Attachment I

圖例 NOTATION

ZONES		地帶
RESIDENTIAL (GROUP D)	R(D)	住宅（丁類）
VILLAGE TYPE DEVELOPMENT	V	鄉村式發展
INDUSTRIAL (GROUP D)	I(D)	工業（丁類）
OPEN STORAGE	OS	露天貯物
GOVERNMENT, INSTITUTION OR COMMUNITY	G/IC	政府、機構或社區
OPEN SPACE	O	休憩用地
OTHER SPECIFIED USES	OU	其他指定用途
UNDETERMINED	U	未決定用途
GREEN BELT	GB	綠化地帶
CONSERVATION AREA	CA	自然保育區

COMMUNICATIONS		交通
WEST RAIL AND STATION (UNDERGROUND)	WEST RAIL STATION	西鐵及車站（地下）
WEST RAIL AND STATION (ELEVATED)	WEST RAIL STATION	西鐵及車站（高架）
MAJOR ROAD AND JUNCTION		主要道路及路口
ELEVATED ROAD		高架道路

MISCELLANEOUS		其他
BOUNDARY OF PLANNING SCHEME		規劃範圍界線
DRAINAGE RESERVE	DR	排水專用範圍

土地用途及面積一覽表 SCHEDULE OF USES AND AREAS

USES	大約面積及百分率 APPROXIMATE AREA & % 公頃 HECTARES	% 百分率	用途
RESIDENTIAL (GROUP D)	16.12	2.69	住宅（丁類）
VILLAGE TYPE DEVELOPMENT	42.81	7.14	鄉村式發展
INDUSTRIAL (GROUP D)	3.53	0.59	工業（丁類）
OPEN STORAGE	5.43	0.91	露天貯物
GOVERNMENT, INSTITUTION OR COMMUNITY	3.38	0.56	政府、機構或社區
OPEN SPACE	8.75	1.46	休憩用地
OTHER SPECIFIED USES	230.35	38.41	其他指定用途
UNDETERMINED	46.40	7.74	未決定用途
GREEN BELT	6.05	1.01	綠化地帶
CONSERVATION AREA	121.52	20.26	自然保育區
DRAINAGE CHANNEL	87.03	14.51	排水道
MAJOR ROAD ETC.	28.29	4.72	主要道路等
TOTAL PLANNING SCHEME AREA	599.66	100.00	規劃範圍總面積

夾附的《註釋》屬這份圖則的一部分
THE ATTACHED NOTES ALSO FORM PART OF THIS PLAN

行政長官會同行政會議於２００６年１０月１７日根據城市規劃條例第９（１）（ａ）條核准的圖則
APPROVED BY THE CHIEF EXECUTIVE IN COUNCIL UNDER SECTION 9(1)(a) OF THE TOWN PLANNING ORDINANCE ON 17 OCTOBER 2006

LAM Chik-ting, Tony 林植廷
CLERK TO THE EXECUTIVE COUNCIL 行政會議秘書

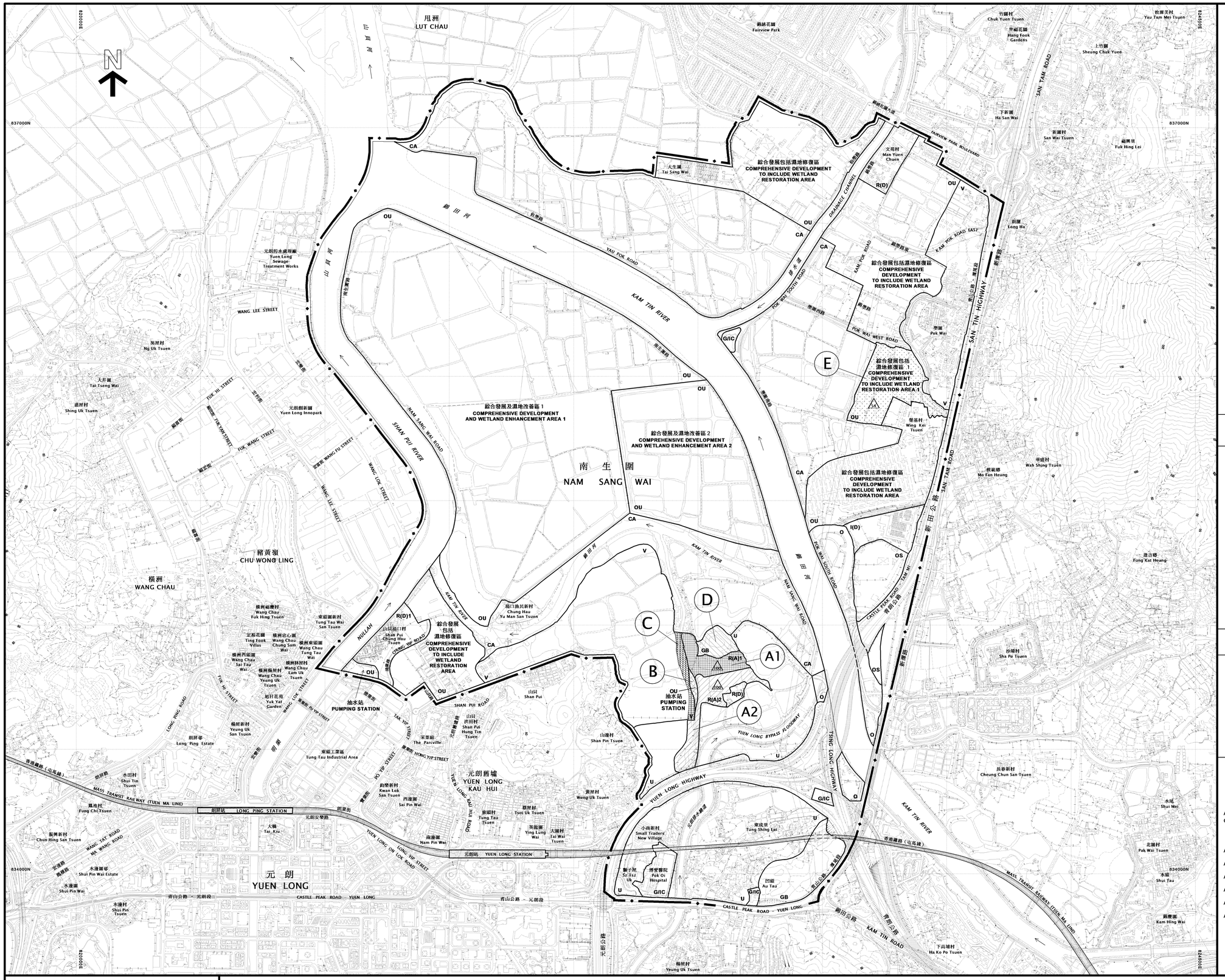
香港城市規劃委員會依據城市規劃條例擬備的南生圍分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
NAM SANG WAI - OUTLINE ZONING PLAN

SCALE 1:7500 比例尺

米 METRES 200 0 200 400 600 800 1,000 METRES 米

規劃署遵照城市規劃委員會指示擬備
PREPARED BY THE PLANNING DEPARTMENT UNDER THE DIRECTION OF THE TOWN PLANNING BOARD

圖則編號 PLAN No. S/YL-NSW/8



圖例 NOTATION

ZONES		地帶
RESIDENTIAL (GROUP A)	R(A)	住宅（甲類）
RESIDENTIAL (GROUP D)	R(D)	住宅（丁類）
VILLAGE TYPE DEVELOPMENT	V	鄉村式發展
INDUSTRIAL (GROUP D)	I(D)	工業（丁類）
OPEN STORAGE	OS	露天貯物
GOVERNMENT, INSTITUTION OR COMMUNITY	G/IC	政府、機構或社區
OPEN SPACE	O	休憩用地
OTHER SPECIFIED USES	OU	其他指定用途
UNDETERMINED	U	未決定用途
GREEN BELT	GB	綠化地帶
CONSERVATION AREA	CA	自然保育區

COMMUNICATIONS		交通
RAILWAY AND STATION (UNDERGROUND)	車站 STATION	鐵路及車站（地下）
RAILWAY AND STATION (ELEVATED)	車站 STATION	鐵路及車站（高架）
MAJOR ROAD AND JUNCTION		主要道路及路口
ELEVATED ROAD		高架道路

MISCELLANEOUS		其他
BOUNDARY OF PLANNING SCHEME		規劃範圍界線
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)	100	最高建築物高度（在主水平基準上若干米）

土地用途及面積一覽表 SCHEDULE OF USES AND AREAS

USES	大約面積及百分率 APPROXIMATE AREA & % 公頃 HECTARES	% 百分率	用途
RESIDENTIAL (GROUP A)	5.86	0.98	住宅（甲類）
RESIDENTIAL (GROUP D)	7.66	1.28	住宅（丁類）
VILLAGE TYPE DEVELOPMENT	43.71	7.29	鄉村式發展
INDUSTRIAL (GROUP D)	3.53	0.59	工業（丁類）
OPEN STORAGE	5.43	0.91	露天貯物
GOVERNMENT, INSTITUTION OR COMMUNITY	3.38	0.56	政府、機構或社區
OPEN SPACE	8.75	1.46	休憩用地
OTHER SPECIFIED USES	230.63	38.46	其他指定用途
UNDETERMINED	46.40	7.74	未決定用途
GREEN BELT	7.47	1.25	綠化地帶
CONSERVATION AREA	121.52	20.26	自然保育區
DRAINAGE CHANNEL	87.03	14.51	排水道
MAJOR ROAD ETC.	28.29	4.71	主要道路等
TOTAL PLANNING SCHEME AREA	599.66	100.00	規劃範圍總面積

夾附的《註釋》屬這份圖則的一部分，
現經修訂並按照城市規劃條例第5條展示。
THE ATTACHED NOTES ALSO FORM PART OF THIS PLAN AND HAVE BEEN AMENDED FOR EXHIBITION UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE

核准圖編號 S/YL-NSW/8 的修訂
AMENDMENTS TO APPROVED PLAN No. S/YL-NSW/8

AMENDMENTS EXHIBITED UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE

按照城市規劃條例第5條展示的修訂

AMENDMENT ITEM A1	修訂項目A1項
AMENDMENT ITEM A2	修訂項目A2項
AMENDMENT ITEM B	修訂項目B項
AMENDMENT ITEM C	修訂項目C項
AMENDMENT ITEM D	修訂項目D項
AMENDMENT ITEM E	修訂項目E項

（參看附表）
(SEE ATTACHED SCHEDULE)

按照城市規劃條例第5條展示的核准圖編號 S/YL-NSW/8 的修訂
AMENDMENTS TO APPROVED PLAN No. S/YL-NSW/8 EXHIBITED UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE ON

SECRETARY
TOWN PLANNING BOARD
城市規劃委員會秘書

香港城市規劃委員會依據城市規劃條例擬備的南生圍分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
NAM SANG WAI - OUTLINE ZONING PLAN

SCALE 1:7 500 比例尺

米 METRES 200 0 200 400 600 800 1 000 METRES 米

規劃署遵照城市規劃委員會指示擬備
PREPARED BY THE PLANNING DEPARTMENT UNDER THE DIRECTION OF THE TOWN PLANNING BOARD

圖則編號 PLAN No. **S/YL-NSW/8A**

~~Approved~~ ***Draft*** Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8***A***

(Being ~~an Approved~~ ***a Draft*** Plan for the Purposes of the Town Planning Ordinance)

NOTES

(N.B. These form part of the Plan)

(1) These Notes show the uses or developments on land falling within the boundaries of the Plan which are always permitted and which may be permitted by the Town Planning Board, with or without conditions, on application. Where permission from the Town Planning Board for a use or development is required, the application for such permission should be made in a prescribed form. The application shall be addressed to the Secretary of the Town Planning Board, from whom the prescribed application form may be obtained.

(2) Any use or development which is always permitted or may be permitted in accordance with these Notes must also conform to any other relevant legislation, the conditions of the Government lease concerned, and any other Government requirements, as may be applicable.

(3) No action is required to make the use of any land or building which was in existence immediately before the first publication in the Gazette of the notice of the interim development permission area plan conform to this Plan, provided such use has continued since it came into existence. Any material change of such use or any other development (except minor alteration and/or modification to the development of the land or building in respect of such use which is always permitted) must be always permitted in terms of the Plan or in accordance with a permission granted by the Town Planning Board.

(4) A use or development of any land or building permitted under an earlier draft or approved plan including interim development permission area plan for the area and effected or undertaken during the effective period of that plan is always permitted under this Plan. Any material change of such use or any other development (except minor alteration and/or modification to the completed development of the land or building which is always permitted) must be always permitted in terms of the Plan or in accordance with a permission granted by the Town Planning Board.

(5) Except to the extent that paragraph (3) or (4) applies, any use or development falling within the boundaries of the Plan and also within the boundaries of the interim development permission area plan, unless always permitted in terms of the Plan, shall not be undertaken or continued on or after the date of the first publication in the Gazette of the notice of the interim development permission area plan without permission from the Town Planning Board.

(6) Except as otherwise specified by the Town Planning Board, when a use or material change of use is effected or a development or redevelopment is undertaken, as always permitted in terms of the Plan or in accordance with a permission granted by the Town Planning Board, all permissions granted by the Town Planning Board in respect of the site of the use or material change of use or development or redevelopment shall lapse.

(7) Road junctions, alignment of roads and railway tracks, and boundaries between zones may be subject to minor adjustments as detailed planning proceeds.

(8) The following uses or developments are always permitted on land falling within the boundaries of the Plan except (a) where the uses or developments are specified in Column 2 of the Notes of individual zones or (b) as provided in paragraph (9) in relation to areas zoned "Conservation Area" or "Other Specified Uses" annotated "Comprehensive Development and Wetland Enhancement Area":

(a) maintenance, repair or demolition of a building;

(b) provision, maintenance or repair of plant nursery, amenity planting, open space, rain shelter, refreshment kiosk, footpath, bus/public light bus stop or lay-by, cycle track, taxi rank, public utility pipeline, electricity mast, lamp pole, telephone booth, telecommunications radio base station, automatic teller machine and shrine;

(c) maintenance or repair of road, railway track, watercourse, nullah, sewer and drain;

(d) geotechnical works, local public works, road works, sewerage works, drainage works, environmental improvement works, marine related facilities and waterworks (excluding works on service reservoir) and such other public works co-ordinated or implemented by Government;

(e) rebuilding of New Territories Exempted House;

(f) replacement of an existing domestic building, i.e. a domestic building which was in existence on the date of the first publication in the Gazette of the notice of the interim development permission area plan, by a New Territories Exempted House; and

(g) provision, maintenance or repair of a grave of an indigenous New Territories villager or a locally based fisherman and his family members for which permission has been obtained from Government.

(9) In areas zoned "Conservation Area" or "Other Specified Uses" annotated "Comprehensive Development and Wetland Enhancement Area",

(a) the following uses or developments are always permitted:

(i) maintenance or repair of plant nursery, amenity planting, sitting out area, rain shelter, refreshment kiosk, road, watercourse, nullah, public utility pipeline, electricity mast, lamp pole, telephone booth, shrine and grave;

(ii) geotechnical works, local public works, road works, sewerage works, drainage works, environmental improvement works, marine related facilities, waterworks (excluding works on service reservoir) and such other public works co-ordinated or implemented by Government; and

(iii) provision of amenity planting by Government; and

(b) the following uses or developments require permission from the Town Planning Board:

provision of plant nursery, amenity planting (other than by Government), sitting out area, rain shelter, refreshment kiosk, footpath, public utility pipeline, electricity mast, lamp pole, telephone booth and shrine.

(10) In any area shown as 'Road', all uses or developments except those specified in paragraphs (8)(a) to (8)(d) and (8)(g) above and those specified below require permission from the Town Planning Board:

road, toll plaza, on-street vehicle park, railway station and railway track.

(11) (a) Except in areas zoned "Conservation Area" or "Other Specified Uses" annotated "Comprehensive Development and Wetland Enhancement Area", temporary use or development of any land or building not exceeding a period of two months is always permitted provided that no site formation (filling or excavation) is carried out and that the use or development is a use or development specified below:

structures for carnivals, fairs, film shooting on locations, festival celebrations, religious functions or sports events.

(b) Except as otherwise provided in paragraph (11)(a) ***above***, and subject to temporary uses for open storage and port back-up purposes which are prohibited in areas zoned "Conservation Area" or "Other Specified Uses" annotated "Comprehensive Development and Wetland Enhancement Area", temporary use or development of any land or building not exceeding a period of three years requires permission from the Town Planning Board. Notwithstanding that the use or development is not provided for in terms of the Plan, the Town Planning Board may grant permission, with or without conditions, for a maximum period of three years, or refuse to grant permission.

(c) Temporary use or development of land or building exceeding three years requires permission from the Town Planning Board in accordance with the terms of the Plan.

(12) Unless otherwise specified, all building, engineering and other operations incidental to and all uses directly related and ancillary to the permitted uses and developments within the same zone are always permitted and no separate permission is required.

(13) In the "Undetermined" zone, all uses or developments except those specified in paragraphs (8) and (11)(a) above require permission from the Town Planning Board.

(14) In these Notes, unless the context otherwise requires or unless as expressly provided below, terms used in the Notes shall have the meanings as assigned under section 1A of the Town Planning Ordinance.

"Existing building" means a building, including a structure, which is physically existing and is in compliance with any relevant legislation and the conditions of the Government lease concerned.

"New Territories Exempted House" means a domestic building other than a guesthouse or a hotel; or a building primarily used for habitation, other than a guesthouse or a hotel, the ground floor of which may be used as 'Shop and Services' or 'Eating Place', the building works in respect of which are exempted by a certificate of exemption under Part III of the Buildings Ordinance (Application to the New Territories) Ordinance (Cap. 121).

~~APPROVED~~***DRAFT*** NAM SANG WAI OUTLINE ZONING P`LAN NO. S/YL-NSW/8***A***

Schedule of Uses

	Page
RESIDENTIAL (GROUP A)	***1***
RESIDENTIAL (GROUP D)	~~1~~***4***
VILLAGE TYPE DEVELOPMENT	~~3~~***6***
INDUSTRIAL (GROUP D)	~~5~~***8***
OPEN STORAGE	~~7~~***10***
GOVERNMENT, INSTITUTION OR COMMUNITY	~~8~~***11***
OPEN SPACE	~~9~~***12***
OTHER SPECIFIED USES	
Comprehensive Development and Wetland Enhancement Area	~~10~~***13***
Comprehensive Development to include Wetland Restoration Area	~~13~~***16***
Pumping Station	~~16~~***19***
GREEN BELT	~~17~~***20***
CONSERVATION AREA	~~19~~***22***

RESIDENTIAL (GROUP A)

Column 1 ***Uses always permitted***	***Column 2*** ***Uses that may be permitted with or without conditions on application to the Town Planning Board***
Ambulance Depot ***Flat*** ***Government Refuse Collection Point*** ***Government Use (not elsewhere specified)*** ***House*** ***Library*** ***Market*** ***Place of Recreation, Sports or Culture*** ***Public Clinic*** ***Public Convenience*** ***Public Transport Terminus or Station (excluding open-air terminus or station)*** ***Public Vehicle Park (excluding container vehicle) (on land designated "R(A)1" only)*** ***Residential Institution*** ***School (in free-standing purpose-designed building only)*** ***Social Welfare Facility*** ***Utility Installation for Private Project***	***Commercial Bathhouse/ Massage Establishment*** ***Eating Place*** ***Educational Institution*** ***Exhibition or Convention Hall*** ***Hospital*** ***Hotel*** ***Institutional Use (not elsewhere specified)*** ***Office*** ***Petrol Filling Station*** ***Place of Entertainment*** ***Private Club*** ***Public Transport Terminus or Station (not elsewhere specified)*** ***Public Utility Installation*** ***Public Vehicle Park (excluding container vehicle) (not elsewhere specified)*** ***Religious Institution*** ***School (not elsewhere specified)*** ***Shop and Services (not elsewhere specified)*** ***Training Centre***

(Please see next page)

RESIDENTIAL (GROUP A) *(cont'd)*

In addition, the following uses are always permitted (a) on the lowest three floors of a building, taken to include basements; or (b) in the purpose-designed non-residential portion of an existing building, both excluding floors containing wholly or mainly car parking, loading/unloading bays and/or plant room:

Eating Place
Educational Institution
Institutional Use (not elsewhere specified)
Off-course Betting Centre
Office
Place of Entertainment
Private Club
Recyclable Collection Centre
School
Shop and Services
Training Centre

Planning Intention

This zone is intended primarily for medium-density residential developments. Commercial uses are always permitted on the lowest three floors of a building or in the purpose-designed non-residential portion of an existing building.

(Please see next page)

RESIDENTIAL (GROUP A) *(cont'd)*

Remarks

(a) ***On land designated "Residential (Group A)1" ("R(A)1"), no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum gross floor area (GFA) of 95,100 m^2, or the GFA of the existing building, whichever is the greater.***

(b) ***On land designated "Residential (Group A)2" ("R(A)2"), no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum domestic GFA of 50,179 m^2, and a maximum non-domestic GFA of 2,245 m^2, or the GFA of the existing building, whichever is the greater.***

(c) ***No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building height in terms of metres above Principal Datum as stipulated on the Plan, or the height of the existing building, whichever is the greater.***

(d) ***In determining the maximum GFA for the purposes of paragraph (a) above, any floor space that is constructed or intended for use solely as Government, institution and community facilities, as required by the Government, may be disregarded.***

(e) ***In determining the maximum GFA for the purposes of paragraph (b) above, any floor space that is constructed or intended for use solely as public transport facilities, as required by the Government, may be disregarded.***

(f) ***In determining the maximum GFA for the purposes of paragraphs (a) and (b) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room, caretaker's office and caretaker's quarters, or recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.***

(g) ***Based on the individual merits of a development or redevelopment proposal, minor relaxation of the GFA/building height restrictions as stated in paragraphs (a) to (c) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.***

RESIDENTIAL (GROUP D)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use Government Use (Police Reporting Centre, Post Office only) House (Redevelopment; Addition, Alteration and/or Modification to existing house only) On-Farm Domestic Structure Rural Committee/Village Office	Eating Place Flat Government Refuse Collection Point Government Use (not elsewhere specified) # House (not elsewhere specified) Institutional Use (not elsewhere specified) # Library ~~Market~~ Petrol Filling Station Place of Recreation, Sports or Culture Public Clinic Public Convenience Public Transport Terminus or Station Public Utility Installation # Public Vehicle Park (excluding container vehicle) Recyclable Collection Centre Religious Institution # Residential Institution # School # Shop and Services Social Welfare Facility # Utility Installation for Private Project

In addition, the following uses are always permitted on the ground floor of a New Territories Exempted House:

Eating Place
Library
School
Shop and Services

Planning Intention

This zone is intended primarily for improvement and upgrading of existing temporary structures within the rural areas through redevelopment of existing temporary structures into permanent buildings. It is also intended for low-rise, low-density residential developments subject to planning permission from the Town Planning Board.

(Please see next page)

RESIDENTIAL (GROUP D) (Cont'd)

Remarks

(a) No addition, alteration and/or modification to or in-situ redevelopment of an existing temporary structure or an existing building (except to 'New Territories Exempted House' or to those annotated with #) shall result in a total development and/or redevelopment in excess of a maximum building area of 37.2m^2 and a maximum building height of 2 storeys (6m) or the building area and height of the building which was in existence on the date of the first publication in the Gazette of the notice of the interim development permission area plan, whichever is the greater.

(b) No development including redevelopment for 'Flat' and 'House' (except 'New Territories Exempted House') uses, other than those to which paragraph (a) above shall apply, shall result in a development and/or redevelopment in excess of a maximum plot ratio of 0.2 and a maximum building height of 2 storeys (6m) on land designated "Residential (Group D)" and a maximum plot ratio of 0.4 and a maximum building height of 3 storeys (9m) on land designated "Residential (Group D)1".

(c) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio ~~and/~~building height restrictions ***as*** stated in paragraph (b) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

(d) In determining the maximum plot ratio for the purposes of paragraph (b) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room, caretaker's office and caretaker's quarters,~~–~~or recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

(e) Any filling of land/pond or excavation of land, including that to effect a change of use to any of those specified in Columns 1 and 2 above or the uses or developments always permitted under the covering Notes (except public works co-ordinated or implemented by Government, and maintenance, repair or rebuilding works), shall not be undertaken or continued on or after the date of the first publication in the Gazette of the notice of the interim development permission area plan without the permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

VILLAGE TYPE DEVELOPMENT

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use ***Government Refuse Collection Point*** Government Use (Police Reporting Centre, Post Office only) House (New Territories Exempted House only) On-Farm Domestic Structure ***Public Convenience*** Religious Institution (Ancestral Hall only) Rural Committee/Village Office	Burial Ground Eating Place ***Field Study/Education/Visitor Centre*** Flat ~~Government Refuse Collection Point~~ Government Use (not elsewhere specified) # ***Hotel (Holiday House only)*** House (not elsewhere specified) Institution***al*** Use (not elsewhere specified) # ~~Market~~ Petrol Filling Station Place of Recreation, Sports or Culture Private Club Public Clinic ~~Public Convenience~~ Public Transport Terminus or Station Public Utility Installation # Public Vehicle Park (excluding container vehicle) Religious Institution (not elsewhere specified) # Residential Institution # School # Shop and Services Social Welfare Facility # Utility Installation for Private Project
In addition, the following uses are always permitted on the ground floor of a New Territories Exempted House:	
Eating Place Library School Shop and Services	

(Please see next page)

VILLAGE TYPE DEVELOPMENT (Cont'd)

Planning Intention

The planning intention of this zone is to designate both existing recognized villages and areas of land considered suitable for village expansion. Land within this zone is primarily intended for development of Small Houses by indigenous villagers. It is also intended to concentrate village type development within this zone for a more orderly development pattern, efficient use of land and provision of infrastructures and services. Selected commercial and community uses serving the needs of the villagers and in support of the village development are always permitted on the ground floor of a New Territories Exempted House. Other commercial, community and recreational uses may be permitted on application to the Town Planning Board.

Remarks

(a) No new development, or addition, alteration and/or modification to or redevelopment of an existing building (except development or redevelopment to those annotated with #) shall result in a total development and/or redevelopment in excess of a maximum building height of 3 storeys (8.23m) or the height of the building which was in existence on the date of the first publication in the Gazette of the notice of the interim development permission area plan, whichever is the greater.

(b) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height restriction ***as*** stated in paragraph (a) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

(c) Any filling of land/pond or excavation of land, including that to effect a change of use to any of those specified in Columns 1 and 2 above or the uses or developments always permitted under the covering Notes (except public works co-ordinated or implemented by Government, and maintenance, repair or rebuilding works), shall not be undertaken or continued on or after the date of the first publication in the Gazette of the notice of the interim development permission area plan without the permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

INDUSTRIAL (GROUP D)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Cargo Handling and Forwarding Facility (not elsewhere specified) Eating Place (Canteen, Cooked Food Centre only) Government Refuse Collection Point Government Use (not elsewhere specified) Industrial Use (not elsewhere specified) Open Storage (not elsewhere specified) Public Convenience Public Utility Installation Public Vehicle Park (excluding container vehicle) Recyclable Collection Centre Rural Workshop Shop and Services (Services Trades only) Utility Installation for Private Project Vehicle Repair Workshop Warehouse (other than Dangerous Goods Godown) Wholesale Trade	Animal Boarding Establishment Broadcasting, Television and/or Film Studio Cargo Handling and Forwarding Facility (Container Freight Station, Logistics Centre only) Concrete Batching Plant Container Storage/Repair Yard Container Vehicle Park/ Container Vehicle Repair Yard Dangerous Goods Godown Eating Place (not elsewhere specified) Offensive Trades Open Storage of Cement/Sand Open Storage of Chemical Products/ Dangerous Goods Petrol Filling Station Refuse Disposal Installation (Refuse Transfer Station only) Shop and Services (not elsewhere specified) Vehicle Stripping/Breaking Yard

Planning Intention

This zone is intended primarily for industrial uses that cannot be accommodated in conventional flatted factories due to extensive land and/or high ceiling requirements. It is also intended for the redevelopment of existing informal industrial uses, which are operated in workshop premises in rural area, to properly designed permanent industrial buildings.

Remarks

(a) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 1.6, a maximum site coverage of 80% and a maximum building height of 13m, or the plot ratio, site coverage and height of the building which was in existence on the date of the first publication in the Gazette of the notice of the interim development permission area plan, whichever is the greater.

(b) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio, site coverage ~~and~~/ building height restrictions ***as*** stated in paragraph (a) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

(Please see next page)

INDUSTRIAL (GROUP D) (Cont'd)

Remarks (Cont'd)

(c) In determining the maximum plot ratio and site coverage for the purposes of paragraph (a) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

OPEN STORAGE

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use	Cargo Handling and Forwarding Facility (Container Freight Station, Logistics Centre only)
Cargo Handling and Forwarding Facility (not elsewhere specified)	Cement Manufacturing
Eating Place (Canteen only)	Concrete Batching Plant
Government Refuse Collection Point	Container Storage/Repair Yard
Government Use (not elsewhere specified)	Container Vehicle Park/ Container Vehicle Repair Yard
On-Farm Domestic Structure	Dangerous Goods Godown
Open Storage (not elsewhere specified)	Eating Place (not elsewhere specified)
Public Convenience	Industrial Use (not elsewhere specified)
Public Utility Installation	Open Storage of Cement/Sand
Public Vehicle Park (excluding container vehicle)	Open Storage of Chemical Products/ Dangerous Goods
Rural Workshop	Petrol Filling Station
Shop and Services (Service Trades Only)	Shop and Services (not elsewhere specified)
Utility Installation for Private Project	Vehicle Stripping/Breaking Yard
Vehicle Repair Workshop	Wholesale Trade
Warehouse (excluding Dangerous Goods Godown)	

Planning Intention

This zone is intended primarily for the provision of land for appropriate open storage uses and to regularize the already haphazard proliferation of open storage uses. It provides for the orderly development of land for open storage uses which cannot be accommodated in conventional godown premises.

GOVERNMENT, INSTITUTION OR COMMUNITY

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot	Animal Boarding Establishment
Animal Quarantine Centre (in Government building only)	Animal Quarantine Centre (not elsewhere specified)
Broadcasting, Television and/or Film Studio	Columbarium
Eating Place (Canteen, Cooked Food Centre only)	Correctional Institution
Educational Institution	Crematorium
Exhibition or Convention Hall	Driving School
Field Study/Education/Visitor Centre	Eating Place (not elsewhere specified)
Government Refuse Collection Point	Flat
Government Use (not elsewhere specified)	Funeral Facility
Hospital	Helicopter Landing Pad
Institutional Use (not elsewhere specified)	Holiday Camp
Library	Hotel
Market	House (other than rebuilding of New ~~Territorial~~***Territories*** Exempted House or replacement of existing domestic building by New Territories Exempted House permitted under the covering Notes)
Place of Recreation, Sports or Culture	Off-course Betting Centre
Public Clinic	Office
Public Convenience	Petrol Filling Station
Public Transport Terminus or Station	Place of Entertainment
Public Utility Installation	Private Club
Public Vehicle Park (excluding container vehicle)	Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation
Recyclable Collection Centre	Residential Institution
Religious Institution	Sewage Treatment/Screening Plant
Research, Design and Development Centre	Shop and Services ***(not elsewhere specified)***
Rural Committee/Village Office	Utility Installation for Private Project
School	***Zoo***
Service Reservoir	
Social Welfare Facility	
Training Centre	
Wholesale Trade	

Planning Intention

This zone is intended primarily for the provision of Government, institution or community facilities serving the needs of the local residents ~~and the district population.~~ ***and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, or other institutional establishments.***

OPEN SPACE

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Aviary Barbecue Spot Bathing Beach Field Study/Education/Visitor Centre Park and Garden Pavilion Pedestrian Area Picnic Area Playground/Playing Field Promenade Public Convenience Sitting Out Area Zoo	Eating Place Government Refuse Collection Point Government Use (not elsewhere specified) Holiday Camp Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Religious Institution Service Reservoir Shop and Services Tent Camping Ground Utility Installation for Private Project

Planning Intention

This zone is intended primarily for the provision of outdoor open-air public space for active and/or passive recreational uses serving the needs of local residents as well as the general public.

Remarks

Any filling of land/pond or excavation of land, including that to effect a change of use to any of those specified in Columns 1 and 2 above or the uses or developments always permitted under the covering Notes (except public works co-ordinated or implemented by Government, and maintenance, repair or rebuilding works), shall not be undertaken or continued on or after the date of the first publication in the Gazette of the notice of the interim development permission area plan without the permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

OTHER SPECIFIED USES

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board

For "Comprehensive Development and Wetland Enhancement Area" only

Agricultural Use (Fish Pond Culture only)	Eating Place
Nature Reserve	Field Study/Education/Visitor Centre
Wetland Habitat	Flat
	Government Refuse Collection Point
	Government Use (not elsewhere specified)
	House (other than New Territories Exempted House)
	Nature Trail
	Public Clinic
	Public Convenience
	Public Transport Terminus or Station
	Public Utility Installation
	Religious Institution
	School
	Shop and Services
	Social Welfare Facility
	Utility Installation for Private Project

Planning Intention

~~The "Other Specified Uses" annotated "Comprehensive Development and Wetland Enhancement Area" ("OU(CDWEA)")~~***This*** zone is intended for conservation and enhancement of ecological value and functions of the existing fish ponds or wetland through consideration of application for development or redevelopment under the "private-public partnership approach". Low-density private residential or passive recreational development within this zone in exchange for committed long-term conservation and management of the remaining fish ponds or wetland within the development site may be permitted subject to the "no-net-loss in wetland" principle and planning permission from the Town Planning Board. Any new building should be located farthest away from Deep Bay.

Remarks

(a) Application for permission of use or development shall be in the form of a comprehensive development scheme with minimum pond filling and no decline in the wetland function of the fish ponds within and near the development site. An applicant shall prepare a layout plan and any other documents showing the following information for consideration of the Town Planning Board:

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

For "Comprehensive Development and Wetland Enhancement Area" only (Cont'd)

Remarks (Cont'd)

(i) the proposed land uses, development parameters, the nature, position and heights of all buildings to be erected in the area;

(ii) a wetland conservation and enhancement scheme, including its detailed design, wetland buffer proposals, a long-term maintenance and management plan, and monitoring and implementation mechanism;

(iii) an environmental impact study report, including but not limiting to an ecological impact assessment and a visual impact assessment, to examine any possible environmental, ecological and visual problems that may be caused to or by the proposed development or redevelopment during construction and after completion and the proposed mitigation measures to tackle them;

(iv) landscape proposals;

(v) a traffic impact study report to examine any possible traffic problems that may be caused by the proposed development or redevelopment and the proposed measures to tackle them;

(vi) a drainage and sewerage impact study report to examine any possible flooding, drainage, sewerage and associated problems that may be caused to or by the proposed development or redevelopment and the proposed mitigation measures to tackle them;

(vii) programming, phasing and implementation schedule of each component of the proposed development or redevelopment (including the wetland conservation and enhancement scheme); and

(viii) such other information as may be required by the Town Planning Board.

(b) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum gross floor area (GFA) specified below:

Sub-area	Maximum GFA
OU(CDWEA1)	a domestic GFA of 306,581m^2, a non-domestic GFA of 13,000m^2 including a club house with GFA of 8,000m^2
OU(CDWEA2)	a total GFA of 52,840m^2 including a club house with GFA of 1,000m^2

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

For "Comprehensive Development and Wetland Enhancement Area" only (Cont'd)

Remarks (Cont'd)

(c) In determining the maximum GFA for the purposes of paragraph (b) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room, caretaker's office and caretaker's quarters, or recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

(d) Any development or redevelopment within the "OU(CDWEA1)" zone is required to be developed together with the "Site of Special Scientific Interest (1)" ("SSSI(1)") zone on the Mai Po and Fairview Park Outline Zoning Plan in a comprehensive and integrated manner. An applicant shall submit a layout plan covering the whole of the "OU(CDWEA1)" zone and the "SSSI(1)" zone for the consideration of the Town Planning Board in accordance with the provisions of the Notes of both zones.

(e) Any filling of land/pond or excavation of land, including that to effect a change of use to any of those specified in Columns 1 and 2 above or the uses or developments always permitted under the covering Notes ***(except public works co-ordinated or implemented by Government, and maintenance, repair or rebuilding works)***, shall not be undertaken or continued on or after the date of the first publication in the Gazette of the notice of the interim development permission area plan without the permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board

For "Comprehensive Development to include Wetland Restoration Area" only

Agricultural Use
Barbecue Spot
Field Study/Education/Visitor Centre
Nature Trail
On-Farm Domestic Structure
Picnic Area
Religious Institution (Ancestral Hall only)
Rural Committee/Village Office

Eating Place #
Flat
Golf Course
Government Refuse Collection Point #
Government Use (not elsewhere specified) #
Holiday Camp
Hotel
House (other than rebuilding of New Territories Exempted House or replacement of existing domestic building by New Territories Exempted House permitted under the covering Notes) #
Nature Reserve
Place of Recreation, Sports or Culture
Private Club
Public Clinic #
Public Convenience #
Public Transport Terminus or Station
Public Utility Installation #
Religious Institution (not elsewhere specified)
Residential Institution
School #
Shop and Services #
Social Welfare Facility #
Tent Camping Ground #
Theme Park
Utility Installation for Private Project
Wetland Habitat
Zoo

Planning Intention

This zone is intended to provide incentive for the restoration of degraded wetlands adjoining existing fish ponds through comprehensive residential and/or recreational development to include wetland restoration area. It is also intended to phase out existing sporadic open storage and port back-up uses on degraded wetlands. Any new building should be located farthest away from Deep Bay.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

For "Comprehensive Development to include Wetland Restoration Area" only (Cont'd)

Remarks (Cont'd)

(a) Application for permission of use or development, except as otherwise specified in paragraph (c) below, shall be in the form of a comprehensive development scheme to include wetland restoration proposal. An applicant shall prepare a layout plan and other documents showing the following information for consideration of the Town Planning Board:

(i) the proposed land uses, development parameters, the nature, position and heights of all buildings to be erected in the area;

(ii) a wetland restoration and/or creation scheme, including its detailed design, wetland buffer proposals, a long-term maintenance and management plan, and monitoring and implementation mechanism;

(iii) an environmental impact study report, including but not limiting to an ecological impact assessment and a visual impact assessment, to examine any possible environmental, ecological and visual problems that may be caused to or by the proposed development or redevelopment during construction and after completion and the proposed mitigation measures to tackle them;

(iv) landscape proposals;

(v) a traffic impact study report to examine any possible traffic problems that may be caused by the proposed development or redevelopment and the proposed measures to tackle them;

(vi) a drainage and sewerage impact study report to examine any possible flooding, drainage, sewerage and associated problems that may be caused to or by the proposed development or redevelopment and the proposed mitigation measures to tackle them;

(vii) programming, phasing and implementation schedule of each component of the proposed development or redevelopment (including the wetland restoration and/or creation scheme); and

(viii) such other information as may be required by the Town Planning Board.

(b) Any application for permission of use or development on the "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" zone to the north of Shan Pui Road, except as otherwise specified in paragraph (c) below, should be in the form of a layout plan covering the whole zone.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

For "Comprehensive Development to include Wetland Restoration Area" only (Cont'd)

Remarks (Cont'd)

(c) For application for uses annotated with #, if developed individually and not forming part of a comprehensive development scheme, the requirement of the provision of wetland restoration proposal and the submission of layout plan as required under paragraph (a) above may be exempted.

(d) ***On land designated "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" ("OU(CDWRA)"), no***~~No~~ new development, or addition, alteration and/or modification to or redevelopment of an existing building (except development or redevelopment to a 'New Territories Exempted House') shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 0.4 and a maximum building height of 6 storeys including car park, or the plot ratio~~, site coverage~~ and height of the building which was in existence on the date of the first publication in the Gazette of the notice of the interim development permission area plan, whichever is the greater.

(e) On land designated "OU(CDWRA)(1)", no new development, or addition, alteration, and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 1.55 and a maximum building height in terms of metres above Principal Datum as stipulated on the Plan, or the plot ratio and height of the existing building, whichever is the greater.

(~~e~~***f***) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio~~ and~~/building height restrictions ***as*** stated in paragraph***s*** (d) ***and (e)*** above~~,~~ may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

(~~f~~***g***) In determining the maximum plot ratio for the purposes of paragraph***s*** (d) ***and (e)*** above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room, caretaker's office and caretaker's quarters, or recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

(~~g~~***h***) Any filling of land/pond or excavation of land, including that to effect a change of use to any of those specified in Columns 1 and 2 above or the uses or development always permitted under the covering Notes ***(except public works co-ordinated or implemented by Government, and maintenance, repair or rebuilding works)***, shall not be undertaken or continued on or after the date of the first publication in the Gazette of the notice of the interim development permission area plan without the permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
For "Pumping Station" only	
Public Utility Installation (Pumping Station only)	Government Use (not elsewhere specified) Utility Installation not ancillary to the Specified Use

Planning Intention

This zone is intended primarily for pumping station use.

GREEN BELT

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use Barbecue Spot Government Use (Police Reporting Centre only) Nature Reserve Nature Trail On-Farm Domestic Structure Picnic Area Public Convenience Tent Camping Ground Wild Animals Protection Area	Animal Boarding Establishment Broadcasting, Television and/or Film Studio Burial Ground Cable Car Route and Terminal Building Columbarium (within a Religious Institution or extension of existing Columbarium only) Crematorium (within a Religious Institution or extension of existing Crematorium only) Field Study/Education/Visitor Centre Firing Range Flat Golf Course Government Refuse Collection Point Government Use (not elsewhere specified) Helicopter Landing Pad Holiday Camp House (other than rebuilding of New Territories Exempted House or replacement of existing domestic building by New Territories Exempted House permitted under the covering Notes) Petrol Filling Station Place of Recreation, Sports or Culture Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Religious Institution Residential Institution Rural Committee/Village Office School Service Reservoir Social Welfare Facility Utility Installation for Private Project Zoo

(Please see next page)

GREEN BELT (Cont'd)

Planning Intention

The planning intention of this zone is primarily for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. There is a general presumption against development within this zone.

Remarks

Any filling or excavation of land, including that to effect a change of use to any of those specified in Columns 1 and 2 above or the uses or developments always permitted under the covering Notes (except public works co-ordinated or implemented by Government, and maintenance, repair or rebuilding works), shall not be undertaken or continued on or after the date of the first publication in the Gazette of the notice of the interim development permission area plan without the permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

CONSERVATION AREA

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use (Fish Pond Culture only) Nature Reserve On-Farm Domestic Structure Wetland Habitat Wild Animals Protection Area	Field Study/Education/Visitor Centre Government Refuse Collection Point Government Use (not elsewhere specified) House (Redevelopment only) Nature Trail Public Convenience Public Utility Installation Utility Installation for Private Project

Planning Intention

The planning intention of this zone is to conserve the ecological value of wetland and fish ponds which form an integral part of the wetland ecosystem in the Deep Bay Area. The "no-net-loss in wetland" principle is adopted for any change in use within this zone. The primary intention is to discourage new development unless it is required to support the conservation of the ecological integrity of the wetland ecosystem or the development is an essential infrastructure project with overriding public interest.

Remarks

(a) No redevelopment, including alteration and/or modification, of an existing house shall result in a total redevelopment in excess of the plot ratio, site coverage and height of the house which was in existence on the date of the first publication in the Gazette of the notice of the interim development permission area plan.

(b) Any filling of land/pond or excavation of land, including that to effect a change of use to any of those specified in Columns 1 and 2 ***above*** or the uses or developments always permitted under the covering Notes ***(except public works co-ordinated or implemented by Government, and maintenance, repair or rebuilding works)***, shall not be undertaken or continued on or after the date of the first publication in the Gazette of the notice of the interim development permission area plan without the permission from the Town Planning Board under section 16 of the Town Planning Ordinance.

~~APPROVED~~ ***DRAFT*** NAM SANG WAI OUTLINE ZONING PLAN NO. S/YL-NSW/8***A***

EXPLANATORY STATEMENT

~~APPROVED~~***DRAFT*** NAM SANG WAI OUTLINE ZONING PLAN NO. S/YL-NSW/8***A***

EXPLANATORY STATEMENT

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~~APPROVED~~***DRAFT*** NAM SANG WAI OUTLINE ZONING PLAN NO. S/YL-NSW/8***A***

(Being ~~an Approved~~***a Draft*** Plan for the Purpose of the Town Planning Ordinance)

Explanatory Statement

Note : For the purposes of the Town Planning Ordinance, this statement shall not be deemed to constitute a part of the approved Plan.

1. INTRODUCTION

This Explanatory Statement is intended to assist an understanding of the ~~approved~~***draft*** Nam Sang Wai Outline Zoning Plan (OZP) No. S/YL-NSW/8***A***. It reflects the planning intention and objectives of the Town Planning Board (the Board) for various land-use zonings of the Plan.

2. AUTHORITY FOR THE PLAN AND PROCEDURE

2.1 The land covered by the draft Nam Sang Wai OZP was previously included in the Nam Sang Wai Interim Development Permission Area (IDPA) Plan and the Nam Sang Wai Development Permission Area (DPA) Plan.

2.2 On 17 August 1990, the Nam Sang Wai IDPA Plan No. IDPA/YL-NSW/1 prepared by the Director of Planning was notified in the Gazette.

2.3 On 12 July 1991, the draft Nam Sang Wai DPA Plan No. DPA/YL-NSW/1 including land previously within the IDPA Plan was exhibited for public inspection under section 5 of the Town Planning Ordinance (the Ordinance). On 26 April 1994, the then Governor in Council, under section 9(1)(a) of the Ordinance, approved the draft Nam Sang Wai DPA Plan which was subsequently renumbered as DPA/YL-NSW/2.

2.4 On 17 May 1993, under the power delegated by the then Governor, the then Secretary for Planning, Environment and Lands directed the Board, under section 3(1)(a) of the Ordinance, to prepare an OZP for the area of Nam Sang Wai.

2.5 On 3 June 1994, the draft Nam Sang Wai OZP No. S/YL-NSW/1 was exhibited for public inspection under section 5 of the Ordinance. Subsequently, the draft Nam Sang Wai OZP was amended twice and exhibited for public inspection under section 7 of the Ordinance. On 5 February 2002, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft Nam Sang Wai OZP, which was subsequently renumbered as S/YL-NSW/4.

2.6 On 8 July 2003, the CE in C referred the approved Nam Sang Wai OZP No. S/YL-NSW/4 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The reference back of the OZP was notified in the Gazette on 18 July 2003 under section 12(2) of the Ordinance. ***Subsequently, the OZP has***

been amended three times to reflect the changing circumstances.

~~2.7 On 16 April 2004, the draft Nam Sang Wai OZP No. S/YL-NSW/5, incorporating mainly amendments to rezone an area near Shan Pui Chung Hau Tsuen from "Residential (Group D)" to "Residential (Group D)1", "Comprehensive Development Area" and "Other Specified Uses" annotated "Pumping Station" and amendments to the Notes of the OZP in accordance with the revised Master Schedule of Notes to Statutory Plans endorsed by the Board, was exhibited for public inspection under section 5 of the Ordinance. During the exhibition period, 87 valid objections were received. After giving preliminary and further considerations to the objections, the Board decided to propose amendments to the OZP by rezoning the "Comprehensive Development Area" zone to "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" to partially meet 19 objections and not to uphold the others.~~

~~2.8 On 11 March 2005, the draft Nam Sang Wai OZP No. S/YL-NSW/6 incorporating amendments to rezone an elongated area stretching from the northwest of Man Yuen Chuen towards Yau Pok Road from "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" and "Conservation Area" to area shown as 'Drainage Channel' and adjustment of the boundary of the "Residential (Group D)" zone to the east of the drainage channel was exhibited for public inspection under section 7 of the Ordinance. During the exhibition period, no objection was received.~~

~~2.9 On 12 August 2005, the proposed amendments to the draft Nam Sang Wai OZP to partially meet the 19 objections were notified in the Gazette under section 6(7) of the Ordinance. Four valid further objections were received during the notification period. On 4 November 2005, after giving consideration to these further objections, the Board decided not to propose any further amendment to the OZP to meet them and agreed that the amendments notified under section 6(7) of the Ordinance on 12 August 2005 were a decision under section 6(9) of the Ordinance and formed part of the draft Nam Sang Wai OZP No. S/YL-NSW/6.~~

~~2.10 On 9 December 2005, the draft Nam Sang Wai OZP No. S/YL-NSW/7, incorporating mainly amendments to the planning intention of the "Open Space" zone and the definition of "existing building" in the covering Notes, was exhibited for public inspection under section 7 of the Ordinance. During the exhibition period, no valid objection was received.~~

2.~~11~~***7*** On 17 October 2006, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Nam Sang Wai OZP, which was subsequently renumbered as S/YL-NSW/8. On 27 October 2006, the approved Nam Sang Wai OZP No. S/YL-NSW/8 ~~(the Plan)~~ was exhibited under section 9(5) of the Ordinance.

2.8 On 28 March 2023, the CE in C referred the approved Nam Sang Wai OZP No S/YL-NSW/8 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The reference back of the OZP was notified in the Gazette

on 6 April 2023 under section 12(2) of the Ordinance.

2.9 On_____ 2024, the draft Nam Sang Wai OZP No. S/YL-NSW/9 (the Plan) was exhibited for public inspection under section 5 of the Ordinance. The Plan incorporates amendments mainly to rezone an area to the north of Ho Chau Road from "Residential (Group D)" ("R(D)") to "Residential (Group A)1" ("R(A)1"), "Residential (Group A)2" ("R(A)2"), "Other Specified Uses" annotated "Pumping Station" ("OU(Pumping Station)") to facilitate a Land Sharing Pilot Scheme (LSPS) development; and from "R(D)" to "Village Type Development" ("V") and "Green Belt" to form part of the adjacent "V" zone and reflect existing condition respectively; to rezone a site at Wing Kei Tsuen from "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" ("OU(CDWRA)") to "OU(CDWRA)(1)" zone; and other technical amendments to the Notes of the OZP.

3. OBJECT OF THE PLAN

3.1 The object of the Plan is to indicate the broad land-use zonings and transport network for the Nam Sang Wai area so that development and redevelopment within the area can be put under statutory planning control. It also provides the planning framework for preparing more detailed non-statutory plans which form the basis for public works planning and site reservation for various uses.

3.2 The Plan is to illustrate the broad principles of development and control only. It is a small-scale plan and the road alignments and boundaries between the land-use zones may be subject to minor alterations as detailed planning proceeds.

3.3 Since the Plan is to show broad land use zonings, there would be situations in which small strips of land not intended for building development purposes and carry no development right under the lease, such as areas restricted for garden, slope maintenance and access road purposes, are included in the residential zones. The general principle is that such areas should not be taken into account in plot ratio and site coverage calculation. Development within residential zones should be restricted to buildings lots carrying development right in order to maintain the character and amenity of the Nam Sang Wai area and not to overload the road network in this area.

4. NOTES OF THE PLAN

4.1 Attached to the Plan is a set of Notes which shows the types of uses or developments which are always permitted within the Planning Scheme Area (the Area) and in particular zones and which may be permitted by the Board, with or without conditions, on application. The provision for application for planning permission under section 16 of the Ordinance allows greater flexibility in land use planning and control of development to meet changing needs.

4.2 For the guidance of the general public, a set of definitions that explains some

of the terms used in the Notes may be obtained from the Technical Services Division of the Planning Department and can be downloaded from the Board's website at ~~http://www.info.gov.hk/tpb~~ ***http://www.tpb.gov.hk/***.

5. THE PLANNING SCHEME AREA

5.1 The Area ***is about 600 ha.*** ~~, covering about 600 ha. of land,~~ ***It*** is bounded by San Tin Highway and Castle Peak Road in the east, ***Mai Po and*** Fairview Park ***area*** in the north, Shan Pui River ***and Yuen Long New Town*** in the west and Shan Pui Chung Hau Tsuen and Au Tau in the south. The boundary of the Area is shown in a heavy broken line on the Plan.

5.2 The boundary of the Area is delineated having regard to physical and topographical features such as roads, drainage channels and hills. Therefore, the Area boundary does not necessarily follow the Heung boundaries which are used for administration purpose only. Also, the name of the Plan is geographical in nature and would not cause implications on development rights, particularly Small House applications.

5.3 The Area comprises a low-lying alluvial flood plain draining into Deep Bay. It is largely rural in character with considerable amount of fish ponds and a few parcels of farm land ***in the northern part of the Area***. In recent years, large tracts of fish ponds and agricultural land, particularly those located by or near the main roads, have been filled up and converted for open storage ***and warehouse*** uses.

5.4 ~~Items of historical merits such as grave of Tang Wai kap and Pun Uk as well as historic villages such as Tung Shing Lei and Pok Wai are located within the area. These historic monuments and villages are worthy of preservation~~ ***There are a number of graded historic buildings located with the Area***. Prior consultation with the Antiquities and Monuments Office of the ~~Leisure and Cultural Services Department~~***Development Bureau*** is required for any ***works,*** development***,*** ~~or~~ redevelopment ***or rezoning proposals that might affect the graded historic buildings*** ~~affecting the historic monuments and villages in the area~~ and their immediate environs.

6. POPULATION

6.1 ~~According to the 2001 Population Census~~***Based on the 2021 Population By-census***, the ~~total~~ population ~~in~~ ***of*** the Area ***was estimated by the Planning Department as about*** ~~was approximately 2,400~~***3,800***. ~~There are a number of main settlements in the Area, namely Pok Wai, Man Yuen Chuen, Tai Sang Wai, Shan Pui Chung Hau Tsuen, Chung Hau Yu Man San Tsuen, Small Traders New Village and Tung Shing Lei/Au Tau, of which Pok Wai is a recognized/indigenous village.~~

6.2 It is estimated that the ***total*** planned population ~~in~~***for*** the Area ~~will~~***would*** be about ~~28,900~~ ***28,500*** persons.

7. OPPORTUNITIES AND CONSTRAINTS

7.1 Opportunities

7.1.1 The "Study on Ecological Values of Fish Ponds in Deep Bay Area" ("Fish Pond Study") completed in 1997 has confirmed the unique international and regional importance of the fish pond system in the Deep Bay Area particularly for ardeids. It has established that the fish pond areas in Nam Sang Wai form an integral part of the Deep Bay Area wetland ecosystem, and have significant ecological value. With the support of scientific surveys and analysis, the Fish Pond Study sets out the principles of "precautionary approach" and "no-net-loss in wetland" which present opportunities to prevent/enhance these natural resources, and to restore some of the degraded areas.

7.1.2 Where situation warrants, environmental upgrading of open storage sites along San Tin Highway and Castle Peak Road through redevelopment proposals should be encouraged provided that these proposals would have minimal adverse impacts in terms of drainage, sewerage, traffic, environment and ecology.

7.1.3 ***Opportunities for developments in the Area are expected to be concentrated at the existing less ecologically sensitive*** ~~The openness of the~~ flat land under~~ private ownership~~, ***capitalizing on the close proximity of the Area to the Yuen Long New Town*** and the improved accessibility ***to be brought by several strategic transport links including the existing*** ~~as a result of the completion of the~~ San Tin Highway***, Yuen Long Highway and Tsing Long Highway, and the Northern Metropolis Highway as well as the Northern Link Main Line under planning*** ~~render opportunity for development on less ecologically sensitive sites and areas not involving pond filling~~.

7.2 Development Constraints

7.2.1 The ***existing*** Mai Po Nature Reserve ***(MPNR)*** and the adjoining fish ponds form part of the wetland system and wildlife habitats in the Deep Bay Area providing an extensive area of undisturbed feeding and resting habitats for migratory birds. In order to preserve and sustain ~~Mai Po Nature Reserve~~ ***MPNR*** and the wildlife habitats in the areas surrounding the Deep Bay Area, new development proposals should not be allowed unless it can be demonstrated that it would have minimal adverse impact on drainage, sewerage, traffic, environment and ecology in the area.

7.2.2 The Area is on low-lying terrain. Over the past decades, there have been substantial modifications of the floodplain which have reduced the flood storage capacity and affected floodways and watercourses in

the Area. These changes have caused substantial increase in flooding hazards and flood damages to the Area. To relieve the regional flooding problem, construction of main drainage channels for Ngau Tam Mei and the village flood protection works for Pok Wai and Chuk Yuen Tsuen/Ha San Wai ~~commenced in end 2002 and will~~ ***was*** ~~be~~ completed ***in 2004*** ~~by 2005~~. However, there is still some local residual flooding which occurs at low-lying areas. Mitigation measures against flooding should be assured for every development to be carried out in this Area. ~~The trunk sewer system is under review. To uphold the principle of "no-net-increase in pollution load to Deep Bay", development should be kept to a minimum in the interim to avoid generating adverse impacts on the environment.~~

7.2.3 With the rapid growth of Yuen Long New Town***,*** ~~and~~ the committed/approved developments in Mai Po, Ngau Tam Mei and Nam Sang Wai areas ***and the proposed San Tin Technopole***, traffic flow on the subject section of Castle Peak Road and San Tin Highway will soon reach their capacity. This imposes a constraint on future new development proposals ***in the Area*** and improvement to the road infrastructure would be required. ***While the existing San Tin Highway, Yuen Long Highway and Tsing Long Highway serving the Area, in the long term, addition of a new strategic road such as the Northern Metropolis Highway is needed.***

7.2.4 Existing water treatment works capacity for the North West New Territories (NWNT) has already been committed. Extension of water supply system will be required if there is a substantial increase in population resulting from large scale residential developments.

8. GENERAL PLANNING INTENTION

8.1 In the light of the findings and recommendations of the ***earlier*** Fish Pond Study, the ***general*** planning intention of the Area is to conserve the ecological value of the fish ponds which form an integral part of the wetland ecosystem in the Deep Bay Area. The existing and contiguous, active or abandoned fish ponds in the Deep Bay Area should all be conserved. Moreover, the loss of fish ponds and habitat fragmentation should be avoided and any negative impacts arising from undesirable land uses and human disturbance should be mitigated.

8.2 In order to achieve the conservation objectives, a "precautionary approach" and the principle of "no-net-loss in wetland" have been adopted. New development within the fish pond areas would not be allowed unless it is required to support or to enhance the ecological value of the area, or the development is an essential infrastructural project with overriding public interest.

8.3 The planning intention of the area further away from the fish ponds is to protect the ecological integrity of the wetland ecosystem, and prevent development that would have a negative off-site disturbance impact on the

ecological value of fish ponds. Application for new open storage or port back-up uses would normally not be allowed.

8.4 In the designation of various zones in the Area, other than the recommendation of the ***earlier*** Fish Pond Study, considerations have been given to the physical landform, existing settlements, land status, availability of infrastructure and local development pressures, ***and the latest territorial spatial development strategy (i.e. the Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030 promulgated in October 2021)*** ~~the Territorial Development Strategy Review and NWNT Development Strategy Review~~. In addition, buildings and places of historical and archaeological interest in the Area would be preserved as far as possible.

9. LAND-USE ZONINGS

9.1 Residential (Group A) ("R(A)") (Total Area : 5.86 ha)

9.1.1 The planning intention of this zone is primarily for medium-density residential developments. The "R(A)" zone includes sites for public and private residential developments under the LSPS[1] in an area to the north of Ho Chau Road. Commercial uses are always permitted on the lowest three floors of a building or in the purpose-designed non-residential portion of an existing building. Various community, social welfare and ancillary recreational facilities may be included in these sites.

9.1.2 This zoning includes two sub-zones which are subject to the following development restrictions:

"Residential (Group A)1" ("R(A)1"): (Total Area : 2.21 ha)

(a) A site for public housing development under the LSPS located to the north of the "R(A)2" zone is under this zoning. Development within this sub-zone is subject to a maximum gross floor area (GFA) of 95,100m^2 and a maximum building height of 100mPD. Under the proposed LSPS scheme, the domestic and non-domestic GFA for the public housing development would be 93,400m^2 and 1,700m^2 respectively.

(b) In order to facilitate provision of Government, institution and community (GIC) facilities, in determining the maximum GFA of the development and/or redevelopments, any floor space that is

[1] ***The LSPS aims to unlock the development potential of private land in areas not covered by the Government's planning studies or conservation areas, and serves to complement government-led land supply initiatives. Under the LSPS, each project should be capable of delivering an increased domestic GFA of not less than 50,000m^2 in total and at least 1,000 additional housing units (assuming an average flat size of 50m^2), being the total domestic GFA attainable by the project net the original scale of development of the private lots permissible under statutory plans or planning approvals in the absence of LSPS. No less than 70% of the increased domestic GFA should be set aside for public housing or starter homes development as intended by the Government.***

constructed or intended for use solely as GIC facilities, as required by the Government, may be disregarded.

(c) A planning brief setting out the planning parameters and the design requirements of the public housing development will be provided to guide the future development of the site.

"Residential (Group A)2" ("R(A)2"): (Total Area : 3.65 ha)

(d) A site for private housing development under the LSPS located to the north of Ho Chau Road is under this zoning. Development within this sub-zone is subject to a maximum domestic GFA of 50,179m^2, a maximum non-domestic GFA of 2,245m^2 and a maximum building height of 100mPD. Retail facilities and a kindergarten will be provided in the "R(A)2" zone. Besides, compensation wetlands of about 6,900m^2, and a public transport terminus with a GFA of about 4,675m^2 would be provided within the "R(A)2" zone.

(e) In order to facilitate provision of public transport facilities, in determining the maximum GFA of the development and/or redevelopments, any floor space that is constructed or intended for use solely as public transport facilities, as required by the Government, may be disregarded.

9.1.3 The GFA control under the "R(A)1" and "R(A)2" zones are regarded as being stipulated in a "new or amended statutory plan" according to the Joint Practice Note No. 4 "Development Control Parameters Plot Ratio/Gross Floor Area", and shall be subject to the streamlining arrangements stated therein.

9.~~1~~***2*** Residential (Group D) ("R(D)") (Total Area : ~~16.12~~***7.66*** ha~~.~~)

9.~~1~~***2***.1 The planning intention of this zone is primarily to improve and upgrade the existing temporary structures within the rural area to permanent buildings. Replacement housing for temporary structures shall not result in a total redevelopment in excess of a maximum building area of 37.2m^2 and a maximum building height of 2 storeys (6m).

9.~~1~~***2***.2 Apart from the intention of residential upgrading, low-rise and low-density residential development may be permitted on application to the Board. Generally, the applicant has to prove to the Board that the proposed development would have no or minimal adverse impact on the environment.

9.~~1~~***2***.3 Man Yuen Tsuen and ~~an area~~ ***two parcels of land*** to the south of Kam Tin River are zoned "R(D)". These area are rural in character. To be in line with the development intensity of existing domestic accommodation within the area, residential development other than New Territories Exempted House shall not result in a total development in excess of a plot ratio of 0.2 and a maximum building

height of 2 storeys (6m).

9.~~1~~***2***.4 An area covering Shan Pui Chung Hau Tsuen and its adjacent land is zoned "R(D)1" where residential development other than New Territories Exempted House shall not exceed a maximum plot ratio of 0.4 and a maximum building height of 3 storeys (9m).

~~9. 1.5 To provide flexibility for innovative design adapted to the characteristics of particular sites, minor relaxation of the plot ratio and building height restrictions stated in paragraphs 9.1.3 and 9.1.4 above may be considered by the Board through the planning permission system. Each proposal will be considered on its individual planning merits.~~

9.~~2~~***3*** Village Type Development ("V") (Total Area : ~~42.81~~ ***43.71*** ha~~.~~)

9.~~2~~***3***.1 The planning intention of this zone is to designate both existing recognized villages and areas of land considered suitable for village expansion. Land within this zone is primarily intended for development of Small Houses by indigenous villagers. It is also intended to concentrate village type development within this zone for a more orderly development pattern, efficient use of land and provision of infrastructures and services. Selected commercial and community uses serving the needs of the villagers and in support of the village development are always permitted on the ground floor of a New Territories Exempted House. Other commercial, community and recreational uses may be permitted ~~on application~~ ***under section 16 of the Ordinance*** to the Board.

9.~~2~~***3***.2 The boundaries of the "V" zones are drawn up having regard to the existing village "environs", outstanding ~~s~~***S***mall ~~h~~***H***ouse demands for the next ten years, topography and site constraints. Areas of difficult terrain, dense vegetation, stream courses and burial grounds had been avoided. Village expansion areas and other infrastructural improvements will be guided by detailed layout plans whenever applicable.

9.~~2~~***3***.3 Pok Wai is the only recognized village in the Area. It is located at the north-eastern part of the Area along the western side of the San Tin Highway. An area to the north-east of Shan Pui is also zoned "V" to cater for village expansion for the villages of Shan Pui and in Yuen Long Kau Hui area.

9.3.4 As filling of land/pond and excavation of land may cause adverse drainage impacts on the adjacent areas and adverse impacts on the environment, permission from the Board is required for such activities.

9.~~3~~***4*** Industrial (Group D) ("I(D)") (Total Area : 3.53 ha.)

9.~~3~~***4***.1 The planning intention of this zone is primarily to provide land for

industrial uses that cannot be accommodated in conventional flatted factories due to extensive land and/or high ceiling requirements. It is also intended for the redevelopment of existing informal industrial uses, which are operated in workshop premises in rural area, to properly design permanent industrial buildings.

9.~~3~~***4***.2 New industrial developments are encouraged to be constructed in permanent materials. Each establishment shall be provided with water supply and connections for sewage disposal. To avoid pollution, new sites shall be connected to a Government reticulatory sewer system or contain satisfactory on-site sewage treatment facilities. New industrial developments should demonstrate that the nature of their operations could not be accommodated in conventional flatted factory accommodation. Developments are restricted to a maximum plot ratio of 1.6, a maximum site coverage of 80% and a maximum building height of 13m. ~~To provide flexibility for innovative design adapted to the characteristics of particular sites, minor~~ ***Minor*** relaxation of the plot ratio, site coverage and building height restrictions stated above may be considered by the Board ***on application under section 16 of the Ordinance*** ~~through the planning permission system~~. Each ~~proposal~~***application*** will be considered on its ~~individual planning~~***own*** merits.

9.~~3~~***4***.3 A soy factory at Castle Peak Road – Tam Mi Section to south-west of Mo Fan Heung is zoned "I(D)".

9.***4*** Open Storage ("OS") (Total Area : 5.43 ha~~.~~)

9.~~4~~***5***.1 The planning intention of this zone is primarily to provide land for appropriate open storage uses and to regularize the already haphazard proliferation of open storage uses within this zone. This zoning also provides for the orderly development of land for open storage of goods which cannot be accommodated in conventional godown premises.

9.~~4~~***5***.2 Specified open storage uses such as container storage, vehicles stripping/breaking yard, and storage of dangerous goods which may cause environmental nuisance, safety hazards or transport problems require permission from the Board. Development proposals for such purposes have to clearly demonstrate that they would have no adverse environmental, drainage, traffic and other impacts on the surroundings. Other storage uses (not elsewhere specified), such as storage of agricultural products, construction materials (except storage of cement/sand) and equipment, which would unlikely cause adverse environmental, drainage or transport problems, are always permitted.

9.~~4~~***5***.3 In order to meet the demand for open storage, an area located at the south-eastern part of the Area along the western side of San Tin Highway is zoned "OS". The area should be properly paved and landscaped to reduce the visual impact.

9.~~5~~***6*** Government, Institution or Community ("G/IC") (Total Area : 3.38ha~~.~~)

9.~~5~~***6***.1 ~~The planning intention of this zone is to provide sites~~ ***This zone is intended primarily*** for the provision of Government, institution or community (GIC) facilities serving the needs of the local ***residents*** ~~as well as district population~~ ***and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, and other institutional establishments.*** ~~As detailed planning proceeds, other land may be designated from other uses to this category to meet the envisaged demands of the growing population in the Area.~~

9.~~5~~***6***.2 The Pok Oi Hospital and the church near Au Tau roundabout are zoned "G/IC". A site to the north-east of Tung Shing Lei is used for a gas offtake station. Another site to the east of the confluence of the Kam Tin River and the drainage channel is designated for the construction of a low flow pump.

9.~~6~~***7*** Open Space ("O") (Total Area : 8.75 ha~~.~~)

9.~~6~~***7***.1 The planning intention of this zone is to provide outdoor open-air public space for the development of active and passive recreational uses serving the local residents and the general public.

9.~~6~~***7***.2 Three sites to the west of San Tin Highway on both sides of the Kam Tin River are zoned "O". The intention is to provide recreation opportunities for the public and offer a buffer and easy access to the Kam Tin River.

9.~~7~~***8*** Other Specified Uses ("OU") (Total Area : 230.~~35~~***63*** ha~~.~~)

The sites zoned "OU" on the Plan include the following as annotated on the Plan:

"OU(Comprehensive Development and Wetland Enhancement Area)" "OU(CDWEA)") (Total Area : 151.30 ha~~.~~)

9.~~7~~***8***.1 Within the "OU(CDWEA)" zone, the ecological value of the existing continuous and contiguous fish ponds should be conserved and the "precautionary approach" and "no-net-loss in wetland" principle shall apply. According to the "precautionary approach", these existing continuous and contiguous fish ponds are to be protected and conserved in order to maintain the ecological integrity of the Deep Bay wetland ecosystem as a whole. "No-net-loss in wetland" can refer ***no*** ~~to both loss in area and function. No~~ decline in wetland or ecological functions served by the existing fish ponds ~~should occur~~.

9.~~7~~***8***.2 Having regard to the "precautionary approach" and "no-net-loss in wetland" principle, the planning intention of the "OU(CDWEA)" zone is to conserve and enhance the ecological value and functions of the existing fish ponds or wetland through consideration of application for development or redevelopment under a "private-public partnership approach". Under the "private-public partnership approach", the Board may, subject to the "no-net-loss in wetland" principle, allow limited low-density private residential or passive recreational development within this zone in exchange for committed long-term conservation and management of the remaining ponds or wetland within a development site. Development of this nature should involve minimum pond filling and no decline in the wetland function of the fish ponds within and near the development site. Any new development should be located to the southernmost portion of the zone and as far away from the ~~Mai Po Nature Reserve~~ ***MPNR*** and the Deep Bay and/or adjoining to existing developments in the area. Compensation for loss of wetland area and its ecological functions is required for any development involving pond filling.

9.~~7~~***8***.3 New development or redevelopment should be developed in a comprehensive manner and would require planning permission from the Board under section 16 of the Ordinance to ensure that such development or redevelopment would adhere to the "precautionary approach" and "no-net-loss in wetland" principle. An applicant should submit such a development or redevelopment proposal to the Board in the form of a comprehensive development scheme to include a layout plan with supporting documents, including an environmental impact study report which should include inter alia, an ~~ecological impact assessment~~***Ecological Impact Assessment*** (EcoIA) and a ~~visual impact assessment~~***Visual Impact Assessment (VIA)***; and traffic impact, drainage and sewerage impacts study reports as well as information on programming, phasing and implementation schedule of the development. The applicant should also submit a wetland conservation and enhancement scheme, including its detailed design, wetland buffer proposals to mitigate the potential impacts on the existing wetland, a maintenance and management plan with implementation details, arrangements of funding and monitoring programme to ensure the long-term management of the wetland. The EcoIA should demonstrate that such development or redevelopment proposal would not result in, or be able to fully compensate for, any loss of the total ecological function of the original fish ponds within this zone as well as the ponds nearby, and that the development or redevelopment impact can be fully mitigated through positive measures. The submission should also demonstrate that the development or redevelopment would not cause a net increase of pollution load into Deep Bay.

9.~~7~~***8***.4 Under this zoning, development shall not result in a total development or redevelopment intensity in excess of the maximum GFA specified below:

Zoning	Maximum GFA
OU(CDWEA1)	a domestic GFA of 306,581m^2, a non-domestic GFA of 13,000m^2 including a club house with GFA of 8,000m^2
OU(CDWEA2)	a total GFA of 52,840m^2 including a club house with GFA of 1,000m^2

Any new development should be located to the southernmost portion of the zone and as far away from the ~~Mai Po Nature Reserve~~***MPNR*** and the Deep Bay and/or adjoining to existing developments in the area.

9.~~7~~***8***.5 Any development or redevelopment within the "OU(CDWEA1)" zone on this Plan is required to be developed in a comprehensive and integrated manner with the whole of the "Site of Special Scientific Interest (1)" ("SSSI(1)") zone on the Mai Po and Fairview Park OZP. As mentioned in paragraph 9.~~7~~***8***.3 above, an applicant for development or redevelopment in the "OU(CDWEA1)" zone is required to submit a layout plan with supporting documents and wetland conservation and enhancement scheme which should provide details on the management and monitoring plan as well as implementation mechanisms for both the whole of the "OU(CDWEA1)" zone and the whole of the said "SSSI(1)" zone for the consideration of the Board under section 16 of the Ordinance.

9.~~7~~***8***.6 The "OU(CDWEA1)" zone on this Plan and the "SSSI(1)" zone on Mai Po and Fairview Park OZP are primarily to facilitate the proposed residential development at Nam Sang Wai with a nature reserve at Lut Chau, Mai Po granted by the Town Planning Appeal Board in 1994 and upheld by the Privy Council in 1996, taking into account the Town Planning Board Guidelines for "Application for Developments within Deep Bay Area". The proposed nature reserve at Lut Chau should form part of the above development at Nam Sang Wai.

9.~~7~~***8***.7 The area at Nam Sang Wai located to the north of Chung Hau Yu Man San Tsuen is zoned "OU(CDWEA1)". This area comprises fish ponds which form an integral part of the Deep Bay wetland ecosystem.

9.~~7~~***8***.8 The area at Tin Fook Wai is zoned "OU(CDWEA2)". This area comprises fish ponds which also form an integral part of the Deep Bay wetland ecosystem. The "OU(CDWEA2)" zone is to allow limited low-density private residential development in exchange for committed long-term conservation and management of the remaining ponds or wetland within this zone. As mentioned in paragraph 9.~~7~~***8***.3 above, an applicant for development or redevelopment in the "OU(CDWEA2)" zone is required to submit a layout plan with supporting documents and wetland conservation and enhancement scheme which should provide details on the management and monitoring plan as well as implementation mechanisms for the remaining ponds or wetland within this zone.

9.~~7~~***8***.9 Filling of land/pond and excavation of land may cause adverse drainage impacts on the adjacent areas and adverse impacts on the natural environment. In view of the conservation value of the area within this zone, permission from the Board is required for such activities.

"OU(Comprehensive Development to include Wetland Restoration Area)" ("OU(CDWRA)") (Total Area : 78.44 ha~~.~~)

9.~~7~~***8***.10 The planning intention of this zone is to provide incentive for the restoration of degraded wetlands adjoining existing fish ponds, and to encourage the phasing out of sporadic open storage and port back-up uses on degraded wetland. This can be achieved through comprehensive residential and/or recreational development to include wetland restoration area. Development or redevelopment schemes on the degraded wetlands directly adjoining areas of the existing continuous and contiguous fish ponds should include wetland restoration and buffer proposals to separate the development from and minimize its impact on the fish pond areas. Any new building should be located farthest away from Deep Bay.

9.~~7~~***8***.11 To ensure that development or redevelopment which requires planning permission would be developed in a comprehensive manner, an applicant should submit to the Board a development or redevelopment proposal in the form of a comprehensive development scheme to include a layout plan with supporting documents, including an environmental impact study report which should include, inter alia, an EcoIA and a ***VIA***~~visual impact assessment~~; and traffic impact, drainage and sewerage impacts study reports as well as information on programming, phasing and implementation schedule of the development. The applicant should also submit a wetland restoration and/or creation scheme, including its detailed design, wetland buffer proposals to mitigate the potential impact on the nearby existing wetland, a maintenance and management plan with implementation details, arrangement of funding and monitoring programme to ensure the long-term management of the restored wetland. The EcoIA should demonstrate that any negative ecological impacts on the area can be fully mitigated through positive measures. The submission should demonstrate that the development or redevelopment would not cause a net increase of pollution load into Deep Bay.

9.~~7~~***8***.12 To be in line with the rural setting which is mainly low-rise residential developments and village houses, to minimize visual impact and to take into account the capacities of local road network and infrastructure in this area, development or redevelopment shall not result in a total development or redevelopment intensity in excess of a total plot ratio of 0.4 and a maximum building height of 6 storeys including car park. ~~To provide flexibility for innovative design adapted to the characteristics of particular sites, minor relaxation of the plot ratio and building height restrictions stated above may be~~

~~considered by the Board through the planning permission system. Each proposal will be considered on its individual planning merits. Full justifications and illustration materials should be provided to the Board for consideration.~~

9.~~7~~***8***.13 It is recognized that the degraded wetlands within the zone may not be developed as a whole and the objectives of comprehensive development to include wetland restoration may take time to materialize. To provide flexibility in the planning application system, certain uses or developments, which are small-scale and have insignificant environmental impacts, may be permitted as interim development on an individual basis on application to the Board. Application for such uses and/or developments may be exempted from the requirement of the provision of wetland restoration proposal and the submission of layout plan.

9.~~7~~***8***.14 Within the "OU(CDWRA)" zone, while open storage and port back-up uses that existed immediately before the first publication in the Gazette of the notice of the Nam Sang Wai IDPA Plan and those with planning permission from the Board are tolerated, new temporary open storage and port back-up uses would not be allowed by the Board.

9.~~7~~***8***.15 The areas near Tai Sang Wai, Man Yuen Chuen, Wing Kei Tsuen and the area north of the Shan Pui Road are zoned "OU(CDWRA)". These areas comprise scattered ponds, formed land and fish ponds, some of which were filled prior to the publication of the Nam Sang Wai IDPA Plan. They are currently occupied by a mix of uses including open storage uses, ***warehouses,*** repair workshops, container vehicle park and vacant land.

9.~~7~~***8***.16 For the "OU(CDWRA)" zone to the north of Shan Pui Road, any application for permission of use or development, except in paragraph (c) of the Notes, should be in the form of a layout plan covering the whole "OU(CDWRA)" zone. Apart from the requirement for wetland restoration, a stepped height concept with building height ranging from 6 to 3 storeys from the landward side to the waterfront should be adopted in the design of future development on the site.

9.8.17 A site, with a total area of about 6.84 ha, for private comprehensive residential development located at Wing Kei Tsuen is zoned "OU(CDWRA)1". Development within this sub-zone is subject to a maximum plot ratio of 1.55 and a maximum building height of 54mPD.

9.~~7.17~~***8.18*** Filling of land/pond and excavation of land may cause adverse drainage impacts on the adjacent areas and adverse impacts on the natural environment. In view of the conservation value of the area within this zone, permission from the Board is required for such activities.

"OU(Pumping Station)" (Total Area : ~~0.61~~***0.90*** ha~~.~~)

9.~~7.18~~***8.19*** This zone covers a stormwater pumping station and a sewage pumping station near Shan Pui Chung Hau Tsuen which are already in operation handling prevention of flooding and sewage disposal of the area including Yuen Long Kau Hui respectively. ***Another site at the western part of the LSPS development at Ho Chau Road is also designated for the provision of a sewage pumping station.***

9.~~8~~***9*** Undetermined ("U") (Total Area : 46.40 ha~~.~~)

9.~~8~~***9***.1 Three areas to the north of Pok Oi Hospital are zoned "U" as they are subject to impacts from the existing major roads like Castle Peak Road, Yuen Long Highway, Tsing Long Highway, ~~West Rail~~***Tuen Ma Line (TML)*** ~~as well as~~***and*** the Yuen Long Bypass Floodway (YLBF) ~~currently under construction~~. At present, these areas mainly consist of squatters and small stone houses ~~and~~**,** fish ponds***and rural workshops***. The areas are located in close proximity to the Yuen Long New Town and within a transitional location between the urban and rural areas. Development within the areas has to be comprehensively planned as piecemeal development or redevelopment would have the effect of degrading the environment and thus jeopardizing the long-term planning intention of the areas. ***According to the 2017 Policy Address, the "U" zone in Tung Shing Lei is one of the potential sites for public housing development in the short to medium term.*** ~~While~~***With*** the ***completion of*** ~~alignments of West Rail~~***TML*** and YLBF ~~have been fixed~~**,** the areas zoned "U" are subject to future land use review.

9.~~8~~***9***.2 Under the "U" zone, any private developments or redevelopments require planning permission from the Board so as to ensure that the environment would not be adversely affected and that infrastructure, GIC facilities, open space are adequately provided. The proposed development should also take into account the ~~West Rail~~***TML*** and the YLBF. To realize a built-form which represents a transition from the Yuen Long New Town to the rural area, the development intensity should take into account the urban type developments immediately to the west of the "U" zone and the rural characteristics of the area to its north.

9.~~9~~***10*** Green Belt ("GB") (Total Area : ~~6.05~~***7.47*** ha~~.~~)

9.~~9~~***10***.1 The planning intention of this zone is primarily to define the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. The "GB" zone may include foothills, lower hill slopes, spurs, isolated knolls, woodland or vegetated land which occur at the urban fringe. There is a general presumption against development within the "GB" zone. However, limited developments may be permitted with or

without conditions on application to the Board, and each application will be considered on its individual merits taking into account the relevant Town Planning Board Guidelines.

9.~~9~~***10***.2 An area which is a burial ground located near Au Tau and ***a knoll to the north of the LSPS development at Ho Chau Road*** ~~is~~***are*** zoned "GB". As filling and excavation of land may cause adverse drainage impacts on the adjacent areas and adverse impacts on the ~~natural~~ environment, permission from the Board is required for such activity.

9.~~10~~***11*** Conservation Area ("CA") (Total Area : 121.52 ha~~.~~)

9.~~10~~***11***.1 The planning intention of this zone is to conserve the ecological value of the wetland and fish ponds which form an integral part of the wetland ecosystem in the Deep Bay Area and function as a substantial source of food supply for birds and as an important habitat for roosting and foraging of waterbirds. The "no-net-loss in wetland" principle is adopted for any change in use within this zone. "No-net-loss in wetland" can refer to ~~both loss in area and function. No~~ ***no*** decline in wetland or ecological functions served by the existing fish ponds ~~should occur~~. Fragmentation of continuous and contiguous fishpond habitats within the "CA" zone should be avoided.

9.~~10~~***11***.2 The existing fish pond culture within this zone should be maintained and its continuous operation is encouraged. Conservation management activities which will enhance the overall Deep Bay wetland ecosystem are also promoted. The primary intention of this zone is to discourage new development unless it is required to support the conservation of the ecological integrity of the wetland ecosystem or the development is an essential infrastructural project with overriding public interest. Alternative beneficial uses to fish ponds such as nature reserve or wetland habitat are permitted as of right within the zone. For those developments which may be permitted on application to the Board, such application should be supported by an EcoIA and a management plan to demonstrate that the development would not result in any net loss in wetland function and negative disturbance impact. Such development should also be compatible with the conservation objectives of the wetland in the Deep Bay Area and should be appropriate as well as be able to enhance the visual and landscape quality of the area. Wetland compensation is required for any development involving pond filling and mitigation measures against any disturbance would be necessary. Certain uses/facilities that are of small scale or necessary to serve the local needs may also be considered on application to the Board.

9.~~10~~***11***.3 The area in the northern part of the Area is zoned "CA" to protect the existing wetland in the vicinity of the Mai Po Nature Reserve. The land covered by this "CA" zone is largely Government owned and is predominantly fish ponds. Similarly, an area stretching from Chung Hau Yu Man San Tsuen eastwards to Nam Sang Wai Road comprising mangroves and fish ponds is also zoned "CA".

9.~~10~~***11***.4 Filling of land/pond and excavation of land may cause adverse drainage impacts on the adjacent areas and adverse impacts on the natural environment. In view of the conservation value of the area within this zone, permission from the Board is required for such activities.

9.12 For the zone(s) where minor relaxation of relevant restriction(s) is applicable, based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/building height/GFA restrictions as stated in the relevant paragraph(s) above may be considered by the Board on application under section 16 of the Ordinance. Each application will be considered on its own merits.

10. TRANSPORT AND COMMUNICATION

10.1 Road Network

10.1.1 ***San Tin Highway, as part of Route 9 (i.e. New Territories Circular Route), is an expressway connecting the Area to various districts in New Territories, such as Yuen Long and Lok Ma Chau. Yuen Long Highway and*** Tsing Long Highway ~~is a~~ ***are*** main trunk road***s, with the former one connects to Tin Shui Wai and Tuen Mun Areas, and the latter one*** running through the south-eastern part of the Area and connects NWNT with the urban area.

10.1.2 ~~Apart from Tsing Long Highway, the~~***The*** Area is ***also*** accessed by ~~San Tin Highway,~~ Castle Peak Road and Fairview Park Boulevard. The inland part of the Area is ~~now~~***largely*** not accessible by vehicles. However, as part of the Kam Tin and Yuen Long Main Drainage Channels Project, a 6.75m-wide Nam Sang Wai Road has been built from San Tin Highway north-westward up to Tin Fook Wai along the Kam Tin River. This road and the 3.5m wide Pok Wai South Road which is on the eastern side of the channel are maintenance roads open to public at all times.

10.2 Railway

The ~~West Rail~~ ***Tuen Ma Line*** provides a ~~sub-regional~~ passenger link connecting the NWNT to the urban areas ***and the Shatin/Ma On Shan areas***. ~~It provides a passenger line from Nam Cheong in West Kowloon to Tuen Mun via Mei Foo, Tsuen Wan West, Kam Sheung Road, Yuen Long, Long Ping, Tin Shui Wai and Siu Hong.~~ ***Besides, the proposed Northern Link Main Line will run to the east of the Area with intermediate stations at Au Tau, and Ngau Tam Mei and San Tin. The railway is planned to provide interchange service with the existing Tuen Ma Line and East Rail Line at Kam Sheung Road Station and Kwu Tung Station respectively connecting to the metro areas of Hong Kong.***

10.3 Public Transport

For public transport, the Area is well served by buses and public light buses which run along Castle Peak Road and San Tin Highway.

11. UTILITY SERVICES

11.1 Water Supply

The capacity of the existing water treatment works available in the NWNT has already been fully committed. Further treatment works capacity, if required, will be made available from the future extension to Ngau Tam Mei Water Treatment Works.

11.2 Sewerage Facilities

11.2.1 At present, ***only part of the Area is served by*** ~~there is no~~ public sewer ~~serving the Area~~. Private residential developments in ***the unsewered part of*** the Area must contain suitable and satisfactory on-site sewage treatment facilities and be connected to a public sewer once it is in place.

11.2.2 ~~According to the implementation programme of the Yuen Long and Kam Tin Sewerage Master Plan, the work package for Ngau Tau Mei/San Tin Trunk Sewage Phase 2~~ ***The Nam Sang Wai sewage pumping station and Sha Po sewage pumping station*** to serve the Area ~~is under review~~***are in operation***. Private residential developments in ***the unsewered part of*** the Area must contain suitable and satisfactory on-site sewage treatment facilities to achieve the requirements of "no-net-increase in pollution load to Deep Bay" and make connections to a public sewer once it is in place.

11.3 Electricity

The Area has long been supplied with electricity. The electricity supply is reinforced by the 132 kV network.

11.4 Gas

Gas pipes have already been laid from Tai Po to Yuen Long along San Tin Highway.

12. CULTURAL HERITAGE

Within the boundary of the Area, there are a number of graded historic buildings. On 19 March 2009, the Antiquities Advisory Board (AAB) released the list of 1,444 buildings, and accorded grading to some buildings/structures. The AAB also released a number of new items pending grading assessment by the AAB. Details of the list of 1,444 buildings and the new items for grading assessment have been uploaded onto the official website of the AAB at

http://www.aab.gov.hk**. The list of graded buildings will be updated from time to time. Prior consultation with the Antiquities and Monuments Office (AMO) of Development Bureau should be made if any works, development, redevelopment or rezoning proposals may affect the declared monuments, proposed monuments, historic buildings and sites graded by AAB, Government historic sites identified by AMO, as well as any other buildings/structures identified with heritage value, both at grade and underground, and their immediate environs. Information of the declared monuments, proposed monuments, historic buildings and sites graded by the AAB and Government historic sites identified by AMO are available on the website of AMO.

12***3***. IMPLEMENTATION

12***3***.1 The Plan provides a broad land-use framework for development control and implementation of planning proposals. More detailed plans will be prepared as a basis for public works planning and private developments.

12***3***.2 At present there is no overall programme for the provision of infrastructure within the Area. The implementation process will be gradual and may stretch over a long period depending on the availability of resources. It will be undertaken through the participation of both the public and private sectors.

12***3***.3 The provision ***and improvement*** of infrastructure, e.g. road widening and laying of services, will be implemented through the Public Works Programme and the Rural Public Works as and when resources are available. Private developments will be effected principally through private sector initiatives to develop or redevelop their properties in accordance with the zoned use indicated on the Plan, provided that their proposals meet Government requirements.

13***4***. PLANNING CONTROL

13***4***.1 The types of permitted developments and uses within the Area are listed in the Notes to the Plan. Unless otherwise specified, all building, engineering and other operations incidental to and all uses directly related and ancillary to the permitted developments and uses within the same zone are always permitted and no separate permission is required.

13***4***.2 Uses of land or building which were in existence immediately before the first publication in the Gazette of the notice of the IDPA plan and which are not in compliance with the terms of the Plan may have adverse impact on the environment, drainage and traffic of the area. Although no action is required to make such use conform to this Plan, any material change of such use or any other development (except minor alteration and/or modification to the development of the land or building in respect of such use which is always permitted) must be always permitted in terms of the Plan or, if permission is required, in accordance with a permission granted by the Board. The Board will consider these applications on their individual merits. Those alteration and/or modification works which may lead to an environmental improvement or

upgrading to the Area may be considered favourably by the Board.

1~~3~~***4***.3 Planning applications to the Board will be assessed on individual merits. In general, the Board, in considering the planning applications, will take into account all relevant planning considerations which may include departmental outline development plans and layout plans, and guidelines published by the Board. The outline development plans and layout plans are available for public inspection at the Planning Department. Guidelines published by the Board are available from the Board's website, the Secretariat of the Board and the Technical Services Division of the Planning Department. Application forms and Guidance Notes for planning applications can be downloaded from the Board's website and are available from the Secretariat of the Board, the Technical Services Division and relevant District Planning Offices of the Planning Department. Applications should be supported by such materials as the Board thinks appropriate to enable it to consider the applications.

1~~3~~***4***.4 Any development, other than those referred to in paragraph 1~~3~~***4***.1 above or in conformity with this Plan or with the permission of the Board, undertaken or continued on or after 17 August 1990 on land included in a plan of the Nam Sang Wai IDPA may be subject to enforcement proceedings under the Ordinance. Any filling of land/pond and excavation of land in the relevant zones on or after the exhibition of the specific plan referred to in the Notes of the relevant zones without the permission from the Board may also be subject to enforcement proceedings.

TOWN PLANNING BOARD
~~OCTOBER 2006~~***XXX 2024***

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Yuen Long, the New Territories (Land Sharing Pilot Scheme Application No. LSPS/002)

Consolidated Report

May 2024

llewelyn davies
In association with

AECOM Asia Company Ltd.
ArchiPlus International (Hong Kong) Ltd.
Ecosystem Ltd.
Ove Arup & Partners Hong Kong Ltd.
Ramboll Hong Kong Ltd.
Urbis Ltd.

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1 Introduction

1.1 Purpose of Submission

1.1.1 This proposal was first submitted to the Land Sharing Office (LSO) of the Development Bureau (DevB) on 3 August 2021 with a view to ascertaining the technical feasibility for a proposed application for public housing and private housing development submitted under the Land Sharing Pilot Scheme (LSPS) (i.e. hereafter referred to as the Proposed Development / Proposed Scheme) at various lots in D.D. 115, Tung Shing Lei, Yuen Long, the New Territories (i.e. hereafter referred to as the Application Site (**Figure 1.1** refers). The Application Site is currently zoned "Residential (Group D)" ("R(D)") on the Approved Nam Sang Wai Outline Zoning Plan (OZP) No. S/YL-NSW/8 (**Figure 1.2** refers) and majority of this planned housing site was previously approved for a private residential development and the associated road works (Y/YL-NSW/4).

1.1.2 After the submission of the LSPS application, the Applicant has been proactively liaising with various concerned Government departments and LSO and submitted Further Information on 5 October 2021, 2 November 2021, 4 February 2022, 1 March 2022, 17 June 2022 and 5 September 2022 in response to the departmental comments received. Subsequently, the LSPS proposal was endorsed in principle by the Chief Executive-in-Council on 1 November 2022.

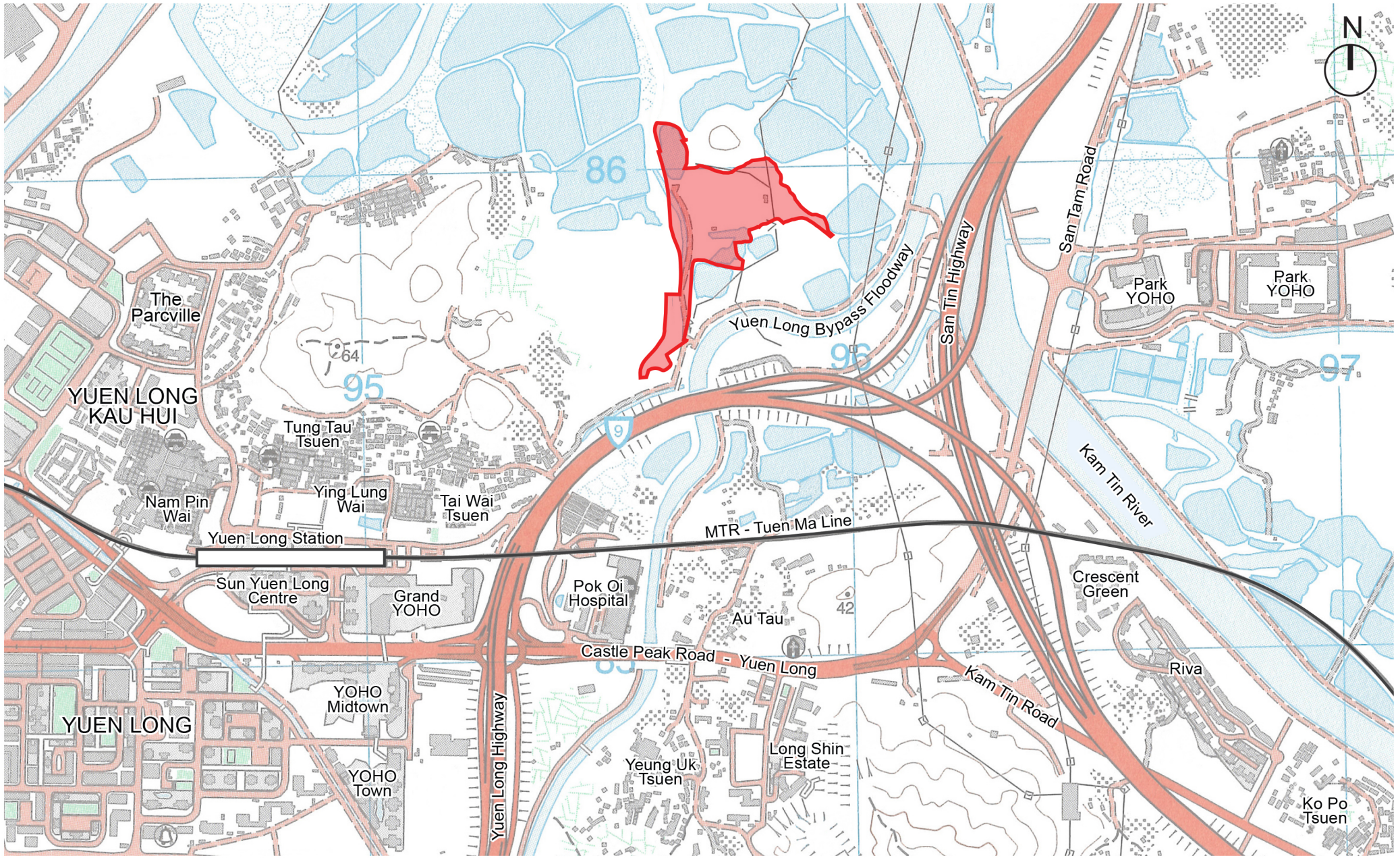
1.1.3 A consolidated report was submitted on 22 December 2023 to facilitate the statutory and land administration procedures referred to as "Stage 3" in paragraph 11 of the LSPS Guidance Note on Applications (GN). Further departmental comments were received in January and April 2024. This current revised consolidated report is submitted to depict the latest schematic design with corresponding updates on technical assessments.

1.2 Report Structure

1.3.1 This proposal includes the following sections:

Section 2: describes and analyses the Application Site, its surrounding context, and reports the land status of the Application Site;

Section 3 depicts the indicative development proposal to be submitted under LSPS;



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Title

Location Plan

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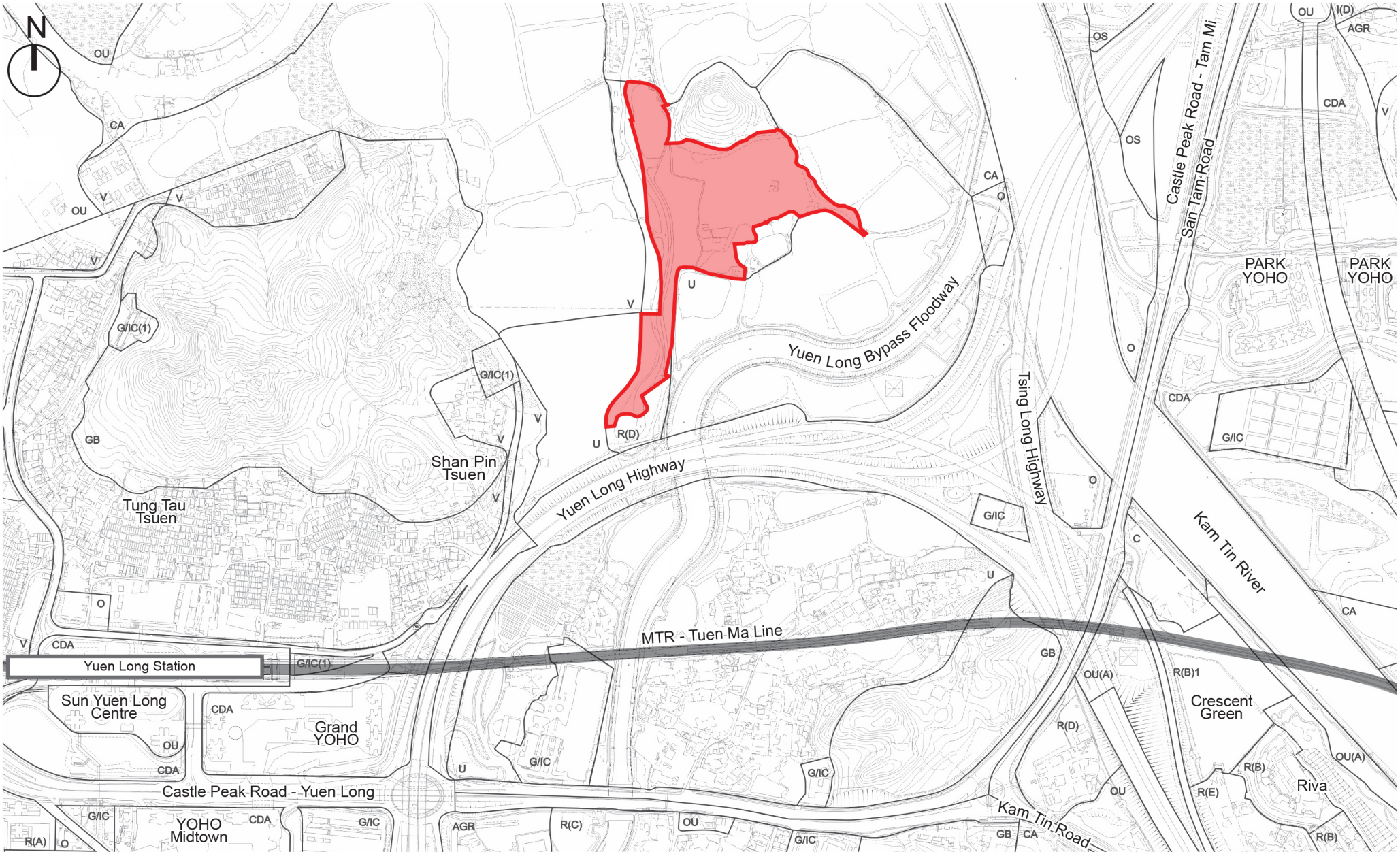

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Extract of Approved Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8

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Section 4: provides the key findings of various technical appraisals on ecological, visual, air ventilation, traffic, environmental and engineering aspects;

Section 5: highlights the justifications and merits for the Proposed Development; and

Section 6: concludes the proposal.

2 SITE AND SURROUNDING CONTEXTS

2.1 Site Location and Context

Site Location

2.1.1 The Application Site is situated only about 1km away from the West Rail Yuen Long Station to the northeast of Yuen Long Town Centre in the NWNT (**Figure 1.1** refers). It is an approved housing site located within the Wetland Buffer Area (WBA) as defined under Town Planning Board Guidelines No. 12C (TPB Guidelines No. 12C) "Application for Developments within Deep Bay Area" (**Figure 2.1** refers), which is less ecologically sensitive than Wetland Conservation Area (WCA).

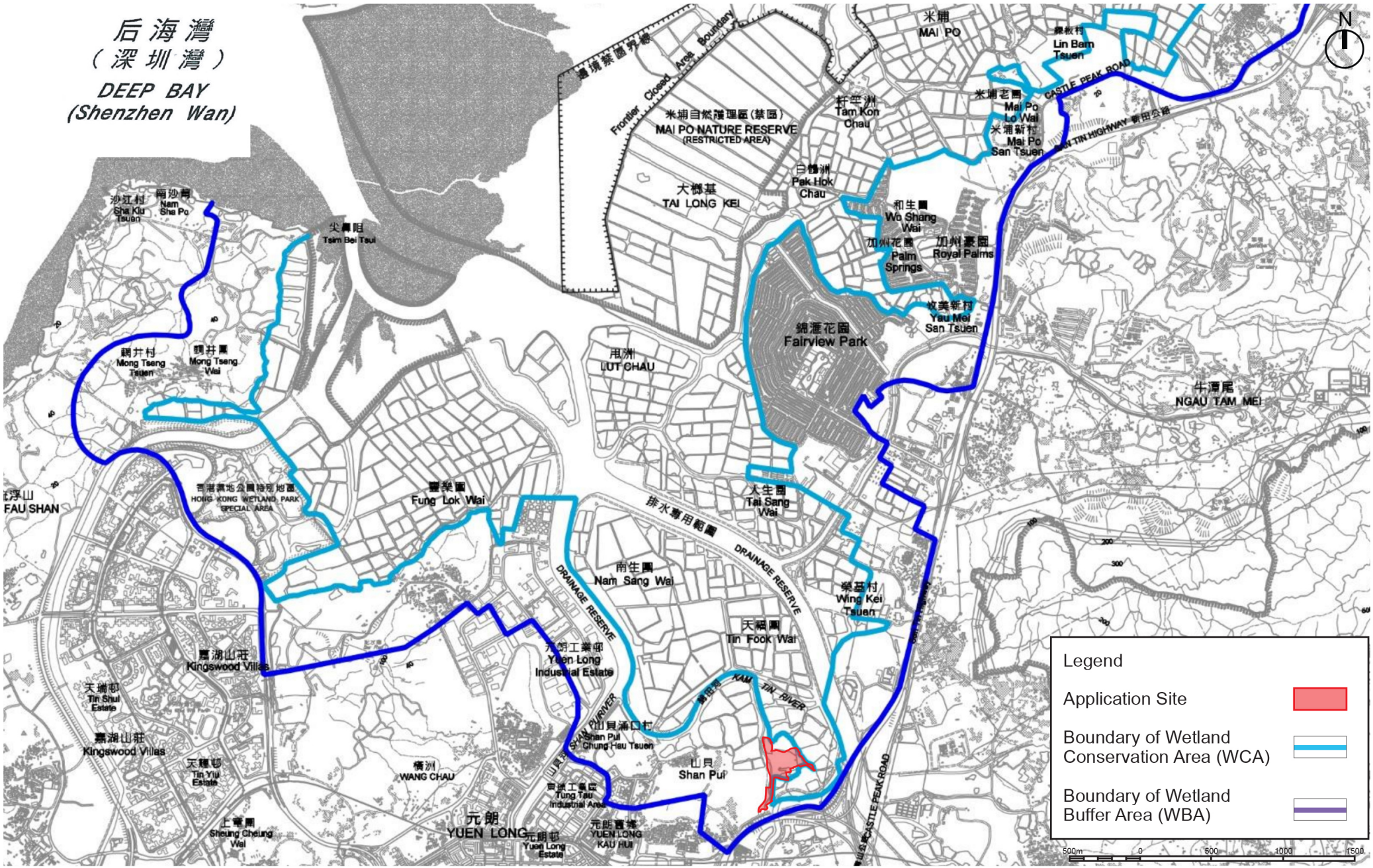
2.1.2 The nature of WBA is to buffer the negative disturbances of developments on the wetlands in the WCA, but not to prohibit development at all. With reference to the recent discussion in the Legislative Council[1], in view of the changing planning circumstances and social needs, the Government is reviewing the planning guidelines relating to the WBA with due regard to the needs for conservation and increase of housing land supply, including but not limited to increasing the maximum permissible plot ratio for residential developments.

2.1.3 Ho Chau Road, a local access road, links up the Application Site and the adjacent housing site with San Tin Highway, Castle Peak Road and Yuen Long Highway that in turn link up with other areas in the NWNT, as well as with the main urban areas via Route 3.

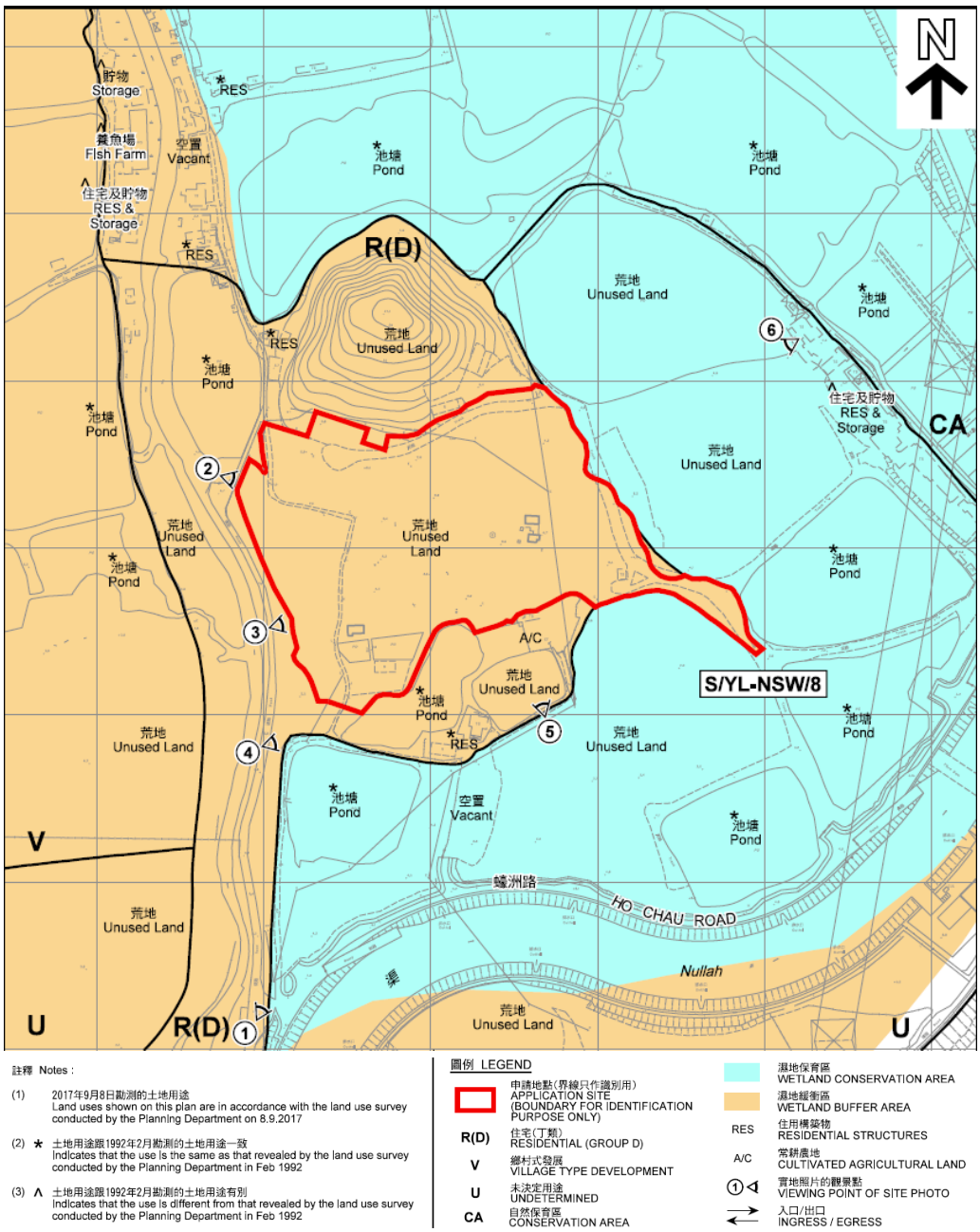
Site Context

2.1.4 Several geographical features of the Application Site are identified, namely (i) a tidal stream along the western edge of the site along the existing village track; and (ii) scattered ponds. With reference to the figure below extracted from the TPB paper of the Approved Scheme, as at September 2017, majority of the "R(D)" zone are unused land while only 2 scattered pond areas are located along the northern and southern edge of the Application Site with a total area of about 6,900m^2 (subject to detailed land survey).

[1] "LCQ8: Wetland Buffer Area" on 24.3.2021 - https://www.info.gov.hk/gia/general/202103/24/P2021032300585.htm



llewelyn davies	Title: Deep Bay Wetland Buffer Area (WBA) and Wetland Conservation Area (WCA) Boundaries (An Extract from Deep Bay Wetland Conservation and Buffer Areas Boundaries Plan No. SRNW-OT99/1)	Checked: DH; Drawn: PW; Rev: 0; Date: May 2024; Scale: N/A; Figure: 2.1	



Extract from Plan Z-2 of the TPB paper of Approved Scheme (Y/YL-NSW/4)

2.1.5 Existing medium-rise development such as Park Yoho, Riva and Crescent Green are located to the further east of the Application Site in the sub-urban area in Yuen Long, while a medium-rise development (A/YL-NSW/274) approved on 26 February 2021 is located to the immediate southwest of the site.

2.1.6 The Application Site is largely left vacant. Due to its close proximity to Yuen Long Highway, Yuen Long Bypass Floodway (YLBF) and some village settlements, the Application Site has been exposed to a relatively higher level of human disturbance for a long time already (**Figure 2.2** refers).



