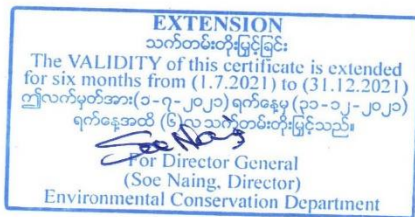
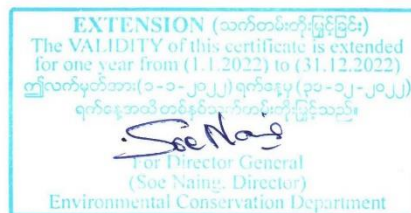


Signature

Director General  
Environmental Conservation Department  
Ministry of Natural Resources and Environmental Conservation

Areas of Expertise Permitted  
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Geology and Soil,
2. Risk Assessment and Hazard Management





**APPENDIX C**  
**Air Quality including Wind Speed and Direction Results by TBS**  
**Co., Ltd.**



## 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)

### Air Quality Report

<b>Client</b> တိုင်းတာလိုသူ အမည်	<b>Esung Myanmar Co., Ltd.</b>	<b>Latitude</b> လတ္တီတွဒ်	16° 53' 27.95" N
<b>Project Location</b> စီမံကိန်းတည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	<b>Longitude</b> လောင်ဂျီတွဒ်	96° 14' 7.05" E
<b>Sampling Equipment</b> တိုင်းတာသည့် စက်ပစ္စည်း	AQM-09 Model	<b>Sampling Duration</b> တိုင်းတာသည့် ကြာချိန်	24-hour
<b>Project Number</b> စီမံကိန်းအမှတ်	TBS-202	<b>Station Height</b> (from ground) မြေပြင်မှ စက်တည်အမြင့်	5 ft / 1.5 m
<b>Start Date</b> တိုင်းတာသည့်နေ့ရက်	22.4.2022	<b>Sampling I.D</b> လေ့လာမှုအမှတ်စဉ်	TBS-063
		<b>End Date</b> ပြီးစီးသည့်နေ့ရက်	23.4.2022

### Air Sampling Results/ လေထုတိုင်းတာစမ်းသပ်မှုအဖြေ

No. စဉ်	Parameters တိုင်းတာသည့် အရာအသွေး	Result ရလဒ်	Unit ယူနစ်	Sampling Duration ယူနစ်ကြာချိန်	*Guideline value ထုတ်လွှတ်မှုစံနှုန်း	Avg.Period ပျမ်းမျှကာလ
1.	Carbon dioxide (CO <sub>2</sub> ) ကာဗွန်ဒိုင်အောက်ဆိုဒ်	391	ppm	24 hours	NG	-
2.	Carbon monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	254	µg/m <sup>3</sup>	24 hours	NG	-
3.	Methane (CH <sub>4</sub> ) မီသိန်း	154	ppm	24 hours	NG	-
4.	Nitrogen dioxide (NO <sub>2</sub> ) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	81.9	µg/m <sup>3</sup>	1 hour	200 µg/m <sup>3</sup>	1-hour
5.	Ozone (O <sub>3</sub> ) အိုဇွန်	24	µg/m <sup>3</sup>	8 hours	100 µg/m <sup>3</sup>	8-hour daily maximum
6.	Particulate Matter (PM <sub>10</sub> ) လေထုထဲရှိ အမှုန်အမွှား	29	µg/m <sup>3</sup>	24 hours	50 µg/m <sup>3</sup>	24-hour
7.	Particulate Matter (PM <sub>2.5</sub> ) လေထုထဲရှိ အမှုန်အမွှား	23	µg/m <sup>3</sup>	24 hours	25 µg/m <sup>3</sup>	24-hour
8.	Sulphur dioxide (SO <sub>2</sub> ) ဆာလဖာဒိုင်အောက်ဆိုဒ်	17	µg/m <sup>3</sup>	24 hours	20 µg/m <sup>3</sup>	24-hour
9.	Volatile Organic Compound (VOCs)	0	ppb	24 hours	NG	-
10.	Humidity (စိုထိုင်းစ)	64	%	24 hours	-	-
11.	Temperature (အပူချိန်)	32	°C	24 hours	-	-
12.	Wind Speed (လေတိုက်နှုန်း)	1.2	m/s	24 hours	-	-
13.	Wind Direction (လေတိုက်ရာအရပ်)	228	-	24 hours	-	-

\*National Environmental Quality Emission Guideline (2015)

NG= No Guideline

Remark: This air quality report cannot be edited without the permission of TBS.

Field Technician

Analyzed by

Reviewed by

U Htet Thiha Phone Myint  
Environmental Geologist

Daw Hnin Lai Win  
Environmental Manager

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.

