







Initial Environmental Examination Report

Pun Hlaing Lodge Hotel Development,

Hlaing Tharya Township, Yangon, Union of Myanmar

SLP Environmental

SLP Environmental Co., Ltd.

PHL Hotel Management Limited

Final - Rev 2

2nd January 2020

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	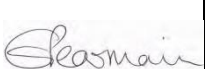	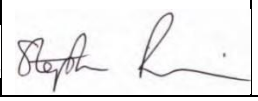	

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SLP Environmental Co., Ltd
10/109, Floor 8
The Trendy Office Building
Sukhumvit Soi 13
Klong Toei Nua, Wattana
Bangkok, 10110
Thailand

Email: info@slpenvironmental.com
Website: www.slpenvironmental.com

စကားချီး။

ယခုတင်ပြသည့် IEE Report (Initial Environmental Examination – IEE) သည်မူလတင်ပြခဲ့သည့် IEE Report အပေါ် ဂန်ကြီးဌာန၏ သဘော ထားမှတ်ချက်ဖြင့်ညှိနှိုင်းထားသည့်အချက်များအရ ပြန်လည်ပြင်ဆင် ရေးသားတင်ပြ ထားခြင်းဖြစ်ပါသည်။

ယခုအခါစီမံကိန်းသည် ဆောက်လုပ်ရေးလုပ်ငန်းများကို ရည်မှန်းချက်အတိုင်းဆောက်လုပ်ပြီးစီး၍လုပ်ငန်းလည် ပတ်သည့်အဆင့်ရောက်လျက်ရှိပါသည်။

ဂန်ကြီးဌာန၏လုပ်ငန်းစဉ်များ ဂန်ထုတ်ဂန်ပိုးလျော့ချစေနိုင်ရန်အတွက်သော်၄င်း၊ လုပ်ငန်းစဉ်များမကြန့်ကြာ စေ ရန်အတွက်၄င်း၊ လိုအပ်ချက်များ ကို ညှိနှိုင်းမှုပေးနိုင်ပါရန် အကြံပြုတင်ပြအပ်ပါသည်။

ယခုအစီရင်ခံစာအပေါ် တင်ပြချက် အကျဉ်းချုပ်။

ယခုအစီရင်ခံစာတွင် အပိုင်း ၂ ပိုင်းပါရှိပြီး၊ အပိုင်း(က) သည် သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်း ရေးဝန်ကြီးဌာန၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ သဘောထားမှတ်ချက်၊ လိုက်နာဆောင်ရွက်ရန် ညှိနှိုင်းချက်နှင့် ယင်းတို့အပေါ် လိုက်နာဆောင်ရွက်ထားမှုများကို တင်ပြသည့် အစီရင်ခံစာဖြစ်ပါသည်။

အပိုင်း(ခ)သည် မူလအစီရင်ခံစာအပေါ်ပြင်ဆင်ရန်အကြံပြုထားသည့် အပိုင်းများတွင် မည်သို့ ပြန်လည် ဖြည့် စွပ်ထားသည်ကို သိရှိစေရန် တင်ပြထားခြင်းဖြစ်သည်။

သို့ဖြစ်ပါသဖြင့် ယခုအစီရင်ခံစာသည် ဦးစီးဌာန၏ ညှိနှိုင်းချက်အရ မူလအစီရင်ခံစာအပေါ် ပြန်လည်ဖြည့်စွပ်၊ လိုက်နာတင်ပြထားသည့်အစီရင်ခံစာဖြစ်ပါသည်။

မာတိကာ

(၁) အစီရင်ခံစာအပိုင်း (က)

သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ ရုံးအမှတ် (၅၃) နေပြည်တော်၏ ၁၂-၁၁-၂၀၁၈ ရက်နေ့စွဲပါ စာအမှတ်၊ အီးအိုင်အေ-၁/ဂ(၁၇၄၃/၂၀၁၈) ဖြင့် ပေးပို့ ခဲ့သည့် ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာ (IEE Report) အပေါ် သဘောထားမှတ်ချက်၊ လိုက်နာ ဆောင်ရွက်ရန်ညှိနှိုင်းချက်များနှင့် ယင်းတို့အပေါ် လိုက်နာဆောင်ရွက်ထားမှုများ၊

(၂) အစီရင်ခံစာအပိုင်း (ခ)

(မူလအစီရင်ခံစာအပေါ် ပြင်ဆင်တင်ပြထားရှိမှု)

သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင် ထန်းသိမ်းရေးဝန်ကြီးဌာန၏ သဘောထားမှတ်ချက်နှင့် လိုက်နာဆောင် ရွက်ရန်၊ ညှိနှိုင်းချက်နှင့် ယင်းအပေါ် လိုက်နာဆောင်ရွက်ထားမှုများ။

(၃) နောက်ဆက်တွဲများ။

အစီရင်ခံစာအပိုင်း (က)

(၁) သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဝန်ကြီးဌာန၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီး ဌာန၏ ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်းအစီရင်ခံစာ (IEE Report) အပေါ် သဘောထားမှတ်ချက်၊

သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ ၁၂-၁၁- ၂၀၁၈ ရက်နေ့စွဲပါ စာအမှတ်၊ အီးအိုင်အေ-၁/ဂ(၁၇၄၃/၂၀၁၈)

(၂) သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဝန်ကြီးဌာန၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီး ဌာန၏ ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်းအစီရင်ခံစာ (IEE Report) အပေါ် သဘောထားမှတ်ချက်၊ လိုက်နာဆောင်

ရွက်ရန်ညွှန်ကြားချက်များအပေါ် ကုမ္ပဏီဘက်မှ လိုက်နာဆောင်ရွက်ထားချက်များ၊
ရည်ညွှန်းချက်။ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊ ပတ်ဝန်းကျင်ထိန်း သိမ်းရေးဦး စီးဌာန၏ ၁၂-၁၁-၂၀၁၈ ရက်နေ့စွဲပါ စာအမှတ်၊ အီးအိုင်အေ-၁/ဂ(၁၇၄၃/၂၀၁၈)။

ရည်ညွှန်းချက်ပါ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာနရုံး၏ စာအရပေးပို့လာသည့် သဘောထား မှတ်ချက် နှင့်အညီ ပြင်ဆင်ဖြည့်စွက်ရေးဆွဲ၍ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ ပြန်လည်တင်ပြရန် ညွှန်ကြား ချက် အားအောက်ပါအတိုင်းလိုက်နာတင်ပြအပ်ပါသည်။

သုံးသပ်အကြံပြုချက်များအပေါ် လိုက်နာဆောင်ရွက်ထားရှိမှု

စဉ်	သုံးသပ်အကြံပြုချက်များ	လိုက်နာဆောင်ရွက်ထားရှိမှု	စာမျက်နှာ
(က)	**အစီရင်ခံစာအကျဉ်းချုပ်**		
	-Executive Summary တွင် ကနဦး ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းမှ တွေ့ရှိရသည့် သိသာထင်ရှားသော ထိုပြဿနာများ၊ လူမှုပတ်ဝန်းကျင်အား အဓိကသက်ရောက်မှုများ၊ ထိုပြဿနာများ/သက်ရောက်မှုများကို လျော့ပါးသက်သာစေမည့်နည်းလမ်းများနှင့် စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရမည့် အစီအစဉ်များ၊ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးမှု ရလဒ်များစသည်တို့ကို အကျဉ်းချုပ်ဖော်ပြရန်။ - အစီရင်ခံစာအကျဉ်းချုပ်အား မြန်မာ-အင်္ဂလိပ် နှစ်ဘာသာရောနှောရေးသားဖော်ပြခြင်းမပြုဘဲ သီးခြားစီ ခွဲခြားဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg. 20 - 32
(၂)	**ကတိကဝတ်**		
	-အစီရင်ခံစာသည် တိကျခိုင်မာကြောင်း နှင့် ပြည့်စုံကြောင်း၊ သက်ဆိုင်ရာဥပဒေ၊ နည်းဥပဒေများနှင့် လုပ်ထုံးလုပ်နည်းများကို လိုက်နာ ဆောင်ရွက်မည်ဖြစ်ကြောင်း ကတိဝန်ခံချက်ကို လက်မှတ်ရေးထိုးဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg. 213 Plate: 43
(၃)	**မူဝါဒ၊ ဥပဒေနှင့် အဖွဲ့အစည်းဆိုင်ရာ မူဘောင်များ**		
(က)	-စီမံကိန်းမှ အဓိကလိုက်နာဆောင်ရွက်မည့် ဥပဒေ၊ နည်းဥပဒေ၊ လုပ်ထုံးလုပ်နည်းများကို ထည့်သွင်းဖော်ပြရန်၊ -အစီရင်ခံစာတွင် မြန်မာ့ဟိုတယ်နှင့် ခရီးသွားလာရေးဥပဒေ (၁၉၉၃)၊ အမျိုးသားပတ်ဝန်းကျင်အရည်အသွေး (ထုတ်လွှတ်မှု)၊ စံချိန်စံညွှန်း၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံး လုပ်နည်း ပုဒ်မ ၁၀၂၊ ၁၀၃၊ ၁၀၄၊ ၁၀၅၊ ၁၀၆၊ ၁၀၇၊ ၁၀၈၊ ၁၀၉၊ ၁၁၀၊ ၁၁၃၊ ၁၁၇ နှင့် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး နည်းဥပဒေ ပုဒ်မ ၆၉ (က) (ခ)၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဥပဒေပုဒ်မ ၇ (ဏ)၊ ၁၄၊ ၁၅၊ ၂၄၊ ၃၁၊ ၃၂ တို့ကိုလည်း ထည့်သွင်းဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg. 40–48 Article 2, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5
(ခ)	အဆောက်အဦး Design ရေးဆွဲရာတွင် အသုံးပြုသည့် Building Code (Myanmar National Building Code/ ACI/ UBC အစရှိသဖြင့်) ကိုဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Appen-Dix – A Pg-229
(ဂ)	Structural Design Safety အတွက်လိုအပ်သော အထောက်အထားများ (လက်မှတ်ရ Design Engineer ၏ ထောက်ခံချက်အစရှိသဖြင့်) ကိုဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Appen-dix- A Pg. 249
(၄)	**စီမံကိန်းအကြောင်း ဖော်ပြချက်၊ ပတ်ဝန်းကျင် အခြေအနေနှင့် အခြေပြုအချက်အလက်များ**		
(က)	စီမံကိန်း၏ ပိုင်ရှင်များ၊ ဒါရိုက်တာများနှင့် စီမံကိန်းအရာရှိများ၏ အကြောင်းအရာဖော်ပြချက်၊ ၎င်းတို့၏ လုပ်ငန်းတာဝန်များနှင့် ဟိုတယ်ဝန်းထမ်းဦးရေ စသည်တို့ကို ထည့်သွင်းဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg. 35 Article-1.5
(ခ)	အစီရင်ခံစာတွင် Baseline Data များ ကောက်ယူရရှိသောရလဒ်များကို WHO ၏ Ambient စံချိန်စံညွှန်းများနှင့် နှိုင်းယှဉ်ဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Article 8

(ဂ)	-ဟိုတယ်၏ တည်နေရာနှင့် အနီးပတ်ဝန်းကျင်ကို ရှင်းလင်း ပြတ်စွာတွေ့မြင်နိုင်မည့် မြေပုံနှင့် အညွှန်းများကို ထည့်သွင်းဖော်ပြရန်။ -စီမံကိန်းဇရိယာတွင် စီမံကိန်းတွင် ဆောက်လုပ်မည့် အဆောက်အဦးများ (ကားရပ်နားရန်နေရာအပါအဝင်) အတွက် အတိုင်းအတာနှင့် တကွဖော်ပြသည့် Layout Plan ကိုရှင်းလင်းပြတ်သားသည့် ပုံဖြင့်ဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Appen-Dix – A Pg. 229 -248
(ဃ)	တင်ပြလာသောစီမံကိန်းတွင် golf operation ဝန်ဆောင်မှု ပါ/မပါ ရှင်းလင်းစွာဖော်ပြရန်နှင့် golf operation area ကိုပုံနှင့်တကွ ရှင်းလင်းစွာဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg. 82 Plate: 9
(င)	စီမံကိန်းလုပ်ငန်းအဆင့်ဆင့်တွင့် ထွက်ရှိမည့် စွန့်ပစ်ပစ္စည်း ပမာဏများအား ခန့်မှန်းတွက်ချက်၍ ထည့်သွင်းဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg. 88 Article – 5.14
(စ)	စာမျက်နှာ (၇၂) တွင် တည်ဆောက်ရေးလုပ်ငန်းတွင် အသုံးပြုမည့်သဲ၊ ကျောက်များကို ဖော်ပြရာတွင် Dredged River Sand, Dredged River Stone ဟုဖော်ပြထားသဖြင့် စီမံကိန်းပိုင်ရှင်သည် မြစ်မှသဲနှင့် ကျောက်များကို ကိုယ်တိုင်ထုတ်ယူသုံးစွဲခြင်း ပြု/မပြု ရှင်းလင်းစွာ ဖော်ပြရန်။	ပြင်ဆင်တင်ပြအပ်ပါသည်။	Pg. 83 Article – 5.3
(ဆ)	အသုံးပြုမည့် ဆောက်လုပ်ရေးပစ္စည်းများ (သဲ၊ ကျောက်) ရယူမည့်နေရာ၊ သယ်ယူမည့် နည်း စနစ်များကိုထည့်သွင်းဖော်ပြရန်။	ပြင်ဆင်တင်ပြအပ်ပါသည်။	Pg. 83 Article – 5.3
(၅)	ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် (EMP)		
(က)	EMP တွင်အရေးပေါ်ဘေးအန္တရာယ်ကျရောက်ပါက ဆောင်ရွက်မည့်အစီအစဉ်များနှင့် ကြိုတင်ဆောင်ရွက်ထားရှိမှုများကို ထည့်သွင်း ဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg. 167 Article-10.16
(ခ)	စီမံကိန်းမန်နေဂျာများ၊ ဝန်ထမ်းများပါဝင်သည့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အား အကောင်အထည်ဖော်ဆောင်ရွက်မည့် အဖွဲ့အစည်းတွင်ဖော်ပြရန်။	ထည့်သွင်းဖော်ပြထားပါသည်။	Pg. 155 Article-10.5
(ဂ)	အစီရင်ခံစာ၏ ဇယား (၈၉) တွင် လေအရည်အသွေး၊ စွန့်ပစ်ရေ၊ ရေအရည်အသွေးစသည်တို့နှင့် ပတ်သက်၍ စောင့်ကြည့်စစ်ဆေးတိုင်းတာမည့် Parameter များ၊ Cost၊ Frequency စသည်တို့ကို ထည့်သွင်းဖော်ပြရန်။	ထည့်သွင်းဖော်ပြထားပါသည်။	Table-73,74,75, 76, 91
(ဃ)	Gas Storage Arrangement အတွက် ဘေးအန္တရာယ်မရှိစေရေး စီမံခန့်ခွဲမှုကို ထည့်သွင်းရေးသားရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg-98 Article – 5.25
(င)	စီမံကိန်းလည်ပတ်ခြင်း အဆင့်တွင် စွန့်ပစ်ရည်ထွက်ရှိမည့် အရင်းအမြစ်တစ်ခုချင်းစီမှ ထွက်ရှိနိုင်မည့် စွန့်ပစ်ရည်ပမာဏကို ခန့်မှန်းတွက်ချက်ပြီး ဖော်ပြရန်၊ -Treatment Plant သို့မဟုတ် သိုလှောင်ထားရှိမှု အစီအမံကိုဖော်ပြရန်၊ -ရေဆိုးသန့်စင်မည့် နည်းစနစ်အား ပြည့်စုံစွာဖော်ပြရန်နှင့် ရေဆိုး	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg-90~94 Article – 5.17

	သန့်စင်မည့် ရေဆိုးသန့်စင်ကန်နှင့် မိလ္လာရည် သန့်စင်ကန်မှသန့်စင်ပြီး ထွက်ရှိလာမည့် အရည်များအား စွန့်ပစ်ပုံ အဆင့်ဆင့် (ဥပမာ-ရေဆိုးစီးဆင်းရာ ရေနူတ်မြောင်းများ၊ နောက်ဆုံး စွန့်ပစ်မည့်နေရာ) စသည့် အချက်အလက်များကို ပြည့်စုံစွာ ဖော်ပြရန်၊		
(စ)	စီမံကိန်းတည်ဆောက်ရေးကာလတွင် အဆောက်အအုံများ တည်ဆောက်ခြင်း၊ Landscape ပြုလုပ်ခြင်း၊ ဂေါက်ကွင်း ဆောက်လုပ်ခြင်းတို့မှ ထွက်ရှိလာမည့် မြေများကို သိုလှောင်မည့် နည်းလမ်းများနှင့် နောက်ဆုံး စွန့်ပစ်ခြင်းတို့အတွက် သေချာတိကျသော စွန့်ပစ်နည်းလမ်းနှင့် နောက်ဆုံးစွန့်ပစ်မည့် နေရာတို့ကို ဖော်ပြပေးရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg-165 Article – 10.11.14
(ဆ)	အစီရင်ခံစာ၏ ဇယား (၇၈) တွင် စီမံကိန်းမှ LPG Leak ကြောင့် ထိခိုက်နိုင်မည့် လေအရည်အသွေး၊ မြေအရည်အသွေးနှင့် ရေအရည်အသွေးတို့ကို တိုင်းတာစစ်ဆေး၍ ထည့်သွင်းဖော်ပြရန်။	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg-141 Table: 78
(ဇ)	အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းနှင့် သတင်းအချက်အလက်များထုတ်ဖော်တင်ပြခြင်း		
(က)	- စီမံကိန်းနှင့် သက်ဆိုင်သူများနှင့် တိုင်ပင်ဆွေးနွေးခြင်း၊ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းများ ဆောင်ရွက်ထားရှိမှုကို ထည့်သွင်းဖော်ပြရန်၊ - အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးပွဲသို့ တက်ရောက်လာ သူများ၏ စာရင်းကို ပူးတွဲဖော်ပြရန်၊ -စီမံကိန်း၏ ဆောက်လုပ်ရေးလုပ်ငန်း စတင်သည့် အချိန်မှစ၍ စီမံကိန်း ပိတ်သိမ်းသည့် ကာလအထိ ဒေသခံ ပြည်သူများ၏ မကျေနပ်ချက်များ၊ စီမံကိန်းကြောင့် ဖြစ်ပေါ်လာသည့် ပြဿနာအဝဝကို လက်ခံသုံးသပ်၍ဖြေရှင်းပေးရန်အတွက် နစ်နာမှု ဖြေရှင်းရေး လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ ဖော်ပြရန်၊ -ထိုနစ်နာမှု ဖြေရှင်းရေးလုပ်ငန်းစဉ်အား ဒေသခံပြည်သူများ သိရှိစေပြီး ဒေသခံပြည်သူများမှ ပြဿနာများ၊ မကျေနပ်ချက်များ ရှိပါက လွယ်ကူစွာတိုင်ကြားနိုင်ကြောင်းကိုလည်း သတင်းထုတ်ပြန်ကြေငြာ ရန်၊	ဖြည့်စွက် တင်ပြအပ်ပါသည်။	Pg-200 Article-11

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ACRONYMS AND ABBREVIATIONS

ADB	=	Asian Development Bank
AGAS	=	Asia Least Cost Green House Gas Abatement Strategy
ALARP	=	As Low As Reasonably Practicable
AMSL	=	Above Mean Sea Level
AMWQC	=	ASEAN Marine Water Quality Criteria
APPPC	=	Asia and Pacific Plant Protection Commission
ASEAN	=	Association of South East Asian Nations
AWPT	=	Asia World Port Terminal
BANCA	=	Biodiversity and Nature Conservation Association
CBOs	=	Community Based Organizations
CEnv	=	Chartered Environmentalist
CIA	=	Cumulative Impact Assessment
CITES	=	Convention on International Trade in Endangered Species of Wild Fauna & Flora
COC	=	Chain of Custody
CSci	=	Chartered Scientist
CSOs	=	Civil Society Organizations
CSR	=	Corporate Social Responsibility
CYDL	=	City of Yangon Development Law
DCI	=	Dulwich College International
DHSHD	=	Department of Human Settlements and Housing Development
DOH	=	Department of Health
E&S	=	Environmental and Social
ECC	=	Environmental Compliance Certificate
ECD	=	Environmental Conservation Department
ECD	=	Environmental Conservation Department
ECL	=	Environmental Conservation Law
EIA	=	Environmental Impact Assessment
EMMP	=	Environmental Management and Monitoring Plan
EMP	=	Environmental Monitoring Plan
ENC	=	English National Curriculum
EPAS	=	Environmental Parameter Air Stations
EPAS	=	Environmental Perimeter Air Stations
EPC	=	Engineering Procurement Construction
EQG	=	Environmental Quality Guidelines
EQS	=	Environmental Quality Standards
ERP	=	Emergency Response Plan
ESHS	=	Environmental, Social and Health & Safety
IEE	=	Environmental and Social Impact Assessment
ESMS	=	Environmental and Social Management System
EU	=	European Union
FIC	=	Farmland and other Lands Confiscation Investigation Commission
FIL	=	Foreign Investment Law
FOM	=	Field Operations Manager
GITC	=	Global Infinity Trading and Construction
GoM	=	Government of Myanmar
HPH	=	Hutchison Port Holdings
HSP	=	Health and Safety Plan
IBC	=	Intermediate Bulk Container
IEE	=	Initial Environmental Examination

IFC EHSG	=	International Finance Corporation Environmental Health and Safety Guidelines
IFC PS	=	International Finance Corporation Performance Standards
IFC	=	International Finance Corporation
ILO	=	International Labor Organization
ISO	=	International Standard Organization
IUCN	=	International Union for Conservation of Nature
KP	=	Kyoto Protocol
MCIWEM	=	Member of the Chartered Institute of Water and Environmental Management
MIC	=	Myanmar Investment Commission
MITT	=	Myanmar International Terminal Thilawa
MODIS	=	Moderate Resolution Imaging Spectroradiometer
MOECAF	=	Ministry of Environmental Conservation and Forestry
MOGE	=	Myanmar Oil and Gas Enterprise
MSDS	=	Material Safety Data Sheet
NHC	=	National Health Committee
NHP	=	National Health Plan
OHD	=	Occupational Health Division
OHSE	=	Occupational Health, Safety and Environment
PAP	=	Project Affected People
PCCD	=	Pollution Control and Cleansing Department
PDCAML	=	Prevention from Danger of Chemicals and Associated Materials Law
PM	=	Project Manager
PS	=	Performance Standards
QA/QC	=	Quality Assurance and Quality Control
QAP	=	Quality Assurance Plan
SHE	=	Safety, Health and Environment
SPS	=	Safeguard Policy Statement
STP	=	Sewage Treatment Plant
TBS	=	Traffic Baseline Survey
TED	=	Thanlyin Estates Development
TMP	=	Traffic Management Plan
TSS	=	Total Suspended Solids
U.S. EPA	=	United States Environmental Protection Agency
UNDP	=	United Nations Development Program
UNESCO	=	United Nations Educational, Scientific and Cultural Organization
UNFCCC	=	United Nation Framework Convention on Climate Change
UNOSAT	=	United Nations Operational Satellite Applications Programme
USEPA	=	United States Environmental Protection Agency
WHO	=	World Health Organization
WPAL	=	Wildlife and Protected Areas Law
YCDC	=	Yangon City Development Committee
YSH	=	Yoma Strategic Holdings

Executive Summary

Project Introduction	
Project Background	SLP Environmental Co., Ltd (SLP) was appointed by PHL Hotel Management Ltd (the 'Project Proponent) to prepare the initial Environmental Examination (IEE) for the Pun Hlaing Golf Estate complex in Hlaingtharya Township, Yangon Division.
Project Overview	The Project comprises of a luxury hotel lodge comprising in an 8 storey building with a total of 46 rooms and a Gross Floor Area (GFA) of 13,617 sq.m on a total plot area of 8,887 sq.m.
Regulatory Framework and Study Benchmarks	The IEE study was prepared in general accordance with the requirements stipulated in Chapter IV of the ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE, Ministry of Environmental Conservation and Forestry, Notification No. 616 / 2015 (29 December 2015). The IEE study was also conducted and reported cognisant of guidance presented in the: • International Finance Corporation (IFC) Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development (April,2007)
Study Objectives	The primary objectives of the IEE study were: • To development an environmental and socio-economic profile of the Project Area including the existing status of the physico-chemical and biological systems and identification of potentially sensitive environmental and social receptors; • To examine the activities of the Project in order to identify those aspects must likely to have interactions with environmental and social receptors. • To ensure that any potential adverse impacts on the natural environment and or social receptors arising as a result of the development of the Project are clearly identified; • To develop a suitably robust environmental management and monitoring plan (EMMP) for the Project to ensure that any identified significant adverse impacts are, where possible, prevented, managed and/or otherwise mitigated; and • To ensure that the proposed development Project is implemented in conformance with the environmental regulatory requirements of the Republic of the Union of Myanmar and cognisant of the relevant international guidelines used as benchmarks in the study.
Consultants Credentials	SLP Environmental is listed by MOECAF as an accredited Third Party to prepare IEE/EIA/EMP reports in Myanmar. SLP has successfully completed numerous assignments to IFC standard across multiple sectors in Myanmar on behalf of project developers which have subsequently been approved by MOECAF and the MIC.
Project Site Location and Description	The Project Site is situated in Myaung Ywa Village Tract, Hlaing Tharyar Township located on the outskirts of Yangon Division approximately 20 km west of Yangon City Center, Myanmar. The Project Site is located in lowland setting and the primary land-uses in the locality of the Project Site comprise of residential, agricultural, and amenity (gold course). The total Project Site area is approximately 8,887 sq.m (95,658 sq.ft) and the approximate geographic coordinates of the Project Site centre are 16˚ 50′ 28.34′N, 96˚ 5′ 49.09′ E.
Development Programme	The Project will be constructed over 1,170 days with completion and handover scheduled for February 2017.
Construction Phase Activities	In summary the construction phase of the project will comprise of the following activities; • Site clearance and upfilling with dredged river sand and soil from borrow pits

	to provide development platform; • Development enabling works such as perimeter fencing, erection of site office compound with offices and latrines, laying of temporary haul roads, construction of temporary drainage and connecting to local power grid and sanitary wastewater conveyance system. • Substructure works – pre-cast driven piles to approximately 32m below surface to support main hotel structure. The piles will be restrained by a group of pile caps and tie beams. • Superstructure works – reinforced concrete structural frame with reinforced concrete beams and slabs. • Facades – aluminium powder coating and glass. • Interiors – masonry and gypsum board partition walls with paint, wallpaper or veneer finish. • Flooring – wood, carpet or tiles. • Doors and windows – mostly metal, guest room doors wooden. • Landscaping – grass, flower and shrub beds.
Operational Phase Activities	The Project comprises of the construction and operation of a luxury hotel lodge comprising of 8 stories (basement levels, 1st level, mezzanine, 2nd level, 3rd level,4th level, 5th level and 6th level) with a total of 46 rooms and a Gross Floor Area (GFA) of 13,617 sq.m on a total plot area of 8,887 sq.m. The basement level will comprise of a golf operations area with a total footprint of 1,518 sq.m; common areas and hotel back of house totalling some 2,315 sq.m^{2}. Level 1 of the building will comprise of four apartment suites measuring approximately 136 sq.m per unit and 3,346 sq.m of amenities. The amenities include reception, lobby and public areas, conference room, meeting rooms, management office, cigar bar and restaurants. Level 2 to level 5 will contain forty two units comprising of 30 typical standard guest suites measuring 63 sq.m each; 4 corner suite Type 1 units measuring 101 sq.m each; 4 corner suite Type 2 units measuring 82 sq.m each and 4 garden suite units measuring 143 sq.m each. The maximum building height will be 31.70m and the development will have parking for 28 vehicles. Electricity will be provided by the national grid with a 100% backup capacity also available from the Pun Hlaing Golf Estate which has its own generating capacity. Water will be provided by Pun Hlaing Golf Estate and sanitary wastewaters will be discharged to Pun Hlaing Golf Estate's own sewage treatment plant (STP).
Project Baseline	
Overview of Environmental Baseline Study	The environmental baseline survey focused on the most sensitive environmental and social receptors as identified during the Project Site and Environs Reconnaissance. In summary, the environmental baseline approach involved: • The erection of one air quality and noise monitoring station for a 24-hour period; and • The collection of two surface water samples from the temporary stormwater drainage discharge points. The surface water samples were dispatched to an ISO: 17025 accredited laboratory for analysis of a range of parameters.

<table>
<tr><td>Ambient Air Quality</td><td>Ambient air quality was monitored at one location for a 24-hour duration during the period 15-16 January 2016. The sampling and analysis of ambient air pollutants was conducted in accordance with practice recommended by the United States Environmental Protection Agency (U.S. EPA) using Haz-Scanner EPAS Wireless Environmental Perimeter Air Stations. The results were compared against Myanmar ambient air quality guidelines and no exceedances of thresholds were recorded.</td></tr>
<tr><td>Ambient Noise Levels</td><td>The nuisance noise quality monitoring was undertaken at one location for a 24-hour duration during the period 15-16 January 2016. The results were compared against Myanmar ambient noise level guidelines and no exceedances of thresholds were recorded.</td></tr>
<tr><td>Surface Water Quality</td><td>The surface water laboratory testing results were compared against the MOECAF Guideline for construction site wastewater discharges and no exceedances of quality standards were recorded.</td></tr>
<tr><td>Socio-Economic Baseline Study</td><td>As part of the study SLP developed a socio-economic profile of the Township and Village Tract within which the Project Site is located. The socio-economic baseline study considered authoritative baseline data sourced from government agencies via desk study and direct consultation with Township authorities.</td></tr>
<tr><td colspan="2">Impact Assessment</td></tr>
<tr><td>Scoping Study</td><td>The potential environmental and social impacts associated with the Project were assessed by conducting a qualitative Scoping Study to identify the potential interactions between Project activities and environmental and social receptors and to prioritize these in terms of their potential magnitude and significance. The aim of the Scoping Study was to rank the predicted impacts in terms of their assessed significance and ensure that all impacts ranked Moderate or above were taken forward for further detailed examination in the Impacts Evaluation Assessment which was undertaken for each of the two primary project stages (construction and operation). It should be noted that the findings of the Impact Identification Scoping Study considered the mitigation and any other control measures that have already incorporated into the Project design as well as the findings of the Environmental and Socio-Economic Baseline Studies. The Scoping Study identified several potentially significant adverse impacts associated with the Construction and Operations Phase of the Project which were taken forward for further detailed impact evaluation as detailed below.</td></tr>
<tr><td>Scoping Study (cont.)</td><td>
<table>
<tr><th colspan="3">Potential Construction Phase Impacts</th></tr>
<tr><th>Activity/Source of Impact</th><th>Aspect</th><th>Receptors/Resource</th></tr>
<tr><td>• Land Preparation Activities
• Onsite Traffic and Plant</td><td>Fugitive particulate (dust) emissions</td><td>• Local Air Quality
• Community Health</td></tr>
<tr><td>• Construction Works</td><td>Noise Emissions</td><td>• Community Nuisance
• Community Health</td></tr>
<tr><td>Use of Hazardous Materials
(fuel, formwork oils, solvents)</td><td>Accidental spillage/leakage
• Infiltration and downward percolation</td><td>• Soil and Groundwater Quality
• Water Resources</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>Impact Assessment</td><td>
<table>
<tr><th colspan="3">Potential Operations Phase Impacts</th></tr>
<tr><th>Activity/Source of Impact</th><th>Aspect</th><th>Receptors/Resource</th></tr>
<tr><td>Water Supply to Hotel</td><td>Water Resource depletion</td><td>Community Water Security</td></tr>
<tr><td>Water Supply to Hotel</td><td>Water Quality Deterioration</td><td>Community Water Security</td></tr>
<tr><td>Irrigation</td><td>Water Quality Deterioration</td><td>Community Water Security</td></tr>
<tr><td>LPG Storage and Use</td><td>Leakage/Fire/Explosion</td><td>Life and Fire Safety</td></tr>
</table>
The above-mentioned impacts were assessed as requiring detailed examination in the impacts assessment study as they may require additional mitigation measures, over and above those already built into the design to reduce any significant impacts to acceptable levels. This is a systematic process, whereby the potential impacts were evaluated about their potential adverse (and positive) impacts on the identified vulnerable environmental and social receptors. The impact assessment was conducted in accordance with international good practice and sought to identify the direct and indirect, short and long term, positive and negative, environmental and socioeconomic impacts associated with those Project activities identified during the scoping study as having potentially adverse environmental and social impacts.

The detailed impact assessment identified the following impacts rated Minor and above associated with the Construction Phase of the Project:

Minor Impacts
• Construction activities leading to a deterioration in local air quality
• Construction activities leading to an increase in community noise levels.

The detailed impact assessment identified the following impacts rated Minor and above associated with the OPERATION PHASE of the project:

Minor-Moderate Impacts
• Potential fire and explosion risk associated with LPG storage compound.

Moderate Impacts
• Operational activities leading to over-exploitation of groundwater resources.
• Operational activities leading to a deterioration of groundwater resources.
• Operational activities leading to over-exploitation of groundwater resources resulting in a concomitant impact on community water security.
</td></tr>
<tr><td colspan="2">Environmental Management & Monitoring Plan (EMMP)</td></tr>
<tr><td>Overview of EMMP</td><td>Based on the findings of the impact assessment SLP has prepared a detailed EMMP to ensure that the potential significant adverse impacts to the natural environment and social receptors that could arise because of the Project activities are appropriately mitigated. The EMMP provides a set of managerial tools which will enable SPA Project Management Services (Construction) and PHL Hotel Management Ltd (Operator) to clearly identify the environmental and social impacts of the Project activities and to systematically implement cost effective measures which respond to monitor and control environmental and social performance.</td></tr>
</table>

Conclusion	
Conclusion	SLP Environmental has conducted an Initial Environmental Examination (IEE) for the Project in general accordance with the requirements stipulated in Chapter IV of the ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE, Ministry of Environmental Conservation and Forestry, Notification No. 616 / 2015 (29 December 2015). The study was also conducted cognisant of guidance presented in: • International Finance Corporation (IFC) Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development (April 2007). The key potential impacts associated with the Project have been identified and evaluated and SLP has formulated a robust project specific Environmental Management and Monitoring Plan (EMMP) to mitigate the potential impacts and ensure that legislative compliance and standards of good practice are upheld during the execution of the Project. Provided that the recommended mitigation measures are appropriately implemented the IEE concludes that there will be no residual impacts of Minor, Moderate, Major or Critical significance arising because of project activities and that all impacts will have been appropriately mitigated to be as low as reasonably practical.

စီမံကိန်းအကျဉ်းချုပ်

စီမံကိန်းမိတ်ဆက်	
စီမံကိန်းနောက်ခံ	အက်စ်အယ်လ်ပီ(SLP) ပတ်ဝန်းကျင်ဆိုင်ရာကုမ္ပဏီလီမိတက် (SLP Environmental Co., Ltd.) အား ပီအိပ်ချ်အယ်လ် ဟိုတယ်စီ မံခန့်ခွဲရေး လီမစ်တက် (စီမံကိန်းရင်း နှီးမြှုပ်နှံသူ) မှရန်ကုန်တိုင်းဒေသကြီး လှိုင်သာယာ မြို့နယ် ပန်းလှိုင်ဂေါက်ကွင်း အတွင်းတွင် တည်ရှိသော ပန်းလှိုင်လော့ဂျ် ဟိုတယ်တည်ဆောက်ရေးအတွက် အစည်းပိုင်း ပတ်ဝန်းကျင်ဆိုင်ရာစစ် ဆေးရေး (IEE) ပြုလုပ်ရန်ခန့်အပ်ခဲ့ပါသည်။
စီမံကိန်းအကျဉ်းချုပ်	စီမံကိန်းတွင် အထပ် ၈ ထပ် (မြေအောက်ထပ်၊ ပထမထပ်၊ ထပ်ခိုးထပ်၊ ဒုတိယထပ်၊ တတိယထပ်၊ စတုတ္ထထပ်၊ ပဉ္စမထပ်၊ ဆဋ္ဌမထပ်) ပါဝင်ပြီး စုစုပေါင်း မြေဧရိယာ ၈၈၈၇ စတုရန်းမီတာပေါ်တွင် စုစုပေါင်းကြမ်းပြင်ဧရိယာ (GFA) ၁၃,၆၁၇ စတုရန်းမီးတာရှိသည့် အခန်းပေါင်း ၄၆ ခန်းပါ အဆင့်မြင့် ဟိုတယ်အဆောက်အဦး ပါဝင်ပါသည်။
စည်းမျဉ်းဘောင်နှင့် လေ့လာရေးစံနှုန်းများ	IEE စစ်ဆေးရေးကို ပတ်ဝန်းကျင်ထိမ်းသိမ်းရေးနှင့် သစ်တောဝန်ကြီးဌာန ကြေညာ ချက် အမှတ် ၆၁၆/၂၀၁၅ (၂၀၁၅ ခုနှစ် ဒီဇင်ဘာလ ၂၉ ရက်) ပတ်ဝန်းကျင် အကျိုး သက်ရောက်မှု လေ့လာဆန်းစစ်ရေးလုပ်ထုံးလုပ်နည်း အပိုင်း ၄တွင် ဖော်ပြသောလို အပ်ချက်များနှင့်အညီ စီစဉ်ဆောင်ရွက်မည် ဖြစ်ပါသည်။ IEE စစ်ဆေးရေးကို အောက်ဖော်ပြပါ လမ်းညွှန်ချက်များနှင့်အညီ စီစဉ်ဆောင်ရွက်မည်ဖြစ်ပါသည်။ IEE စစ်ဆေးရေးကို အောက်ဖော်ပြပါ လမ်းညွှန်ချက်နှင့်အညီ လေ့လာဆန်းစစ်ပြီး အစီရင်ခံရမည်ဖြစ်ပါသည်။ • ခရီးသွားလုပ်ငန်းနှင့် ဟိုတယ်ဝန်ဆောင်မှုဖွံ့ဖြိုးမှုအတွက်အပြည်ပြည်ဆိုင် ရာဘဏ္ဍာရေး ကော်ပိုရေးရှင်း (IFC) ပတ်ဝန်းကျင်၊ ကျန်းမာရေးနှင့် လုံခြုံရေးဆိုင်ရာ အထွေထွေလမ်းညွှန်ချက်များ (၂၀၁၇ ခုနှစ် ဇူလိုင်)
လေ့လာရေးဦးတည်ချက်များ	IEE လေ့လာရေး၏ အဓိကဦးတည်ချက်များမှာ • စီမံကိန်းဧရိယာတွင် ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားရေး အခြေအနေ ကို လေ့လာရန်၊ ရှုပဓါတုဗေဒဆိုင်ရာစနစ်နှင့် ဇီဝဗေဒဆိုင်ရာစနစ်၏ လက်ရှိ အခြေ အနေ၊ ဖြစ်ပွားနိုင်ဖွယ်ရှိသော ဆင်ခြင်သတိထား ရမည့် ပတ်ဝန်း ကျင်ဆိုင်ရာ ပြန်ကြားမှုများကို လေ့လာရန်၊ • အဆိုပါ ရှုထောင့်များဖော်ထုတ်သိရှိပြီး ပတ်ဝန်းကျင်နှင့် လူမှုရေး ဆိုင် ရာပြန်ကြားမှုများနှင့် အပြန်အလှန်အကျိုးပြုခြင်းရှိမရှိ စီမံကိန်း ဆောင် ရွက်ချက်ကိုများ အားလေ့လာစစ်ဆေးရန် • ရှင်းလင်းတိကျစွာဖော်ပြထားသော စီမံကိန်းဖော်ဆောင်မှုကြောင့် ဖြစ် လာသည့်သဘာဝပတ်ဝန်းကျင် နှင့်/သို့မဟုတ် လူမှုစီးပွားရေး ပြန်

	ကြား မှုများအပေါ် ထင်ထင်ရှားရှား ထိခိုက်နိုင်သည့် အကျိုးသက်ရောက်မှု များ သေချာစွာလုပ်ဆောင်မှုရှိစေရန် • ထင်ထင်ရှားရှားထိခိုက်သော မည်သည့် အကျိုးသက်ရောက်မှု များအား လုံးကို မဆိုဖြစ်နိုင်ခြေ၊ ကာကွယ်တားဆီးရေး၊ စီမံခန့်ခွဲရေး နှင့်/သို့မဟုတ် လျော့ပါးသက်သာစေရေး သေချာစွာ လုပ်ဆောင်မှု ရှိစေရန် အတွက် စီမံ ကိန်းနှင့် သင့်လျော်ကောင်းမွန်သည့် ပတ်ဝန်းကျင်ဆိုင် စီမံခန့်ခွဲရေးနှင့် စောင့်ကြည့်လေ့လာရေး အစီအစဉ် (EMMP) ပြုလုပ် ဆောင်ရွက်ရန် • အဆိုပြုသောစီမံကိန်းဖော်ဆောင်မှုအား မြန်မာနိုင်ငံ၏ပတ်ဝန်းကျင် ဆိုင်ရာစည်းကမ်းသတ်မှတ်ချက်များနှင့်အညီ လေ့လာရေးတွင်စံ အဖြစ် သတ်မှတ်သည့်နိုင်ငံတကာပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာစွမ်းဆောင် နိုင်မှု လမ်းညွှန်ချက်များနှင့်အညီ သေချာစွာဖော်ဆောင်လုပ်ကိုင်မှု ရှိ စေ ရန်
အတိုင်ပင်ခံအရည် အချင်း	SLP သည် MOECAF မှမြန်မာနိုင်ငံတွင် IEE/EIA/EMP အစီရင်ခံစာများ ပြုစုရန် အတည်ပြုချက်ရထားသောကြားခံအဖွဲ့အနေဖြင့် စာရင်းသွင်းထား ခြင်းခံရပါ သည်။ SLP သည် MOECAF နှင့် MIC မှအတည်ပြုချက်ရရှိထားသည့် နိုင်ငံ တကာရင်းနှီး မြှုပ်နှံသူများကိုယ်စား မြန်မာနိုင်ငံရှိ IFC စံသတ်မှတ်ချက် ကဏ္ဍာ မျိုးစုံတွင် မြောက် များစွာသော ESIA ၏တာဝန်ပေးအပ်သည့် လုပ်ငန်းများ စွာကို အောင်မြင်စွာပြုလုပ် ခဲ့ပြီးဖြစ်ပါသည်။
စီမံကိန်းအကြောင်းအရာ	
စီမံကိန်းနေရာနှင့် အကြောင်းအရာ	စီမံကိန်းတည်နေရာသည် မြန်မာနိုင်ငံ ရန်ကုန်မြို့၏ အနောက်ဖက် ၂၀ ကီလို မီတာခန့်အကွာ၊ ရန်ကုန်မြို့ဆင်ခြေဖုံးလွှင်သာယာမြို့နယ် ညောင်ရွာ ကျေးရွာ တွင် တည်ရှိပါသည်။ စီမံကိန်းသည် မြေပြန့်ပိုင်းတွင် တည်ရှိပြီး လူနေအိမ်ယာ များ၊ ဥယျာဉ်ခြံမြေနှင့် အပန်းဖြေအနားယူရေး (ဂေါက်ကွင်း) စသည်တို့ အဓိကအသုံးပြု သော ဒေသခံမြေအတွင်းတွင် တည်ရှိပါသည်။ စီမံကိန်း၏ စုစုပေါင်း ဧရိယာသည် ခန့်မှန်းခြေ ၈,၈၈၇ စတုရန်းမီတာ (၉၅,၆၅၈ စတုရန်းပေ) ရှိပြီး ပထဝီအနေအထား အရစီမံကိန်းအလည်တည်နေရာသည် 16˚ 50′28.34′N, 96˚ 5′ 49.09′ E ဖြစ်ပါသည်။
တည်ဆောက်ရေး အစီအစဉ်	စီမံကိန်းအား ရက်ပေါင်း ၁,၁၇၀ ကျော်ဖြင့် ဆောက်လုပ်သွားမည်ဖြစ်ပြီး ၂၀၁၇ ခုနှစ် ဖေဖော်ဝါရီလတွင်တည်ဆောက်မှု ပြီးစီး၍ လွှဲပြောင်းပေးအပ်သွား မည် ဖြစ်သည်။
ဆောက်လုပ်ရေးအဆင့် လှုပ်ရှားမှုများ	အကျဉ်းချုပ်အားဖြင့် စီမံကိန်းဆောက်လုပ်ရေးအဆင့်သည် အောက်ပါလုပ် ဆောင် ချက်များပါဝင်ပါသည်။

	• စီမံကိန်းနေရာရှင်းလင်းခြင်းလုပ်ငန်း၊တည်ဆောက်မှု အောက်ခံခင်း ရန်မြစ်၊ ချောင်း မှ သဲ၊ မြေကြီးဖို့ခြင်းလုပ်ငန်း • လုပ်ငန်းလုပ်ဆောင်ရန်အတွက်တည်ဆောက်မှုလုပ်ငန်း ဥပမာ ခြံစည်းရိုးခတ်ခြင်း၊ရုံးခန်းများနှင့်အိမ်သာပါသောစီမံကိန်းရုံးခန်းတည် ဆောက်ခြင်း၊ယာယီလမ်းဖောက်လုပ်ခြင်း၊ ယာယီရေမြောင်း ဆောက်လုပ်ခြင်းနှင့် လျှပ်စစ် သွယ်တန်းခြင်း ၊ ရေးဆိုးထုတ် မြောင်း ဖောက်လုပ် ခြင်း၊ • အဆောက်အအုံဆိုင်ရာထပ်ဆင့်လုပ်ငန်းများ- အဓိကဟိုတယ်အဆောက်အုံ အတွက်မြေမျက်နှာပြင်အောက် ၃၂ မီတာအနက်ရှိသော တိုင်စိုက်ခြင်း လုပ်ငန်း၊ တိုင်များကို အုပ်စုလိုက်ပူးတွဲပြီးရက်များဖြင့် ချည်တုပ်ထားမည်။ • အဆောက်အအုံဆိုင်ရာအဓိကလုပ်ငန်းများ- ကွန်ကရစ်ရက်မနှင့် ကွန်ကရစ် ပြားများဖြင့် တောင့်တင်း ခိုင်မာ စေသည့် ကွန်ကရစ်အ ဆာက်အအုံ ဘောင်လုပ်ငန်း • အပြင်ပန်းလုပ်ငန်း - အလူမီနီယမ်မှန့်ဆေးသုတ်ခြင်းနှင့် မှန်တပ်ဆင်ခြင်း • အတွင်းပိုင်းလုပ်ငန်း - ပန်းရံနှင့် ဆေးသုတ်ထားသော ဂျစ်ပဆင် ပြားနံရံ ပြုလုပ်ခြင်း၊ နံရံကပ်ပန်းစက္ကူကပ်ခြင်းလုပ်ငန်း (သို့မဟုတ်) သစ်ပါးလွှာကပ် လုပ်ငန်း • အခင်း - သစ်သား၊ ကော်ဇာ သို့မဟုတ် ကြွေပြား • တံခါးနှင့်ပြတင်းပေါက်များ - အများအားဖြင့် သတ္တုတံခါးနှင့် ဇည့်ခန်းအ တွက်သစ်သားတံခါးများ • ရှုခင်း - မျက်၊ ပန်းပင်နှင့် သစ်ပင်စိုက်ပျိုးခြင်း
လုပ်ငန်းလည်ပတ်မှုအဆင့် လူပ်ရှားမှုများ	စီမံကိန်းတွင် အထပ် ၈ ထပ် (မြေအောက်ထပ်၊ ပထမထပ်၊ ထပ်ခိုးထပ်၊ ဒုတိယထပ်၊ တတိယထပ်၊ စတုတ္ထထပ်၊ ပဉ္စမထပ်၊ ဆဋ္ဌမထပ်) ပါဝင်ပြီး စုစုပေါင်း မြေဧရိယာ ၈၈၈၇ စတုရန်းမီတာပေါ်တွင် စုစုပေါင်းကြမ်းပြင်ဧရိယာ (GFA) ၁၃,၆၁၇ စတုရန်းမီးတာရှိသည့် အခန်းပေါင်း ၄၆ ခန်းပါ အဆင့် မြင့်ဟိုတယ်အဆောက်အဦး ဆောက်လုပ်ခြင်းနှင့် လည်ပတ်လုပ်ကိုင်ခြင်း ပါဝင်ပါ သည်။ မြေအောက်ထပ်တွင် စုစုပေါင်း အကျယ် ၁,၅၁၈ စတုရန်းမီတာ ရှိ ဂေါက်ကွင်းလည်ပတ်လုပ်ဆောင်မှုပါဝင်ပြီး စုစုပေါင်းအကျယ်အဝန်း ၂,၃၁၅ စတုရန်းမီတာရှိ အများနားရန်နေရာနှင့် ဟိုတယ်အထောက်အ ကူပြုလုပ်ငန်း နေရာများပါဝင်သည်။ အဆောက်အဦးပထမထပ်တွင် တစ်ဆောင်လျှင် ခန့်မှန်းခြေ ၁၃၆ စတုရန်းမီတာရှိ ခန်းမဆောင် ၄ ခန်းတွဲနှင့် ၃,၃၄၆ စတုရန်းမီတာရှိ

	ဟိုတယ်သာယာရေးနေရာ ပါဝင်သည်။ ဟိုတယ်သာယာရေးနေရာတွင် ဟိုတယ် ကြိုဆိုလက်ခံရန်နေရာ၊ ဟိုတယ်ဧည့် ခန်း၊ အများနားရန်နေရာ၊ ညီလာခံခန်းမ၊ အစည်းအဝေးခန်းမများ၊ စီမံခန့်ခွဲရေး၊ ဆေးလိပ်သောက်ခန်းနှင့် စားသောက် ဆိုင်များ ပါဝင်သည်။ ဒုတိယထပ်မှ ပဉ္စမထပ် များတွင် ၆၃ စတုရန်းမီတာရှိ ပုံမှန်ဟိုတယ်ခန်း ၃၀ ခန်း၊ ၁၀၁ စတုရန်းမီတာရှိ ထောင့်ခန်းအမျိုးအစား ၁ အခန်း ၄ ခန်း၊ ၈၂ စတုရန်းမီတာရှိ ထောင့် ခန်း အမျိုးအစား ၂ အခန်း ၄ ခန်း၊ စုစုပေါင်း ၄၂ ခန်းပါဝင်သည်။ အဆောက်အဦးအမြင့်သည် ၃၁.၇၀ မီတာမြင့်ပြီး ယာဉ် ၂၈ စီးရပ်နား ရန်နေရာ ပါဝင်သည်။ လျှပ်စစ်မီးကို national grid မှပံ့ပိုးပြီး ပန်းလှိုင်ဂေါက်ကွင်း ကိုယ်ပိုင်မီးစက်မှ ၁၀၀% ပြည့်အရံလျှပ်စစ်မီးပါဝင်သည်။ ရေကို ပန်းလှိုင် ဂေါက် ကွင်းမှ ပံ့ပိုးပြီး မိလ္လာ ရေဆိုးကို ပန်းလှိုင်ဂေါက်ကွင်းကိုယ်ပိုင် မိလ္လာ ရေဆိုးသန့်စင်စက်ရုံ (STP) သို့ပေး ပို့မည်ဖြစ်သည်။
Project Baseline စီမံကိန်းအခြေခံ	
ပတ်ဝန်းကျင်အခြေခံ လေ့လာရေးအကျဉ်းချုံး	ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံဆန်းစစ်လေ့လာခြင်းကို စီမံကိန်းတည်ရှိရာနှင့် ပတ်ဝန်း ကျင်ကြည့်ရှုစစ်ဆေးမှုပြုလုပ်ချိန်အတွင်း တွေ့ရှိရသည့် သတိထား ရဆုံး ပတ်ဝန်း ကျင်နှင့် လူမှုရေးပြန်ကြားမှုများအား အာရုံစိုက် လေ့လာ မည် ဖြစ်ပါသည်။အကျဉ်းချုံးအားဖြင့် ပတ်ဝန်းကျင်အခြေခံချဉ်းကပ်မှုတွင် အောက် ပါ အချက်များ ပါဝင်သည်။ • လေထုအရည်အသွေးနှင့် အသံဆူညံမှု ၂၄ နာရီ စောင့်ကြည့် လေ့ လာ ရေး စခန်း ၁ ခုတည်ဆောက်ရေး • ယာယီမုန်တိုင်းရေနုတ်မြောင်းမှ မြေပြင်ရေနမူနာ ၂ မျိုးကောက်ယူ ရေး မြေပြင်ရေနမူနာများကို ISO: 17025 အရ အတည်ပြုချက်ရရှိထားသော ဓါတ်ခွဲခန်း များတွင် ပါဝင်သည့် ဓါတ်များကို စီစစ်ရန် ပေးပို့စစ်ဆေးသည်။
ပတ်ဝန်းကျင်လေထု အရည်အသွေး	လေထုအရည်အသွေးကို ၂၀၁၆ ခုနှစ် ဇန်နဝါရီလ ၁၅-၁၆ ရက်အတွင်း တိုင်းတာရေး စခန်း ၁ နေရာတွင် ၂၄ နာရီစောင့် ကြည့်လေ့လာ ခဲ့ပါသည်။ လေထုညစ်ညမ်းခြင်း နမူ နာရွေးချယ်မှုနှင့် လေ့လာဆန်းစစ်မှုကို ကုလသမဂ္ဂ ပတ်ဝန်းကျင်ထိမ်းသိမ်း စောင့် ရှောက်ရေးအေဂျင်စီ (U.S EPA) မှ အသုံး ပြု ရန် အကြံပေးသည့် ကြိုးမဲ့ပတ်ဝန်းကျင် လေထု ညစ်ညမ်းမှု တိုင်းတာ ရေး ကရိယာ (Haz-Scanner EPAS) ကိုအသုံးပြုဆောင်ရွက်ခဲ့သည်။
ပတ်ဝန်းကျင်ဆူညံမှု အဆင့်	အသံဆူညံမှုအရည်အသွေး လေ့လာစောင့်ကြည့်ခြင်းကို ၂၀၁၆ ခုနှစ် ဇန်နဝါရီ လ ၁၅-၁၆ ရက်အတွင်း တိုင်းတာရေးစခန်း ၁ နေရာတွင် ၂၄ နာရီစောင့်ကြည့် လေ့လာခဲ့ ပါသည်။ အသံဆူညံမှု အရည်အသွေး လေ့လာဆန်းစစ် ရေးရ လဒ်ကို မြန်မာနိုင်ငံ၏အသံဆူညံမှုအဆင့် လမ်းညွှန်ချက်များနှင့် နှိုင်း ယှဉ်ရာ တွင် သတ်မှတ် အဆင့်ထက် ကျော်လွန်မှု မရှိကြောင်း မှတ်တမ်းရရှိ သည်။

<table>
<tr><td>မြေပြင်ရေ
အရည်အသွေး</td><td>မြေပြင်ရေခါတ်ခွဲစမ်းသပ်မှုရလာဒ်ကို ဆောက်လုပ်ရေးလုပ်ငန်း စွန့်ပစ် ရေဆိုး အ တွက် MOECAF လမ်းညွှန်ချက်များနှင့် နှိုင်းယှဉ်ရာတွင် သတ်မှတ်အ ရည်အသွေးစံ ချိန်ထက် ကျော်လွန်မှုမရှိကြောင်း မှတ်တမ်းရရှိသည်။</td></tr>
<tr><td>လူမှု-စီးပွားရေးအခြေခံ
လေ့လာရေး</td><td>လေ့လာမှုအစိတ်အပိုင်းအဖြစ် SLP သည်စီမံကိန်းတည်ရှိရာ အတွင်းရှိ မြို့နယ် နှင့် ကျေးရွာ၏ လူမှု-စီးပွားရေးအချက်အလက်များကို စုဆောင်း ခဲ့ပါသည်။ လူမှု-စီးပွားရေးအခြေခံလေ့လာဆန်းစစ်မှုကို စာအုပ်စာတမ်းအထောက်အထား နှင့် မြို့နယ်အာဏာပိုင်အဖွဲ့အစည်းများနှင့်တိုင်ပင်ဆွေး နွေးမှုတို့ မှ တဆင့် အစိုးရ အဖွဲ့အစည်းများမှ ကိုးကားရရှိသောခိုင်လုံသည့်သက်သေခံ အချက်အ လက် များဟု သတ်မှတ်ပါသည်။</td></tr>
<tr><td colspan="2">အကျိုးသက်ရောက်မှုလေ့လာဆန်းစစ်ခြင်း</td></tr>
<tr><td>နယ်ပယ်သတ်မှတ်
လေ့လာခြင်း</td><td>စီမံကိန်းနှင့် ပတ်သက်ပြီးဖြစ်ပွားနိုင်သည့် ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ အကျိုး သက်ရောက်မှုများကို စီမံကိန်းဖော်ဆောင်မှုနှင့် ပတ်ဝန်းကျင်လူ မှု ရေးပြန်ကြားမှုများ ရှိနိုင်သည့် အပြန်အလှန်အကျိုးပြုမှုများအား ၄င်းတို့၏ သက်ရောက်မှုပမာဏနှင့် အကြိမ်အရေအတွက်ကို ဖော်ထုတ်နိုင်ရန် လေ့လာ ရေး ဘောင်နိမိတ်ကို သတ်မှတ်ပြီး ဆောင်ရွက်ခဲ့ပါသည်။ အဆိုပါ လေ့လာ ရေးဘောင်နိမိတ်သတ်မှတ်ခြင်းရည်ရွယ်ချက် မှာ ကြီးတင်ခန့်မှန်းသည့် အကျိုး သက်ရောက်မှုများအား ဖြစ်ပွားနိုင်ခြေအားဖြင့်အဆင့်ခွဲခြားသတ်မှတ်ရန်၊
အကျိုး သက်ရောက်မှုအားလုံး အလတ်စားအကျိုးသက် ရောက်မှုသာရှိ စေရန် ၊ကျော်လွန်ပါက အကျိုးသက်ရောက်မှုလေ့လာဆန်းစစ်ရေးအား အသေး စိတ်ထပ်မံ ပြုလုပ်သွားနိုင်ရန်ဖြစ်ပါသည်။ အကျိုးသက်ရောက်မှုဘောင်နိ မိတ်ကို အဓိကစီမံကိန်းကာလ (တည်ဆောက်ရေးကာလနှင့် လည်ပတ်မှု ကာလ) အတွင်း ဆောင်ရွက်ခဲ့သည်။ ကနေဦး အကျိုးသက်ရောက်မှု ဘောင်နိ မိတ်သက်မှတ်ရေး လေ့လာမှုတွေ့ရှိချက်များကို မှတ်သားထည့်သွင်း စဉ်းစားပြီး ပြောင်း လဲပေးနိုင်မှုနှင့် အခြားဆောင်ရွက်သင့်သည့် ထိမ်းချုပ်ရေးဆောင် ရွက်ချက်များ ကို စီမံကိန်းဒီဇိုင်းတွင် ပူးပေါင်းကာ ပတ်ဝန်းကျင်နှင့် လူမှုစီး ပွားရေးအခြေခံလေ့လာရေးတွေ့ရှိချက်များကိုပါ ပူးပေါင်းထည့်သွင်းသည်။ လေ့ လာရေးဘောင်နိမိတ်ကို တည်ဆောက်ချိန်နှင့် လည်ပတ်လုပ်ဆောင်ချိန်အ ဆင့်နှင့် စပ်လျဉ်း၍ ထင်ရှားစွာဖြစ်ပွားနိုင်သည့် ဆန့်ကျင်ဖီ လာပြုသော အကျိုးသက်ရောက်မှု များစွာ ဖြစ်ပွားနိုင်မှုအား လေ့လာသတ်မှတ်ပေးနိုင်ပြီးလို အပ်ပါက အောက်ပါအတိုင်း နောက်ထပ် အကျိုးသက်ရောက်မှု လေ့လာ ဆန်းစစ်မှု ဆက်လက်ပြုလုပ်သွားနိုင်ရန် ဖြစ်ပါသည်။
<table>
<tr><th colspan="3">ဖြစ်ပွားနိုင်သည့် ဆောက်လုပ်ရေးအဆင့် အကျိုးသက်ရောက်မှုများ</th></tr>
<tr><th>အကျိုးသက်ရောက်မှု
လှုပ်ရှားမှု/အရင်းအမြစ်</th><th>ရှုထောင့်</th><th>ပြန်ကြားမှု/အရင်းအမြစ်</th></tr>
<tr><td>• မြေစီစဉ်ရေးလုပ်</td><td>ရှုထောင့်</td><td>• ဒေသလေထုအ</td></tr>
</table>
</td></tr>
</table>

	ငန်းများ • ဖုံအတွင်းယာဉ်ကြောနှင့် စက်ရုံ		ရည်အသွေး • လူထုကျန်းမာရေး
	• ဆောက်လုပ်ရေးလုပ်ငန်းများ	အသံဆူညံမှုဖြစ်ပွားခြင်း	• လူထုအနှောင့်အယှက်ပေးမှု • လူထုကျန်းမာရေး
	• အန္တရာယ်ရှိသည့် ပစ္စည်းအသုံးပြုမှု • လောင်စာဆီ၊ စက်သုံးဆီ၊ ပျော်ဝင်ဆေးရည်	-မတော်တဆပေါက်ထွက်မှု စိမ့်ထွက်မှု -စိမ့်ဝင်မှုနှင့် အောက်ပိုင်းသို့ အင်္ဂေ့စိမ့်ဝင်မှု	• မြေဆီလွှာနှင့် မြေအောက်ရေအရည်အသွေး
	• အန္တရာယ်ရှိသည့် ပစ္စည်းအသုံးပြုမှု • လောင်စာဆီ၊ စက်သုံးဆီ၊ ေ ပျော်ဝင် ဆေးရည်	-မတော်တဆပေါက်ထွက်မှု စိမ့်ထွက်မှု -စိမ့်ဝင်မှုနှင့် အောက်ပိုင်းသို့ အင်္ဂေ့စိမ့်ဝင်မှု	• ရေအရင်းအမြစ်များ
အကျိုးသက်ရောက်မှု အကဲဖြတ်ခြင်း	လေ့လာရေး ဘောင်နိမိတ်သတ်မှတ်စဉ်တိုက်ရိုက်နှင့်သွယ်ဝိုက်သောနည်းဖြင့် ရေတို နှင့်ရေရှည်၊ ကောင်းကျိုးနှင့် ဆိုးကျိုး၊ ပတ်ဝန်းကျင်၊ လူမှု စီးပွားရေး အကျိုးသက်ရောက်မှုများကို သတ်မှတ်ဖော်ပြနိုင်ရန်လေ့လာဆန်းစစ်သည်။ စီမံကိန်းတည်ဆောက်မှုကာလနှင့် ဆက်စပ်ပြီး အောက်ပါ အကျိုးသက် ရောက်မှုအသေး စိတ်လေ့လာ ဆန်းစစ်မှုအား သာမန်အကျိုးသက်ရောက်မှုဟု သတ်မှတ်ပါသည်။ သာမန်အကျိုးသက်ရောက်မှုများ • ဒေသလေထုအရည်အသွေးပျက်ပြားမှုဦးတည်သည့် ဆောက်လုပ်ရေးလုပ်ဆောင် ချက်များ • ပတ်ဝန်းကျင်ဆူညံမှုအဆင့် တိုးပွားမှုဦးတည်သည့် ဆောက်လုပ် ရေးလုပ်ဆောင်ချက် များ စီမံကိန်းလည်ပတ်မှုကာလနှင့် ဆက်စပ်ပြီး အောက်ပါအကျိုးသက်ရောက်မှုအသေး စိတ်လေ့ လာဆန်းစစ်မှုအား သာမန်အကျိုးသက်ရောက်မှုဟု သတ်မှတ်ပါသည်။		

	သာမန်-အလတ်စားအကျိုးသက်ရောက်မှုများ • LPG ဓါတ်ငွေ့သိုလှောင်သည့်နေရာတွင် မီးလောင်မှုနှင့် ပေါက်ကွဲ မှု ဖြစ်ပွားနိုင်ခြေ အန္တရာယ်ရှိခြင်း အလတ်စားအကျိုးသက်ရောက်မှုများ • မြေအောက်ရေအရင်းအမြစ် ပိုလှဲစွာထုတ်ယူမှုဦးတည်သည့် လည်ပတ်မှုလုပ် ဆောင်ချက်များ • မြေအောက်ရေအရင်းအမြစ်ဆိုးရွားမှု ဦးတည်သည့် လည်ပတ်မှု လုပ်ဆောင်ချက်များ • မြေအောက်ရေအရင်းအမြစ် ပိုလှဲစွာထုတ်ယူမှုဦးတည်ပြီး လူထုရေလုံခြုံရေးအား တဆက်တည်းအကျိုးသက်ရောက်မှုရှိစေသည့် လည်ပတ်မှု လုပ်ဆောင်ချက်များ
ပတ်ဝန်းကျင် စီမံခန့်ခွဲရေးနှင့် လေ့လာစောင့်ကြည့်ရေး အစီအစဉ် (EMMP)	
EMMP ခြုံငုံသုံးသပ်ချက်	အကျိုးသက်ရောက်မှုလေ့လာဆန်းစစ်ချက် တွေ့ ရှိချက်များအပေါ် အခြေခံကာ SLP သည်ထင်ထင်ရှားရှား ဖြစ်ပွားနိုင်သောဆိုးရွားသည့် သဘာဝ ပတ်ဝန်း ကျင်နှင့် လူမှုရေးဆိုင်ရာ ပြန်ကြားမှုများအား စီမံကိန်း လုပ်ငန်းတစ်လျှောက် သင့်လျော်သလိုလျော့နည်းမှုရှိစေရန် EMMP အသေးစိတ်ကို အသင့်ပြင် ဆင်ထားပြီးဖြစ်သည်။ EMMP သည်စီမံကိန်းလုပ်ငန်းများ ၏ ပတ်ဝန်းကျင်နှင့် လူမှုရေးအကျိုးသက်ရောက်မှုများ ရှင်းလင်းစွာ ဖော်ပြရန်၊ ပတ်ဝန်းကျင် နှင့် လူမှုရေးစွမ်းဆောင်နိုင်မှုအား ပြန်ကြား၊ ထိန်းချုပ်၊ ထိန်း သိမ်းမှုရှိသော စနစ်တကျကုန်ကျမှု သက်သာသည့်လုပ်ငန်း ဖော်ဆောင်များ ဖော်ဆောင်ရန် စီမံကိန်းရင်းနှီးမြှုပ်နှံသူအတွက် စီမံခန့်ခွဲရေး ကိရိယာတစ်ခုအဖြစ်အထောက် ကူပြုပါသည်။
ထင်ရှားသည့် အကြွင်းအကျန် အကျိုး သက်ရောက်မှုများ	အကြံပြုထားသည့် လျော့ပါးသက်သာရေးဆောင်ရွက်ချက်များအား သင့်လျော်စွာ အကောင် အထည်ဖော်ပြီးနောက် စီမံကိန်းလုပ်ငန်းများ ကြောင့် ဖြစ်ပွားရသည့် သာမန်၊ အလတ်စား၊ အဓိက သို့မဟုတ် စိုးရိမ်ဖွယ်ရာ အရေးပါသော အကြွင်းအကျန်များ မရှိကြောင်း၊ အကျိုး သက်ရောက်မှုအားလုံးအား အကြောင်းရင်းခိုင်လုံစွာ လက်တွေ့ကျကျ နိမ့်ကျမှုရှိစေရန် သင့်မြတ် လျော်ကန်စွာ လျော့ပါးစေကြောင်း IEE မှကောက်ချက်ချပါသည်။
လေ့လာစောင့်ကြည့်ရေး အစီအစဉ်	ပတ်ဝန်းကျင်လေ့လာစောင့်ကြည့်ရေးကို စီမံကိန်းတည်ဆောက်မှု လုပ်ငန်းနှင့် လုပ်ငန်းလည် ပတ်မှုအဆင့်ကာလအတောအတွင်း လေ့လာစောင့်ကြည့် (အစီရင်ခံစာတင်) မည်ဖြစ်ပါ သည်။ အဓိကလေ့လာစောင့် ကြည်ရေးလုပ်ငန်းရည်ရွယ်ချက်များသည် အောက်ပါအတိုင်း ဖြစ်ပါသည်။ • သတ်မှတ်ထားသောပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေးစံချိန်များနှင့်

	အညီရှိ ကြောင်းအကဲဖြတ်တိုင်းတာရန် • ပတ်ဝန်းကျင်ထိမ်းချုပ်ရေး အကဲဖြတ်တိုင်းတာခြင်း သို့မဟုတ် လုပ်ဆောင်ချက်များ သည်လက်ခံနိုင်သည့် စံနှုန်းမမှီပါက ကနဦး အရိပ်လက္ခဏာ တင်ပြနိုင်ရန် • စဉ်ဆက်မပြတ် ပြန်လည်သုံးသပ်ခြင်းနှင့် လုပ်ငန်းပိုင်း ဆိုင်ရာလေ့လာ စောင့်ကြည့် ရေးအစီအစဉ်တိုး တက်ကောင်းမွန်အောင် ပြုလုပ်ခြင်း အတွက် အခြေခံများ သတ် မှတ်သွားရန် အချုပ်အားဖြင့် ပတ်ဝန်းကျင်လေထုအရည်အသွေး၊ အသံဆူညံမှု အဆင့်အ တန်း၊ မြေပြင်ရေအရည်အသွေးများကို စီမံကိန်းဆောက်လုပ်ရေးကာ လ အ တွင်း ၄ လတ ကြိမ် စောင့်ကြည့် စစ်ဆေးသွားမည်။ မုန်တိုင်း ရေအရည်အသွေး စီမံကိန်းလည် ပတ်မှုကာလအတွင်း ၄ လတကြိမ် စောင့်ကြည့်စစ် ဆေးသွား မည်။
နိဂုံးချုပ်	
နိဂုံးချုပ်	SLP သည် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးနှင့် သစ်တောဝန်ကြီးဌာန ကြေညာ ချက်အမှတ် ၆၁၆/၂၀၁၅ (၂၀၁၅ ခုနှစ် ဒီဇင်ဘာလ ၂၉ ရက်) ပတ်ဝန်း ကျင်အကျိုးသက်ရောက်မှု လေ့ လာဆန်းစစ်ရေး လုပ်ထုံးလုပ်နည်း အပိုဒ် ၄ တွင် ဖော်ပြသောလိုအပ်ချက်များနှင့်အညီ စီမံ ကိန်းအတွက် အစဦး ပတ်ဝန်း ကျင်ဆိုင်ရာ စစ်ဆေးမှု (IEE) ကိုပြုလုပ်ခဲ့ပါသည်။ လေ့လာမှု တွင် အောက် ဖော်ပြပါ လမ်းညွှန်ချက်များနှင့် အညီပြုလုပ်ခဲ့ပါသည်။ အပြည်ပြည်ဆိုင်ရာ ဘဏ္ဍာရေး ကော်ပိုရေးရှင်း (IFC) Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development (April 2007) စီမံကိန်း၏ အဓိကဖြစ်နိုင်ဖွယ် အကျိုးသက်ရောက်မှုများကို သတ်မှတ်လေ့ လာဆန်းစစ်ပြီး ဖြစ်နိုင်ဖွယ်အ ကျိုးသက်ရောက်မှု လျော့နည်းပါး သက်သာ စေရန်၊ စီမံကိန်းဆောင်ရွက်ချိန် အတွင်း ကောင်းမွန်သောထုံး တမ်း အစဉ်အ လာစံနှုန်းများ ဥပဒေပြဋ္ဌာန်းချက်နှင့်အညီရှိစေရန် SLP သည်အလိုအလျောက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေးနှင့် ကြည့်ရှုစောင့်ရှောင့်ရေးအစီ အစဉ် (EMMP) အားဖန်တီးလုပ်ဆောင်ခဲ့ပါသည်။ အကြံပြုထားသည့် လျော့ပါးသက်သာရေးဆောင်ရွက်ချက်များအား သင့်လျော် စွာ အကောင် အထည်ဖော်ပြီးနောက် စီမံကိန်း လုပ်ငန်းများကြောင့် ဖြစ်ပွား ရသည့် သာမန်၊ အလတ်စား၊ အဓိက သို့မဟုတ် စိုးရိမ်ဖွယ်ရာ အရေးပါသော အကျွင်းအကျန်များ မရှိကြောင်း၊ အကျိုး သက်ရောက်မှုအားလုံးအား အကြောင်းရင်းခိုင်လုံစွာ လက်တွေ့ကျကျ နိမ့်ကမှုရှိစေရန် သင့် မြတ်လျော် ကန်စွာ လျော့ပါးစေကြောင်း IEE မှကောက်ချက်ချပါသည်။

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

SLP Environmental Co., Ltd (SLP) has been appointed by PHL Hotel Management Ltd (hereafter the 'Project Proponent) to prepare the Initial Environmental Examination (IEE) for the 46 room Pun Hlaing Golf Lodge hotel development (the "Project") situated within the Pun Hlaing Golf Estate located in Hlaing Tharyar Township, Yangon Division (the "Project Site Area") as shown in **Plate 1** below.

The Project Proponent proposes to construct a golf lodge hotel which will comprise of an eight storey hotel structure with 46 guest rooms, associated lobby/lounge, conference and meeting rooms, kitchen and guest restaurant, staff accommodation and canteen and a golf operations centre.

The development will have a Gross Floor Area (GFA) of 13,617 sq.m on a total plot area of 8,887 sq.m. Construction works commenced in June 2013 and are scheduled to take 1,170 days in total with completion and handover scheduled for 24th February 2017.

The Project is situated within the Pun Hlaing Golf Estate which was founded in 1997 by a joint venture of SPA/FMI group companies and the Department of Human Settlement and Housing Development (DHSHD), with a vision to develop a world class golf course supplemented with a gated residential community.

Plate 1: Location of the Project Site

The Myanmar Investment Commission (MIC) has requested that the Project Proponent prepare an Initial Environmental Examination (IEE) report for the Project in accordance with the requirements of the Myanmar Investment Commission Notification No. 50/2014.

This IEE report has been prepared in general accordance with the requirements stipulated in Chapter IV of the ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE, Ministry of Environmental Conservation and Forestry, Notification No. 616 / 2015 (29 December 2015) and Chapters VII and Annex 4 of the ADMINISTRATIVE INSTRUCTION OF ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE, Ministry of Environmental Conservation and Forestry (*draft*).

Furthermore, the IEE study was also conducted and reported cognisant of guidance presented in the International Finance Corporation (IFC) Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development (April 2007).

This report presents the finding of the IEE study conducted with reference to the construction and operation of the Project. This IEE has been prepared using information provided by the Project Proponent, secondary data obtained from government agencies and other referenced authoritative sources and primary data obtained by SLP via fieldwork, consultation and laboratory analysis.

1.2 PROJECT OVERVIEW

PHL Hotel Management Ltd proposes to construct a luxury hotel lodge comprising of 8 stories (basement, 1st level, mezzanine, 2nd level, 3rd level, 4th level, 5th level and 6th level) with a total of 46 rooms and a Gross Floor Area (GFA) of 13,617 sq.m on a total plot area of 8,887 sq.m.

The basement level will comprise of a golf operations area with a total footprint of 1,518 sq.m; common areas and hotel back of house totalling some 2,315 sq.m.

Level 1 of the building will comprise of four apartment suites measuring approximately 136 sq.m per unit and 3,346 sq.m of amenities. The amenities include reception, lobby and public areas, conference room, meeting rooms, management office, cigar bar and restaurants.

Level 2 to level 5 will contain forty-two units comprising of 30 typical standard guest suites measuring 63 sq.m each; 4 corner suite Type 1 units measuring 101 sq.m each; 4 corner suite Type 2 units measuring 82 sq.m each and 4 garden suite units measuring 143 sq.m each.

The maximum building height will be 31.15m and the development will have parking for 28 vehicles. Electricity will be provided by the national grid with a 100% backup capacity also available from the Pun Hlaing Golf Estate which has its own generating capacity. Water will be provided by Pun Hlaing Golf Estate and sanitary wastewaters will be discharged to Pun Hlaing Golf Estate's own wastewater treatment plant (WWTP).

An artist's impression of the finished development is presented in **Plate 2** below.

Plate 2: Artists Impression of Pun Hlaing Lodge Hotel

1.3 IEE REQUIREMENT

The Myanmar Investment Commission (MIC) has requested that the Project Proponent prepare an Initial Environmental Examination (IEE) report for the Project in accordance with the requirements of the Myanmar Investment Commission Notification No. 50/2014.

This IEE report has been prepared in general accordance with the requirements stipulated in Chapter IV of the ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE, Ministry of Environmental Conservation and Forestry, Notification No. 616 / 2015 (29 December 2015) and Chapters VII and Annex 4 of the ADMINISTRATIVE INSTRUCTION OF ENVIRONMENTAL IMPACT ASSESSMENTPROCEDURE, Ministry of Environmental Conservation and Forestry (draft).

Furthermore, the IEE study was also conducted and reported cognisant of guidance presented in the International Finance Corporation (IFC) Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development (April 2007).