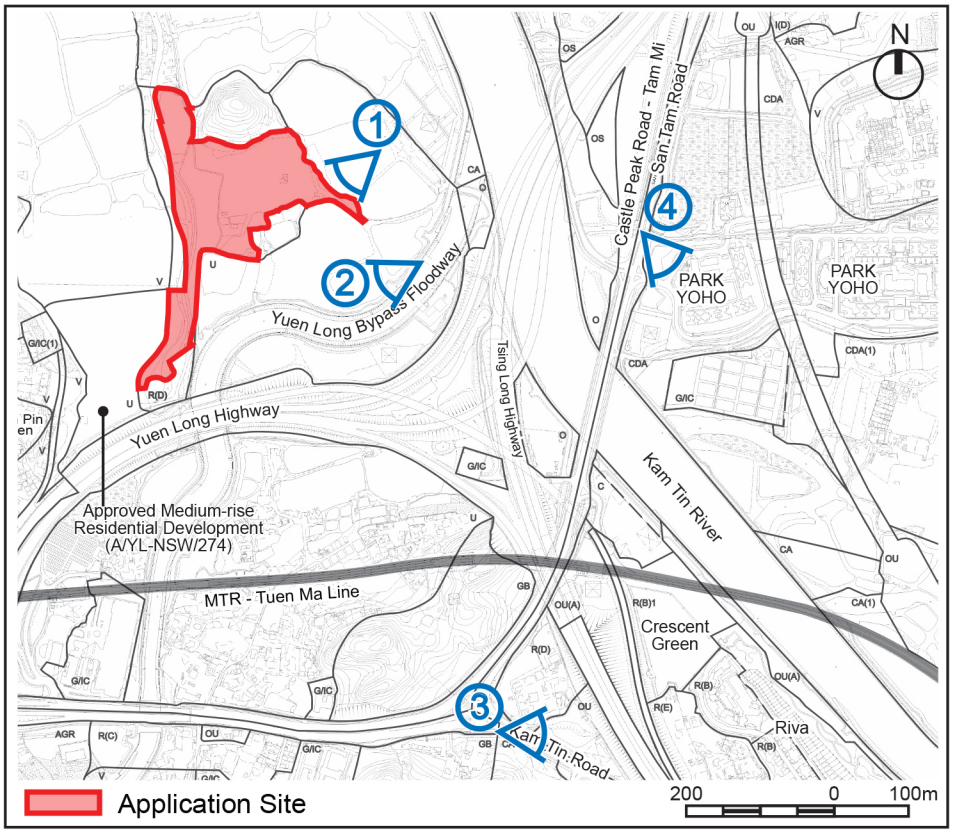
The Application Site is currently abandoned as derelict area



View from Ho Chau Road



Residential Developments (Crescent Green , Riva) along the Kam Tin Road





Residential Development (PARK YOHO) view from San Tam Road

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2.2 Surrounding Context

2.2.1 With its improved infrastructural capacity and accessibility, Yuen Long Town Centre as well as its sub-urban and fringe areas where the Application Site is located have been experiencing gradual transformation. Various existing and planned developments in the areas are listed below (**Figures 2.3 and 2.4** refer):-

- Near West Rail Yuen Long Station
  - To the southwest of the Application Site of just about 1km (equivalent to 13 minutes walking) is the West Rail Yuen Long Station which is clustered with high-rise and high-density residential developments namely Grand Yoho, West Rail Yuen Long Station Topside Development, Yoho Midtown, Yoho Town, etc. The maximum building height and PR of these developments could be up to 45 storeys (175.5mPD) and PR of 5.8 respectively.

- Suburban Area of Yuen Long
  - Extending northward and eastward from the West Rail Yuen Long Station is the sub-urban area of Yuen Long. A number of medium-rise residential developments with building height of about 16-29 storeys and PR of about 3 (e.g. The Parcville, One Regent Place and Long Shin Estate) are developed adjacent to some village settlements. To the northwest of West Rail Yuen Long Station of about 400m-600m are two medium-density residential developments – The Parcville and One Regent Place (both with PR of 3). To the southeast of the station right opposite to Yeung Uk Tsuen is the completed public housing namely Long Shin Estate (with PR of 3) with population intake in 2017.

  - An application for residential and community hub development (Application No. A/YL-NSW/274) situated in WBA to the immediate southwest of the Application Site was also recently approved by TPB in February 2021 with total PR of 2.29 and maximum building height of 19 storeys.

  - Two sites currently zoned “U” and “Green Belt” (“GB”) in Tung Shing Lei and Au Tau respectively have been identified for public housing purpose in the 2017 Policy Address as the “Some 25 Potential Housing Sites to be Made Available in Five Years”. The estimated land availability year of these projects are expected to be beyond 2024-2025 according to the latest public housing programme 2020-2021 to 2024-2025, as they are not listed within the said public housing development programme.

Legend

Application Site

Plot Ratio:

≥ 5.0

2.0 - 3.0

< 2.0

N

Approved Commercial Development: Y/YL-NSW/3

Planned Public Housing Development near Sha Po Tsuen and Mo Fan Heung

Approved Residential Development: A/YL-KTN/604

Approved Residential Development: A/YL-NSW/274

The Parcville

One Regent Place

Shan Pin Tsuen

Yuen Long Highway

Approved Residential Development: A/YL-KTN/663

Park Yoho

Park Yoho

Yuen Long Station Development

Yuen Long Station

Sun Yuen Long Centre

Grand Yoho

Castle Peak Road - Yuen Long

Yoho Midtown

Yoho Town

Tung Shing Lei

Potential Public Housing (Land Available Beyond 2024-25)

Long Shin Estate

Potential Public Housing (Land Available Beyond 2024-25)

Crescent Green

Riva

Kam Tin River

Approved Residential Development: A/YL-KTN/698

MTR - Tuen Ma Line

Ho Hok Shan

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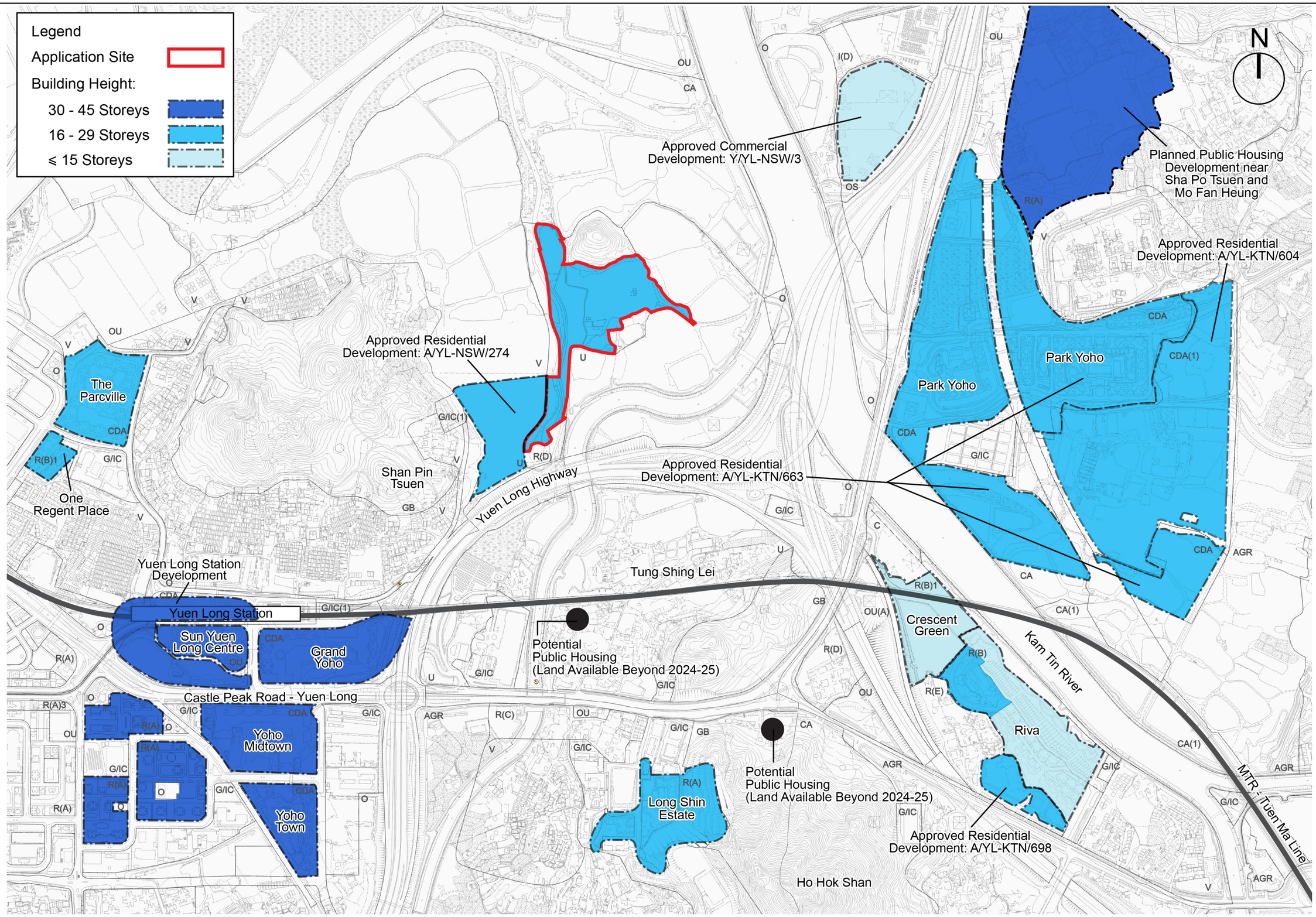

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- Fringe of Yuen Long Near Kam Tin
  - Further away from the West Rail Yuen Long Station to the northeast, east and southeast of the Application Site are some medium-rise developments. To the northeast of the Application Site across Kam Tin River is a site involved in another rezoning application. In 2016, TPB approved to rezone this site from "Open Storage" ("OS") to "Commercial" ("C") to facilitate a hotel development (Application No. Y/YL-NSW/3) with a PR of 1.5 and a building height of 8 storeys above a 2-storey podium.

  - Further to the east and southeast of the Application Site along the two banks of Kam Tin River is another cluster of medium-rise developments. A residential development namely Park Yoho within a "CDA" zone is under an approved Application No. A/YL-KTN/663 for a comprehensive residential and commercial development approved in May 2020, of which the Phase 1 Development with a PR of about 1.0 and a maximum building height of about 16 domestic storeys had been largely completed in 2017. To the immediate south of Park Yoho is a "CDA(1)" zone which has been recently approved for residential use with a maximum building height of 17 storeys and PR of about 1.2 (Application No. A/YL-KTN/604). Further to the south of Park Yoho across Kam Tin River are newly completed residential development called Riva (with a building height up to 23 storeys and a PR of about 1.0) and two planned residential developments – one within the "R(E)" zone under Application No. A/YL-KTN/698 approved by the Board in September 2020 with a maximum building height of 16 storeys and PR of 1.44, while another development namely Crescent Green within "R(B)1" zone with a maximum building height of 13 storeys and PR of 1.2.

  - A planned public housing site development with GIC provision is also located to the northern side of Park Yoho in Sha Po. According to RNTPC Paper No. 9/22, a development site area of about 11.8 ha. will be dedicated for the proposed public housing development with total maximum PR of 6.7 (including domestic PR 6.5 and non-domestic PR 0.2) and maximum building height of 185mPD, accommodating 16,300 units. The development intensity at fringe of Yuen Long at Kam Tin has been substantially increased.

2.2.2 The Application Site is an approved private residential site next to the existing road and immediately available for housing development. With its surrounding land use and planning context mentioned above, the Application Site is found to be situated in a medium-density development zone in the suburban area near the existing high-density Yuen Long Town and railway station (**Figures 2.3 and 2.4** refer). Obviously, the site is a logical extension of the Yuen Long Town and has a great potential to be better utilised for more housing supply.

2.3 Land holding

2.3.1 The Applicant has secured all private lots within the Application Site, ensuring that the implementation of the project would be carried out in a timely fashion. Subject to the approval of a new zoning and the relevant development parameters by the TPB, the site is readily set for the proposed medium-rise development. The Landholding Plan of the Application Site is shown in **Figure 2.5** and the Landholding Schedule is shown in **Table 2.1** below.

Table 2.1 Landholding Schedule within the Application Site

Land Lots	Site Area (about)
Private Lots under Applicant's Ownership	37,591m^2 (1) (67.6%)
Government Land	17,992m^2 (32.4%)
Total Area	55,583m^2 (100%)

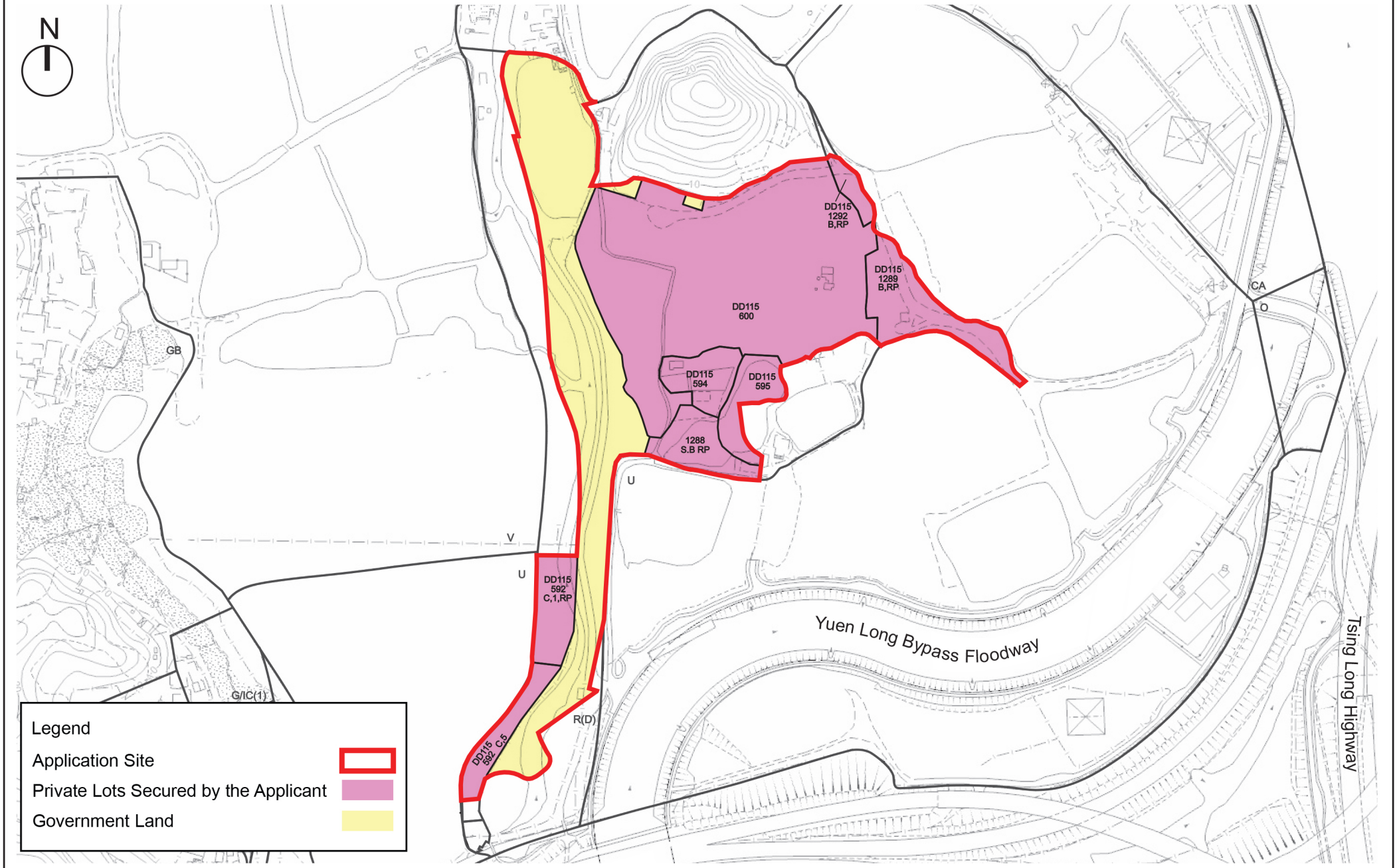
Remarks:
(1) Including area of about 603m^2 of private land to be designated for provision of public access road under the current scheme.

2.3.2 In fact, if excluding some constrained areas / existing topographical features (such as ponds) within the Application Site, the proportion of private lots that are more readily set for development would be even much higher. Please refer to **Table 2.2** below.

Table 2.2 Landholding Schedule within the Application Site (excluding constrained areas / existing topographical features)

Land Lots	Site Area (about)
Private Lots under Applicant's Ownership (1)	35,327m^2 (70.3%)
Government Land (2)	13,356m^2 (29.7%)
Total Area	48,683m^2 (100%)

Remarks:
(1) Exclude pond area of about 2,264m^2 within land under Applicant's ownership (subject to detailed land survey)
(2) Exclude pond area of about 4,636m^2 (subject to detailed land survey)



llewelyn davies

Title

Landholding Plan

Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale	N/A	Figure	2.5

3 THE PROPOSAL

3.1 Overall Parameters of the Proposal

3.1.1 An indicative scheme is prepared to ascertain the technical feasibility of the Proposed Development. The proposed site boundaries of respective portion are demarcated in **Figure 3.1** while the Indicative Block Plan, Floor Plans and Section Plans are attached in **Figures 3.2 to 3.7**. The calculation of development site area, increased domestic GFA and no. of units as per the technical notes of LSPS is in **Attachment A** of the current submission.



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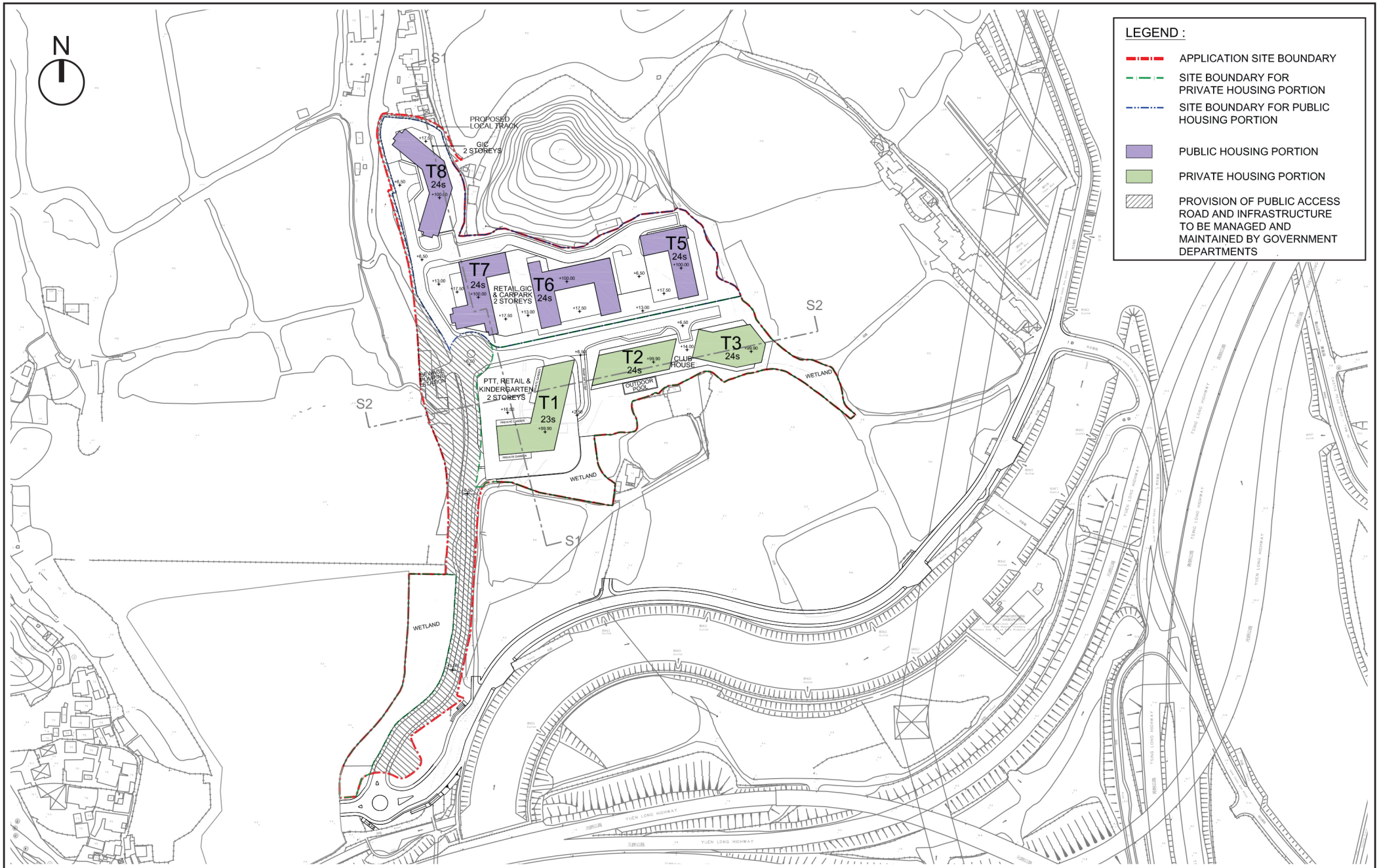
Site Demarcation Plan

Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale	N/A	Figure	3.1



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Title

Indicative Block Plan

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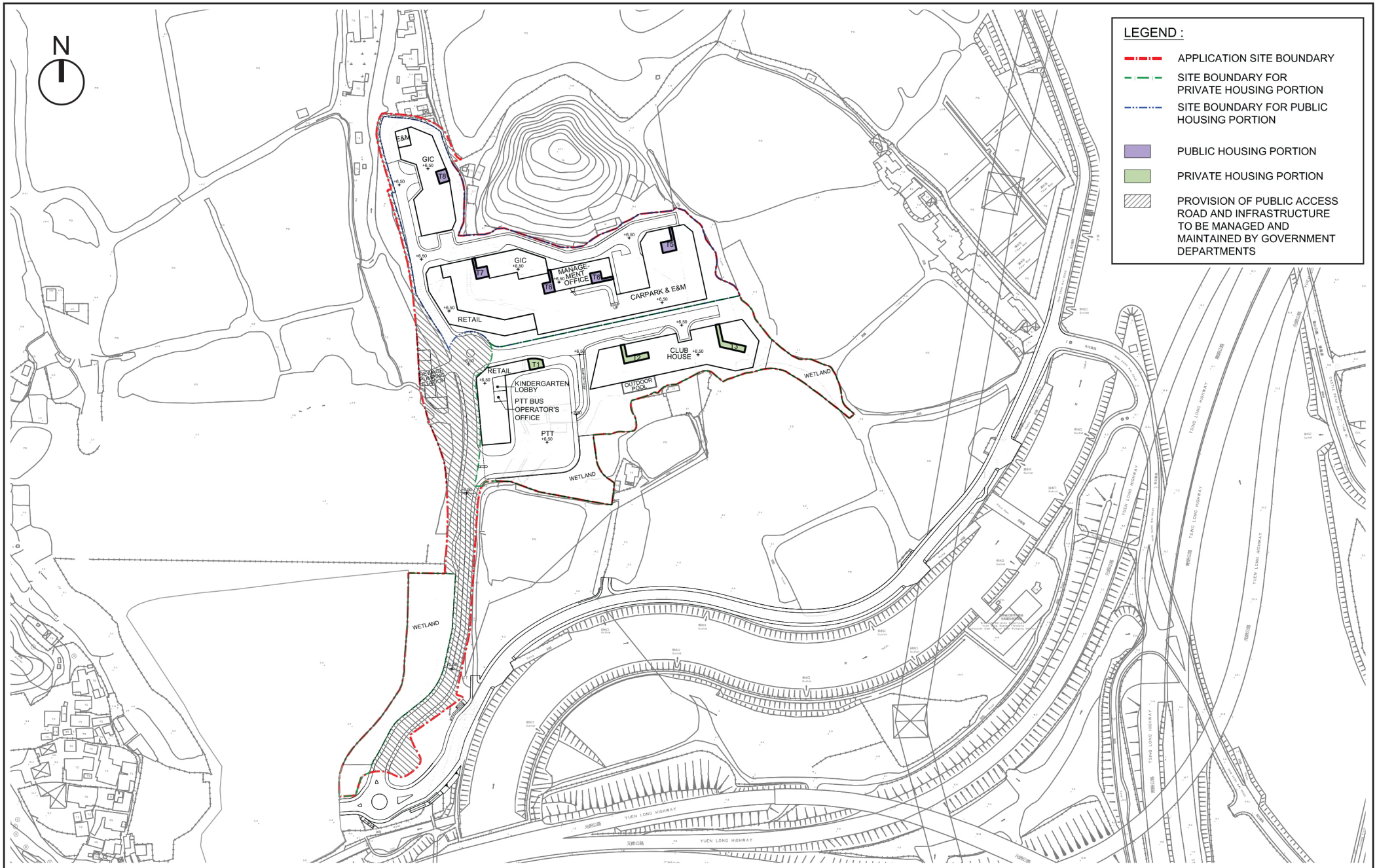
Rev	0	Date	May 2024
Scale	N/A	Figure	3.2



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Indicative Ground Floor Plan

Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale	N/A	Figure	3.3



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Title

Indicative First Floor Plan

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Rev	0	Date	May 2024
Scale	N/A	Figure	3.4

N



LEGEND :

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION

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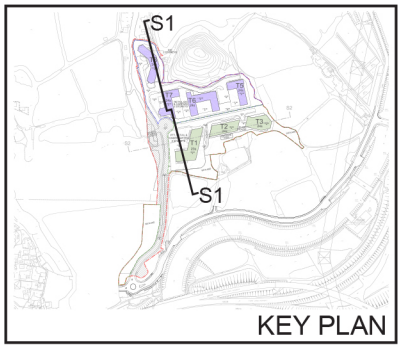
Title

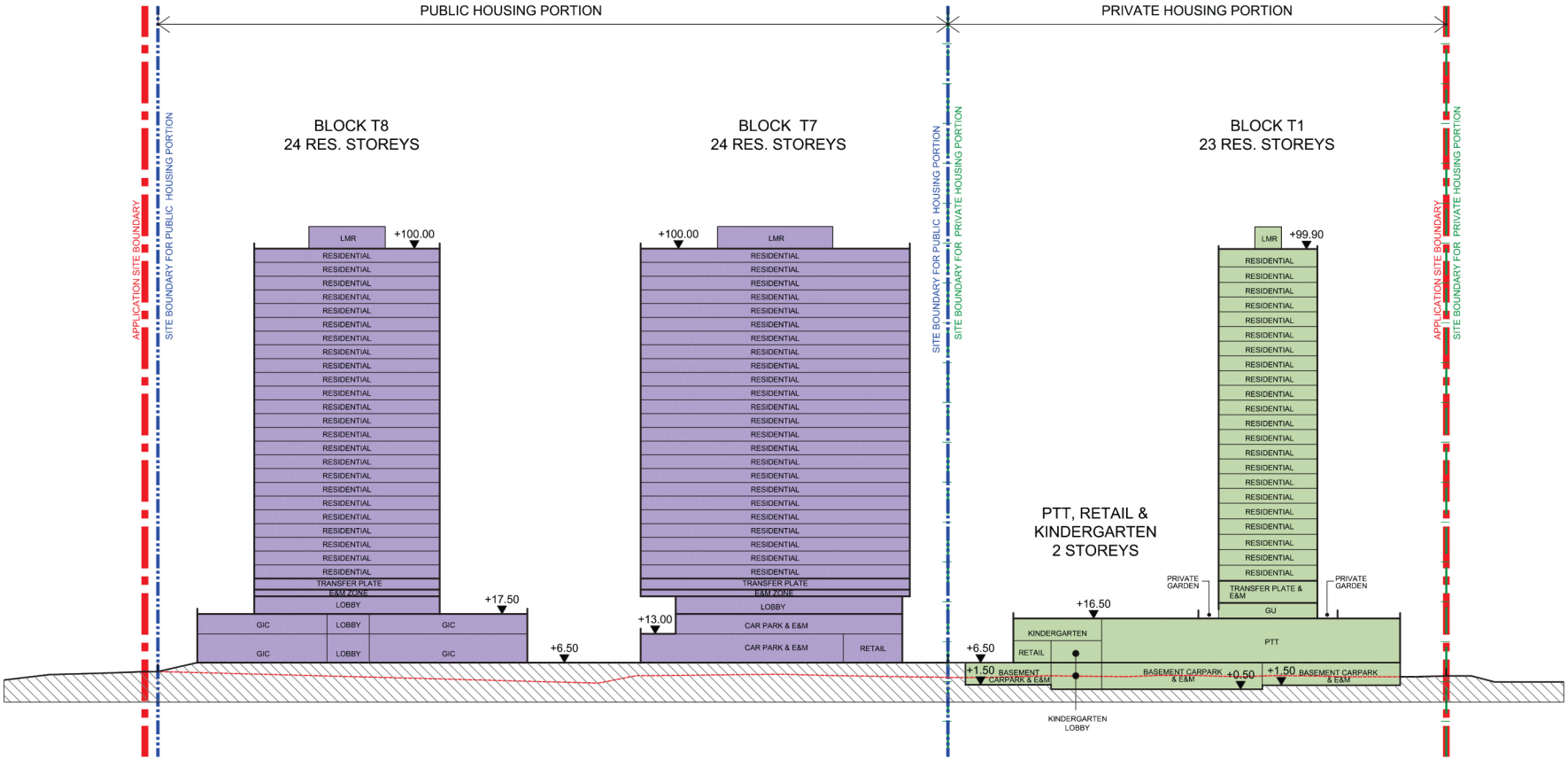
Indicative Basement Floor Plan

Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale	N/A	Figure	3.5



LEGEND

EXISTING SITE LEVEL



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Title

Indicative Section S1

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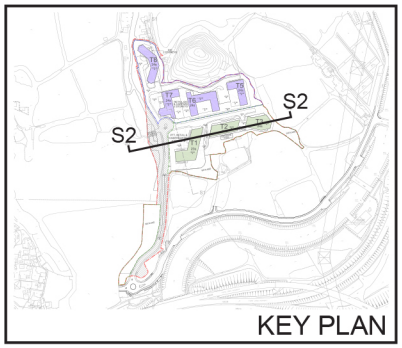
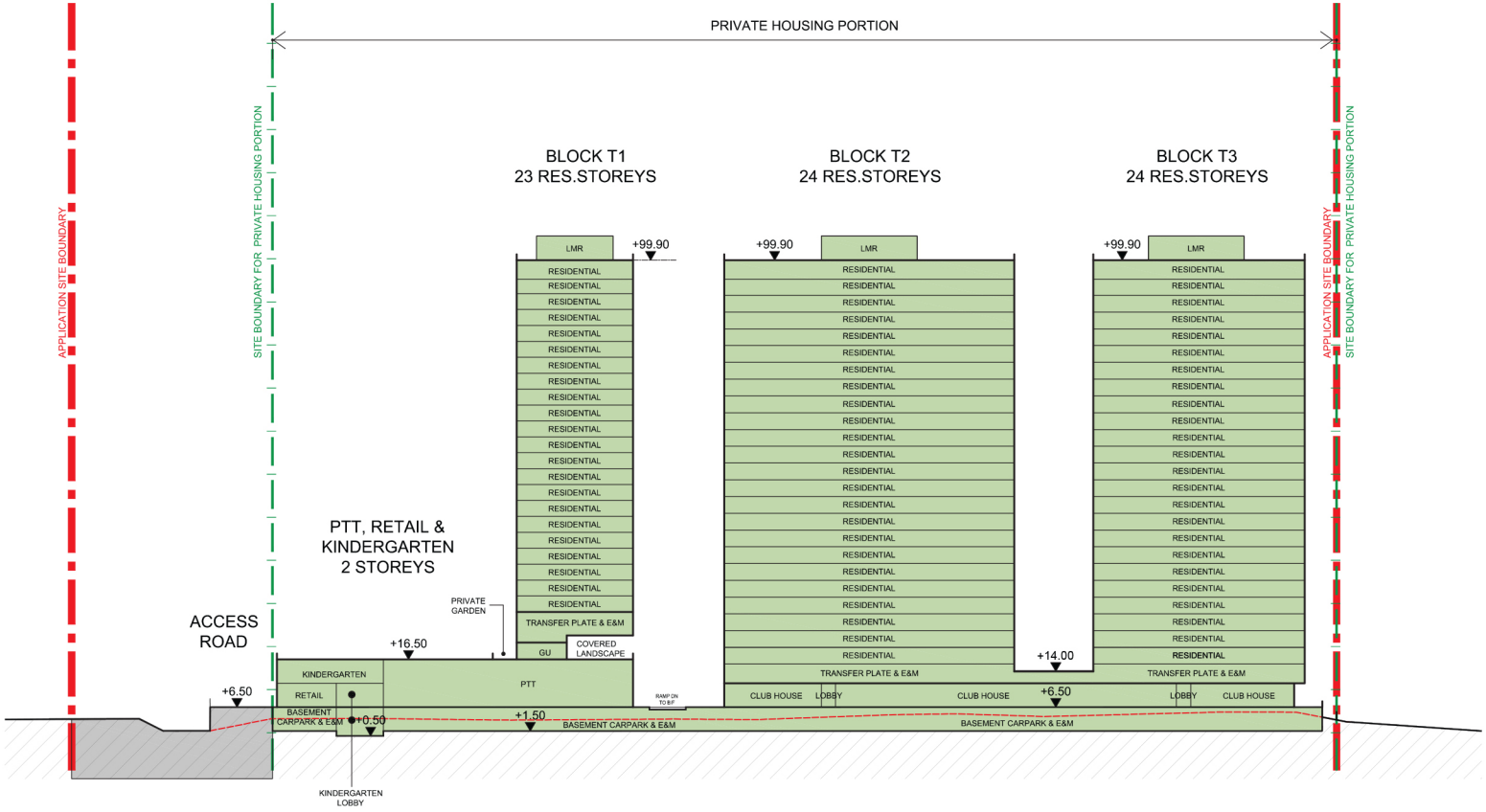
Rev	0	Date	May 2024
Scale	N/A	Figure	3.6



LEGEND

EXISTING SITE LEVEL



ARCHI+ ARCHIPLUS INTERNATIONAL LIMITED	Title: Indicative Section S2	Checked: DH	Drawn: PW
		Rev: 0	Date: May 2024
		Scale: N/A	Figure: 3.7

3.2 Public Housing Portion

3.2.1 The development schedule of the public housing portion is shown in **Table 3.1** below. The proposed design of public housing portion is notional and subject to detailed design by the Housing Authority.

Table 3.1– Development Schedule of Public Housing Portion

Development Schedule of Public Housing Portion	
Development Site Area	About 21,375m^2 ^
Total GFA - Domestic Portion - Non Domestic Portion	About 95,100m^2 - About 93,400m^2 (1) - About 1,700m^2 #
Equivalent Total PR - Domestic Portion - Non Domestic Portion	About 4.45 (2) - About 4.37 (2) - About 0.08 (2)
Domestic Portion	
Domestic GFA	About 93,400m^2
Maximum Building Height	Not more than 100mPD
No. of Residential Storeys	Not more than 24 storeys (3) *
No. of Residential Towers	4 * (Tower 5 – Tower 8)
No. of Units	1,868 units
Average Flat Size	About 50m^2 (4)
Anticipated Population	About 5,231 person (5)
Local Open Space	Not less than 5,231m^2 (6)
Non-Domestic Portion – Retail, Management Office, G/IC and Ancillary Car Parking Facilities	
Maximum Building Height	Not more than 17.5mPD *
No. of Storeys	Not more than 2 storeys *
Retail Facilities	
Retail GFA	About 1,200m^2
Management Office	
Management Office GFA	About 500m^2
G/IC Facilities (8)(9)	
G/IC GFA (7) <u>Social Welfare Facilities Requested by SWD:</u> - Neighbourhood Elderly Centre (NEC) - One team of Home Care Services (HCS) for Frail Elderly Persons (4-team size non-kitchen based)	About 4,670m^2

Ancillary Car Parking Facilities (7)	
Domestic & Retail Car Park GFA	About 12,980m^2
G/IC Car Park GFA	N/A (Open Carpark on Ground Floor)

Remarks:

(1) The actual domestic GFA shall be 93,400.3m^2 (i.e. 70% of the total increased GFA of current LSPS application). It is rounded to whole number as 93,400m^2 for reference.
(2) Based on the development site boundary of the public housing portion
(3) Excluding above ground car park, GIC, lobby and transfer plate floor
(4) Average flat size of 50m^2 formulated in accordance with Paper No. DEVB(PL-CR)1-55/127/1 – Legislative Council Brief Land Sharing Pilot Scheme
(5) Person per flat ratio of 2.8 adopted as per LSPS-TG 1
(6) Not less than 1m^2 per person
(7) GFA for both G/IC Facilities and Ancillary Car Parking Facilities are exempted from GFA and PR calculation.
(8) Area equivalent to about 5% of the total attainable domestic GFA of the public housing portion has been set aside for the provision of welfare facilities as per Policy Address 2020
(9) Including SWD's suggested Neighbourhood Elderly Centre (about 328m^2 of NOFA or about 722m^2 of GFA); One team of Home Care Services (HCS) for Frail Elderly Persons (4-team size non-kitchen based) (about 257m^2 of NOFA or about 565m^2 of GFA). The final GFA and layout will be subject to detailed design of the relevant government departments.

& Net site area of public housing portion will be subject to further study for site formation scheme

* For reference only, subject to future design

\# Social welfare facilities and aboveground carpark GFA are accountable under Building Ordinances and can be exempted from GFA and PR calculation under planning requirement

3.2.2 The residential towers of the public housing are located at the northern portion of the Application Site. With a maximum domestic PR of 4.37 and building height of 24 residential storeys, the Proposed Development can offer 1,868 public housing units.

3.2.3 With an aim to shorten construction period by simplifying the construction process and reduce disturbance and nuisance to the neighbourhood during construction, MiC provisions as advocated in JPN No.8 for the public housing portion have been reviewed as per the comments from the Housing Department (HD). The Indicative Typical Tower Internal Layout Plan showing the incorporation of modular flats with different flat types is attached in **Attachment B** for reference.

3.2.4 To cater for the need of the future residents, retail, G/IC (including a neighbourhood elderly centre (NEC) and one team of HCS for Frail Elderly Persons (4-team size non-kitchen based)) and carparking facilities are provided at the podium of the residential towers. The detailed design of the G/IC facilities would be subject to review by relevant Government departments upon the handover of the formed land of the public housing site. In particular, the provision of welfare facilities are equivalent to a 5% of the total attainable domestic GFA of the public housing portion that is to respond to the recent Government's policy direction in improving people's livelihood as stated in the 2020 Policy Address.

3.2.5 To address the comments from HD received on 21 December 2022 regarding the provision of 900m^2 IFA of retail floor space at public housing development, the retail GFA has been increased from 800m^2 to 1,200m^2 (based on conversion factor of 1.33). A Management Office with GFA of about 500m^2 is also incorporated at the ground floor of podium. To cater the carparking need of future residents in public housing development, sufficient bulk has been reserved based on a high-end car parking standard with buffer reserved to cater for 10% increase in flat production. The Indicative Ground Floor and First Floor Internal Layout Plans are provided in **Attachment B** of the current submission for reference.

3.3 Private Housing Portion

3.3.1 The development schedule of the private housing portion is shown in **Table 3.2** below.

Table 3.2 – Development Schedule of Private Housing Portion

Development Schedule of Private Housing Portion	
Development Site Area (1)	About 24,301m^2
Total GFA - Domestic Portion - Non Domestic Portion	About 52,424m^2 - About 50,179m^2 (2) - About 2,245m^2
Equivalent Total PR - Domestic Portion - Non Domestic Portion	About 2.16 (3) - About 2.06 (3) - About 0.09 (3)
Domestic Portion	
Domestic GFA (Total) - Approved / Permitted GFA - Increased GFA	About 50,179m^2 (2) - About 10,150m^2 - About 40,029m^2
Maximum Building Height	Not more than 99.9mPD
No. of Residential Storeys	Not more than 24 storeys (4)
No. of Residential Towers	3 (Tower 1 – Tower 3)
No. of Units	1,261 units
Average Flat Size	About 39.8m^2
Anticipated Population	About 3,153 person (5)
Private Open Space	Not less than 3,153m^2 (6)
Non-Domestic Portion – Retail, Kindergarten and Public Transport Terminus	
Maximum Building Height	Not more than 16.5mPD
Total No. of Storeys	Not more than 2 storeys
Retail and Kindergarten	
Commercial GFA - Retail - Kindergarten (7)	About 2,245m^2 - About 1,245m^2 - About 1,000m^2
Public Transport Terminus (including bus operator's office)	
Gross Floor Area (8)	About 4,675m^2
Clubhouse	
Gross Floor Area (9)	About 2,250m^2
Maximum Building Height	Not more than 14mPD
No. of Storeys (10)	1

Remarks:

(1) With the inclusion of compensation wetlands of about 6,900m^2 which is not suitable for housing development thereon, the remaining effective site area is about 17,401m^2

(2) The actual domestic GFA shall be 50,178.7m^2 (i.e. including approved domestic GFA of

10,150m^2 at the Application Site and 30% of the total increased GFA of current LSPS application of 40,028.7m^2). It is rounded to whole number as 50,179m^2 for reference.
(3) Based on the development site boundary of the private housing portion (24,301m^2).
(4) Excluding basement(s) for carpark / E&M / Clubhouse / transfer plate floor
(5) Adopting the same person per flat (i.e. 2.5) as per the approved Application No. A/YL-NSW/274.
(6) Not less than 1m^2 per person
(7) Provision of a 8-classroom private kindergarten to cater for the needs of the anticipated population generated from both private housing and public housing developments as per HKPSG requirement
(8) GFA for public transport terminus, as required by the Government, is disregarded from GFA and PR calculation
(9) About 4% of total domestic GFA or 2,250m^2 (whichever is greater); exempted from GFA calculation
(10) Excluding basement floor

Additional Remarks:
As requested by LSO, the table below summarizes the hypothetical parameters of the no. of units and the anticipated population if the average flat size of the private housing portion is assumed to be 50m^2. It should be noted that the table below is for reference only, as the proposed scheme prepared by the Applicant is based on a flat mix with an average flat size of about 39.8m^2 based on which various technical assessments have been conducted.

	Hypothetical Parameters
Average Flat Size	50m^2
No. of Units	1,004 units
Anticipated Population	About 2,510 person

3.3.2 The private housing portion consists of domestic portion and non-domestic portion, which is located at the southern portion and south-western edge of the Application Site respectively. The private housing portion, with a maximum domestic PR of 2.06 and a building height of not more than 24 residential storeys, can offer about 1,261 residential units. The non-domestic provision within the private housing portion includes the GFA exempted clubhouse located at the basement and ground floors of Tower 2 and Tower 3, a public transport terminus (as required by government), retail and kindergarten block along the western boundary of private housing portion accommodating retail facilities of 1,245m², a kindergarten of 1,000m² in GFA (also serving the population of both private and public housing developments) and a GFA exempted public transport terminus.

3.4 Access Road and Infrastructure Portion (Outside Public and Private Housing Portion)

3.4.1 The remaining portion, with an area of about 11,379m^2, of the Application Site would be dedicated for the access road connecting the Application Site with Ho Chau Road together with the extension of local track at the north of the Application Site to the proposed public access road, and sewage pumping station.

3.4.2 The access road would be a 7.3m-wide single 2-lane carriageway, with 2.5m-wide footpaths provided on each side of the carriageway. It would serve both the public housing portion and the private housing portion (including the proposed public transport terminus therein), and there would be separate private estate road / EVA linking up each of the public housing portion and the private housing portion with this access road. Besides, at the northern end of the access road, a local track will be provided outside of the public housing portion and be extended to connect with the existing local track further north for the use of existing villagers to the north of the Application Site. It is proposed that this access road together with the local track extension will be constructed by the Applicant and be handed over to the Government for future maintenance and management upon completion. There would be no land resumption required and no existing user affected. During the road construction stage, construction access to facilitate and expedite the public housing construction will be agreed with Government separately.

3.4.3 The existing ponds identified within the Application Site will be affected by the development project, involving a total pond area of about 6,900m^2. Under the current proposal, new ponds will be provided on the site at a compensation ratio of 1m^2 to 1m^2 as per the requirement stipulated under TPB PG-No. 12C to ensure no net loss in the wetland / pond area due to the Proposed Development. Based on the current indicative scheme, despite the fact that only about 33% of the existing pond area falls on private, the Applicant will provide 100% compensation wetland in terms of area within private housing portion (i.e. not less than 6,900m^2).

3.4.4 In regard to the future management and maintenance arrangement for the compensation wetlands within the private housing portion, reference will be made to similar examples in Hong Kong such as Park Yoho – a residential development located to the east of the Application Site across Kam Tin River – where a restored wetland habitat under private management and maintenance is provided. **Attachment C** shows the land status of existing and compensation wetlands within the Application Site, whereas the conceptual design of these compensation wetlands is enclosed in the Ecological Impact Assessment in **Appendix J** for reference.

3.5 Landscape Design and Tree Preservation

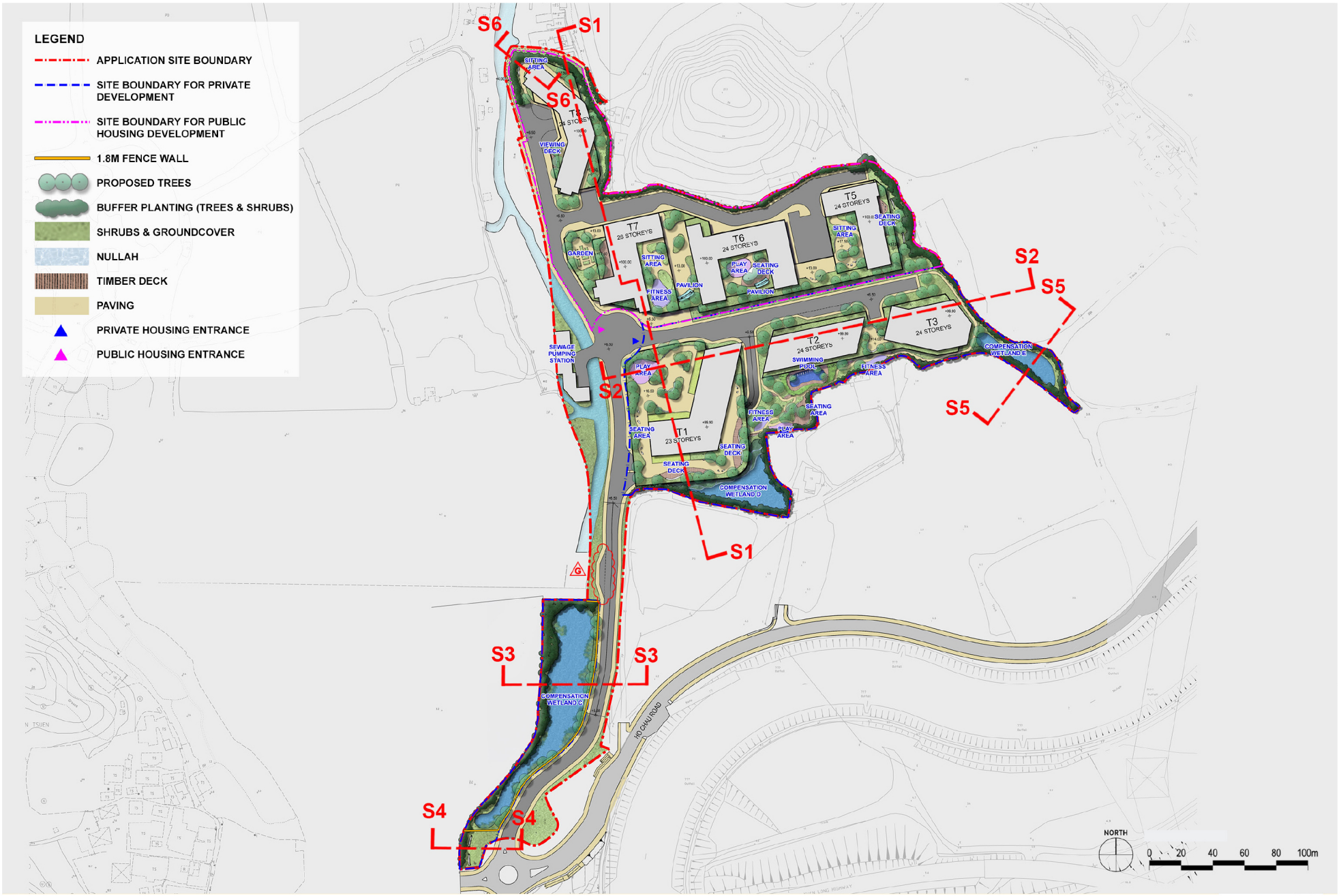
3.5.1 The Landscape Design and Tree Preservation Removal Proposal has been prepared to illustrate the proposed landscape design concept of the Proposed Development together with the tree preservation proposal. The details of the Landscape Design Proposal are enclosed in **Appendix A**, while **Figure 3.8** illustrates the Indicative Landscape Plan.

Tree Preservation Scheme

3.5.2 The tree survey carried out in August 2021 confirmed that there are 10 tree groups containing a total of approximately 153 nos. of existing trees within the Application Site boundary with mostly of poor form, poor to fair health and low amenity value. None of these trees are protected species listed under Forestry Regulations, Forests and Countryside Ordinance (Cap.96 sub. Leg.) or are an "Old and Valuable Tree" as defined in DEVB TC (W) No. 5/2020 "Registration of Old and Valuable Trees" or "Champion Tree" as identified in the book "Champion Trees in Urban Hong Kong".

3.5.3 Tree groups SG1 – 4, RG1 – 4 & RG1 – 2 will be affected by the Proposed Development and are proposed to be felled. 104 nos. of trees within the tree groups are *Leucaena leucocephala*, an undesirable exotic species which is acknowledged to be invasive (refer Development Bureau Technical Circular (Works) No. 4/2020 Clause 8). This self-seeded fast-growing species will prevent natural succession of indigenous species and the establishment of newly planted species and therefore, all *Leucaena leucocephala* are proposed to be felled. There are no existing trees within the Application Site proposed to be retained.

3.5.4 As noted above, among the 153 nos. of trees proposed to be felled, 104 nos. are *Leucaena leucocephala*. As they are undesirable and invasive species which should have been removed under routine horticultural maintenance (refer DEVB TC(W) No. 4/2020 Clause 8), no compensation is considered necessary. However, 49 nos. of new heavy-standard trees will be provided as part of the landscape proposal which will enhance the amenity of the Application Site.



Title	Indicative Landscape Plan	Checked	DH	Drawn PW
		Rev	0	Date May 2024
		Scale	N/A	Figure 3.8

Landscape Design

3.5.5 The Landscape Design has been developed to:

(i) Create a landscape design commensurate with the specific site surroundings of the Proposed Development;

(ii) Ensure the landscape character is consistent with the overall design language and aesthetic of the architectural elements;

(iii) Ensure the Proposed Development is sensitively integrated into the surrounding areas via naturalistic interface treatments;

(iv) Minimise the visual impact of the Proposed Development through sensitive landscape treatment;

(v) Create suitable outdoor spaces for active and passive recreational activities; and

(vi) Promote the use of indigenous plant species throughout the landscape to contribute to the sustainability of the Application site and to introduce exotic ornamental species to enhance the amenity of feature areas.

3.5.6 As for local communal open space provision, the Proposed Development is divided into 2 portions, which includes the public housing portion and private housing portion. The proposed population for the public housing portion is about 5,231 while about 3,153 for the private housing portion. The minimum standard of 10 ha per 100,000 persons ($1m^2$ per person) as stipulated in Chapter 4 of the Hong Kong Planning Standards and Guidelines will be achieved by the proposed layout.

3.5.7 A minimum 30% greenery is achieved in accordance with the requirement of PNAP (APP – 152) for the private development portion. Greenery Provision for public housing will provide at least 20% greenery coverage as a minimum at the planning, design, and implementation stage and will target to achieve an overall target of 30% greenery coverage.

3.5.8 The proposed landscape design consists of the following:

3.5.9 **Compensation Wetlands** – Compensation Wetlands are proposed in the southeastern corner, southern middle and the southwestern corner of the Application Site, creating visual and functional landscape buffers to the adjacent sites. The landscape ponds will consist of several water bodies with planted edges of native species to create scenic views and improve local biodiversity. The landscape pond zones are designed as wetland compensation areas, but are expected to generally enhance the overall visual amenity and environmental sustainability of the area.

3.5.10 **Landscape Gardens** – Landscaped gardens are provided in various pocket spaces of the development and will comprise of relaxed and informal garden layouts with paths and sitting areas with a rich framework of tree and shrub planting providing year-round amenity.

3.5.11 Major landscape elements proposed in the Landscape Design Proposal include:

3.5.12 **Landscape at Main Access** – Access to the Proposed Development will be from existing Ho Chau Road. The entry to the Proposed Development will be defined by ornamental trees and flowering shrub planting. The planting scheme for the entry areas will create an attractive landscape and signature identity for the Proposed Development.

3.5.13 **Streetscape** – Extensive soft landscaping is intended to generally enhance and personalize the interior streetscape. The planting will provide colour and texture to the streetscape and generally soften the appearance of the built elements.

3.5.14 **Residential Area** – The careful integration of the landscape elements with the residential buildings will create a coherent layout. Planting will be an important component within these areas. Landscape guidelines will be prepared to control the landscape design within each unit to maintain a consistent landscape image whilst allowing for variety between units. A selection of natural and contemporary materials will be utilized to produce sensitive and attractively detailed design solutions.

3.5.15 **Recreational Facilities and Communal Gardens** – A number of passive and active recreational facilities and communal gardens will be incorporated throughout the development allowing easy access to all residents. The communal gardens will provide small scale, intimate stings with seating for informal use by all residents at the central site are and at the upper level of the community hub. Shade planting will be located throughout the communal gardens and extensive ornamental shrub planting beds will be provided to create interest and variety throughout the year.

4. TECHNICAL CONSIDERATIONS

4.1 Visual Aspect

4.1.1 A Visual Impact Assessment (VIA) is prepared in order to evaluate the degree of visual impacts on the visual sensitive receivers (VSRs) from major public viewpoints (VPs) identified as a result of the Proposed Development of the LSPS at the Application Site. The detailed VIA is appended in **Appendix B**.

4.1.2 A total of 7 nos. of key public VPs have been selected to evaluate the overall visual impact of the Proposed Development, which include:

- VP1: Portion of Yuen Long Highway
- VP2: Kai Kung Leng in Lam Tsuen Country Park
- VP3: San Pui Tsuen Graves
- VP4: Ho Hok Shan
- VP5: Ho Chau Road
- VP6: Pedestrian Footbridge Connecting to Exit G of Tuen Ma Line Yuen Long Station
- VP7: Further North of Pok Wai South Road

4.1.3 The overall visual impact of the Proposed Development is considered as Moderately Adverse. With reference to the analysis and as illustrated on the photomontages taken at the selected VPs, 3 out of the 7 selected VPs would have “Moderately Adverse” visual impacts, the rest of the 4 selected VPs would have “Negligible”, “Slightly Adverse” and “Significantly Adverse” visual impact respectively.

4.1.4 With mitigation design measures incorporated, including building setback, building gaps, landscaped ponds compensation, buffer plantings and sensitive architectural and chromatic treatment to buildings, the Proposed Development is visually acceptable considering its surrounding context is characterised by a sub-urban township with medium density developments.

4.1.5 In conclusion, the Proposed Development is considered to be acceptable in visual terms.

4.2 Air Ventilation Aspect

4.2.1 A revised qualitative Air Ventilation Assessment – Expert Evaluation (AVA-EE) was conducted to identify opportunity and good design features that can be practicably adopted in the Proposed Scheme from air ventilation standpoint and evaluate if there would be any impact on the overall air ventilation performance of the assessment area by comparing the Proposed Scheme with the "Approved Scheme" (i.e. approved rezoning Application No. Y/YL-NSW/4 for house development). Details of the revised AVA-EE are provided in **Appendix C**.

4.2.2 According to the findings of the AVA-EE, the annual prevailing wind comes from NNE, E and S directions while the summer prevailing wind comes from SSE, S and SSW directions. After considering the potential environmental impacts on the Application Site, the layout of the Proposed Development has carefully considered and incorporated the good design in air ventilation aspect. Taking into consideration of the existing topography, the location of the existing built areas and provision of mitigation measures (to be further explored in detailed design stage), it is considered that the Proposed Development would not have significant adverse impact on surrounding environment.

4.2.3 The Proposed Scheme will incorporate effective mitigation measures such as more building separation with width not less than 15m and aligned with prevailing wind directions, and not less than 5m setback from site boundary. Moreover, these wind corridors based on building separation will be oriented with prevailing wind direction where practicable and with sufficient separation distance to maintain good air ventilation performance. While higher building height would impose more blockage effect, the proposed building separations and building setback would mitigate the blockage problem in some extent. Therefore, the Proposed Scheme is unlikely to impose significant impacts on the surrounding sites from air ventilation perspective as compared with the Approved Scheme.

4.3 Traffic Aspect

4.3.1 A revised Traffic Impact Assessment (TIA) for the Proposed Development was conducted to assess the potential traffic impact arising from the Proposed Development onto the local road network as well as the provision of serving facilities deriving from the future transport demand. The details of the revised TIA are provided in **Appendix D**.

4.3.2 Within the Public Housing Portion, the Proposed Development will provide 214 car parking spaces, 20 visitor parking spaces, 14 motorcycle parking spaces, 274 bicycle parking spaces, 8 Light Goods Vehicle (LGV) and Light Bus loading/unloading (L/UL) bays and 8 “shared-use” coaches/bus and Medium/Heavy Goods Vehicle (M/HGV) L/UL bays for residential (Public Housing portion) according to the HKPSG. For the commercial portion, the Proposed Development will provide 6 car parking spaces, 1 motorcycle parking spaces and 2 L/UL bay for goods vehicles. For the G/IC Facilities (Including a NEC and HCS for Frail Elderly Persons), 1 designated Private Light Bus Parking Space and 1 Shared L/UL Bay for private light bus will also be provided. The proposed parking provision is subject to the flat mix and agreement with relevant Government departments at subsequent detailed design stage.

4.3.3 Within the Private Housing Portion, the Proposed Development will provide 228 car parking spaces, 15 visitor parking spaces, 11 motorcycle parking spaces, 85 bicycle parking spaces and 3 L/UL bays for goods vehicles for residential (private housing) portion according to HKPSG requirements. For the commercial portion, the Proposed Development will provide 7 car parking spaces, 1 motorcycle parking space and 2 L/UL bays for goods vehicles. For the kindergarten portion, 1 private car parking spaces, 10 taxi/private car laybys and 5 small coach laybys would be provided. The proposed parking provision is subject to the flat mix and agreement with relevant Government departments at subsequent detailed design stage.

4.3.4 In order to cater for the potential demand of public transport services arising from the Proposed Development, a public transport terminus with 2 bus bays, 1 GMB bay and a taxi stand is proposed within the Private Housing portion. Franchised bus services are proposed to serve the Proposed Development by circular route to Yuen Long Station Public Transport Interchange. In addition, long-haul bus routes to/from urban areas (such as Hong Kong Island, Kowloon East and Kowloon) are proposed during AM/PM peak hours. Subject to the future planning of public transport services, the provision of transport terminus will allow adequate hardware facility to serve the future public transport demand generated by the Proposed

Development.

4.3.5 Currently, the Application Site is served by a village road which branches off from existing Ho Chau Road. The village road is a 3.5m – 5.5m wide single-track access road with no footpath on neither side of the carriageway; while Ho Chau Road is a 3.5m wide single-track access road with passing bays.

4.3.6 Under another approved planning application no. A/YL-NSW/274 for the adjacent site, the existing Ho Chau Road is planned to be widened to a standard 7.3m wide single 2 lane 2-way carriageway between the adjacent site to the junction of Nam Sang Wai Road. One 38m long bus/GMB bay is planned at widened Ho Chau Road to serve for the whole area. This can serve as bus/GMB bay for additional terminating bus /GMB routes serving the area if required in the future. In addition, a section of Nam Sang Wai Road near its junction with Castle Peak Road – Tam Mi was also planned to be widened.

4.3.7 An access road is proposed within the Application Site to connect the Application Site with widened Ho Chau Road. The access road would be a 7.3m wide single 2-lane carriageway, with footpaths provided on each side of the carriageway.

4.3.8 In order to review the existing traffic condition, traffic count surveys were conducted at the following 8 identified critical junctions to investigate the traffic condition during commuting peak hours. At present, all the critical junctions are operating within capacity.

- J/O Castle Peak Road – Tam Mi / San Tam Road (J1)
- J/O Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen (J2)
- J/O Castle Peak Road – Tam Mi / Nam Sang Wai Road (J3)
- Au Tau Interchange (J4)
- J/O Kam Tin Road / Tsing Long Highway Slip Road (J5)
- J/O Kam Tin Road / Kam Tin Bypass / Kam Ho Road (J6)
- Pok Oi Interchange (J7)
- J/O Ho Chau Road / Tung Shing Lei (J8)

4.3.9 The Proposed Development will generate 2-way traffic of about 470 pcu/hr and 262 pcu/hr during the commuting AM and PM peak.

4.3.10 The Proposed Development is scheduled for completion in 2031 tentatively. Traffic forecast for design year 2034 was produced to assess the traffic impact arising from the Proposed Development. The results of junction capacity assessments revealed that all junctions (except J1, J2 and J3) would be able to handle the future traffic demand with all planned improvement works implemented.

4.3.11 A junction improvement proposal to signalize the J/O Castle Peak Road – Tam Mi / Nam Sang Wai Road (J3) is recommended to allow right-turn movement from Nam Sang Wai eastbound to Castle Peak Road – Tam Mi southbound. In addition, a U-turn facility for 7m-long vehicles is proposed at Nam Sang Wai Road such that traffic from Castle Peak Road – Tam Mi northbound can route via Nam Sang Wai Road northbound, U-turn to Nam Sang Wai Road southbound, and back to Ko Po Path. In view of the above, additional land would be required from the government land lots.

4.3.12 The performance for J/O Castle Peak Road – Tam Mi with San Tam Road (J1), Unnamed Access Road to Cheung Chun San Tsuen (J2) and Nam Sang Wai Road (J3) would be improved and operating within capacity upon completion of the proposed improvement works.

4.3.13 The critical road links along San Tam Road, Castle Peak Road – Tam Mi, Castle Peak Road – Yuen Long and Kam Tin Road are also assessed and the volume-to-capacity (v/c) ratios are presented in **Table 4.1** below.

Table 4.1 Road Link Assessments

Link Index	Road Link	Dir.	Capacity (pcu/hr)	Traffic Flows				V/C Ratio			
				Reference Case		Design Case		Reference Case		Design Case	
				AM	PM	AM	PM	AM	PM	AM	PM
L1N	San Tam Road	NB	3600(1)	970	770	1010	800	0.27	0.21	0.28	0.22
L1S		SB	3600(1)	1660	1360	1660	1350	0.46	0.38	0.46	0.38
L2N	Castle Peak Road - Tam Mi (Between San Tam Road and Access Road to Cheung Chun San Tsuen)	NB	3600(1)	1820	1530	1600	1400	0.51	0.43	0.44	0.39
L2S		SB	3600(1)	2340	1940	2110	1810	0.65	0.64	0.59	0.50
L3N	Castle Peak Road - Tam Mi (Between Access Road to Cheung Chun San Tsuen and Nam Sang Wai Road)	NB	3600(1)	2110	1770	1890	1650	0.59	0.49	0.53	0.46
L3S		SB	3600(1)	2720	2170	2490	2050	0.76	0.60	0.69	0.57
L4N	Castle Peak Road - Tam Mi (Between Nam Sang Wai Road and Au Tau Interchange)	NB	3600(1)	2090	1800	2310	1970	0.58	0.50	0.64	0.55
L4S		SB (Ground Level)	3600(1)	1580	1140	1770	1230	0.44	0.32	0.49	0.34
		SB (Flyover)	1800(6)	1150	1070	1230	1110	0.64	0.59	0.68	0.62
L5E	Castle Peak Road - Yuen Long (Between Pok Oi Int' and Long Yat Road)	EB	5400(2)	4040	3610	4070	3640	0.75	0.67	0.75	0.67
L5W		WB	5400(2)	3450	3500	3500	3530	0.64	0.65	0.65	0.65
L6E	Castle Peak Road - Yuen Long (Between Au Tau Int' and Pok Oi Int')	EB	5400(2)	3150	2710	3230	2780	0.58	0.50	0.60	0.51
L6W		WB	5400(2)	3530	3220	3640	3280	0.65	0.60	0.67	0.61
L7E	Kam Tin Road (Between Au Ta Int' and Tsing Long Highway Slip Road)	EB	3600(1)	2350	1870	2480	1930	0.65	0.52	0.69	0.54
L7W		WB	3600(1)	2070	2530	2170	2610	0.58	0.70	0.60	0.73
L8E	Kam Tin Road (Between Tsing Long Highway Slip Road and Kam Ho Road Roundabout)	EB	5400(2)	2450	1980	2590	2040	0.45	0.37	0.48	0.38
L8W		WB	3600(1)	2170	2280	2300	2350	0.60	0.63	0.64	0.65
L9	Kam Tin Road	Two-way	2200(3)	1640	1510	1660	1530	0.75	0.69	0.75	0.70
L10	Ho Chau Road	Two-way	2200(3)	410	260	920	560	0.19	0.12	0.42	0.25
L11	Castle Peak Road – Yuen Long (Exit arm of Pok Oi Int')	EB	1800(4)	1520	1230	1570	1270	0.84	0.68	0.87	0.71

Link Index	Road Link	Dir.	Capacity (pcu/hr)	Traffic Flows				V/C Ratio			
				Reference Case		Design Case		Reference Case		Design Case	
				AM	PM	AM	PM	AM	PM	AM	PM
L12N	Tai Lam Tunnel	NB	5400(2)	2560	4440	2650	4500	0.47	0.82	0.49	0.83
L12S		SB		5990	2830	6100	2890	1.11	0.52	1.13	0.54
L13E	Yuen Long Highway	EB	6100(5)	5860	6860	5920	6910	0.96	1.12	0.97	1.13
L13W		WB	6100(5)	6970	5950	7050	5990	1.14	0.98	1.16	0.98
L14N	Tsing Long Highway	NB	6100(5)	2440	4040	2530	4100	0.40	0.66	0.41	0.67
L14S		SB	6100(5)	5420	2620	5530	2680	0.89	0.43	0.91	0.44

Note:
(1) Road capacity for Dual 2-lane carriageway
(2) Road capacity for Dual 3-lane tunnel
(3) Road capacity for 7.3m wide Single 2-lane carriageway
(4) Road capacity for 4m wide Dual 1-lane carriageway
(5) Road capacity for Dual 3-Trunk Road
(6) Road capacity for single lane carriageway

4.3.14 The assessment results in **Table 4.1** indicated that all the above road links are expected to operate within capacity except Tai Lam Tunnel (L12) and Yuen Long Highway (L13). With the opening of future Route 11, it is anticipated that the traffic condition of both Tai Lam Tunnel and Yuen Long Highway could be significantly improved. Between the year 2031 (completion year of the development) and the opening year of Route 11, the V/C ratio of both Tai Lam Tunnel and Yuen Long Highway would reach 1.1 in both reference and design case, meaning that traffic speed would be reduced, but would still be manageable with V/C ratio under 1.2.

4.3.15 A sensitivity analysis has been carried out for the scenario without the approved Sha Po North and Tung Shing Lei developments under Application No. A/YL-KTN/663 (Phase 2), A/YL-KTN/604 and A/YL-NSW/274 respectively and without the improvement works at J1, J2 and J4, to assess the traffic condition if the proposed improvement by others cannot be implemented timely before completion of the Proposed Development. The junction assessment results reveal that the assessed junctions J1 and J2 would be able to handle the future traffic demand under the sensitivity test scenario. For J4, the aforementioned junction improvement measure (i.e. proposed exclusive left turn lane) is deemed necessary under the sensitivity analysis (i.e. without the approved Sha Po North and Tung Shing Lei developments under Application No. A/YL-KTN/663 (Phase 2), A/YL-KTN/604 and A/YL-NSW/274 respectively and without the relevant junction improvement works). Therefore, the Applicant will implement the improvement measure of J4 accordingly.

4.3.16 An additional sensitivity test has been carried out for to assess the traffic impact induced by three potential private residential developments proposed under planning Application No. Y/YL-NSW/7, Y/YL-NSW/8 and Y/YL-NSW/9. Junction

assessment results reveal that all the assessed junctions would be able to handle the future traffic demand under the sensitivity test scenario with all planned junction improvements implemented timely.

4.3.17 In light of the findings of the TIA, it is concluded that there is no insurmountable traffic impact imposed onto the local road network brought by the Proposed Development (please refer to **Appendix D** for the full revised TIA report). With the proposed mitigation measures in place, the Proposed Development is technically feasible in traffic terms.

4.4 Environmental Aspect

4.4.1 In proof of the environmental acceptability of the Proposed Development, a revised Environmental Assessment (EA) has been carried out to examine its associated environmental noise, air quality, water quality impacts and waste implications. The details of the revised EA are provided in **Appendix E** and the key findings are summarized below.

4.4.2 Potential industrial noise and emission, vehicular emission and railway noise impacts have been evaluated and considered insignificant, due to absence of industrial emission source, remoteness and insignificance of fixed noise source, adequate separation from carriageways and long separation from railway system.

4.4.3 The Proposed Development is not environmentally polluting in nature. There is no chimney stack. However, noisy equipment will inevitably be provided onsite. As this is in early planning stage of the project, there is lack of detail such as type of equipment, location, orientation, etc. Nevertheless, the requirement to meet HKPSG standard (Acceptable Noise Level – 5 dB(A) or prevailing background whichever is lower) is well noted and will be specified in future document for detailed design and tender so that engineers and contractors need to strictly follow.

4.4.4 The potential road traffic noise impact on the Proposed Development has been assessed quantitatively. According to the assessment result, there is no exceedance of relevant noise standard for noise sensitive receivers of the Proposed Development. No noise mitigation measure is further recommended.

4.4.5 Potential environmental impacts arising from construction activities of the Proposed Development, including dust emission, construction wastewater, noise and waste impacts have been qualitatively assessed. Potential environmental impacts are anticipated to be acceptable with the implementation of effective environmental mitigation measures. In conclusion, it is envisaged that construction phase environmental impacts arising from the Proposed Development would be acceptable.

4.5 Engineering Aspects

Drainage Consideration

4.5.1 A revised Drainage Impact Assessment (DIA) has been carried out for the Proposed Development to address the existing and proposed arrangement for drainage for the Application Site and assess their potential impacts to the vicinity arising from the Proposed Development at the Application Site. The details of the revised DIA are provided in **Appendix F**.

4.5.2 The maximum water level at the downstream existing drainage system would be increased by 0.001m after the Proposed Development mainly by the increased of runoff due to changes from unpaved area to paved area.

4.5.3 Based on the hydraulic assessment, there is no adverse drainage impact to the surrounding drainage system arising from the proposed residential developments at Application Site with proposed drainage works.

4.5.4 Suitable internal drainage system would be further considered during the detailed design stage to collect the drainage flow within the Application Site to the public drainage system.

4.5.5 The drainage facilities proposed within the Application Site to convey the surface runoff outside site and discharged to the terminal manholes at the proposed widen road are recommended to be undertaken by the Proposed Development. The stormwater drains to be laid beneath the proposed widen road which connect to the existing DSD drainage channel will be handed back to the Drainage Services Department (DSD) upon completion of the drainage works.

4.5.6 The proposed private development should have minimum 30% greenery area which tally with the blue-green concept as stipulated in Section 3.2.2 of the Stormwater Drainage Manual (2018).

Sewerage Consideration

4.5.7 A revised Sewerage Impact Assessment (SIA) has been carried out for the Proposed Development to assess the existing and proposed sewerage arrangement for the Application Site and assess the potential impacts to the surrounding that arises from the Proposed Development at the Application Site. The detailed revised SIA is appended in **Appendix G**.

4.5.8 The estimated sewage generated in terms of Average Dry Weather Flow, from the Proposed Development is about 2,708.4 m^3/day including 10% increase in design numbers of population. The flow is equal to approximately 25.31% of the current capacity of Au Tau Sewage Pumping Station (ATSPS). It is unlikely that the ATSPS will be overloaded.

4.5.9 As revealed by hydraulic assessment results, the proposed sewage discharge scheme is feasible. No significant impact on sewerage conveyance system is anticipated.

4.5.10 Subject to the updated sewerage connection to ATSPS at detailed design stage. A detailed design for the sewerage connection will be submitted to DSD for approval.

Water Supply Consideration

4.5.11 A revised Water Supply Impact Assessment (WSIA) has been performed for the Proposed Development to assess the existing and proposed water supply arrangement for the Application Site and assess the potential impacts to the surrounding that arises from the Proposed Development at the Application Site. The detailed revised WSIA is appended in **Appendix H**.

4.5.12 The Proposed Development is located at the water supply zone of Au Tau Fresh Water Service Reservoir (ATFWSR) and there is existing salt water supply at Wong Uk Tsuen. It is proposed to source flushing water from the DN100 Salt Water Mains at Wong Uk Tsuen.

4.5.13 Based on the above assessment, the existing 900mm diameter distribution main running underneath Yau Shin Street near Castle Peak Road is adequate to meet the water demand required for the Application Site. It is proposed that a new 400mm diameter fresh water main shall be laid to connect to the existing water supply system. As such, the Proposed Development is considered to be acceptable in water supply terms.

Geotechnical Consideration

4.5.14 A revised Geotechnical Planning Review Report (GPRR) has been carried out to review the geotechnical feasibility of and identify any features or hazards that would potentially affect the Proposed Development. The detailed GPRR is appended in **Appendix I**.

4.5.15 As proven in the GPRR, site formation works shall be technically feasible.

4.5.16 According to GEO Report 138 (2017), the Application Site is subject to potential natural terrain hazards according to the geometry of the adjacent hillside and proximity to high consequence facilities within the Proposed Development, and thus a Natural Terrain Hazard Study (NTHS) is required.

4.5.17 However, the hillside is small (20m high), generally gently sloping (<20°) where adjacent to Proposed Development apart from the west-facing open hillslope catchment (locally up to 30°). No existing landslides, historical landslide catchments, incident reports or other evidence of past instability are recorded. No significant boulders are recorded or observed from air photos. Thus, it is considered that the potential natural terrain hazards are not severe and subject to ground trothing, it is considered that mitigation works, if necessary, will be minimal.

4.5.18 In addition, the following works shall be considered:

- Project specified ground investigation field works prior to the finalization of GBP; and
- Geotechnical instrumentation shall be provided an monitored during the construction works to ensure the adjoin ground and structures will not be adversely affected.

4.5.19 Geotechnical Assessment Report and detailed design and works proposal of associated works at adjacent features shall be submitted before construction stage.

4.6 Ecological Aspect

4.6.1 An Ecological Impact Assessment (EcoIA) has been conducted in **Appendix J** to evaluate if there are any potential ecological impacts due to the Proposed Development.

4.6.2 Information on the ecological baseline conditions of the Application Site was collected through literature review and surveys, and they were integrated into the present EcoIA to support the planning application.

4.6.3 Within the Application Site, the pond, abandoned pond, wasteland and developed area will be lost directly, but the meander will not be impacted. **Due to the domination by wasteland of low ecological values, and small sizes of other habitats (developed area of 0.21 ha, abandoned pond of 0.23 ha, and pond of 0.46 ha) the potential impact due to loss of those habitats within the Application Site is considered minor or minor to moderate**. However, compensation wetlands with the same size to those lost abandoned pond and pond within Application Site will be provided during the operational phase.

4.6.4 Tung Shing Lane egretry was abandoned in 2021, chance of recolonization to this egretry is considered low. In fact, the breeding ardeids previously passed through the Application Site was also low due to avoidance of the existing knoll and preference over the Kam Tin River, given the manoeuvrability of waterbirds, the potential fragmentation impacts to waterbirds including breeding ardeids from Tung Shing Lane Egretry from the Proposed Development are considered minor.

4.6.5 The Proposed Development would satisfy the requirements listed in Town Planning Board Guidelines No. 12C (TPB PG-No. 12C). First, since compensation wetlands including three fed by rainwater will be provided to mitigate the loss of abandoned pond and pond within the Application Site, the Proposed Development will not incur any net loss in wetland area or function at any scale and therefore will comply with the “no net loss in wetland” guideline stipulated in TPB PG-No. 12C. Second, this EcoIA demonstrates that the Proposed Development would not have significant disturbance impacts to the surroundings including wetlands inside WCA, and will provide wetland and visual buffer to the WCA, and is thus in line with the intention of WBA.

4.7 Utility Aspect

4.7.1 In order to ascertain that sufficient utility facilities are available for the Proposed Development, utilities companies including Towngas and CLP Power Hong Kong have been consulted. It is confirmed that both gas source and power supply are available for connection in the vicinity of the Application Site. The correspondences with Towngas and CLP Power Hong Kong are attached in **Appendix K**.

5. JUSTIFICATIONS AND MERITS OF THE PROPOSAL

5.1 Proposed Development Satisfies the criteria set out in the Land Sharing Pilot Scheme in Boosting Housing Supply

5.1.1 **Table 5.1** below illustrates the Proposed Scheme satisfies the criteria list out under LSPS in terms of "housing supply gain" and "geographical limit".

Table 5.1– Table illustrating how the Proposed Scheme Satisfies Criteria Set out in the LSPS

Criteria listed out under LSPS in boosting housing supply and geographical limit	**Proposed Scheme**
A proposal that yields at least 50,000m^2 of increased domestic GFA and an additional 1,000 housing units.	✓ The Proposed Scheme is capable in offering about **133,429m^2** of domestic GFA in addition and **2,872 (based on 50m^2 average flat size) or 3,129 (based on 39.8m^2 average flat size) residential units** in total. ✓ Comparing with the Approved Scheme which only offers 57 house units, the Proposed Scheme **can offer 2,815 (based on 50m^2 average flat size) or 3,072 (based on 39.8m^2 average flat size) units in addition**. ✓ All private lots are under the applicant's ownership and no need for land resumption, thereby ensuring timely implementation.
No less than 70% of the increased domestic GFA have to be used for public housing or Public Housing development	✓ **70%** of the increased domestic GFA is for **Public Housing development** while the remaining 30% is for Private Housing development. ✓ Public Housing portion can be carved out in the form of formed land for a self-contained site.

Geographical Limit: Site falling within Government's completed, on-going, soon-to-commence development studies supporting the use of land intended for public purposes and within country parks, six environmental sensitive zonings and areas covered by 12 priority sites for enhanced conservation under the New Nature Conservation Policy	✓ The Application Site **is not located in areas listed out as "geographical limit" listed out under LSPS** ✓ Although it is located within the WBA as defined under TPB Guidelines No. 12C, the Application Site is zoned "R(D)" which is planned for residential development. Section 5.2 below will further illustrate how the Proposed Development complies with the TPB Guidelines.

5.1.2 As illustrated above, the Proposed Scheme fully satisfies relevant criteria in terms of boosting housing supply.

5.2 Proposed Scheme Observes the TPB Guidelines No. 12C with No Net Loss in Wetland

5.2.1 With reference to TPB Guidelines No. 12C, the Application Site is situated in WBA and about 6,900m^2 (subject to detailed land survey) of abandoned ponds are identified in the Application Site. The existing condition of abandoned ponds are scattered among the site.

5.2.2 In "area" aspect, the compensation wetland with not less than 6,900m^2 (subject to detailed land survey) will provide connection and near the existing Kam Tin River and the wetland in the WCA. In "functional" aspect, the compensation wetland in the southwestern portion will form a larger amenity area with the "Landscape Area with Natural Habitat and Water Feature" agreed under Application No. A/YL-NSW/274. As for the compensation wetland adjoining the WCA in the southeastern edge of the Application Site will reinforce the buffer function with the WCA.

5.2.3 Further details regarding the compensation wetlands will be presented in the Ecological Impact Assessment to be submitted in later stage.

5.3 Proposed Development is Situated in a Residential Zoning and Has Proven Suitable for Residential Development

5.3.1 The Application Site is situated in "R(D)" zone with planning intention to improve and upgrade the existing temporary structures through redevelopment into permanent buildings. Part of the Application Site is subject of an approved rezoning

application under Town Planning Board (TPB) Application No. Y/YL-NSW/4 (i.e. the Approved Scheme). Under the Approved Scheme, TPB has agreed to rezone part of the Application Site from "R(D)" to "R(D)2" zone to facilitate the implementation of the house development with PR of not more than 0.34 and total domestic GFA of not more than 10,150m^2. The approval of the Approval Scheme has proven the site is suitable for residential type development.

5.3.2 Proposed Development for Public and Private Housing development is in line with the planning intention of "R(D)" zone and can provide additional residential units to the public in a timely manner under the LSPS, which can in turn better utilise the scarce land resources.

5.4 Proposed Development Intensity is Compatible with the Surrounding Context and is Comparable with the Approved Developments in Wetland Buffer Area

5.4.1 In the course of scheme formulation, the Applicant has proposed a development intensity with overall domestic PR of about 3.14 (based on development site area) to ensure the Proposed Scheme is compatible with the surrounding development, including the adjacent approved residential development in "Undetermined" zone under Application No. A/YL-NSW/274 with a domestic plot ratio of about 2.15.

5.4.2 As illustrated in Section 2.2 and in **Figures 2.3 and 2.4**, the overall development intensity generally descends from high-density development in Yuen Long Town Centre (with PR above 5) to the medium-density development in the fringe of Yuen Long near Kam Tin Centre (with PR below 3). The recently announced public housing development in Sha Po to the east of Application Site also adopts a domestic PR of 6.5. By adopting a similar development intensity comparing with medium-rise residential development in the sub-urban area of Yuen Long, such as The Parcville, One Regent Place and Long Shin Estate (with PR of 3), the Proposed Development with domestic PR of about 3.14 can serve as a smooth transition and maintain the overall development profile with the highest development intensity being the residential clusters in Yuen Long Town Centre and gradually descends to the sub-urban and fringe area of Yuen Long towards Kam Tin from a southwest to northeast direction.

5.4.3 Approved developments with similar development intensity are also found in the WBA, which are listed below. Obviously, the proposed overall domestic PR of about 3.14 is entirely compatible with these developments.

- The Parcville (with domestic PR of 3)
- Approved residential and community hub development under Application No. A/YL-NSW/274 (with domestic PR of 2.15)

5.5 Fully Secured Private Land Ownership for Timely Implementation

5.5.1 The Application Site only consists of private lots under Applicant ownership and Government Land without involving any third party lots. Comprehensive and timely implementation of the Proposed Development could be warranted to cope with the acute housing needs.

5.6 Design Merits to be Offered in the Proposal Would be Further Explored

5.6.1 Under the current proposal, design merits including (i) building separations are incorporated to create visual interest as well as to facilitate air penetration within the sites and to surrounding areas (subject to detailed design); (ii) provide landscape area and compensation wetlands at appropriate location to reinforce the buffer with the WCA and blends in with the surrounding landscape character; (iii) and setback from site boundary with landscape treatment in form of trees and shrubs so as to screen off and soften the perceived built form of the Proposed Development at street level.

5.6.2 Subject to comments received upon submitting the current proposal, the Applicant will further explore the possibility to enhance the overall design of the development, including but not limited to the following:

- In line with the latest Sustainable Building Design Guidelines (SBDG) to foster a sustainable and quality built environment. Greening opportunity of the Proposed Development will be maximized by provision of green coverage of not less than 30% of the Application Site. The Housing Authority will provide at least 20% of greenery coverage for public housing portion at planning, design and implementation stage, with a target to achieve an overall target of 30% of greenery coverage; and
- In order to ensure a smooth transition to the surrounding area, the Proposed Development will adopt a sensitive architectural and chromatic treatment to buildings. For example, earth tone colour would be adopted instead of sharp colour tone.

5.7 Technically Feasible with no Insurmountable Problems in Ecological, Traffic, Environmental, Engineering, Air Ventilation, Landscape, Visual and Geotechnical Terms

5.7.1 Relevant appraisals on ecological, traffic, environmental, engineering, air ventilation, landscape, visual and geotechnical impacts of the project have been duly considered. It is concluded that the proposal would be sustainable with no insurmountable technical problems.

5.7.2 In particular, infrastructural upgrading work is required as per the preliminary technical review. The Applicant will be responsible for the provision of all necessary infrastructural connections up to the boundary of the Public Housing site. The completed public infrastructural works will be handed over to the Government for future management and maintenance. The Applicant will liaise and seek agreement with relevant Government departments in this regard at detailed design stage subsequent to amendments to OZP. Besides, in order not to affect the implementation programme of Public Housing development, the internal infrastructure serving the public housing development is proposed to be implemented by the Government. The summary of the proposed infrastructural upgrading work is listed in **Table 5.2** for easy reference:

Table 5.2 – Summary of the Proposed Infrastructural Upgrading Work under the Proposed Scheme

		For Public Housing Site	For Private Housing Site
Ecological	1	--	Compensation wetlands of about 6,900m^2 (subject to detailed land survey) to enhance both "area" or "function" of the wetland (to be implemented, managed and maintained by the Applicant)
Traffic	2	Re-align and upgrade the existing village road to a 7.3m wide single 2 lane carriageway with 2.5m wide footpaths provided on both sides and extension of existing local track at the north to connect with proposed access road (to be implemented by the Applicant and handed over the Government for future management and maintenance upon completion); Internal road of Public Housing site branching off from the proposed access road (to be implemented, managed and maintained by the Government)	
	3	-	A transport terminus with 2 bus bays, 1 GMB bay and a taxi stand (to be implemented by the Applicant and handed over the Government for future management and maintenance upon completion)
	4	Junction Improvement work at J/O Castle Peak Road – Tam Mi / Nam Sang Wai Road to signalize the junction and to provide right-turn movements from Nam Sang Wai Road eastbound to Castle Peak Road – Tam Mi southbound. In addition, a U-turn facility for 7m-long vehicles is proposed at Nam Sang Wai Road such that traffic from Castle Peak Road – Tam Mi northbound can route via Nam Sang Wai Road northbound, U-turn to Nam Sang Wai Road southbound and back to Ko Po Path. Moreover, a signal controlled pedestrian crossing has also been proposed at Ko Po Path (to be implemented by the Applicant and handed over the Government for future management and maintenance upon completion)	
Drainage	5	Please refer to DIA report in **Appendix F** for details	

Sewerage	6	Sewage generated from the public and private housing site will be discharged to the proposed sewage pumping station (SPS) by gravity PE sewer sizing DN375. The sewage flow will then be pumped from the proposed pumping station to ATSPS through the proposed 2 nos. of rising mains. (The proposed SPS and DN375 gravity PE sewers will be implemented by the Applicant and handed over to the Government for future management and maintenance)
Water Supply	7	A new 400mm diameter fresh water main is required to be branched off from the existing DN900 fresh water mains for supply of fresh water to the Proposed Development. It is proposed that the DN100 salt water main will be used for supplying flushing water to the Proposed Development (Both to be implemented by the Applicant and handed over to the Government for future management and maintenance)

5.7.3 The Land Requirement Plan showing the land parcels required for provision of supporting infrastructure and their respective works area will be provided separately for the consideration of relevant Government department. No land resumption is required for provision of infrastructure and works area, as the associated land parcels fall entirely on Government land. The cost estimate for land resumption and clearance will also be submitted to relevant Government department separately for vetting.

6. CONCLUSION

6.1 The LSPS proposal was endorsed in principle by the Chief Executive-in-Council on 1 November 2022. To facilitate the subsequent statutory planning and lands procedures, this proposal is submitted to the LSO of the DevB to ascertain the technical feasibility for the proposed application for public and private housing development to be submitted under the LSPS at various lots in D.D. 115, Tung Shing Lei, Yuen Long, the New Territories.

6.2 The Application Site is a planned housing site zoned "R(D)" under the current OZP. Part of the site is subject of an approved rezoning application under Town Planning Board (TPB) Application No. Y/YL-NSW/4 (i.e. the Approved Scheme). Under the Approved Scheme, TPB has agreed to rezone part of the Application Site from "R(D)" to "R(D)2" zone to facilitate the implementation of the house development with PR of not more than 0.34 and total domestic GFA of not more than 10,150m^2.

6.3 The current proposal is in line with the criteria of the LSPS by offering 143,579m^2 domestic GFA and 3,129 residential units in total, of which 133,429m^2 of additional domestic GFA is contributed based on overall domestic PR of 3.14. The additional domestic GFA will be distributed to the Public Housing portion and Private Housing in a 70% and 30% spilt thereby contribution to about 1,868 public housing units and 1,261 private housing units to alleviate the shortage of housing supply problem in Hong Kong.

6.4 Relevant appraisals on ecological, traffic, environmental, engineering, air ventilation, landscape and visual impacts have been duly reviewed and the preliminary findings concluded that there will be no insurmountable problems, with appropriate mitigation measures implemented.

6.5 The Proposed Scheme is supported by the following development justifications and merits:

- Proposed development satisfies the criteria set out in the LSPS in boosting housing supply;
- Proposed scheme observes the TPB Guidelines No. 12C with no net loss in wetland;
- Proposed Development is situated in a residential zoning and has proven suitable for residential development;
- Proposed Development intensity is compatible with the surrounding context and is comparable with the approved Developments in wetland buffer area;
- Fully secured private land ownership for timely implementation;

- Design merits to be offered in the proposal would be further explored; and
- Technically feasible with no insurmountable problems in ecological, traffic, environmental, engineering, air ventilation, landscape, visual and geotechnical terms.

Appendix A
Revised Landscape Design Proposal

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A.1 INTRODUCTION

A.1.1 A comprehensive residential development of both private housing and public housing portions (hereafter referred as the "Proposed Development") has been proposed at various lots in D.D. 115 at Tung Shing Lei, Yuen Long, New Territories (hereafter referred as the "Application Site"). This report outlines the landscape design proposals for the Proposed Development at the Application Site.

A.1.2 This landscape design proposal is submitted to demonstrate the effect of the building design of the Proposed Development at the Application Site on landscape and visual aspects. It includes an assessment of existing trees, landscape layout and proposed planting to establish a coherent character for future development. The landscape proposal provides a concept to improve the quality of the existing environment and enhance the Proposed Development.

A.1.3 Relevant Legislation and Guidelines

In preparation for this Report, reference has been made to the following technical circular, practice notes, and publications:

- Forests and Countryside Ordinance (Cap.96 sub.Leg.);
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586);
- General Regulation 740 (GR 740);
- Lands Administration Office Lands Department Practice Note Issue No. 6/2023 – Processing of Tree Preservation and Tree Removal Proposals for Building Development in Private Projects Compliance with Tree Preservation Clause under Lease;
- DEVB Technical Circular (Works) No. 6/2015 -- Maintenance of Vegetation and Hard Landscape Features;
- DEVB (Works) No.4/2020 (Clause 8) –Tree Preservation;
- DEVB (Works) No.5/2020 – Registration and Preservation of Old and Valuable Trees;
- Agriculture, Fisheries and Conservation Department Publication - 'Check List of Hong Kong Plants 2004' (2004);
- Agriculture, Fisheries and Conservation Department Publication - 'Rare and Precious Plants of Hong Kong' (2003);
- Guidelines promulgated by the Development Bureau at: http://www.greening.gov.hk/en/management
- Town Planning Ordinance (TPO) (2023);
- TPB PG-No.12C – Planning Application for Developments within Deep Bay Area;
- The Hong Kong Planning Standard and Guidelines– Chapter 4: Recreation, Open Space & Greening;
- The Hong Kong Planning Standard and Guidelines– Chapter 10: Conservation;
- The Hong Kong Planning Standard and Guidelines– Chapter 11: Urban Design Guidelines ;
- Practice Notes for Professional Persons (PN APP) 1/2019 – Processing and Compliance Checking of Landscape Submission related to Planning Applications;
- Practice Notes for Authorized Persons (PN APP-152) – Site Coverage of Greenery; and
- Joint Practice Note (JPN) No.3 – Landscape and Site Coverage of Greenery.

A.2 EXISTING SITE CONDITIONS

A.2.1 Context/ General Neighbourhood – The Application Site is located at the fringe of the Yuen Long urban area, north of the Yuen Long Highway and is bounded by abandoned ponds to the east and south with abandoned ponds, wasteland, plantation, a wooded knoll and some village houses to the north and the approved residential development under Application No. A/YL-NSW/274 to the west. Surrounding land-uses are predominantly a mix of undeveloped rural landscape, occasional scattered village houses, vacant land and abandoned ponds.

A.2.2 The Site – The Application Site has an area of approximately **55,583**m^2 and is currently zoned "Residential (Group D)" ("R(D)") on the Approved Nam Sang Wai Outline Zoning Plan No.S/YL-NSW/8. The existing site is generally flat and consists of unused and abandoned land. A woodland knoll is located to the north of the Application Site. There are two areas of existing ponds within the Application Site. Most of them are abandoned and colonized by common local vegetation in poor condition.

A.3 PROPOSED DEVELOPMENT FORM

A.3.1 Building Layout – The Proposed Development consists of **7** residential towers with a height of not more than 24 domestic storeys. The Application Site is divided into two portions, one for private development and the other for public housing development. Of the 7 residential towers, **4** towers are proposed for the public housing development, while **3** towers are proposed for the private development. In the private development, the non-domestic block is proposed for a public transport terminus (PTT) as well as for retail and kindergarten respectively.

A.3.2 Road and Civil Works – Access to the Application Site will be from the existing Ho Chau Road. The additional layby(s) are provided along the proposed access road (outside both public and private housing developments).

A. 4 TREE PRESERVATION SCHEME

A. 4.1 Tree Survey Findings – The tree survey of the Application Site was carried out in August 2021. There are **10** tree groups containing a total of approximately **153** nos. of existing trees found within the Application Site boundary. The most frequently occurring species are *Leucaena leucocephala, Melia azedarach* and *Dimocarpus longan*. They are mostly of poor form, poor to fair health and low amenity value.

None of these trees are protected species listed under Forestry Regulations, Forests and Countryside Ordinance (Cap.96 sub. Leg.) or are an "Old and Valuable Tree" as defined in DEVB TC (W) No. 5/2020 "Registration of Old and Valuable Trees" or "Champion Tree" as identified in the book "Champion Trees in Urban Hong Kong" (A Tree Assessment Schedule, Tree Survey Photographs and Tree Survey Plan are shown in Figures A1-A3.1 to A3.11).

A. 4.2 Proposed Treatment of Existing Trees

A.4.2.1 **Retained Tree Groups –** There are no existing trees proposed to be retained.

A.4.2.2 **Affected Tree Groups –** Tree groups SG1 – 4, PG1 – 4 & RG1 - 2 (a total of **153** nos. trees) will all be affected by the Proposed Development and are proposed to be felled. Among these 153nos.

of trees, **49** nos. of them are not *Leucaena leucocephala* while **104** nos. of trees are *Leucaena leucocephala* - an undesirable exotic species which is acknowledged to be invasive and which should been removed under routine horticultural maintenance (refer to Development Bureau Technical Circular (Works) No. 4/2020 Clause 8). This self-seeded fast-growing species will prevent natural succession of indigenous species and the establishment of newly planted species and therefore, all *Leucaena leucocephala* are proposed to be felled.

A4.2.3 A summary of proposed treatments to existing trees within the Application Site boundary is provided in **Table A.1** below:

Table A.1 Summary of Existing Trees to be Affected

Tree Groups	Retain	Transplant	Fell
In Public Housing Portion			
• SG1	-	-	21 nos.
• SG2	-	-	37 nos.
• SG3	-	-	7 nos.
• SG4A	-	-	18 nos.
Subtotal No. of Trees			***83 nos.***
In Private Housing Portion			
• PG1	-	-	10 nos.
• PG2	-	-	6 nos.
• PG3	-	-	16 nos.
• PG4	-	-	2 nos.
Subtotal No. of Trees			***34 nos.***
In Access Road (to be constructed by the Applicant)			
• RG1	-	-	18 nos.
• RG2	-	-	8 nos.
• SG4B	-	-	10 nos.
Subtotal No. of Trees			***36 nos.***
Total No. of Trees			***153 nos.***

A. 4.3 New Planting Proposal

A.4.3.1 A minimum of **49** nos. of new heavy-standard trees will be provided within the private housing portion to enhance the planting amenity. Indicative tree planting species are provided in Table A.2 below and indicative locations are shown on the Landscape Master Plans in Annex B.1.

A.5 LANDSCAPE DESIGN

A.5.1 The Landscape Design has been developed to:

(i) Create a landscape design commensurate with the specific site conditions of the Proposed Development;

(ii) Ensure the landscape character is consistent with the overall design language and aesthetic of the architectural elements;

(iii) Ensure the Proposed Development is sensitively integrated into the surrounding areas via naturalistic interface treatments;
(iv) Minimise the visual impact of the Proposed Development through sensitive landscape treatment;
(v) Create suitable outdoor spaces for active and passive recreational activities; and
(vi) Promote the use of indigenous plant species throughout the landscape to contribute to the sustainability of the site and to introduce exotic ornamental species to enhance the amenity of feature areas.

A.5.2 Conceptual Landscape Design

A.5.2.1 The development comprises seven residential towers, and a clubhouse located on a portion of G/F of Towers 2 and 3. The clubhouse provides indoor and outdoor recreational facilities for the future residents. A community hub is proposed for each public housing development and private development. It consists of retail, covered PTT, kindergarten, and a podium garden within the private development, and the public housing development will consist of retail, management office, G/IC, ancillary car parking facilities, and the podium garden. An internal access road serves as an efficient connector and EVA. Ground floor parking is provided and accessed via a ramp next to Tower 1 of private development. For the layout of the Proposed Development, please refer to the Master Layout Plan and Planning Statement for details. A variety of communal open spaces is provided between the residential towers catering to a wide range of active and passive recreation to enhance social interaction and understanding that improve community harmony. The proposed landscape design consists of the following:

a) *Compensation Wetlands* – Compensation Wetland zones are proposed in the southeastern corner, southern middle and southwestern corner of the Application Site, creating visual and functional landscape buffers to the adjacent sites. The compensation wetland will consist of several water bodies with planted edges of native species to create scenic views and improve local biodiversity. These compensation wetland areas are expected to generally enhance the overall visual amenity and environmental sustainability of the area.

b) *Landscape Gardens* – Landscaped gardens are provided in various pocket spaces of the development and will comprise relaxed and informal garden layouts with paths and sitting areas within a rich framework of tree and shrub planting providing year-round amenity.

A.5.3 Major Landscape Elements (Refer to Figures B1 to B3)

A.5.3.1 **Landscape at Main Access** – Access to the Proposed Development will be from the existing Ho Chau Road. The entry to the Proposed Development will be defined by ornamental trees and flowering shrub planting. The planting scheme for the entry areas will create an attractive landscape and signature identity for the Proposed Development.

A.5.3.2 **Streetscape** – Extensive soft landscaping is intended to generally enhance and personalize the interior streetscape. The planting will provide color and texture to the streetscape and generally soften the appearance of the built elements.

A.5.3.3 **Residential Area** – The careful integration of the landscape elements with the residential buildings will create a coherent layout. Planting will be an important component within these areas.

Landscape guidelines will be prepared to control the landscape design within each unit to maintain a consistent landscape image whilst allowing for variety between units. A selection of natural and contemporary materials will be utilized to produce sensitive and attractively detailed design solutions.

A.5.3.4 **Recreational Facilities and Communal Gardens** – A number of passive and active recreational facilities and communal gardens will be incorporated throughout the development allowing easy access to all residents and visitors. The communal gardens will provide small scale, intimate settings with seating for informal use by all residents at the central site area and at the upper level of the community hub. Shade planting will be located throughout the communal gardens and extensive ornamental shrub planting beds will be provided to create interest and variety throughout the year.

A.5.4 Landscape Hardworks Schedule – General landscape hardworks elements and materials are as follows:

Table A.2 General Landscape Hardworks Elements and Materials

AREA/ LOCATION	LANDSCAPE HARDWORKS
Main Entrance	*Vehicular road surface* – natural granite setts/ tiles or similar; *Pedestrian footpath* – natural granite/ tiles or similar; *Kerb/ Planter* – natural granite/ tiles or similar;
Streetscape	*Vehicular road surface* – precast concrete/ clay pavers; *Pedestrian footpath* – precast concrete/ clay pavers; *Kerb/ Planter* – precast concrete kerb; *Street furniture* – proprietary products
Residential & Clubhouse Landscape	*Footpath* – natural granite/ stone paving/ tiles or similar; *Kerb/ Planter* – natural granite/ stone paving/ tiles or similar; *Swimming pool* – timber deck and glass mosaic tile finish to pool; *Children's Playground* – proprietary play equipment and safety matting; *Shade Structures* – Concrete structure with granite cladding, metal frames, and glass canopy

A.5.5 Children's Playground Safety – The outdoor children's playground (Play Ares) will be designed in full compliance with the relevant safety standards and guidelines with sufficient safety zones and impact absorbing matting and will be installed in accordance with the manufacturer's specification or guidelines.

A.5.6 Peripheral Planting – A peripheral planting strip (min. 3m width) along the site boundary, except for the entrances will provide the green interface with the surrounding land uses (including adjacent to Wetland Conservation Area (WCA)) and will screen the development from the surroundings.

A.5.7 Planting Palette – Tree species will be planted at optimum spacing for growth, so that the Proposed Development will result in an improved landscape quality. An indicative choice of plant materials is indicated in **Table A.3**.

Table A.3 Proposed Planting Palette

SPECIES *	SIZE
TREES	
Cinnamomum burmannii *	Heavy Standard
Ficus benjamina	Heavy Standard
Michelia x *alba*	Heavy Standard
Spathodea campanulata	Heavy Standard
Sterculia lanceolata *	Heavy Standard
Terminalia mantaly	Heavy Standard
SHRUBS	
Gardenia jasminoides	Varies
Gordonia axillaris *	Varies
Ixora chinensis *	Varies
Ligustrum sinense *	Varies
Rhododendron simsii *	Varies
Liriope spicata *	Varies

*) native species

A.5.8 **Soil Depth** – Sufficient soil depth and structural loading capacity will be provided for all planting (minimum 1,200mm soil depth will be provided for tree planting, 600mm will be provided for shrub and 300mm for groundcover and grass areas).

A.5.9 **Landscape Maintenance** – A minimum of 12 months Establishment Period will be provided for all planting. Landscape maintenance will be undertaken by an approved landscape maintenance company. A landscape maintenance manual shall be prepared to specify maintenance procedures required. A Compensation Wetland C is allowed for maintenance access only for the staff to conduct necessary maintenance work. Please refer to separate information in **Appendix J** for further details on the maintenance access.

A.5.10 Landscape Area Provision

Open Space Provision – The Proposed Development is divided into 2 portions, which includes the public housing portion and private development portion. The proposed population for the public housing portion is about 5,231 while about 3,153 for the private development portion. The minimum standard of 10 ha per 100,000 persons (1 sq.m. per person) as stipulated in Chapter 4 of the Hong Kong Planning Standards and Guidelines will be achieved by the proposed layout.

Greenery Provision – A minimum 30% greenery is achieved in accordance with the requirement of PNAP (APP - 152). An indicative Greenery Provision for public housing is shown in Figure B.10 – Indicative Greenery Provision at Public Housing Development (*Note: Greenery Provision for public housing will provide at least 20% greenery coverage as a minimum at the planning, design, and implementation stage and will target to achieve an overall target of 30% greenery coverage*).

Tree Assessment Figure

A.1 Tree Group Survey Schedule
A.2 Tree Treatment Plan
A.3.1 Tree Survey Photographs – SG1
A.3.2 Tree Survey Photographs – SG2
A.3.3 Tree Survey Photographs – SG3
A.3.4 Tree Survey Photographs – SG4
A.3.5 Tree Survey Photographs – PG1
A.3.6 Tree Survey Photographs – PG2
A.3.7 Tree Survey Photographs – PG3
A.3.8 Tree Survey Photographs – PG4
A.3.9 Tree Survey Photographs – RG1
A.3.10 Tree Survey Photographs – RG2

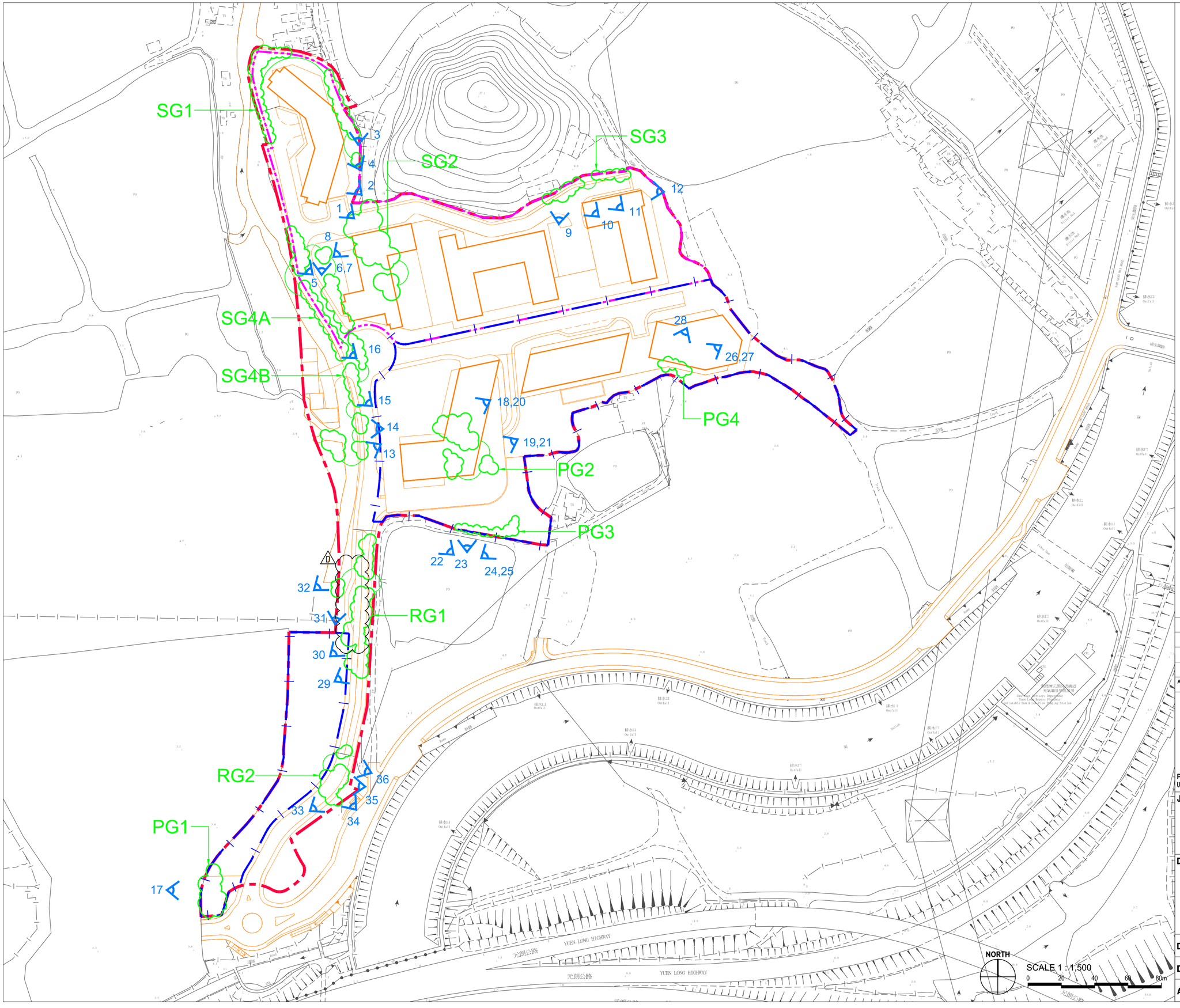
Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115,Tung Shing Lei, Yuen Long

Tree Group Survey Schedule

Date of survey: August 2021

TREE GROUP No.	Photo No.	BOTANICAL NAME	CHINESE NAME	APPROX. NOS.	APPROX. SIZE (m)			FORM (G/F/P)	HEALTH (G/F/P)	AMENITY VALUE (H/M/L)	SURVIVAL RATE AFTER TRANSPLANTING (H/M/L)	PROPOSED TREATMENT (RETAIN/ TRANSPLANT/ FELL)	REMARKS
					OVERALL HEIGHT	DBH	CROWN SPREAD						
SG1	1-4	*Dimocarpus longan*	龍眼	10	4 - 8	0.3 - 0.5	3 - 6	F - P	F	L	L	FELL : 21	SG1 is a stand of fruit tree species.
		Melia azedarach	苦楝	8	8 - 10	0.4 - 0.6	5 - 8	F - P	F	M - L	L		
		Syzygium jambos	蒲桃	1	6	0.5	5	F	F	L	L		
		Mangifera indica	芒果	1	12	0.6	12	F	F	M	L		
		Citrus maxima	柚	1	5	0.3	4	F	F	L	L		
		SG1 SUBTOTAL		***21***									
SG2	7-8	*Leucaena leucocephala*	銀合歡	30	3 - 8	0.1 - 0.3	3 - 6	P	F	L	L	FELL : 37	SG2 is a stand of planted fruit trees as well self-set and invasive pest plants.
		Dimocarpus longan	龍眼	5	5 - 8	0.3 - 0.5	4 - 8	P	F - P	L	L		
		Sonneratia caseolaris	海桑	1	8 - 12	0.5 - 0.7	8 - 12	P	F	L	L		
		Melia azedarach	苦楝	1	8	0.3	6	P	F	L	L		
		SG2 SUBTOTAL		***37***									
SG3	9-12	*Leucaena leucocephala*	銀合歡	6	3 - 6	0.1 - 0.3	2 - 4	P	F	L	L	FELL : 7	SG3 contains a juvenile *Litsea* and self-set pest plants *Leucaena* .
		Litsea monopetala	假柿木薑子	1	3	0.1	3	F	F	L	M		
		SG3 SUBTOTAL		***7***									
SG4A	5,6,16	*Leucaena leucocephala*	銀合歡	15	4 - 8	0.1 - 0.3	3 - 6	P	F - P	L	L	FELL : 18	SG4A is a stand of self-set and invasive pest plants. These are undesirable and pose a threat to the local ecology throughout the area.
		Sonneratia caseolaris	海桑	3	8 - 12	0.5 - 0.7	8 - 12	P	F	L	L		
		SG4A SUBTOTAL		***18***									
SG4B	13-15	*Leucaena leucocephala*	銀合歡	5	4 - 8	0.1 - 0.3	3 - 6	P	F - P	L	L	FELL : 10	SG4B is a stand of self-set and invasive pest plants. These are undesirable and pose a threat to the local ecology throughout the area.
		Sonneratia caseolaris	海桑	5	8 - 12	0.5 - 0.7	8 - 12	P	F	L	L		
		SG4B SUBTOTAL		***10***									
PG1	17	*Leucaena leucocephala*	銀合歡	10	4 - 8	0.1 - 0.3	3 - 6	P	F	L	L	FELL : 10	PG1 is a stand of self-set and invasive pest plants. These are undesirable species.
		PG1 SUBTOTAL		***10***									
PG2	18-21	*Leucaena leucocephala*	銀合歡	5	3 - 8	0.1 - 0.4	3 - 6	P	F	L	L	FELL : 6	PG2 is stand of largely invasive pest plants scattered throughout this area.
		Melia azedarach	苦楝	1	6	0.5	8	F	F	L	L		
		PG2 SUBTOTAL		***6***									
PG3	22-25	*Leucaena leucocephala*	銀合歡	10	3 - 6	0.1 - 0.3	3 - 5	P	F	L	L	FELL : 16	PG3 is stand of largely invasive pest plants scattered throughout this area.
		Melia azedarach	苦楝	6	5 - 8	0.2 - 0.5	5 - 8	F - P	F	L	L		
		PG3 SUBTOTAL		***16***									
PG4	26-28	*Celtis sinensis*	朴樹	1	5	0.6	6	P	P	L	L	FELL : 2	PG4 contains a fruit tree species and a tree (*Celtis*) that is severely damaged, half dead and fungal fruiting bodies could be observed.
		Dimocarpus longan	龍眼	1	5	0.3	4	F	F	L	L		
		PG4 SUBTOTAL		***2***									
RG1	29-32	*Leucaena leucocephala*	銀合歡	18	3 - 7	0.1 - 0.3	3 - 6	P	F - P	L	L	FELL : 18	RG1 is a stand of self-set and invasive pest plants. These are undesirable species scattered throughout this area.
		RG1 SUBTOTAL		***18***									
RG2	33-36	*Leucaena leucocephala*	銀合歡	5	4 - 10	0.1 - 0.4	3 - 6	P	F	L	L	FELL : 8	RG2 is a stand of tall and narrowly formed trees dominated by self-set and invasive pest plants. The majority of these trees are undesirable species.
		Melia azedarach	苦楝	2	8 - 10	0.3 - 0.4	5 - 6	P	F	L	L		
		Bridelia tomentosa	土蜜樹	1	5.0	0.1	4	P	F	L	L		
		RG2 SUBTOTAL		***8***									

GRAND TOTAL: 153 nos.