## **APPENDIX D-1**

### **Water Quality Results by Alarm Ecological Laboratory**



## ALARM Ecological Laboratory

### Water Testing Result Report



Report Number: EL-WR-22-00242

Date: May 3, 2022

#### Client Information

Client Name : Total Business Solution Co.,Ltd  
Organization : E Sung Myanmar Co.,Ltd  
Client ID : -  
Registration Date & Time : 22.4.2022 ; 4:15 PM  
Contact : 09784181980  
Testing Purpose : For Standard

#### Sample Information

Sample ID : 7900  
Sample Name : Wastewater  
Sample Type / Source : Waste  
Sampling Date & Time : 22.4.2022 ; 2:30 PM  
Sample Location : East Dagon Industrial Zone  
Latitude : 16°53'30.05"N  
Longitude : 96°14'6.20"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	Emission Standards	Remarks
1	Turbidity <sup>3</sup>	6	FAU	-	-
2	TSS <sup>3</sup>	8	mg/L	≤50 <sup>d</sup>	Normal
3	Dissolved Oxygen <sup>2</sup>	4.5	mg/L	-	-
4	BOD <sub>5</sub> <sup>6</sup>	35	mg/L	≤ 50 <sup>d</sup>	Normal
5	COD <sup>3</sup>	42	mg/L	≤ 250 <sup>d</sup>	Normal
6	Free Cyanide <sup>3</sup>	< 0.01	mg/L	≤ 0.1 <sup>d</sup>	Normal
7	Total Phosphorous <sup>3</sup>	2.92	mg/L	≤2 <sup>d</sup>	Above the limit
8	Arsenic <sup>8</sup>	0.005	mg/L	≤ 0.1 <sup>d</sup>	Normal
9	Iron <sup>7</sup>	0.78	mg/L	≤ 3.5 <sup>d</sup>	Normal
10	Lead <sup>7</sup>	ND	mg/L	≤ 0.1 <sup>d</sup>	LOD = 0.1 mg/L
11	Total Nitrogen <sup>3</sup>	< 0.5	mg/L	-	-

"ND" = Not Detected

"LOD" = Lower limit of detection

" - " = No Reference Standard

Tested by

Checked by

Approved by

Daw May Myat Khine  
Lab. Technician II  
Ecological Laboratory  
ALARM

Daw Lin Myat Myat Aung  
Lab. Technician I  
Ecological Laboratory  
ALARM

Daw Aye Aye Win  
Laboratory In Charge  
Ecological Laboratory  
(ALARM)

## **APPENDIX D-2**

### **Water Quality Results by TBS Co., Ltd. (In-situ)**



## 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)

### Water Testing Result Form

ရေနမူနာစမ်းသပ်သည့်ရလဒ်

Client တိုင်းတာလိုသူ အမည်	Esung Myanmar Co., Ltd.	Testing Date/Time စမ်းသပ်သည့် နေ့ရက်/အချိန်	2:05PM 22.4.2022
Project Location စီမံကိန်း တည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	Testing ID စမ်းသပ်သည့် နံပါတ်	TBS - 003/2022
Testing Name စမ်းသပ်သည့်အမည်	Tap Water	Testing Type စမ်းသပ်သည့် အမျိုးအစား	Inlet Water
		Latitude/ Longitude လတ္တီကျု/ လောင်ဂျီကျု	16°53'30.07"N 96°14'6.17"E

Sr. စဉ်	Parameters တိုင်းတာသည့် နေရာ	Unit ယူနစ်	Result ရလဒ်	NEQEG Guideline	National Drinking Water Guideline		Water Testing Instrument	Remark
					Value	Units		
1.	PH	S.U	5.73	6.0-9.0	6.5-8.5	mg/L	Oakton PCTS Tester™ Waterproof Pocket Tester	
2.	Temperature	°F	102.5	-	-			
3.	TDS	ppm	160	-	1000	mg/L		
4.	Conductivity	µs/cm	311	-	-			
5.	Salinity	ppt	0.01	-	-			

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 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.





## 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)

### Water Testing Result Form

ရေနမူနာစမ်းသပ်သည့်ရလဒ်

Client တိုင်းတာလိုသူ အမည်	Esung Myanmar Co., Ltd.	Testing Date/Time စမ်းသပ်သည့် နေ့ရက်/အချိန်	2:05PM 22.4.2022
Project Location စီမံကိန်း တည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	Testing ID စမ်းသပ်သည့် နံပါတ်	TBS – 003/2022
Testing Name စမ်းသပ်သည့်အမည်	Wastewater	Testing Type စမ်းသပ်သည့် အမျိုးအစား	Outlet Water
		Latitude/ Longitude လတ္တီကျု/ လောင်ဂျီကျု	16°53'30.07"N 96°14'6.17"E

Sr. စဉ်	Parameters တိုင်းတာသည့် နေရာ	Unit ယူနစ်	Result ရလဒ်	NEQEG Guideline	National Drinking Water Guideline		Water Testing Instrument	Remark
					Value	Units		
1.	PH	S.U	5.66	6.0-9.0	6.5-8.5	mg/L	Oakton PCTS Tester™ Waterproof Pocket Tester	
2.	Temperature	°F	93.3	-	-			
3.	TDS	ppm	200	-	1000	mg/L		
4.	Conductivity	µs/cm	400	-	-			
5.	Salinity	ppt	0.02	-	-			

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 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.

## **APPENDIX E**

### **Noise Level Results by TBS Co., Ltd.**



## 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)

### Noise Measurement Result

Client တိုင်းတာလိုသူ အမည်	Esung Myanmar Co., Ltd.	Latitude လတ္တီတွဒ်	16°53'28.26" N
Project Location စီမံကိန်း တည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	Longitude လောင်ဂျီတွဒ်	96°14'6.67" E
Measurement Location တိုင်းတာသည့် တည်နေရာ	Inside of the Factory Compound	Sampling Duration တိုင်းတာသည့်ကြာချိန်	24-hour
Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Bentech GM - 1356	Project Number စီမံကိန်းအမှတ်	TBS-202
Start Date တိုင်းတာသည့်နေ့စွဲ	22.4.2022	End Date ပြီးစီးသည့်နေ့စွဲ	23.4.2022