1.4 IEE APPROACH AND OBJECTIVES

SLP Environmental has been appointed by the Project Proponent to prepare the Initial Environmental Examination (IEE) for the Pun Hlaing Lodge development (the Project) located in Hlaing Tharyar Township, Yangon Division. The approach adopted by SLP for the completion of this IEE study is based on the utilisation of existing secondary data supplemented by some limited field baseline surveys to characterise the natural and socio-economic in the Project Site area. The proposed approach for the IEE study conforms to the regulatory requirements for preparing IEE reports as stipulated in the MOECAF Environmental Impact Assessment Procedure and Administrative Instruction of Environmental Impact Assessment Procedure documents.

The IEE study has the following primary objectives:

- To develop an environmental and socio-economic profile of the Project Area including the existing status of the physio-chemical and biological systems and identification of potentially sensitive environmental and social receptors;
- To examine the activities of the Project in order to identify those aspects must likely to have interactions with environmental and social receptors;
- To ensure that any potential adverse impacts on the natural environment and or social receptors arising as a result of the development of the Project are clearly identified;
- To develop a suitably robust environmental management and monitoring plan (EMMP) for the Project to ensure that any identified significant adverse impacts are, where possible, prevented, managed and/or otherwise mitigated; and
- To ensure that the proposed development Project is implemented in conformance with the environmental regulatory requirements of the Republic of the Union of Myanmar and cognisant of the relevant international guidelines used as benchmarks in the study.

1.5 PROJECT PROPONENT DETAILS

The Project is being developed by PHL Hotel Management Ltd whose registered office is at FMI Centre Level 10 & 11, 380 Bogyoke Aung San Road, Pabedan Township, Yangon, Myanmar. PHL Hotel Management Ltd is a subsidiary of Yoma Strategic Holdings Ltd which owns a 70% economic interest in the Land Development Rights (LDR) for the overall Pun Hlaing Golf Estate development within which the project is situated. Yoma Strategic Holdings Ltd was listed on the main board of the Singapore Exchange in 2006 and has established itself as the one of the leading real estate developers in

Myanmar with a reputation for high quality housing projects in the country. The Company is affiliated to Serge Pun and Associates (Myanmar) Ltd (SPA) and First Myanmar Investment Co. Ltd (FMI) in Myanmar.

Adopting the conglomerate strategy; Yoma Strategic Holdings strives to build a portfolio of businesses in Myanmar through expansion and cooperation with the SPA group and FMI. In addition to its strong foothold in the real estate market, Yoma Strategic Holdings diversified portfolio includes consumer, automotive, agriculture, logistics and tourism businesses. The Company has also made several investments in infrastructure-related sectors together with established multinational partners.

Leveraging on its experience in Myanmar and its strong emphasis on corporate good governance, the group has forged strategic alliances with international partners such as Mitsubishi Corporation, Sumitomo Corporation, Hong Kong and Shanghai Hotels, Yum Brands, the International Finance Corporation (IFC) and the Asian Development Bank (ADB). These partnerships provide invaluable expertise, add to the Group's capacity to execute its business strategy and continue to ensure that the Group's projects are of the highest international standards.

The primary representative of the Project Proponent with responsibility for the delivery of the Project is detailed below in **Table 1.**

Table 1: Project Proponents Representative

Name	Company	Position
Mr Peter Crowhurst	Yoma Strategic Holdings Limited	Head of Asset Management

Detailed Information of Proposed Organization

Name of Principle Organization	SM Mawlamyaing Hotel Limited
Type of Business	Hotel Services
Address in Myanmar	The Campus, 1 Office Park, Rain Tree Drive, Pun Hlaing Estate Hlaing Thayar Township, Yangon, Myanmar 11401
Authorized Capital	USD 14,200,000
Manufacturing	-
Production System	-
Investment Location	No.12/121-A + 121-B, Ever Green Street, Hlaing Tharyar Township, Yangon, Myanmar
Type of Land	Ancestral Land

List of Executives of SM Mawlamyaing Hotel Limited

- U Tun Tun (Director)
- U Theim Wai@ Serge Pun (Director)
- Mr. Chi Yam Cyrus Pun (Director)

- Daw Tin Winn Nge (Director)

Numbers of Employee

No.	Department	No. of Employee
1	F & B	13
2	Kitchen	18
3	Front Office	14
4	Housekeeping	18
5	HR	2
6	M & E	4
7	Security	5
8	Finance	1
9	IT	2
	Total	77

1. 6 SLP ENVIRONMENTAL PROFESSIONAL CREDENTIALS

SLP Environmental has extensive experience in providing Environmental and Social Impact Assessment services across all of the ASEAN jurisdictions including Myanmar. Our experience covers a wide range of sectors including; real estate, commodities, manufacturing, petro-chemical, pharmaceutical, agri-business, energy, waste and transport. Recent EIA related projects in Myanmar include:

- ESIA – Dulwich International College, Thanlyin, Yangon;
- ESIA– Galaxy Towers, Thanlyin, Yangon;
- ESIA for Oil and Gas Seismic Survey, Offshore Block MD-02, Moattama Basin;
- Preparation of EIA Guidelines for Onshore and Offshore Oil and Gas Developments in Myanmar (on behalf of Myanmar Government);
- EIA – Bulk Fuel Storage and Distribution Facility; Mandalay Division;
- EIA – Bioethanol Production Facility, Sagaing Division; and
- IEE – Manufacturing Facility, Thanlyin SEZ, Yangon Division.

SLP is an accredited third party by MOECAF to prepare IEE/EIA/EMP reports in Myanmar and a copy of our accreditation is presented in **Appendix C**. SLP has successfully completed numerous EIA/IEE assignments to IFC standards across multiple sectors in Myanmar on behalf of international inward investors, which have subsequently been approved by MOECAF and the MIC, and our clients awarded investor privileges under the Foreign Investment Law (FIL).

SLP is uniquely placed in the SE Asian market to deliver high quality environmental and social assessment services as we combine internationally acquired expertise and experience with an in-depth understanding of the regions regulatory frameworks and cultural sensitivities. Our multi-national team comprises of highly qualified and experienced staff including Chartered Environmentalists (CEnv), Chartered Scientists (CSci) and Members of the Chartered Institute of Water and Environmental Management (MCIWEM).

1.7 PROFESSIONAL CREDENTIALS OF THE SLP IMPACT ASSESSORS

SLP assigned a multi-national Project Team with the necessary expertise and experience to deliver a high quality IEE report. The proposed Project Management and Delivery Team included international and local experts as well as several Chartered professionals as detailed in **Table 2.**

Table 2: Specialists contributing to the IEE Study

Name	Qualifications	Role/Specialism	Experience (yrs)
Mr Stephen Pearmain	BSc, MSc, CEnv, MIEnvSC	Project Director, Environmental and Social Safeguards Specialist	20
Mrs Elizabeth Health MCIWEM,	BSc, MSc, CEnv, CSci	Project Manager, Environmental Management Specialist	15
Mrs Khin Ohnmar Htwe	BA.MA	Social Impact Assessment Specialist	15
Ms Teeranard	BSc. MSc. MEEAT	Field Operations Manager, Environmental Baseline Studies	8
Mr Chit Myo Lwin	BSc, MGS, MEI	Geology & Hydrogeology	8

1.8 INFORMATION PROVIDED BY THE CLIENT

Information provided by PHL Hotel Management Ltd. is summarised below:

- Site Location and Site Master Plan, Pun Hlaing Lodge, 8 December 2014;
- Pun Hlaing Lodge - Fact Sheet, 7 January 2016;
- Pun Hlaing Lodge, Soil Test Report, 25 March 2013;
- Pun Hlaing Lodge Project Master Schedule, 31 December 2015;
- Topographical Survey Drawing; and
- Architects Perspective of the finished development.

1.9 REPORT STRUCTURE

The report consists of the following sections:

- Section 1; Introduction, Project Background and Study Objectives;
- Section 2; Policy, Legal and Administrative Framework pertaining to the Project;
- Section 3; IEE Methodology;
- Section 4; Project Site Description;
- Section 5; Project Description;
- Section 6; The Natural Environment;

- Section 7; The Socio-Economic Environment;
- Section 8; Baseline Studies;
- Section 9; Environmental and Social Impact Assessment;
- Section 10; Environmental Management and Monitoring Plan;
- Section 11; Conclusions; and
- Section 12; References and Sources of Information.

1.10 LIMITATIONS, EXCLUSIONS AND RELIANCE

This report has been prepared by SLP Environmental Co., Ltd, with all reasonable skill, care and diligence within the terms of the instructed proposal a nd taking account of the resources devoted to us by agreement with the client. This report is based upon the application of scientific principles and professional judgement to certain facts with resultant subjective interpretations. Professional judgements expressed herein are based on the currently available facts within the limits of the existing and field collected data, scope of work, budget and schedule.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on this report at its own risk.

It is understood that the services performed, and opinions expressed by SLP Environmental in the report are based upon the limits of the investigation as described above. It is understood that SLP Environmental has relied upon the accuracy of third-party documents, oral information, and other material and information provided by the client and others, and SLP Environmental assumes no responsibility for the accuracy or completeness of such data.

SLP Environmental makes no warranties, expressed or implied, including without limitation, warranties as to merchantability or fitness for a particular purpose. The information provided in this report shall not be construed as legal advice.

2.0 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 INTRODUCTION

A synopsis is presented below of the environmental and social regulatory framework that is considered relevant to the Project activity. The Environmental Conservation Law (2012) is the major governing law and the Environmental Conservation Department (ECD) and the Ministry of Environmental Conservation and Forestry (MOECAF) are the prime governing bodies of the law enforcement. In addition, the Constitution (2008), the National Environmental Policy (1994), Environmental Conservation Rules and Regulation (2014) are also included to be abided in the process of initial environmental examination (IEE). The above-mentioned existing national laws, rules and regulations of the Republic of the Union of Myanmar to be abided by the project proponents/ investors on mitigating negative environmental impacts are compiled and presented in the following Table. It is equally important for this project proponent which shall also comply with Myanmar Hotel and Tourism Law (1993), regulations and The Social Security Law (2012).

2.2 INSTITUTIONAL CONTEXT

2.2.1 Administrative Structure Overview

The governmental structure in Myanmar is separated to 3 sections; Government, Regional Administration and Local Administration as shown in **Plate 3**.

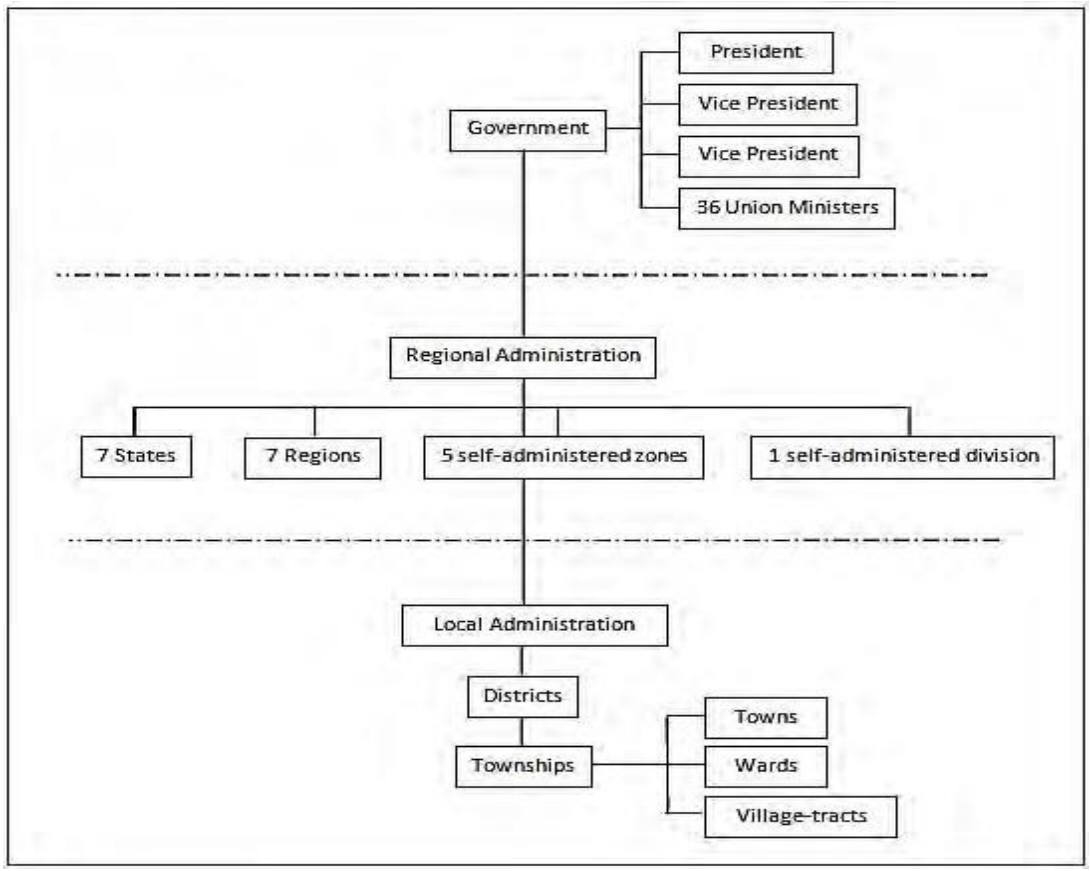


Plate 3: The Governmental Structure in Myanmar

Myanmar administrative divisions are divided into 21 sub-divisions which include 7 States, 7 Regions (aka Divisions), 1 Union Territory, 5 Self-administered Zones and 1 Self-administered Division. The regions are characterised by majority Bamar populations whereas in the states ethnic minority populations predominate. Yangon Region has the largest population the highest density population. Regions and states are divided into districts. Each district consists of townships which include towns and village-tracts (a group of adjacent villages).

The main government agencies responsible for controlling the potential environmental and social impacts of large urban redevelopment mixed use type developments in Yangon comprise of:

- Ministry of Environmental Conservation and Forestry (MOECAF) – the Environmental Conservation Department (ECD) within MOECAF is the primary government agency responsible for environmental protection and managing the environmental and social impacts of projects. MOECAF's responsibilities include reviewing and approving a project developers IEE Project Proposal, IEE Scoping Study, Environmental and Social Impact Assessment (IEE) report and Environmental and Management and Monitoring Plan (EMMP) report. Projects cannot commence until MOECAF has issued an Environmental Compliance Certificate (ECC).

- The Myanmar Investment Commission (MIC) – responsible for scrutinizing investors proposals made under the Foreign Investment Law (2012), granting investor privileges and issuing investment permits. The MIC has a duty to consider environmental and social impacts when considering project proposals.

- The Department of Health (DOH) within the Ministry of Health is responsible for occupational and environmental health protection in Myanmar. This department deals with the prevention of adverse health effects due to air and water pollution, toxic and hazardous wastes and chemical safety. The Occupational Health Division (OHD) within the DOH is responsible for health promotion in work places, environmental monitoring of work places, biological monitoring of exposed workers and health education on occupational hazards.

- Yangon City Development Committee (YCDC) is the administrative body of Yangon and responsible for waste management, water supply and sanitary systems, implementing land policies, administration of lands, developing and enforcing planning controls, protection of heritage buildings, regulation of construction sites, environmental regulations including business licenses and registries and maintenance of public property.

2.3 OVERVIEW OF PERMITTING PROCESS AND AUTHORITIES INVOLVED

In accordance with Myanmar Investment Commission (MIC) Notification 50/2014; the Project Proponent has been requested to prepare an Initial Environmental Examination (IEE) for the Project for submission to the MIC for their review and approvals prior to the issuance of an Investment Permit for the Project.

A brief synopsis of the primary legislation and regulation related to the Environmental Impact Assessment process in Myanmar is presented below.

2.3.1 Myanmar Hotel & Tourism Law (1993)

Section 3 (b)	To enable tourists to observe Myanmar culture heritage and natural scenic beauty
Section 3 (c)	To prevent destruction and damage of Myanmar cultural heritage and natural scenic beauty, due to the hotel tourism industry
Section 3 (e)	To develop technical relating to hotel and tourism industry and to open up more employment opportunities

2.3.2 Environmental Quality Standards

The Ministry may, with the approval of the Union Government and the Committee, stipulate the following environmental quality standards:

(a)suitable surface water quality standards in the usage in rivers, streams, canals, springs, marshes, swamps, lakes, reservoirs and other inland water sources of the public;

(b) water quality standards for coastal and estuarine areas;

(c) underground water quality standards;

(d) atmospheric quality standards;

(e) noise and vibration standards;

(f) emissions standards;

(g) effluent standards;

(h) solid wastes standards;

(i) Other environmental quality standards stipulated by the Union Government.

2.3.3 Environmental Conservation Law, Law No. 9/2012, 30th March 2012

Despite drafting an environmental policy in 1994, there was no recognized environmental law in Myanmar until The Environmental Conservation Law (ECL) was enacted in 2012. The Environmental Conservation Law contains 14 chapters that define the rights and responsibilities of the Ministry of Environmental Conservation and Forestry which includes; environmental quality standards, environmental conservation, management in urban areas, conservation of natural and cultural resources, process for businesses to apply for permission to engage in an enterprise that has the potential to damage the environment, prohibitions, offences and punishments.

Under **Article 7** (m) the ECL states that the Ministry has duties and powers with respect to implementing 'a system of environmental impact assessment and social impact assessment as to whether or not a project or activity to be undertaken by any Government department, organization or person may cause a significant impact on the environment'.

(o) 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;

Article 14; A person causing a point source of pollution shall treat, emit, discharge and deposit the

substances which cause pollution in the environment in accord with stipulated environmental quality standards.

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

Article 18 states that relevant Government departments and Government organizations shall carry out the conservation, management, beneficial use, sustainable use etc., of natural resources. MOECAF shall cooperate with the relevant Government departments and Government organizations for the preservation of cultural heritage areas, natural heritage areas, cultural monuments, and natural areas.

Articles 22 – 25 allow the Ministry to establish a prior permitting scheme for businesses that may cause significant environmental harm by prescribing categories of business that require a permit for the activity which may also come with prescribed and binding conditions.

Articles 31; Whoever, without the prior permission, operates business, work-site or factory, workshop which is required to obtain the prior permission under this law shall, on conviction, be punished with imprisonment for a term not exceeding three years, or with fine from a minimum of one hundred thousand kyats to a maximum of one million kyats, or with both.

Articles 32; Whoever violates any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law shall, on conviction, be punished with imprisonment for a term not exceeding one year, or with fine, or with both.

2.3.4 Environmental Conservation Rules (2013)

The Environmental Conservation Rules (2013) was issued by The Ministry of Environmental Conservation and Forestry (MOECAF), in exercise of power conferred under sub-section (a) of section 42 of the Environmental Conservation Law 2012. It details the functions and duties of the Environmental Conservation Department (ECD) under the Ministry of Environmental Conservation and Forestry (MOECAF).

Article 26 (g) states that ECD shall determine and issue guidance relating to the environmental impact assessment process.

Article 26 (h) states that ECD shall formulate the environmental impact assessment system and submitting it to MOECAF.

Article 31 (a) states that MOECAF shall establish an environmental management fund with the income received from the State budget.

Article 38 (a) states that MOECAF may declare and determine, by notification, the environmental quality standards contained in sub-section (d) of section 7 and section 10 of the Law for conservation and enhancement of environment for the whole country, or for any urban or rural area, river, stream, lake or any part thereof.

Article 39 (a) states that ECD shall coordinate with the relevant Government departments as may be necessary in the formulation of environmental quality standards.

Article 41 states that MOECAF shall determine categories and classes of hazardous wastes, which may come out from producing or using chemicals or other hazardous materials in industries, agricultural businesses, mineral explorations, livestock breeding and fisheries, waste disposal and other works.

Article 44 states that ECD shall prepare the categories and classes of hazardous wastes which may come out from producing or using chemicals or other hazardous materials in industry, agricultural business, mineral exploration, livestock breeding and fishery, waste disposal and other works, and submit to MOECAF.

Article 45 states that ECD shall inspect whether the businesses which are responsible to establish waste treatment facility or centre under rule 42 comply with the stipulations relating to waste treatment and carry out, and submit in accordance, with the guidance of the Ministry.

Article 46(a) states that ECD shall prepare terms and conditions for treatment of effluent in industrial areas, special economic zones and other necessary areas and buildings, and terms and conditions relating to emissions of machines, vehicle and other machinery and submit to the Ministry.

Article 52 states that MOECAF shall determine the categories of business and or activities which shall be required to prepare environmental impact assessment.

Article 53 states that MOECAF may, so as to scrutinize whether or not it is necessary to conduct environmental impact assessment, determine the proposed plans, businesses or activities which do not include in stipulation under rule 52 as the categories which are required to conduct Initial Environmental Examination (IEE).

Article 54 states that project proponents who are required to prepare EIAs under Article 52:

(a) shall carry out environmental impact assessment for his plan, business or activity,

(b) shall submit to the Ministry in advance the details of the organisation or person who will be preparing the environmental impact assessment,

(c) shall submit the environmental impact assessment report to MOECAF.

Article 56 states that the project developer shall arrange and carry out for conducting the EIA for any project, business or activity by a qualified third person or organization accepted by MOECAF.

Article 57 states that MOECAF shall, determine and decide, after making scrutiny, whether it is suitable level of international organization or person to carry out the EIA. The decision of the Ministry relating to such matter is final and conclusive.

Article 58 states that MOECAF shall form the Environmental Impact Assessment Report Review Body with the experts from the relevant Government departments and Government organizations.

Article 60 states that MOECAF may assign duty to the ECD to scrutinize the report of EIA prepared and submitted by a third person or organization relating to EIA and report through the Environmental Impact Assessment Report Review Body.

Article 61 states that MOECAF may approve and reply on the EIA report or EMP with the approval of the Committee.

Article 62 states that MOECAF shall determine and declare categories of business, workplace, mills or factories which are required to **obtain prior permission,** and which may affect the necessary environmental quality standards after obtaining the approval of the Committee and the agreement of the Union Government.

2.3.5 Environmental Impact Assessment Procedure (January 2016)

The Ministry of Environmental Conservation and Forestry has enacted an Environmental Impact Assessment Procedure to implement the EIA aspects of the Environmental Conservation Law. The EIA

procedure was promulgated in January 2016.

The Environmental Impact Assessment Procedure aims 'to established a system of environmental impact assessment which shall require any proposed project or business or activity or undertaking in Myanmar by any ministry, government department, organization, corporation, board, development committee, local government or authority, company, cooperative, institution, enterprise, firm, partnership or individual having the potential to cause significant Adverse Impacts to undertake either an IEE or an EIA and to obtain an Environmental Compliance Certificate (ECC) in accordance with the Procedure'.

Article 13 states that any organization or person who wishes to prepare an EIA or IEE shall first apply to register with the Ministry who will determine their suitability to carry out such assessments.

Article 19 states that no Project Proponent shall prepare or submit to the Ministry any assessment contemplated in this Procedure which has not been prepared by an organization or person duly registered with the Ministry in accordance with Article 13.

Article 21 states that the project proponent is required to submit a Project Proposal in the prescribed format to the Ministry of Environmental Conservation and Forestry for **Screening** purposes at the same time as the project is submitted to the Myanmar Investment Commission or other relevant agencies for project approval. The Ministry shall then determine whether the Project is an EIA Type Project or an IEE Type Project.

Articles 41 and 42 state that all EIA Type Projects shall undergo **Scoping** and the Project Proponent shall be responsible to ensure that the Scoping and the preparation of the TOR for the EIA Report are undertaken in a professional manner and in accordance with this Procedure and any applicable guidelines issued or adopted by the Ministry.

Article 48 states that MOECAF will within fifteen (15) days of receipt of the Scoping Report and TOR either; approve the Scoping Report and TOR with or without conditions or require the Project Proponent to revise the Scoping Report and TOR in accordance with the comments of the Ministry.

Articles 49 to 55 provide guidance of the required minimum scope of the EIA study itself and Article 56 the EIA reporting requirements.

Articles 64 states that upon completion of MOECAF's review of the EIA Report (generally completed within 90 days of report submission), the Ministry shall either approve the EIA Report, subject to any conditions as may be prescribed, and issue an ECC; or inform the Project Proponent of its decision to reject the EIA Report and cite reasons for doing so.

Article 70 confirms that for any project that requires an IEE or an EIA, before any permit is granted or issued by any ministry, or any other competent authority in respect of any application to proceed with implementation of such Projects, an Environmental Compliance Certificate (ECC) shall first have been duly issued by the Ministry in accordance with this Procedure.

Article 74 states that when the Myanmar Investment Commission or the relevant authority (e.g. MOGE) has given approval to a Project **for which an ECC has been issued**, it shall communicate such approval to the Ministry. Only upon receipt of the written approval by the Myanmar Investment Commission or other relevant authority, shall the Project Proponent commence implementation of the Project, which should be in strict accordance with the conditions attached to the ECC and the EMP, within such time as may be prescribed by the Ministry.

Article 92 states that the Project Owner shall, during all phases of the Project (pre-construction, construction, operation, decommissioning, closure and post closure), engage in continuous, pro-active and comprehensive self-monitoring of the Project and activities related thereto, all adverse impacts, and compliance with applicable laws and standards, the conditions of the ECC, and the

requirements of the EMP.

A simplified EIA process flow diagram is presented overleaf in **Plate 4**.

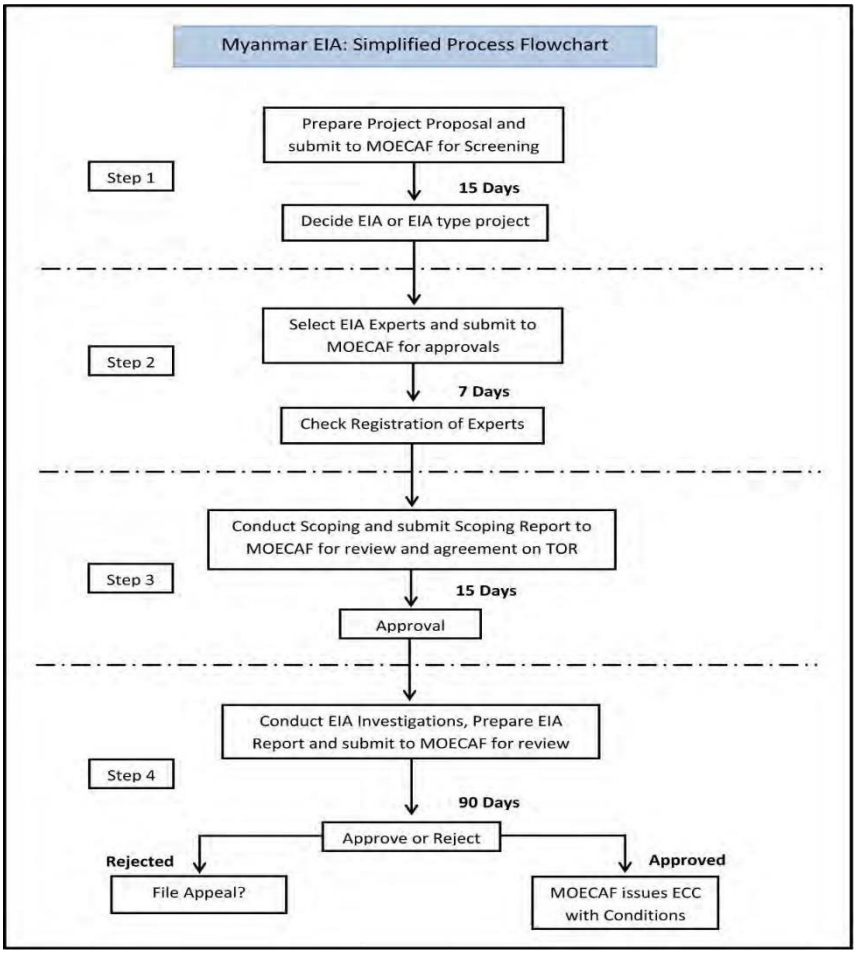


Plate 4: Simplified EIA Process Flow Diagram

Article 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) 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.

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

Article 104 states that The Project Proponent shall be responsible for, and shall fully and effectively implement, all requirements set forth in the ECC, applicable Laws, the Rules, this Procedure and standards.

Article 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.

Article 106; 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.

Article 107; 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.

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

Article 109; The monitoring reports shall include:

a) documentation of compliance with all conditions;

b) progress made to date on implementation of the EMP against the submitted implementation schedule;

c) difficulties encountered in implementing the EMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties;

d) number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation;

e) accidents or incidents relating to the occupational and community health and safety, and the environment; and

f) monitoring data of environmental parameters and conditions as committed in the EMP or otherwise required.

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

Article 111; The Ministry has the right, using the Department's officers at national, regional, state, Nay Pyi Taw Union Territory and/or local offices, the services of any consultant, or both, to conduct monitoring and inspections of a Project and activities related thereto in order to control and determine compliance by the Project with all applicable environmental and socio-economical requirements and, where possible, to prevent violations of the Project's obligations. The Ministry may also, for the implementation of monitoring and inspections, enlist the assistance of other relevant government departments and organizations.

Article 112; If, upon inspection, the Ministry identifies any non-compliance with the conditions in the ECC, the Ministry may require the Project Proponent to undertake remedial measures and/or

may impose penalties as provided for in this Procedure.

Article 113; 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.

Article 114; In carrying out any inspection, the Ministry may take photographs and make other audio and video recordings of any type, take soil, sediment, water, and air samples, and examine computers, copy documents including digital files, interview persons, and carry out any other investigation which the Ministry believes to be necessary or appropriate. The Ministry, as it deems necessary, may carry out such inspection in coordination with any other ministries.

Article 115; 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.

Article 116; The Ministry's inspections may include without limitation sites, facilities, vehicles, computers, archives, documents and all other forms and types of media and information storage, and persons.

Article 117; 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.

2.3.6 Administrative Instruction of Environmental Impact Assessment Procedure (Draft)

The draft Administrative Instruction of Environmental Impact Assessment Procedure (hereafter 'EIA-AI') was issued in 2015 by The Ministry of Environmental Conservation and Forestry (MOECAF) in exercise of power conferred under sub-section (b) of section 42 of the Myanmar Environmental Conservation Law 2012 (Law No. 9, 2012).

The objectives of the Administrative Instruction are to provide a common framework and formats to project proponent/practitioners for IEE and EIAs and to ensure a minimum quality level of the reports and/or documents that are be submitted to the Ministry (e.g. Project Proposal, Scoping Report/TOR, IEE Report, EIA Report and EMMP) for Project Proponents and their Study Team.

Article 4 of the EIA-AI states that IEE or EIA studies should:

(a) Present the characteristics of a project and its justification;

(b) Describe the environmental and social baseline data of the study area as well as the changes that will occur during and after project implementation;

(c) Analyse project alternatives and define measures that will minimize negative impacts on environmental, social, health and cultural components, and maximize benefits to affected communities; and

(d) Propose environmental, social, health and cultural management and monitoring plans to ensure that the requests from the government and the commitments of the Project Proponent are implemented.

Article 7 states that an IEE/EIA report should cover and assess all environmental, social, economic, health, cultural and visual impacts of the project during the pre-construction, construction and operation phases, and if applicable, decommissioning/closure/post-closure phases as well. Where relevant, resettlement issues should be detailed in a separate report which complies with specific procedures issued by the responsible ministries in accordance with Article 7 of the EIA Procedure, but summarized in the IEE/EIA report. IEE/EIA reports should include the preparation of an Environmental Management Plan (EMP).

Article 9 states that when the project proponent submits a document and/or a report to the MOECAF, the project proponent shall fill in the official application forms related to the document/report to be submitted which are contained within Annex 6 of this Instruction.

CHAPTER III: Language of the Documents

Article 11 and 12 confirm that the Project Proposal, IEE Report, Scoping Report and ToR, EIA Report, EMP report and the other documents determined in the EIA Procedure shall be written in Myanmar language or in English language. In case where the reports/documents are written in English language, at least the executive summary of the reports/documents shall be translated into Myanmar language. All materials to be distributed to local stakeholders in Public Consultations Meetings shall be in Myanmar language.

CHAPTER IV: Project Proposal

Article 13 and 14 state that the Project Proposal submitted by the Project Proponent shall provide sufficient information for the Ministry to make a decision on the Screening of the proposed project in accordance with Article 23 of the EIA procedure. Annex 1 of this Instruction provides the format for a Project Proposal.

CHAPTER VI: Scoping Report and Terms of Reference

Article 18 states that the Scoping phase shall establish the framework of activities and impacts that will require further investigation during the Environmental Impact Assessment study of the proposed project.

Article 19 states that the Scoping phase shall identify the likely key environmental impacts and risks from the proposed project including impacts on social conditions, health and livelihood.

Article 20 states that Project Proponent shall prepare a Scoping Report and Terms of Reference for the EIA study, based on the formats set out in Annex 2 Format for a Scoping Report and Terms of Reference.

CHAPTER VIII: IEE Report

Article 27 states that the general objectives of the Initial Environmental Examination (IEE) report are to provide in an appropriate level of detail:

a) Executive Summary,

b) Introduction,

c) Policy, Legal and Institutional Framework,

d) Project Description and Alternatives Selection,

e) Description of the Surrounding Environment,

f) Impact Assessment, and Mitigation Measures,

g) Environmental Management Plan, and

h) Public Consultation and Disclosure.

Article 28 states that the IEE Report shall address the potential impacts based on existing data and simple field surveys at the different stages of a proposed project, as relevant, and, pre- construction, construction, operation, and if applicable, decommissioning/closure/post- closure as well. The format of an IEE Report is set out in Annex 4 of this Instruction

CHAPTER IX: Environmental Management Plan

Article 30 states that the Project Proponent shall be responsible to ensure the preparation of the Environmental Management Plan (EMP) as a part of IEE/EIA report in accordance with Article 36 of the EIA Procedure for IEE Type project, Article 63 of the EIA Procedure for EIA Type projects.

Article 31 states that the general objective of the Environmental Management Plan is to ensure that mitigation of the negative impacts and the enhancement of positive impacts are carried out effectively during the life-cycle of the project.

Article 32 and 33 state that the EMP shall address the mitigation and management measures at the different stages of the proposed project, as relevant, and in particular, the pre-construction, construction and operation phases, and if applicable, decommissioning/closure/post-closure phases as well. The format of an EMP is set out in Annex 5 of this Instruction.

2.3.7 Myanmar Investment Commission Notification 50/2014

The Myanmar Investment Commission Notification 50/2014 dated 14th August 2014, under power of section 56(b) of the Foreign Investment Law (FIL), lists the economic activities requiring environmental impact assessments. Activities listed include; 'Construction of large-scale hotels, recreation places and resorts'. The MIC has a duty to consider environmental and social impacts when considering project proposals and a synopsis of the relevant requirements under the FIL is presented below:

Article 8 (i) states that the investment shall be allowed based on the 'protection and conservation of the environment'.

Article 12 (a) states that the duties of the Commission include taking into consideration the facts such as and protection and conservation of environment in scrutinising the proposals of investment.

Article 17 (h) states that the duties of the investor will include not causing environmental pollution or damage in accordance with existing laws.

If the Project Proponent is applying for an Investment Permit under the FIL then the Project Proponent will also be required to issue copies of the aforementioned IEE report to the MIC for their review.

2.4 REGULATORY CONTEXT - AIR QUALITY PROTECTION

This paragraph reports a description of main laws applicable to the air quality protection.

2.4.1 Legislation

The Public Health Law of 1972 contained a general provision in Section 3 which empowers the

Ministry of Health "to carry out measures" relating to environmental health, such as garbage disposal, use of water for drinking and other purposes, radioactivity, **protection of air from pollution**, and food and drug safety. However, the detailed subsidiary guidance and regulations required to implement this provision were never developed.

Article 14 of the Environmental Conservation Law (ECL 2012) states that 'Any person causing a point source of pollution shall treat, emit, discharge, or deposit any pollutants which cause environmental pollution, in accord with stipulated environmental quality standards. Pollution is detailed as any direct or indirect alteration or effect on any part of the environment (including air) by discharging, emitting or depositing environmental hazardous substances, pollutants, or wastes. A Pollutant is detailed as any liquid, solid, or **gas** which alters the quality of the environment or is hazardous or potentially hazardous.'

Furthermore**, Article 15** of the ECL 2012 states 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.

Article 10 (d) of the ECL 2012 states that the Ministry may, with the approval of the Union Government and the Committee, stipulate environmental quality standards including atmospheric quality standards.

As specified in **Article 56** of the EIA Procedure, all projects are obliged to use, comply with and refer to applicable national guidelines or standards or international standards adopted by the Ministry. These Guidelines will be applied by the Ministry in satisfying this requirement until otherwise modified or succeeded by other guidelines or standards

As specified in **Article 77** of the EIA Procedure, following project approval a project shall commence implementation strictly in accordance with the project's Environmental Management Plan (EMP) and any additional requirements set out in the project's Environmental Compliance Certificate (ECC), which will encompass conditions relating to air emissions where appropriate.

The final draft of the National Environmental Quality (Emission) Guidelines dated April 2015 (Draft EQG 2015) prepared by the Ministry of Environmental Conservation and Forestry (MOECAF), In exercise of the power conferred on them under section 42 (b) of the 2012 Environmental Conservation Law (ECL), stipulates Air Emission Quality Standards for projects with significant sources of air emissions and potential for significant impacts to ambient air quality. The project proponent should prevent or minimize impacts by ensuring that emissions do not result in concentrations that reach or exceed national ambient air quality guidelines and standards, or in their absence, current World Health Organization (WHO) Air Quality Guidelines for the most common pollutants as summarized in **Table 3** below.

Table 3: WHO Air Quality Standards (Draft EQG, 2015, MOECAF)

No	Parameter	Averaging Period	Guideline Value	Units
1.	Nitrogen dioxide	1-year 1-hour	40 200	ug/m3
2.	Particulate matter PM10a	1-year 24-hour	20 50	ug/m3

3.	Particulate matter PM2.5b	1-year 24-hour	10 25	ug/m3
4.	Sulphur dioxide	24-hour 10-minutes	20 500	ug/m3

Remarks: aPM10 = Particulate matter 10 micrometres or less in diameter

bPM2.5 = Particulate matter 2.5 micrometres or less in diameter

2.4.2 Legal Requirements and Permits

The Penal Code, 1 May 1961 (and extended in Public Health Law, 1972) states that it is considered an offence to "pollute the atmosphere arising from smoke, fumes, noxious odours, dust particles, noise and radioactive substances".

Article 21 of the ECL 2012 states that the Ministry may, with the approval of the Union Government, stipulate the categories of business, work-site or factory, work-shop which may cause impact on the environmental quality that are required to obtain prior permission (permit/licence etc).

Atmospheric emissions generated because of project activities are most likely to be regulated under the air quality control commitments agreed with MOECAF as presented in the approved Environmental Management Plan submitted for the project.

Article 12 of The Draft EQG, 2015 states that "As specified in the EIA Procedure, projects shall engage in continuous, proactive and comprehensive self-monitoring of the project and comply with applicable guidelines and standards. For purposes of these Guidelines, projects shall be responsible for the monitoring of their compliance with general and applicable industry-specific Guidelines as specified in the project EMP and ECC.

Furthermore, **Article 13** of The Draft EQG, 2015 states that "Air emissions will be sampled and measured at points of compliance as specified in the project EMP and ECC.

2.5 REGULATORY CONTEXT - WATER QUALITY PROTECTION AND MANAGEMENT

This paragraph reports a description of main laws applicable to the water quality protection and management.

2.5.1 Legislation

Article 14 of the Environmental Conservation Law (ECL 2012) states that 'Any person causing a point source of pollution shall treat, emit, discharge, or deposit any pollutants which cause environmental pollution, in accord with stipulated environmental quality standards'. Pollution is detailed as any direct or indirect alteration or effect on any part of the environment (including air) by discharging, emitting or depositing environmental hazardous substances, pollutants, or wastes. A Pollutant is detailed as any **liquid**, solid, or gas which alters the quality of the environment or is hazardous or potentially hazardous.'

Furthermore, **Article 15** of the ECL 2012 states 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.

As specified in **Article 56** of the EIA Procedure, all projects are obliged to use, comply with and refer to applicable national guidelines or standards or international standards adopted by the Ministry. These Guidelines will be applied by the Ministry in satisfying this requirement until otherwise modified or succeeded by other guidelines or standards

As specified in **Article 77** of the EIA Procedure, following project approval a project shall commence implementation strictly in accordance with the project's Environmental Management Plan (EMP) and any additional requirements set out in the project's Environmental Compliance Certificate (ECC), which will encompass conditions relating to air emissions where appropriate.

The final draft of the National Environmental Quality (Emission) Guidelines dated April 2015 (Draft EQG 2015) prepared by the Ministry of Environmental Conservation and Forestry (MOECAF), In exercise of the power conferred on them under section 42 (b) of the 2012 Environmental Conservation Law (ECL) stipulates the **Sanitary Wastewater Quality Standards** apply to tourism and hospitality facilities, including hotels, resorts and other accommodation and catering facilities.

Annex 1, **Article 1.2** of the draft EQG 2015 states that industry-specific guidelines apply during the **operations phase** of projects and cover direct or indirect discharge of wastewater to the environment. They are also applicable to industrial discharges to sanitary (domestic) sewers that discharge to the environment without any treatment. Wastewater generated from project operations includes process wastewater, wastewater from utility operations, runoff from process and storage areas, and miscellaneous activities including wastewater from laboratories, and equipment maintenance shops. Projects with the potential to generate process wastewater, sanitary wastewater and or storm water should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety or the environment. Industry-specific guidelines summarized hereinafter shall be applied by all projects, where applicable, to ensure that effluent emissions conform to good industry practice.

The Sanitary Wastewater Quality Standards applied to tourism and hospitality facilities, including hotels, resorts and other accommodation buildings are summarized in **Table 4** overleaf.

Table 4: Sanitary Wastewater Quality Standards (Final Draft EQG, 2015, MOECAF)

No.	Parameter	Guideline Value	Unit
1.	Chemical Oxygen demand	250	mg/L
2.	Oil and grease	10	mg/L
3.	pH Value	6-9	S.U [a]
4.	Total Nitrogen	10	mg/L
5.	Total Phosphorus	2	mg/L
6.	Suspended Solids	50	mg/L

Remarks: [a] S.U. = Standard Unit

[b] MPN = Most Probable Number

In addition to general and industry-specific wastewater guidelines applicable during project operations, the guideline values presented in **Table 5** below apply during the construction phase of projects, covering storm water, surface water runoff and sanitary wastewater discharges from all Project Sites.

Table 5: Construction Phase Water Quality Standards (Final Draft EQG, 2015, MOECAF)

No.	Parameter	Maximum Concentration	Unit
1.	Chemical Oxygen Demand	max 125	mg/L
2	Oil and Grease	max 10	mg/L
3.	pH Value	6-9	S.U a
4.	Total Nitrogen	10	mg/L
5	Total phosphorus	2	mg/L
6	Total Suspended Solids	50	

Remarks: [a] S.U. = Standard Unit

[b] MPN = Most Probable Number

Water Pollution guidelines were also issued in June 1994 by the Myanmar Investment Commission. These guidelines require that all projects already permitted by the Commission under the Union of Myanmar Foreign Investment Law 1988 and all future proposals, shall compulsorily install sewage treatment plant, industrial wastewater treatment plant and other pollution control procedures as soon as possible and abide with the sanitary and hygienic rules and regulations set by the authorities concerned.

The Ministry on Industry Standing Order No.3 1995 contains industrial effluent wastewater quality standards but these are directed at factories rather than hotel and hospitality type developments. **Table 6** overleaf presents the industrial wastewater quality standards.

Table 6: Industrial Wastewater Effluent Quality Standards (Ministry of Industry)

No.	Parameter	Allowable Rate	Unit	Notes
1.	BOD (5 days at 20· C°)	max 20-60	ppm	Depending on quality of waste discharging point
2.	Suspended Solids	max 30	ppm	
3.	Dissolved Solids	max 2,000	ppm	
4.	pH Value	5-9	-	
5.	Sulphide (as HS)	max 1	ppm	
6.	Cyanide (as HCN)	max 0.2	ppm	
7.	Oil and grease	max 5	ppm	
8.	Tar	none	-	
9.	Formaldehyde	max 1	ppm	
10.	Phenols and cresols	max 1	ppm	
11.	Free chlorine	max 1	ppm	
12.	Zinc	max 5	ppm	
13.	Chromium	max 0.5	ppm	

14.	Arsenic	max 0.25	ppm	
15.	Copper	max 1.0	ppm	
16.	Mercury	max 0.005	ppm	
17.	Cadmium	max 0.03	ppm	
18.	Barium	max 1.0	ppm	
19.	Selenium	max 0.02	ppm	
20.	Lead	max 0.2	ppm	
21.	Nickel	max 0.2	ppm	
22.	Insecticides	None	-	
23.	Radioactive Materials	None	-	
24.	Temperature	max 40	ºC	
25.	Colour and Odour	-	-	Not objectionable when mixed in receiving water

Furthermore, Yangon City Development Committee (YCDC) has duties and responsibilities relating to the management of wastewater. Article 7 (l, m) of the **City of Yangon Development Law (CYDL, 1990)** states that the City of Yangon Development Committee is responsible for 'carrying out works for sanitation and for public health'.

Under the provisions of YCDC Order No. 3/96, any kind of waste (solid/liquid/gas) generated from construction, business, factory is not permitted to be disposed of to public places (common properties) such as roads, drains, lakes, streams, creeks and valley (low-land area).

Section 5(4) of the YCDC Order No. 10/99 provides that YCDC has authority to direct the responsible persons of any premises to avoid discharging wastewater coming from their activities to public places (common properties).

Section 7(7) of the YCDC Order No. 10/99 prohibits discharging of wastewater into common properties. Nobody shall be allowed disposing and/or flowing of – sewage, wastewater from any activity into drainage channels, creeks and rivers without necessary treatment for compliance with standards, norms and criteria designated by the agency concerned.

2.5.2 Legal Requirements and Permits

Article 21 of the ECL 2012 states that the Ministry may, with the approval of the Union Government, stipulate the categories of business, work-site or factory, work-shop which may cause impact on the environmental quality that are required to obtain prior permission (permit/licence etc).

Article 12 of the final Draft EQG, 2015 states that "as specified in the EIA Procedure, projects shall engage in continuous, proactive and comprehensive self-monitoring of the project and comply with applicable guidelines and standards. For purposes of these Guidelines, projects shall be responsible for the monitoring of their compliance with general and applicable industry-specific Guidelines as specified in the project EMP and ECC".

Article 13 of the final Draft EQG, 2015 states that "Liquid/effluent discharges will be sampled and measured at points of compliance as specified in the project EMP and ECC".

Annex 2.6.4 of the final Draft EQG, 2015 state that "wastewater discharges should be managed through conventional treatment to achieve the indicated guideline values for discharge of sanitary water".

There is currently no permitting system for wastewater discharges to marine and estuarine waters and the water quality standards for coastal and estuarine areas cited in Article 10 (b) of the ECL 2012 have not been released.

Wastewater discharges to marine waters as a consequence of project activities are most likely to be regulated under the water quality control commitments agreed with MOECAF as presented in the approved Environmental Management Plan submitted for the project.

It is considered that the ASEAN Marine Water Quality Criteria (AMWQC) could be used as substitute water quality standards for any project discharges into marine or estuarine environments.

2.6 REGULATORY CONTEXT - NOISE AND VIBRATIONS

This paragraph reports a description of main laws related to the noise and vibration.

2.6.1 Legislation

Article 15 of the ECL 2012 states 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. Whilst not implicitly mentioned it is considered that this article could be applied to noise pollution and abatement as well as vibration nuisance and abatement.

Article 10 (e) of the ECL 2012 states that the Ministry may, with the approval of the Union Government and the Committee, stipulate environmental quality standards including **noise and vibration standards.**

As specified in Article 56 of the EIA Procedure, all projects are obliged to use, comply with and refer to applicable national guidelines or standards or international standards adopted by the Ministry. These Guidelines will be applied by the Ministry in satisfying this requirement until otherwise modified or succeeded by other guidelines or standards

As specified in Article 77 of the EIA Procedure, following project approval a project shall commence implementation strictly in accordance with the project's Environmental Management Plan (EMP) and any additional requirements set out in the project's Environmental Compliance Certificate (ECC), which will encompass conditions relating to air emissions where appropriate.

The final draft of the National Environmental Quality (Emission) Guidelines dated April 2015 (Draft EQG 2015) prepared by the Ministry of Environmental Conservation and Forestry (MOECAF), In exercise of the power conferred on them under section 42 (b) of the 2012 Environmental Conservation Law (ECL) stipulates **Noise Level Quality Standards** applicable to all projects where predicted (or measured) noise impacts from a project facility or operation exceed the applicable noise level guideline at the most sensitive point of reception as presented in **Table 7.**

Table 7: Average Noise Monitoring Quality Standard

Receptor	One Hour LAeqa		Unit
	Daytime 07:00 – 22:00 (10:00 – 22:00 for Public holidays)	**Night-time 22:00 – 07:00 (22:00 – 10:00 for Public holidays)**	
Residential, Institutional, Educational	**55**	**45**	dBA

Remarks: [a] LAeq = Equivalent continuous sound level in decibels

2.6.2 Legal Requirements and Permits

Article 21 of the ECL 2012 states that the Ministry may, with the approval of the Union Government, stipulate the categories of business, work-site or factory, work-shop which may cause impact on the environmental quality that are required to obtain prior permission (permit/licence etc).

Article 12 of The Draft EQG, 2015 states that "as specified in the EIA Procedure, projects shall engage in continuous, proactive and comprehensive self-monitoring of the project and comply with applicable guidelines and standards. For purposes of these Guidelines, projects shall be responsible for the monitoring of their compliance with general and applicable industry-specific Guidelines as specified in the project EMP and ECC".

Article 13 of The Draft EQG, 2015 states that "Noise will be sampled and measured at points of compliance as specified in the project EMP and ECC".

Annex 1, Article 1.4 of the final draft EQG, 2015 states that "Noise impacts should not exceed the levels shown in **Table 7** above or result in a maximum increase in background levels of three decibels at the nearest receptor location off-site".

There are currently no Myanmar ese vibration standards and noise and vibration generated as a consequence of project activities are most likely to be regulated under the noise and vibration control commitments agreed with MOECAF as presented in the approved Environmental Management Plan submitted for the project.

2.7 REGULATORY CONTEXT - WASTE MANAGEMENT

This paragraph reports a description of main laws applicable to the waste management.

2.7.1 Legislation

Article 7 (g) of the ECL 2012 states that duties and powers relating to the environmental conservation of the Ministry include prescribing categories and classes of hazardous **wastes** generated from the production and use of chemicals or other hazardous substances, in carrying out industry, agriculture, mineral production, sanitation or other activities.

Article 7 (i) of the ECL 2012 states that duties and powers relating to the environmental conservation of the Ministry include promoting and carrying out the establishment of necessary factories and stations for the treatment of solid wastes.

Article 10 (h) of the ECL 2012 states that the Ministry may, with the approval of the Union

Government and the Committee, stipulate environmental quality standards including **solid wastes standards.**

Article 14 of the ECL 2012 states that 'Any person causing a point source of pollution shall treat, emit, discharge, or deposit any pollutants which cause environmental pollution, in accord with stipulated environmental quality standards'. Pollution is detailed as any direct or indirect alteration or effect on any part of the environment (including air) by discharging, emitting or depositing environmental hazardous substances, pollutants, or **wastes**. A Pollutant is detailed as any liquid, solid, or gas which alters the quality of the environment or is hazardous or potentially hazardous.'

Furthermore, **Article 15** of the ECL 2012 states 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 of the wastes in accordance with environmentally sound methods (no further guidance on what constitutes environmentally sound methods is provided).

Other miscellaneous Myanmarese laws which include provisions related to waste management include:

The Public Health Law of 1972 contained a general provision in Section 3 which empowers the Ministry of Health "to carry out measures" relating to environmental health, such as garbage disposal". However, the detailed subsidiary regulations required to implement this provision were never developed.

Responsibility for waste management in Myanmar is currently regulated by the various Township Committees such as Yangon City Development Committee (YCDC). Article 7 (l, m) of **the City of Yangon Development Law (CYDL, 1990)** states that the City of Yangon Development Committee is responsible for 'carrying out works for sanitation and for public health'.

Waste management in YCDC is the responsibility of Pollution Control and Cleansing Department (PCCD). They are responsible for both daily management and pollution control and their primary functions are waste collection, transportation and disposal.

Under the provisions of YCDC Order No. 3/96, any kind of waste (solid/liquid/gas) generated from construction, business, factory is not permitted to be disposed of two public places (common properties) such as roads, drains, lakes, streams, creeks and valley (low-land area).

Section 5(4) of the YCDC Order No. 10/99 provides that YCDC has authority to direct the responsible persons of any premises to avoid flowing, piling, scattering, disposing or discharging of solid waste and/or wastewater coming from their activities to public places (common properties).

Section 5(10) of the YCDC Order No. 10/99 also requires making pollution control arrangements prior to the establishment of any business. The person, who intends to establish any business and/or factory, needs to propose the environmental pollution control plan to YCDC. Only after getting permission from YCDC, the person can continue implementing his activity.

Section 7(7) of the YCDC Order No. 10/99 prohibits discharging of wastewater into common properties. Nobody shall be allowed disposing and/or flowing of – sewage, wastewater from any activity such as business, factory – into drainage, creeks and rivers without necessary treatment for compliance with standards, norms and criteria designated by the agency concerned.

According to Article 2 of Notification 10/99 issued by the YCDC waste is classified into eight broad categories;

- Kitchen Waste means all useless materials thrown away from houses, apartments and kitchens except garden waste;
- Garden Waste means all waste from pruning / cutting trees, grass, bushes within compound and broken parts of house and furniture;
- Factory Waste means all useless materials thrown away from factories;
- Construction Waste means all useless materials thrown away from construction sites;
- Commercial Waste means all useless materials thrown away from commercial business facilities;
- General Waste means all useless materials such as kitchen waste and other waste except green waste, factory waste, construction waste and commercial waste;
- Offensive Waste means dead bodies of animals, excrement, blood, foul smelling liquid or dirt; and
- Hospital Waste means all useless materials thrown away from State owned hospitals, organization owned hospitals, private owned hospitals and clinics within the city area.

In YCDC, waste is separated into two major groups; wet and dry, but both types are transported together and disposed of at open dump sites. Open dumping is the major disposal method in YCDC and there are currently six dumpsites for the Yangon City area. Business or households pay a waste collection fee which varies depending upon the distance to the nearest dump.

It is worth noting that there is currently no specific government agency assigned with the task of industrial waste management in Myanmar and at the time of writing there are no operational specifically designed hazardous waste disposal facilities in Myanmar.

2.7.2 Legal Requirements and Permits

Article 21 of the ECL 2012 states that the Ministry may, with the approval of the Union Government, stipulate the categories of business, work-site or factory, work-shop which may cause impact on the environmental quality that are required to obtain prior permission (permit/licence etc).

There is currently no permitting system for the disposal of solid wastes from urban mixed-use type development schemes and the solid waste standards cited in Article 10 (h) of the ECL 2012 have not yet been released.

If the project proponent intends to dispose of project activity related wastes in Yangon, then service fees will apply. Solid and semi-solid wastes generated as a consequence of project activities are most likely to be regulated under the waste management commitments agreed with MOECAF as presented in the approved Environmental Management Plan submitted for the project.

2.8 REGULATORY CONTEXT - HAZARDOUS SUBSTANCES

This paragraph reports a description of main laws applicable to hazardous substances.

2.8.1 Legislation

Article 7 (h) of the ECL 2012 states that duties and powers relating to the environmental conservation of the Ministry include prescribing categories of hazardous substances that have the

potential to cause adverse environmental impacts, both in the short and long term.

Article 13 (b) of the ECL 2012 states that the Ministry shall, under the guidance of the Committee, maintain a comprehensive monitoring system, and implement by itself or in co-ordination with relevant Government departments and organizations; the transport, storage, use, treatment and disposal of pollutants and hazardous substances in industries.

Section 13 of the Prevention from Danger of Chemicals and Associated Materials Law, No.28/2013 (PDCAML 2013) states that any person whose business involves prescribed chemicals or associated materials (defined as dangerous by-products of chemicals) shall apply to the central supervising body for the acquisition of a license, attached with the management plan for environmental conservation, in accordance with the stipulations.

Section 15 of the PDCAML 2013 states that before commencing the business operation that involves the use of prescribed hazardous chemicals and or associated materials the license holder:

a) Shall be inspected by the relevant supervising and inspecting team for the safety and endurance of the equipment;

b) The persons who are discharging the duty shall be asked to attend the relevant foreign training for prevention from the danger of chemicals and the associated materials, conducted by the government department and organizations.

Section 16 the PDCAML 2013 states that the license holders:

a) Shall follow the principles contained in the license;

b) Shall follow the directives for safety in handling the chemicals and associated materials;

c) Shall keep the necessary safety equipment in sufficient quantities in the chemical and associated materials business operation and shall issue personal protective equipment and clothing to the workers free of charge;

d) Shall provide training in the use of personal protective equipment and clothing;

e) Shall be subject to government inspection to check whether the chemicals represent a danger to humans, wildlife or the environment;

f) Shall provide medical check-ups to the workers exposed to prescribed chemicals and associated materials and keep records of such at the business operation;

g) If prescribed dangerous chemicals and or associated materials are stored at the business operation, then a copy of the permit shall be provided to the relevant township general administration department;

h) If the business is prone to fire hazard due to the use, storage or production of flammable or explosive materials then the prior consent of the relevant fire service department must be obtained;

i) Shall ensure that transportation of the prescribed chemicals and associated materials complies with the quantity stipulations upon transporting the chemical and the associated materials in the country;

j) Shall first obtain the approval of the central supervising body if the chemicals or the associated materials are transported from the permitted region to any other region; and

k) Shall follow and abide by the laws relating to the environment in order not to impact the environment.

Section 27 of the PDCAML 2013 states that the license holder shall comply with the following stipulations to control, prevent and alleviate dangers related to chemicals and associated materials:

a) To classify the danger level according to the properties of the chemical and associated materials so as to prevent the danger in advance;

b) To reveal the danger via warning signs and safety level certificates (i.e. MSDS);

c) To attend appropriate training for maintaining and correct usage of personal protective equipment; and

d) To comply with the stipulations in connection with transporting, storing, using and disposing of chemicals and associated materials.

Section 33 of the PDCAML 2013 states that no one is allowed to produce, change, use, store, distribute, sell, transport, import or export any chemicals and or associated materials, prohibited by the central body.

Section 34 of the PDCAML 2013 states that no one is allowed engage in the chemicals and associated materials business without having the license.

2.8.2 Legal Requirements and Permits

As per the requirements of **Section 13** of the Prevention from Danger of Chemicals and Associated Materials Law 2013; any business entity engaged in a business that involves Chemicals and or Associated Materials Business (defined as any business; storing, producing, using, importing, exporting, transporting, distributing, buying, selling or disposing of prescribed chemicals or associated materials) is required to apply to the Central Supervising Body for a licence. The Central Supervising Board is chaired by the Ministry of Industry and Co-chaired by the Ministry of Health.

The Central Supervising Body upon scrutinising the application has the authority to approve or reject the application. If the application is approved, and once payment of licence fees is received, the licence will be issued along with any associated conditions.

Under **Section 20** of the PDCAML 2013 the licence holder is then required to register the chemicals and associated materials used in their business operation and obtain a Registration Certificate. The Central Supervising Body scrutinises the application under section 20, and if it is in compliance with the stipulations, and once the licence holder pays the registration fees, issues the Registration Certificate with conditions.

Section 38 of the PDCAML 2013 states that anyone convicted of operating a chemicals and associated materials business without a licence or using unregistered chemicals or associated materials shall be punished with imprisonment not more than five years or with a fine not more than 500,000 Kyat, or with both, and the relevant materials related with the offense shall be confiscated as state property.

2.9 REGULATORY CONTEXT - FLORA, FAUNA AND ECOSYSTEM PROTECTION

This paragraph reports a description of main laws applicable to the flora, fauna and ecosystem protection.

2.9.1 Legislation

The objectives of the Wildlife & Protected Areas Law 1994 (WPAL 1994) include the protection of endangered species of wildlife and their natural habitats. The law is mostly focused on terrestrial

wildlife and habitats but there are a few provisions relating to the marine environment.

Article 12 of the WPAL 1994 states that the Director General may 'carry out necessary measures to prevent external environmental dangers and disturbances within the natural areas.

Section 14(c) of the WPAL 1994 states that the Forestry Department shall carry out the following functions and duties according to the category of natural area in conformity with the guidance laid down by the Committee or the Minister;

Preservation of naturally bred creatures, their habitats of coral reefs, planktons, moss and algae and wildlife breeding and inhabiting along the coast, in deltaic areas and their habitats within the Marine National Park, in order that they may exist in their natural state.

Sections 35 and 36 of the WPAL 1994 prohibits under penalty of fine or prison; causing water pollution or disposing of pollutants or mineral pollutants in a natural area, destroying ecosystem or any natural state in a natural area.

Article 7 (n) of the ECL 2012 states that the duties and powers relating to environmental conservation of the Ministry include laying down guidance relating to the management, conservation and enhancement of the environment for the matters of protection of ozone layer, conservation of biological diversity, conservation of coastal environment, mitigation and adaptation of global warming and climate change, combating desertification and management of non-depleting substances and management of other environmental matters.

Article 18 (f to i) of the ECL 2012 states that the relevant Government departments and Government organizations shall, in accord with the guidance of the Union Government and the Committee, carry out the conservation, management, beneficial use, sustainable use and enhancement of regional cooperation of the following environmental and natural resources:

- Fisheries resources;
- Marine resources;
- Natural ecosystems; and
- Natural areas, wildlife, natural plants and biological diversity.

2.9.2 Legal Requirements and Permits

There are no specific authorisations or permits required with respect to the preservation of flora and fauna for the construction and operation of urban mixed use type developments and the potential risks to terrestrial and aquatic habitats and ecosystems that may occur as a consequence of project activities will be controlled under the environmental protection measures agreed with MOECAF in the Environmental Management Plan submitted for the project.

2.10 REGULATORY CONTEXT – SOIL, SUBSOIL AND SEDIMENTS QUALITY PROTECTION

This paragraph reports a description of main laws applicable to the soil, subsoil and sediments quality protection.

2.10.1 Legislation

Article 14 of the Environmental Conservation Law (ECL 2012) states that 'Any person causing a point source of pollution shall treat, emit, discharge, or deposit any pollutants which cause environmental pollution, in accordance with stipulated environmental quality standards. Pollution is detailed as any direct or indirect alteration or effect on any part of the environment (including **soil and sediments**) by

discharging, emitting or depositing environmental hazardous substances, pollutants, or wastes. A Pollutant is detailed as any liquid, solid, or gas which alters the quality of the environment or is hazardous or potentially hazardous.'

Furthermore, **Article 15** of the ECL 2012 states 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.

Whilst there is no explicit mention of soil or sediment quality standards in the ECL 2012, Article 10 (i) of the ECL 2012 states that the Ministry may, with the approval of the Union Government and the Committee, stipulate environmental quality standards including **other environmental quality standards stipulated by the Union Government.**

2.10.2 Legal Requirements and Permits

There are no specific authorisations or permits required with respect to the preservation of soil and sediment quality and the potential risks to soil and sediment quality that may occur because of project activities will be controlled under the environmental protection measures agreed with MOECAF and detailed in the Environmental Management Plan submitted for the project.

2.11 REGULATORY CONTEXT – LANDSCAPE AND VISUAL

This paragraph reports a description of main laws applicable to the landscape and visual aspects.

2.11.1 Legislation

There is no specific legislation or regulation relating to the preservation of landscapes or controlling the visual impacts of a project.

The draft Environmental Impact Procedure states in **Article 46** that 'an EIA investigation shall consider all biological, physical, social, economic, health, cultural and **visual** components of the environment'.

Article 53 (5.7) of the draft Environmental Impact Procedure states that the EIA report shall contain 'visual components including landscape and three-dimensional models.

2.11.2 Legal Requirements and Permits

The potential landscape and visual impacts of the project will be controlled under the environmental protection measures agreed with MOECAF during the scoping study phase and detailed in the Environmental Management Plan submitted for the project.

2.12 REGULATORY CONTEXT – WATER SECURITY

This paragraph reports a description of main laws applicable to the water security.

2.12.1 Legislation

Article 11 (a) of the Conservation of Water Resource and River Law (No.8/2006) states that 'the

disposal of engine oil, chemicals, poisonous materials and other materials into waterways which may cause environmental damage is prohibited'.

Article 12 of the Conservation of Water Resource and River Law (No.8/2006) states that 'No person shall carry out growing of garden, digging, filling, silt trapping, closing pond, dyke building or erecting spur in the river-creek boundary, bank boundary and waterfront boundary without the permission of the relevant government department and organization'.

Article 21(b) of the Conservation of Water Resource and River Law (No.8/2006) states that 'No one shall drill well or pond or dig earth without the permission of the Directorate'.

2.12.2 Legal Requirements and Permits

Article 30 of the Conservation of Water Resource and River Law (No.8/2006) states that 'Any government department and organization or any person desirous of constructing drainage, **utilizing river water intake**, constructing bridges spanning rivers, connecting underground pipe, connecting underground electric power cable, connecting underground telecom cable or digging in rivers and creeks, bank boundary and waterfront boundary, under the requirement of work, shall in order not to adversely affect the water resources and rivers and creeks, carry out only after obtaining the approval of the Ministry of Transport'.

If the project proponent proposes to abstract significant quantities of surface and or groundwater, then they should also inform the Water Resources Utilization Department under the Ministry of Agriculture and Irrigation.

Article 3 of the Underground Water Act 1930, Burma Act IV 1930 state that 'No person shall sink a tube for the purpose of obtaining underground water except under and in accordance with the terms of a licence granted by the water officer'.

Recent consultations with the Water Resources Utilization Department under the Ministry of Agriculture and Irrigation indicate that a new law related to groundwater and surface water abstractions is in process of being drafted but no date was given as to when it is expected to be enacted.

In the interim period however, there is no legal requirement to obtain a licence/permit to abstract groundwater or river water, but the department recommends that the project proponent proposing to abstract groundwater or river water consult with the relevant Township regarding all proposed groundwater and river water abstractions.

2.13 INTERNATIONAL CONVENTIONS AND AGREEMENTS SIGNED BY MYANMAR

Myanmar has signed several international treaties related to the environment. This section identifies the main conventions and agreements that may have some relevance to the planned project activities. The Union of Myanmar is a Signatory or Party to the following main international conventions and protocols:

- Kyoto Protocol (KP) 1997;
- Ramsar Convention on Wetlands, 1971;
- Stockholm Convention on Persistent Organic Pollutants, 2001;
- Asia Least Cost Green House Gas Abatement Strategy (AGAS), 1998;
- Convention on Biological Diversity, 1992;
- Convention on Climate Change, 1992;
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1989;

- Vienna Convention for the protection of the Ozone Layer, 1988;
- Agenda 21 of the United Nations conference on Environment and Development UNCED, 1992;
- Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972; and
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973.

The descriptions of the domain of action of these international conventions/agreements are summarized below in **Table 8.**

Table 8: International Conventions/Agreements signed by Myanmar

Agreement/Convention	Description
The Kyoto Protocol (KP) 1997	An International treaty, which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that commits State Parties to reduce greenhouse gases emissions, based on the premise that (a) global warming exists and (b) man-made CO2 emissions have caused it.
The Ramsar Convention, 1971	An international treaty for the conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value.
Stockholm Convention on Persistent Organic Pollutants, 2001	An international environmental treaty, signed in 2001 and effective from May 2004, that aims to eliminate or restrict the production and use of persistent organic pollutants
Asia Least cost Greenhouse Gas Strategy (1998)	Overall, ALGAS targeted four goals: • Develop and improve capacity to undertake, prepare, and present baseline and historical inventories of greenhouse gas emissions and sinks to meet FCCC standards and requirements. • Improve reliability of greenhouse gas emission and sink inventories for the region. • Develop capacities to identify, formulate, and analyse greenhouse gas abatement initiatives. • Develop and implement national and regional least cost greenhouse gas abatement strategies.
Vienna Convention for the Protection of the Ozone Layer, including the Montreal Protocol and the London Amendment (1994)	The objectives of this convention are to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer and to adopt agreed measures; to control human activities found to have adverse effects on the ozone layer.
Convention on Biological Diversity (1992)	The objectives of this Convention, which was opened for signature at the 1992 Rio Earth Summit, are the conservation of biological diversity, the sustainable use of its components and

	the fair and equitable sharing of benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.
Framework Convention on Climate Change (ratified 1994)	This convention includes a requirement that precautionary measures be taken to anticipate, prevent or minimise the causes of climate change and mitigate its adverse effects. This requirement does not contain any specific requirements applicable to atmospheric emissions from E&P operations, but has prompted in certain jurisdictions legislative developments, which have affected such activities.
Agenda 21 of the United Nations conference on Environment and Development UNCED, 1992	The development of the environmental policy was followed by the drafting of 'Myanmar Agenda 21' in February 1997, which follows a UN framework for a multi-pronged approach to sustainable development. The Myanmar Agenda 21 recognizes the need for Environmental Impact Assessments and is an environmental action plan policy document which provides an integrated framework of programmes and actions aimed at securing the aims of sustainable development. The most important part of the Myanmar Agenda 21 documentation is the recommendation for creating national framework legislation on the environment to improve coordination and cooperation between Ministries on issues related to the environment; and creating legislation that requires that environmental impact assessments are conducted before any development project is undertaken.
Plant Protection Committee for the South East Asia and Pacific Region, 1983	The objectives of this Convention are to strengthen international cooperation in plant protection measures in order to prevent the introduction of destructive plant diseases and pests and their spread within the region. Original title, in April 1983 at the thirteenth Session of the Commission title was amended as Asia and Pacific Plant Protection Commission (APPPC).
Convention concerning the Protection of the World Cultural and Natural Heritage (1972)	The Convention was adopted by the General Conference of UNESCO on 16 November 1972. As of June 2014, it has been ratified by 191 states. The General Convention defined the kind of natural or cultural heritage sites which can be considered for inscription on the World Heritage List and established the World Heritage Fund and the World Heritage Committee. By signing the Convention, each country pledges to conserve not only the World Heritage sites located within its own territory, but also to protect its national heritage. Myanmar ratified the Convention in 1994 and 14 sites had been included in the World Heritage List by UNESCO.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973	CITES is the only treaty that regulates international trade in wildlife. The treaty was signed in 1975 and, to date, 175 countries have signed on to it. With this agreement, nations pledged to follow rules to monitor, regulate or ban

	international trade in species under threat. CITES lists protected species around 37,000 species of wild animals and plants.

2.14 INTERNATIONAL ENVIRONMENTAL QUALITY STANDARDS

Whilst Myanmar's environmental quality standards (where available) were considered in this study it should be noted that the environmental baseline monitoring data was in some cases also screened against the international environmental quality standards as detailed below.

2.14.1 International Ambient Air Quality Screening Standards

The ambient air quality monitoring data was also screened against the international guidelines presented in **Table 9**.

Table 9: International Ambient Air Quality Guidelines used in the Assessment

Common Air Pollutant (COPs)	Myanmar Air Quality Standards					USEPA National Ambient Air Quality Standards						WHO Ambient Air Quality Guidelines				European Union Ambient Air Quality Standards				
	Unit	10 mins	1hr	24hr	1yr	Unit	1hr	3hr	8hr	24hr	1yr	Unit	1hr	24hr	1yr	Unit	1hr	8hr	24hr	1yr
Carbon monoxide (CO)	mg/m^3	-	-	-	-	ppm	35	-	9	-	-	-	-	-	-	mg/m^3	-	**10**	-	-
Nitrogen Dioxide (NO_2)	µg/m^3	-	**200**	-	40	ppb	100	-		-	53	µg/m^3	200	-	40	µg/m^3	200	-	-	40
Sulfur Dioxide (SO_2)	µg/m^3	500	-	**20**	-	ppm	0.1	0.5	-	-	-	µg/m^3	-	20	-	µg/m^3	350	-	125	-
PM-10 (PMØ < 10 µm)	µg/m^3	-	-	**50**	20	µg/m^3	-	-	-	150	-	µg/m^3	-	50	20	µg/m^3	-	-	50	40
PM-2.5 (PMØ < 2.5 µm)	µg/m^3	-	-	**25**	10	µg/m^3	-	-	-	35	12	µg/m^3	-	25	10	µg/m^3	-	-	-	25

2.5.1 International Nuisance Noise Standards used in the Assessment

The noise monitoring data was also screened against the international guidelines presented in **Table 10.**

Table 10: International Ambient Nuisance Noise Standards used in the Assessment

Environment	WHO		US EPA	
	LAeq [dB]	Time base [hours]	LAeq [dB]	Time base [hours]
Outdoor living area	55	16	<55	24
Industrial area	70	24	70	24

Source: WHO Guidelines for Community Noise, 1999 and Quiet Community Act, 1978.

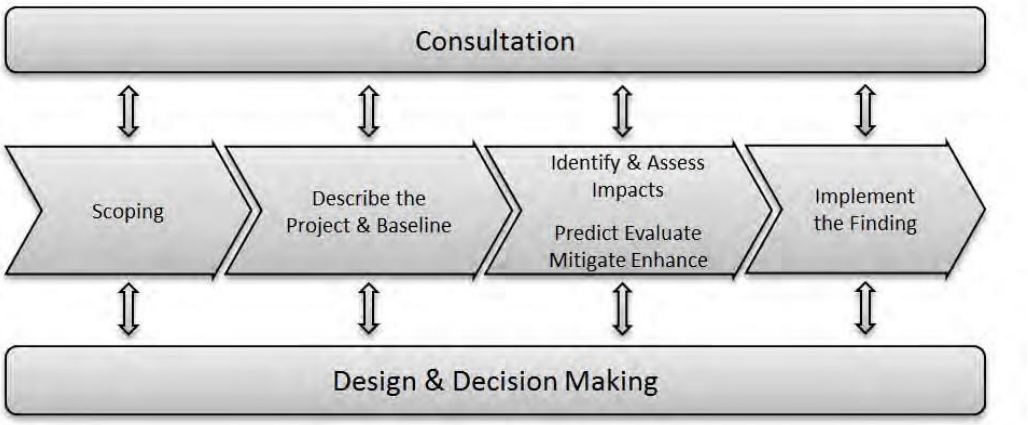
Note: LAeq = the average equivalent level of the sound over a period T.

3. 0 IEE METHODOLOGY

3.1 IEE PROCESS

An overview of the IEE/EIA process adopted in this study is shown in **Plate 5** below and key elements are described in the following sections.

Plate 5: Environmental and Social Impact Assessment Process



3.2 IEESCOPE AND STUDY BOUNDARIES

The scope of this IEE includes the construction and operation of a hotel and the IEE study considers the main activities and potential unplanned events associated with the establishment and operation of the Project.

3.3 ENVIRONMENTAL AND SOCIALRECEPTORS

This study has been limited to the environmental and social receptors that have the potential to be impacted because of the planned project activities, which includes:

- Physical receptors (e.g. soil, water and air);
- Biological receptors (e.g. ecosystems, habitats, flora and fauna); and
- Socio-economic receptors (e.g. project affected peoples and communities).

3.4 SCOPING

A Preliminary Scoping Study was undertaken as a first phase of the overall IEE process with the primary objective of setting the boundary conditions for the main IEE study, identifying the interactions between the proposed Project activities and environmental and social receptors and to prioritize these in terms of potential magnitude or significance. The finding of the preliminary impacts scoping study is presented in the Project Proposal and Scoping Study report which was prepared by SLP under separate cover[1].

This initial evaluation exercise was intended to ensure that the IEE focused on those issues that are most important for design, decision-making and stakeholder interest. This initial evaluation exercise also had the benefit of identifying the receptors which are not likely to be significantly affected because of Project activities and these were scoped out of the full IEE study The Preliminary Scoping Study was updated based on the findings of the main IEE study phase and is presented in

Section 9.1 of this report.

3.5 INFORMATION COLLECTION

The information collection stage will involve collecting information on the Project **(Project Description**) and the existing physical, biological and human environment (**Environmental & Social Baseline**) within which the Project will be located.

3.5.1 Project Description

The Project Description sets out the scope of the Project with reference to those aspects of the Project most likely to have a significant interaction with the identified environmental and social receptors. Details of the Project facilities' design characteristics, as well as construction and operational phase activities will be considered.