LEGEND

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE DEVELOPMENT
- SITE BOUNDARY FOR PUBLIC HOUSING DEVELOPMENT
- PROPOSED LAYOUT
- SG1/PG1/RG1 — EXISTING TREE GROUP TO BE FELLED
- 1 — VIEWPOINT

Amendment Numbers	Date	Amendment Description	Drawn by	Checked by	Approved by
D	19-03-2024	REVISED THE LAYOUT PLAN	EI	DH	TO
C	10-07-2023	REVISED THE LAYOUT PLAN	SAN	DH	TO
B	01-06-2023	REVISED THE LAYOUT PLAN	SAN	DH	TO
A	16-12-2022	REVISED THE LAYOUT PLAN	SAN	DH	TO

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Job title

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

Drawing title

TREE TREATMENT PLAN

Drawn	EI	**Scale**	1:1500@A2
Designed	DK	**Date**	2021-08-18
Approved by	TO	**Dwg. No.**	SHK65/TT01

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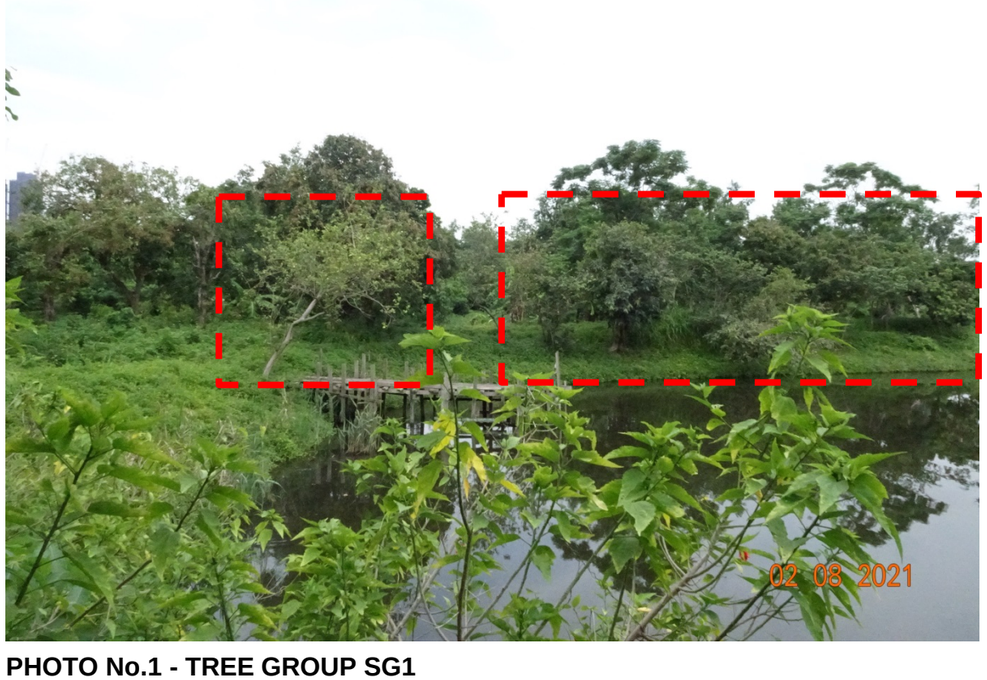

PHOTO No.1 - TREE GROUP SG1

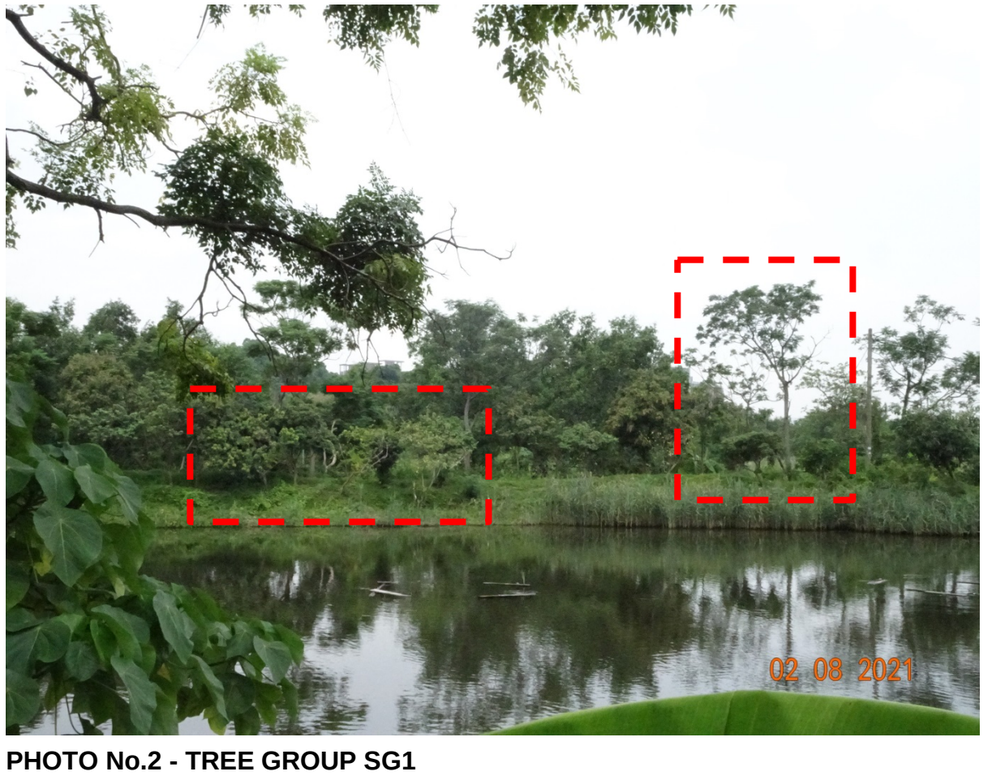

PHOTO No.2 - TREE GROUP SG1



PHOTO No.3 - TREE GROUP SG1



PHOTO No.4 - TREE GROUP SG1

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 11, Tung Shing Lei, Yuen Long

FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS



PHOTO No.5 - TREE GROUP SG4A



PHOTO No.6 - TREE GROUP SG4A



PHOTO No.7 - TREE GROUP SG2



PHOTO No.8 - TREE GROUP SG2

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FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS



PHOTO No.9 - TREE GROUP SG3



PHOTO No.10 - TREE GROUP SG3



PHOTO No.11 - TREE GROUP SG3



PHOTO No.12 - TREE GROUP SG3

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FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS



PHOTO No.13 - TREE GROUP SG4B



PHOTO No.14 - TREE GROUP SG4B



PHOTO No.15 - TREE GROUP SG4B



PHOTO No.16 - TREE GROUP SG4A

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 11, Tung Shing Lei, Yuen Long

FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS



PHOTO No.17 - TREE GROUP PG1



PHOTO No.18 - TREE GROUP PG2

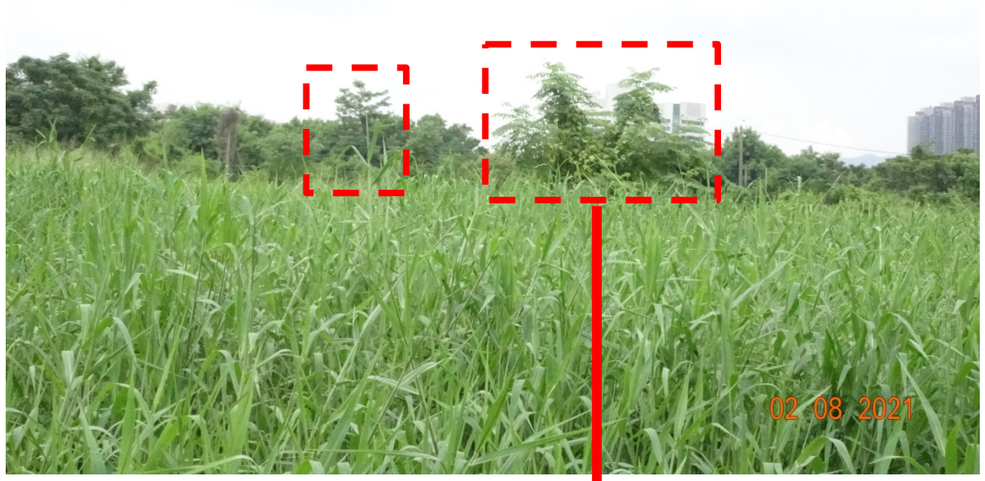


PHOTO No.19 - TREE GROUP PG2

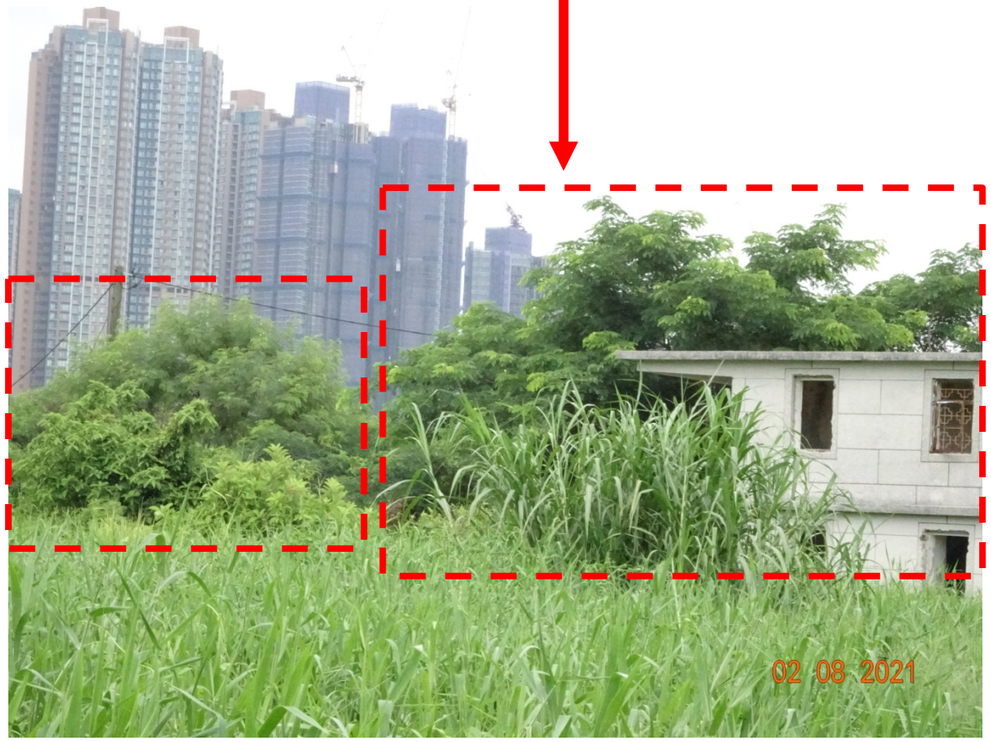


PHOTO No.20 - TREE GROUP PG2

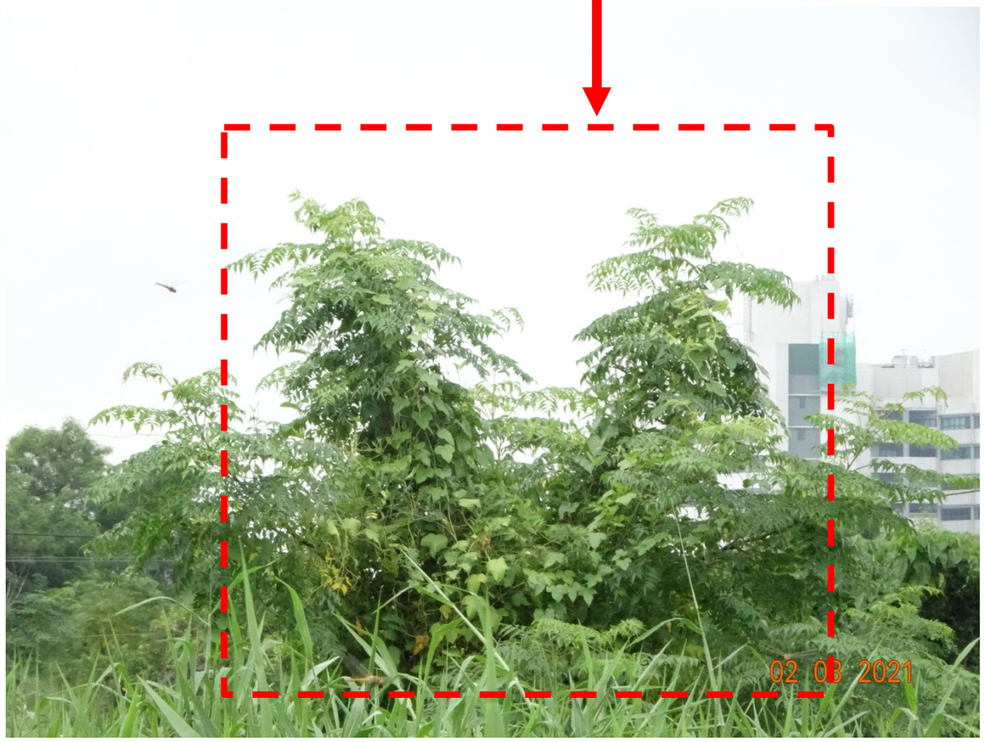


PHOTO No.21 - TREE GROUP PG2

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 11, Tung Shing Lei, Yuen Long

FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS



PHOTO No.22 - TREE GROUP PG3

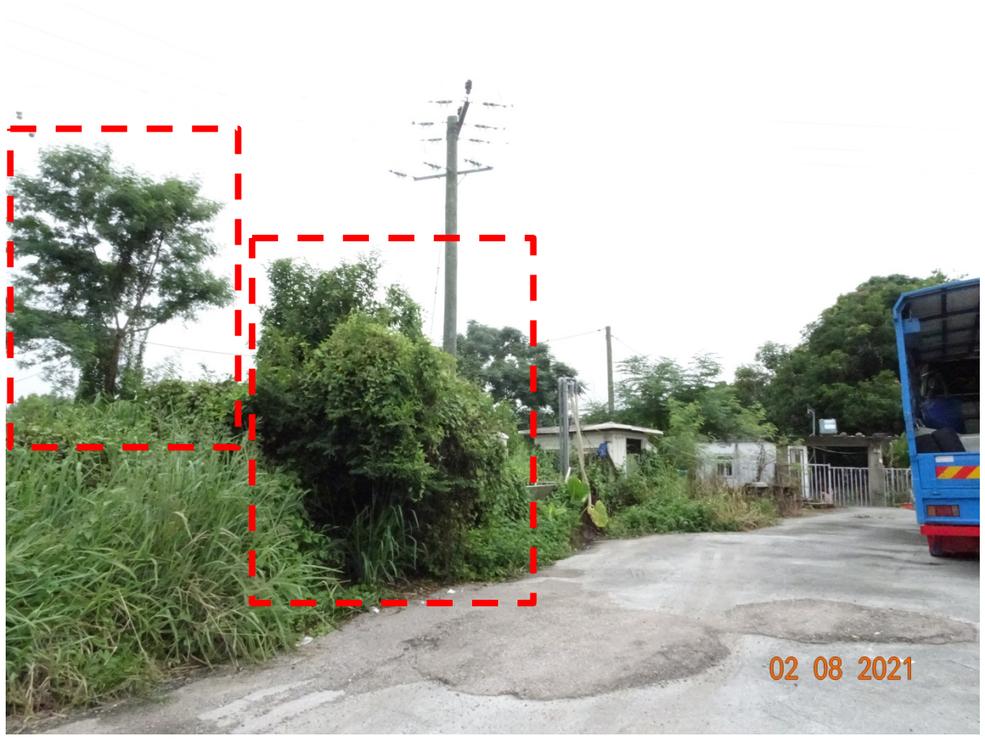


PHOTO No.23 - TREE GROUP PG3



PHOTO No.24 - TREE GROUP PG3



PHOTO No.25 - TREE GROUP PG3

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 11, Tung Shing Lei, Yuen Long

FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS



PHOTO No.26 - TREE GROUP PG4

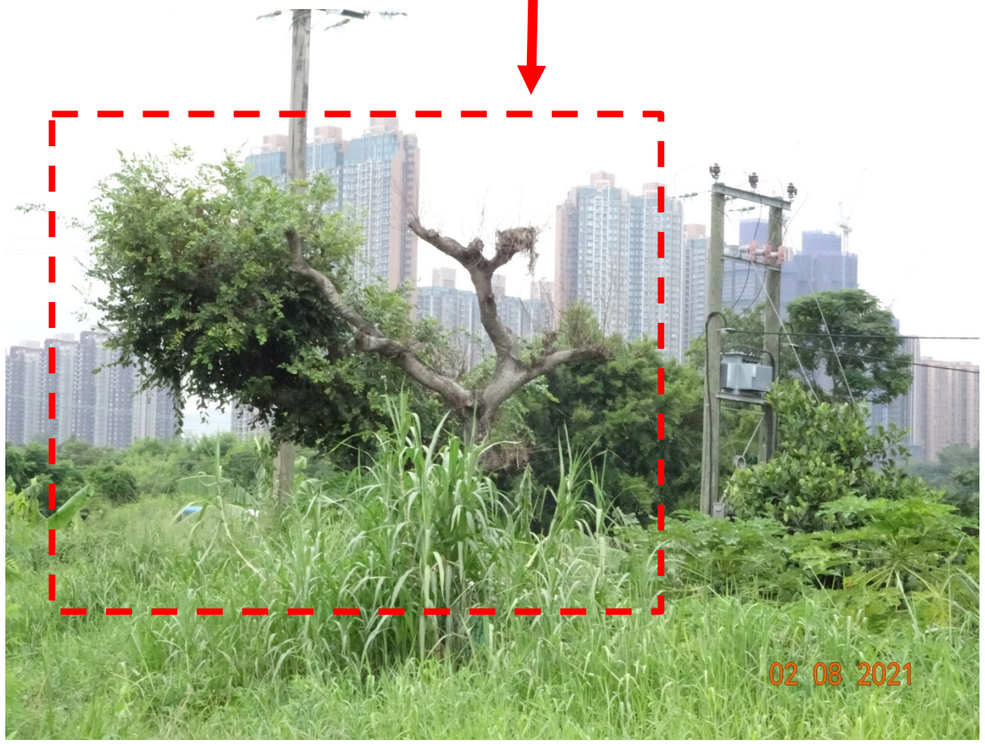


PHOTO No.27 - TREE GROUP PG4

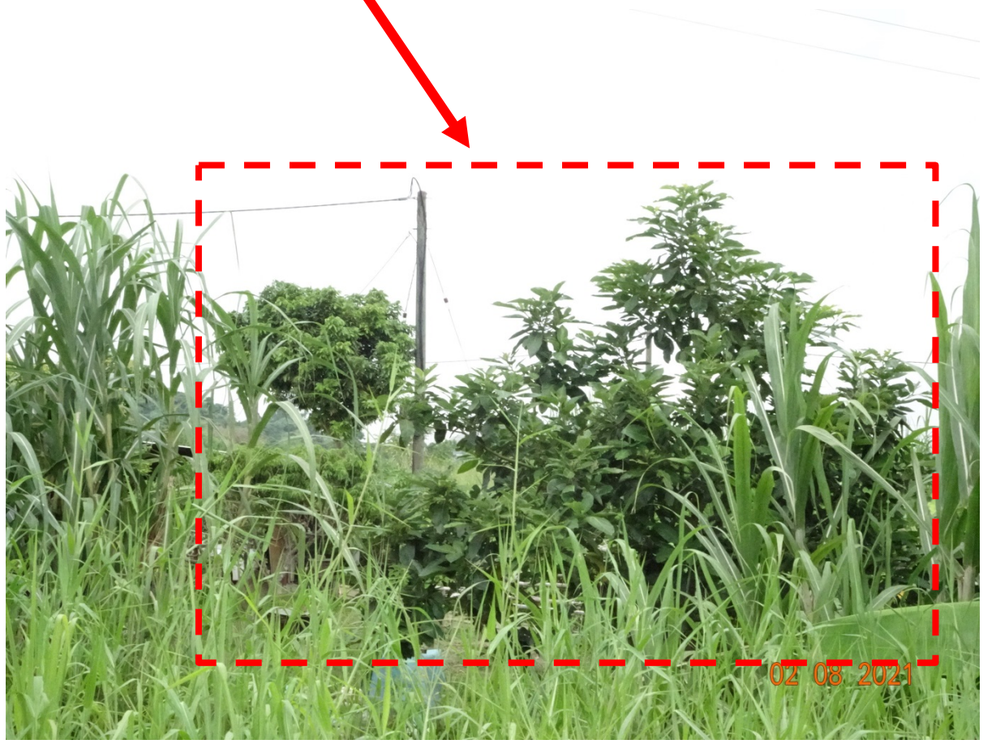


PHOTO No.28 - TREE GROUP PG4

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 11, Tung Shing Lei, Yuen Long
FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS



PHOTO No.29 - TREE GROUP RG1



PHOTO No.30 - TREE GROUP RG1



PHOTO No.31 - TREE GROUP RG1



PHOTO No.32 - TREE GROUP RG1

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 11, Tung Shing Lei, Yuen Long

FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS



PHOTO No.33 - TREE GROUP RG2



PHOTO No.34 - TREE GROUP RG2



PHOTO No.35 - TREE GROUP RG2

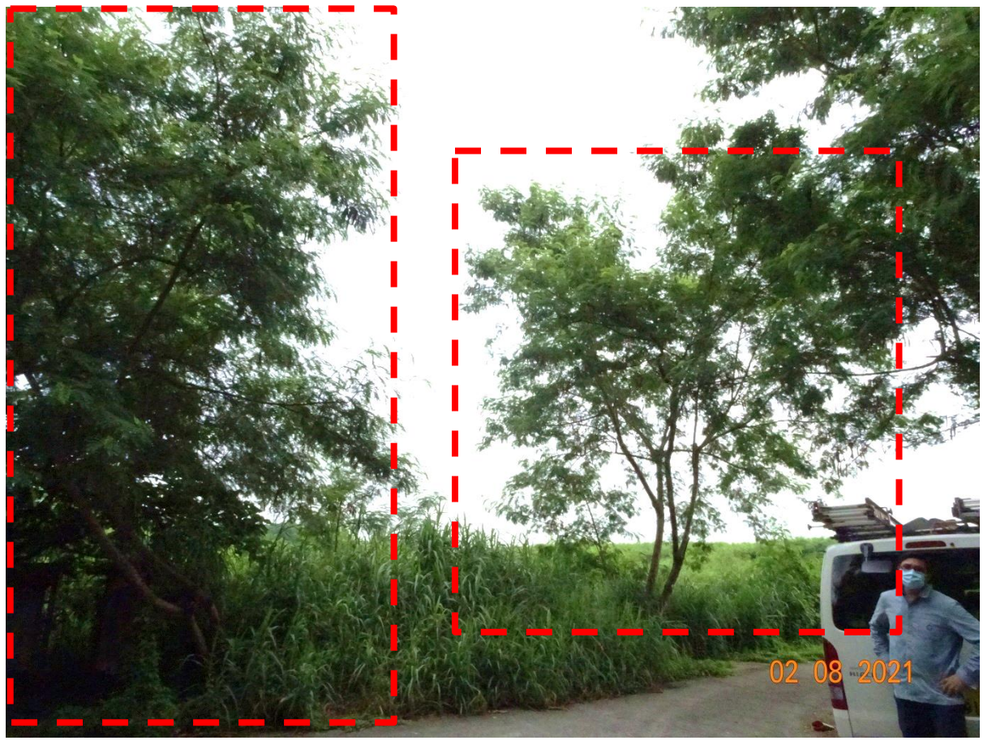


PHOTO No.36 - TREE GROUP RG2

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 11, Tung Shing Lei, Yuen Long

FIGURE B.2.1 TREE SURVEY PHOTOGRAPHS

Landscape Design Figures

B.1 Landscape Master Plan
B.2 Blow Up Northern Landscape Master Plan
B.3 Blow Up Southern Landscape Master Plan
B.4 Landscape Section S1 – S1
B.5 Landscape Section S2 – S2
B.6 Landscape Section S3 – S3
B.7 Landscape Section S4 – S4
B.8 Landscape Section S5 – S5
B.9 Open Space Provision
B.10 Indicative Greenery Provision for Public Housing Development

LEGEND

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE DEVELOPMENT
- SITE BOUNDARY FOR PUBLIC HOUSING DEVELOPMENT
- 1.8M FENCE WALL
- PROPOSED TREES
- BUFFER PLANTING (TREES & SHRUBS)
- SHRUBS & GROUNDCOVER
- NULLAH
- TIMBER DECK
- PAVING
- PRIVATE HOUSING ENTRANCE
- PUBLIC HOUSING ENTRANCE

S6 S1 S6 SITTING AREA T8 24 STOREYS VIEWING DECK T7 26 STOREYS GARDEN SITTING AREA FITNESS AREA PAVILION T6 24 STOREYS PLAY AREA SEATING DECK PAVILION T5 24 STOREYS SITTING AREA SEATING DECK S2 S5 T3 24 STOREYS COMPENSATION WETLAND E SEWAGE PUMPING STATION PLAY AREA T2 24 STOREYS SWIMMING POOL FITNESS AREA S2 T1 23 STOREYS SEATING AREA FITNESS AREA SEATING AREA PLAY AREA SEATING DECK SEATING DECK COMPENSATION WETLAND D S5 S1 S3 S3 COMPENSATION WETLAND C HO CHAU ROAD S4 S4 NORTH SCALE 1 : 2,000 0 20 40 60 80 100m

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B1 LANDSCAPE MASTER PLAN | MAR 2024 REV.G SCALE 1:2000 (A3)

LEGEND

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE DEVELOPMENT
- SITE BOUNDARY FOR PUBLIC HOUSING DEVELOPMENT
- PROPOSED TREES
- BUFFER PLANTING (TREES & SHRUBS)
- SHRUBS & GROUNDCOVER
- NULLAH
- TIMBER DECK
- PAVING
- PRIVATE HOUSING ENTRANCE
- PUBLIC HOUSING ENTRANCE

S1
S2
S5
S6
T1 23 STOREYS
T2 24 STOREYS
T3 24 STOREYS
T5 24 STOREYS
T6 24 STOREYS
T7 26 STOREYS
T8 24 STOREYS
SITTING AREA
VIEWING DECK
GARDEN
SITTING AREA
FITNESS AREA
PAVILION
PLAY AREA
SEATING DECK
PAVILION
SEATING DECK
SITTING AREA
SEWAGE PUMPING STATION
PLAY AREA
SEATING AREA
SEATING DECK
SEATING DECK
COMPENSATION WETLAND D
SWIMMING POOL
FITNESS AREA
SEATING AREA
FITNESS AREA
PLAY AREA
COMPENSATION WETLAND E
NORTH
SCALE 1 : 1,250
0 10 20 30 40 50m

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B2 | FEB 2024
BLOW UP NORTHERN LANDSCAPE MASTER PLAN | REV.F
SCALE 1:1250 (A3)

LEGEND

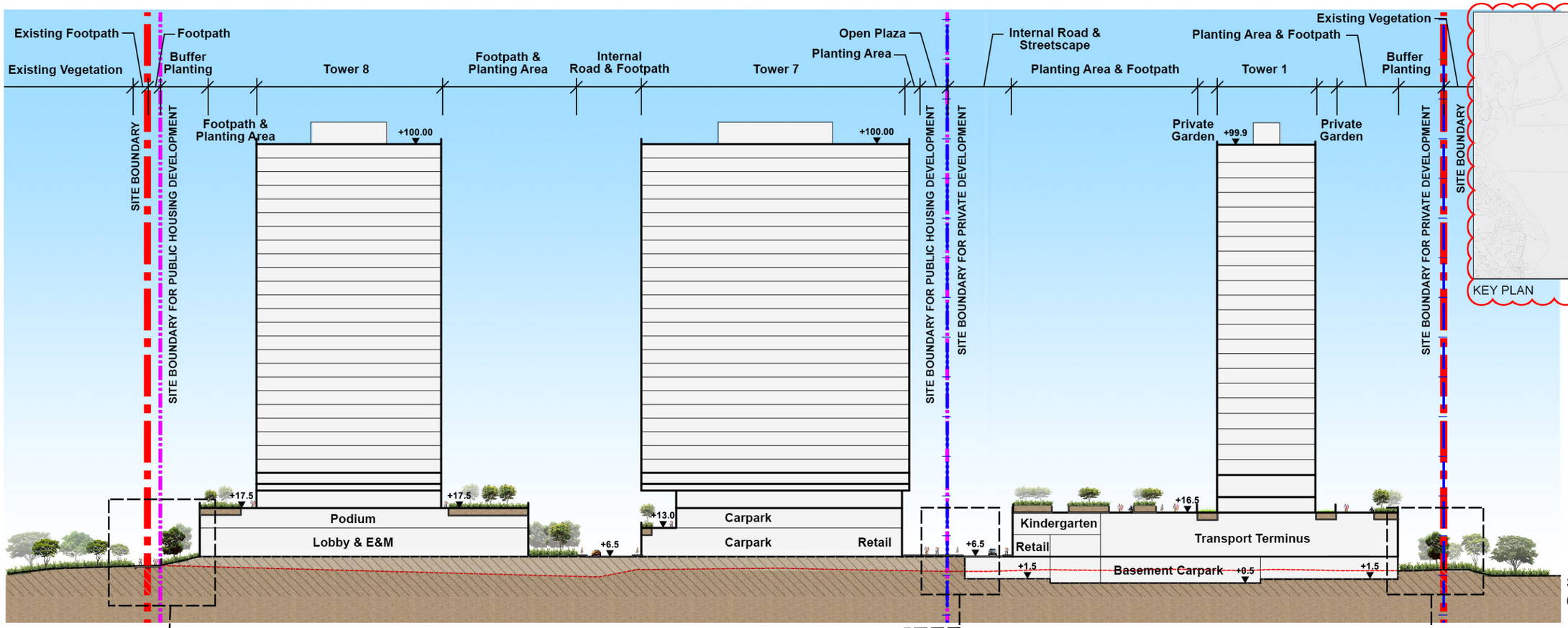
- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE DEVELOPMENT
- SITE BOUNDARY FOR PUBLIC HOUSING DEVELOPMENT
- 1.8m FENCE WALL
- PROPOSED TREES
- BUFFER PLANTING (TREES & SHRUBS)
- SHRUBS & GROUNDCOVER
- NULLAH
- TIMBER DECK
- PAVING

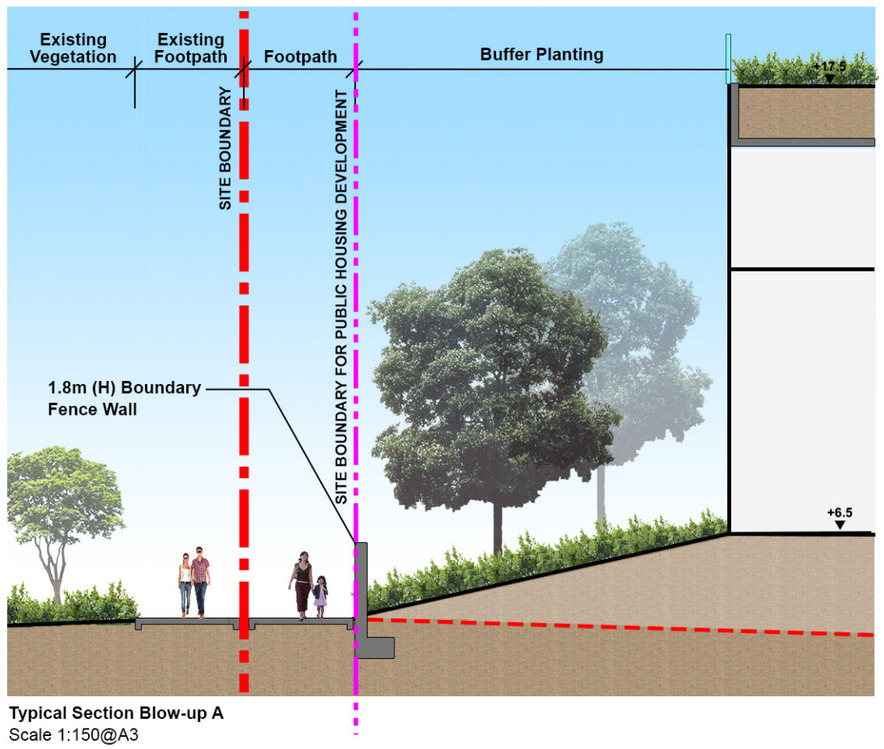
T1
23 STOREYS
+99.90

SEATING AREA
FITNESS AREA
SEATING AREA
PLAY AREA
SEATING DECK
SEATING DECK
COMPENSATION WETLAND D
COMPENSATION WETLAND C
+6.50
+5.50
S3
S3
S4
S4
HO CHAU ROAD
YUEN LONG HIGHWAY
YUEN LONG HIGHWAY
NORTH
SCALE 1 : 1,250
0 10 20 30 40 50m

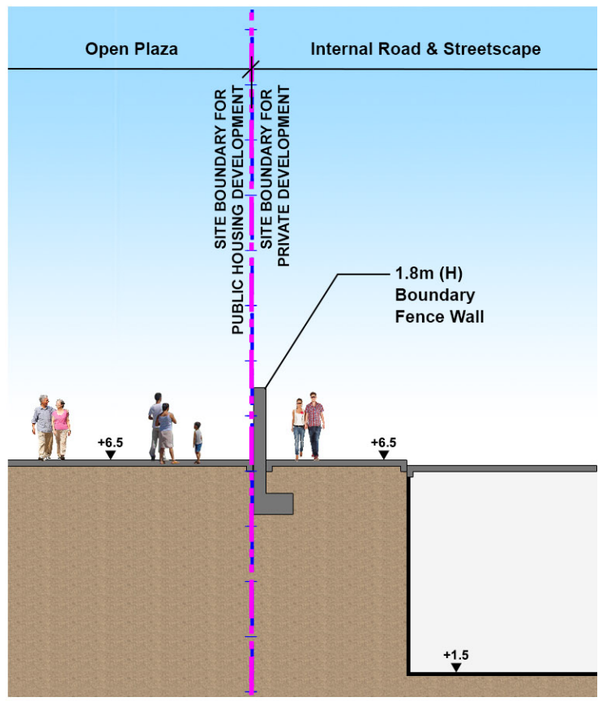
PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B3 | MAR 2024
BLOW UP SOUTHERN LANDSCAPE MASTER PLAN | REV.E
SCALE 1:1250 (A3)

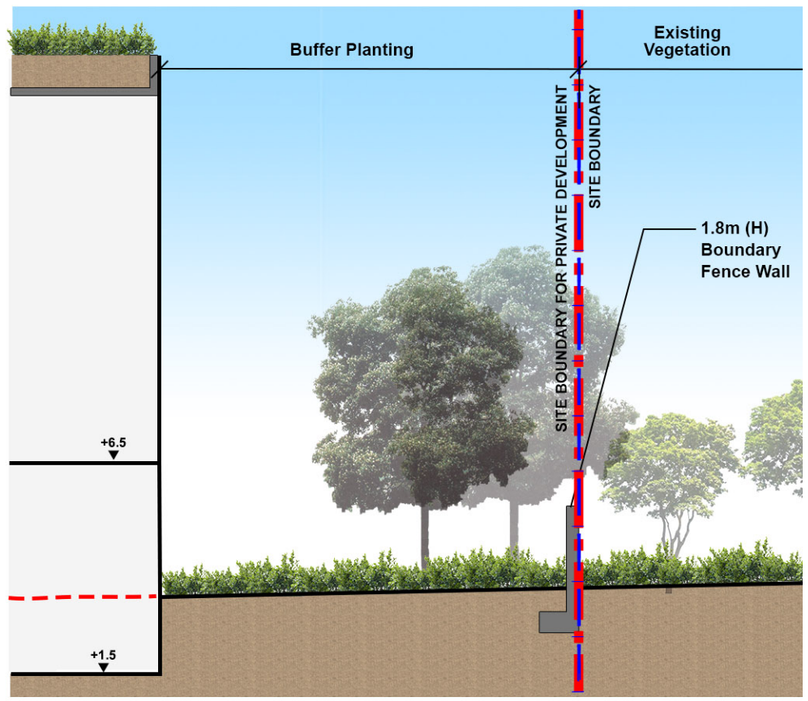




Typical Section Blow-up A
Scale 1:150@A3



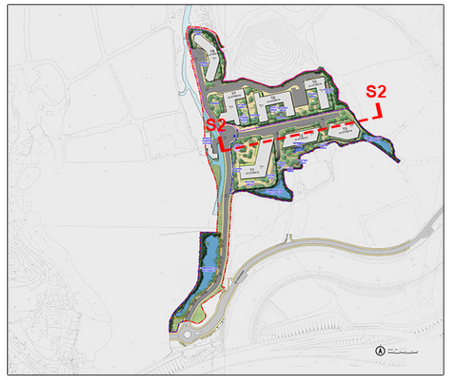
Typical Section Blow-up B
Scale 1:150@A3



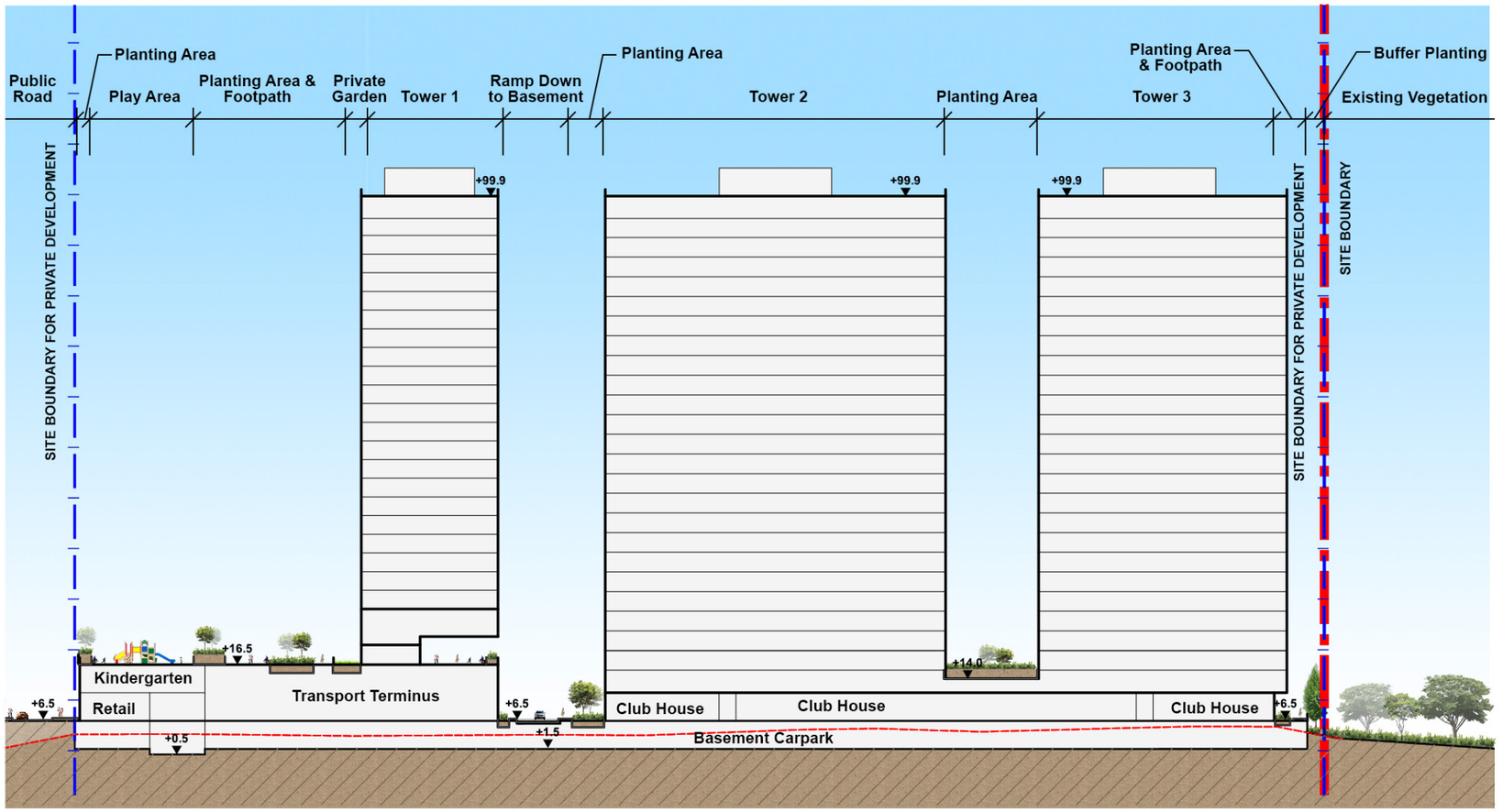
Typical Section Blow-up C
Scale 1:150@A3

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B4 SECTION 1 | FEB 2024 REV.G SCALE 1:1000 (A3)



KEY PLAN



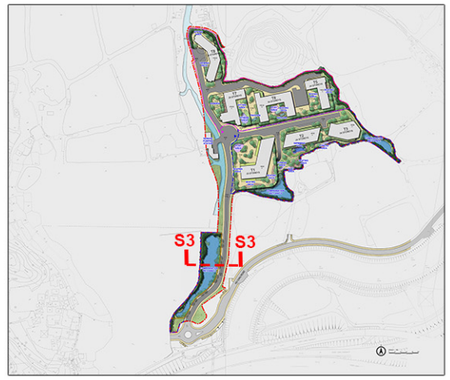
SCALE 1 : 1,000

0 10 20 30 40 50m

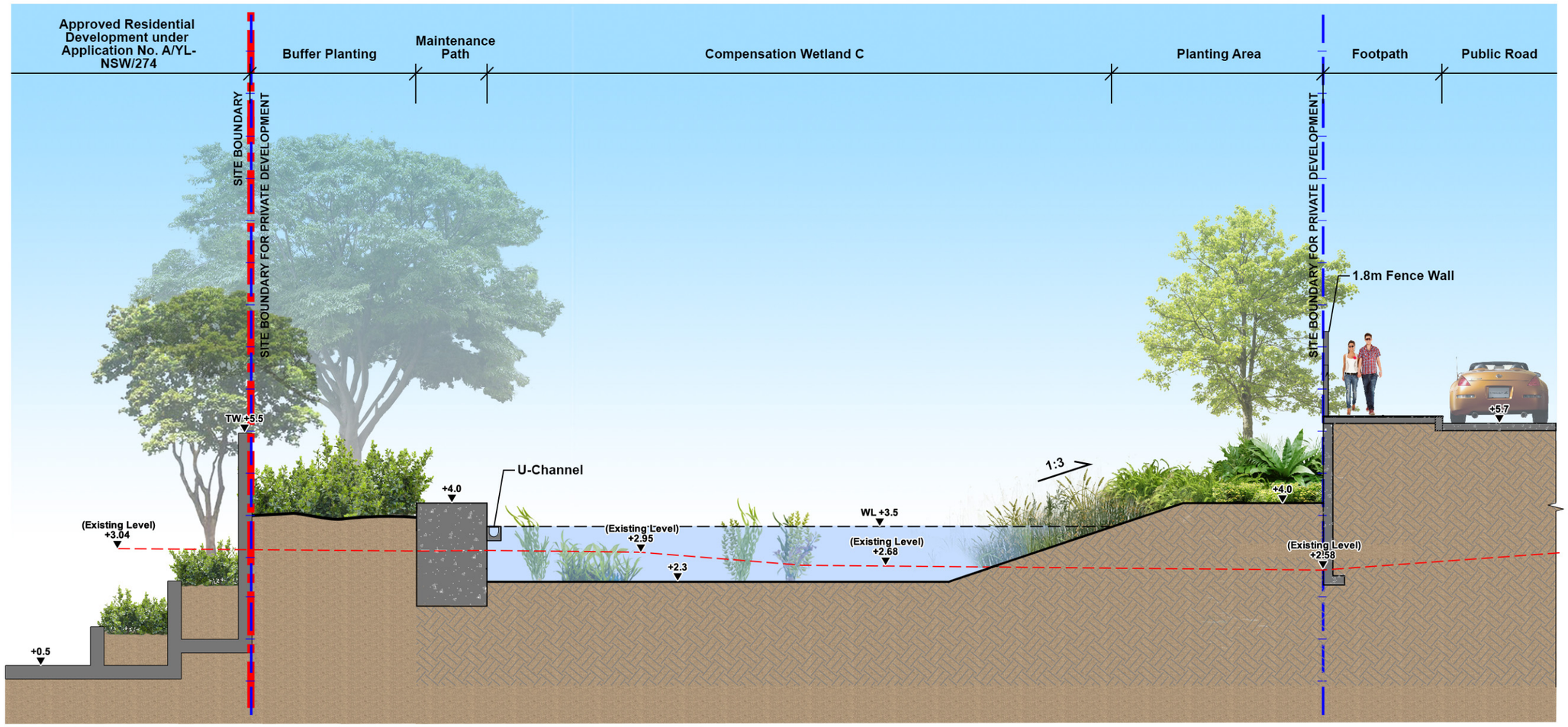
PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B5
SECTION 2

NOV 2023
REV.D
SCALE 1:1000 (A3)



KEY PLAN

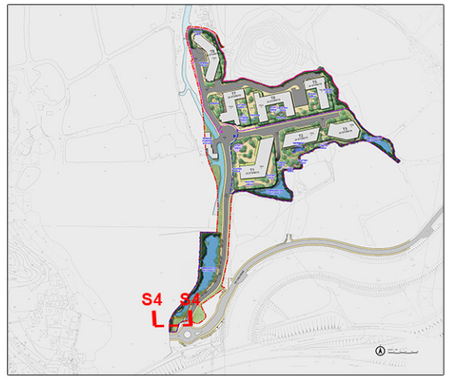


SCALE 1 : 100

0 1 2 3 4 5m

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B6 SECTION 3 | NOV 2023 REV.D SCALE 1:100 (A3)



KEY PLAN

Approved Residential Development under Application No. A/YL-NSW/274

Buffer Planting | Landscape Area | Footpath | Public Road | Footpath

SITE BOUNDARY

SITE BOUNDARY FOR PRIVATE DEVELOPMENT

SITE BOUNDARY FOR PRIVATE DEVELOPMENT

SITE BOUNDARY

+5.6

+5.5

+5.6

JAGUAR

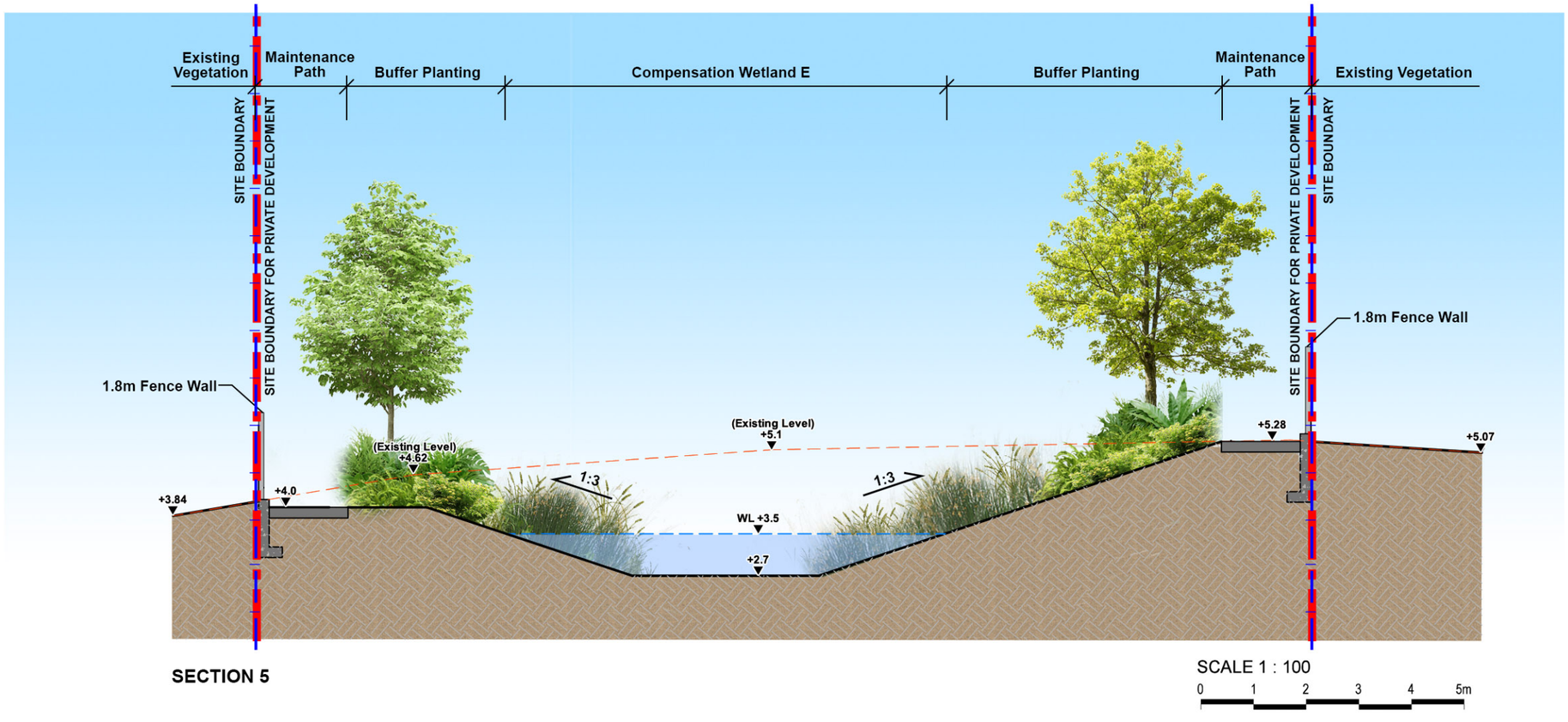
SCALE 1 : 100

0 1 2 3 4 5m

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B7
SECTION 4

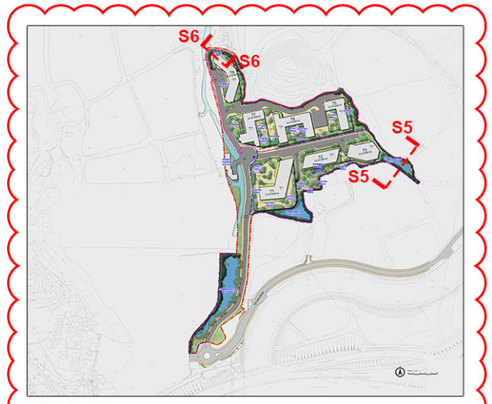
NOV 2023
REV.D
SCALE 1:100 (A3)



SECTION 5

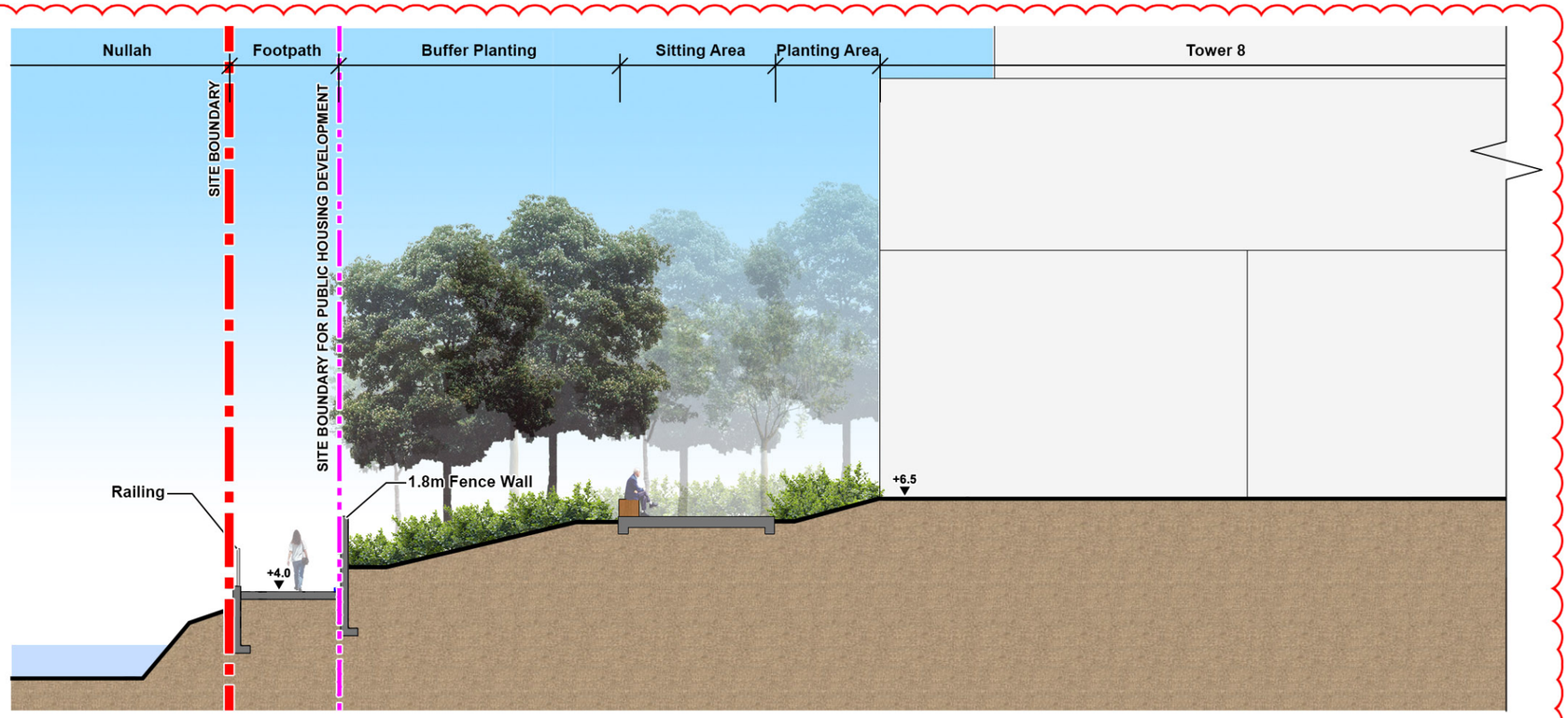
SCALE 1 : 100

0 1 2 3 4 5m



KEY PLAN

E



SECTION 6

SCALE 1 : 150

0 2 4 6 8m

E

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B8
SECTION 5 & 6

FEB 2024
REV.E
SCALE 1:100 (A3)

LEGEND

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE DEVELOPMENT
- SITE BOUNDARY FOR PUBLIC HOUSING DEVELOPMENT
- OPEN SPACE PROVISION FOR PRIVATE DEVELOPMENT NOT LESS THAN 3,153 sq.m
- OPEN SPACE PROVISION FOR PUBLIC HOUSING DEVELOPMENT NOT LESS THAN 5,231 sq.m

T8
24 STOREYS
+100.00

T7
26 STOREYS
+100.00

T6
24 STOREYS
+100.00

T5
24 STOREYS
+100.00

T3
24 STOREYS
+99.90

T2
24 STOREYS
+99.90

T1
23 STOREYS
+99.90

HO CHAU ROAD

NORTH

SCALE 1 : 2,000
0 20 40 60 80 100m

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B9
PRIVATE OPEN SPACE PROVISION

MAR 2024
REV.F
SCALE 1:2000 (A3)

LEGEND

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PUBLIC HOUSING DEVELOPMENT
- POTENTIAL GREENERY PROVISION FOR PUBLIC HOUSING
  (HD will provide at least 20% greenery coverage as a minimum at planning, design and implementation stage and will target to achieve an overall target of 30% greenery coverage. This plan demonstrates not less than 30% greenery coverage for illustration purpose only)

T8
24 STOREYS
+100.00

T7
26 STOREYS
+100.00

T6
24 STOREYS
+100.00

T5
24 STOREYS
+100.00

T2
24 STOREYS
+99.90

T3
24 STOREYS
+99.90

+4.00
+17.50
+6.50
+13.00
+16.50
+14.00

NORTH

SCALE 1 : 2,000
0 20 40 60 80 100m

The current design of public housing portion is indicative and provided to demonstrate technical feasibility only. It will be subject to refinement by the relevant goverment department at detailed design stage.

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

FIGURE B10
INDICATIVE GREENERY PROVISION FOR PUBLIC HOUSING DEVELOPMENT

FEB 2024
REV. C
SCALE 1:2000 (A3)

Appendix B

Revised Visual Impact Assessment

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Yuen Long, the New Territores

Revised Visual Impact Assessment

(May 2024)

llewelyn davies
ARCHITECTS PLANNERS DESIGNERS
Llewelyn-Davies Hong Kong Ltd

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1 INTRODUCTION

1.1 Background

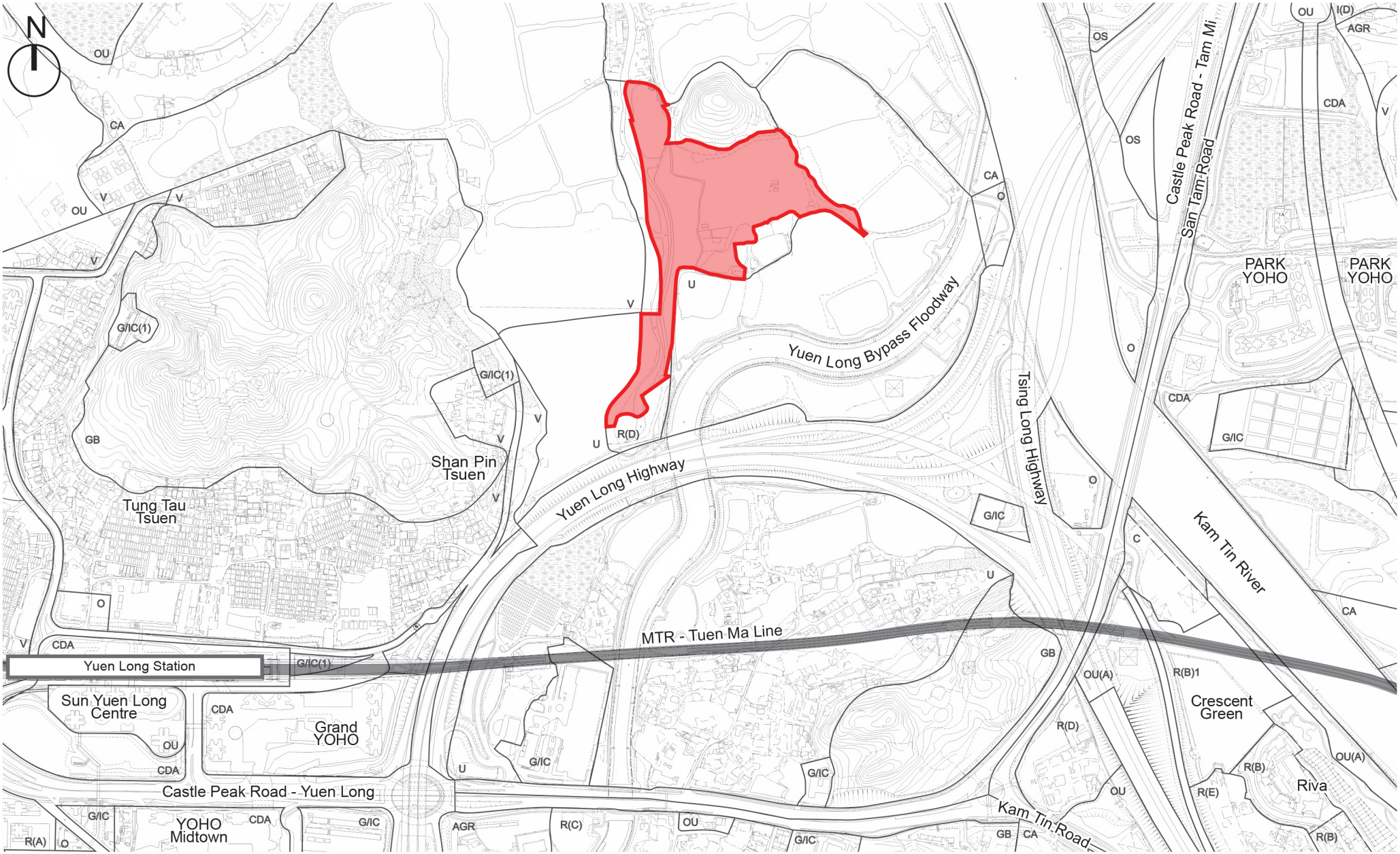
1.1 This Visual Impact Assessment (VIA) is prepared for the Land Sharing Pilot Scheme (LSPS) application submitted to the Land Sharing Office of the Development Bureau for the proposed residential developments of private and public housing types respectively, with commercial uses, community facilities and transport terminus (hereafter referred to as the "Proposed Development/ Proposed Scheme") at various lots in Tung Shing Lei**,** Yuen Long, New Territories (i.e. hereafter referred to as the "Application Site").

1.2 The Application Site falls within an area zoned "Residential Group (D)" ("R(D)") on the approved Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8 (the OZP) (**Figure 1.1** refers). Part of the Application Site is the subject of one previously approved rezoning application numbered Y/YL-NSW/4 (i.e. hereafter referred to as the "Approved Scheme") for the facilitation of a house development that was granted approval by the Town Planning Board on 12th January 2018. The approved rezoning proposed a "R(D)2" zoning subject to a maximum domestic PR restriction of 0.34 and total gross floor area (GFA) of about 10,150m^2 that offer 57 nos. of houses in total. The approved development parameters have yet to be reflected on the OZP and the Application Site remains as a "R(D)" zone with a maximum domestic PR restriction of 0.2 and a maximum building height of 2 storeys (6m).

1.3 Situated adjacent to the northeast of Yuen Long Town, the Application Site enjoys high accessibility due to the close proximity to the Tuen Ma Line Yuen Long Station and Yuen Long Highway. Taking into account the changing surrounding development context including the dense and high-rise residential developments concentrated around Tuen Ma Line Yuen Long Station and gradually spilling into its surrounding, the nearby completed/planned residential developments as well as the potential public housing sites announced in 2017 Policy Address in Tung Shing Lei and Au Tau near the Application Site, it is evident that the area is gradually transforming into an urban township.

1.4 With an aim to contributing to the Government's established policy direction of boosting housing supply while not trading off affordable housing at the same time, the Applicant wishes to contribute to accelerate the housing supply in town in cooperative effort with the Government in participating in the LSPS to share partial of the Application Site for the development of public housing that accounts for 70% of the increased domestic GFA derived from this Proposed Development.

1.5 The LSPS is set to complement the government-led planning of private land to make timely and meaningful impact on the housing supply in the territory that safeguards public interest, the Proposed Development is subject to a few minimum requirements on housing gain. They include the delivery of an **increased domestic GFA of no less than 50,000m^2 and at least 1,000 additional housing units**; and no less than 70% of the increased domestic GFA are allocated for public housing or public housing. As the policy objective of the LSPS is to substantially increase housing supply on available land (i.e. at least 1,000 additional housing units), it is therefore expected that **notable visual change to the Application Site is inevitable as a result of the LSPS requirement**.



llewelyn davies	Title: Location Plan		
		Checked: DH	Drawn: PW
		Rev: 0	Date: May 2024
		Scale: N/A	Figure: 1.1

1.6 This VIA is prepared in accordance with the 'Town Planning Board Guidelines No. 41 – Guidelines on Submission of Visual Impact Assessment for Planning Applications to the Town Planning Board' ('TPB PG-No. 41') in order to evaluate the degree of visual impacts on visual sensitive receivers (VSRs) from major public viewpoints (VPs) due to the proposed development at the Application Site.

1.7 This VIA will cover the followings:

Section 2: describes the proposed development;
Section 3: identifies the visual context and the baseline visual condition of the Application Site;
Section 4: identifies the key public viewpoints and visual sensitive receivers;
Section 5: appraises the potential visual impacts induced by the proposed development; and
Section 6: summarises the findings of the VIA.

2 INDICATIVE PROPOSED SCHEME

2.1 Indicative Proposed Scheme

2.1.1 Based on the aforementioned requirements in Section 1, the indicative development schedules for public housing and private housing are highlighted below in **Tables 2.1 and 2.2** while the indicative Master Layout Plan and Section Plans are attached in **Figures 2.1 to 2.5**.

Table 2.1 – Indicative Development Schedule of Public Housing

Development Schedule of Public Housing Portion	
Development Site Area	About 21,375m^2 ^
Total GFA - Domestic Portion - Non Domestic Portion	About 95,100m^2 - About 93,400m^2 (1) - About 1,700m^2 #
Equivalent Total PR - Domestic Portion - Non Domestic Portion	About 4.45 (2) - About 4.37 (2) - About 0.08 (2)
Domestic Portion	
Domestic GFA	About 93,400m^2
Maximum Building Height	Not more than 100mPD
No. of Residential Storeys	Not more than 24 storeys (3) *
No. of Residential Towers	4 * (Tower 5 – Tower 8)
No. of Units	1,868 units
Average Flat Size	About 50m^2 (4)
Anticipated Population	About 5,231 person (5)
Local Open Space	Not less than 5,231m^2 (6)
Non-Domestic Portion – Retail, Management Office, G/IC and Ancillary Car Parking Facilities	
Maximum Building Height	Not more than 17.5mPD *
No. of Storeys	Not more than 2 storeys *
Retail Facilities	
Retail GFA	About 1,200m^2
Management Office	
Management Office GFA	About 500m^2
G/IC Facilities (8)(9)	
G/IC GFA (7) <u>Social Welfare Facilities Requested by SWD:</u> - Neighbourhood Elderly Centre (NEC) - One team of Home Care Services (HCS) for Frail Elderly Persons (4-team	About 4,670m^2

size non-kitchen based)	
Ancillary Car Parking Facilities (7)	
Domestic & Retail Car Park GFA	About 12,980m^2
G/IC Car Park GFA	N/A (Open Carpark on Ground Floor)

Remarks:

(1) The actual domestic GFA shall be 93,400.3m^2 (i.e. 70% of the total increased GFA of current LSPS application). It is rounded to whole number as 93,400m^2 for reference.
(2) Based on the development site boundary of the public housing portion
(3) Excluding above ground car park, GIC, lobby and transfer plate floor
(4) Average flat size of 50m^2 formulated in accordance with Paper No. DEVB(PL-CR)1-55/127/1 – Legislative Council Brief Land Sharing Pilot Scheme
(5) Person per flat ratio of 2.8 adopted as per LSPS-TG 1
(6) Not less than 1m^2 per person
(7) GFA for both G/IC Facilities and Ancillary Car Parking Facilities are exempted from GFA and PR calculation.
(8) Area equivalent to about 5% of the total attainable domestic GFA of the public housing portion has been set aside for the provision of welfare facilities as per Policy Address 2020
(9) Including SWD's suggested Neighbourhood Elderly Centre (about 328m^2 of NOFA or about 722m^2 of GFA); One team of Home Care Services (HCS) for Frail Elderly Persons (4-team size non-kitchen based) (about 257m^2 of NOFA or about 565m^2 of GFA). The final GFA and layout will be subject to detailed design of the relevant government departments.

& Net site area of public housing portion will be subject to further study for site formation scheme
* For reference only, subject to future design
# Social welfare facilities and aboveground carpark GFA are accountable under Building Ordinances and can be exempted from GFA and PR calculation under planning requirement

Table 2.2 – Indicative Development Schedule of Private Housing

Development Schedule of Private Housing Portion	
Development Site Area (1)	About 24,301m^2
Total GFA - Domestic Portion - Non Domestic Portion	About 52,424m^2 - About 50,179m^2 (2) - About 2,245m^2
Equivalent Total PR - Domestic Portion - Non Domestic Portion	About 2.16 (3) - About 2.06 (3) - About 0.09 (3)
Domestic Portion	
Domestic GFA (Total) - Approved / Permitted GFA - Increased GFA	About 50,179m^2 (2) - About 10,150m^2 - About 40,029m^2
Maximum Building Height	Not more than 99.9mPD
No. of Residential Storeys	Not more than 24 storeys (4)
No. of Residential Towers	3 (Tower 1 – Tower 3)
No. of Units	1,261 units
Average Flat Size	About 39.8m^2
Anticipated Population	About 3,153 person (5)
Private Open Space	Not less than 3,153m^2 (6)
Non-Domestic Portion – Retail, Kindergarten and Public Transport Terminus	
Maximum Building Height	Not more than 16.5mPD
Total No. of Storeys	Not more than 2 storeys
Retail and Kindergarten	
Commercial GFA - Retail - Kindergarten (7)	About 2,245m^2 - About 1,245m^2 - About 1,000m^2
Public Transport Terminus (including bus operator's office)	
Gross Floor Area (8)	About 4,675m^2
Clubhouse	
Gross Floor Area (9)	About 2,250m^2
Maximum Building Height	Not more than 14mPD
No. of Storeys (10)	1

Remarks:

(1) With the inclusion of compensation wetlands of about 6,900m^2 which is not suitable for housing development thereon, the remaining effective site area is about 17,401m^2

(2) The actual domestic GFA shall be 50,178.7m^2 (i.e. including approved domestic GFA of 10,150m^2 at the Application Site and 30% of the total increased GFA of current LSPS application of 40,028.7m^2). It is rounded to whole number as 50,179m^2 for reference.

(3) Based on the development site boundary of the private housing portion (24,301m^2).

(4) Excluding basement(s) for carpark / E&M / Clubhouse / transfer plate floor

(5) Adopting the same person per flat (i.e. 2.5) as per the approved Application No. A/YL-

NSW/274.
(6) Not less than 1m^2 per person
(7) Provision of a 8-classroom private kindergarten to cater for the needs of the anticipated population generated from both private housing and public housing developments as per HKPSG requirement
(8) GFA for public transport terminus, as required by the Government, is disregarded from GFA and PR calculation
(9) About 4% of total domestic GFA or 2,250m^2 (whichever is greater); exempted from GFA calculation
(10) Excluding basement floor

Additional Remarks:
As requested by LSO, the table below summarizes the hypothetical parameters of the no. of units and the anticipated population if the average flat size of the private housing portion is assumed to be 50m^2. It should be noted that the table below is for reference only, as the proposed scheme prepared by the Applicant is based on a flat mix with an average flat size of about 39.8m^2 based on which various technical assessments have been conducted.

	Hypothetical Parameters
Average Flat Size	50m^2
No. of Units	1,004 units
Anticipated Population	About 2,510 person

2.1.2 Under the indicative development scheme, the Proposed Development will be delivered into a public housing portion and private housing portion, both with domestic and non-domestic provisions. For the public housing portion, with a domestic plot ratio of about 4.37 and total domestic GFA of about 93,400m², the proposed public housing development consists of 4 residential towers of not more than 24 residential storeys with building height of not more than 100mPD (excluding ground car park, GIC, lobby and transfer plate floor). The public housing development is able to yield a total of 1,868 affordable housing units to cater for the acute housing needs of many across the city. Considering the self-sustainable nature of the Proposed Development, supporting supplementary facilities including retail uses of about 1,200m², ancillary car-parking facilities and community facilities of about 12,980m² and 4,670m² respectively that are exempted from GFA calculation will be provided to serve future residents and the area.

2.1.3 Meanwhile, for the private housing portion, a total domestic GFA of about 50,179m² including the 10,150m² from the approved application is proposed to be translated into 3 nos. of residential towers of not more than 23 and 24 residential storeys with a building height of also not more than 99.9mPD. The non-domestic provision within the private housing portion includes the GFA exempted clubhouse located at the basement and ground floors of Tower 2 and Tower 3, a non-domestic block along the western boundary of private housing portion accommodating retail facilities of 1,245m², a kindergarten of 1,000m² in GFA and a GFA exempted public transport terminus.



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Title

Site Demarcation Plan

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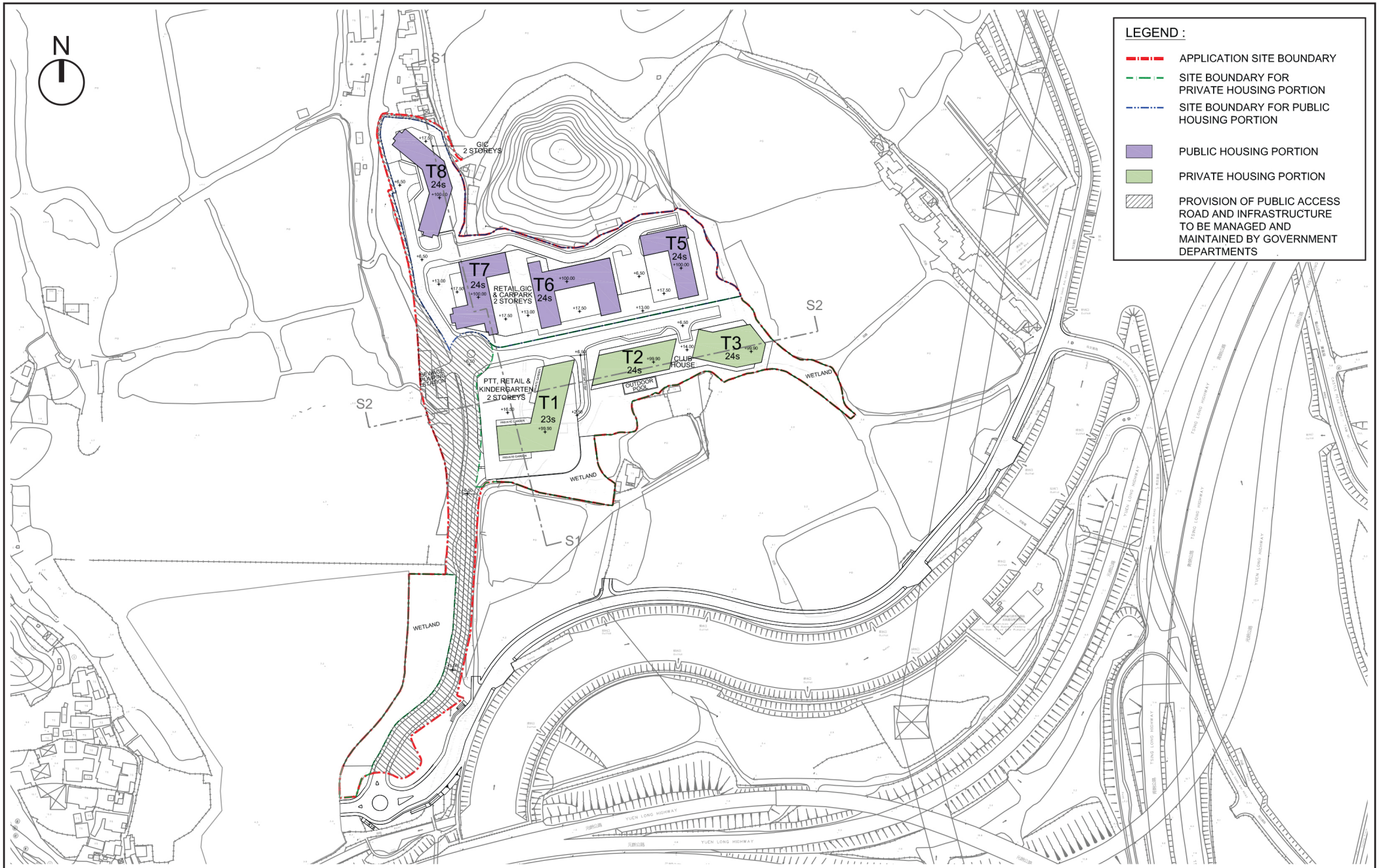
Rev	0	Date	May 2024
Scale	N/A	Figure	2.1



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Title

Indicative Block Plan

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Rev	0	Date	May 2024
Scale	N/A	Figure	2.2

N



LEGEND :

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION

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Title

Indicative Basement Floor Plan

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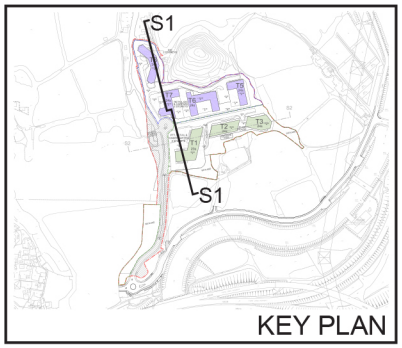
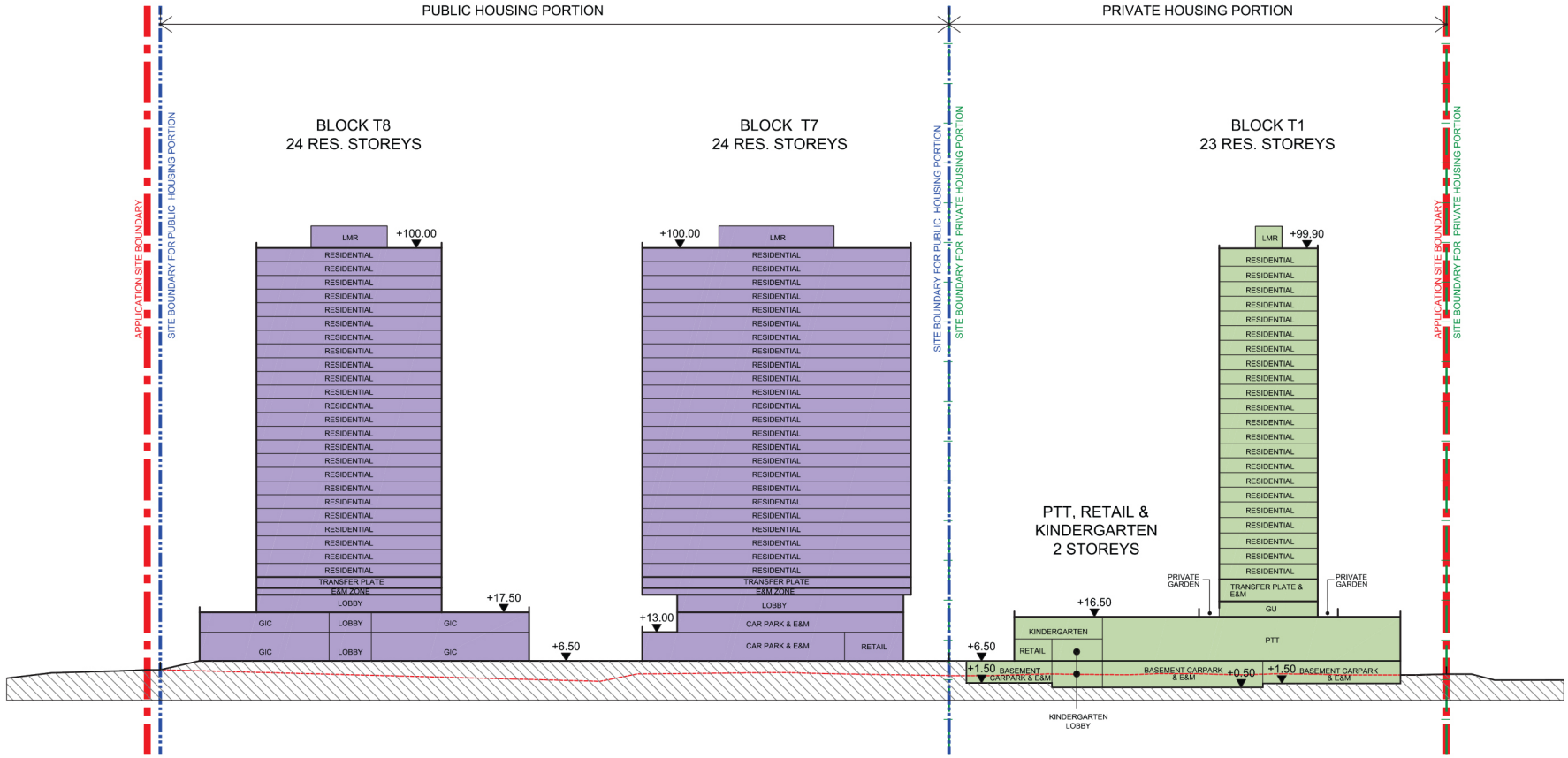
Rev	0	Date	May 2024
Scale	N/A	Figure	2.3



LEGEND

EXISTING SITE LEVEL



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Title

Indicative Section S1

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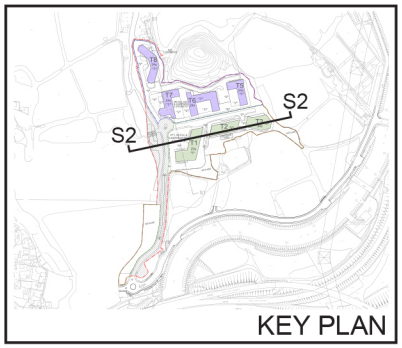
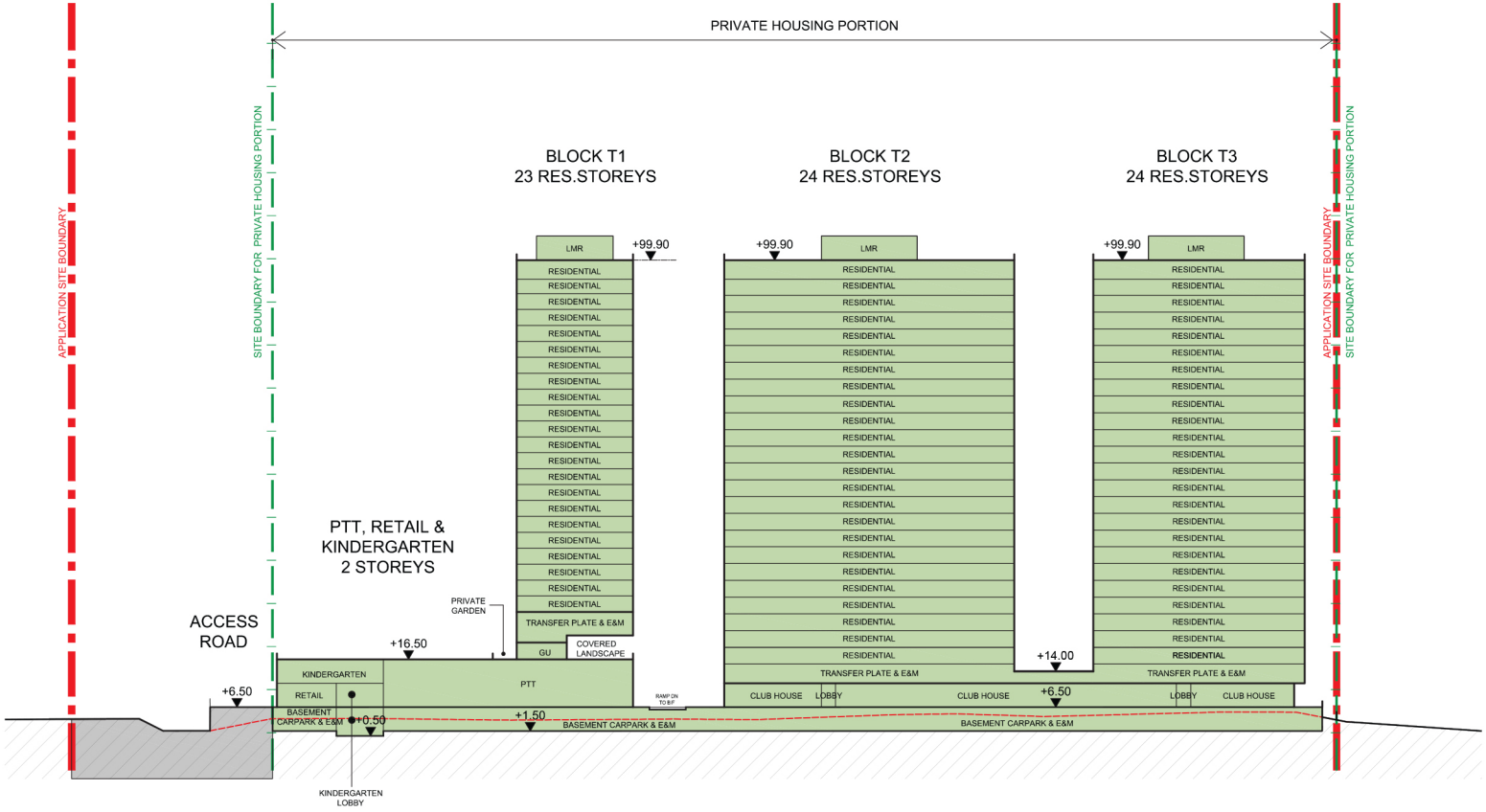
Rev	0	Date	May 2024
Scale	N/A	Figure	2.4



LEGEND

EXISTING SITE LEVEL



ARCHI+ ARCHIPLUS INTERNATIONAL LIMITED	Title: Indicative Section S2	Checked: DH	Drawn: PW
		Rev: 0	Date: May 2024
		Scale: N/A	Figure: 2.5

3 BASELINE VISUAL CONDITION

3.1 Visual Context & Character

3.1.1 The Application Site is situated in close proximity to Yuen Long Town Centre in with only about 1km distance away from Tuen Ma Line Yuen Long Station. It is an approved housing site located within the Wetland Buffer Area (WBA) as defined under Town Planning Board Guidelines NO. 12C (TPB PG No. 12C) and is currently zoned as "R(D)". It is bounded by an "Undetermined" ("U") zone and Yuen Long Bypass Floodway (YLBF) to the immediate northeast and east; Yuen Long Highway to the immediate south; an approved application for medium-rise development (i.e. No. A/YL-NSW/274) (hereafter referred to as the "Adjacent Approved Application"); some village settlements (i.e. Shan Pui Tsuen and Shan Pin Tsuen) to the west and a knoll to the north. While in the vicinity, existing medium-rise development such as Park Yoho, Riva and Crescent Green are located to the further east of the Application Site that characterizes the sub-urban area of Yuen Long. A new high-density public housing site in Sha Po located to the north of Park Yoho is recently proposed by the Government.

3.1.2 The Application Site is largely left vacant, or "unused land" according to the TPB Paper for the Approved Scheme and is currently occupied by substantial vegetation and some scattered abandoned ponds located along the edges of the Application Site of about 6,900m² in total. In view of its close proximity to Yuen Long Highway, the Proposed Development is in face of high level of disturbance due to frequent human activities arising from the existing environment within the near the Application Site. **Figure 3.1** illustrates the existing site condition and the surrounding context.

3.1.3 With improved infrastructural capacity and accessibility of Yuen Long as supported by the Tuen Ma Line Railway, the Application Site and its surrounding area is gradually transforming to a sub-urban township with various planned commercial/residential developments including the high-rise developments clusters near Tuen Ma Line Yuen Long Station, the medium-rise development in the suburban area of Yuen Long and Kam Tin and the planned PRH in Tung Shing Lei.

3.1.4 **Figures 3.2 and 3.3** illustrate the plot ratio and building height profile of the existing and planned development in the vicinity of the Application Site. It is obvious that the Application Site is situated in a medium-density development zone in the sub-urban area of Yuen Long between the high-density development in Yuen Long Town Centre and the medium-density development in the fringe of Yuen Long near Kam Tin. The strategic nature of the location of the Application Site makes it of great potential to be optimized for residential development with higher development intensity to serve as a logical extension of Yuen Long Town.

3.2 Visual Elements and Resources

3.2.1 Situated in the sub-urban area of Yuen Long between the high-rise residential development in Yuen Long Town and the medium-rise residential development along Kam Tin River, the visual context of the Application Site is shaped by various visual elements which come into sights of the viewers. All major visual elements, including the visual resources or attractors and visual eyesores or distractors that currently exist or planned are identified below. Different visual elements may enhance, degrade or neutralize the overall visual impact of the proposed development being assessed.



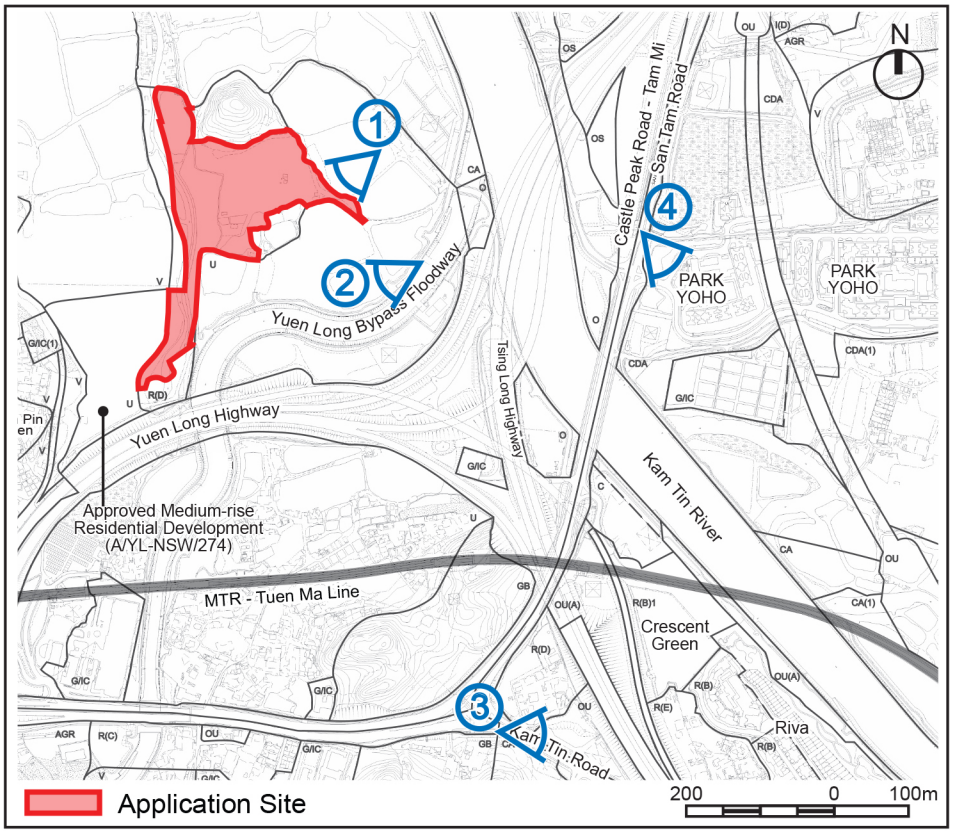
The Application Site is currently abandoned as derelict area



View from Ho Chau Road



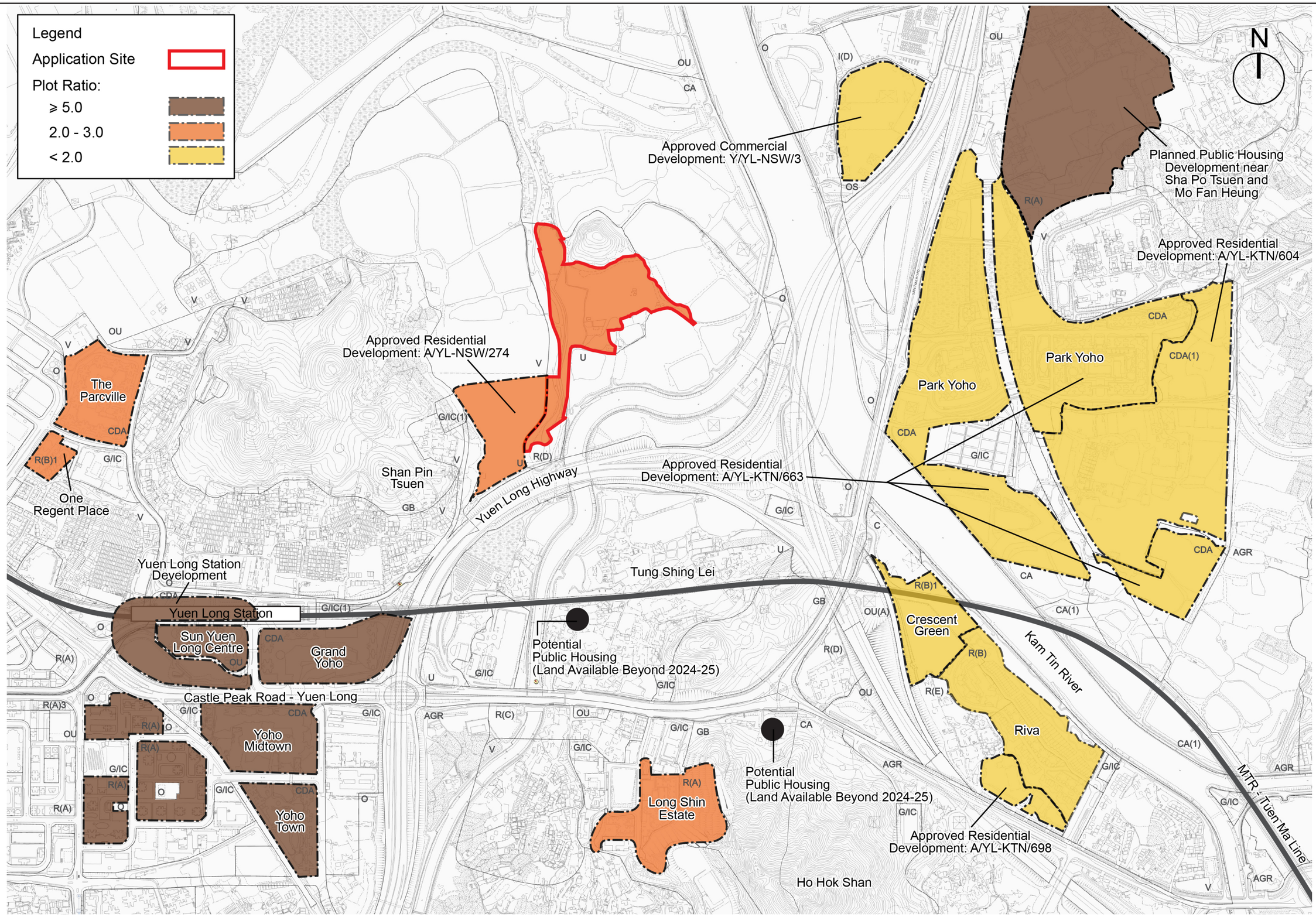
Residential Developments (Crescent Green , Riva) along the Kam Tin Road



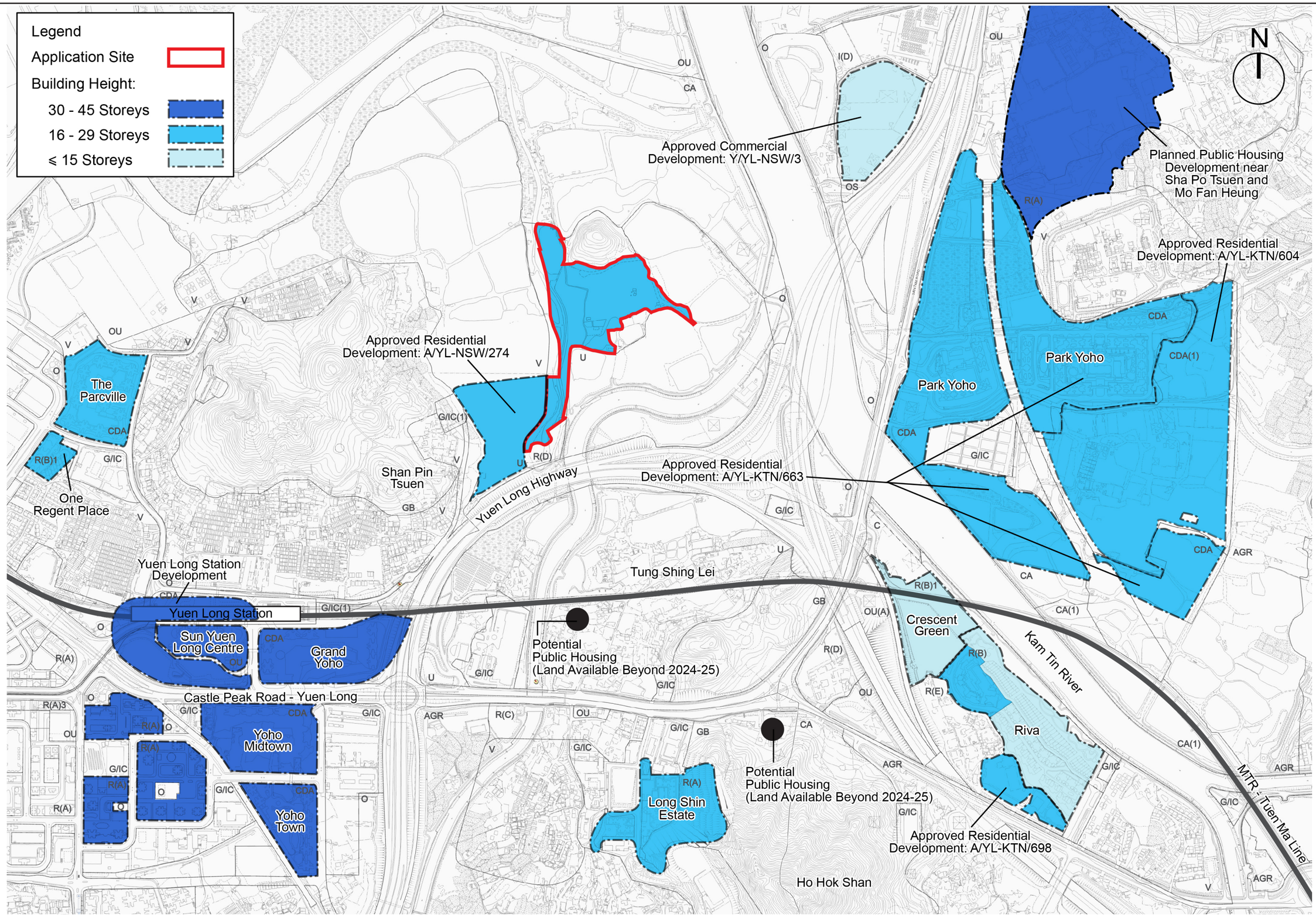


Residential Development (PARK YOHO) view from San Tam Road

llewelyn davies	Title: Site Condition and Surrounding Context	Checked: DH / Drawn: PW	
		Rev: 0 / Date: May 2024	
		Scale: N/A	Figure: 3.1



llewelyn davies	Title: Plot Ratio Profile of Surrounding Developments	Checked: DH	Drawn: PW
		Rev: 0	Date: May 2024
		Scale	Figure: 3.2



llewelyn davies

Title

Building Height Profile of Surrounding Developments

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Rev	0	Date	May 2024
Scale		Figure	3.3

Visual Attractors

3.2.2 **Topography** – The Proposed Development lies on a flat floodplain and is overlooking the steep mountain ranges of the Kai Kung Lang of the Lam Tsuen Country Park to the east and the Tai Lam Country Park to the south. The environment to the immediate north is dominated by a wooded knoll just outside of the boundary of the Application Site while the further north is largely essentially flat that stretches to the Nam Sang Wai and Mai Po wetlands and Deep Bay estuary. The contrast between flat floodplain and hilly ridgelines features a high-degree of openness and creates a dynamic overall visual backdrop to the locality.

3.2.3 **River and Ponds** – The Shan Pui River and the Kam Tin River are located to the west and east of the Application Site respectively. The area to the north of the Application Site comprises a patchwork of ponds, riverine and pond water surfaces and have considerable visual amenity.

3.2.4 **Existing Vegetation** – Extensive vegetation is established along the edges of rivers and ponds, on the low hill ranges surrounding the Proposed Development and along the major road corridors. This provides a green framework to the landscape and positive visual amenity.

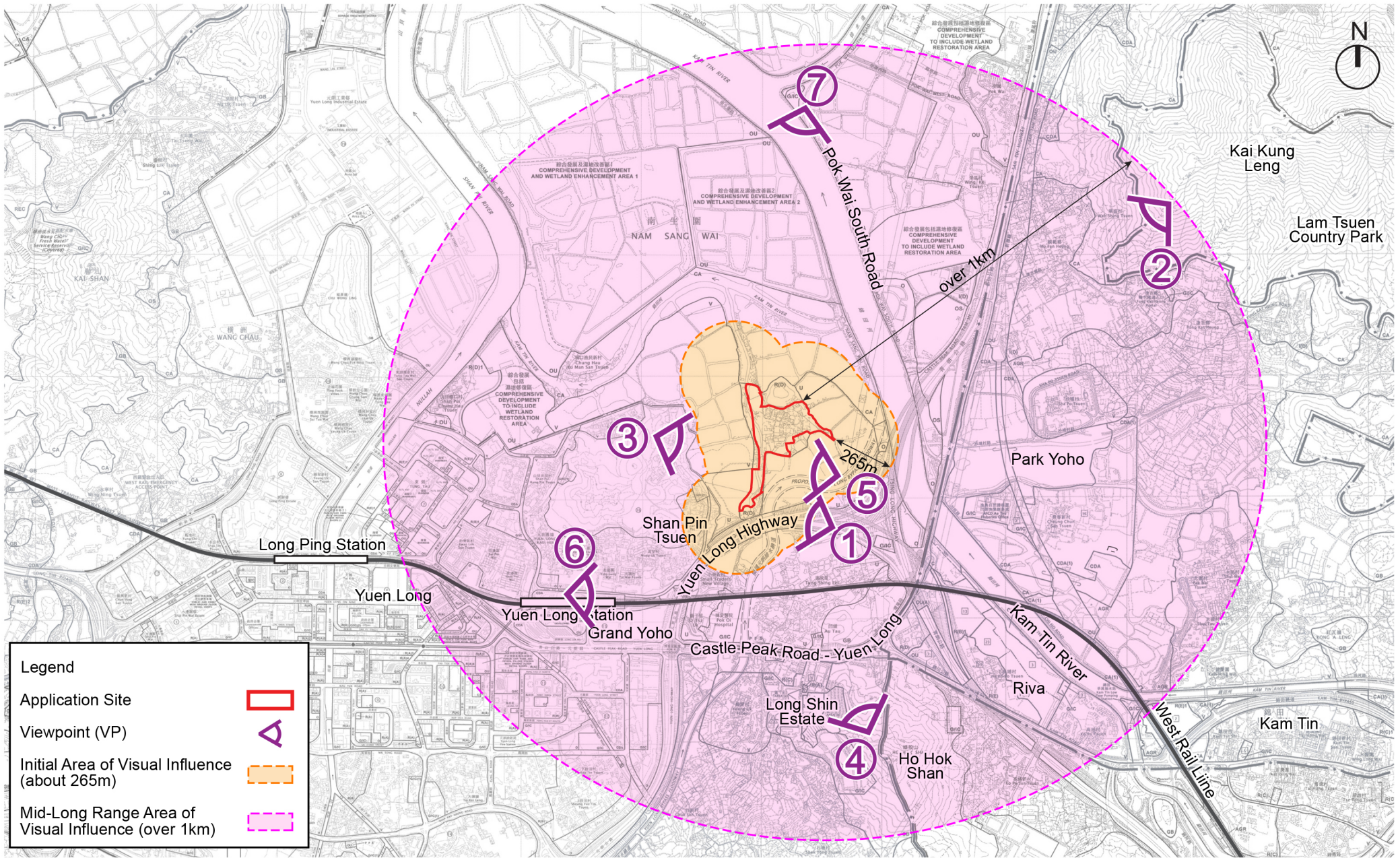
3.2.5 **Sub-urban residential developments** – The existing sub-urban residential developments surrounding the Application Site characterized by their low-medium rise nature, which includes the village type developments largely sitting in vegetated area with ample amount of trees, and together with the medium-rise residential developments in both Kam Tin and suburban area of Yuen Long carefully designed with visually compatible facades and high greenery coverage. The synergy of the above makes the built environment more attractive and visually appealing compared to the adjacent highly urbanized cityscape of Yuen Long Town Centre.

Visual Eyesores and Distractors

3.2.6 **Major road infrastructures** – Yuen Long Highway and its extensive viaducts running to the east and south of the proposed development are highly visible. With large amount of busy traffic flow, Yuen Long Highway is considered as a visual eyesore as it is incompatible with the sub-urban landscape surrounding the Application Site. Similarly, the elevated viaduct for Tuen Ma Line which dominates a large part of the sub-urban landscape is also highly visible from various visual attractors/amenities.

3.2.7 **Rural fringe open storage –** Situated in an area intermixed with urban and sub-urban landscape, temporary uses with open storage activities and iron sheet shelter on bare land without greening especially in the “Open Storage” zone located to the northeast of the Application Site across Kam Tin River create visual distractors and degrades the visual environment.

3.2.8 **High-rise development in Yuen Long Town Centre** – The large-scale high-density urban developments in Yuen Long Town with plot ratio of above 5 and building height over 30 storeys are considered as visual obstructions to the surrounding environment.



llewelyn davies

Title

Location of Selected Public Viewpoints

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Rev	0	Date	May 2024
Scale	N/A	Figure	3.4

3.3 Planned and Committed Development

3.3.1 Having identified the surrounding visual context including the existing and planned developments in the vicinity, it should be highlighted that the Application Site and its vicinity is transforming to an urban township. In this regard, the planned developments being visible from the potential VPs namely (i) the approved residential development under Application No. A/YL-KTN/663; (ii) the approved residential development under Application No. A/YL-KTN/604 (i.e. the "CDA(1)" site next to Park Yoho); (iii) the approved rezoning application for residential development under Application No. Y/YL-NSW/4 (i.e. the Approved Scheme); (iv) the Recently Approved Scheme for the multi-generational residential development under Application No. A/YL-NSW/274 (i.e. the "U" zone adjacent to the Application Site); (v) potential public housing sites in Au Tau and Tung Shing Lei; and (vi) Proposed Public Housing Development in Sha Po would be taken into account to serve as the Baseline Condition for visual assessment purpose.

3.4 Location of Selected Public Viewpoints

3.4.1 According to the TPB PG-No. 41, the assessment area (i.e. the visual envelope) should cover the area of visual influence within which any part of the proposed development is visible from key sensitive viewers. When selecting the location of public viewpoints of the subject VIA, the above visual context and visual resources, the popular public recreational spaces, the distance of the development and its potential visibility from the selected viewing points, and the actual site and surrounding topographical conditions of the Application Site by ground inspection have been taken into account.

3.4.2 In gist, 7 nos. of public viewpoints (VPs) have been identified for the subject VIA (**Figure 3.4** refers). Analyses of the visual sensitivity of the public viewers at these VPs are discussed in the following section.

4 KEY VISUAL SENSITIVE RECEIVERS AT PUBLIC VIEWPOINTS

4.1 As per the requirements of TPB PG-No. 41, key visually sensitive receivers (VSRs) are those people, who have views of the Application Site from the most affected public viewing points (VP), and these VSRs are likely to be affected most by the proposed visual change. The identified VSRs of the subject VIA include the public at popular areas for outdoor recreation activities, leisure, walking, sightseeing and key pedestrian nodes and prominent public travel routes where their visual attention may be caught by the proposed residential development.

4.2 VSRs are categorised based on the characters and what they engage in at the public VPs. The sensitivity of receivers to visual changes will be influenced by:

1) The activities they are engaged in;
2) The duration which the portion of the proposed development remain visible;
3) View towards the change is full or partial; and
4) The public perception towards the portion of the proposed development.

4.3 With consideration to the nature of the people who are mostly affected by the proposed visual changes at the key VPs, the selected VSRs of the subject VIA are categorised into three groups, namely:

Recreation - General public have sights on the Application Site while engaging in recreational facilities. Their visual sensitivity varies depending on the type of recreational activity they are engaging in.

Traveler - General public have sights on the Application Site in public passageways. Their visual experience depends on the speed of travel and whether their views will be continuous or occasional.

Transient - General public have sights on the Application Site while engaging in other activities in public realm. Their visual experience depends on the type of activity they are engaging in and whether their views will be continuous or occasional.

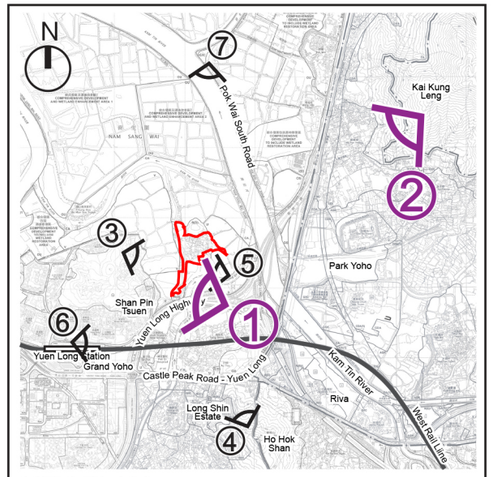
4.4 Based on the above criteria, VSRs' sensitivity towards visual change at the Application Site are categorised into 3 classifications (i.e. "High", "Medium" and "Low").

4.5 Existing views of different VPs are provided on **Figures 4.1 to 4.4.** The selected public VSRs of the subject visual sensitivity are listed out below in **Table 4.1**.

4.6 It should be noted that, the analysis presented in **Table 4.1** below has taken into account the committed and planned developments as stated in Section 3.3 above, which is also the Baseline Scheme as shown in **Figures 5.1 to 5.7**.