Noise Results (dBA) per Hour			
Day Time (07:00Hr-22:00Hr)	Leq 1(Hour)	Night Time (22:00Hr-07:00Hr)	Leq 1(Hour)
7:00-8:00	59.7	22:00-23:00	47.6
8:00-9:00	66.4	23:00-00:00	41.4
9:00-10:00	64.2	00:00-01:00	40.8
10:00-11:00	65.0	01:00-02:00	40.4
11:00-12:00	58.7	02:00-03:00	40.7
12:00-13:00	59.5	03:00-04:00	41.0
13:00-14:00	59.9	04:00-05:00	41.7
14:00-15:00	58.2	05:00-06:00	44.5
15:00-16:00	60.7	06:00-07:00	54.9
16:00-17:00	58.8		
17:00-18:00	67.3		
18:00-19:00	57.7		
19:00-20:00	54.0		
20:00-21:00	52.7		
21:00-22:00	49.1		
Day Time (AVG)	59.5	Night Time (AVG)	43.7
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.

## **APPENDIX F**

### **Vibration Level Results by TBS Co., Ltd.**



## TOTAL BUSINESS SOLUTION CO., LTD.

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Client တိုင်းတာလိုသူ အမည်	Esung Myanmar Co., Ltd.	Date တိုင်းတာသည့် နေ့ရက်	22 <sup>nd</sup> – 23 <sup>rd</sup> April, 2022
Project Location စီမံကိန်း တည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	Monitoring Period တိုင်းတာသည့် ကြာချိန်	24-hour
Measurement Location တိုင်းတာသည့် တည်နေရာ	Within Project Site	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Vibration Level
Project Number စီမံကိန်းအမှတ်	TBS-202	Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Nomis Seismograph (Mini Supergraph II)
		Latitude/ လတ္တီကျု	16°53'28.39"N
		Longitude/ လောင်ဂျီကျု	96°14'6.43"E

Station ဂြိုဟ်	Result ရလဒ်		
	Direction ဦးတည်ချက်	Frequency ကြိမ်နှုန်း (Hz)	Peak particle velocity အလျင် (mm/s)
V1	Radial	41.23	0.42
	Transverse	24.95	0.21
	Vertical	7.97	0.47
German standard DIN 4150-3			
Type	Peak Particle Velocity (mm/s)		
	4-8 Hz	8-30 Hz	30-100 Hz
Commercial	20	20-40	40-50
Residential	5	5-15	15-20
Very sensitive	3	3-8	8-10

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.



## TOTAL BUSINESS SOLUTION CO., LTD.

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Client တိုင်းတာလိုသူ အမည်	Esung Myanmar Co., Ltd.	Date တိုင်းတာသည့် နေ့ရက်	22.4.2022
Project Location စီမံကိန်း တည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	Start Time/ စတင်သည့်အချိန်	9:15AM
Measurement Location တိုင်းတာသည့် တည်နေရာ	Inside the Factory	End Time/ ပြီးစီးသည့်အချိန်	11:30AM
Project Number စီမံကိန်းအမှတ်	TBS-202	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Portable Vibration
		Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	BENETECH GM63B

No. စဉ်	Site Description တိုင်းတာသည့် နေရာ	Location/တည်နေရာ		Result ရလဒ်	Unit ယူနစ်
		Latitude/ လတ္တီကျု	Longitude/ လောင်ဂျီကျု		
1.	Cutting Machine (Webbing)	16°53'28.62"N	96°14'6.20"E	0.13	mm/s
2.	Finishing Machine (2 needles)	16°53'28.89"N	96°14'5.86"E	04.4	mm/s
3.	Finishing Machine (Bar Tack)	16°53'28.94"N	96°14'5.79"E	05.0	mm/s
4.	Air Compressor	16°53'28.84"N	96°14'6.18"E	00.4	mm/s
5.	Cutting Machine (Cargo net)	16°53'28.64"N	96°14'6.51"E	1.07	mm/s

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Field Technician

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Environmental Geologist

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Environmental Manager

Reviewed by

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Managing Director

HNIN LAI WIN  
Environmental Manager  
Total Business Solution Co., Ltd.

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



## **APPENDIX G**

### **Light Measurement Results by TBS Co., Ltd.**



## TOTAL BUSINESS SOLUTION CO., LTD.

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Client တိုင်းတာလိုသူ အမည်	Esung Myanmar Co., Ltd.	Date တိုင်းတာသည့် နေ့ရက်	22.4.2022
Project Location စီမံကိန်း တည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	Start Time/ စတင်သည့်အချိန်	9:15AM
Measurement Location တိုင်းတာသည့် တည်နေရာ	Inside the Factory	End Time/ ပြီးစီးသည့်အချိန်	11:30AM
Project Number စီမံကိန်းအမှတ်	TBS-202	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Light
		Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Victor 1010A

No. စဉ်	Site Description တိုင်းတာသည့် နေရာ	Location/တည်နေရာ		Result ရလဒ်	Unit ယူနစ်
		Latitude/ လတ္တီကျု	Longitude/ လောင်ဂျီကျု		
1.	Warehouse (Ground Floor)	16°53'29.83"N	96°14'6.33"E	135	Lux
2.	Pattern Cutting	16°53'29.08"N	96°14'5.77"E	293	Lux
3.	Finishing Section 1	16°53'29.21"N	96°14'6.31"E	207	Lux
4.	Finishing Section 3	16°53'29.11"N	96°14'6.54"E	150	Lux
5.	QC Room (Ground Floor)	16°53'28.92"N	96°14'6.82"E	185	Lux
6.	Packing	16°53'29.10"N	96°14'7.01"E	425	Lux
7.	Warehouse (1st Floor)	16°53'29.87"N	96°14'6.26"E	260	Lux
8.	QC Room (1st Floor)	16°53'28.74"N	96°14'6.73"E	285	Lux
9.	Office	16°53'28.74"N	96°14'7.20"E	286	Lux

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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.