3.5.2 Environmental and Socio-Economic Baseline

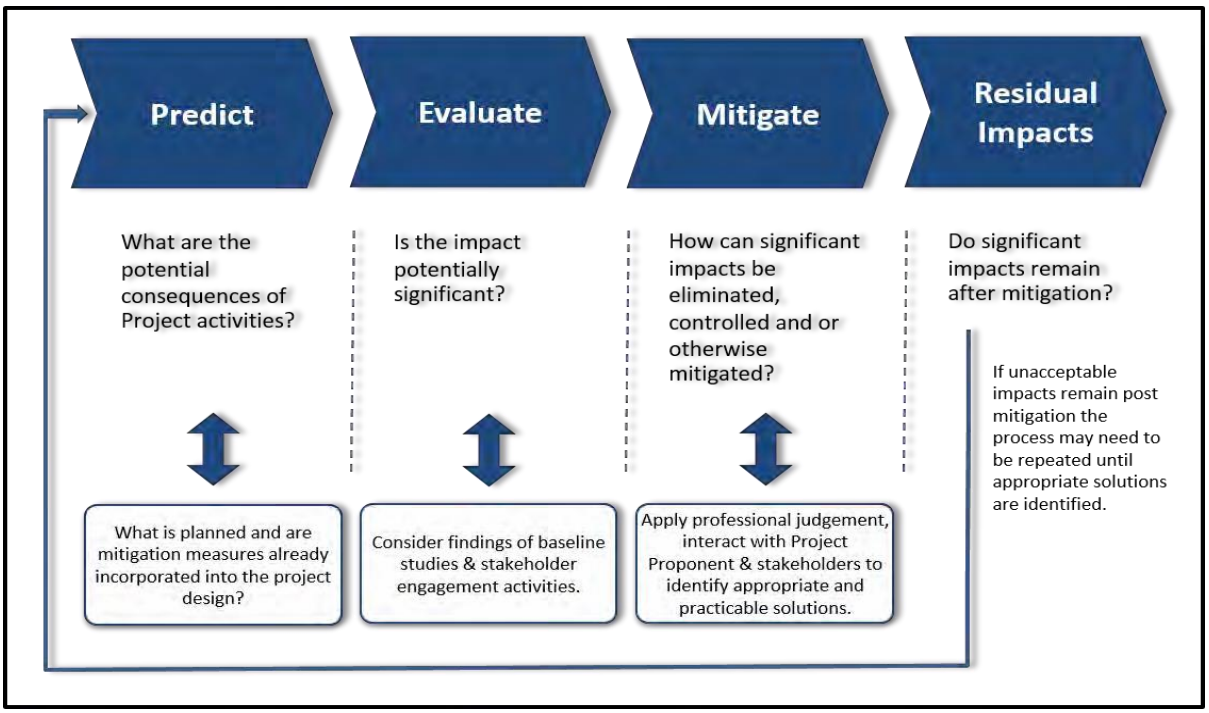
The environmental and socio-economic baseline in the Project Site area will be established through some limited *primary* data collection (Environmental Baseline Studies) as well as a review of readily available and authoritative *secondary* data.

3.6 IDENTIFICATION AND ASSESSMENT OF IMPACTS

Environmental and social impact identification and assessment starts with scoping and continues through the impact assessment phase. The main activities of an IEE study are outlined overleaf in **Plate 6**.

- Impact Prediction: to determine what could potentially happen to the environment and socio-economic conditions because of the Project and its associated activities;
- Impact Evaluation: to determine the significance (i.e. importance) of the predicted impacts by considering their severity and likelihood of occurrence, and the sensitivity of the receiving environmental and social receptors;
- Mitigation and Enhancement: to identify ways to reduce the negative impacts and enhance the benefits of Project activities; and
- Residual Impact Identification: to assess the significance of impacts that are residual in nature (i.e. remain after mitigation measures have been designed into the intended activity).

Plate 6: Simplified Adverse Impacts Identification and Evaluation Process



3.6.1 Prediction of Impacts

Prediction of impacts is essentially an objective exercise to determine what could potentially happen to the environment and or human receptors because of the Project and its associated activities. The diverse range of potential impacts considered in the IEE process results in a wide range of prediction methods being used including quantitative, semi-quantitative and qualitative techniques.

The types of impacts considered have been categorised according to their various characteristics (e.g. are they detrimental or beneficial, direct or indirect, etc.). The various types of impacts that may arise, and the terms used in this assessment are shown in **Table 11** and **Table 12**.

Table 11: Types of Impacts

Term	Definition
Impact Magnitude	
Impact Nature	
Magnitude	Estimate of the size of the impact (e.g. the size of the area damaged or impacted (i.e. the % of a resource that is lost or affected etc.)
Negative Impact	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor
Positive Impact	An impact that is considered to represent an improvement on the baseline or introduces a new desirable factor
Neutral Impact	An impact that is considered to represent neither an improvement nor in baseline conditions

Temporary	Impacts are predicted to be of short duration and intermittent/ occasional in nature
Short-term	Impacts that are predicted to last only for a limited period (e.g. during construction) but will cease on completion of the activity, or as a result of mitigation/ reinstatement measures and natural recovery
	Impacts that will continue over an extended period (e.g. operational noise) but cease when the Project stops operating. These will include impacts that may be intermittent or repeated rather than continuous if they occur over an extended time period
	Impacts that occur once on development of the Project and cause a permanent change in the affected receptor or resource (e.g. the loss of a sensitive habitat) that endures substantially beyond the Project lifetime
Impact Extend	
Local	Impacts are on a local scale (e.g. restricted to the vicinity of the plant, or transport route etc.)
Regional	Impacts are on a national scale (effects extend well beyond the immediate vicinity of the facilities and affect an entire region)
Global	Impacts are on a global scale (e.g. global warming, depletion of the ozone layer)

Table 12: Definition of Impact Type

Impact Type	Definition
Direct Impact	Impacts that result from a direct interaction between a planned Project activity and the receiving environment (e.g. between development of a plot of land and the habitats which are lost)
Secondary Impact	Impacts that follow on from the primary interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g. loss of part of a habitat affects the viability of a species population over a wider area)
Indirect (Induced) Impact	Impacts that result from other activities that are encouraged to happen as a consequence of the Project (e.g. presence of Project promotes service industries in the region)
Cumulative Impact	Impacts that act together with other impacts to affect the same environmental resource or receptor
Residual Impact	Impacts that remain after mitigation measures have been designed into the intended activity

It is important to note that impact prediction will consider any mitigation or control measures that are already part of the Project design (e.g. secondary containment beneath hazardous liquid storage tanks). Additional mitigation measures aimed at further reducing predicted impacts are proposed where necessary or appropriate.

3.6.2 Evaluation of Impacts

In evaluating the significance (i.e. importance) of impacts, the following factors were taken into consideration:

- **Impact severity**: The severity of an impact is a function of a range of considerations including impact magnitude, impact duration, impact extent, and legal & guideline compliance; and
- **Nature and sensitivity of the receiving environment/receptor**: The characteristics of the receptor/resource will be taken into consideration with respect to its vulnerability/sensitivity to an impact/change and for ecological resources their conservation value.

For unplanned / accidental events, the impact evaluation also considered:

- **Likelihood of occurrence**: how likely or probable is the impact to occur.

3.6.2.1 Severity Criteria

In evaluating the severity of environmental impacts, the following factors were taken into consideration:

- **Impact Magnitude**: The magnitude of the change that is induced (i.e. % of a resource that is lost; the predicted increase in ambient pollutant levels etc.);
- **Impact Duration**: The time period over which the impact is expected to last;
- **Impact Extent**: The geographical extent of the induced change; and
- **Regulations, Standards & Guidelines**: The status of the impact in relation to regulations (e.g. discharge limits), standards (e.g. environmental quality criteria) and guidelines.

Where quantification of potential impacts was possible, derived severity criteria have been based on numerical values, representing regulatory limits, Project standards or guidelines (e.g. noise and air quality impacts).

Some environmental aspects require a more qualitative approach for determination of severity due to the absence of statutory limits or universally applicable standards against which potential impacts can be evaluated. Semi-quantitative methods will therefore be used whereby the criteria will be set according to a combination of the value or sensitivity or the resource affected and the magnitude of the effect on it.

3.6.2.2 Nature, Sensitivity and Value of the Receiving Environment

The nature, importance (i.e. is it of local, regional, national or international importance) and sensitivity to change of the receptors or resources that could be affected will be defined as an outcome of the baseline studies. Criteria for evaluating sensitivity are presented in **Table 13**.

Table 13: Evaluation Criteria for the Sensitivity of Resources and Receptors

Sensitivity of receptor	Definition				Overall Level of Sensitivity
	Abundance	State	Adaptability	Value	
Resilient	Common/ Abundant same everywhere	Good and Robust- Already experienced similar change and fully embraced	Readily able to adapt and absorb with no difficulty	Valued but not as unique	**Low**
Moderately Resilient	Reasonably common in surrounding area	Experienced similar change and largely adapted/ absorbed without much difficulty	Able to absorb/ adapt with only small effort	Valued by few individuals in its present state	**Low Medium**
Partially Sensitive	Range/abundance restricted to a few locations in surrounding area	Experiencing some pressure and responding slowly with some difficulty	May adapt/ absorb change but with some difficulty	Valued locally in its present state	**Medium**
Sensitive	Rare with some unique elements	Under pressure and showing signs of stress	Fragile to change, will not adapt readily	Highly valued locally and regionally	**Medium High**
Highly vulnerable	Very rare and unique	Under significant pressure and likely to fail	Intolerable to further pressure – will change irreparably	Significant intrinsic and extrinsic value, locally, nationally and internationally	**High**

With respect to ecological habitats, the factors presented in **Table 14** will also be taken into consideration which provide for a balanced perspective on the importance of biological resources in a area (habitats).

Table 14: Evaluation Criteria for Establishing Ecological/Conservation Importance of Habitats

Criteria	Factors	Definition
Abundance	Presence of species that are rare, protected or designated in need of conservation efforts	Higher importance is attached to habitats that support species under statutory protection or non- statutory designation for rarity or vulnerability.
	Size/extent of habitat	In general larger areas of habitat are more valuable than smaller ones, all else being equal
	Abundance of wildlife	Habitats supporting more wildlife will tend to be rated higher. Habitats that support higher numbers of protected or vulnerable species are rated higher.
	Diversity of species	Species assemblages and communities of a habitat with higher diversity will generally be rated as having higher conservation value
	Nursery/breeding ground	Such areas are important for the regeneration and survival of populations.

		Higher value is attached to areas which are important for breeding or nursery grounds for rare or protected species. Nursery /breeding grounds implies species migrate to, and are dependent on, specific areas for their reproductive success.
Adaptability	Fragility of habitat	Habitats with species assemblages that are difficult to recover from temporary impacts are usually valued higher. Resilient habitats able to absorb/rapidly recover from temporary impacts by are rated lower.
State	Naturalness of habitat	Truly natural habitats (pristine/minimal modification by humans) are usually highly valued. As the degree of modification by humans (disturbance and pollution) increases, the habitat will tend to be rated lower.
	Rarity of habitat	Habitat types that are uncommon or rare, either naturally or because of human activity, or have notable ecological features of scientific interest, are generally rated with higher conservation value.
	Fragmentation/connectivity	In general, the more fragmented the habitat the lower its value
	Age	Ancient natural or semi-natural habitats are normally more highly valued. Stable habitats with stands of sessile organisms that are long-lived and long-established are usually rated higher.
Value	Potential value	A site under consideration for statutory protection or non-statutory designation would tend to have higher potential value. A site, through appropriate management or natural processes, may eventually develop a nature conservation interest substantially greater than that existing at present. A habitat which is identified to have ecological features, which may be of scientific or amenity or educational value may be considered of higher value.
	Areas of Recognised Conservation Importance	Higher importance is attached to sites subject to statutory protection or non-statutory designation.
	Ecological Linkage	The value of a habitat increases if it lies in close proximity and/or links functionally to another highly valued habitat.

3.6.2.3 Likelihood of Occurrence

For unplanned events, the likelihood (probability) or an event occurring will be ascribed using a qualitative scale of probability categories as described in **Table 15**.

Table 15: Likelihood Categories

Likelihood	Definition
Extremely unlikely	The event is very unlikely to occur under normal operating conditions but may occur in exceptional circumstances, i.e. rare occurrence.
Unlikely	The event is unlikely, but may potentially occur, at some time during normal operating conditions.
Low likelihood	The event is likely to occur occasionally at some time during normal operating conditions.
Medium likelihood	The event is very likely to occur during normal operating conditions, i.e. frequent occurrence.
High likelihood/Inevitable	The event will occur during normal operating conditions (is inevitable), i.e. routine occurrence.

Likelihood is estimated based on experience and/or evidence that such an outcome has previously occurred. Impacts resulting from routine/planned events (i.e. normal operations) are classified as having a high likelihood of occurrence.

3.6.3 Evaluation of Significance

The significance of each impact will be determined by comparing the impact **severity** against the **sensitivity of the receptor** in the impact significance matrix provided in **Table 16**. For unplanned events (e.g. accidents etc.), **severity** is considered against the **likelihood of the impact occurring** as presented in **Table 17**.

Table 16: Determining the Significance of Planned Events

		Sensitivity of Receptor				
		Low	**Low - Medium**	**Medium**	**Medium - High**	**High**
Impact Severity	**No Change**	Negligible	Negligible	Negligible	Negligible	Negligible
	Slight	Negligible	Negligible	Negligible	Minor	Minor
	Low	Negligible	Negligible	Minor	Minor	Moderate
	Medium	Negligible	Minor	Minor	Moderate	Moderate
	High	Minor	Moderate	Moderate	Major	Major

Table 17: Determining the Significance of Unplanned Events

		Impact Likelihood				
		Extremely Unlikely	**Unlikely**	**Low Likelihood**	**Medium Likelihood**	**High Likelihood/ Inevitable**
Impact Severity	**Slight**	Negligible	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible	Negligible - Minor	Minor
	Medium	Negligible	Minor	Minor	Moderate	Moderate
	High	Minor	Minor	Moderate	Major	Major
	Critical	Minor - Moderate	Moderate - Major	Major	Major	Critical

Significance definitions are defined in **Table 18** (i.e. relative ranking of importance).

Table 18: Definition of Impacts

Significance	Definition
Positive Impact	An impact that is considered to represent an improvement on the baseline or introduces a new desirable factor.
Negligible Impact	Magnitude of change comparable to natural variation.
Minor impact	Detectable but not significant
Moderate impact	Significant; amenable to mitigation; should be mitigated where practicable.
Major impact	Significant; amenable to mitigation; must be mitigated.
Critical impact	Intolerable; not amenable to mitigation; alternatives must be identified.

Impacts assessed as Negligible or Minor will require no additional management or mitigation measures (on the basis that the magnitude of the impact is sufficiently small, or that the receptor is of low sensitivity (and/or that adequate controls are already included in the Project design). Negligible and Minor impacts are therefore deemed to be "**Insignificant**" and fall within the "**No Action**" criterion.

Impacts evaluated as Moderate or Major require the implementation of further management or mitigation measures. Major and Moderate impacts are therefore deemed to be "**Significant**" and will required further detailed evaluation.

Major impacts always require further management or mitigation measures to minimize or reduce the impact to an acceptable level. An "acceptable level" is the reduction of a Major impact to a Moderate one after mitigation.

In seeking to mitigate Moderate impacts, the emphasis is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). It will not always be practical to reduce Moderate impacts to Minor ones in consideration of the cost-ineffectiveness of such an approach (due to the diminishing return of a reduction of impact versus cost).

Impacts evaluated as Critical cannot be managed or mitigated and require the identification of alternatives (elimination of source of potential impact). Such impacts are "**Unacceptable**" and could potentially result in the abandonment of the Project.

3.6.4 Mitigation & Monitoring

The IEE process is intended to identify impacts and benefits associated with Project activities and the ways of dealing with them during the planning and design stages of the Project. The ultimate goal of the IEE process is to reduce the negative impacts and enhance the benefits of an intended activity. Planned mitigation measures will be described; additional mitigation measures/controls will be recommended where impacts are considered unacceptable. Recommended post-Project monitoring will be identified and included in the EMMP section of the IEE.

In this assessment the mitigation hierarchy for planned events is as follows:

Avoid at Source/Reduce at Source: Avoiding or reducing at source is essentially "designing" the Project so that a feature causing an impact is designed out or altered.

Abate on Site: This involves adding something to the basic design to abate the impact – pollution controls fall within this category.

Abate at Receptor: If an impact cannot be abated on-site then consider measures that can be implemented off-site to reduce impacts.

Repair or Remedy: Some impacts involve unavoidable damage to a resource. Repair involves restoration and reinstatement type measures.

Compensate in Kind/Compensate Through Other Means: Where other mitigation approaches are not possible or fully effective, then compensation for loss or damage might be appropriate.

The mitigation hierarchy for unplanned events is as follows:

Control: The objective is to reduce the risk to as reasonably practicable (ALARP) which can be achieved by reducing the likelihood of the initiating event or by reducing the consequence or by a combination of both.

Recovery: Typical contingency measures include Emergency Response Plans and Procedures.

The environmental performance of the Project should be monitored, and the extent of the monitoring should be commensurate with the Project's risks and impacts and with the Project's compliance requirements.

3.6.5 Residual Impacts

In some cases, it may only be possible to reduce the impact to a certain degree. These impacts are therefore residual in the sense that they remain after mitigation measures have been designed into the intended activity. In the assessment, any residual impacts will be identified, and their significance evaluated.

3.7 COMMUNICATION REPORTING (IEE REPORT)

The main deliverable from the IEE process is the IEE Report which provides the primary means of communicating they key findings of the assessment to stakeholders, project decision makers and the regulatory authorities.

4.0 PROJECT SITE DESCRIPTION

4.1 LOCATION

The Project Site is situated in Nyaung Ywa Village Tract, Hlaing Tharyar Township located on the outskirts of Yangon Division and approximately 20 km west of Yangon City Centre, Myanmar. The Project Site is in a lowland setting and the primary land-uses in the locality of the Project Site comprise of residential, agricultural, and amenity (golf course).

The nearest operational airport is Yangon International Airport which is located approximately 14 km to the east of the Project Site and the nearest railway station is Hleden Station which is located approximately 13km to the southeast of the Project Site. The Asia World Port Terminal is also located approximately 16 km southeast of the Project Site.

Based on information provided by the Project Proponent, the total Project Site area is approximately 8,887sq.m (95,658 sq. ft). The approximate geographic coordinates of the Project Site centre are 16°50'28.34'N, 96° 5'49.09'E.

The location of the Project Site is presented in **Plate 7** below.

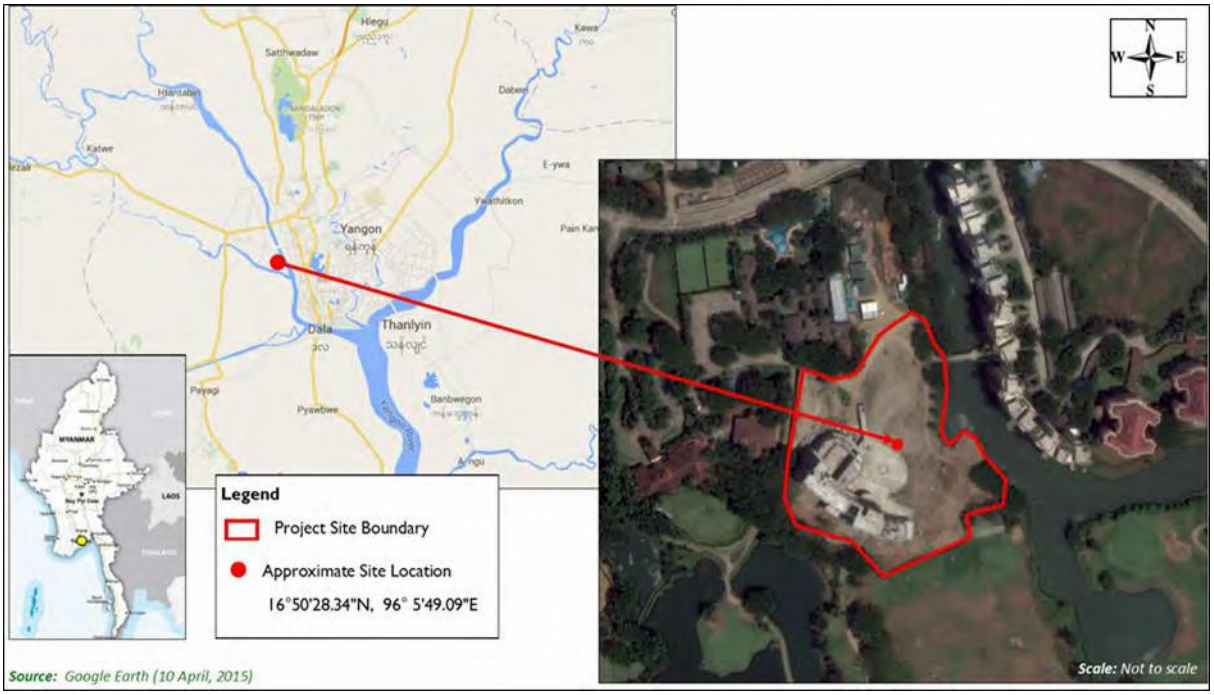


Plate 7: The Location of the Project Site

4.2 PROJECT SITE DESCRIPTION

The topography of the Project Site is and its environs is generally flat but the eastern sectors of the Project Site are approximately 3-4m lower than the western sectors of the site. Google Earth Imagery captured early 2015 indicates that the study site sits at an elevation ranging from approximately 6- 8m AMSL.

The main entrance of the Pun Hlaing Lodge is located off the Yangon-Pathein Road. The Project Site is accessed via a 1.7 km-paved road turn off from the Yangon-Pathein Road followed by a 1.5km Pun Hlaing Ave which leads to the main site entrance in the north sector of the Project Site. The site is bounded by steel hoarding on the western and southern boundaries, a canal on the eastern boundary and the security guardhouse on the northern boundary. Vehicular and pedestrian access is via

a security gate house at the main site entrance.

The golf lodge hotel building is being constructed in the south and the construction office is located off site to the immediate north of the Project Site. Power to the construction site is provided by a combination of grid supply and onsite generating sets and water via piped water supply from Pun Hlaing Golf Estate. Temporary stormwater drainage runs from south to east of the Project Site and discharges into a canal in the east of the Project Site. A current Project Site Layout Plan is presented in **Plate 8.**

Plate 8: Construction Site Layout Plan

4.3 PROJECT SITE AREA

The general land-uses in the Project Site area predominantly comprise of low and medium density residential land uses, agricultural land and amenity uses (Pun Hlaing Golf Course).

The land-uses in the immediate environs of the Project Site are detailed below:

North: The north of the Project Site is bounded by an internal road, Pun Hlaing Lodge temporary office, Pun Hlaing swimming pool and country club with residential area and Jasmine Dr Road beyond.

East: The east of the Project Site is bounded by a canal with apartment blocks on the opposite side.

South: The south of the Project Site is bounded by a golf course with ornamental lakes.

West: The west of the Project Site is bounded by Pun Hlaing Golf Clubhouse, the Jasmine garden residential area and a golf driving range beyond.

A surrounding land-uses plan is presented in **Figure 1** in **Appendix A**

4.4 HISTORICAL LANDUSES

The 1:250,000 Burma Topographic Survey Map of Rangoon, Series U542, Sheet No. NE 47-13, Edition 1-AMS dated 1998 indicates that the Project Site is situated in an area historically characterised by rice cultivation and low density residential land uses. An extract from the Topographic Survey Map is presented in **Figure 2** in **Appendix A.**

4.4.1 Satellite Imagery Review

A review was undertaken of the available Google Earth satellite imagery for the Project Site area and the findings are presented in **Table 19.** The Google Satellite Imagery for the Project Site area is presented in **Figure 3** in Appendix A.

Table 19: Satellite Imagery Review Findings

Year	Image ID	Project Site Observations	Adjacent Property and Surrounding Area Observations
2004	Imagery Date: 22 Apr 2004	The project Site has been cleared ready for redevelopment although no significant infrastructure is yet present.	The adjacent property and the surrounding area are characterised by amenities (golf course) and low-density residential land uses. No significant infrastructure is present on the immediately neighbouring land although two buildings appears to be under construction further beyond. A small building located at the adjacent SE corner with a golf driving range to the S and one large building is located on the property adjacent W of the Project Site.
2009	Imagery Date: 8 Dec 2009	A small pond has been dug in the northern sector and one building is present in the northwest corner of the Project Site. Internal roads are present in the north and southwest sectors of the Project Site and the southwestern sector appears to have been converted into a golf driving range.	The property adjacent N remains unchanged. A swimming pool, two tennis court and several buildings are now present on the property adjacent NW. the lake adjacent E has elongated and the two buildings which were under construction are finished. The small building at the SE corner in the property adjacent NW has been extended. No significant changes to properties adjacent S and E.
2013	Imagery Date: 16 Nov 2013	The pond in the northern sector is no longer shown. Most areas excepting the south eastern sector of the Project Site have been cleared ready for	The land adjacent N has been cleared and appears to be in the process of redevelopment and several structures are present. Large apartment blocks are present on the property to the E and a bridge has been noted to the

		redevelopment and a new internal road has been constructed at the eastern and southern sector of the Project Site.	properties adjacent S, W and NW of the project site.
2015	Imagery Date: 21 Apr 2015	The project site has been cleared and is in the process of redevelopment. The main hotel building is now shown in the SW sector of the site.	No significant changes noted on the property adjacent N which still appears to be in the early stages of redevelopment. The properties adjacent E, S and W remain unchanged.

4.4.2 Consultation Information

Yoma Strategic Holdings Ltd (parent company of the Project Proponent) instructed Reeman Consulting to prepare a Land Acquisition and Resettlement Evaluation Report[2] focussed on addressing potential legacy land acquisition issues at the larger 652acre Pun Hlaing Golf Estate (PHGE) site within which the Project Site is located. As part of this study consultations were undertaken to determine the land use history at the Project Site. This study identified the following land use history at Pun Hlaing Golf Estate (PHGE) within which the Project Site is located:

- Pre 1980 the Project Site area comprised of marshland and agricultural land cultivated by dispersed low-density settlements and village communities.
- Construction works for the larger Pun Hlaing Golf Estate in which the Project is located commenced in 1997.
- Preparatory works for the construction of Pun Hlaing Lodge Golf Hotel commenced in June 2013.

5.0 PROJECT DESCRIPTION

5.1 OVERVIEW

Pun Hlaing Lodge Ltd. proposes to construct a luxury hotel lodge comprising of 8 stories (basement, 1st level, mezzanine, 2nd level, 3rd level, 4th level, 5th level and 6th level) with a total of 46 rooms and a Gross Floor Area (GFA) of 13,617 sq.m on a total plot area of 8,887 sq.m.

The basement level will comprise of a golf operations area with a total footprint of 1,518 sq.m; common areas and hotel back of house totalling some 2,315 sq.m. The project will not be included golf operation.

Level 1 of the building will comprise of four apartment suites measuring approximately 136 sq.m per unit and 3,346 sq.m of amenities. The amenities include reception, lobby and public areas, conference room, meeting rooms, management office, cigar bar and restaurants.

Level 2 to level 5 will contain forty-two units comprising of 30 typical standard guest suites measuring 63 sq.m each; 4 corner suite Type 1 units measuring 101 sq.m each; 4 corner suite Type 2 units measuring 82 sq.m each and 4 garden suite units measuring 143 sq.m each.

The maximum building height will be 31.15m and the development will have parking for 28 vehicles. Electricity will be provided by the national grid with a 100% backup capacity also available from the Pun Hlaing Golf Estate which has its own generating capacity. Water will be provided by Pun Hlaing Golf Estate and sanitary wastewaters will be discharged to Pun Hlaing Golf Estate's own wastewater treatment plant (WWTP). The exact location of the Awei Metta Hotel is stated in **Plate 9** as below.

Plate 9: Location of the Awei Metta Hotel

According to the above photo, the golf operation area is stated with yellow cycled and Pun Hlaing Lodge Hotel (now Awei Metta Hotel) is situated beside the golf operation.

5.2 DEVELOPMENT PROGRAMME

The project will be constructed over 1,170 days as detailed in Table 20 with completion and handover anticipated in February 2017.

Table 20: Project Development Timeline

Activity	Duration (days)	Period
Foundation & Structure	527	1st Jun 2013 – 5th Feb 2015
Construction – Civil, Masonry, Façade	436	25th May 2015 – 16th Oct 2016
Civil Works	286	25th May 2015 – 21st Apr 2016
Masonry Works	185	25th May 2015 – 25th Dec 2015
Façade Work	376	3rd Aug 2015 – 13th Oct 2016
Construction- MEP	363	25th May 2015 – 20th Jul 2016
MEP Services	363	25th May 2015 – 20th Jul 2016
Construction- Interiors	471	4th Aug 2015 – 2nd Feb 2017
Back of House Areas	289	4th Aug 2015 – 5th Jul 2016
Guest Rooms, Suites and Corridors	365	4th Sep 2015 – 2nd Nov 2017
Public Areas	176	13th Jul 2016 – 2nd Feb 2017
Landscaping & External Works	316.25	22nd Feb 2016 – 24th Feb 2017
Testing & Commissioning	257	16th Apr 2016 – 9th Feb 2017
Handover	251	22nd Apr 2016 – 9th Feb 2017
Total Duration of the Construction Timetable:	**1,170 Days**	**June 2013 – February 2017**

5.3 CONSTRUCTION PHASE ACTIVITIES

In summary, the construction phase of the project will comprise of the following aspects:

- Site clearance and upfilling with dredged river sand and soil from borrow pits to provide development platform (this means that the project owner will buy dredged river sand and soil from clients);
- Development enabling works such as perimeter fencing, erection of site office compound with offices and latrines, laying of temporary haul roads, construction of temporary drainage and connecting to local power grid and sanitary wastewater conveyance system.
- Substructure works – pre-cast driven piles to approximately 32m below surface to support main hotel structure. The piles will be restrained by a group of pile caps and tie beams.
- Superstructure works - reinforced concrete structural frame with reinforced concrete beams and slabs.
- Facades – aluminium powder coating and glass.
- Interiors – masonry and gypsum board partition walls with paint, wallpaper or veneer finish.
- Flooring – wood, carpet or tiles.
- Doors and windows – mostly metal, guest room doors wooden.
- Landscaping – grass, flower and shrub beds.

A summary of the main construction phase activities that have the potential to interact with environmental and or social receptors at the Project Site are presented in the following sections.

5.4 CONSTRUCTION CONTRACTOR

The construction of the Project has been let to three main contractors as detailed in **Table 21** below:

Table 21: Construction Phase Contractors

Company Name	Service	EHS Representative Name
Myo & Myint Brothers	Civil	Mr. Kaung Sett
Myo & Myint Brothers	Structural	Mr. Kaung Sett
NZB	MEP	Mr. Nyi Nyi Aung

5.5 CONSTRUCTION PLANT AND EQUIPMENT

A variety of plant and other equipment will be used to facilitate the construction of the Project as shown in **Table 22**.

Table 22: Construction Plant and Equipment

Activity	Number and Type	Energy Source (electric, gas, fuel etc.)
Earth Moving Equipment		
1.Loader	1	Fuel
2.Dumper	2	Fuel
Road Making Equipment		
1.Escavator	1	Fuel
Hauling Equipment		
1.Truck	1	Fuel
2.Lorry Crane	1	Fuel
3.Mobile Crane	1	Fuel
Piling Equipment		
1.Hydraulic Press Pile Machine	1	Fuel
Concreting Equipment		
1.Concrete Pump	1	Fuel
Lifting and Handling Equipment		
1.Passenger Hoist	1	Electric

2.Material Hoist	1	Electric
Welding Equipment		
1.Welding Machine	4	Fuel
Shop Fabrication and Testing Equipment		
1.Pressure Pump	2	Electric
Other Miscellaneous (specify below)		
1. Concrete Vibrator	2	Electric
2.Water Jet	2	Electric

5.6 CONSTRUCTION SITE LAYOUT

The construction site layout is shown on **Plate 10** below. The plan shows the locations of all of the key project aspects that have the potential to interact with environmental and social receptors.

Plate 10: Construction Phase Site Layout Plan with Key Environmental Aspects

5.7 NATURAL BUILDING MATERIALS CONSUMPTION

The construction of the Project will require the use of natural materials/resources such as sand, soil and timber. An inventory of these natural building materials, their sources and projected consumption quantities are provided below in Table 23.

Table 23: Inventory of Natural Building Materials, Sources & Projected Quantities

Material	Projected consumption	Source/s	Material required for
Sand	6,014m3	Dredged River Sand	Site Upfill Material
Gravel/Stone	3000m3	Dredged River Stone	Ready Mixed Concrete
Timber	16 Tons	Commercial Supplier	Formwork Component
Soil	8,014m3	Commercial Supplier	Site Upfill Material

5.8 WATER CONSUMPTION

The construction of the Project will require the use of water and it is estimated that the Project will consume approximately 15.6 m3/day. A breakdown of the projected water consumption rates and sources is presented in Table 24.

Table 24: Water Consumption during Construction, Sources & Projected Quantities

Uses	Projected quantities m^3/day	Source/s (groundwater, surface, municipal)	Total Number of onsite GW wells
Construction Purposes	10	Groundwater#	None
Latrines	5.6	Groundwater#	None
Total	**15.6**		

From groundwater wells on Pun Hlaing Golf Estate

5.9 ELECTRICITY CONSUMPTION

The construction of the Project will require power and the projected peak demand electricity requirement and sources of electricity are presented below in **Table 25**. The location of the electricity generating set is shown in **Plate 9.**

Table 25: Projected Power Consumption Requirements during Construction

Projected Requirement KW/Day (peak demand)	Source/s (grid/generator)	Number of generators and rated output	Fuel Type
210	National Grid and PHGE Local Grid	N/A	N/A
	Contractors Generators	1	Diesel

5.10 STORMWATER AND WASTEWATER DISCHARGES

There are two main wastewater streams generated as a consequence of construction phase project activities and these comprise of sanitary and grey wastewater from the latrines and stormwater runoff.

A temporary drainage network has also been constructed to manage stormwater runoff which conveys stormwater to two discharge points which outfall into the canal to the immediate east of the Project Site (see **Plate 9**). A breakdown of wastewater discharges and disposal routes is presented in **Table 26**.

Table 26: Stormwater and Wastewater Discharges during Construction Activities

Sources	Disposal Rout (river, septic tank)	Estimated Daily Discharge Volume	Total Number of Septic Tanks onsite
Stormwater	Temporary site drainage network to canal on eastern site boundary	Unknown	N/A
Latrines	Pun Hlaing Golf Estate Sewage Treatment Plant (STP)	10 m3	None

5.11 AIR EMISSIONS

The 1No. diesel fuelled electricity generating sets used by the contractors intermittently is the main static point source of air emissions on the Project Site during construction activities which will generate emissions to the atmosphere when in operation. There are also numerous fugitive sources of air emissions such as those from site vehicles, plant and machinery as well as windblown dust.

The location of the main static source of air emissions is shown on **Plate 9**.

5.12 HAZARDOUS SUBSTANCES

Relatively small quantities of hazardous substances will be utilised and stored on site during the construction phase of the Project. An inventory of the hazardous substances that will be used during the construction works and the projected consumption rates is presented below in **Table 27.**

Table 27: Hazardous Substances used during Construction and Projected Consumption

Substance	Projected usage per month	Storage Arrangements (Bulk tank, IBC, drums, bottle, can etc.)	Dedicated storage area with secondary containment (Y/N?)
Gasoline	300 liters	Can	Y
Diesel	2,850 liters	Drum/Can	Y
Solvents	7.5 liters	Can	Y
Formwork Oil	42 liters	Drum	Y

5.13 NON-HAZARDOUS SOLID WASTES

The primary non-hazardous solid waste streams at the Project Site comprise of general refuse and construction wastes which are disposed of off-site. The breakdown of non-hazardous solid wastes generated during construction works is shown in **Table 28.** The location of the temporary onsite waste storage area is shown in **Plate 9.**

Table 28: Non-hazardous Solid Wastes generated during Construction

Waste Type	Disposal Method (Offsite, Landfill Onsite, Recycled etc.)	Name of Waste Haulier, Disposal Site and or Recycling Company
Plastic	Offsite	Batching Plant Compound
Paper/Cardboard/Packaging	Offsite	Batching Plant Compound
Rebar	Offsite	Batching Plant Compound
Bricks	Offsite	Batching Plant Compound
Concrete	Offsite	Batching Plant Compound
Wood	Offsite	Batching Plant Compound

5.14 HAZARDOUS SOLID AND LIQUID WASTES

The Project is expected to generate small quantities of hazardous wastes during its construction as detailed in **Table 29**. The location of the temporary onsite waste storage area is shown in **Plate 10.**

Table 29: Hazardous Solid & Liquid Wastes generated during Construction

Waste Type	Disposal Method (Offsite, Landfill Onsite, Recycled etc.)	Name of Waste Haulier, Disposal Site and or Recycling Company
Waste oils	None anticipated	N/A
Used hazardous substances containers (e.g. fuel and chemical drums, cans)	Offsite	Dumping Yard
Batteries	Offsite	Dumping Yard
Aerosol cans	Offsite	Dumping Yard
Fluorescent light tubes	Offsite	Dumping Yard
Expired or waste chemicals	None anticipated	N/A
Electronic wastes	None anticipated	N/A

Estimated Solid Waste

During operation phase, total of 46 guest rooms for 92 guests will be available for throughout its lifespan by the Awei Metta.

Therefore,

Total guests = (Hotel Rooms) * number of guests per room

= (46) * 2

= 92 (approximately 90 guests)

Estimated occupancy rates of the Yangon are 65% during high season and 32% during low season. During operation phase of the high season and low season, therefore, 58 guests and 28 will stay at that area respectively.

Thence, it is estimated that average one kilogram of solid wastes will be generated from the guest rooms per guest per night. So, there may occur totally 58 kilograms of solid wastes will be generated during high season and totally 28 kilograms will be generated during low season.

Apart from that various amount of solid wastes may be generated from operation of the hotels and its related facilities such as waste kitchen, dining rooms, reception, office etc.

Estimated Liquid waste

Estimated liquid waste generation from the 3km study area of the project site is mentioned as below;

Estimation (1)

Estimate Maximum number of rooms = 46 rooms

Estimation (2)

Average no. of guest with 65% occupancy rate = (46 * 2) * 55% = 58 guests per night (high season)

Average no. of guest with 32% occupancy rate = (46 * 2) *15% = 28 guests per night (low season)

Assume (1) that, 220 litres (60 gallons) per guest per day will be applied.

Total average water requirement per day = 12,760 litters (3,371 gallons) (high season)

Total average water requirement per day = 6,160 litters (1,627 gallons) (low season)

5.15 VEHICLE MOVEMENTS

The projected average daily number of vehicle movements associated with the construction phase of the Project Site are presented Table 30.

Table 30: Projected Daily Vehicle Movements during Construction Phase

Activity	Average Number Vehicles Daily
Materials/Goods/Equipment Inbound	6
Materials/Wastes Outbound	2

5.16 OPERATIONAL HOURS

The operational hours of the construction site during the construction phase of the Project is presented in **Table 31** below.

Table 31: Operational Hours during Construction

Day	Operational Hours	Any YCDC Restrictions on Operational Hours (Y/N)
Monday	8am to 5.30pm	N
Tuesday	8am to 5.30pm	N
Wednesday	8am to 5.30pm	N
Thursday	8am to 5.30pm	N
Friday	8am to 5.30pm	N
Saturday	8am to 5.30pm	N
Sunday	8am to 5.30pm (if required)	N

5.17 OVERVIEW OF OPERATIONAL ACTIVITIES

PHL Hotel Management Ltd proposes to construct a luxury hotel lodge comprising of 8 stories (basement levels, 1st level, mezzanine, 2nd level, 3rd level, 4th level, 5th level and 6th level) with a total of 46 rooms and a Gross Floor Area (GFA) of 13,617 sq.m on a total plot area of 8,887 sq.m.

The basement level will comprise of a golf operations area with a total footprint of 1,518 sq.m; common areas and hotel back of house totalling some 2,315 sq.m.

Level 1 of the building will comprise of four apartment suites measuring approximately 136 sq.m per unit and 3,346 sq.m of amenities. The amenities include reception, lobby and public areas, conference room, meeting rooms, management office, cigar bar and restaurants.

Level 2 to level 5 will contain forty-two units comprising of 30 typical standard guest suites measuring 63 sq.m each; 4 corner suite Type 1 units measuring 101 sq.m each; 4 corner suite Type 2 units measuring 82 sq.m each and 4 garden suite units measuring 143 sq.m each.

The maximum building height will be 31.70m and the development will have parking for 28 vehicles.

Electricity will be provided by the national grid with a 100% backup capacity also available from the Pun Hlaing Golf Estate which has its own generating capacity. Water will be provided by Pun Hlaing Golf Estate and sanitary wastewaters will be discharged to Pun Hlaing Golf Estate's own wastewater treatment plant (WWTP).

During construction phases, there is a low significant impact for discharging sewage and litter. The project is designed to have alternative proper waste management system such as waste collection, segregation and disposal.

During operation phase, there is environmental impact with low significance which is water resource depletion due to domestic water consumption from the Pun Hlaing Golf Estate. Mitigation measures are installing water meter and water saving equipment for control of water use. There is also low significant environmental impact due to discharging of sewage and litter to the nearby Pun Hlaing river which must be mitigated by installing sewage treatment plant and developing proper waste segregation and disposal system.

Estimated Solid Waste

During operation phase, total of 46 guest rooms for 92 guests will be available for throughout its lifespan by the Awei Metta.

Therefore,

Total guests = (Hotel Rooms) * number of guests per room

= (46) * 2

= 92 (approximately 90 guests)

Estimated occupancy rates of the Yangon are 65% during high season and 32% during low season. During operation phase of the high season and low season, therefore, 58 guests and 28 will stay at that area respectively.

Thence, it is estimated that average one kilogram of solid wastes will be generated from the guest rooms per guest per night. So, there may occur totally 58 kilograms of solid wastes will be generated during high season and totally 28 kilograms will be generated during low season.

Apart from that various amount of solid wastes may be generated from operation of the hotels and its related facilities such as waste kitchen, dining rooms, reception, office etc.

Estimated Liquid waste

Estimated liquid waste generation from the 3km study area of the project site is mentioned as below;

Estimation (1)

Estimate Maximum number of rooms = 46 rooms

Estimation (2)

Average no. of guest with 65% occupancy rate = (46 * 2) * 55% = 58 guests per night (high season)

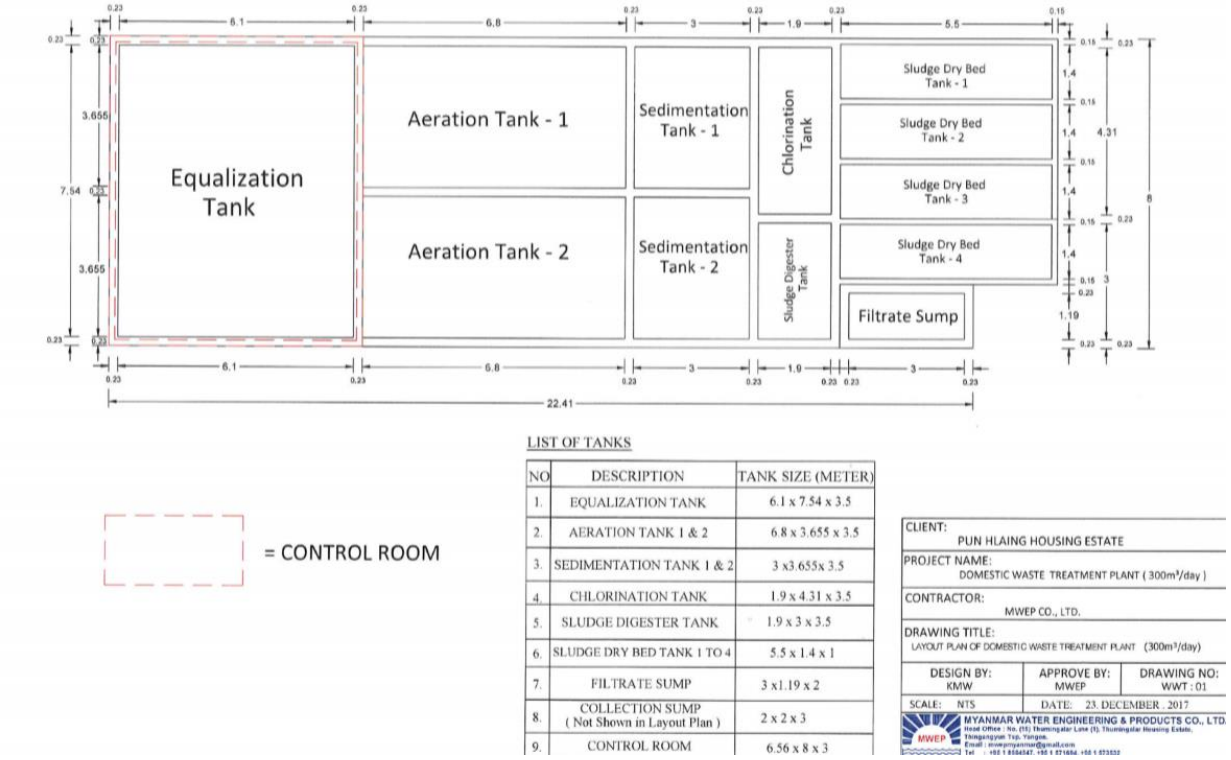
Average no. of guest with 32% occupancy rate = (46 * 2) *15% = 28 guests per night (low season)

Assume (1) that, 220 litres (60 gallons) per guest per day will be applied.

Total average water requirement per day = 12,760 litters (3,371 gallons) (high season)

Total average water requirement per day = 6,160 litters (1,627 gallons) (low season)

There are two types of wastes (hazardous waste and non-hazardous waste) will be generated from proposed project. Hazardous waste water (e.g. Kitchen, restaurant) flows into grease trap (500 mm * 500 mm * 700 mm) and flows through the 15.6 m3 (Sump pit) Basin in the basement Area. The Non-Hazardous waste water directly flows into that Sump pit. And then the waste form the Sump Pit is sent to the Sewage Treatment Plant located in Pun Hlaing Compound with two 15 kw water pump that are sink underground. The layout plan and Schematic Flow Diagrams of Domestic Waste Treatment Plant are stated below.



LIST OF TANKS

NO	DESCRIPTION	TANK SIZE (METER)
1.	EQUALIZATION TANK	6.1 x 7.54 x 3.5
2.	AERATION TANK 1 & 2	6.8 x 3.655 x 3.5
3.	SEDIMENTATION TANK 1 & 2	3 x3.655x 3.5
4.	CHLORINATION TANK	1.9 x 4.31 x 3.5
5.	SLUDGE DIGESTER TANK	1.9 x 3 x 3.5
6.	SLUDGE DRY BED TANK 1 TO 4	5.5 x 1.4 x 1
7.	FILTRATE SUMP	3 x1.19 x 2
8.	COLLECTION SUMP (Not Shown in Layout Plan)	2 x 2 x 3
9.	CONTROL ROOM	6.56 x 8 x 3

CLIENT: PUN HLAING HOUSING ESTATE

PROJECT NAME: DOMESTIC WASTE TREATMENT PLANT (300m³/day)

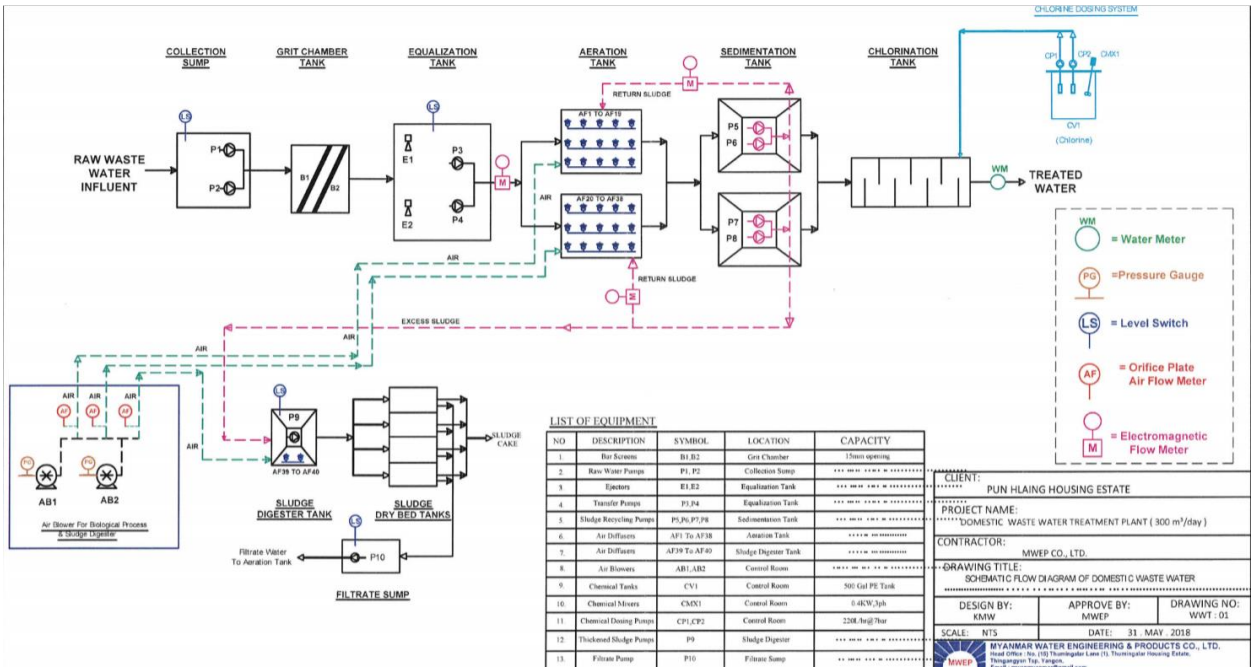
CONTRACTOR: MWEP CO., LTD.

DRAWING TITLE: LAYOUT PLAN OF DOMESTIC WASTE TREATMENT PLANT (300m³/day)

DESIGN BY:	APPROVE BY:	DRAWING NO:
KMW	MWEP	WWT : 01
SCALE: NTS	DATE: 23. DECEMBER . 2017	

MYANMAR WATER ENGINEERING & PRODUCTS CO., LTD.

Plate 11: Layout Plan of Domestic Waste Treatment Plant



NO	DESCRIPTION	SYMBOL	LOCATION	CAPACITY
1.	Bar Screens	B1,B2	Grit Chamber	15mm opening
2.	Raw Water Pumps	P1, P2	Collection Sump	...
3.	Ejectors	E1,E2	Equalization Tank	...
4.	Transfer Pumps	P3,P4	Equalization Tank	...
5.	Sludge Recycling Pumps	P5,P6,P7,P8	Sedimentation Tank	...
6.	Air Diffusers	AF1 To AF38	Aeration Tank	.....
7.	Air Diffusers	AF39 To AF40	Sludge Digester Tank	.....
8.	Air Blowers	AB1,AB2	Control Room	...
9.	Chemical Tanks	CV1	Control Room	500 Gal PE Tank
10.	Chemical Mixers	CMX1	Control Room	0.4KW,3ph
11.	Chemical Dosing Pumps	CP1,CP2	Control Room	220L/hr@7bar
12.	Thickened Sludge Pumps	P9	Sludge Digester	...
13.	Filtrate Pump	P10	Filtrate Sump	...

Plate 12: Schematic Flow Diagram of Domestic Waste Treatment Plant

An artist's impression of the finished development is presented in **Plate 13** below.

Plate 13: Artists Impression of Pun Hlaing Lodge Golf Hotel.

5.18 AREA AND HEIGHTS OF COMPLETED BUILDINGS

Table 32 details the gross floor area and height of each storey within the hotel building.

Table 32: Area and Height of Completed Building

Storeys	GFA (m^2)	Height (m AMSL)
Basement	3,833	7.50
1st floor + Podium	4,167	11.10
1st (Mezzanine)	594	14.70
2nd floor	1,346	18.30
3rd floor	1,228	21.90
4th floor	1,144	25.50
5th floor	1,055	29.10
6th floor (Terrace)	250	31.70
GFA Entire Developme	13,617	N/A

A plan showing the front and rear elevations of the hotel building is presented overleaf in **Plate 14**.

5.19 GROUND AREAS UNDER HARD AND SOFT COVER

The approximate percentage of the completed Project that will be under hard cover compared to that which will be under soft cover (landscaping) is presented in **Table 33**.

Table 33: Approximate Percentage of Development under Hard Cover vs Soft Cover

Total Property Area (m^2)	Total Area under Hard Cover (m^2)	Total Area under Softcover (m^2)
8,887	4,167	4,720

5.20 MATERIALS AND FINISHINGS

The materials and finishing in the hotel building are presented below in **Table 34.**

Table 34: Materials and Finishing

Sub-structure and Super-structure	Materials and Finishings
Reinforced Concrete	• The facade is aluminium powder coating and glass. • Guestrooms and public area interiors will have wood/carpet/tiled flooring. Interior walls will comprise of a combination of masonry and gypsum board finished with paint, wall paper or veneer as appropriate. • Doors and windows will be mostly metal doors although guest room doors will be wood. • Porcelain sanitary ware. • Fabric curtains or blinds on windows.

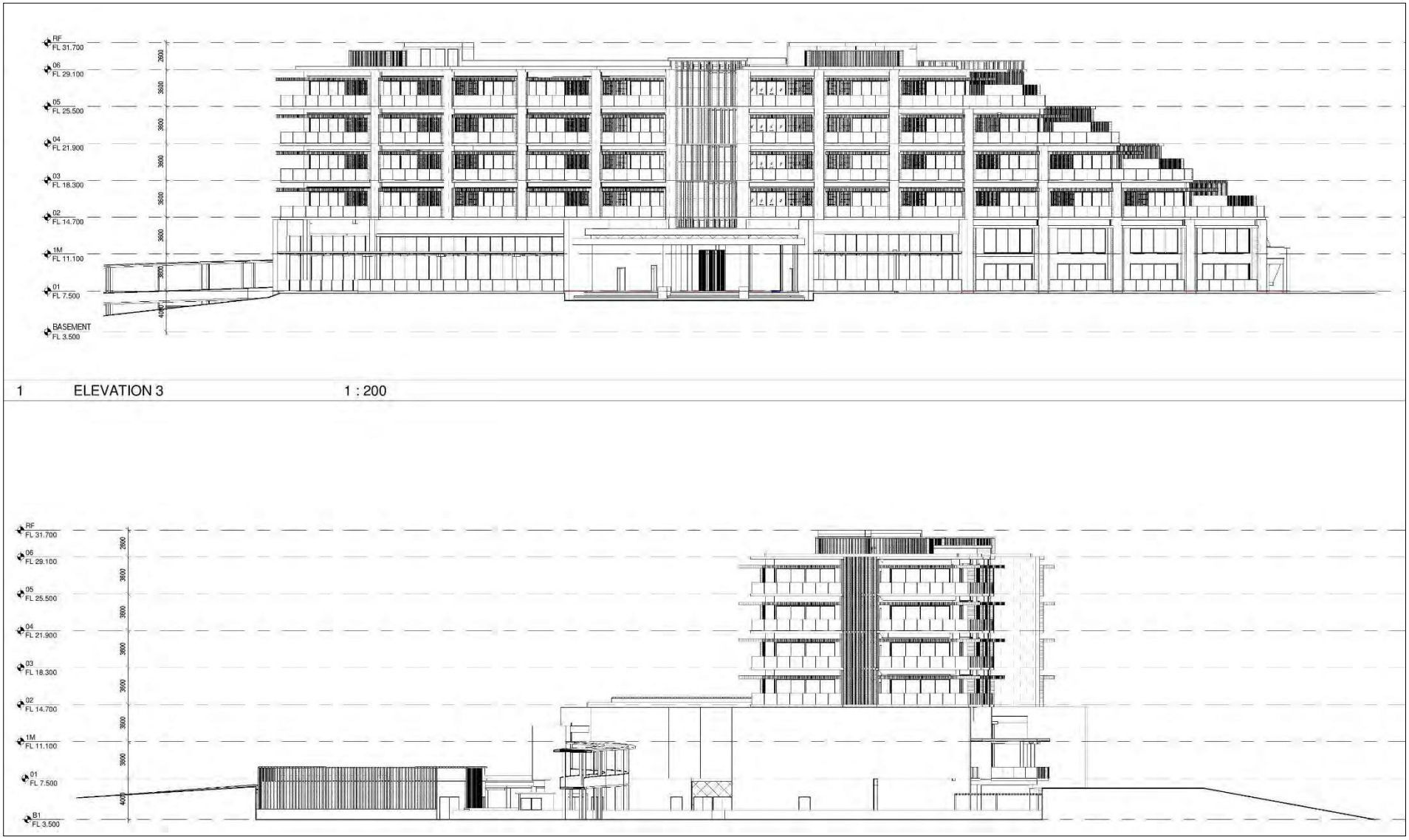


Plate 14: Front and Rear Elevation of Pun Hlaing Lodge Boutique Golf Hotel

5.21 Water Consumption

The completed project will be supplied with water by the Pun Hlaing Golf Estate (PHGE) water distribution network. PHGE sources its water from a network of private groundwater abstraction wells and the groundwater is treated at the estates water treatment plan (WTP) prior to being put into circulation for use on the estate.

The projected water consumption rates for the completed project are presented in **Table 35**.

Table 35: Projected Water Consumption Rates & Sources when Development Operational

Uses	Projected Consumption (m3/day)	Source/s (surface water, groundwater, municipal)
Guest Rooms	19.6	Groundwater#
Amenities (Restaurant etc)	10.2	Groundwater#
Staff Accommodation (Incl. canteen)	4	Groundwater#
Water Feature	3	Groundwater#
Other Misc.	5.6	Groundwater#
TOTAL	42.4	Groundwater#

#Supplied by Pun Hlaing Golf Estate

5.22 Electricity Consumption

The projected daily electricity consumption rate and power sources for the Project when fully operational are presented below in **Table 36.**

Table 36: Projected Daily Electricity Usage & Source/s when Development Operational

Projected Daily Usage (kWh)	Source/s (grid, generators,	Number of generators, rated outputs and fuel type
17.404 kWh/dav	Grid Supply from PHGE Private Power Generating Station	None for scheme supply

5.23 Strom water and Waste water Discharges

The projected stormwater and wastewater discharges from the operational Project are presented below in Table 37. The location of the stormwater discharge points is shown on Plate13.

Table 37: Operational Phase – Stormwater and Wastewater Discharges

Source	Projected Volumes (m3/day)	Describe treatment if any (STP, Sedimentation etc.)	Final Discharge Point

Storm Water	315	None	Lake Diplomat (on eastern boundary)
Sanitary Wastewater	36	STP on PHGE#	PHGE
Grey water from miscellaneous source	215	STP on PHGE	PHGE

#PHGE = Pun Hlaing Golf Estate

5.24 BULK STORAGE TANKS (LIQUID)

The completed development will have several below ground tanks as detailed in **Table 38** below. The location of the tanks is shown on **Plate 14.**

Table 38: Bulk Storage Tanks in Finished Development

Construction Type (concrete, steel, fibre glass etc.)	Above/Below Ground	Capacity (m^3)	Contents
Concrete	Below	117	Water Tank No.1
Concrete	Below	130	Water Tank No.2
Concrete	Below	87	Fire Water Tank
Concrete	Below	1.2	Grease Trap
Steel	Above	0.15	Diesel for Fire Pump

5.25 GAS STORAGE

The completed development will have gas storage tanks/cylinders associated with the restaurant and staff canteen as detailed in **Table 39** below. The location of the gas storage compound is shown on **Plate 14**.

Table 39: Gas Storage Arrangements

Container Type (Bulk or Cylinder)	Above/Below Ground	#	Capacity (m^3)	Contents
Cylinder	Above	8	1.57	LPG

The hotel is arranging safety of gas storage by always store and use gas bottles in an upright position. Then store gas bottles in a well-ventilated place and ensure gas bottles are stored away from sources of heat and ignition.

5.26 AIR EMISSIONS

There will be one intermittent static point source of air emissions on the Project site when operational. This will be from the fire pump diesel engine, but this air emission will be intermittent in nature (i.e. during routine maintenance and testing etc.) and as such this is not regarded as a significant source of air emissions. There will also be numerous fugitive sources of air emissions such as those from vehicles and various site maintenance equipment.

The location of the static source of air emissions is shown on **Plate 14.**

5.27 HAZARDOUS SUBSTANCES

The Project when operational will use relatively small volumes of hazardous substances. The types of hazardous substance, projected usage and storage details are presented below in **Table 40.** The locations of the hazardous materials storage area are shown in **Plate 14.**

Table 40: Projected Hazardous Materials Consumption Rates when Development Operational

Types of Hazardous Material	Projected usage per month	Storage arrangement (Bulk tank, IBC, drums, bottle, can etc.)	Fitted with secondary containment (Y/N?)
Diesel	As required- backup diesel engine for fire pump	Steel Tank (150l)	None
Oils for MEP Equipment	Negligible	Tins	None
Solvents for MEP Equipment	Negligible	Tins	None

5.28 Non-Hazardous Solid Wastes

The operational project will generate several non-hazardous solid waste streams as detailed below in **Table 41.** The location of the onsite non-hazardous waste storage area is shown in **Plate 14.**

Table 41: Operational Phase – Non-hazardous Solid Waste Streams and Disposal Methods

Waste Type	Disposal Method (Offsite, Landfill Onsite, Recycled etc.)	Name of Waste Haulier, Disposal Site and or Recycling Company
Kitchen Waste	Offsite	YCDC
Paper/Cardboard	Offsite	YCDC
Plastic/Cans/Glass	Offsite	YCDC
Gardening Wastes	Offsite	YCDC

5.29 HAZARDOUS SOLID AND LIQUID WASTES

The Project when operational will generate small volumes of hazardous wastes as detailed in **Table 42**.

The location of the hazardous waste temporary storage area is shown in **Plate 11.**

Table 42: Projected Hazardous Waste Streams & Disposal Methods

Waste Type	Disposal Method (Offsite, Landfill Onsite, Recycled etc.)	Name of Waste Haulier, Disposal Site and or Recycling Company
Waste oils from MEP Plant Room	Offsite	YCDC
Used chemical/oil containers	Offsite	YCDC
Used batteries	Offsite	YCDC
Fluorescent light tubes	Offsite	YCDC

5.30 Vehicle Movements

The projected vehicle movements associated with the operational phase of the Project are presented **Table 43.**

Table 43: Projected Operational Phase Vehicle Movements

Activity	Projected Average Number Daily Vehicle Movements
Materials/Goods inbound	15
Staff Vehicles	15
Visitors	100
Materials/Wastes Outbound	4

5.31 OPERATIONAL HOURS OF PUN HLAING LODGE

The operational hours of the Project when completed are presented in **Table 44.**

Table 44: Operational Hours of the Pun Hlaing Lodge

Day	Operational Hours	Any Planning Restrictions on Operational Hours (Y/N)
Monday	24 hours	N
Tuesday	24 hours	N
Wednesday	24 hours	N
Thursday	24 hours	N
Friday	24 hours	N
Saturday	24 hours	N
Sunday	24 hours	N

5.32 DEVELOPMENT LAYOUT AND KEY ENVIRONMENTAL ASPECTS

Plates 15 and **16** overleaf show the layout of the completed Project and the location of the key features of the development scheme which have the potential to interact with environmental receptors.

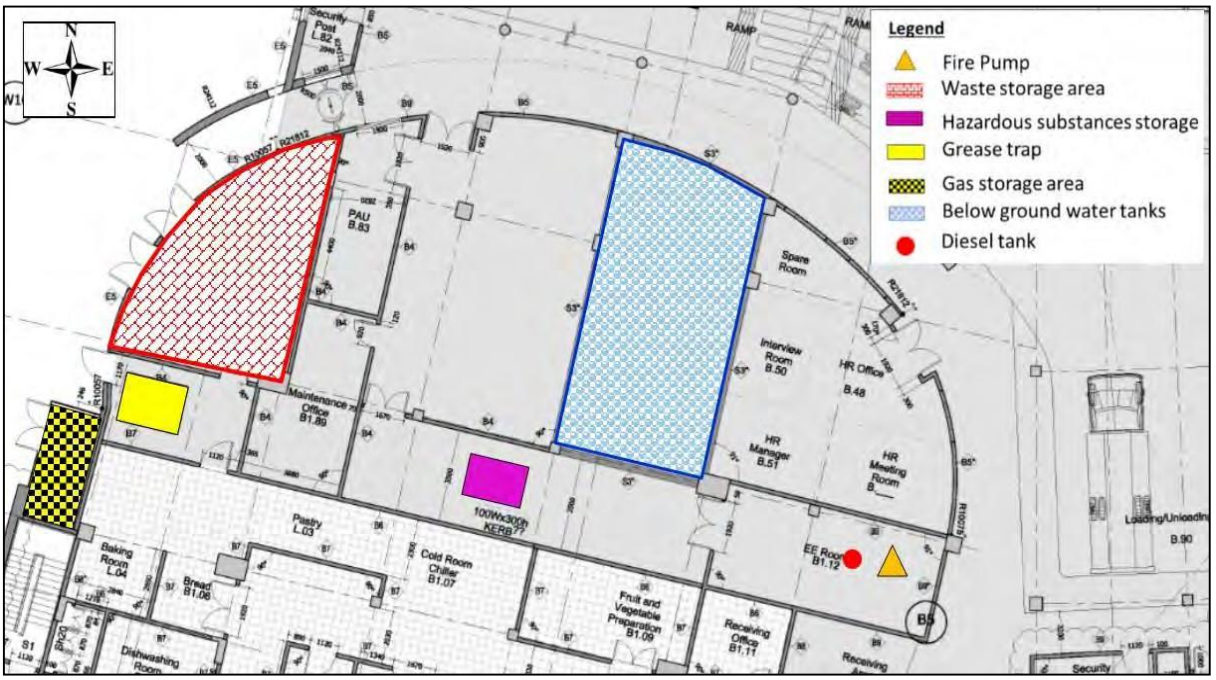


Plate 15: Internal Development Layout (Basement Level) showing Key Environmental Aspects

Plate 16: External Development Layout showing Key Environmental Aspect

6.0 THE NATURAL ENVIRONMENT

6.1 TOPOGRAPHY

Myanmar is divided into four topographic regions. The first one is a mountainous area in the north and west, ranging from about 1,830 to 6,100 m in altitude, and including the Arakan coastal strip between the Arakan Yoma mountain range and the Bay of Bengal. The second one is the Shan Highlands in the east, a deeply dissected plateau averaging 910 m in height and extending southward into the Tenasserim Yoma, a narrow strip of land that projects some 800 km along the Malay Peninsula in the southeast. The third one is central Myanmar, a principal area of cultivation, bounded by the Salween River in the east and the Irrawaddy River and its tributary (the Chindwin) in the west. The forth one is the fertile delta and lower valley regions of the Irrawaddy and Sittang rivers in the south, covering an area of about 25,900 sq. km and forming one of the world's great rice granaries.

The topography of the Project Site and its environs is generally flat but the eastern sectors of the Project Site are approximately 3-4m lower than the western sectors of the site. Google Earth Imagery captured early 2015 indicates that the study site sits at an elevation ranging from approximately 6-8m AMSL.

The Project Manager for the construction phase of the Project reported that site levels have been raised by approximately 7m in the SW sector of the property using a mixture of imported sand and soil.

6.2 CLIMATE

6.2.1 Temperature and Rainfall

The Project Site is in Yangon Division which has a tropical monsoon climate. Yangon Division is located near the Gulf of Mataban and consequently there are only slight changes of temperatures throughout the year. Temperatures are warm to hot throughout the year with April and May being the hottest with the average temperature in April being 37.5° C.

The Cold Dry Season generally occurs from November to February with the north winds. The coldest months are December and January which have an average temperature of about 16.7°C.

The Rainy Season generally runs from May to October with the southwest wind direction and rainfall is generally heaviest in July and August. The reported annual total precipitation in the study site area is 2,787mm (Meteorology and Hydrology Department, Kabaaye Station, Yangon, 1981-2010). The Annual Rainfall Map of Myanmar (FAO 2009) indicates that the Project Site is situated in the 1,250-2,500 mm/year precipitation zone. Rainfall and temperatures graphs are presented in **Plates 17** and **18** overleaf.

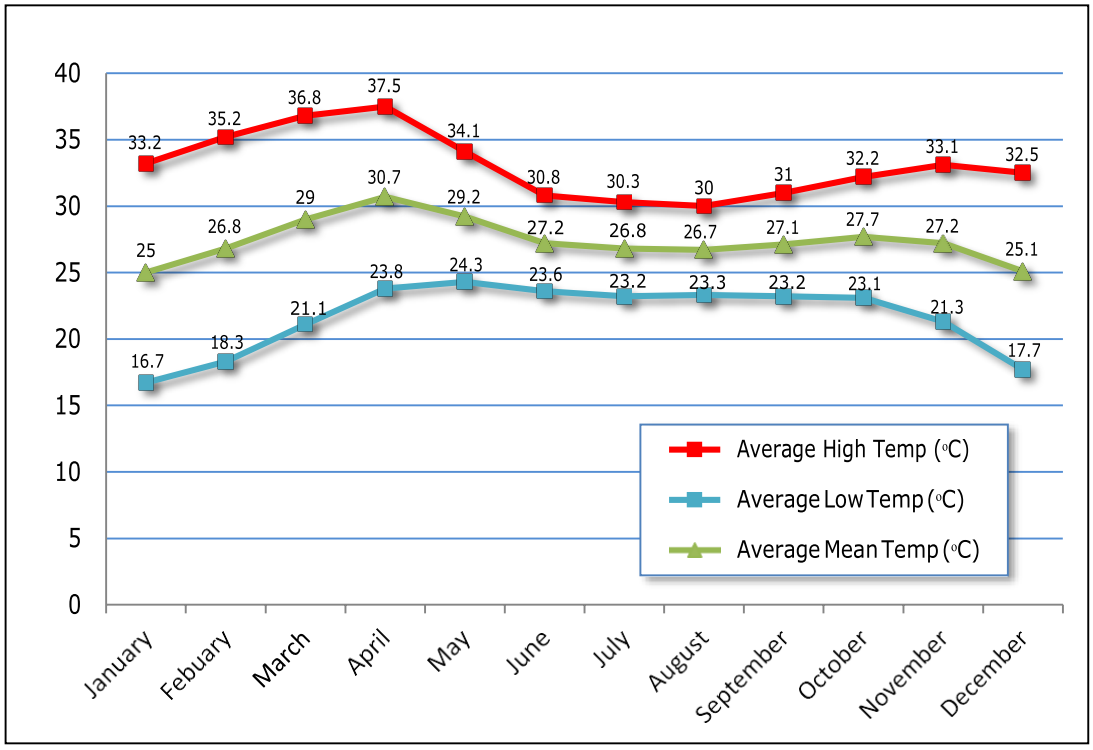


Plate 17: Average Temperature in Yangon

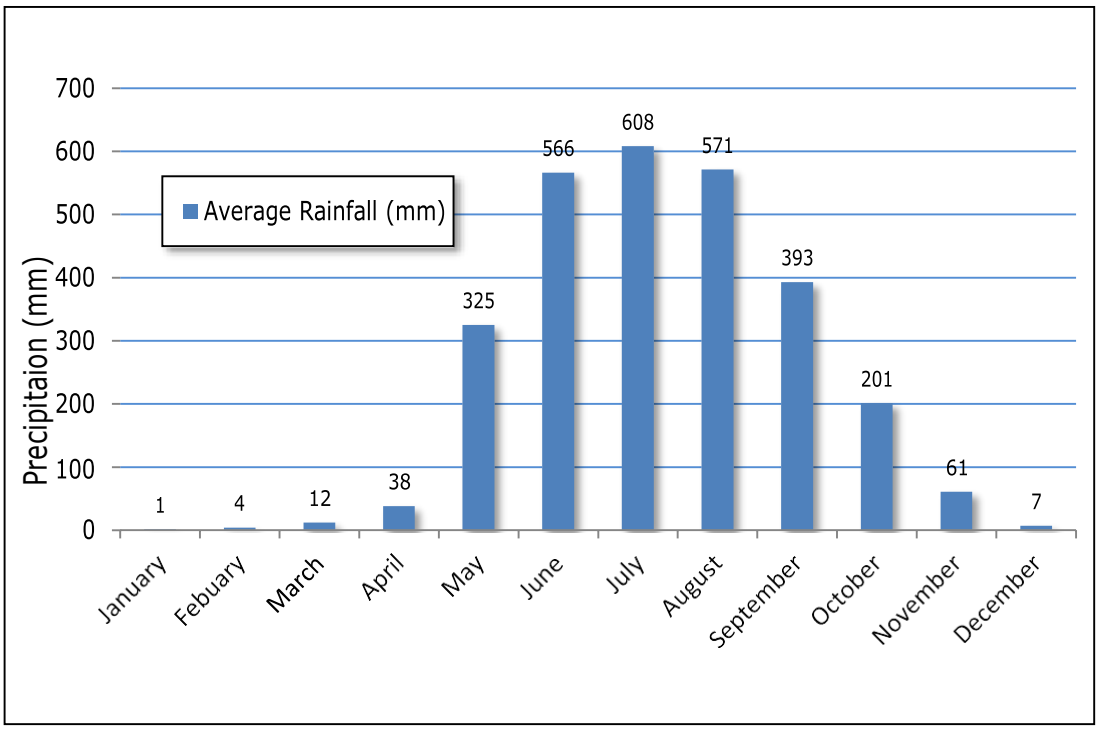


Plate 18: Average Rainfall in Yangon

6.2.2 Wind Speed and Wind Direction

Wind speed and direction data obtained from Yangon International Airport is presented in **Table 45.**
The arrows point in the direction that the wind is blowing.

Table 45: Wind Speed and Direction statistics based on observations taken between January 2012 and September 2014

Month	Average Wind speed (knots)	Direction	Dominant Wind dir.
January	4	NE	
February	4	W	
March	5	WSW	
April	5	WSW	
May	5	WSW	
June	5	SW	
July	5	SW	
August	5	SW	
September	4	SW	
October	5	NE	
November	4	NNE, NE	
December	4	NE	
Year	4	SW	

6.2.3 Cyclones

The Multi Hazard Risk Assessment in Nargis-affected Areas (Ayeyarwady, Bago, Yangon) published by the United Nations Development Program (UNDP) in January 2011 reported that there are two prominent cyclone seasons in the country between April to May and October to December.

The most devastating cyclone in Myanmar recently was Cyclone Nargis which made landfall in May 2008 devastating the Ayeyarwady Delta region. Approximately 84,500 people were killed, 53,800 people went missing and a total of 37 townships were significantly affected by the cyclone. The UN estimates that as many as 2.4 million people were affected in total.

However, the frequency of high intensity cyclones making landfall in Ayeyarwady Delta region are rare. Over the last sixty years eleven tropical cyclones have hit Myanmar but only two made landfall in the Delta region.

Plate 19 overleaf shows the pathway and intensity of cyclone Nargis in May 2008. The Project Site is situated in the corridor of the typhoon but by the time the cyclone arrived in Yangon the wind speed intensity decreased from 114-135 knots/hr to 83-95 knots/hr.

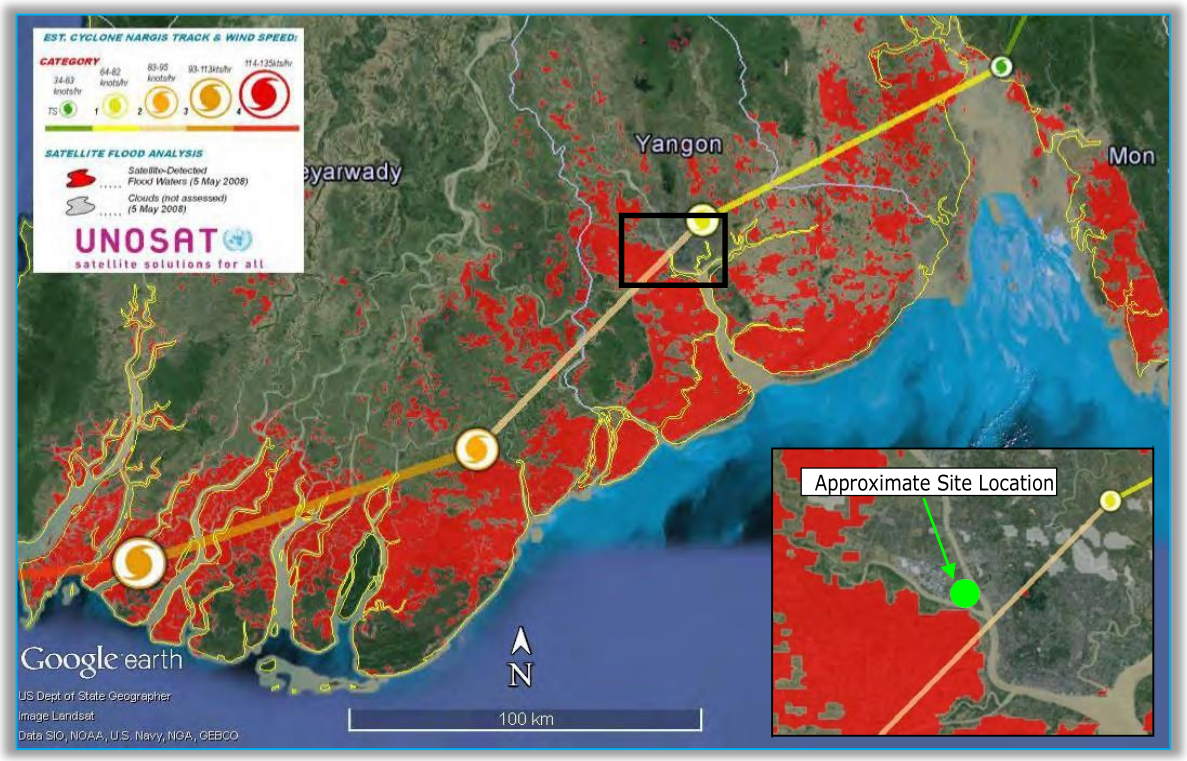


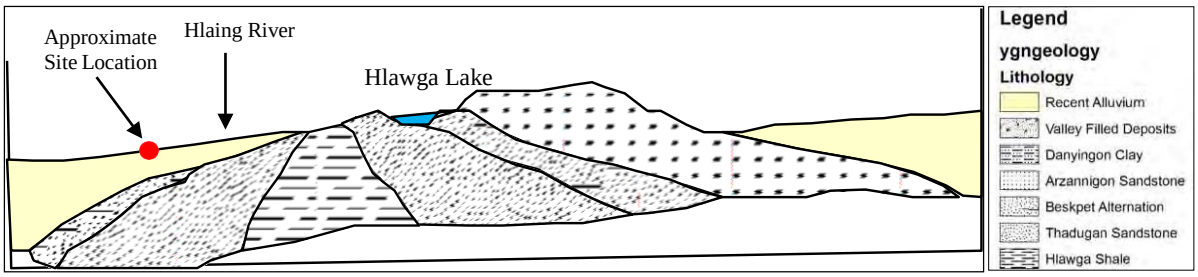
Plate 19: Pathway and Intensity of Cyclone Nargis in May 2008

6.3 GEOLOGY

The regional geological setting comprises of ridges and deltaic lands which lie south of the Pegu Yoma Range between the Sittaung River to the east and the Irrawaddy River to the west. The Project Site area is located in area characterised by a north-south trending geosynclinal basin which contains a thick layer of Tertiary-Quaternary sedimentary deposits.