VP1 – Portion of Yuen Long Highway



KEY PLAN



VP2 – Kai Kung Leng in Lam Tsuen Country Park

llewelyn davies

Title

Existing Views of VP1 & VP2

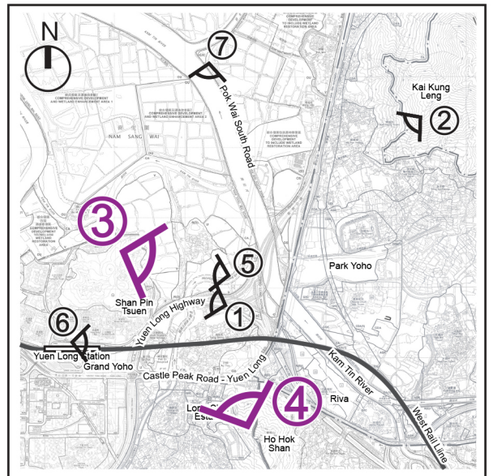
Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale		Figure	4.1



VP3 – Shan Pui Tsuen Graves



VP4 – Ho Hok Shan

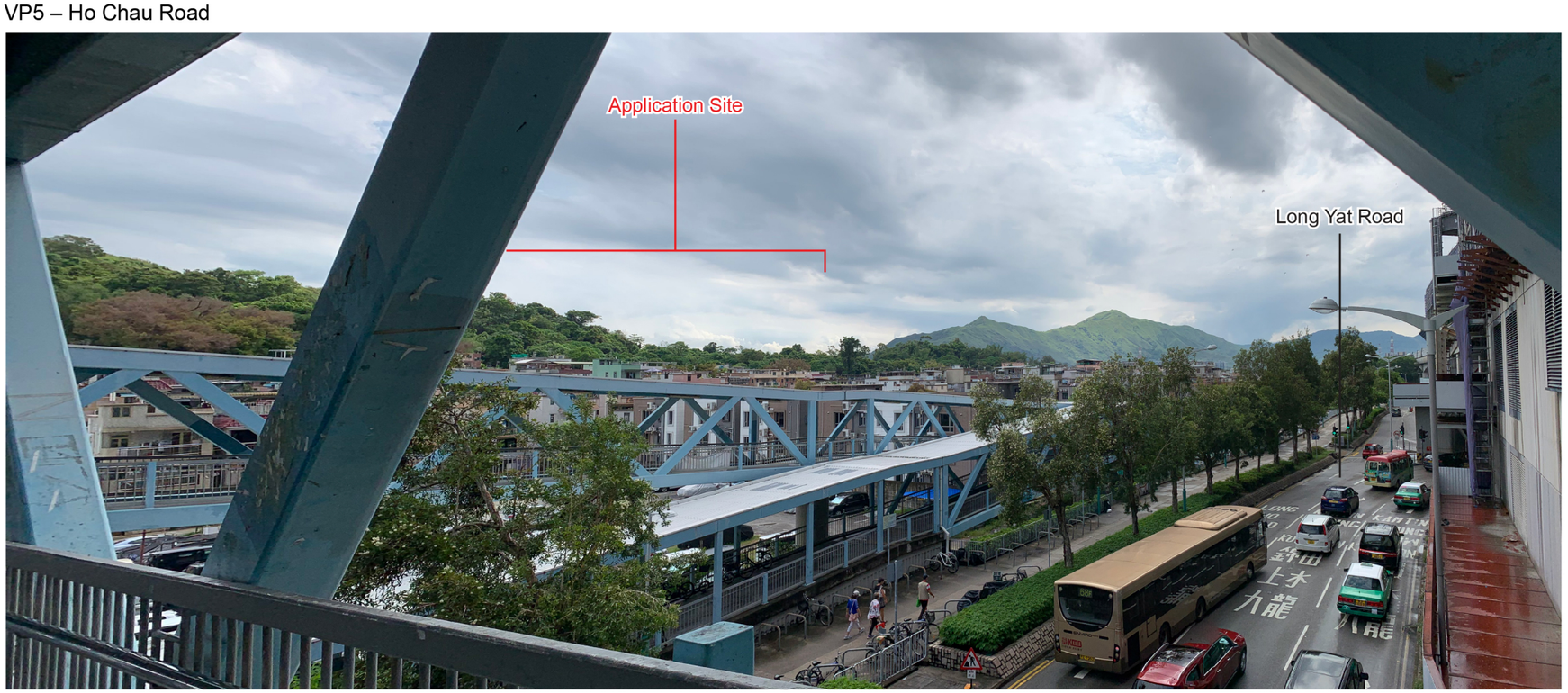


KEY PLAN

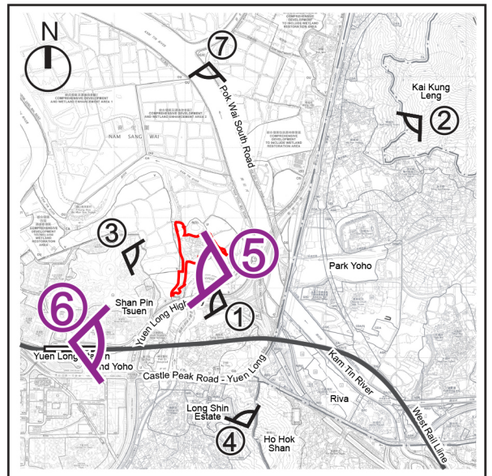
llewelyn davies	Title: Existing Views of VP3 & VP4	Checked: DH	Drawn: PW
		Rev: 0	Date: May 2024
		Scale:	Figure: 4.2



VP5 – Ho Chau Road



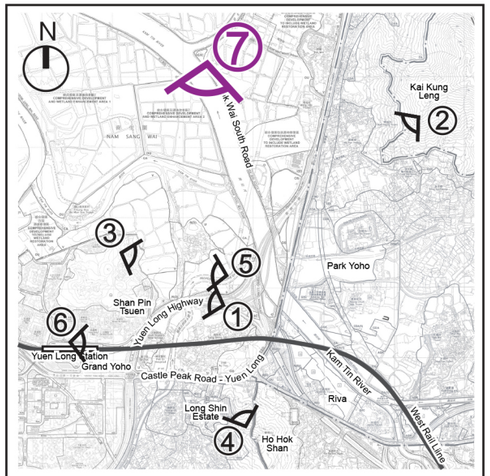
VP6 – Pedestrian Footbridge Connection to Exit G of Tuen Ma Line Yuen Long Station



llewelyn davies	Title: Existing Views of VP5 & VP6	Checked: DH / Drawn: PW	
		Rev: 0	Date: May 2024
		Scale:	Figure: 4.3



VP7 – Further North of Pok Wai South Road



KEY PLAN

llewelyn davies	Title: Existing View of VP7	Checked: DH	Drawn: PW
		Rev: 0	Date: May 2024
		Scale:	Figure: 4.4

Table 4.1 – Brief Analysis of Visual Sensitive Receivers at Selected Public VPs

Visually Sensitive Receiver and Type of user (Recreation and/or Traveller)	Approx. Viewing Distance	Quality of View (With Completion of Planned / Committed Developments under Baseline Scheme) (Good / Fair / Poor)	Degree of Visibility towards the Application Site (With Completion of Planned / Committed Developments under Baseline Scheme) (Full / Partial / Glimpsed) Frequency of View towards the Application Site (Frequent / Occasional / Rare)	Sensitivity
VSR1: Drivers and Passengers on Yuen Long Highway Yuen Long Highway is one of the road accesses connecting the New Town to urban areas in Kowloon. Locating to the south of the Application Site, it captures an elevated view of Tung Shing Lei and Nam Sang Wai. **Traveler** – The VSRs are the drivers and passengers on Yuen Long Highway who are travelling to Kowloon.	About 380m	**Good** – Located at a major elevated road infrastructure, the highway enjoys an open view of Tung Shing Lei and Nam Sang Wai. The existing view on the highway is dominated by an extensive woodland in the foreground. Upon completion of the adjacent approved residential and community hub development (A/YL-NSW/274) at Tung Shing Lei, it will fill the background along with the open-sky view behind the woodland.	**Partial view** – The Application Site is partially visible from this VP as it is screened off by the woodland. The upper portion of houses under Approved Scheme (Y/YL-NSW/4) are visible on top of the woodland. **Rare view** – The view is only accounted for a tiny portion of their journey on Yuen Long Highway towards Tai Lam Tunnel, and at a high travelling speed, drivers and passengers are attached to the road traffic.	Low
VSR2: Hikers at Kai Kung Leng in Lam Tsuen Country Park Kai Kung Leng is a popular mountain range of Lam Tsuen Country Park with several peaks for recreational hiking with a 7.5km trail. **Recreation** – The VSRs are the recreational hikers reaching the peak of Kai Kung Leng in search of a panoramic view over Yuen Long Basin	About 1.8km	**Good** – Kai Kung Leng captures a long-range and panoramic view overseeing Yuen Long Basin including the village type development and low-medium density residential developments of Kam Tin at the foreground (e.g. Park Yoho, Riva and Green Crescent). Other planned and committed developments including the planned public housing development near Sha Po Tsuen and approved comprehensive residential development (A/YL-KTN/604) will also be visible. The Application Site coupling with Yuen Long New Town form the background of this VP.	**Partial view** – Located to the further northwest of the Application Site on the mountain, Kai Kung Leng is capable of capturing a long distance and partial view of the Application Site as majority of the site will be screened off by the planned public housing development near Sha Po Tsuen in the foreground. Only a very minor portion of the Approved Scheme (Y/YL-NSW/4) is visible. **Occasional view** – The VSRs are mainly hikers who have reached the peak of Kai Kung Leng after the long hike climbing up which this open and panoramic view is considered short duration in nature in their full hike.	High
VSR 3: Visitors to Shan Pui Tsuen Graves Sham Pui Tsuen is one of the recognized villages in Shap Pat Heung while these local graves reserved for ancestors of Shan Pui Tsuen while the posterities come together to worship during the festivals. **Transient –** The VSRs are the visitors to the Shan Pui Tsuen Graves for worshipping activities.	About 290m	**Fair –** Shan Pui Tsuen Graves captures a side view of the Application Site from its west while the existing view is dominated by an open sky view overseeing Kai Kung Leng at the backdrop and some scattered ponds and vegetation at the foreground. The adjacent approved residential and community hub development (A/YL-NSW/274 in Tung Shing Lei and the planned public housing development near Sha Po Tsuen will fill the right and left side of the view in the middle ground upon their completion.	**Partial view** – Located to the west of the Application Site, it captures partial view of the Application Site. A portion of houses of the Approved Scheme (Y/YL-NSW/4) is visible while the remaining portion is screened of by existing mature trees and vegetation. **Occasional view** – Although the view is direct to the visitors when at the graves, they will be focusing on worshipping the ancestors. The view is hence considered occasional in nature.	Low

Visually Sensitive Receiver and Type of user (Recreation and/or Traveller)	**Approx. Viewing Distance**	**Quality of View (With Completion of Planned / Committed Developments under Baseline Scheme) (Good / Fair / Poor)**	**Degree of Visibility towards the Application Site (With Completion of Planned / Committed Developments under Baseline Scheme) (Full / Partial / Glimpsed)** **Frequency of View towards the Application Site (Frequent / Occasional / Rare)**	**Sensitivity**
VSR 4: Hikers at Ho Hok Shan Ho Hok Shan is a hiking trail at local level that has a comparatively low altitude (only 149m) among the mountain ranges in Hong Kong. The hiking trail of Ho Hok Shan is informal and about 4.5km long. **Recreation –** The VSRs are the recreational hikers to Ho Hok Shan for exercising and the panoramic view of Yuen Long Basin.	About 1.3km	**Good** – Ho Hok Shan captures an elevated view of Yuen Long Basin featuring the Yuen Long New Town and Sha Po on the left, Tung Shing Lei and Nam Sang Wai in the centre, and Kam Tin area on the left. Standing at the summit of Ho Hok Shan, the foreground view is dominated by lush shrubs and grassland.	**Full view** – Located to the southeast of the Application Site on the mountain, the Application Site together with the Approved Scheme (Y/YL-NSW/4) are fully visible from this VP. **Occasional view** – The VSRs are mainly hikers who have reached the peak of Ho Hok Shan after of the long hike climbing up which this open and panoramic view is considered short duration in nature in their full hike.	High
VSR 5: Pedestrians and Drivers on Ho Chau Road Ho Chau Road is a local road connecting Tung Shing Lei to Nam Sang Wai Road and then to Castle Peak Road – Tam Mi section to both Yuen Long Town Centre and Kam Tin. **Traveler –** The VSRs are the drivers or pedestrians commuting to Yuen Long Town Centre or Kam Tin via Ho Chau Road.	About 250m	**Good** – Ho Chau Road is surrounded by vegetation on the unused land. It also sees a great balance of open-sky view and the green network. The upper part of approved residential and community hub development (A/YL-NSW/274) are visible above the woodland on the left.	**Partial view** – Located in the immediate southeast of the Application Site, it is partially visible as the southern portion is screened off by the woodland. Some of the houses proposed under the Approved Scheme (Y/YL-NSW/4) are partially visible. **Occasional view** – As the sole access road linking the Application Site and its surrounding with Yuen Long Town Centre and Kam Tin area, commuters tend to focus on the road traffic while the view is considered to be short line of sight.	Medium
VSR 6: Passengers to and from Tuen Ma Line Yuen Long Station Tuen Ma Line Yuen Long Station is one of the two only railway stations in Yuen Long linking the New Town to the urban areas as well as the other parts in the New Territories via Tuen Ma Line. **Traveler –** The VSRs are the passengers travelling to and from the station interchanging with other transportation modes.	About 1.2km	**Fair** – Located on the major pedestrian node adjacent to the Tuen Ma Line Yuen Long Station Exit G, the view looking from the footbridge is dominated by the footbridge structure of substantial scale in the foreground, village developments of Ying Lung Wai in the middle-ground while it also captures partial of Kai Kung Leng as the backdrop since it will be partially blocked by the approved residential and community hub development (A/YL-NSW/274) upon its completion.	**Partial view** – The Application Site is partially visible from this VP as the mountain of Shan Pin Tsuen and the woodland stretching towards Tung Shing Lei as well as the medium-rise development from the approved residential and community hub development (A/YL-NSW/274) block most of the view towards the Application Site at this distant view. **Occasional view** – As the VSRs are the passengers travelling to and from the station, the commuters tend to focus on their journey and pedestrian traffic surrounding them instead of the distant view. Should there be any, the duration will be short and occasional.	Low
VSR 7: Cyclists, Pedestrians and Drivers on Further North of Pok Wai South Road Pok Wai South Road is a single lane two-way traffic local road adjacent to the recently launched cycling track of the NT Cycle Track Network running from Tuen Mun to Ma On Shan of a total length of 60km. **Recreation** – The VSRs are the recreational cyclists travelling on the NT Cycle Track Network. **Traveler** – Other VSRs on Pok Wai South Road are the drivers commuting to the villages, brownfield workshops or open storages located in San Tin near Fairview Park.	About 1.2km	**Good** – Located across Kam Tin River to the northeast of the Application Site, Pok Wai South Road captures an open view featuring Kam Tin River, woodlands along the road and on Nam Sang Wai Road at the other bank. The overall view is highlighted by an urban-rural balance transiting from the natural environment of Tai Lam Country Park to the sub-urban development at the fringe of Yuen Long as well as the high-rise urban developments of the YOHO cluster surrounding Yuen Long Station. The medium-rise residential developments such as Park YOHO, Riva and approved residential and community hub development (A/YL-NSW/274) are also visible.	**Partial view** – The Application Site is largely screened off by the woodland along Nam Sang Wai Road. The houses proposed under the Approved Scheme (Y/YL-NSW/4) are not visible as they are blocked by the existing woodland in front. **Occasional view** – The VSRs are mainly the recreational cyclists travelling along Pok Wai South Road. They are transient in nature and it is expected that their view towards the Application Site and hence the development thereon will be of short duration. Their focus would tend to be on cycling journey and traffic condition with only occasional view to the Application Site.	High

5 ASSESSMENT OF VISUAL IMAPCTS

5.1 Methodology for the Appraisal of Visual Impact

5.1.1 With reference to the "TPB PG-No. 41", the appraisal of overall visual impacts to VSRs can be determined by four aspects:

1) Visual composition (i.e. to assess the visual effects resulted from the change in building forms, bulk and etc.);

2) Visual obstruction (i.e. to assess whether the proposed development may cause any views in the foreground or background to be intercepted);

3) Effects on visual resources (i.e. to assess the change in visual quality and character of the Area of Visual Influence (AVI); and

4) Effects on public viewers from key public VPs.

5.1.2 The significance of the overall visual impact to the VSRs is a synthetic analysis between the visual sensitivity of VSRs towards the Application Site and the VSRs' perception of the magnitude of change from the above four aspects. The resultant overall visual impact can be rated as "Significant", "Moderate", "Slight" or "Negligible" (**Table 5.1** refers)

Table 5.1 - Matrix for Appraisal of Significance of the Overall Visual Impact

		Sensitivity of VSRs		
		Low	**Medium**	**High**
Magnitude of Change	**Negligible**	Negligible	Negligible	Negligible
	Slight	Negligible / Slightly Adverse	Slightly Adverse / Moderately Adverse	Moderately Adverse
	Moderate	Slightly Adverse / Moderately Adverse	Moderately Adverse	Moderately Adverse / Significantly Adverse
	Substantial	Moderately Adverse	Moderately Adverse / Significantly Adverse	Significantly Adverse

Remarks: The resultant overall visual impacts are classified as negligible or negative (i.e. ranging from negligible to significant) unless the proposed development exhibits visual effects that enhance the visual quality.

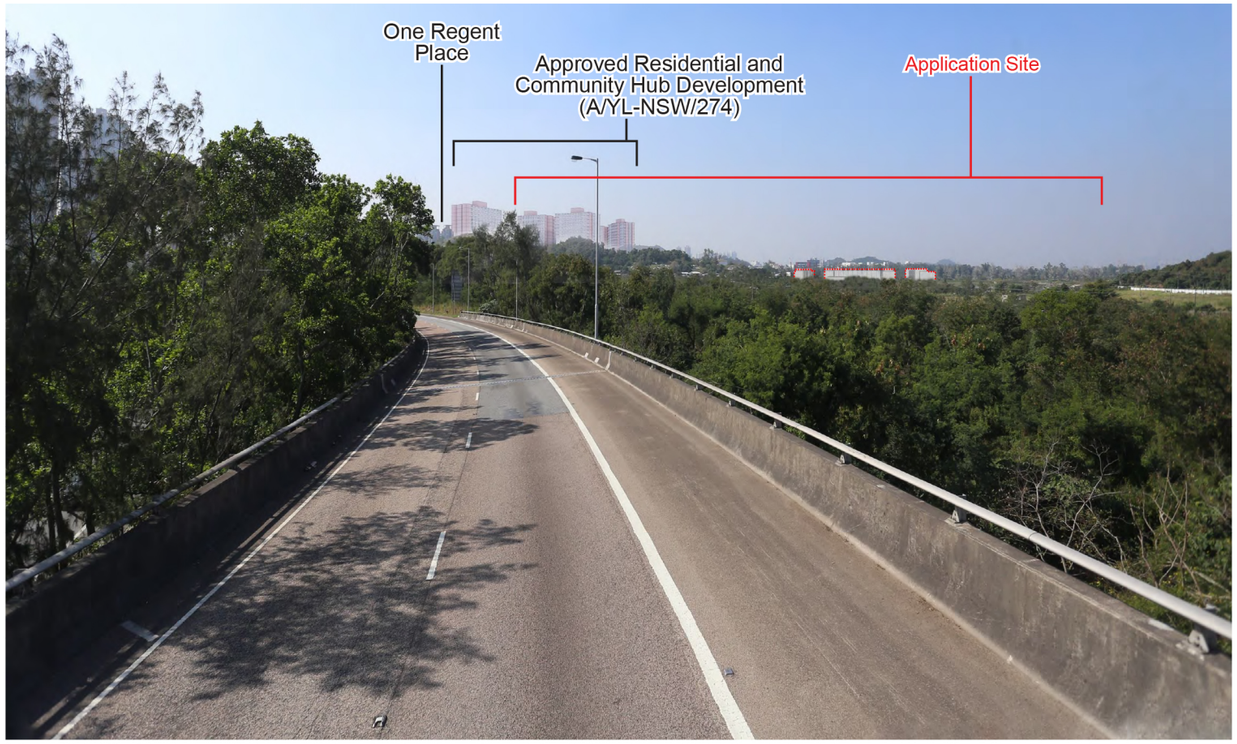
5.1.3 According to "TPB PG-No. 41", the classification of the significance of the overall visual impacts and its associated descriptions are set out in **Table 5.2** below.

Table 5.2 - Classification of Overall Visual Impact

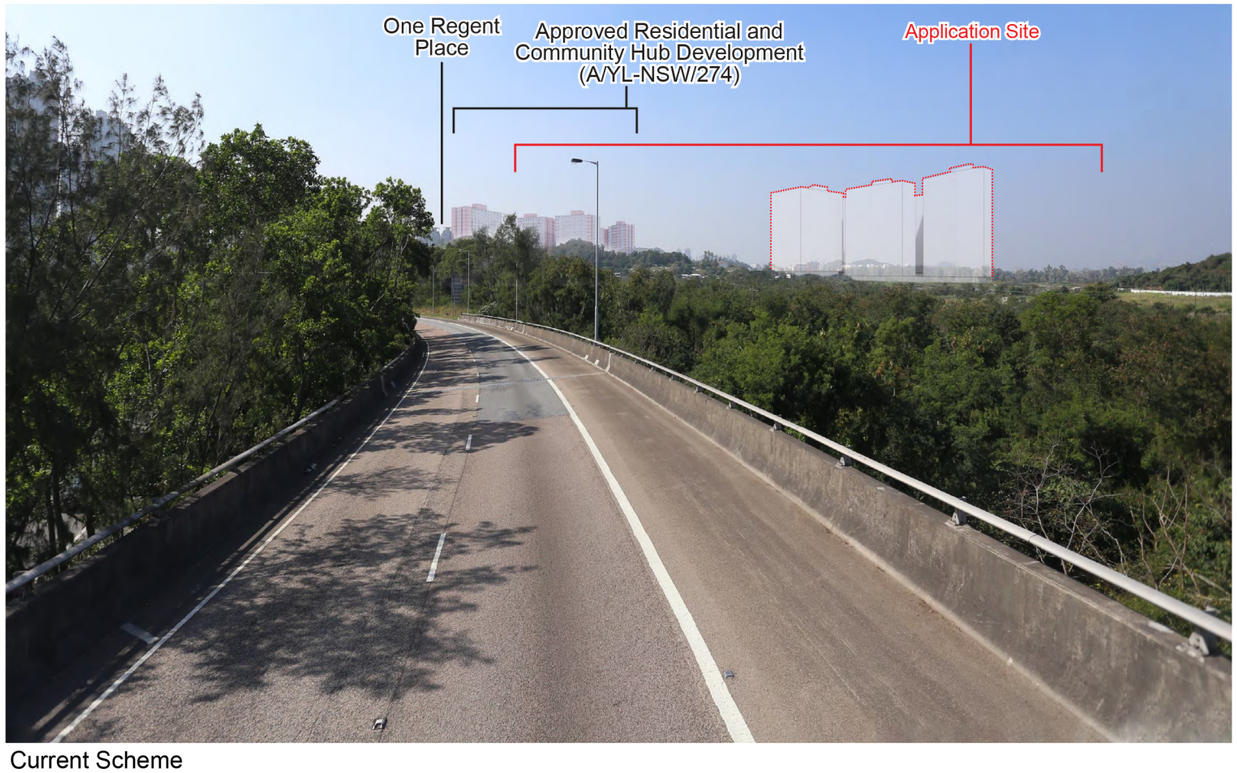
Classifications	Descriptions
Significantly Adverse	The proposed development will in overall terms cause serious and detrimental visual impacts on most of the identified key public VPs even with mitigation measures.
Moderately Adverse	The proposed development will, with or without mitigation measures, result in overall terms in negative visual effects to most of the key identified key public VPs.
Slightly Adverse	The proposed development will, with or without mitigation measures, result in overall terms in some negative visual effects to most of the identified key public VPs.
Negligible	The proposed development will, with or without mitigation measures, in overall terms have insignificant visual impacts on most of the identified key public VPs, or the visual effects would be screened or filtered by other distracting visual elements in the assessment area.
Partly Enhanced / Partly Adverse	The proposed development will exhibit enhanced visual effects to some of the identified key public VPs and at the same time, with or without mitigation measures, exhibit adverse visual effects to some other key public VPs.
Enhanced	The proposed development in overall terms will improve the visual quality and complement the visual character of its setting from most of the identified key public VPs.

5.2 Appraisal of Visual Impacts on Different VSRs

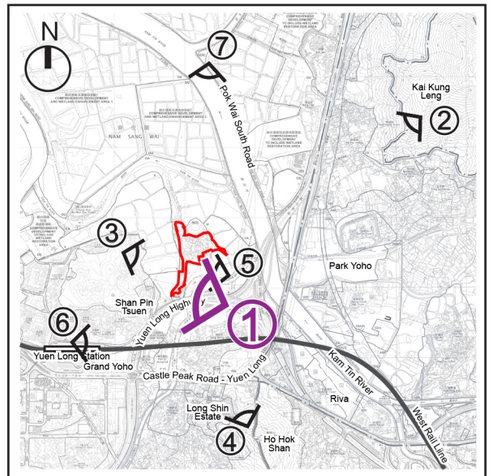
5.2.1 The appraisal of visual impacts on VSRs at the key VPs induced by the Proposed Development as compared to the baseline conditions are discussed below in **Table 5.3**. The corresponding photomontages are attached in **Figures 5.1 to 5.7**.



Baseline Scheme



Current Scheme



KEY PLAN

Proposed Mitigation Measures (subject to refinements at detailed design stage):

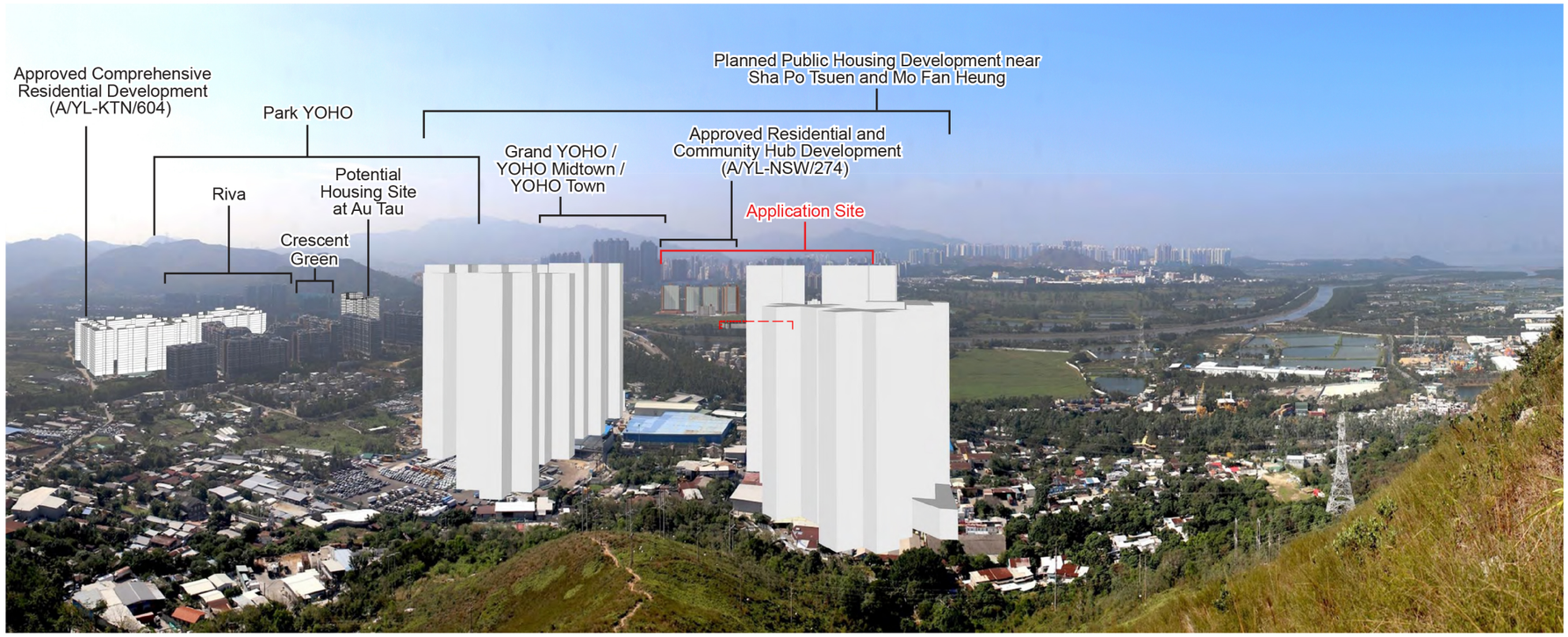
1. Incorporation of building setback of not less than 5m from site boundary
2. Building gaps of not less than 15m-wide are proposed between public housing site and private housing site, T2 & T3 and T7 & T8 of the Proposed Development
3. Provision of sufficient greenery within development sites
4. Provision of peripheral planting strip along site boundary to promote green interfacing with the surroundings
5. Compensation wetlands will be provided in private housing development based on "no net loss in wetland" principle
6. Careful architectural treatments, such as visually compatible colour scheme of building facades, will be incorporated

llewelyn davies

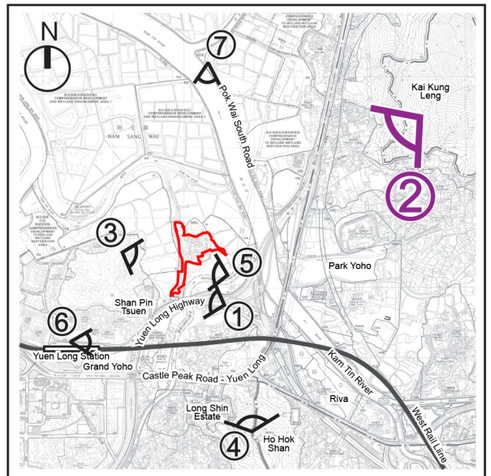
Title

Photomontages – Viewing from VP1 : Portion of Yuen Long Highway

Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale		Figure	5.1



Baseline Scheme



KEY PLAN



Current Scheme

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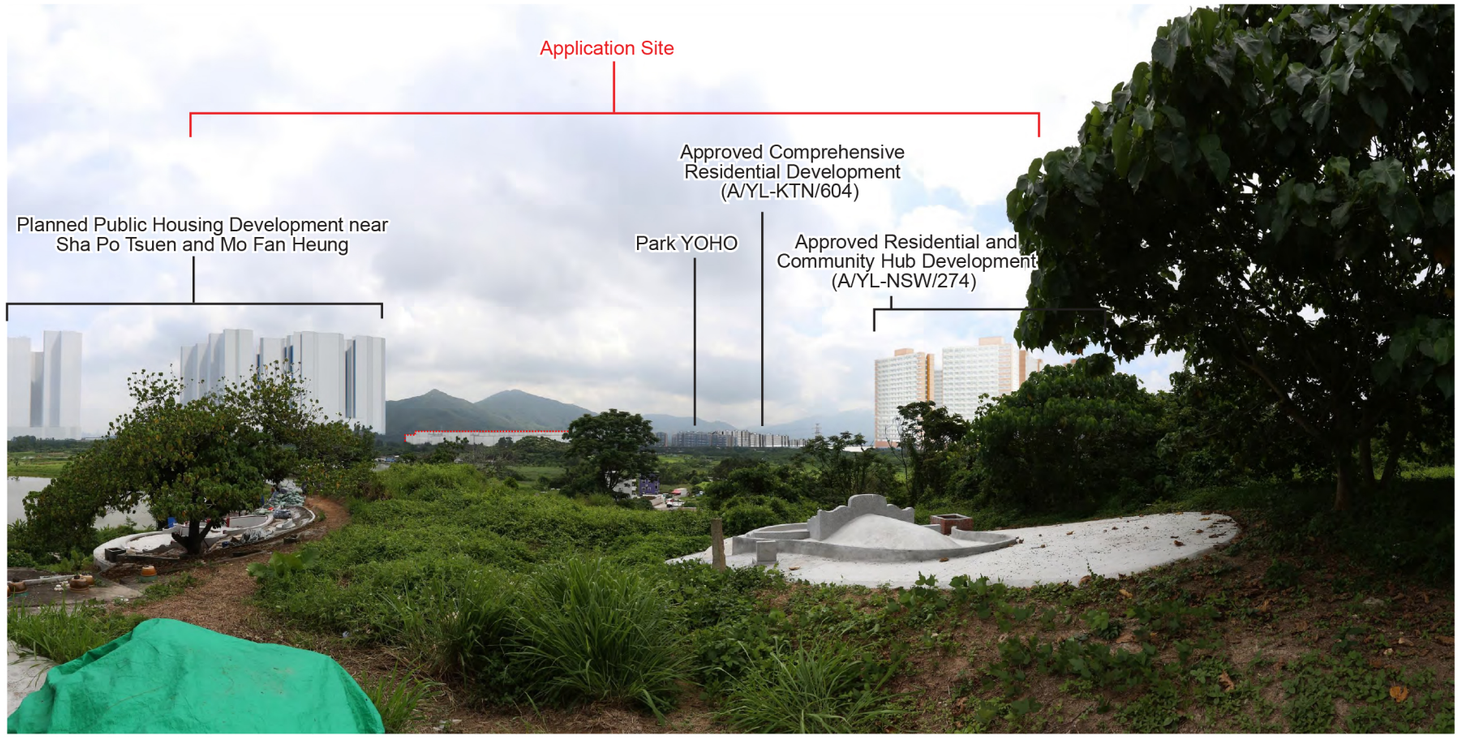
llewelyn davies

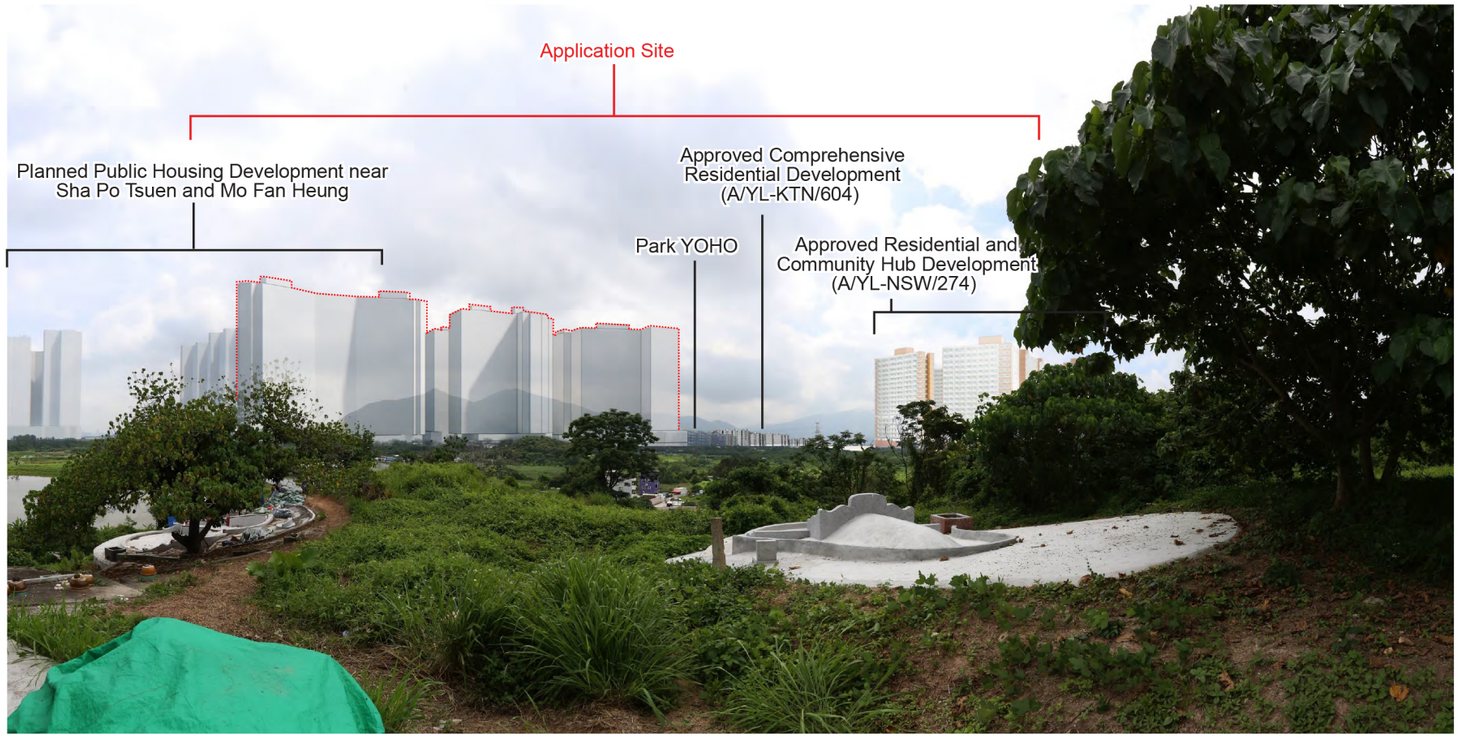
Title

Photomontages – Viewing from VP2 : Kai Kung Leng in Lam Tsuen Country Park

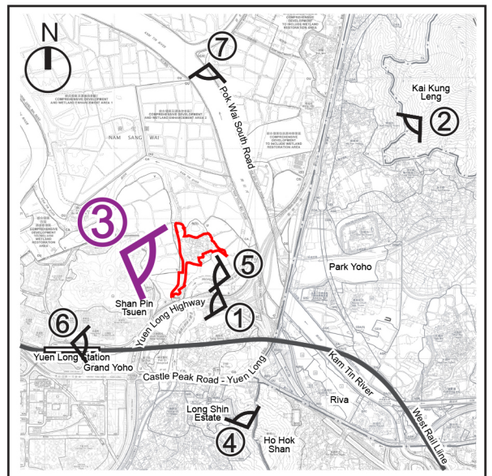
Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale		Figure	5.2



Baseline Scheme



Current Scheme



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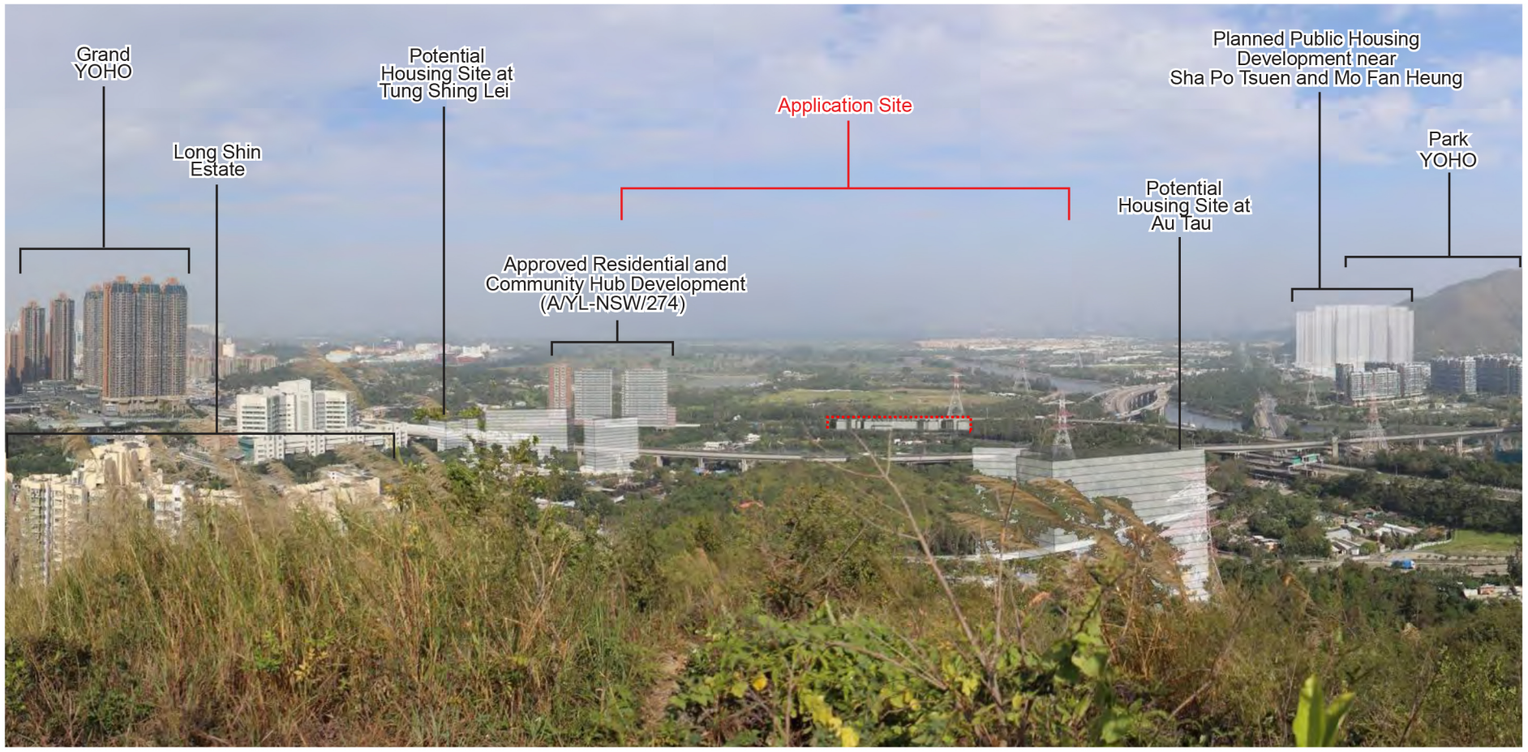
llewelyn davies

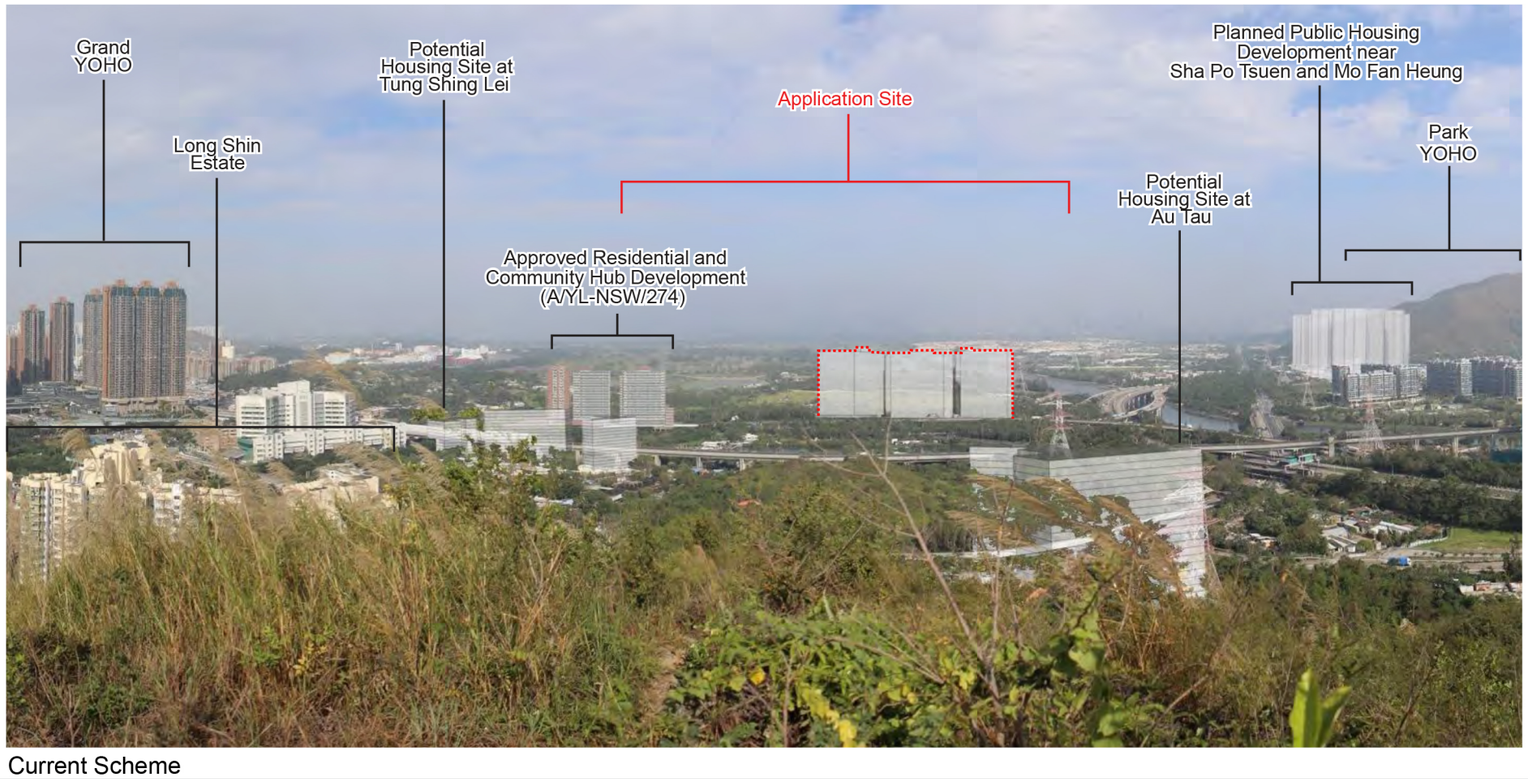
Title

Photomontages – Viewing from VP3 : Shan Pui Tsuen Graves

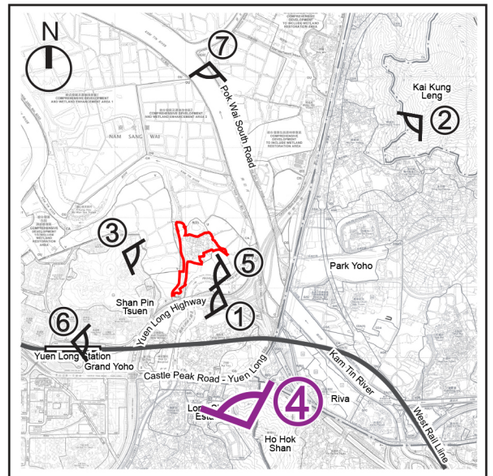
Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale		Figure	5.3



Baseline Scheme



Current Scheme



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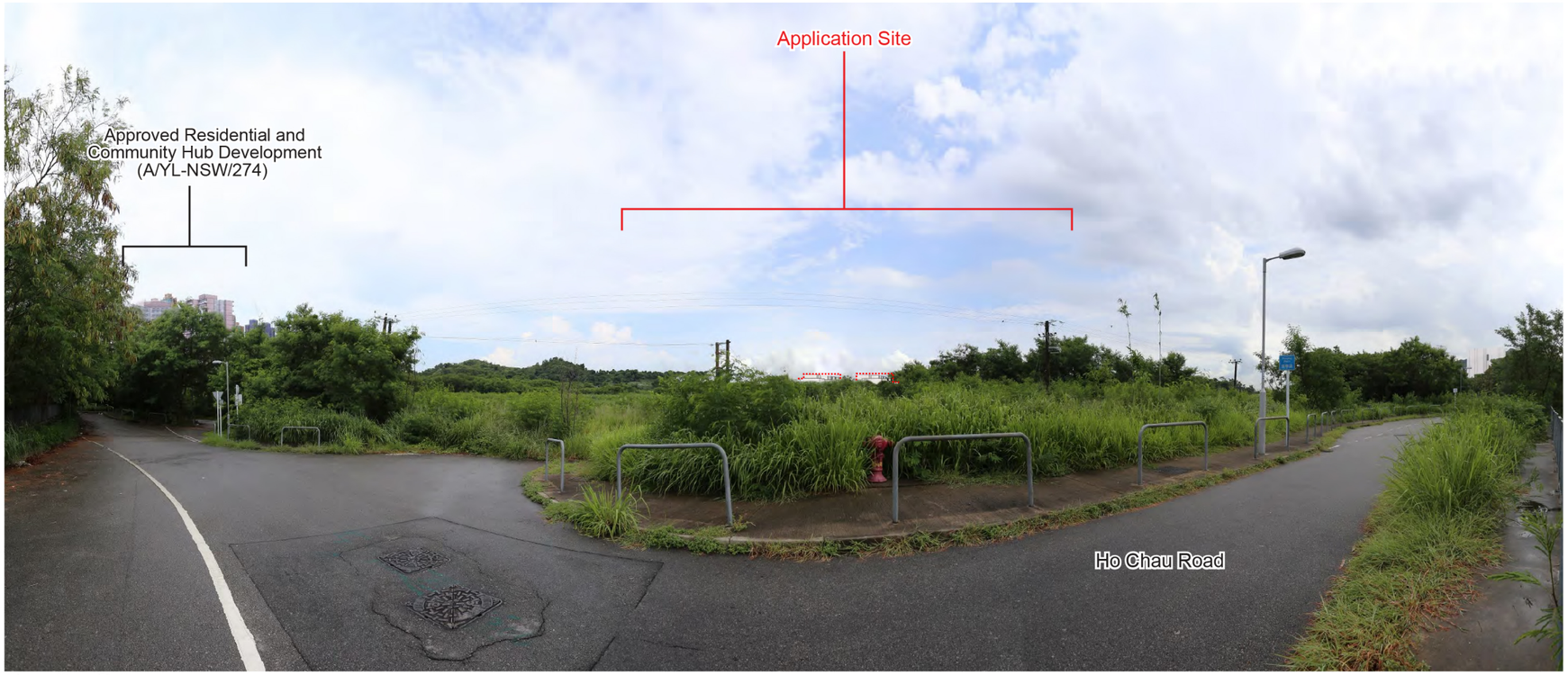
6. Careful architectural treatments, such as visually compatible colour scheme of building facades, will be incorporated

llewelyn davies

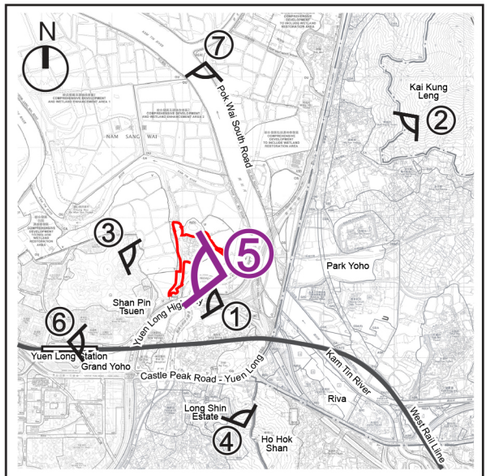
Title

Photomontages – Viewing from VP4 : Ho Hok Shan

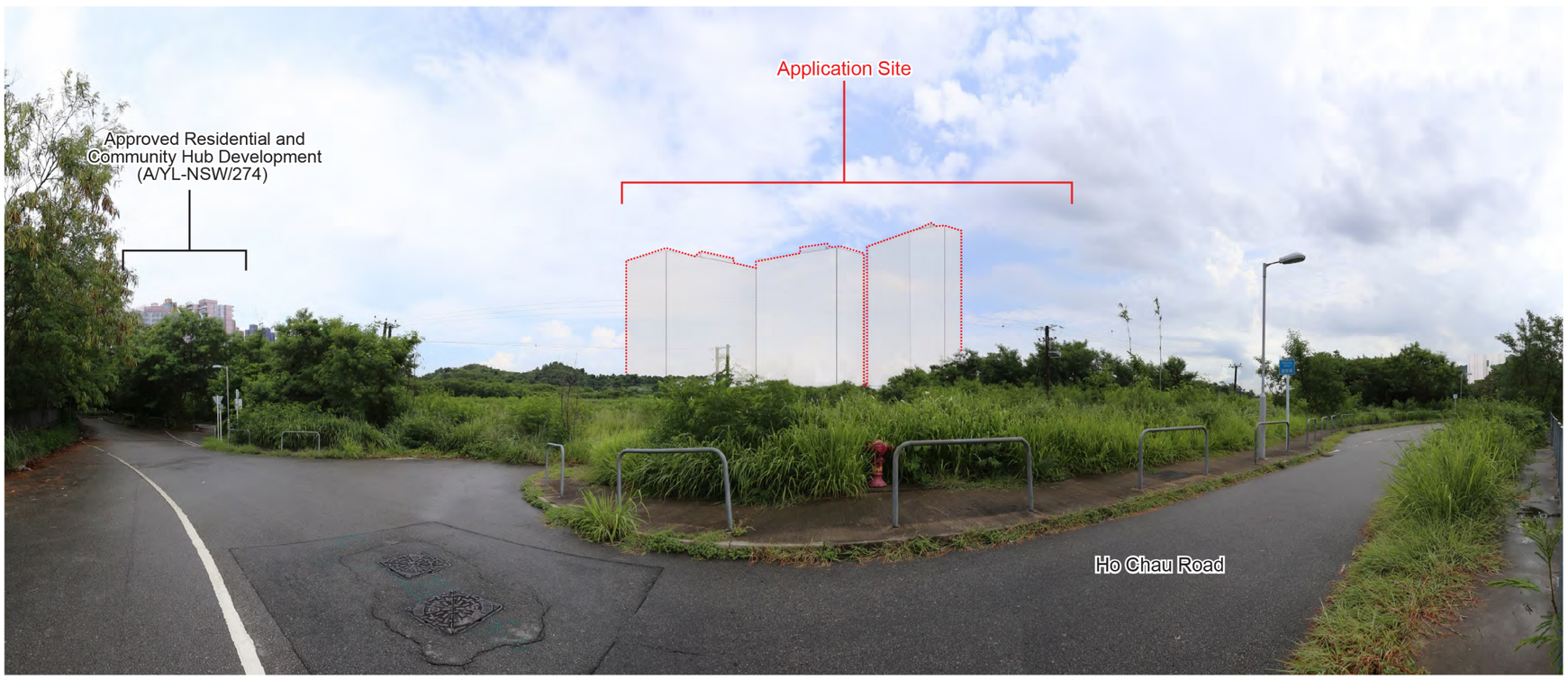
Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale		Figure	5.4



Baseline Scheme



KEY PLAN



Current Scheme

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llewelyn davies

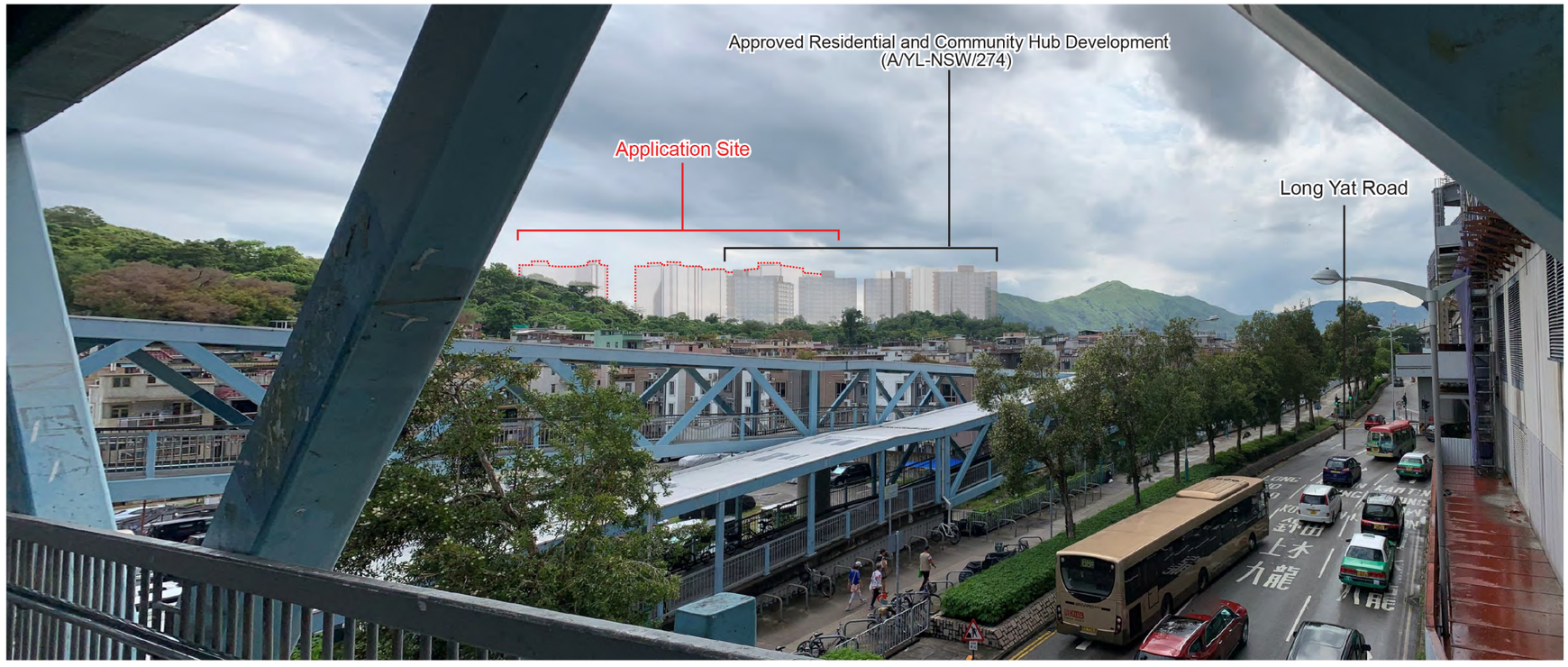
Title

Photomontages – Viewing from VP5 : Ho Chau Road

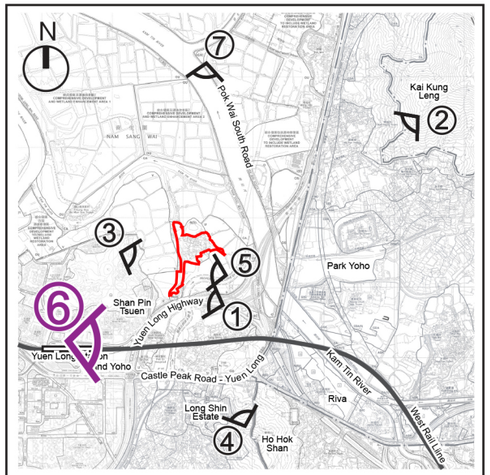
Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale		Figure	5.5



Baseline Scheme



Current Scheme



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6. Careful architectural treatments, such as visually compatible colour scheme of building facades, will be incorporated

llewelyn davies

Title

Photomontages – Viewing from VP6 : Pedestrian Footbridge Connection to Exit G of Tuen Ma Line Yuen Long Station

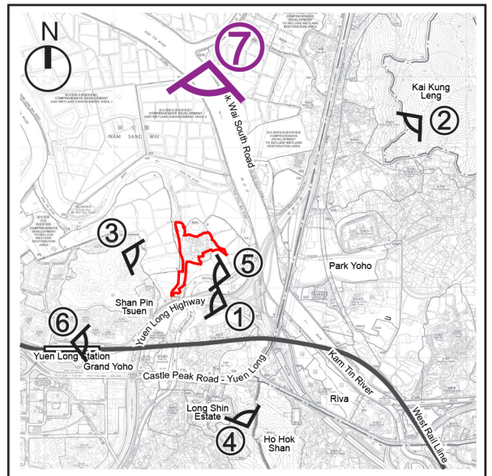
Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale		Figure	5.6



Baseline Scheme



Current Scheme



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6. Careful architectural treatments, such as visually compatible colour scheme of building facades, will be incorporated

llewelyn davies

Title

Photomontages – Viewing from VP7 : Further North of Pok Wai South Road

Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale		Figure	5.7

Table 5.3 – Summary of Visual Impact Assessment

Viewpoints	**VSR Type**	**Degree of Visibility of Potential Source of Visual Impact** *(Full, Partial, Glimpsed)*	**Distance and Direction between the VPs and the Application Site**	**Visual Composition**	**Visual Obstruction and Visual Permeability**	**Effect on Visual Elements and Resources**	**Effect on Public Viewers**	**Magnitude of Visual Change** *(Negligible, Slight, Moderate, Substantial)*	**Visual Sensitivity of VSRs** *(Low, Medium, High)*	**Resultant Overall Visual Impact** *(Enhanced, Negligible, Slightly Adverse, Moderately Adverse, Significantly Adverse)*
VP1 Portion of Yuen Long Highway	Traveler	Partial	About 380m to the southeast	The view towards the Proposed Development from this VP is at an elevated angle. Considering the distant view as well as the screening effect of the extensive vegetation established between the highway and the Application Site, the Proposed Development will blend in well with the medium-rise towers from the Adjacent Approved Application to contribute to a sub-urban environment in the area. The potential impact caused on the overall visual composition is considered to be minor.	The screening effect of the vegetation will have the foreground of the view unchanged that also dominate about two-third of the future view upon the completion of the Proposed Development. It is noted that the open-sky view may be slightly affected, however, considering the completion of the Adjacent Approved Application, the Proposed Development will share similar building height profile with the former, additional obstruction to the overall view is not significant.	The key visual element at this VP is the harmony between the extensive vegetation and the open-sky view. The Proposed Development will not degrade the green visual resources but partially encroach into the sky-view. Yet, the Proposed Development will blend in well to the sub-urban environment with the Adjacent Approved Application, while the separation between the two developments will ensure the preservation of the openness of the built environment.	The effect to public viewers is not substantial as the future public viewers remain the drivers and passengers on Yuen Long Highway which are transient in nature. The openness of the view is largely maintained.	Moderate	Low	Slightly Adverse

Viewpoints	VSR Type	Degree of Visibility of Potential Source of Visual Impact *(Full, Partial, Glimpsed)*	Distance and Direction between the VPs and the Application Site	Visual Composition	Visual Obstruction and Visual Permeability	Effect on Visual Elements and Resources	Effect on Public Viewers	Magnitude of Visual Change *(Negligible, Slight, Moderate, Substantial)*	Visual Sensitivity of VSRs *(Low, Medium, High)*	Resultant Overall Visual Impact *(Enhanced, Negligible, Slightly Adverse, Moderately Adverse, Significantly Adverse)*
VP2 Kai Kung Leng in Lam Tsuen Country Park	Recreation	Full	About 1.8km to the northeast	This VP enjoys an elevated and long-range view over the Proposed Development in the middle of the panoramic view over Yuen Long Basin. Brownfield workshop and open storage sites in Kam Tin area dominated the foreground of this panoramic view, while the sub-urban environment shaped by the Proposed Development and the Adjacent Approved Application gives a smooth transition from the rural environment and the urban development of Yuen Long and Tin Shui Wai New Towns at the backdrop. The overall visual composition features a stepping building height profile from Yuen Long Town Centre to the Proposed Development in Tung Shing Lei and to the village type developments in the surrounding. It should be noted that the brownfield cluster in Sha Po at the foreground of the VP has been identified public housing development with maximum building height of 185mPD and maximum plot ratio of 6.7, which will ultimately transform the visual composition significantly into a residential neighbourhood together with the existing	While the Adjacent Approved Application already took the lead to shape a sub-urban area in creating a harmonized transition between the urban and rural landscapes in Tung Shing Lei area, the Proposed Development will join in and blend in well with the medium-density developments in its vicinity. With similar and compatible development scale with other planned and existing developments, the visual permeability of the overall view remain similar and additional obstruction to the open view at this elevated VP is not significant. It should be noted that, with the implementation of planned public housing development in Sha Po with maximum building height of 185mPD and maximum plot ratio of 6.7, it will dominate the front view from this VP and becomes the major visual obstruction viewing from this VP. Majority of the Proposed Development will be blocked by the planned public housing development.	The key visual elements at this VP are the lower summit of Kai Kung Leng, the mountain ranges of Tai Lam Country Park, Yuen Tau Shan and Castle Peak, sub-urban developments in the fringe of Yuen Long and Kam Tin area, as well as the patchworks of ponds. Given the long distance and elevation of this VP, the effect on the above visual resources would be insignificant which the view towards the visual amenities would be largely preserved except for some scattered ponds in the middle-ground.	The effect to public viewers is not substantial as the future public viewers remain the recreational hikers climbing Kai Kung Leng in search of an overall view of Yuen Long Basin while the openness of the view will be well maintained.	Negligible	High	Negligible

Viewpoints	**VSR Type**	**Degree of Visibility of Potential Source of Visual Impact** *(Full, Partial, Glimpsed)*	**Distance and Direction between the VPs and the Application Site**	**Visual Composition**	**Visual Obstruction and Visual Permeability**	**Effect on Visual Elements and Resources**	**Effect on Public Viewers**	**Magnitude of Visual Change** *(Negligible, Slight, Moderate, Substantial)*	**Visual Sensitivity of VSRs** *(Low, Medium, High)*	**Resultant Overall Visual Impact** *(Enhanced, Negligible, Slightly Adverse, Moderately Adverse, Significantly Adverse)*
				residential developments (e.g. Park Yoho, Riva and Crescent Green) and other planned residential developments (e.g. Approved comprehensive residential development under A/YL-KTN/604).						

Viewpoints	**VSR Type**	**Degree of Visibility of Potential Source of Visual Impact** *(Full, Partial, Glimpsed)*	**Distance and Direction between the VPs and the Application Site**	**Visual Composition**	**Visual Obstruction and Visual Permeability**	**Effect on Visual Elements and Resources**	**Effect on Public Viewers**	**Magnitude of Visual Change** *(Negligible, Slight, Moderate, Substantial)*	**Visual Sensitivity of VSRs** *(Low, Medium, High)*	**Resultant Overall Visual Impact** *(Enhanced, Negligible, Slightly Adverse, Moderately Adverse, Significantly Adverse)*
VP3 Shan Pui Tsuen Graves	Transient	Partial	About 290m to the west	Located near some ponds of Shan Pui Tsuen, the view from this VP is largely taken up by the graves and vegetation at the foreground and Kai Kung Leng in the background with an open-sky view. A direct view towards the Proposed Development will be available when viewing from the graves. However, in view of the high-rise planned public housing development near Sha Po and Mo Fan Heung, as well as the medium-rise development from the Adjacent Approved Application and the Approved Comprehensive Residential Development (A/YL-KTN/604) at the background, the Proposed Development will not be incompatible with the sub-urban environment in the area that is facing gradual transformation towards an urban township.	Given the existing use of the Application Site and its surrounding as abandoned land or scattered ponds, the scale of the Proposed Development exhibits a contrast to the existing environment, additional obstruction to the overall view is substantial. However, it is worth noting that the disposition of buildings is carefully designed with building gaps to enhance the visual permeability within the Application Site. Meanwhile, a large gap is reserved between the buildings of the Proposed Development and the residential towers of the Adjacent Approved Application to safeguard the visual permeability to the mountain ranges at the background. The visual openness from this VP is generally retained.	With the ponds, mountain ranges of Kai Kung Leng, the woodland and the open-sky view being the key visual amenities at this VP, most of these will be largely preserved except for the mountain ranges of Kai Kung Leng. However, careful disposition of the buildings and appropriate landscape and chromatic treatment to buildings would be incorporated to ensure the visual computability to the surrounding and enhance the visual interest of the Proposed Development.	The future public viewers are the occasional visitors of the graves of Shan Pui Tsuen, the effect on them is however not significant as the visitors will mainly engage in worship activities. Their view to the surroundings will only be occasional. The effect on viewers is considered low.	Moderate	Low	Slightly Adverse

Viewpoints	**VSR Type**	**Degree of Visibility of Potential Source of Visual Impact** *(Full, Partial, Glimpsed)*	**Distance and Direction between the VPs and the Application Site**	**Visual Composition**	**Visual Obstruction and Visual Permeability**	**Effect on Visual Elements and Resources**	**Effect on Public Viewers**	**Magnitude of Visual Change** *(Negligible, Slight, Moderate, Substantial)*	**Visual Sensitivity of VSRs** *(Low, Medium, High)*	**Resultant Overall Visual Impact** *(Enhanced, Negligible, Slightly Adverse, Moderately Adverse, Significantly Adverse)*
VP4 Ho Hok Shan	Recreation	Full	About 1.3km to the southeast	Being a local scale summit, Ho Hok Shan holds a panoramic view over Yuen Long Town Centre, Au Tau and Tung Shing Lei area, and stretches outwards to Sha Po in Kam Tin. The existing view at this VP is dominated by vegetation of the mountain itself at the foreground that sometimes screen off the medium-scale public housing development of Au Tau and developments with a prominent stepped building height profile spanning rightwards from the urbanized Yuen Long Town Centre towards the sub-urban environment in Tung Shin Lei and Sha Po. The Proposed Development will fit in well with the sub-urban built environment and the potential visual impact is insignificant.	Considering the planned developments in the vicinity including the potential housing development of Au Tau and Tung Shing Lei, coupled with the Adjacent Approved Application as well as the medium-density community established near Sha Po, the Proposed Development will blend in with the sub-urban contexts in the surrounding and cause no significant obstruction to the overall view.	The harmonized townscape of Yuen Long Basin composed of a great balance between the urban, sub-urban and rural landscape together with the open-sky view contribute to major visual resources at this VP. The immediate nearby low-lying context might be transformed by the Proposed Development, however, when zooming out to the wider view of Yuen Long New Town and Sha Po, the Proposed Development and the Adjacent Approved Development show a logical transition between the high-density environs and the sub-urban context on both ends. That being said, the panoramic view stretching from Yuen Long New Town to Kam Tin will be secured in view of the elevation and long-distance.	Recreational hikers remain as the major VSRs at this VP in the future which this panoramic view overlooking Yuen Long Basin will not be affected although the specific view to Nam Sang Wai wetland might be affected.	Slight	High	Moderately Adverse

Viewpoints	**VSR Type**	**Degree of Visibility of Potential Source of Visual Impact** *(Full, Partial, Glimpsed)*	**Distance and Direction between the VPs and the Application Site**	**Visual Composition**	**Visual Obstruction and Visual Permeability**	**Effect on Visual Elements and Resources**	**Effect on Public Viewers**	**Magnitude of Visual Change** *(Negligible, Slight, Moderate, Substantial)*	**Visual Sensitivity of VSRs** *(Low, Medium, High)*	**Resultant Overall Visual Impact** *(Enhanced, Negligible, Slightly Adverse, Moderately Adverse, Significantly Adverse)*
VP5 Ho Chau Road	Travelers	Partial	About 250m to the southeast	As the sole access road linking the Application Site to other destinations in the district, Ho Chau Road has a frontal view of the Proposed Development from its slight southeast. The existing view at this VP captures the rural essence of Yuen Long Basin that is dominated by the extensive woodland formed by lush vegetation of the abandoned farmland and unused land with an open-sky view above. While the multigenerational residential development from the Recently Approved Scheme would join in which the high floor zone of its will be visible on the leftmost in the background above the trees. The Proposed Development will be become the middle-ground between the woodland and sky-view that might cause significant potential visual impact to the overall composition.	With the residential towers of the Adjacent Approved Application being visible from this VP that marks the gradual transformation of the area to a sub-urban township, the Proposed Development will be less incompatible with the surrounding despite the contrast between the existing use of the Application Site with the Proposed Scheme. Having said that, the Proposed Development is considered to bring additional visual obstruction of the centre of the view and slightly degrade the visual permeability of the area.	The harmony between the green resources contributed by the woodland and the open-sky view make the most important visual amenity at this VP. Despite the Proposed Development will potentially obstruct the seamless integration between the greens and the open-sky view, the stretch of woodland at the foreground will be fully preserved while the open-sky view could also be largely preserved.	The effect to public viewers is low as the future public viewers remain travellers commuting from the Application Site or nearby sub-urban developments that the view is transient in nature.	Moderate	Medium	Moderately Adverse

Viewpoints	**VSR Type**	**Degree of Visibility of Potential Source of Visual Impact** *(Full, Partial, Glimpsed)*	**Distance and Direction between the VPs and the Application Site**	**Visual Composition**	**Visual Obstruction and Visual Permeability**	**Effect on Visual Elements and Resources**	**Effect on Public Viewers**	**Magnitude of Visual Change** *(Negligible, Slight, Moderate, Substantial)*	**Visual Sensitivity of VSRs** *(Low, Medium, High)*	**Resultant Overall Visual Impact** *(Enhanced, Negligible, Slightly Adverse, Moderately Adverse, Significantly Adverse)*
VP6 Pedestrian Footbridge Connecting to Exit G of Tuen Ma Line Yuen Long Station	Traveler	Partial	About 1.2km to the southwest	Located adjacent to Exit G of Tuen Ma Line Yuen Long Station, the footbridge has a side view of the Application Site from its southwest. The existing view from this VP is dominated by the footbridge structure and Long Yat Road, the major route that road transports take towards other districts including Kowloon and Sheung Shui. The visual composition remains largely similar from the baseline view that only two-third of the Proposed Development of lower building height than the medium-rise developments of the Adjacent Approved Application are potentially visible. In view of the substantial distance between this VP and the Application Site (i.e. 1.2km), the potential visual impact is not significant.	As the view towards mountain ranges of Kai Kung Leng have already been obstructed by the residential towers of the Adjacent Approved Application, the Proposed Development will not further encroach into the ridgeline of Lam Tsuen Country Park but take up a small portion of the sky-view between the hill of Shan Pui Tsuen and the aforementioned residential towers.	The visual elements when viewing from this VP include the intermix of the urban and sub-urban built environments characterized by the modern infrastructure of footbridge and station and the village-type development, as well as the mountain ranges of Shan Pui Tsuen and Kai Kung Leng and the open-sky view atop them. As the residential towers of the Recently Approved Scheme will already obstruct the continuity of the ridgeline of Kai Kung Leng and partially block this visual amenity, other visual amenities visible from this VP will be largely preserved.	The effect to public viewers is not substantial as the future public viewers remain the passenger travelling to and from Tuen Ma Line Yuen Long Station which the view over the sub-urban are is transient in nature.	Slight	Low	Negligible

Viewpoints	**VSR Type**	**Degree of Visibility of Potential Source of Visual Impact** *(Full, Partial, Glimpsed)*	**Distance and Direction between the VPs and the Application Site**	**Visual Composition**	**Visual Obstruction and Visual Permeability**	**Effect on Visual Elements and Resources**	**Effect on Public Viewers**	**Magnitude of Visual Change** *(Negligible, Slight, Moderate, Substantial)*	**Visual Sensitivity of VSRs** *(Low, Medium, High)*	**Resultant Overall Visual Impact** *(Enhanced, Negligible, Slightly Adverse, Moderately Adverse, Significantly Adverse)*
VP7 Further North of Pok Wai South Road	Recreation	Partial	About 1.2km to the northeast	Located across Kam Tin River to the further northeast of the Application Site, this VP enjoys an open-view overseeing the Kam Tin River bounded by the existing tree groups and a harmonized landscape between the urban developments in Yuen Long Town Centre and the sub-urban environment at the fringe of Yuen Long and Kam Tin with Tai Lam Country Park sitting at the back. The Proposed Development will be standing behind the tree groups along Nam Sang Wai Road where only the high floor zone will be visible which it will take up a little bit of the sky-view and encroach into a portion of the continuous mountain ranges at the backdrop.	The stepping building height profile spanning from the high-rise urban developments of Yuen Long Town Centre towards Tung Shing Lei makes the Proposed Development not entirely visually incompatible with the surrounding. It should also be highlighted that the Proposed Development is partially screened off by the tree groups along Nam Sang Wai Road where this natural visual buffer scales down the degree of the visual obstruction caused by the Proposed Development.	Key visual elements at this VP are the Kam Tin River, existing trees along Nam Sang Wai Road, mountain ranges of Tai Lam Country Park and the open-sky view. The Proposed Development, a logical extension to the high-rise development context at the fringe of Yuen Long New Town characterized by Grand YOHO, might potentially encroach a tiny portion of the open-sky view and partial view over of the mountain ranges of Tai Lam Country Park, other amenities will be fully preserved, in particular, the vast vegetation in the middle-ground will stand to screen off an extensive portion of the Proposed Development.	The effect to public viewers is not substantial as the future public viewers remain the transient drivers along Pok Wai South Road and occasional recreational cyclists where the open-view towards Kam Tin River and vegetation in the middle-ground will be maintained.	Slight	High	Moderately Adverse

6 PROPOSED MITIGATION MEASURES

6.1 Visual mitigation measures seek to minimise potential impacts from the proposed development by screening sensitive views of building structures and blending the new development into the landscape pattern of the surrounding area. The following mitigation measures were inherently incorporated into the layout and arrangement of blocks which ensure that the Proposed Development would be compatible to and adds visual interest to the surrounding environment:

6.2 *Incorporation of Building Setback from Site Boundary*:

- While the major building mass concentrates at the northern portion of the Application Site, building setback of not less than 5m is incorporated to enhance the visual permeability and safeguard the air ventilation in the area (**Figure 6.1** refers).

6.4 *Creation of Building Gaps*:

- Building gaps of not less than 15m are proposed between the public housing site and private housing site to facilitate permeability through the site to serve as the visual relief and break up the perceivable bulk. Two other building gaps of not less than 15m are provided between T2 & T3 and T7 & T8 which align with annual and summer wind prevailing wind directions to facilitate air ventilation and at the same time avoid continuous building façade (**Figure 6.1** refers).

6.5 Provision of a Multi-layered Greenery Network

- The Housing Authority will provide at least 20% of greenery coverage for public housing portion at planning, design and implementation stage, with a target to achieve an overall target of 30% of greenery coverage.

6.6 *Provision of Buffer Planting*:

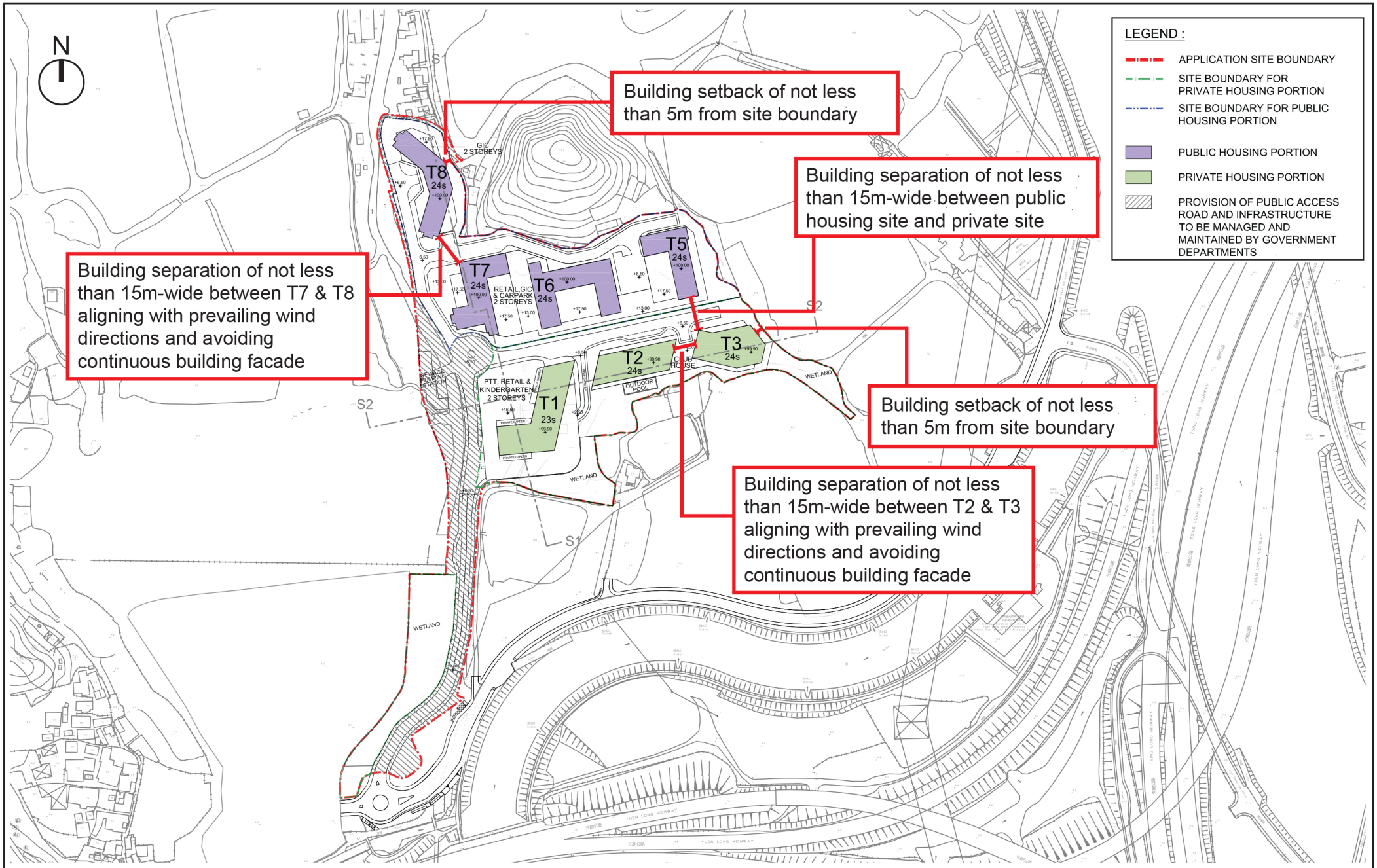
- A peripheral planting strip along the site boundary is provided to encourage a green interface with the surrounding land uses and create a better visual experience to the key VSRs in the vicinity.

6.7 Compensation of Ponds with Rural and Naturalistic Approach:

- Achieved “no net loss in wetland” as required by TPB PG No. 12C, a total area of 6,900m^2 of compensative ponds will be provided under a landscape design approach of rural and naturalistic that will be enhanced with continuous buffer planting of selected indigenous plant specifies to create a sense of place.

6.8 *Sensitive Architectural and Chromatic Treatment to Buildings*:

- Careful landscape and architectural treatment to buildings are incorporated including visually compatible colour scheme of building facades of the Proposed Development and with an extensive multi-layered greenery network to strengthen the integration between the Proposed Development and its surrounding.



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Title

Indicative Location of Building Setback and Building Gaps

Checked	DH	Drawn	PW
Rev	0	Date	May 2024
Scale	N/A	Figure	6.1

7 CONCLUSION

7.1 This VIA is submitted to in order to evaluate the degree of visual impacts on visual sensitive receivers (VSRs) from major public viewpoints (VPs) brought by the Proposed Development of the LSPS at the Application.

7.2 A total of 7 key public VPs have been selected to evaluate the overall visual impact of the Proposed Development. With reference to the analysis in preceding sections, and as illustrated on the photomontages taken at the selected VPs, 3 out of the 7 selected VPs would have “Moderately Adverse” visual impacts, the rest of the 4 selected VPs would have “Negligible”, “Slightly Adverse” and “Significantly Adverse” visual impact respectively. The overall visual impact of the proposed development is considered as **Moderately Adverse**.

7.3 With mitigation design measures incorporated, including building setback, building gaps, landscaped ponds compensation, buffer plantings and sensitive architectural and chromatic treatment to buildings, the Proposed Development is visually **acceptable** considering its surrounding context is characterised by a sub-urban township with medium density developments.

7.4 In conclusion, the Proposed Development is considered to be acceptable in visual terms.

Appendix C
Revised Air Ventilation Assessment (Expert Evaluation)

Prepared by

Ramboll Hong Kong Limited

PROPOSED LAND SHARING PILOT SCHEME FOR A SITE AT VARIOUS LOTS IN D.D 115, TUNG SHING LEI, YUEN LONG

AIR VENTILATION ASSESSMENT (EXPERT EVALUATION)

Date	**May 202429/05/2024 14:20:00**
Prepared by	**Mike Kwan** **Assistant Environmental Consultant**
Signed	
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Signed	
Project Reference	**SHKTSLRDEI00**
Document No.	**R8163_V1.7.docx**

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APPENDIX

Appendix 1 The Indicative Block Plan of the Approved Scheme
Appendix 2 The Indicative Block Plan of the Proposed Scheme
Appendix 3 Illustration of Downwash Effect

1. INTRODUCTION

1.1 Project Background

1.1.1 Subsidized Housing and Private Housing, with Retail Facilities, GIC Facilities and Transport Terminus are proposed at various lots in D.D. 115 and adjoining Government Land, Tung Shing Lei, Yuen Long, New Territories (the Application Site) under Land Sharing Pilot Scheme (LSPS).

1.1.2 Ramboll Hong Kong Limited has been commissioned by the Applicant to prepare the Air Ventilation Assessment Study report – Expert Evaluation (AVA-EE report) for the Application for Proposed Subsidized Housing and Private Housing, with Retail Facilities, GIC Facilities and Public Transport Facilities, Tung Shing Lei, Yuen Long, New Territories.

1.2 Objective

1.2.1 This AVA-EE report has been prepared to identify opportunity and good design features that can be practicably adopted in the Proposed Scheme from air ventilation standpoint and evaluate if there would be any impact on the overall air ventilation performance of the assessment area by comparing the Proposed Scheme with the "Approved Scheme" (i.e. approved rezoning Application No. Y/YL-NSW/4 for house development).

1.3 Application Site and its Environs

1.3.1 **Figure 1** shows the location of the Application Site and its environs.

1.3.2 The Application Site is currently zoned as "Residential (Group D)" ("R(D)") under Approved Nam San Wai Outline Zoning Plan (No. S/YL-NSW/8). The Application Site includes a tidal stream (along western side). Southern portion of the Application Site is a narrow strip of land for provision of access road connecting to Ho Chau Road.

1.3.3 A Fung Shui hill knoll is to the immediate north of the Application Site within "R(D)" zone. The Application Site is located to the north of Yuen Long Bypass Floodway and Yuen Long Highway. Shan Pin Tsuen is a small village cluster about 150m to the west of the Application Site. A planned residential development (Planning Application No. A/YL-NSW/274) (max. building height +75mPD) is to the immediate west of the southern portion of the Application Site. The area to the north of Fung Shui hill knoll, east and on northwest side of northern portion of the Application Site contains existing ponds and is currently zoned "Conservation Area" ("CA"), "Undetermined" ("U") or "Village Type Development" ("V").

1.4 Approved Scheme

1.4.1 A house development was proposed at the same site and approved under Section 12A planning application (No. Y/YL-NSW/4).

1.4.2 The Approved Scheme refers to the layout plan for the S12A rezoning approval (No. Y/YL-NSW/4) for houses development. The residential development under the Approved Scheme comprises 57 houses (+16.5mPD) and a clubhouse (+10.5mPD), with a domestic PR of 0.34. The 3-storey houses (11m above ground) are located above a 1-storey basement carpark/E&M floor of about 4.5m high. The Indication Plan of the Approved Scheme is shown in **Appendix 1**.

1.5 Proposed Scheme

1.5.1 Under LSPS, 7 residential towers (T1 to T8, T4 omitted) of 23 to 24 storeys are proposed at the Application Site and elevated up to +100mPD. The proposed

development also includes facilities such as retail, GIC & carpark and PTT & kindergarten. Compensation wetlands are provided at various areas in connection to existing ponds, tidal stream and planned water pond of adjacent planned development.

1.5.2 Under the Proposed Scheme, building separation with width not less than 15m and not less than 5m building setback along site boundary which could serve as air corridor have been considered. Building separations between residential towers and their alignments will be further explore at detailed design stage of the housing developments to facilitate air ventilation.

1.5.3 The Indicative Block Plan of the Proposed Scheme and sections are shown in **Appendix 2**.

2. SITE WIND AVAILABILITY DATA

2.1 Site Wind Availability Data From RAMS

2.1.1 According to the Planning Department's website, a meso-scale Regional Atmospheric Modeling System (RAMS) was used to produce a simulated 10-year wind climate at the horizontal resolution of 0.5 km x 0.5 km covering the whole territory of Hong Kong. The simulated wind data represents the annual, winter and summer wind condition at various levels, i.e. 200 m, 300 m, and 500 m above terrain.

2.1.2 The RAMS data of the grid (X: 053, Y:072) has been extracted from the Site Wind Availability Data of Planning Department's website.

2.1.3 Based on the wind roses with different heights (200, 300 or 500m) available, the 200 m site wind availability data represents wind data that takes into account the topographical effect around the Application Site. Therefore, a lower level of wind roses at 200 m height is selected to study the prevailing wind condition as it represents the incoming wind to the Application Site and considers the influence on the prevailing winds by the surrounding topography.

2.1.4 According to the wind roses at 200 m altitude, annual and summer prevailing wind directions for the Application Site are NNE, E and S whereas summer prevailing wind directions are SSE, S and SSW. **Figure 2** shows the relevant wind roses diagrams representing the frequency and wind speed distribution at 200m height in annual and summer conditions. The wind frequency data is provided in **Table 2.1** below.

Table 2.1 Summary of RAMS Data and Wind Direction at 200m

Wind Direction	Probability for Annual Condition (%)	Probability for Summer Condition (%)
N	2.9%	1.2%
NNE	**15.8%**	1.8%
NE	8.6%	1.7%
ENE	6.5%	2.6%
E	**16.9%**	9.4%
ESE	9.0%	5.5%
SE	6.0%	8.2%
SSE	6.6%	**12.2%**
S	**11.2%**	**23.7%**
SSW	5.1%	**12.0%**
SW	3.0%	7.7%
WSW	1.9%	4.2%
W	2.4%	4.9%
WNW	1.6%	2.6%
NW	1.3%	1.4%
NNW	1.3%	1.0%

Note: Bolded characters highlighted in grey represent the selected prevailing wind directions for evaluation.

2.2 Topography

2.2.1 The Application Site is located in the inland Yuen Long area. The surrounding is topographically flat and the ground elevation gradually increases on the further south side of Yuen Long Highway. To the north to east of the Application Site is area including Fung Shui hill knoll and Kam Tin River without any building mass. It is expected that annual NNE, E and S prevailing winds can penetrate the Application Site and reach its

downstream areas thus existing site wind availability and immediate surrounding is anticipated to be satisfactory. To the further northeast and south side of the Application Site is Kai Kung Leng (4km apart) and Tai Lam Country Park (more than 3km apart) with higher topography (up to about 560mPD at Kai Kung Leng and 250mPD at Tai Lam Country Park). The influence to the wind flow pattern around the Application Site is minimal due to long separation.

2.3 Building Morphology

2.3.1 All noise barriers, elevated structures, planned and committed development, if any, are considered in this report. After checking by the site visit for existing developments and the published information in Statutory Planning Portal under the Town Planning Board regarding planned / committed developments in the model area, the Application Site is surrounded by some high-rise to low-rise developments, e.g. planned residential development (Planning Application No. A/YL-NSW/274) to the southwest, some village type developments or some temporary structures to the east, north, southwest and west.

2.3.2 Under the existing wind condition, the building density of the surrounding is considered low. The surrounding areas are either abandoned ponds or erected with low-rise buildings including scattered development such as Shan Pui, Shan Pin Tsuen, Wong Uk Tsuen and some temporary building structures to the west.

2.3.3 To the further south of the Application Site is Small Traders New Village and Yuen Long Small Traders New Village Public School. Remaining areas are either open storage area or abandoned ponds and meander. Potential building blockage effect due to the surrounding existing developments (to the northwest and south) are considered low.

2.3.4 The planned development (Planning Application No. A/YL-NSW/274) to the southwest consists of residential towers ranging from 26.9mPD to 75mPD. The separation distance between building blocks of the Proposed Development and this planned development is at least 160m. Wind from southwest will be blocked under SW wind but generally not affected under prevailing wind directions.

2.3.5 Moreover, there are noise barrier (up to about 5m high) along Yuen Long Highway which is separated by around 270m from the nearest building of the Application Site. These building structures will likely block air flow at pedestrian level (2m above ground) in some extent, but should not affect wind availability at the Application Site and nearby area.

2.4 Summary of Existing Site Wind Availability

2.4.1 According to the wind availability data, the annual wind directions of the area include NNE, E and S.

2.4.2 From **Table 2.1Table 2.1** above, the wind probability from the E direction is 16.9 % and is considered to be the most dominant annual wind direction for the area. The NNE (15.8 %) and S (11.2 %) wind are also dominant annual prevailing wind directions other than the E wind.

2.4.3 Under annual NNE and E wind, wind flow via the abandoned ponds to the Application Site. The surrounding traffic network and open space already opens up areas for wind penetration.

2.4.4 During summer condition, prevailing winds from the SSE, S and SSW are the dominant wind directions. Similar to annual wind conditions, it is anticipated that the surrounding traffic network and open space shall open up area for wind penetration. For the prevailing SSW wind, wind will flow on east side of the planned high-rise development

to the Application Site In addition, Yuen Long Highway acts as wind corridor for SSW wind direction.

2.4.5 **Figure 3** and **Figure 4** show the identified major air corridors / paths under the annual and summer wind conditions.

3. EXPERT EVALUATION OF AIR VENTIALTION PERFORMACE OF THE PROPOSED DEVELOPMENT

3.1 Important Areas

3.1.1 Important surrounding areas that the public would often access have been identified as the following:

- Roads surrounding the Application Site (Ho Chau Road, Kam Tin River and Yuen Long Highway; and
- Nearby residential and village-type developments.

3.2 Evaluation of Merit/Demerit of Design Features of the Proposed Development

3.2.1 Under the Proposed Scheme, various good design feature beneficial to air ventilation such as separation of building from site boundary, optimal building disposition and building separation advantageous to prevailing wind penetration are incorporated.

- Building separation (not less than 15m), aligning approximately along E-W direction, is proposed to be incorporated particularly in the areas between the development site boundary where the private housing and public housing sites adjoins. This separation facilitates wind penetration mainly from E direction to benefit its downstream areas. The provision and alignment of other possible building separation will be further explored at detailed design stage.
- Building separation (not less than 15m), aligning approximately along NNE-SSW direction, is proposed to be incorporated. Some portion of prevailing SSW wind can flow through this building separation and reach downward areas. The provision and alignment of other possible building separation will be further explored at detailed design stage.
- Building setback (for residential portion) from the eastern, southern and western boundaries of the Application Site. These setbacks (not less than 5m) facilitate wind penetration mainly from NNE, E, S, SSE and SSW direction to benefit its surrounding areas.

3.2.2 Further discussion of the scheme based on the good design features above is included below.

Air corridors/ Air paths

3.2.3 **Figure 3** and **Figure 4** illustrate the prevailing winds from annual and summer wind directions for the Approved Scheme. **Figure 5** and **Figure 6** illustrate the prevailing winds from annual and summer wind directions for the Proposed Scheme.

3.2.4 Major wind corridors nearby the Application Site are along E-W axis through open space, Ho Chau Road, Kam Tin River and Yuen Long Highway. These wind corridors are comparable for the Approved Scheme and the Proposed Scheme.

3.2.5 It is noted that there are low-rise houses (+16.5mPD) within the Application Site under the Approved Scheme. The annual and summer prevailing wind would flow atop the clusters of low-rise houses and would skim over the Application Site to reach the downward areas further apart. It is expected wind blockage is limited to area at immediate leeward location only. Therefore, slightly lower wind availability would be expected within the Application Site and its immediate surrounding.

3.2.6 Under the Proposed Scheme, it is not likely that wind can flow atop the development and reach pedestrian level then easily. Therefore, building setbacks (not less than 5m)

and building separations (not less than 15m) are provided to enhance the ventilation performance at pedestrian level. There are proposed building setbacks from site boundary at pedestrian level from the eastern, southern and western boundaries of the Application Site, with the width of about 6m, 21m, 10m respectively. These building setbacks would allow more effective NNE, E, S, SSE and SSW prevailing wind penetration across the Application Site. In addition, there are building separations of not less than 15m and aligned with prevailing wind directions (say, NNE, E, SSW wind) to allow wind penetration. Therefore, it is anticipated that overall unfavourable impact in terms of wind environment would be minimal.

Building Disposition and Development Permeability

3.2.7 Under the Approved Scheme, despite closely clustered residential houses, the proposed low-rise houses of 11m above ground would allow wind flowing atop the houses and reach its downwind area eventually. Wind availability would be reduced only among the immediate downwind area. It is expected that it would not result in any significant impact to most of the surroundings in terms of air ventilation.

3.2.8 Under the Proposed Scheme, various building gaps are incorporated into the design of the proposed development at the Application Site, which would allow the wind penetration in annual and summer prevailing wind conditions. There are building separations proposed to facilitate SSW wind flow along this building separation towards surrounding areas. S wind penetration can likely be allowed (façade capable to welcome and divert S wind to the gap). Furthermore, building separation to facilitate E wind towards the Application Site will also be explored at detailed design stage.

3.2.9 By comparing to the Approved Scheme, the overall building footprint of the proposed building blocks in the Proposed Scheme would impose some blockage to the winds. Moreover, it is apparent that the towers in the Proposed Scheme would be wider when compared to the Approved Scheme. It is anticipated that the towers would block some portions of wind towards downwind areas and the decrease of wind flow to further downwind areas would be expected. However, considerable number of building separation (not less than 15m) and setbacks allow prevailing winds penetrate through the residential towers and thus increase airflow towards the leeward areas. Especially for building separations (not less than 15m) between T8 and T7 as well as T2 and T3, they divert NNE, E and S winds towards the planned residential development (Planning Application No. A/YL-NSW/274) and pedestrian accessible areas including Ho Chau Road under annual condition. While for summer condition, the 15m-wide building gaps allow dominant prevailing winds (SSW and W wind) penetrating through the building blocks and reaching downwind areas. Therefore, it is anticipated that unfavourable impact in terms of wind environment would be mitigated in certain degree and minimised.

3.2.10 Since various mitigation measures/ wind enhancement features are incorporated in the design of the Proposed Scheme, it would allow wind penetration across the Application Site and ameliorate the impact in certain extent.

Building Height

3.2.11 The proposed maximum building height of the Proposed Scheme at +100mPD is higher than the maximum building height permissible in the Approved Scheme (+16.5mPD). Theoretically, the Proposed Scheme with higher buildings would result in more wind blockage impact and it is more difficult for wind to pass over the building and come to the pedestrian level when compared to the Approved Scheme. Thus, there will be slightly lower wind availability in the downwind areas (under E wind) and planned residential development, Shan Pin Tsuen, Wong Uk Tsuen (under NNE wind) in

comparison to the Approved Scheme. Since the planned residential development is located at the southwest side of the Application Site, the high-rise buildings of the planned residential development would have some additional influence on the air ventilation performance of the surrounding areas at pedestrian level. Wind wake area would be created as the incoming wind deflect and flow around the building tower (see illustration in **Appendix 3**). It is expected the wake area would slightly impact the wind availability within the Application Site and its leeward side.

3.2.12 There would be blockage effect due to higher building height. Yet, the provision of building separations (not less than 15m) would mitigate the impact in some degree and allow wind to flow to downwind area.

3.3 Directional Analysis of the development

As discussed in **Sections 2.1** and **2.3**, winds from NNE, E and S directions are annual prevailing winds whereas winds from SE, SSE and SSW are dominant in the summer.

NNE Wind

3.3.1 Under NNE wind condition, the massing of proposed high-rise developments would inevitably obstruct some pedestrian wind flow. With the provision of building separations between T7/T8, between T2/T3 (not less than 15m), and alignment to be further explored at detailed design stage, and building setback along northern and eastern side of the site boundary (about 10m and 6m respectively), the NNE wind would penetrate through these building separations, setbacks and reaching the Application Site and further penetrate the downstream areas including the southwestern side of the Application Site. Therefore, the unfavourable impact in terms of wind availability on the surrounding areas is expected to be reduced.

E Wind

3.3.2 Under E wind, the massing of proposed high-rise developments would inevitably obstruct some pedestrian wind flow. It is anticipated that the wind availability would be slightly lower among the downwind areas of the Application Site under the Proposed Scheme.

However, under the Proposed Scheme, the proposed building setback along the southern boundary (about 21m) and open spaces within the Application Site would facilitate the wind flowing through this setback area and reaching the downward areas. In addition, it is considered that the building separations between public and private housing portion (not less than 15m) and alignment to be further explored at detailed design stage would help to alleviate the potential impact of the proposed development. Therefore, it is anticipated that impact on leeward area would be minimised.

S Wind

3.3.3 S wind will mainly flow along the abandoned ponds and open spaces. As shown in **Figure 5** & **Figure 6**, there are building setback along the eastern and western side of the site boundary (about 6m and 10m respectively). These would allow S wind flow through the Application Site and towards the downward areas easier. Some portion of S wind would flow along the proposed access road and penetrate through the building separation between T1/T2 (not less than 15m) to supply air ventilation to the public housing portion at pedestrian level.

3.3.4 In addition, while the building separation between T7/T8 and T2/T3 (not less than 15m) are not exactly orienting to S wind direction, the building façade should be able to divert S wind to pass through the building separation to downwind area. Furthermore, the high-rise buildings of the Proposed Scheme could block the S wind

and wind wake would be occurred at the leeward side. It is expected that the wind availability under S wind would be slightly lower.

3.3.5 However, the high-rise building of private housing portion could generate downwash wind from high level wind flow. The high-level wind will flow downward and towards the pedestrian level including Ho Chau Road and nearby open spaces. The high-rise building of public housing portion could also generate downwash wind and provide air ventilation to the building separation between public and private portion. The downwash wind would further circulate within the Application Site through the building separation. It is expected the impact on wind environment at the northern part of Application Site is less significant.

SSE wind

3.3.6 SSE wind would mainly flow from along the surrounding traffic network and open space. Under the Proposed Scheme, proposed development would block the winds from reaching its surrounding areas on leeward side which are generally pond areas. Slight reduction of wind availability at the downstream areas would be expected.

3.3.7 Similar to S wind, the high-rise building of the proposed development in the Proposed Scheme would block some portion of the incoming wind to flow through the Application Site. Slightly lower wind availability would be resulted at the northern site boundary. On the other hand, the high-rise buildings would capture some portion of high-level SSE winds and would create high-level wind and flow to the pedestrian level within the Application Site and the adjacent surrounding areas. In addition, as the building setback from the south-eastern and south-western side of the boundary are provided (about 45 m and 6m respectively), more SSE winds could flow around the massing of the proposed development to the downward areas. Therefore, it is anticipated that impact on downward area would be minimised.

SSW Wind

3.3.8 Under SSW wind, the planned residential development (to the SW) is likely at or close to upwind location and can slightly reduce the wind availability to the Application Site. The proposed high-rise development may further obstruct wind flow to its downwind areas. It is anticipated that there would be reduced wind availability at the surroundings.

3.3.9 However, various building design measures are proposed to be incorporated in the proposed development. Some portion of SSW wind can flow through the building separation between T7/T8, between T2/T3 (not less than 15m), and alignment to be further explored at detailed design stage, and reach the downwind areas. Building separations can facilitate the penetration of SSW prevailing wind through the Application Site and enhance the wind environment within the Application Site and the downward areas.

3.3.10 As there would be high-rise buildings under the Proposed Scheme, more downwash effect would be induced to benefit area nearby. It is expected that the wind availability under the Proposed Scheme would not be adversely impacted. In conjunction, building separations and setbacks to be further developed at detailed design stage that can increase wind penetration through the Application Site. Therefore, the unfavourable impact in terms of wind availability on the surrounding areas is expected to be reduced.

3.4 Summary of Relative Air Ventilation Performance

3.4.1 The air ventilation performance of the Approved Scheme and the Proposed Scheme has been appraised. Under the Approved Scheme, it consists of 57 houses and a clubhouse with maximum building height of +16.5mPD. Under the Proposed Scheme,

high-rise building is proposed and building separations and building setbacks along site boundary which could serve as air corridor are provided.

3.4.2 Building separations (not less than 15m) and alignment to be further explored at detailed design stage will facilitate wind flow of prevailing wind. Besides, the building setbacks from the site boundary (not less than 5m) to facilitate the wind flows.

3.4.3 In addition, the proposed building height of the Proposed Scheme (23 to 24 storeys above ground) is higher than that of the Approved Scheme (about 3 storeys above ground). The high-rise buildings of the Proposed Scheme might impose more blockage at higher level. However, the proposed building separations and building setback in the proposed development would increase the overall wind permeability of the Application Site to mitigate the wind blockage effect by high-rise building development in some degree. To summarise, various good design measures have been incorporated to mitigate air ventilation impact so that the Proposed Scheme is considered unlikely to impose significant impacts on the surrounding areas in air ventilation perspective.

4. CONCLUSION

4.1.1 A qualitative assessment on the air ventilation performance of the Proposed Development has been carried out.

4.1.2 According to the findings of this AVA-EE, the annual prevailing wind comes from NNE, E and S directions while the summer prevailing wind comes from SSE, S and SSW directions. After considering the potential environmental impacts on the Application Site, the layout of the Proposed Development has carefully considered and incorporated the good design in air ventilation aspect. Taking into consideration of the existing topography, the location of the existing built areas and tentative mitigation measures to be further explored in detailed design stage, it is considered that the Proposed Development would not have significant adverse impact on surrounding environment.

4.1.3 The Proposed Scheme will incorporate effective mitigation measures such as more building separation with width not less than 15m and aligned with prevailing wind directions, and not less than 5m setback from site boundary. Moreover, these wind corridors based on building separation will be oriented with prevailing wind direction where practicable and with sufficient separation distance to maintain good air ventilation performance. While higher building height would impose more blockage effect, the proposed building separations and building setback would mitigate the blockage problem in some extent. Therefore, the Proposed Scheme is unlikely to impose significant impacts on the surrounding sites from air ventilation perspective as compared with the Approved Scheme.