## **APPENDIX H**

### **Temperature Measurement Results by TBS Co., Ltd.**



## TOTAL BUSINESS SOLUTION CO., LTD.

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Client တိုင်းတာလိုသူ အမည်	Esung Myanmar Co., Ltd.	Date တိုင်းတာသည့် နေ့ရက်	22.4.2022
Project Location စီမံကိန်း တည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	Start Time/ စတင်သည့်အချိန်	9:15AM
Measurement Location တိုင်းတာသည့် တည်နေရာ	Inside the Factory	End Time/ ပြီးစီးသည့်အချိန်	11:30AM
Project Number စီမံကိန်းအမှတ်	TBS-202	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Temperature
		Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Infrared Thermometer

No. စဉ်	Site Description တိုင်းတာသည့် နေရာ	Location/တည်နေရာ		Result ရလဒ်	Unit ယူနစ်
		Latitude/ လတ္တီကျု	Longitude/ လောင်ဂျီကျု		
1.	Warehouse (Ground Floor)	16°53'29.83"N	96°14'6.33"E	34	°C
2.	Pattern Cutting	16°53'29.08"N	96°14'5.77"E	34.3	°C
3.	Finishing Section 1	16°53'29.21"N	96°14'6.31"E	34	°C
4.	Finishing Section 3	16°53'29.11"N	96°14'6.54"E	34	°C
5.	QC Room (Ground Floor)	16°53'28.92"N	96°14'6.82"E	33.1	°C
6.	Packing	16°53'29.10"N	96°14'7.01"E	33	°C
7.	Warehouse (1st Floor)	16°53'29.87"N	96°14'6.26"E	34.5	°C
8.	QC Room (1st Floor)	16°53'28.74"N	96°14'6.73"E	34	°C
9.	Office	16°53'28.74"N	96°14'7.20"E	30	°C

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Field Technician

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Environmental Geologist

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Environmental Manager

Reviewed by

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Managing Director

HNIN LAI WIN  
Environmental Manager  
Total Business Solution Co., Ltd.

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

## **APPENDIX I**

### **Traffic Counting Results by TBS Co., Ltd**



## TOTAL BUSINESS SOLUTION CO., LTD.

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Client တိုင်းတာလိုသူ အမည်	Esung Myanmar Co., Ltd.	Date တိုင်းတာသည့် နေ့ရက်	28.4.2022
Project Location စီမံကိန်း တည်နေရာ	No. (149/1-6), Ka Naung Min Thar Gyi Street, East Dagon Industrial Zone, East Dagon Township, Yangon, Myanmar.	Start Time/ End Time စတင်သည့်အချိန်/ ပြီးစီးသည့်အချိန်	7:00AM to 7:00PM
Project Number စီမံကိန်းအမှတ်	202	Sampling Type တိုင်းတာသည့် အမျိုးအစား	Traffic Counting
		Sampling Equipment တိုင်းတာသည့် စက်ပစ္စည်း	Manually

No. စဉ်	Site Description တိုင်းတာသည့် နေရာ	Location/တည်နေရာ		Total Traffic Volume Result ရလဒ်	Traffic Capacity Ratio (V/C)	Nature of Flow လမ်းအခြေအနေ
		Latitude လတ္တီကျု	Longitude လောင်ဂျီကျု			
3.	TC-A	16° 53' 33.57" N	96° 14' 16.77" E	1,257	0.22	Free flow
4.	TC-B	16° 53' 33.95" N	96° 14' 15.18" E	1,153	0.22	Free flow

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Field Technician

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Environmental Geologist

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Reviewed by

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## **APPENDIX J**

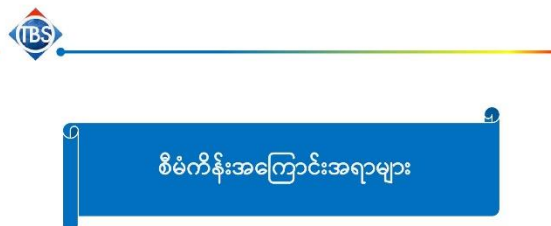
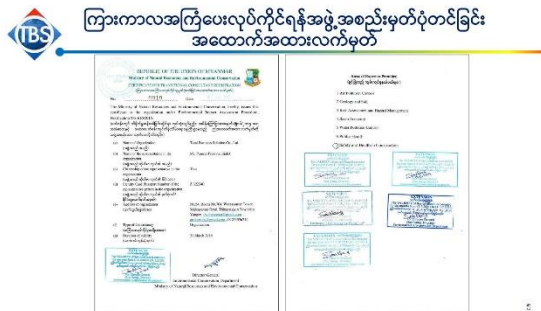
### **Powerpoint Presentation Slide for PCM**



- ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ပြုလုပ်ရခြင်း၏ရည်ရွယ်ချက်**
- ❖ အဆိုပြု စီမံကိန်းကြောင့် ဖြစ်ပေါ်နိုင်သော ပတ်ဝန်းကျင် နှင့် လူမှုရေးဆိုင်ရာသက်ရောက် ထိခိုက်မှုများကို ကြိုတင်သတ်မှတ်၍ ခန့်မှန်းအကဲဖြတ်နိုင်ခြင်း။
  - ❖ ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာသက်ရောက်မှုများအပေါ် သက်ရောက်နိုင်မည့် ဆိုးကျိုးများကို လျော့ချနိုင်ရန် နည်းလမ်းအစီအစဉ်များ ရေးဆွဲနိုင်ခြင်း။
  - ❖ စီမံကိန်းမှ ထွက်ရှိသော ပတ်ဝန်းကျင် အရည်အသွေးများကို တိုင်းတာပြီး ရရှိလာသည့် ရလဒ်များကိုအမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး(ထုတ်လွှတ်မှု)လမ်းညွှန်ချက်များ (၂၀၁၅) ဖြင့် ကိုက်ညီစွာဆောင်ရွက်ပြီး ပတ်ဝန်းကျင်ထိခိုက်မှု လျော့ပါးအောင် ပြုလုပ်ရန်။
  - ❖ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းများ ပြုလုပ်ပြီး အကြံပြုချက်သဘောထားများကို ရယူခြင်း။

- ဆွေးနွေးတင်ပြမည့် အကြောင်းအရာများ**
- ❖ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ပြုလုပ်ရခြင်း၏ ရည်ရွယ်ချက်။
  - ❖ စီမံကိန်းအကြောင်းအရာကို တင်ပြခြင်း။
  - ❖ ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များ လေ့လာခြင်းနှင့် တွေ့ရှိချက်များကို တင်ပြခြင်း။
  - ❖ စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်အပေါ် အကျိုးသက်ရောက်မှုများအား အကဲဖြတ်ဆန်းစစ်ခြင်း။
  - ❖ သက်ရောက်မှုလျော့ချရေး အစီအစဉ်များကို တင်ပြခြင်း။
  - ❖ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု နှင့် ဓာတ်ပုံယာဉ်သုံး အဖုံးအမျိုးမျိုး ချုပ်လုပ်ခြင်း အစီအစဉ်များကို တင်ပြခြင်း။

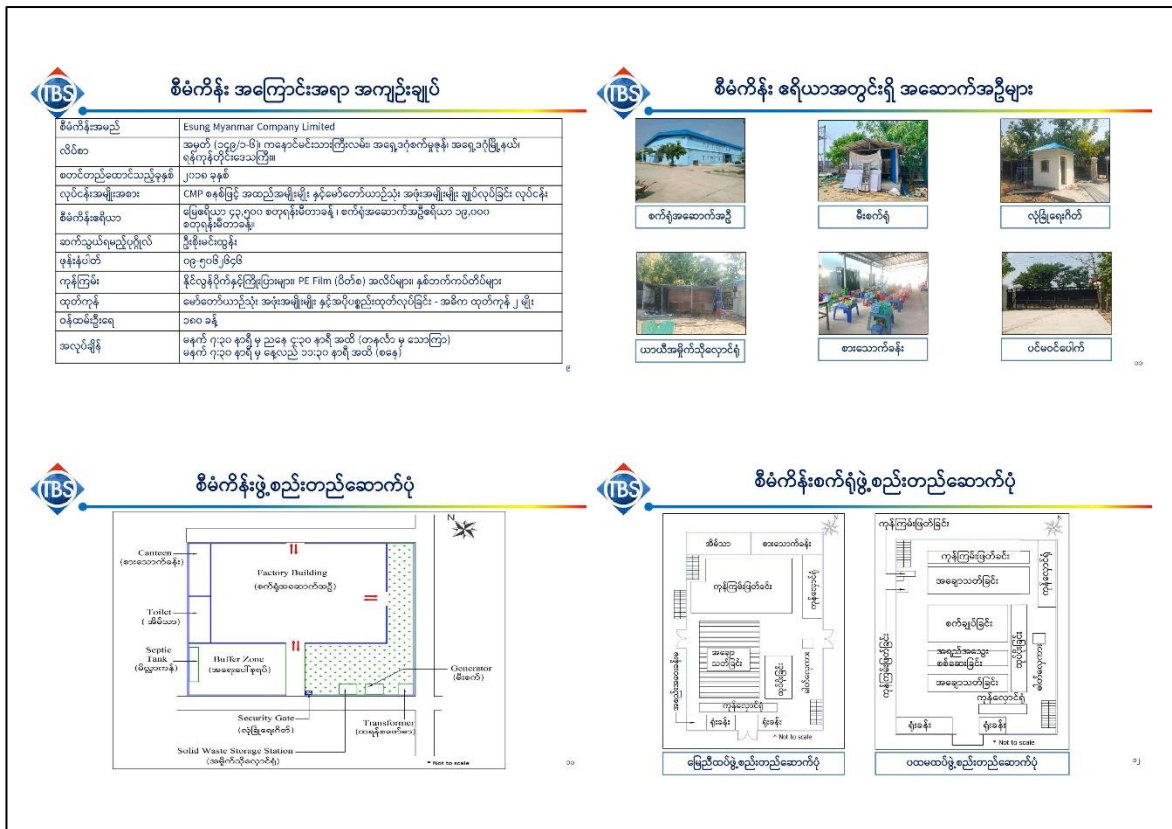
- TOTAL BUSINESS SOLUTION CO., LTD**
- ❖ ၂၀၁၂ ခုနှစ်တွင် စတင်တည်ထောင်ခဲ့ပါသည်။
  - ❖ TBS မှ တာဝန်ယူဆောင်ရွက် ဖူးသော လုပ်ငန်းများ မှာ
    - ✓ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းများ
    - ✓ ဘူမိအင်ဂျင်နီယာဆိုင်ရာ လုပ်ငန်းများ
    - ✓ ဆောက်လုပ်ရေးဆိုင်ရာ စီမံခန့်ခွဲမှု နှင့် စစ်ဆေးရေးလုပ်ငန်းများ
    - ✓ သတ္တုတူးဖော်ရေး အစီအစဉ် နှင့် သတ္တုတွင်းပိတ်သိမ်းရေး လုပ်ငန်း များ