The Tertiary deposits are strongly folded into narrow echelon anticlinal folds such as the Yangon ridge, Thanlyin-Kyauktan ridge and Twentay-Kawhmu ridge. All these ridges trend south towards the Gulf of Martaban. The underlying rocks of the Tertiary Period contain well consolidated marine sandstone, shale of the Pegu Group and semi-consolidated, continental deltaic and marginal marine deposits of the Irrawaddy Group. A geological cross section of the Project Site area is presented below in **Plate 20.**

Plate 20: Geological Cross Section of the Project Site Area



The reported geological profile underlying the Yangon Division area is presented in **Table 46**.

Table 46: Reported Geological Profile in the Yangon Division Area

Formation	Litho-stratigraphic Units	Approximate Thickness (m)	Geological Age	Physical Characteristics
	Young alluvium	0-1.5	Quaternary	Clay and silts with trace sand
IRRAWADDY GROUP	Valley-filled deposits	20-100	Pleistocene	Clay, silt, sand and very coarse gravels
	Danyingon clays	Unrecorded	Pliocene	Reddish brown, grey to blue, laminated clays, with interbedded sand-rocks
PEGU GROUP	Arzanigon sand-rocks	Unrecorded	Pliocene	Yellowish grey to bluish grey sand rocks, fine to coarse-grained, sometimes very coarse-grained, sometimes very coarse to gritty with intercalated clays and mudstone/siltstones.
	Besapet alternations	2,500	Miocene	Alternation of shale and argillaceous sandstones.
	Thadugan sandstone	2,000(?)	Miocene	Well consolidated, jointed argillaceous sandstones
	Hlawga shales	Unrecorded	Oligocene	Generally indurated shales

The Geological Map indicates that the subject property overlies Quaternary Alluvial deposits underlain in turn by Pegu Group units of Besapet Alterations, Thadugan Sandstone and Hlawga Shales. This formation was deposited in relatively recent times and blankets the delta area. The Younger Alluvium deposits consists essentially of yellowish grey, brownish grey silts and clays with some organic matter such as decomposed wood and traces of sand are found scattered throughout the deposits.

The Besapet Alteration consists of shale on thinly laminated sandstones, which are exposed in the vicinity of Besapet Lake. These are characterised by bluish grey to greenish grey, thin bedded, silty shale with very thin porting of micaceous sandstones, and yellowish brown, fine to medium-grained, soft micaceous and carbonaceous sandstones with calcareous concretion in places. A few

fossiliferous beds are noted in this formation.

The Thadugan Sandstones are exposed the north-west and south of Hlawga Lake. This formation consists of bluish-brownish grey, fine to medium-grained micaceous and argillaceous sandstone with ferruginous bands along the bedding plane.

The Hlawga Shales occupy the low area west of Hlawga Lake and though exposures are rare some outcrops are found along the west bank of Hlawga Lake. The shales and laminated clays of this formation are considered to be the core of the Hlawga anticline or Yangon anticline.

The Geological Map extract showing the regional geology of the subject property area is presented in **Figure 4** in **Appendix A.**

6.4 SOIL TYPES

The Soil Type Map of Yangon prepared by Land use division, Myanmar Agriculture Service, 2002 indicates that the Project Site is situated in an area characterised by Meadow & Meadow Alluvial Soil Deposits, which occur near the river plains with occasional tidal floods, predominantly comprising silty clay loam and they can be utilized for groundnut, sesame, sunflower, jute, sugarcane and vegetables in addition to rice cultivation.

The Soil Map extract for the Project Site area is presented in **Figure 5** in **Appendix A.**

6.5 LANDSLIP HAZARDS

The Project Site area located in the western limb of Yangon anticline which is characterised by a flat topography with no steep slopes and it is currently assessed that landslip risks are relatively **LOW**.

However, localised landslip features can be found along major watercourses such as the Hlaing River and its tributaries. These landslip hazards are related to the seasonal rise and fall of river water levels. In rainy season, the water level of Hlaing River is high, and a large amount of water may enter the banks, producing bank storage phenomena. When the water level suddenly drops in the hot season, the stored water in the bank is left unsupported. This process can produce an abnormal pore-water pressure which reduces the resisting forces whilst simultaneously the weight of the stored water increases the driving forces and these phenomena causes undercutting of river banks. River bank failure tends to occur along the river after the flooded water has receded.

The Landslip Hazard Map extract for the Project Site area is provided in **Figure 6** in **Appendix A.**

6.6 SEISMICITY

Based on the history of considerably high magnitude earthquakes, Yangon Region can be regarded as a medium risk seismic event region. Tectonically the region is surrounded by the subduction zone between the Indian Plate and Burma Plate to the west and the right lateral Sagaing fault to the east. The most significant earthquake in this region was the Bago earthquake of 5th May 1930 with a magnitude of 7.3 on the Richter Scale. This earthquake caused 500 casualties and great destruction in Bago and considerable damage and 50 deaths were recorded in Yangon. It originated from the Sagaing fault.

The Seismic Hazard Zone Map of Myanmar (2005) published by Myanmar Earthquake Committee

indicates that Yangon Region is located in a Moderate Risk Seismic Zone corresponding to Degree VII on the Modified Mercalli Scale. This indicates that seismic events have the potential to result in considerable damage to poorly built or badly designed structures.

An extract from the Seismic Hazard Zone Map of Myanmar is presented in **Figure 7** in **Appendix A.**

6.7 HYDROGEOLOGY

The groundwater map of the study site area (Win Naing, 2009) indicates that potential aquifers are present in the shallow Alluvium Aquifer and the deeper interbedded sand, gravel and shale of the Arzanigon Sand-Rocks of the Irrawaddy Formation. Fresh groundwater can be found with seasonal groundwater table changes. The average groundwater yield in the Project Site area is reportedly approximately 1,000 GPH (Wint Wint Htun, 2015).

The groundwater specific yield map and test well locations extract for the Project Site area is presented in **Plate 21** below and the Groundwater Map extract for the Project Site area is presented in **Figure 8** in **Appendix A**.

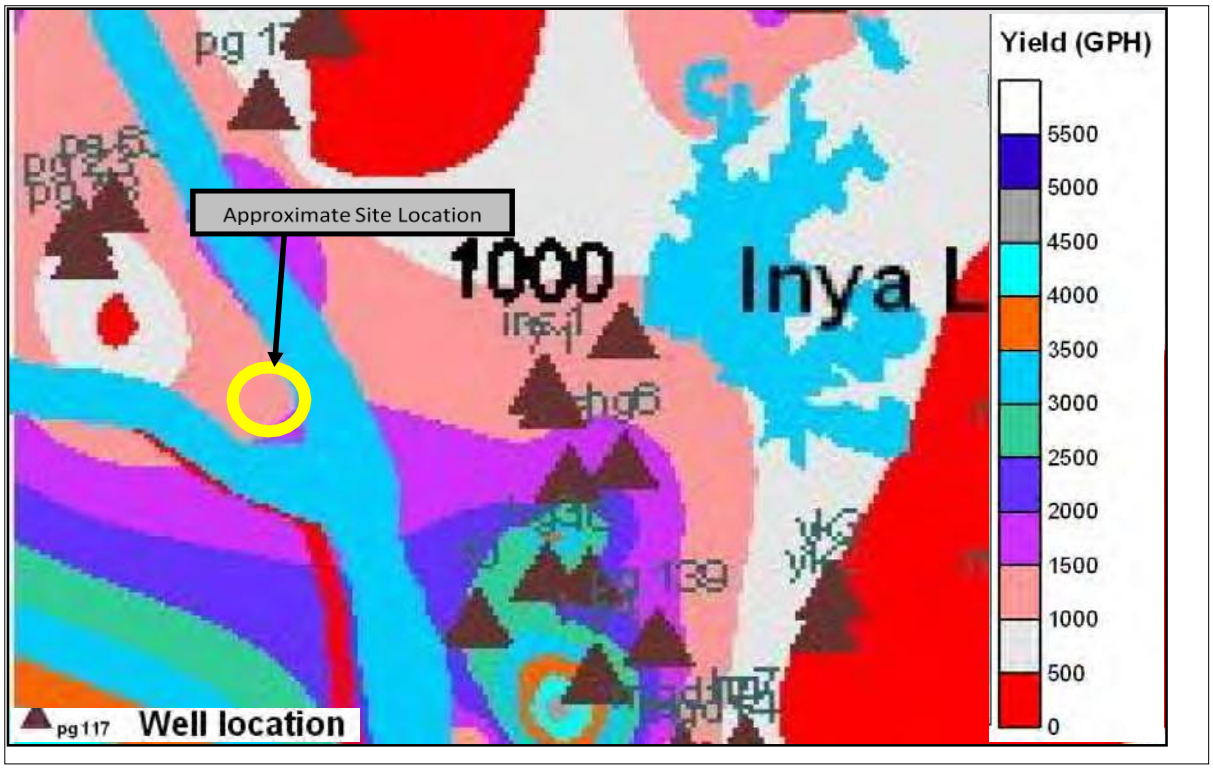


Plate 21: Groundwater Yield Map and Test Well Locations

6.8 HYDROLOGY AND FLOOD RISK

The nearest major surface water course is the Hlaing River which is located approximately 600m east of the Project Site. The nearest surface water bodies are the ponds present in the golf course adjacent east and southwest of the Project Site.

The Project Site is situated in a lowland floodplain setting. The Hazard Profile of Myanmar report (2009) indicates that the Project site is situated within, or on the edge of, a flood prone area, see **Figure 9** in **Appendix A.**

According to the 'Estimated Total Flood Water Area Map' produced after Cyclone Nargis as part of a flood analysis using MODIS satellite imagery on 5th May 2008 and published by UNOSAT, the Project Site was not flooded as a consequence of Cyclone Nargis, see **Figure 10** in **Appendix A.**

The Pun Hlaing Golf Estate has a flood defense system and has not experienced any flooding events since its inception.

6.9 WATER SCARCITY/WATER SECURITY

The potential drought hazard level of Myanmar is described as "High" for the regions located in the dry zone which is in the central area of Myanmar (see **Plate 22**), "Medium" in Bago Region and the eastern mountain ranges, and "Low" in the remaining regions except Yangon and Tanintharyi Divisions. The area of the Dry Zone is 67,700 square kilometres and it constitutes 10 percent of the total area of Myanmar.

Plate 22: Dry Zone Map of Myanmar

The report of "Drought Conditions and Management in Myanmar" prepared by Tin Yi (Deputy Director of Department of Meteorology and Hydrology) states that Yangon Division suffered a severe drought in 2010. Many groundwater wells dried up due to the depletion of underground water supply due to the late onset of the monsoon season which caused drinking water scarcity problems in Myanmar.

The Project will rely on groundwater for supply although the water will be supplied by wells located on the Pun Hlaing Golf Estate in which the Project Site is located. No groundwater abstraction wells will be drilled onsite. Over abstraction of groundwater has the potential to result in the depletion of this natural resource to the detriment of other local users of this resource.

6.10 PROTECTED AND ECOLOGICALLY SENSITIVE AREAS

The terrestrial habitat on the Project Site has been highly modified from its natural state as a result of anthropogenic activities such as historic cultivation and the current construction works. It is currently considered that this terrestrial habitat at the Project Site area would be classified as 'Modified Habitat' under IFC Performance Standard 6 as human activity has substantially modified the areas primary ecological functions and species composition.

According to the Myanmar Protected Areas Report produced by the Istituto Oikos and the Biodiversity and Nature Conservation Association (BANCA 2011) the nearest nationally protected area is Hlawga National Park located approximately 19km north of the site. This park was gazetted in 1989 with the objectives of providing environmental education facilities and protecting forest and plant cover in the catchment of Hlawga Lake. The natural habitat consists of semi-evergreen forests, mixed deciduous forests and swamp forests and many ecological resources can be found in the park. Common animal species include Barking deer, hog deer and wild boar and common tree species include Dipterocarps. Resident and migratory birds are abundant inside the park with 191 species identified. The location of the Project Site relative to Hlawga National Park is presented in **Plate 23** below.

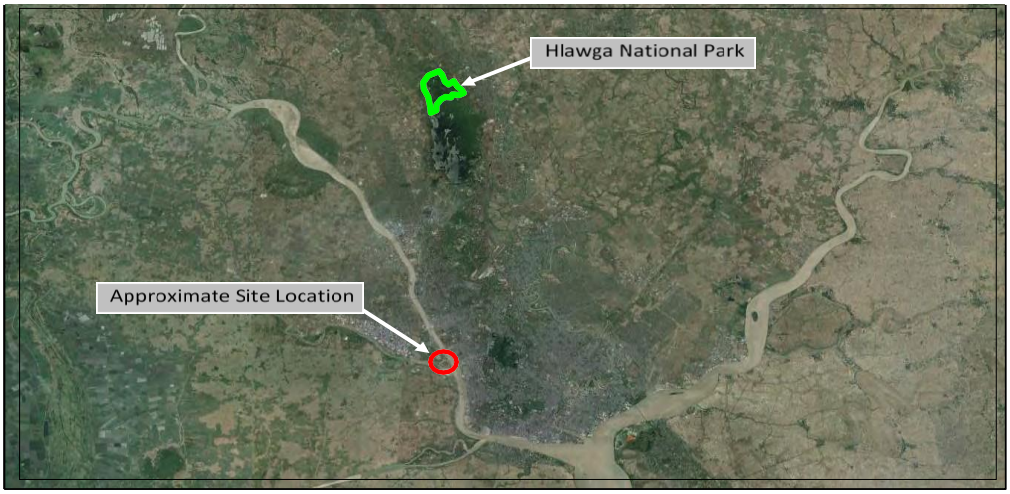


Plate 23: Project Site location relative to Hlawga National Park

7.0 THE SOCIO-ECONOMIC ENVIRONMENT

7.1 ADMINISTRATIVE STRUCTURE

The governmental structure in Myanmar is separated to 3 sections; Government, Regional Administration and Local Administration as shown in **Plate 24.**

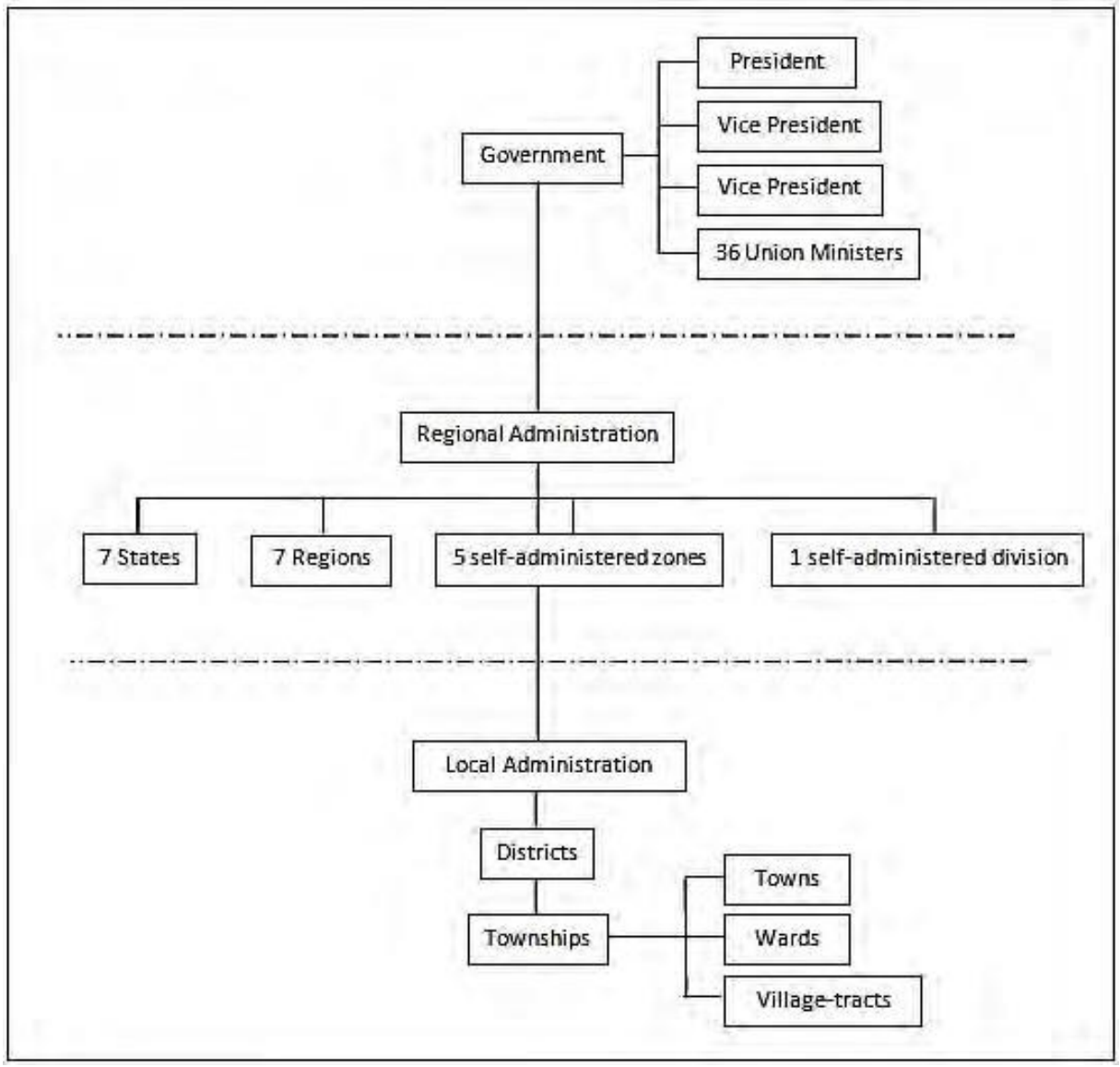


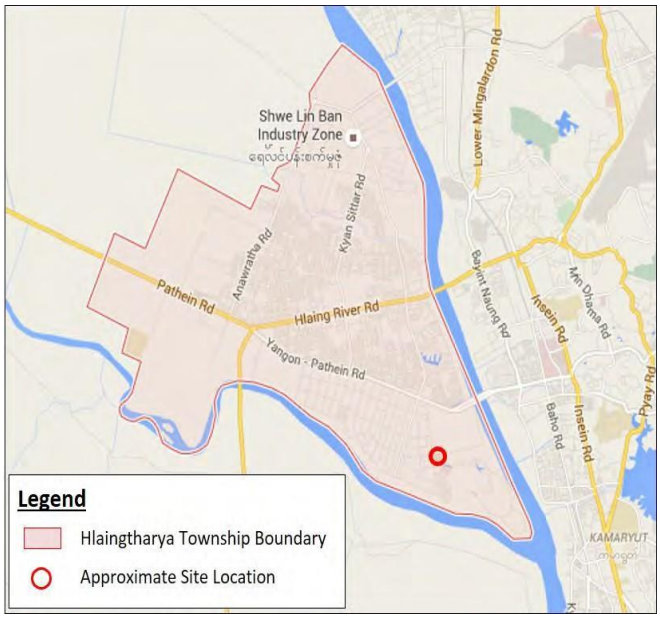
Plate 24: The Governmental Structure in Myanmar

Myanmar administrative divisions are divided into 21 sub-divisions which include 7 states, 7 regions,
1 union territory, 5 self-administered zones and 1 self-administered division. The region is characterized by high ethnic dominant while the state is characterized by ethnic minority-dominant. Yangon Region has the largest population the highest density population, see **Table 47**. Regions and states are divided into districts. Each district consists of townships which include towns and village-tracts (a group of adjacent villages).

Table 47: List of Regions and States in Myanmar.

Name	Type	Capital	Area (km²)	Population
Ayeyarwady	Region	Pathein	35,138	6,175,123
Bago	Region	Bago	39,404	4,863,455
Chin	State	Hakha	36,019	478,690
Kachin	State	Myitkyina	89,041	1,689,654
Kayah	State	Loikaw	11,670	286,738
Kayin	State	Pa-an	30,383	1,572,657
Magway	Region	Magwe	44,819	3,912,711
Mandalay	Region	Mandalay	37,021.29	6,145,588
Mon	State	Mawlamyaing	12,155	2,050,282
Rakhine	State	Sittwe	36,780	3,188,963
Shan	State	Taunggyi	155,801	5,815,384
Sagaing	Region	Sagaing	93,527	5,320,299
Tanintharyi	Region	Dawei	43,328	1,406,434
Yangon	Region	Yangon	10,170	7,355,075

Source: Population and Housing Census 2014 Provisional Results, Department of Population, Ministry of Immigration and Population (30th August).



The Project Site is located in Hlaingtharya Township which is located in the western part of Yangon, Myanmar.

The township comprises of 20 wards and 9 village tracts, and shares borders with Htantabin Township in the north and west, Insein Township, Mayangon Township and Hlaing Township in the east across the Yangon River, and Twante Township in the south.

The area of Hlaingtharya Township is 67.4 square kilometres.

The location of the Project Site relative to the administrative boundary of Hlaingtharya Township is shown in **Plate 25.**

Plate 25: Project Site location in Hlaingtharya Township

7.2 SOCIAL PROFILE

7.2.1 Population and Gender

Based on population data from General Administrative Department the population of Hlaingtharya Township as recorded in July 2015 stands at 687,867 people of which 322,862 are male and 365,005 are females; see **Table 48.**

Table 48: Total Population of Hlaingtharya Township in July 2015

Township	Urban Population		Rural Population		Population		Total
	Male	Female	Male	Female	Male	Female	
Hlaingtharya	223,568	258,560	99,294	106,445	322,862	365,005	687,867

Source: General Administrative Department, Hlaingtharya Township

The area of Hlaingtharya Township is 67.4 square kilometer and the population density of Hlaingtharya Township is 10,205 person/ square kilometer.

The population of Hlaingtharya Township classified by age and dependency ratios as reported for 2015 is shown in **Table 49.**

Table 49: Reported Population of Hlaingtharya Township classified by Age and dependency ratios in 2015

Selected age groups and dependency ratios							
0-14	15-64	65+	Total dependency ratio	Child dependency ratio	Elderly dependency ratio	10-17	18+
164,834	501,030	22,003	37.3	32.9	4.4	95,076	484,300

The population of Hlaing Tharyar Township classified by gender, age and administrative district as reported for 2015 is shown in **Table 50 to Table 52** overleaf.

Table 50: Reported Population of Hlaingtharya Township classified by Age and dependency ratios in 2015

Ward/ village tract	House	Household	Under 18 years			Above 18 years			Total Population		
			Male	Female	Total	Male	Female	Total	Male	Female	Total
Wards (20)	46,978	62,178	42,735	47,373	90,108	102,945	117,497	220,442	145,680	164,870	310,550
Village Tracts (9)	10,792	18,523	14,348	14,434	28,782	32,819	30,698	63,517	47,167	45,132	92,299
Total	**57,770**	**80,701**	**57,083**	**61,807**	**118,890**	**136,052**	**148,560**	**284,612**	**193,135**	**210,367**	**403,502**

Source: General Administrative Department, Hlaing Tharyar Township

Table 51: Reported Population of Hlaing Tharyar Township classified by Ward in January 2016

No.	Ward/ village tract	House	Household	Under 18 years			Above 18 years			Total Population		
				Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Ward (1)	4,035	4,480	3,157	3,115	6,272	9,384	10,384	19,768	12,541	13,499	26,040
2	Ward (2)	1,450	1,870	1,429	1,446	2,875	3,413	3,931	7,344	4,842	5,377	10,219
3	Ward (3)	2,558	2,927	2,823	3,061	5,884	5,277	5,834	11,111	8,100	8,895	16,995
4	Ward (4)	1,088	1,088	253	295	548	1,553	2,024	3,577	1,806	2,319	4,125
5	Ward (5)	1,373	4,456	1,668	1,728	3,396	5,378	5,704	11,082	7,046	7,432	14,478
6	Ward (6)	2,000	2,650	2,668	2,967	5,635	4,671	5,632	10,303	7,339	8,599	15,938
7	Ward (7)	5,212	7,040	4,376	4,789	9,165	9,424	11,461	20,885	13,800	16,250	30,050
8	Ward (8)	1,025	1,395	915	977	1,892	2,248	2,554	4,802	3,163	3,531	6,694
9	Ward (9)	3,032	3,375	2,316	2,251	4,567	5,501	6,367	11,868	7,817	8,618	16,435
10	Ward (10)	2,495	2,840	2,150	2,080	4,230	5,315	5,834	11,149	7,465	7,914	15,379
11	Ward (11)	3,456	3,880	2,780	3,073	5,853	6,441	7,302	13,743	9,221	10,375	19,596

12	Ward (12)	1,868	2,235	1,798	1,894	3,692	4,528	5,183	9,711	6,326	7,077	13,403
13	Ward (13)	1,612	1,893	1,167	1,393	2,560	3,259	3,807	7,066	4,426	5,200	9,626
14	Ward (14)	1,396	2,356	1,638	1,614	3,252	4,979	5,840	10,819	6,617	7,454	14,071
15	Ward (15)	2,400	3,150	2,745	2,826	5,571	4,387	5,812	10,208	7,132	8,647	15,779
16	Ward (16)	3,160	3,830	2,068	2,191	4,259	6,110	6,914	13,024	1,878	9,105	17,283
17	Ward (17)	215	235	165	138	303	840	547	1,387	1,005	685	1,690
18	Ward (18)	2,025	4,101	2,834	2,874	5,708	5,661	6,554	12,215	8,495	9,428	17,923
19	Ward (19)	2,605	3,547	3,498	3,545	7,043	7,553	7,847	15,400	11,051	11,392	22,443
20	Ward (20)	3,973	4,830	2,287	5,116	7,403	7,289	8,253	15,542	9,576	13,369	22,945
	Total	**46,978**	**62,178**	**42,735**	**47,373**	**90,108**	**103,211**	**117,784**	**220,995**	**139,696**	**165,164**	**310,550**

Source: General Administrative Department, Hlaing Tharyar Township

Table 52: Reported Population of Hlaing Tharyar Township classified by Village Tract in January, 2016

No.	Village Tract	Village	House	Household	Under 18 years			Above 18 years			Total Population		
					Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Oak Kan Taung Kyarr	Oak Kan Taung Kyarr , Oak Kan	2,899	3,786	1,824	1,835	3,659	5,354	5,044	10,398	7,178	6,879	14,057
2	Nyaung	Nyaung, Dai Su	1,065	2,642	3,025	2,901	5,926	8,263	6,257	14,520	11,288	9,158	20,446
3	Kalar Gyi Su	KalarSu Gyi, Kan Hla	815	1,498	1,665	1,767	3,432	3,547	3,404	6,951	5,212	5,171	10,383
4	Shw Lin Ban	Shwe Lin Ban, Kyone Su	1,123	2,636	2,296	2,313	4,609	3,719	3,721	7,440	6,015	6,034	12,049
5	Shan Chaung	Shan Chaung	1,014	1,898	1,914	1,913	3,827	3,636	3,803	7,439	5,550	5,716	11,266

6	Ah Twin Pa Dan	Ah Twin Pa Dan, Kyun Ka Lay	868	1,306	864	819	1,683	2,458	2,589	5,047	3,322	3,408	6,730
7	Ah Pyin Pa Dan	Ah Pyin Pa Dan, Kyun Gyi, Ka Pyo	657	1,293	895	905	1,800	1,584	1,729	3,313	2,479	2,634	5,113
8	Ah Lae	Ah Lae, Kan Nar	1,327	1,769	1,100	1,174	2,274	2,223	2,012	4,235	3,323	3,186	6,509
9	Ka Sin	Ka Sin, Nyan Chaung	1,024	1,668	765	807	1,572	2,035	2,142	4,177	2,088	2,949	5,749
Total			**10,792**	**18,496**	**14,348**	**14,434**	**28,782**	**32,819**	**30,701**	**63,520**	**46,455**	**45,135**	**92,302**

Source: General Administrative Department, Hlaing Tharyar Township

The Project Site is located in Nyaung Ywa Village, Nyaung Ywa Village Tract, Hlaingtharya Township. According to the survey of households living in Nyaung Ywa village, there are 1,467 households and 533 houses in the village. The total population is reportedly 15,363 persons and there is one monastery in the area, see **Table 53.**

Table 53: Reported Population of Nyaung Ywa Village of Hlaing Tharyar Township in January, 2016

Particular	House	Household	Above 18 years			Above 18 years			Total		
			Male	Female	Total	Male	Female	Total	Male	Female	Total
Population (June, 2015)	533	1,467	2,162	1,926	4,088	6,681	4,594	11,275	8,843	**6,520**	**15,363**

Source: General Administrative Department, Hlaing Tharyar Township

7.2.2 Education

Education plays a vital role in Hlaingtharya Township. Most of the people in the township are able to read and write. According to recent government data from the period of 2009 – 2012, the number of schools, teachers and students in Primary, Middle and High school in Hlaingtharya Township is shown in **Table54.**

Table 54: Number of Schools, Teachers and Students in Primary, Middle and High School of Hlaingtharya Township in 2009 – 2012

Year	Schools			Teachers			Students		
	Primary	Middle	High	Primary	Middle	High	Primary	Middle	High
2009	47	8	3	962	444	170	37,675	19,022	6,527
2010	47	8	3	973	451	163	38,007	20,093	6,842
2011	47	8	3	1,066	467	159	39,346	20,841	6,970
2012	46	8	3	768	764	202	42,310	22,043	7,395

Source: Department of Educational Planning and Training, Education Statistical Year Book, 2009-2012.

The population 25 years and over by highest level of education completed and sex (both households and institutions) is shown in **Table 55.**

Table 55: The population 25 years and over by highest level of education completed and sex (both households and institutions)

Sex	Total	None	Primary school	Middle school	High school	Diploma	University	Post-graduate and above	Vocational training	Other
Male	165,823	6,128	51,331	56,507	33,254	581	15,885	344	275	1,518
Female	189,467	13,596	77,101	51,412	26,352	243	18,651	587	73	1,452
Total	355,290	19,724	128,432	107,919	59,606	824	34,536	931	348	2,970

Source: Baseline Census Data, 16 July 2015

There is one university (Yangon Technological University (HTY)), 8 basic education high schools, 18 basic education middle schools, 32 basic education primary schools, 25 pre-kindergartens and 13 monastic schools in Hlaing Tharyar Township (see **Tables 56, 57, 58 and 59** overleaf).

According to the survey of households living in Nyaung Ywa Village where the Project Site is located, there is one post High school.

Table 56: Universities in Hlaing Tharyar Township

No.	Name	Location	Area (acre)	No. of teachers	No. of students	Ratio of teacher and students
1	Yangon Technological University	Ah Pyin Pa Dan Village	201.34	**402**	**9,211**	1:25

Source: General Administrative Department, Hlaing Tharyar Township

Table 57: High Schools in Hlaing Tharyar Township

No.	Name	Location	Area (acre)	No. of teachers	No. of students	Ratio of teacher and students
1	No.1	2 Ward	10.2	96	3,662	1:40
2	No.2	12 Ward	8.14	131	4,052	1:30
3	No.3	17 Ward	15.6	96	3,322	1:34
4	No.4	5 Ward	3.855	87	4,508	1:51
5	No.5	7 Ward	4.857	54	2,447	1:40
6	No. 6	Yay Okkan	3.865	53	2,578	1:45
7	No.7	16 Ward	3.4	47	1,762	1:40
8	No.8	20 Ward	2.755	101	6,056	1:59
Total				**665**	**28,387**	

Source: General Administrative Department, Hlaing Tharyar Township

Table 58: Middle Schools in Hlaing Tharyar Township

No.	Name	No. of teachers	No. of students	Ratio of teacher and students
1	18	**877**	**34,366**	1:39

Source: General Administrative Department, Hlaing Tharyar Township

Table 59: Primary Schools in Hlaing Tharyar Township.

No.	Number of school	No. of teachers	No. of students	Ratio of teacher and students
1	Primary School	603	47,631	1:74
2	Pre-Primary School	48	732	1:15
	Total	**651**	**48,363**	2:89

Source: General Administrative Department, Hlaing Tharyar Township

7.2.3 Vulnerable Groups

There is limited information available in Hlaingtharya Township regarding vulnerable groups. However, the survey of baseline census data undertaken in 2015 indicates that conventional households in Hlaingtharya Township number 148,711 and of this number some 80% are male headed and female-headed as shown below in **Table 60**. The average population per household is approx. 4.5 persons.

Table 60: Households by Head and Total Population

Conventional Households			Population in	
Number	**Male-headed**	**Female-headed**	**Conventional households**	**Institutions**
148,711	118,386	30,325	663,463	24,404

Source: Baseline Census Data, 16 July 2015

7.2.4 Ethnicity and Religion

Most of the people in Hlaingtharya Township are Bamar (375,105 persons), Kayin (6,035 persons), Rakhine (5,405 persons), Kachin (160 persons), Kayah (57 persons), Chin (962 persons), Mon (510 persons) and Shan (627 persons), see **Table 61**.

Non Myanmar nationals in Hlaingtharya Township reportedly comprise of Chinese (371 persons), Indian (7,090 persons), Bangladesh (425 persons), Pakistan (64 persons) and others (2,615 persons).

The population in Hlaingtharya Township is mostly Buddhist (198,157 persons). The other main religions are Hindu (7,579 persons), Islam (2,102 persons), Christian (1,851 persons) and others (2,615 persons).

Table 61: Reported Ethnicity and Religion in Hlaingtharya Township

No.	National	Population	Township population	Percentage of Township population
1	Kachin	160	402,849	0.04%
2	Kayah	57	402,849	0.014%
3	Kayin	6,035	402,849	1.5%
4	Chin	962	402,849	0.24%

5	Mon	510	402,849	0.13%
6	Burma	375,105	402,849	93.3%
7	Rakhine	5,405	402,849	1.34%
8	Shan	627	402,849	0.16%
	Total	**388,861**	**402,849**	**96.72%**

Source: General Administrative Department, Hlaingtharya Township

7.2.5 Migration

According to data reported in the Levels, Trends and Patterns of Internal Migration in Myanmar published in September 2013 by Department of Population of the Ministry of Immigration and Population, the trend of inward and outward migration rates of lifetime migrants, by State and Region in 2007 are shown in **Plate 26.**

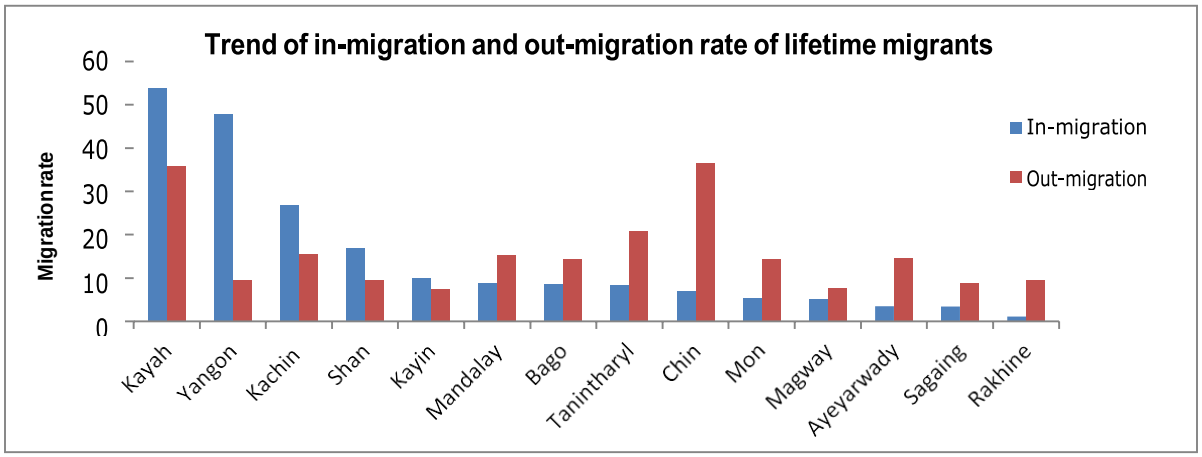


Plate 26: Trend of In-migration and Out-migration Rate of Lifetime Migrants, Myanmar, 2007

7.2.6 Cultural & Archaeological Heritage

There are 3 Pagodas, 117 Buddhist Monasteries, 5 Churches, 10 Mosques, 31 Hindu Temples and 2 Chinese Temples located in Hlaingtharya Township. The Kyaik Khauk Pagoda which is located approximately 8.8km to the south-east of the Project Site is considered particularly significant from a religious and cultural perspective. There are two historical pagodas in the township which are Myo Oo Aung Zamu Aye Pagoda and Kyeik Myiet Myaw Myway Lun Pagoda. There are no significant Pagodas situated within 5km radius of the Project Site. Data on the Pagodas, Monasteries and number of monks in Hlaingtharya Township are shown in **Table 62.**

Table 62: Pagoda, Monastery and Monks

Pagoda	Monastery	No. of monks			No. of convents	No. of nuns
		Monks	Novices	Total		
3	117	1,612	1,453	3,065	6	523

Source: General Administrative Department, Hlaingtharya Township

7.2.7 Migration

According to data reported in the Levels, Trends and Patterns of Internal Migration in Myanmar published in September 2013 by Department of Population of the Ministry of Immigration and Population, the trend of inward and outward migration rates of lifetime migrants, by State and Region in 2007 are shown in **Plate 27.**

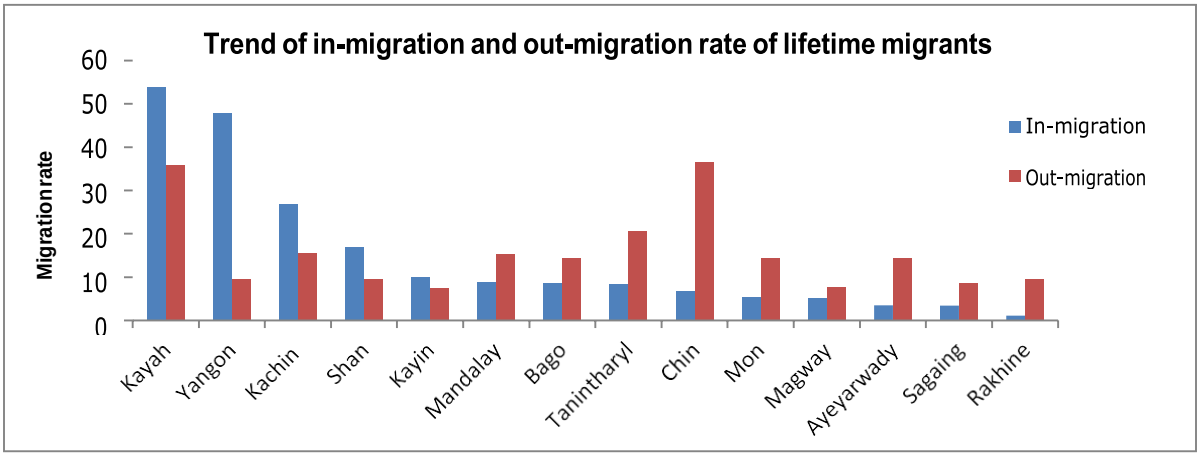


Plate 27: Trend of In-migration and Out-migration Rate of Lifetime Migrants, Myanmar, 2007

7.2.8 Cultural & Archaeological Heritage

There are 3 Pagodas, 117 Buddhist Monasteries, 5 Churches, 10 Mosques, 31 Hindu Temples and 2 Chinese Temples located in Hlaingtharya Township. The Kyaik Khauk Pagoda which is located approximately 8.8km to the south-east of the Project Site is considered particularly significant from a religious and cultural perspective. There are two historical pagodas in the township which are Myo Oo Aung Zamu Aye Pagoda and Kyeik Myiet Myaw Myway Lun Pagoda. There are no significant Pagodas situated within 5km radius of the Project Site. Data on the Pagodas, Monasteries and number of monks in Hlaingtharya Township are shown in **Table 62.**

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		Monks	Novices	Total		
3	117	1,612	1,453	3,065	6	523

Source: General Administrative Department, Hlaingtharya Township

7.3 ECONOMIC PROFILE

7.3.1 Employment and Livelihoods

According to the survey of households living in **Nyaung Ywa Village** where the Project Site is located the primary forms of employment in the area comprise of casual labour, venders and shopkeepers,

fishermen, government employees and private company staff. Based on the findings of the survey the primary livelihoods in **Hlaing Tharyar Township** are agriculture, fishing, aquaculture and salaried government employment. Other livelihoods include livestock rearing, casual labour and betel leaf and coconut cultivation. Most of the casual labour is employed in the agricultural sector. The data is presented in **Tables 63** overleaf.

Table 63: Employment and Livelihoods in Hlaing Tharyar Township

Government Services	Services	Agriculture	Livestock	Trades	Manufacture	Casual Labour	Others	Total
3,970	200	91	35	38,333	71,742	35,117	58,700	208,188

7.3.2 Income

There is limited information available in Hlaingtharya Township regarding income levels. The average household monthly income and expenditure of the whole country in 1997 was reportedly 10,122.98 and 13,784.51 Kyat respectively (Report of 1997 Household Income and Expenditure Survey (Yangon: CSO, 1999)). The average reported household monthly income and expenditure in each State/ Division in 1997 is shown above in **Plate 28**.

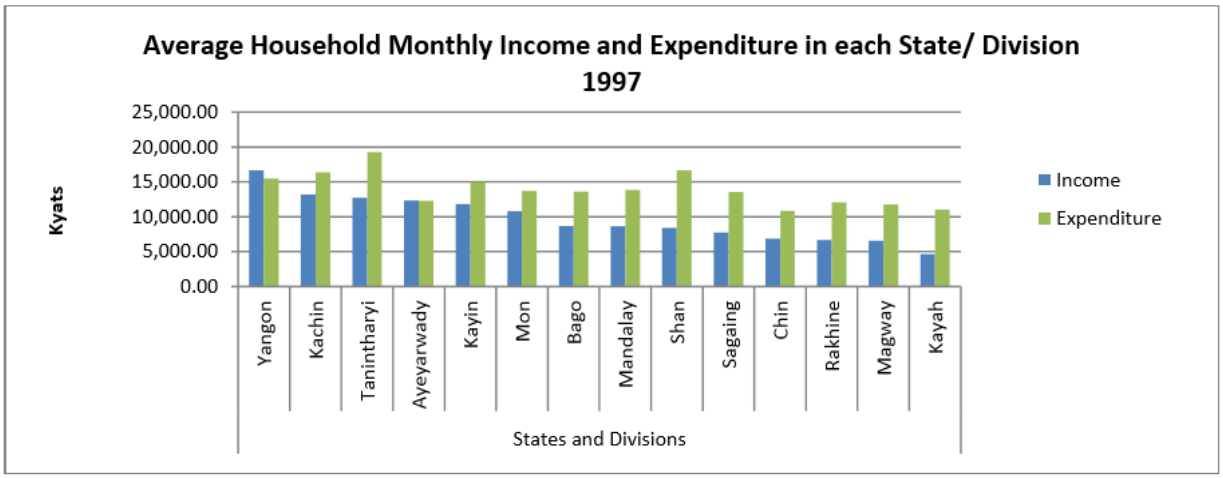


Plate 28: Average household monthly income and expenditure by State/Division in 1997.

7.3.3. Industries

Industries are increasing in Myanmar as a developing country. The name, type and size of workforce in each type of factory in the Township are also shown in **Table 64.**

Table 64: Recorded Factories in Hlaing Tharyar Township

No.	Type	Government/ Private	Number of Factories
1	Food	Private	270
2	Goods	Private	93
3	Others	Private	92
4	Plastics	Private	88
5	Clothing	Private	74
6	Car Body	Private	27
7	Saw Mill	Private	21
8	Farm Tools	Private	20
9	Electric	Private	19
10	Book and Paper	Private	17
11	Animals Food	Private	10
12	Maintenance	Private	11
13	Furniture	Private	12
14	Cosmetic	Private	12
15	Edible Oil	Private	11
16	Lathe	Private	5
17	Tank(Steel)	Private	3
18	Steel	Private	5
19	Batik	Private	4
TOTAL			**795**

Source: General Administrative Department, Hlaing Tharyar Township

7.4 HEALTH PROFILE

7.4.1 Access to Health Services

There are four hospitals in Hlaingtharya Township. As shown below in **Table 65.**

Table 65: Hospitals in Hlaingtharya Township

No.	Name	Government/ Private	Total number of beds
1	Hlaing Tharyar Hospital	Government	25
2	Township Hospital	Government	16
3	Pan Hlaing Hospital	Private	95
4	Tun Foundation	Private	20

Source: General Administrative Department, Hlaing Tharyar Township

The number of health care providers in Hlaing Tharyar Township is low. There are only 11 doctors, 19 nurses and 1 health assistant registered in Hlaing Tharyar Township Hospital; see **Table 66.**

Table 66: Health Care Provision in Hlaing Tharyar Township

Township Population	Percent of health care from Doctor		Percent of health care from Nurse		Percent of health care from Health Assistant	
	Doctor	Population/ Doctor	Nurse	Population per Nurse	Health Assistant	Population per Health Assistant
401,983	11	1:35,151	19	1:20,350	1	1:386,664

Source: General Administrative Department, Hlaing Tharyar Township

7.4.2 Mortality and Morbidity

According to the Annual Hospital Statistics Report prepared by Department of Health Planning in January 2013, the main causes of mortality and morbidity by sex in Yangon Region in 2010-2011 are shown in **Table 67** and **Table 68** respectively.

Table 67: Single Leading Causes of Mortality by Sex in Yangon Region in 2010 and 2011

Causes	Year 2010			Year 2011		
	Male	Female	Total	Male	Female	Total
Septicaemia, unspecified	374	319	693	232	223	455
Tuberculosis of lung, without mention of bacteriological or histological confirmation	306	156	462	351	192	543
HIV disease resulting in mycobacterial infection	331	128	459	222	118	340
Unspecified injury of head	303	85	288	326	78	404
Intracerebral haemorrhage, unspecified	197	113	310	190	111	301
Acute myocardial infarction, unspecified	165	134	299	128	147	275
Other and unspecified cirrhosis of liver	198	62	260	184	63	247
HIV disease resulting in multiple infections	152	103	255	195	118	313
Stroke, not specified as haemorrhage or infarction	148	105	253	124	92	216
Other preterm infants	127	117	244	168	149	317
Respiratory tuberculosis unspecified, confirmed bacteriologically and histologically	111	46	157	-	-	-
Malignant neoplasm of bronchus and lung	100	57	157	71	54	125
Congenital heart failure	47	92	139	80	80	160
Pneumonitis due to food and vomit	87	51	138	87	33	120
Pulmonary oedema	70	62	132	-	-	-
All other causes	3,806	2,672	6,478	3,649	2,626	6,275
Total	**6,522**	**4,302**	**10,824**	**6,007**	**4,084**	**10,091**

Table 68: Single Leading Causes of Morbidity by Sex in Yangon Region in 2010 and 2011

Causes	Year 2010			Year 2011		
	Male	Female	Total	Male	Female	Total
Single spontaneous delivery	0	14,152	14,152	0	13,546	13,546
Unspecified injury of head	6,884	2,811	9,695	8,497	3,423	11,920
Cataract, unspecified	3,725	5,660	9,385	3,706	5,639	9,345
Spontaneous vertex delivery	0	8,544	8,544	0	8,694	8,694
Diarrhoea and gastroenteritis of presumed infectious origin	4,324	3,606	7,930	5,832	4,957	10,789
Viral infection, unspecified	3,768	3,321	7,089	2,627	2,421	5,048
Dengue haemorrhagic fever	2,813	2,846	5,659	-	-	-
Neonatal jaundice, unspecified	2,527	2,317	4,844	2,642	2,367	5,009
Incomplete abortion without complication	0	4,115	4,115	0	2,414	2,414
Tuberculosis of lung, without mention of bacteriological or histological confirmation	2,592	1,395	3,987	3,134	1,650	4,784
Other acute gastritis	1,312	1,847	3,159	1,536	2,113	3,649
Unspecified mood [affective] disorder	1,724	1,128	2,852	1,889	1,198	3,087
Delivery by emergency caesarean section	0	2,686	2,686	0	2,892	2,892
Delivery by elective caesarean section	0	2,677	2,677	-	-	-
Pneumonia, unspecified	1,443	1,216	2,659	2,043	1,633	3,676
All other causes	86,563	92,239	178,802	87,185	96,808	183,993
Total	**117,675**	**150,560**	**268,235**	**119,091**	**149,755**	**268,846**

Source: Annual Hospital Statistic Report 2010-2011, Department of Health Planning, January 2013

The mortality rate in Hlaingtharya Township in 2009 – 2011 reported by the Department of Health Planning in January 2013 is shown below in **Plate 29**.

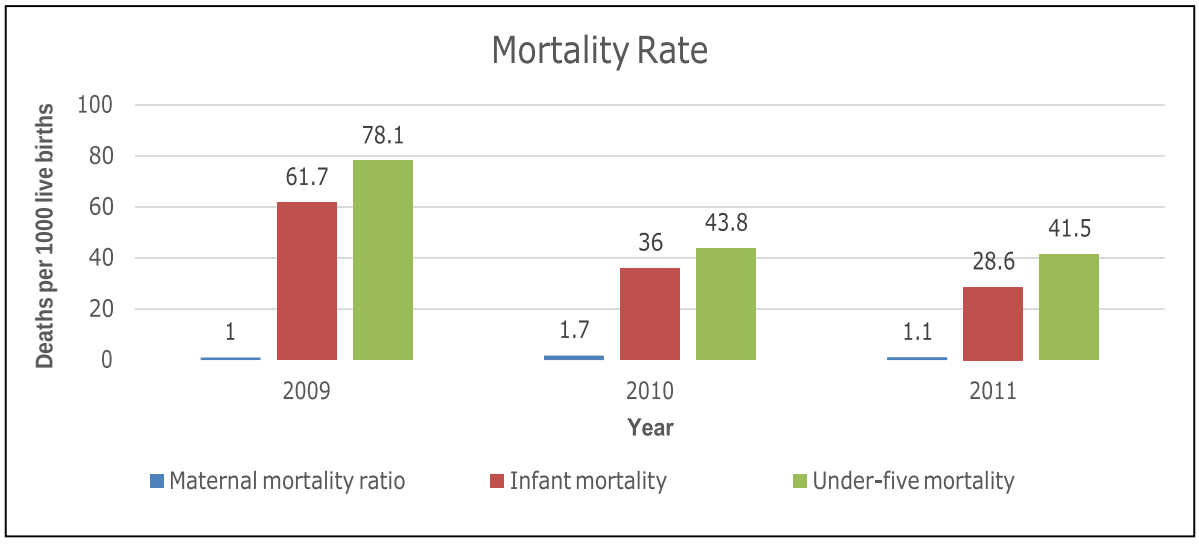


Plate 29: The Mortality Rates in Hlaingtharya Township in 2009 – 2011

7.4.3 Nutrition Levels

According to Township Health Profile in 2011 the percentage of malnourished children in Hlaingtharya Township is relatively high when compared to the Union average, see **Table 69.**

Table 69: Reported Percentage of Malnourished Children in Hlaingtharya Townships compared to the Union Average in 2009 – 2011

Union/ Township	Malnutrition under 1 year			Malnutrition under 3 years			Severe Malnutrition Under 3 Years		
	2009	2010	2011	2009	2010	2011	2009	2010	2011
Union	4.0%	3.8%	2.9%	4.1%	3.8%	3.1%	0.4%	0.4%	0.3%
Hlaingtharya Township	16.8%	6.3%	6.2%	16.7%	9.4%	8.1%	0.4%	0.8%	0.8%

Source: Township Health Profile 2011, Department of Health Planning, MOH.

7.4.4 Communicable Diseases

There is limited information available for Hlaingtharya Township regarding communicable diseases. However, the Department of Health reported that the most common communicable diseases in Yangon are Malaria, Diarrhoea, Tuberculosis, and Leprosy. The morbidity and mortality rate from these communicable diseases is shown in **Table 70**.

Table 70: The Most Common Communicable Diseases in Yangon in 2008

Morbidity and Mortality Rate				Case Detection Rate	
Malaria		Diarrhoea		Leprosy	Tuberculosis
Morbidity[1]	Mortality[2]	Morbidity[1]	Mortality[2]	New Case Detection[2]	New Case Detection (%)
1.00 - 10	0.51 - 2.00	2.0 - 5.0	0.1 - 0.5	5.01 - 8.00	81 - 90

Note: 1 = per 1,000 populations, 2 = per 100,000 populations
Source: Department of Health, MOH & National Tuberculosis Programme, Department of Health, MOH

7.5 INFRASTRUCTURE AND UTILITIES

7.5.1 Water Use and Water Supply

The reported main source of non-potable water in Hlaing Tharyar Township is the Hlaing River although groundwater is also widely used, especially for irrigation purposes during the dry season. According to a survey of households living in Nyaung Ywa Village the main source of water supply for the local community is groundwater abstracted from tube wells.

7.5.2 Sanitation

The type of toilet present in households is a useful indicator with respect to the level of development and quality of life of a particular area. **Table 71** presents household toilet by type data for Yangon in year 2014.

Table 71: Conventional households by type of toilet in urban and rural area of Yangon in year 2014

	Type of toilet						
Urban/ Rural	**Flu sh**	**Water seal (Improved pitlatrine)**	**Pit (Traditional pit latrine)**	**Bucket (Surface latrine)**	**Other**	**None**	**Total**
Yangon	282,001	2,732	2,656	1,208,605	82,287	4,663	**1,58,2944**
Urban	82,483	1,580	2,139	901,487	78,302	3,065	**1,069,056**
Rural	199,518	1,152	517	307,118	3,985	1,598	**513,888**

Source: The 2014 Myanmar Population and Housing Census, Department of Population Ministry of Immigration and Population, May 2015.

7.5.3 Transportation and Infrastructure

The primary means of public transportation in Hlaing Tharyar Township are bus transportation. The total length of road in Hlaing Tharyar Townships is 272 km (165 miles). The township also contains several major bridges; Bayintaung Bridge which links Yangon to Pathein (6.03 miles/4280 ft.), Aungzayar Bridge which links Yangon to Nyaung Done (3768 ft.), Shwepyithar Bridge (3415 ft.), and Panhlaing Bridge (1940ft). The main water way is Hlaing River and it has three ports on the western bank.

Yangon International Airport is located in Mingaladon Township approximately 15km north-east of downtown Yangon and 36km north east of the Project Site.

7.5.4 Navigation

The Port of Yangon is the premier port of Myanmar and handles about 90 % of the country's exports and imports. The Port of Yangon is situated on the Yangon River, about 32km inland from the Elephant Point on the Gulf of Martaban. It is located approximately 10km south east of the Project Site (see **Plate 30)**.

The Asia World Port Terminal (AWPT) is developed and operated by Asia World Port Management Co. Ltd which is a private enterprise. It is located upstream of the Yangon River about 5km south east of the Project Site.

Plate 30: Port Facilities near Project Site

Myanmar International Terminal Thilawa (MITT) is Myanmar's first purpose-built, multi-purpose international container port. Hutchison Port Holdings (HPH), which developed the facility, has managed MITT since 1998. MITT is located at Thilawa, 25 km from downtown Yangon, and adjacent to Thilawa Special Economic Zone. It is located about 26km south east of the Project Site.

8. BASELINE STUDIES

8.1 INTRODUCTION

SLP conducted a limited Environmental Baseline Study as part of the IEE study and the methodology and rationale for the baseline study and the location of the monitoring and sampling locations are presented in the sections below.

8.2 ENVIRONMENTAL BASELINE MONITORING APPROACH

The environmental baseline monitoring works focused on the most sensitive environmental and social receptors as identified during the Project Site and Environs Reconnaissance undertaken on the 15 January 2016. In summary, the environmental baseline approach involved:

- The erection of one air quality and noise monitoring station for a 24-hour period; and
- The collection of two surface water samples from the temporary stormwater drainage discharge points.

The surface water samples were dispatched to an ISO: 17025 accredited labor atory for analysis of a range of parameters as shown in **Appendix B**.

The rationale for each environmental baseline monitoring location is detailed in **Table 72** and the Environmental Baseline Monitoring Location Plan is presented in **Plate 31**.

Table 72: Environmental Baseline Monitoring Locations and Rationale

Sample ID	Coordinates	Sample Media	Parameters Measured	Rationale
SW1	47 Q 190656.51E 1864273.15 N	Surface Water	Organic & Inorganic Constituents	Stormwater discharge from construction site
SW2	47 Q 190664.00 E 1864331.00 N	Surface Water	Organic & Inorganic Constituents	Stormwater discharge from construction site
AQS1	47 Q 190677.00 E 1864242.00 N	Air	PM 10, PM 2.5, CO, NO_2, SO_2	Between the Project Site and residential buildings adj. east of the Project Site
NMS2	47 Q 190677.00 E 1864242.00 N	Noise	Sound level equivalent (Leq)	Between the Project Site and residential buildings adj. east of the Project Site

The locations of the environmental baseline monitoring and sampling locations are shown in **Plate 31** overleaf.

Plate 31: Environmental Baseline Monitoring Location Plan

8.3 QUALITY ASSURANCE AND QUALITY CONTROL DURING FIELDWORKS

The field works were supervised by an appropriately trained and experienced Field Operations Manager (FOM) who fulfils the core competencies detailed in the SLP Core Competencies Matrix. The importance of robust record keeping cannot be over emphasized and all sample collection and measurement activities were traceable through field records to the person collecting the sample or making the measurement and the FOM ensured that the appropriate field data record sheets were completed in accordance with company practice during the environmental baseline study works.

The air and noise monitoring equipment was calibrated prior to the fieldworks commencing and copies of the calibration records can be found in **Appendix B**. All investigation and sampling equipment was thoroughly cleaned between exploratory positions in accordance with detailed procedures presented in SLP Standard Operating Procedure No.09 and in order to prevent cross-contamination during sample collection. The following precautions were taken:

- A clean pair of new, non-powdered, disposable latex gloves were worn each time a different location was sampled;
- The sampling equipment was pre-cleaned in accordance with the requirements set out in SLP Standard Operating Procedure No.10;
- One member of the field sampling team was responsible for recording the works whilst the other team member collected the samples;
- All samples were stored in the designated laboratory-certified clean sample containers; and

- All sample jars were filled with minimal headspace wherever practicable.

After collection and labelling, sample handling was minimized and field personnel used extreme care to ensure that samples were not contaminated during storage. The water samples whilst onsite were stored in new cool boxes equipped with freezer packs. At the end of each sampling event the samples were returned to the temporary project office for storage in a dedicated refrigerator prior to their consignment under chain of custody procedures to the nominated analytical laboratory.

The samples were consigned to the laboratory using a reputable courier company (DHL) in a specially designed EnviroSample Kit. The FOM ensured that new freezer packs were inserted into the EnviroSample Kit prior to dispatch to keep the samples cool whilst in transit and that the container was packed such that the risks of accidental breakage were low. The EnviroSample Kit was taped securely shut and "Fragile – handle with care" labelling attached to the outside. The chain of Custody (COC) document was placed into a sealed plastic pocket within the EnviroSample Kit.

8.4 LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL

SLP Environmental understands the critical importance of only using laboratories that can produce legally defensible data that is accurate, reliable and complete. SLP has systems in place to ensure that we only use laboratories that are accredited under **ISO: 17025** and wherever possible also participate in inter-laboratory proficiency studies.

Just as important as ensuring that we only use laboratories of the highest calibre is our stringent

internal process for ensuring that all analytical data received from our approved analytical laboratories is subject to a thorough in-house quality assurance and quality control (QA/QC) check.

For all project field works a Quality Assurance Plan (**QAP**) is developed by the Project Manager (PM) with input from the Field Operations Manager (FOM) and the QAP included:

1. data-quality objectives for precision, accuracy, and completeness, including description and frequency of QA/QC samples to be collected/analysed to assess data quality;
2. data-quality assessment procedures; and
3. data-quality reporting.

Upon receipt of Analytical Laboratory Analysis Reports the PM checked for compliance with QAP requirements using the SLP Standard Working Method (SWM#18) Analytical Laboratory Lab Data Quality Assurance & Quality Control Checklist.

8.4.1 Holding Times andTemperature

The PM checked and confirmed that no sample holding times had been exceeded and that the samples were received at the laboratory within acceptable temperature limits.

8.4.2 Target Analytes

The PM checked and confirmed that all scheduled analyses were completed by the laboratory and that the laboratory has used the stipulated analytical method for each analyte.

8.4.3 Reporting Limits

The PM shall checked and confirmed that the analytical reporting limits corresponded with the stipulated method.

8.4.4 Reporting Format

The PM checked and confirmed that the laboratory reporting format complied with SLPs specified format which as a minimum shall contain:

- Laboratory report number;
- Sample identification;
- Unique laboratory sample number;
- List of analytes;
- The measurement units;
- Sample matrix;
- Analytical results;
- Analytical methods;
- Associated reporting limits;
- Final Revision of the Laboratory Report; and
- Name and signature of laboratory representative.

8.5 DESCRIPTION OF FIELD WORKS

8.5.1 Ambient Air Quality Monitoring

Ambient air quality was monitored at one location for a 24-hour duration during the period 15th -16th January 2016. The location of the air quality monitoring station relative to the construction site is shown below in **Plate 32.**

Plate 32: Ambient Air Quality Monitoring Station

The sampling and analysis of ambient air pollutants was conducted in accordance with practice recommended by the United States Environmental Protection Agency (U.S. EPA). Haz-Scanner EPAS Wireless Environmental Perimeter Air Stations were used to monitor ambient air quality.

8.5.2 Wind Speed and Wind Direction

Wind speed and wind direction were monitored for 24-hour duration during period 15th -16th January 2016. The sampling and analysis of wind speed and wind direction were conducted in accordance with practice recommended by the United States Environmental Protection Agency (U.S. EPA).

8.5.3 Nuisance Noise Monitoring

Nuisance noise monitoring was conducted over 24 hours at the same location as the ambient air quality monitoring during the period 15th -16th January 2016.

Monitoring of nuisance noise was conducted by referring to the recommendation of International Organization for Standardization (ISO), ISO 1996-1:2003 and ISO 1996-2:2007.

8.5.4 Surface Water Sampling

The surface water samples were collected on 15th January 2016 using a Van Dorn grab sampler. The decontaminated Van Dorn sampler was armed and then lowered into the surface watercourse tocollect a grab sample. Once a sample was retrieved the device was raised to the surface where the sample was decanted into the laboratory provided sample containers.

A further sample was decanted into a clean container for field monitoring and temperature, pH, conductivity and dissolved oxygen levels were measured, and the results recorded on water quality monitoring field record sheets.

The water samples were placed in a cool box whilst onsite and transferred to the project office refrigerator at the end of the day. The samples were consigned to the laboratory in a specially designed Enviro Sample Kit. The FOM ensured that new freezer packs were inserted into the EnviroSample Kit prior to dispatch to keep the samples cool whilst in transit and that the container was packed such that the risks of accidental breakage were low. The EnviroSample Kit was taped securely shut and "Fragile – handle with care" labelling attached to the outside. The chain of Custody (COC) document was placed into a sealed plastic pocket within the EnviroSample Kit.

The field sampling records and laboratory chain of custody (CoC) documentation are presented in **Appendix B.**

8.6 ENVIRONMENTAL BASELINE STUDY RESULTS

The laboratory and field monitoring results from the environmental baseline study were compared with a selection of Myanmar and international Environmental Quality Standards (EQS) as detailed in the subsections below.

8.6.1 Ambient Air Quality Baseline Results

The ambient air quality monitoring results were compared against i) Myanmar Ambient Air Quality Standards or in the absence of such; ii) USEPA National Ambient Air Quality Standards. No exceedances of the adopted air quality standards were recorded and the results are presented in **Table 73**.

Table 73: Ambient Air Quality Baseline Screening Exercise

No.	Common Air Pollution (COPs)	Time	Result
1	Carbon monoxide (CO) mg/m3	11:00 – 19:00	0.21
		19:00 – 03:00	0.26
		03:00 - 11:00	0.32
	USEPA National Ambient Air Quality Standard	8 hr	10
	WHO Guidelines	8 hr	10
2	Nitrogen Dioxide (NO2) µg/m3	11:00-12:00	43
		12:00-13:00	79
		13:00-14:00	81
		14:00-15:00	109
		15:00-16:00	50
		16:00-17:00	72
		17:00-18:00	61
		18:00-19:00	76
		19:00-20:00	99
		20:00-21:00	133
		21:00-22:00	133
		22:00-23:00	116
		23:00-00:00	91
		00:00-01:00	72
		01:00-02:00	80
		02:00-03:00	69
		03:00-04:00	75
		04:00-05:00	63
		05:00-06:00	73
		06:00-07:00	78
		07:00-08:00	82
		08:00-09:00	33

		09:00-10:00	4
		10:00-11:00	4
	Myanmar Air Quality Standard	1 hr	200
	WHO Guidelines	1 hr	400
3	Sulphur Dioxide (SO2) µg/m3	24 hr	11.90
	Myanmar Air Quality Standard	24 hr	20
	WHO Guidelines	1 hr	350
4	PM-10 (PMØ < 10 µm) µg/m3	24 hr	49.43
	Myanmar Air Quality Standard	24 hr	50
	WHO Guidelines	24 hr	70
5	PM-10 (PMØ < 10 µm) µg/m3	24 hr	11.32
	Myanmar Air Quality Standard	24 hr	25
	WHO Guidelines	24 hr	35

8.6.2 Wind Speed and Wind Direction Results

The wind at the monitoring location blew from the northeast to the southwest with a measured wind speed of between 0.5 - 2.1 m/s. The average wind speed was 0.21m/s. The wind rose for the monitoring location is presented in **Plate 33.**

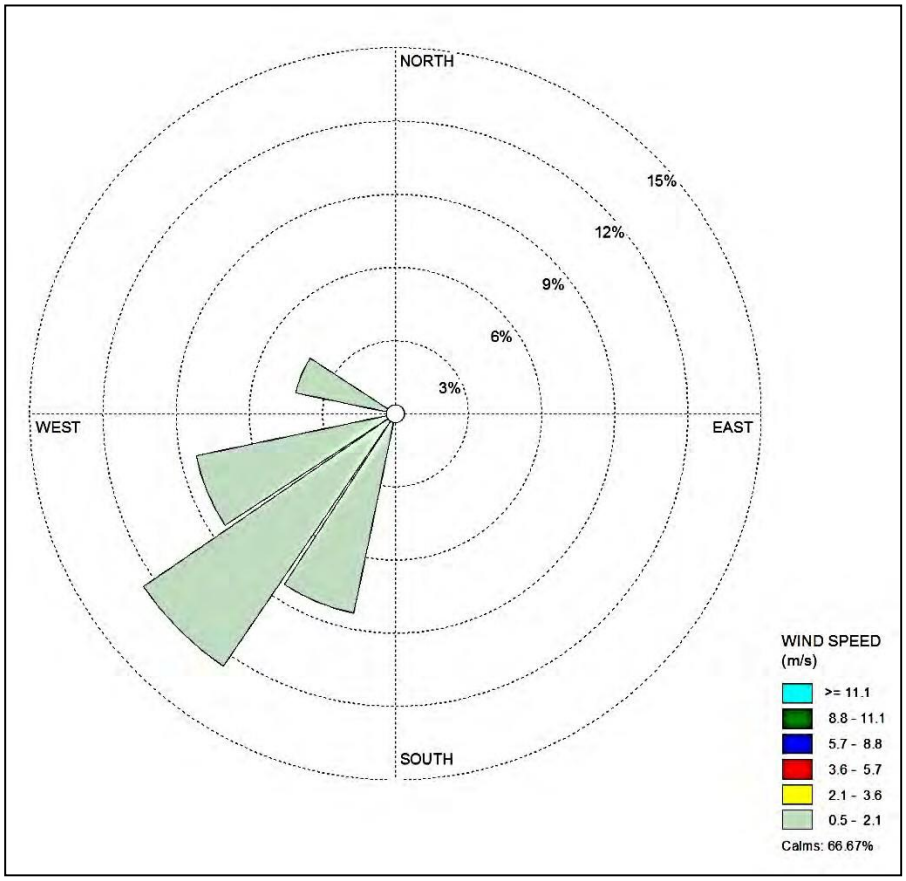


Plate 33: Wind Speed and Wind Direction at the monitoring location

8.6.3 Nuisance Noise Quality Baseline Results

The nuisance noise quality monitoring results was compared against i) Myanmar EQS Nuisance Noise Standards and ii) WHO Nuisance Noise Quality Standards. No exceedances of Nuisance Noise Quality Standards were recorded. The results of the noise monitoring survey are shown in **Table 74**.

Table 74: Nuisance Noise Quality Baseline Screening Exercise

Environment	Myanmar EQG, 2015		WHO, 1999		Result
	LAeq [dB]	Time base [hours]	LAeq [dB]	Time base [hours]	
Outdoor living area	55	Daytime	55	16	51.62
	45	Night-time			43.02

Note: LAeq = the average equivalent level of the sound over a period T.
Daytime = 07:00-22:00
Night-time = 22:00-07:00

8.6.4 Surface Water Quality Field Monitoring Results

Field monitoring of selected surface water parameters was undertaken and the results are presented in **Table 75** below.

Table 75: Surface Water Field Monitoring Results

Parameter	Unit	Result		WHO Guidelines
		SW1	SW2	
pH	S.U.a	6.9	6.9	6-9
Temperature	^{o}C	24.0	24.7	<3b
Conductivity	µS/cm	14	13	-
Dissolved Oxygen	Mg/l	3.87	3.67	150

Note: [a] Standard unit

8.6.5 Surface Water Quality Baseline Results

The surface water laboratory testing results were compared against the MOECAF Standard for construction site wastewater discharges. No exceedances of MOECAF Standards were recorded. The results are shown in **Table 76** and the laboratory report is attached in **Appendix B.**

Table 76: MOECAF Construction Site Wastewater Discharges Screening Exercise

No	Parameter	Unit	Discharge Standard	Results	
				SW1	SW2
1	Chemical oxygen demand	mg/l	125	<14.3	<14.3
2	Oil and grease	mg/l	10	<6.29	6.29
3	pH	S.U.[a]	Within range 6 to 9	6.9	6.9
4	Total nitrogen	mg/l	10	<5.0	<5.0
5	Total phosphorus	mg/l	2	<0.008	<0.008
6	Total Suspended Solids	mg/l	50	<17.9	<17.9

Note: [a] Standard unit
< indicates Laboratory Limit of Detection

9.0 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

9.1 SCOPING OUTCOMES

The potential environmental impacts associated with the Project were assessed by conducting a Scoping Study to set the boundary conditions for the study, identify the potential interactions between project activities and environmental and social receptors and to prioritize these in terms of their potential magnitude and significance. The aim of the preliminary Scoping Study is to rank the predicted impacts in terms of their assessed significance and ensure that all impacts ranked Moderate or above are taken forward for further detailed examination in the IEE study.

It should be noted that the list of Project activities/hazards is not intended to be exhaustive but rather provide an identification of the key aspects of the Project which have the potential to interact with environmental and social receptors and result in adverse impacts. Furthermore, the list of environmental and social receptors is a focused list of the key aspects of the natural and social environment which are considered vulnerable or important in the context of the agreed project brief, the study benchmarks and the findings of the environmental and social baseline studies.

Scoping of impacts was undertaken for each of the two primary project stages (construction and operation) and the findings are presented overleaf in **Tables 77** to **78**. It is important to note that the Scoping Study takes into account the mitigation and any other control measures that are already incorporated into the Project design.

For ease of reference the scoping findings have been colour coded according to the assigned impact rating as detailed in **Plate 34**.

Plate 34: Impact Rating Key

Table 77: Preliminary Scoping of Potential Impacts of Project Activities - **CONSTRUCTION PHASE**

Receptors/Hazards / Project Activities	Physical Environment														Ecology						Occupational Health and Safety											Community Health & Safety									Heritage			
	Soil Quality and Composition	Subsidence	Soil Erosion	Sedimentation	Landscape and Visual	Air Quality (gases)	Air Quality (particulates)	Nuisance Noise	Vibration	Climate Change/GHG	Surface Water Quality	Groundwater Quality	Marine Water Quality	Water Resources	Terrestrial Habitats & Ecology	Freshwater Habitats & Ecology	Marine Habitats & Ecology	Protected Areas	Endangered/Endemic Species		Chemical Hazards	Biological Hazards	Radiological Hazards	Physical Hazards	Electrical Hazards	Noise Exposure	Heat Exposure	Respiratory Exposure	Confined Spaces	Accidents and Injuries	Illness and Disease		Infrastructure & Equipment	Life and Fire Safety	Traffic Safety	Air Quality	Water Quality	Water Security	Crop Yields	Nuisance Noise	Exposure to HazMat	Exposure to Comm. Diseases		Archaeological Heritage	Cultural Heritage	Religious Heritage	
PLANNED																																											
Site clearance & levelling (cut and fill)																																											
Foundation works (substructures)																																											
Construction of buildings (superstructures)																																											
Construction of roads and infrastructure																																											
Fitting out buildings																																											
Installing machinery and equipment																																											
Commissioning machinery and equipment																																											
Electricity Supply																																											
Water Supply																																											
Hazardous materials (storage and use)																																											
Hazardous solid waste																																											
Non-hazardous solid waste																																											
Hazardous liquid waste																																											
Stormwater runoff																																											
Sanitary wastewater																																											
Onsite traffic and plant movement																																											
Offsite traffic movements																																											
UNPLANNED																																											
Fires and explosions																																											
Spills and uncontrolled releases																																											

Table 78: Preliminary Scoping of Potential Impacts of Project Activities – **Operation PHASE**

Receptors/Hazards / Project Activities	Physical Environment														Ecology					Occupational Health and Safety										Community Health & Safety										Socio-Economic			
	Soil Quality and Composition	Subsidence	Soil Erosion	Sedimentation	Landscape and Visual	Air Quality (gases)	Air Quality (particulates)	Nuisance Noise	Vibration	Climate Change/GHG	Surface Water Quality	Groundwater Quality	Marine Water Quality	Water Resources		Terrestrial Habitats & Ecology	Freshwater Habitats & Ecology	Marine Habitats & Ecology	Protected Areas	Endangered/Endemic Species	Chemical Hazards	Biological Hazards	Radiological Hazards	Physical Hazards	Electrical Hazards	Noise Exposure	Heat Exposure	Respiratory Exposure	Confined Spaces	Accidents and Injuries	Illness and Disease	Infrastructure & Equipment	Life and Fire Safety	Traffic Safety	Air Quality	Water Quality	Water Security	Crop Yields	Nuisance Noise	Exposure to HazMat	Exposure to Comm. Diseases	Work Force	Local Business	Local Community	
Electricity supply																																									
Water Supply																																									
Stormwater																																									
Sanitary wastewater																																									
Grey water discharges																																									
Hazardous solid wastes																																									
Non-hazardous solid wastes																																									
Hazardous liquid wastes (used oils etc)																																									
Hazardous materials (storage and use)																																									
Flammable liquids storage																																									
Vehicular traffic																																									
Irrigation																																									
Application of Herbicides/Pesticides																																									
Operation of Water Treatment Plant																																									
Operation of Sewage Treatment Plant																																									
Building & General Maintenance																																									
Working from Height																																									
Below Ground Diesel Storage Tank																																									
Employment																																									
Training																																									
UNPLANNED																																									
LPG Leak																																									

Note: In fact, Propane's lower carbon content helps make it a clean fuel source. As it burns, it also produces fewer tailpipe emissions than petroleum fuels. Propane can't hurt water or soil because it's not toxic. When you switch to it, you reduce carbon monoxide, hydrocarbon and greenhouse gas emissions. The operation team will Close the LPG regulator and put the safety cap on the cylinder.

The Impacts Scoping Study has identified potentially significant adverse impacts associated with the **Construction Phase** of the Project as requiring detailed impact evaluation. These are detailed below in **Table 79**.