Figures

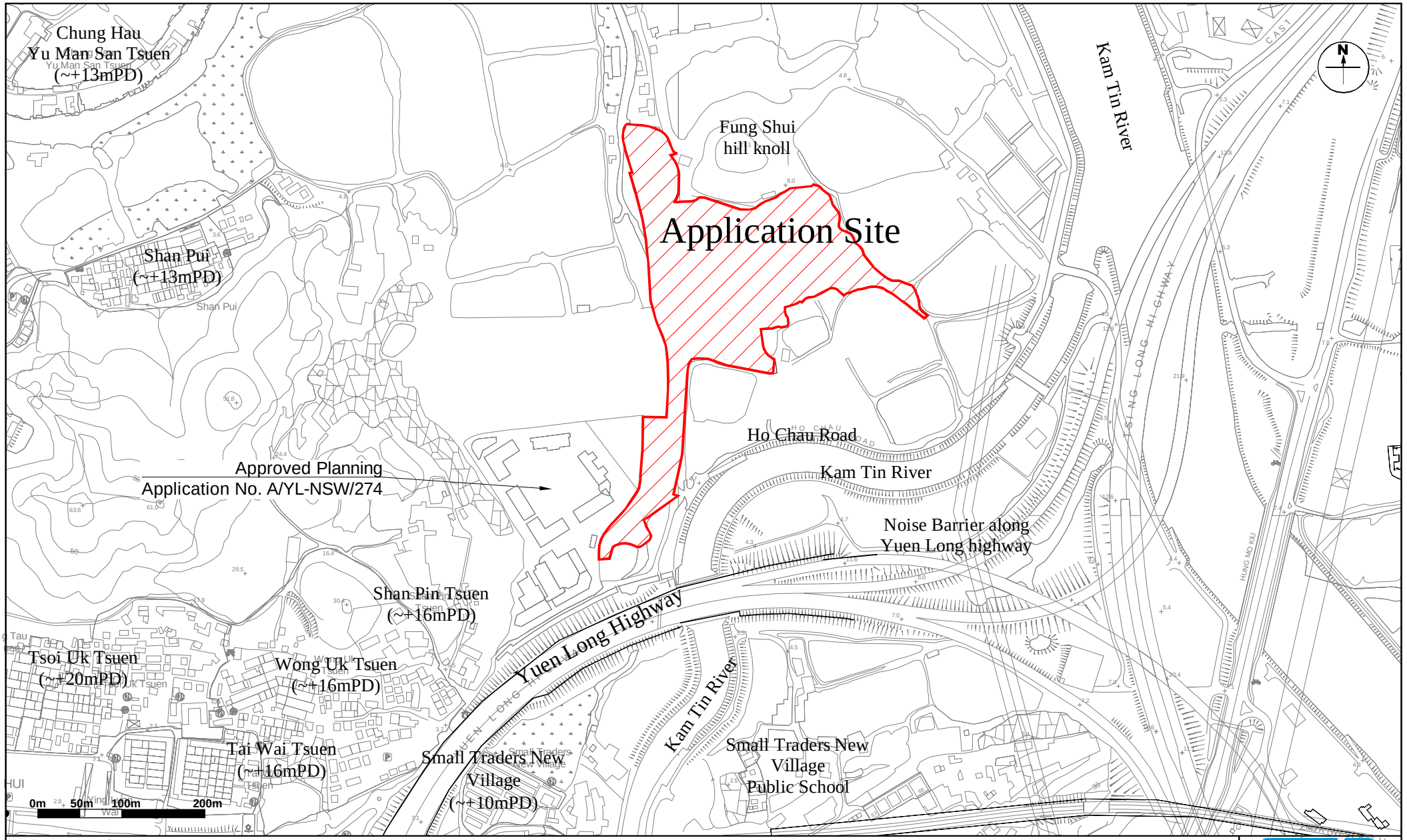

Figure: 1

Title: Location of the Application Site and its Environ

Project: Land Sharing Pilot Scheme - Application for Proposed Subsidized Housing and Private Housing, with Retail Facilities, GIC Facilities and Public Transport Facilities, Tung Shing Lei, Yuen Long, New Territories

RAMBOLL

Drawn by:	CC
Checked by:	CC
Rev.:	1.1
Date:	Jul 2023

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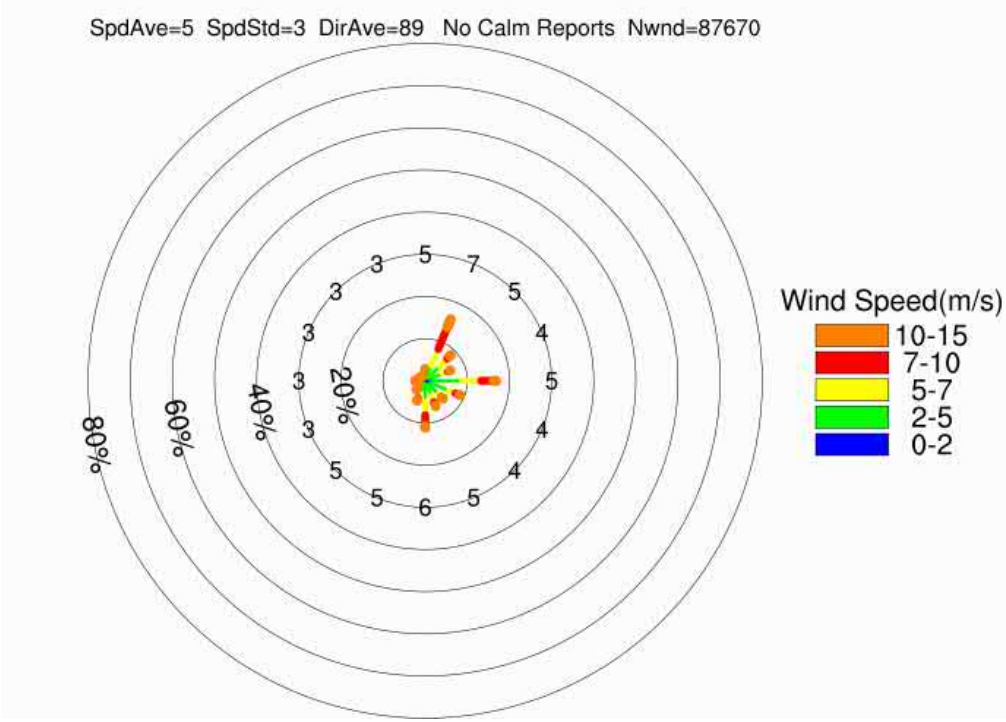
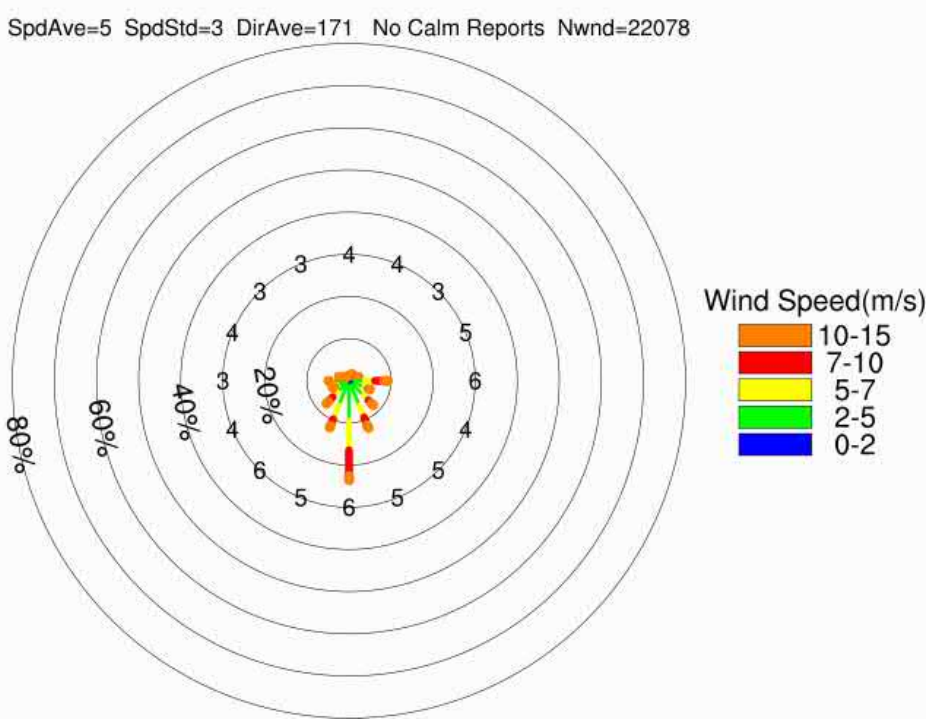


Annual



Summer

Figure: 2	RAMBOLL
Title: Windrose Diagram representing V∞ of the Area under Concern at 500m above ground (X:053, Y:072)	Drawn by: CC Checked by: CC
Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D 115, Tung Shing Lei, Yuen Long	Rev.: 1.0 Date: Aug 2021

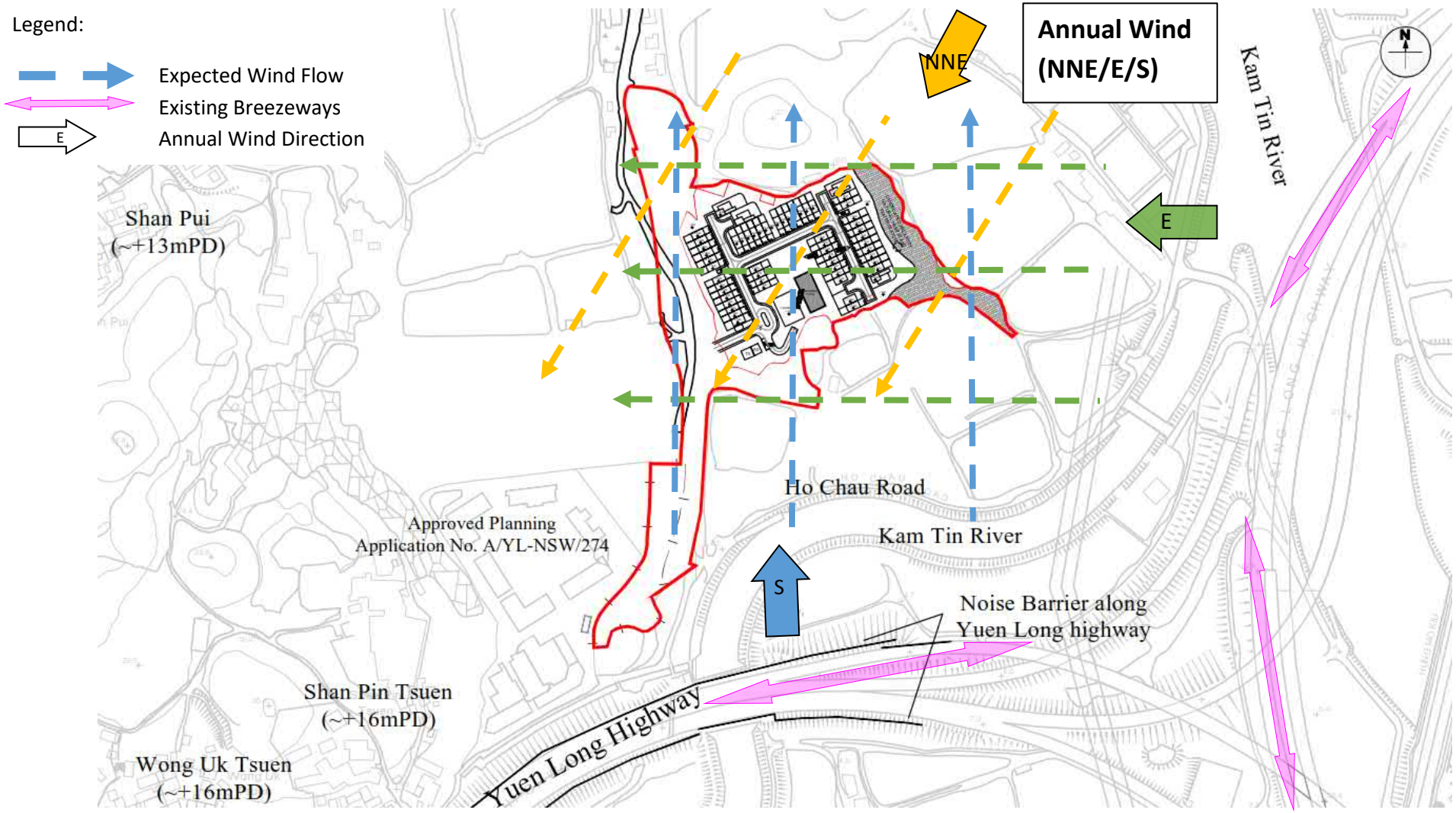


Figure: 3	RAMBOLL
Title: Illustration of Wind Flow from Annual Wind Directions for Approved Scheme	Drawn by: MK Checked by: CC
Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D 115, Tung Shing Lei, Yuen Long	Rev.: 1.6 Date: Jan 2024

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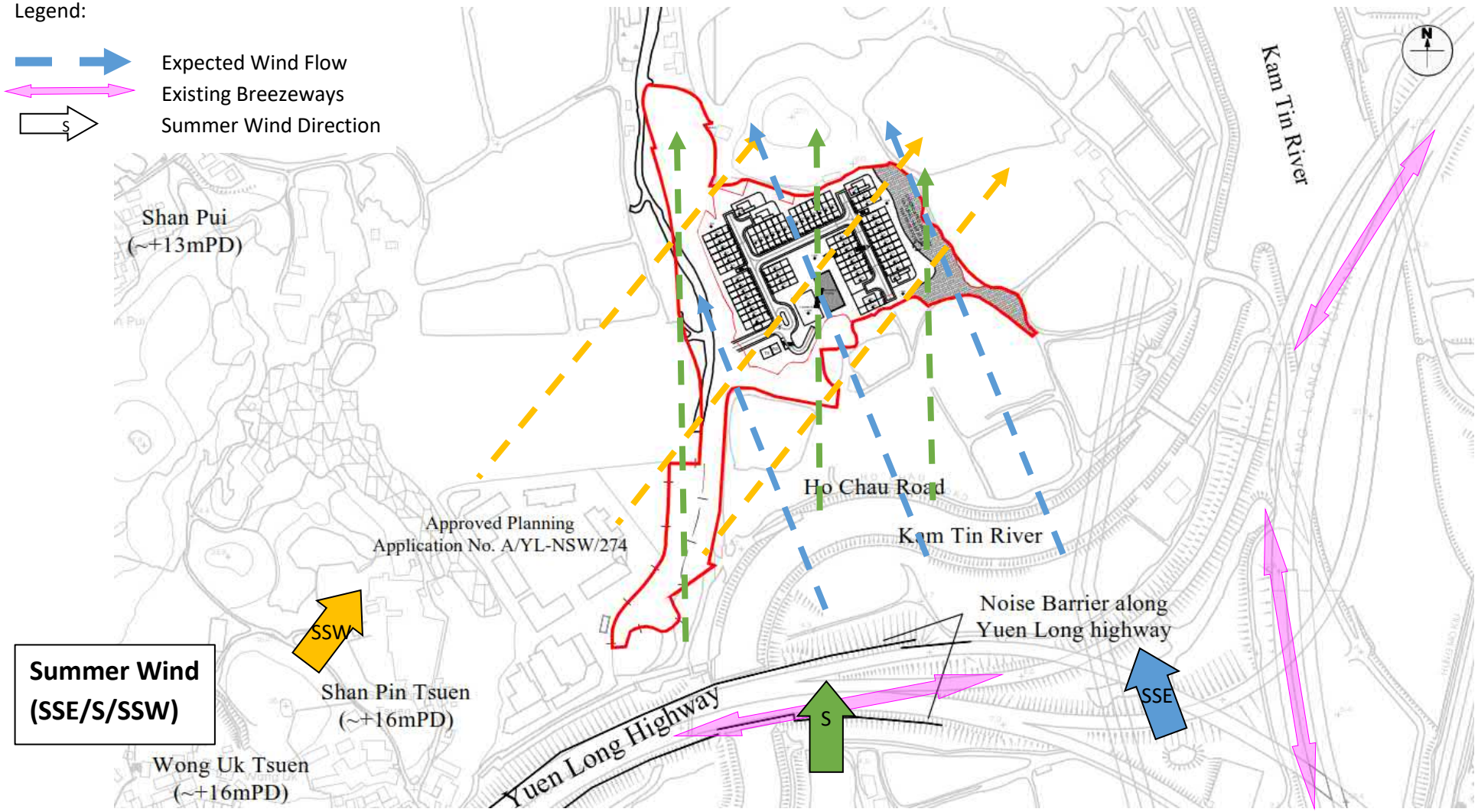

Figure: 4	RAMBOLL
Title: Illustration of Wind Flow from Summer Wind Directions for Approved Scheme	Drawn by: MK Checked by: CC
Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D 115, Tung Shing Lei, Yuen Long	Rev.: 1.6 Date: Jan 2024

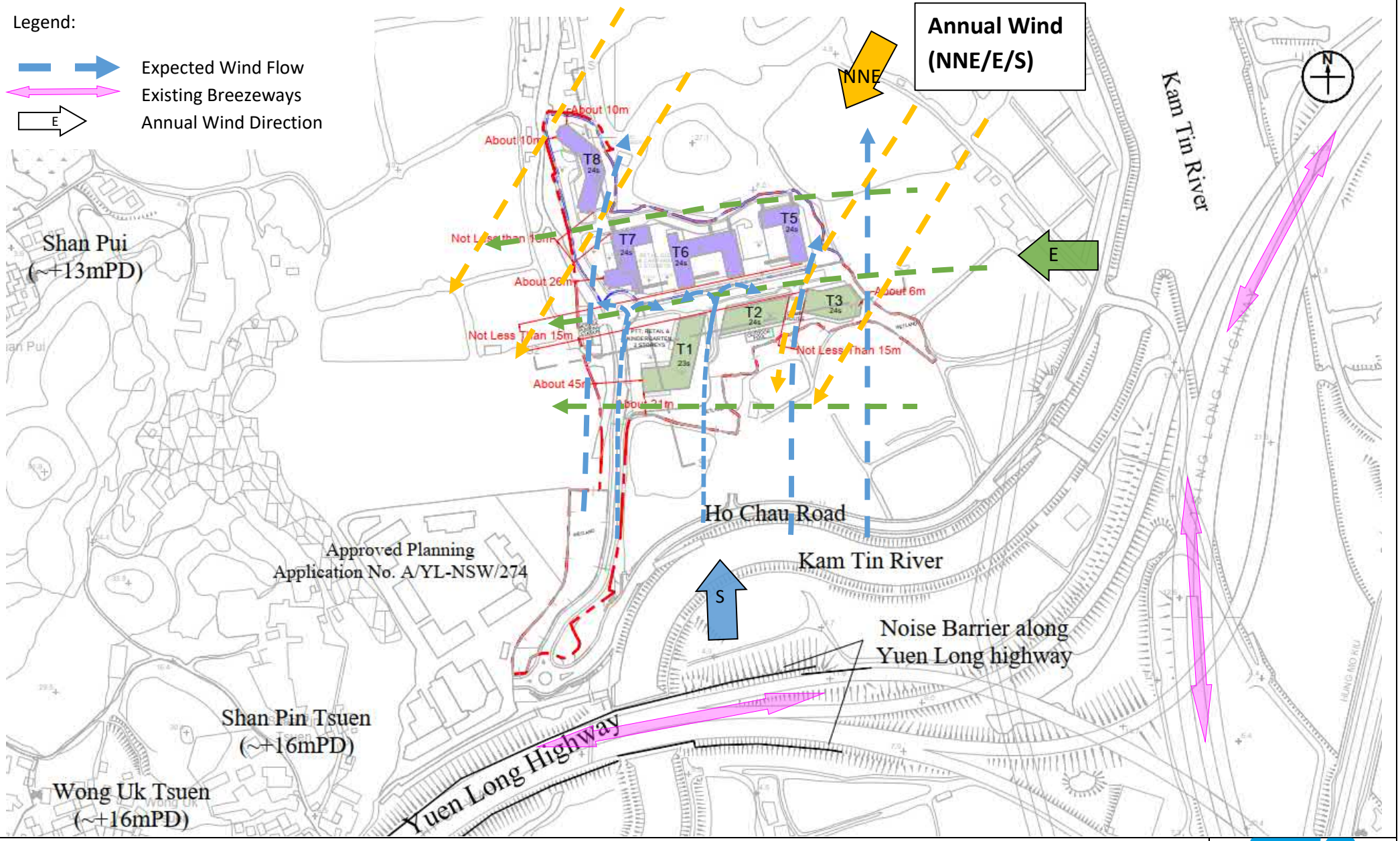

Figure: 5	RAMBOLL
Title: Illustration of Wind Flow from Annual Wind Directions for Proposed Scheme	Drawn by: MK Checked by: CC
Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D 115, Tung Shing Lei, Yuen Long	Rev.: 1.7 Date: May 2024

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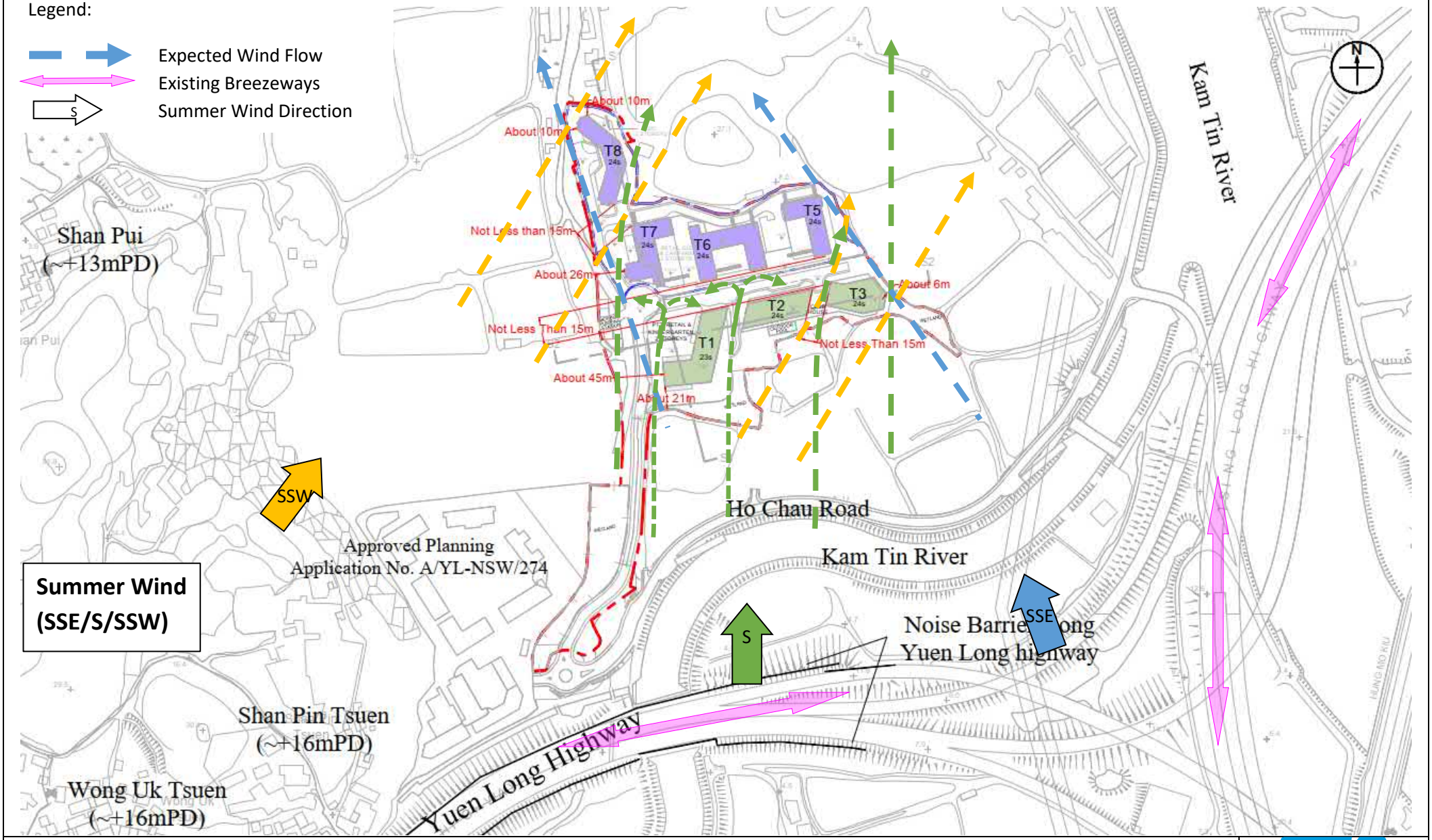


Figure: 6	RAMBOLL
Title: Illustration of Wind Flow from Summer Wind Directions for Proposed Scheme	Drawn by: MK Checked by: CC
Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D 115, Tung Shing Lei, Yuen Long	Rev.: 1.7 Date: May 2024

Appendix 1

The Indicative Block Plan of the Approved Scheme

Area (WBA) of the Deep Bay area. The Site is currently vacant and grassed over. There is no existing fish pond within the Site.

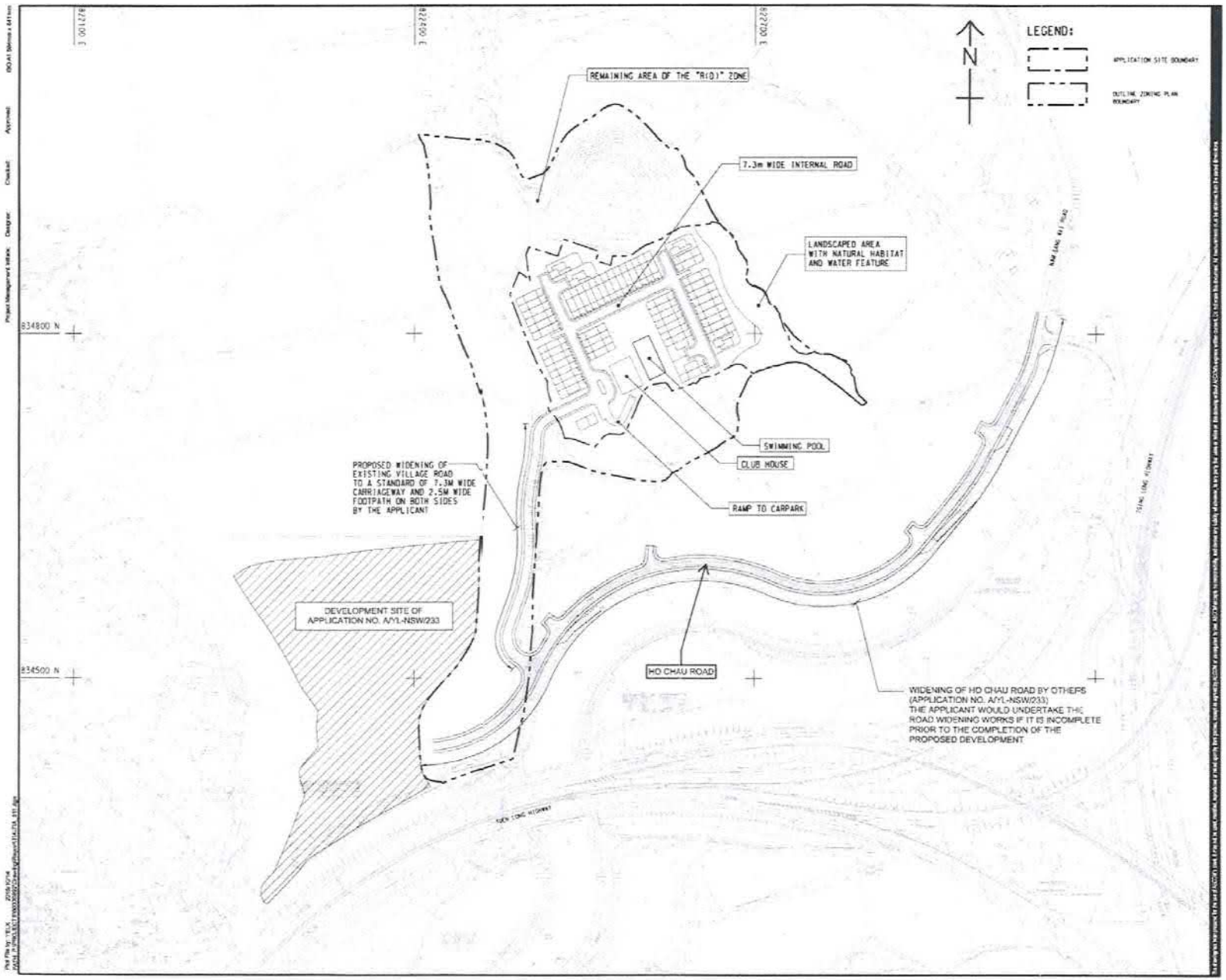
1.2 According to the applicant's indicative development scheme, the proposed residential development comprising 57 houses and a club house, has a domestic PR of 0.34. The 3-storey houses (11m above ground) are located above an 1-storey basement carpark/E&M floor of about 4.5m high. Apart from the private open space/communal garden of not less than 210 m^2, a Landscaped Area with Natural Habitat and Water Feature (LANHWF) with an area of not less than 4,770 m^2 is proposed at the eastern portion of the Site. The vehicular ingress/egress is at the south-western corner of the Site connecting to an existing village road leading to Ho Chau Road in the south. The proposed development is tentatively scheduled for completion by 2022. The Master Layout Plan (MLP), Landscape Master Plan (LMP), section plan and floor plans of the proposed development are at **Drawings Z-1a, Z-1b to Z-6** respectively.

1.3 The proposed development parameters of the indicative development scheme are as follows:

Site Area	30,160 m^2 (about)
Total Domestic GFA	Not more than 10,150 m^2
Domestic Plot Ratio (PR)	Not more than 0.34
Site Coverage (SC)	17.6%
No. of Houses	57
No. of Storeys[(1)]	3 storeys (over one storey basement)
BH (to the main roof)	Not more than 11m above ground and a basement car park/E&M floor of 4.5m below ground
Average Unit Size	178 m^2
Persons Per Flat	3.68
Proposed Population	210
Club House	
Floor Area[(2)]	Not more than 5% of the total domestic GFA
No. of Storeys[(1)]	1 storey
BH (to the main roof)	Not more than 5m above ground
Private Open Space[(3)]	Not less than 210 m^2
Landscaped Area with Natural Habitat and Water Feature	Not less than 4,770 m^2
Total Parking Spaces[(4)]	116
Resident Car Parking Spaces	114
Visitor Car Parking Spaces	2
Motorcycle Parking Spaces	Nil
Loading/Unloading Bays	1

(1) Excluding one storey basement car park/E&M floor of about 4.5m in height
(2) About 508 m^2 (i.e. not more than 5% of the proposed domestic GFA).
(3) Refers to communal open space within the proposed development and excludes private gardens of individual houses.
(4) 2 accessible car parking spaces proposed to be reserved for persons with disabilities

1.4 In support of the rezoning application, the applicant has submitted supplementary planning statement and technical assessments including Landscape Design and Tree Preservation Proposals, Traffic Impact Assessment (TIA), Ecological Impact Assessment (EcoIA), Environmental Assessment (EA), Drainage Impact Assessment (DIA), Sewerage Impact Assessment (SIA) and Water Supply and Site



AECOM

PROJECT
SECTION 12A APPLICATION FOR PROPOSED AMENDMENTS TO THE OUTLINE ZONING PLAN IN SUPPORT OF PRIVATE RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG

CLIENT

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

A	OCT. 14	MINOR AMENDMENTS	

STATUS
PRELIMINARY

SCALE
DIMENSION UNIT
METRES

KEY PLAN

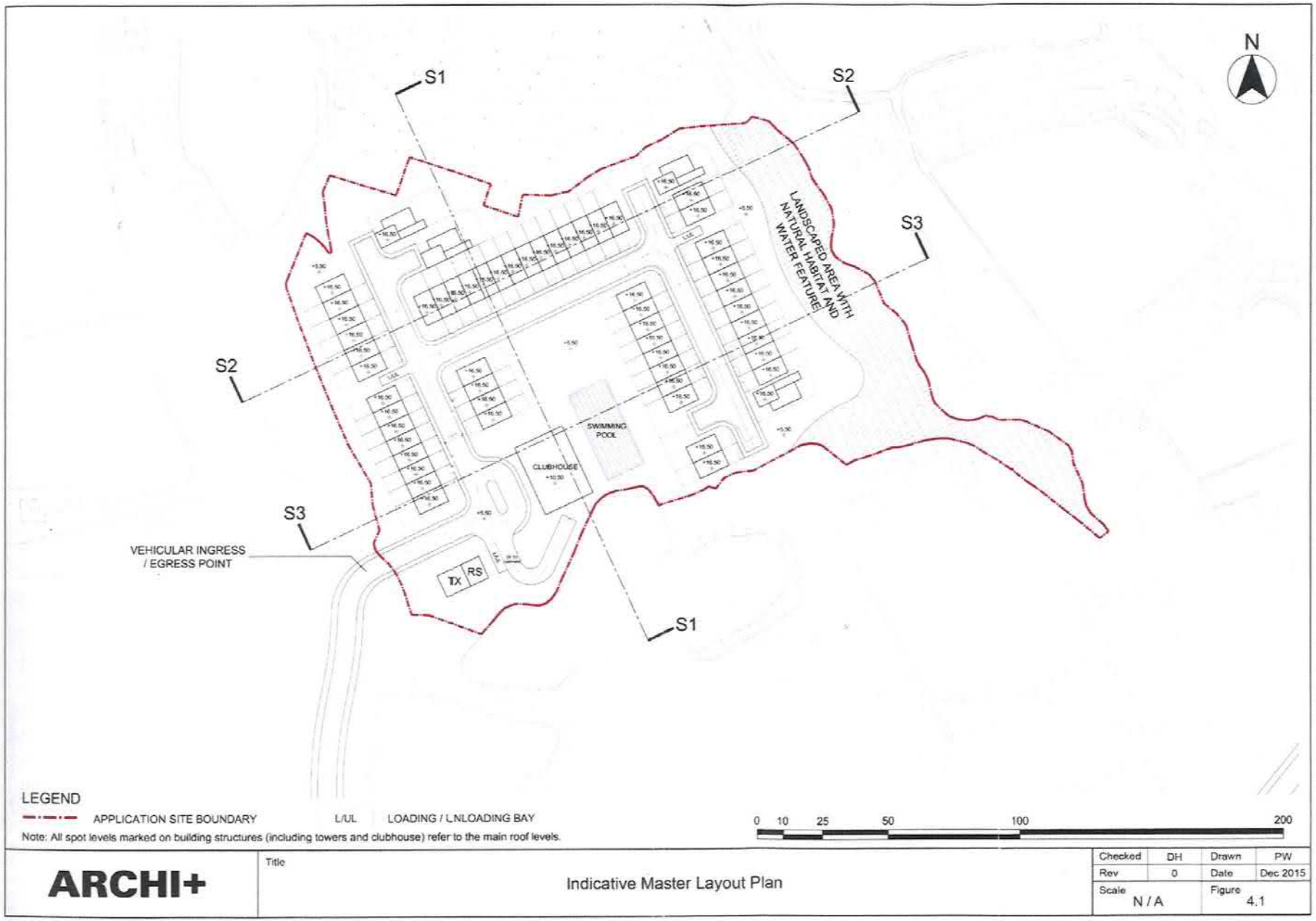
PROJECT NO. 60330892
CONTRACT NO.

SHEET TITLE
INDICATIVE MASTER LAYOUT PLAN

SHEET NUMBER
60330892/FIGURE C2.1

(摘錄自申請人於19. 10. 2017呈交的進一步資料)
(Extract from Applicant's Further Information Submitted on 19.10.2017)

參考編號 REFERENCE No.	繪圖 DRAWING
Y/YL-NSW/4	Z-1a



ARCHI+	Title: Indicative Master Layout Plan	Checked	DH	Drawn PW
		Rev	0	Date Dec 2015
		Scale N / A		Figure 4.1

（摘錄自申請人於 16. 12. 2015 呈交的申請書）
(Extract from Applicant's Submission of 16.12.2015)

參考編號 REFERENCE No.	繪圖 DRAWING
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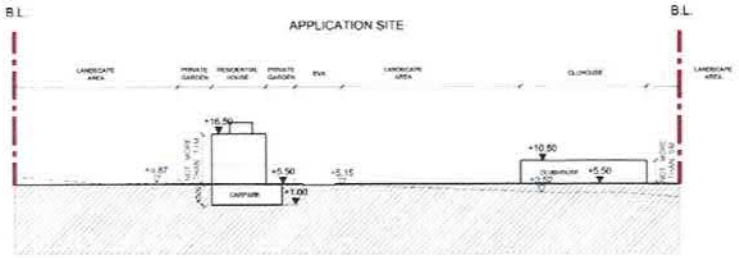
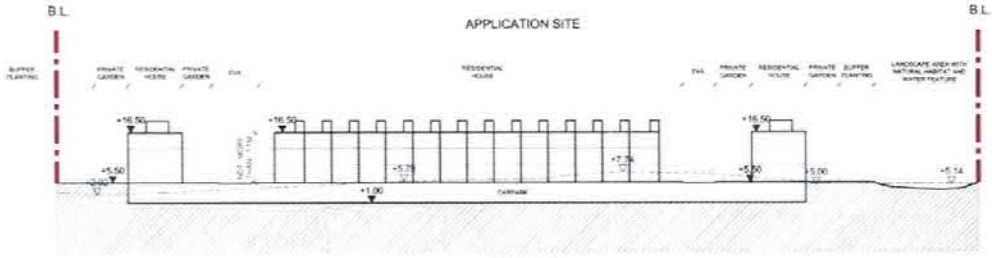


SECTION S1



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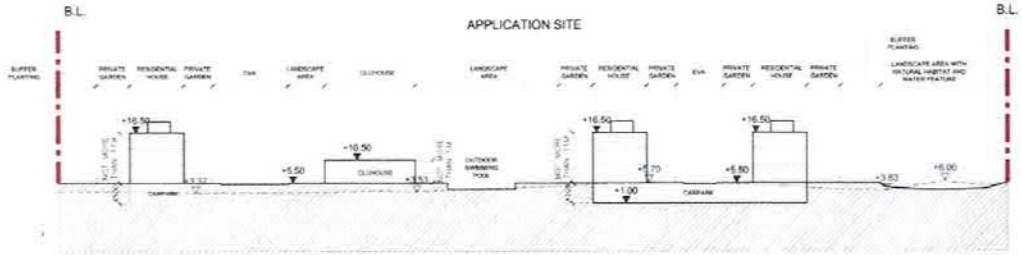

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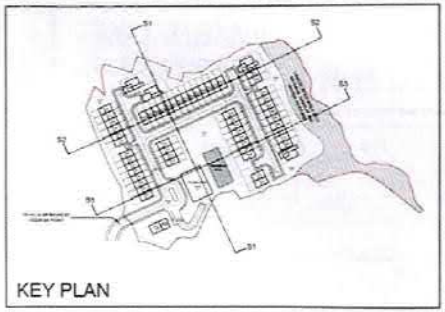

KEY PLAN

LEGEND

APPLICATION SITE BOUNDARY

EXISTING LEVEL

Note: All spot levels marked on building structures (including towers and clubhouse) refer to the main roof levels.

0 5 10 25 50 100

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Title

Indicative Section Plan

Checked	DH	Drawn	PW
Rev	0	Date	Dec 2015
Scale	N / A	Figure	4.2

（摘錄自申請人於 16. 12. 2015 呈交的申請書）
(Extract from Applicant's Submission of 16.12.2015)

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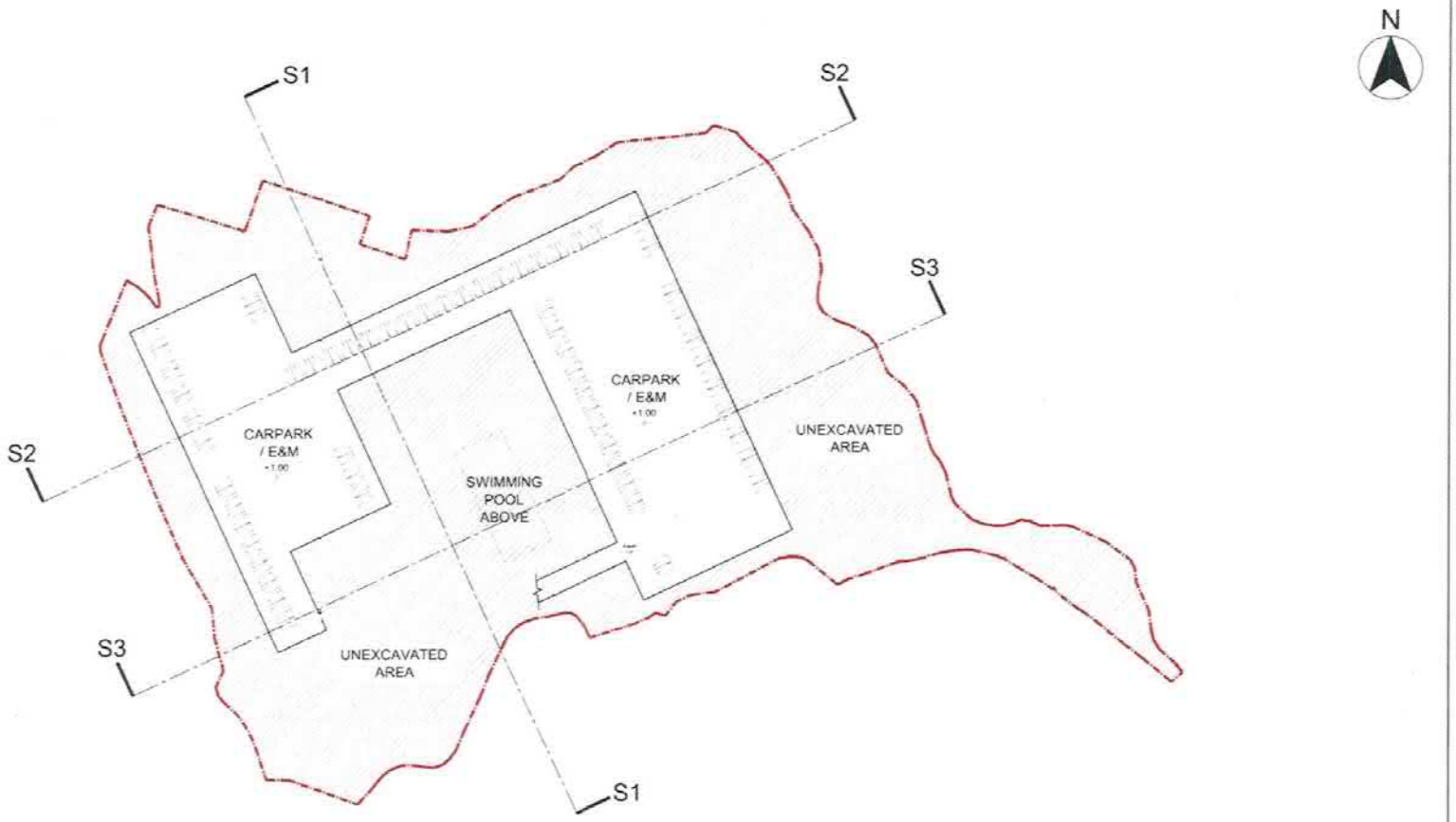

LEGEND

APPLICATION SITE BOUNDARY

UNEXCAVATED AREA

PRIVATE PARKING SPACE

L/UL LOADING / UNLOADING BAY

Note: All spot levels marked on building structures (including towers and clubhouse) refer to the main roof levels.

0 10 25 50 100 200

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Title: Indicative Basement Plan

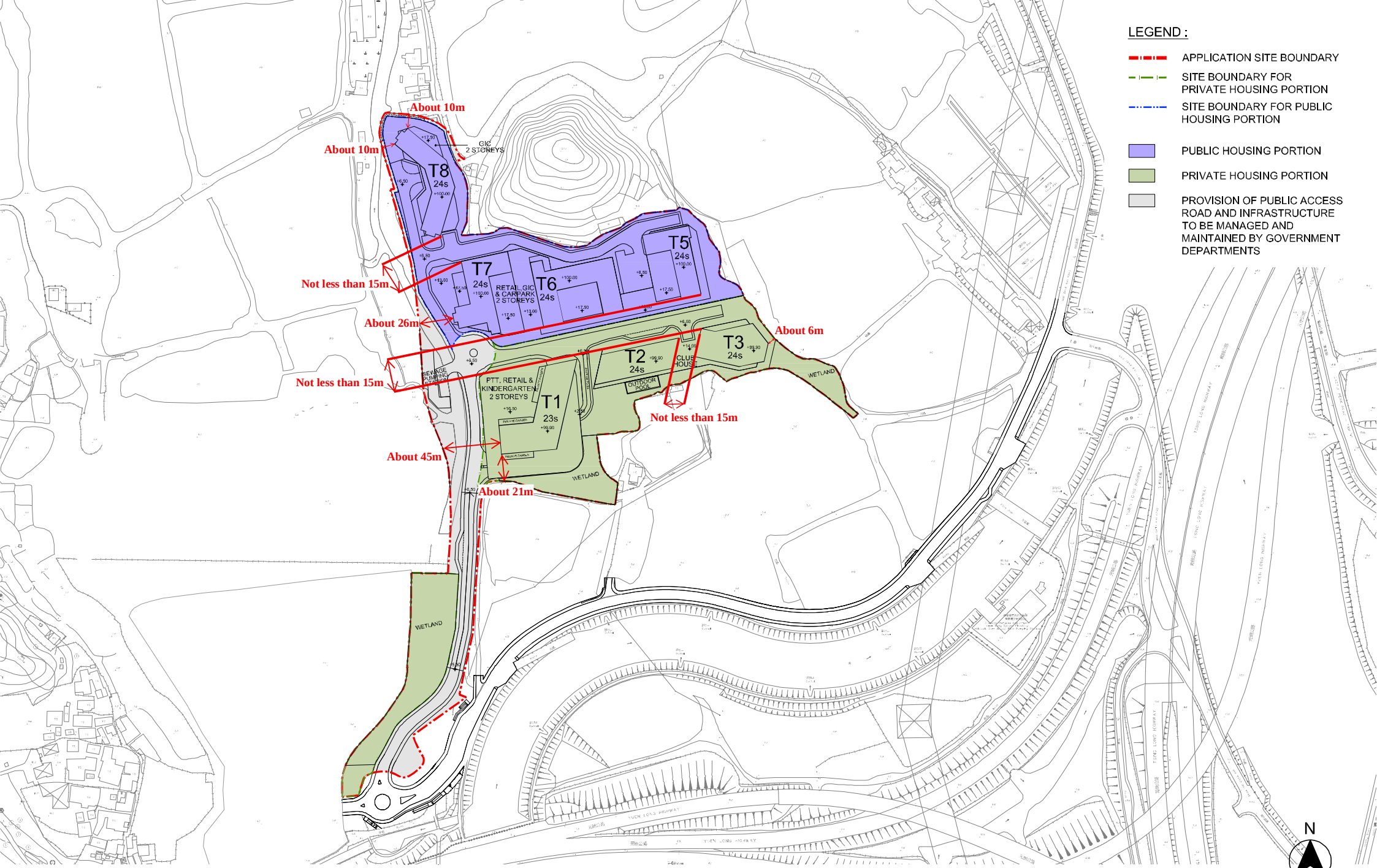
Checked	DH	Drawn	PW
Rev	0	Date	Dec 2015
Scale N / A		Figure 4.3	

（摘錄自申請人於 16. 12. 2015 呈交的申請書）
(Extract from Applicant's Submission of 16.12.2015)

參考編號 REFERENCE No.	繪圖 DRAWING
Y/YL-NSW/4	Z-3

Appendix 2

The Indicative Block Plan of the Proposed Scheme



Site Demarcation Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

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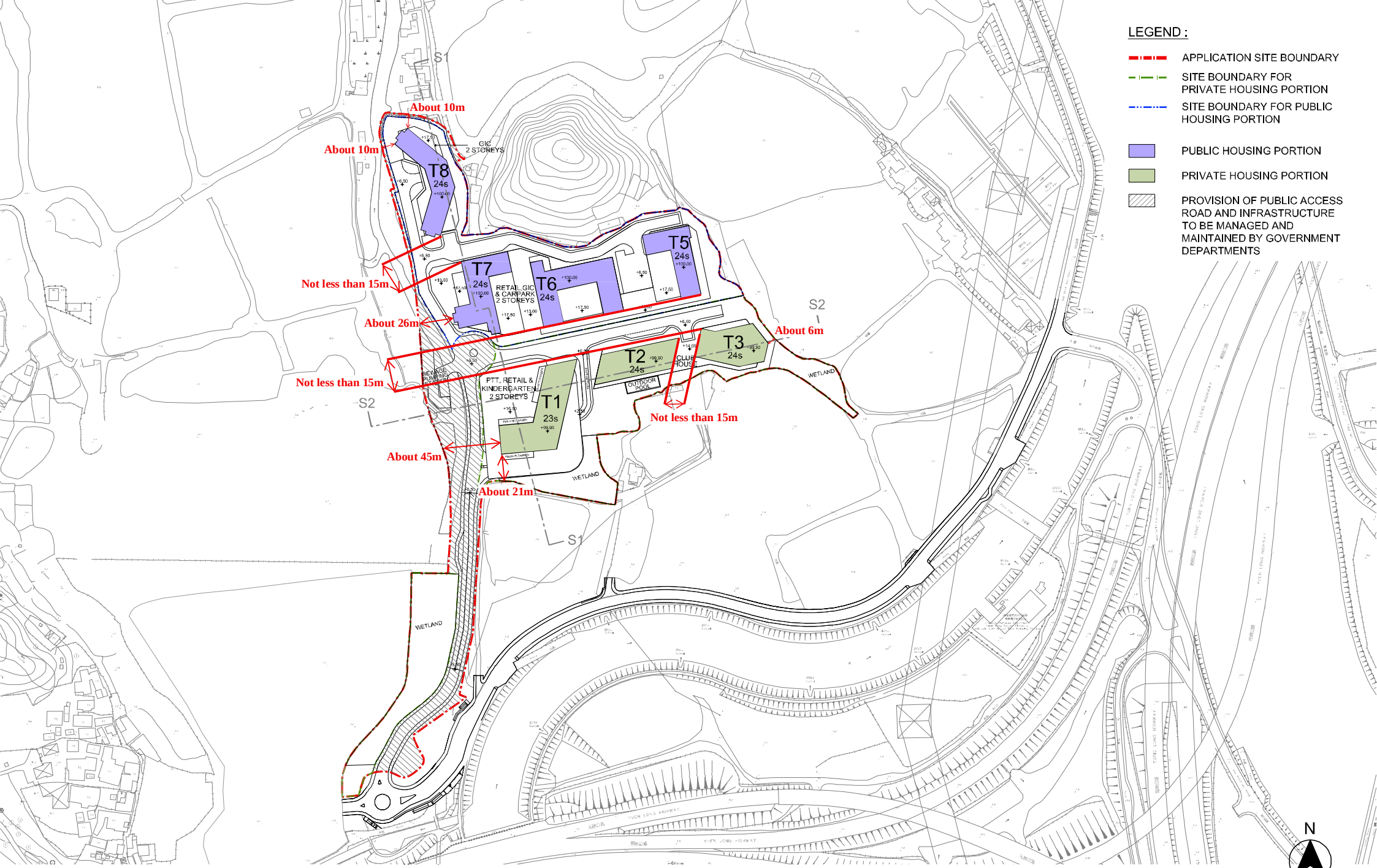

Indicative Block Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

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Indicative Ground Floor Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

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Indicative First Floor Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 2500 (A3)

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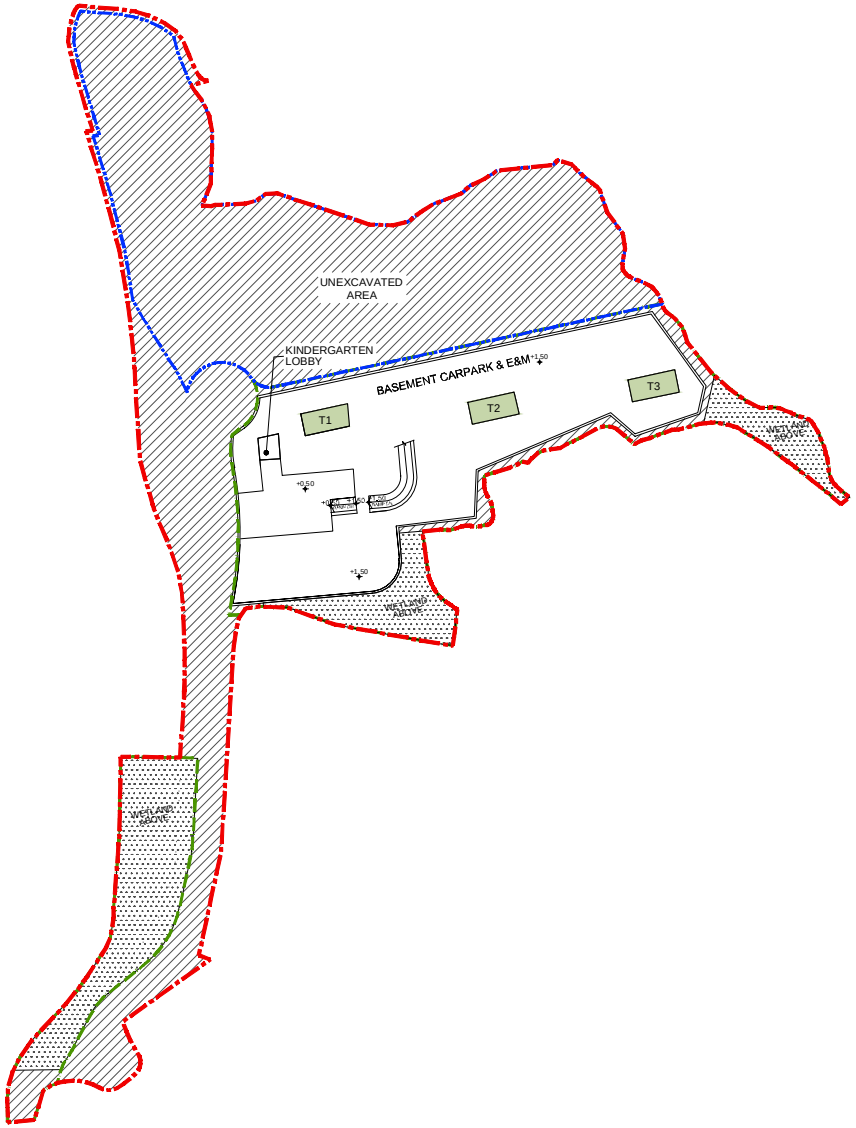
LEGEND :

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION



N

Indicative Basement Floor Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 2500 (A3)

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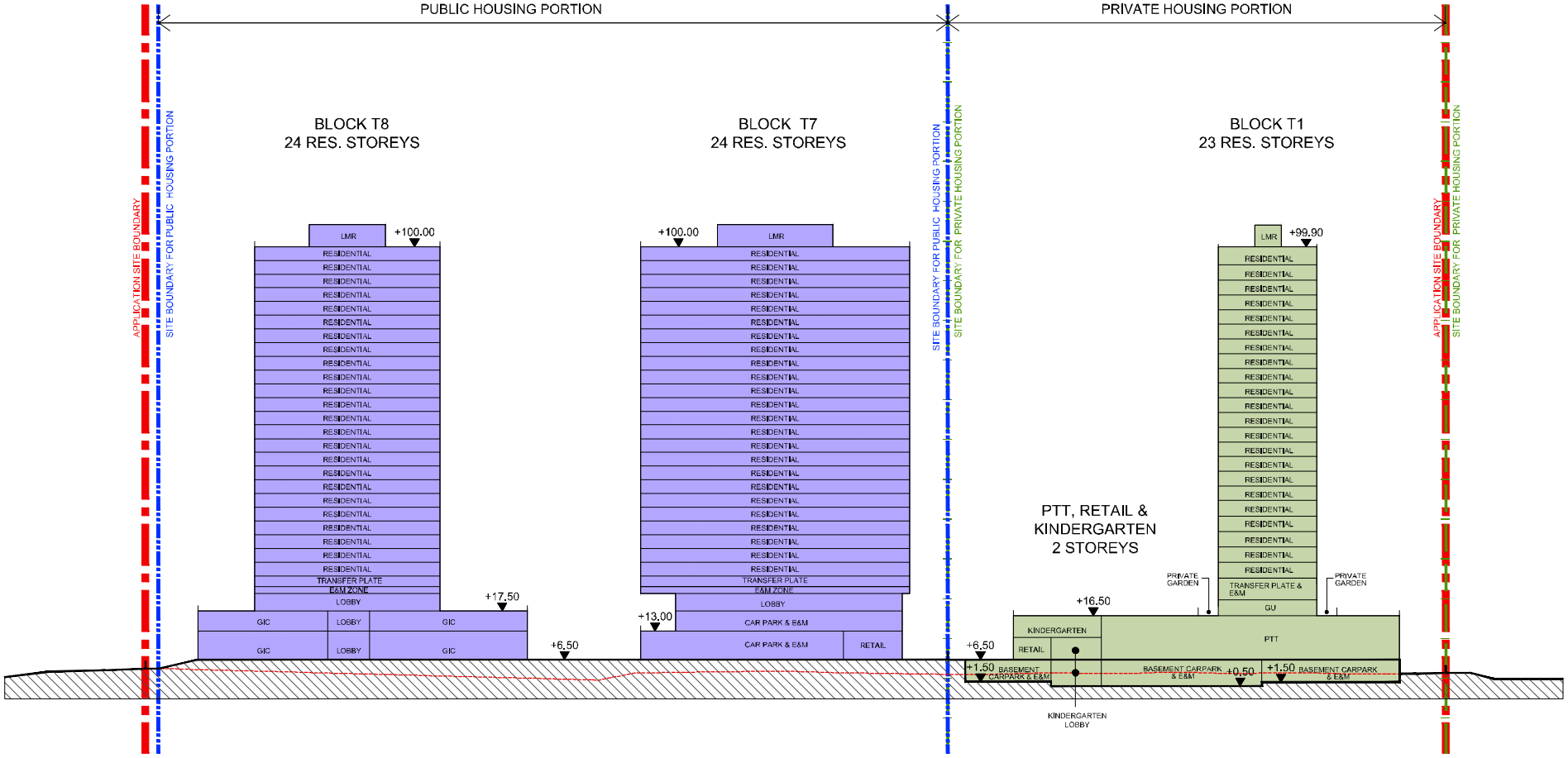
LEGEND

------ EXISTING SITE LEVEL



SECTION S1

Indicative Section S1

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 1000 (A3)

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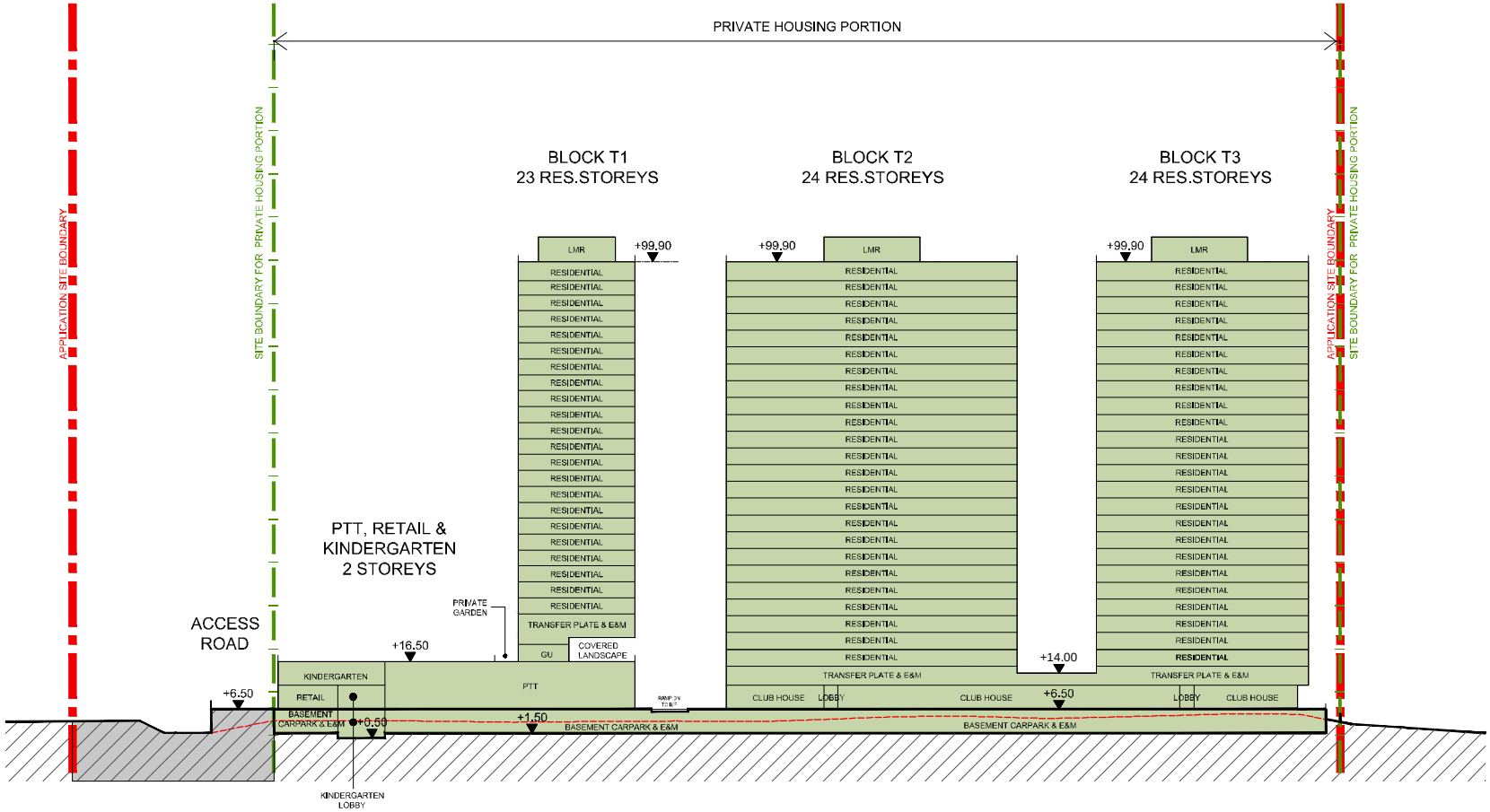
LEGEND

EXISTING SITE LEVEL



SECTION S2

Indicative Section S2

TUNG SHING LEI "R(D)" ZONE

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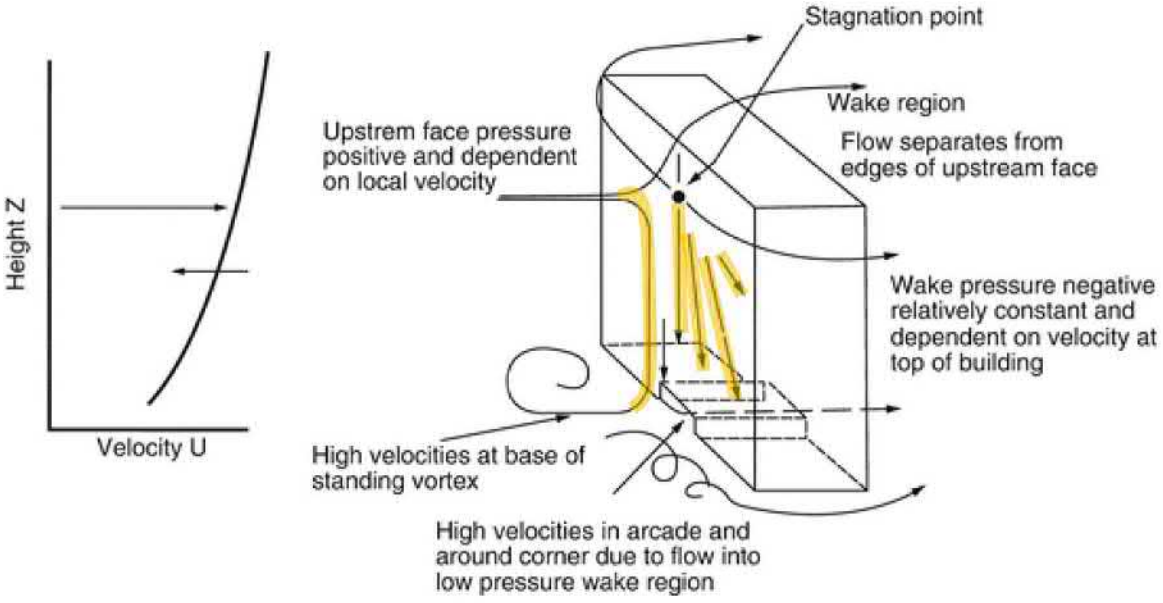
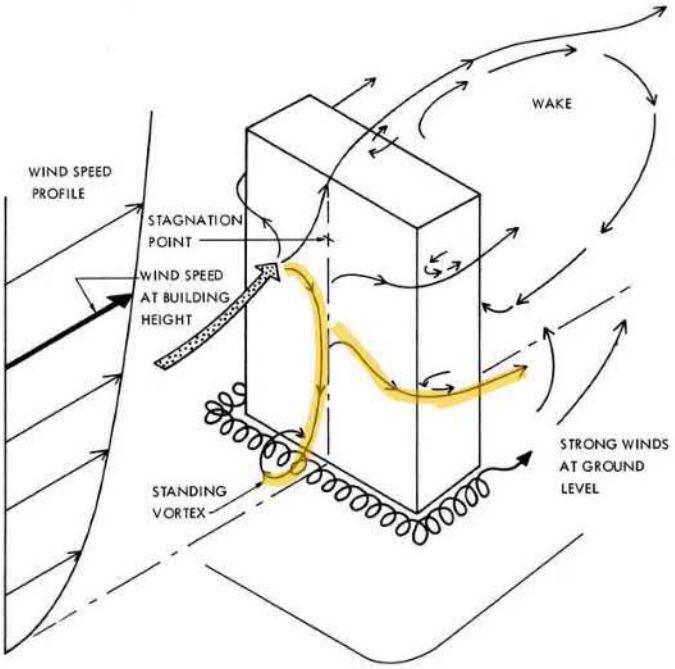
Appendix 3

Illustration of Downwash Effect

Building mass will divert wind to different directions. Wind at higher elevation will flow downward so that air flow at pedestrian level will increase (see illustration below).





Appendix D

Revised Traffic Impact Assessment

Proposed Land Sharing Pilot Scheme

for a Site at Various Lots in D.D. 115, Tung Shing Lei,

Yuen Long, the New Territories

Traffic Impact Assessment

April 2024

10	Apr 2024	TCTH	DWTF
Issue	Date	Prepared by	Reviewed by

AECOM

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1 INTRODUCTION

1.1 Background

1.1.1 The Application Site is located at various lots in D.D. 115, Tung Shing Lei, Yuen Long as indicated in **Figure 1.1**. The Application Site is currently zoned "Residential (Group D)" ("R(D)") on the approved Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8 and covers a site area of approximately 40,947m ^{2}.

1.1.2 Part of the Application Site is the subject of an approved rezoning application under Town Planning Board (TPB) Application No. Y/YL-NSW/4 (i.e. hereafter referred to as the Approved Scheme). Under the Approved Scheme, TPB has agreed to rezone part of the Application Site from "R(D)" to "R(D)1" zone to facilitate the implementation of the residential development with plot ratio (PR) of not more than 0.34 and total (domestic) GFA of not more than 10,150m^2.

1.1.3 The Applicant now proposes a public and private housing development at the subject site (i.e. hereafter referred to as the Proposed Development / Proposed Scheme) under the Land Sharing Pilot Scheme (LSPS), which was put forward in the 2018 Policy Address as part of Government's multi-pronged strategy to increase land and housing supply in the short-to-medium term.

1.1.4 The proposal comprises (i) a public housing development with plot ratio of 4.45 and 1,868 units (with average flat size of 50 m^2), and (ii) a private housing development with plot ratio of 3.01 and 1,261 units (with average flat size of 39.8m^2).

1.1.5 AECOM was commissioned by the Applicant to prepare a Traffic Impact Assessment (TIA) report in support of the application.

1.2 Objectives

1.2.1 The main objectives of this report are as follows:-

- Outline the Proposed Development parameters and internal transport facilities;
- Review the current traffic condition in the vicinity;
- Estimate the future public transport demand of the Proposed Development;
- Estimate the potential traffic generations and attractions of the Proposed Development;
- Produce traffic forecasts on the surrounding road network at the adopted design year;
- Assess traffic impact on the surrounding road network induced from the Proposed Development; and
- Develop traffic improvement proposal(s) if necessary.

1.3 Structure of TIA Report

1.3.1 Following this introductory chapter, the TIA is structured as follows:

- **Chapter 2**: Proposed Development, describes the Proposed Development schedule and its internal traffic facilities provisions, access arrangement, etc.;
- **Chapter 3**: Existing Traffic Condition, reviews the current traffic conditions;
- **Chapter 4**: Traffic Impact Assessment, presents the traffic forecast of the Proposed Development and the results of capacity assessments of the identified critical junctions for scenarios without and with the Proposed Development;
- **Chapter 5**: Public Transport Services, reviews the existing public transport services provision in the vicinity of the Proposed Development, discusses the future public transport demand together with the required transport facilities;
- **Chapter 6**: Summary and Conclusion, summarizes the findings of the study and presents the conclusion of this TIA.

2 PROPOSED DEVELOPMENT

2.1 Development Schedule

2.1.1 The indicative development schedule of the Proposed Development is summarized in **Table 2.1** for technical assessment purpose**.**

Table 2.1 Indicative Development Schedule

Development Parameters	Public Housing Portion	Private Housing Portion
Application Site Area	21,375 m^2	17,401 m^2 (5)
Equivalent Total Plot Ratio	4.45	3.01
Domestic Portion		
Domestic GFA	About 93,400m^2	About 50,179 m^2
Domestic Plot Ratio	4.37	2.88
No. of Residential Towers	4	3
No. of Units	1,868 units(1)	1,261 units
Anticipated Population	About 5,231 persons(1)(2)	About 3,153 persons(6)
Average Flat Size	50 m^2 (3)	39.8 m^2
Non-Domestic Portion		
Non- Domestic GFA	18,850 m^2 • Retail (about 1,200 m^2) • GIC(4) (about 4,670 m^2) • Domestic & Retail Car Park (about 12,980m^2) • G/IC Car Park (N/A – Open Carpark on Ground Floor)	6,920 m^2 • Retail (1,245 m^2) • Kindergarten(7) (1,000m^2) • Transport Terminus (about 4,675 m^2)

Note:
(1) A 10% increase in the design population and flat production for the Public Housing Portion would be adopted for assessment purpose to allow for changes in flat mix, refinement of layout and design etc. in the detailed design stage.
(2) Person per flat ratio of 2.8 adopted.
(3) Average flat size of 50m^2 formulated in accordance with Paper No. DEVB(PL-CR)1-55/127/1 – Legislative Council Brief Land Sharing Pilot Scheme.
(4) G/IC GFA equivalent to 5% of total attainable domestic GFA of subsidised housing development as per Policy Address 2021, including SWD's suggested Neighbourhood Elderly Centre (about 303m2 of NOFA or about 667m2 of GFA); One team of Home Care Services (HCS) for Frail Elderly Persons (4-team size non-kitchen based) (about 257m2 of NOFA or about 565m2 of GFA). The final GFA and layout will be subject to detailed design of the relevant government departments.
(5) With the inclusion of compensation ponds of about 6,900m^2 which is not suitable for housing development thereon, the remaining effective site area is about 17,401m^2

(6) Adopting the same person per flat as per (i.e. 2.5) the recently approved application under Application No. A/YL-NSW/274.
(7) Refer to an 8-classroom private kindergarten

2.2 Development Access

2.2.1 Currently, the Application Site is served by a village road which branches off from existing Ho Chau Road. The village road is a 3.5m-5.5m wide single-track access road with no footpath on neither side of the carriageway; while Ho Chau Road is a 3.5m wide single-track access road with passing bays.

2.2.2 Under another approved planning application no. A/YL-NSW/274 for adjacent site, the existing Ho Chau Road is planned to be widened to a standard 7.3m wide single 2 lane 2-way carriageway between the adjacent site to the junction of Nam Sang Wai Road, as illustrated in **Figure 2.1** for indicative purpose. One 38m long bus/GMB bay is planned at widened Ho Chau Road to serve for the whole area. This can serve as bus/GMB bay for additional terminating bus /GMB routes serving the area if required in the future. In addition, a section of Nam Sang Wai Road near its junction with Castle Peak Road – Tam Mi was also planned to be widened as shown in **Figure 2.2**.

2.2.3 As shown in **Figure 2.1**, within the Application Site, an access road is proposed to connect the Application Site with widened Ho Chau Road. The access road would be a 7.3m-wide single 2-lane carriageway, with footpaths provided on each side of the carriageway.

2.3 Internal Transport Facilities

2.3.1 The parking and loading/unloading facilities of the Proposed Development will be provided in accordance with the requirements as stipulated in the latest Hong Kong Planning Standards and Guidelines (HKPSG) to cater for the transport demand. The respective requirements are summarized in **Table 2.2.**

Table 2.2 HKPSG Parking and Servicing Facilities Provisions Requirement

	HKPSG Requirements
Private Car Parking Spaces	
Private Housing – Private Car Parking Spaces	GPS x R1 x R2 x R3 For flat size < 40m^2 = 1 space per 4-7 flats x 0.5 x 1.00 x 1.00 = 0.5 spaces per 4-7 flats For flat size = 40m^2 -70m^2, = 1 space per 4-7 flats x 1.2 x 1.00 x 1.00 = 1.2 spaces per 4.7 flats For flat size = 70m^2 -100m^2, = 1 space per 4-7 flats x 2.4 x 1.00 x 1.00 = 2.4 spaces per 4-7 flats
Private Housing – Visitor Private Car Parking Spaces	5 spaces per block of more than 75 residential units
Public Housing – Private Car Parking Spaces	GPS x R1 x R2 = 1 space per 4-7 flats x 0.52 x 1.0 = 0.52 spaces per 4-7 flats

	HKPSG Requirements
	(*Assume all flats would be subject to the calculation of overall parking provision as the no. of "one person/ two person" flats is not determined at this stage)
Public Housing – Visitor Private Car Parking Spaces	5 spaces per block of more than 75 residential units
Commercial (Retail) – Private Car Parking spaces	1 car space per 150 – 300m^2 GFA
Commercial (Kindergarten) – Private Car Parking Spaces	0 to 1 car parking space per 4 to 6 classrooms
Motorcycle Parking Spaces	
Private Housing – Motorcycle Parking Spaces	1 space per 100-150 flats
Public Housing – Motorcycle Parking Spaces	1 space per 110-250 flats excluding one person/ two persons flats
Commercial – Motorcycle Parking Spaces	5% - 10% total provision for private cars
Bicycle Parking Spaces	
Public / Private Housing – Bicycle Parking Spaces	1 space for every 15 flats with flat size smaller than 70m^2
Private Light Bus/ Coach Parking Spaces	
G/IC Facilities– Parking Spaces	Nil
Public Housing – "Shared-use" LGV and Light Bus space	1 space per 260 flats
Loading and Unloading Bay	
Private Housing – Loading and Unloading Bay	1 space for every 800 flats subject to min. 1 bay per block
Public Housing – "Shared-use" coaches/ buses and M/HGV Loading and Unloading Bay	2 spaces around each residential block
Retail – Loading and Unloading Bay	1 loading/ unloading bay for goods vehicles for every 800 to 1200m^2 or part thereof, GFA
G/IC Facilities– Loading/ Unloading Bay	Nil
Lay-bys	
Kindergarten – Taxi / private cars lay-by	1 lay-by for taxis and private cars for every 5 to 8 classrooms

	HKPSG Requirements
Kindergarten – Small Coaches Layby	5 lay-bys for small coaches (each 3m x 7m)

2.3.2 Regarding the provision of taxi/ private cars/ school bus layby for kindergarten, reference has been made to planning application no. A/YL-NSW/274 and the provision rates are shown in **Table 2.3**.

Table 2.3 Adopted Servicing Facilities Provisions for Kindergarten

	Private Car/ Taxi Layby	School Bus Layby
Adopted Rates	5.63 spaces / 100 students	Minimum 5 laybys for small coaches

2.3.3 In light of the HKPSG requirements given in **Table 2.2** and **Table 2.3**, the proposed provision for the Public Housing Portion and Private Housing Portion according to the development schedules are summarized in **Table 2.4** and **Table 2.5.** Taken into consideration the proximity to public transport services, availably of public car parking space, traffic conditions and the illegal parking condition in the vicinity, it is proposed to adopt a GPS of 5 for calculating the residential carparking provision according to HKPSG. For other facilities, the mid-range provision requirements has been adopted.

Table 2.4 Required and Proposed Parking and Servicing Facilities Provisions for Public Housing Portion

	Parameters	Required Provision	Proposed Provision
Public Housing – Private Car Parking Spaces	2055 Flats(1)	153 – 268 spaces	214(2) spaces
Public Housing – Visitor Private Car Parking Spaces	4 Towers	20 spaces	20(3) spaces
Retail – Private Car Parking Spaces	1200 m^2	4 –8 spaces	6 spaces(4)
Private Car Parking Spaces(5)			240 spaces
Public Housing – Motorcycle Parking Spaces	2055 Flats(1)	9 – 19 spaces	14 spaces
Retail – Motorcycle Parking Spaces	4 - 8 spaces	1 space	1 space
Motorcycle Parking Spaces			15 spaces
Public Housing – Bicycle Parking Spaces	2055 Flats(1)	137 spaces	274 spaces(6)
G/IC Facilities (Incl. one NEC and one HCS, subject to detailed design) – Private Light Bus Parking Space	-	-	1 space (7) (3.5m x 8m each)
Public Housing – LGV and Light Bus Loading and Unloading Bay	2055 Flats(1)	8 bays	8 bays
Public Housing – "Shared-use" coaches/ buses and M/HGV Loading and Unloading Bay	4 Towers	8 bays	8 bays
Retail – Loading and Unloading Bay	1200 m^2	2 bays	2 bays

	Parameters	Required Provision	Proposed Provision
G/IC Facilities (Incl. one NEC and one HCS, subject to detailed design) – Shared Loading and Unloading Bay for Private Light Bus	-	-	1 bay(7) (3m x 9m)
		Loading and Unloading Bays	**19 spaces**

Notes: Round up figures adopted.
(1) A 10% increase in the design population and flat production for the Public Housing Portion would be adopted for assessment purpose to allow for changes in flat mix, refinement of layout and design etc. in the detailed design stage.
(2) GPS of 1 space per 5 flats is adopted.
(3) All the towers have more than 75 units per block.
(4) 1 car space per 200m^2 GFA is adopted.
(5) Nos. of accessible car parking spaces will be reserved for persons with disabilities in accordance with the HKPSG.
(6) 1 bicycle parking space for every 7.5 flats would be provided according to TD comments.
(7) Parking provision for GIC facilities suggested by Social Welfare Department.

Table 2.5 Required and Proposed Parking and Servicing Facilities Provisions for Private Housing Portion

	Parameters	Required Provision		Proposed Provision
Private Housing – Private Car Parking Spaces	544 Flats	FS ≤ 40m^2	39-68	228(1) spaces
	717 Flats	40m^2<FS≤70m^2	123-216	
	Total: 1,261 Flats	**162 – 284 spaces**		
Private Housing – Visitor Private Car Parking Spaces	3 Towers	15 spaces		15(3) spaces
Retail – Private Car Parking Spaces	1,245 m^2	5 – 9 spaces		7(4) spaces
Kindergarten – Private Car Parking Spaces	8 Classrooms	0 – 2 spaces		1 space
		Private Car Parking Spaces(2)		251 spaces
Private Housing – Motorcycle Parking Spaces	1,261 Flats	9 - 13 spaces		11 spaces
Retail – Motorcycle Parking Spaces	5 – 9 spaces	1 space		1 space
		Motorcycle Parking Spaces		12 spaces
Private Housing – Bicycle Parking Spaces	1,261 Flats(5)	85 spaces		85 spaces
Private Housing – Loading and Unloading Bay	3 Towers	3 bays		3 bays
Retail – Loading and Unloading Bay	1,245 m^2	2 bays		2 bays
		Loading and Unloading Bays		**5 spaces**

	Parameters	Required Provision	Proposed Provision
Kindergarten – Taxi / private cars lay-by	8 Classrooms (160 Students)	2 lay-bys for taxi / private cars	10 lay-bys(6)
Kindergarten – Small Coaches Layby	-	5 lay-bys for small coaches (each 3m x 7m)	5 lay-bys(6)

Notes: Round up figures adopted.
(1) GPS of 1 space per 5 flats is adopted.
(2) Nos. of accessible car parking spaces will be reserved for persons with disabilities in accordance with the HKPSG
(3) All the towers have more than 75 units per block. Hence 5 visitor car parking spaces per block would be provided.
(4) 1 car space per 200m^2 GFA is adopted.
(5) No. of flats with flat size smaller than 70 m^2
(6) Based on the adopted rates of provision for kindergarten as given in Table 2.3

2.4 Proposed Public Transport Terminus

2.4.1 In order to cater for the potential demand of public transport services arising from the Proposed Development, a Public Transport Terminus with 2 bus bays, 1 GMB bay and a taxi stand is proposed within the Private Housing Portion, as illustrated in **Figure 2.3**. The public transport demand and services will be discussed in **Chapter 5**.

3 EXISTING TRAFFIC CONDITION

3.1 Local Road Network

3.1.1 The existing road network in vicinity of the Application Site is shown in **Figure 3.1**.

3.1.2 Ho Chau Road provides the only access to the Application Site, which is currently a single-track access road of about 3.5m wide connecting with Nam Sang Wai Road on its eastern end.

3.1.3 Nam Sang Wai Road is a rural local road connecting Castle Peak Road – Tam Mi and Nam Sang Wai area. The section between Castle Peak Road – Tam Mi and Ho Chau Road is a single 2-lane carriageway, while the remaining section is a single-track access road.

3.1.4 Castle Peak Road – Tam Mi is a rural local road of single 2-lane carriageway running parallel to San Tin Highway on the western side, it connects Castle Peak Road – Yuen Long and Kam Tin Road at Au Tau Interchange on its southern end.

3.2 Traffic Survey

3.2.1 A total of 7 critical junctions were identified for assessment in this TIA, they are listed in **Table 3.1**. Layouts of existing junctions are presented in **Figures 3.2** to **3.8**.

Table 3.1 Critical Junctions

Ref.	Junction	Type	Fig. No.
J1	Castle Peak Road – Tam Mi / San Tam Road	Signal	**3.2**
J2	Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen	Priority	**3.3**
J3	Castle Peak Road – Tam Mi / Nam Sang Wai Road	Priority	**3.4**
J4	Au Tau Interchange	Roundabout	**3.5**
J5	Kam Tin Road / Tsing Long Highway	Signal	**3.6**
J6	Kam Tin Road / Kam Tin Bypass / Kam Ho Road Roundabout	Roundabout	**3.7**
J7	Pok Oi Interchange	Roundabout	**3.8**

3.2.2 Series of manual classified traffic counts surveys were carried out on 25 May 2021 to establish the current traffic condition in the vicinity. The surveys were undertaken during 7:30am – 9:30am and 5:00pm – 7:00pm at the critical junctions as listed in **Table 3.1**.

3.2.3 The identified morning (AM) and evening (PM) peak hour are from 7:45am to 8:45am and from 5:45pm to 6:45pm respectively. The 2021 observed AM and PM peak hour traffic flows are shown in **Figure 3.9**.

3.3 Junction and Road Link Assessment

3.3.1 Junction capacity analysis was carried out for the above surveyed junctions which are located in the vicinity of the Application Site to appraise the existing traffic condition based on the 2021 observed peak hour traffic flows.

3.3.2 Based on the turning flows at the above junctions, capacity assessments were carried out in accordance with the methodology documented in the appendices of Transport Planning and Design Manual (TPDM) Volume 2 Chapter 4 for priority junction / roundabout and Volume 4 for signal junction.

3.3.3 The existing junction performances of the critical junctions are summarized in **Table 3.2**. Capacity calculation sheets are attached in **Annex A**.

Table 3.2 Existing Junction Performance

Ref.	Junction	Indicator*	2021 Existing	
			AM Peak	PM Peak
J1	Castle Peak Road – Tam Mi / San Tam Road	RC	64%	72%
J2	Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen	DFC	0.14	0.10
J3	Castle Peak Road – Tam Mi / Nam Sang Wai Road	DFC	0.05	0.07
J4	Au Tau Interchange	DFC	0.60	0.52
J5	Kam Tin Road / Tsing Long Highway	RC	22%	21%
J6	Kam Tin Road / Kam Tin Bypass / Kam Ho Road Roundabout	DFC	0.59	0.54
J7	Pok Oi Interchange	DFC	0.80	0.81

* DFC = Design Flow / Capacity ratio for priority junction or roundabout;
RC= Reserved Capacity for signalized junction

3.3.4 At present, all critical junctions are operating within capacity.

3.3.5 The existing volume-to-capacity (v/c) ratio at the existing road links are also reviewed and summarized in **Table 3.3**. The locations of critical road links are also illustrated in **Figure 3.1**.

Table 3.3 Road Link Assessment

Link Index	Road Link	Dir.	Capacity (pcu/hr)	Observed Traffic Flows(1)			
				Traffic Flows		V/C Ratio	
				AM	PM	AM	PM
L1N	San Tam Road	NB	3600(2)	510	400	0.14	0.11
L1S		SB	3600(2)	1040	900	0.29	0.25
L2N	Castle Peak Road - Tam Mi (Between San Tam Road and Access Road to Cheung Chun San Tsuen)	NB	3600(2)	960	900	0.27	0.25
L2S		SB	3600(2)	1360	1250	0.38	0.35
L3N	Castle Peak Road - Tam Mi (Between Access Road to	NB	3600(2)	960	900	0.27	0.25

Link Index	Road Link	Dir.	Capacity (pcu/hr)	Observed Traffic Flows(1)			
				Traffic Flows		V/C Ratio	
				AM	PM	AM	PM
L3S	Cheung Chun San Tsuen and Nam Sang Wai Road)	SB	3600(2)	1390	1280	0.39	0.36
L4N	Castle Peak Road - Tam Mi (Between Nam Sang Wai Road and Au Tau Int')	NB	3600(2)	980	910	0.27	0.25
L4S		SB (Ground Level)	3600(2)	910	810	0.25	0.23
		SB (Flyover)	1800(8)	450	500	0.36	0.40
L5E	Castle Peak Road - Yuen Long (Between Pok Oi Int' and Long Yat Road)	EB	5400(3)	1950	1780	0.36	0.33
L5W		WB	5400(3)	1480	1600	0.27	0.30
L6E	Castle Peak Road - Yuen Long (Between Au Tau Int' and Pok Oi Int')	EB	5400(3)	1160	1000	0.21	0.19
L6W		WB	5400(3)	1440	1350	0.27	0.25
L7E	Kam Tin Road (Between Au Ta Int' and Tsing Long Highway Slip Road)	EB	3600(2)	1920	1580	0.53	0.44
L7W		WB	3600(2)	1730	2280	0.48	0.63
L8E	Kam Tin Road (Between Tsing Long Highway Slip Road and Kam Ho Road Roundabout)	EB	3600(2)	2010	1700	0.56	0.47
L8W		WB	3600(2)	1700	1970	0.47	0.55
L9	Kam Tin Road	Two-way	1800(4)	1340	1290	0.74	0.72
L10	Ho Chau Road	Two-way	130(5)	60	60	0.46	0.46
L11	Castle Peak Road - Yuen Long (Exit arm of Pok Oi Int')	EB	1800(6)	1020	860	0.57	0.48
L12N	Tai Lam Tunnel	NB	5400(3)	1850	3400	0.34	0.63
L12S		SB	5400(3)	4950	2200	0.92	0.41
L13E	Yuen Long Highway	EB	6100(7)	4210	4350	0.69	0.71
L13W		WB	6100(7)	4020	4020	0.66	0.66
L14N	Tsing Long Highway	NB	6100(7)	1770	3210	0.29	0.53
L14S		SB	6100(7)	4550	2050	0.75	0.34

Note:
(1) The observed traffic flows in critical road links are obtained from traffic counts.
(2) Road capacity for Dual 2-lane carriageway
(3) Road capacity for Dual 3-lane tunnel
(4) Road capacity for 6.75m wide Single 2-lane carriageway
(5) Road capacity for single track access road with passing bay
(6) Road capacity for 4m-wide Dual 1-lane carriageway
(7) Road capacity for Dual 3-Trunk Road
(8) Road capacity for single lane carriageway

4 TRAFFIC IMPACT ASSESSMENT

4.1 Trip Generation of Proposed Development

4.1.1 Estimates of trip generated by the Proposed Development are derived with reference to the trip generation and attraction rates as stipulated in Annex D of Transport Planning and Design Manual (TPDM) Volume 1 Chapter 3 published by Transport Department. The adopted trip rates and the estimated trip generation of the Proposed Development are presented in **Tables 4.1 , 4.2 and 4.3** respectively.

Table 4.1 Adopted Trip Rates

Land Use	Trip Rates				
	Unit	AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Private Housing(1) (FS=180m^2 mean)	pcu/hr/flat	0.2772	0.1769	0.1635	0.2394
Private Housing (1) (FS=60m^2 Mean)	pcu/hr/flat	0.0718	0.0425	0.0286	0.0370
Public Housing(1)	pcu/hr/flat	0.0622	0.0426	0.0297	0.0401
Commercial (Retail) (1)	pcu/hr/100 m^2 GFA	0.2296	0.2434	0.3100	0.3563
Kindergarten (2)	pcu/hr/100 students	26	26	1	1
Home Care Services (HCS) for Frail Elderly Persons	Pcu/hr	5(3)	5(3)	5(3)	5(3)

Notes:
(1) Trip rates adopted from TPDM
(2) Based on survey and estimated modal split at Zenith Kindergarten (Sha Tin) and Zenith Kindergarten (Yuen Long)
(3) Assume the vehicular trips by 2 private light buses will be generated and attracted within 1 hour, based on PCU factor of 1.5.

Table 4.2 Trip Generation and Attraction – Approved Scheme

Land Use	Trip Generation/ Attractions (pcu/hr)				
	Parameters	AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Approved Scheme (Y/YL-NSW/4)					
Private Housing	57 Houses (Avg. Flat Size = 178m^2)	16	11	10	14

4.1.2 To allow for changes in flat mix for Public Housing in detailed design stage, a 10% increase in the flat production (i.e. 1,868 x (1+10%) = 2,055 flats) is adopted for estimating the trip generation for Public Housing portion.

Table 4.3 Trip Generation and Attraction – Proposed Development

Land Use	Parameters	Trip Generation/ Attractions (pcu/hr)			
		AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Public Housing Portion					
Public Housing	2,055 Flats(1) (Avg. Flat Size = 50m^2)	128	88	62	83
Commercial (Retail)	1,200 m^2	3	3	4	5
Home Care Services (HCS) for Frail Elderly Persons	-	5	5	5	5
Sub-Total (Public Housing Portion)	**-**	**136**	**96**	**71**	**93**
Private Housing Portion					
Private Housing	1,261 Flats (Avg. Flat Size = 39.8m^2)	91	54	37	47
Commercial (Retail)	1,245 m^2	3	4	4	5
Kindergarten	8 Classrooms (160 students)(2)	42	42	2	2
Sub-Total (Private Housing Portion)	**-**	**136**	**100**	**43**	**54**
Total (SH + PH)	**-**	**272**	**196**	**114**	**147**

Note: (1) A 10% increase in flat production for Public Housing development is adopted.
(2) The proposed kindergarten could accommodate up to 160 pupils.

4.2 Design Year

4.2.1 The Proposed Development is tentatively scheduled for completion in 2031. According to Guidelines and Requirements of Traffic Impact Assessment (TIA) Studies, the TIA should assess at least 3 years after the planned completion of the Proposed Development. Hence, 2034 is adopted as the design year for this TIA.

4.3 Planned Junction Improvement Works

J1 – J/O Castle Peak Road – Tam Mi / San Tam Road

4.3.1 Junction improvement was proposed under planned development of Planning Application No. Y/YL-NSW/3. The approaching arm of eastbound Castle Peak Road – Tam Mi would be widened to 2 lanes to enhance the junction capacity.

4.3.2 Under another approved Planning Application No. A/YL-NSW/274, a junction improvement proposal at the J/O Castle Peak Road – Tam Mi / San Tam Road (J1) is recommended as shown in **Figure 4.1A** to allow U-turn movement from Castle Peak Road – Tam Mi northbound to southbound.

4.3.3 Under the feasibility study (CEDD Agreement No. CE10/2020(CE)) for Sha Po Public Housing Development, it is proposed to convert the J/O Castle Peak Road – Tam Mi / San Tam Road from existing signal-controlled junction into a roundabout arrangement. The planned layout of the roundabout is as shown in **Figure 4.1B**.

J2 – J/O Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen

4.3.4 A signalising proposal for the junction of Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen (J2) was proposed under approved Planning Application No. A/YL-KTN/604. In the improvement scheme, right-turning traffic movement from northbound Castle Peak Road – Tam Mi to the unnamed access road to Cheung Chun San Tsuen is allowed. The planned junction improvement for J2 is also shown in **Figure 4.1A**.

J4 – Au Tau Interchange

4.3.5 An improvement measure for Au Tau Interchange was proposed under the feasibility study (CEDD Agreement No. CE10/2020(CE)) for Sha Po Public Housing Development, the approach arm at Castle Peak Road – Yuen Long EB direction is proposed to be widened and be provided with one additional entry lane.

4.3.6 Under another approved Planning Application No. A/YL-KTN/604, it is proposed to widen Castle Peak Road SB direction so as to provide an exclusive left turn lane from Castle Peak Road SB into Kam Tin Road EB. The overall planned layout of Au Tau Interchange is as shown in **Figure 4.2.**

J5 – J/O Kam Tin Road / Tsing Long Highway Slip Road

4.3.7 Local road widening of the 3 approaching arms namely Kam Tin Road eastbound, Kam Tin Road westbound and slip road from Tsing Long Highway were gazetted by the Government in March 2016. The roadworks has been commenced in 2018 for completion in 2021.

J6 – J/O Kam Tin Road / Kam Tin Bypass / Kam Ho Road

4.3.8 A new segregated left turning lane from Kam Ho Road northbound to Kam Tin Road westbound and local widening of Kam Tin Road westbound were gazetted by the Government in March 2016. The roadworks has been commenced in 2018 for completion in 2021.

J7 – Pok Oi Interchange

4.3.9 According to the LegCo Paper for Panel on Housing (LC Paper No. CB(1)276/20-21 (01)) dated 2 November 2020, an exclusive left turn lane at Pok Oi Interchange for the left turn from Castle Peak Road to Yuen Long Highway was recommended to improve the junction performance. The planned improvement works was carried out by CEDD and has been completed in 2022. In addition, according to the proposal which was presented to Traffic and Transport Committee of the Yuen Long District Council, there is a planned road improvement works at Pok Oi interchange for providing traffic signals at approaches from Yuen Long Highway. The planned improvement scheme is shown in **Figure 4.3**.

4.4 Traffic Forecast

4.4.1 Apart from the Proposed Development, the other major newly completed and committed/planned developments in the vicinity of the Proposed Development would also be taken into account in the traffic forecast. All these future developments are listed in **Table 4.4.**

Table 4.4 Other Key New Completed and Future Developments in the Vicinity

Ref.	Development	Key Development Parameters	Estimated 2-way Trip Generation (pcu/hr)	
			AM Peak	PM Peak
1	Tung Shing Lei Development (A/YL-NSW/274)	• 1518 private residential units (average flat size = about 46m^2)	174	101
2	Approved Application No. A/YL-KTN/118-2 (Phase 1 & Phase 2)	• 3,657 private residential units (average flat size = about 70m^2)	419	242
3	Sha Po North Phase 2 Residential Development (A/YL-KTN/663)	• 1,154 private residential units (average flat size = about 42.57m^2)	58(1)	32(1)
4	Grand YOHO (A/YL/139-1)	• 2,508 private residential units (average flat size = about 60m^2) • 42,000m^2 retail GFA	147(2)	134(2)
5	Yuen Long Station Property Development (A/YL/209)	• 1,876 private residential units (average flat size = about 100m^2) • 9,900m^2 retail GFA	263	191
6	Nam Sang Wai Commercial Development (Y/YL-NSW/3)	• 38,300m^2 retail GFA • 700 hotel rooms	378	456
7	Kam Tin North Residential Development (A/YL-KTN/567)	• 200 flats (average flat size = about 65m^2)	28	17
8	Kam Tin South Priority Sites Development	• 8,100 units of public housing (average flat size = about 50m^2) • 2,200 units of private housing (average flat size = about 70m^2)	1,160	751
9	Au Tau Residential Development (Lot 1066 in DD 103)	• 333 private residential units • (average flat size = about 100m^2)	115	91
10	Kam Tin West Outlet Mall (A/YL-NSW/241)	• 37,171m^2 retail GFA	177	249
11	Sha Po South Residential Development (A/YL-KTN/698)	• 561 private residential units (average flat size = about 41.53m^2)	98	51
12	Approved comprehensive residential development (A/YL-KTN/604)	• 3,891 private residential units (average flat size = about 49m^2) • 5,500 m^2 retail GFA	558	334
13	Au Tau School Development (DD107 Lot 1928)	• International school development	250	10

Ref.	Development	Key Development Parameters	Estimated 2-way Trip Generation (pcu/hr)	
			AM Peak	PM Peak
14	Sha Po Public Housing Development	• 16,300 Flats(3) • 1 Primary School • 20,668 m^2 retail GFA • 5 Kindergarten • 38,384 m^2 Welfare Facilities • 19,267 m^2 GIC	2,183	1,628

Note:
(1) Additional traffic in addition to the development under application no. A/YL-KTN/118-2 (Source: http://www.tpb.gov.hk)
(2) Traffic generation/ attraction for 30% of units not yet occupied
(3) An assumption of 70% / 30% split for Public Rental Housing (PRH) and Home Ownership Scheme (HOS) is adopted for trip generation calculation.

Future Traffic Flows

4.4.2 For the future traffic forecasts, in-house local area traffic model (LATM) was developed by referencing Transport Department's 2019-based Base District Traffic Model (BDTM) "NTW1" covering Tuen Mun and Yuen Long Area.

4.4.3 The 2019 / 2026 / 2031 BDTM matrix was cordoned off and fine-tuned to produce a Local Area Traffic Model (LATM) for producing traffic flows within the study area. The coverage of the LATM is presented in **Figure 3.1**.

4.4.4 The 2021 BDTM cordoned matrix was derived by interpolation of the 2019 and 2026 BDTM cordoned matrix. The 2021 LATM has been validated against the 2021 traffic data in the area of influence to ensure that the base year LATM could satisfactorily replicate the base year traffic patterns and volumes before the model is used to produce future years traffic forecasts.

4.4.5 The 2021 / 2031 BDTM cordoned matrices were fed into the 2021 LATM for projecting the traffic flows from year 2021 to year 2034. In addition, the trip ends of traffic zones were adjusted and controlled to the estimated trips generated by the future developments in the vicinity as listed in **Table 4.4** to produce the 2034 reference traffic flows as shown in **Figure 4.4.**

4.4.6 The additional trip ends due to proposed development estimated in **Table 4.3** are then added to 2034 reference traffic flows to produce 2034 design traffic flows. **Figure 4.5** and **Figure 4.6** present the development traffic flows and 2034 design traffic flows.

4.5 Junction Assessment

4.5.1 The main criteria for assessing the traffic impact of critical junctions is whether the additional traffic generated would affect the capacity of junctions in the vicinity of the Proposed Development.

4.5.2 The operational performances of the 8 critical junctions as identified in Section 3 were assessed based on the traffic forecast and the planned junction improvement schemes as mentioned in Section 4. The results are summarized in **Table 4.5**. The junction calculation sheets are shown in **Annex A.**

Table 4.5 2034 Junction Performance

Ref.	Junction	2034 RC/DFC(1)			
		Reference Case		Design Case	
		AM Peak	PM Peak	AM Peak	PM Peak
J1	Castle Peak Road – Tam Mi / San Tam Road(2)	0.74	0.58	0.82	0.62
J2	Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen(3)	20%	39%	10%	33%
J3	Castle Peak Road – Tam Mi / Nam Sang Wai Road	0.60	0.28	1.41	0.63
J4	Au Tau Interchange (4)	0.80	0.72	0.83	0.74
J5	Kam Tin Road / Tsing Long Highway	44%	28%	26%	24%
J6	Kam Tin Road / Kam Tin Bypass / Kam Ho Road Roundabout	0.74	0.59	0.79	0.62
J7	Pok Oi Interchange (Signal NB)	16%	20%	14%	19%
	Pok Oi Interchange (Roundabout)	0.84	0.83	0.85	0.84
J8	Ho Chau Road / Tung Shing Lei Roundabout	0.15	0.08	0.28	0.20

(1) RC in % denotes "Reserve Capacity" for signalized junction; DFC decimal number denotes "Design Flow / Capacity" ratio for priority junction or roundabout.
(2) Roundabout proposal under Sha Po Public Housing Development **(Figure 4.1B)**
(3) Signalising proposal under approved Planning Application No. A/YL-KTN/604 (**Figure 4.1A)**
(4) With widening works at the approach arm of Castle Peak Road – Yuen Long (eastbound) under Sha Po Public Housing Development, and exclusive left-turn lane at Castle Peak Road – Tam Mi (southbound) under approved Planning Application No. A/YL-KTN/604 **(Figure 4.2)**

4.5.3 As shown in **Table 4.5**, all the assessed junctions (except Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen (J2) and Castle Peak Road- Tam Mi/ Nam Sang Wai Road (J3)) would be able to handle the future traffic demand with all planned improvement works implemented timely.

Improvement Recommendation –

J3 – J/O Castle Peak Road – Tam Mi / Nam Sang Wai Road

4.5.4 It is identified that the current left-in/ left-out arrangement at J/O Castle Peak Road – Tam Mi/ Nam Sang Wai Road (J3) would constrain the traffic routings from the Nam Sang Wai Road to detour via the J/O of Castle Peak Road Tam-Mi / San Tam Road (J1) (about 700m) before heading southward via Au Tau Interchange. Therefore, a junction improvement proposal to signalize the J/O Castle Peak Road – Tam Mi / Nam Sang Wai Road (J3) is recommended as shown in **Figure 4.7A** and **Figure 4.7B** to allow right-turn movement from Nam Sang Wai Road eastbound to Castle Peak Road – Tam Mi southbound. As such, the accessibility of the Application Site could be enhanced by reducing the detouring distance.

4.5.5 In addition, a U-turn facility for 8m-long vehicles is proposed at Nam Sang Wai Road such that traffic from Castle Peak Road – Tam Mi northbound can route via Nam Sang Wai Road northbound, U-turn to Nam Sang Wai Road southbound, and back to Ko Po Path. Additional land would be required from the government land lots.

4.5.6 Taken into consideration the diversion effect by the improvement scheme, the design traffic flow (with improvement) is shown in **Figure 4.8**. Capacity analysis for the affected junctions due to the improvement works were carried out and the results are presented in **Table 4.6**. The junction calculation sheets are shown in **Annex A.**

Table 4.6 2034 Junction Performance with Proposed Junction Improvement Works

Ref.	Junction	2034 RC/DFC(1) Design Case (With Improvement)	
		AM Peak	PM Peak
J1	Castle Peak Road – Tam Mi / San Tam Road(2)	0.68	0.56
J2	Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen(3)	30%	47%
J3	Castle Peak Road – Tam Mi / Nam Sang Wai Road(4)	27%	62%

(1) RC in % denotes "Reserve Capacity" for signalized junction;
(2) Roundabout proposal under Sha Po Public Housing Development **(Figure 4.1B)**
(3) Signalising proposal under approved Planning Application No. A/YL-KTN/604 (**Figure 4.1A)**
(4) Junction improvement scheme shown in **Figure 4.7B**

4.5.7 As shown, the performance for J1, J2 and J3 will be improved and operating within capacity upon completion of the proposed improvement works.

4.5.8 For the proposed junction layout of J/O Castle Peak Road – Tam Mi/ Nam Sang Wai Road (J3), queue length assessment is carried out and the results are shown in **Table 4.7**.

Table 4.7 Queue Length Assessment for J3

Approach	Direction	Average Queue Length (m)	
		AM	PM
Castle Peak Road – Tam Mi	Northbound	60	54
Castle Peak Road – Tam Mi	Southbound	66	54
Nam Sang Wai Road	Eastbound	48	24

4.5.9 The implementation responsibility of respective junction improvements is summarized in **Table 4.8**.

Table 4.8 Implementation of Junction Improvement Schemes

Ref.	Junction	Improvement	To Be Implemented under
J1	Castle Peak Road – Tam Mi / San Tam Road (**Figure 4.1A and 4.1B**)	Relocation of Signalized Pedestrian Crossing to allow U-turn movement	A/YL-NSW/274
		Roundabout Proposal	Sha Po Public Housing Development
J2	Castle Peak Road – Tam Mi / Shui Mei Road (**Figure 4.1A**)	Signalized Junction	A/YL-KTN/604 A/YL-KTN/663
J3	Castle Peak Road – Tam Mi/ Nam Sang Wai Road (**Figure 4.7B**)	Signalized Junction and widening at Nam Sang Wai Road	Proposed Development
J4	Au Tau Interchange (**Figure 4.2**)	Exclusive Left-turn Lane	A/YL-KTN/604 A/YL-KTN/663 A/YL-NSW/274 Proposed Development
		Widening of Castle Peak Road – Yuen Long EB Approach Arm	Sha Po Public Housing Development

4.6 Road Link Assessments

4.6.1 The critical road links along San Tam Road, Castle Peak Road- Tam Mi, Castle Peak Road – Yuen Long and Kam Tin Road as shown in **Figure 3.1** are also assessed and the volume-to-capacity (v/c) ratios are presented in **Table 4.9**.

Table 4.9 Road Link Assessments

Link Index	Road Link	Dir.	Capacity (pcu/hr)	Traffic Flows				V/C Ratio			
				Reference Case		Design Case		Reference Case		Design Case	
				AM	PM	AM	PM	AM	PM	AM	PM
L1N	San Tam Road	NB	3600(1)	1110	890	1150	910	0.31	0.25	0.32	0.25
L1S		SB	3600(1)	1850	1480	1850	1470	0.51	0.41	0.51	0.41
L2N	Castle Peak Road - Tam Mi (Between San Tam Road and Access Road to Cheung Chun San Tsuen)	NB	3600(1)	2000	1690	1780	1570	0.56	0.47	0.49	0.44
L2S		SB	3600(1)	2550	2070	2320	1940	0.71	0.58	0.64	0.54
L3N	Castle Peak Road - Tam Mi (Between Access Road to Cheung Chun San Tsuen and Nam Sang Wai Road)	NB	3600(1)	2290	1940	2070	1820	0.64	0.54	0.58	0.51
L3S		SB	3600(1)	2890	2290	2660	2170	0.80	0.64	0.74	0.60

Link Index	Road Link	Dir.	Capacity (pcu/hr)	Traffic Flows				V/C Ratio			
				Reference Case		Design Case		Reference Case		Design Case	
				AM	PM	AM	PM	AM	PM	AM	PM
L4N	Castle Peak Road - Tam Mi (Between Nam Sang Wai Road and Au Tau Interchange)	NB	3600(1)	2280	1970	2500	2150	0.63	0.55	0.69	0.60
L4S		SB (Ground Level)	3600(1)	2040	1470	2250	1590	0.57	0.41	0.63	0.44
		SB (Flyover)	1280(6)	980	850	1040	880	0.77	0.66	0.81	0.69
L5E	Castle Peak Road - Yuen Long (Between Pok Oi Int' and Long Yat Road)	EB	5400(2)	2820	3040	2850	3060	0.52	0.56	0.53	0.57
L5W		WB	5400(2)	2350	2350	2390	2380	0.44	0.44	0.44	0.44
L6E	Castle Peak Road - Yuen Long (Between Au Tau Int' and Pok Oi Int')	EB	5400(2)	2210	1890	2300	1940	0.41	0.35	0.43	0.36
L6W		WB	5400(2)	2970	2230	3080	2290	0.55	0.41	0.57	0.42
L7E	Kam Tin Road (Between Au Ta Int' and Tsing Long Highway Slip Road)	EB	3600(1)	2570	2040	2700	2110	0.71	0.57	0.75	0.59
L7W		WB	3600(1)	2360	2670	2460	2750	0.66	0.74	0.68	0.76
L8E	Kam Tin Road (Between Tsing Long Highway Slip Road and Kam Ho Road Roundabout)	EB	5400(2)	2790	2260	2920	2330	0.52	0.42	0.54	0.43
L8W		WB	3600(1)	2630	2490	2760	2560	0.73	0.69	0.77	0.71
L9	Kam Tin Road	Two-way	2200(3)	1800	1590	1820	1610	0.82	0.72	0.83	0.73
L10	Ho Chau Road	Two-way	2200(3)	410	260	920	560	0.19	0.12	0.42	0.25
L11	Castle Peak Road – Yuen Long (Exit arm of Pok Oi Int')	EB	1800(4)	1380	1150	1440	1180	0.77	0.64	0.80	0.66
L12N	Tai Lam Tunnel	NB	5400(2)	2560	4430	2650	4490	0.47	0.82	0.49	0.83
L12S		SB		5980	2830	6090	2890	1.11	0.52	1.13	0.54
L13E	Yuen Long Highway	EB	6100(5)	5860	6860	5920	6910	0.96	1.12	0.97	1.13
L13W		WB	6100(5)	7010	5980	7090	6020	1.15	0.98	1.16	0.99
L14N	Tsing Long Highway	NB	6100(5)	2440	4030	2530	4090	0.40	0.66	0.41	0.67
L14S		SB	6100(5)	5410	2620	5520	2680	0.89	0.43	0.90	0.44

Note:
(1) Road capacity for Dual 2-lane carriageway
(2) Road capacity for Dual 3-lane tunnel.
(3) Road capacity for 7.3m wide Single 2-lane carriageway
(4) Road capacity for 4m wide Dual 1-lane carriageway
(5) Road capacity for Dual 3-Trunk Road
(6) Road capacity for single lane rural road carriageway (3.5m-4m).

4.6.2 The assessment results in **Table 4.9** indicated that all the above road links are expected to operate within capacity except Tai Lam Tunnel (L12), Yuen Long Highway (L13). With the opening of future Route 11, it was anticipated that the traffic condition of both Tai Lam Tunnel and Yuen Long Highway could be significantly improved. Between the year 2031 (completion year of the development) and the opening year of Route 11, the V/C ratio of both Tai Lam Tunnel and Yuen Long Highway would reach 1.1 in both reference and design case, meaning that traffic speed would be reduced, but would still be manageable with V/C ratio under 1.2.

4.7 Sensitivity Analysis (I)

Without Approved Developments under Planning Application No. A/YL-KTN/663 (Phase 2) and A/YL-KTN/604 in Sha Po North and A/YL-NSW/274 in Tung Shing Lei

4.7.1 As mentioned in **Section 4.3**, junction improvement measures at Castle Peak Road – Tam Mi/ San Tam Road (J1) (introduction of U-turn movement), Castle Peak Road – Tam Mi/ Unnamed Access Road (J2) (signalisation) and Au Tau Interchange (J4) are proposed under the comprehensive residential developments under approved planning application No. A/YL-NSW/274 and A/YL-KTN/604 respectively.

4.7.2 In case of uncertain programme of the approved developments under planning application no. A/YL-KTN/663 (Phase 2), A/YL-KTN/604 and A/YL-NSW/274 as well as the relevant junction improvement measures at J1, J2, and J4, a sensitivity analysis has been carried out for the scenario without the aforementioned developments at Sha Po North and Tung Shing Lei and without the corresponding improvement works, to assess the traffic condition if the proposed junction improvement by others cannot be implemented timely before completion of the Proposed Development.

4.7.3 With similar methodology adopted as discussed in the above section, 2034 traffic forecast for Sensitivity Analysis (without approved Sha Po North and Tung Shing Lei developments under planning application no. A/YL-KTN/663 (Phase 2), A/YL-KTN/604 and A/YL-NSW/274) under Design case (With Proposed Scheme) is derived.

4.7.4 Operational performances of J1, J2 and J4 are assessed according to the traffic forecast. The results are summarized in **Table 4.10**. The junction calculation sheets are shown in **Annex A.**

Table 4.10 2034 Junction Performance – Sensitivity Analysis

Ref.	Junction	2034 RC/DFC(1)	
		Design Case (Sensitivity Test)	
		AM Peak	PM Peak
J1	Castle Peak Road – Tam Mi / San Tam Road	0.67	0.55
J2	Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen(2)	0.20	0.26
J4	Au Tau Interchange(3)	1.18	0.81

(1) RC in % denotes "Reserve Capacity" for signalized junction; DFC decimal number denotes "Design Flow / Capacity" ratio for priority junction or roundabout.
(2) Existing Layout (Priority Junction) – (**Without** Signalising proposal under approved Planning Application No. A/YL-KTN/604)
(3) **Without** exclusive left-turn lane at Castle Peak Road – Tam Mi (southbound) under approved Planning Application No. A/YL-KTN/604)

4.7.5 As shown in **Table 4.10**, all the assessed junctions (except Au Tau Interchange (J4)) would be able to handle the future traffic demand under Sensitivity Test Scenario.

4.7.6 As junction J4 will be overloaded with Design Flow/ Capacity ratio (DFC) of 1.18, the mitigation measures mentioned in **Section 4.3** and shown in **Figure 4.2** are deemed necessary.

4.8 Sensitivity Analysis (II)

With Potential Developments under Planning Application No. Y/YL-NSW/7, Y/YL-NSW/8 and Y/YL-NSW/9

4.8.1 Three potential private residential developments have been proposed under planning application no. Y/YL-NSW/7, Y/YL-NSW/8 and Y/YL-NSW/9, which are situated in the vicinity of the proposed development. A sensitivity test was therefore carried out to assess the traffic impact induced by these additional traffic generation.

4.8.2 For planning application no. Y/YL-NSW/7, as indicated in the planning application document, 1,997 units of flats with an average flat size of 50m^2 are being proposed. With reference to the standard traffic generation and attraction rates as given in the Annex C of Transport Planning and Design Manual (TPDM) Volume 1 Chapter 3, the trip generation of the development are presented in **Table 4.11**.

Table 4.11 Trip Generation and Attraction – Planning Application No. Y/YL-NSW/7

Land Use	Trip Generation/ Attractions (pcu/hr)				
	Parameters	AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Planning Application No. Y/YL-NSW/7					
Private Housing	1,997 Flats	**143**	**85**	**57**	**74**

4.8.3 For planning application Y/YL-NSW/8, 6,825 flats with an average flat size of 37.5m^2 along with 3,950m^2 of retail facilities and kindergarten site are being proposed. The same site was planned as an outlet mall with 37,171m^2 retail GFA under previously approved planning application A/YL-NSW/241 as shown in **Table 4.4**. As the approved planning application A/YL-NSW/241 has already been considered in the traffic forecast, only the difference in trip generation and attraction between these two development proposals would be added to the road network for assessment as shown in **Table 4.12**.

Table 4.12 Trip Generation and Attraction – Planning Application No. Y/YL-NSW/8

Land Use	Trip Generation/ Attractions (pcu/hr)				
	Parameters	AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Latest Planning Application No. Y/YL-NSW/8					
Private Housing	6,825 Flats	491	291	196	253
Retail	3,950m^2	10	10	13	15
GIC facilities	2 nos.	10	10	10	10
Kindergarten	1 Kindergarten (8 classrooms)	25	25	1	1
Total (A)	**-**	**536**	**336**	**220**	**279**
Approved Planning Application No. A/YL-NSW/241					
Retail (B)	37,171m^2	86	91	116	133
Difference (A) – (B)	-	**+450**	**+245**	**+104**	**+146**

4.8.4 For planning application Y/YL-NSW/9, 3,115 flats with an average flat size of 37.2m^2 along with 2,900m^2 of retail facilities, a primary school site, kindergarten sites and a relocated soy sauce factory are being proposed. The same site was planned as a retail facility with 38,300m^2 GFA and a hotel with 700 guest rooms. The difference in trip generation and attraction between these two development proposals are as shown in **Table 4.13**.

Table 4.13 Trip Generation and Attraction – Planning Application No. Y/YL-NSW/9

Land Use	Trip Generation/ Attractions (pcu/hr)				
	Parameters	AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Latest Planning Application No. Y/YL-NSW/9					
Private Housing	3,115 Flats	224	133	90	116
Retail	2,900 m^2	7	8	9	11
Reserved School Site (Primary School)	1 school	7	30	1	1
Kindergarten	1 kindergarten (8 classrooms)	25	25	1	1
Relocated Soy Sauce Factory	13,700m^2	0	4	10	2
Total (A)	**-**	**263**	**200**	**111**	**131**
Approved Planning Application No. Y/YL-NSW/3					
Retail	38,300m^2	88	94	119	137
Hotel	700 guest rooms	94	102	91	109
Total (B)	**-**	**182**	**196**	**210**	**246**
Difference (A) – (B)	**-**	**+81**	**+4**	**-99**	**-115**

4.8.5 The additional traffic generated from the three potential developments has been added into the 2034 design flow, producing the 2034 sensitivity test design flow and is presented in **Figure 4.9**. Operational performances of the critical junctions are reassessed according to the revised traffic forecast. The results are summarized in **Table 4.14**.

Table 4.14 2034 Junction Performance – Sensitivity Test (II) with Potential Developments under Planning Application No. Y/YL-NSW/7, Y/YL-NSW/8 and Y/YL-NSW/9

Ref.	Junction	2034 RC/DFC(1) Design Case (Sensitivity Test)	
		AM Peak	PM Peak
J1	Castle Peak Road – Tam Mi / San Tam Road(2)	0.77	0.58
J2	Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen(3)	15%	42%
J3	Castle Peak Road – Tam Mi / Nam Sang Wai Road	16%	55%
J4	Au Tau Interchange (4)	0.99	0.75
J5	Kam Tin Road / Tsing Long Highway	26%	23%
J6	Kam Tin Road / Kam Tin Bypass / Kam Ho Road Roundabout	0.80	0.62
J7	Pok Oi Interchange (Signal NB)	10%	16%
	Pok Oi Interchange (Roundabout)	0.91	0.86
J8	Ho Chau Road / Tung Shing Lei Roundabout	0.28	0.20

(1) RC in % denotes "Reserve Capacity" for signalized junction; DFC decimal number denotes "Design Flow / Capacity" ratio for priority junction or roundabout.
(2) Roundabout proposal under Sha Po Public Housing Development **(Figure 4.1B)**
(3) Signalising proposal under approved Planning Application No. A/YL-KTN/604 (**Figure 4.1A)**
(4) With widening works at the approach arm of Castle Peak Road – Yuen Long (eastbound) under Sha Po Public Housing Development, and exclusive left-turn lane at Castle Peak Road – Tam Mi (southbound) under approved Planning Application No. A/YL-KTN/604 **(Figure 4.2)**

4.8.6 As shown in **Table 4.14**, all the assessed junctions except Au Tau Interchange (J4) would be able to handle the future traffic demand with all planned improvement works implemented timely.

4.8.7 A sensitivity test for J3 has been carried out with consideration of adopting push button at pedestrian crossing at Ko Po Path. Under this arrangement, the number of stages of MOC could be reduced from three to two. As a result, the performance of J3 would be further improved as shown in **Table 4.14**.

Table 4.15 2034 Junction Performance – Sensitivity Test (IIA) with Potential Developments under Planning Application No. Y/YL-NSW/7, Y/YL-NSW/8 and Y/YL-NSW/9 for J3

Ref.	Junction	2034 RC/DFC(1) Design Case (Sensitivity Test)	
		AM Peak	PM Peak
J3	Castle Peak Road – Tam Mi / Nam Sang Wai Road	20%	55%

4.8.8 The critical road links along San Tam Road, Castle Peak Road- Tam Mi, Castle Peak Road – Yuen Long and Kam Tin Road as shown in **Figure 3.1** are also assessed and the volume-to-capacity (v/c) ratios are presented in **Table 4.16**.