**စီမံကိန်းတည်နေရာ**

- ❖ အမှတ်(၁၄၆/၆) ကမောင်မင်းသာကြီးလမ်း အရွာအုပ်စုနယ်အရွာအုပ်မြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။
- ❖ မြောက်လတ္တီတွဒ် ၁၆° ၅၃' ၃၈.၈၈" နှင့် အရှေ့လောင်ဂျီတွဒ် ၉၆° ၁၄' ၂၁.၆" ကြားတွင်တည်ရှိသည်။
- ❖ စုစုပေါင်းမြေဧရိယာ (၁၅)ဧက မှ (၁၈၈၁၆) အပိုင်းအမှတ် (၆) ကို (၇) နှစ်စာချုပ်ဖြင့် ငှားရမ်းခဲ့ပါသည်။

စီမံကိန်းတည်နေရာ





### လျှပ်စစ်စွမ်းအင် အသုံးပြုမှုများ

❖ လုပ်ငန်းဆောင်ရွက်ခြင်းအတွက် လျှပ်စစ်ဓာတ်အားကို ဖြန့်ချိသော လျှပ်စစ်ဓာတ်အားလိုင်းမှ ၄၀၀ ဂေ့အား အသုံးပြုသော ထရန်စဖော်မာဖြင့် ရယူသုံးစွဲမည် ဖြစ်ပါသည်။

❖ အရေးပေါ်အခြေအနေနှင့် လျှပ်စစ်ဓာတ်အား ပြတ်တောက်ချိန်တွင် ၁၀၀ ဂေ့အား (၈၀-ကီလိုဝပ်) အသုံးပြုသော ဒီဇယ်လောင်စာသုံး မီးစက် ကို တပ်ဆင်သုံးစွဲမည် ဖြစ်ပါသည်။

❖ မီးစက်အတွက် လောင်စာလိုအပ်ချက်မှာ လျှပ်စစ် ဓာတ်အား ရရှိမှုပေါ် အခြေခံ၍ တစ်ပတ်လျှင် ပျမ်းမျှ ဒီဇယ် ၂၂၀ လီတာခန့် ဖြစ်ပါသည်။



၄၀၀ ဂေ့အား ထရန်စဖော်မာ



ဒီဇယ်လိုဗာင်ပုံ

### စွန့်ပစ်အမှိုက်

❖ လုပ်ငန်းလည်ပတ်စဉ် ထွက်ရှိသော အမှိုက်များ

- ✓ ကုန်ကြမ်းပြုတ်စ ရွန့်ပစ်အမှိုက်များ

❖ ဝန်ထမ်းများ အသုံးပြုသော အမှိုက်များ

- ✓ ရေသူများ စားကြွင်းစားကျန်များ၊ ပလတ်စတစ်အိတ်များ၊ ရေဘူးခွံများ ထွက်ရှိနိုင်ပါသည်။

❖ အန္တရာယ်ရှိသော စွန့်ပစ်အမှိုက်များ

- ✓ စက်သုံးဆီအကြွင်းအကျန်များ၊ ဘတ္တရီအဟောင်းများ နှင့် မီးချောင်းများ။
- ✓ IGES (ရွန်လ၊ ၂၀၁၆) အရ လူတစ်ဦး၏ အမှိုက်စွန့်ပစ်မှုမှာ တစ်နေ့လျှင် ၀.၄ ကီလိုဂရမ် ခန့်ဖြစ်၍ဝန်ထမ်းဦးရေ ၁၈၀ ခန့်မှ အမှိုက်စွန့်ပစ်မှုမှာ တစ်နေ့လျှင် ၈၀ ကီလိုဂရမ် ခန့်ထွက်ရှိနိုင်ပါသည်။




စွန့်ပစ်အမှိုက်များ

### မီးဘေးအန္တရာယ်အတွက် စီစဉ်ထားရှိမှု

❖ မီးငြိမ်းသတ်ရေး အထောက်အကူပြု ပစ္စည်းများအနေဖြင့် မီးသတ်ဆေးဘူး ၁၃ ဘူး၊ မီးသတ်ရေဂိုက်ခေါင်း ၂ ခု၊ မီးသတ်ရေဂိုက် ၆ ခု တို့ကို စီစဉ်ထားရှိပါသည်။

❖ ၎င်းအပြင် ဂျက်နီတွင်း အရေးပေါ် မီးငြိမ်းသတ်ရန်အတွက် အပူချိန်အာရုံခံကိရိယာပါသော အလိုအလျောက် ရေပြန်စနစ်ကို တပ်ဆင်ထားရှိပါသည်။