Table 79: Preliminary Scoping of Potential Impacts of Project Activities – **Operation PHASE**

Activity/Source of Impact	Aspect	Receptors/Resource
Land Preparation Activities Onsite Traffic and Plant	Fugitive particulate (dust) emissions	Local Air Quality Community Health
Construction Works	Noise Emissions	Community Nuisance Community Health
Use of Hazardous Materials (fuel, formwork oils, solvents)	Accidental spillage/leakage Infiltration and downward percolation	Soil and Groundwater Quality
Use of Hazardous Materials (fuel, formwork oils, solvents)	Accidental spillage/leakage Infiltration and downward percolation	Water Resources

The Impacts Scoping Study has identified potentially significant adverse impacts associated with the **Operational Phase** of the Project as requiring detailed impact evaluation. These are detailed in **Table 80.**

Table 80: Potential Adverse Impacts during Operation of the Project

Activity/Source of Impact	Aspect	Receptors/Resource
Water Supply to Hotel	Water Resource Depletion	Community Water Security
Water Supply to Hotel	Water Quality Deterioration	Community Water Security
Irrigation	Water Resource Depletion	Community Water Security
Irrigation	Water Quality Deterioration	Community Water Security
LPG Storage and Use	Leakage/Fire/Explosion	Life and Fire Safety

The above mentioned impacts are considered to require detailed examination in the full IEE study as they may require additional mitigation measures, over and above those already built into the design, to reduce any significant impacts to acceptable levels. For those potential impacts associated with the Project which are not specifically identified for detailed examination as noted above (scoring below Moderate), it should be noted that these will be covered in the Environmental Management and Monitoring Plan (EMMP) whereby general good practice measures common to the construction sector

will be recommended. It should be noted that decommissioning activities will not be assessed within the full ESIA study as the Project Proponent does not currently anticipate that the Project will be abandoned at any point in the foreseeable future. A separate and standalone decommissioning plan should be developed at the appropriate time taking into account of the most cost effective and best practicable methods, legal requirements and industry practices at the time of decommissioning and demolishing the buildings. A risk assessment should also be conducted to ensure that nothing which could be constituted as a hazard for other users of the area or for the environment in general will be left at the site. Overall, the aim should be that the Project Site is left in a safe and environmentally acceptable condition.

The Project is situated in an area that is not subject to any other significant redevelopment activities over and above those being implemented by the Project Proponent elsewhere within Pun Hlaing Golf Estate, and on this basis SLP does not propose to conduct a Cumulative Impact Assessment (CIA) as part of the ESIA study. The impacts of urban redevelopment type schemes are relatively modest when compared to the major infrastructure, industrial, energy and mining type schemes for which the practice of CIA was primarily developed. Furthermore, as the development site has already been selected and construction works are underway SLP has not included an Analysis of Alternatives as part of the full IEE study.

9.2 ASSESSMENT OF IMPACTS DURING CONSTRUCTION PHASE

This Section focuses on the potential environmental and social impacts associated with the construction of the Project and associated ancillary infrastructure.

9.2.1 Impacts of Construction of the Project on Local Air Quality

The construction of the Project is likely to generate windblown dusts, especially in the dry season. Land preparation and construction activities and onsite plant and vehicle movements will liberate dusts to the atmosphere which can then be transported offsite by the wind. The ambient air baseline monitoring study did not record any exceedances of Myanmar's ambient air quality standards.

This impact has been subject to further detailed assessment as detailed below in **Table 81** and is ranked as of **MINOR** significance.

Table 81: Assessment of Potential Impacts on Air Quality during Construction

Impact	Deterioration in local air quality due to particulate emissions generated as a consequence of construction phase activities.				
Impact Type	**Direct**	Secondary	Indirect	Cumulative	Residual
	Dust emissions are a direct consequence of project activities.				
Receptor Sensitivity	Low	Low-Medium	**Medium**	Medium-High	High
	The nearest permanent residential receptors are located some 60m from the boundary of the project site. Receptor sensitivity is assessed as medium.				
Impact Nature	**Negative**	Positive	Neutral		
	Impact to air quality is assessed as adverse.				
Impact Duration	**Temporary**	Short-term	Long-term	Permanent	
	Impacts are only associated with the construction phase of the project.				
Impact Extent	**Local**	Regional	Global		
	Impacts are relatively small scale and will be localised in nature.				

Impact Severity	Slight	Low	**Medium**	High	Critical
	Human receptors are potentially exposed to windblown dusts and on this basis the impact severity is assessed as medium.				
Significance	Negligible	**Minor**	Moderate	Major	Critical
	The combination of a Medium Impact Severity and Medium Sensitivity will result in an overall **Minor Impact.**				

9.2.2 Impacts of Construction of the Project on Community Noise Levels

The construction of the Project will generate nuisance noise. Construction activities such as piling, cutting, grinding, welding and the use of power tools generate noise as do site vehicles, machinery and other plant including generators and pumps.

The ambient noise baseline monitoring survey did not record ambient noise levels in excess of Myanmar's environmental quality guidelines at the noise monitoring station that was erected near the Project's eastern site boundary.

This impact has been subject to further detailed assessment as detailed in **Table 82** and is ranked as of **MINOR** significance.

Table 82: Assessment of Potential Impacts on Community Noise Levels during Construction

Impact	Increased community noise levels as a consequence of construction phase project activities.				
Impact Type	**Direct**	Secondary	Indirect	Cumulative	Residual
	Noise emissions are a direct consequence of project activities.				
Receptor Sensitivity	Low	Low-Medium	**Medium**	Medium-High	High
	The nearest permanent residential receptors are located some 60m from the boundary of the project site. Receptor sensitivity is assessed as medium.				
Impact Nature	**Negative**	Positive	Neutral		
	Impact on community noise levels is assessed as adverse.				
Impact Duration	**Temporary**	Short-term	Long-term	Permanent	
	Impacts are only associated with the construction phase of the project.				
Impact Extent	**Local**	Regional	Global		
	Impacts are relatively localised in nature.				
Impact Severity	Slight	Low	**Medium**	High	Critical
	Human receptors are potentially exposed to elevated noise levels and on this basis the impact severity is assessed as medium.				
Significance	Negligible	**Minor**	Moderate	Major	Critical
	The combination of a Medium Impact Severity and Medium Sensitivity will result in an overall **Minor Impact.**				

9.2.3 Impacts of Construction of the Project on Soil Quality

Hazardous materials (fuel, formwork oil, solvents etc) will be used and stored onsite during the construction of the project. It should be noted however, that the quantity used is relatively low and the materials will be containerised. Leakage from site vehicles and other equipment and spills during refuelling and maintenance operations also have the potential to cause localised soil contamination.

This impact has been subject to further detailed assessment as detailed below in **Table 83** and is ranked as of **NEGLIGIBLE** significance.

Table 83: Assessment of Potential Impacts on Soil Quality during Construction

Impact	The potential for accidental leaks and spills of hazardous substances to contaminate site soils locally has been identified.				
Impact Type	**Direct**	Secondary	Indirect	Cumulative	Residual
	Soil contamination could occur as a direct consequence of project activities.				
Likelihood	Extremely unlikely	Unlikely	**Low Likelihood**	Medium Likelihood	High Likelihood
	It is assessed that the potential exists for releases event to occur occasionally during the construction phase of the project.				
Receptor Sensitivity	Low	**Low-Medium**	Medium	Medium-High	High
	The soils on the project site comprise of low permeability alluvial silts and clays which will restrict the downward percolation of any contaminants released to the ground. The site is not planned to be utilised for the cultivation of any food crops. Receptor sensitivity is assessed as Low-Medium.				
Impact Nature	**Negative**	Positive	Neutral		
	The impact of soil contamination is assessed as adverse.				
Impact Duration	Temporary	**Short-term**	Long-term	Permanent	
	Any potential impacts would be short term.				
Impact Extent	**Local**	Regional	Global		
	Impacts would be relatively localised in nature.				
Impact Severity	Slight	**Low**	Medium	High	Critical
	Impact severity is assessed as low due to the short term localised nature of any impacts.				
Significance	**Negligible**	Minor	Moderate	Major	Critical
	The combination of a Low Impact Severity and Low Likelihood will result in an overall **Negligible Impact.**				

9.2.4 Impacts of Construction of the Project on Groundwater Quality/Water Resources

Hazardous materials (fuel, formwork oil, solvents etc) will be used and stored onsite during the construction of the project. It should be noted however, that the quantity used is relatively low and the materials will be containerised. Leakage from site vehicles and other equipment and spills during refuelling and maintenance operations also have the potential to cause localised soil contamination.

This impact has been subject to further detailed assessment as detailed below in **Table 84** and is ranked as of **NEGLIGIBLE** significance.

Table 84: Assessment of Potential Impacts on Groundwater Quality/Water Resources during Construction

Impact	The potential for accidental leaks and spills of hazardous substances to contaminate the shallow groundwater body has been identified.				
Impact Type	**Direct**	Secondary	Indirect	Cumulative	Residual
	Groundwater contamination could occur as a direct consequence of project activities.				
Likelihood	Extremely unlikely	Unlikely	**Low Likelihood**	Medium Likelihood	High Likelihood
	It is assessed that the potential exists for release events to occur occasionally during the construction phase of the project.				
Receptor Sensitivity	Low	Low-Medium	**Medium**	Medium-High	High
	The yield and water quality of the shallow minor aquifer is poor compared to the deeper primary aquifers underlying the site although it has some general uses such as for irrigation. On this basis it is assigned a medium sensitivity.				
Impact Nature	**Negative**	Positive	Neutral		
	The impact of groundwater contamination is assessed as adverse.				
Impact Duration	Temporary	**Short-term**	Long-term	Permanent	
	Impacts could last beyond the construction phase of the project.				
Impact Extent	**Local**	Regional	Global		
	Impacts would be relatively localised in nature.				
Impact Severity	Slight	**Low**	Medium	High	Critical
	Impact severity is assessed as low due to the short term localised nature of any impacts.				
Significance	**Negligible**	Minor	Moderate	Major	Critical
	The combination of a Low Impact Severity and Low Likelihood will result in an overall **Negligible Impact.**				

9.3 ASSESSMENT OF IMPACTS DURING OPERATIONS PHASE

This Section focuses on the potential environmental and social impacts associated with the operation of the Project and any associated ancillary infrastructure.

9.3.1 Impacts of Operation of the Project on Community Water Security

The scoping study has identified the potential for groundwater abstractions during the operational phase of the project to have a detrimental impact on the availability of this resource to other local users as a consequence of over-exploitation. The project designers estimate that the project will require approximately 42m^3 of groundwater per day when the development is fully occupied which will be abstracted from the deeper major aquifer beneath the Project Site area.

This same aquifer is being widely exploited by other users in the project site area and any over-exploitation of this natural resource could potentially result in the depletion of this resource for all users. This could have a significant impact on water security in neighbouring communities.

This impact has been subject to further detailed assessment as detailed in **Table 85** and is ranked as of **MODERATE** significance.

Table 85: Assessment of Potential Impacts on Community Water Security during Operation

Impact	Potential over abstraction of groundwater leading to a depletion of the natural resource and or a deterioration in groundwater quality.				
Impact Type	**Direct**	Secondary	Indirect	Cumulative	Residual
	The impact is a direct consequence of project activities.				
Likelihood	Extremely unlikely	Unlikely	**Low Likelihood**	Medium Likelihood	High Likelihood
	Whilst the development will be entirely dependent on groundwater sources for water supply the abstraction rate is relatively modest and on this basis it is assessed that there is a low likelihood that Project groundwater abstractions, when considered in isolation, will significantly deplete this natural resource.				
Receptor Sensitivity	Low	Low-Medium	Medium	**Medium-High**	High
	The major aquifer underlying the project site is a vital natural resource for the local area and considered vulnerable to over exploitation. Receptor sensitivity is assessed as Medium-High.				
Impact Nature	**Negative**	Positive	Neutral		
	The impact of over abstraction of groundwater is assessed as adverse.				
Impact Duration	Temporary	Short-term	**Long-term**	Permanent	
	Over exploitation of the aquifer could have long term implications for all users of this natural resource.				
Impact Extent	**Local**	Regional	Global		
	The impacts would most likely be restricted to the local (district) level.				
Impact Severity	Slight	Low	Medium	**High**	Critical
	The potential impact severity is assessed as high due to the importance of this resource to local communities and the potential long term consequences of over exploitation.				
Significance	Negligible	Minor	Moderate	**Major**	Critical
	The combination of a High Impact Severity and Low Likelihood will result in an overall **Moderate Impact.**				

9.3.2 Impacts of the Operation of the Project on Local Groundwater Quality

The scoping study has identified the potential for groundwater abstractions during the operational phase of the project to have a detrimental impact on groundwater quality as a consequence of over-exploitation. The project designers estimate that the project will require approximately 42m^3 of groundwater per day when the development is fully occupied which will be abstracted from the deeper major aquifer beneath the Project Site area.

This same aquifer is being widely exploited by other users in the project site area and any over-exploitation of this natural resource could potentially result in deterioration of the water quality due to factors such as saline intrusion. The Project Site is situated at the confluence of two major rivers that are characterised by brackish water quality, and over pumping has the potential to result in saline intrusion whereby the cone of depression reverses the hydraulic gradient and salty or brackish water migrate inland and contaminate the water supply.

This impact has been subject to further detailed assessment as detailed in **Table 86** and is ranked as of **MODERATE** significance.

Table 86: Assessment of Potential Impacts to Groundwater Quality during Operations

Impact	Over-exploitation of groundwater resource leading to deterioration in water quality.				
Impact Type	**Direct**	Secondary	Indirect	Cumulative	Residual
	Project activities have the potential to directly contribute to over-exploitation in the Project Site area.				
Likelihood	Extremely unlikely	Unlikely	**Low Likelihood**	Medium Likelihood	High Likelihood
	Whilst the development will be entirely dependent on groundwater sources for water supply the abstraction rate is relatively modest, and on this basis it is assessed that there is a low likelihood that Project groundwater abstractions (when considered in isolation) will represent a significant risk to groundwater quality.				
Receptor Sensitivity	Low	Low-Medium	Medium	**Medium-High**	High
	The major aquifer underlying the project site is a vital natural resource for the local area and considered vulnerable to over exploitation. Receptor sensitivity is assessed as Medium-High.				
Impact Nature	**Negative**	Positive	Neutral		
	The impact of groundwater quality deterioration is assessed as adverse.				
Impact Duration	Temporary	Short-term	**Long-term**	Permanent	
	Saline intrusion will result in long term detrimental impacts.				
Impact Extent	**Local**	Regional	Global		
	Project attributed impacts most likely local in nature.				
Impact Severity	Slight	Low	Medium	**High**	Critical
	The potential impact severity is assessed as high due to the importance of this resource to local communities and the potential long term consequences of over exploitation.				
Significance	Negligible	Minor	**Moderate**	Major	Critical
	The combination of a Medium Impact Severity and Low Likelihood occurrence rating will result in an overall **Moderate Impact.**				

9.3.3 Impacts of the Operation of the Project on Life and Fire Safety

The project will include an LPG gas storage compound to provide cooking gas to the restaurant and staff canteen. There will be no bulk storage of LPG at the Project Site and the maximum volume stored at any one time will reportedly not exceed 13m^3.

There are fire and explosion risks associated with the storage of LPG and the scoping study has identified a potential risk to Life and Fire Safety. This impact has been subject to further detailed assessment as detailed in **Table 87** and is ranked as of **MINOR- MODERATE** significance.

Table 87: Assessment of Potential Risks to Life and Fire Safety during Operations Phase

Impact	Intermediate storage of LPG and risk of possible explosion if the mixture of LPG and air is within the explosive limits and there is an ignition source.				
Impact Type	**Direct**	Secondary	Indirect	Cumulative	Residual
	LPG storage is a direct consequence of project activities.				
Likelihood	Extremely unlikely	**Unlikely**	Low Likelihood	Medium Likelihood	High Likelihood
	The gas will be stored in a secure dedicated compound and in accordance with supplier's specifications which will reduce the likelihood of accidental releases.				
Receptor Sensitivity	Low	Low-Medium	**Medium**	Medium-High	High
	The gas storage compound is situated adjacent to occupied areas.				
Impact Nature	**Negative**	Positive	Neutral		
	The impact nature of any accidental release is assessed as adverse.				
Impact Duration	Temporary	Short-term	**Long-term**	Permanent	
	Any adverse impacts could have long term effects.				
Impact Extent	**Local**	Regional	Global		
	Impacts would be relatively localised in nature.				
Impact Severity	Slight	Low	Medium	**High**	Critical
	The impact severity of any release event could be high and represent a risk to life and limb.				
Significance	Negligible	Minor	**Moderate**	Major	Critical
	The combination of a High Impact Severity and an Unlikely occurrence rating will result in an overall **Minor-Moderate Impact.**				

10.0 ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

10.1 ENVIRONMENTAL MANAGEMENT STRUCTURE & RESPONSIBILITY

10.1.1 Yoma Strategic Holdings

Yoma Strategic Holdings (YSH) is the parent company of PHL Hotel Management Ltd (Project Developer). **Plate 35** below details the YSH personnel at ***corporate level*** who are responsible for environmental, social and health and safety performance across the wider group of YSH subsidiaries in Myanmar, which includes SPA Project Management and PHL Hotel Management Ltd.

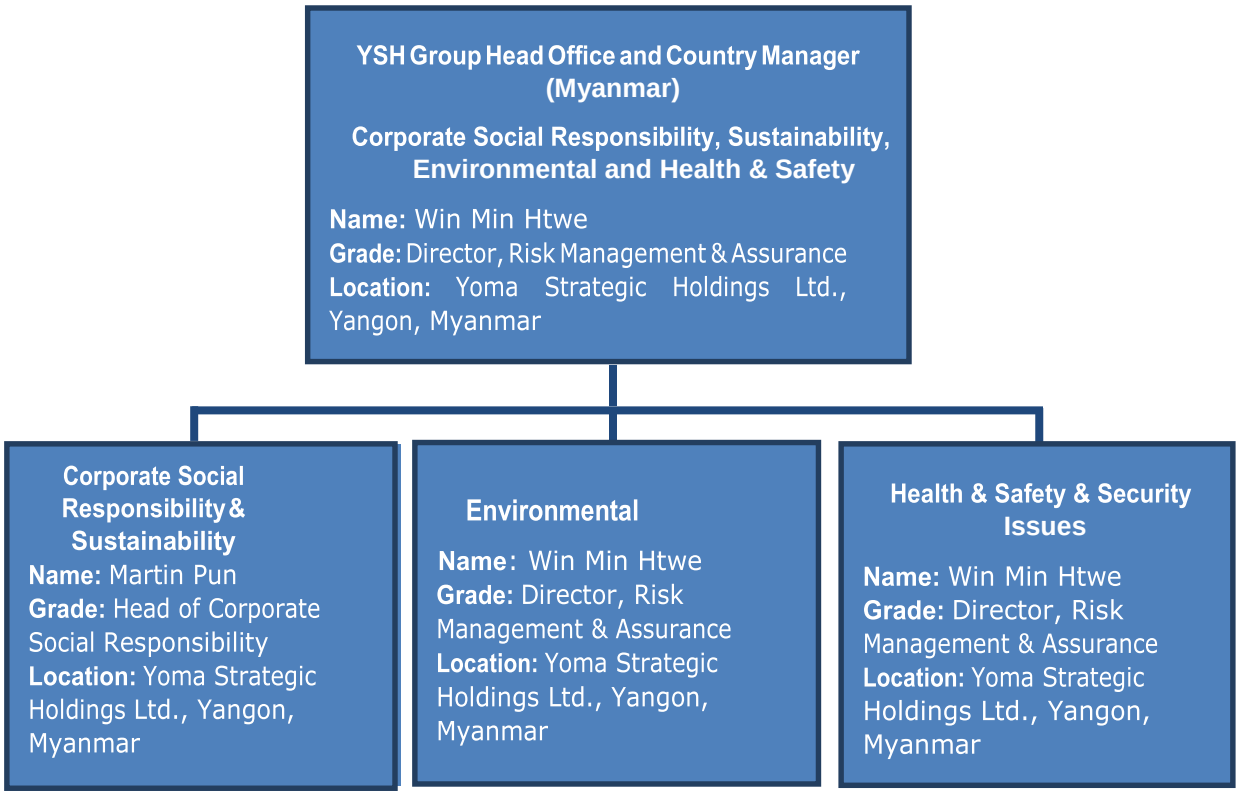


Plate 35: YSH Corporate CSR and EHS Assurance Structure

10.2 YSH ENVIRONMENTAL, HEALTH & SAFETY POLICY

Environmental, Health and Safety (EHS) Policy Objective

Yoma Strategic Holdings Ltd ("YSH") and its subsidiaries (together "the Group") have implemented its policy on 'Environment, Health and Safety' ("EH&S") in support of a Group wide Corporate Governance framework,to:

- Foster greater awareness of sustainable approaches across the Group;
- Enhance its capabilities to identify and manage adverse impacts from all business activities;

- Instill a culture of 'no harm, less pollution and wider conservation approaches to protect the environment' in all business operations.

Our commitment

In line with International Finance Corporation's (IFC) Performance Standards, the Asian Development Bank's (ADB) Safeguard policy, national environmental policies and other applicable laws, the Group is required to safeguard the environment by:

- Incorporating environmental and social considerations into business strategy, and allocate adequate resources to manage EH&S risks associated with projects;
- Promoting a safe, clean and healthy environment and better work culture to minimize any adverse environment, health, safety and social impacts arising out of operations;
- Establishing EH&S system and processes to adhere to and comply with applicable legislation, regulations and other requirements pertaining to environment, health, safety, labour and community at large:
- Optimizing energy and resources by way of minimizing wastes and increasing use of environmentally sustainable products, materials and services;
- Monitoring, reporting and improving of applicable procedures and performances (where required) regularly; and
- Communicating this EH&S Policy to all employees, contractors, suppliers and business partners.
- This EH&S Policy will be disseminated to all employees, contractors, suppliers and business partners.

10.3 YSH CORPORATE ENVIRONMENTAL & SOCIAL MANAGEMENT SYSTEM

YSH established and adopted an Environmental and Social Management System (YSH ESMS) in 2014. The ESMS was developed in line with accordance with the general requirements of the International Finance Corporation (IFC) Performance Standards and has been subsequently updated to comply with the Asian Development Banks (ADB) Safeguard Policy Statement (SPS) requirements. The ESMS document is in line with YSH' s corporate commitment to adhere to international standards and best practices with respect to environmental and social performance.

The ESMS establishes YSH's commitment to put in place adequate environmental, social and health and safety (EHSS) management systems and protocols that will help manage the EHSS risks arising from the various activities of the wider group and embed sustainability considerations into the business model.

10.3.1 YSH Environmental and Social Policy & Mission Statement

The Environmental and Social Management System (ESMS) is a set of management processes and procedures which allows YSH to analyse, control and reduce the environmental and social impacts of its activities. Through the effective implementation of their ESMS, YSH hopes to minimise risks and improve operational efficiency throughout their operations.

The YSH ESMS focuses on three key activities including human resources management, environmental management and occupational health and safety management. Specific systems for

managing community impacts and relations, including dealing with grievances are developed for special projects.

The ESMS allows YSH to analyse the environmental and social (E&S) impacts of its activities and help in managing its impacts by setting up an appropriate environmental and social policy for future growth. In alignment with the objectives of the E&S policy, which shall act as the centralised policy at the corporate level, the following policies of YSH effectively communicate the group's commitments to managing E&S risks and impacts in their operations:

- Code of Conduct ("the Code") that applies to all employees. The Code sets out the principles to guide employees in carrying out their duties and responsibilities to the highest standards of personal and corporate integrity when dealing with YSH, its customers, suppliers and the broader community;
- Occupational Health and Safety (OHS) Policy and Minimum Health and Safety Standards for Major Works; and
- Corporate Social Responsibility (CSR) strategy which defines the Group's commitment to giving back to the community. Even as the Group grows as a conglomerate, it remains committed in its efforts to help build a better society.

10.3.2 YSH ESMS Policy Framework

The YSH ESMS has been developed to comply with the following policy and regulatory requirements:

- Applicable Myanmar national, state and local regulatory requirements;
- The IFC Performance Standards (PS1 to PS8) Framework 2012 for Environmental and Social Sustainability;
- The World Bank Group General EHS Guidelines;
- ADB's Safeguard Policy Statement 2009;
- Other ADB's social policies and guidelines on:
  - 2011 Public Communications Policy;
  - 2001 Social Protection Strategy;
  - 2010 Gender mainstreaming guidelines; and
- Relevant International Labour Organization (ILO) conventions which are ratified by Myanmar government regarding labour standards and basic terms and conditions of employment.

10.3.3 YSH Framework for ESMS Implementation

The ESMS describes the process by which ESHS issues are identified at every stage of the project and details adequate mitigation measures, the institutional structure, resources and monitoring and control measures to be implemented. The ESMS describes the requirements for the following stages of a project.

- Environmental and social screening of potential projects;
- Environmental and social categorization of projects;
- Environmental and Social Due Diligence Assessments;
- Environmental and Social Impact Assessments;
- Ongoing monitoring of environmental and social performance;
- Labour and working conditions;
- Occupational health and safety (OHS);
- Land acquisition, resettlement, and livelihood restoration;
- Site selection and land procurement;
- Indigenous Peoples;
- Stakeholder engagement;
- Grievance mechanism for affected communities;
- Disclosure of information;
- Consultation and participation;
- Ongoing reporting to affected communities;
- Emergency preparedness and response;
- E&S requirements on contractors, sub-contractors, and primary suppliers;
- Pollution prevention;
- Biodiversity management;
- Resource efficiency and waste management;
- Waste minimization;
- Oil and hazardous materials usage and management;
- Climate change risk assessment;
- Institutional structure and capacity for ESMS implementation;
- Training programmes;
- Corporate monitoring and reporting programmes; and
- Continuous improvement: ESMS updating and modification

10.4 EMMP RESPONSIBILITIES

YSH Group has corporate level responsibility for monitoring the performance of all their staff and contractors with respect to the implementation of the Projects EMMP although compliance will be overseen at the Project level by the SPA Project Management Services (SPA) team who are the designated Principal Contractor for the Project with responsibility for environmental, health and safety matters at the Project Site level. Where the measures set out in the EMMP do not result in the achievement of the objectives, YSH and SPA will work with SLP Environmental to refine the measures as appropriate. The EMMP should be fully integrated into the SPA/PHL Hotel Management Ltd HSE management system, to ensure the following:

- Ownership of the plan, from the highest level;
- Appropriate resource allocation for implementation of the plan; and
- Effective implementation of the plan.

Responsibility for proper performance of the EMMP during the construction of the Project will be designated to the **Environmental Manager** (Mr. Chris Lewis). This Environmental Manager, together with the ESHS Country Manager (Win Min Htwe), will be responsible for delivering the commitments

contained within this EMMP. This will involve the incorporation of the commitments into the design, working practices and the overall management procedures of the Project during its construction and operational phases.

The Project Environmental team, in collaboration with the YSH Risk Management and Assurance team, will identify cases where any party fails to meet the requirements of the EMMP, and any unforeseen adverse environmental impacts arising as a consequence, and to take the necessary corrective actions. In keeping with local environmental law, the Group will provide its function in identifying cases where the project is failing to meet the requirements of IFC' s standards and recommend corrective actions.

The organisational structure that defines roles, responsibilities, and authority to implement the EMMP may vary during the project lifespan but will include designated in-house personnel to fulfil the following roles.

Project Director – ultimate responsibility for supervising the construction of the Project and monitoring the works undertaken by contractors and the Environmental Manager, and to ensure the works undertaken are in accordance with the specification and contractual requirements. This person is also responsible for ensuring that contractors and the environmental coordinator are implementing the environmental controls specified under the EMMP and for conducting periodic inspections and audits with other team members to check for compliance.

OHS Safety Manager - overall responsibility for the Health & Safety of employees, visitors and the public at the Project level. Duties include conducting regular inspections during construction, reporting to the Group on a regular basis, and supervising contractors' activities to ensure that occupational health and safety requirements are being met.

Environmental Manager - responsible for conducting the environmental monitoring program specified under the EMMP. The person should have the relevant qualifications and experience in environmental monitoring and compliance auditing. The environmental management and monitoring requirements specified under the Project EMMP should become an integral part of the overarching Environmental and Social Management System for the construction and operational phases of the Project.

Corporate Risk Management and Assurance – responsible for high level periodic audits and corporate reporting to ensure Project is being implemented in accordance with the requirements of both the Projects EMMP and YSH corporate commitments to responsible environmental and social performance.

The structure of the team tasked with ensuring compliance with the project specific EMMP is presented in **Plate 32** overleaf.

10.5 CONTRACTOR ENGAGEMENT/MANAGEMENT

In addition to the roles outlined above all contractors engaged on the Project will be required to nominate an individual to oversee day to day contractor conformance with the environmental management requirements of the EMMP. The contractors nominated Environmental and Health and Safety Supervisor should be suitably qualified and incorporated into the overarching EHS Management Team for the Project to ensure EMMP compliance from the ground level up.

The contractors Environmental and Health and Safety Supervisors should conduct internal compliance reviews and submit performance review reports to the Environmental Manager and the OHS Manager for the Project on a weekly basis. The Project Developer will work with, and influence, Project contractors to ensure that all contractors are aware of and competent with respect to the:

- Important baseline conditions to be aware of, focusing on the key sensitivities of the surrounding environment;
- Environmental and social impacts that could potentially arise from their activities;
- Necessity of conforming to the requirements of the EMMP (i.e. implementing the control and mitigation measures), in order to avoid or reduce those impacts;
- Roles and responsibilities to achieve that conformity, including with regard to change management and emergency response; and
- Documentation and reporting requirements and other ESMP compliance requirements.

Similarly, the Project will require that each of the contractors institute training programmes for its personnel. Each contractor is responsible for site HSE awareness training for personnel working on the job sites. The contractors are also responsible for identification of any additional training requirements to maintain required competency levels.

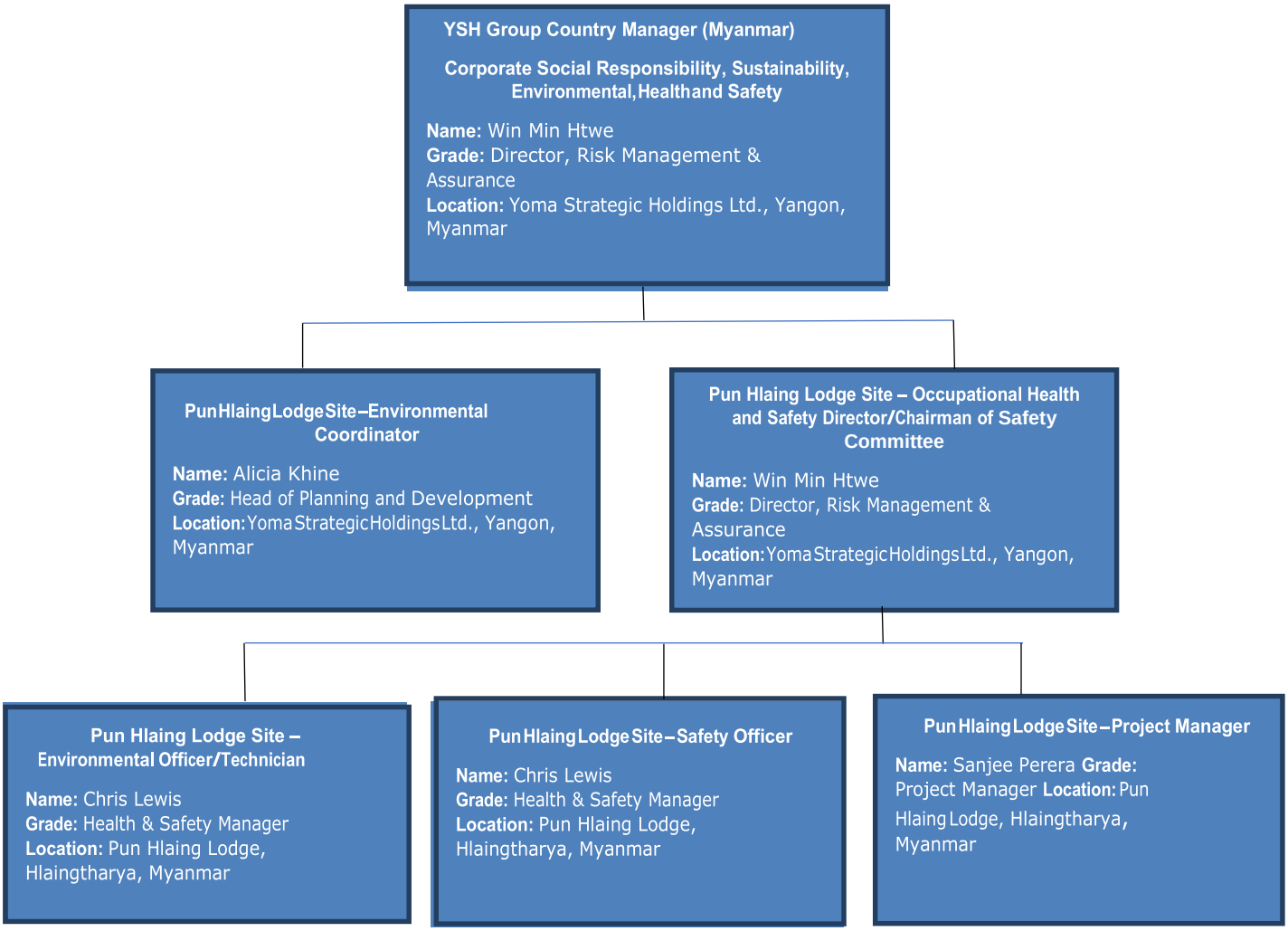


Plate 36: Personnel with Responsibility for ensuring compliance with EMMP at Corporate and Project Site Level

10.6 ENVIRONMENTAL TRAINING

All employees shall undergo general environmental awareness training and training about their individual requirements and responsibilities under the EMMP. For the workers and staff involved in the implementation, relevant environmental managers will identify the knowledge and skills necessary for implementation of the management systems and programs, and identify training requirements, in accordance with company's rules and regulations.

All persons responsible for undertaking work during the life of the project must be trained on the contents of the Project EMMP. The management team is responsible for identifying the knowledge and skills necessary for the implementation of the EMMP commitments and identifying any training requirements for the workers and staff involved in the implementation of the EMMP.

The training should ensure that all employees understand their obligation to exercise due diligence for environmental matters. Employees in this instance means all people working on-site including contractors and subcontractors.

Management should ensure that all site personnel have a basic level of environmental awareness training. The environmental awareness training should include but not be limited to:

- What is meant by "Environment";
- Why the environment needs to be protected and conserved;
- How construction activities can impact on the environment;
- What can be done to mitigate against such impacts;
- Familiarisation with the requirements of the EMMP;
- Awareness of emergency and spills response provisions;
- Environmental emergency response training;
- Familiarisation with site environmental controls;
- Social responsibility during construction; and
- Targeted environmental training for specific personnel.

Training schedules and roll out plans should be prepared in accordance with the requirements of the EMMP. Training material should be customised in accordance with the individual and project requirements. Training material may vary from written manuals, online programs, computer based training, face to face training, on the job training and audio lessons.

The need for additional or revised training should be identified and implemented from the outputs of monitoring and reviewing the EMMP.

Records of all training should be maintained and should include; i) who was trained, ii) when the person was trained, iii) the name of the trainer, and iv) a general description of the training content.

10.7 EMERGENCY CONTACTS

In the event of an environmental incident the following emergency contact numbers should be used. Any environmental incident should be reported to the Emergency Response Controller without delay. The Emergency Response Controller will take all necessary measures to ensure that all environmental incidents are dealt with in a rapid and appropriate manner. Emergency contact numbers are provided in **Table 88** overleaf.

Table 88: Emergency and Environmental Incidents Contact List

Emergency Contact	Contact Details
SPA Security Office	01-684323-(ex 1414)
Police Station	01-645018 / 01-645016
Myanmar Fire Brigade	01 666912
Labour Office	01 745026/ 01 68 5103
EPC (Township)	01684735/ 01687894

Township Administration Office	01-645013
Local Municipality	01-645024

10.8 ENVIRONMENTAL MANAGEMENT ACTIVITIES AND CONTROLS

For each of the key identified impacts presented in Section 9, the EMMP sets out the following in a tabular format:

- Impact source;
- Impact type;
- Key mitigation/control and enhancement measures;
- Key actions required to ensure mitigation/enhancement measures are implemented and the monitoring required to measure the effectiveness of their implementation;
- The timing of the implementation of the actions to ensure that the objectives of the mitigation are fully met;
- Suggested designation of responsibility for ensuring implementation of identified actions, and;
- Review activities required to verify the effectiveness of the EMMP.

Table 89 and **Table 90** overleaf outline the key elements of the Project's EMMP for the construction and operational phases of the Project.

Table 89: Construction Phase Environmental Management and Monitoring Plan (EMMP) for the Pun Hlaing Lodge Development Project

Activity/Source of Impact	Potential Impacts	Mitigation Measures	Significance of Residual Impacts	Specific Actions	Responsibility	Timing	Verification
Generator and other combustion engine emissions	Local air quality deterioration	Routine monitoring and maintenance of engines and all equipment to ensure optimal efficiency	Negligible	Implement and enforce machinery maintenance programme	SPA	Immediately and ongoing	Environmental Manager
Generator and other combustion engine emissions	Local air quality deterioration	Switch off all machinery when not in use - do not leave engines idling	Negligible	Conduct training for staff and contractor's on general environment awareness	SPA	Immediately and ongoing	Environmental Manager
Groundworks and onsite vehicle movements	Windblown dusts: Local air quality deterioration	Deploy water bowser onsite and keep site surfaces wetted down	Negligible	Conduct training for staff and contractor's on general environment awareness	SPA	Immediately and ongoing	Environmental Manager
Construction activities	Nuisance noise	Restrict primary noise generating activities to normal working hours (08.00 – 17.30)	Negligible	Conduct training for staff and contractor's on general environment awareness	SPA	Immediately and ongoing	Environmental Manager
Accidental leakage/spillage of hazardous substances	Soil and Groundwater Contamination	Construct dedicated storage areas with adequate secondary containment for all hazardous substances	Not Significant	Instruct contractor to build secure storage areas for hazardous substances(e.g. fuels, formwork oils)	SPA	Immediately	Environmental Manager
Accidental leakage/spillage of hazardous substances	Soil and Groundwater Contamination	Restrict handling of hazardous substances to trained personnel	Not Significant	Train all personnel in the safe handling and use of hazardous substances	SPA	Immediately	Environmental Manager

Activity/Source of Impact	Potential Impacts	Mitigation Measures	Significance of Residual Impacts	Specific Actions	Responsibility	Timing	Verification
Accidental leakage/spillage of hazardous materials	Surface water contamination	Construct dedicated storage areas with adequate secondary containment for all hazardous materials	Not Significant	Instruct contractor to build secure storage areas for hazardous substances (e.g. fuels, formwork oils)	SPA	Immediately	Environmental Manager
Stormwater runoff	Surface water contamination	Install silt traps at all temporary drainage discharge points	Not Significant	Instruct contractor to build silt traps at all stormwater discharge points	SPA	Immediately	Environmental Manager
Accidental spills and stormwater runoff	Surface water contamination	Monitor stormwater runoff quality	-	Collect stormwater runoff samples for laboratory analysis	SPA	Quarterly	Environmental Manager
Disposal of Hazardous Wastes	Community Health	Only use government licenced contractors to dispose of hazardous wastes	Not Significant	Commence procurement process to identify suitably licensed contractor	SPA	Immediately	Environmental Manager
Disposal of Hazardous Wastes	Community Health	Only consign hazardous wastes to facilities/premises that are licensed to dispose of and or treat hazardous wastes	Not Significant	Commence procurement process to identify suitably licensed disposal facilities	SPA	Immediately	Environmental Manager

Table 90: Operations Phase Environmental Management and Monitoring Plan (EMMP) for the Pun Hlaing Lodge Development Project

Activity/Source of Impact	Potential Impacts	Mitigation Measures	Significance of Residual Impacts	Specific Actions	Responsibility	Timing	Verification
Abstraction of groundwater for scheme supply	Over abstraction and depletion of natural resource Community water security	Implement water conservation measures and explore options for switching to municipal supply in the medium term	**Negligible** (if switch to municipal supply implemented in medium term)	Consult with local authorities to explore the feasibility of switching in the future from groundwater to municipal piped water as the supply source	PHL Hotel Management Ltd	Upon Construction completion	Environmental Manager
Abstraction of groundwater for scheme supply	Over abstraction and depletion of natural resource Groundwater Quality Deterioration	Implement water conservation measures and explore options for switching to municipal supply in the medium term	**Negligible** (if switch to municipal supply implemented)	Consult with local authorities to explore the feasibility of switching in the future from groundwater to municipal piped water as the supply source	PHL Hotel Management Ltd	Upon Construction completion	Environmental Manager
Disposal of Hazardous Wastes	Community Health	Only use government licenced contractors to dispose of hazardous wastes	Not Significant	Commence procurement process to identify suitably licensed contractor	PHL Hotel Management Ltd	Prior to operations commencing	Environmental Manager
Disposal of Hazardous Wastes	Community Health	Only consign hazardous wastes to facilities/premises that are licensed to dispose of and or treat hazardous wastes	Not Significant	Commence procurement process to identify suitably licensed disposal facilities	PHL Hotel Management Ltd	Prior to operations commencing	Environmental Manager

Activity/Source of Impact	Potential Impacts	Mitigation Measures	Significance of Residual Impacts	Specific Actions	Responsibility	Timing	Verification
Storage of flammable/explosive gases	Life and Fire Safety	Ensure a minimum safe distance between the LPG cylinders and any building, boundary line or fixed source of ignition	Negligible	Prepare specification for LPG installation	SPA	Immediately	Environmental Manager
Storage of flammable/explosive gases	Life and Fire Safety	Ensure that the installation and service pipework is regularly inspected and maintained	Negligible	Conduct regular inspections and maintenance of gas installation and associated equipment	PHL Hotel Management Ltd	Routinely during operations	Environmental Manager

10.9 SIGNIFICANCE OF RESIDUAL IMPACTS

Provided that the additional mitigation and management measures described in **Tables 89** and **90** described above are followed, there should be no significant residual environmental impacts associated with the Project.

Once the water supply is switched from groundwater to municipal piped supply the potential adverse impacts to groundwater resources/community water security will be downgraded from Moderate to **Negligible.**

10.10 ENVIRONMENTAL QUALITY MONITORING

Some potential environmental effects can be predicted with a degree of precision. A number of effects can, however, only be accurately evaluated once the activity commences (through impact monitoring). It is a requirement of the EMMP that environmental monitoring and reporting is conducted throughout the lifecycle of the Project.

Monitoring will be required in order to demonstrate compliance with relevant environmental quality standards and YSH's commitment to environmental and social performance. The environmental monitoring will also provide verification of the effectiveness of the control measures inbuilt into the Project design.

The key objectives of the environmental monitoring activities are as follows:

- To measure compliance with statutory environmental quality standards;
- To provide an early indication if any of the environmental control measures or practices are failing to achieve acceptable standards; and
- To provide a basis for continuous review and improvements to the operational monitoring programme.

In formulating the environmental monitoring programme, the following considerations and strategies have been applied:

- Consistent with internationally acceptable practices;
- Responsive to detect environmental changes/trends;
- Logistically practical; and
- Cost effective.

The following sections outline the recommended environmental monitoring activities for the construction and operational phases of the Project. It is recommended that SPA and PHL Hotel Management Ltd make due budgetary and resourcing allowances to facilitate the implementation of the environmental management and monitoring measures detailed herein.

10.11 CONSTRUCTION PHASE ENVIRONMENTAL QUALITY MONITORING

The following environmental monitoring regime is recommended to be implemented for the construction phase of the Project.

10.11.1 Ambient Air Quality Monitoring

It is recommended that ambient air quality is measured on a ***quarterly basis*** at one location during the

construction phase of the Project in order to monitor the impact of Project activities on local air quality.

The proposed location of the ambient air quality monitoring station is shown on **Plate 33** below. The results of the monitoring activities should be compared against the Myanmar Ambient Air Quality Standards which can be found in **Section 2.4.1**.

10.11.2 Community Noise Level Monitoring

It is recommended that ambient noise levels are measured on a ***quarterly basis*** at one location during the construction phase of the Project in order to monitor the impact of Project activities on local noise levels.

The proposed location of the ambient noise level monitoring station is shown on **Plate 33** below. The results of the monitoring activities should be compared against the Myanmar Ambient Noise Quality Standards which can be found in **Section 2.6.1**.

10.11.3 Surface Water Quality

It is recommended that stormwater discharge quality is measured on a ***quarterly basis*** at two locations during the construction phase of the Project in order to monitor the impact of Project activities on local surface water quality.

The proposed locations for surface water sampling are shown on **Plate 33** below. The results of the monitoring activities should be compared against the Myanmar Construction Phase Water Quality Standards which can be found in **Section 2.5.1.**

10.11.14 Construction Waste Disposal Method

The project was designed to minimize the amount of materials going to landfills during construction by diverting the construction waste and demolition and land clearing debr is from landfill disposal. It also helps redirect recyclable recovered resources back to the manufacturing process and redirect reusable materials to appropriate sites. From the outset project waste is recognized as an integral part of overall materials management.

Moreover, the project developed and implemented a construction waste–management plan that at a minimum identifies and quantifies the materials generated during construction that is to be salvaged, recycled, refurbished, or diverted from disposal and notes whether such materials will be sorted on-site or comingled. Typical items would include recycled cardboard, metal, brick, acoustical tile, concrete, plastics, clean wood, glass, gypsum board, carpet and insulation, as well as doors and windows, ductwork, clean dimensional wood, paperboard, panelling, cabinetry and plastic used in packing, etc.

The project made a contract with Yangon City Development Committee (YCDC) to collect waste regularly and they have full responsible for their final waste disposal method.

Plate 37: Proposed Location of Construction Phase Environmental Monitoring Activities

10.12 CONSTRUCTION PHASE ENVIRONMENTAL MONITORING SCOPE AND PROGRAMME

Table 91 presents details the scope, location and frequency of environmental monitoring that is recommended to be undertaken during the **construction phase** of the Project.

Location ID	Coordinates	Parameters Measured	Frequency
SW1	47 Q 190656.51E 1864273.15 N	Surface Water	Organic & Inorganic Constituents
SW2	47 Q 190664.00 E 1864331.00 N	Surface Water	Organic & Inorganic Constituents
AQS1	47 Q 190677.00 E 1864242.00 N	Air	PM 10, PM 2.5, CO, NO_2, SO_2
NMS2	47 Q 190677.00 E 1864242.00 N	Noise	Sound level equivalent (Leq)

AAS: Ambient air quality monitoring station
NMS Noise monitoring station
SWM Surface water monitoring

10.13 OPERATIONS PHASE ENVIRONMENTAL QUALITY MONITORING

The following environmental monitoring regime is recommended for the **operations phase** of the Project.

10.13.1 Surface Water Quality

It is recommended that stormwater discharge water quality is measured at ***quarterly intervals*** at the

main stormwater outfall points into Diplomat Lake for the list of parameters presented in Section **2.5.1 Table 4.**

10.14 ENVIRONMENTAL COMPLIANCE AUDITING

Regular EMMP compliance audits should be undertaken by the YSH and SPA EHS Quality Assurance Team during the construction phase of the Project. Once the Project is handed over to PHL Hotel Management Ltd the responsibility for compliance with the operational phase requirements of the EMMP passes to them.

The audit and inspection frequencies will be established by YSH/SPA/ PHL Hotel Management Ltd, and increased or decreased according to the findings and the degree of confidence arising from the audit findings. Furthermore, independent third party audits shall be undertaken on a yearly basis to measure compliance with the EMMP. The EMMP will subject to on-going review and development as deemed necessary to ensure that it remains appropriate to all aspects of the Project. All audit findings will be reviewed by the YSH Corporate Social Responsibility, Sustainability, Environmental, Health and Safety Country Manager and where corrective actions are deemed necessary, specific plans (with designated responsibility and timing) will be developed aimed at continuous improvement in environmental, social and health and safety performance.

10.16 Disaster Risk Management and Contingency Planning

Pun Hlaing Lodge Hotel Management Prepared Disaster Risk Management and Contingency Plan to minimize the potential effects of disaster that is stated below.

Disaster Risk Management and Contingency Planning

Developed from a presentation by

Training Resource Group DRM Technical Adviser Asian Disaster Preparedness Center

Disaster Risk Management

- All activities which are undertaken to minimize the potential effects of disasters.
- Includes both pre-and post-disaster activities and how to manage them best.

Hazard Identification

Formal risk identification process for all departments:

- What is our problem?
- Type(s) of hazard(s)?
- Likelihood of occurrence (low, moderate, high)
- Impact (low, medium, high)
- Location: Where and how much of the community will this hazard affect
- Hazard Index (prioritize based on degree of impact and probability of occurrence)

What is our Problem? Internal Communication (wide spread property, loudspeaker?)

- Infrastructure – Escape Routes
- External Warning System
- Language Barriers

Type of Hazards

- Bushfire
- Cyclones, storm surge
- Fire
- Flood
- Medical emergency
- Pandemic
- Serious Transport accidents
- Severe weather / storm damage
- Tsunami
- Chemical, biological & radiological accidents
- Civil disorder
- Earthquake
- Hazardous substances incidents
- Bombs
- Structural instability
- Terrorism
- Toxic emission

Hazards

	Likelihood of occurrence	**Impact (low, medium, high)**	**Location: (involving community)**	**Hazard Index**
Severe Weather conditions	High	Moderate	Partly	2
Pandemic	Moderate	High	All	4
Bushfire	Low	High	Partly	2
Terrorist Attack	Medium	Medium	Few	2
Fire	Moderate	High	Partly	4
Cyclones, Storm Surge	Medium	High	Mostly	3
Flood	Moderate	High	Mostly	3
Medical Emergency	High	Medium (dependent on situation)	Few	3
Serious Transport Accident	High	Low	Few	1

Strategic Goals

Reducing loss of life and personal injury from hazards

Minimizing damage resulting from the impact of hazards

Disaster Emergency Plan

Must be flexible enough to:

- Identify required changes to policies that increase vulnerability
- Create new mitigation initiatives and policies to address the problems identified.
- Match programs to vulnerable areas

Adoption

It is important that the Plan is approved and accepted by all stakeholders including owners, all level of management, staff and the local community (as much as is practical and possible)

Monitoring

The Plan must be regularly reviewed to ensure its currency and relevance to current situations.

Establish monitoring and evaluation procedures to:

- Assess the success of the plan.
- Identify shortfalls.
- Address problem areas.
- Assess changing levels of vulnerability

Relationships with Government Department

- The Hotel will be relying on Government services to assist to manage and recover from the disaster.
- Need to meet ASAP with police, fire and emergency preparedness people on a regular basis.

During a Crisis: Minimizing Damage

The first 24 hours of a crisis are crucial

What information needs to be included in the Emergency Plan?

Section One (Key Elements)

- What is the purpose and objectives of the document?
- A listing of all identified potential emergency situations
- An overview of emergency resources at the site
- Detailed Emergency Response procedure (Initial Notification protocol)
- An evacuation procedure
- Contingency and post incident considerations

Section Two (Specific advice regarding individual Hazards):

- Preparedness
- Response
- Recovery
- Reconstruction
- Development
- Prevention
- Planning

Section Three (supporting Documentation)

- Emergency Control Organization contact list (Warden list)
- External Services contact list
- Site Plan
- A listing of any definitions within the plan
- A Training Appendix

Minimum compliance to be aware from Sanderson Phillips Limited (Hotel Safety Assessment Consultants):

General				
Number of floors including ground:	**5**	Number of Rooms:		**46**
Are the corridors and stairways external/outside of the buildings?		Yes	No	
Does the hotel possess the obligatory national certificates including fire, hygiene, electricity and gas?		Yes	No	
Do any accommodation units have individual gas water heaters, gas fires or gas cookers?		Yes	No	
Do any accommodation units have log/wood burning stoves or open wood/ coal fires?		Yes	No	
Is the main gas boiler (for hot water/ radiators) located next to any bedroom accommodations?		Yes	No	
Does the hotel have current Public Liability insurance cover?		Yes	No	
Are bedroom balconies over 1.0 m high with no gaps in excess of 10 cm and without step-ups for young children?		Yes	No	**N/A**
Fire Safety				
Is the hotel equipped with manual fire alarms (break glass, push button)?		Yes	No	
Are smoke detectors located in the bedrooms?		Yes	No	
Are smoke detectors located in the bedroom corridors?		Yes	No	
Are there clear Exit signs throughout the escape routes?		Yes	No	**N/A**
Can all ground floor emergency exit doors be opened from the inside, without the use of a key?		Yes	No	**N/A**
Are there fire extinguishers in the corridors or close at hand?		Yes	No	
Is there emergency back-up lighting to illuminate escape routes?		Yes	No	
Food Hygiene				
Do all kitchen staff receive personal hygiene and food handling training?		Yes	No	
Are raw and cooked meats stored and prepared in separate areas?		Yes	No	

FIRE

According to NFPA (National Fire Protection Association), 3700 fires occur in hotels each year. Of all those incidents, 45% were caused by cooking equipment and the rest were mainly by smoking materials, clothes dryer, washers and heating equipment, leaving a small percentage caused by electricity.

Types of fires:

The different types of fires are called classes, as shown below:

- Class A: ordinary combustibles like cloth, wood, and paper (Can use water)
- Class B: flammable liquids like grease, gasoline, and oil. Do not use water!!
- Class C: electrical appliances and tools. Do not use water!!
- Class K (kitchen): vegetable oils, animal oils, or fats in cooking appliances. Do not use water!!

Prevention measures to decrease chance of causing a fire:

A regular inspection of all fire protection systems is required to maintain a low risk of occurring a fire hazard:

- Fire evacuation routes (Signs)
- Fire extinguishers

Very important to check everything for potential need of executing the PEEP (bottom of p.7)

In addition, it is essential to inspect and replace old/current (or faulty) electronic equipment to confirm the absence of a potential fire starter and kindling.

Potential fire starter:

- Faulty plugs
- Kitchen equipment
- Heating equipment
- Dishwasher
- Washing machine
- Clothes dryer

Potential kindling:

- Furniture (if not fire resistant)
- Wood
- Paper

To be prepared we need to:

1. Carry out a fire risk assessment (Section III)

   This report identifies the hazard, determines the measures to be applied and Reviews and updates all materials

2. Appoint Fire Wardens
   Responsibilities described below

3. Train staff to be prepared (always expect the worst)

   Training biannually is essential for the preparedness of the staff, in addition, it reduces the potential panic and anxiety in case of a crisis.

4. Know the fire escape routes by heart

5. Execute the evacuation strategy
6. Provide information to the guests (guest directory)
7. Execute the PEEP (Personal Emergency Escape Plan)

Fire Wardens Responsibility:

- Updating a fire evacuation and emergency plan.
- Ensuring that fire-fighting and safety equipment has been properly installed.
- Ensuring that said equipment is always readily available and in good working order.
- Carrying out fire risk assessments.
- Carrying out fire drills and assessing results.
- Taking swift, appropriate action in the event of a fire, i.e. evacuation and fighting fires.
- Monitoring fire safety at all times.
- Actively adopting good fire safety practices.
- Checking all fire doors

Fire Warden's role during a fire evacuation:

- Instruct people to leave the area via the safest route and offer assistance.
- Search the area to confirm the absence of all guests and employees. It is also imperative to scout escape routes and make sure they have not been compromised before sending people onto them.
- Minimize risks. Confine the fire if possible.
- Decide whether you can fight the fire safely.
- Report to and cooperate with others who are also in charge of fire safety. Communication with other fire wardens and emergency services is key to a successful execution of the Fire Escape Plan.
- Report to assembly points and take roll calls. Once you've evacuated the Yurts. If a person is absent inform the emergency services.
- Remember: REMAIN CALM, if guests see that fire wardens panicking, they will panic as a result. Remaining calm and reserved is key to a smooth escape.

PEEP:

In summary, the PEEP (Personal Emergency Evacuation Plan) focuses on aiding the guests with disabilities, whether assisting unsighted guests or helping people on wheelchairs. (to be developed and updated by the fire warden.)

Specific Advice

Preparedness

- Identify assembly points
- Fire detection training
- Alarm tests
- Firefighting team established
- Evacuation Routes Determined
- Assembly points determined
- Communication centre set up

Response

- Identification of Location
- Assessment of Scale of Fire
- Fire Fighting / Evacuation
- Row call: Guests/ Staff
- First Aid
- Prevent Access
- Redirect Arrival Guests
- Design Spokesperson

Recovery

- Assessment of Loss and Damage
- Prioritizing of needs and actions
- Plan for the next stage/insurance/finances/time frame

Reconstruction

- Rebuild / Repair Structures
- Limit possible future reoccurrence
- PR all the way to reopening
- Re-establish services with community sensibility

Development

- Continue PR

Prevention

- Identify all elements linked to fire
- Incorporate all fire preventive technology and lessons identified
- Invest in community to rebuild confidence

Planning

- Review Training Procedures and Policies
- Implement Improvements

EARTHQUAKE

Earthquakes

An earthquake is caused by the movement of tectonic plates. Tension between them can lead to a sudden and violent shaking of the ground. It may last for seconds, to five minutes. Aftershocks may occur. Aftershocks are the reoccurrence of a lighter shaking of the ground after the min earthquake.

Severe earthquakes may cause loss of life, injuries, property damage, disruption of business, disrupt transportation and communications, as well as damage to gas and power lines.

Earthquakes alone cannot kill anyone.

Earthquakes is the source of the problem, however it is the consequences of the earthquake that are very dangerous, for example:

- Partial building collapse.
- Flying glass from broken windows.
- Overturned bookcases, filing cabinets, fixtures, furniture, office machines and appliances.
- Fires, broken gas lines and similar causes. The danger may be aggravated by lack of water due to broken mains.
- Fallen power lines.
- Inappropriate actions resulting from panic.
- Potential tsunamis

Measurements of the strength of earthquakes:

Earthquakes are measured in terms of "magnitude" on the Richter scale.

Richter Scale	Earthquake Effects	Frequency of Occurrence
4.0-4.9	Noticeable shaking of indoor items, rattling noises. Significant damage unlikely.	6,200 per year (est.)
6.0-6.9	Can be destructive in areas up to about 100 miles across in populated areas.	120 per year
7.0-7.9	Can cause serious damage over larger areas.	18 per year
8.0-8.9	Can cause serious damage in areas several hundred miles across.	1 per year
9.0-9.9	Devastating in areas several thousand miles across.	1 per 20 years
10.0+	Never recorded; see below for equivalent seismic energy yield.	Extremely rare (unknown)

Preventive Maintenance

FIRE RISKS:

Generator rooms, Oil tanks, gas bottles, electricity lines (etc.) are fire risks during an earthquake

UTILITIES:

Beware of the locations of all electrical main switches and gas shut-off valves and know how to turn off these utilities.

STORAGE:

Large and heavy objects should be stored on lower shelves to prevent injury from falling during an earthquake. Chemicals should never be stored near places of potential ignition.

INSTRUCTIONS:

It is important to ensure that all staff and line employees are familiar with the Emergency Procedures and know what to do in the event of an earthquake.

Specific advice:

- Preparedness
- Earthquake and Tsunami Awareness Training
- Alarm Tests

- Evacuation Team established
- Evacuation Routes Determined
- Assembly points determined
- Communication Center set up
-

Response

- Identification of Earthquake location
- Assessment of Earthquake magnitude
- Guest education
- Firefighting, preventing collapse, etc.
- Evacuation if necessary (Tsunami)
- Row call: Guests/ Staff
- First Aid
- Prevent Return before it is safe
- Redirect Arrival Guests
- Design Spokesperson

Recovery

- Assessment of Loss and Damage
- Prioritizing of needs and actions
- Plan for the next stage/insurance/finances/time frame

Reconstruction

- Rebuild / Repair Structures
- Limit possible future reoccurrence
- PR all the way to reopening
- Reestablish services with community sensibility

Development

- Continue PR

Prevention

- Identify all shortfalls during warning, recognition and evacuation
- Incorporate all lessons identified
- Invest in community to rebuild confidence

Planning

- Review Training Procedures and Policies
- Implement Improvements

GENERAL SAFETY RULES DURING AN EARTHQUAKE

DO NOT PANIC, REMAIN CALM!

If you stay calm you will be better able to assess the situation. Think through the consequences of any action you plan to take.

- IF YOU ARE INSIDE THE YURT – MOVE TO THE AREA ASSEMBLY!
- DO NOT RUSH OUTSIDE
- IF YOU ARE OUTSIDE, STAY THERE.
- Move away from the building, garage, walls, power poles, lampposts. Electric power lines are a serious hazard. If possible, proceed cautiously to an open area.
- IF YOU ARE IN A MOVING VEHICLE, STOP.
- AVOID FALLEN POWER LINES.

If located inside the hotel:

- Brace yourself in an inside corner, away from windows.
- Choose shelter which will provide an airspace if it collapses. If your furniture shelter moves, stay under it and follow it around the room.
- Watch for falling objects: plaster, bricks, light fixtures, pots and pans, etc.
- Stay away from tail shelves, china cabinets and other furniture which might slide or topple over.
- Stay away from windows, sliding glass doors, mirrors.
- Grab anything handy (blanket, pillow, tablecloth, newspapers, box, etc.) to shield your head and face from falling debris and splintering glass.
-

Within the first several minutes:

- DO NOT LIGHT MATCHES, candles, cigarettes, or turn on electrical switches.
- Protect hands and feet in all areas near broken glass or debris. Keep head and face protected (hardhat, blanket, tablecloth, etc.).
- Make a quick check for injuries or trapped people. Provide emergency first aid if needed.

- Turn off all appliances and office machines. Extinguish all open flames. Check power lines and cords.
- STAY ON HOTEL PROPERTY. You should not try to get home until Government Authorities say it is safe.
- Advise your family that you may be detained at work.
- DON'T GO OUT SIGHTSEEING. Keep streets clear for passage of emergency vehicles. Cooperate with requests for help from Police, Fire fighters, civil defense officials, and relief organizations. The hotel could possibly become a place of refuge for others in the area.
- If power is out, check freezers and refrigerated areas.
- DO NOT ALLOW UNQUALIFIED OR UNAPPOINTED STAFF TO SPEAK TO JOURNALISTS OR TO SPREAD RUMOURS. They can cause great harm in a disaster.

To diminish the risk of injuries, be prepared through training and apply everything written on the specific advice.

POTENTIAL DISEASES

Crisis Procedures for Avian Flu

Constant awareness and control will lead to the combat of Avian Flu!!

The Avian influenza or" Bird Flu" is a contagious bird disease (affects mostly domestic poultry) caused by influenza A viruses, one of these viruses is highly infectious to people. Unfortunately, we have little immunity to it.

Ten countries have had previously reported avian flu outbreaks, these outbreaks are thought to have significantly heightened the risk of another influenza pandemic. Since its emergence in poultry in Korea in mid-December 2003, this strain has infected poultry in many countries in Asia

Symptoms

Fever, cough, muscle aches, runny nose and sore throat.

- At an early stage, it is difficult to tell which infection is responsible for the symptoms, but the Avian Influenza appears to be more aggressive than normal influenza in causing pneumonia.
- Unfortunately, early symptoms are of many common respiratory illnesses and therefore, false alarms are likely.
-

How is Avian Influenza transmitted?

- Close contact with live infected poultry, or surfaces and objects contaminated by their droppings
- Currently no evidence that properly cooked poultry or eggs can be a source of infection.
- Transmission to people remains relatively rare

Pandemic Phases

The World Health Organization has divided a pandemic into "Phases".

Inter pandemic Period	
Phase 1	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infections or disease is considered to be low.

Phase 2	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.
Pandemic Alert Period	
Phase 3	Human infections with a new subtype. No human to human spread or at most rare instances at spread to a close-contact.
Phase 4	Small Closter(s) with limited human to human transmission. Spread is highly localized, suggesting that the virus is not well adapted to humans.
Phase 5	Larger cluster(s), but human to human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).
Pandemic Period	
Phase 6	Pandemic: increased and sustained transmission in general population.

Impact on business

Potential for downturn in travel and tourism:

- Resulting financial impact
- Travelers will most likely be advised not to travel to affected areas or countries
- International and regional travel restrictions may be imposed.
- Absences from work: Absence due to illness
- Absence due to workers may need time off to care for family members
-

Plans of Action

- Close monitoring of Health Authorities
- Communication of situation on a regional level with the Hygiene and Health Authorities and building awareness of the disease and its implications to staff members
- Assembling, of hygiene kits including disinfectants, cleaning equipment, thermometers and personal protective equipment for staff.
- Train staff and demand high standards of personal and environmental hygiene
- Implementing appropriate food preparation and storage methods•
- Risk avoidance by selecting reputable and reliable food suppliers
- Risk avoidance by not serving raw/partly cooked food

- Review of cleaning and disinfection techniques to minimize spread of infection through the hotel
- Securing a safe environment within the hotel through symptoms screening of guests and staff
- Taking action in compliance with Hygiene & Health Authorities on case management

Staff Canteen

- All utensils (chopsticks, spoons, forks) are to be changed to disposal type
- Paper napkins to be used
- Food to be served pre-portioned and in individual containers
- Self-service discontinued
- Staff should not be allowed to scoop rice or soup on their own
- Water fountain to be removed. Use only single use canned / pre-packaged drinks
- Paper cups to be used.
- D4 to be used for table top disinfection
- Anti-bacterial soap to be made available for hand washing
-

Clean linen handling

- To reduce the chance of potentially contaminated cleaned linen returned from laundry
- Cleaned laundry must covered with clean linen when in storage
- Laundry Dept must adhere to the proper temperatures when cleaning uniforms and linen
-

Food Handling for Kitchen, & F B Team

- In general, good hygiene practices during handling of raw poultry meat and usual recommended cooking practices for poultry products would lower any potential risk to insignificant levels.
- Eggs from infected poultry could also be contaminated with the virus and therefore care should be taken in handling shell eggs or raw egg products.
-

These are the basics.

The most commonly reported causes of food borne illnesses:

- A failure to cool / thaw food properly
- A failure to cook and hold food at the proper temperature
- Poor personal hygiene

It is everybody's responsibility as a team member to follow good sanitization and hygiene practices.

Receiving

At the receiving point all product deliveries should be thoroughly washed and checked for freshness and temperature abuse.

Storage

Once checked all delivered products should be quickly stored in proper clean temperature-controlled environments with the dates of expiry and other information marked on clear labeling. The "first-in first-out" stock rotation system should be strictly followed.

Guidelines to Preventing Cross Contamination

Prepare raw meat, fish, and poultry in separate areas from produce or cooked and ready-to-eat foods

- Assign specific equipment (cutting boards, utensils and containers) to each type of food products
- Clean and sanitize all work surfaces, equipment, and utensils after each task using a cleaner sanitizer

Meat, Fish & Poultry

- Use clean and sanitized work areas, cutting boards, knives and utensils
- Take out from the refrigerator / chiller only as much product as you can prepare at one time
- Always return prepared meats to the refrigerator / chillers as quickly as possible, cook them as soon as possible and store them at carefully controlled temperatures to suit the product

Fruit & Vegetables

Ensure that fruit and vegetable do not come into contact with any surfaces that have been exposed to raw meats and poultry

- Prepare fruit and vegetables away from raw meats, poultry, eggs and ready to eat cooked foods
- Wash fruits and vegetables thoroughly using a salad/garnish wash and sanitizer (identify and name the product) to remove dirt and other contaminants before cutting, cooking or combining with other ingredients
- Refrigerate sensitive fruits at recommended temperatures

Eight Rules of Safe Handling

- Practice Strict Personal Hygiene
- Monitor time and temperature
- Prevent cross-contamination

- Clean and sanitize food contact surfaces, equipment and utensils with sanitizer (identify and name the product) before and after every use, and at least every four hours during continuous use
- Cook foods to its required minimum internal temperature or higher
- Hold potentially hazardous hot foods at 63°C or higher and cold food at 5°C or lower.
- Cool cooked food from 63°C to 21°C within Two Hours and then from 21°C to 5°C or lower in an additional four hours, for a total of six hours cooling time.
- Reheat potentially hazardous food for hot holding to an internal temperature of 75°C for a minimum period fifteen seconds as quickly as possible.

Personal Protective Equipment (PPE)

Personal protective equipment must always be readily available for all those directly involved in cleaning operations. It must include:

- Face masks
- Disposable Gloves
- Rubber Gloves and aprons
- Hair Covers
- Eye protective ware (goggles)
- Boots or shoe covers
- The PPE stock must be stored where it can be readily accessed 24 hours a day, 7 days a week.

Hand washing

It is the single most important and effective component for preventing the transmission of infection. Running water and antibacterial hand soap with friction should be ideally used for at least 1 minute. It is important to dry hands after washing. A 70% alcohol-based hand rub solution after hand washing can be used. Hand washing must be done:

- After removing gloves
- Before and after guest contact or contact with potentially infected material
- After contact with blood, body fluids, human and animal excrements
- After cleaning a bathroom or a toilet area
- After using bath room
- After blowing / wiping nose
- Before eating and preparing food

Linen handling

- Laundry employees must wear full PPE when handling, bagging or counting linen that has been returned form bedroom
- Linen must be washed in a laundry with hot water and detergent, bleach may be added

if compatible with the detergent being used

- Wear disposable gloves and a facemask
- Use antibacterial hand soap for hand washing

Waste disposal

- Puncture proof and leak proof containers must be used
- Waste should be collected and double bagged for transport to a sealable container that can be locked when not in use

Cleaning and disinfection of environment and equipment

- Items and areas requiring cleaning and disinfection are:
- Bedside table, bed stand, accessible areas of bed and floors (use 0.1% sodium hypochlorite as disinfectant
- If any surface is grossly contaminated, pour 1% sodium hypochlorite first (name the product) and leave it for 10-15 minutes to be followed by cleaning and usual disinfection (using 0.1% sodium hypochlorite)
- Spray disinfectant is prohibited.

FOOD & BEVERAGE

- Closure of some F&B Outlets
- Opening hours of some F&B outlets to be reduced
- Limited service
- Concentrate on set menus
- Minimize the menu items of the overnight room service
- Reduced opening hours of the store room

At all times, you should observe the following

Avoid contact with live animal markets, poultry farms, dead migratory birds or wild birds showing signs of disease.

- Seek immediate medical attention if you develop the symptoms and have traveled to the affected provinces /countries or are in contact with persons diagnosed with Avian Flu.
- Be responsible. If you are not well, see the Hotel Nurse immediately.
- Observe personal hygiene: cover your mouth with tissue when you cough or sneeze, and wash your hands with disinfectants, liquid soap and water.

Other potential medical risks

Malaria

Merriam-Webster dictionary defines Maiaria as a disease caused by protozoan parasites in the red blood cells, transmitted by the bite of infected mosquitoes.

Malaria is the leading cause of morbidity and mortality in Myanmar. However, there has been considerable progress in decreasing the burden since the 1990s.

Symptoms

The symptoms are usually experienced 10 days to 4 weeks after the infection. These symptoms include:

- High fever
- Chills
- Shaking
- Extreme sweating
- Fatigue
- Body aches
- Headache
- Nausea, vomiting, and diarrhea
- Anemia
- Jaundice (yellowing of the skin and eyes)

Preventive Measures

- Train the nurse to understand what actions must be taken to cure this infection
- Mosquito net over the bed
- Spraying the net with a mosquito repellent product
- Wearing light colored pants and shirts
- Protect yourself with a hug repellent spray that contains more than 35% of a chemical called DEET
- Avoid going outdoors without protection in the evening, where mosquitos are typically more active

A medicine called "prophylactic" can help prevent Malaria (to be taken during the trip and for 1 to 4 weeks after).

Malaria treatment

Can be treated using prescription medicine depending on the type of malaria infection the location of the infection, the guest's age and the gravity of the sickness in the beginning of the treatment.

Dengue Fever

The dengue fever is a very weakening (debilitating) viral disease, transmitted by affected mosquitos. It is a disease that is very present in Myanmar, and expert have predicted a spike of dengue cases in Yangon with already 1,000 people affected (compared to last year's 270)

Symptoms

- Very high fever (>40 Celsius)
- Severe headache
- Pain behind the eye
- Severe pain in joints and muscles
- Continuous pain in the stomach, potential hemorrhage (internal bleeding)
- Nausea vomiting

Preventive Measures

Since it is also transmitted by mosquitos, the necessary preventive measures to be taken are the same as Malaria

Dengue Fever treatment

There is no specific treatment for the dengue fever, though treatment is given to protect from other bacterial or viral infections. Patients usually recover from the infection within a couple of weeks

Snakes

Myanmar, home to 40 different kinds of venomous snakes, has one of the highest incidences of death from snakebites. It is reported that there is between 14'000 and 42'000 snakebites a year.

Symptoms

If bitten and as envenomation progresses, the victim's symptoms include:

-
- Skin feels like its burning
- Excruciating pain in the affected limb
- Fever
- Nausea and vomiting
- Rapid pulse
- Increased thirst
- Weakness

- Numbness or tingling
- Intermittent loss of consciousness

If untreated, the snakebite may cause death!

Preventive Measures

- If a guest has been bitten, stop what you are doing and direct them immediately to the nearest Pun Hlaing Hospital (5 minutes' drive)
- If you notice a snake in the resort, remove it safety or guide as far from the guests as possible.
- Get safety equipment against snakes (ex: hooks, etc.)
- Killing the snake is always the last resort.

Snakebite treatment

If bitten by the most common deadly snakes in Myanmar (Russel's viper). It is necessary to receive antivenom within the first 1-3 hours after the bite has occurred. Otherwise the victim risks severe renal failure and death.

The treatment process for curing the patient will be decided by the doctor of hospital.

EVACUATION PROCEDURES AT NIGHT

SECURITY 1:

- Activate the bell of Fire ring continuously.
- Call fire brigade number
- Call ambulance or hospital
- Bring Master keys, flashlights, Walkie-Talkies, key box and jackets out to security entrance and give to Security Shift Leader as Chief Warden.
-

SECURITY 2: Front of the hotel.

- Guide the fire engines to the nearest hydrant and coordinate with the rescue team to carry victims out.
- Make sure no guest leaves the Assembly Area to the hotel before the announcement from Chief Warden.

SECURITY 3: Gate

- Call local police.
- Guide the police and assist them to prevent intruders
- Call Golf club for additional security

SECURITY 4: Supervisor or Shift Leader – Chief Warden

Security supervisor or shift leader will be the chief warden but must inform 1) Chief Warden, 2) Chief Warden, then GM and MOD (Manager on duty) of the situation

- Stay the evacuation message if necessary
- Announce the evacuation to all on duty staff and give tasks to them
- Phone call FO to evacuate guest rooms

STAFF 1: Preferred for receptionist

- Stay at the reception as long as possible to maintain telephone contact
- Phone call all guest rooms and villa with Evacuation message
- Take the following things to Assembly Area:
  - »Print-out the list of all in – house guests with balances,
  - »Guests passports
  - »Cash floats
  - »Important keys
- Unplug all electrical appliances
- Switch all computers off and go to Assembly Area after lobby is clear and all guests have been evacuated.

STAFF 2: Preferred for bell boy

- Go to Control point to get instruction from Security Shift leader
- Switch off electrical appliances at the lobby.
- Assist receptionist to do phone call to guest rooms and villa rooms with Evacuation message
- Instruct guest to go to Assembly Area.
- Conduct the roll call for all guests at the Assembly Area.
- Report to the Chief Warden.

STAFF 3: Preferred for HK (Housekeeping) staff.

- Go to the Control Point to get the task from Security Shift Leader.
- Switch off all the electrical appliances at the laundry area.
- Bring out the laundry inflammable chemical.
- Check staff area to make sure no staff stuck inside.
- Instruct guests to go to Assembly Area.

STAFF 4: Preferred for Restaurant Staff.

- Go to Control Point to get the instruction from Security Shift Leader.
- Switch off all electrical equipment in the restaurant (micros, fridge, coffee machine, ice machine), also in the Bar
- Help kitchen staff moving all gas containers in the restaurant out.
- Take logbook, turn off the main switch and close all the doors before leaving the restaurant.
- Bring the cash box at the time office then go to the Assembly Area and assist the guest list roll call.

STAFF 5 + 6: Preferred for kitchen staff.

- Go to the Control Point to get task from Security Shift Leader.
- Switch off all electrical equipment in the kitchen.
- Switch off the main valve of the gas supply.
- Moving all gas containers in the kitchen outside.
- Take the First Aid Kit at the Time Office.
- Go to Assembly Area and assist the Security 2 in front of the hotel for keeping order and stopping outsiders.
- Report to Chief Warden.

STAFF 7: Preferred for the Night Auditor

- Go to Control Point when hearing the fire alarm ring
- Responsibility to take back up tape and shut down server, collect important documents of Finance then go to Personnel Office to take Social insurance books of all staff (put in two bags) and laptop.
- Go to the Assembly Area to assist the guests' roll call.