Table 4.16 Road Link Assessments

Link Index	Road Link	Dir.	Capacity (pcu/hr)	Design Case (Sensitivity Test)			
				Traffic Flows		V/C Ratio	
				AM	PM	AM	PM
L1N	San Tam Road	NB	3600(1)	1150	910	0.32	0.25
L1S		SB	3600(1)	1880	1480	0.52	0.41
L2N	Castle Peak Road - Tam Mi (Between San Tam Road and Access Road to Cheung Chun San Tsuen)	NB	3600(1)	2000	1670	0.56	0.46
L2S		SB	3600(1)	2680	2020	0.74	0.56
L3N	Castle Peak Road - Tam Mi (Between Access Road to Cheung Chun San Tsuen and Nam Sang Wai Road)	NB	3600(1)	2290	1920	0.64	0.53
L3S		SB	3600(1)	3010	2270	0.84	0.63
L4N	Castle Peak Road - Tam Mi (Between Nam Sang Wai Road and Au Tau Interchange)	NB	3600(1)	2720	2250	0.76	0.63
L4S		SB (Ground Level)	3600(1)	2460	1640	0.68	0.46
		SB (Flyover)	1280(6)	1190	920	0.93	0.72
L5E	Castle Peak Road - Yuen Long (Between Pok Oi Int' and Long Yat Road)	EB	5400(2)	2900	3090	0.54	0.57
L5W		WB	5400(2)	2480	2400	0.46	0.44
L6E	Castle Peak Road - Yuen Long (Between Au Tau Int' and Pok Oi Int')	EB	5400(2)	2470	2030	0.46	0.38
L6W		WB	5400(2)	3370	2360	0.62	0.44
L7E	Kam Tin Road (Between Au Ta Int' and Tsing Long Highway Slip Road)	EB	3600(1)	2740	2120	0.76	0.59
L7W		WB	3600(1)	2490	2760	0.69	0.77
L8E	Kam Tin Road (Between Tsing Long Highway Slip Road and Kam Ho Road Roundabout)	EB	5400(2)	2960	2340	0.55	0.43
L8W		WB	3600(1)	2790	2570	0.78	0.71
L9	Kam Tin Road	Two-way	2200(3)	1880	1630	0.85	0.74
L10	Ho Chau Road	Two-way	2200(3)	920	560	0.42	0.25
L11	Castle Peak Road – Yuen Long (Exit arm of Pok Oi Int')	EB	1800(4)	1560	1240	0.87	0.69
L12N	Tai Lam Tunnel	NB	5400(2)	2760	4530	0.51	0.84
L12S		SB		6280	2920	1.16	0.54
L13E	Yuen Long Highway	EB	6100(5)	6010	6940	0.99	1.14
L13W		WB	6100(5)	7250	6050	1.19	0.99
L14N	Tsing Long Highway	NB	6100(5)	2640	4130	0.43	0.68
L14S		SB	6100(5)	5710	2710	0.94	0.44

Note:
(1) Road capacity for Dual 2-lane carriageway
(2) Road capacity for Dual 3-lane tunnel

(3) Road capacity for 7.3m wide Single 2-lane carriageway
(4) Road capacity for 4m wide Dual 1-lane carriageway
(5) Road capacity for Dual 3-Trunk Road
(6) Road capacity for single lane rural road carriageway (3.5m-4m).

4.8.9 The assessment results in **Table 4.16** indicated that all the above road links are expected to operate within capacity except Tai Lam Tunnel (L12), Yuen Long Highway (L13). With the opening of future Route 11, it was anticipated that the traffic condition of both Tai Lam Tunnel and Yuen Long Highway could be significantly improved. Between the year 2031 (completion year of the development) and the opening year of Route 11, the V/C ratio of both Tai Lam Tunnel and Yuen Long Highway would reach 1.1, meaning that traffic speed would be reduced, but would still be manageable with V/C ratio under 1.2.

5 PUBLIC TRANSPORT SERVICES

5.1 Existing Public Transport Facilities

5.1.1 Currently, there is no public transport serving the Application Site. The nearest railway station is Yuen Long Station which is located about 1km walking distance away from the Application Site and within 13 minutes' walk, as shown in **Figure 5.1** There are also bus stops and GMB stands in the public transport interchange (PTI) of Yuen Long Station. The public transport services at the PTI and bus stop at Long Yat Road are summarised in **Table 5.1**.

Table 5.1 Existing Public Transport Services near Yuen Long Station

Route No.	Origin / Destination			Frequency (min.)
Yuen Long Station Public Transport Interchange				
Franchised Bus				
53	Yuen Long Station	↔	Tsuen Wan (Nina Tower)	25 – 35
B1	Ma Wang Road (Shan Shui House)	↔	Lok Ma Chau Station	60
B1	Tin Tsz B/T	↔	Lok Ma Chau Station	5 – 15
B2	Yuen Long Station	↔	Shenzhen Bay Port	10 – 20
K65	Yuen Long Station	↔	Lau Fau Shan	9 – 16
Green Mini-Bus (GMB)				
32	Yuen Long Station (North) PTI	↔	Tan Kwai Tsuen	10 - 15
71	Yuen Long (Yuen Long Tai Hang Street)	↔	Shek Wu Tong (Ho Pui)	15
72	Yuen Long (Yuen Long Tai Hang Street)	↔	Lui Kung Tin	10
77	Tin Shui Wai	↔	Lok Ma Chau (San Tin) PTI / Lok Ma Chau Control Point	15
77A	Tin Shui Wai North (Grandeur Terrace)	↔	Pok Oi Hospital	15 - 20
77B	Tin Shui Wai	↔	Pok Oi Hospital / Sun Yuen Long Centre	15
77P	Tin Yiu Estate	↔	Lok Ma Chau (San Tin) PTI	15 (Mon – Fri)

Route No.	Origin / Destination			Frequency (min.)
79S	Tin Shui Wai (Grandeur Terrace)	↔	Lok Ma Chau Control Point	10 - 15
601	Yuen Long (Fung Cheung Road)	↔	Pak Wai Tsuen	10 - 20
601C	Yuen Long (Fung Cheung Road)	↻	Kam Sheung Road Station	20
602	Yuen Long (Fung Cheung Road)	↔	Tai Kong Po	15 - 20
602C	Yuen Long (Fung Cheung Road)	↻	Kam Sheung Road Station	20
603	Yuen Long (Fung Cheung Road)	↔	Fung Kat Heung	20 – 25
604	Yuen Long (Fung Cheung Road)	↔	Shan Ha Tsuen	10 – 20
609	Long Shin Estate	↻	Yuen Long Town	10
609	Pok Oi Hospital	↻	Yuen Long Town	10
609	Yuen Long Stadium	↻	Pok Oi Hospital	6 - 15
609B	Long Shin Estate	↻	Yuen Long Station	6 (Mon – Sat)
611A	Yuen Long Station	↻	Shan Pui Road	5
611B	Kwan Lok Lan	↻	Yuen Long Station	15
MTR Yuen Long Station (near Long Yat Road)(LR Yuen Long Stop)				
Franchised Bus				
54	Yuen Long (West)	↻	Sheung Tsuen (Shek Kong)	20 - 30
64K	Yuen Long (West)	↔	Tai Po Market	6 - 15
68	Park Yoho	↻	Yoho Mall	30
68E	Yuen Long Park	↔	Tsing Yi Station	15 – 30
68F	Yuen Long Park	↻	Park Yoho	30
68M	Tsuen Wan Station	↔	Yuen Long (West) B/T	5 – 15
68X	Hung Shui Kiu (Hung Fuk Estate)	↔	Mong Kok (Park Avenue)	9 – 25
68X	Yuen Long (West)	→	Mong Kok (Park Avenue)	AM Peak: 2 trips (Mon – Sat)
76K	Ching Ho Estate Bus Terminus	↔	Long Ping Estate B/T	20 – 30
77K	Yuen Long (Fung Cheung Road)	↔	Sheung Shui	20 – 30
261X	Tuen Mun Central	↔	Fanling (Cheung Wah)	AM/ PM Peaks: 4 trips for each direction
264R	Tai Po Market Station	↔	Tin Yiu B/T	30 (Sat, Sun and PH)
268A	Long Ping Estate	→	Kwun Tong Ferry	AM Peak: 2 trips only
268B	Long Ping Station	↔	Hung Hom (Hung Luen Road)	20 - 30
268C	Long Ping Station	↔	Kwun Tong Ferry	5 - 15
268P	Ma Wang Road (Shan Shui House)	↔	Kwun Tong Ferry	AM Peak: 3 trips (to Kwun Tong) PM Peak: 1 trip (to Ma Wang Road)
268X	Hung Shui Kiu (Hung Fuk Estate)	↔	West Kowloon Station	10 – 30
269D	Tin Fu	↔	Lek Yuen	5 – 25
276	Tin Tsz	↔	Sheung Shui	15 - 25
276P	Tin Shui Wai Station	↔	Sheung Shui	5 – 20
968	Yuen Long (West)	↔	Causeway Bay (Tin Hau)	3 – 15
968A	Yuen Long (West)	→	Causeway Bay (Tin Hau)	AM Peak: 2 trips

Route No.	Origin / Destination			Frequency (min.)
968X	Yuen Long (West)	↔	Quarry Bay (King's Road)	AM Peak: 4 trips (to Quary Bay); PM Peak: 2 trips (to Yuen Long (West))
A36	Long Ping Station	↔	Airport (Ground Transportation Centre)	15 - 60
E34B	Yuen Long	↔	Airport (Ground Transportation Centre)	7 - 25
E34P	Tin Shui Wai Town Centre	↔	Tung Chung (Yat Tung)	To Tung Chung (Yat Tung): 1 trip (AM Peak) To Tin Shui Wai Town Centre: 4 trips (AM/PM Peaks) (Mon – Sat)
K74	Tin Chui	↻	Au Tau	12 – 20
N269	Tin Tsz Estate	↔	Mei Foo	12 – 20 (Night Service)
N368	Yuen Long (West)	↔	Central (Macau Gerry Pier)	20 – 25 (Night Service)
NA34	HZMB Hong Kong Port	↔	Tin Shui Wai Town Centre B/T	To Tin Shui Wai Town Centre: 9 trips during midnight; To HZMB Hong Kong Port: 4 trips at early morning
Green Mini-Bus (GMB)				
36	Yuen Long (Fook Hong Street)	↔	Tai San Wai Rural Office	10 - 15
37	Yuen Long (Fook Hong Street)	↔	Yau Tam Mei Village Office	12 - 15
38	Yuen Long (Fook Hong Street)	↔	Yau Tam Mei West (near Ho Sang Farm)	10 - 15
608	Wang Toi Shan (Pat Heung)	↻	Yuen Long Fung Cheung Road	10 - 13
611	Shan Pui Road	↻	Fau Tsoi Street	8 - 15

5.2 Transport Demand and Proposed Transport Facilities

5.2.1 As mentioned in **Section 2.4.1**, a Public Transport Terminus is proposed within the Private Housing Portion to cater for the provision of public transport services for the future residents of the Proposed Development. The Public Transport Terminus would be handed over to Transport Department for future management and maintenance.

5.2.2 Referring to **Table 2.1**, the population of the Private Housing Portion development will be 3,153. For Public Housing Portion, a 10% increase in the design population and flat production would be adopted (i.e. 5,231 x (1+10%) = 5,755 persons). Hence, the overall population at the Proposed Development will be 8,908 persons.

5.2.3 Reference was made to the published "Travel Characteristics Survey (TCS) 2011 Final Report". According to the TCS Final Report, the daily mechanised trip rate per population is 1.83 trips and the morning peak hour accounted for about 12% of the daily trips. The percentage of using public transport is about 73% of the total trips. The estimated additional public transport demand in AM peak hour would thus be about 1,428 pax/hr (i.e. 8,908 x 1.83 x 0.12 x 0.73).

5.2.4 A passenger count survey was conducted at existing Park YOHO, which is considered a comparable reference as the Subject Site. Based on the surveyed results, about 45% are destined to MTR Station, 35% via Long-haul bus service (via 268M) and 20% to Yuen Long Town Centre are identified.

5.2.5 As the major public transport demand would be likely to be destined to MTR Station/ Yuen Long Town. A circular bus service is proposed between Yuen Long Station PTI and the development site, with terminating point at the development site and a bus stop at Yuen Long Station PTI for passenger boarding / alighting. Subject to future planning, the conceptual routing of the proposed bus service is diagrammatically shown in **Figure 5.2**. Based on the demand of 928 pax/hr (i.e. 1,428 x 65%) and a capacity of 90 persons/bus, the proposed headway is about 5 minutes.

5.2.6 For the demand of the long-haul bus services, the overall demand for the development sites is about 500 pax/hr (i.e. 1,428 x 35%). Based on a capacity of 90 persons/bus, this would be equivalent to about 6 bus trips/hour. Hence 6 bus trips of long-haul bus routes to/from urban areas (such as Hong Kong Island, Kowloon East and Kowloon) are proposed during the AM / PM peak hours. Passengers taking these bus services can also interchange with other bus routes to various districts via Tai Lam Bus Interchange.

5.2.7 As mentioned in **Section 2.4**, a Public Transport Terminus is proposed within the Private Housing Portion. The indicative layout of proposed Transport Terminus is shown in **Figure 2.3**. As shown in the indicative layout, 2 bus bays, 1 GMB bay and a taxi stand are provided. One of the bus bays would be designated to serve for the proposed bus service (to/from Yuen Long Station PTI), the other bus bay could serve the long-haul bus routes during the AM / PM peak hours, while the GMB bay would be reserved for the provision of GMB services if required in future.

5.2.8 Subject to the future planning of public transport services, the provisions of transport terminus within the Application Site will allow adequate hardware facility to serve the future public transport demand generated by the proposed development.

5.2.9 In addition, as mentioned in **Section 2.2.2**, one 38m long bus/GMB bay is planned at Ho Chau Road to serve for the whole area. This can serve as bus/GMB bay for additional terminating bus /GMB routes serving the area if required in the future.

5.3 Impact on Tuen Ma Line

5.3.1 Referring to **Section 5.2.4,** the public transport demand for Tuen Ma Line (formerly named as West Rail Line) would be around 643 pax/hr (ie 1,428 x 45%) in AM peak outbound direction.

5.3.2 Referring to Press Releases (2019). LCQ7: Loading of trains of West Rail Line[1], The patronage per direction of the West Rail Link in its critical link (i.e. from Kam Sheung Road to Tsuen Wan West) in year 2018 AM peak hour is 40,400 pax/hr.

[1] Press Releases (2019). LCQ7: Loading of trains of West Rail Line. Retrieved from HKSAR Government, Web site: https://www.info.gov.hk/gia/general/201905/08/P2019050800304.htm)

5.3.3 To forecast the patronage flow in year 2034, annual growth rate was estimated with reference to 2016-based Territorial Population and Employment Data Matrix (TPEDM) data which is available in Planning Department website. Below table shows the planning data of Tuen Mun, Yuen Long, Tin Shui Wai, and northwest New Territories.

Table 5.2 2016-based TPEDM Planning Data

Planning Data District	Year 2016	Year 2021	Year 2026
	Population	Population	Population
Tuen Mun	464,150	489,450	534,600
Yuen Long	164,500	175,200	180,000
Tin Shui Wai	286,250	285,200	281,100
Northwest New Territories	189,650	211,600	257,200
Total	**1,104,550**	**1,161,450**	**1,252,900**
Annual growth rate from year 2016 to 2021 = 1.0% **Annual growth rate from year 2021 to 2026 = 1.5%**			

5.3.4 By adopting the annual growth rate of 1% (from year 2018 to 2021) and annual growth rate of 1.5% (from year 2021 to year 2034), the forecasted patronage flow in the critical link (i.e. from Kam Sheung Road to Tsuen Wan West) in year 2034 AM peak hour is 50,513 pax/hr (i.e. 40,400 x $(1.01)^3$ x $(1.015)^{13}$). By adopting the demand generated from the development, the overall patronage flow is 51,156 pax/hr (i.e. 50,513 + 643) in year 2034 AM peak.

5.3.5 As suggested by Transport Department, the carrying capacity of Tuen Ma Line upon full commission would be around 64,200 pax/hr and 45,700 pax/hr by adopting a passenger density level of 6 ppsm and 4 ppsm respectively.

5.3.6 As shown in **Table 5.3**, by adopting the 6 ppsm induced carrying capacity of 64,200 pax/hr, even with the development, the Tuen Ma Line is anticipated to be operating within capacity in year 2034.

Table 5.3 2034 Tuen Ma Line Impact Assessment

Passenger Density Level	Capacity (C) (pax/hr)	Patronage Forecast (V) (pax/hr)	V/C
6 ppsm	64,200	51,156	0.80
4 ppsm	45,700		1.12

5.4 Pedestrian Impact Assessment

Internal Footpaths and Pedestrian Crossing

5.4.1 To establish the future pedestrian demand at various internal critical footpaths as shown in **Figure 5.3**, different trip rates were adopted for estimating the pedestrian generation induced by the public housing portion and private housing portion of the proposed development as shown in **Table 5.4.**

Table 5.4 Pedestrian Trip Generation Rate (For Public Transport Trips and Walk Trips)

Land Use	AM Peak	
	Generation	Attraction
Private Residential (ppl/ unit)(1)	0.72	0.16
Public Residential (ppl/ unit)(2)	0.47	0.13

Note:
(1) Based on survey data for Yuen Long Park YOHO development. Such trip generation estimation covers the pedestrian trip to/from public transport and walk trips.
(2) Based on survey data for Long Sin Estate development. Such trip generation estimation covers the pedestrian trip to/from public transport and walk trips.

5.4.2 Based on trip rates as shown in **Table 5.4,** the pedestrian generation and attraction of both public and private residential portions of the proposed development during morning peak has been derived as shown in **Table 5.5**.

Table 5.5 Pedestrian Trip Generation for Proposed Development (For Public Transport Trips and Walk Trips)

Site	Parameters	AM Peak	
		Generation (pph)	Attraction (pph)
Private Residential	1,261 units	908	202
Public Residential	1,868 units(1)	966	267

Note:
(1) A 10% increase in the design population and flat production for the Public Housing Portion would be adopted for assessment purpose to allow for changes in flat mix, refinement of layout and design etc. in the detailed design stage.

5.4.3 With reference on the modal split data for work trips in Kam Tin area and school trips in Yuen Long District as reported in 2021 Population By-census published by the Census and Statistics Department, the assumed modal split of these pedestrian generations / attractions are summarized in **Table 5.6** below.

Table 5.6 Adopted Modal Split

Assumed Modal Split(1)	To / From Residential
Walk	6%
Public Transport	94%

Note:
(1) Private vehicle has not been included in the adopted modal split for residential portion as the trip rate for estimating residential trips covers only the pedestrian trip to/from public transport and walk trips.

5.4.4 By assuming that all the public transport pedestrian trips would be destined to the PTI in the proposed development, the additional pedestrian generation / attraction as given in **Table 5.5** were assigned to the road network, resulting in the 2034 design pedestrian flows. Based on the forecasted pedestrian flows, the footpath sections have been assessed and the results are summarized in **Table 5.7**.

Table 5.7 Summary of Pedestrian Flows at Critical Footpath Sections in Proposed Development

Critical Footpath Section	2034 AM Peak Design Pedestrian Flows (ped/hr)	Clear Minimum Width (m)	Effective Minimum Width (m)	Flow Rate (Ped/m/min)	Level of Service (LOS)
F1	1,233	1.8	0.8	25.7	C
F2	1,233	3.5	2.5	8.2	A
F3	2,343	2.5	1.5	26	C
F4	2,343	2.5	1.5	26	C
F5	134	2.5	1.5	1.5	A

5.4.5 As shown in **Table 5.7**, all the critical footpath sections would result in a level of service A-C under the 2034 design traffic pedestrian flows, which are better than the preferred upper end of LOS C as stated in TPDM and is therefore considered acceptable. The description of LOS from TPDM Volume 6 Chapter 10 is extracted and shown in **Table 5.8** for reference.

Table 5.8 Description of Level-of-Service (LOS)

LOS	Flow Rate (ped/min/m)	Description
A	≤ 16	Pedestrians basically move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected, and conflicts between pedestrians are unlikely.
B	16 - 23	Sufficient space is provided for pedestrians to freely select their walking speeds, to bypass other pedestrians and to avoid crossing conflicts with others. At this level, pedestrians begin to be aware of other pedestrians and to respond to their presence in the selection of walking paths.
C	23 - 33	Sufficient space is available to select normal walking speeds and to bypass other pedestrians primarily in unidirectional stream. Where reverse direction or crossing movement exist, minor conflicts will occur, and speed and volume will be somewhat lower.
D	33 - 49	Freedom to select individual walking speeds and bypass other pedestrians is restricted. Where crossing or reverse-flow movements exist, the probability of conflicts is high and its avoidance requires changes of speeds and position. The LOS provides reasonable fluid flow; however considerable friction and interactions between pedestrians are likely to occur.

E	49 - 75	Virtually, all pedestrians would have their normal walking speeds restricted. At the lower range of this LOS, forward movement is possible only by shuffling. Space is insufficient to pass over slower pedestrians. Cross- and reverse-movement are possible only with extreme difficulties. Design volumes approach the limit of walking capacity with resulting stoppages and interruptions to flow.

Existing Footpaths near Castle Peak Road – Tam Mi and Ko Po Path

5.4.6 A pedestrian count survey was conducted at existing footpaths near Castle Peak Road – Tam Mi and Ko Po Path during the AM peak hour from 07:00-09:00 on a typical weekday in November 2023. The location of the identified critical footpath sections along Castle Peak Road – Tam Mi and Ko Po Path is as shown in **Figure 5.4** and the existing flow is as shown in **Table 5.9.**

5.4.7 Given the long walking distance (over 1km) and the availability of public transport services in the vicinity of the subject site, it is assumed that no additional pedestrian trips would be induced by the proposed development to these existing footpaths near Castle Peak Road – Tam Mi and Ko Po Path.

5.4.8 A nominal growth of 1% per annum is applied to the 2023 observed pedestrian flows along existing footpath sections at Castle Peak Road – Tam Mi and Ko Po Path to produce the 2034 reference pedestrian flows. As no additional pedestrian generation / attraction were assigned to these existing footpaths, the reference pedestrian flows in 2034 would be equivalent to the 2034 design pedestrian flows. Based on the forecasted pedestrian flows, the footpath sections have been assessed and the results are summarized in **Table 5.9.**

Table 5.9 Summary of Pedestrian Flows at Critical Footpath Sections near Castle Peak Road – Tam Mi

Critical Footpath Section	2023 AM Peak Observed Pedestrian Flows (ped/hr)	2034 AM Peak Design Pedestrian Flows (ped/hr)	Clear Minimum Width (m)	Effective Minimum Width (m)	Flow Rate (Ped/m/min)	Level of Service (LOS)
F6	18	21	2.0	1.0	0.35	A
F7	18	21	3.2	2.2	0.16	A
F8	28	32	2.0	1.0	0.53	A
F9	30	34	2.0	1.0	0.57	A
F10	14	16	1.5	0.5	0.53	A
F11	16	18	2.0	1.0	0.30	A

5.4.9 As shown in **Table 5.9**, all the critical footpath sections would result in a level of service A under the 2034 design traffic pedestrian flows, which are better than the preferred upper end of LOS C as stated in TPDM and is therefore considered acceptable.

SUMMARY AND CONCLUSION

5.5 Summary

5.5.1 AECOM was commissioned by the Applicant to prepare a TIA in support of the Application for the Land Sharing Pilot Scheme.

5.5.2 The Application Site is located at various lots in D.D. 115, Tung Shing Lei, Yuen Long as indicated in **Figure 1.1**. The Application Site is currently zoned "Residential (Group D)" ("R(D)") on the approved Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8 and covers a site area of approximately 40,947m^2.

5.5.3 The Applicant now proposes a public and private housing development at the subject site under the Land Sharing Pilot Scheme (LSPS). The proposal comprises (i) a Public Housing development with plot ratio of 4.45 and 1,868 units (with average flat size of 50 m^2), and (ii) a private housing development with plot ratio of 3.01 and 1,261 units (with average flat size of 39.8m^2).

5.5.4 Within the Public Housing Portion, the Proposed Development will provide 214 car parking spaces; 20 visitor parking spaces, 14 motorcycle parking spaces, 274 bicycle parking spaces, 8 LGV and Light Bus loading/ unloading bays and 8 "shared-use" coaches/ bus and M/HGV loading/unloading bays for residential (Public Housing) portion according to the HKPSG. For the commercial portion, the Proposed Development will provide 6 car parking spaces, 1 motorcycle parking spaces, and 2 loading/ unloading bays for goods vehicles. For G/IC Facilities (including one NEC and HCS), 1 Private Light Bus Parking Space and 1 Shared Loading and Unloading Bay for Private Light Bus will be provided.

5.5.5 Within the Private Housing Portion, the Proposed Development will provide 228 car parking spaces; 15 visitor parking spaces, 11 motorcycle parking spaces, 85 bicycle parking spaces, and 3 loading/unloading bays for goods vehicles for residential (private housing) portion according to the HKPSG. For the commercial portion, the Proposed Development will provide 7 car parking spaces, 1 motorcycle parking spaces, and 2 loading/ unloading bays for goods vehicles. For the kindergarten, 1 private car parking spaces, 10 taxi/ private cars layby and 5 small coaches laybys would be provided.

5.5.6 In order to cater for the potential demand of public transport services arising from the Proposed Development, a Public Transport Terminus with 2 bus bays, 1 GMB bay and a taxi stand is proposed within the Private Housing Portion. Franchised bus services are proposed to serve the Proposed Development by circular route to Yuen Long Station PTI. In addition, long-haul bus routes to/from urban areas (such as Hong Kong Island, Kowloon East and Kowloon) are proposed during the AM / PM peak hours. Subject to the future planning of public transport services, the provision of transport terminus will allow adequate hardware facility to serve the future public transport demand generated by the proposed development.

5.5.7 Currently, the Application Site is served by a village road which branches off from existing Ho Chau Road. The village road is a 3.5m-5.5m wide single-track access road with no footpath on neither side of the carriageway; while Ho Chau Road is a 3.5m wide single-track access road with passing bays.

5.5.8 Under another approved planning application no. A/YL-NSW/274 for adjacent site, the existing Ho Chau Road is planned to be widened to a standard 7.3m wide single 2 lane 2-way carriageway between the adjacent site to the junction of Nam Sang Wai Road. One 38m long bus/GMB bay is planned at widened Ho Chau Road to serve for the whole area. This can serve as bus/GMB bay for additional terminating bus /GMB routes serving the area if required in the future. In addition, a section of Nam Sang Wai Road near its junction with Castle Peak Road – Tam Mi was also planned to be widened.

5.5.9 An access road is proposed within the Application Site to connect the Application Site with widened Ho Chau Road. The access road would be a 7.3m-wide single 2-lane carriageway, with footpaths provided on each side of the carriageway

5.5.10 In order to review the existing traffic condition, traffic count surveys were conducted at the following 8 identified critical junctions to investigate the traffic condition during commuting peak hours. At present, all the critical junctions are operating within capacity.

- J/O Castle Peak Road – Tam Mi / San Tam Road (J1)
- J/O Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen (J2)
- J/O Castle Peak Road – Tam Mi / Nam Sang Wai Road (J3)
- Au Tau Interchange (J4)
- J/O Kam Tin Road / Tsing Long Highway Slip Road (J5)
- J/O Kam Tin Road / Kam Tin Bypass / Kam Ho Road (J6)
- Pok Oi Interchange (J7)
- J/O Ho Chau Road / Tung Shing Lei (J8)

5.5.11 The Proposed Development will generate 2-way traffic of about 470 pcu/hr and 262 pcu/hr during the commuting AM and PM peak.

5.5.12 The Proposed Development is scheduled for completion in 2031 tentatively. Traffic forecast for design year 2034 was produced to assess the traffic impact arising from Proposed Development. The results of junction capacity assessments revealed that all junctions (except J2 and J3) would be able to handle the future traffic demand with all planned improvement works implemented.

5.5.13 A junction improvement proposal (**Figure 4.7B**) to signalize the J/O Castle Peak Road – Tam Mi / Nam Sang Wai Road (J3) is recommended to allow right-turn movement from Nam Sang Wai Road eastbound to Castle Peak Road – Tam Mi southbound. In addition, a U-turn facility for 7m-long vehicles is proposed at Nam Sang Wai Road such that traffic from Castle Peak Road – Tam Mi northbound can route via Nam Sang Wai Road northbound, U-turn to Nam Sang Wai Road southbound, and back to Ko Po Path. In view of the above, additional land would be required from the government land lots.

5.5.14 The performance for J/O Castle Peak Road – Tam Mi with San Tam Road (J1), Unnamed Access Road to Cheung Chun San Tsuen (J2) and Nam Sang Wai Road (J3) would be improved and operating within capacity upon completion of the proposed improvement works.

5.5.15 Road Link Assessment on the design case traffic flows indicated that all the above road links are expected to operate within capacity except Tai Lam Tunnel (L12), Yuen Long Highway (L13). With the opening of future Route 11, it was anticipated that the traffic condition of both Tai Lam Tunnel and Yuen Long Highway could be significantly improved. Between the year 2031 (completion year of the development) and the opening year of Route 11, the V/C ratio of both Tai Lam Tunnel and Yuen Long Highway would reach 1.1 in both reference and design case, meaning that traffic speed would be reduced, but would still be manageable with V/C ratio under 1.2.

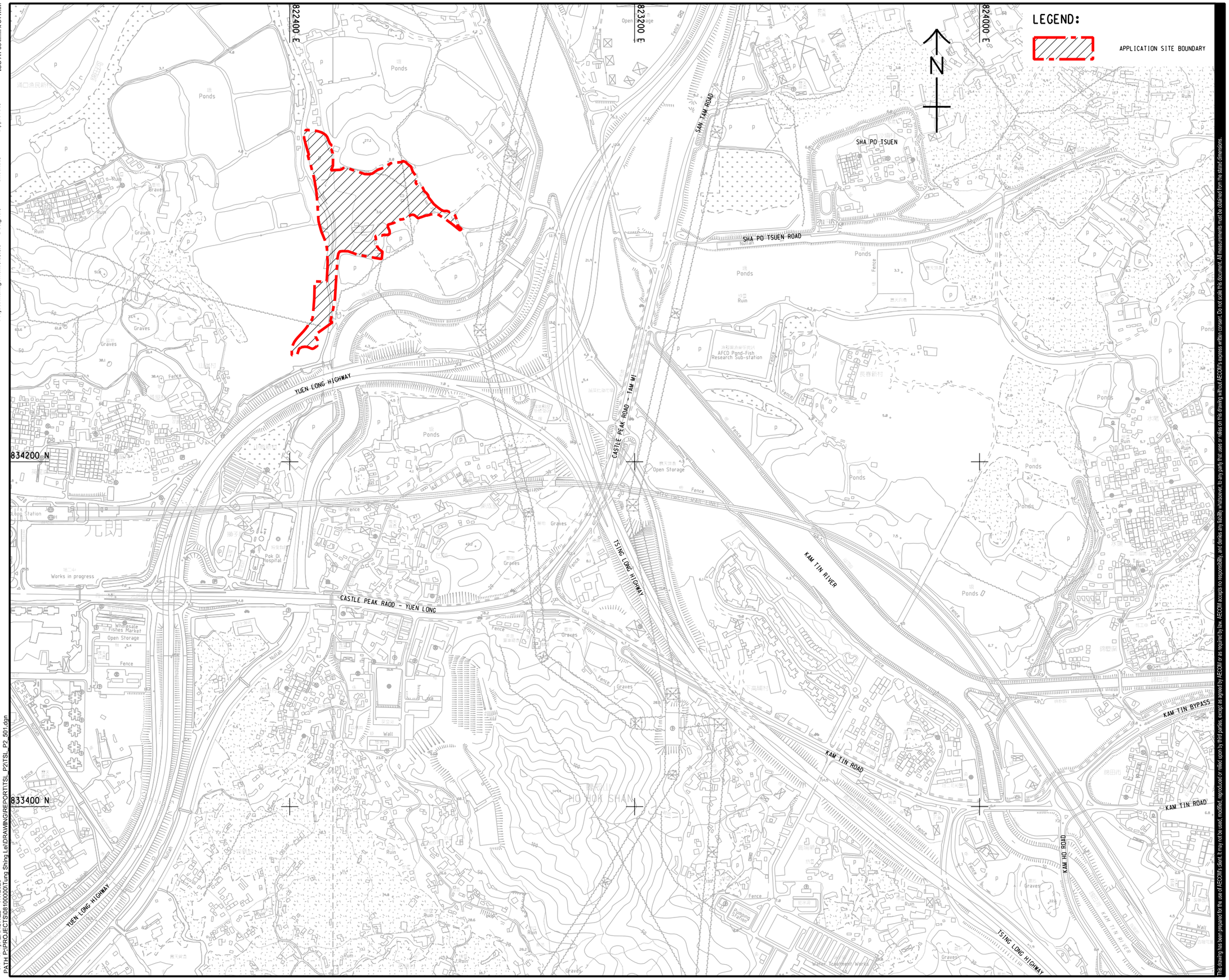
5.5.16 A sensitivity analysis has been carried out for the scenario without the approved Sha Po North and Tung Shing Lei developments under Application No. A/YL-KTN/663 (Phase 2), A/YL-KTN/604 and A/YL-NSW/274 respectively and without the improvement works at J1, J2, and J4, to assess the traffic condition if the proposed junction improvement by others cannot be implemented timely before completion of the Proposed Development. The junction assessment results reveal that the assessed junctions J1 and J2 would be able to handle the future traffic demand under the sensitivity test scenario. For J4, the aforementioned junction improvement measure (i.e. proposed exclusive left turn lane) is deemed necessary under the Sensitivity Analysis (i.e. without the approved Sha Po North and Tung Shing Lei developments under Application No. A/YL-KTN/663 (Phase 2), A/YL-KTN/604 and A/YL-NSW/274 respectively and without the relevant junction improvement works). Therefore the Applicant will implement the improvement measure of J4 accordingly.

5.5.17 An additional sensitivity test has been carried out for to assess the traffic impact induced by three potential private residential developments proposed under planning application no. Y/YL-NSW/7, Y/YL-NSW/8 and Y/YL-NSW/9. Junction assessment results reveal that all the assessed junctions (except J4) would be able to handle the future traffic demand under the sensitivity test scenario with all planned junction improvements implemented timely.

5.6 Conclusion

5.6.1 In light of the findings of this TIA, it is concluded that there is no insurmountable traffic impact imposed onto the local road network due to the Proposed Development. With the proposed mitigation measures in place, the Proposed Development is technically feasible in traffic terms.

Figure



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PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

SCALE 比例
A3 1 : 8000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

SITE LOCATION PLAN

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 1.1

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Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

822200 E

822500 E

822800 E

834800 N

834500 N

LEGEND:

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE DEVELOPMENT
- SITE BOUNDARY FOR PUBLIC HOUSING DEVELOPMENT
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION
- PROVISION OF PUBLIC ACCESS ROAD & COMPENSATION PONDS OUTSIDE PRIVATE & PUBLIC DEVELOPMENT SITES

N

T8 24s +100.00

GIC 2 STOREYS

T7 24s +100.00

RETAIL,GIC & CARPARK 2 STOREYS

T6 24s +100.00

T5 24s +100.00

T2 24s +99.90

CLUB HOUSE

T3 24s +99.90

T1 23s +99.90

PTT, RETAIL & KINDERGARTEN 2 STOREYS

OUTDOOR POOL

SEWAGE PUMPING STATION

PRIVATE GARDEN

WETLAND

PUBLIC HOUSING PORTION (ACCESS ROAD WITHIN SUBSIDIZED HOUSING PORTION TO BE IMPLEMENTED BY GOVERNMENT)

ACCESS ROAD PORTION (TO BE IMPLEMENTED BY THE APPLICANT)

DEVELOPMENT SITE OF APPLICATION NO. A/YL-NSW/274

PRIVATE HOUSING PORTION

PLANNED WIDENING OF HO CHAU ROAD UNDER APPROVED PLANNING APPLICATION NO. A/YL-NSW/274

PLANNED 38m LONG BUS/GMB LAYBY

VEHICULAR INGRESS EGRESS POINT

NAM SANG WAI ROAD

YUEN LONG HIGHWAY

TSING LONG HIGHWAY

SHAN PIN TSUEN

WONG UK TSUEN

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STATUS
階段

SCALE 比例
A3 1 : 3000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

PROPOSED WIDENING OF HO CHAU ROAD

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 2.1

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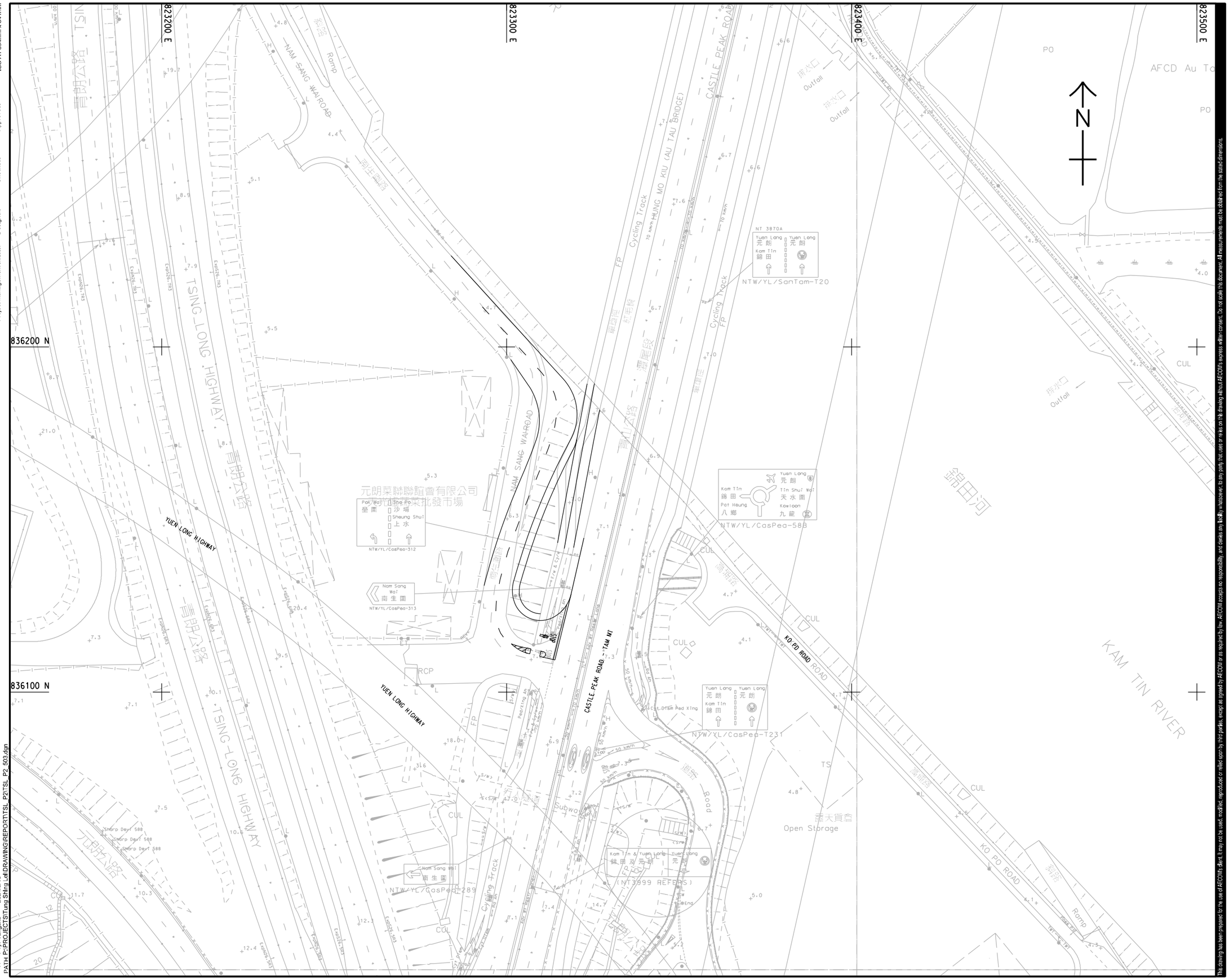

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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
狀況

SCALE 比例
A3 1 : 500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60530652

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱
PLANNED REALIGNMENT OF NAM SANG WAI ROAD

SHEET NUMBER
圖紙名稱
TSL_P2_FIGURE 2.2

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

822450 E
822500 E
822550 E

834750 N
834700 N

SEWAGE PUMPING STATION

LEGEND:

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE DEVELOPMENT
- SITE BOUNDARY FOR SUBSIDIZED HOUSING DEVELOPMENT
- TS511 — TEMPORARY TRAFFIC SIGN / TRAFFIC SIGN NO.

N

10 m

RAMP DN TO B/F

BUS STACKING AREA
TAXI BAY
GMB BAY
BUS STACKING AREA
BUS BAY
TAXI BAY
BUS BAY

RM1013
RM1115
RM1101
RM1019
RM1115
RM1013

GIVE WAY 讓
TS102

WETLAND

Plot File by: ZHAOHG2 4/23/2024
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階段

SCALE 比例 — A3 1 : 500

DIMENSION UNIT 尺寸單位 — METRES

LOCATION PLAN
位置圖

PROJECT NO. 項目編號

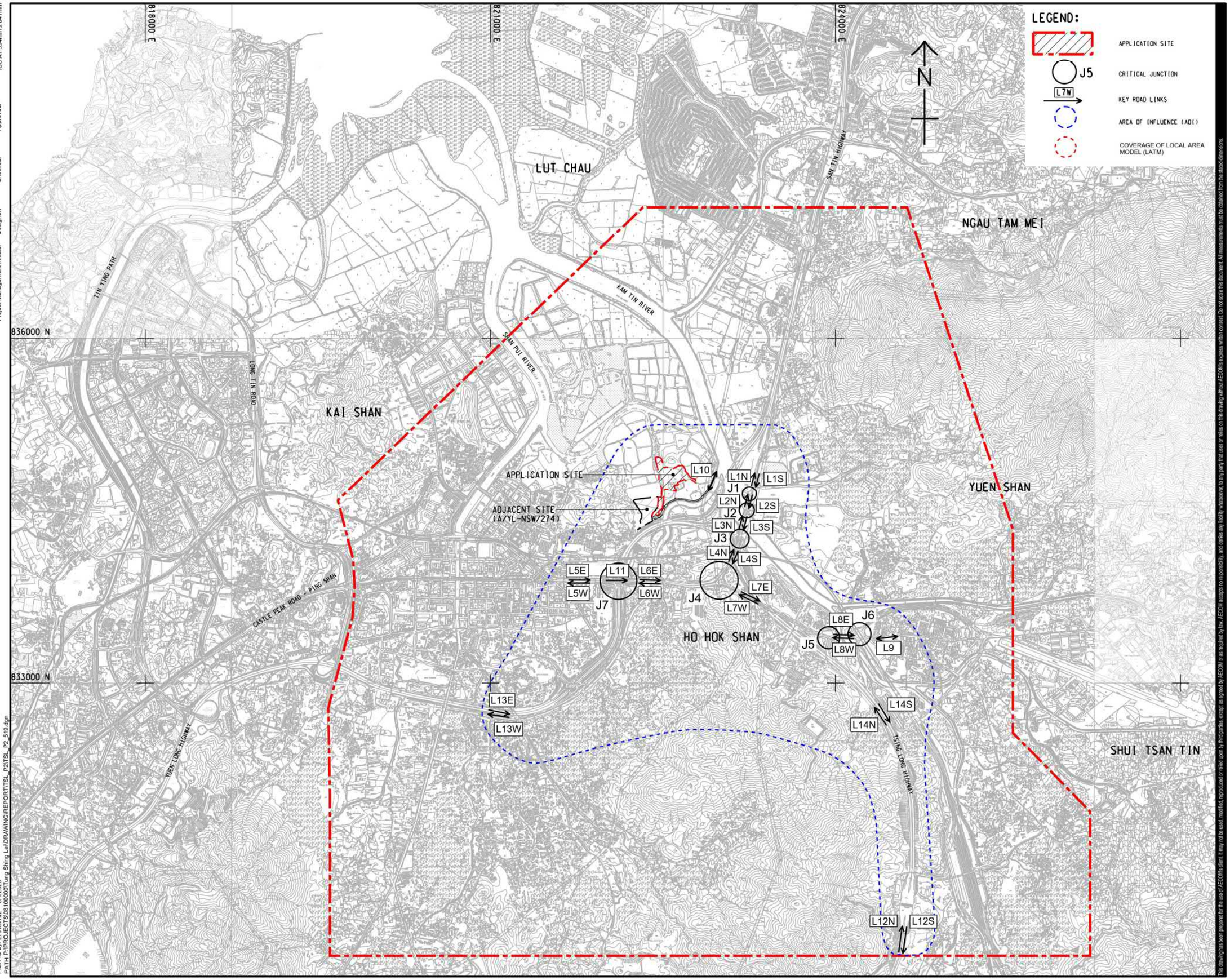
CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

INDICATIVE LAYOUT OF PUBLIC TRANSPORT INTERCHANGE

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 2.3



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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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PRELIMINARY

SCALE A3 1 : 30000

DIMENSION UNIT METRES

KEY PLAN

PROJECT NO.

CONTRACT NO.

SHEET TITLE

CRITICAL JUNCTIONS

SHEET NUMBER

TSL_P2_FIGURE 3.1

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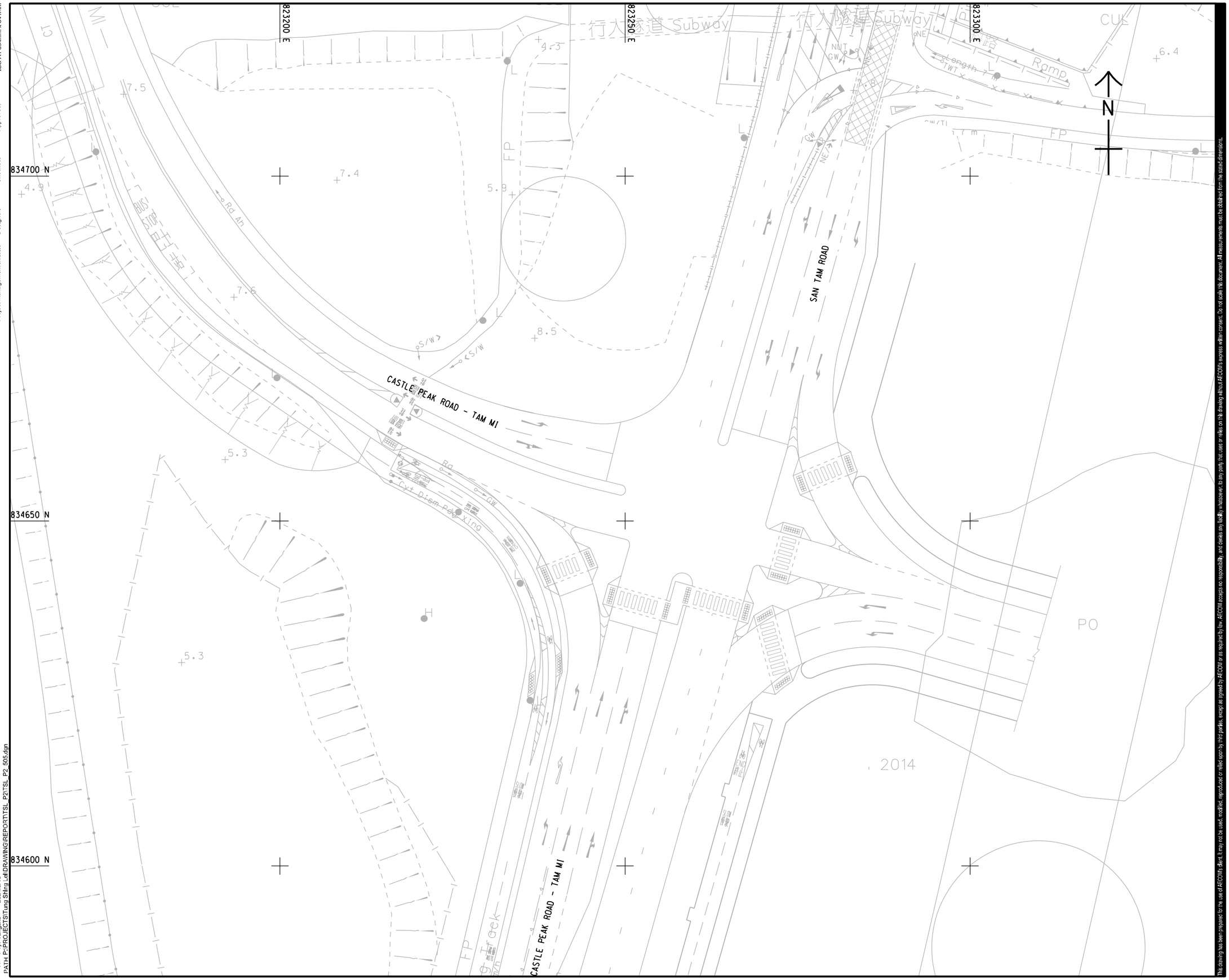

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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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階段

SCALE 比例 A3 1 : 500

DIMENSION UNIT 尺寸單位 METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號 60530652

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

EXISTING LAYOUT FOR JUNCTION OF CASTLE PEAK ROAD-TAM MI/SAN TAM ROAD (J1)

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 3.2

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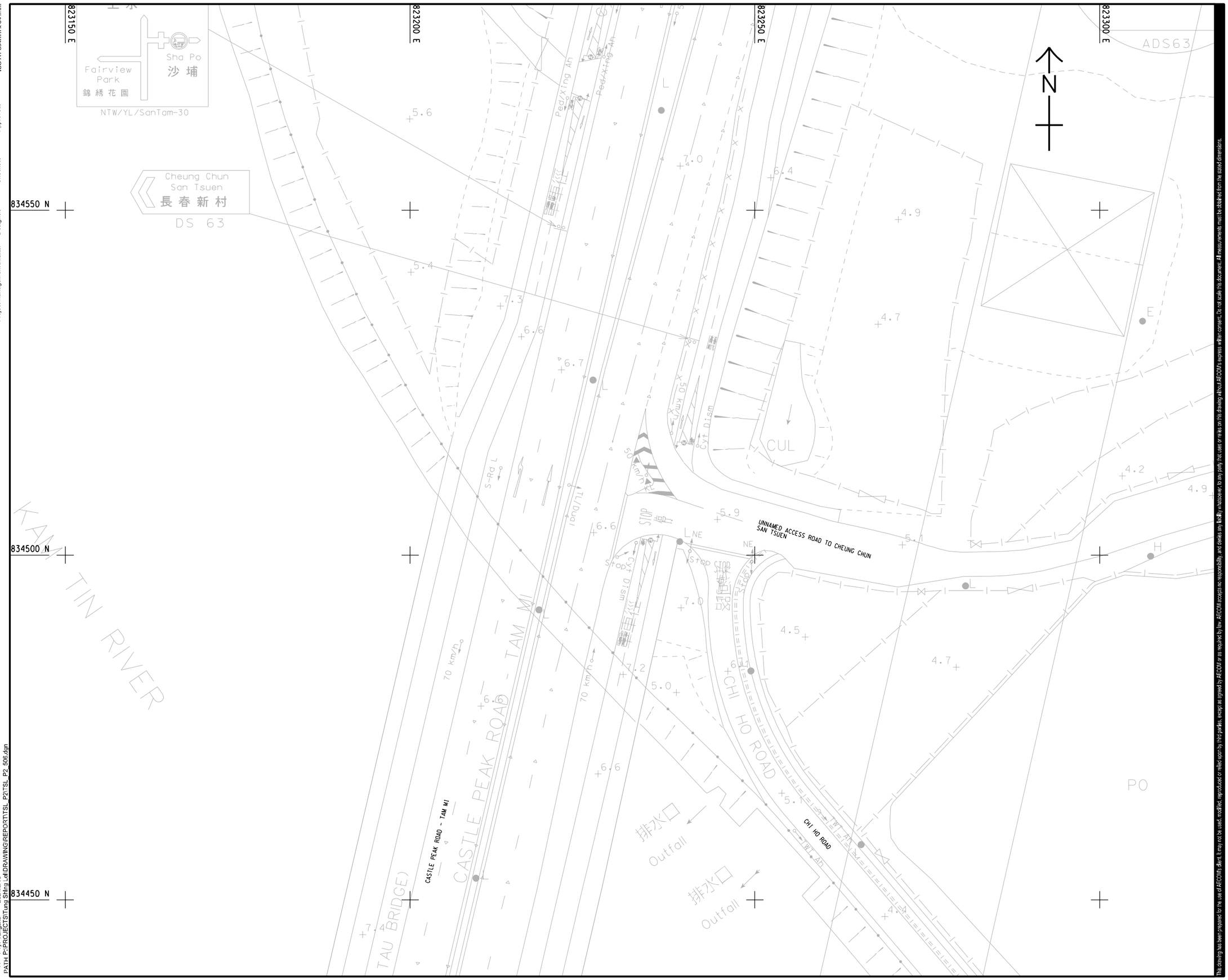

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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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階段

SCALE 比例 A3 1 : 500

DIMENSION UNIT 尺寸單位 METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號 60530652

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

EXISTING LAYOUT FOR JUNCTION OF CASTLE PEAK ROAD-TAM MI/ UNNAMED ACCESS ROAD TO CHEUNG CHUN SAN TSUEN (J2)

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 3.3

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Project Management Initials:
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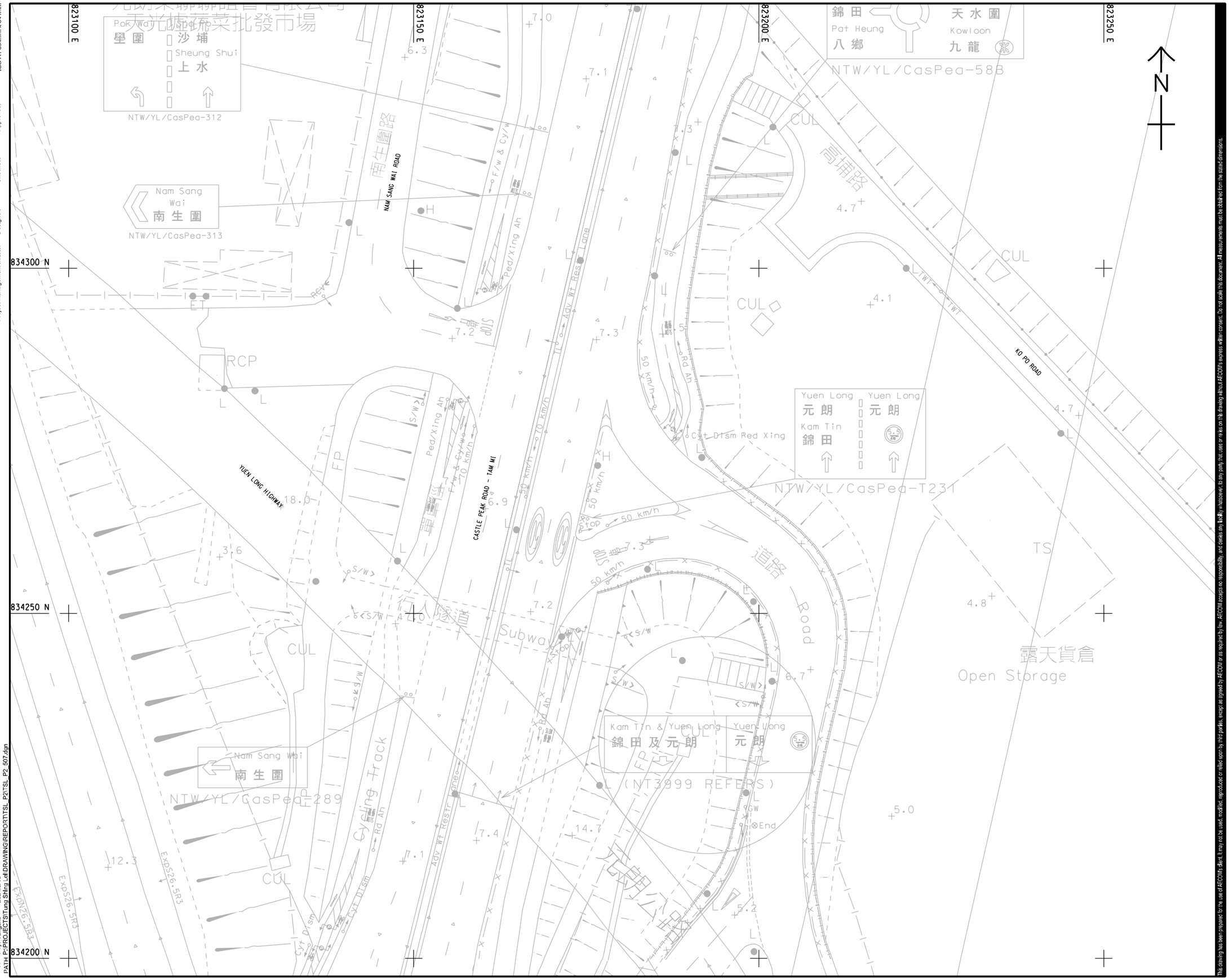

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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS

SCALE A3 1 : 1000

DIMENSION UNIT METRES

KEY PLAN

PROJECT NO. 60530652

CONTRACT NO.

SHEET TITLE

EXISTING LAYOUT FOR JUNCTION OF CASTLE PEAK ROAD-TAM MI/NAM SANG WAI ROAD (J3)

SHEET NUMBER

TSL_P2_FIGURE 3.4

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Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

822900 E
823000 E
823100 E
834000 N
833900 N
833800 N

CASTLE PEAK RADD - YUEN LONG
CASTLE PEAK RADD - TAM MI
Elevated Road
Cycling Track
Subway
KAM TIN ROAD
Road
墓地 Graves
露天貨倉 Open Storage
凹頭青少年中心 Au Tau Youth Centre
香港童軍總會元朗東區區會中心 HK Boy Scouts Association Yuen Long East District Centre
Fairview Park 錦綉花園
Shatung Shut 上水
Kowloon 九龍
Pok Oi Hospital 博愛醫院
Yuen Long 元朗
Tin Shui Wai 天水圍
Kam Tin 錦田
Pat Heung 八鄉
Tsak Yue Wu 石崗
Lok Ma Chau 落馬洲
Fanling 粉嶺
NTW/YL/AuTau!-03
NTW/YL/Au!au!-02
NTW/YL/KamTin-T01
NTW/YL/KamTin-T05
NTW/YL/Au!au!-01A
NTW/YL/KamTin-06
R/a Ah/Reduce Sp
Eng Exp Board
Cyc Board
Footway
Subway
CUL
ET
TS
FP
GW/TL

Plot File by: Tangskw 2021/8/18
PATH P:/PROJECTS/Tung Shing Lei/DRAWING/REPORT/TSL_P2/TSL_P2_508.dgn

AECOM

PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

SCALE 比例
A3 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60530652

CONTRACT NO. 合約編號

SHEET TITLE
本圖名稱
EXISTING LAYOUT FOR AU TAU INTERCHANGE (J4)

SHEET NUMBER
本圖編號
TSL_P2_FIGURE 3.5

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ISO A1 594mm x 841mm

Approved:

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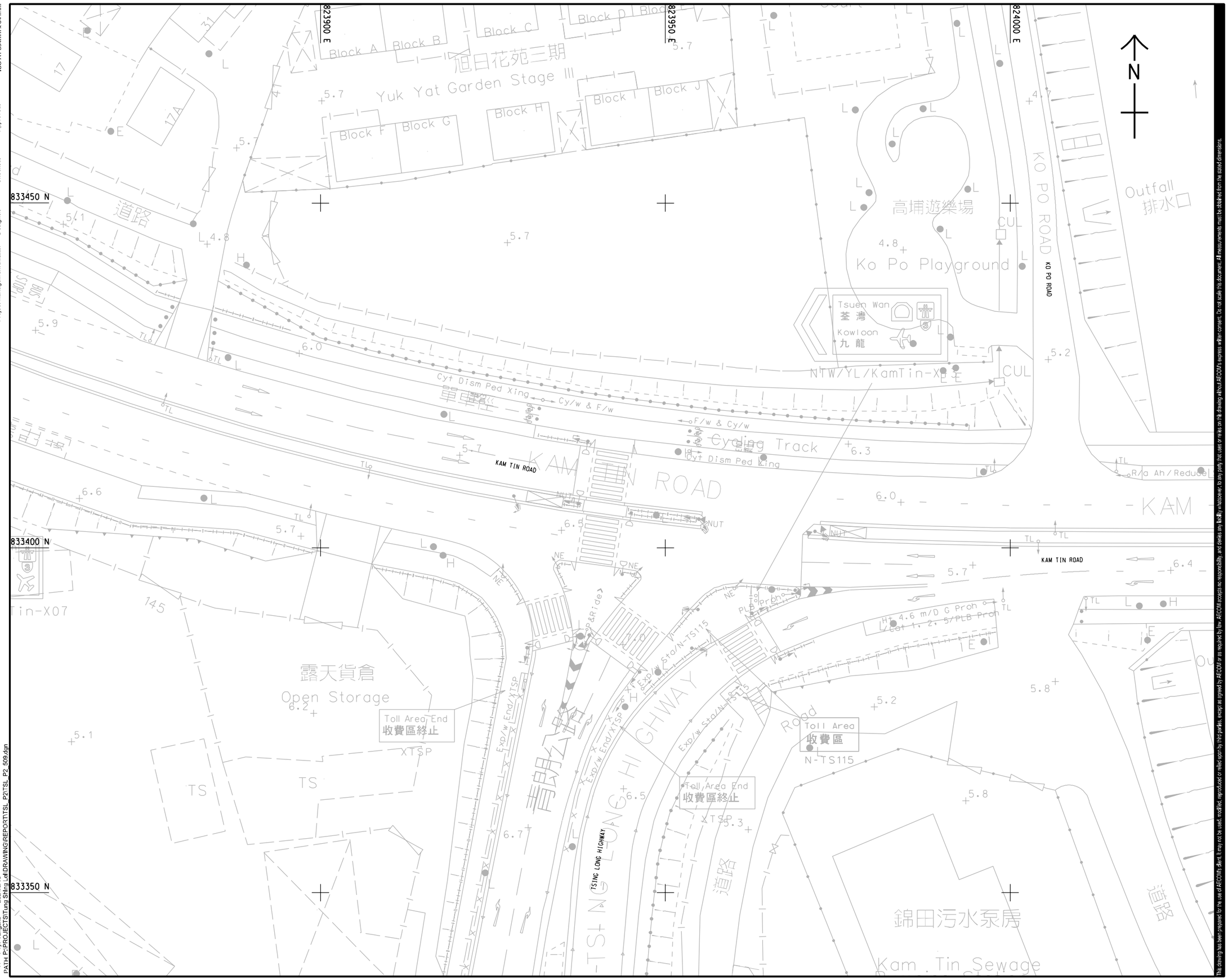
Designer:

Project Management Initials:



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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

SCALE 比例
A3 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

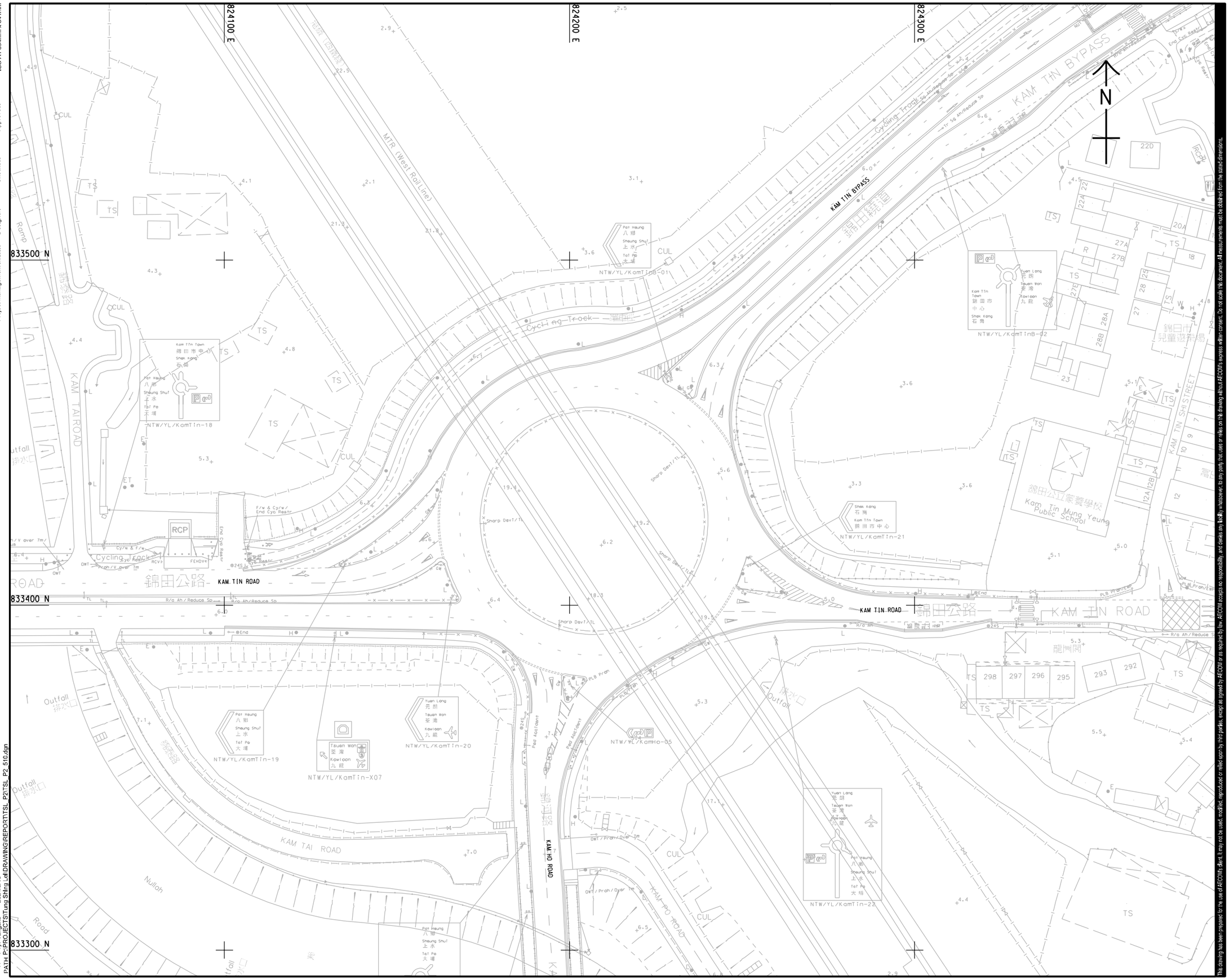
PROJECT NO. 工程項目號
60530652

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱
EXISTING LAYOUT FOR JUCTION OF KAM TIN ROAD /TSING LONG HIGHEAY (J5)

SHEET NUMBER
圖紙編號
TSL_P2_FIGURE 3.6

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm



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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
狀態

SCALE 比例
A3 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 工程項目編號
60530652

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

EXISTING LAYOUT FOR KAM TIN ROAD/KAM TIN BYPASS/KAM HO ROAD ROUNDABOUT (J6)

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 3.7

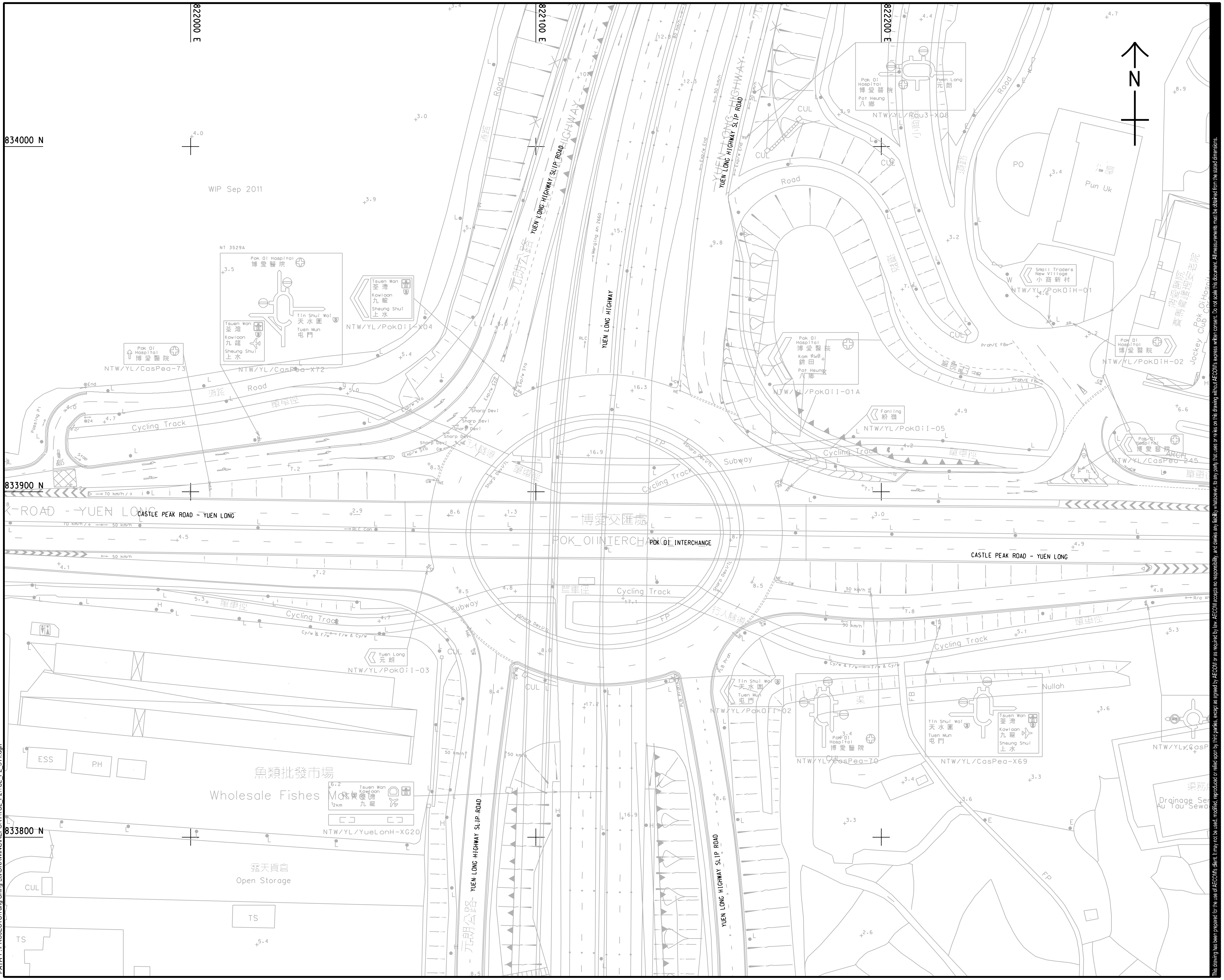
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

SCALE
比例

A3 1 : 1000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60530652

CONTRACT NO.
合約編號

SHEET TITLE
圖紙名稱

EXISTING LAYOUT FOR POK OI INTERCHANGE (J7)

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 3.8

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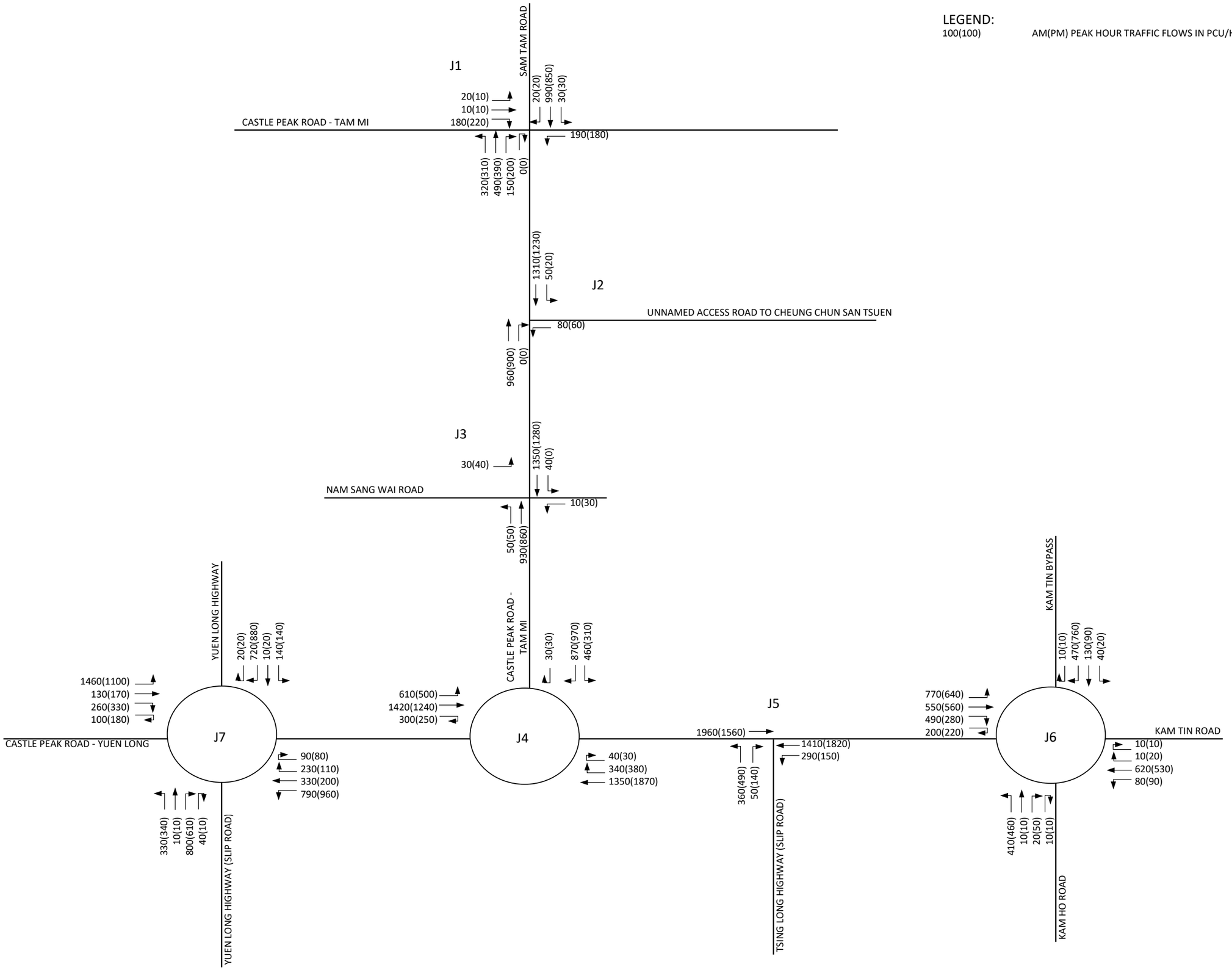
LEGEND:
100(100) AM(PM) PEAK HOUR TRAFFIC FLOWS IN PCU/HR



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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS

SCALE **DIMENSION UNIT**

N.T.S.

KEY PLAN

PROJECT NO. **CONTRACT NO.**

SHEET TITLE

2021 OBSERVED TRAFFIC FLOWS

SHEET NUMBER

TSL_P2 FIGURE 3.9

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

823100 E

823200 E

823300 E

834600 N

834500 N

834400 N

青朗公路 TSING LONG HIGHWAY

元朗公路 YUEN LONG HIGHWAY

TRAFFIC ISLAND TO BE SET BACK FOT U-TURN MOVEMENT

PEDESTRIAN CROSSING TO BE RELOCATED

CONTINUE TO MATCH WITH EXISTING

ONLY ONE TRAFFIC LANE TO BE PROVIDED

SLIP ROAD FROM PARK YOHO (RM1003)

SIGNALISED PEDESTRIAN CROSSING (PUSH BUTTON)

PLANNED PUBLIC ROAD UNDER A/YL-KTN/604

CASTLE PEAK ROAD - TAM MI

KAM TIN RIVER

CHI HO ROAD

NAM SANG Ramp

Tower 7A

Tower 7B

漁農自然護理署凹頭漁業辦事處
AFCD Au Tau Fisheries Office

排水口 Outfall

LEGEND:

C/W	CARRIAGEWAY
F/P	FOOTPATH
P/T	PLANTER
C/T	CYCLE TRACK
V	VERGE

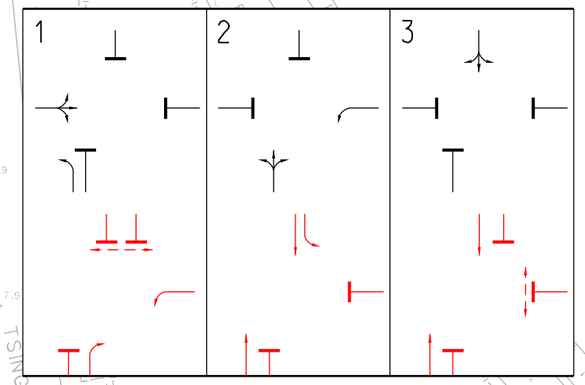
3.5m C/T | 1.0m V | 2.0m F/P | 3.5m C/T | 2.0m F/P

1m V | 3m C/T | 2m F/P

2.0m F/P | 1.3 C/W | 2.0m F/P | 3.5m C/T | 1.0m P/T

1.0m V | 2.5.0m F/P | 3.5 C/W

PROPOSED METHOD OF CONTROL



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PATH: $FILE$

$DATES

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PROJECT
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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
阶段

SCALE 比例
A3 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

PLANNED LAYOUT FOR J/O CASLTE PEAK ROAD - TAM MI / SAN TAM ROAD (J1) AND CASTLE PEAK ROAD - TAM MI / UNNAMED ACCESS ROAD TO CHEUNG CHUN SAN TSUEN (J2)

SHEET NUMBER
圖紙編號

TSL_FIGURE_4.1A

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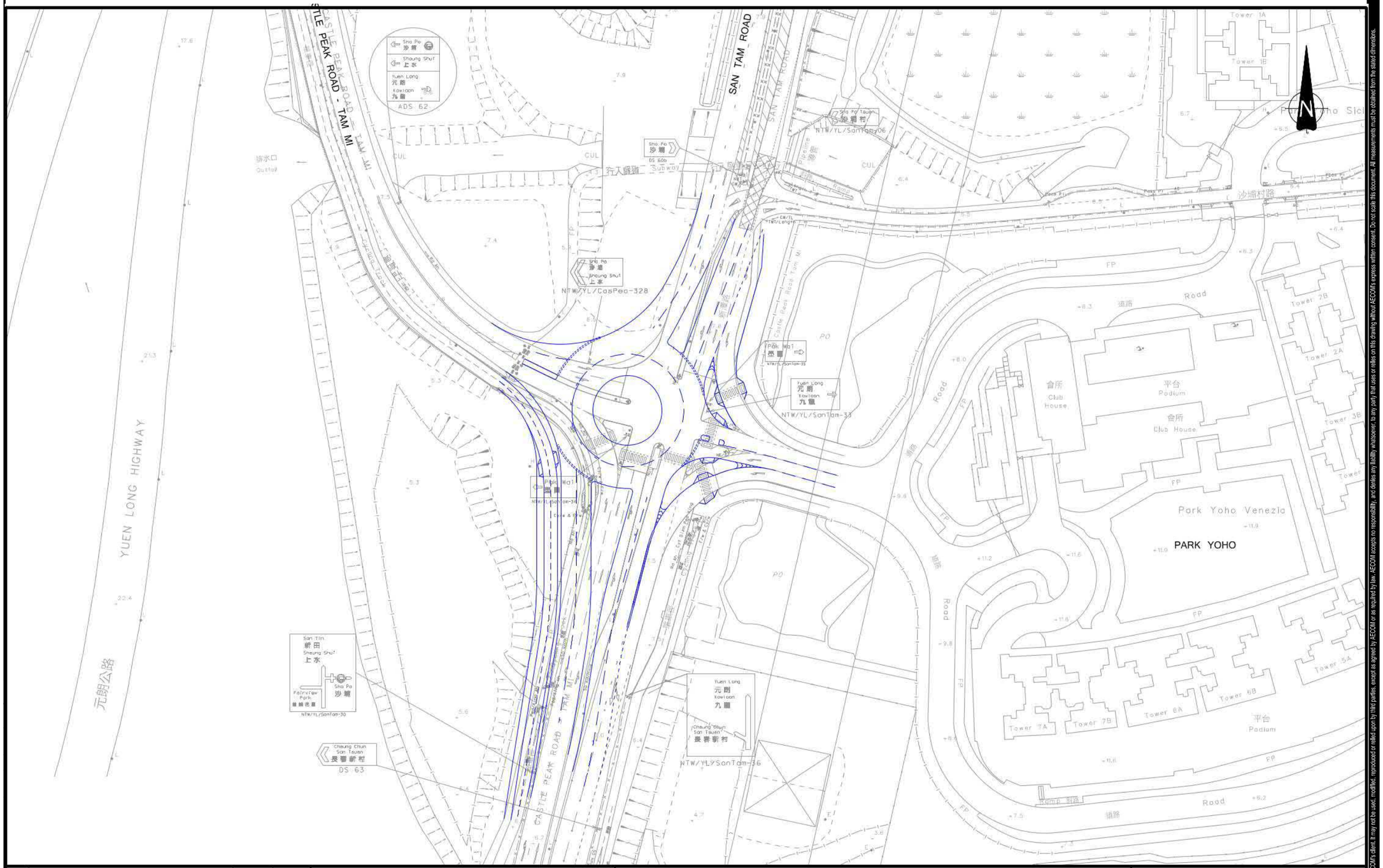

Note: Extracted from feasibility study (CEDD Agreement No. CE10/2020(CE)) for Sha Po Public Housing Development

AECOM

PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

SCALE 比例: N.T.S

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號: 60223708

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

PLANNED IMPROVEMENT LAYOUT FOR JUNCTION OF CASLTE PEAK ROAD - TAM MI / SAN TAM ROAD (J1)

SHEET NUMBER
圖紙編號

TSL_FIGURE_4.1B

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

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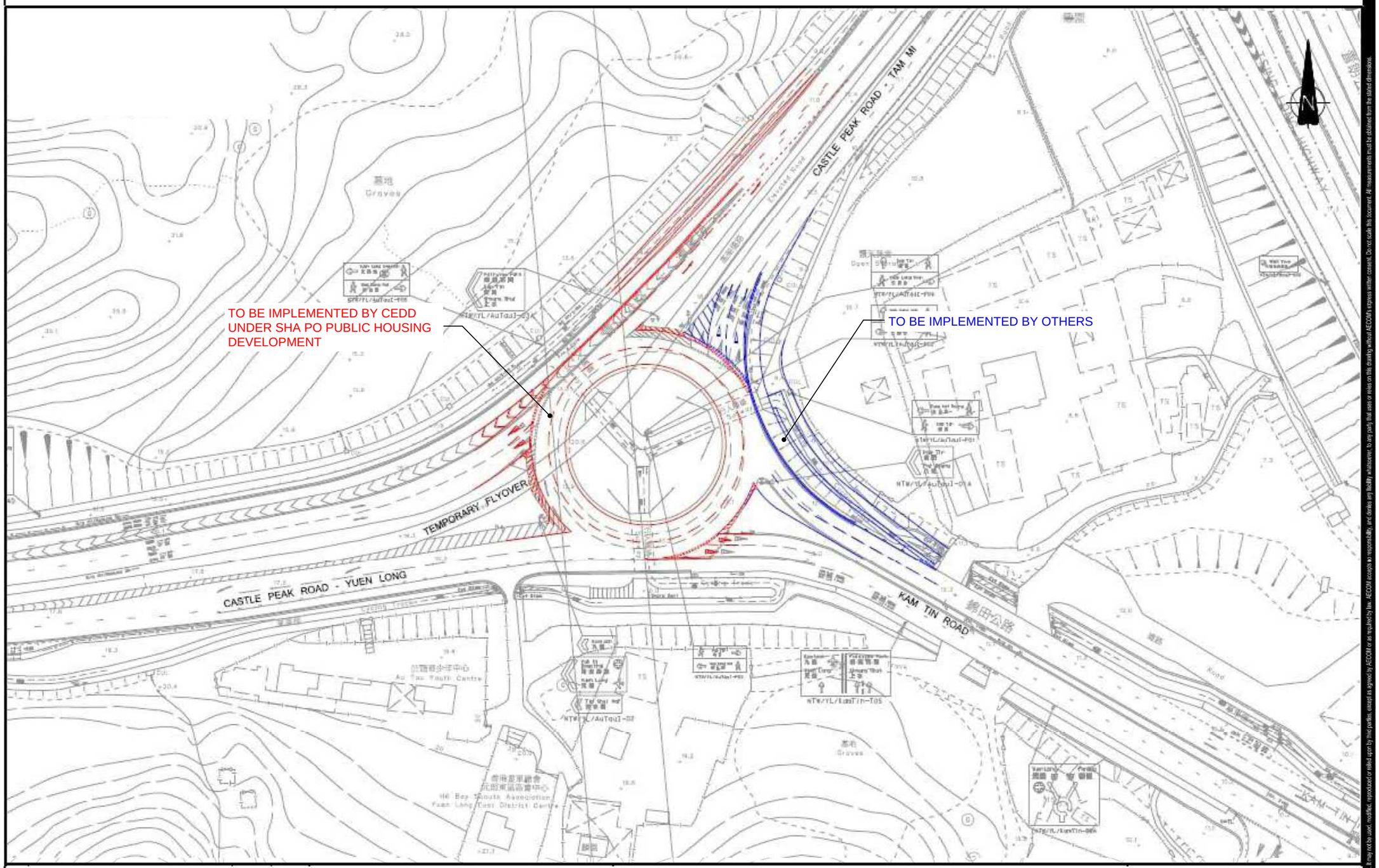
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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STATUS

SCALE

N.T.S

DIMENSION UNIT

METRES

KEY PLAN

PROJECT NO.

60223708

CONTRACT NO.

SHEET TITLE

PLANNED LAYOUT FOR
AU TAU INTERCHANGE (J4)

SHEET NUMBER

TSL_FIGURE_4.2

附圖三 - 擬議交通改善措施

往上水及九龍

元朗公路

Grand YOHO

博愛醫院

元朗公路與迴旋處交界處加設交通燈

效果:

1. 元朗公路 (南行) 和元朗公路 (北行) 入口的車輛有秩序地進出迴旋處；
2. 可制訂交通燈號預案，配合不同時段的車流。

擴闊迴旋處往凹頭單線支路至兩線支路

效果：

1. 增加出口交通容量；
2. 減少現時因車輛於迴旋處切線匯合而阻礙交通的問題

青山公路 (元朗段)

往元朗市

往凹頭

青山公路 (元朗段)

建造中的青山公路 (西行) 往
元朗公路 (南行) 的左轉專用行車線(1)

魚類批發市場
Wholesale Fishes Market

元政路停車場
Yuen Ching Road Car Park

元朗公路

往十八鄉交匯處、 元朗 (南) 及屯門

NTW2021019A (A3)

Note (1): Improvement works for exclusive left-turn lane from Castle Peak Road to Yuen Long Highway has been completed in 2022.

Source: Yuen Long District Council - Traffic and Transport Committee Discussion Paper No. 14/2022

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STATUS

SCALE: N.T.S
DIMENSION UNIT: METRES

KEY PLAN

PROJECT NO.: 60530652
CONTRACT NO.:

SHEET TITLE
PLANNED JUNCTION IMPROVEMENT FOR POK OI INTERCHANGE

SHEET NUMBER
TSL_P2_FIGURE 4.3

ISO A1 594mm x 841mm
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Checked:
Designer:
Project Management Initials:

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2021/8/18
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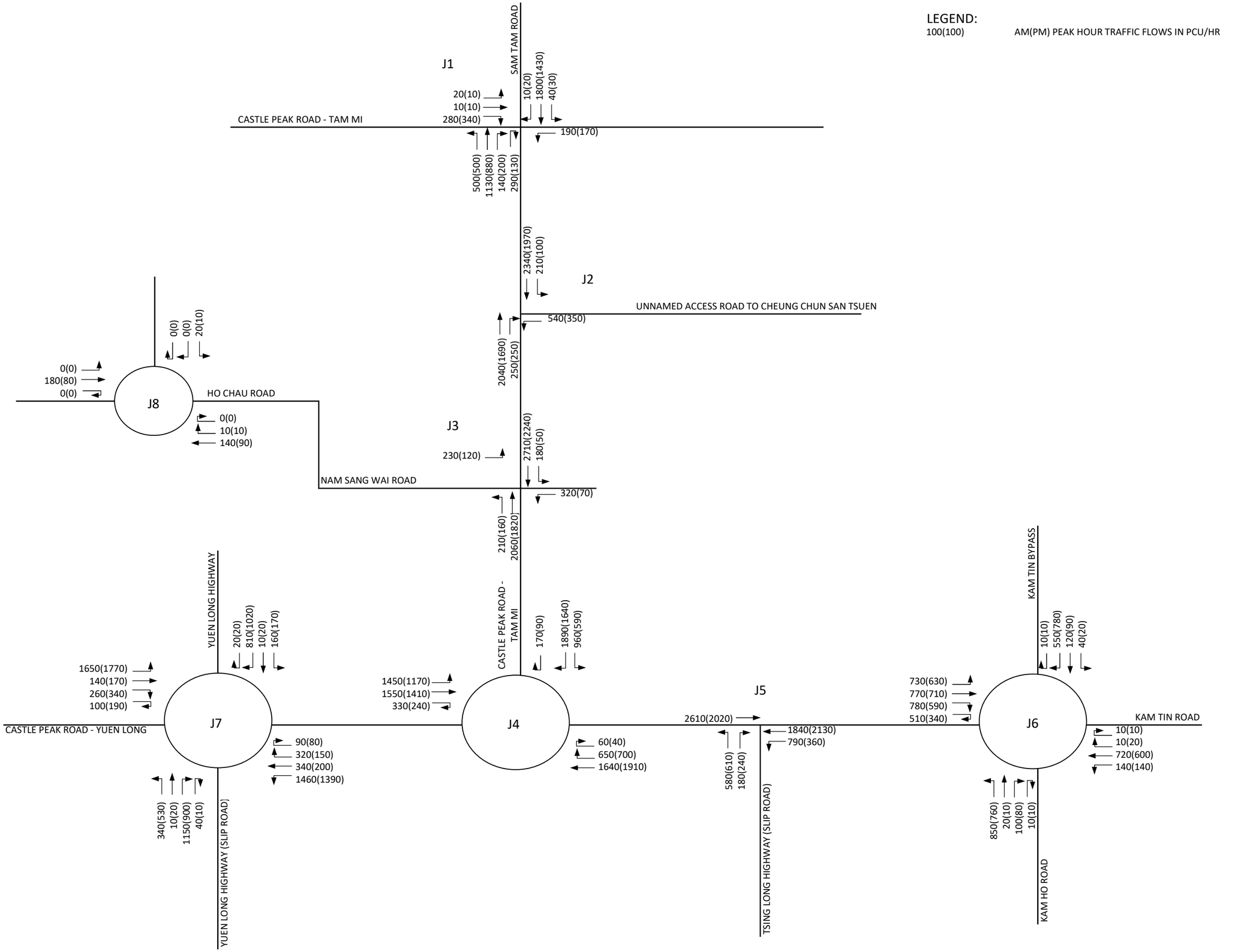

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SCALE **DIMENSION UNIT**

N.T.S.

KEY PLAN

PROJECT NO. **CONTRACT NO.**

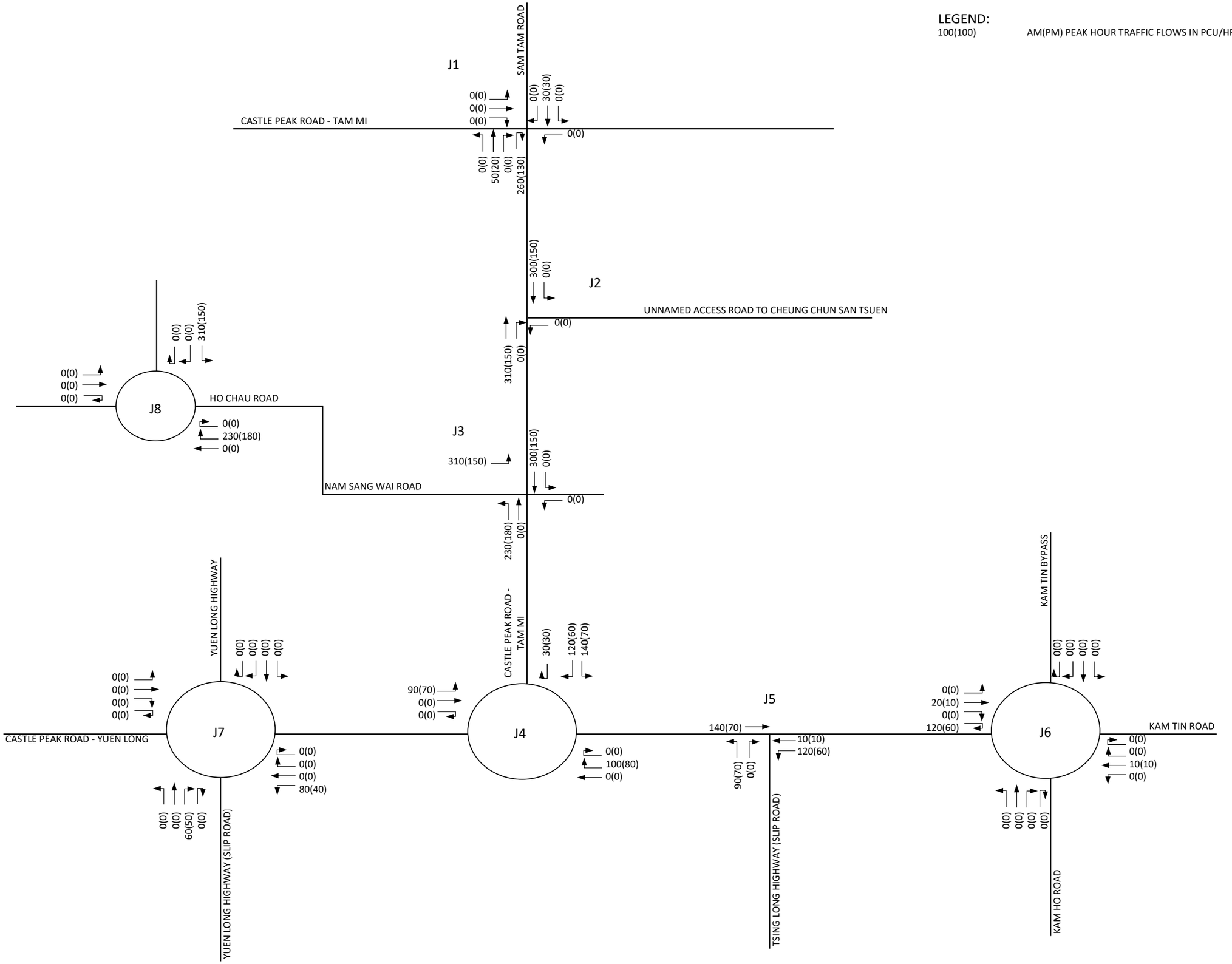
SHEET TITLE

2034 REFERENCE TRAFFIC FLOWS

SHEET NUMBER

TSL_P2 FIGURE 4.4

LEGEND:
100(100) AM(PM) PEAK HOUR TRAFFIC FLOWS IN PCU/HR



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SCALE **DIMENSION UNIT**
N.T.S.

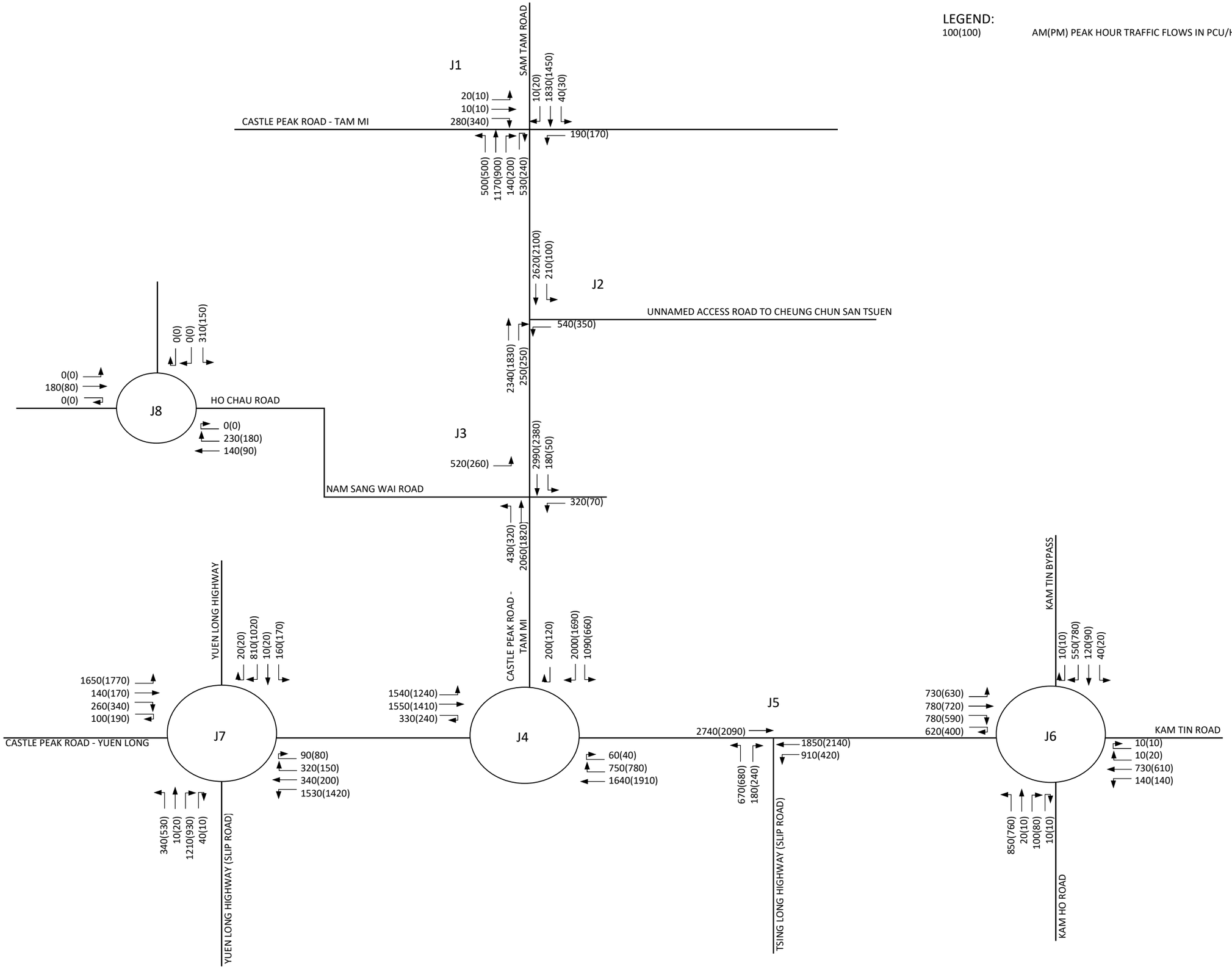
KEY PLAN

PROJECT NO. **CONTRACT NO.**

SHEET TITLE
DEVELOPMENT TRAFFIC FLOWS

SHEET NUMBER
TSL_P2 FIGURE 4.5

LEGEND:
100(100) AM(PM) PEAK HOUR TRAFFIC FLOWS IN PCU/HR



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SCALE **DIMENSION UNIT**
N.T.S.

KEY PLAN

PROJECT NO. **CONTRACT NO.**

SHEET TITLE
2034 DESIGN TRAFFIC FLOWS

SHEET NUMBER
TSL_P2 FIGURE 4.6

ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:
Plot File by: chancwe 4/5/2023
PATH: F:\BACK UP (E)\MAGITUNG SHING LEI P2\20210401\FIGURE 4.1.dgn

823100 E
823200 E
823300 E
834600 N
834500 N
834400 N

青朗公路 TSING LONG HIGHWAY
元朗公路 YUEN LONG HIGHWAY
NAM SANG Ramp
TSING LONG HIGHWAY

TRAFFIC ISLAND TO BE SET BACK FOT U-TURN MOVEMENT
PEDESTRIAN CROSSING TO BE RELOCATED
CONTINUE TO MATCH WITH EXISTING
ONLY ONE TRAFFIC LANE TO BE PROVIDED
SLIP ROAD FROM PARK YOHO (RM1003)
SIGNALISED PEDESTRIAN CROSSING (PUSH BUTTON)
PLANNED PUBLIC ROAD UNDER A/YL-KTN/604
CUT LINE A-A

3.5m C/T
1.0m V
2.0m F/P
2.0m F/P
3.5m C/T
1m V
3m C/T
2m F/P
1.0m V
2.5.0m F/P
3.5 C/W
2.0m F/P
7.3 C/W
2.0m F/P
1.0m P/T
3.5m C/T

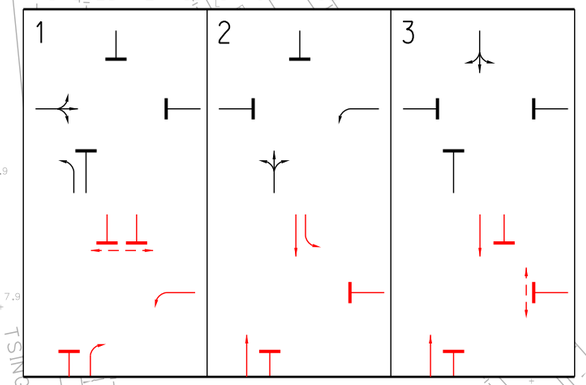
CASTLE PEAK ROAD - TAM MI
CASTLE PEAK ROAD - TAM MI (AU TAU BRIDGE)
KAM TIN RIVER
CHI HO ROAD
SAN TAM ROAD
Tower 7A
Tower 7B
漁農自然護理署凹頭漁業辦事處
AFCD Au Tau Fisheries Office
排水口 Outfall

LEGEND:

C/W	CARRIAGEWAY
F/P	FOOTPATH
P/T	PLANTER
C/T	CYCLE TRACK
V	VERGE

N

PROPOSED METHOD OF CONTROL



LEGEND

PROPOSED JUNCTION IMPROVEMENT UNDER SUBJECT PLANNING APPLICATION

PLANNED JUNCTION IMPROVEMENT UNDER PLANNING APPLICATION NO. A/YL-NSW/274 & A/YL-KTN/604

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PROJECT 項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

CLIENT 客戶

CONSULTANT 工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS 分判工程顧問公司

ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 複核

STATUS 階段

SCALE 比例 A3 1 : 1000

DIMENSION UNIT 尺寸單位 METRES

KEY PLAN 索引圖

PROJECT NO. 項目編號

CONTRACT NO. 合約編號

SHEET TITLE 圖紙名稱

PLANNED LAYOUT FOR J/O CASLTE PEAK ROAD - TAM MI / SAN TAM ROAD (J1) AND CASTLE PEAK ROAD - TAM MI / UNNAMED ACCESS ROAD TO CHEUNG CHUN SAN TSUEN (J2)

SHEET NUMBER 圖紙編號

TSL_FIGURE_4.7A

CUT LINE A-A

TURN-AROUND FACILITY FOR 8m VEHICLES

GLA-TYL 2957
(VACANT GOVERNMENT LAND)

STT 1723
(EXISTING WHOLESALE MARKET)

NAM SANG WAI ROAD

TSING LONG HIGHWAY

YUEN LONG HIGHWAY

CASTLE PEAK ROAD - TAM MI

KO PO ROAD

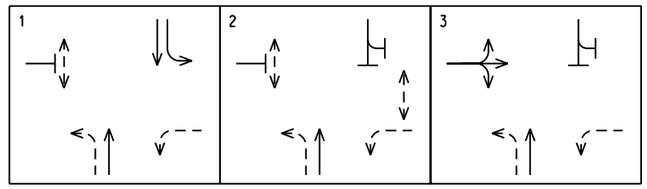
LEGEND:

PROPOSED JUNCTION IMPROVEMENT UNDER SUBJECT PLANNING APPLICATION

PROPOSED JUNCTION IMPROVEMENT UNDER PLANNING APPLICATION NO.A/YL-KTN/604

WIP
Nov 2019

PROPOSED METHOD OF CONTROL:



ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: chanxwa 26/3/2024
PATH: F:\BACK UP (E)\MAGIT\UNG SHING LEI P2\20210401\FIGURE 4.7.dgn

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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

PRELIMINARY

SCALE 比例
A3 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

CONTRACT NO. 合約編號

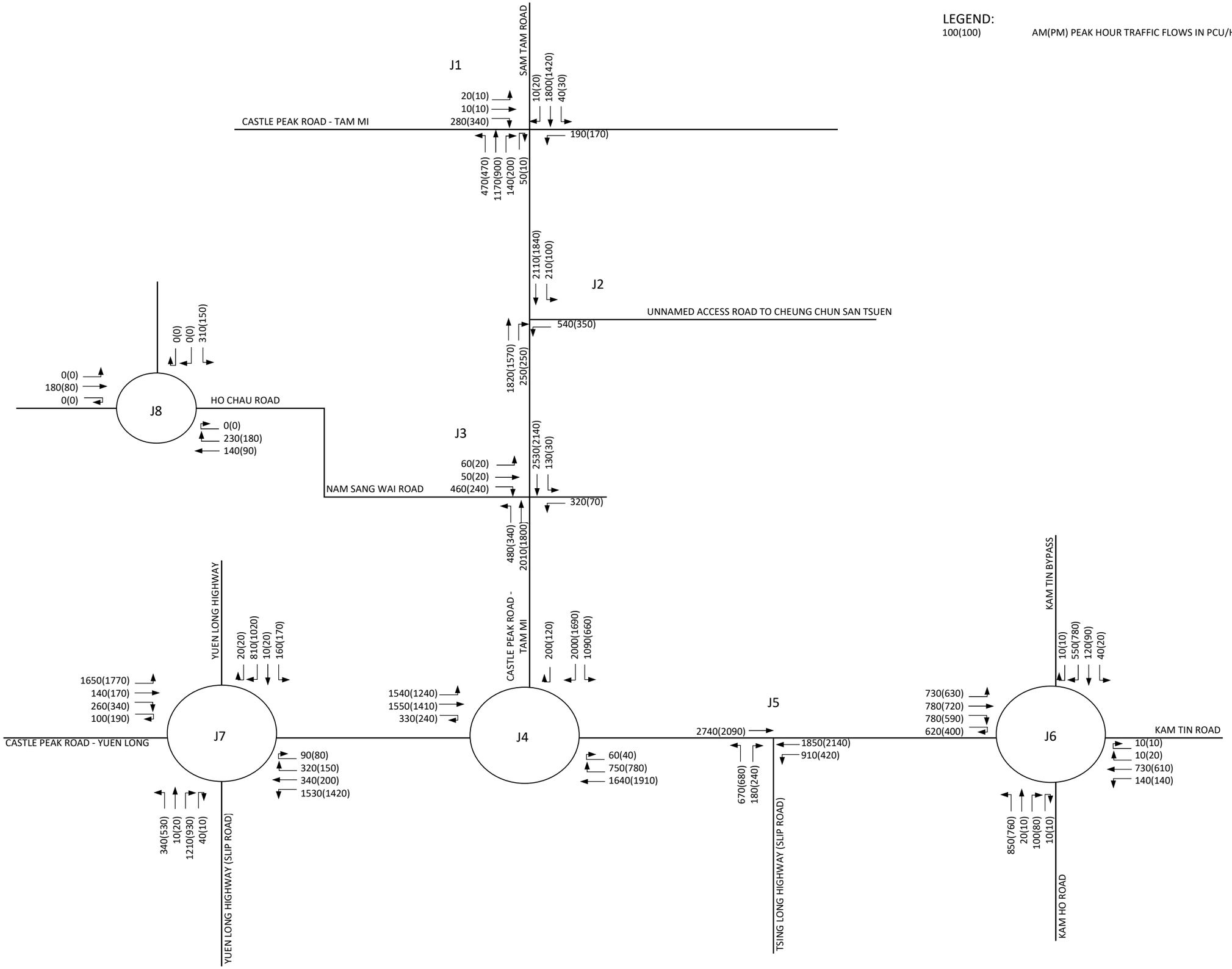
SHEET TITLE
圖紙名稱

PROPOSED LAYOUT FOR JUNCTION OF CASTLE PEAK ROAD - TAM MI / NAM SANG WAI ROAD (J3)

SHEET NUMBER
圖紙編號

FIGURE 4.7B

LEGEND:
100(100) AM(PM) PEAK HOUR TRAFFIC FLOWS IN PCU/HR



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PROJECT

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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CONSULTANT

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STATUS

SCALE **DIMENSION UNIT**

N.T.S.

KEY PLAN

PROJECT NO. **CONTRACT NO.**

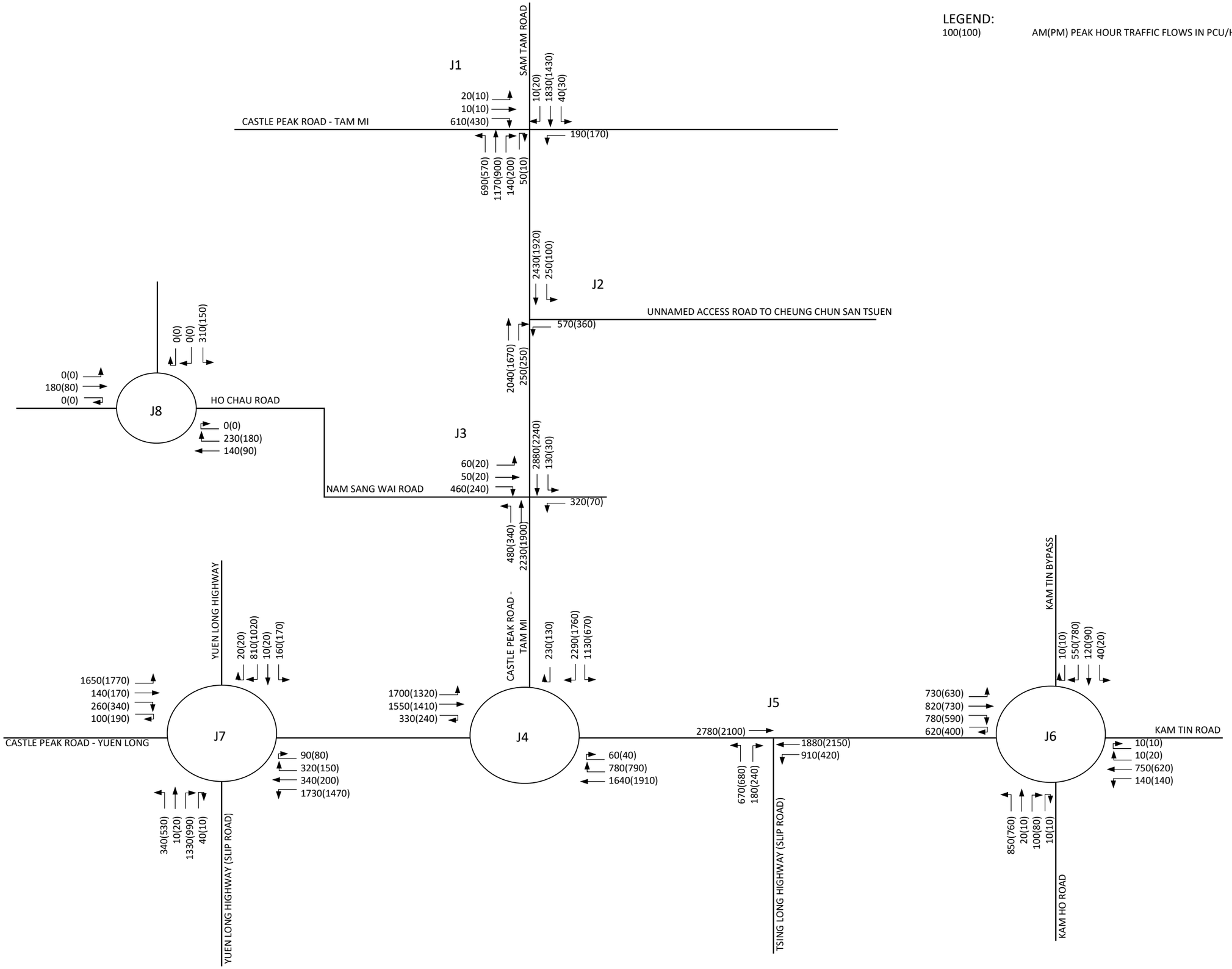
SHEET TITLE

2034 DESIGN TRAFFIC FLOWS
(WITH IMPROVEMENTS)

SHEET NUMBER

TSL_P2 FIGURE 4.8

LEGEND:
100(100) AM(PM) PEAK HOUR TRAFFIC FLOWS IN PCU/HR



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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

CLIENT

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ISSUE/REVISION

STATUS

SCALE **DIMENSION UNIT**

N.T.S.