❖ မိမိတို့နီးလီယာအတွင်း စက်ရုံများမှာစာရို ၆,၆၀၀ တွေ့ရန်စီတင်ခန့် ကျယ်ဝန်းသော မြေနေရာအလွတ်ကို အရေးပေါ်ရေရပ်အဖြစ်အသုံးပြုနိုင်ရန် ပြုပြင် ဆောင်ရွက် သွားမည်ဖြစ်ပါသည်။

❖ ဝန်ထမ်းများကိုလည်း မီးသတ်ပစ္စည်းများ ကျွမ်းကျင်စွာ အသုံးပြုနိုင်ရန် လေ့ကျင့်သင်ကြားပေးသွားပါမည်။



မီးသတ်ရေဂိုက်ခေါင်း



ရေပြန်စနစ်



မီးသတ်ရေဂိုက်

### စွန့်ပစ်ရေဆိုးများ

❖ ကုန်ထုတ်လုပ်ငန်းတွင်ရေအသုံးပြုမှုမရှိသဖြင့်စွန့်ပစ်ရေဆိုးမထွက်ပါ။

❖ ဝန်ထမ်းများအသုံးပြုရာမှ ထွက်ရှိလာသော စွန့်ပစ်ရေများကို စက်ရုံဧရိယာအတွင်းရှိ ရေနုတ်မြောင်းများမှတစ်ဆင့် စည်ပင်ချေငြိမ်းသို့ စွန့်ထုတ်ပါသည်။

❖ ရေပေါင်းသန့်စင်ခန်း ၁၂ လုံးထားရှိပြီး မိလ္လာကန် ၁ ကန် ရှိပါသည်။

❖ မိလ္လာကန်မှထွက်ရှိသော အညစ်အကြေးများကို ရန်ကုန်မြို့တော် စည်ပင်သာယာရေးကော်မတီ နှင့် ချိတ်ဆက်ပြီး ပုံမှန်စွန့်ပစ်မည် ဖြစ်ပါသည်။

❖ U.S.EPA. (1978) အရ လူတစ်ဦး၏ ရေအသုံးပြုမှုမှာ တစ်နေ့လျှင် ၁၅၀ လီတာ ခန့် ရှိနိုင်ပါသည်။ ထို့ကြောင့် ဝန်ထမ်း ၁၈၀ ခန့်မှ ထွက်ရှိလာသောစွန့်ပစ်ရေပမာဏမှာ တစ်နေ့လျှင် ၂၇,၀၀၀ လီတာခန့် ရှိနိုင်ပါသည်။



ရေနုတ်မြောင်း



သန့်စင်ခန်း



မိလ္လာကန်

### ဝန်ထမ်းများအတွက် စီစဉ်ထားရှိမှု

❖ စီမံကိန်းလုပ်ငန်းအတွက် လိုအပ်သောလုပ်ငန်းများတွင် တာဝန်ထမ်းဆောင်ရန် ဒေသခံများကို ဦးစားပေးခန့်အပ်ခြင်း။

❖ အသိပညာတိုးတက်ရေးအတွက် သင်တန်းများ တက်ရောက်စေခြင်း။

❖ လုပ်ငန်းကျွမ်းကျင်မှုဆိုင်ရာ နှင့် နည်းပညာဆိုင်ရာများ လေ့ကျင့်သင်ကြားပေးခြင်း။

❖ နာမကျန်ဖြစ်ပါက အရေးပေါ်ကုသနိုင်ရန်အတွက် ဆေးနှင့်ဆေးအထောက်အကူပြုပစ္စည်းများ ကိုလည်း လုပ်ငန်းနေရာတွင် ထားရှိပေးခြင်းအပြင်၊ လိုအပ်ပါက ဆေးခန်းသို့ ပို့ဆောင်ပေးခြင်း။

❖ အလုပ်တာဝန်ပေါ် မူတည်ပြီး လိုအပ်သော တစ်ကွက်လုံးလုံးအကာအကွယ်ပစ္စည်းများ ပံ့ပိုးပေးခြင်း။

❖ လုပ်ငန်းစွမ်းဆောင်ရည်ပေါ် မူတည်ပြီး နှစ်စဉ်အပိုဆုများ ချီးမြှင့်ခြင်း။

❖ ဝန်ထမ်းများအတွက် အခြားသောလိုအပ်ချက်များရှိပါက လုပ်ငန်းအခြေအနေပေါ်မူတည်၍ ဖြည့်ဆည်း ဆောင်ရွက်ပေးသွားမည် ဖြစ်ပါသည်။