STAFF 8: Preferred for Engineering Shift Leader

- Switch off electricity and air conditioning at affected area.
- Switch off all ventilation fans.
- Turn of all equipment in chiller plant.
- Close all the doors of the office and plant.
- Assist the firefighting operation

STAFF 9: Preferred for Engineering Staff

- Cut gas supply valve at main gas tank.
- Co-ordinate with bellboy to shut off the elevator
- Check power house for stand by condition.
- Assist the firefighting operation

GENERAL EVACUATION PROCEDURE (EVENING)

Around 35 up to more staff working including (Security, F&B (Food and beverage), FO (Front office), HK, KC (Kitchen), EN (engineering), GS (Guest Service))

Security Supervisors & Shift Leaders at this time will be the Chief Warden to decide and carry out the evacuation.

SECURITY 1:

- Activate the bell of Fire ring continuously.
- Call fire brigade number (as available)
- Call ambulance (or emergency rescue as required)
- Bring Master keys, flashlights, Walkie-Talkies, key box and jackets out to security entrance and give to Security Shift Leader as Chief Warden. Help the Chief Warden to write keys taken out & in on the control board
- Help the Finance, Accounting, Personnel bring out importance document, back up tape, server. Security inside will become the communication officer as well
- Control the fire alarm bell system and recorder for evacuation message.

SECURITY 2: Main entrance, front of security office.

- Guide the fire extinguisher truck to the nearest hydrant
- Make sure no staff and guest come back to the hotel before safe announcement
- Keep in touch with local police and staff to keep safe, protect from outsiders entering.

SECURITY 4: Supervisor & Shift Leader

- Declare the evacuation to all departments and give the Warden the specific tasks
- The last person leaves the area after closing all doors behind
- Takes position of the personnel manager to make roll call of how many staff & guests at the assembly point
- Make sure no guest & staff remain in and back to the hotel before the Chief Warden announce all clear

*FO department:

- Call each guest room by telephone to inform and advise of evacuation
- Print out the list of all in- house guest with balance
- Guest passport.
- Cash floats / cash boxes
- Important keys
- For "high rise", coordinate with Maintenance to take the lift down the ground floor and lock(bellboy)
- Unplug all the electric appliances, computers
- Bring the guest list, all documents out to the Assembly point

* HK department:

- Housekeeping warden assigns staff to evacuate guests to the assembly area
- Switch all the electric appliances
- Evacuate staff back of house
- Report to Chief Warden at the Assembly point

*Kitchen:

- Turn off the gas system, electric equipments
- Move the gas containers out with FB help
- Go to the assembly point

*FB department:

- Restaurant:

- Inform guest of the evacuation in place, advise them to move to the assembly area
- Switch off all electric equipment
- Help KC staff moving gas cylinders out of the restaurant / kitchen area
- Take any logbooks, close all doors and meet at the Assembly Area

Banquet (where applicable)

- Inform guests in the meeting room of the emergency status and evacuation
- Guide the guest to assembly points using exit staircase (no elevators)
- Switch off all electric sources in the Audio room.
- Check no guest in the rest room
- Make sure all doors are closed
- Concentrate at the Assembly point

*Guest Service:

- Check whether guests still remain in the sauna area to move them out
- Turn off electric source and close doors
- Coordinate and help the Reception to bring documents of importance, necessary items outside

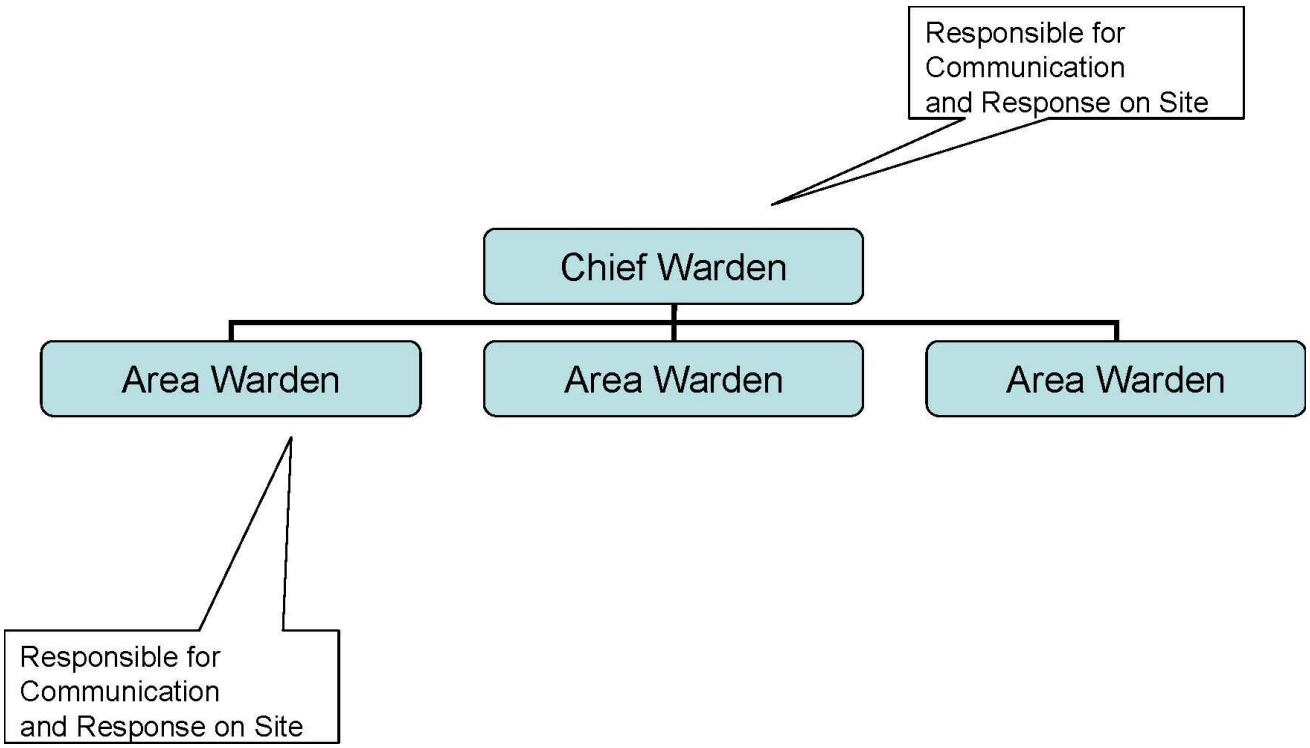
*Engineering (EN):

- Switch off electricity and air conditioning at the affected areas
- Cut gas supply valve at the main gas tank
- Switch off all ventilation fans
- Available for any assistance requested from the fire fighting operation, assist the evacuation process

General Evacuation Procedure (At Night)

It is very important to have a plan that allocate and gather the staff if a disaster occurs at night. This section should be developed and updated by the Chief Warden.

Emergency Response Structure



Chief Warden

Responsible for coordinating the on-site response to an emergency

- Ascertain nature of the emergency and determining appropriate response actions
- Ensure the safety of persons on site
- Ensure that appropriate emergency services have been notified
- Ensure that ECO personnel (wardens) are advised of the situation
- Coordinate deployment of wardens & staff
- Responsible for coordinating the on-site response to an emergency
- Initiate evacuation and controlled entry procedures (if necessary)
- Where safe to do so, take steps to contain or control the hazard
- Where applicable (and practicable) ensure smooth evacuation in accordance with Evacuation Plan
- Coordinate post-incident recovery / investigation strategies, including protection of any evidence material.
- Keep appropriate senior management informed on developments.

Area Warden

Oversee initial response to an emergency within a designated area, pending the arrival of the Chief Warden.
In the event of evacuation, Area Wardens must:

- Coordinate and implement safe evacuation of their area
- Check to ensure that each designated area has been completely vacated and promptly report results to the Chief Warden

Training and testing

Regular training for staff is essential

Training must be included:

- The roles and responsibilities of the emergency team
- Practical application of skills through formal exercises.
- Emergency Control Organization
- Designated personnel, responsibilities, identification / access control
- Site emergency systems and their use

Evacuation Plan

- Evacuation signal
- Assembly areas
- Designated control point
- Re-entry protocols & internal meeting point
- First Aid response
- Roles and responsibilities

Evacuation Guidelines

- Exits routes
- Directives
- Re-entry
- Media enquiries
- Dealing with disabilities
- Incident and procedures discussion
- For every training session, staff and attendants will need to sign in to prove their presence. Their will need to be photographic evidence.

Communication

Before a Crisis: Prepare for the Worst

- Never underestimate the possible harm a crisis can do to your tourism
- The best way to minimize the impact of a crisis is to be well-prepared.

Preparing a Communication Crisis Management Strategy

- Designate responsibilities in the chain of command for decision-makers.
- Collect a list of key contacts to be used in an emergency.
- Involve public services and private companies in the planning process.

The Victims

- First communication should be about what is being done to help the victims.
- The local community, as well as the employees are also victims

Press Communications

Department / Team

- Should include staff trained in working with the media
- The hotel should maintain a current contact list of local and international media.
- Preparing a mass e-mail computer directory capable of reaching media.
- Pro forma responses should be prepared and held in a readily accessible place
- Use the website to advise tourists of the state of disaster, emergency telephone numbers or other points of contact.

Spokespersons

- Response to media and guests is critical
- Should be a high-ranking official and in case of unavailability, additional spokespersons also need to be designated.
- It will be necessary to train spokespersons in mock news conferences and crisis rehearsals.

Demeanor

- Be Honest and Transparent. Protect credibility and adopt a policy of full disclosure about what is known and not known.
- Deliver the message. Do not cover up an incident or lie to the media.
- Anticipate what the reporters may ask and have the necessary responses ready.

Developing a disaster communications strategy

- Preparing for the worst before the event
- Managing the actual disaster/crisis
- Minimizing disruption immediately after a disaster/crisis

News Releases

- Do not impose a news blackout as this is only leads to speculation and often false or exaggerated reporting.
- With social media, news travels around the world in a matter of seconds. The Hotel has to respond as quickly as the media is reporting
- Release information as it becomes available – do not wait

The Website

- Contact with central IT personnel will ensure that the Internet allows the property to become its own news channel
- Identify what is being done to deal with the crisis / disaster.
- Be honest and factual.
- Update information on a daily basis at a minimum

On-Site Communication

- Lack of communication can be the single greatest source of concern among guests and managers alike.
- Small facilities may only need a place where staff checks in with a centralized manager on a routine basis.
- Facilities with in-house television should use these to make routine updates on the status of the disaster and hotel or resort's response.
- Simple bulletin boards are extremely effective in keeping guests and employees informed.
- Resort managers should be prepared with messengers, who can move between government centers with information on medical emergencies, fires, utility outages, and related immediate needs.

Following a Crisis: Recovering Tourist Confidence

- The damage caused by a crisis can stay in the minds of potential tourist for a long time.
- Recovery demands a doubling of efforts, especially in the areas of communication and

promotion.

- Proactive Communications
- Positive News
- Trips for Journalists
- New Market Products
- Special Price Offers

Ongoing Research

- It is important to understand what makes people continue to visit your property even after disaster.
- Get to know the people who are still visiting your property or the destination (who they are, where they come from and why they are traveling).
- Feed this information immediately to the advertising, sales and promotion department(s) or an advertising and PR agency.

Key Conclusions

- Planning and research are essential at all stages in the disaster management process.
- Being prepared for a disaster is an ongoing process of research, data collection, testing and training.
- Cooperation in research and promotion with all partners is crucial.
- Overcoming the crisis requires effective proactive communications.
- Speed of response is essential. Flexibility in marketing and promotion is the key to surviving a crisis situation.

11. Public Consultation and Information Disclosure

In order to ensure the public involvement, the following procedures were followed during IEE report preparation. IEE team also carried out interaction with local communities and related stakeholders during field survey to collect the public concerns and suggestions. The casual meeting is held at different stakeholders of proposed project site. The consultation results are shown as below.

Stakeholder Meeting
Location – The Campus, 1 Office Park, Pun Hlaing Estate, Hlaing Thayar
Date –

Government Organization and Department

No.	Name	Occupation	Department
1	U Aung Ko Latt	Assistant Director	GAD (Yangon North)
2	U Wint Phyo Hlaing	Second Officer	GAD (Hlaing Thayar)
3.	U Khin Maung Gyi	Director	City Development Committee
4	U Than Zaw	Village Administrator	Nyaung Ywar Village

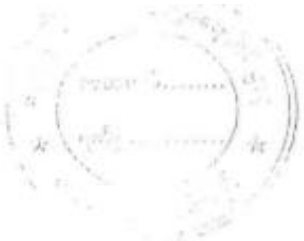
Local People

No.	Name	Address	Occupation
1.	Khin Sandar Win	Pun Hlaing Golf Estate	Manager

List of Participants

No.	Type of Participants	Total
1.	Government Organization and Department	4
3	Local People	3

Plate 38: Recommendation Letter from General Administration Department



ခ ရိုင် အုပ် ချုပ် ရေး မှူး ရုံး
(အ ထွေ ထွေ အုပ် ချုပ် ရေး ဦး စီး ဌာ န)
ရန် ကုန် မြောက် ပိုင်း ခ ရိုင်၊ အင်း စိန် မြို့
စာအမှတ်၊ ၁၈၆၃/ ၂ - ၉ / ၂၀၁၆
ရက်စွဲ၊ ၂၀၁၆ ခုနှစ်၊ ဧပြီလ ၂၈ ရက်

သို့

တိုင်းဒေသကြီးအစိုးရအဖွဲ့
ရန်ကုန်တိုင်းဒေသကြီး

အကြောင်းအရာ။ ပန်းလှိုင်ဟိုတယ် (Pun Hlaing Lodge) ဆောက်လုပ်ခြင်း လုပ်ငန်းခွင့်ပြုရန် လျှောက်ထားလာခြင်းကိစ္စ

၁။ ရန်ကုန်မြောက်ပိုင်းခရိုင်၊ လှိုင်သာယာမြို့နယ်၊ ညောင်ကွေးရွာအုပ်စု၊ ပန်းလှိုင်ဂေါက်ကွင်းအိမ်ရာ၊ Ever Green လမ်း၊ မြေကွက်အမှတ် (၅၂၈)တွင် ပန်းလှိုင်ဟိုတယ် (Pun Hlaing Lodge) ဆောက်လုပ်ခွင့်ပြုပါရန် ကွေးရွာအုပ်စုအုပ်ချုပ်ရေးမှူး၊ မြို့နယ်စည်ပင်သာယာအုပ်ချုပ်ရေးမှူးရုံး၊ မြို့နယ်လှုပ်စစ်ခါတ်အားပေးရေးအဖွဲ့၊ မြို့နယ်ရဲတပ်ဖွဲ့မှူးရုံးနှင့် မီးသတ်ဦးစီးဌာန (ရုံးချုပ်) တို့၏ ဆောက်ခဲ့ချက်များနှင့်အတူ ဘရိုက်တာဦးထွန်းထွန်းမှ လျှောက်ထားလာခြင်းအပေါ် လှိုင်သာယာမြို့နယ်အထွေထွေ အုပ်ချုပ်ရေးဦးစီးဌာနမှထောက်ခံတင်ပြလာပါသည်။

၂။ အဆိုပါ ပန်းလှိုင်ဟိုတယ် ဆောက်လုပ်ခွင့်လျှောက်ထားလာခြင်းနှင့်ပတ်သက်၍ (၂၇. ၄. ၂၀၁၆) ရက်နေ့ (၀၉၃၀) အချိန်တွင် အောက်ပါပုဂ္ဂိုလ်များပါဝင်သော အဖွဲ့ဖြင့် ကွင်းဆင်းစစ်ဆေးခဲ့ပါ သည် -

(က) ဦးအောင်ကိုလတ် လက်ထောက်ညွှန်ကြားရေးမှူး၊ ခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန ရန်ကုန်မြောက်ပိုင်းခရိုင်

(ခ) ဦးဝင့်ဖြိုးလှိုင် ဒုတိယဦးစီးမှူး၊ လှိုင်သာယာမြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန

(ဂ) ဦးခင်မောင်ကြီး အုပ်ချုပ်ရေးမှူး၊ လှိုင်သာယာမြို့နယ်စည်ပင်သာယာအုပ်ချုပ်ရေးမှူးရုံး

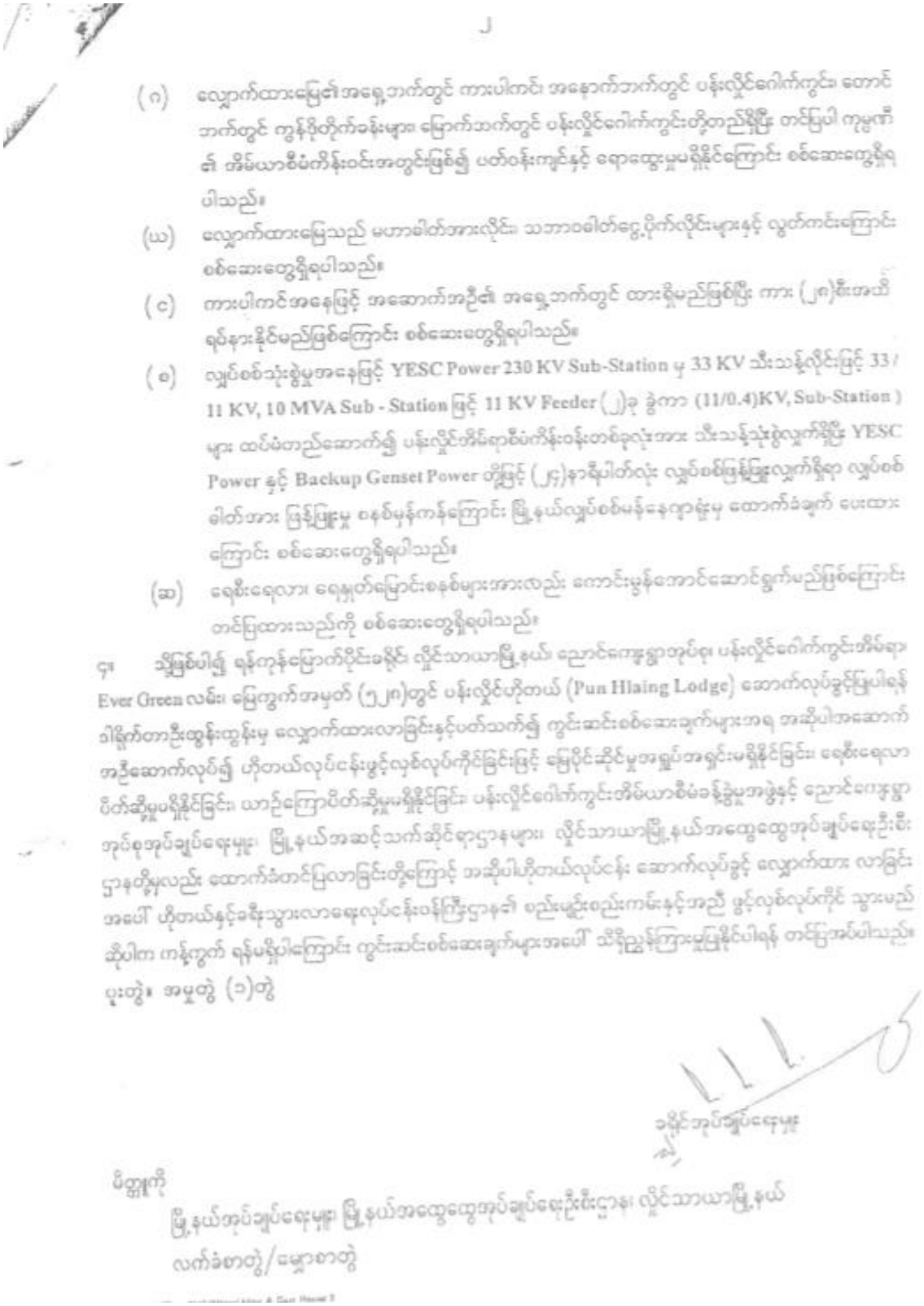
(ဃ) ဦးသန်းဇော် ကွေးရွာအုပ်စုအုပ်ချုပ်ရေးမှူး၊ ညောင်ကွေးရွာအုပ်စု လှိုင်သာယာမြို့နယ်

၃။ အထက်ပါ ပန်းလှိုင်ဟိုတယ် ဆောက်လုပ်ခွင့်ပြုပါရန် လျှောက်ထားလာခြင်းနှင့်ပတ်သက်၍ ကွင်းဆင်းစစ်ဆေးတွေ့ရှိချက်များအား အောက်ပါအတိုင်း တင်ပြအပ်ပါသည် -

(က) ပန်းလှိုင်ဟိုတယ် ဆောက်လုပ်ခြင်း လုပ်ငန်းလုပ်ကိုင်ခွင့် လျှောက်ထားလာသောမြေနေရာသည် လှိုင်သာယာမြို့နယ်၊ ညောင်ကွေးရွာအုပ်စု၊ ပန်းလှိုင်ဂေါက်ကွင်းအိမ်ရာ၊ Ever Green လမ်း မြေကွက်အမှတ် (၅၂၈)ရှိ ဧရိယာ (၂. ၁၉၆)ဧကဖြစ်ပြီး Pun Hlaing Lodge Limited အမည်ဖြင့် နှစ်(၆၀) မြေငှားဂရန်ရရှိထားသောမြေဖြစ်ကြောင်း စစ်ဆေးတွေ့ရှိရပါသည်။

(ခ) အဆိုပါမြေပေါ်၌ အလွှာ(၃၂၃. ၉)ဧကအနံ(၂၂၉)ပေ အမြင့် (၈၄. ၂)ပေရှိ Basement + ၆ ထပ် တိုက် အဆောက်အဦးအား ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ၊ အင်ဂျင်နီယာဌာနမှ (၁၃. ၁၁. ၂၀၁၅)ရက်စွဲပါစာအမှတ်၊ ၃၁၂၂/၃၁၂၀/စည်ပင်-ယာ(အဲ)ဖြင့် Service Apartment အဆောက်အဦဆောက်ခွင့်ပြုထားပြီး ယင်းအဆောက်အဦအား ဟိုတယ် အဆောက်အဦအဖြစ် ပြင်ဆင်ခွင့်ပြုရန် တင်ပြပြင်းဖြစ်ကြောင်း စစ်ဆေးတွေ့ရှိရပါသည်။

Plate 38.1: Recommendation Letter from General Administration Department



J

(ဂ) လျှောက်ထားမြေ၏အရှေ့ဘက်တွင် ကားပါကင်၊ အနောက်ဘက်တွင် ပန်းလှိုင်ဂေါက်ကွင်း၊ တောင်ဘက်တွင် ကွန်ပုံတိုက်ခန်းများ၊ မြောက်ဘက်တွင် ပန်းလှိုင်ဂေါက်ကွင်းတို့တည်ရှိပြီး တင်ပြပါ ကုမ္ပဏီ၏ အိမ်ယာစီမံကိန်းဝင်းအတွင်းဖြစ်၍ ပတ်ဝန်းကျင်နှင့် ရောထွေးမှုမရှိနိုင်ကြောင်း စစ်ဆေးတွေ့ရှိရပါသည်။

(ဃ) လျှောက်ထားမြေသည် မဟာဓါတ်အားလိုင်း၊ သဘာဝဓါတ်ငွေ့ပိုက်လိုင်းများနှင့် လွတ်ကင်းကြောင်း စစ်ဆေးတွေ့ရှိရပါသည်။

(င) ကားပါကင်အနေဖြင့် အဆောက်အဦ၏ အရှေ့ဘက်တွင် ထားရှိမည်ဖြစ်ပြီး ကား (၂၈)စီးအသိရှိနားနိုင်မည်ဖြစ်ကြောင်း စစ်ဆေးတွေ့ရှိရပါသည်။

(စ) လျှပ်စစ်သုံးစွဲမှုအနေဖြင့် YESC Power 230 KV Sub-Station မှ 33 KV သီးသန့်လိုင်းဖြင့် 33/11 KV, 10 MVA Sub - Station ဖြင့် 11 KV Feeder (၂)ခု ခွဲကာ (11/0.4)KV, Sub-Station များ ထပ်မံတည်ဆောက်၍ ပန်းလှိုင်အိမ်ရာစီမံကိန်းဝန်းတစ်ခုလုံးအား သီးသန့်သုံးစွဲလွှက်ရှိပြီး YESC Power နှင့် Backup Genset Power တို့ဖြင့် (၂၄)နာရီပါတ်လုံး လျှပ်စစ်ဖြန့်ဖြူးလျှက်ရှိရာ လျှပ်စစ်ဓါတ်အား ဖြန့်ဖြူးမှု ဝန်မှန်ကန်ကြောင်း မြို့နယ်လျှပ်စစ်မန်နေဂျာမှ ထောက်ခံချက် ပေးထားကြောင်း စစ်ဆေးတွေ့ရှိရပါသည်။

(ဆ) ရေစီးရေလာ၊ ရေနုတ်မြောင်းစနစ်များအားလည်း ကောင်းမွန်အောင်ဆောင်ရွက်မည်ဖြစ်ကြောင်း တင်ပြထားသည်ကို စစ်ဆေးတွေ့ရှိရပါသည်။

၄။ သို့ဖြစ်ပါ၍ ရန်ကုန်မြောက်ပိုင်းခရိုင်၊ လှိုင်သာယာမြို့နယ်၊ ညောင်ကွေးရွာအုပ်စု၊ ပန်းလှိုင်ဂေါက်ကွင်းအိမ်ရာ Ever Green လမ်း၊ မြေကွက်အမှတ် (၅၂၈)တွင် ပန်းလှိုင်ဟိုတယ် (Pun Hlaing Lodge) ဆောက်လုပ်ခွင့်ပြုပါရန် ခါရိုက်တာဦးထွန်းထွန်းမှ လျှောက်ထားလာခြင်းနှင့်ပတ်သက်၍ ကွင်းဆင်းစစ်ဆေးချက်များအရ အဆိုပါအဆောက်အဦဆောက်လုပ်၍ ဟိုတယ်လုပ်ငန်းဖွင့်လှစ်လုပ်ကိုင်ခြင်းဖြင့် မြေပိုင်ဆိုင်မှုအရှုပ်အရှင်းမရှိနိုင်ခြင်း၊ ခရီးရေလာပိတ်ဆို့မှုမရှိနိုင်ခြင်း၊ ယာဉ်ကြောပိတ်ဆို့မှုမရှိနိုင်ခြင်း၊ ပန်းလှိုင်ဂေါက်ကွင်းအိမ်ယာစီမံခန့်ခွဲမှုအဖွဲ့နှင့် ညောင်ကွေးရွာအုပ်စုအုပ်ချုပ်ရေးမှူး၊ မြို့နယ်အဆင့်သက်ဆိုင်ရာဌာနများ၊ လှိုင်သာယာမြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာနတို့မှလည်း ထောက်ခံတင်ပြလာခြင်းတို့ကြောင့် အဆိုပါဟိုတယ်လုပ်ငန်း ဆောက်လုပ်ခွင့် လျှောက်ထား လာခြင်းအပေါ် ဟိုတယ်နှင့်ခရီးသွားလာရေးလုပ်ငန်းဝန်ကြီးဌာန၏ စည်းမျဉ်းစည်းကမ်းနှင့်အညီ ဖွင့်လှစ်လုပ်ကိုင် သွားမည်ဆိုပါက ကန့်ကွက် ရန်မရှိပါကြောင်း ကွင်းဆင်းစစ်ဆေးချက်များအပေါ် သိရှိညွှန်ကြားမှုပြုနိုင်ပါရန် တင်ပြအပ်ပါသည်။ ပူးတွဲ။ အမှုတွဲ (၁)တွဲ

ခရိုင်အုပ်ချုပ်ရေးမှူး

ဖိတ္တုကို

မြို့နယ်အုပ်ချုပ်ရေးမှူး၊ မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ လှိုင်သာယာမြို့နယ်

လက်ခံစာတွဲ/မှတ်စာတွဲ

Plate 38.2: Recommendation Letter from General Administration Department

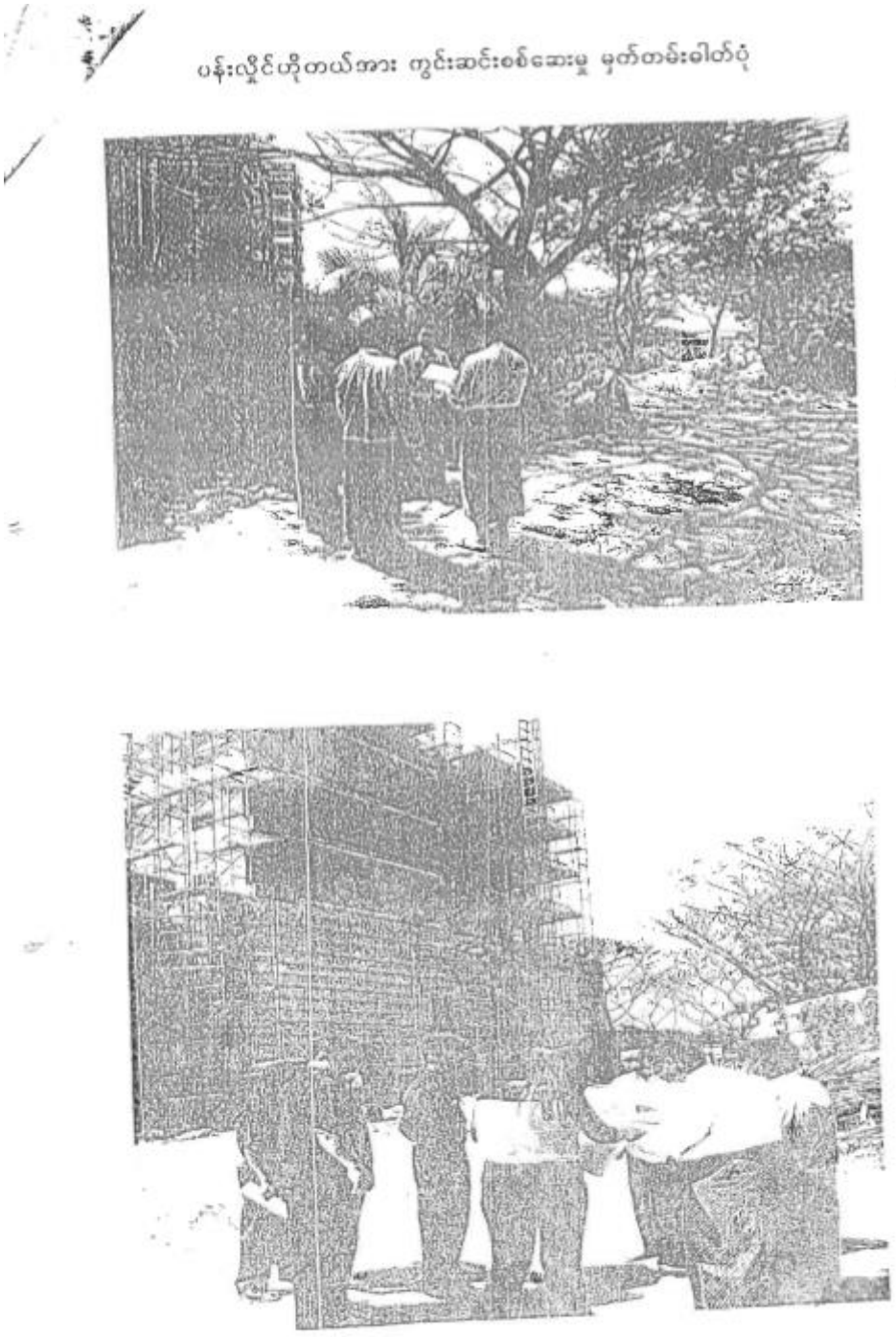
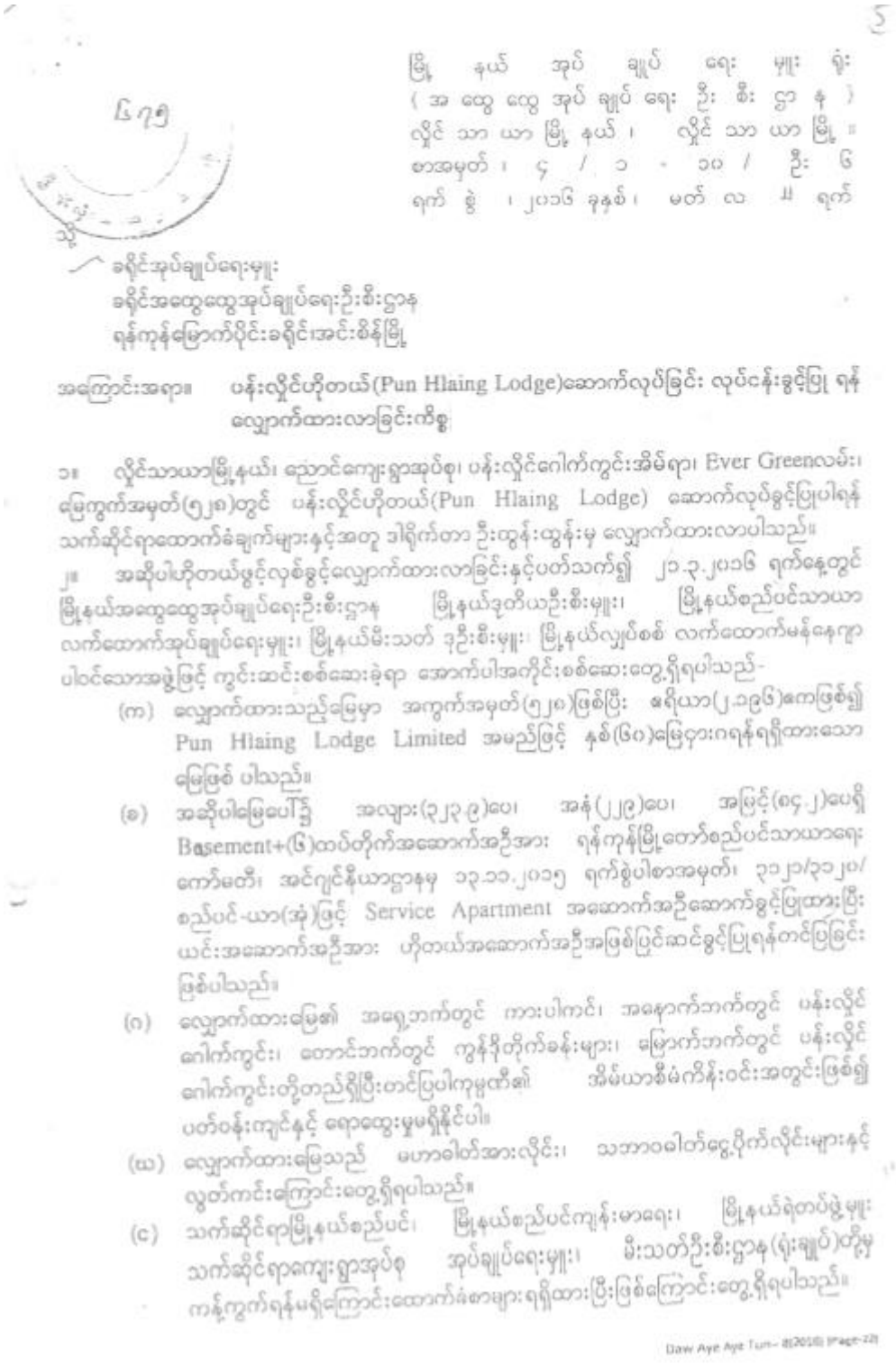


Plate 39: Recommendation Letter from General Administration Department (Hlaing Thayar)



မြို့ နယ် အုပ် ချုပ် ရေး မှူး ရုံး
(အ ထွေ ထွေ အုပ် ချုပ် ရေး ဦး စီး ဌာ န)
လှိုင် သာ ယာ မြို့ နယ် ၊ လှိုင် သာ ယာ မြို့ ။
စာအမှတ် ၊ ၄ / ၁ - ၁၀ / ဦး ဖ
ရက် စွဲ ၊ ၂၀၁၆ ခုနှစ် ၊ မတ် လ ၂၂ ရက်

ခရိုင်အုပ်ချုပ်ရေးမှူး
ခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန
ရန်ကုန်မြောက်ပိုင်းခရိုင်၊အင်းစိန်မြို့

အကြောင်းအရာ။ ပန်းလှိုင်ဟိုတယ်(Pun Hlaing Lodge)ဆောက်လုပ်ခြင်း လုပ်ငန်းခွင့်ပြု ရန် လျှောက်ထားလာခြင်းကိစ္စ

၁။ လှိုင်သာယာမြို့နယ်၊ ဧရာင်ကျေးရွာအုပ်စု၊ ပန်းလှိုင်ဂေါက်ကွင်းအိမ်ရာ၊ Ever Greenလမ်း၊ မြေကွက်အမှတ်(၅၂၈)တွင် ပန်းလှိုင်ဟိုတယ်(Pun Hlaing Lodge) ဆောက်လုပ်ခွင့်ပြုပါရန် သက်ဆိုင်ရာထောက်ခံချက်များနှင့်အတူ ဒါရိုက်တာ ဦးထွန်းထွန်းမှ လျှောက်ထားလာပါသည်။

၂။ အဆိုပါဟိုတယ်ဖွင့်လှစ်ခွင့်လျှောက်ထားလာခြင်းနှင့်ပတ်သက်၍ ၂၁.၃.၂၀၁၆ ရက်နေ့တွင် မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန မြို့နယ်ဒုတိယဦးစီးမှူး၊ မြို့နယ်စည်ပင်သာယာ လက်ထောက်အုပ်ချုပ်ရေးမှူး၊ မြို့နယ်မီးသတ် ဒုဦးစီးမှူး၊ မြို့နယ်လျှပ်စစ် လက်ထောက်မန်နေဂျာ ပါဝင်သောအဖွဲ့ဖြင့် ကွင်းဆင်းစစ်ဆေးခဲ့ရာ အောက်ပါအကိုင်းစစ်ဆေးတွေ့ရှိရပါသည်-

(က) လျှောက်ထားသည့်မြေမှာ အကွက်အမှတ်(၅၂၈)ဖြစ်ပြီး ဧရိယာ(၂.၁၉၆)ကေဖြစ်၍ Pun Hlaing Lodge Limited အမည်ဖြင့် နှစ်(၆၀)မြေငှားဂရန်ရရှိထားသော မြေဖြစ် ပါသည်။

(ခ) အဆိုပါမြေပေါ်၌ အလျား(၃၂၃.၉)ပေ၊ အနံ(၂၂၉)ပေ၊ အမြင့်(၈၄.၂)ပေရှိ Basement+(၆)ထပ်တိုက်အဆောက်အဦအား ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီ၊ အင်ဂျင်နီယာဌာနမှ ၁၃.၁၁.၂၀၁၅ ရက်စွဲပါစာအမှတ်၊ ၃၁၂၁/၃၁၂၀/ စည်ပင်-ယာ(အုံ)ဖြင့် Service Apartment အဆောက်အဦဆောက်ခွင့်ပြုထားပြီး ယင်းအဆောက်အဦအား ဟိုတယ်အဆောက်အဦအဖြစ်ပြင်ဆင်ခွင့်ပြုရန်တင်ပြခြင်း ဖြစ်ပါသည်။

(ဂ) လျှောက်ထားမြေ၏ အရှေ့ဘက်တွင် ကားပါကင်၊ အနောက်ဘက်တွင် ပန်းလှိုင် ဂေါက်ကွင်း၊ တောင်ဘက်တွင် ကွန်ဒိုတိုက်ခန်းများ၊ မြောက်ဘက်တွင် ပန်းလှိုင် ဂေါက်ကွင်းတို့တည်ရှိပြီးတင်ပြပါကုမ္ပဏီ၏ အိမ်ယာစီမံကိန်းဝင်းအတွင်းဖြစ်၍ ပတ်ဝန်းကျင်နှင့် ရောထွေးမှုမရှိနိုင်ပါ။

(ဃ) လျှောက်ထားမြေသည် မဟာဓါတ်အားလိုင်း၊ သဘာဝဓါတ်ငွေ့ပိုက်လိုင်းများနှင့် လွတ်ကင်းကြောင်းတွေ့ရှိရပါသည်။

(c) သက်ဆိုင်ရာမြို့နယ်စည်ပင်၊ သက်ဆိုင်ရာကျေးရွာအုပ်စု မြို့နယ်စည်ပင်ကျန်းမာရေး၊ အုပ်ချုပ်ရေးမှူး၊ မြို့နယ်ရဲတပ်ဖွဲ့မှူး မီးသတ်ဦးစီးဌာန(ရုံးချုပ်)တို့မှ ကန့်ကွက်ရန်မရှိကြောင်းထောက်ခံစာများရရှိထားပြီးဖြစ်ကြောင်းတွေ့ရှိရပါသည်။

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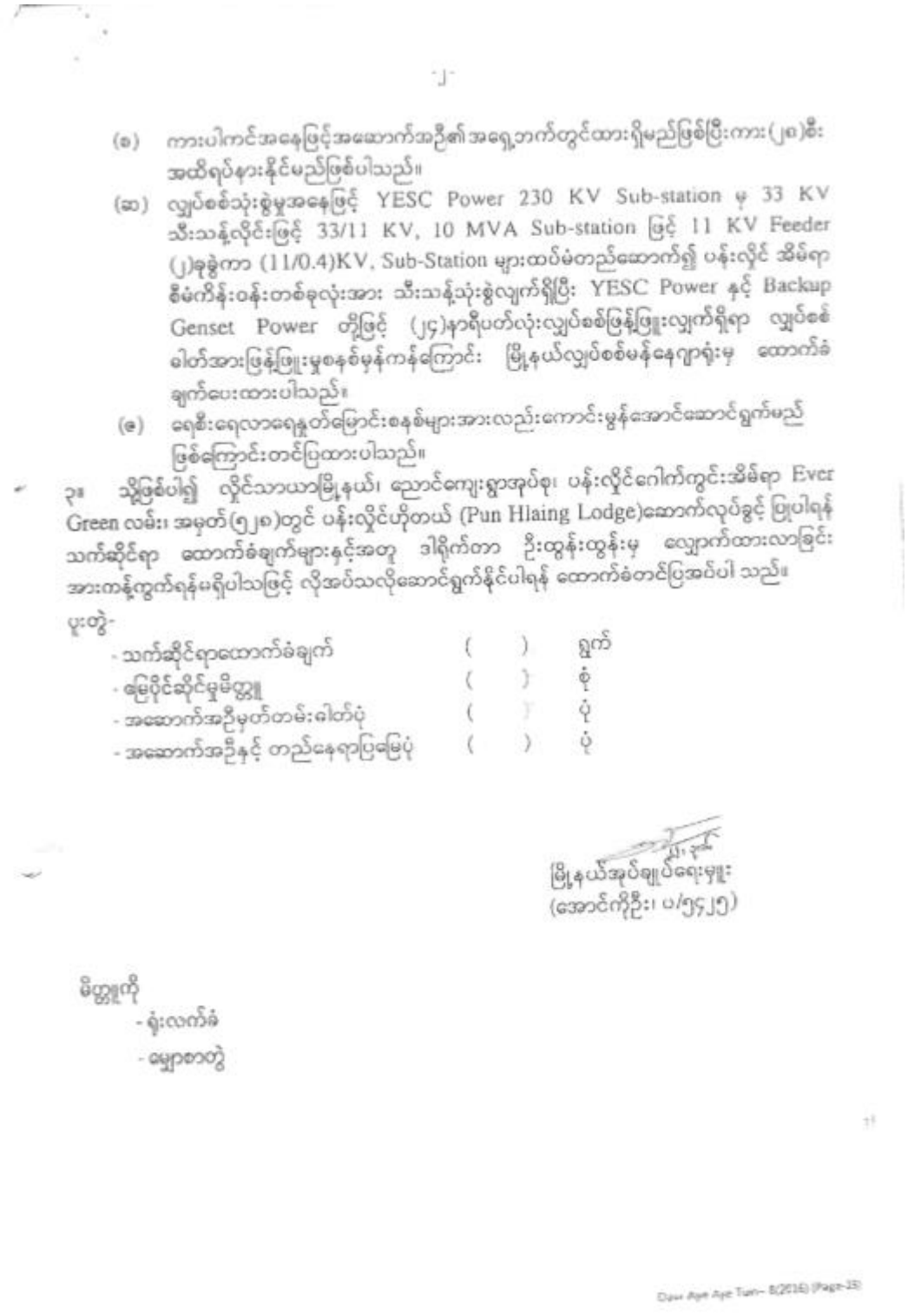
Plate 39.1: Recommendation Letter from General Administration Department (Hlaing Thayar)



-၂-

(စ) ကားပါကင်အနေဖြင့်အဆောက်အဦ၏အရှေ့ဘက်တွင်ထားရှိမည်ဖြစ်ပြီးကား(၂၀)စီး အထိရပ်နားနိုင်မည်ဖြစ်ပါသည်။

(ဆ) လျှပ်စစ်သုံးစွဲမှုအနေဖြင့် YESC Power 230 KV Sub-station မှ 33 KV သီးသန့်လိုင်းဖြင့် 33/11 KV, 10 MVA Sub-station ဖြင့် 11 KV Feeder (၂)ခုခွဲကာ (11/0.4)KV, Sub-Station များထပ်မံတည်ဆောက်၍ ပန်းလှိုင် အိမ်ရာ စီမံကိန်း၀န်းတစ်ခုလုံးအား သီးသန့်သုံးစွဲလျက်ရှိပြီး YESC Power နှင့် Backup Genset Power တို့ဖြင့် (၂၄)နာရီပတ်လုံးလျှပ်စစ်ဖြန့်ဖြူးလျက်ရှိရာ လျှပ်စစ် ဓါတ်အားဖြန့်ဖြူးမှုစနစ်မှန်ကန်ကြောင်း မြို့နယ်လျှပ်စစ်မန်နေဂျာရုံးမှ ထောက်ခံ ချက်ပေးထားပါသည်။

(ဇ) ရေစီးရေလာရေနုတ်မြောင်းစနစ်များအားလည်းကောင်းမွန်အောင်ဆောင်ရွက်မည် ဖြစ်ကြောင်းတင်ပြထားပါသည်။

၃။ သို့ဖြစ်ပါ၍ လှိုင်သာယာမြို့နယ်၊ ညောင်ကျေးရွာအုပ်စု၊ ပန်းလှိုင်ဂေါက်ကွင်းအိမ်ရာ Ever Green လမ်း၊ အမှတ်(၅၂၀)တွင် ပန်းလှိုင်ဟိုတယ် (Pun Hlaing Lodge)ဆောက်လုပ်ခွင့် ပြုပါရန် သက်ဆိုင်ရာ ထောက်ခံချက်များနှင့်အတူ ဒါရိုက်တာ ဦးထွန်းထွန်းမှ လျှောက်ထားလာခြင်း အားကန့်ကွက်ရန်မရှိပါသဖြင့် လိုအပ်သလိုဆောင်ရွက်နိုင်ပါရန် ထောက်ခံတင်ပြအပ်ပါ သည်။

ပူးတွဲ-

- သက်ဆိုင်ရာထောက်ခံချက် ( ) ရွက်
- ဧရိယိုင်ဆိုင်ရာမြေပုံ ( ) စုံ
- အဆောက်အဦမှတ်တမ်းဓါတ်ပုံ ( ) ပုံ
- အဆောက်အဦနှင့် တည်နေရာပြမြေပုံ ( ) ပုံ

မြို့နယ်အုပ်ချုပ်ရေးမှူး
(အောင်ကိုဦး၊ ပ/၅၄၂၅)

မိတ္တူကို
- ရုံးလက်ခံ
- မျှော်စာတွဲ

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Plate 39.2: Recommendation Letter from General Administration Department (Hlaing Thayar)

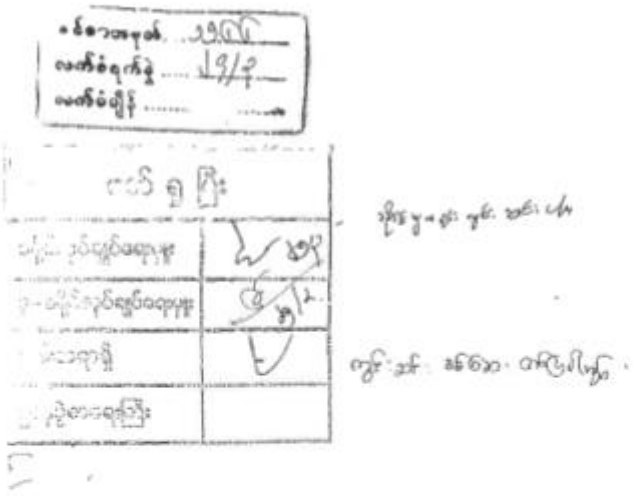


Plate 40: Recommendation Letter from City Development Committee (Hlaing Thayar)

မြို့နယ် စည် ပင် သာ ယာ အုပ် ချုပ် ရေး မှူး ရုံး
လှိုင် သာ ယာ မြို့ နယ်
စာအမှတ်၊ ၅၄၀၅ / ၃၇၃ / စည်ပင်(လသယ)
ရက်စွဲ ၊ ၂၀၁၆ခုနှစ်၊ ဖေဖော်ဝါရီ လ ၂၆ ရက်

သို့
သက်ဆိုင်ရာ

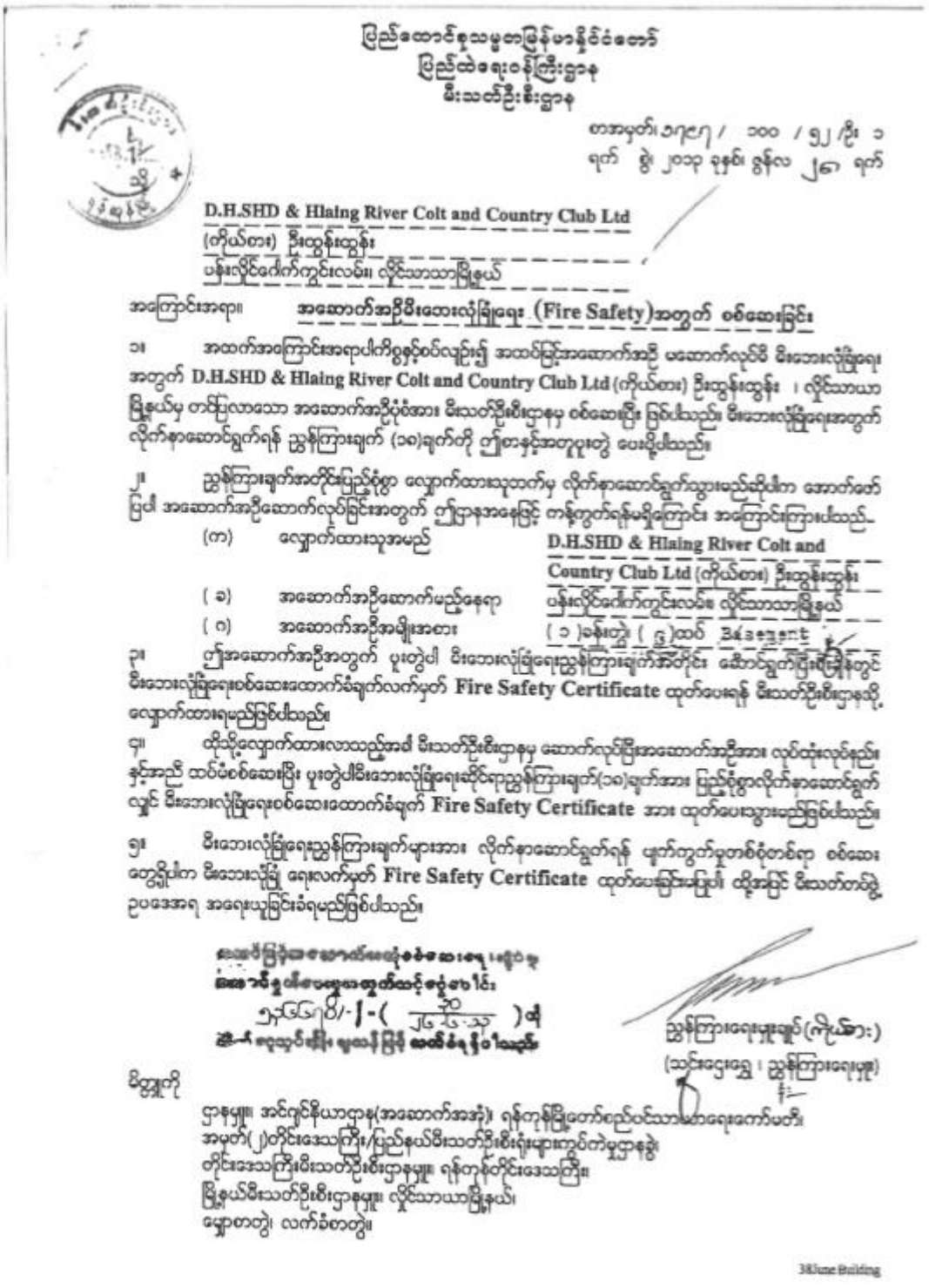
အကြောင်းအရာ။ ထောက်ခံချက်ပေးပို့ခြင်း

အထက်အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ လှိုင်သာယာမြို့နယ်၊ပန်းလှိုင်ဂေါက်ကွင်းအိမ်ရာစီမံကိန်း၊Ever Green လမ်းအမှတ်(၅၂၈)၊မြေတိုင်းရပ်ကွက်အမှတ်(၁၂)၊မြေကွက်အမှတ်၊၁၂၁-A၊၁၂၁၊B ဥဘမြေ၂၅၃ဧတုရန်းပေ၂-၁၉ဖြစ်ကေအကျယ်ရှိ Hlaing River Golf and Country Club Co;Ltd ၏ (ဖိတ္ထ+Basement ၁ထပ်)တိုက် Pum Hlaing Logde (ပန်းလှိုင်ဟိုတယ်)လုပ်ငန်းလုပ်ကိုင်ရန် လျှောက်ထားမှုအပေါ် သက်ဆိုင်ရာဌာနများ၏ နည်းဥပဒေ/ဥပဒေ/လုပ်ထုံး/လုပ်နည်းများနှင့်အညီ ဆောင်ရွက်ပါက ကန့်ကွက်ရန်မရှိကြောင်း ထောက်ခံအပ်ပါသည်။

မြို့နယ်အုပ်ချုပ်ရေးမှူး

မိတ္တူကို
ရုံးလက်ခံ
မျှောစာတွဲ

Plate 41: Recommendation Letter from Fire Services Department (Hlaing Thayar)



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
ပြည်ထဲရေးဝန်ကြီးဌာန
မီးသတ်ဦးစီးဌာန

စာအမှတ်၊ ၁၇၉၅ / ၁၀၀ / ၅၂ / ဦး ၁
ရက် ၆၊ ၂၀၁၃ ခုနှစ်၊ ဇွန်လ ၂၈ ရက်

D.H.SHD & Hlaing River Colt and Country Club Ltd
(ကိုယ်စား) ဦးထွန်းထွန်း
ပန်းလိုင်ဂေါက်ကွင်းလမ်း၊ လိုင်သာယာမြို့နယ်

အကြောင်းအရာ။ **အဆောက်အဦမီးဘေးလုံခြုံရေး (Fire Safety)အတွက် စစ်ဆေးခြင်း**

၁။ အထက်အကြောင်းအရာပါကိစ္စနှင့်စပ်လျဉ်း၍ အထပ်မြင့်အဆောက်အဦ မဆောက်လုပ်မီ မီးဘေးလုံခြုံရေး အတွက် D.H.SHD & Hlaing River Colt and Country Club Ltd (ကိုယ်စား) ဦးထွန်းထွန်း ၊ လိုင်သာယာမြို့နယ်မှ တင်ပြလာသော အဆောက်အဦပုံစံအား မီးသတ်ဦးစီးဌာနမှ စစ်ဆေးပြီး ဖြစ်ပါသည်။ မီးဘေးလုံခြုံရေးအတွက် လိုက်နာဆောင်ရွက်ရန် ညွှန်ကြားချက် (၁၈)ချက်တို့ ဤစာနှင့်အတူပူးတွဲ ပေးပို့ပါသည်။

၂။ ညွှန်ကြားချက်အတိုင်းပြည့်စုံစွာ လျှောက်ထားသူထက်မှ လိုက်နာဆောင်ရွက်သွားမည်ဆိုပါက အောက်တွင် ပြပါ အဆောက်အဦဆောက်လုပ်ခြင်းအတွက် ဤဌာနအနေဖြင့် ကန့်တွက်ရန်မရှိကြောင်း အကြောင်းကြားပါသည်-

(က) လျှောက်ထားသူအမည် — D.H.SHD & Hlaing River Colt and Country Club Ltd (ကိုယ်စား) ဦးထွန်းထွန်း
(ခ) အဆောက်အဦဆောက်မည့်နေရာ — ပန်းလိုင်ဂေါက်ကွင်းလမ်း၊ လိုင်သာယာမြို့နယ်
(ဂ) အဆောက်အဦအမျိုးအစား — (၁)ခန်းတွဲ (၆)ထပ် Basement

၃။ ဤအဆောက်အဦအတွက် ပူးတွဲပါ မီးဘေးလုံခြုံရေးညွှန်ကြားချက်အတိုင်း ဆောင်ရွက်ပြီးစီးနိုင်ပါက မီးဘေးလုံခြုံရေးစစ်ဆေးထောက်ခံချက်လက်မှတ် **Fire Safety Certificate** ထုတ်ပေးရန် မီးသတ်ဦးစီးဌာနသို့ လျှောက်ထားရမည်ဖြစ်ပါသည်။

၄။ ထိုသို့လျှောက်ထားလာသည့်အခါ မီးသတ်ဦးစီးဌာနမှ ဆောက်လုပ်မြဲအဆောက်အဦအား လုပ်ထုံးလုပ်နည်း နှင့်အညီ ထပ်မံစစ်ဆေးပြီး ပူးတွဲပါမီးဘေးလုံခြုံရေးဆိုင်ရာညွှန်ကြားချက်(၁၈)ချက်အား ပြည့်စုံစွာလိုက်နာဆောင်ရွက်လျှင် မီးဘေးလုံခြုံရေးစစ်ဆေးထောက်ခံချက် **Fire Safety Certificate** အား ထုတ်ပေးသွားမည်ဖြစ်ပါသည်။

၅။ မီးဘေးလုံခြုံရေးညွှန်ကြားချက်များအား လိုက်နာဆောင်ရွက်ရန် မှတ်တွတ်မှုတစ်စုံတစ်ရာ စစ်ဆေးတွေ့ရှိပါက မီးဘေးလုံခြုံ ရေးလက်မှတ် **Fire Safety Certificate** ထုတ်ပေးခြင်းမပြုပါ၊ ထို့အပြင် မီးသတ်တပ်ဖွဲ့ ဥပဒေအရ အရေးယူခြင်းခံရမည်ဖြစ်ပါသည်။

ညွှန်ကြားရေးမှူးချုပ် (ကိုယ်စား)
(သင်းဌေးရွှေ ၊ ညွှန်ကြားရေးမှူး)

မိတ္တူကို
ဌာနမှူး၊ အင်ဂျင်နီယာဌာန(အဆောက်အအုံ)၊ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ၊
အမှတ်(၂)တိုင်းဒေသကြီး/ပြည်နယ်မီးသတ်ဦးစီးရုံးများကွပ်ကဲမှုဌာနခွဲ၊
တိုင်းဒေသကြီးမီးသတ်ဦးစီးဌာနမှူး၊ ရန်ကုန်တိုင်းဒေသကြီး၊
မြို့နယ်မီးသတ်ဦးစီးဌာနမှူး၊ လိုင်သာယာမြို့နယ်၊
မျှော်တွဲ၊ လက်ခံတွဲ။

3Klune Building

Plate 40.1: Recommendation Letter from Fire Services Department (Hlaing Thayar)

(၃)ထပ်မှ (၈)ထပ်အထိ အထပ်မြင့်အဆောက်အအုံ ဆောက်လုပ်ခြင်းလုပ်ငန်းများအတွက် မီးသတ်ဦးစီးဌာန၏ မီးဘေးလုံခြုံမှုနှင့် အရေးပေါ်လွတ်မြောက်မှုဆိုင်ရာ သဘောထားများ

၁။ ကွန်ကရစ်လှေကားခွင်အကျယ် (Interior Distance) အနည်းဆုံး(၇)ပေဖြစ်ရန်၊ Main Column (၂)ခု၏ အလယ်(Centre to Centre) အကွာအဝေး(၇)ပေမဖြစ်ရန်။ အသားတင်အကျယ် (Clear) (၇)ပေ ဖြစ်ရန် လိုအပ်ပါသည်။ သို့မှသာ လှေကား(Fight)တစ်ခင်း၏အကျယ်(Waist)သည်(၃½)ပေရှိရမည်။ ခိုင်ခံ့တောင့်တင်းသောလက်ရန်း (Hand Rail)တစ်ခု အနည်းဆုံးတပ်ဆင်ထားရှိရန်။

၂။ ကွန်ကရစ်လှေကားတစ်လျှောက်တွင် လှေကားထစ်တစ်ထစ်စီ၏အမြင့် Riserသည် (၇)လက်မထက်မပိုစေရန်နှင့် လှေကားထစ်တစ်ထစ်စီ၏အကျယ် (Tread)ကို(၁၀)လက်မနှင့်အထက် ရှိအောင် ဆောက်လုပ်ရန်။

၃။ လှေကားခွင်တစ်လျှောက် လေဝင်လေထွက် ကောင်းမွန်စေရေးနှင့် Smoke Management အတွက် လှေကားခန်းအထပ်တိုင်း၏ အဆောက်အအုံမျက်နှာစာဖက် လှေကားခန်းနံရံ (Stair Wall)တွင် အနည်းဆုံး (9 Sq:ft)ဧရိယာရှိသော လေဝင်လေထွက်ပေါက် (ဥပမာ-ပြတင်းပေါက်၊ တရုတ်ကာဝ်၊ လျှာတံခါး.....စသည်ဖြင့်) ပြုလုပ်ထားရှိရန်။

၄။ ပင်မဝင်ထွက်တံခါး (Main Door)များကို အနည်းဆုံး(၃½)ပေအကျယ်၊(၆⅔)ပေအမြင့်ရှိစေရန်နှင့် Self Closing Device & Min:½hr: Fire Doorများ ဖြစ်စေရန်၊လှေကားခန်း(Stair Way)အား Smoke Stop Lobby, Fire Fighting Lobbyနှင့် Min: 1hr: Fire Rated Enclosure အဖြစ် စီမံထားရှိရန်။

၅။ အရေးပေါ်အသက်ကယ်လုပ်ငန်းများဆောင်ရွက်နိုင်ရေးအတွက် ခေါင်မိုးထိပ်၌ ၂-လက်မ သံပိုက်တန်းကို ၄-ပေ အမြင့်တွင် ပတ်လည်တပ်ဆင်၍ (2 Tons)ခံနိုင်ရည်ရှိအောင် ပြုလုပ်ထားရှိရန်။

၆။ အရေးပေါ်သုံးမီးသတ်လှေကားကို ခေါက်ရိုးပုံ(Zig Zag)ဖြင့်ဆောက်လုပ်ပါက အောက်ပါအချက်အလက်များနှင့်အညီ လိုက်နာဆောင်ရွက်ရန်-

(က) ခေါက်ရိုးပုံ မီးသတ်လှေကား၏ Down Ward Angle သည် ၆၀ ဒီဂရီထက်မပိုစေရ၊
(ခ) လှေကားခွင်သည်(၁၈)လက်မထက်မကျဉ်းစေရ၊
(ဂ) လှေကားထစ်တစ်ထစ်စီ၏ အမြင့်(Riser)သည်(၁၀)လက်မထက်မပိုစေရ၊
(ဃ) လှေကားထစ် တစ်ထစ်စီ၏အကျယ်(Tread)သည် (၆)လက်မထက် မနည်းစေရ၊
(င) ပထမထပ်တွင် မြေညီထပ်သို့ ဆင်းနိုင်သော လှေကားအရှင်ထားရှိပေးရန်၊
(စ) လှေကားကို ခိုင်ခံ့စွာ ဆောက်လုပ်ထားရန်နှင့်လှေကားခွင်တွင် လမ်းရှင်းနေစေရန်၊
(ဆ) လှေကားတစ်ခုနှင့်တစ်ခု ကူးပြောင်းသည့်နေရာ၊ဆင်းတက်သည့်နေရာ(Landing Area)တွင်လည်းကောင်း၊လှေကားလိုင်းတွင်လည်းကောင်း ခိုင်ခံ့သော လက်ရန်းအကာများပါဝင်စေရန်၊
(ဇ) ဆင်းတက်သည့်နေရာ (Landing Area)ကို (၂၉)လက်မထက် မကျဉ်းစေရ၊

မှတ်ချက်၊ အထက်ပါစံချိန်စံညွှန်းများကို ကိုက်ညီစေရန်အတွက် ခေါက်ရိုးပုံ(Zig Zag) မီးသတ်လှေကား၏အတွင်းခွင် (Interior Distance)သည် အနည်းဆုံး (၁၀×၄)ပေ အကျယ်ရှိရန် လိုအပ်ပါသည်။ တစ်ခုမှအခြားတစ်ဖက်သို့ လျှောက်ကူးသည့်လမ်းအား အနည်းဆုံး(၃)ပေအမြင့်ရှိသည့် သံပန်းဖြင့်ကာရန်ထားရှိရန် လိုအပ်ပါသည်။

Plate 40.2: Recommendation Letter from Fire Services Department (Hlaing Thayar)

၇။ အရေးပေါ်ထွက်ပေါက်(Emergency Exit)သို့မဟုတ် လွတ်မြောက်ပေါက်(Escape Door)တိုင်းကို အနည်းဆုံး(၂ ၁/၂)ပေအကျယ်နှင့်(၆ ၁/၂)ပေအမြင့်ရှိအောင်ဆောက်ရန်နှင့်(Self Closing Divice)တပ်ဆင်၍ အပြင်ဖွင့်စနစ် ပြုလုပ်ထားရှိရန်။

၈။ သံပန်း၊သံတံခါးများ၊ ကာရန်ထားမည်ဆိုပါက အသေပိတ်တပ်ဆင်ခြင်းမပြုရန်။

၉။ မီးငြိမ်းသတ်ရေးအတွက် အနည်းဆုံးရေဂါလံ(၅၀၀၀)ဆံ့ မီးသတ်ရေကန်(၁)ခုပြုလုပ်ပြီး၊ အမြဲတမ်း ရေပြည့်နေအောင် သိုလှောင်ထားရှိရန်။

၁၀။ အနည်းဆုံး(၄)လက်မအရွယ်ရှိသော မီးလှန့်အချက်ပေးခေါင်းလောင်း (Fire Alarm Bell)ကွန်ကရစ် လှေကားခွင် တစ်လျှောက်မျက်နှာကြက်အမြင့်နှင့်ရုံဘေးတွင် အထပ်(၂)ထပ်အကြား၌(၁)ခု တပ်ဆင်၍ အချက်ပေး ခလုတ်များကို လှေကားခွင်ဘေးနံရံတစ်လျှောက် (၅)ပေအမြင့်တွင် တစ်ထပ်လျှင်တစ်ခုစီတပ်ဆင်ကာ ခလုပ်တစ်ခုကိုနှိပ်၍ အချက်ပေးလျှင် ခေါင်းလောင်းအားလုံးအသံမြည်စေသောစနစ်(Fire Alarm System)ဖြင့် ဆက်သွယ်တပ်ဆင် ထားရှိရန်။

၁၁။ မြေညီထပ်မှအပေါ်ဆုံးထပ်အထိ(30m Hose Reel)ကို (Cabinet)ဖြင့် တပ်ဆင်၍ (Roof Top)ရှိ ဂါလန် (၅၀၀)ဆံ့ (Over Head Tank)ဖြင့် ဆက်သွယ် တပ်ဆင်ထားရှိပြီး အနည်းဆုံး (Pressure 2.5 Bar)ခန့် ရရှိအောင်ဆောင်ရွက်ထားရှိရန်၊ အရေအတွက်နှင့်တပ်ဆင်ရမည့်နေရာ များကို မီးသတ်ဦးစီးဌာနတွင် အကြံဉာဏ်ရယူဆောင်ရွက်ရန်။

၁၂။ မြေညီထပ်မှ အပေါ်ဆုံးထပ်အထိ (၄)လက်မ GI ပိုက် သို့မဟုတ် တစ်နေရာထက် ပိုပါက (၆)လက်မ GI ပိုက်ဖြင့် မီးသတ်ပိုက်လိုင်း (Dry Riser) တပ်ဆင်ထားရန်၊ အထပ်တိုင်းတွင် (Landing Valve) တပ်ဆင်၍ (Instantaneous Female Coupling) တပ်ဆင်ရန်၊ မြေညီထပ်တွင် (2 or 4 Way Breeching Male Inlet) တပ်ဆင်ထားရှိရန်နှင့် ယင်းအနီးတွင် (½ Inches, Dia:) အနီရောင်စာလုံးဖြင့် Rising Main ဟုရေးသားထားရှိရန်၊ (Dry Riser)တွင် (Air Release Valve)ပါရှိရန်နှင့် တပ်ဆင်ထားရှိမည့် နေရာများကို မီးသတ်ဦးစီးဌာနတွင် အကြံဉာဏ်ရယူဆောင်ရွက်ရန်၊

၁၃။ တည်ဆောက်ပြီးအချိန်၌ မီးသတ်ဦးစီးဌာနမှ အသိအမှတ်ပြုထားသောမီးသတ်ဆေးဘူး(Fire Extinguisher) များကို တစ်ခန်း(၁)လုံးနှုန်းထားရှိရန်၊

၁၄။ အထပ်မြင့်အဆောက်အဦများ တည်ဆောက်ခြင်းမပြုမီ Architectural Drawing များကို ကြိုတင် တင်ပြပြီး မီးဘေးကြိုတင်ကာကွယ်ရေးအတွက် မီးသတ်ဦးစီးဌာနနှင့် ညှိနှိုင်းဆောင်ရွက်သွားရန်၊

၁၅။ အထပ်မြင့်အဆောက်အဦများ၊ မီးဘေးလုံခြုံရေးအတွက် စစ်ဆေးအကြံပြုခြင်းဆိုင်ရာ ဝန်ဆောင်ခများကို အဆောက်အဦ၏အထပ်အားလုံးရှိ ဧရိယာစတုရန်းပေပေါင်း၏ (၈၀%)အတွက် တစ်စတုရန်းပေလျှင် (၄/၆၅)ကျပ် နှုန်းပေးဆောင်ရန်၊

Plate 41: Recommendation Letter from Public Health Department (Hlaing Thayar)

သို့

မြို့နယ်ကျန်းမာရေးဦးစီးဌာနမှူး
မြို့နယ်ကျန်းမာရေးဦးစီးဌာန
လှိုင်သာယာမြို့နယ်

ရက်စွဲ ၂၄- ၂- ၂၀၁၆

အကြောင်းအရာ ။ ပန်းလှိုင်ဂေါက်တွင်းအိမ်ယာအတွင်းရှိ **Pun Hlaing Lodge** လုပ်ငန်း တည်ဆောက်မှုနှင့် ပြုပြင်မွမ်းမံမှုတို့အတွက် ကျန်းမာရေးထောက်ခံချက် လျှောက်ထားခြင်း

အထက်ပါအကြောင်းအရာကိစ္စနှင့် ပတ်သက်၍ လှိုင်သာယာမြို့နယ်ရှိ ပန်းလှိုင်ဂေါက်ကွင်းအိမ်ယာစီမံကိန်း အတွင်း၌ (၉၅၆၄၂- ၅၃ စတုရန်းပေ ၊ ၂- ၁၉၆ ဧက) အကျယ်ရှိ မြေကွက်တွင် (၆ထပ် + Basement (၁)ထပ်) တိုက် Pun Hlaing Lodge (ပန်းလှိုင်ဟိုတယ်) လုပ်ငန်းတည်ဆောက်မှုနှင့် ပြုပြင်မွမ်းမံမှုတို့အတွက် လိုအပ်သော ကျန်းမာရေးထောက်ခံ ချက်ကို ထောက်ခံပေးပါရန် လေးစားစွာ တင်ပြလျှောက်ထားအပ်ပါသည်။

လေးစားစွာဖြင့်

24/2/2016

(Alicia Khine)
Real Estate
Head of Planning and Development
YOMA Strategic Holdings Ltd
Mobile : +95 92500 35672

Plate 42: Recommendation Letter from Myanmar Police Force (Hlaing Thayar)

ထောက်ခံချက်

သက်ဆိုင်ရာ

လွိုင်သာယာမြို့နယ်၊ ပန်းလွိုင်ဂေါက်ကွင်းအိမ်ယာစီမံကိန်း၊ Ever Green လမ်း၊ အမှတ်(၅၂၀)၊ မြေတိုင်းရပ်ကွက်အမှတ်(၁၂)၊ မြေကွက်အမှတ်(၁၂၁-A၊ ၁၂၁-B)၊ (၉၅၆၄၃၃.၅၃၃စတုရန်းပေ၊ ၂.၁၉၆ဧကာ)အကျယ်ရှိ မြေကွက်တွင် (၆ထပ်+Basement (၁)ထပ်)တိုက် Pun Hlaing Logde (ပန်းလွိုင်ဟိုတယ်)လုပ်ငန်းတည်ဆောက်မှုနှင့် ပြုပြင်မွမ်းမံမှုလုပ်ငန်းလုပ်ကိုင်ရန် လျှောက်ထားမှု အပေါ် သတ်မှတ်စည်းကမ်းချက်များအတိုင်းဆောင်ရွက်မည်ဆိုပါက ကန့်ကွက်ရန်မရှိပါကြောင်း ထောက်ခံအပ်ပါသည်။

Plate 43: Undertaking Letter from Pun Hlaing Lodge Hotel Management Limited

PUN HLAING LODGE HOTEL MANAGEMENT LIMITED

Company Registration Number: 452FC/2016-2017(YGN)
The Campus, 1 Office Park, Rain Tree Drive, Pun Hlaing Estate, Hlaing Thayar Township, Yangon, 11401, Myanmar
Tel: +95 1 3687766 Fax: +95 1 3687687, 3687698, 3687699

သို့

ညွှန်ကြားရေးမှူးချုပ်
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန
ရုံးအမှတ် (၅၃)၊ နေပြည်တော်။

ရက်စွဲ။ ။ ၂၀၁၉ ခုနှစ်၊ နိုဝင်ဘာလ၊ (၂၉) ရက်။

အကြောင်းအရာ။ ။ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အား လိုက်နာဆောင်ရွက်မည်ဖြစ်ကြောင်း ကတိကဝတ်ပြုခြင်း။

အထက်အကြောင်းအရာပါ ကိစ္စနှင့်ပတ်သက်၍ Pun Hlaing Lodge Hotel Management Limited အတွက် ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာ (Initial Environmental Examination – IEE) အား တတိယအဖွဲ့အစည်းဖြစ်သော SLP Environmental Co., Ltd. မှ ပြုစုပြင်ဆင်ရေးသားထားပါသည်။ ထိုအစီရင်ခံစာတွင်ပါဝင်သည့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) အားလုံးကို စီမံကိန်းအဆိုပြုသူ Pun Hlaing Lodge Hotel Management Limited မှ အကောင်အထည်ဖော် လိုက်နာဆောင်ရွက်မည်ဖြစ်ကြောင်း ကတိကဝတ်ပြုအပ်ပါသည်။

လေးစားစွာဖြင့်

U Tun Tun
Director
Pun Hlaing Lodge Hotel Management Limited

မိတ္တူကို-

- ရုံးလက်ခံ

12 CONCLUSIONS

SLP Environmental has conducted an Initial Environmental Examination (IEE) for the Project in general accordance with the requirements stipulated in Chapter IV of the ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE, Ministry of Environmental Conservation and Forestry, Notification No. 616 / 2015 (29 December 2015). The study was also conducted cognisant of guidance presented in:

- International Finance Corporation (IFC) Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development (April 2007).

The key potential impacts associated with the Project have been identified and evaluated (see Section 9) and SLP has formulated a robust project specific Environmental Management and Monitoring Plan (EMMP) to mitigate the potential impacts and ensure that legislative compliance and standards of good practice are upheld during the execution of the Project.

Provided that the recommended mitigation measures are appropriately implemented the IEE concludes that there will be no residual impacts of Minor, Moderate, Major or Critical significance arising as a consequence of project activities and that all impacts will have been appropriately mitigated to be as low as reasonably practical.