KEY PLAN

PROJECT NO. **CONTRACT NO.**

SHEET TITLE

2034 DESIGN TRAFFIC FLOWS
(SENSITIVITY TEST 2)

SHEET NUMBER

TSL_P2 FIGURE 4.9

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

821800 E

822200 E

822600 E

834800 N

834400 N

834000 N

LEGEND:

APPLICATION SITE BOUNDARY

PEDESTRIAN ROUTE

PEDESTRIAN ROUTE
(APPROX. 1km)

YUEN LONG STATION

YUEN LONG HIGHWAY

TSING LONG HIGHWAY

SHAN PUI

SHAN PIN TSUEN

WONG UK TSUEN

TSOI UK TSUEN

YING LUNG WAI

TAI WAI TSUEN

TUNG SHING LEI

Plot File by: ZHAOHQ2 7/7/2023
PATH: P:\PROJECTS\60100000\Tung Shing Lei\DRAWING\REPORT\TSL_P2\TSL_P2_517.dgn

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STATUS
階段

SCALE 比例
A3 1 : 4000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

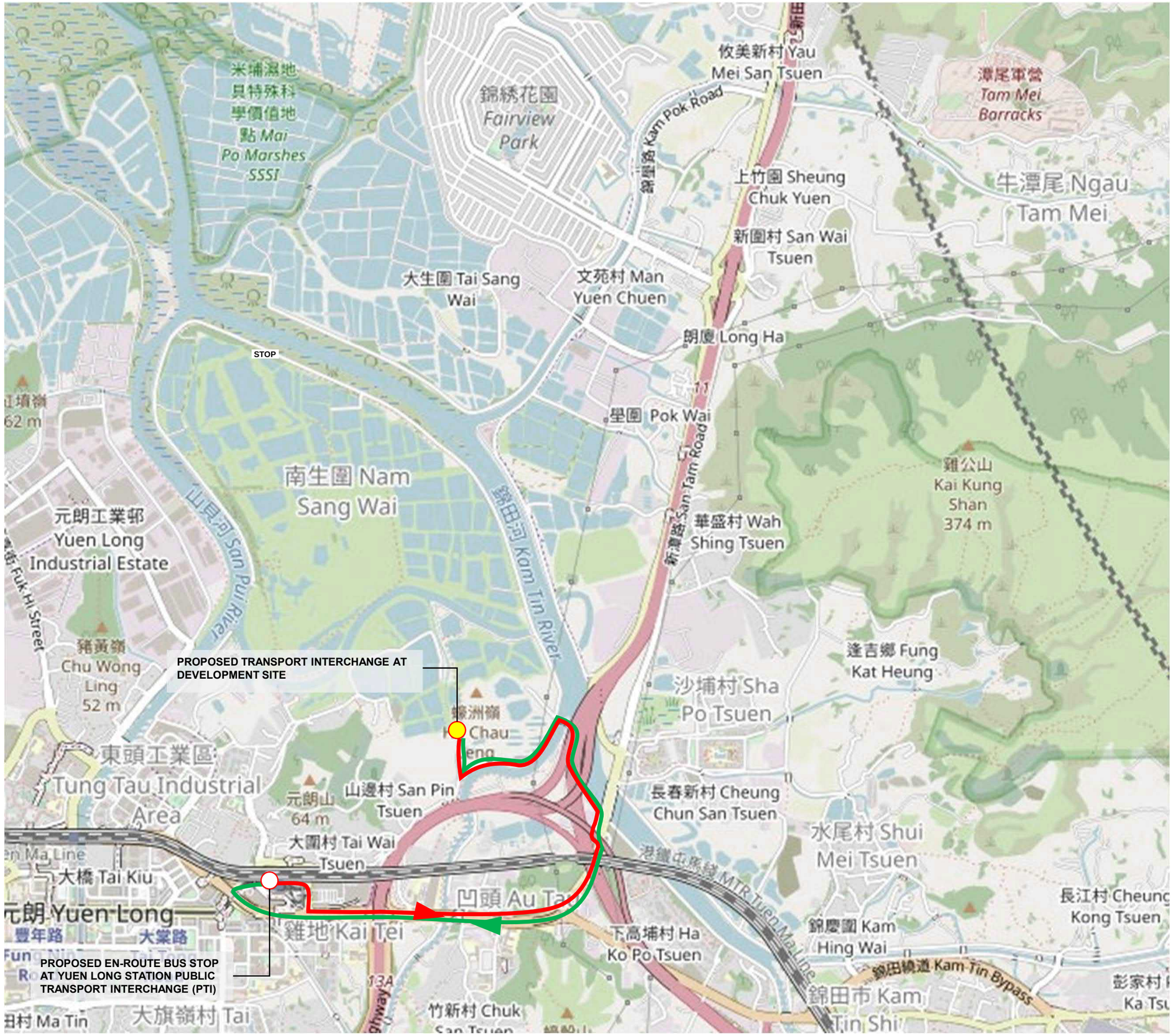
CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

PEDESTRIAN ROUTE TO
TUEN MA LINE YUEN LONG STATION

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 5.1



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PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

SCALE 比例: N.T.S.

DIMENSION UNIT 尺寸單位: METRES

LOCATION PLAN
查覽圖

PROJECT NO. 項目編號: 60607989

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

PROPOSED ROUTING OF BUS SERVICE BETWEEN DEVELOPMENT SITE AND YUEN LONG STATION PTI

SHEET NUMBER
圖紙編號

TSL_P2_FIGURE 5.2

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Plot File by: ZHAOHQ2 2020/4/23
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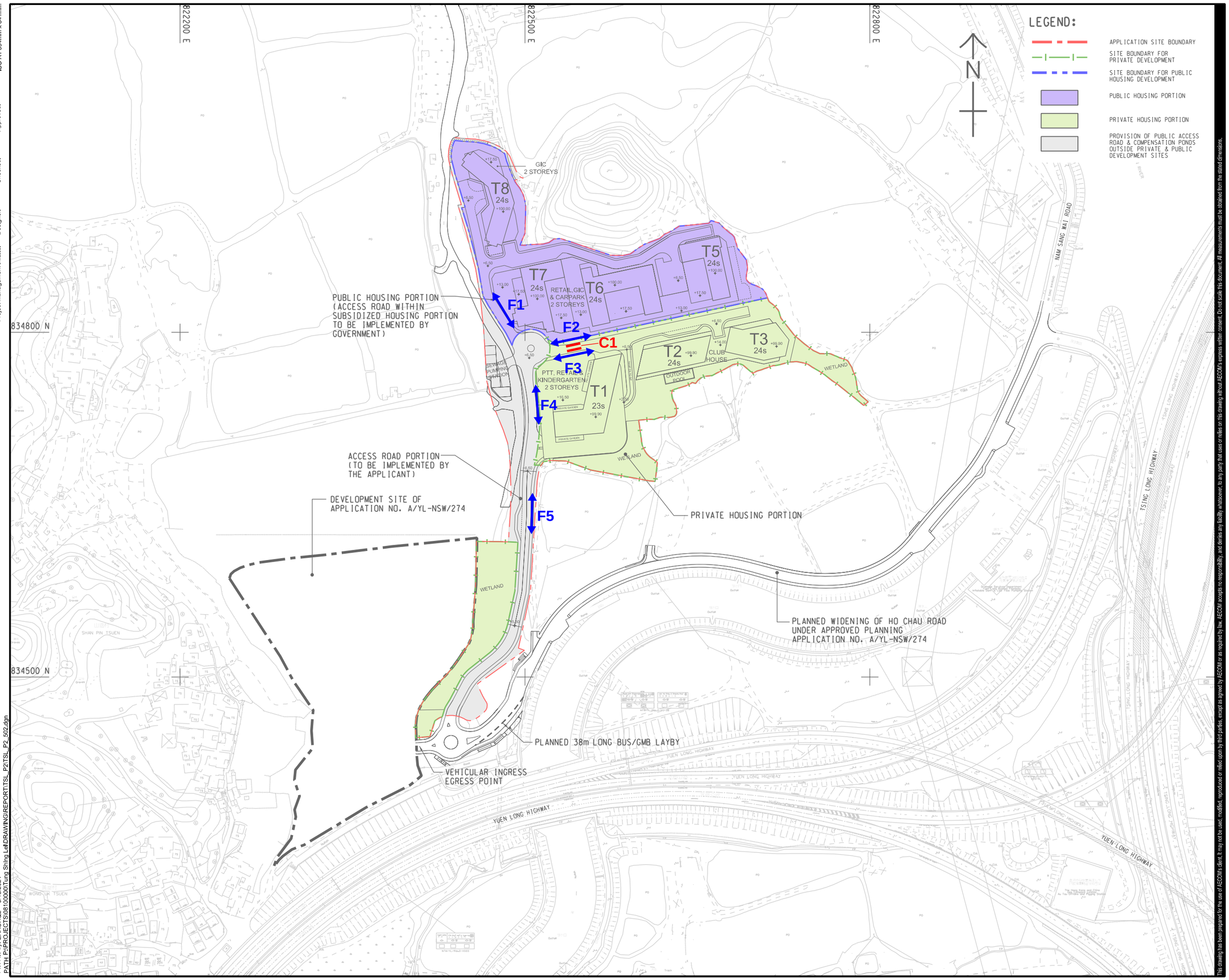

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

Plot File by: ZHAOHO2 3/18/2024
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PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

SCALE 比例
A3 1 : 3000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

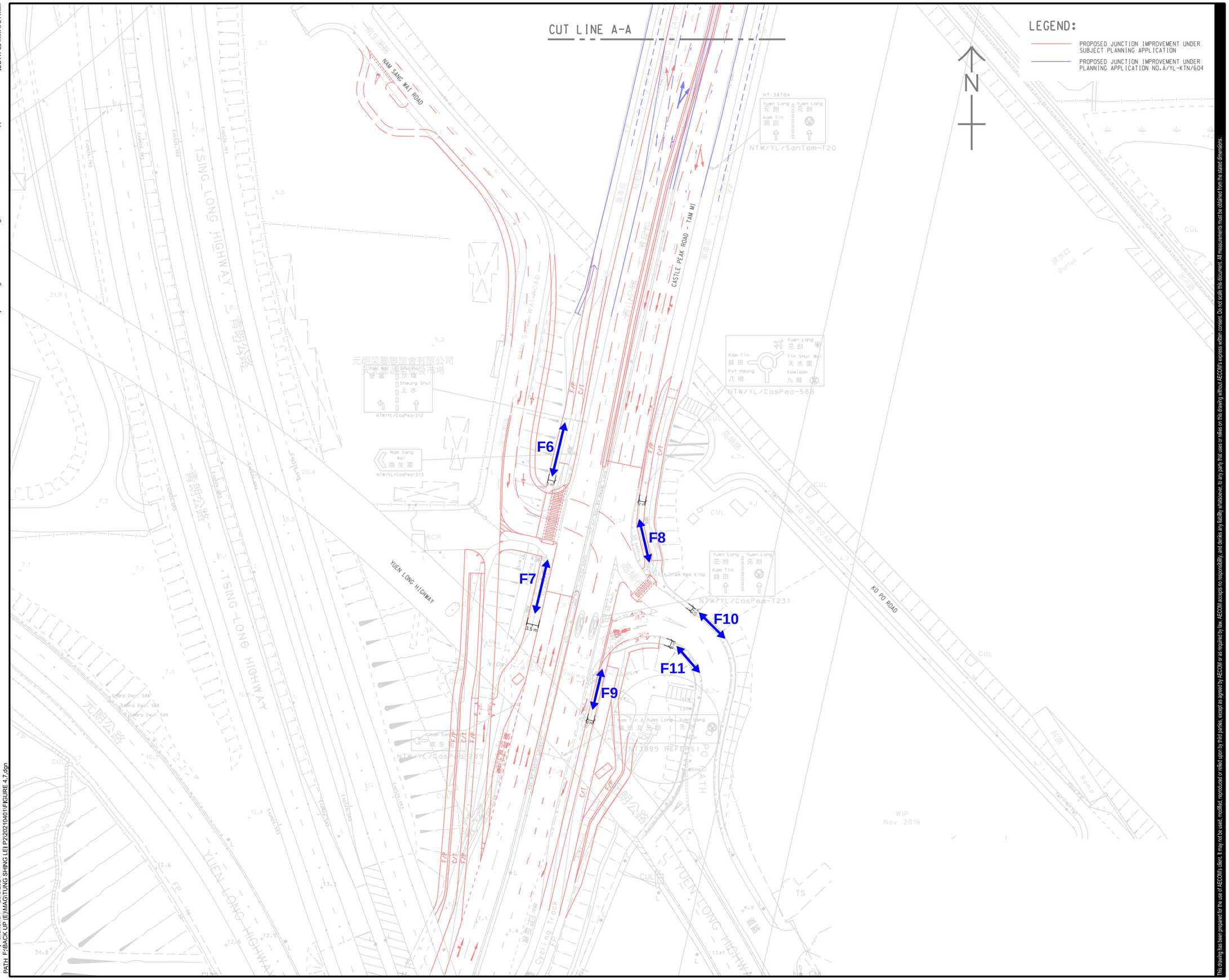
CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

CRITICAL FOOTPATH SECTIONS WITHIN PROPOSED DEVELOPMENT

SHEET NUMBER
圖紙編號

FIGURE 5.3



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PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

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STATUS
階段

PRELIMINARY

SCALE 比例 — A3 1 : 1000

DIMENSION UNIT 尺寸單位 — METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

CRITICAL FOOTPATH SECTIONS NEAR CASTLE PEAK ROAD - TAM MI

SHEET NUMBER
圖紙編號

FIGURE 5.4

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Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

Plot File by: chancwa 26/3/2024
PATH F:\BACK UP (E)\MAG\TUNG SHING LEI P2\20210401\FIGURE 4.7.dgn

Annex A

Junction Capacity Calculation Sheets

Observed Flow

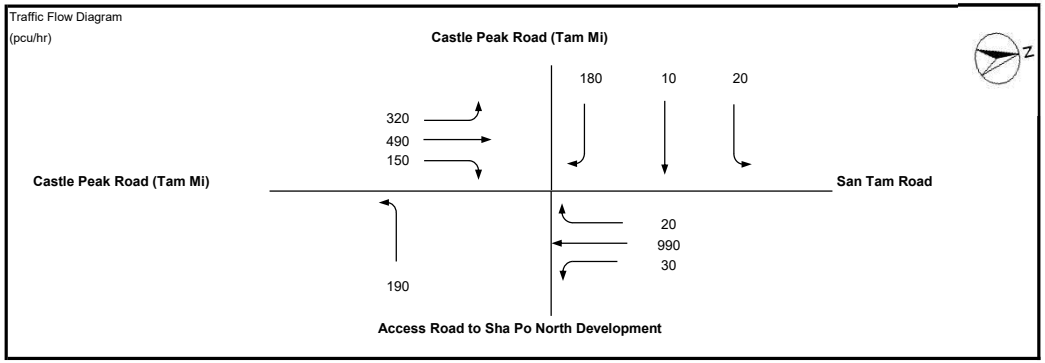
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Castle Peak Road -Tam Mi / San Tam Road	2021 AM Peak Hour Observed Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J7

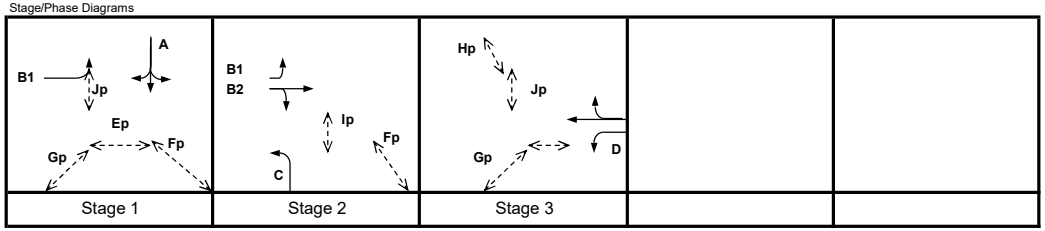
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.489	
Lost time	L =	13	sec
Total Flow	=	20,570	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	48	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	25	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.803	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	64.2	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	28	sec
Y_{max}	$= 1-L/C$	=	0.892	

Stage/Phase Diagrams



I/G = 5 I/G = 6 I/G = 5

Critical Case : A,B2,D

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 64%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	1	3.500	1	17.25			1		0		1965	20			20	100%		1808	0.011	
	A	1	3.500	1		20	0	0		0		2105		10	180	190		95%	1965	0.097	0.097
	B1	1,2	3.500	1	30			1		0		1965	320			320	100%		1871	0.171	
	B2	2	3.500	1				0		0		2105		329		329			2105	0.156	0.156
	B2	2	3.500	1		12.5	0	0		0		2105		161	150	311		48%	1990	0.156	
	C	2	3.500	2	22.5			1		0		4070	190			190	100%		3816	0.050	
	D	3	3.500	1	30			1		0		1965	30			30	100%		1871	0.016	
	D	3	3.900	1				0		0		2145		506		506			2145	0.236	0.236
	D	3	3.900	1		20	0	0		0		2145		484	20	504		4%	2139	0.236	

Pedestrian Crossing				GM		FGM				
	Ep	1,3	min.	5	+	5	=	10	sec	
	Fp	1,2	min.	5	+	5	=	10	sec	
	Gp	1,3	min.	7	+	5	=	12	sec	
	Hp	3	min.	5	+	5	=	10	sec	
	Ip	2	min.	6	+	5	=	11	sec	
	Jp	1,3	min.	6	+	5	=	11	sec	

JUNCTION CAPACITY CALCULATION

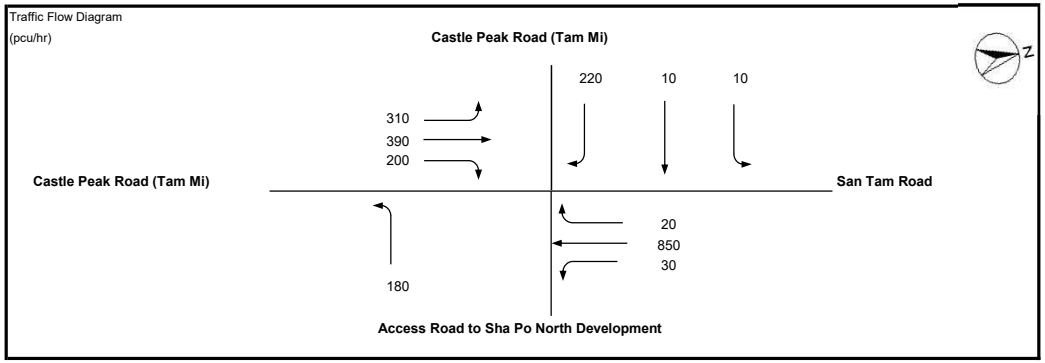
AECOM

Junction J7 - Castle Peak Road -Tam Mi / San Tam Road	2021 PM Peak Hour Observed Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J7

Traffic Flow Diagram

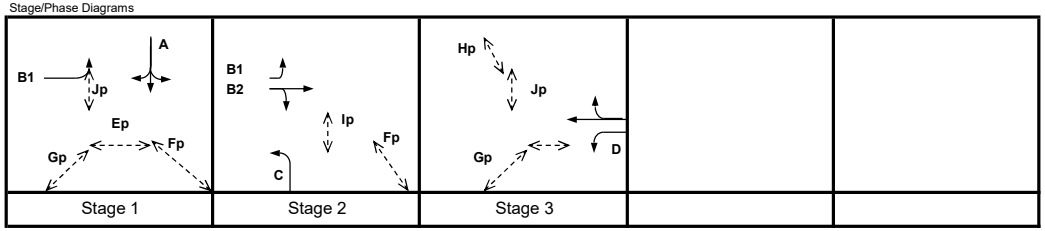
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.466	
Lost time	L =	13	sec
Total Flow	=	20,570	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	46	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	24	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.803	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	72.2	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	27	sec
Y_{max}	= 1-L/C	=	0.892	

Stage/Phase Diagrams



I/G = 5 I/G = 6 I/G = 5

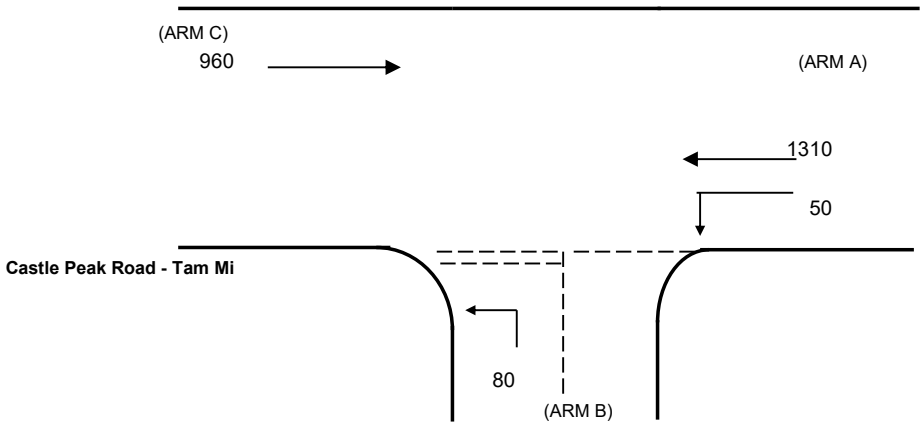
Critical Case : A,B2,D

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 72%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	1	3.500	1	17.25			1		0		1965	10			10	100%		1808	0.006	
	A	1	3.500	1		20	0	0		0		2105		10	220	230		96%	1964	0.117	0.117
	B1	1,2	3.500	1	30			1		0		1965	310			310	100%		1871	0.166	
	B2	2	3.500	1				0		0		2105		307		307			2105	0.146	0.146
	B2	2	3.500	1		12.5	0	0		0		2105		83	200	283		71%	1940	0.146	
	C	2	3.500	2	22.5			1		0		4070	180			180	100%		3816	0.047	
	D	3	3.500	1	30			1		0		1965	30			30	100%		1871	0.016	
	D	3	3.900	1				0		0		2145		436		436			2145	0.203	0.203
	D	3	3.900	1		20	0	0		0		2145		414	20	434		5%	2138	0.203	

Pedestrian Crossing				GM		FGM				
	Ep	1,3	min.	5	+	5	=	10	sec	
	Fp	1,2	min.	5	+	5	=	10	sec	
	Gp	1,3	min.	7	+	5	=	12	sec	
	Hp	3	min.	5	+	5	=	10	sec	
	Ip	2	min.	6	+	5	=	11	sec	
	Jp	1,3	min.	6	+	5	=	11	sec	

Junction	J8 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsuen	Scenario	2021 AM Peak Hour Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar-24



NOTES : (GEOMETRIC INPUT DATA)
W = MAJOR ROAD WIDTH
W cr = CENTRAL RESERVE WIDTH
W b-a = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-a
W b-c = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-c
W c-b = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM c-b
Vl b-a = VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM b-a
Vr b-a = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-a
Vr b-c = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-c
Vr c-b = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM c-b

D = STREAM-SPECIFIC B-A
E = STREAM-SPECIFIC B-C
F = STREAM-SPECIFIC C-B
Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W =	14.6	(metres)
W cr =	2	(metres)
q a-b =	50	(pcu/hr)
q a-c =	1310	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b =	0	(metres)
Vr c-b =	0	(metres)
q c-a =	960	(pcu/hr)
q c-b =	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a = 0	(metres)
W b-c = 5	(metres)
Vl b-a = 0	(metres)
Vr b-a = 150	(metres)
Vr b-c = 150	(metres)
q b-a = 0	(pcu/hr)
q b-c = 80	(pcu/hr)

GEOMETRIC FACTORS :

D =	0.613919
E =	1.157326
F =	0.585955
Y =	0.496300

THE CAPACITY OF MOVEMENT :

Q b-a =	188
Q b-c =	584
Q c-b =	293
Q b-ac =	584

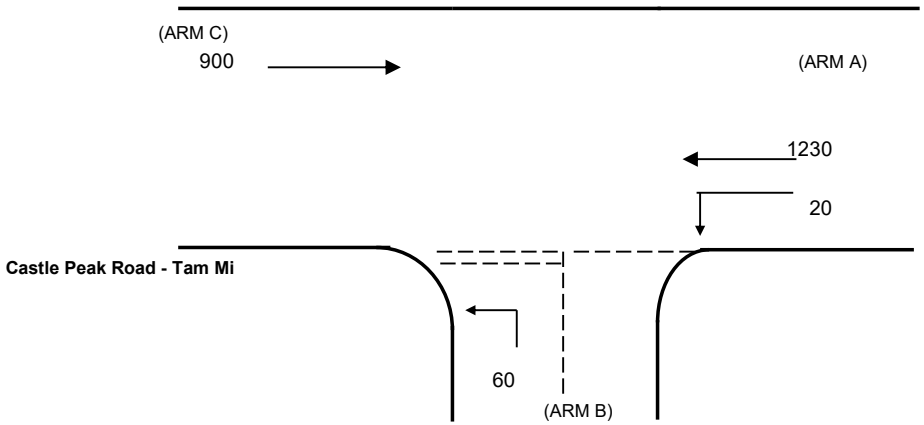
CRITICAL DFC = 0.14

COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a =	0.00
DFC b-c =	0.14
DFC c-b =	0.00
DFC b-ac =	0.00

Filename : - Castle Peak Road-Cheung Chun San Tsuen Road.xlsm / Obs_

Junction	J8 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsuen	Scenario	2021 PM Peak Hour Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar-24



NOTES : (GEOMETRIC INPUT DATA)
W = MAJOR ROAD WIDTH
W cr = CENTRAL RESERVE WIDTH
W b-a = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-a
W b-c = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-c
W c-b = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM c-b
Vl b-a = VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM b-a
Vr b-a = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-a
Vr b-c = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-c
Vr c-b = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM c-b

D = STREAM-SPECIFIC B-A
E = STREAM-SPECIFIC B-C
F = STREAM-SPECIFIC C-B
Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W =	14.6	(metres)
W cr =	2	(metres)
q a-b =	20	(pcu/hr)
q a-c =	1230	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b =	0	(metres)
Vr c-b =	0	(metres)
q c-a =	900	(pcu/hr)
q c-b =	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a = 0	(metres)
W b-c = 5	(metres)
Vl b-a = 0	(metres)
Vr b-a = 150	(metres)
Vr b-c = 150	(metres)
q b-a = 0	(pcu/hr)
q b-c = 60	(pcu/hr)

GEOMETRIC FACTORS :

D =	0.613919
E =	1.157326
F =	0.585955
Y =	0.496300

THE CAPACITY OF MOVEMENT :

Q b-a =	202
Q b-c =	603
Q c-b =	304
Q b-ac =	603

CRITICAL DFC = 0.10

COMPARISION OF DESIGN FLOW TO CAPACITY :

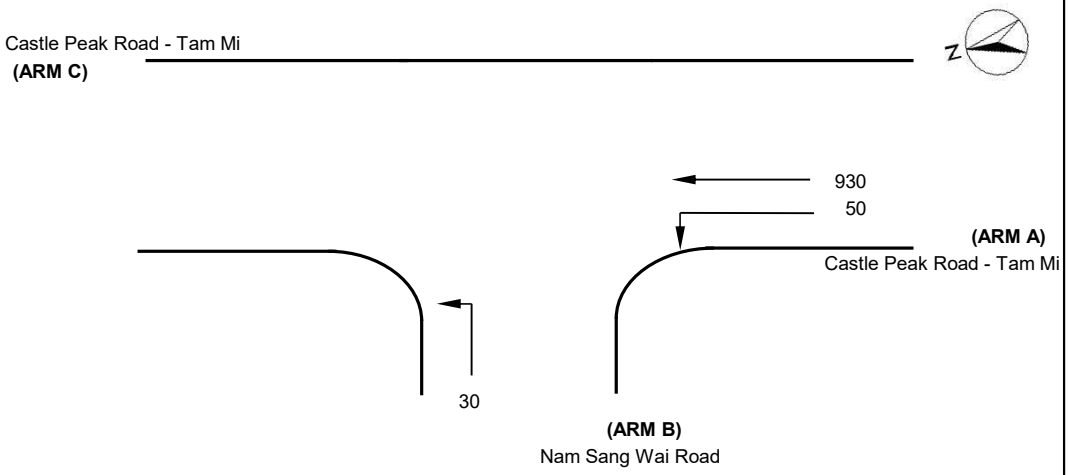
DFC b-a =	0.00
DFC b-c =	0.10
DFC c-b =	0.00
DFC b-ac =	0.00

Filename : - Castle Peak Road-Cheung Chun San Tsuen Road.xlsm / Obs_

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2021 AM Peak Hour Observed Traffic Flows	Designed By : MKCN	Checked By : SHSN	Job No. : -	Date : Mar 24



NOTES : (GEOMETRIC INPUT DATA) J3

- W = Major Road Width (6.4 - 20.0)
- W cr = Central Reserve width (1.2 - 9.0, kerbed central reserve only)
- W b-a = Lane width available to vehicle waiting in stream b-a (2.05 - 4.7)
- W b-c = Lane width available to vehicle waiting in stream b-c (2.05 - 4.7)
- W c-b = Lane width available to vehicle waiting in stream c-b (2.05 - 4.7)
- Vl b-a = Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
- Vr b-a = Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
- Vr b-c = Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
- Vr c-b = Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)

- D = Stream-specific B-A
- E = Stream-specific B-C
- F = Stream-specific C-B
- Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	16 (metres)
W cr	=	0 (metres)
q a-b	=	50 (pcu/hr)
q a-c	=	930 (pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	0 (metres)
Vr c-b	=	0 (metres)
q c-a	=	0 (pcu/hr)
q c-b	=	0 (pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	0 (metres)
W b-c	=	4.07 (metres)
Vl b-a	=	40 (metres)
Vr b-a	=	35 (metres)
Vr b-c	=	40 (metres)
q b-a	=	0 (pcu/hr)
q b-c	=	30 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.566608
E	=	0.964637
F	=	0.585955
Y	=	0.448000

THE CAPACITY OF MOVEMENT :

Q b-a	=	268
Q b-c	=	569
Q c-b	=	343
Q b-ac	=	569

CRITICAL DFC = 0.05

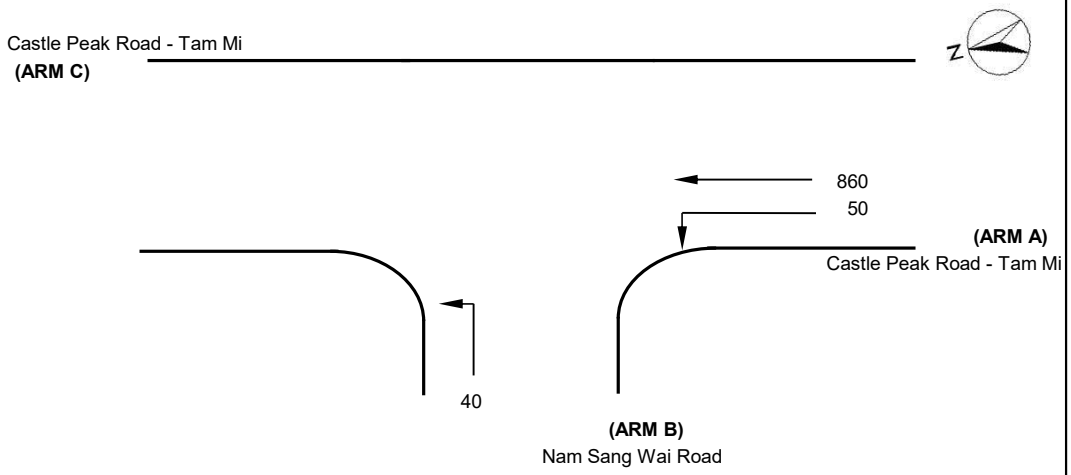
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.05
DFC c-b	=	0.00
DFC b-ac	=	0.05

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2021 PM Peak Hour Observed Traffic Flows	Designed By : MKCN	Checked By : SHSN	Job No. : -	Date : Mar 24



NOTES : (GEOMETRIC INPUT DATA) J3

- W = Major Road Width (6.4 - 20.0)
- W cr = Central Reserve width (1.2 - 9.0, kerbed central reserve only)
- W b-a = Lane width available to vehicle waiting in stream b-a (2.05 - 4.7)
- W b-c = Lane width available to vehicle waiting in stream b-c (2.05 - 4.7)
- W c-b = Lane width available to vehicle waiting in stream c-b (2.05 - 4.7)
- Vl b-a = Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
- Vr b-a = Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
- Vr b-c = Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
- Vr c-b = Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)

- D = Stream-specific B-A
- E = Stream-specific B-C
- F = Stream-specific C-B
- Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	16 (metres)
W cr	=	0 (metres)
q a-b	=	50 (pcu/hr)
q a-c	=	860 (pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	0 (metres)
Vr c-b	=	0 (metres)
q c-a	=	0 (pcu/hr)
q c-b	=	0 (pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	0 (metres)
W b-c	=	4.07 (metres)
Vl b-a	=	40 (metres)
Vr b-a	=	35 (metres)
Vr b-c	=	40 (metres)
q b-a	=	0 (pcu/hr)
q b-c	=	40 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.566608
E	=	0.964637
F	=	0.585955
Y	=	0.448000

THE CAPACITY OF MOVEMENT :

Q b-a	=	274
Q b-c	=	580
Q c-b	=	350
Q b-ac	=	580

CRITICAL DFC = 0.07

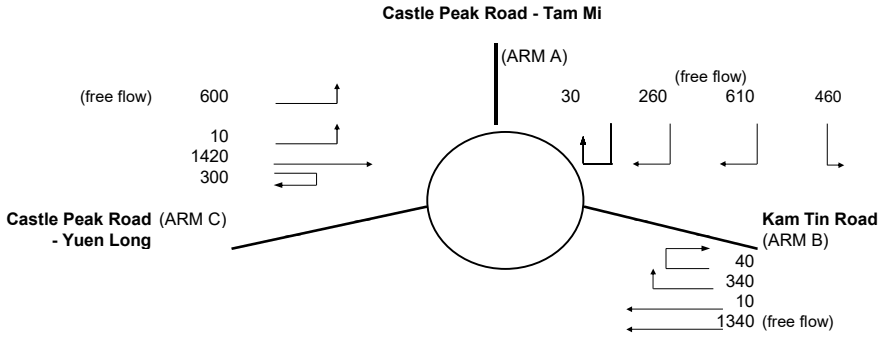
COMPARISION OF DESIGN FLOW TO CAPACITY :

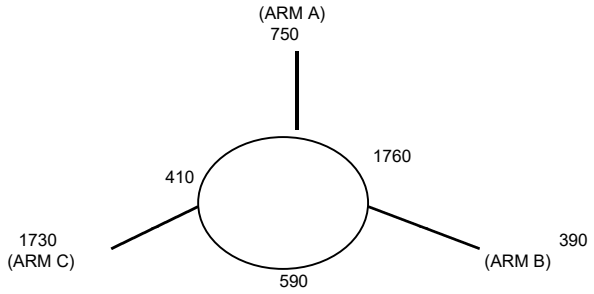
DFC b-a	=	0.00
DFC b-c	=	0.07
DFC c-b	=	0.00
DFC b-ac	=	0.07

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J10 - Au Tau Interchange	Scenario	2021 AM Peak Hour Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	7.00	7.00	7.30
E = Entry width (m)	10.00	7.00	10.50
L = Effective length of flare (m)	13.00	1.00	45.00
R = Entry radius (m)	50.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	45.00	30.00	20.00
Q = Entry flow (pcu/h)	750	390	1730
Qc= Circulating flow across entry (pcu/h)	1760	590	410
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.37	0.00	0.11
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	1.04	1.07
X2= V + ((E-V)/(1+2S))	8.73	7.00	9.91
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2644	2121	3002
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.69	0.60	0.74
Qe= K(F-Fc*Qc)	1405	1837	2896
DFC = Design flow/Capacity = Q/Qe	0.53	0.21	0.60

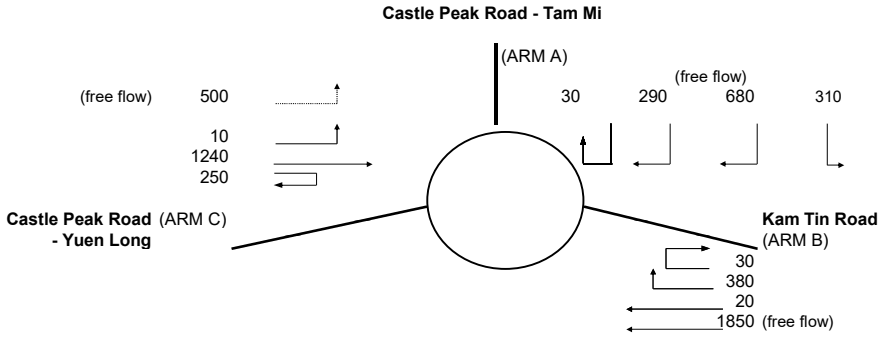
TOTAL ENTRY FLOWS = 4750 PCU

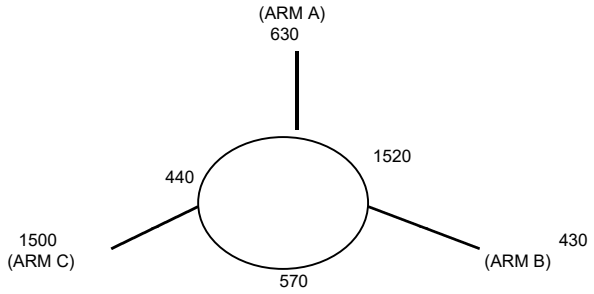
CRITICAL DFC = 0.60

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J10 - Au Tau Interchange	Scenario	2021 PM Peak Hour Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	7.00	7.00	7.30
E = Entry width (m)	10.00	7.00	10.50
L = Effective length of flare (m)	13.00	1.00	45.00
R = Entry radius (m)	50.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	45.00	30.00	20.00
Q = Entry flow (pcu/h)	630	430	1500
Qc= Circulating flow across entry (pcu/h)	1520	570	440
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.37	0.00	0.11
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	1.04	1.07
X2= V + ((E-V)/(1+2S))	8.73	7.00	9.91
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2644	2121	3002
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.69	0.60	0.74
Qe= K(F-Fc*Qc)	1566	1849	2872
DFC = Design flow/Capacity = Q/Qe	0.40	0.23	0.52

TOTAL ENTRY FLOWS = 5030 PCU

CRITICAL DFC = 0.52

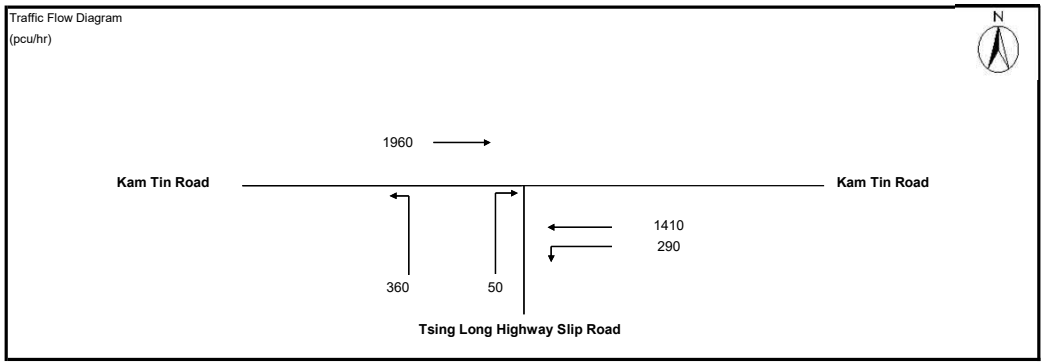
JUNCTION CAPACITY CALCULATION

AECOM

Junction J12 - Kam Tin Road / Tsing Long Highway Slip Road	2021 AM Peak Hour Observed Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

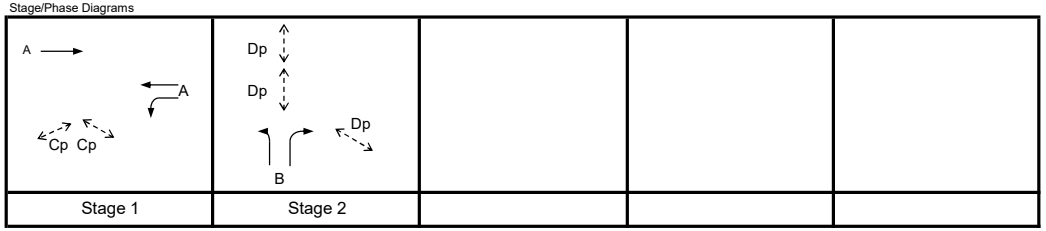
J12

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.670	
Lost time		L =	11	sec
Total Flow		=	16,755	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	=	65	sec
Min. Cycle Time C_m	= L/(1-Y)	=	33	sec
Y_{ult}	= 0.9-0.0075×L	=	0.818	
$R.C._{ult}$	= $(Y_{ult}-Y)/Yx100\%$	=	22.0	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	43	sec
Y_{max}	= 1-L/C	=	0.908	

Stage/Phase Diagrams



Critical Case : A,B

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 22%

I/G = 8 I/G = 5

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
→	A	1	3.650	2				1		0		4100		1960		1960			4100	0.478	0.478
←	A	1	3.600	2				0		0	190	4230		1410		1410			4420	0.319	
↰	A	1	3.650	1	50			1		0		1980	290			290	100%		1922	0.151	
↰	B	2	4.000	1	20			1		0		2015	360			360	100%		1874	0.192	0.192
↱	B	2	3.650	2		35	0	0		0		4240			50	50		100%	4066	0.012	

Pedestrian Crossing				GM		FGM			
	Cp	1	min.	5	+	7	=	12	sec
	Dp	2	min.	5	+	10	=	15	sec

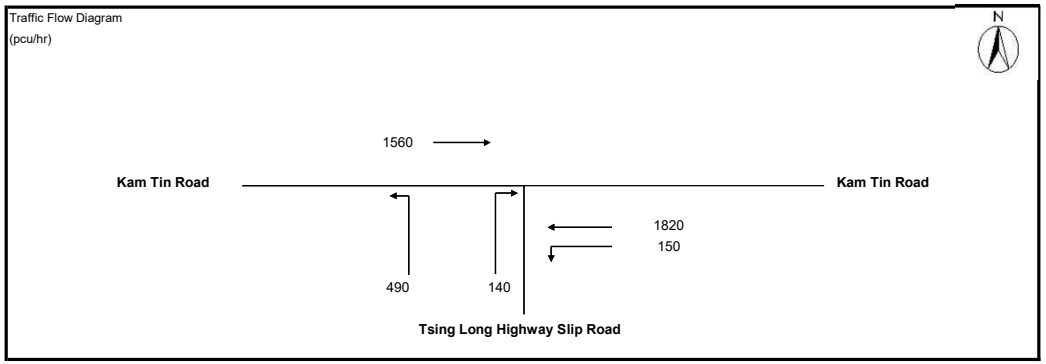
JUNCTION CAPACITY CALCULATION

AECOM

Junction J12 - Kam Tin Road / Tsing Long Highway Slip Road	2021 PM Peak Hour Observed Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J12

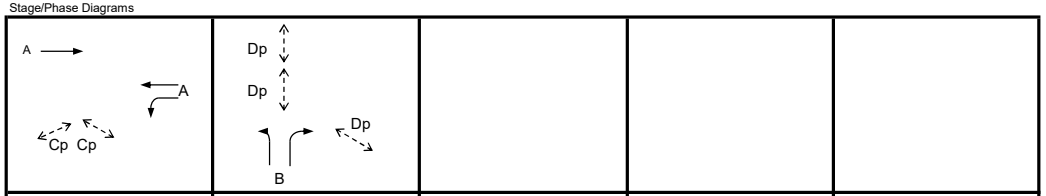
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	120	sec
Sum(y)	Y =	0.673	
Lost time	L =	11	sec
Total Flow	=	16,755	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	66	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	34	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	21.4	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	44	sec
Y_{max}	= 1-L/C	=	0.908	

Stage/Phase Diagrams



I/G = 8 I/G = 5

Critical Case : A,B

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 21%

).xlsm]

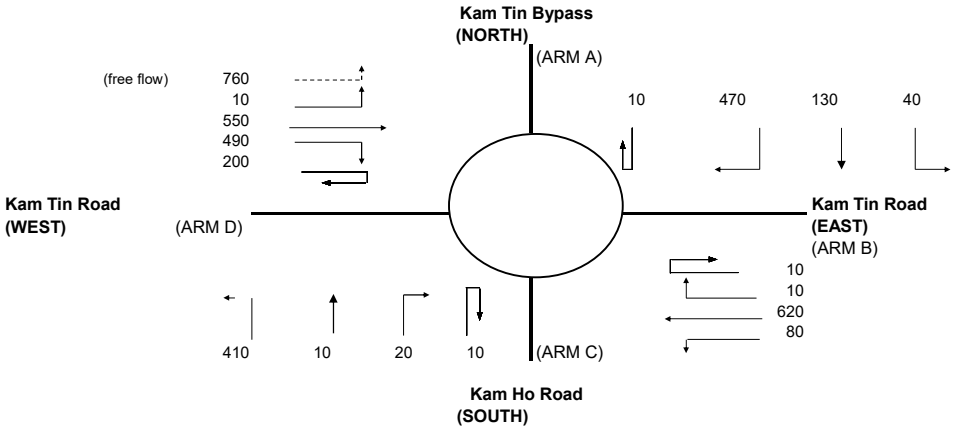
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
→	A	1	3.650	2				1		0		4100		1560		1560			4100	0.380	
←	A	1	3.600	2				0		0	190	4230		1820		1820			4420	0.412	0.412
↰	A	1	3.650	1	50			1		0		1980	150			150	100%		1922	0.078	
↰	B	2	4.000	1	20			1		0		2015	490			490	100%		1874	0.261	0.261
↱	B	2	3.650	2		35	0	0		0		4240			140	140		100%	4066	0.034	

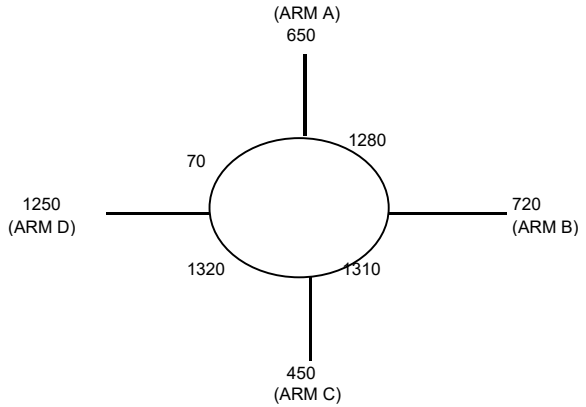
Pedestrian Crossing			GM		FGM				
	Cp	1	min.	5	+	7	=	12	sec
	Dp	2	min.	5	+	10	=	15	sec

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J13 - Kam Tin Road / Kam Tin Bypass / Kam Ho Road	Scenario	2021 AM Peak Hour Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.50	3.50	5.00	7.30
E = Entry width (m)	11.00	11.50	10.00	11.00
L = Effective length of flare (m)	15.00	10.50	9.50	13.00
R = Entry radius (m)	42.50	100.00	20.00	42.50
D = Inscribed circle diameter (m)	88.00	88.00	88.00	88.00
A = Entry angle (degree)	39.00	23.00	37.50	29.00
Q = Entry flow (pcu/h)	650	720	450	1250
Qc= Circulating flow across entry (pcu/h)	1280	1310	1320	70
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.48	1.22	0.84	0.46
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.06	0.97	1.03
X2= V + ((E-V)/(1+2S))	8.80	5.83	6.86	9.24
M = EXP((D-60)/10)	16.44	16.44	16.44	16.44
F = 303*X2	2665	1766	2079	2799
Td= 1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc= 0.21*Td(1+0.2*X2)	0.60	0.47	0.51	0.62
Qe= K(F-Fc*Qc)	1892	1226	1366	2836
DFC = Design flow/Capacity = Q/Qe	0.34	0.59	0.33	0.44

TOTAL ENTRY FLOWS = 3830 PCU

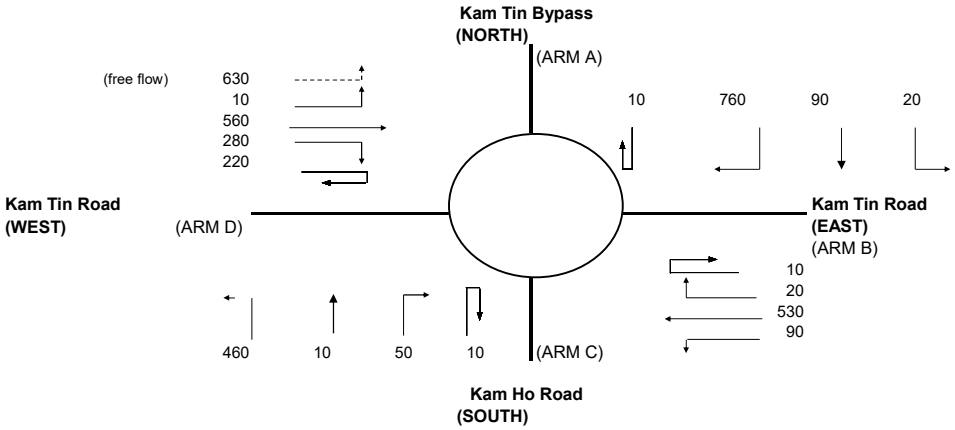
CRITICAL DFC = 0.59

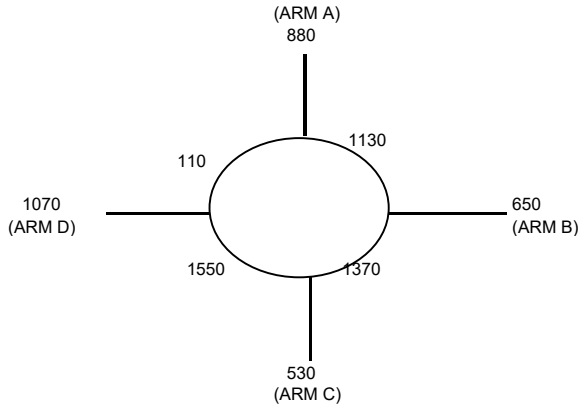
Filename : J13 - Kam Tin Road-Kam Tin Bypass-Kam Ho Road.xlsx / Obs_AM_Model

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J13 - Kam Tin Road / Kam Tin Bypass / Kam Ho Road	Scenario	2021 PM Peak Hour Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.50	3.50	5.00	7.30
E = Entry width (m)	11.00	11.50	10.00	11.00
L = Effective length of flare (m)	15.00	10.50	9.50	13.00
R = Entry radius (m)	42.50	100.00	20.00	42.50
D = Inscribed circle diameter (m)	88.00	88.00	88.00	88.00
A = Entry angle (degree)	39.00	23.00	37.50	29.00
Q = Entry flow (pcu/h)	880	650	530	1070
Qc= Circulating flow across entry (pcu/h)	1130	1370	1550	110
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.48	1.22	0.84	0.46
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.06	0.97	1.03
X2= V + ((E-V)/(1+2S))	8.80	5.83	6.86	9.24
M = EXP((D-60)/10)	16.44	16.44	16.44	16.44
F = 303*X2	2665	1766	2079	2799
Td= 1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc= 0.21*Td(1+0.2*X2)	0.60	0.47	0.51	0.62
Qe= K(F-Fc*Qc)	1981	1196	1252	2811
DFC = Design flow/Capacity = Q/Qe	0.44	0.54	0.42	0.38

TOTAL ENTRY FLOWS = 3760 PCU

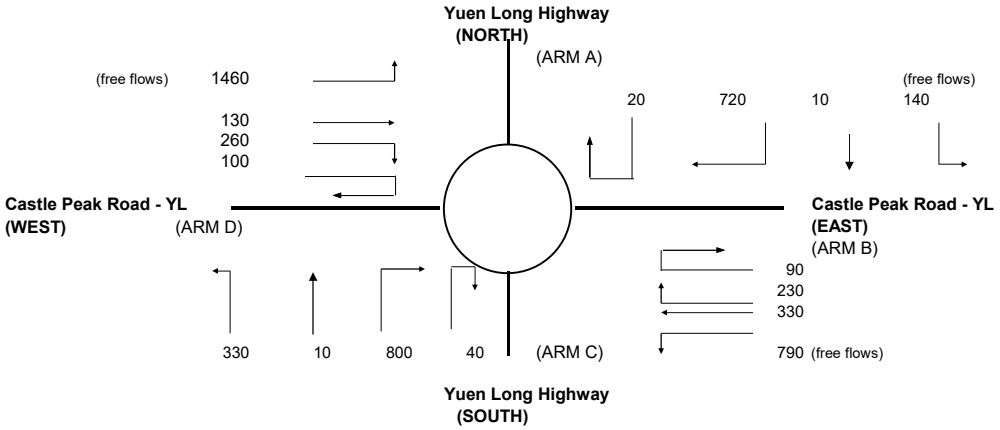
CRITICAL DFC = 0.54

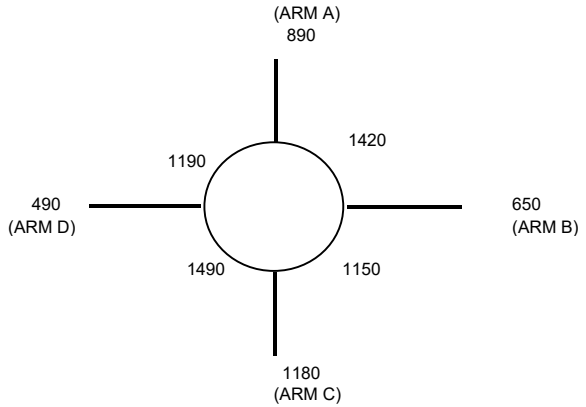
Filename : J13 - Kam Tin Road-Kam Tin Bypass-Kam Ho Road.xlsx / Obs_PM_Model

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J11 - Pok Oi Interchange	Scenario	2021 AM Peak Hour Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.30	3.70	9.00	3.50
E = Entry width (m)	7.30	7.40	12.00	7.00
L = Effective length of flare (m)	13.00	4.00	5.00	5.00
R = Entry radius (m)	21.00	25.00	25.00	25.00
D = Inscribed circle diameter (m)	110.00	80.00	110.00	80.00
A = Entry angle (degree)	35.00	65.00	45.00	45.00
Q = Entry flow (pcu/h)	890	650	1180	490
Qc= Circulating flow across entry (pcu/h)	1420	1150	1490	1190
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.12	1.48	0.96	1.12
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	0.89	0.96	0.96
X2= V + ((E-V)/(1+2S))	7.10	4.63	10.03	4.58
M = EXP((D-60)/10)	148.41	7.39	148.41	7.39
F = 303*X2	2152	1404	3038	1388
Td= 1+(0.5/(1+M))	1.00	1.06	1.00	1.06
Fc= 0.21*Td(1+0.2*X2)	0.51	0.43	0.63	0.43
Qe= K(F-Fc*Qc)	1406	809	2006	843
DFC = Design flow/Capacity = Q/Qe	0.63	0.80	0.59	0.58

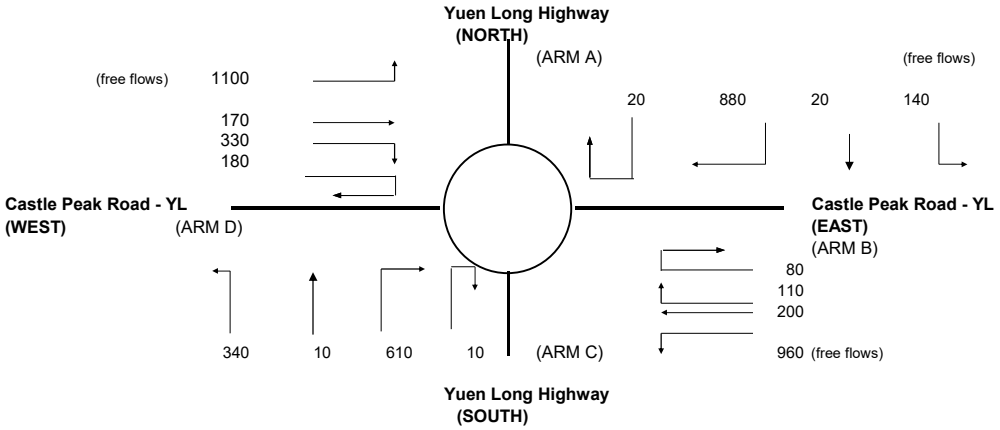
TOTAL ENTRY FLOWS = 5460 PCU

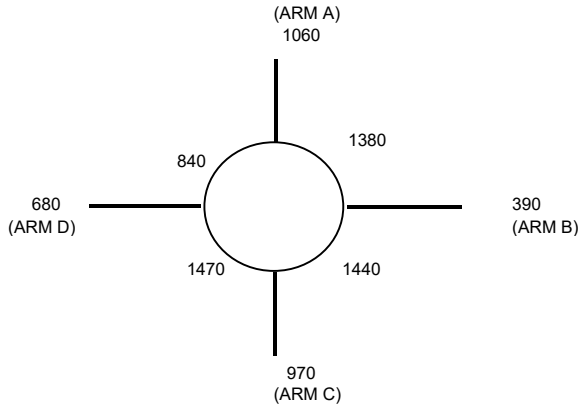
CRITICAL DFC = 0.80

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J11 - Pok Oi Interchange	Scenario	2021 AM Peak Hour Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.30	3.70	9.00	3.50
E = Entry width (m)	7.30	7.40	12.00	7.00
L = Effective length of flare (m)	13.00	6.00	5.00	5.00
R = Entry radius (m)	21.00	25.00	25.00	25.00
D = Inscribed circle diameter (m)	110.00	80.00	110.00	80.00
A = Entry angle (degree)	60.00	50.00	45.00	45.00
Q = Entry flow (pcu/h)	1060	390	970	680
Qc= Circulating flow across entry (pcu/h)	1380	1440	1470	840
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.12	0.99	0.96	1.12
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.90	0.94	0.96	0.96
X2= V + ((E-V)/(1+2S))	7.10	4.94	10.03	4.58
M = EXP((D-60)/10)	148.41	7.39	148.41	7.39
F = 303*X2	2152	1498	3038	1388
Td= 1+(0.5/(1+M))	1.00	1.06	1.00	1.06
Fc= 0.21*Td(1+0.2*X2)	0.51	0.44	0.63	0.43
Qe= K(F-Fc*Qc)	1301	810	2018	986
DFC = Design flow/Capacity = Q/Qe	0.81	0.48	0.48	0.69

TOTAL ENTRY FLOWS = 5160 PCU

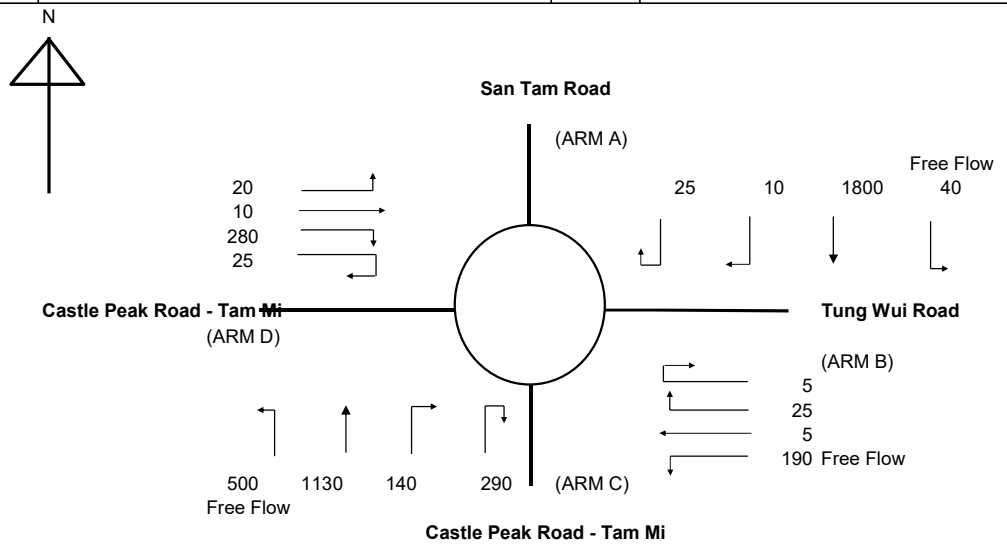
CRITICAL DFC = 0.81

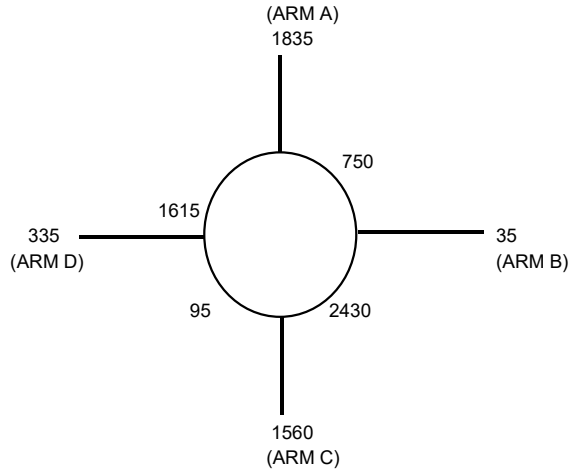
Reference Flow

ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 AM Reference Traffic Flows (Planned Layout)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1835	35	1560	335	*
Qc= Circulating flow across entry (pcu/h)	750	2430	95	1615	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2492	150	2463	822	
DFC = Design flow/Capacity = Q/Qe	0.74	0.23	0.63	0.41	

TOTAL ENTRY FLOWS 4495 PCU

CRITICAL DFC 0.74

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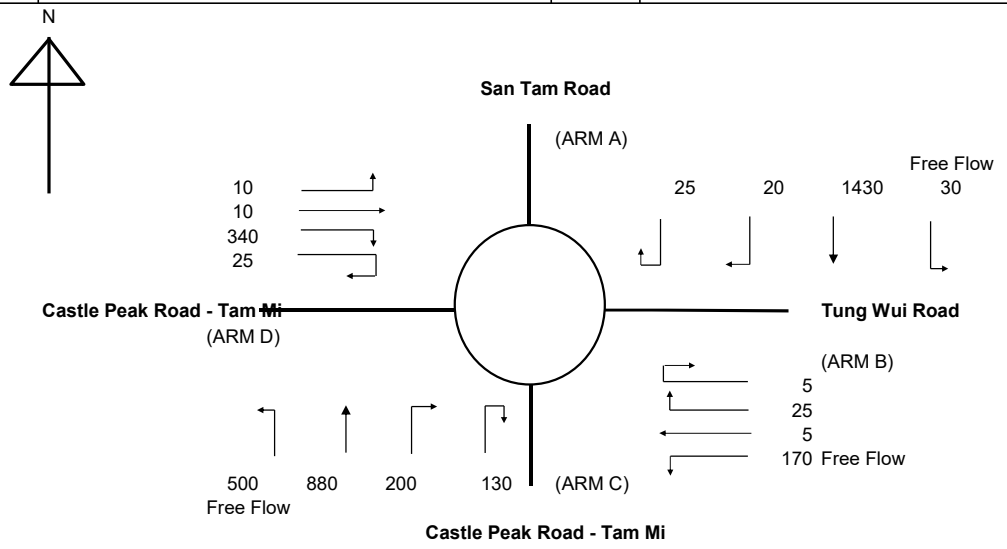
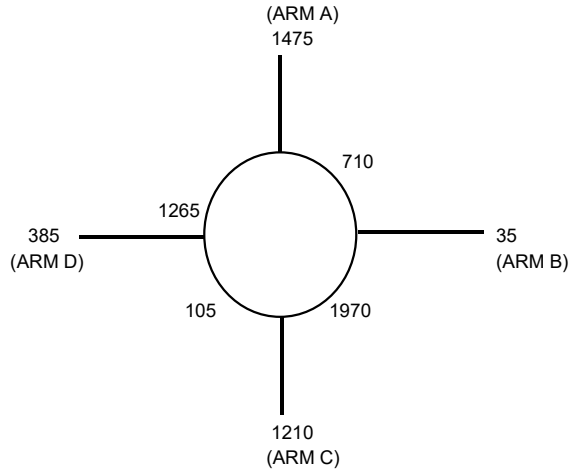
ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 AM Reference Traffic Flows (Planned Layout)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1475	35	1210	385	*
Qc= Circulating flow across entry (pcu/h)	710	1970	105	1265	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2528	438	2455	1057	
DFC = Design flow/Capacity = Q/Qe	0.58	0.08	0.49	0.36	

TOTAL ENTRY FLOWS 3805 PCU

CRITICAL DFC 0.58

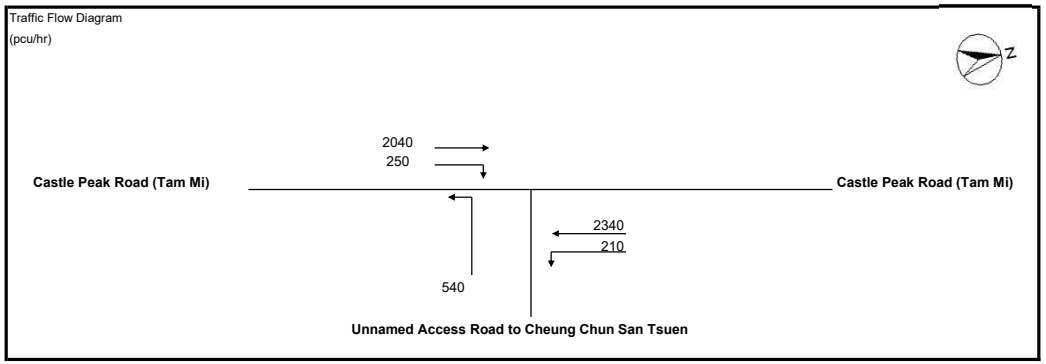
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsu	2034 AM Peak Hour Reference Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J2

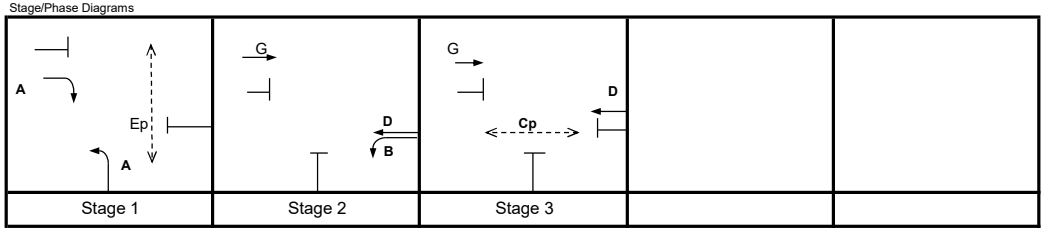
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.693	
Lost time	L =	9	sec
Total Flow	=	16,495	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	60	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	29	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	20.0	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	39	sec
Y_{max}	$= 1-L/C$	=	0.925	

Stage/Phase Diagrams



Critical Case : A,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 20%

CHECK CRITICAL !!!

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↓	A	1	3.500	1		12.5	0	0		0		2105			250	250		100%	1879	0.133	
→	G	2,3	3.500	2				1		0		4070		2040		2040			4070	0.501	
↰	A	1	3.650	2	20			1		0		4100	540			540	100%		3814	0.142	0.142
↰	B	2	3.650	1	15			1		0		1980	210			210	100%		1800	0.117	
←	D	2,3	3.650	2				0		0		4240		2340		2340			4240	0.552	0.552

Pedestrian Crossing				GM		FGM				
	Cp	3	min.	11	+	21	=	32	sec	
	Ep	1	min.	11	+	10	=	21	sec	

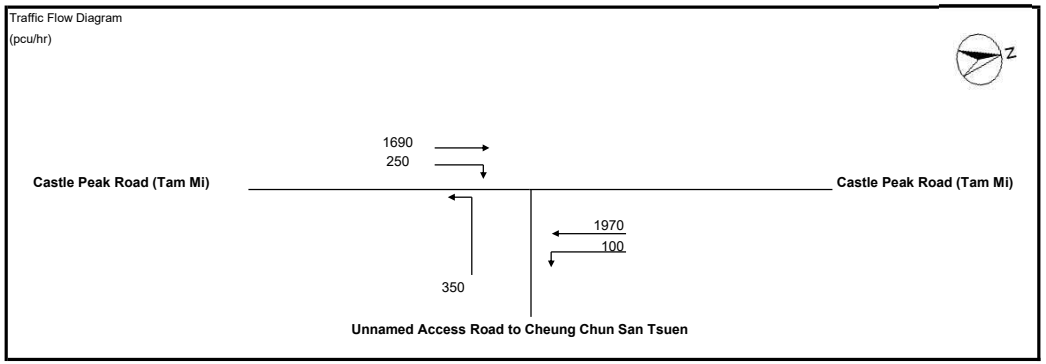
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsu	2034 AM Peak Hour Reference Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

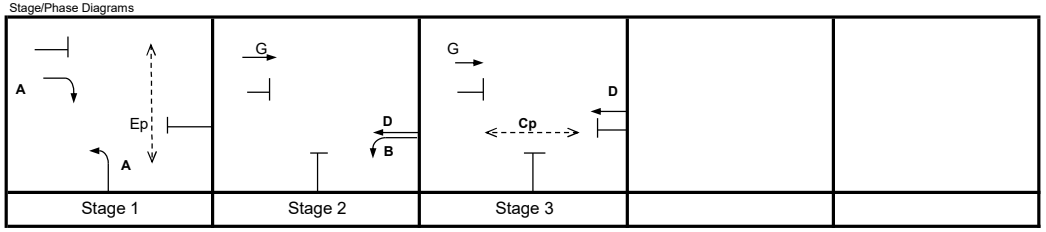
J2

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	120	sec
Sum(y)		Y =	0.598	
Lost time		L =	9	sec
Total Flow		=	16,495	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	46	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	22	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	39.3	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	27	sec
Y_{max}	$= 1-L/C$	=	0.925	

Stage/Phase Diagrams



I/G = 5 I/G = 6 I/G =

Critical Case : A,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 39%

CHECK CRITICAL !!!

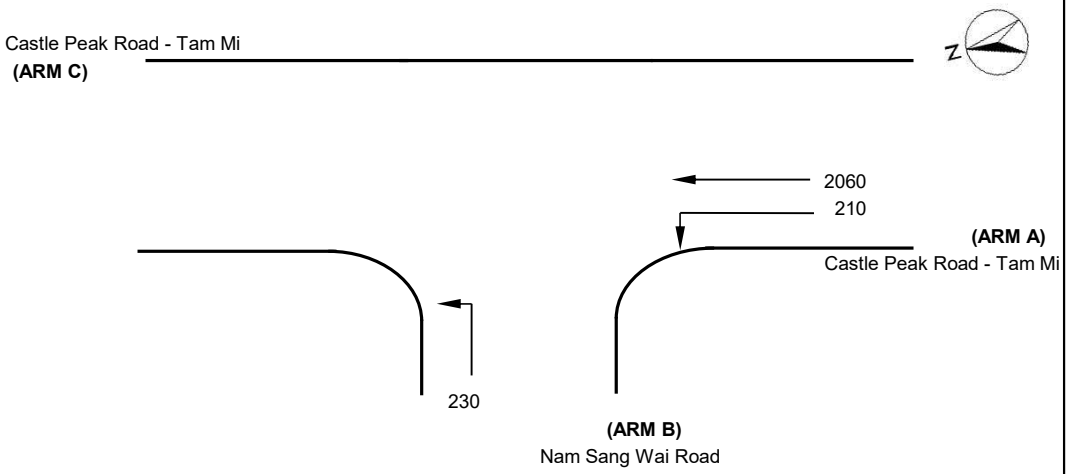
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↓	A	1	3.500	1		12.5	0	0		0		2105			250	250		100%	1879	0.133	0.133
→	G	2,3	3.500	2				1		0		4070		1690		1690			4070	0.415	
↰	A	1	3.650	2	20			1		0		4100	350			350	100%		3814	0.092	
↰	B	2	3.650	1	15			1		0		1980	100			100	100%		1800	0.056	
←	D	2,3	3.650	2				0		0		4240		1970		1970			4240	0.465	0.465

Pedestrian Crossing			GM		FGM				
	Cp	3	min.	11	+	21	=	32	sec
	Ep	1	min.	11	+	10	=	21	sec

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 AM Peak Hour Reference Traffic Flows	Designed By : MKCN	Checked By : SHSN	Job No. : -	Date : Mar 24



NOTES : (GEOMETRIC INPUT DATA) J3

- W = Major Road Width (6.4 - 20.0)
- W cr = Central Reserve width (1.2 - 9.0, kerbed central reserve only)
- W b-a = Lane width available to vehicle waiting in stream b-a (2.05 - 4.7)
- W b-c = Lane width available to vehicle waiting in stream b-c (2.05 - 4.7)
- W c-b = Lane width available to vehicle waiting in stream c-b (2.05 - 4.7)
- Vl b-a = Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
- Vr b-a = Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
- Vr b-c = Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
- Vr c-b = Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)

- D = Stream-specific B-A
- E = Stream-specific B-C
- F = Stream-specific C-B
- Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	16	(metres)
W cr	=	0	(metres)
q a-b	=	210	(pcu/hr)
q a-c	=	2060	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	0	(metres)
Vr c-b	=	0	(metres)
q c-a	=	0	(pcu/hr)
q c-b	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	0	(metres)
W b-c	=	4.07	(metres)
Vl b-a	=	40	(metres)
Vr b-a	=	35	(metres)
Vr b-c	=	40	(metres)
q b-a	=	0	(pcu/hr)
q b-c	=	230	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.566608
E	=	0.964637
F	=	0.585955
Y	=	0.448000

THE CAPACITY OF MOVEMENT :

Q b-a	=	157
Q b-c	=	382
Q c-b	=	220
Q b-ac	=	382

CRITICAL DFC = 0.60

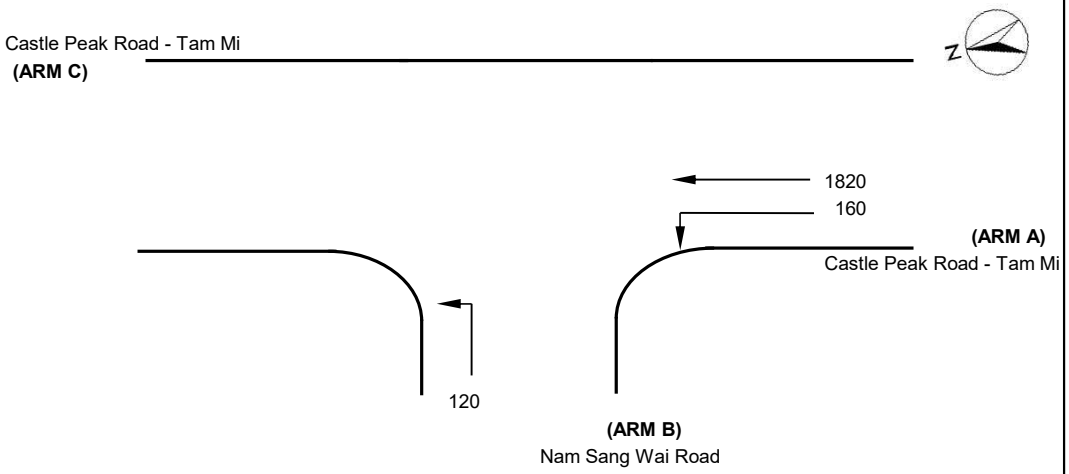
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.60
DFC c-b	=	0.00
DFC b-ac	=	0.60

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 PM Peak Hour Reference Traffic Flows	Designed By : MKCN	Checked By : SHSN	Job No. : -	Date : Mar 24



J3

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.7)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.7)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.7)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	16	(metres)
W cr	=	0	(metres)
q a-b	=	160	(pcu/hr)
q a-c	=	1820	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	0	(metres)
Vr c-b	=	0	(metres)
q c-a	=	0	(pcu/hr)
q c-b	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	0	(metres)
W b-c	=	4.07	(metres)
Vl b-a	=	40	(metres)
Vr b-a	=	35	(metres)
Vr b-c	=	40	(metres)
q b-a	=	0	(pcu/hr)
q b-c	=	120	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.566608
E	=	0.964637
F	=	0.585955
Y	=	0.448000

THE CAPACITY OF MOVEMENT :

Q b-a	=	181
Q b-c	=	422
Q c-b	=	247
Q b-ac	=	422

CRITICAL DFC = 0.28

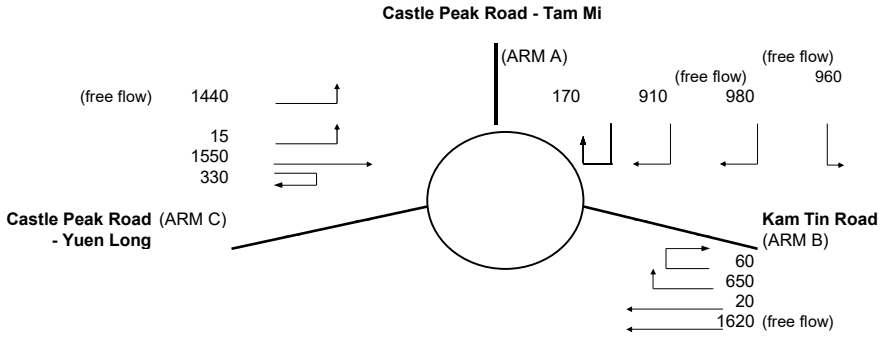
COMPARISION OF DESIGN FLOW TO CAPACITY :

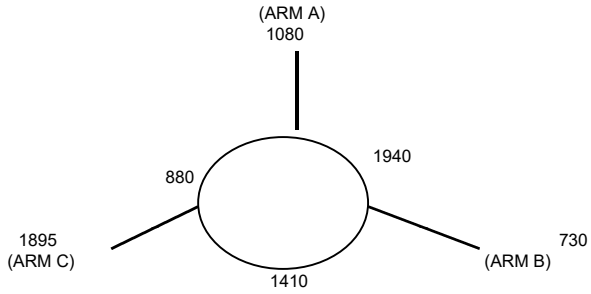
DFC b-a	=	0.00
DFC b-c	=	0.28
DFC c-b	=	0.00
DFC b-ac	=	0.28

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J4 - Au Tau Interchange	Scenario	2034 AM Peak Hour Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	6.50	7.00	7.30
E = Entry width (m)	11.00	7.00	9.70
L = Effective length of flare (m)	22.00	1.00	50.00
R = Entry radius (m)	45.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	20.00	5.00	20.00
Q = Entry flow (pcu/h)	1080	730	1895
Qc= Circulating flow across entry (pcu/h)	1940	1410	880
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.33	0.00	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.06	1.13	1.07
X2= V + ((E-V)/(1+2S))	9.22	7.00	9.38
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2794	2121	2842
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.71	0.60	0.72
Qe= K(F-Fc*Qc)	1504	1437	2374
DFC = Design flow/Capacity = Q/Qe	0.72	0.51	0.80

TOTAL ENTRY FLOWS = 6075 PCU

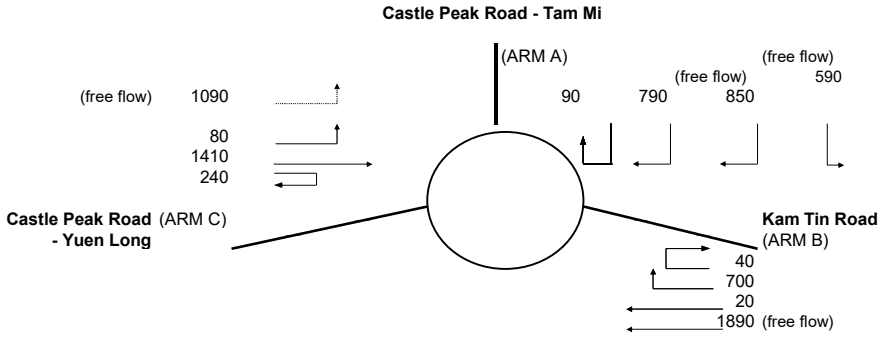
CRITICAL DFC = 0.80

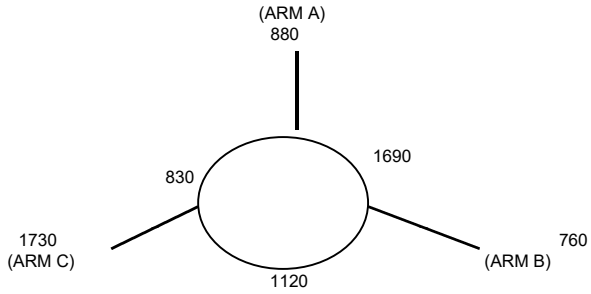
Filename : J10 - Au Tau Interchange.xlsx / RefA_AM

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J4 - Au Tau Interchange	Scenario	2034 PM Peak Hour Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	6.50	7.00	7.30
E = Entry width (m)	11.00	7.00	9.70
L = Effective length of flare (m)	22.00	1.00	50.00
R = Entry radius (m)	45.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	20.00	5.00	20.00
Q = Entry flow (pcu/h)	880	760	1730
Qc= Circulating flow across entry (pcu/h)	1690	1120	830
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.33	0.00	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.06	1.13	1.07
X2= V + ((E-V)/(1+2S))	9.22	7.00	9.38
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2794	2121	2842
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.71	0.60	0.72
Qe= K(F-Fc*Qc)	1692	1632	2412
DFC = Design flow/Capacity = Q/Qe	0.52	0.47	0.72

TOTAL ENTRY FLOWS = 5980 PCU

CRITICAL DFC = 0.72

Filename : J10 - Au Tau Interchange.xlsx / RefA_PM

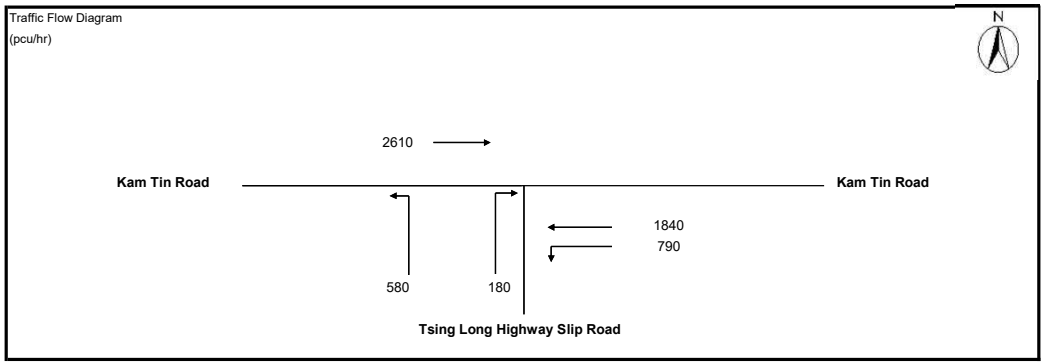
JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - Kam Tin Road / Tsing Long Highway Slip Road	2034 AM Peak Hour Reference Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

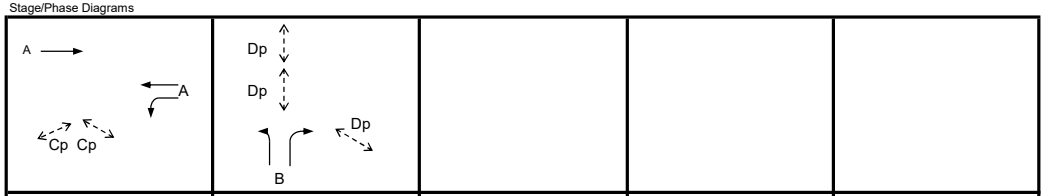
J5

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.570	
Lost time		L =	11	sec
Total Flow		=	20,960	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	50	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	26	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	43.5	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	30	sec
Y_{max}	$= 1-L/C$	=	0.908	

Stage/Phase Diagrams



I/G = 8 I/G = 5

Critical Case : A,B

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 44%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
→	A	1	3.650	3				1		0		6220		2610		2610			6220	0.420	0.420
←	A	1	3.600	2				0		0	190	4230		1840		1840			4420	0.416	
↰	A	1	3.650	1	50			1		0		1980	790			790	100%		1922	0.411	
↰	B	2	3.650	2	25			1		0		4100	580			580	100%		3868	0.150	0.150
↱	B	2	3.650	2		40	0	0		0		4240			180	180		100%	4087	0.044	

Pedestrian Crossing				GM		FGM			
	Cp	1	min.	5	+	7	=	12	sec
	Dp	2	min.	5	+	10	=	15	sec

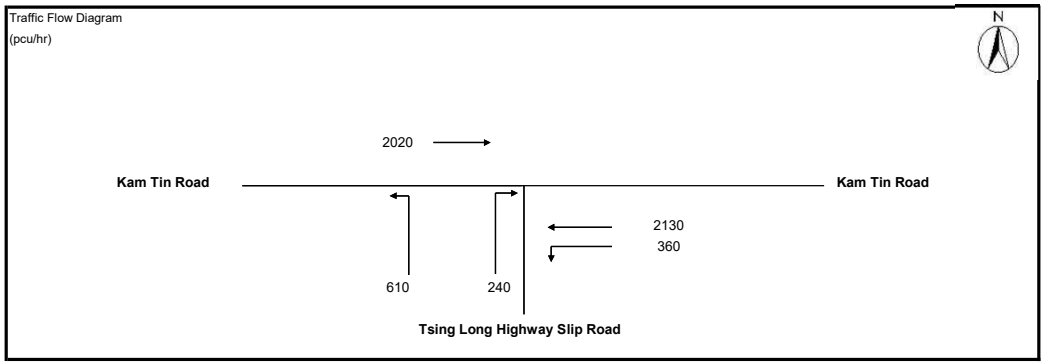
JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - Kam Tin Road / Tsing Long Highway Slip Road	2034 PM Peak Hour Reference Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J5

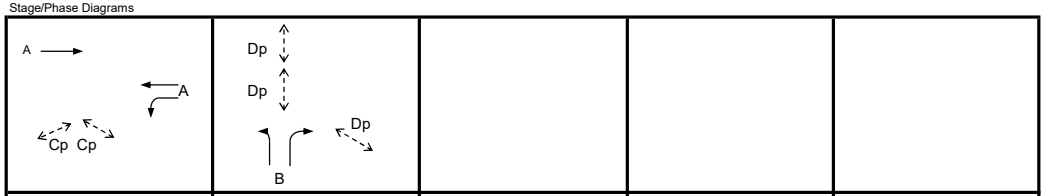
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	120	sec
Sum(y)	Y =	0.640	
Lost time	L =	11	sec
Total Flow	=	20,960	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	60	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	31	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	27.8	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	38	sec
Y_{max}	$= 1-L/C$	=	0.908	

Stage/Phase Diagrams



I/G = 8 I/G = 5

Critical Case : A,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 28%

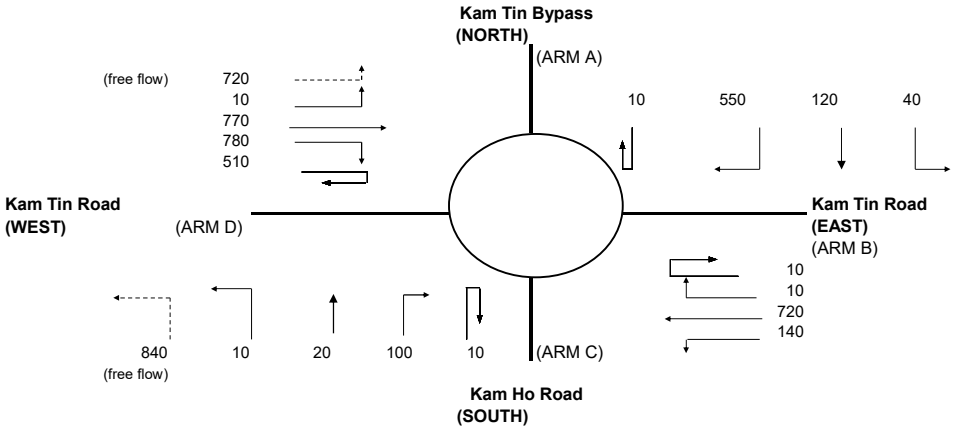
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
→	A	1	3.650	3				1		0		6220		2020		2020			6220	0.325	
←	A	1	3.600	2				0		0	190	4230		2130		2130			4420	0.482	0.482
↰	A	1	3.650	1	50			1		0		1980	360			360	100%		1922	0.187	
↰	B	2	3.650	2	25			1		0		4100	610			610	100%		3868	0.158	0.158
↱	B	2	3.650	2		40	0	0		0		4240			240	240		100%	4087	0.059	

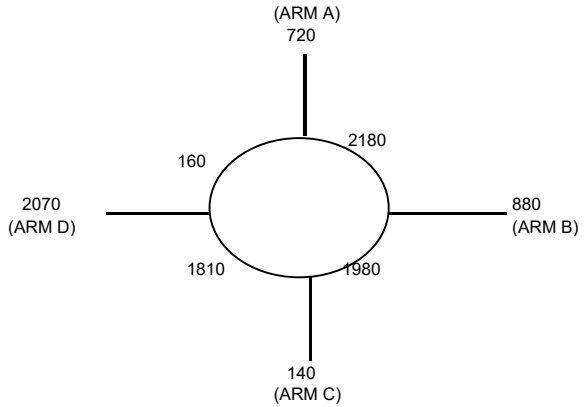
Pedestrian Crossing			GM		FGM				
	Cp	1	min.	5	+	7	=	12	sec
	Dp	2	min.	5	+	10	=	15	sec

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J6 - Kam Tin Road / Kam Tin Bypass / Kam Ho Road	Scenario	2034 AM Peak Hour Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.50	7.30	9.00	7.30
E = Entry width (m)	11.00	10.00	10.00	11.00
L = Effective length of flare (m)	15.00	12.00	1.00	13.00
R = Entry radius (m)	42.50	70.00	20.00	42.50
D = Inscribed circle diameter (m)	88.00	88.00	88.00	88.00
A = Entry angle (degree)	39.00	30.00	37.50	29.00
Q = Entry flow (pcu/h)	720	880	140	2070
Qc= Circulating flow across entry (pcu/h)	2180	1980	1810	160
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.48	0.36	1.60	0.46
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.03	0.97	1.03
X2= V + ((E-V)/(1+2S))	8.80	8.87	9.24	9.24
M = EXP((D-60)/10)	16.44	16.44	16.44	16.44
F = 303*X2	2665	2688	2799	2799
Td= 1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc= 0.21*Td(1+0.2*X2)	0.60	0.60	0.62	0.62
Qe= K(F-Fc*Qc)	1359	1554	1642	2779
DFC = Design flow/Capacity = Q/Qe	0.53	0.57	0.09	0.74

TOTAL ENTRY FLOWS = 4530 PCU

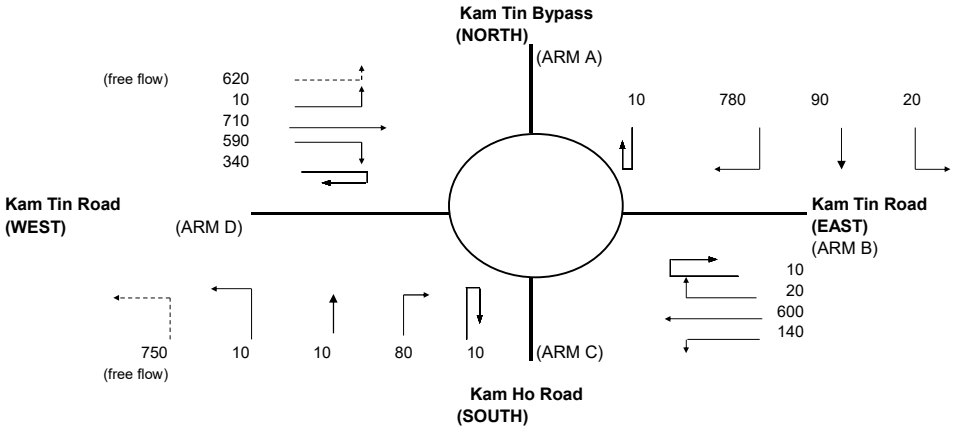
CRITICAL DFC = 0.74

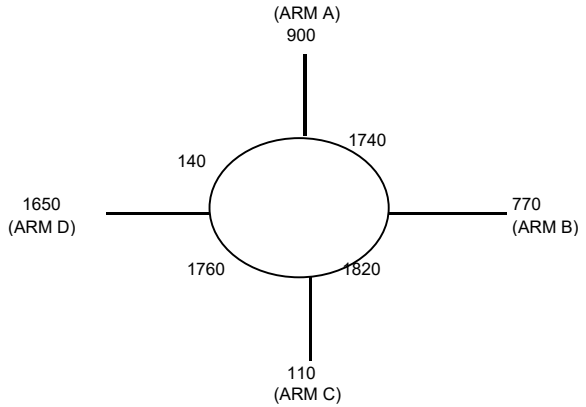
Filename : J13 - Kam Tin Road-Kam Tin Bypass-Kam Ho Road.xlsx / RefA_AM

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J6 - Kam Tin Road / Kam Tin Bypass / Kam Ho Road	Scenario	2034 PM Peak Hour Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.50	7.30	9.00	7.30
E = Entry width (m)	11.00	10.00	10.00	11.00
L = Effective length of flare (m)	15.00	12.00	1.00	13.00
R = Entry radius (m)	42.50	70.00	20.00	42.50
D = Inscribed circle diameter (m)	88.00	88.00	88.00	88.00
A = Entry angle (degree)	39.00	30.00	37.50	29.00
Q = Entry flow (pcu/h)	900	770	110	1650
Qc= Circulating flow across entry (pcu/h)	1740	1820	1760	140
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.48	0.36	1.60	0.46
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.03	0.97	1.03
X2= V + ((E-V)/(1+2S))	8.80	8.87	9.24	9.24
M = EXP((D-60)/10)	16.44	16.44	16.44	16.44
F = 303*X2	2665	2688	2799	2799
Td= 1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc= 0.21*Td(1+0.2*X2)	0.60	0.60	0.62	0.62
Qe= K(F-Fc*Qc)	1619	1653	1672	2792
DFC = Design flow/Capacity = Q/Qe	0.56	0.47	0.07	0.59

TOTAL ENTRY FLOWS = 4050 PCU

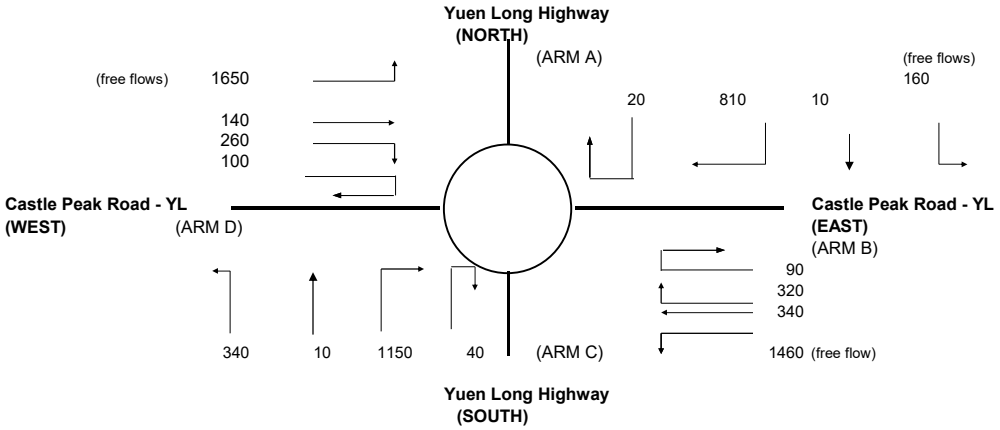
CRITICAL DFC = 0.59

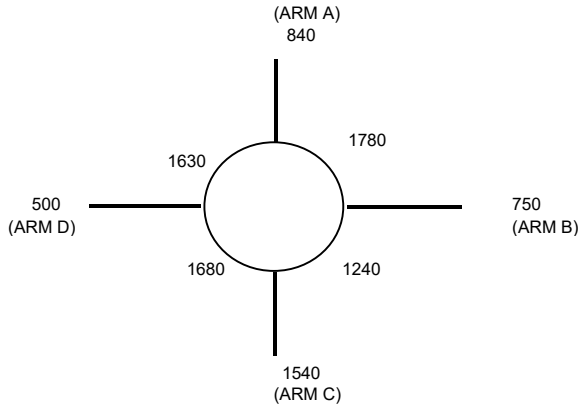
Filename : J13 - Kam Tin Road-Kam Tin Bypass-Kam Ho Road.xlsx / RefA_PM

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J7 - Pok Oi Interchange	Scenario	2034 AM Peak Hour Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.30	3.70	9.00	3.50
E = Entry width (m)	7.30	7.40	12.00	7.00
L = Effective length of flare (m)	13.00	6.00	5.00	5.00
R = Entry radius (m)	21.00	25.00	25.00	25.00
D = Inscribed circle diameter (m)	110.00	80.00	110.00	80.00
A = Entry angle (degree)	35.00	50.00	45.00	45.00
Q = Entry flow (pcu/h)	840	750	1540	500
Qc= Circulating flow across entry (pcu/h)	1780	1240	1680	1630
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.12	0.99	0.96	1.12
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	0.94	0.96	0.96
X2= V + ((E-V)/(1+2S))	7.10	4.94	10.03	4.58
M = EXP((D-60)/10)	148.41	7.39	148.41	7.39
F = 303*X2	2152	1498	3038	1388
Td= 1+(0.5/(1+M))	1.00	1.06	1.00	1.06
Fc= 0.21*Td(1+0.2*X2)	0.51	0.44	0.63	0.43
Qe= K(F-Fc*Qc)	1226	893	1891	664
DFC = Design flow/Capacity = Q/Qe	0.69	0.84	0.81	0.75

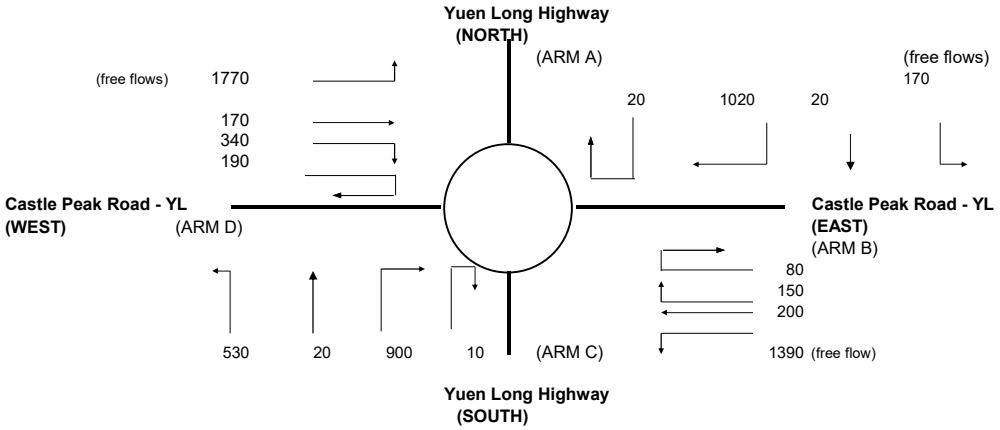
TOTAL ENTRY FLOWS = 5280 PCU

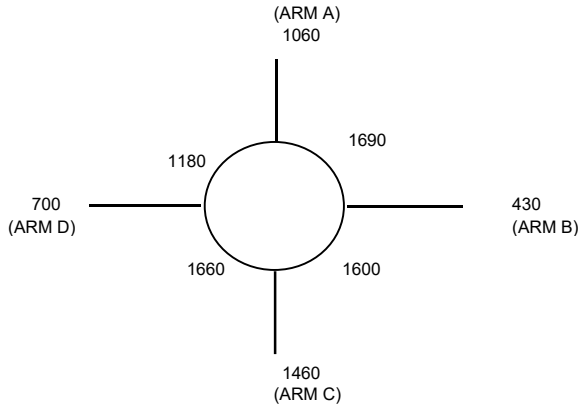
CRITICAL DFC = 0.84

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J7 - Pok Oi Interchange	Scenario	2034 PM Peak Hour Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.30	3.70	9.00	3.50
E = Entry width (m)	7.30	7.40	12.00	7.00
L = Effective length of flare (m)	13.00	6.00	5.00	5.00
R = Entry radius (m)	21.00	25.00	25.00	25.00
D = Inscribed circle diameter (m)	110.00	80.00	110.00	80.00
A = Entry angle (degree)	35.00	50.00	45.00	45.00
Q = Entry flow (pcu/h)	1060	430	1460	700
Qc= Circulating flow across entry (pcu/h)	1690	1600	1660	1180
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.12	0.99	0.96	1.12
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	0.94	0.96	0.96
X2= V + ((E-V)/(1+2S))	7.10	4.94	10.03	4.58
M = EXP((D-60)/10)	148.41	7.39	148.41	7.39
F = 303*X2	2152	1498	3038	1388
Td= 1+(0.5/(1+M))	1.00	1.06	1.00	1.06
Fc= 0.21*Td(1+0.2*X2)	0.51	0.44	0.63	0.43
Qe= K(F-Fc*Qc)	1271	743	1903	847
DFC = Design flow/Capacity = Q/Qe	0.83	0.58	0.77	0.83

TOTAL ENTRY FLOWS = 5420 PCU

CRITICAL DFC = 0.83

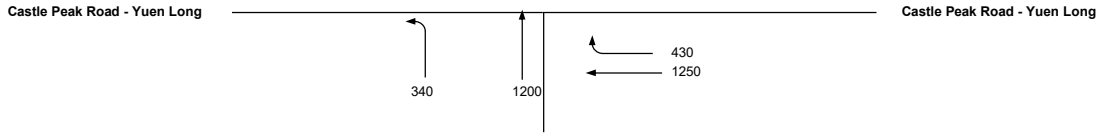
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Pok Oi Interchange (Yuen Long Highway NB Slip Road)	2034 AM Reference Trafic Flows	DESIGN: 0	CHECK: 0	JOB NO:	DATE: Nov 20

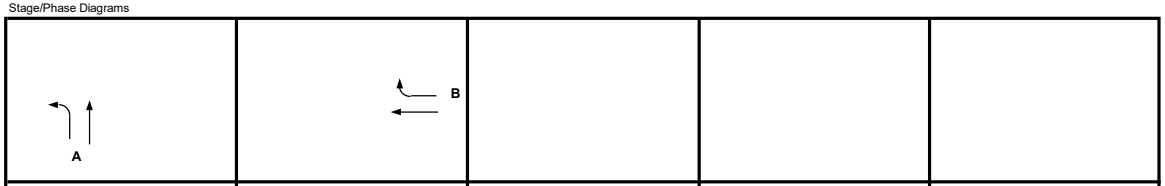
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.724	
Lost time		L =	8	sec
Total Flow		=	9,020	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	62	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	29	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.840	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	16.0	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	41	sec
Y_{max}	$= 1-L/C$	=	0.933	

Stage/Phase Diagrams



Critical Case : A,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 16%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↰	A	1	5.000	1	25			0		0		2255	340	420		760	45%		2196	0.346	0.346
↑	A	1	5.000	1				0		0		2255		780		780			2255	0.346	
↑	B	2	5.000	1				0		0		2255		853		853			2255	0.378	
↱	B	2	5.000	1		25	0	0		0		2255		397	430	827		52%	2187	0.378	0.378

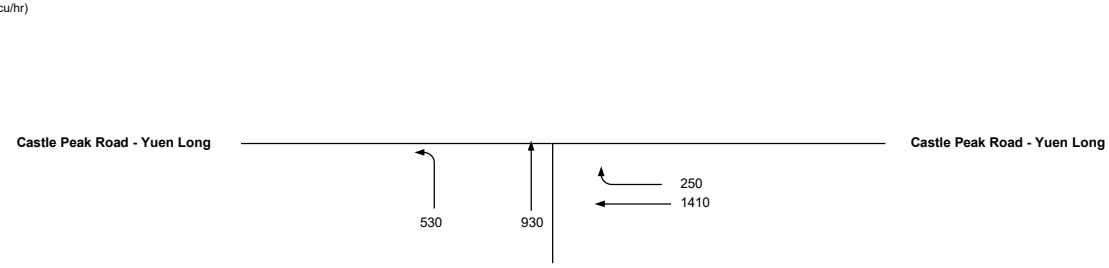
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Pok Oi Interchange (Yuen Long Highway NB Slip Road)	2034 PM Reference Trafic Flows	DESIGN: 0	CHECK: 0	JOB NO:	DATE: Nov 20

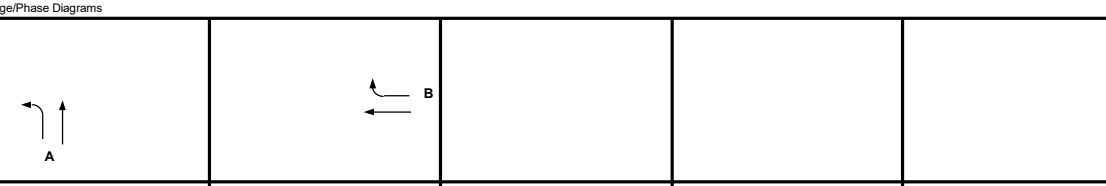
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.702	
Lost time		L =	8	sec
Total Flow		=	9,020	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	57	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	27	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.840	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	19.6	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	36	sec
Y_{max}	$= 1-L/C$	=	0.933	

Stage/Phase Diagrams



I/G = 5 I/G = 5

Critical Case : A,B

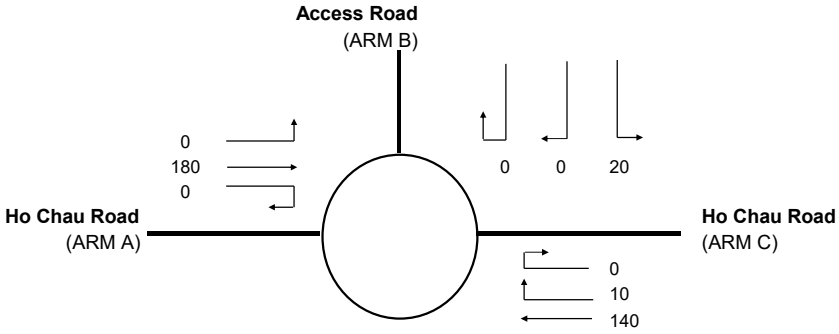
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 20%

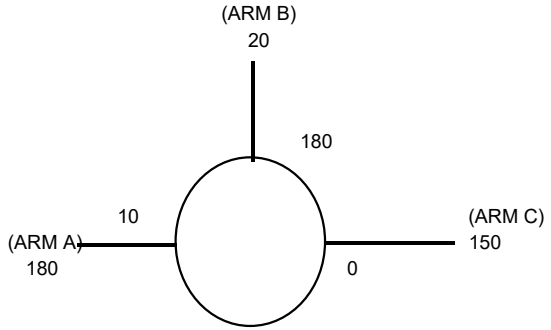
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↰	A	1	5.000	1	25			0		0		2255	530	184		714	74%		2159	0.331	0.331
↑	A	1	5.000	1				0		0		2255		746		746			2255	0.331	
↑	B	2	5.000	1				0		0		2255		838		838			2255	0.371	0.371
↱	B	2	5.000	1		25	0	0		0		2255		573	250	823		30%	2215	0.371	

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J8 - Ho Chau Road / Access Road	Scenario	2034 AM Peak Hour Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
							22/Mar/24





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	3.70	4.50	4.00
E = Entry width (m)	4.50	5.70	4.60
L = Effective length of flare (m)	4.50	4.00	2.50
R = Entry radius (m)	15.00	7.50	35.00
D = Inscribed circle diameter (m)	28.00	28.00	28.00
A = Entry angle (degree)	40.00	38.00	34.00
Q = Entry flow (pcu/h)	180	20	150
Qc= Circulating flow across entry (pcu/h)	10	180	0
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.28	0.48	0.38
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.95	0.89	1.01
X2= V + ((E-V)/(1+2S))	4.21	5.11	4.34
M = EXP((D-60)/10)	0.04	0.04	0.04
F = 303*X2	1276	1549	1315
Td= 1+(0.5/(1+M))	1.48	1.48	1.48
Fc= 0.21*Td(1+0.2*X2)	0.57	0.63	0.58
Qe= K(F-Fc*Qc)	1205	1279	1324
DFC = Design flow/Capacity = Q/Qe	0.15	0.02	0.11

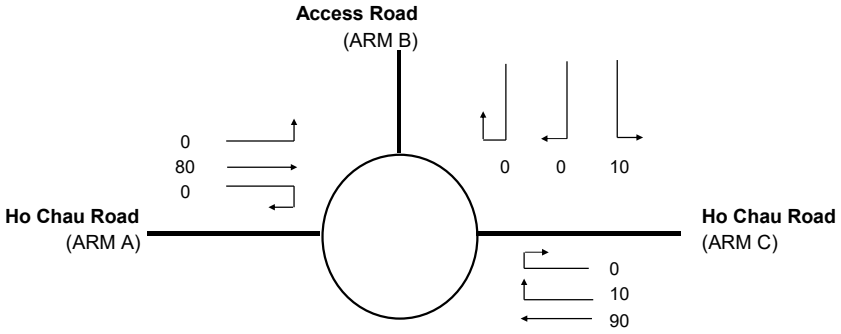
TOTAL ENTRY FLOWS = 350 PCU

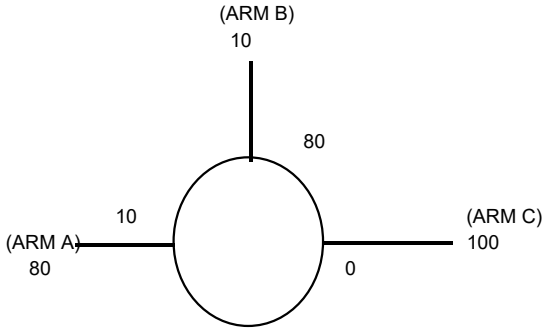
CRITICAL DFC = 0.15

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J8 - Ho Chau Road / Access Road	Scenario	2034 PM Peak Hour Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
							22/Mar/24





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	3.70	4.50	4.00
E = Entry width (m)	4.50	5.70	4.60
L = Effective length of flare (m)	4.50	4.00	2.50
R = Entry radius (m)	15.00	7.50	35.00
D = Inscribed circle diameter (m)	28.00	28.00	28.00
A = Entry angle (degree)	40.00	38.00	34.00
Q = Entry flow (pcu/h)	80	10	100
Qc= Circulating flow across entry (pcu/h)	10	80	0
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.28	0.48	0.38
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.95	0.89	1.01
X2= V + ((E-V)/(1+2S))	4.21	5.11	4.34
M = EXP((D-60)/10)	0.04	0.04	0.04
F = 303*X2	1276	1549	1315
Td= 1+(0.5/(1+M))	1.48	1.48	1.48
Fc= 0.21*Td(1+0.2*X2)	0.57	0.63	0.58
Qe= K(F-Fc*Qc)	1205	1335	1324
DFC = Design flow/Capacity = Q/Qe	0.07	0.01	0.08

TOTAL ENTRY FLOWS = 190 PCU

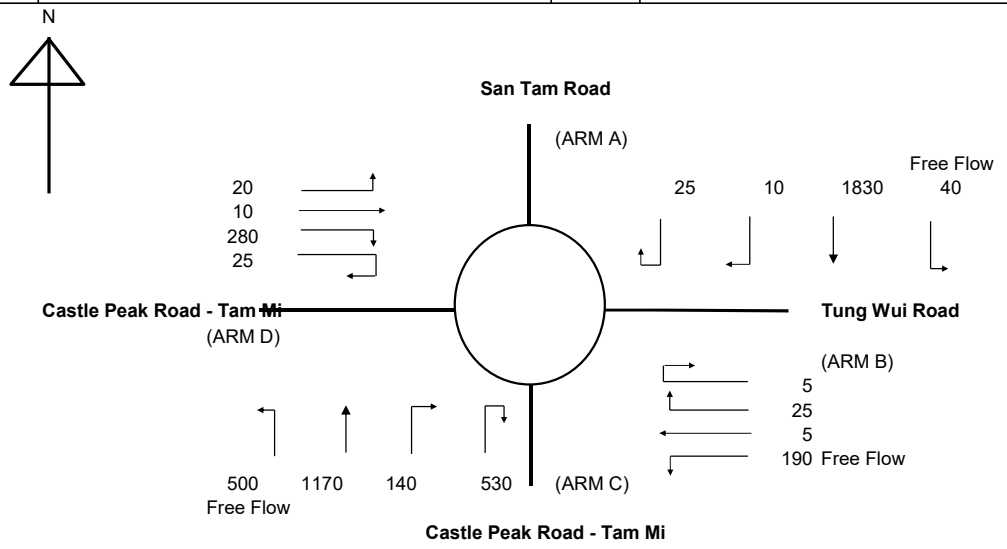
CRITICAL DFC = 0.08

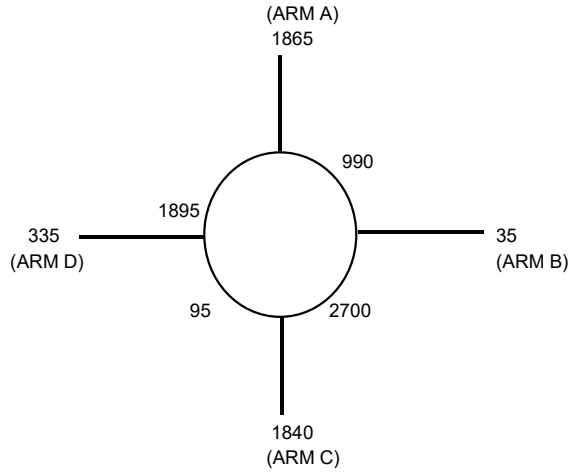
Design Flow

ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 AM Design Traffic Flows (Planned Layout)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1865	35	1840	335	*
Qc= Circulating flow across entry (pcu/h)	990	2700	95	1895	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2271	-20	2463	634	
DFC = Design flow/Capacity = Q/Qe	0.82	-1.78	0.75	0.53	

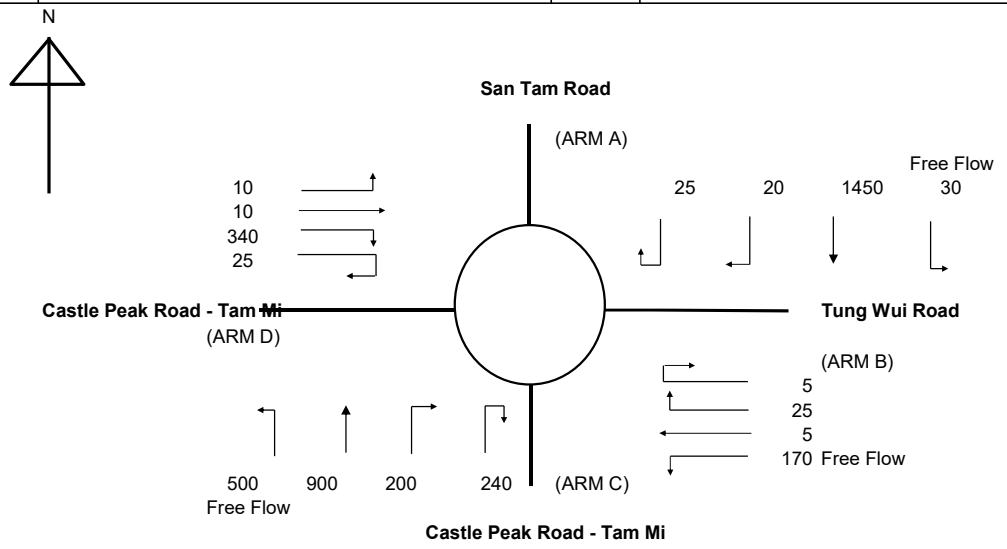
TOTAL ENTRY FLOWS 4805 PCU

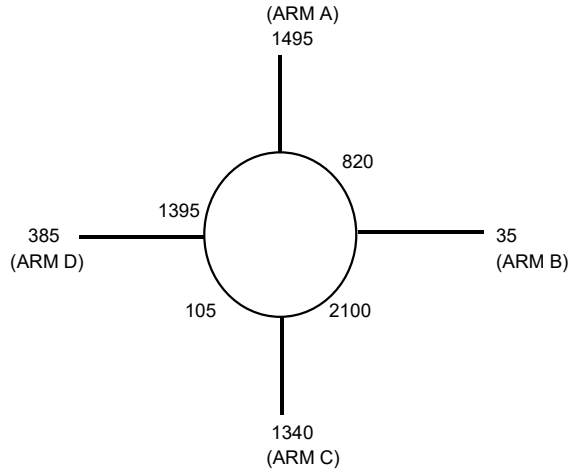
CRITICAL DFC 0.82

ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 PM Design Traffic Flows (Planned Layout)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1495	35	1340	385	*
Qc= Circulating flow across entry (pcu/h)	820	2100	105	1395	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2427	357	2455	969	
DFC = Design flow/Capacity = Q/Qe	0.62	0.10	0.55	0.40	

TOTAL ENTRY FLOWS 3955 PCU

CRITICAL DFC 0.62

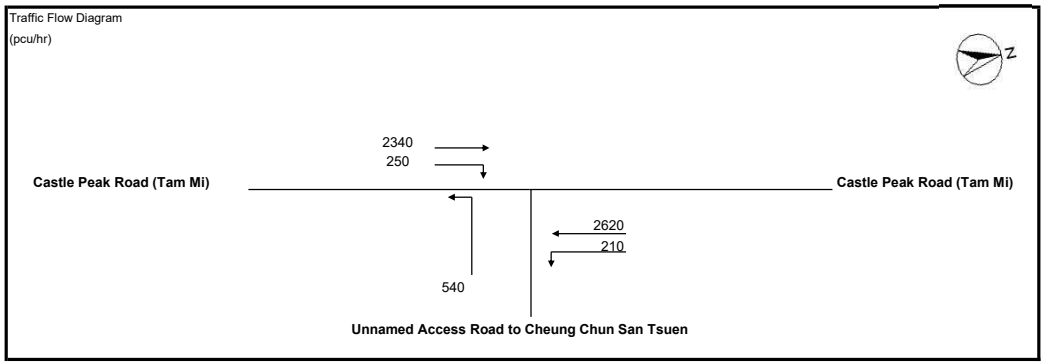
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsu	2034 AM Peak Hour Design Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

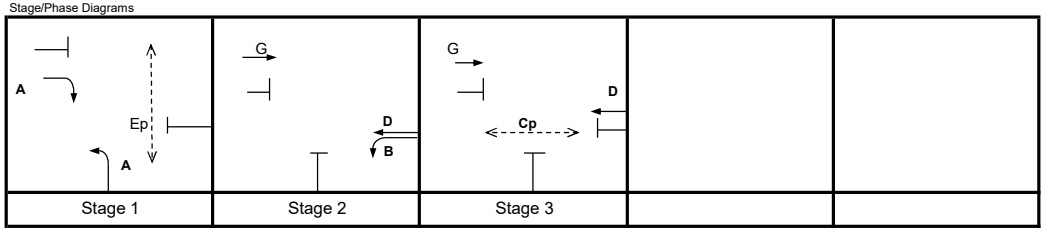
J2

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	120	sec
Sum(y)		Y =	0.760	
Lost time		L =	9	sec
Total Flow		=	16,495	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	77	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	37	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	9.6	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	58	sec
Y_{max}	$= 1-L/C$	=	0.925	

Stage/Phase Diagrams



I/G = 5 I/G = 6 I/G =

Critical Case : A,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 10%

CHECK CRITICAL !!!