### ပတ်ဝန်းကျင်အရည်အသွေးတိုင်းတာသည့်နယ်ပယ်များ

❖ မြေအသုံးချမှု

❖ လေထုအရည်အသွေး တိုင်းတာခြင်း

❖ ရေထုအရည်အသွေး တိုင်းတာခြင်း

❖ ဆူညံသံ တိုင်းတာခြင်း

❖ အလင်း နှင့် အပူချိန် တိုင်းတာခြင်း

❖ တုန်ခါမှု တိုင်းတာခြင်း

### ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံ အချက်အလက်များ တင်ပြခြင်း

### မြေအသုံးချမှု လေ့လာခြင်း

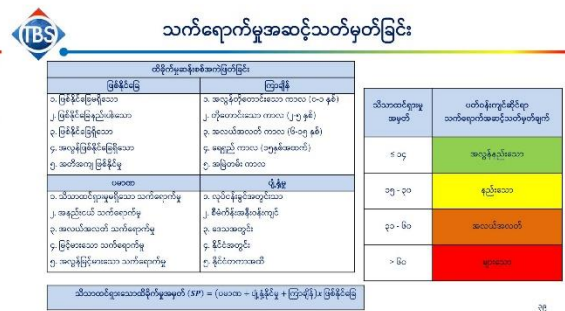
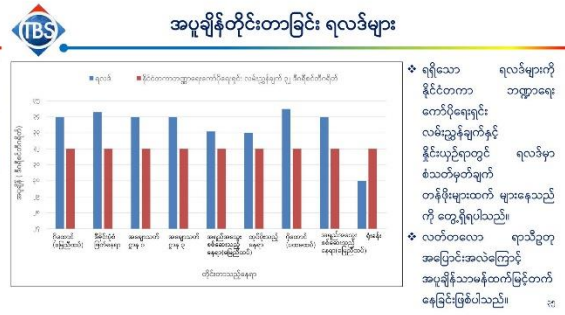


ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံ အချက်အလက်များ တင်ပြခြင်း

စဉ်	အမည်	ဧရိယာ (ဟက်တာ)	ရာခိုင်နှုန်း (%)
၁။	မြေလွတ် မြေရိုင်း	၁၁.၇၆	၁၄.၉၄
၂။	စီးပွားရေး နယ်မြေ	၈.၁၇	၁၀.၃၇
၃။	အစိုးရပိုင်နယ်မြေ	၄.၂၈	၅.၄၃
၄။	စက်မှုဇုန်နယ်မြေ	၃၄.၁၈	၄၃.၄၀
၅။	အပန်းဖြေနေရာ	၃.၁၇	၄.၀၀
၆။	လူနေဧရိယာ	၁၀.၈၇	၁၃.၇၉
၇။	လမ်းခရီးယာ	၅.၁၈	၆.၅၇
၈။	ရေထုထည်	၁၃.၉၈	၂၁.၂၂
စုစုပေါင်း		၇၈.၇၁	၁၀၀









**TOTAL BUSINESS SOLUTION CO., LTD.**

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်

[illegible]

<div>  <div> <b>လူမှုအကျိုးတူ ပူးပေါင်းပါဝင်မှု နှင့် ဒေသဖွံ့ဖြိုးရေးအတွက် ပါဝင်မည့် အစီအစဉ်များ</b> </div> </div>			
လူမှုအကျိုးတူ ပါဝင်မည့် အစီအစဉ်အမျိုးအစား	ဆောင်ရွက် မည့်အမျိုးအစား	ထည့်ဝင်မည့် နှစ် (ကုဒ်)	လူမှုပူးပေါင်းမှု
ကုန်သွယ်ရေး	<ul style="list-style-type: none"> <li>ဆေးလုပ်ငန်းများမှ ဆေးလုပ်ငန်းများထွက် အစားအသောက်များ</li> <li>ကုန်သွယ်ရေး ပြောင်းလဲမှု အစားအသောက် နှင့် လူမှုပူးပေါင်းမှု အသိပညာများ ပြုစုပေးခြင်း</li> </ul>	၂၀၁၀.၀၈.၀၁	<ul style="list-style-type: none"> <li>စီမံကိန်းလုပ်ငန်းတွင် လူပုဂ္ဂိုလ်ကပါဝင်သောလုပ်ငန်းများ ကုန်သွယ်ရေး အစားအသောက် ဖန်တီးမှုများ</li> </ul>
ပညာရေး	<ul style="list-style-type: none"> <li>စာပေ၊ စာအုပ်များအတွက် လိုအပ်သော အရာတွင် အလုပ်လုပ်ဆောင်ခြင်း</li> </ul>	၂၀၁၀.၀၈.၀၁	<ul style="list-style-type: none"> <li>ပိုမိုကောင်းမွန်သော လူမှုအသိပညာ ဖြန့်ချိပေးခြင်း</li> <li>လူပုဂ္ဂိုလ်၏ ပညာရေး ပြုစုပေးခြင်း</li> </ul>
ဒေသဖွံ့ဖြိုးရေး	<ul style="list-style-type: none"> <li>လူမှုပူးပေါင်းမှုများ</li> <li>စီမံကိန်းလုပ်ငန်းများတွင် ပါဝင်မှုပေးခြင်း</li> <li>လူပုဂ္ဂိုလ်၏ ဖွံ့ဖြိုးရေး အစီအစဉ်များ</li> <li>ဆေးလုပ်ငန်းများ</li> </ul>	၂၀၁၀.၀၈.၀၁	<ul style="list-style-type: none"> <li>ဒေသတွင်း လူပုဂ္ဂိုလ်ကပါဝင်သော ဒေသအဖွဲ့အစည်းများ</li> <li>ကောင်းမွန်သောလုပ်ငန်းများ</li> <li>ဒေသတွင်းလူပုဂ္ဂိုလ်ကပါဝင်သော အစားအသောက် ဖွံ့ဖြိုးမှုများ</li> <li>အစားအသောက်များတွင် လူပုဂ္ဂိုလ်ကပါဝင်မှုများ</li> <li>လူပုဂ္ဂိုလ်၏ ဖွံ့ဖြိုးရေး အစီအစဉ်များ</li> <li>လူပုဂ္ဂိုလ်၏ ဖွံ့ဖြိုးရေး အစီအစဉ်များ</li> <li>လူပုဂ္ဂိုလ်၏ ဖွံ့ဖြိုးရေး အစီအစဉ်များ</li> </ul>

ကျေးဇူးတင်ပါသည်။