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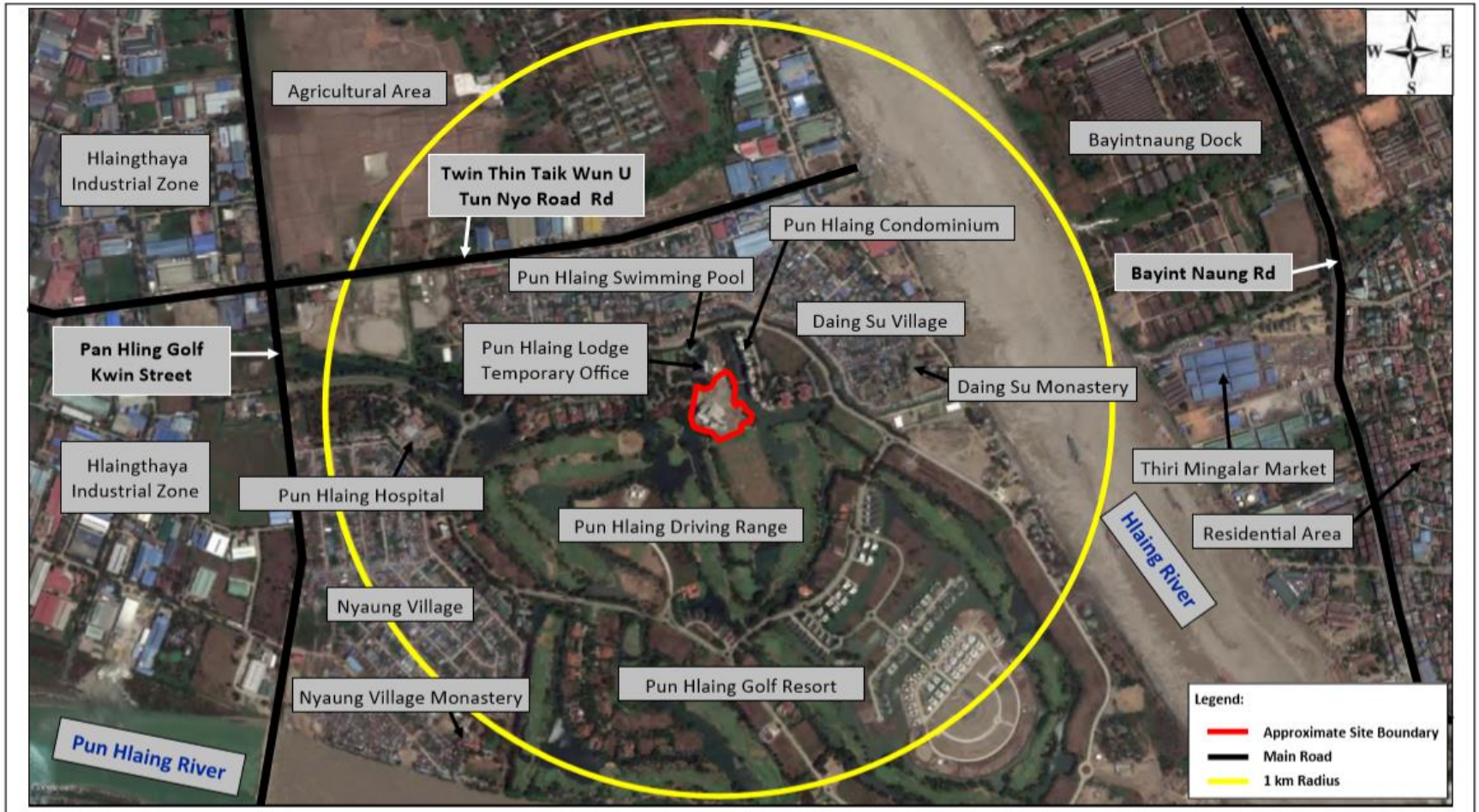
AppendixA-FIGURES



Source: *Google Earth (2015)*

Scale: *Not to Scale*

Figure 1:	Surrounding Landuses in 1km Radius.
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP_1105
Client:	PHL Hotel Management Ltd
Date:	March 2016
Revision:	0

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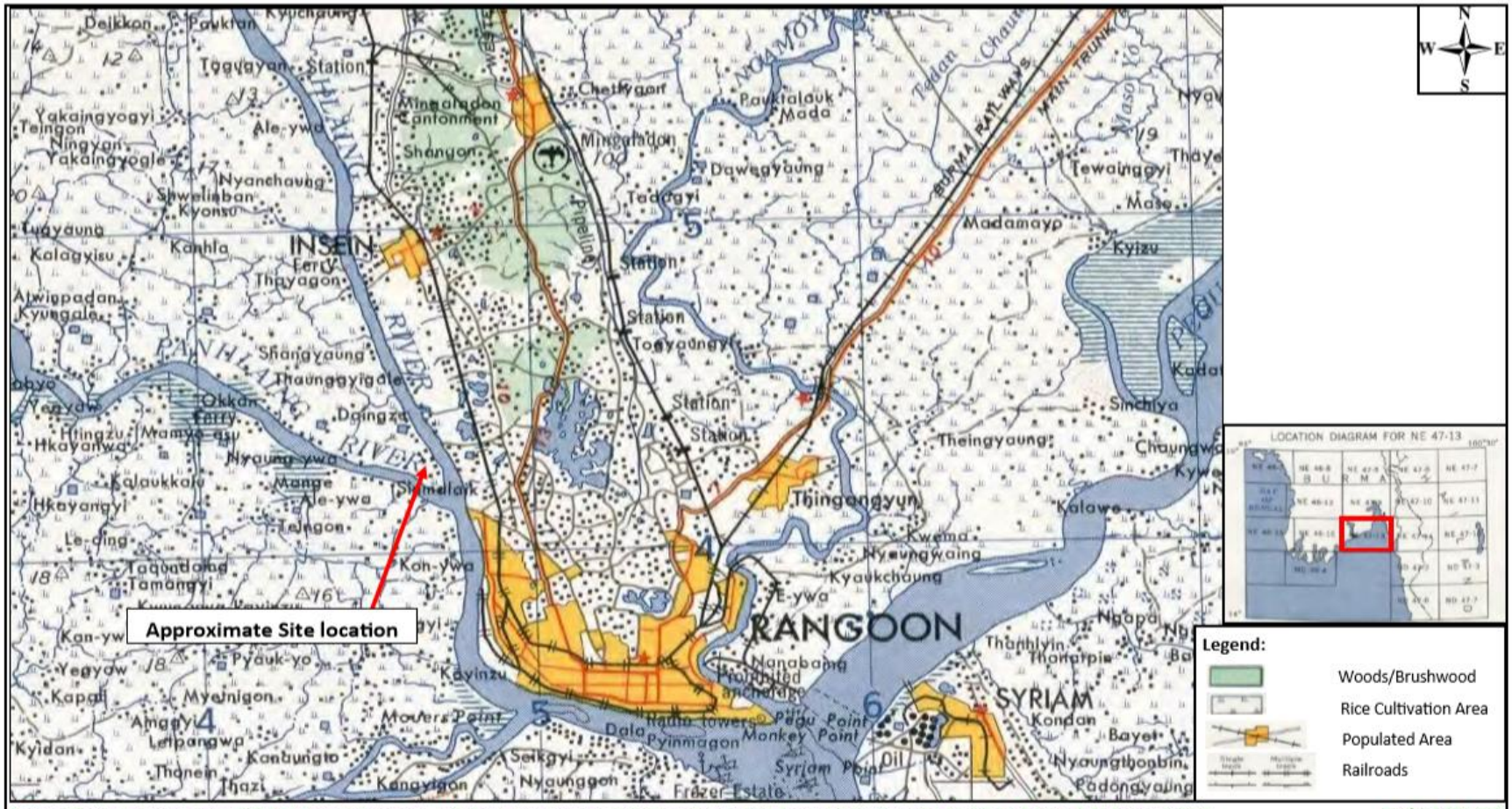

Source: *The Army Map Service (GDVLB),Core of Engineers, U.S. Army, Washington, D.C. Compiled in 1954, Series U542, Sheet No. NE 47-13, Edition 1-AMS dated 1998.* ***Scale:*** *1:250,000*

Figure 2:	Topographic Survey Map Extract
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP_1105
Client:	PHL Hotel Management Ltd
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Source: *Google Earth.*

Approximate Site Boundary ***Scale:*** *not to scale*

Figure 3:	Google Earth Imagery Dated 2004, 2009, 2013 and 2015
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP_1105
Client:	PHL Hotel Management Ltd
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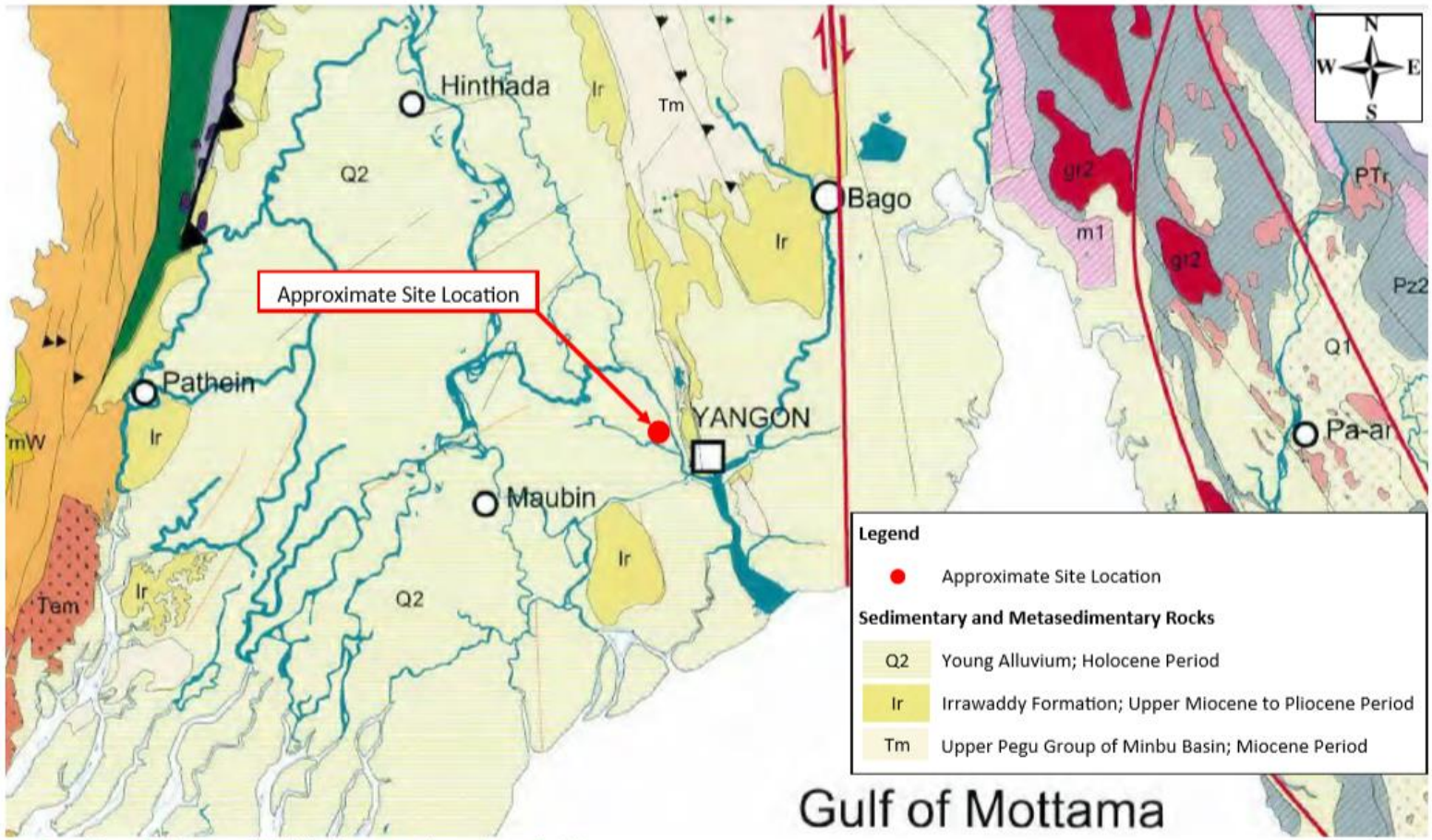

Source: Geology Map of Myanmar (2014), *Myanmar Geoscience Society.*

Figure 4:	Geological Map Extract
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP_1105
Client:	PHL Hotel Management Ltd
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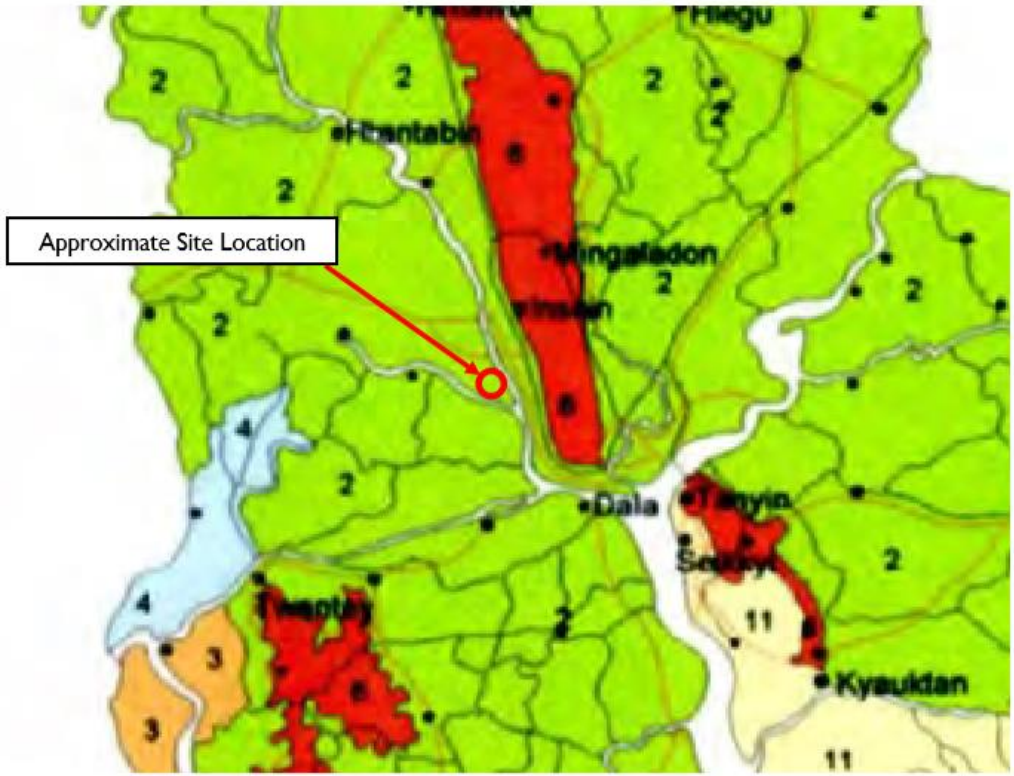

Source: *Land use division, Myanmar Agriculture Service, 2002.*

Figure 5:	Soil Map Extract
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP_1105
Client:	PHL Hotel Management Ltd
Date:	March 2016
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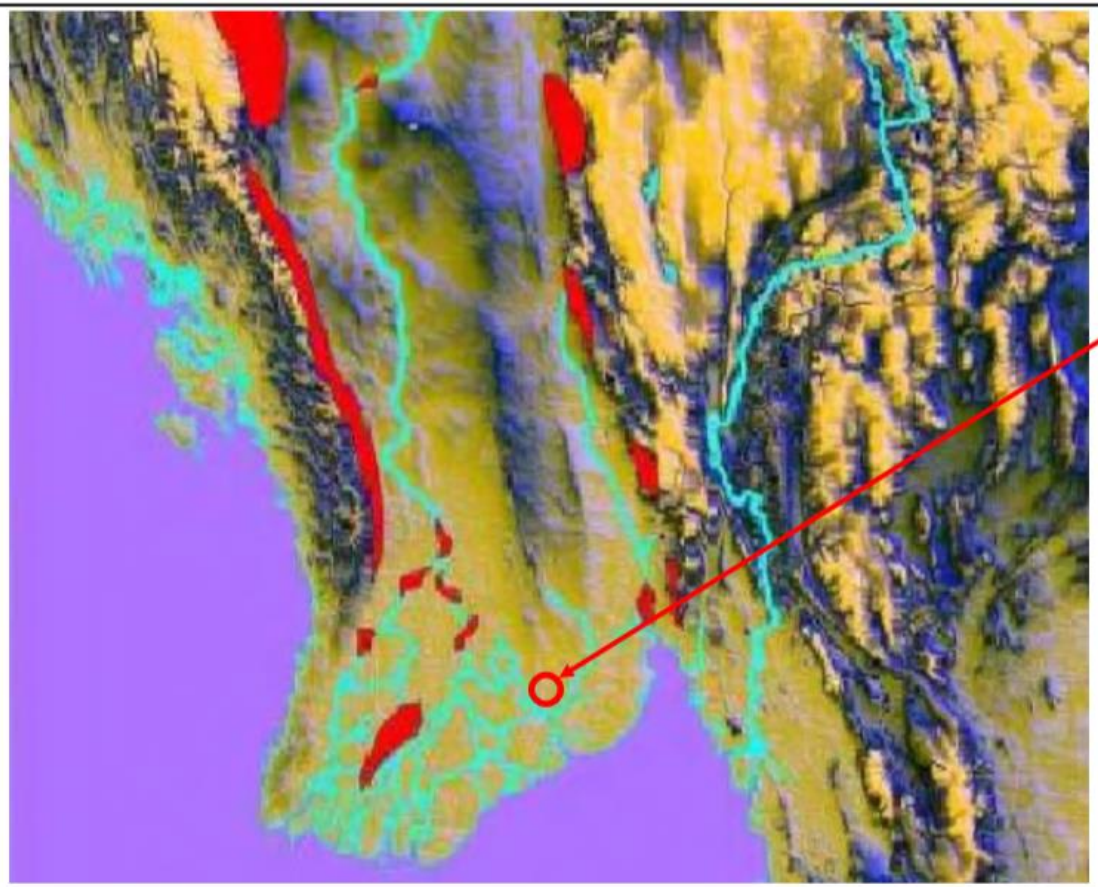

Source: *Hazard Profile of Myanmar, 2009.*

Scale: *Not to Scale*

Figure 6:	Landslip Hazard Map
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP_1105
Client:	PHL Hotel Management Ltd
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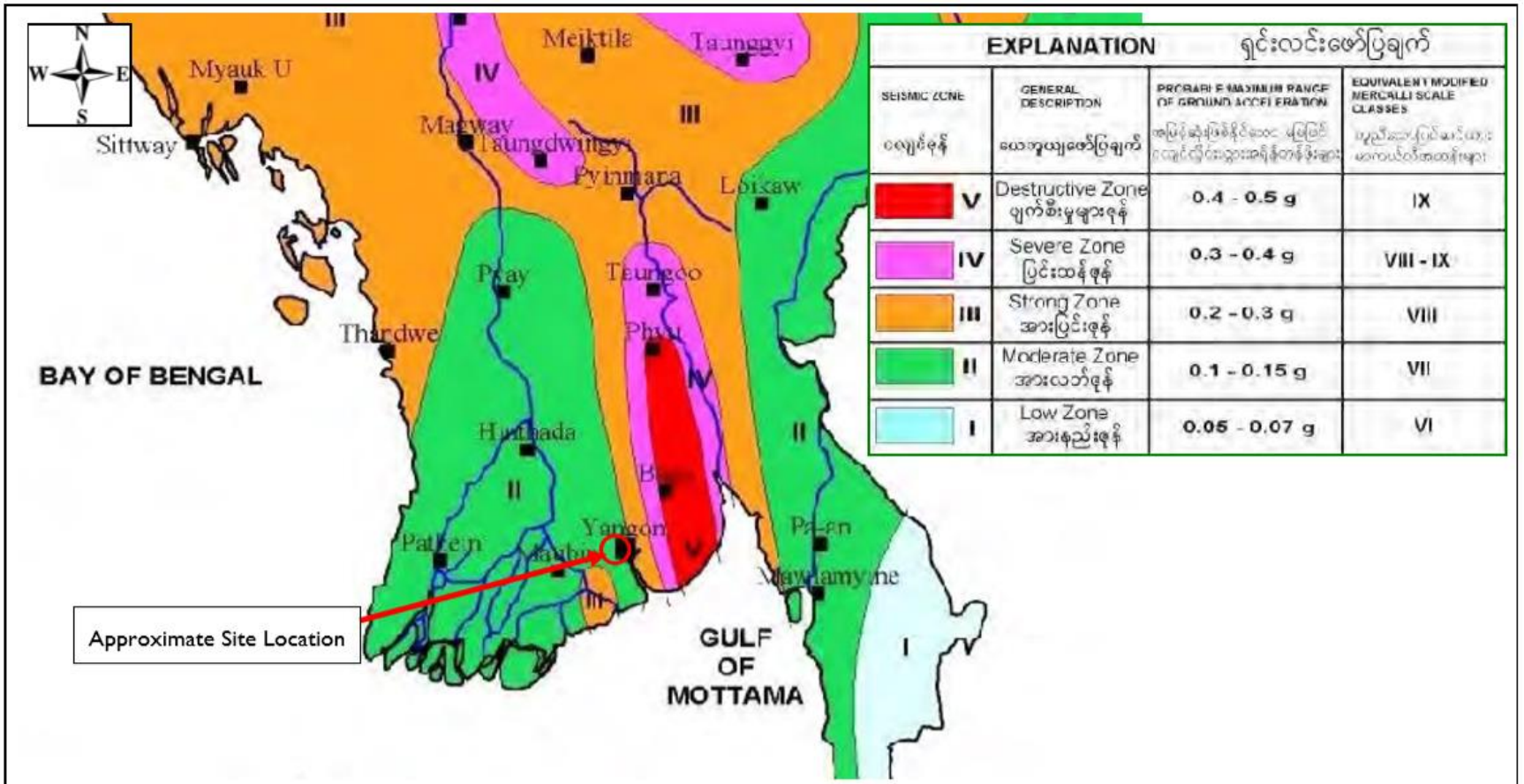

Source: *Hazard Profile of Myanmar, 2009.* ***Scale:*** *Not to Scale*

Figure 7:	Seismic Hazard Map
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP_1105
Client:	PHL Hotel Management Ltd
Date:	March 2016
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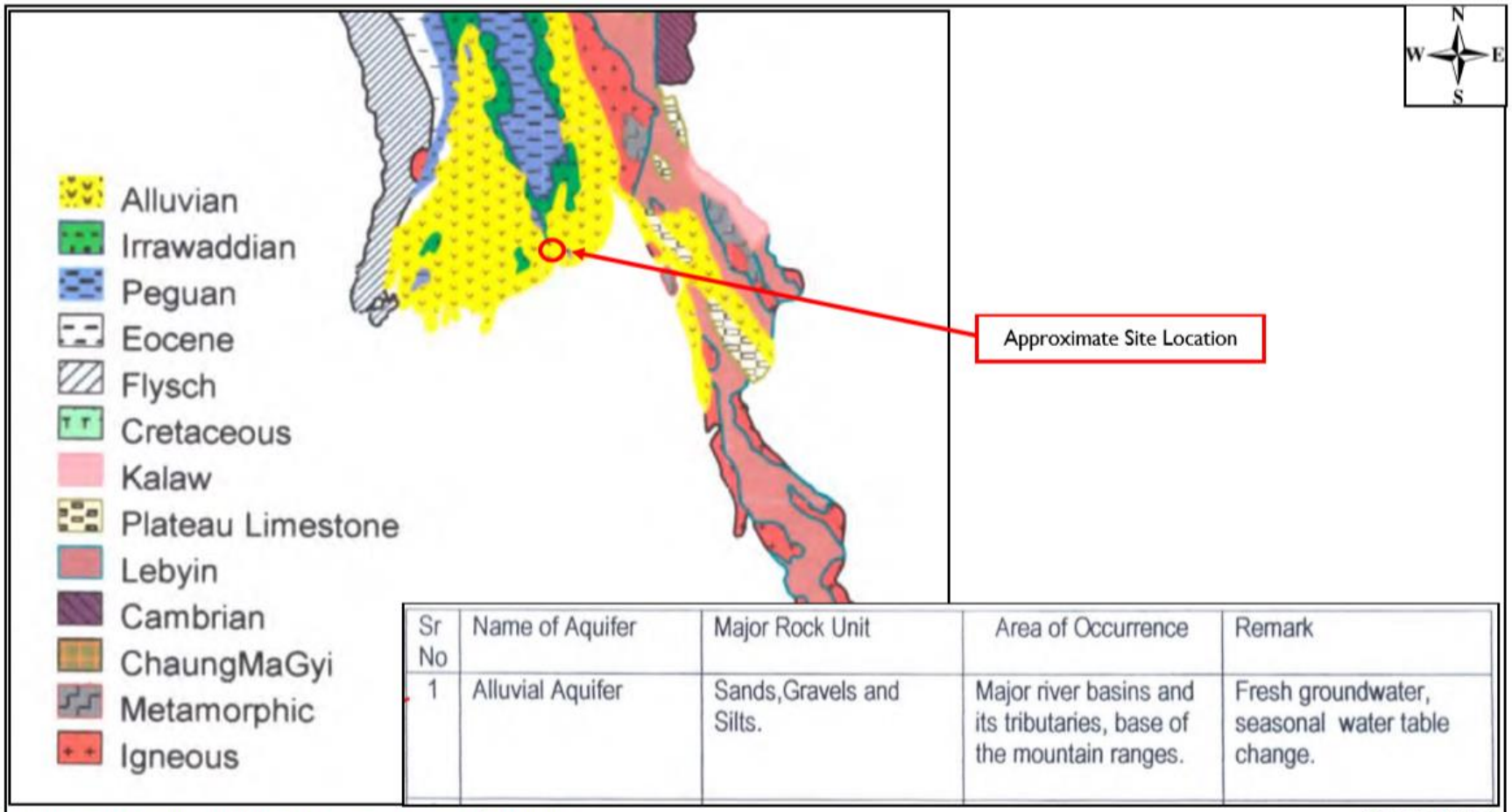

Sr No	Name of Aquifer	Major Rock Unit	Area of Occurrence	Remark
1	Alluvial Aquifer	Sands,Gravels and Silts.	Major river basins and its tributaries, base of the mountain ranges.	Fresh groundwater, seasonal water table change.

Source: Water Resources Utilization Department, Union of Myanmar

Scale: Not to Scale

Figure 8: Groundwater Map Extract
Project Name: Pun Hlaing Lodge Hotel Development
Project Number: SLP_1105
Client: PHL Hotel Management Ltd
Date: March 2016
Rev: 0

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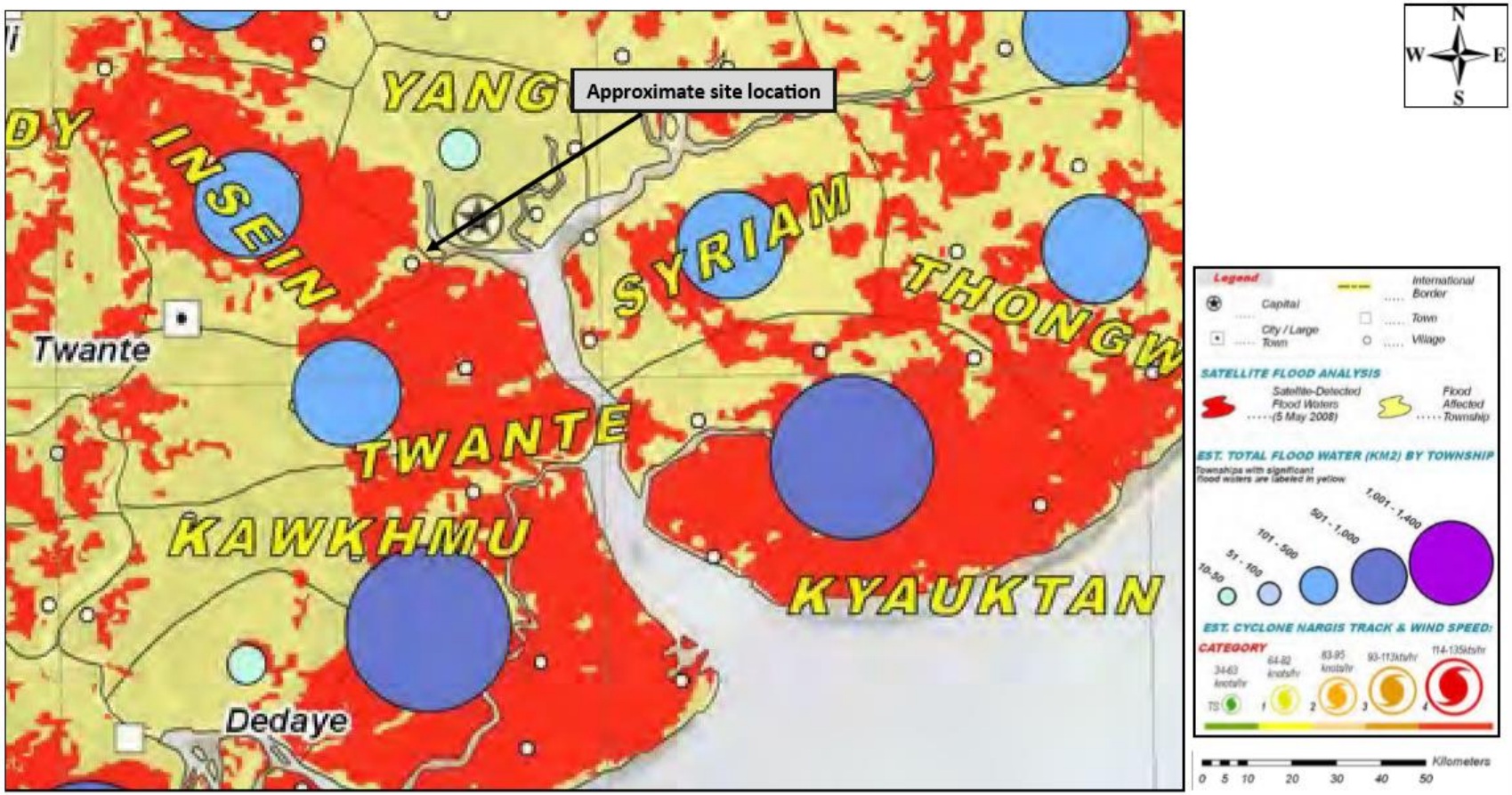

Source: Flood Analysis with MODIS Terra & Aqua Data recorded 5 May & 15 April 2008 by UNOSAT

Figure 9:	Estimated Total Flood Water Area Map.
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP 1105
Client:	PHL Hotel Management Ltd
Date:	March 2016
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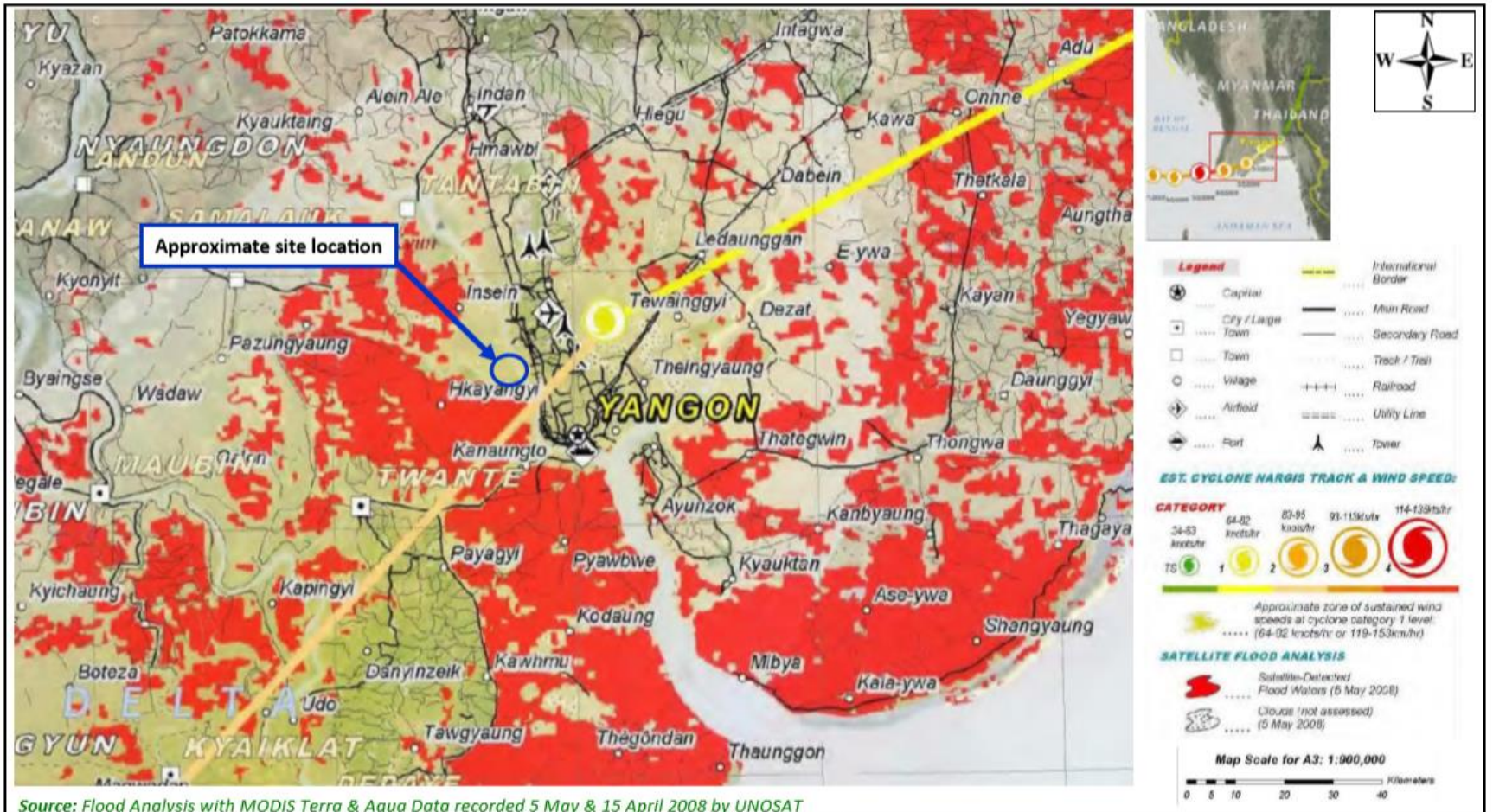

Source: Flood Analysis with MODIS Terra & Aqua Data recorded 5 May & 15 April 2008 by UNOSAT

Figure 10:	Flood Water Area as a Consequence of Nargis Map.
Project Name:	Pun Hlaing Lodge Hotel Development
Project Number:	SLP_1105
Client:	PHL Hotel Management Ltd
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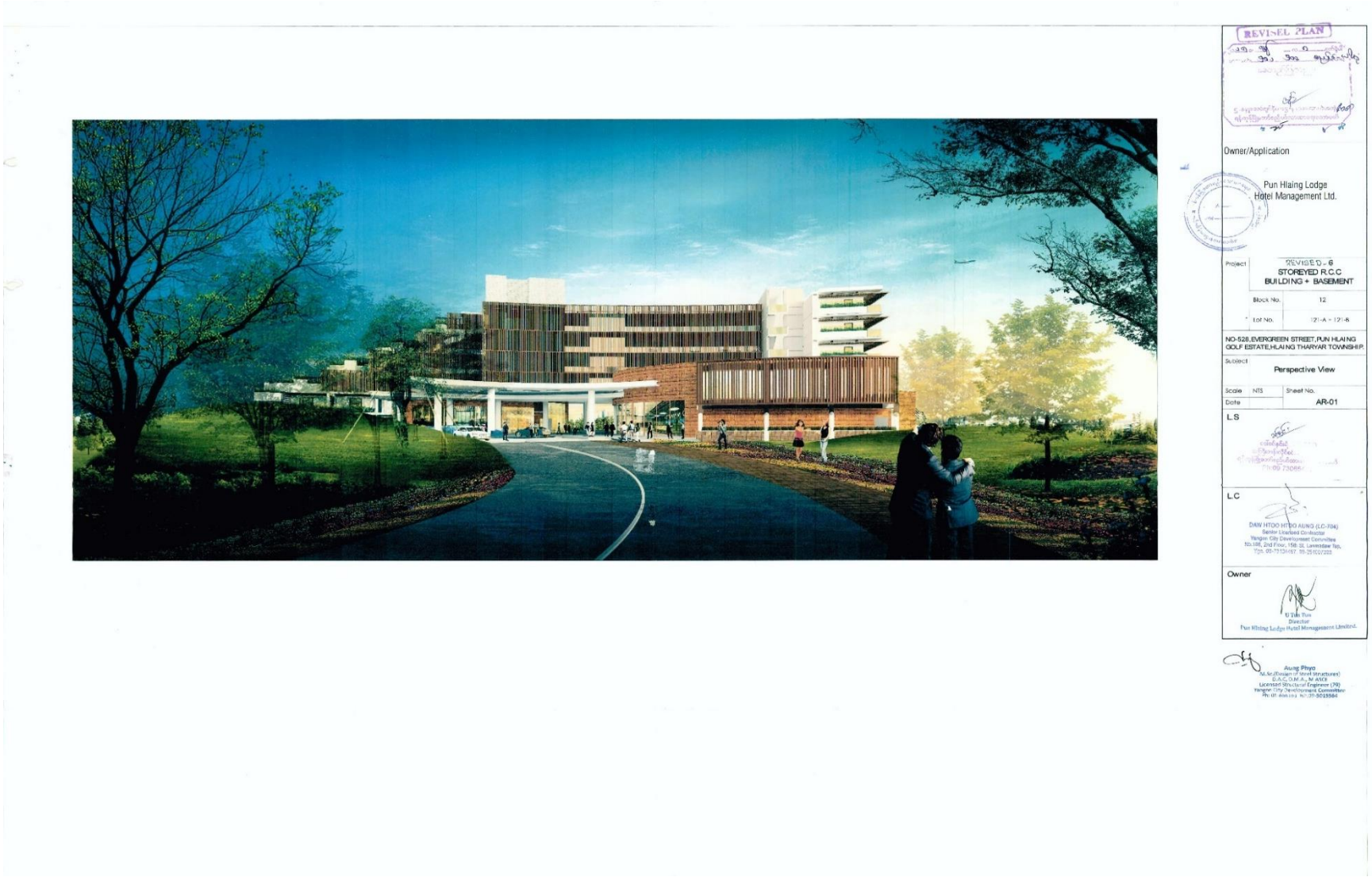


Figure 11: Perspective View of the Project

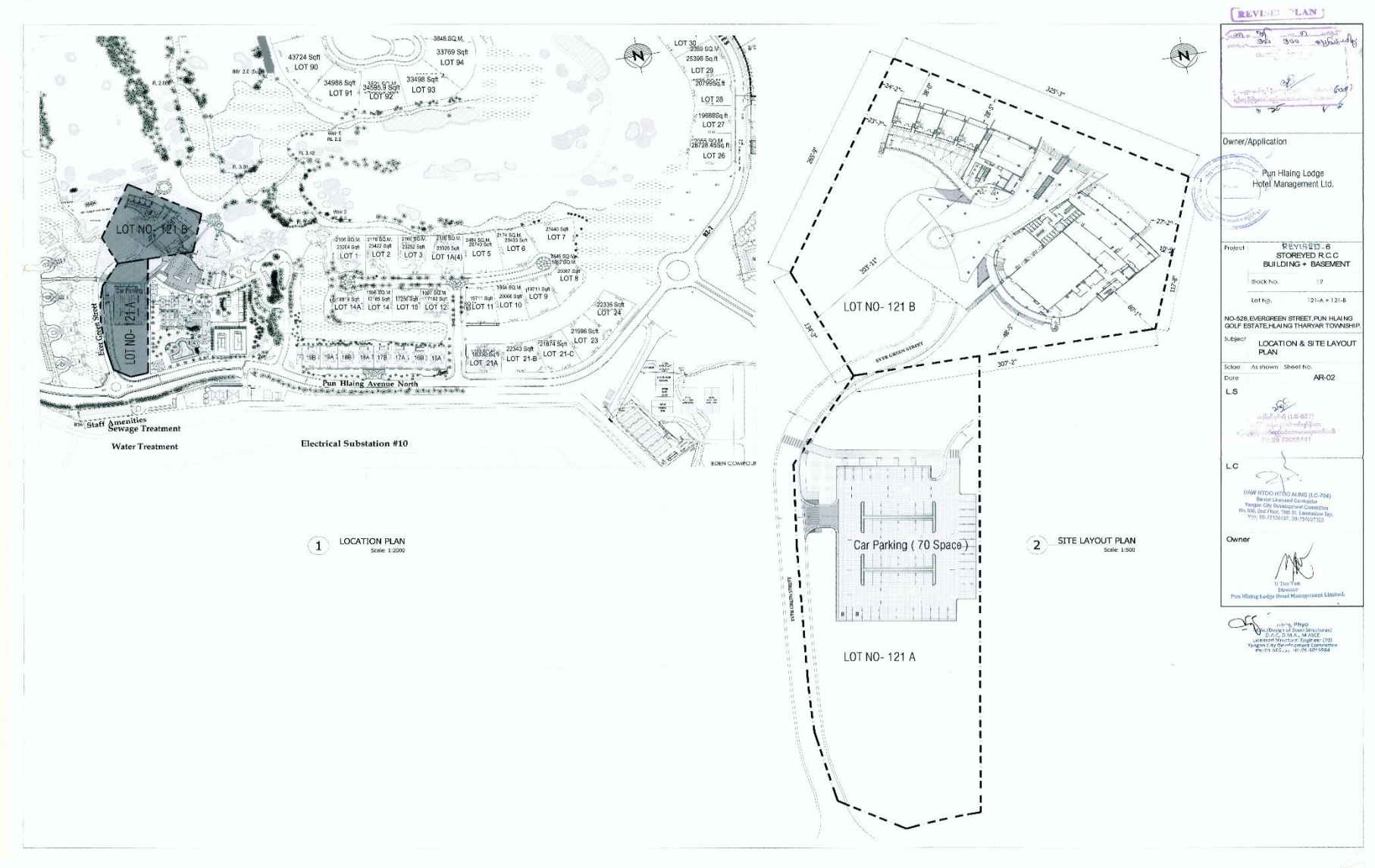


Figure 12: Location & Site Layout Plan

Figure 13: Car Parking Layout Plan

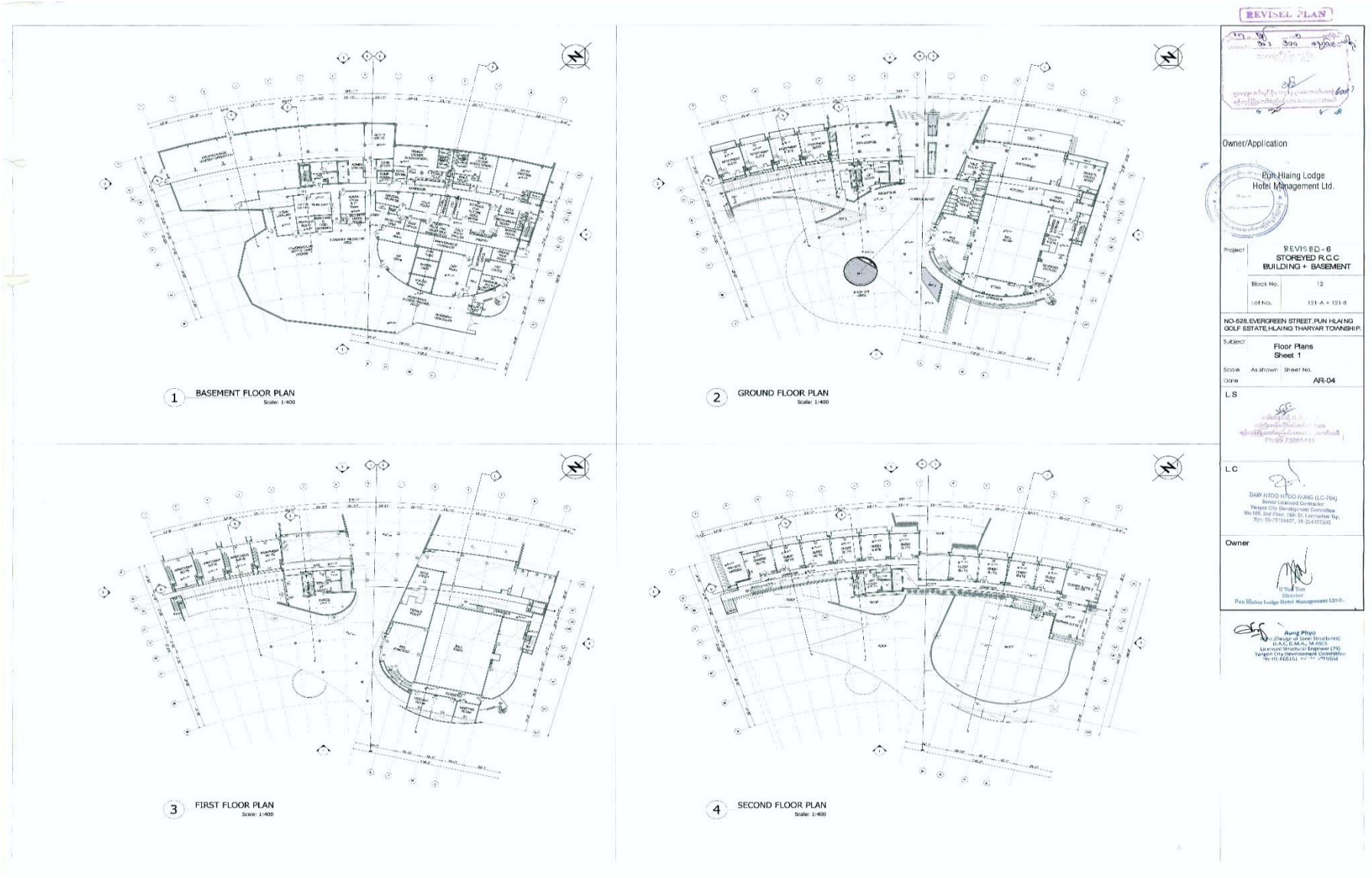


Figure 14: Floor Plans-Sheet 1

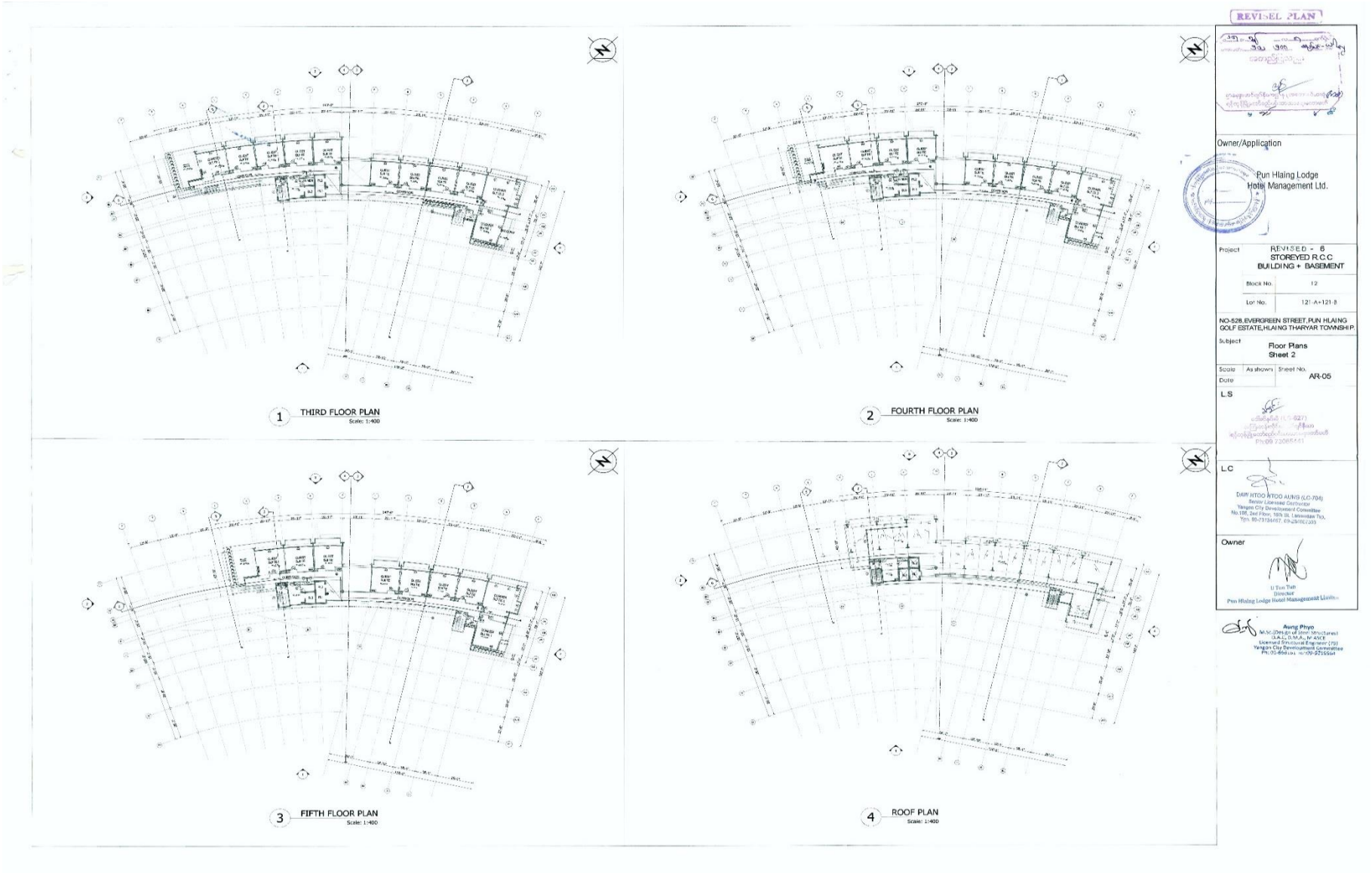


Figure 15: Floor Plans- Sheet 2

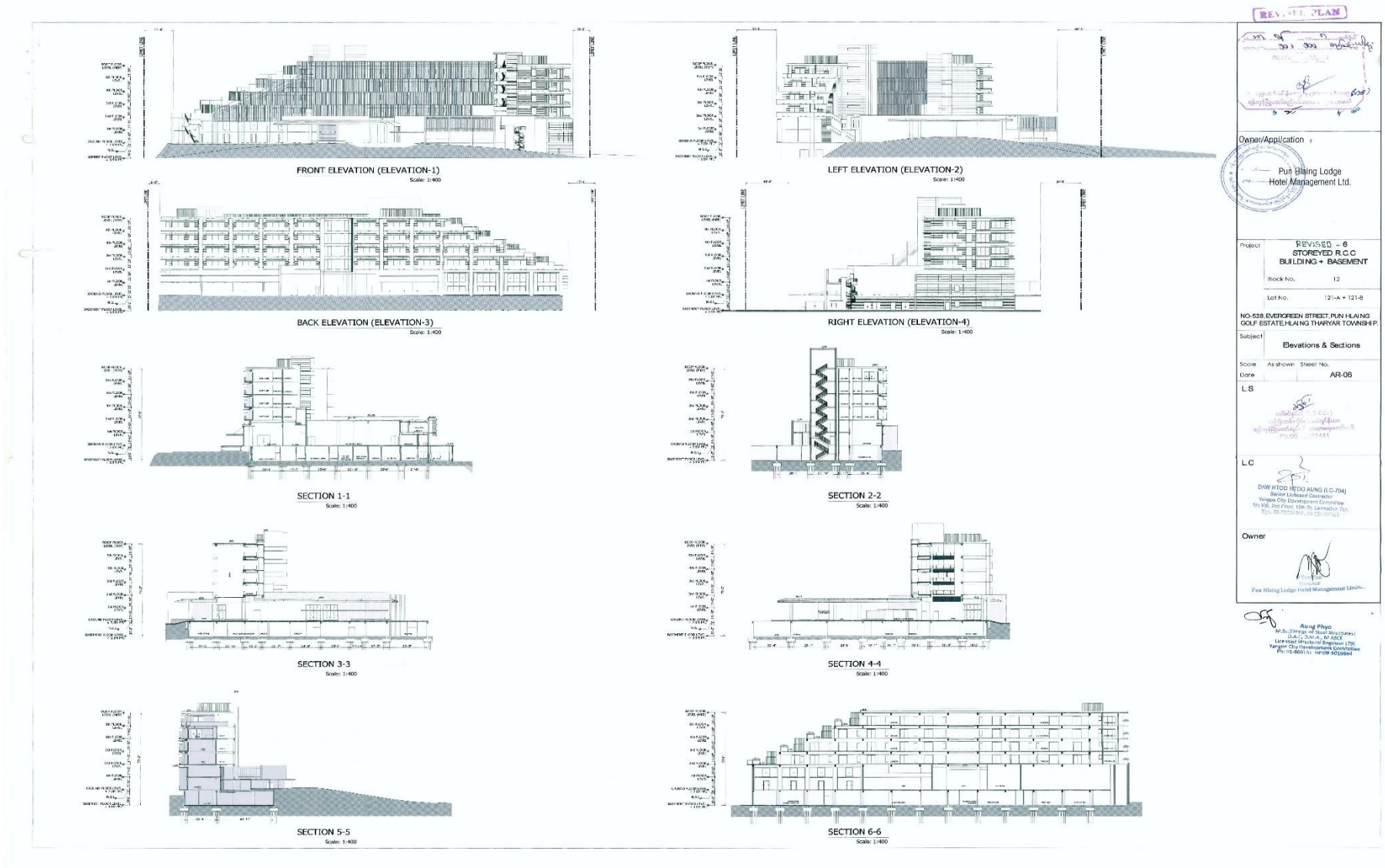


Figure 16: Elevations & Sections

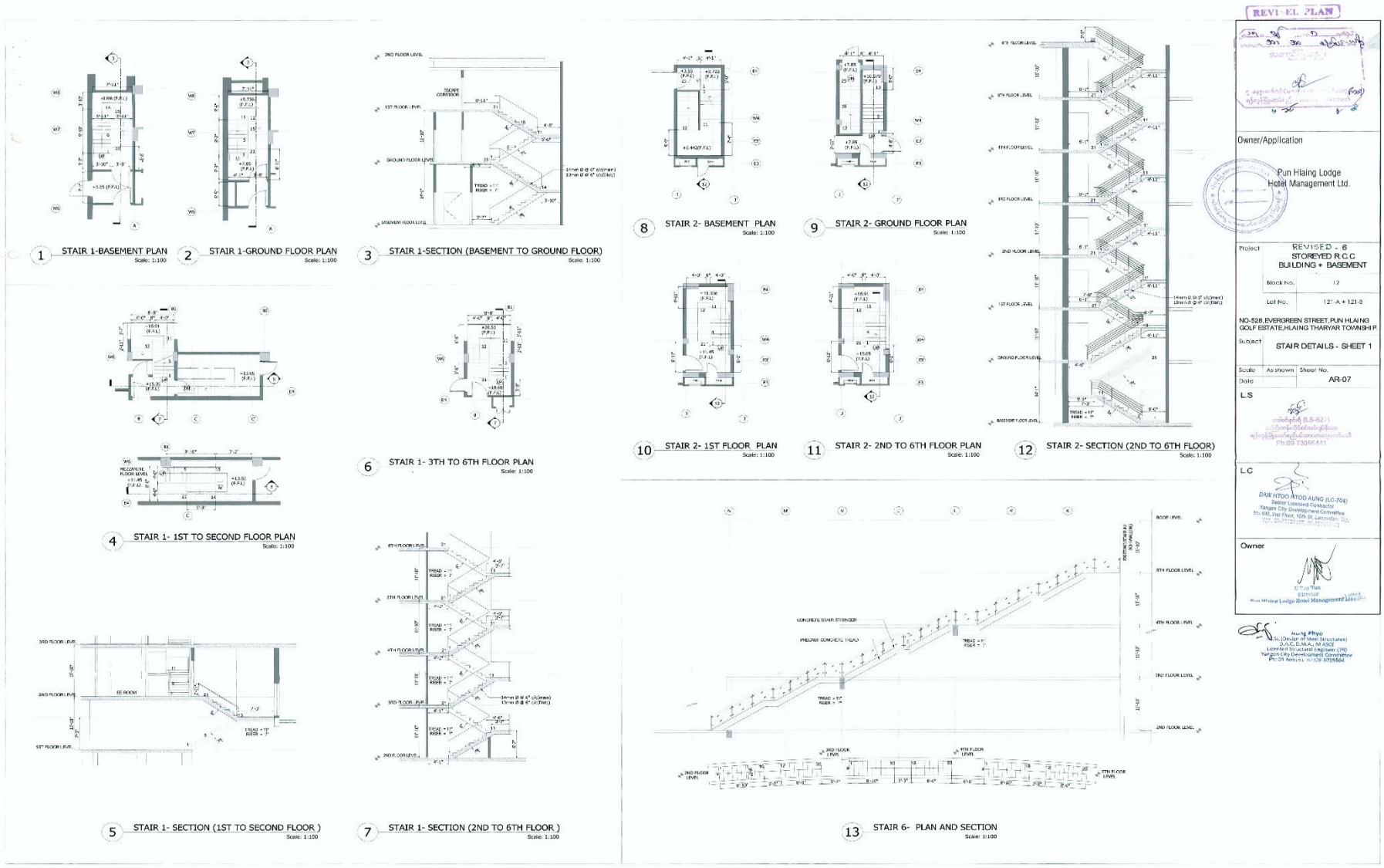


Figure 17: Stair Details – Sheet 1

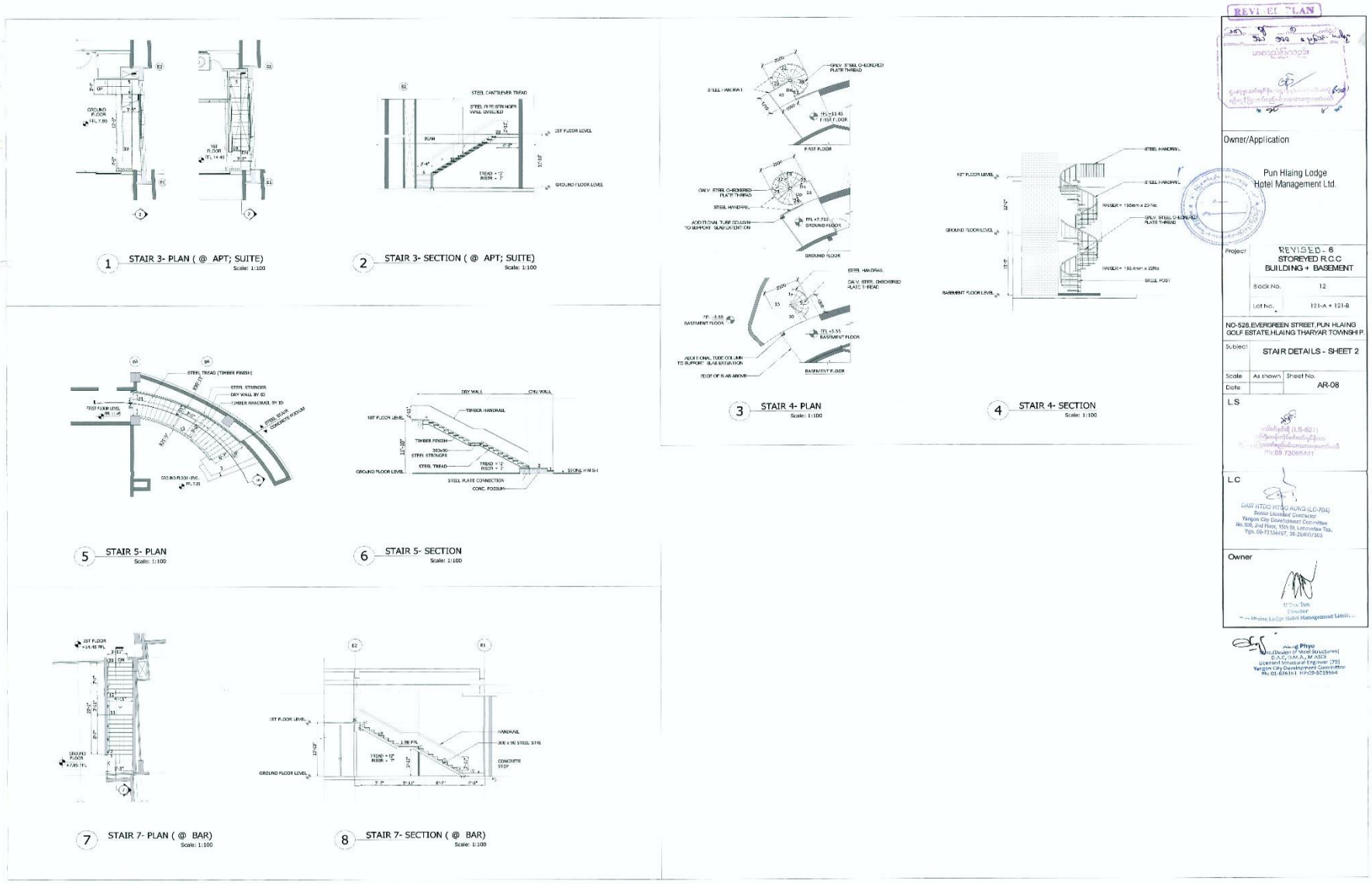


Figure 18: Stair Details – Sheet 2

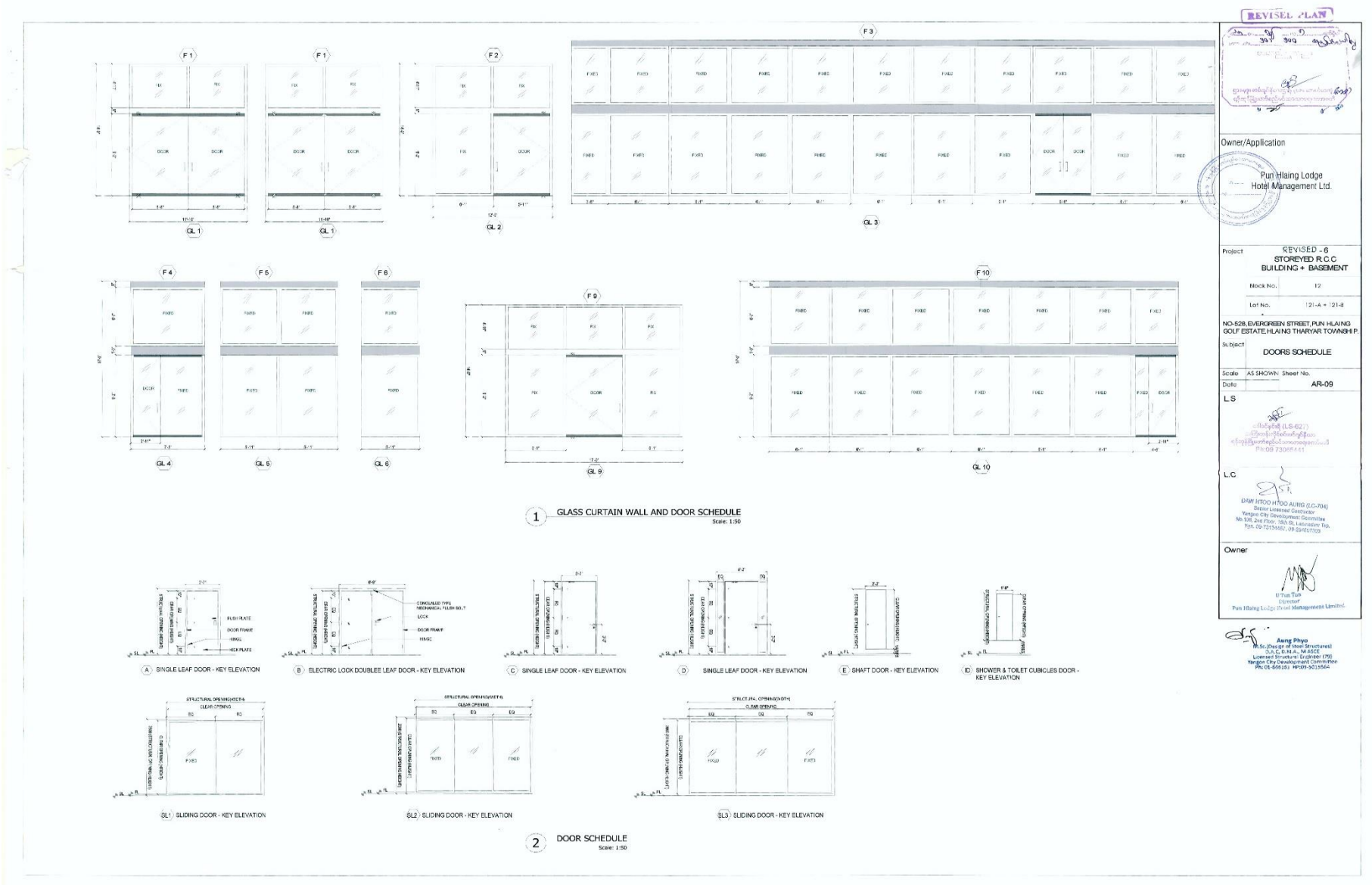


Figure 19: Doors Schedule

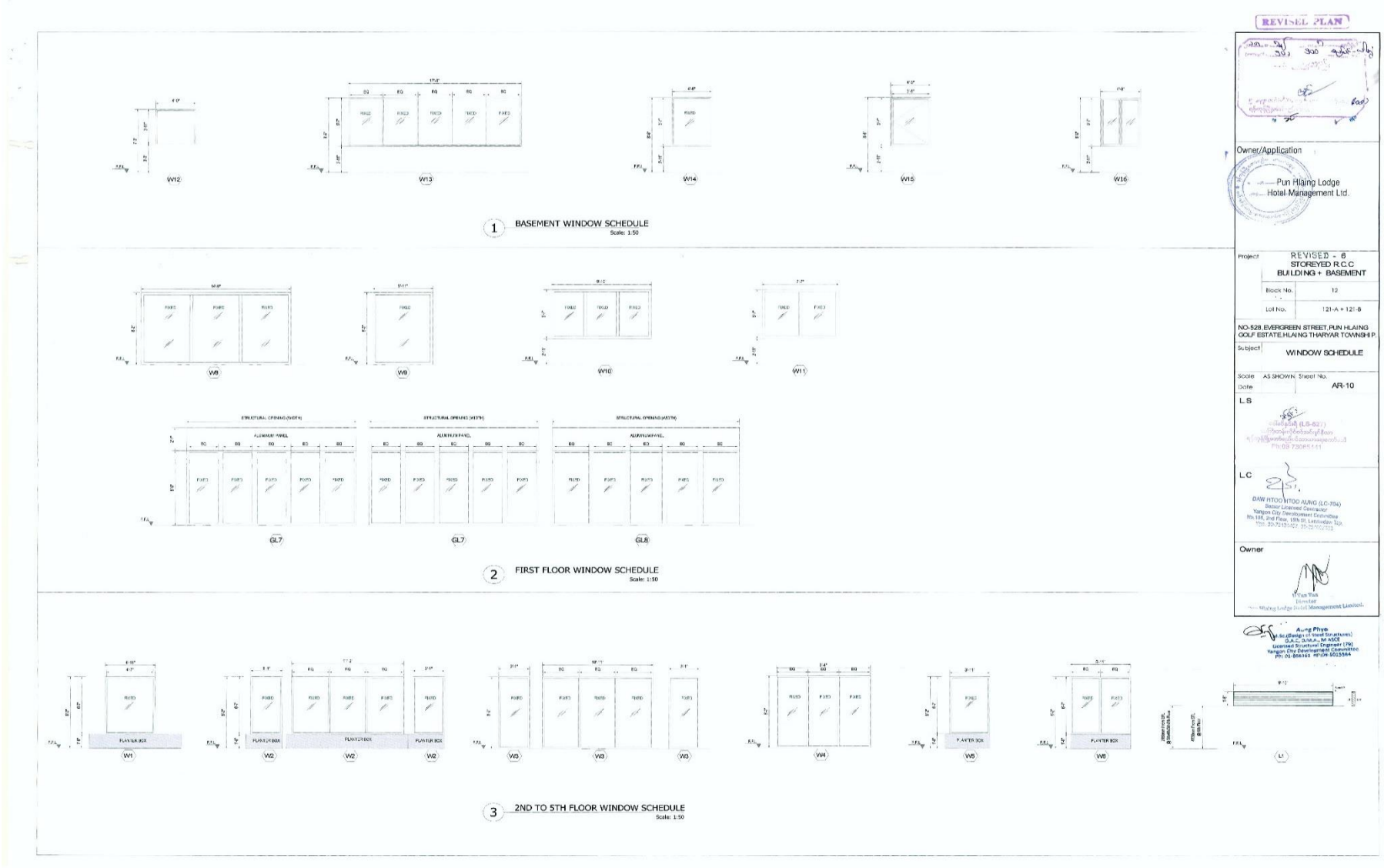


Figure 20: Window Schedule

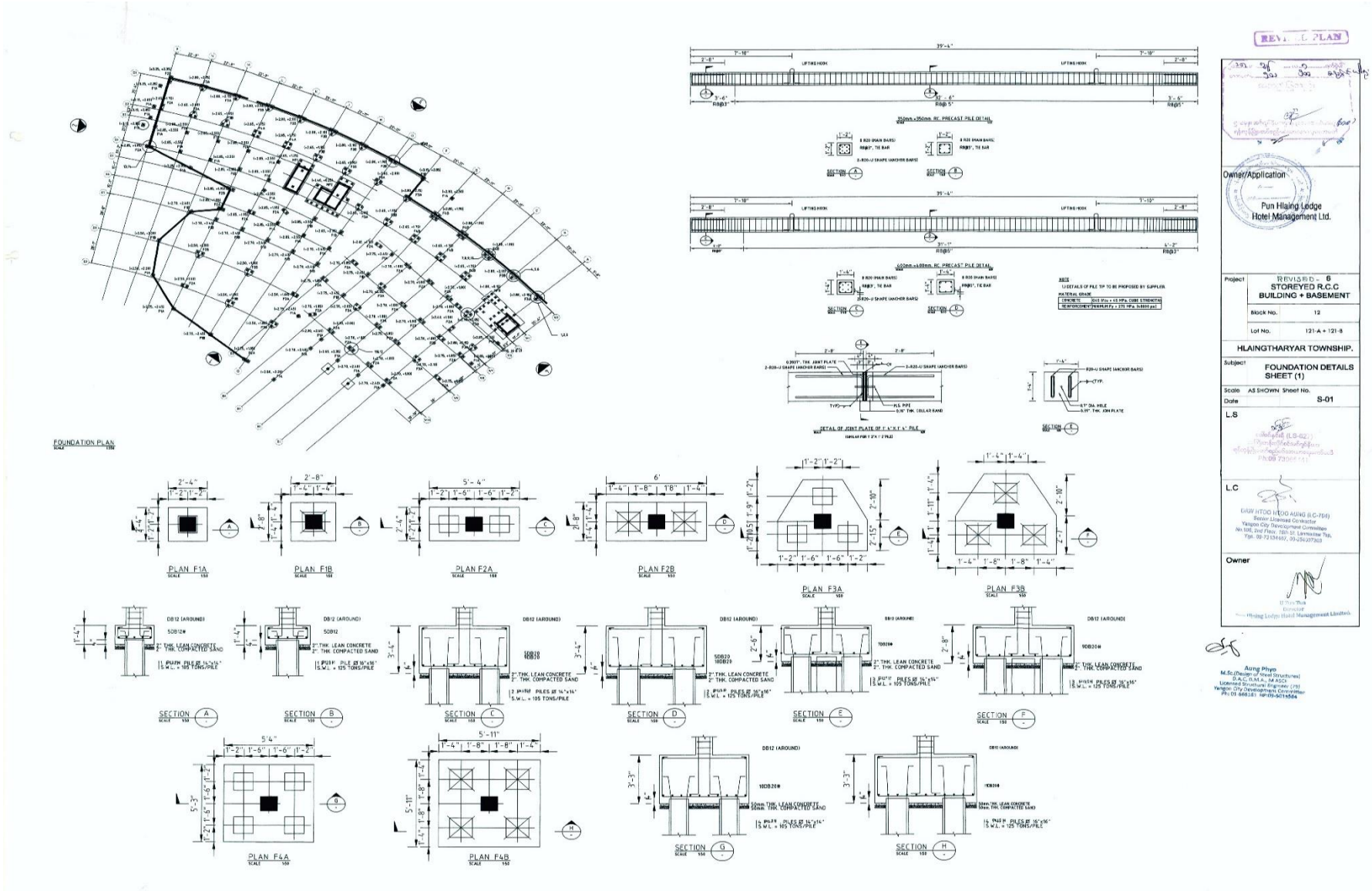


Figure 21: Foundation Details – Sheet 1

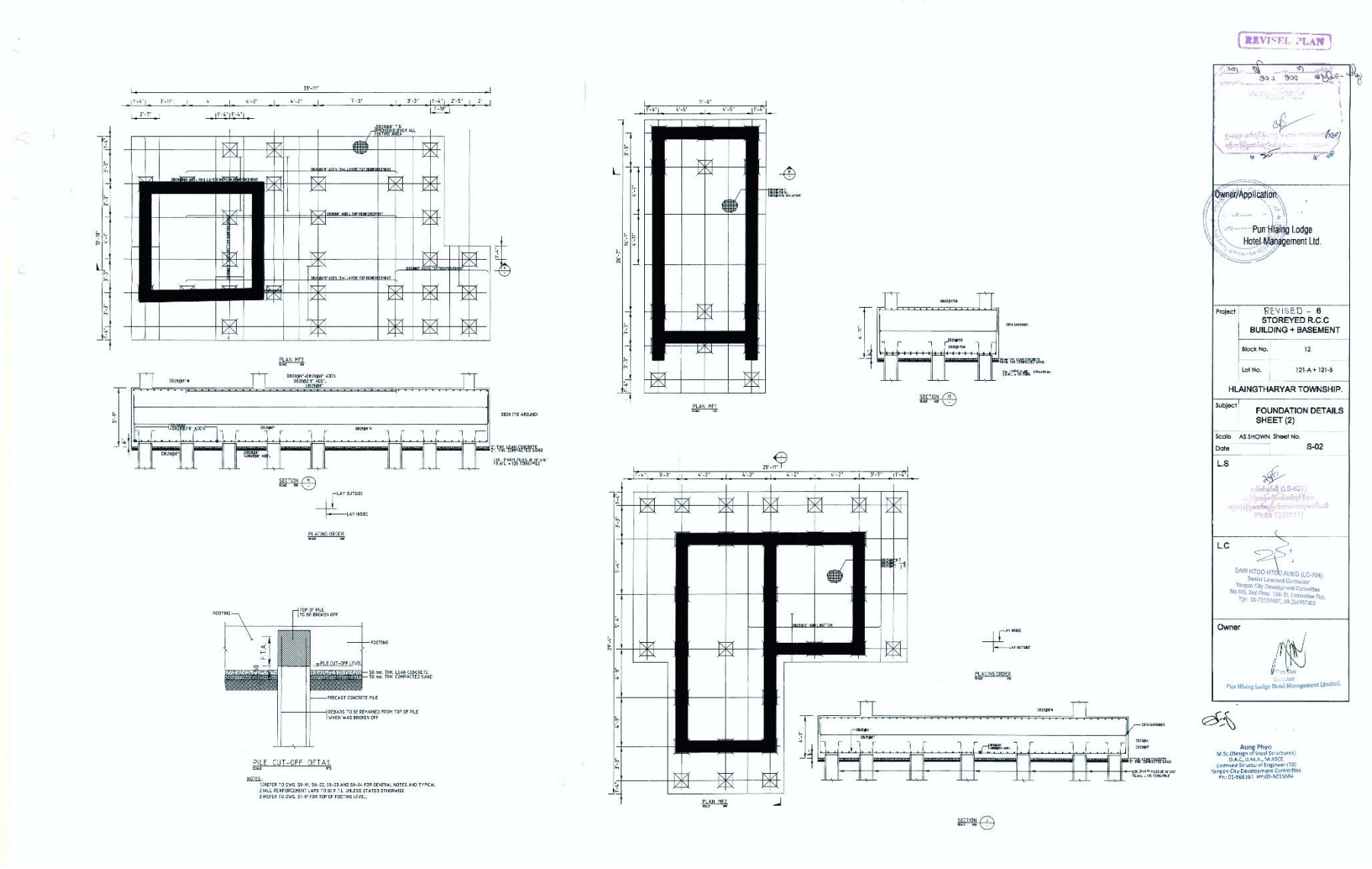


Figure 22: Foundation Details – Sheet 2

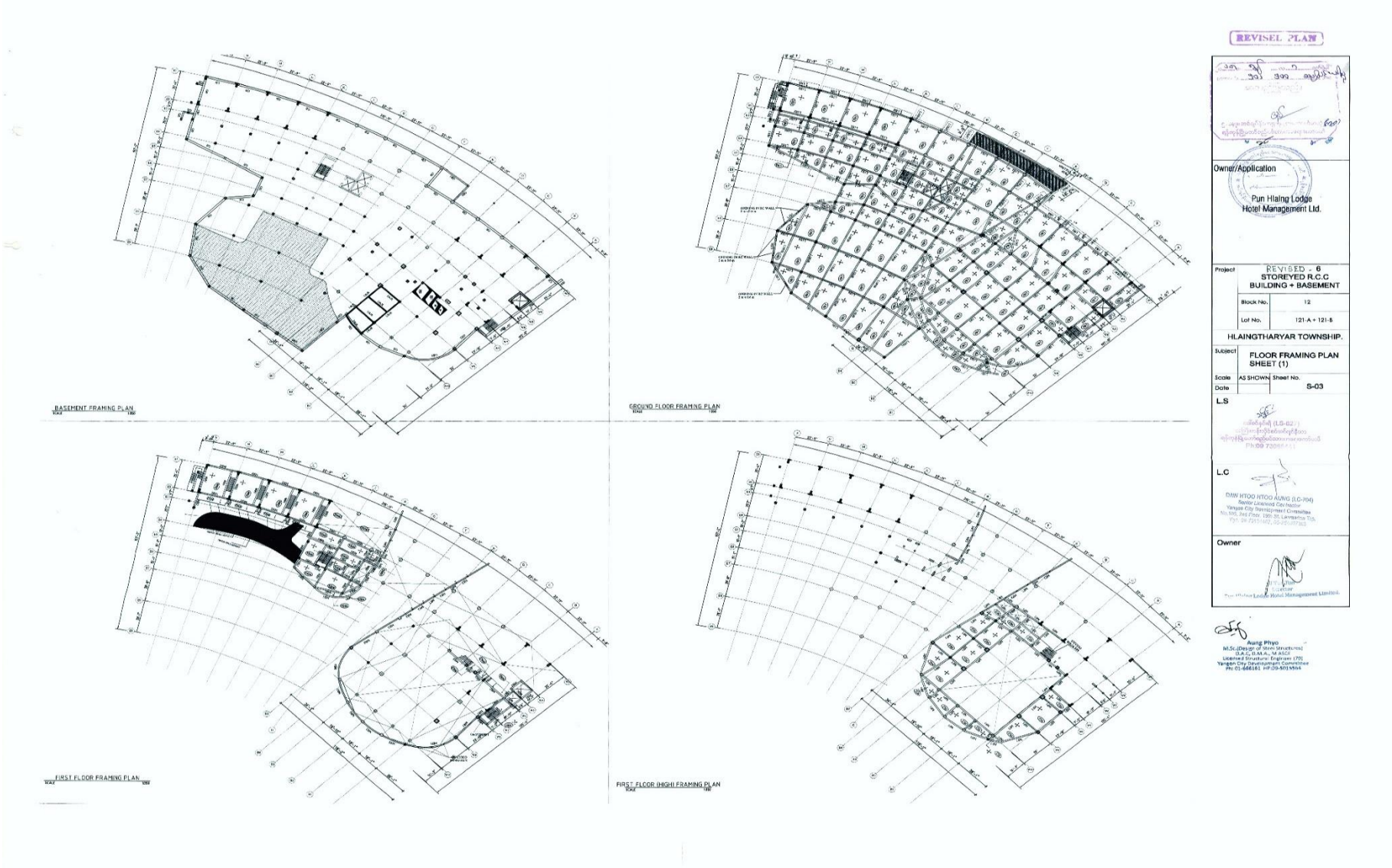


Figure 23: Floor Framing Plan- Sheet 1

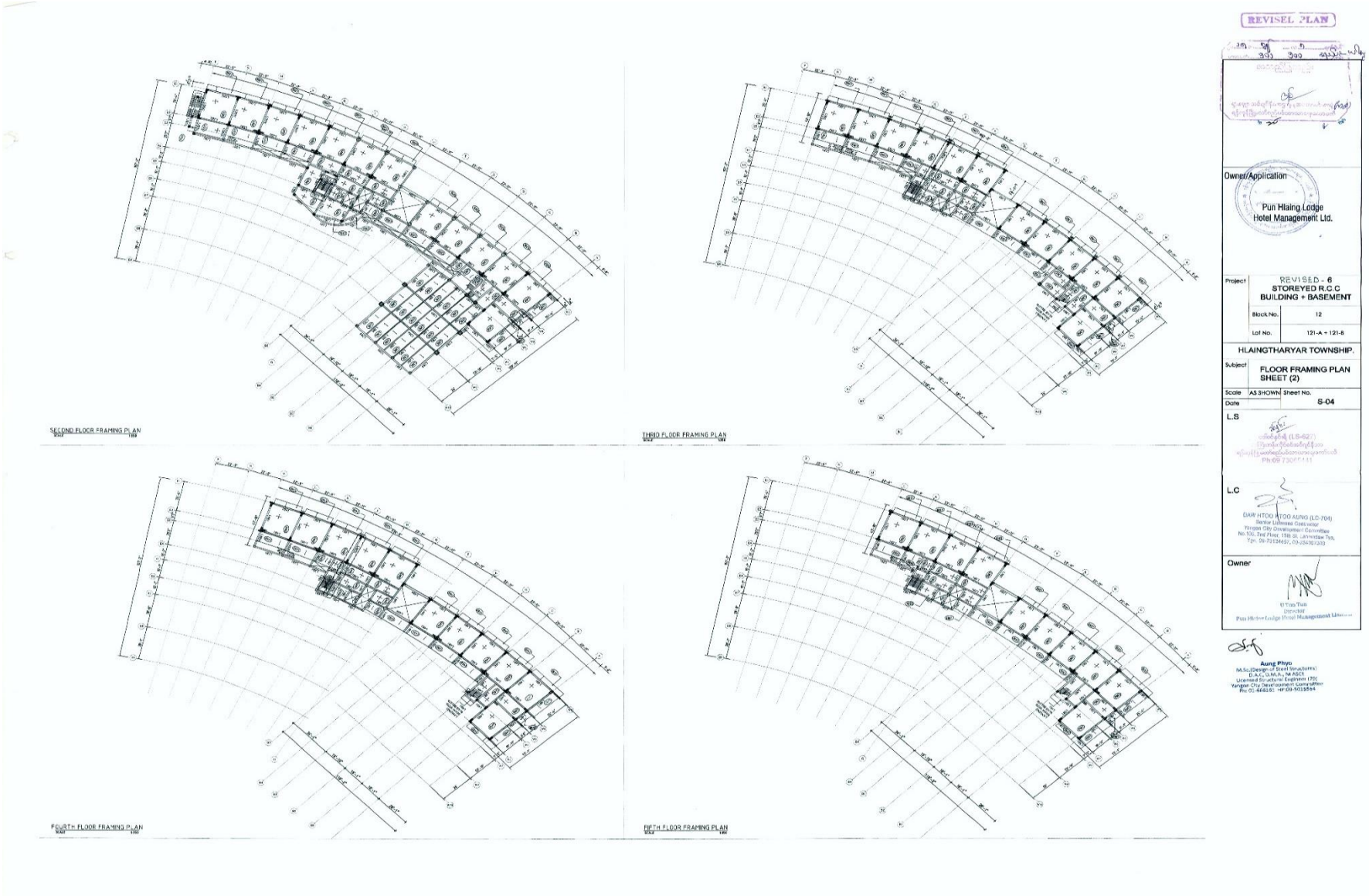


Figure 24: Floor Framing Plan-Sheet 2

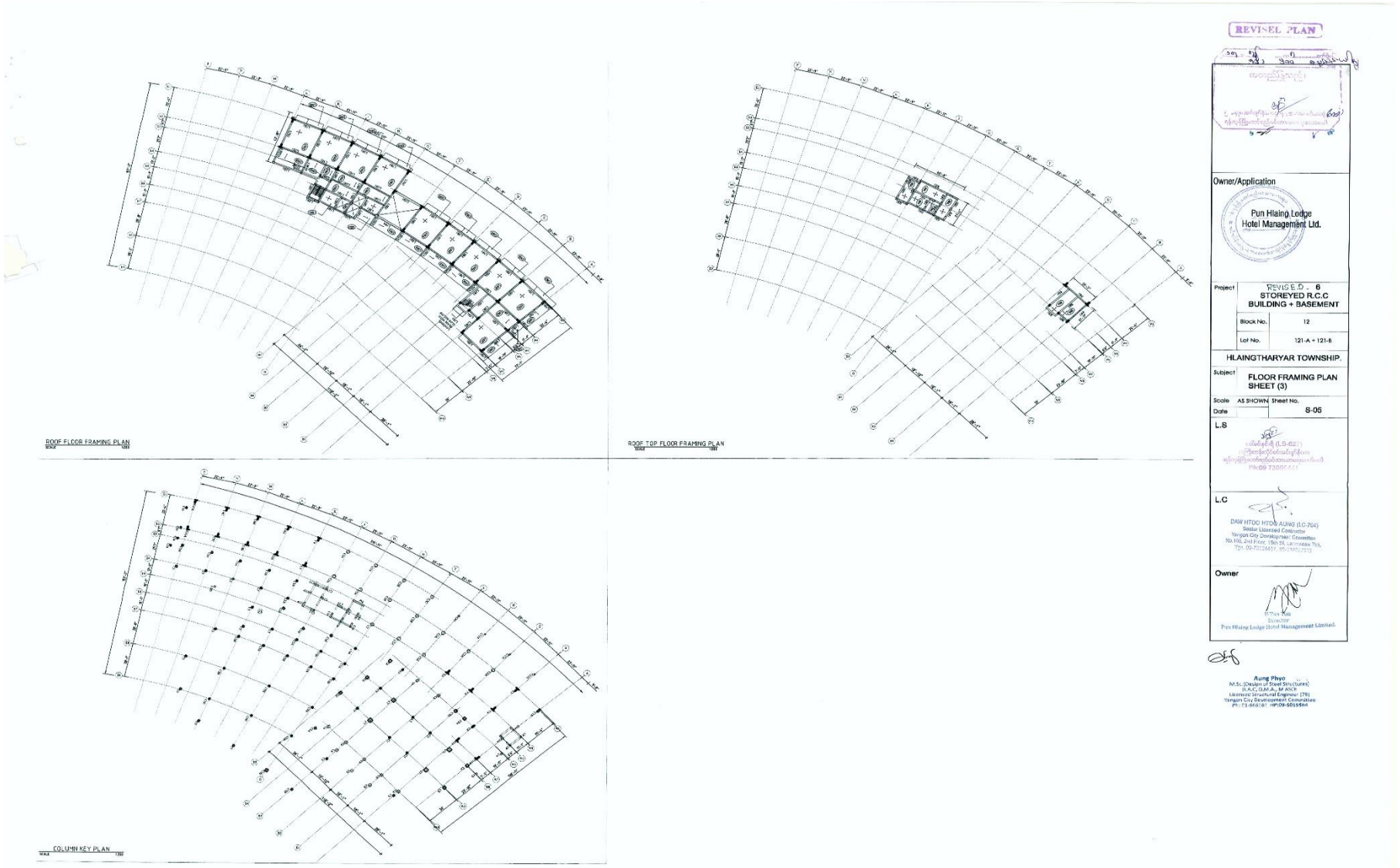


Figure 25: Floor Framing Plan- Sheet 3

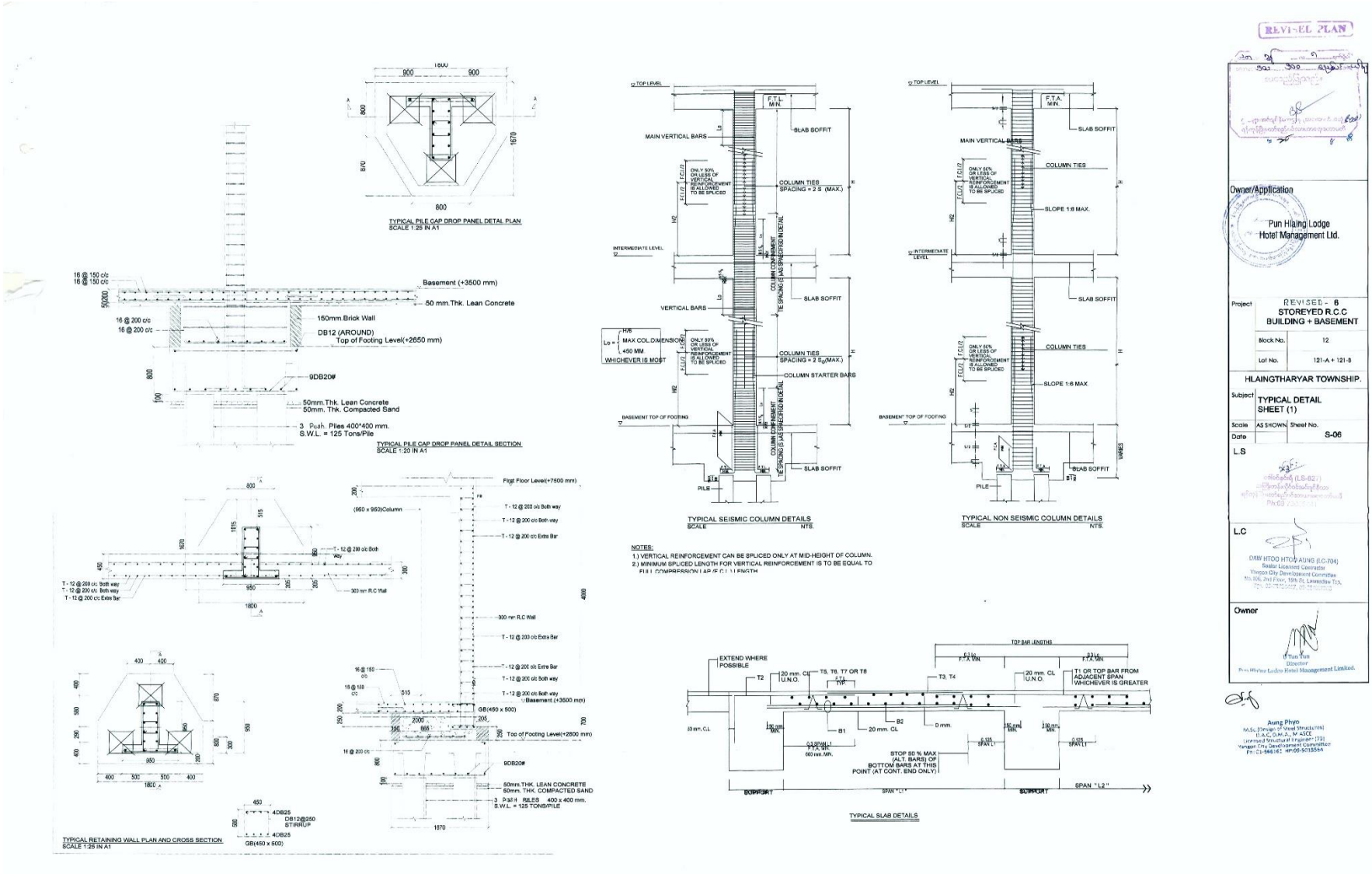


Figure 26: Typical Detail-Sheet 1

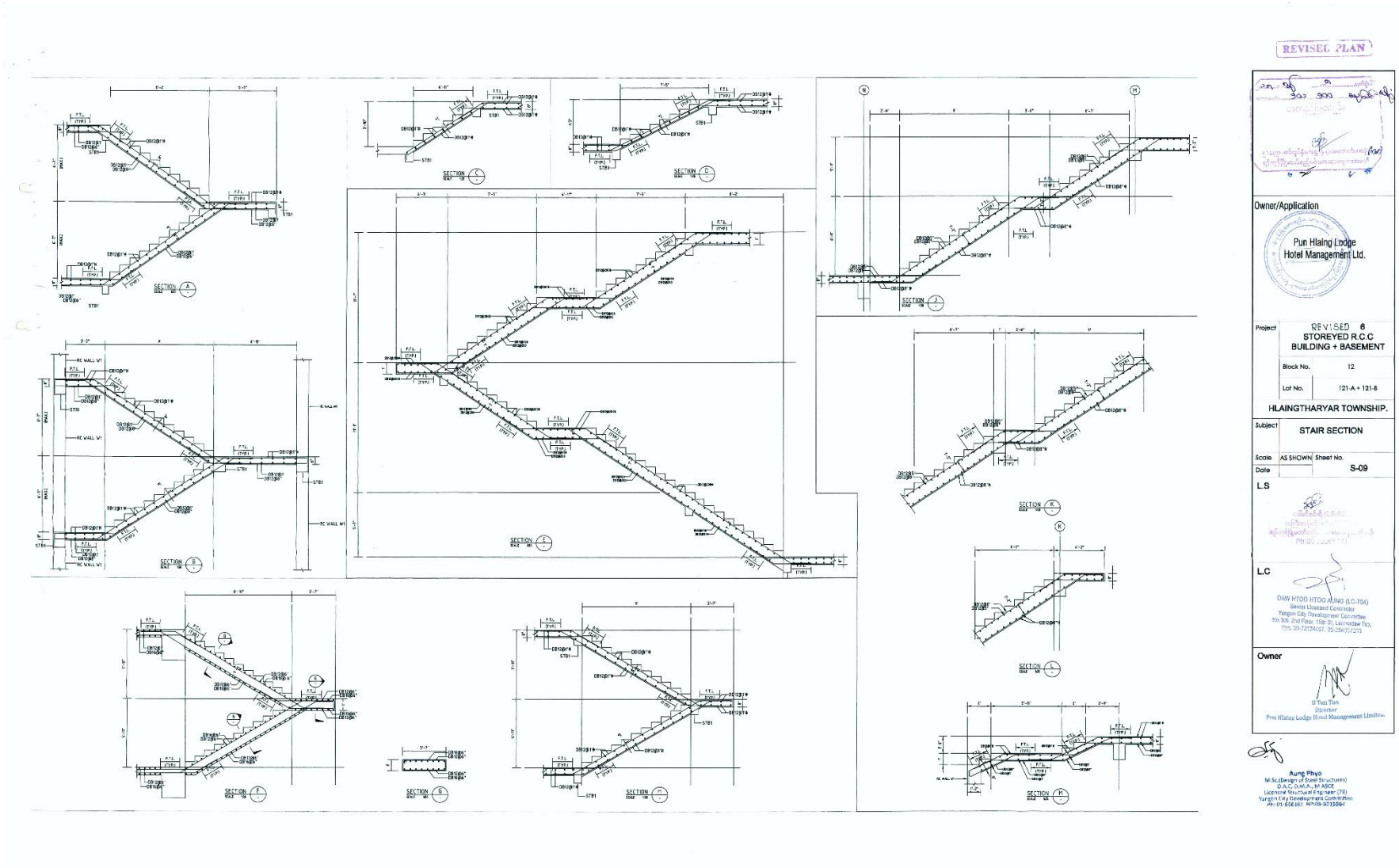


Figure 27: Stair Section

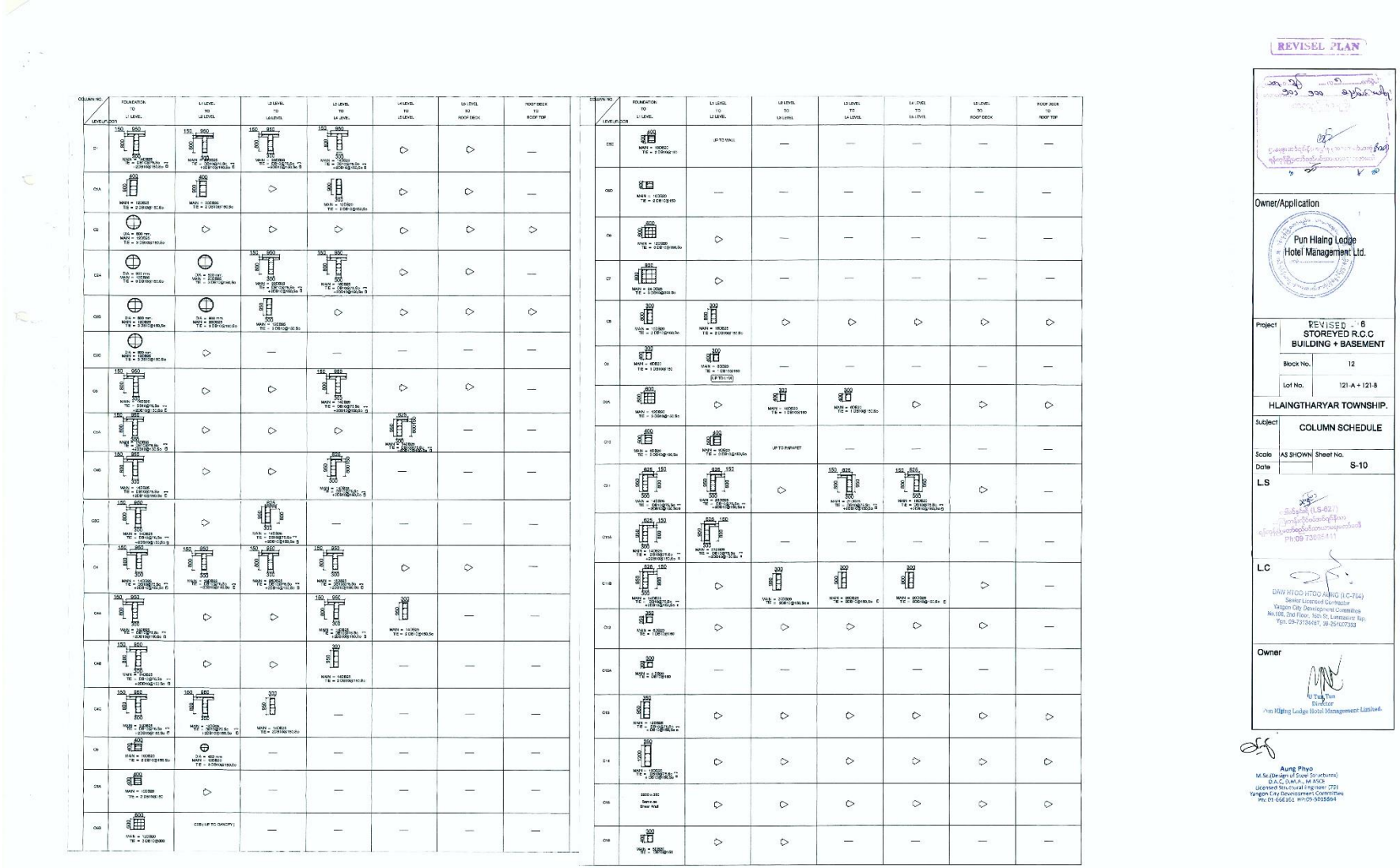


Figure 28: Column Schedule

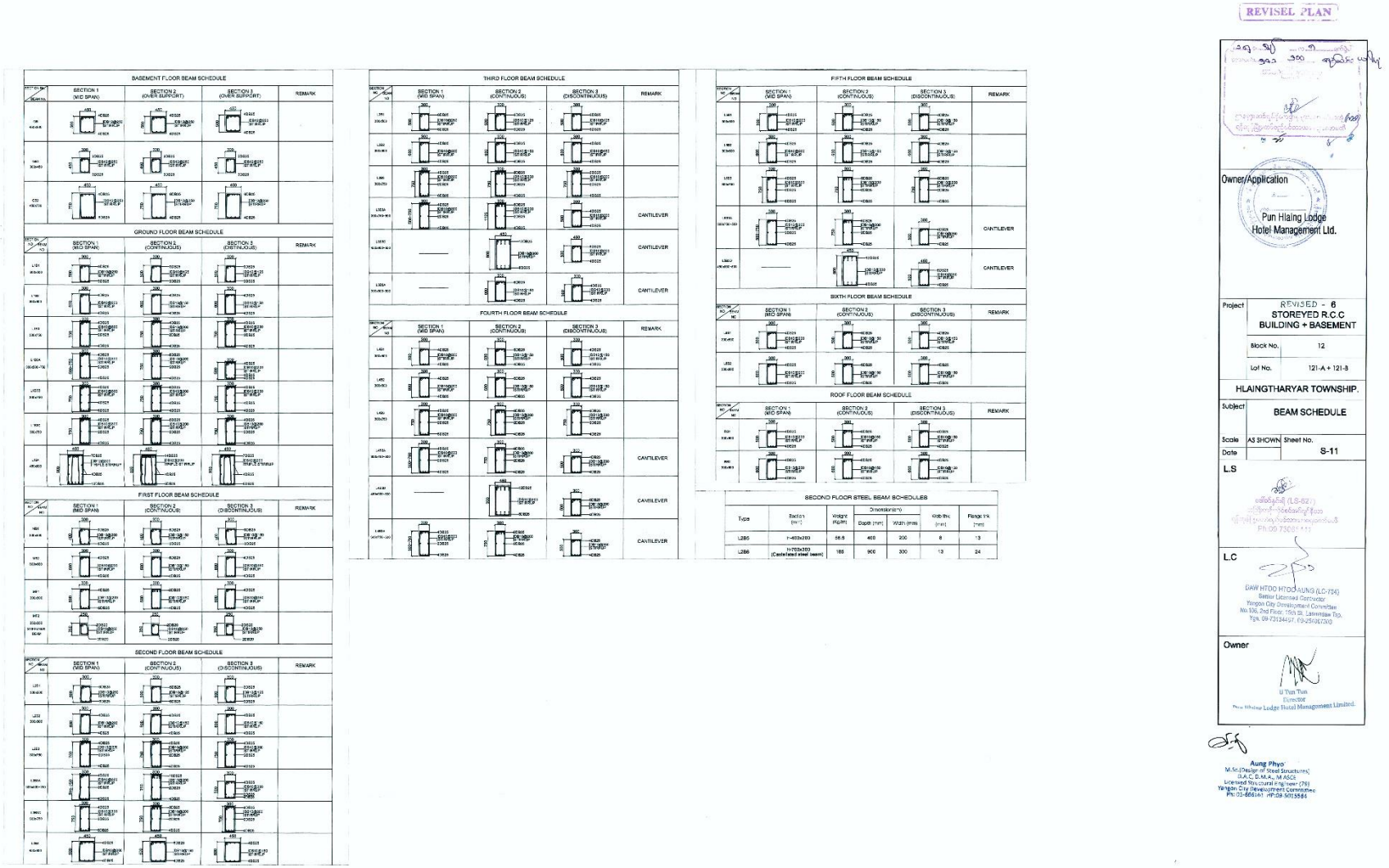


Figure 29: Beam Schedule

REVISEL PLAN

GROUDN FLOOR SLAB SCHEDULE

TYPE	THK;	LAYER	REINFORCEMENT						REMARK
			SHORT DIRECTION			LONG DIRECTION			
			DISCONT: EDGE	MID SPAN	CONT: EDGE	DISCONT: EDGE	MID SPAN	CONT: EDGE	
L1S1	250	TOP	DB 12 @ 200 c/c	-	DB 12 @ 100 c/c	DB 12 @ 200 c/c	-	DB 12 @ 100 c/c	Two Way
		BOTTOM	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	
L1S2	200	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L1S3	250	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	-	DB 12 @ 75 c/c	3 Sided
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	
L1S4	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L1S5	200	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Cantilever
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	

FIRST FLOOR SLAB SCHEDULE

TYPE	THK;	LAYER	REINFORCEMENT						REMARK
			SHORT DIRECTION			LONG DIRECTION			
			DISCONT: EDGE	MID SPAN	CONT; EDGE	DISCONT; EDGE	MID SPAN	CONT; EDGE	
M1S1	250	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
M1S2	200	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 250 c/c	DB 12 @ 150 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
M1S3	150	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	-	DB 12 @ 75 c/c	3 SIDED
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	
M1S4	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
M1S5	200	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	Cantilever
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	
M2S1	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	

SECOND FLOOR SLAB SCHEDULE

TYPE	THK;	LAYER	REINFORCEMENT						REMARK
			SHORT DIRECTION			LONG DIRECTION			
			DISCONT; EDGE	MID SPAN	CONT; EDGE	DISCONT; EDGE	MID SPAN	CONT; EDGE	
L2S1	250	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L2S2	200	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 250 c/c	DB 12 @ 150 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L2S3	150	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	-	DB 12 @ 75 c/c	3 SIDED
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	
L2S4	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L2S5	200	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	Cantilever
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	
L2SC	75 + 50	-	DB 10 @ 150 c/c			DB 10 @ 150 c/c are lager at 20 mm from top.			Composite floor slab

THRID FLOOR SLAB SCHEDULE

TYPE	THK;	LAYER	REINFORCEMENT						REMARK
			SHORT DIRECTION			LONG DIRECTION			
			DISCONT: EDGE	MID SPAN	CONT; EDGE	DISCONT; EDGE	MID SPAN	CONT: EDGE	
L3S1	250	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L3S2	200	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 250 c/c	DB 12 @ 150 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L3S3	150	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	-	DB 12 @ 75 c/c	3 SIDED
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	
L3S4	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L3S5	200	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	Cantilever
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	

FOURTH FLOOR SLAB SCHEDULE

TYPE	THK;	LAYER	REINFORCEMENT						REMARK
			SHORT DIRECTION			LONG DIRECTION			
			DISCONT; EDGE	MID SPAN	CONT; EDGE	DISCONT; EDGE	MID SPAN	CONT; EDGE	
L4S1	250	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L4S2	200	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 250 c/c	DB 12 @ 150 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L4S3	150	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	-	DB 12 @ 75 c/c	3 SIDED
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	
L4S4	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L4S5	200	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	Cantilever
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	

FIFTH FLOOR SLAB SCHEDULE

TYPE	THK:	LAYER	REINFORCEMENT						REMARK
			SHORT DIRECTION			LONG DIRECTION			
			DISCONT: EDGE	MID SPAN	CONT; EDGE	DISCONT: EDGE	MID SPAN	CONT; EDGE	
L5S1	250	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L5S2	200	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 250 c/c	DB 12 @ 150 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L5S3	150	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	-	DB 12 @ 75 c/c	3 SIDED
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	
L5S4	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L5S5	200	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	Cantilever
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	

ROOF FLOOR SLAB SCHEDULE

TYPE	THK;	LAYER	REINFORCEMENT						REMARK
			SHORT DIRECTION			LONG DIRECTION			
			DISCONT; EDGE	MID SPAN	CONT; EDGE	DISCONT: EDGE	MID SPAN	CONT; EDGE	
L6S1	250	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L6S2	200	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 250 c/c	DB 12 @ 150 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L6S3	150	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	-	DB 12 @ 75 c/c	3 SIDED
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	DB 12 @ 150 c/c	
L6S4	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	Two Way
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
L6S5	200	TOP	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 75 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	Cantilever
		BOTTOM	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	DB 12 @ 300 c/c	

ROOF TOP SLAB SCHEDULE

TYPE	THK;	LAYER	REINFORCEMENT						REMARK
			SHORT DIRECTION			LONG DIRECTION			
			DISCONT: EDGE	MID SPAN	CONT; EDGE	DISCONT; EDGE	MID SPAN	CONT; EDGE	
RS1	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	
		BOTTOM	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 200 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	
RS2	150	TOP	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	DB 12 @ 300 c/c	-	DB 12 @ 150 c/c	
		BOTTOM	DB 12 @ 250 c/c	DB 12 @ 150 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	DB 12 @ 250 c/c	

Owner/Application
Pun Hlaing Lodge Hotel Management Ltd.

Project	REVISED - 6 STOREYED R.C.C BUILDING + BASEMENT	
	Block No.	12
	Lot No.	121-A + 121-B
HLAINGTHARYAR TOWNSHIP.		
Subject	SLAB SCHEDULE	
Scale	AS SHOWN	Sheet No. S-12
Date		

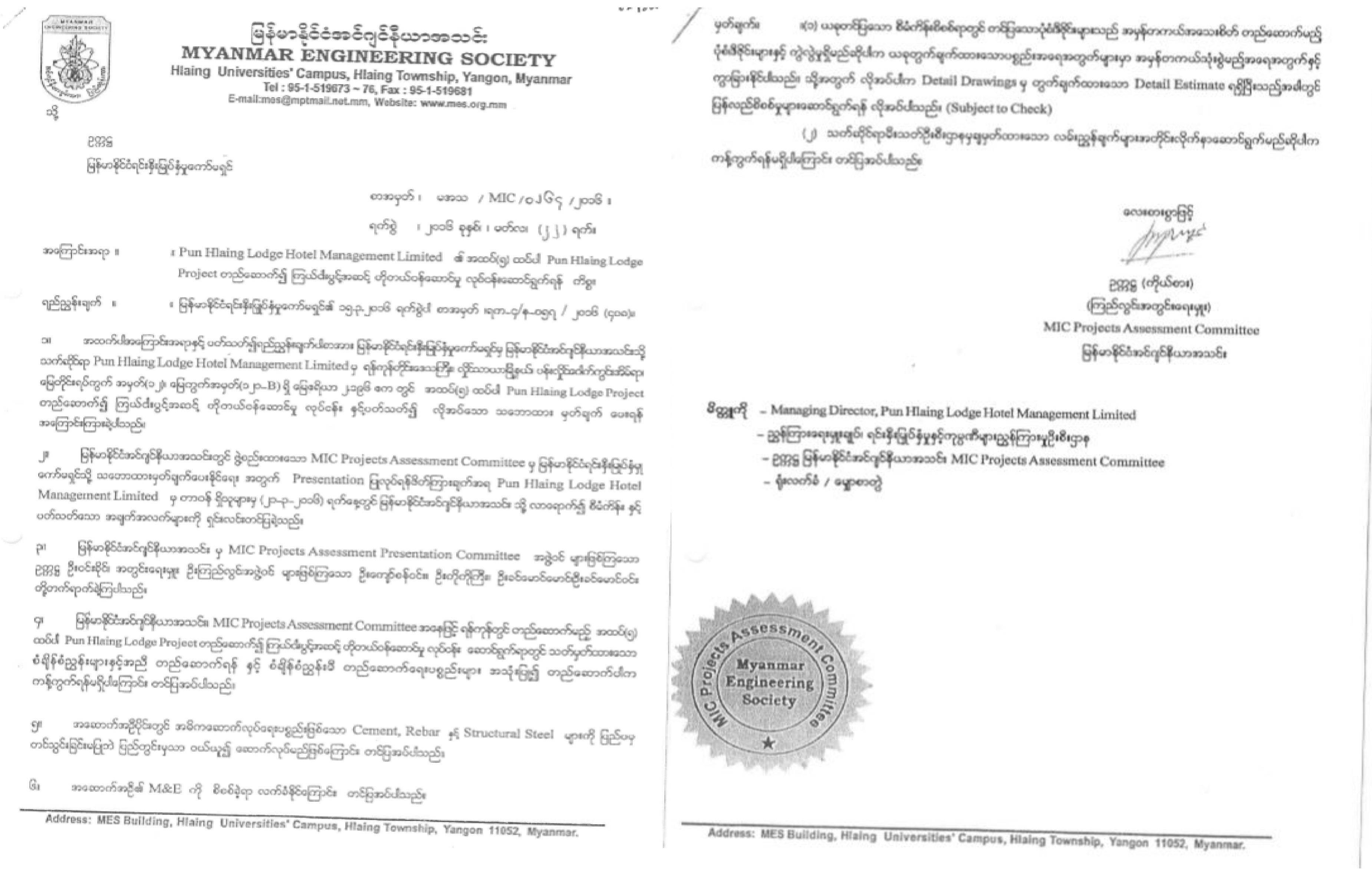
L.S
(LS-827)
Ph:09 7308...

L.C
DAW HTOO HTOO AUNG (LC-704)
Senior Licensed Contractor
Yangon City Development Committee
No.106, 2nd Floor, 15th St, Lanmadaw Tsp, Ygn. 09-73134487, 09-254087303

Owner
U Tun Tun
Director
Pun Hlaing Lodge Hotel Management Limited.

Aung Phyo
M.Sc.(Design of Steel Structures)
D.A.C, D.M.A., M.ASCE
Licensed Structural Engineer (79)
Yangon City Development Committee

Figure 30: Slab Schedule



MYANMAR ENGINEERING SOCIETY

Hlaing Universities' Campus, Hlaing Township, Yangon, Myanmar

Tel : 95-1-519673 ~ 76, Fax : 95-1-519681

E-mail:mes@mptmail.net.mm, Website: www.mes.org.mm

MIC /0၂၆၄ /၂၀၁၆

: Pun Hlaing Lodge Hotel Management Limited

Pun Hlaing Lodge Project

Pun Hlaing Lodge Hotel Management Limited

Pun Hlaing Lodge Project

MIC Projects Assessment Committee

Presentation

Pun Hlaing Lodge Hotel Management Limited

MIC Projects Assessment Presentation Committee

MIC Projects Assessment Committee

Pun Hlaing Lodge Project

Cement, Rebar Structural Steel

M&E

Address: MES Building, Hlaing Universities' Campus, Hlaing Township, Yangon 11052, Myanmar.

Detail Drawings Detail Estimate

(Subject to Check)

MIC Projects Assessment Committee

- Managing Director, Pun Hlaing Lodge Hotel Management Limited

MIC Projects Assessment Committee

Address: MES Building, Hlaing Universities' Campus, Hlaing Township, Yangon 11052, Myanmar.

Figure 31: Recommendation Certificate from Myanmar Engineering Society

Appendix B

FIELD MONITORING DATA AND LABORATORY TESTING REPORTS

Project Name: Pun Hlaing
Project Number: SLP 1105
Monitoring Round No: 1

Surface Water Sampling Record Sheet

Sampling Location:	SW1
Project Name:	Pun Hlaing
Client:	Thanlyin Estate Development
Project Location:	Yangon, Myanmar
Project Number:	SLP1105
Date &Time of Sampling:	15 January 2016 & 9:30
Name of Sampler:	SW1
Sampling Method:	Grab Sampler

DESCRIPTION: Low solid suspended

WATER SAMPLE DESCRIPTION

Colour:	No colour	Turbidity:	Low
Odour:	No odour	Sediment Content:	

FIELD MEASUREMENTS OF WATER SAMPLE

Temperature (°C):	24.0	pH (units):	6.9	Conductivity (µS/cm):	14
Dissolved Oxygen (mg/l):		3.87		Altitude (m AOD):	-

CHEMICAL ANALYSES

Analytical suite instructed:	QRA Comprehensive spectrum suite
Laboratory used:	HiAdvance Thailand
Date / time dispatched:	20th January 2016 at 14:55 pm

REMARKS:

Sampling Location:	SW2
Project Name:	Pun Hlaing
Client:	Thanlyin Estate Development
Project Location:	Yangon, Myanmar
Project Number:	SLP1105
Date &Time of Sampling:	15 January 2016 & 9:40
Name of Sampler:	SW2
Sampling Method:	Grab Sampler

DESCRIPTION: Low solid suspended

WATER SAMPLE DESCRIPTION

Colour:	No colour	Turbidity:	Low
Odour:	No odour	Sediment Content:	

FIELD MEASUREMENTS OF WATER SAMPLE

Temperature (°C):	24.7	pH (units):	7.1	Conductivity (µS/cm):	13
Dissolved Oxygen (mg/l):		3.67		Altitude (m AOD):	-

CHEMICAL ANALYSES

Analytical suite instructed:	QRA Comprehensive spectrum suite
Laboratory used:	HiAdvance Thailand
Date / time dispatched:	20th January 2016 at 14:55 pm

REMARKS:

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

05 February 2016

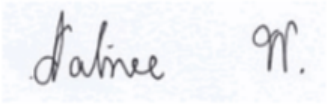
SLP Environmental
SLP Environmental
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nua,Wattana,
Bangkok, THAILAND 10110

RE: Pun Hlaing Ladge

Enclosed are the results of analyses for samples received by the laboratory on 20-Jan-16

15:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Nalinee Wachiranugul
Project Manager

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu
Bangkok THAILAND, 10110

Project: **Pun Hlaing Ladge**
Project Number: SLP 1105
Project Manager: SLP Environmental

Reported:
05-Feb-16 19:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW1	TZA0006-01	Water	15-Jan-16 09:30	20-Jan-16 15:30
SW2	TZA0006-02	Water	15-Jan-16 09:30	20-Jan-16 15:30

HiAdvance Thailand

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Nalinee Wachiranugul, Project Manager

HiAdvance

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu
Bangkok THAILAND, 10110

Project: **Pun Hlaing Ladge**
Project Number: SLP 1105
Project Manager: SLP Environmental

Reported:
05-Feb-16 19:14

HiAdvance Thailand
Level 8 PM Tower
731 Asoke-Dindaeng Rd
Dindaeng, Bangkok 10400
Thailand
Tel: +66.2.641.7509

CHAIN-OF-CUSTODY / Anal 'cal Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All vant fields must be completed accurately.

HA

Page: 1 of 1

Section A – Required Client Information:
Company: SLP Environmental
Address: 10/109, Floor8, The Tiendy Offic Building, Sukumvit13, Nong Toei Nua, Wattana, 10110, BKK, Thailand
Email To: info@slpenvironmental.com
Phone: 021687016 Fax: 021687230
Requested Due Date/TAT: Standard

Section B – Required Project Information:
Report To: SLP Environmental
Copy To:
Purchase Order No.: N/A →
Project Name: Pun Hlaing Lodge
Project Number: SLP 1105

Section C – Invoice Information:
Attention: Steve Pearmain
Company Name: SLP Environmental
Address: See Section (A)
HA Quote Reference: Email Burt Blackburn dated 14/12/2015
HA Project Manager: Teeranard Promsuwan
HA Profile #:

REGULATORY AGENCY
☐ EFFLUENT ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ WASTE ☑ OTHER Surface Water

Site Location: Hlaing Thaiyar Township, Yangon, Myanmar

Requested Analysis Filtered (Y/N)

Section D – Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes: MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Analysis Test (Filtered Y/N): COD (N), Oil and Grease (N), TKN (N), Total Phosphorus (N), TSS (N)

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	TIME	COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	COD	Oil and Grease	TKN	Total Phosphorus	TSS	Residual Chlorine (Y/N)	HiAdvance Project No./ Lab I.D. TZA0006
1	SW1	WT	G	15/01/16	9.30	15/01/16	9.40		3		✓							X	X	X	X	X		TZA0006-01
2	SW2	WT	G	15/01/16	9.40	15/01/16	9.55		3		✓							X	X	X	X	X		TZA0006-02
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Teeranard Promsuwan	20/01/16	14:55	[illegible]	20/01/16	14:55
				Somluck S.	20/01/16	15:30

SAMPLE CONDITIONS: Temp in °C: 9.4; Received on Ice (Y/N): N; Custody Sealed Cooler (Y/N): ; Samples Intact (Y/N):

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Teeranard Promsuwan
SIGNATURE of SAMPLER: [signature]
DATE Signed (MM/DD/YY): 15/01/2016

Rev. 2; 12 November 2015

HiAdvance Thailand

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Nalinee Wachiranugul, Project Manager

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental

10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu
Bangkok THAILAND, 10110

Project: **Pun Hlaing Ladge**

Project Number: SLP 1105
Project Manager: SLP Environmental

Reported:
05-Feb-16 19:14

SW1
TZA0006-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
HiAdvance Thailand									
Physical and Aggregate Properties by APHA/AWWA Methods									
Total Suspended Solids	ND	17.9	mg/L	1	16A0017	27-Jan-16	27-Jan-16	APHA 2540D	H11
Inorganic Non-Metallic Constituents by APHA/AWWA Methods									
Phosphorus	ND	0.008	mg/L	1	16B0008	04-Feb-16	05-Feb-16	APHA 4500-P	
Aggregate Organic Constituents by APHA/AWWA Methods									
Oil & Grease	ND	6.29	mg/L	1	16A0010	22-Jan-16	04-Feb-16	APHA 5520B	
Conventional Chemistry Parameters by EPA Methods									
Chemical Oxygen Demand	ND	14.3	mg/L	1	16B0013	01-Feb-16	04-Feb-16	EPA 410.4	

HiAdvance Thailand

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HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental	Project: **Pun Hlaing Ladge**	
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu Bangkok THAILAND, 10110	Project Number: SLP 1105 Project Manager: SLP Environmental	**Reported:** 05-Feb-16 19:14

SW2
TZA0006-02 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
HiAdvance Thailand									
Physical and Aggregate Properties by APHA/AWWA Methods									
Total Suspended Solids	ND	17.9	mg/L	1	16A0017	27-Jan-16	27-Jan-16	APHA 2540D	H11
Inorganic Non-Metallic Constituents by APHA/AWWA Methods									
Phosphorus	**0.01**	0.008	mg/L	1	16B0008	04-Feb-16	05-Feb-16	APHA 4500-P	
Aggregate Organic Constituents by APHA/AWWA Methods									
Oil & Grease	ND	6.29	mg/L	1	16A0010	22-Jan-16	04-Feb-16	APHA 5520B	
Conventional Chemistry Parameters by EPA Methods									
Chemical Oxygen Demand	ND	14.3	mg/L	1	16B0013	01-Feb-16	04-Feb-16	EPA 410.4	

HiAdvance Thailand

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Nalinee Wachiranugul, Project Manager

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu
Bangkok THAILAND, 10110

Project: **Pun Hlaing Ladge**
Project Number: SLP 1105
Project Manager: SLP Environmental

Reported:
05-Feb-16 19:14

Physical and Aggregate Properties by APHA/AWWA Methods - Quality Control

HiAdvance Thailand

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 16A0017 - Solids TSS APHA 2540D										
Blank (16A0017-BLK1)				Prepared & Analyzed: 27-Jan-16						
Total Suspended Solids	ND	17.9	mg/L							
LCS (16A0017-BS1)				Prepared & Analyzed: 27-Jan-16						
Total Suspended Solids	94.0	17.9	mg/L	101		93.2	90-110			
LCS Dup (16A0017-BSD1)				Prepared & Analyzed: 27-Jan-16						
Total Suspended Solids	91.0	17.9	mg/L	101		90.2	90-110	3.24	5	

HiAdvance Thailand

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Nalinee Wachiranugul, Project Manager

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu
Bangkok THAILAND, 10110

Project: **Pun Hlaing Ladge**
Project Number: SLP 1105
Project Manager: SLP Environmental

Reported:
05-Feb-16 19:14

Inorganic Non-Metallic Constituents by APHA/AWWA Methods - Quality Control

HiAdvance Thailand

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 16B0008 - Persulfate Digestion										
Blank (16B0008-BLK1)				Prepared: 04-Feb-16 Analyzed: 05-Feb-16						
Phosphorus	ND	0.008	mg/L							
LCS (16B0008-BS1)				Prepared: 04-Feb-16 Analyzed: 05-Feb-16						
Phosphorus	0.13	0.008	mg/L	0.125		107	80-120			
LCS Dup (16B0008-BSD1)				Prepared: 04-Feb-16 Analyzed: 05-Feb-16						
Phosphorus	0.12	0.008	mg/L	0.125		92.9	80-120	14.4	20	

HiAdvance Thailand

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Nalinee Wachiranugul, Project Manager

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu
Bangkok THAILAND, 10110

Project: **Pun Hlaing Ladge**
Project Number: SLP 1105
Project Manager: SLP Environmental

Reported:
05-Feb-16 19:14

Aggregate Organic Constituents by APHA/AWWA Methods - Quality Control

HiAdvance Thailand

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 16A0010 - O&G APHA 5520 B										
Blank (16A0010-BLK1)				Prepared: 22-Jan-16 Analyzed: 04-Feb-16						
Oil & Grease	ND	6.29	mg/L							
LCS (16A0010-BS1)				Prepared: 22-Jan-16 Analyzed: 04-Feb-16						
Oil & Grease	38.8	6.29	mg/L	40.1		96.8	80-120			
LCS Dup (16A0010-BSD1)				Prepared: 22-Jan-16 Analyzed: 04-Feb-16						
Oil & Grease	37.5	6.29	mg/L	40.1		93.6	80-120	3.41	20	

HiAdvance Thailand

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Nalinee Wachiranugul, Project Manager

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental	Project: **Pun Hlaing Ladge**	
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu	Project Number: SLP 1105	**Reported:**
Bangkok THAILAND, 10110	Project Manager: SLP Environmental	05-Feb-16 19:14

Conventional Chemistry Parameters by EPA Methods - Quality Control

HiAdvance Thailand

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 16B0013 - COD APHA 5220B										
Blank (16B0013-BLK1)				Prepared: 01-Feb-16 Analyzed: 04-Feb-16						
Chemical Oxygen Demand	ND	14.3	mg/L							
LCS (16B0013-BS1)				Prepared: 01-Feb-16 Analyzed: 04-Feb-16						
Chemical Oxygen Demand	40.2	14.3	mg/L	40.0		100	90-110			
LCS Dup (16B0013-BSD1)				Prepared & Analyzed: 04-Feb-16						
Chemical Oxygen Demand	43.6	14.3	mg/L	40.0		109	90-110	8.14	10	
Matrix Spike (16B0013-MS1)		**Source: TZA0006-02**		Prepared: 01-Feb-16 Analyzed: 04-Feb-16						
Chemical Oxygen Demand	43.6	14.3	mg/L	40.0	12.2	78.4	75-125			

HiAdvance Thailand

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Nalinee Wachiranugul, Project Manager

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Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
burt.blackburn@hiadvance.com

SLP Environmental	Project: **Pun Hlaing Ladge**	
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei Nu	Project Number: SLP 1105	**Reported:**
Bangkok THAILAND, 10110	Project Manager: SLP Environmental	05-Feb-16 19:14

Notes and Definitions

Report Specific Notes

H11 Sample was analyzed past holding time. Holding time was shortened to 7 days for inadequately preserved samples.

Laboratory Reporting Conventions:

ND Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR Not Reported

dry Sample results reported on a dry weight basis. Reporting Limits have been corrected for % Solid.

RPD Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL METHOD REPORTING LIMIT. Reporting level at, or above, the lowest level standard of the Calibration Table

DIL Dilutions are calculated based on deviations from the standard dilution performed for an analysis and may not represent the Dilution found on the analytical raw data.

Reporting Limit Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solid, where applicable

Prepared Date indicated is the same as Extraction Date

HiAdvance Thailand

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Nalinee Wachiranugul, Project Manager

HiAdvance Thailand

HiAdvance Inc. (Thailand)
731 PM Tower 8th floor,
Asoke-Dindaeng Road, Dindaeng,
Dindaeng, Bangkok 10400
Office : +66 2 641 7509
Nalinee.wachiranugul
@hiadvance.com

05 February 2016

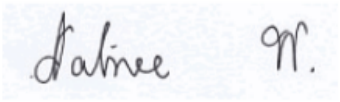
SLP Environmental
SLP Environmental
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Toei
Bangkok, THAILAND 10110

RE: Pun Hlaing Ladge

Enclosed are the results of analyses for samples received by the laboratory on 20-Jan-16 15:30.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Nalinee Wachiranugul
Project Manager

HiAdvance Thailand

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nalinee wachiranugul
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SLP Environmental
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong
Bangkok THAILAND, 10110

Project: **Pun Hlaing Ladge**
Project Number: SLP 1105
Project Manager: SLP Environmental

Reported:
05-Feb-16 19:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW1	TZA0006-01	Water	15-Jan-16 09:30	20-Jan-16 15:30
SW2	TZA0006-02	Water	15-Jan-16 09:30	20-Jan-16 15:30

HiAdvance Thailand

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Nalinee Wachiranugul, Project Manager

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@hiadvance.com

SLP Environmental 10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Bangkok THAILAND, 10110	Project: **Pun Hlaing Ladge** Project Number: SLP 1105 Project Manager: SLP Environmental	**Reported:** 05-Feb-16 19:14

HiAdvance Thailand
Level 8 PM Tower
731 Asoke-Dindaeng Rd
Dindaeng, Bangkok 10400
Thailand
Tel: +66 2 641 7509

CHAIN-OF-CUSTODY / Anal· ·cal Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All ·vant fields must be completed accurately.

HA Page: 1 of 1

Section A Required Client Information:

Company: SLP Environmental	
Address: 10/109, Floor 8, The Trendy Offic Building, Sukhumvit 13, Nong Toei Nua, Wattana, 10110, BKK, Thailand	
Email To: info@slpenvironmental.com	
Phone: 021687016	Fax: 021687230
Requested Due Date/TAT: Standard	

Section B Required Project Information:

Report To: SLP Environmental	
Copy To:	
Purchase Order No.: N/A →	
Project Name: Pun Hlaing Lodge	
Project Number: SLP 1105	

Section C Invoice Information:

Attention: Steve Pearnain	
Company Name: SLP Environmental	
Address: See Section (A)	
HA Quote Reference: Email Burt Blackburn dated 14/12/2015	
HA Project Manager: Teeranard Promsuwan	
HA Profile #:	

REGULATORY AGENCY

EFFLUENT / GROUND WATER / DRINKING WATER / UST / WASTE / ✓ OTHER Surface Water

Site Location: Hlaing Tharyar Township, Yangon, Myanmar

Section D Required Client Information

Valid Matrix Codes (MATRIX – CODE): DRINKING WATER – DW; WATER – WT; WASTE WATER – WW; PRODUCT – P; SOIL/SOLID – SL; OIL – OL; WIPE – WP; AIR – AR; OTHER – OT; TISSUE – TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

HA TZA0006

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	TIME	COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	COD	Oil and Grease	TKN	Total Phosphorus	TSS	Residual Chlorine (Y/N)	HiAdvance Project No./ Lab I.D.
Requested Analysis Filtered (Y/N)																		N	N	N	N	N		
1	SW1	WT	G	15/01/16	9.30	15/01/16	9.40		3		✓							X	X	X	X	X		TZA0006-01
2	SW2	WT	G	15/01/16	9.40	15/01/16	9.55		3		✓							X	X	X	X	X		TZA0006-02
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Teeranard Promsuwan	20/01/16	14:55	[illegible]	20/01/16	14:50
				Somchok S.	20/01/16	15:30

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Teeranard Promsuwan

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 15/01/2016

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
9.4	N		

Rev. 2, 12 November 2015

HiAdvance Thailand

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[signature]

Nalinee Wachiranugul, Project Manager

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nalinee wachiranugul
@hiadvance.com

SLP Environmental	Project: **Pun Hlaing Ladge**	
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Bangkok THAILAND, 10110	Project Number: SLP 1105 Project Manager: SLP Environmental	**Reported:** 05-Feb-16 19:14

SUBCONTRACTED

United Analyst and Engineering Consultant Co., Ltd

Sample	Sample Conditions	Parameter	LOQ mg/L
		Total Kjeldahl Nitrogen (mg/L)	
TZA0006-01	Colourless	< LOQ	≥1.5 to <5.0
TZA0006-02	Colourless	< LOQ	≥1.5 to <5.0

Nalinee Wachiranugul, Project Manager

HiAdvance Thailand

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SLP Environmental	Project: **Pun Hlaing Ladge**	
10/109,Floor8,The Trendy Offic Building, Sukumvit, Klong Bangkok THAILAND, 10110	Project Number: SLP 1105 Project Manager: SLP Environmental	**Reported:** 05-Feb-16 19:14

SUBCONTRACTED

United Analyst and Engineering Consultant Co., Ltd

Quality Control	Total Kjeldahl Nitrogen (mg/L)
Method Blank, mg/L	<1.5
Laboratory Fortified Blank, %Recovery (BS)	102
Laboratory Fortified Matrix, % Recovery (MS)	106
Duplicate ,% RPD	0.91

Remark: Method: In-House Method UAE.TP.TN.02* (Kjeldahl Method) ; SM 2012:4500-N $_{org}$ C

- Based on Standard Method for the Examination of Water and Wastewater, APHA,WEF,22nd Edition,2012
- < LOQ : < Level of Quantitation (Total Kjeldahl Nitrogen ≥1.5 to <5.0)

Nalinee Wachiranugul, Project Manager

Sound level Meter Calibration

Calibration Certificate

This certificate guarantees that the product has been inspected and tested in according to the published specifications.

The instrument has been calibrated by equipments which are already calibrated to traceable international standards.

CE

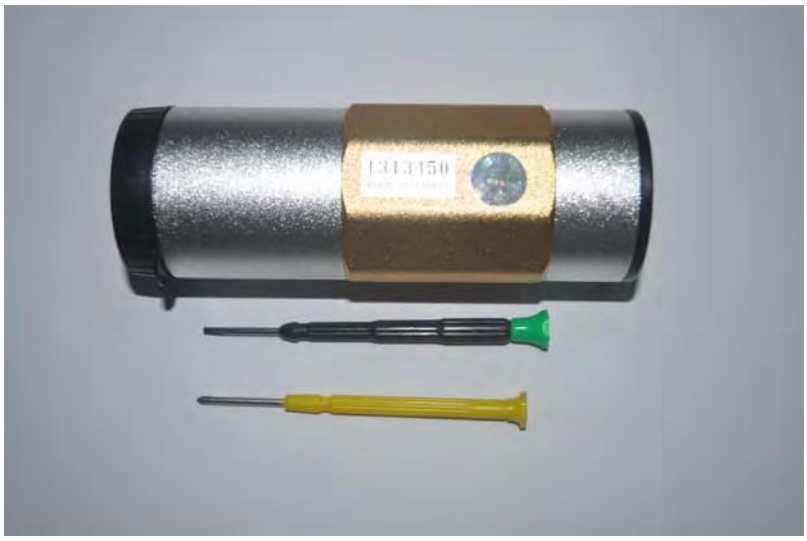
LUTRON ELECTRONIC ENTERPRISE CO., LTD.

Lutron The Art of Measurement

ISO 9001 Quality Management System Certified by SGS

Sound Calibrator

Front View



Back View

Calibration Method

Sound calibrator (lutron, SL-4023SD) is used to calibrate the sound level meter in every time before monitor the survey at site. Sound level meter sensors the sound level in dB unit and the calibration index is 94 dB.

Air Quality Monitoring Machine Calibration (EPAS Environmental Perimeter Air Station)

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

Environmental Devices Corporation certifies the Haz-Scanner model EPAS is calibrated to published specifications and NIST traceable.

Calibration Dust Specifications are NIST traceable using Coulter Mutisizer II e. ISO12103 –1 A2 Fine Test Dust and is designed to agree with EPA Class I and Class III FRM and FEM particulate samplers and monitors and EN 12341 and EN 14907 standards.

Gas sensors are Calibrated against NIST/EPA traceable Calibration Gas using NIST primary Flow Standard: LFE774300 to ISO 17025 and EPA Instrumental Test Methods as defined by 40 CFR Part 60.

Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Temperature = 22°C
Relative Humidity = 30%
Atmospheric Pressure = 760 mmHg
Measurement Uncertainty Estimated @ 95% Confidence Level (k=2)

Technician	Model	Serial Number	Date
Matt Gosselin	EPAS	914032	October 2014

Checked By: _____
Manager: *Mark J. Sullivan*

Next Calibration Due Date: October 2015

Environmental Devices Corporation
4 Wilder Drive Building #15
Plaistow, NH 03865
ISO-9001 Certified

ENVIRONMENTAL DEVICES CORPORATION

Date: October 7, 2014

Customer Name:
System ID: EPAS S/N 914032

BASIC CHECK		NOTES:
Turns On	PASS	
Terminal Block Screws	PASS	
Other Screws	PASS	
Logger Connections	PASS	
Battery Connection	PASS	
Fuses	PASS	
Sensor Boards	PASS	
Signal Board	PASS	
Memory Card	PASS	
Wires and Connectors	PASS	
Sensors and Switches	PASS	

CALIBRATION

SENSOR	LOW	ACTUAL	HIGH	ACTUAL
Temp	66°F	66°F	97°F	97°F
RH	43%	43%	86%	86%
Baro.	NA	NA	NA	NA
PM A *(10µ)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³
PM B *(2.5µ)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³
Wind Speed	0 kph	0 kph	5 kph	5 kph
Wind Direction	90°	90°	270°	270°
Sound	NA	NA	NA	NA
ELF	NA	NA	NA	NA
ARAD	NA	NA	NA	NA
UV/SolRad	NA	NA	NA	NA
Battery	10.5 VDC	10.5 VDC	13.5 VDC	13.5 VDC
CO	0 ppb	0 ppb	5000 ppb	5000 ppb
CO_2	NA	NA	NA	NA
NO_2	0 ppb	0 ppb	2000 ppb	2000 ppb
SO_2	0 ppb	0 ppb	2000 ppb	2000 ppb
NO	0.0 ppm	0.0 ppm	50.0 ppm	50.0 ppm
VOC	NA	NA	NA	NA
Indoor Light	NA	NA	NA	NA
O3	NA	NA	NA	NA
CHOH	NA	NA	NA	NA
NH3	NA	NA	NA	NA
H2S	NA	NA	NA	NA
Hydrocarbons	NA	NA	NA	NA
CH4	NA	NA	NA	NA

Shipping Check List

Packing Date 10/7/14
Inspectors DR

Environmental Devices Corporation

Model EPAS Environmental Perimeter Air Station

Quantity	Item #	Description	Installed	1st Check	2nd Check
1	**EPAS**	Serial Number 914032		✓	✓
	Basic Kit Includes:				
1	IMS-105	Impactor Sleeve		✓	✓
1	HS-10	PM 10 Particle Size Impactor		✓	✓
1	PC-106	Solar/Precipitation Cap		✓	✓
1	Temp & R.H	Temperature & Relative Humidity Sensor (Installed)	✓	✓	✓
1	HS-CM-6000	Carbon Monoxide Sensor CO (Installed)	✓	✓	✓
1	HS-ND-6000	Nitrogen Dioxide Sensor NO2 (Installed)	✓	✓	✓
1	GTM-600	Acid Gas Scrubber	✓	✓	✓
1	HazCommPro	HazComm Pro Software & Instruction Manual on		✓	✓
1	CC-102	RS-232 Cable		✓	✓
1	CC-USB-102	Serial Download and USB Cable		✓	✓
1	EPC-600	External Power Connector Cable		✓	✓
1	18-1	Pump Adjust Trim Stick		✓	✓
1	BC 105-110-220	Universal Battery Charger US, Euro, AUS,& UK		✓	✓
1	Cert. -NIST	Certificate of Calibration		✓	✓
1	Warranty Label	Warranty Label		✓	✓
	EPAS-BYO "Build Your Own"	**Standard Configuration for BYO**			
	EPAS BYO	Serial Number			
	EPAS BYO Kit Includes:				
	Temp & R.H	Temperature & Relative Humidity Sensor (Installed)			
	HazCommPro	HazComm Pro Software & Instruction Manual on			
	CC-102	Serial Download and USB Cable			
	EPC-600	External Power Connector Cable			
	18-1	Pump Adjust Trim Stick			
	BC 105-110-220	Universal Battery Charger US, Euro, AUS,& UK			
	Cert. -NIST	Certificate of Calibration			
	Warranty Label	Warranty Label			
	Particulates Accessories				
	HS-PSPM-1.0	Additional Particulate Sensor for PM 1.0			
1	HS-PSPM-2.5	Additional Particulate Sensor for PM 2.5	✓	✓	✓
	HS-PSPM-10	Additional Particulate Sensor for PM 10			
	HS-1.0	Additional Particulate Impactor for PM 1.0			
	HS-2.5	Additional Particulate Impactor for PM 2.5			
	HS-10	Additional Particulate Impactor for PM 10			
	CS-105	Calibration Span Reference			
1	FM-105	Rotameter/Flow Audit Meter		✓	✓
	HA-600	Conditioning Inlet Heater			
	IG-105	Impactor Grease			
	IMS-105	Replacement Impactor Sleeve			
	PC-106	Solar/ Precipitation Cap			

	GAS SENSORS				
	HS-CD-6000	Carbon Dioxide (CO2) Sensor			
	HS-CL2-6000	Chlorine (Cl) Sensor			
	HS-EO-6000	Ethylene Oxide (C2H40) Sensor			
	HS-H-6000	Hydrocarbons Sensor (Non-Methane)			
	HS-H2S-6000	Hydrogen Sulfide (H2S) Sensor			
	HS-HCL-6000	Hydrogen Chloride (HCL) Sensor			
	HS-HCN-6000	Hydrogen Cyanide (HCN) Sensor			
	HS-M-6000	Methane (CH4) Sensor			
	HS-NH3-6000	Ammonia (NH3) Sensor			
1	HS-NO-6000	Nitric Oxide (NO) Sensor			
	HS-02-6000	Oxygen (O2) Sensor			
	HS-03-6000	Ozone (O3) Sensor			
	HS-PH3-6000	Phosphine (PH3) Sensor			
	HS-PID-6000	PID Volatile Organic Compound (VOC) Sensor			
1	HS-SD-6000	Sulfur Dioxide (S02) sensor			
1	GTM-6000	Acid Gas Scrubber			
	Communication & Power Accessories				
	AL-6000	Audible & Visual Threshold Exceedance Alarm			
	AP-6000	Automotive Adapter			
1	BC-6000	Universal Battery Charger- Replacement			
	BC-BUBP-6000	Charger for Back Up Battery- External			
1	BP-6000	Battery Pack Replacment			
	BUBP-6000	Back Up Battery - External			
	EPC-600	External Power Connector Cable			
	EPC-BUP-600	Cable Adpater for External BackUp Battery			
	ETH-600	Ethernet Option			
	HA-600	Conditioning Heating Element			
	RM-105	Wireless Data Transfer Radio Modem 1500ft line of			
	RM-105EXT	Wireless Data Transfer Radio Modem 5 miles line			
	SP-6000	80W Solar Panel for EPAS			
1	TP-600	Tripod Stand			
	Meteorological				
	HS-BP-6000	Barometric Pressure Sensor			
	HS-DP-6000	Dew Point Sensor			
	HS-RS-6000	Rainfall/Precipitation Sensor			
1	HS-WS&D-6000	Wind Speed and Direction Sensor			
	Optional Meters				
	ASLM-6000	Quest Compatible Sound Level Meter			
	HS-AR-6000	Atomic/Nuclear Radiation Meter			
	HS-ELF-6000	Extremely Low Frequency Radiation Meter			
	HS-SM-6000	Sound Level Meter			
	HS-SR-6000	Solar Radiance Intensity Meter			
	Calibration Gas				
	CALG-200-103-ZERO	Zero Air Calibration Gas			
	CALG-200-103-CO	Carbon Monoxide Calibration Gas			
	CALG-200-103-NO2	Nitrogen Dioxide Calibration Gas			
	CALG-200-103-SO2	Sulfur Dioxide Calibration Gas			
	REG-200-1.0Lpm	Calibration Regulator			
	Other				
	Other				

Environmental Devices Corp. Fieldstone Industrial Park. 4 Wilder Drive Bldg. 15. Plaistow, N.H. 03865
Phone (603) 378. 2112 Fax (603) 378.2113

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

Environmental Devices Corporation certifies the Haz-Scanner model EPAS is calibrated to published specifications and NIST traceable.

Calibration Dust Specifications are NIST traceable using Coulter Mutisizer II e. ISO12103 –1 A2 Fine Test Dust and is designed to agree with EPA Class I and Class III FRM and FEM particulate samplers and monitors and EN 12341 and EN 14907 standards.

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Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Temperature = 22°C
Relative Humidity = 30%
Atmospheric Pressure = 760 mmHg
Measurement Uncertainty Estimated @ 95% Confidence Level (k=2)

Technician	Model	Serial Number	Date
Matt Gosselin	EPAS	914043	October 2014

Checked By _____

Manager: *Mark J. Sullivan*

Next Calibration Due Date October 2015

Environmental Devices Corporation
4 Wilder Drive Building #15
Plaistow, NH 03865
ISO-9001 Certified

ENVIRONMENTAL DEVICES CORPORATION

Date: October 7, 2014

Customer Name:
System ID: EPAS S/N 914043

BASIC CHECK		NOTES:
Turns On	PASS	
Terminal Block Screws	PASS	
Other Screws	PASS	
Logger Connections	PASS	
Battery Connection	PASS	
Fuses	PASS	
Sensor Boards	PASS	
Signal Board	PASS	
Memory Card	PASS	
Wires and Connectors	PASS	
Sensors and Switches	PASS	

CALIBRATION

SENSOR	LOW	ACTUAL	HIGH	ACTUAL
Temp	66°F	66°F	97°F	97°F
RH	43%	43%	86%	86%
Baro.	NA	NA	NA	NA
PM A *(10µ)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³
PM B *(2.5µ)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³
Wind Speed	0 kph	0 kph	5 kph	5 kph
Wind Direction	90°	90°	270°	270°
Sound	NA	NA	NA	NA
ELF	NA	NA	NA	NA
ARAD	NA	NA	NA	NA
UV/SolRad	NA	NA	NA	NA
Battery	10.5 VDC	10.5 VDC	13.5 VDC	13.5 VDC
CO	0 ppb	0 ppb	5000 ppb	5000 ppb
CO_2	NA	NA	NA	NA
NO_2	0 ppb	0 ppb	2000 ppb	2000 ppb
SO_2	0 ppb	0 ppb	2000 ppb	2000 ppb
NO	0.0 ppm	0.0 ppm	50.0 ppm	50.0 ppm
VOC	NA	NA	NA	NA
Indoor Light	NA	NA	NA	NA
O3	NA	NA	NA	NA
CHOH	NA	NA	NA	NA
NH3	NA	NA	NA	NA
H2S	NA	NA	NA	NA
Hydrocarbons	NA	NA	NA	NA
CH4	NA	NA	NA	NA

Shipping Check List

Packing Date 10/7/14
Inspectors DR /

Environmental Devices Corporation

Model EPAS Environmental Perimeter Air Station

Quantity	Item #	Description	Installed	1st Check	2nd Check
1	**EPAS**	Serial Number 914043		✓	✓
	Basic Kit Includes:				
1	IMS-105	Impactor Sleeve		✓	✓
1	HS-10	PM 10 Particle Size Impactor		✓	✓
1	PC-106	Solar/Precipitation Cap		✓	✓
1	Temp & R.H	Temperature & Relative Humidity Sensor (Installed)	✓	✓	✓
1	HS-CM-6000	Carbon Monoxide Sensor CO (Installed)	✓	✓	✓
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1	GTM-600	Acid Gas Scrubber	✓	✓	✓
1	HazCommPro	HazComm Pro Software & Instruction Manual on		✓	✓
1	CC-102	RS-232 Cable		✓	✓
1	CC-USB-102	Serial Download and USB Cable		✓	✓
1	EPC-600	External Power Connector Cable		✓	✓
1	18-1	Pump Adjust Trim Stick		✓	✓
1	BC 105-110-220	Universal Battery Charger US, Euro, AUS,& UK		✓	✓
1	Cert. -NIST	Certificate of Calibration		✓	✓
1	Warranty Label	Warranty Label		✓	✓
	EPAS-BYO "Build Your Own"	**Standard Configuration for BYO**			
	EPAS BYO	Serial Number			
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	Particulates Accessories				
	HS-PSPM-1.0	Additional Particulate Sensor for PM 1.0			
1	HS-PSPM-2.5	Additional Particulate Sensor for PM 2.5	✓	✓	✓
	HS-PSPM-10	Additional Particulate Sensor for PM 10			
	HS-1.0	Additional Particulate Impactor for PM 1.0			
	HS-2.5	Additional Particulate Impactor for PM 2.5			
	HS-10	Additional Particulate Impactor for PM 10			
	CS-105	Calibration Span Reference			
1	FM-105	Rotameter/Flow Audit Meter		✓	✓
	HA-600	Conditioning Inlet Heater			
	IG-105	Impactor Grease			
	IMS-105	Replacement Impactor Sleeve			
	PC-106	Solar/ Precipitation Cap			

	GAS SENSORS				
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	HS-CL2-6000	Chlorine (Cl) Sensor			
	HS-EO-6000	Ethylene Oxide (C2H40) Sensor			
	HS-H-6000	Hydrocarbons Sensor (Non-Methane)			
	HS-H2S-6000	Hydrogen Sulfide (H2S) Sensor			
	HS-HCL-6000	Hydrogen Chloride (HCL) Sensor			
	HS-HCN-6000	Hydrogen Cyanide (HCN) Sensor			
	HS-M-6000	Methane (CH4) Sensor			
	HS-NH3-6000	Ammonia (NH3) Sensor			
1	HS-NO-6000	Nitric Oxide (NO) Sensor			
	HS-02-6000	Oxygen (O2) Sensor			
	HS-03-6000	Ozone (O3) Sensor			
	HS-PH3-6000	Phosphine (PH3) Sensor			
	HS-PID-6000	PID Volatile Organic Compound (VOC) Sensor			
1	HS-SD-6000	Sulfur Dioxide (S02) sensor			
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	Communication & Power Accessories				
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	RM-105	Wireless Data Transfer Radio Modem 1500ft line of			
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	SP-6000	80W Solar Panel for EPAS			
1	TP-600	Tripod Stand			
	Meteorological				
	HS-BP-6000	Barometric Pressure Sensor			
	HS-DP-6000	Dew Point Sensor			
	HS-RS-6000	Rainfall/Precipitation Sensor			
1	HS-WS&D-6000	Wind Speed and Direction Sensor			
	Optional Meters				
	ASLM-6000	Quest Compatible Sound Level Meter			
	HS-AR-6000	Atomic/Nuclear Radiation Meter			
	HS-ELF-6000	Extremely Low Frequency Radiation Meter			
	HS-SM-6000	Sound Level Meter			
	HS-SR-6000	Solar Radiance Intensity Meter			
	Calibration Gas				
	CALG-200-103-ZERO	Zero Air Calibration Gas			
	CALG-200-103-CO	Carbon Monoxide Calibration Gas			
	CALG-200-103-NO2	Nitrogen Dioxide Calibration Gas			
	CALG-200-103-SO2	Sulfur Dioxide Calibration Gas			
	REG-200-1.0Lpm	Calibration Regulator			
	Other				
	Other				

Environmental Devices Corp. Fieldstone Industrial Park. 4 Wilder Drive Bldg. 15. Plaistow, N.H. 03865
Phone (603) 378. 2112 Fax (603) 378.2113

Appendix C

IMPACT SEVERITY CRITERIA

Impact Severity Criteria

Overview

This Annex Presents the severity criteria that have been used in evaluating environmental impacts in this assessment.
Where quantification of potential impacts was possible, derived severity criteria have generally been based on numerical values, representing regulatory limits, projects standards or guidelines.
Environmental aspects such as ecology require more qualitative approach for determination of severity due to the absence of statutory limits or universally applicable standards against which potential impacts can be evaluated.

Air Quality
Severity criteria for air quality impacts are presented below:

Severity Criteria for Air Quality Impacts

Impact Severity	Definition
Slight	• Air quality impacts are well within ambient criteria • Emissions are well below statutory emission limits
Low	• Air quality impacts are within ambient criteria • Emissions are within statutory emission limits
Medium	• Air quality impacts result in occasional exceedances of ambient criteria (limited periods of exceedance)
High	• Air quality impacts routinely exceed ambient criteria (extended periods of exceedance) • Repeated breaches of statutory emission limits (extended periods)

Water Quality
Severity criteria for surface water quality impacts are presented below:

Severity Criteria for Water Quality Impacts

Impact Severity	Definition
Slight	• Water quality impacts are well within ambient criteria • Discharges are well within statutory limits • Short-term localized effects on water quality but which are which natural fluctuations
Low	• Water quality impacts are within ambient criteria • Discharges are well within statutory limits • Short-term localized effects on water quality but which will return to equilibrium conditions within a short-time
Medium	• Water quality impacts result in occasional exceedances of ambient criteria (limited periods of exceedance) • Occasional breach of statutory discharge limits (limited periods) • Localized effects on water quality which are likely to give rise to secondary ecological impacts
High	• Water quality impacts routinely exceed ambient criteria (extended periods of exceedance) • Repeated breaches of statutory discharge limits (extended periods) • Severe effects on water quality/ long-term degradation/ severe secondary ecological impacts

AppendixD

SLP ACCREDITATION TO PREPARE IEE/EIAs in MYANMAR

Third Party အဖွဲ့အစည်းများ

ပြည်တွင်း၌ IEE ၊ EIA ၊ EMP လုပ်ငန်းဆောင်ရွက်သည့် ပြည်ပအဖွဲ့အစည်းများစာရင်း

၁၆ (16)	SLP Environmental Co., Ltd	Address: 10/109 Trendy Office Building, Sukhumvit Soi 13, Klong Toei Nua, Wattana, Bangkok, 10110, Thailand Tel: +66 (0) 2168 7016, Fax: +66 (0) 2168 7023 Email: info@slpenvironmental.com Website: www.slpenvironmental.com

မှတ်ချက်။ ။ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းများအား ကူညီဆောင်ရွက်မည့် တတိယပုဂ္ဂိုလ်/ အဖွဲ့အစည်း (Third Party) စာရင်း များနှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးနှင့် သစ်တောရေးရာဝန်ကြီးဌာနမှ တရားဝင်လုပ်ကိုင်ခွင့် လိုင်စင်ထုတ်ပေး ထားခြင်းမရှိသေးပါကြောင်း၊ အဆိုပါလုပ်ငန်းလုပ်ကိုင်ခွင့်လိုင်စင် ထုတ်ပေးနိုင်ရေးအတွက်လည်း လိုအပ်သည်များအား ဆောင်ရွက်လျက်ရှိပါကြောင်းနှင့် ယခုဖော်ပြထားသည့် တတိယ ပုဂ္ဂိုလ်/ အဖွဲ့အစည်း (Third Party) များမှာ မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်မှတစ်ဆင့် ပေးပို့လာသော စီမံကိန်းများ/ စီးပွားရေးလုပ်ငန်းများအနက် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း(EIA)၊ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း (IEE)၊ ပတ်ဝန်းကျင်နှင့် လူမှုရေး ထိခိုက်မှုဆန်းစစ်ခြင်း (ESIA)၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) စသည်တို့ရေးဆွဲဆောင်ရွက်ရန်အတွက် ကနဦးသဘောထားမှတ်ချက်ရရှိထားသော လုပ်ငန်းရှင်များအား သတင်းအချက်အလက် အနေဖြင့်အထောက်အကူပြုရန်ရည်ရွယ်လျက် မှတ်တမ်းပြုစုဖော်ပြထားခြင်းသာဖြစ်ပါသည်။

SLP Environmental

SLP Environmental Co., Ltd.

Operating throughout:

Cambodia | China | Indonesia | Laos | Malaysia | Myanmar | Philippines | Singapore | Sri Lanka | Thailand | Vietnam

www.slpenvironmental.com

ASEAN Headquarters:

10/109 Trendy Office Building

Sukhumvit Soi 13, Klong Toei Nua, Wattana

Bangkok, 10110, Thailand

Tel: +66 (0) 21687016 Fax: +66 (0) 2168 7230

Email: info@slpenvironmental.com Web: www.slpenvironmental.com