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↓	A	1	3.500	1		12.5	0	0		0		2105			250	250		100%	1879	0.133	
→	G	2,3	3.500	2				1		0		4070		2340		2340			4070	0.575	
↰	A	1	3.650	2	20			1		0		4100	540			540	100%		3814	0.142	0.142
↰	B	2	3.650	1	15			1		0		1980	210			210	100%		1800	0.117	
←	D	2,3	3.650	2				0		0		4240		2620		2620			4240	0.618	0.618

Pedestrian Crossing				GM		FGM				
	Cp	3	min.	11	+	21	=	32	sec	
	Ep	1	min.	11	+	10	=	21	sec	

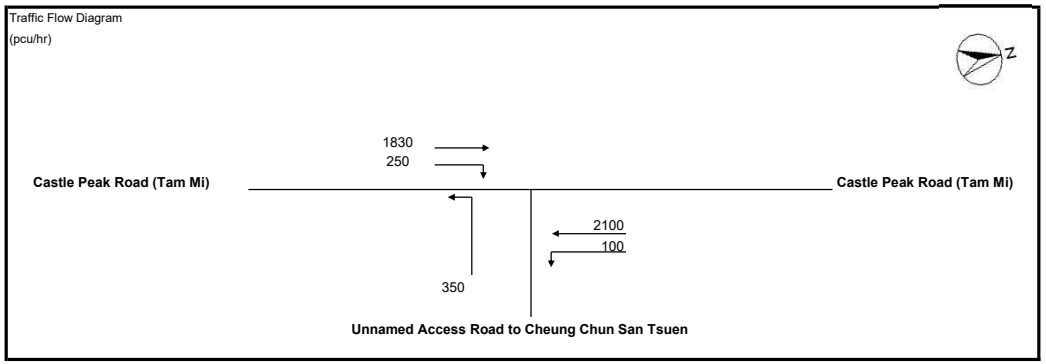
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsu	2034 PM Peak Hour Design Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

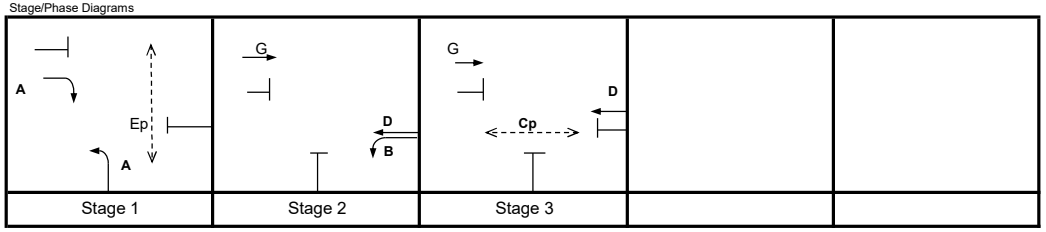
J2

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	120	sec
Sum(y)		Y =	0.628	
Lost time		L =	9	sec
Total Flow		=	16,495	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	50	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	24	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	32.5	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	30	sec
Y_{max}	$= 1-L/C$	=	0.925	

Stage/Phase Diagrams



I/G = 5 I/G = 6 I/G =

Critical Case : A,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 33%

CHECK CRITICAL !!!

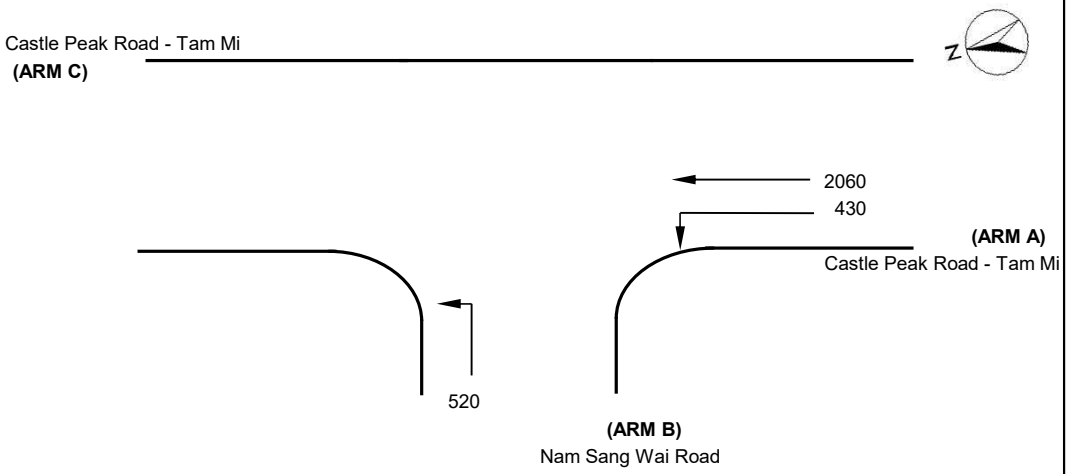
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↓	A	1	3.500	1		12.5	0	0		0		2105			250	250		100%	1879	0.133	0.133
→	G	2,3	3.500	2				1		0		4070		1830		1830			4070	0.450	
↰	A	1	3.650	2	20			1		0		4100	350			350	100%		3814	0.092	
↰	B	2	3.650	1	15			1		0		1980	100			100	100%		1800	0.056	
←	D	2,3	3.650	2				0		0		4240		2100		2100			4240	0.495	0.495

Pedestrian Crossing			GM		FGM				
	Cp	3	min.	11	+	21	=	32	sec
	Ep	1	min.	11	+	10	=	21	sec

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 AM Peak Hour Design Traffic Flows	Designed By : MKCN	Checked By : SHSN	Job No. : -	Date : Mar 24



NOTES : (GEOMETRIC INPUT DATA) J3

- W = Major Road Width (6.4 - 20.0)
- W cr = Central Reserve width (1.2 - 9.0, kerbed central reserve only)
- W b-a = Lane width available to vehicle waiting in stream b-a (2.05 - 4.7)
- W b-c = Lane width available to vehicle waiting in stream b-c (2.05 - 4.7)
- W c-b = Lane width available to vehicle waiting in stream c-b (2.05 - 4.7)
- Vl b-a = Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
- Vr b-a = Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
- Vr b-c = Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
- Vr c-b = Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)

- D = Stream-specific B-A
- E = Stream-specific B-C
- F = Stream-specific C-B
- Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	16	(metres)
W cr	=	0	(metres)
q a-b	=	430	(pcu/hr)
q a-c	=	2060	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	0	(metres)
Vr c-b	=	0	(metres)
q c-a	=	0	(pcu/hr)
q c-b	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	0	(metres)
W b-c	=	4.07	(metres)
Vl b-a	=	40	(metres)
Vr b-a	=	35	(metres)
Vr b-c	=	40	(metres)
q b-a	=	0	(pcu/hr)
q b-c	=	520	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.566608
E	=	0.964637
F	=	0.585955
Y	=	0.448000

THE CAPACITY OF MOVEMENT :

Q b-a	=	149
Q b-c	=	368
Q c-b	=	199
Q b-ac	=	368

CRITICAL DFC = 1.41

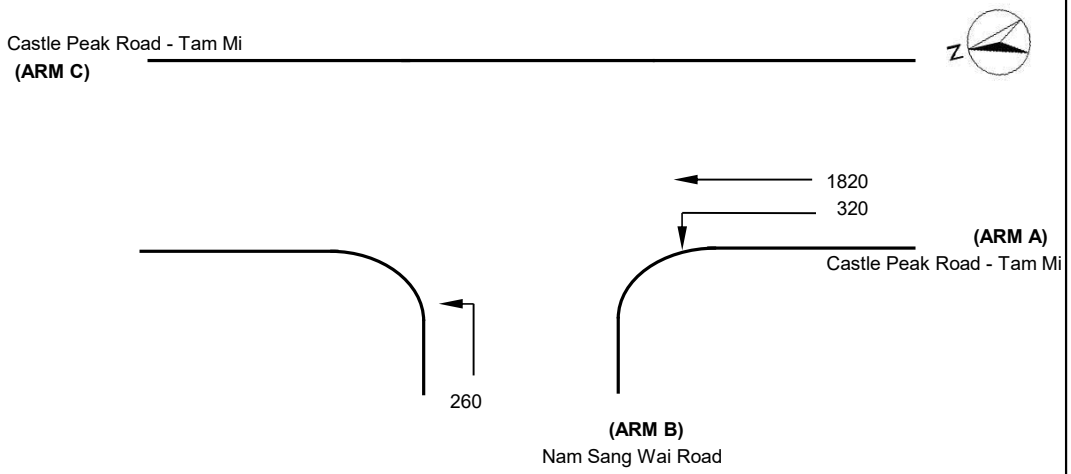
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	1.41
DFC c-b	=	0.00
DFC b-ac	=	1.41

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 PM Peak Hour Design Traffic Flows	Designed By : MKCN	Checked By : SHSN	Job No. : -	Date : Mar 24



NOTES : (GEOMETRIC INPUT DATA) J3

- W = Major Road Width (6.4 - 20.0)
- W cr = Central Reserve width (1.2 - 9.0, kerbed central reserve only)
- W b-a = Lane width available to vehicle waiting in stream b-a (2.05 - 4.7)
- W b-c = Lane width available to vehicle waiting in stream b-c (2.05 - 4.7)
- W c-b = Lane width available to vehicle waiting in stream c-b (2.05 - 4.7)
- Vl b-a = Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
- Vr b-a = Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
- Vr b-c = Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
- Vr c-b = Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)

- D = Stream-specific B-A
- E = Stream-specific B-C
- F = Stream-specific C-B
- Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	16	(metres)
W cr	=	0	(metres)
q a-b	=	320	(pcu/hr)
q a-c	=	1820	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	0	(metres)
Vr c-b	=	0	(metres)
q c-a	=	0	(pcu/hr)
q c-b	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	0	(metres)
W b-c	=	4.07	(metres)
Vl b-a	=	40	(metres)
Vr b-a	=	35	(metres)
Vr b-c	=	40	(metres)
q b-a	=	0	(pcu/hr)
q b-c	=	260	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.566608
E	=	0.964637
F	=	0.585955
Y	=	0.448000

THE CAPACITY OF MOVEMENT :

Q b-a	=	175
Q b-c	=	412
Q c-b	=	232
Q b-ac	=	412

CRITICAL DFC = 0.63

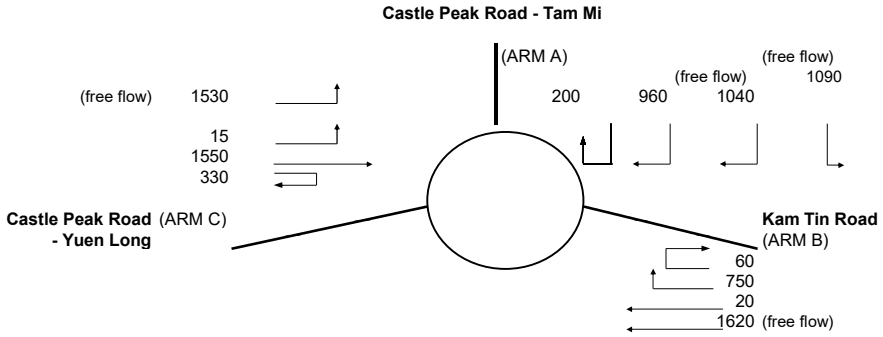
COMPARISION OF DESIGN FLOW TO CAPACITY :

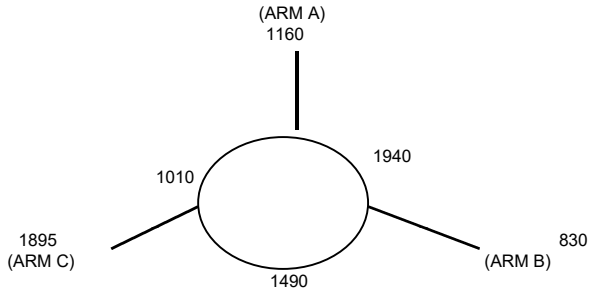
DFC b-a	=	0.00
DFC b-c	=	0.63
DFC c-b	=	0.00
DFC b-ac	=	0.63

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J4 - Au Tau Interchange	Scenario	2034 AM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	6.50	7.00	7.30
E = Entry width (m)	11.00	7.00	9.70
L = Effective length of flare (m)	22.00	1.00	50.00
R = Entry radius (m)	45.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	20.00	5.00	20.00
Q = Entry flow (pcu/h)	1160	830	1895
Qc= Circulating flow across entry (pcu/h)	1940	1490	1010
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.33	0.00	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.06	1.13	1.07
X2= V + ((E-V)/(1+2S))	9.22	7.00	9.38
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2794	2121	2842
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.71	0.60	0.72
Qe= K(F-Fc*Qc)	1504	1383	2273
DFC = Design flow/Capacity = Q/Qe	0.77	0.60	0.83

TOTAL ENTRY FLOWS = 6285 PCU

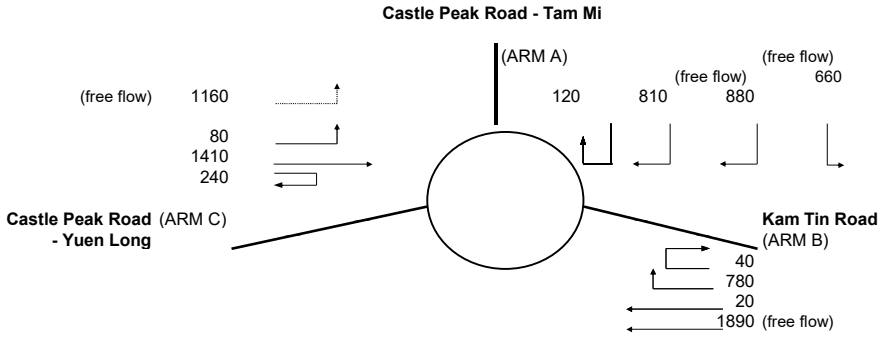
CRITICAL DFC = 0.83

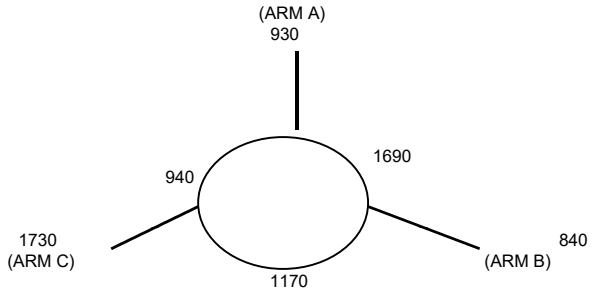
Filename : J10 - Au Tau Interchange.xlsx / DesAB_AM_OG

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J4 - Au Tau Interchange	Scenario	2034 PM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	6.50	7.00	7.30
E = Entry width (m)	11.00	7.00	9.70
L = Effective length of flare (m)	22.00	1.00	50.00
R = Entry radius (m)	45.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	20.00	5.00	20.00
Q = Entry flow (pcu/h)	930	840	1730
Qc= Circulating flow across entry (pcu/h)	1690	1170	940
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.33	0.00	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.06	1.13	1.07
X2= V + ((E-V)/(1+2S))	9.22	7.00	9.38
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2794	2121	2842
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.71	0.60	0.72
Qe= K(F-Fc*Qc)	1692	1599	2327
DFC = Design flow/Capacity = Q/Qe	0.55	0.53	0.74

TOTAL ENTRY FLOWS = 6110 PCU

CRITICAL DFC = 0.74

Filename : J10 - Au Tau Interchange.xlsx / DesAB_PM_OG

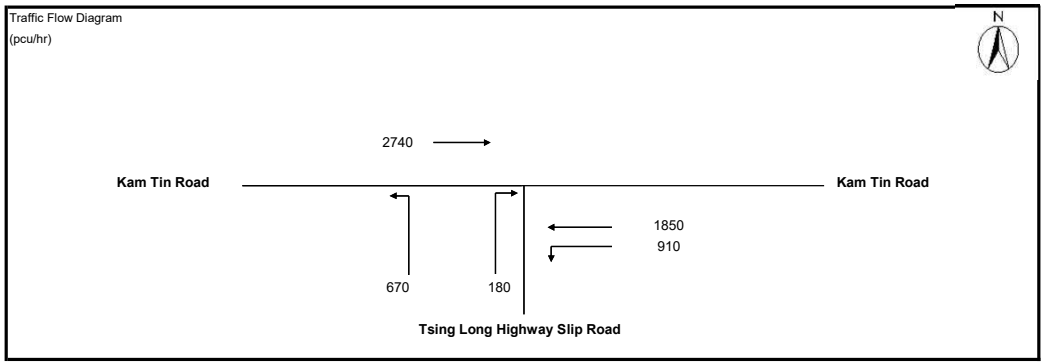
JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - Kam Tin Road / Tsing Long Highway Slip Road	2034 AM Peak Hour Design Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

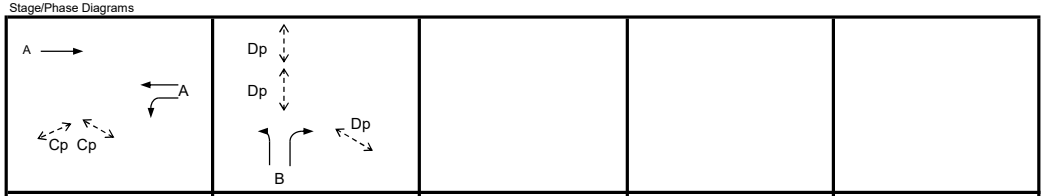
J5

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.647	
Lost time		L =	11	sec
Total Flow		=	20,960	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	61	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	31	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	26.4	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	39	sec
Y_{max}	$= 1-L/C$	=	0.908	

Stage/Phase Diagrams



I/G = 8 I/G = 5

Critical Case : A,B

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 26%

).xlsm]

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
→	A	1	3.650	3				1		0		6220		2740		2740			6220	0.441	
←	A	1	3.600	2				0		0	190	4230		1850		1850			4420	0.419	
↰	A	1	3.650	1	50			1		0		1980	910			910	100%		1922	0.473	0.473
↰	B	2	3.650	2	25			1		0		4100	670			670	100%		3868	0.173	0.173
↱	B	2	3.650	2		40	0	0		0		4240			180	180		100%	4087	0.044	

Pedestrian Crossing			GM		FGM				
	Cp	1	min.	5	+	7	=	12	sec
	Dp	2	min.	5	+	10	=	15	sec

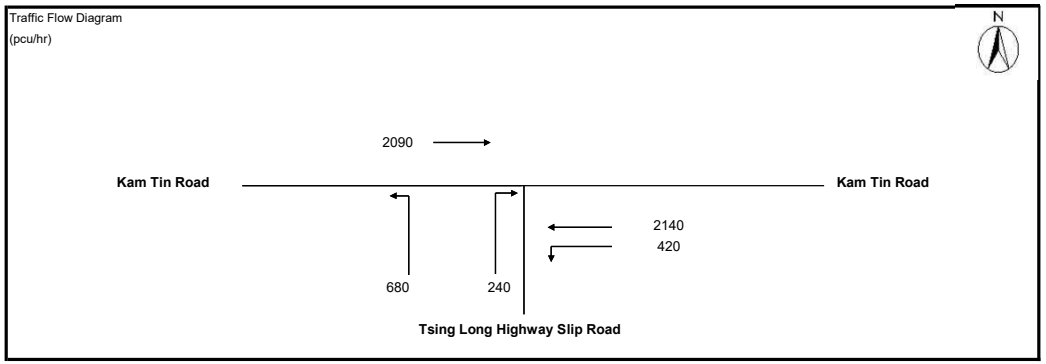
JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - Kam Tin Road / Tsing Long Highway Slip Road	2034 PM Peak Hour Design Traffic Flows	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J5

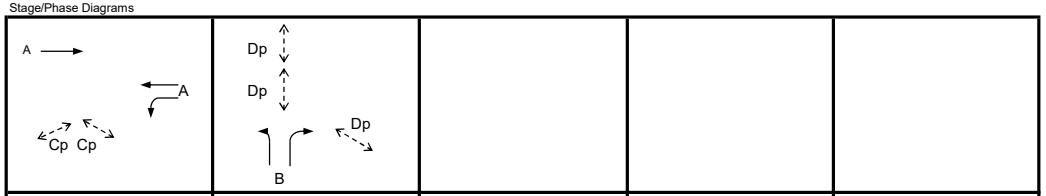
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	120	sec
Sum(y)	Y =	0.660	
Lost time	L =	11	sec
Total Flow	=	20,960	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	63	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	32	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	23.9	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	41	sec
Y_{max}	$= 1-L/C$	=	0.908	

Stage/Phase Diagrams



I/G = 8 I/G = 5

Critical Case : A,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 24%

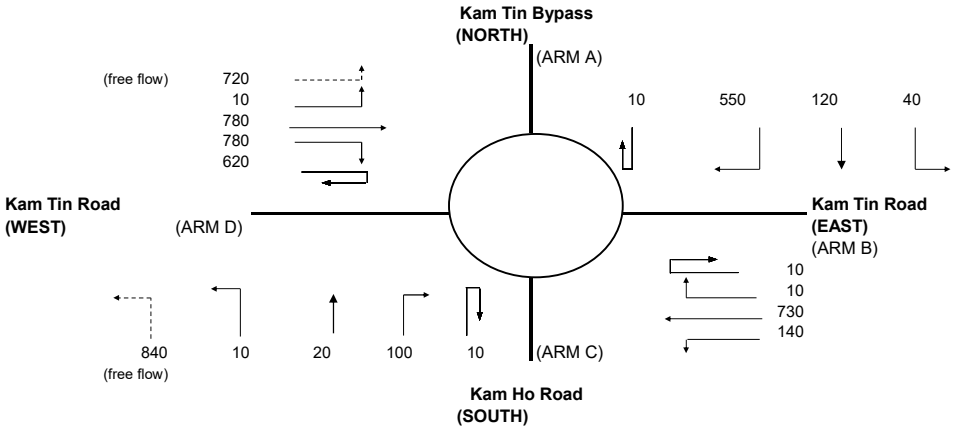
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
→	A	1	3.650	3				1		0		6220		2090		2090			6220	0.336	
←	A	1	3.600	2				0		0	190	4230		2140		2140			4420	0.484	0.484
↰	A	1	3.650	1	50			1		0		1980	420			420	100%		1922	0.218	
↰	B	2	3.650	2	25			1		0		4100	680			680	100%		3868	0.176	0.176
↱	B	2	3.650	2		40	0	0		0		4240			240	240		100%	4087	0.059	

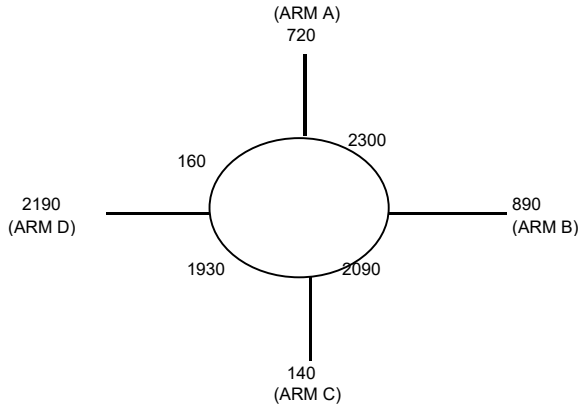
Pedestrian Crossing				GM		FGM			
	Cp	1	min.	5	+	7	=	12	sec
	Dp	2	min.	5	+	10	=	15	sec

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J6 - Kam Tin Road / Kam Tin Bypass / Kam Ho Road	Scenario	2034 AM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.50	7.30	9.00	7.30
E = Entry width (m)	11.00	10.00	10.00	11.00
L = Effective length of flare (m)	15.00	12.00	1.00	13.00
R = Entry radius (m)	42.50	70.00	20.00	42.50
D = Inscribed circle diameter (m)	88.00	88.00	88.00	88.00
A = Entry angle (degree)	39.00	30.00	37.50	29.00
Q = Entry flow (pcu/h)	720	890	140	2190
Qc= Circulating flow across entry (pcu/h)	2300	2090	1930	160
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.48	0.36	1.60	0.46
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.03	0.97	1.03
X2= V + ((E-V)/(1+2S))	8.80	8.87	9.24	9.24
M = EXP((D-60)/10)	16.44	16.44	16.44	16.44
F = 303*X2	2665	2688	2799	2799
Td= 1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc= 0.21*Td(1+0.2*X2)	0.60	0.60	0.62	0.62
Qe= K(F-Fc*Qc)	1287	1485	1570	2779
DFC = Design flow/Capacity = Q/Qe	0.56	0.60	0.09	0.79

TOTAL ENTRY FLOWS = 4660 PCU

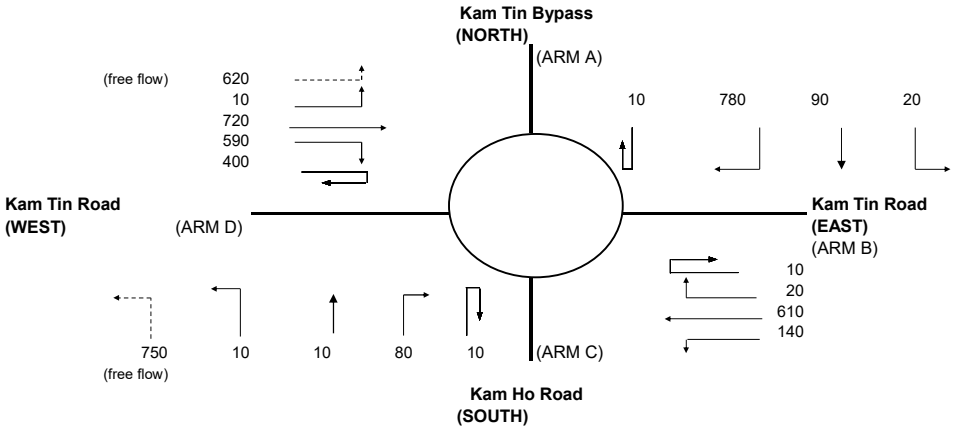
CRITICAL DFC = 0.79

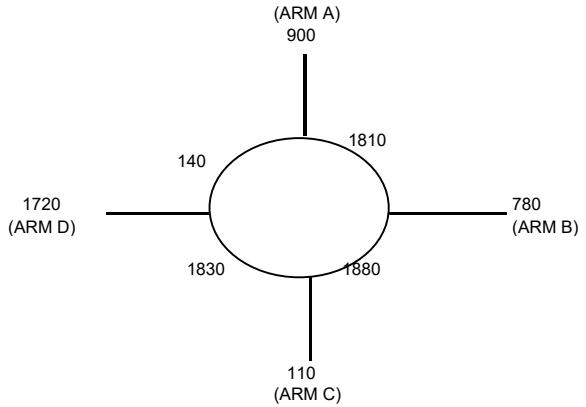
Filename : J13 - Kam Tin Road-Kam Tin Bypass-Kam Ho Road.xlsx / DesAB_AM_OG

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J6 - Kam Tin Road / Kam Tin Bypass / Kam Ho Road	Scenario	2034 PM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.50	7.30	9.00	7.30
E = Entry width (m)	11.00	10.00	10.00	11.00
L = Effective length of flare (m)	15.00	12.00	1.00	13.00
R = Entry radius (m)	42.50	70.00	20.00	42.50
D = Inscribed circle diameter (m)	88.00	88.00	88.00	88.00
A = Entry angle (degree)	39.00	30.00	37.50	29.00
Q = Entry flow (pcu/h)	900	780	110	1720
Qc= Circulating flow across entry (pcu/h)	1810	1880	1830	140
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.48	0.36	1.60	0.46
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.03	0.97	1.03
X2= V + ((E-V)/(1+2S))	8.80	8.87	9.24	9.24
M = EXP((D-60)/10)	16.44	16.44	16.44	16.44
F = 303*X2	2665	2688	2799	2799
Td= 1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc= 0.21*Td(1+0.2*X2)	0.60	0.60	0.62	0.62
Qe= K(F-Fc*Qc)	1578	1616	1630	2792
DFC = Design flow/Capacity = Q/Qe	0.57	0.48	0.07	0.62

TOTAL ENTRY FLOWS = 4130 PCU

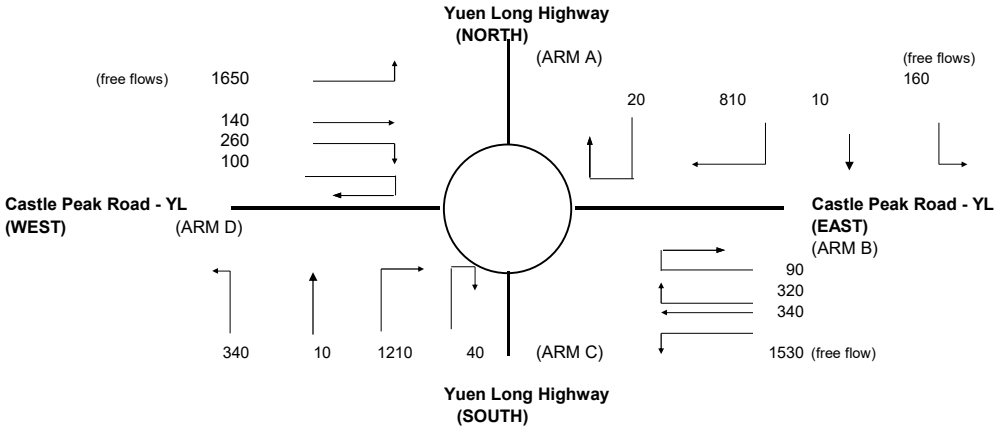
CRITICAL DFC = 0.62

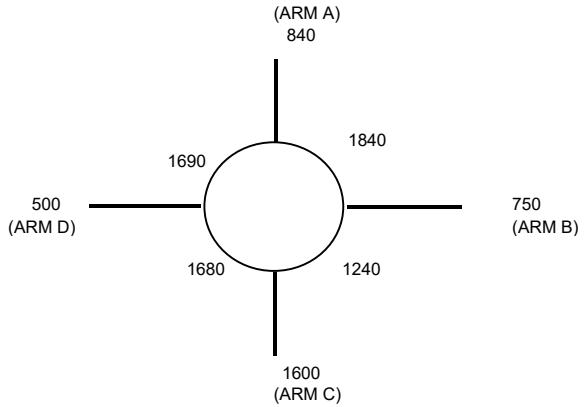
Filename : J13 - Kam Tin Road-Kam Tin Bypass-Kam Ho Road.xlsx / DesAB_PM_OG

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J7 - Pok Oi Interchange	Scenario	2034 AM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.30	3.70	9.00	3.50
E = Entry width (m)	7.30	7.40	12.00	7.00
L = Effective length of flare (m)	13.00	6.00	5.00	5.00
R = Entry radius (m)	21.00	25.00	25.00	25.00
D = Inscribed circle diameter (m)	110.00	80.00	110.00	80.00
A = Entry angle (degree)	35.00	50.00	45.00	45.00
Q = Entry flow (pcu/h)	840	750	1600	500
Qc= Circulating flow across entry (pcu/h)	1840	1240	1680	1690
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.12	0.99	0.96	1.12
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	0.94	0.96	0.96
X2= V + ((E-V)/(1+2S))	7.10	4.94	10.03	4.58
M = EXP((D-60)/10)	148.41	7.39	148.41	7.39
F = 303*X2	2152	1498	3038	1388
Td= 1+(0.5/(1+M))	1.00	1.06	1.00	1.06
Fc= 0.21*Td(1+0.2*X2)	0.51	0.44	0.63	0.43
Qe= K(F-Fc*Qc)	1195	893	1891	639
DFC = Design flow/Capacity = Q/Qe	0.70	0.84	0.85	0.78

TOTAL ENTRY FLOWS = 5340 PCU

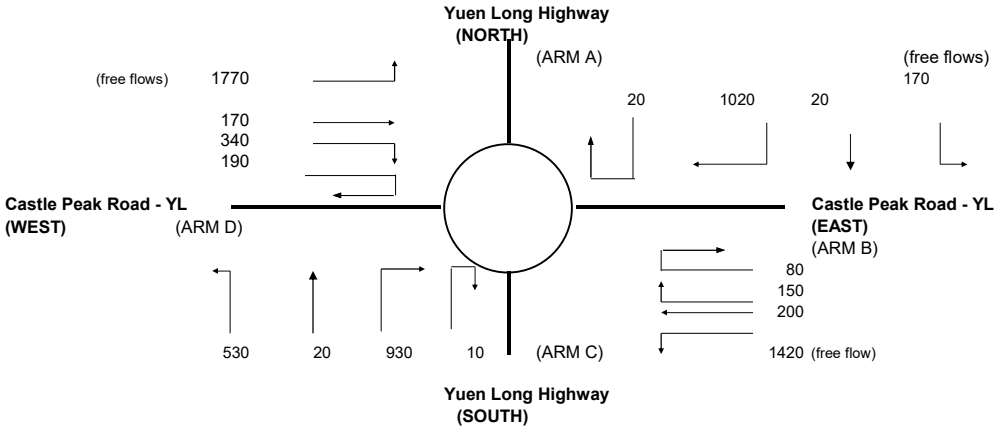
CRITICAL DFC = 0.85

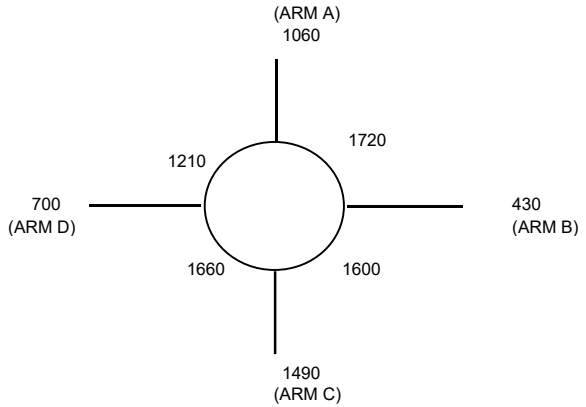
Filename : J11 - Pok Oi Interchange_(with Signal).xlsm / DesAB_AM

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J7 - Pok Oi Interchange	Scenario	2034 PM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.30	3.70	9.00	3.50
E = Entry width (m)	7.30	7.40	12.00	7.00
L = Effective length of flare (m)	13.00	6.00	5.00	5.00
R = Entry radius (m)	21.00	25.00	25.00	25.00
D = Inscribed circle diameter (m)	110.00	80.00	110.00	80.00
A = Entry angle (degree)	35.00	50.00	45.00	45.00
Q = Entry flow (pcu/h)	1060	430	1490	700
Qc= Circulating flow across entry (pcu/h)	1720	1600	1660	1210
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.12	0.99	0.96	1.12
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	0.94	0.96	0.96
X2= V + ((E-V)/(1+2S))	7.10	4.94	10.03	4.58
M = EXP((D-60)/10)	148.41	7.39	148.41	7.39
F = 303*X2	2152	1498	3038	1388
Td= 1+(0.5/(1+M))	1.00	1.06	1.00	1.06
Fc= 0.21*Td(1+0.2*X2)	0.51	0.44	0.63	0.43
Qe= K(F-Fc*Qc)	1256	743	1903	835
DFC = Design flow/Capacity = Q/Qe	0.84	0.58	0.78	0.84

TOTAL ENTRY FLOWS = 5450 PCU

CRITICAL DFC = 0.84

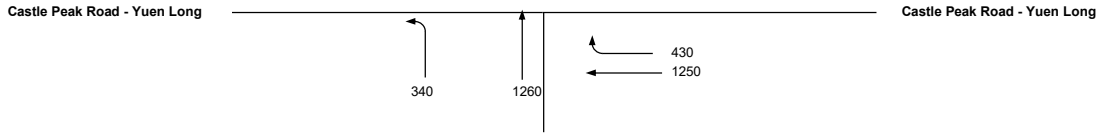
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Pok Oi Interchange (Yuen Long Highway NB Slip Road)	2034 AM Design Trafic Flows	DESIGN: 0	CHECK: 0	JOB NO:	DATE: Nov 20

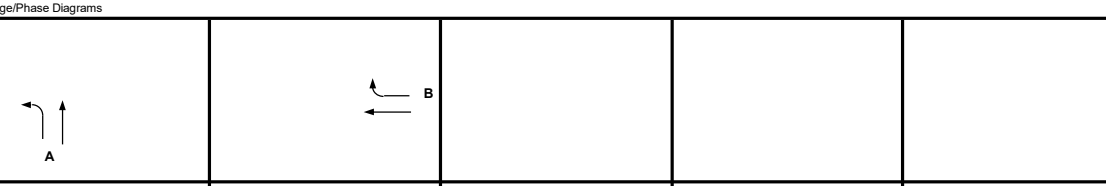
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.738	
Lost time		L =	8	sec
Total Flow		=	9,020	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	65	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	30	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.840	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	13.9	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	44	sec
Y_{max}	$= 1-L/C$	=	0.933	

Stage/Phase Diagrams



I/G = 5 I/G = 5

Critical Case : A,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 14%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↰	A	1	5.000	1	25			0		0		2255	340	450		790	43%		2198	0.359	
↑	A	1	5.000	1				0		0		2255		810		810			2255	0.359	0.359
↑	B	2	5.000	1				0		0		2255		853		853			2255	0.378	
↱	B	2	5.000	1		25	0	0		0		2255		397	430	827		52%	2187	0.378	0.378

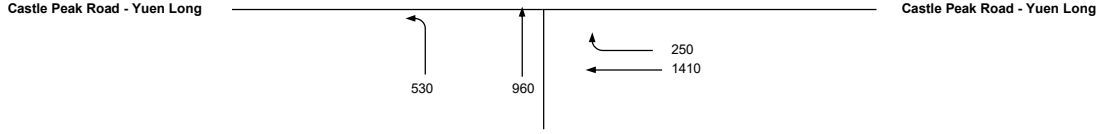
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Pok Oi Interchange (Yuen Long Highway NB Slip Road)	2034 PM Design Trafic Flows	DESIGN: 0	CHECK: 0	JOB NO:	DATE: Nov 20

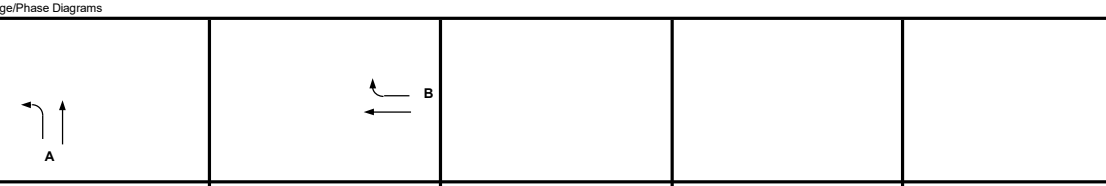
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.709	
Lost time		L =	8	sec
Total Flow		=	9,020	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	58	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	27	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.840	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	18.5	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	38	sec
Y_{max}	$= 1-L/C$	=	0.933	

Stage/Phase Diagrams



I/G = 5 I/G = 5

Critical Case : A,B

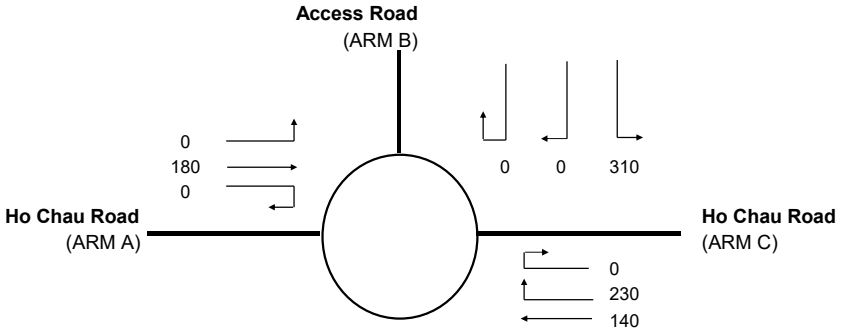
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 19%

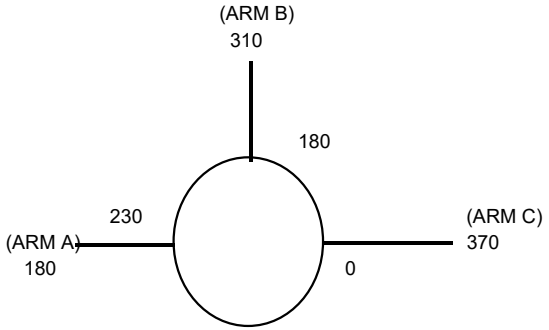
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↰	A	1	5.000	1	25			0		0		2255	530	199		729	73%		2161	0.337	0.337
↑	A	1	5.000	1				0		0		2255		761		761			2255	0.337	
↑	B	2	5.000	1				0		0		2255		838		838			2255	0.371	0.371
↱	B	2	5.000	1		25	0	0		0		2255		573	250	823		30%	2215	0.371	

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J8 - Ho Chau Road / Access Road	Scenario	2034 AM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
							22/Mar/24





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	3.70	4.50	4.00
E = Entry width (m)	4.50	5.70	4.60
L = Effective length of flare (m)	4.50	4.00	2.50
R = Entry radius (m)	15.00	7.50	35.00
D = Inscribed circle diameter (m)	28.00	28.00	28.00
A = Entry angle (degree)	40.00	38.00	34.00
Q = Entry flow (pcu/h)	180	310	370
Qc= Circulating flow across entry (pcu/h)	230	180	0
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.28	0.48	0.38
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.95	0.89	1.01
X2= V + ((E-V)/(1+2S))	4.21	5.11	4.34
M = EXP((D-60)/10)	0.04	0.04	0.04
F = 303*X2	1276	1549	1315
Td= 1+(0.5/(1+M))	1.48	1.48	1.48
Fc= 0.21*Td(1+0.2*X2)	0.57	0.63	0.58
Qe= K(F-Fc*Qc)	1086	1279	1324
DFC = Design flow/Capacity = Q/Qe	0.17	0.24	0.28

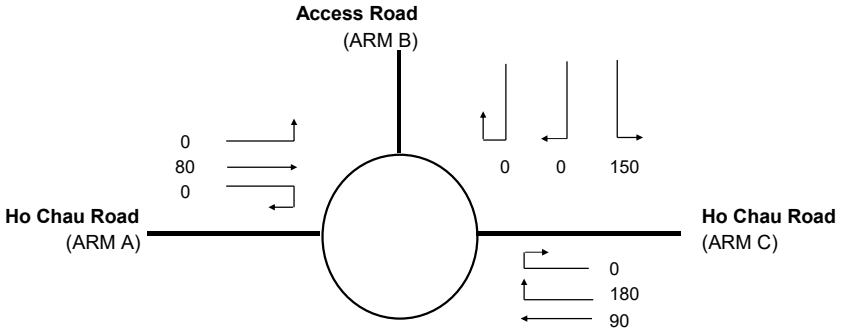
TOTAL ENTRY FLOWS = 860 PCU

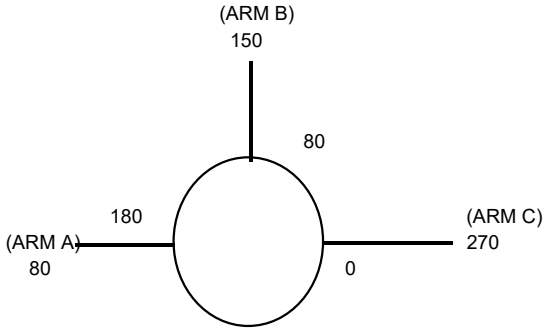
CRITICAL DFC = 0.28

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J8 - Ho Chau Road / Access Road	Scenario	2034 PM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
							22/Mar/24





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	3.70	4.50	4.00
E = Entry width (m)	4.50	5.70	4.60
L = Effective length of flare (m)	4.50	4.00	2.50
R = Entry radius (m)	15.00	7.50	35.00
D = Inscribed circle diameter (m)	28.00	28.00	28.00
A = Entry angle (degree)	40.00	38.00	34.00
Q = Entry flow (pcu/h)	80	150	270
Qc= Circulating flow across entry (pcu/h)	180	80	0
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.28	0.48	0.38
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.95	0.89	1.01
X2= V + ((E-V)/(1+2S))	4.21	5.11	4.34
M = EXP((D-60)/10)	0.04	0.04	0.04
F = 303*X2	1276	1549	1315
Td= 1+(0.5/(1+M))	1.48	1.48	1.48
Fc= 0.21*Td(1+0.2*X2)	0.57	0.63	0.58
Qe= K(F-Fc*Qc)	1113	1335	1324
DFC = Design flow/Capacity = Q/Qe	0.07	0.11	0.20

TOTAL ENTRY FLOWS = 500 PCU

CRITICAL DFC = 0.20

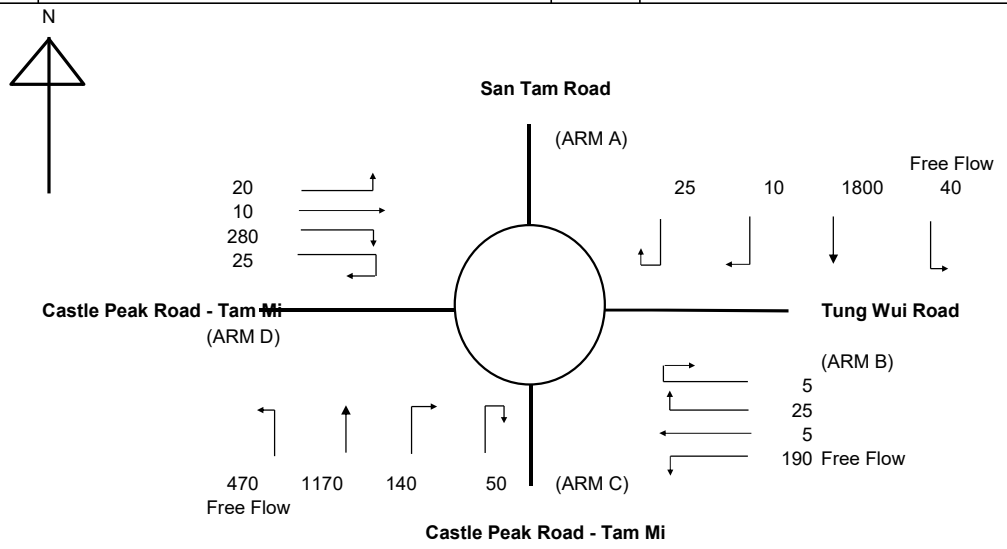
Design Flow

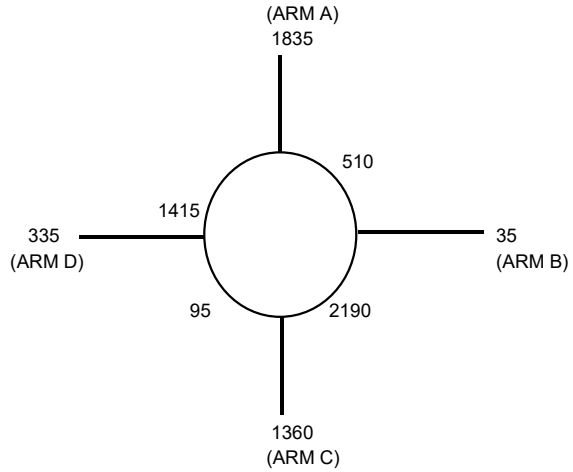
(With Improvements)

ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 AM Design Traffic Flows (Planned Layout) - With Improvement	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1835	35	1360	335	*
Qc= Circulating flow across entry (pcu/h)	510	2190	95	1415	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2712	300	2463	956	
DFC = Design flow/Capacity = Q/Qe	0.68	0.12	0.55	0.35	

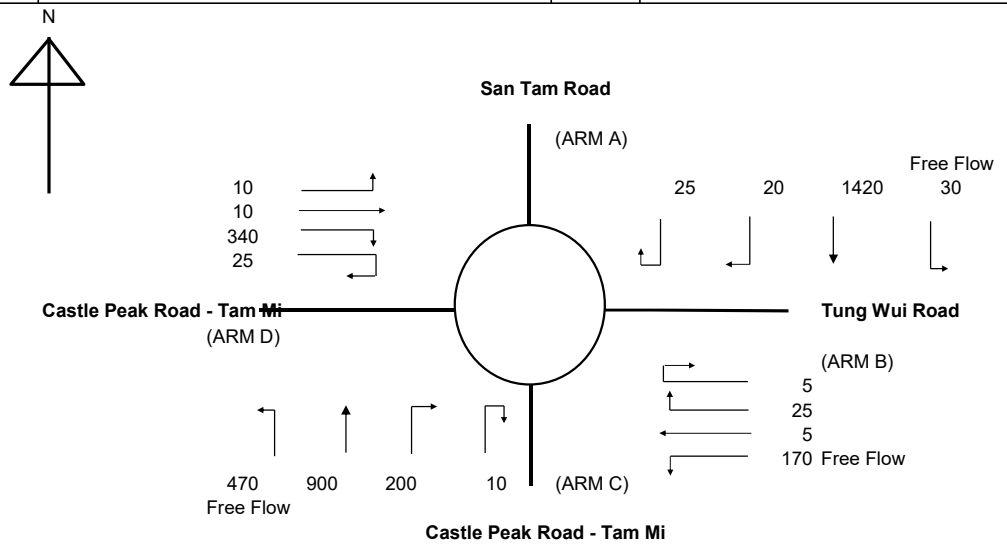
TOTAL ENTRY FLOWS 4265 PCU

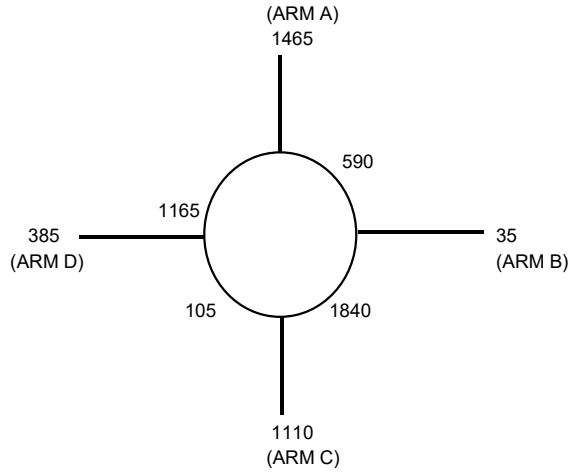
CRITICAL DFC 0.68

ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 PM Design Traffic Flows (Planned Layout) - With Improvement	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1465	35	1110	385	*
Qc= Circulating flow across entry (pcu/h)	590	1840	105	1165	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2639	520	2455	1124	
DFC = Design flow/Capacity = Q/Qe	0.56	0.07	0.45	0.34	

TOTAL ENTRY FLOWS 3665 PCU

CRITICAL DFC 0.56

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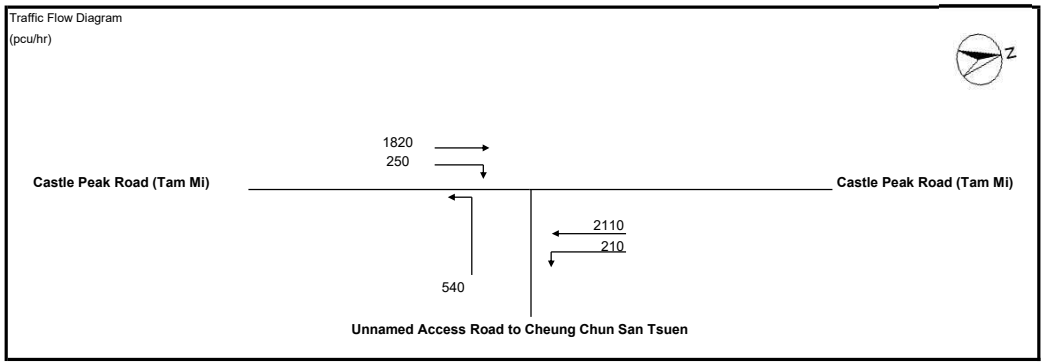
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsu	2034 AM Peak Hour Design Traffic Flows - With Improvement	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

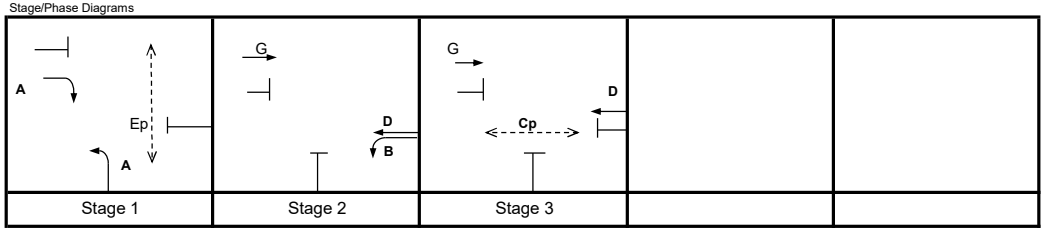
J2

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	120	sec
Sum(y)		Y =	0.639	
Lost time		L =	9	sec
Total Flow		=	16,495	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	51	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	25	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	30.2	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	31	sec
Y_{max}	$= 1-L/C$	=	0.925	

Stage/Phase Diagrams



I/G = 5 I/G = 6 I/G =

Critical Case : A,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 30%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↓	A	1	3.500	1		12.5	0	0		0		2105			250	250		100%	1879	0.133	
→	G	2,3	3.500	2				1		0		4070		1820		1820			4070	0.447	
↰	A	1	3.650	2	20			1		0		4100	540			540	100%		3814	0.142	0.142
↰	B	2	3.650	1	15			1		0		1980	210			210	100%		1800	0.117	
←	D	2,3	3.650	2				0		0		4240		2110		2110			4240	0.498	0.498

Pedestrian Crossing			GM		FGM				
	Cp	3	min.	11	+	21	=	32	sec
	Ep	1	min.	11	+	10	=	21	sec

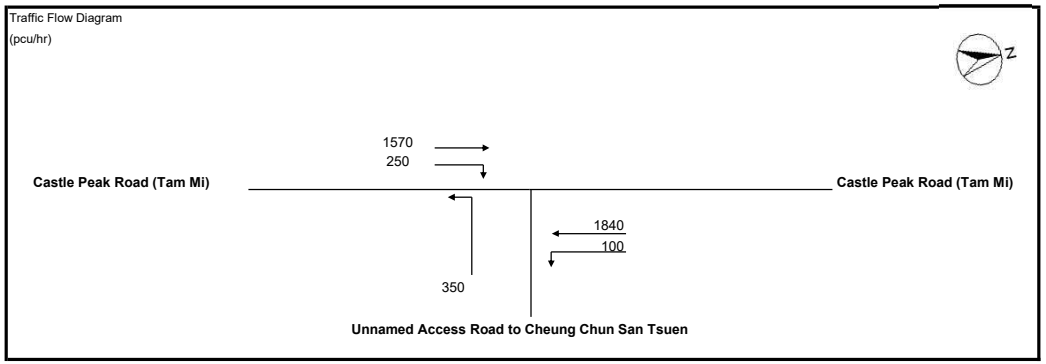
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsu	2034 PM Peak Hour Design Traffic Flows - With Improvement	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J2

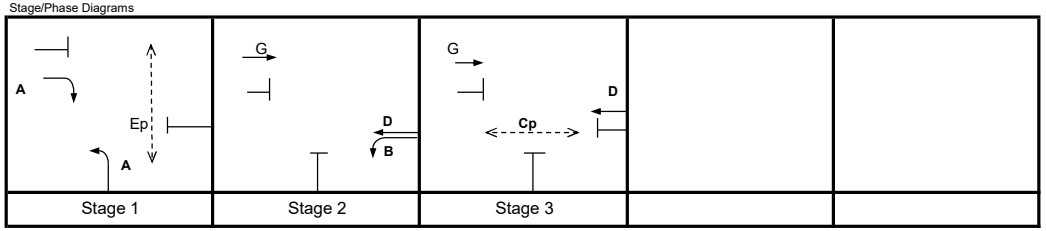
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.567	
Lost time	L =	9	sec
Total Flow	=	16,495	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	43	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	21	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	46.8	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	24	sec
Y_{max}	$= 1-L/C$	=	0.925	

Stage/Phase Diagrams



I/G = 5 I/G = 6 I/G =

Critical Case : A,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 47%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↓	A	1	3.500	1		12.5	0	0		0		2105			250	250		100%	1879	0.133	0.133
→	G	2,3	3.500	2				1		0		4070		1570		1570			4070	0.386	
↰	A	1	3.650	2	20			1		0		4100	350			350	100%		3814	0.092	
↰	B	2	3.650	1	15			1		0		1980	100			100	100%		1800	0.056	
←	D	2,3	3.650	2				0		0		4240		1840		1840			4240	0.434	0.434

Pedestrian Crossing			GM		FGM				
	Cp	3	min.	11	+	21	=	32	sec
	Ep	1	min.	11	+	10	=	21	sec

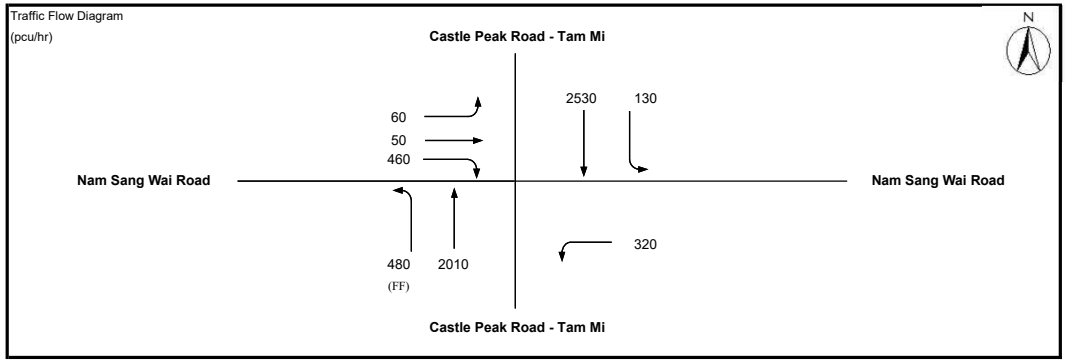
JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 AM Design Traffic Flows with Improvement	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: Apr 24

J3

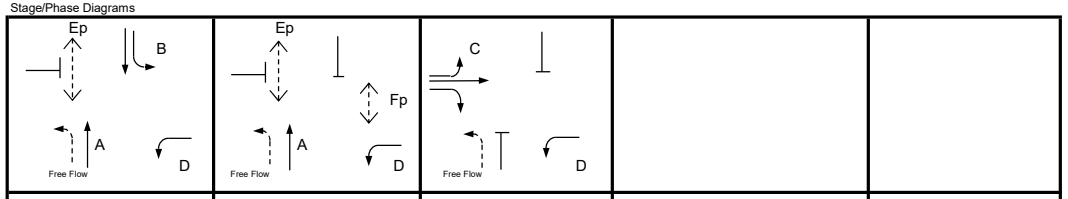
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.579	
Lost time	L =	22	sec
Total Flow	=	16,720	pcu

Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	=	90	sec
Min. Cycle Time C_m	= L/(1-Y)	=	52	sec
Y_{ult}	= 0.9-0.0075×L	=	0.735	
$R.C._{ult}$	= $(Y_{ult}$-Y)/Yx100%	=	27.0	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	62	sec
Y_{max}	= 1-L/C	=	0.817	

Stage/Phase Diagrams



I/G = 9 G = 5 I/G = 5 I/G = 5

Critical Case : B,Fp,C

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 27%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	ADJ. SAT. FLOW	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y	EFFECTIVE GREEN g=y/Yx(C-L) (sec)	ACTUAL GREEN G (sec)	DEGREE OF SATURATION X	Average Queue N
↑	A	1,2	3.750	2				1		0		4120	4120		2010		2010			4120	0.488		83	82	0.000	10
↓	B	1	3.400	1	35			1		0		1955	1955	130	712		842	15%		1942	0.434	0.434	73	72	0.000	11
↓	B	1	3.400	2				0		0		4190	4190		1818		1818			4190	0.434		73	72	0.000	12
↰	D	1,2,3	6.300	1	18			1		0		2245	2245	320			320	100%		2072	0.154			120		
↕	C	3	4.200	1	10	25	0	1		0		2035	2035	60	50	166	276	22%	60%	1904	0.145	0.145	25	24	0.000	7
↳	C	3	4.200	1		20	0	0		0		2175	2175			294	294		100%	2023	0.145		25	24	0.000	8
Pedestrian Crossing				GM		FGM																				
	Ep	1,2	min.	7	+	13	=	20	sec																	
	Fp	2	min.	5	+	5	=	10	sec													*				

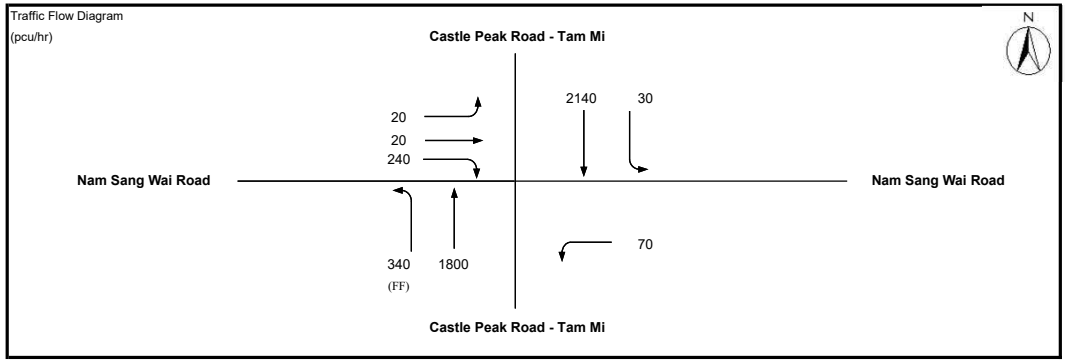
JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 PM Design Traffic Flows with Improvement	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: Apr 24

J3

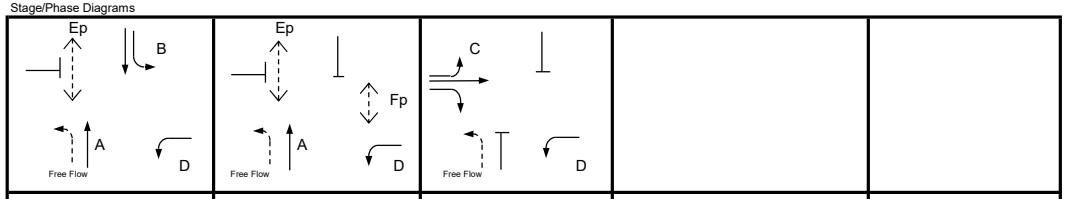
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.508	
Lost time	L =	10	sec
Total Flow	=	16,720	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	41	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	20	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.825	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	62.4	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	23	sec
Y_{max}	$= 1-L/C$	=	0.917	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G =	I/G = 6	I/G = 6		

Critical Case : A,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 62%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	ADJ. SAT. FLOW	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*	EFFECTIVE GREEN g=y/Yx(C-L) (sec)	ACTUAL GREEN G (sec)	DEGREE OF SATURATION X	Average Queue N
↑	A	1,2	3.750	2				1		0		4120	4120		1800		1800			4120	0.437	0.437	95	82	0.000	9
↓	B	1	3.400	1	35			1		0		1955	1955	30	659		689	4%		1951	0.353		77	76	0.000	8
↓	B	1	3.400	2				0		0		4190	4190		1481		1481			4190	0.353		77	76	0.000	9
↰	D	1,2,3	6.300	1	18			1		0		2245	2245	70			70	100%		2072	0.034			120		
↕	C	3	4.200	1	10	25	0	1		0		2035	2035	20	20	96	136	15%	71%	1912	0.071		15	14	0.000	4
↳	C	3	4.200	1		20	0	0		0		2175	2175			144	144		100%	2023	0.071	0.071	15	14	0.000	4

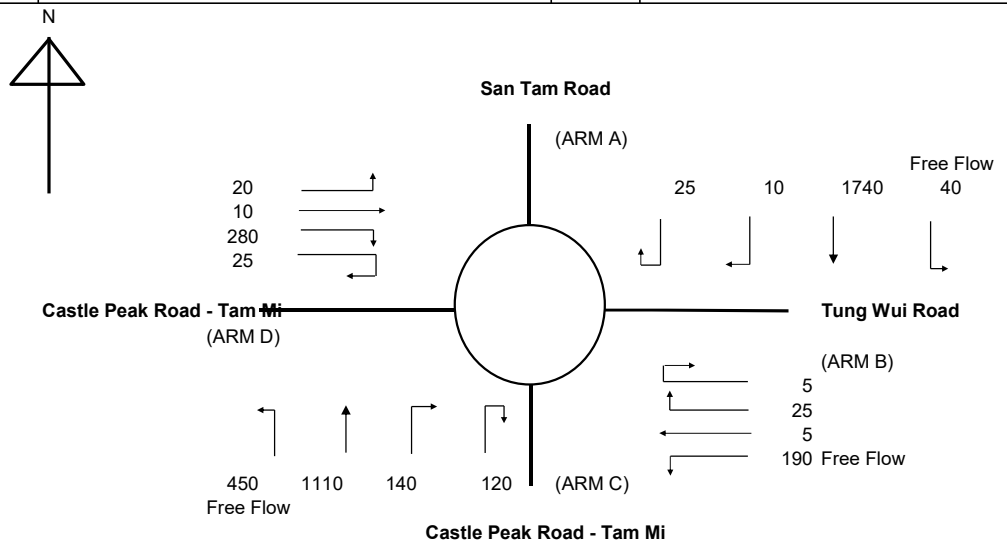
Pedestrian Crossing			GM		FGM				
Ep	1,2	min.	7	+	13	=	20	sec	
Fp	2	min.	5	+	5	=	10	sec	

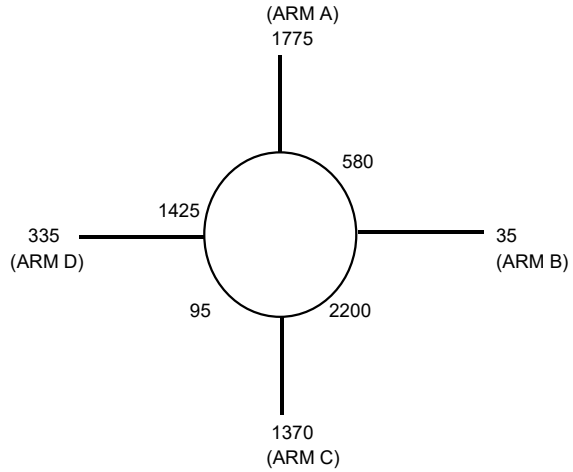
Design Flow - Sensitivity Test I

ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 AM Design Traffic Flows (Planned Layout) - Sensitivity Test (I)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1775	35	1370	335	*
Qc= Circulating flow across entry (pcu/h)	580	2200	95	1425	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2648	294	2463	949	
DFC = Design flow/Capacity = Q/Qe	0.67	0.12	0.56	0.35	

TOTAL ENTRY FLOWS 4195 PCU

CRITICAL DFC 0.67

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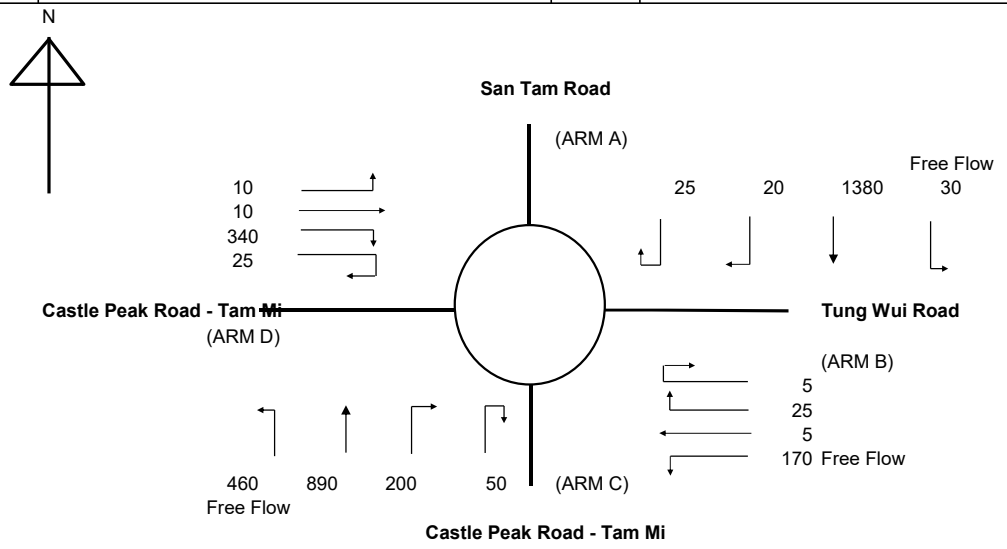
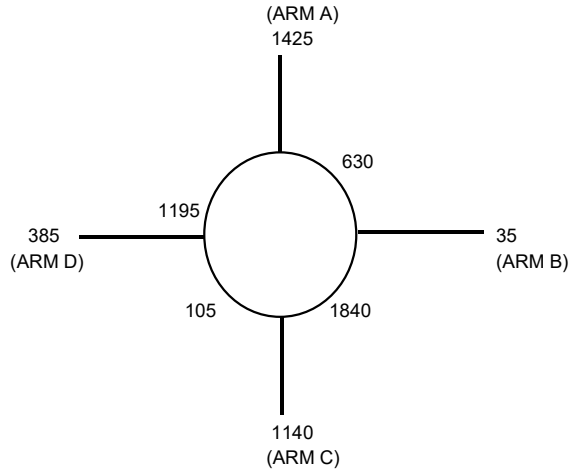
ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 PM Design Traffic Flows (Planned Layout) - Sensitivity Test (I)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24



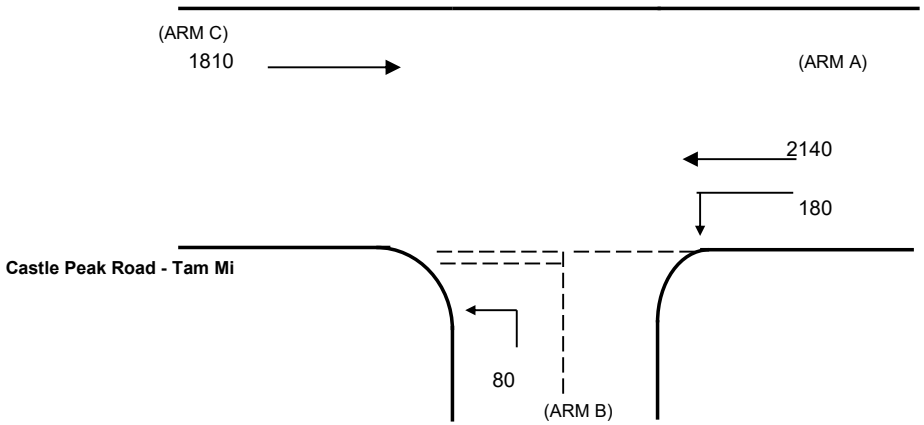


ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1425	35	1140	385	*
Qc= Circulating flow across entry (pcu/h)	630	1840	105	1195	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2602	520	2455	1104	
DFC = Design flow/Capacity = Q/Qe	0.55	0.07	0.46	0.35	

TOTAL ENTRY FLOWS 3645 PCU

CRITICAL DFC 0.55

Junction	J8 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsuen	Scenario	2034 AM Design Flow - Sensitivity Test (I)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar-24



NOTES : (GEOMETRIC INPUT DATA)
W = MAJOR ROAD WIDTH
W cr = CENTRAL RESERVE WIDTH
W b-a = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-a
W b-c = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-c
W c-b = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM c-b
Vl b-a = VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM b-a
Vr b-a = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-a
Vr b-c = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-c
Vr c-b = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM c-b

D = STREAM-SPECIFIC B-A
E = STREAM-SPECIFIC B-C
F = STREAM-SPECIFIC C-B
Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W =	14.6	(metres)
W cr =	2	(metres)
q a-b =	180	(pcu/hr)
q a-c =	2140	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b =	0	(metres)
Vr c-b =	0	(metres)
q c-a =	1810	(pcu/hr)
q c-b =	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a = 0	(metres)
W b-c = 5	(metres)
Vl b-a = 0	(metres)
Vr b-a = 150	(metres)
Vr b-c = 150	(metres)
q b-a = 0	(pcu/hr)
q b-c = 80	(pcu/hr)

GEOMETRIC FACTORS :

D =	0.613919
E =	1.157326
F =	0.585955
Y =	0.496300

THE CAPACITY OF MOVEMENT :

Q b-a =	31
Q b-c =	400
Q c-b =	191
Q b-ac =	400

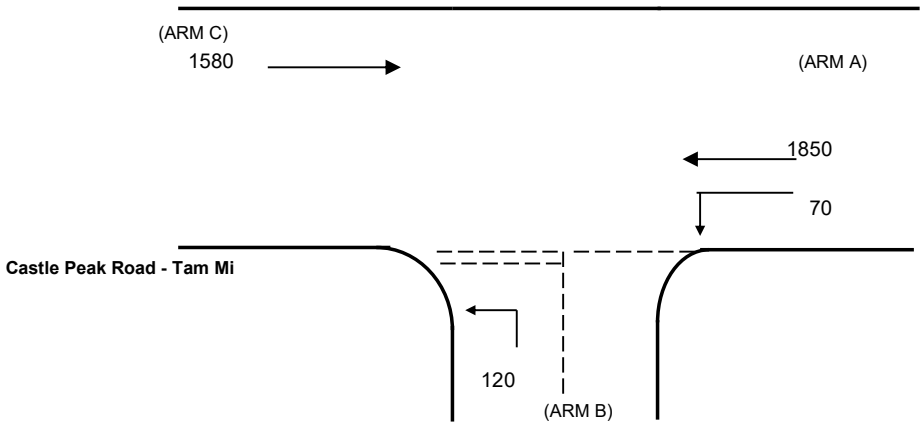
CRITICAL DFC = 0.20

COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a =	0.00
DFC b-c =	0.20
DFC c-b =	0.00
DFC b-ac =	0.00

Filename : stle Peak Road-Cheung Chun San Tsuen Road.xlsm / DesAB_Se

Junction	J8 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsuen	Scenario	2034 PM Design Flow - Sensitivity Test (I)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar-24



NOTES : (GEOMETRIC INPUT DATA)
W = MAJOR ROAD WIDTH
W cr = CENTRAL RESERVE WIDTH
W b-a = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-a
W b-c = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-c
W c-b = LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM c-b
Vl b-a = VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM b-a
Vr b-a = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-a
Vr b-c = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-c
Vr c-b = VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM c-b

D = STREAM-SPECIFIC B-A
E = STREAM-SPECIFIC B-C
F = STREAM-SPECIFIC C-B
Y = (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W =	14.6	(metres)
W cr =	2	(metres)
q a-b =	70	(pcu/hr)
q a-c =	1850	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b =	0	(metres)
Vr c-b =	0	(metres)
q c-a =	1580	(pcu/hr)
q c-b =	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a = 0	(metres)
W b-c = 5	(metres)
Vl b-a = 0	(metres)
Vr b-a = 150	(metres)
Vr b-c = 150	(metres)
q b-a = 0	(pcu/hr)
q b-c = 120	(pcu/hr)

GEOMETRIC FACTORS :

D =	0.613919
E =	1.157326
F =	0.585955
Y =	0.496300

THE CAPACITY OF MOVEMENT :

Q b-a =	84
Q b-c =	470
Q c-b =	233
Q b-ac =	470

CRITICAL DFC = 0.26

COMPARISION OF DESIGN FLOW TO CAPACITY :

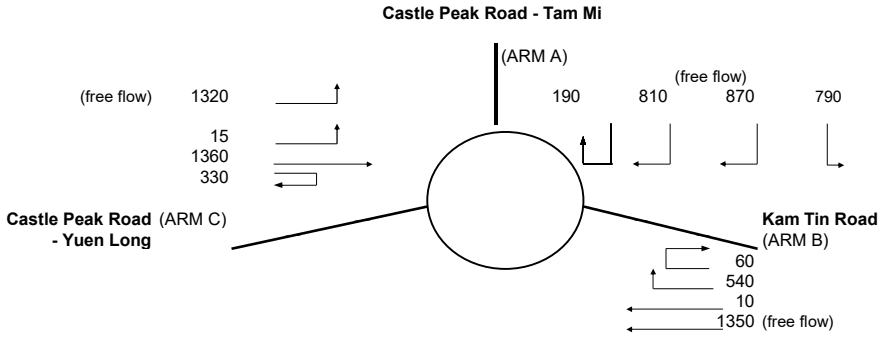
DFC b-a =	0.00
DFC b-c =	0.26
DFC c-b =	0.00
DFC b-ac =	0.00

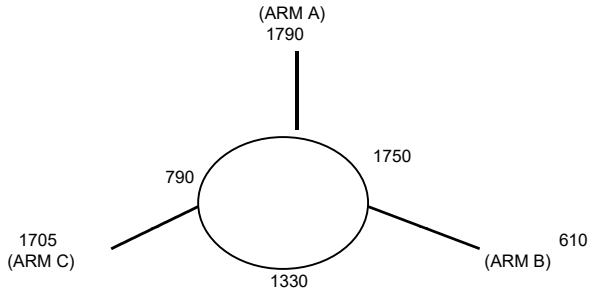
Filename : stle Peak Road-Cheung Chun San Tsuen Road.xlsm / DesAB_Se

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J4 - Au Tau Interchange	Scenario	2034 AM Peak Hour Design Traffic Flows - Sensitivity Test (I)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	6.50	7.00	7.30
E = Entry width (m)	11.00	7.00	9.70
L = Effective length of flare (m)	22.00	1.00	50.00
R = Entry radius (m)	45.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	45.00	30.00	20.00
Q = Entry flow (pcu/h)	1790	610	1705
Qc= Circulating flow across entry (pcu/h)	1750	1330	790
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.33	0.00	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	1.04	1.07
X2= V + ((E-V)/(1+2S))	9.22	7.00	9.38
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2794	2121	2842
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.71	0.60	0.72
Qe= K(F-Fc*Qc)	1513	1376	2443
DFC = Design flow/Capacity = Q/Qe	1.18	0.44	0.70

TOTAL ENTRY FLOWS = 6075 PCU

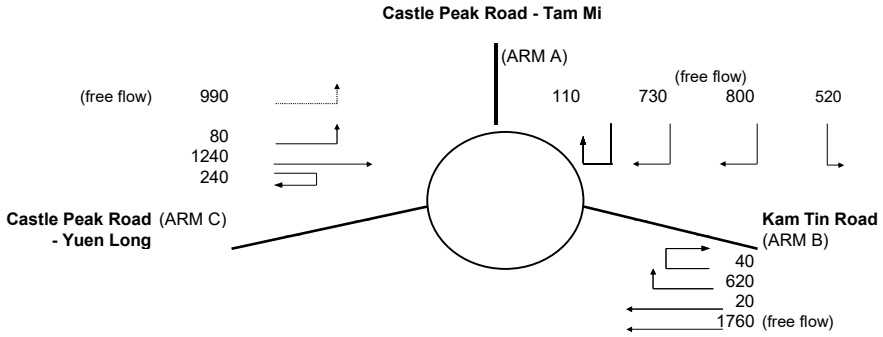
CRITICAL DFC = 1.18

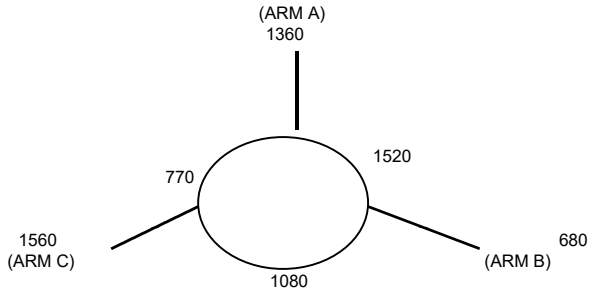
Filename : J10 - Au Tau Interchange.xlsx / DesAB_Sen1_AM

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J4 - Au Tau Interchange	Scenario	2034 PM Peak Hour Design Traffic Flows - Sensitivity Test (I)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	6.50	7.00	7.30
E = Entry width (m)	11.00	7.00	9.70
L = Effective length of flare (m)	22.00	1.00	50.00
R = Entry radius (m)	45.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	45.00	30.00	20.00
Q = Entry flow (pcu/h)	1360	680	1560
Qc= Circulating flow across entry (pcu/h)	1520	1080	770
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.33	0.00	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	1.04	1.07
X2= V + ((E-V)/(1+2S))	9.22	7.00	9.38
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2794	2121	2842
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.71	0.60	0.72
Qe= K(F-Fc*Qc)	1672	1532	2458
DFC = Design flow/Capacity = Q/Qe	0.81	0.44	0.63

TOTAL ENTRY FLOWS = 6010 PCU

CRITICAL DFC = 0.81

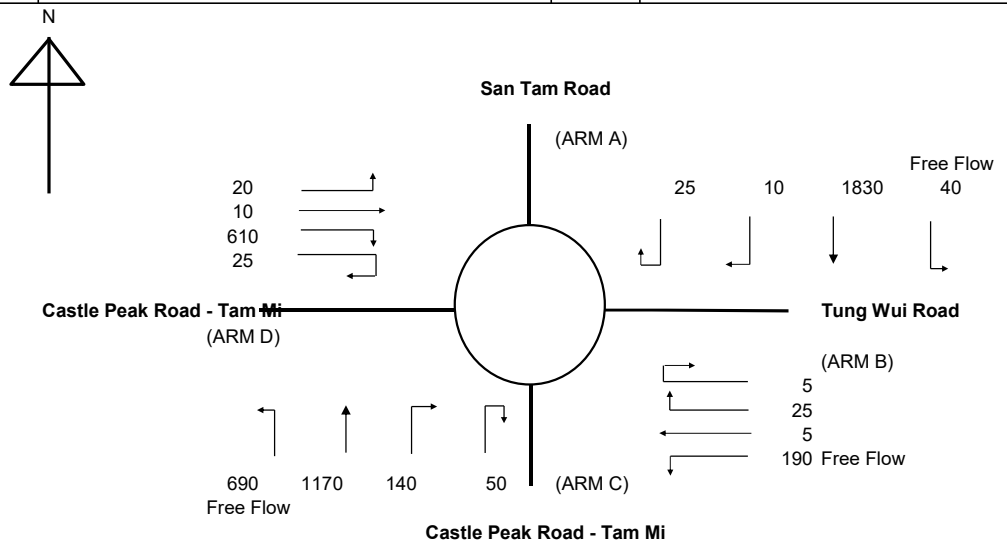
Filename : J10 - Au Tau Interchange.xlsx / DesAB_Sen1_PM

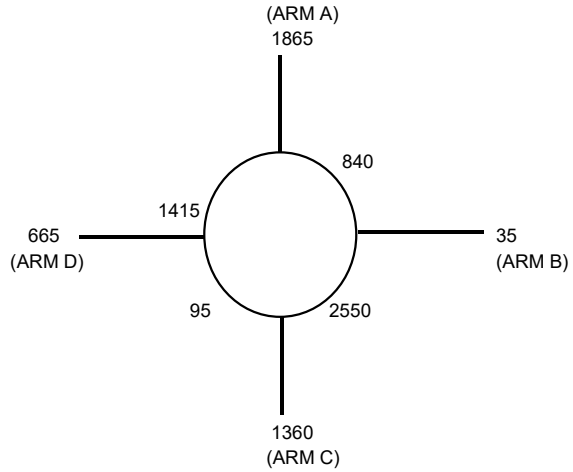
Design Flow - Sensitivity Test II

ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 AM Design Traffic Flows (Planned Layout) - Sensitivity Test (II)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1865	35	1360	665	*
Qc= Circulating flow across entry (pcu/h)	840	2550	95	1415	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2409	74	2463	956	
DFC = Design flow/Capacity = Q/Qe	0.77	0.47	0.55	0.70	

TOTAL ENTRY FLOWS 4845 PCU

CRITICAL DFC 0.77

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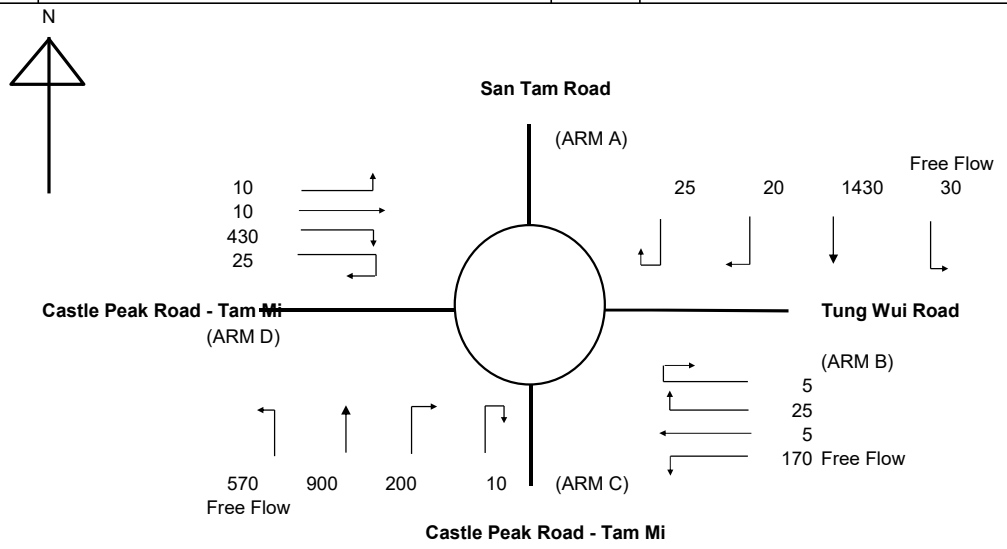
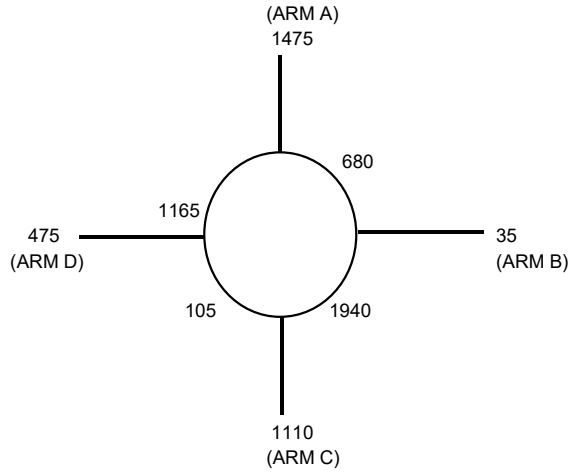
ROUNDABOUT CAPACITY CALCULATIO

AECOM

Junction	J1 - Castle Peak Road - Tam Mi / San Tam Road	Scenario	2034 PM Design Traffic Flows (Planned Layout) - Sensitivity Test (II)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	22/Mar/24





ARM	A	B	C	D	
INPUT PARAMETERS:					
V = Approach half width (m)	10.30	4.00	8.70	4.10	
E = Entry width (m)	10.60	6.50	9.00	8.00	
L = Effective length of flare (m)	13.00	12.00	10.00	16.00	
R = Entry radius (m)	25.00	22.00	21.00	20.00	
D = Inscribed circle diameter (m)	44.00	44.00	44.00	44.00	
A = Entry angle (degree)	35.00	30.00	50.00	30.00	
Q = Entry flow (pcu/h)	1475	35	1110	475	*
Qc= Circulating flow across entry (pcu/h)	680	1940	105	1165	*
OUTPUT PARAMETERS:					
S = Sharpness of flare = 1.6(E-V)/L	0.04	0.33	0.05	0.39	
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.00	0.93	1.00	
X2= V + ((E-V)/(1+2S))	10.58	5.50	8.97	6.29	
M = EXP((D-60)/10)	0.20	0.20	0.20	0.20	
F = 303*X2	3206	1667	2719	1906	
Td= 1+(0.5/(1+M))	1.42	1.42	1.42	1.42	
Fc= 0.21*Td(1+0.2*X2)	0.93	0.62	0.83	0.67	
Qe= K(F-Fc*Qc)	2556	457	2455	1124	
DFC = Design flow/Capacity = Q/Qe	0.58	0.08	0.45	0.42	

TOTAL ENTRY FLOWS 3865 PCU

CRITICAL DFC 0.58

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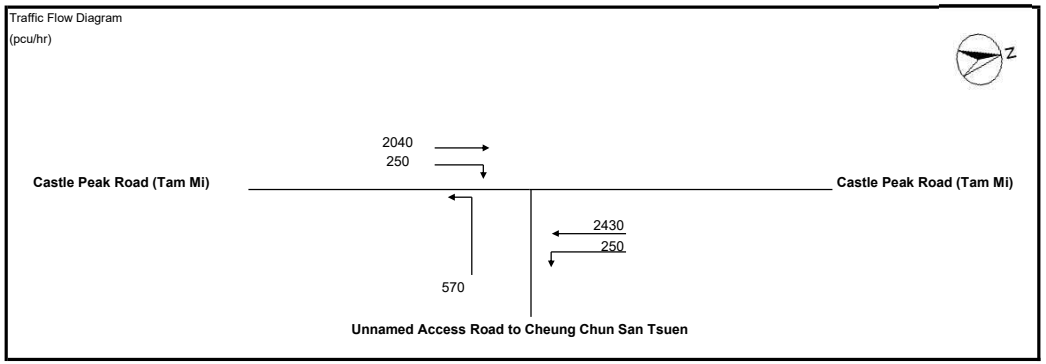
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsu	2034 AM Peak Hour Design Traffic Flows - Sensitivity Test (II)	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J2

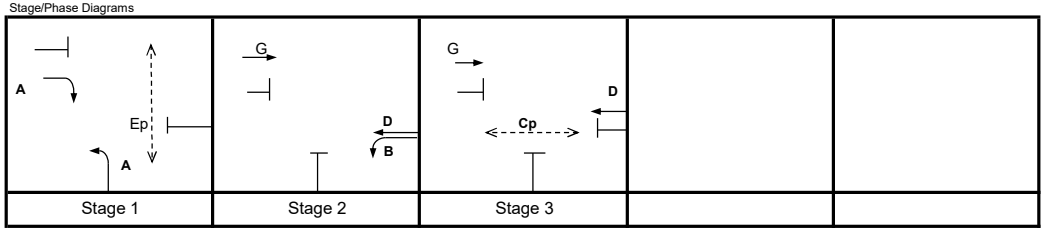
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.723	
Lost time	L =	9	sec
Total Flow	=	16,495	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	67	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	32	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	15.2	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	46	sec
Y_{max}	$= 1-L/C$	=	0.925	

Stage/Phase Diagrams



Critical Case : A,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 15%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↓	A	1	3.500	1		12.5	0	0		0		2105			250	250		100%	1879	0.133	
→	G	2,3	3.500	2				1		0		4070		2040		2040			4070	0.501	
↰	A	1	3.650	2	20			1		0		4100	570			570	100%		3814	0.149	0.149
↰	B	2	3.650	1	15			1		0		1980	250			250	100%		1800	0.139	
←	D	2,3	3.650	2				0		0		4240		2430		2430			4240	0.573	0.573

Pedestrian Crossing			GM		FGM				
	Cp	3	min.	11	+	21	=	32	sec
	Ep	1	min.	11	+	10	=	21	sec

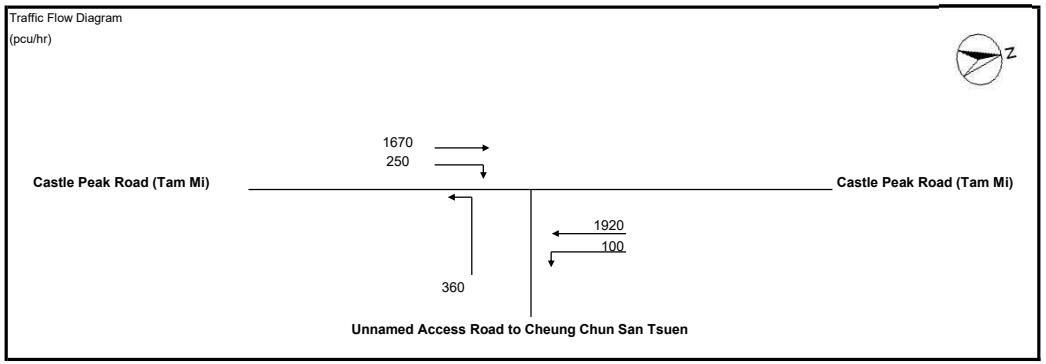
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Castle Peak Road / Unnamed Access Road to Cheung Chun San Tsu	2034 PM Peak Hour Design Traffic Flows - Sensitivity Test (II)	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J2

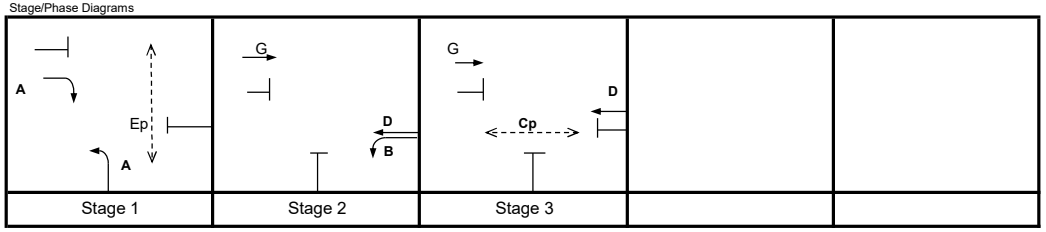
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.586	
Lost time	L =	9	sec
Total Flow	=	16,495	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	45	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	22	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	42.1	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	26	sec
Y_{max}	$= 1-L/C$	=	0.925	

Stage/Phase Diagrams



I/G = 5 I/G = 6 I/G =

Critical Case : A,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 42%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↓	A	1	3.500	1		12.5	0	0		0		2105			250	250		100%	1879	0.133	0.133
→	G	2,3	3.500	2				1		0		4070		1670		1670			4070	0.410	
↰	A	1	3.650	2	20			1		0		4100	360			360	100%		3814	0.094	
↰	B	2	3.650	1	15			1		0		1980	100			100	100%		1800	0.056	
←	D	2,3	3.650	2				0		0		4240		1920		1920			4240	0.453	0.453

Pedestrian Crossing			GM		FGM				
	Cp	3	min.	11	+	21	=	32	sec
	Ep	1	min.	11	+	10	=	21	sec

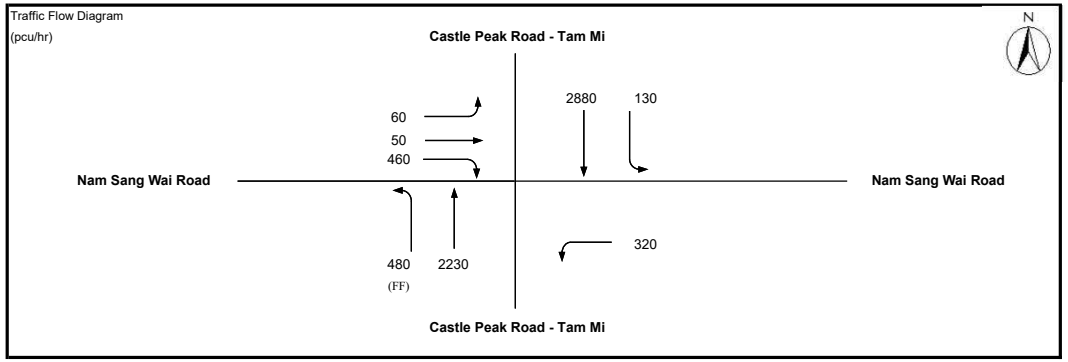
JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 AM Design Traffic Flows with Improvement	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: Nov 23

J3

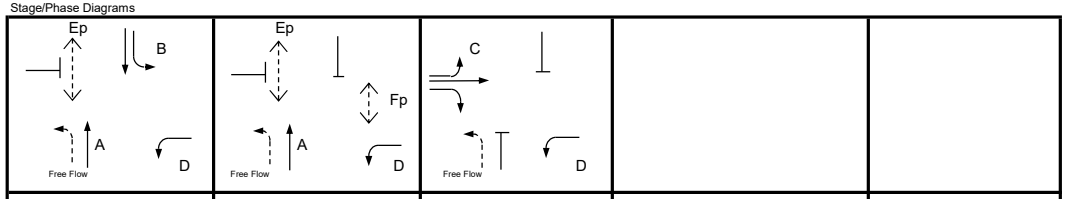
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.636	
Lost time	L =	22	sec
Total Flow	=	16,720	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	104	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	60	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.735	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	15.6	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	75	sec
Y_{max}	$= 1-L/C$	=	0.817	

Stage/Phase Diagrams



I/G = 9 G = 5 I/G = 5 I/G = 5

Critical Case : B,Fp,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 16%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	ADJ. SAT. FLOW	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↑	A	1,2	3.750	2				1		0		4120	4120		2230		2230			4120	0.541	
↓	B	1	3.400	1	35			1		0		1955	1955	130	824		954	14%		1944	0.491	0.491
↓	B	1	3.400	2				0		0		4190	4190		2056		2056			4190	0.491	
↰	D	1,2,3	6.300	1	18			1		0		2245	2245	320			320	100%		2072	0.154	
↕	C	3	4.200	1	10	25	0	1		0		2035	2035	60	50	166	276	22%	60%	1904	0.145	0.145
↳	C	3	4.200	1		20	0	0		0		2175	2175			294	294		100%	2023	0.145	
Pedestrian Crossing				GM		FGM																
	Ep	1,2	min.	7	+	13	=	20	sec													
	Fp	2	min.	5	+	5	=	10	sec													*

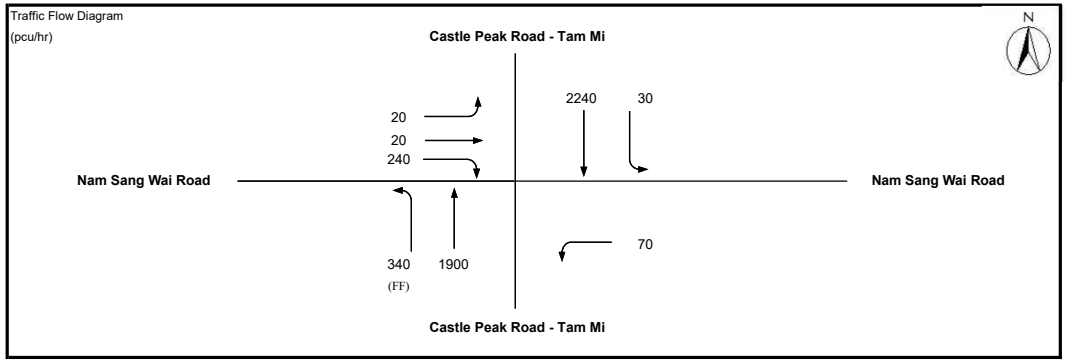
JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 PM Design Traffic Flows with Improvement	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: Nov 23

J3

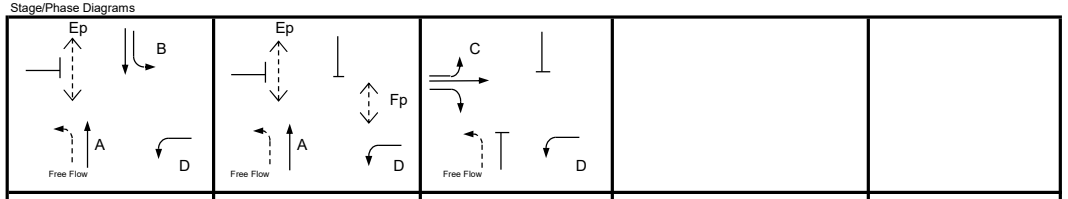
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.532	
Lost time	L =	10	sec
Total Flow	=	16,720	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	43	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	21	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.825	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	55.0	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	24	sec
Y_{max}	$= 1-L/C$	=	0.917	

Stage/Phase Diagrams



I/G = I/G = 6 I/G = 6

Critical Case : A,C

$R.C._{(C)} = (0.9xY_{max}-Y)/Yx100\% = 55\%$

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	ADJ. SAT. FLOW	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↑	A	1,2	3.750	2				1		0		4120	4120		1900		1900			4120	0.461	0.461
↓	B	1	3.400	1	35			1		0		1955	1955	30	691		721	4%		1952	0.370	
↓	B	1	3.400	2				0		0		4190	4190		1549		1549			4190	0.370	
↰	D	1,2,3	6.300	1	18			1		0		2245	2245	70			70	100%		2072	0.034	
↕	C	3	4.200	1	10	25	0	1		0		2035	2035	20	20	96	136	15%	71%	1912	0.071	
↳	C	3	4.200	1		20	0	0		0		2175	2175			144	144		100%	2023	0.071	0.071

Pedestrian Crossing				GM		FGM																
	Ep	1,2	min.	7	+	13	=	20	sec													
	Fp	2	min.	5	+	5	=	10	sec													*

JUNCTION CAPACITY CALCULATION

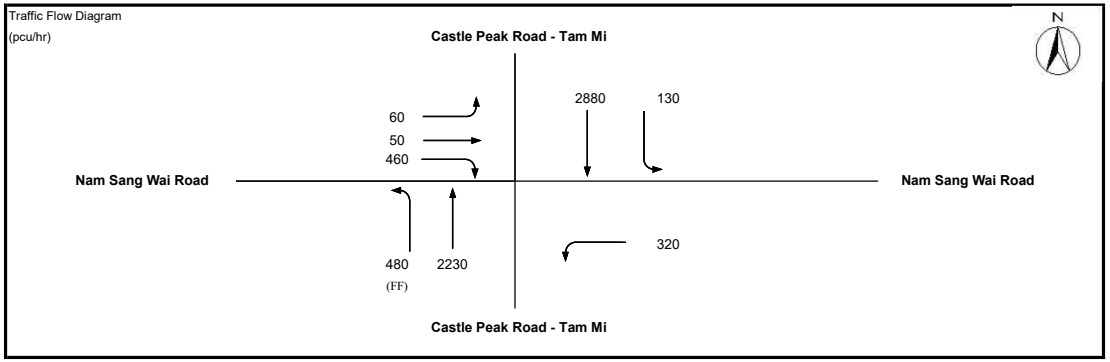
AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 AM Design Traffic Flows - Sensitivity Test (II)	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 23

J3

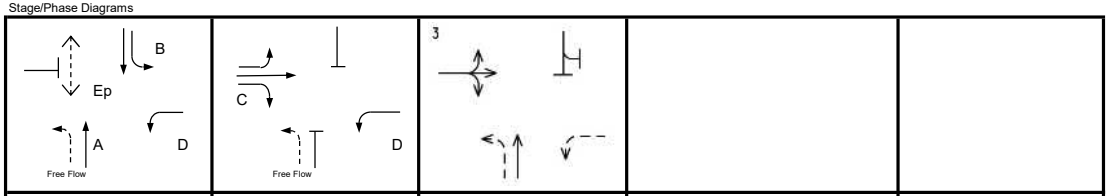
Traffic Flow Diagram

(pcu/hr)



No. of stages per cycle		N = 2	
Cycle time		C = 120	sec
Sum(y)		Y = 0.686	
Lost time		L = 10	sec
Total Flow		= 16,420	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	= 64	sec
Min. Cycle Time C_m	= L/(1-Y)	= 32	sec
Y_{ult}	= 0.9-0.0075×L	= 0.825	
R.C.$_{ult}$	= (Y_{ult}-Y)/Yx100%	= 20.2	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	= 42	sec
Y_{max}	= 1-L/C	= 0.917	

Stage/Phase Diagrams



Stage 1	Stage 2	(Demand Dependent)		
I/G = 6	I/G = 6			

Critical Case : A,C

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 20%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	ADJ. SAT. FLOW	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↑	A	1	3.750	2				1		0		4120	4120		2230		2230			4120	0.541	0.541
↓	B	1	3.400	1	35			1		0	-300	1955	1655	130	718		848	15%		1644	0.516	
↓	B	1	3.400	2				0		0		4190	4190		2162		2162			4190	0.516	
↰	D	1,2	6.300	1	18			1		0		2245	2245	320			320	100%		2072	0.154	
↕	C	2	4.200	1	10	25	0	1		0		2035	2035	60	50	166	276	22%	60%	1904	0.145	0.145
↳	C	2	4.200	1		20	0	0		0		2175	2175			294	294		100%	2023	0.145	
Pedestrian Crossing				GM		FGM																
	Ep	1	min.	7	+	14	=	21	sec													

JUNCTION CAPACITY CALCULATION

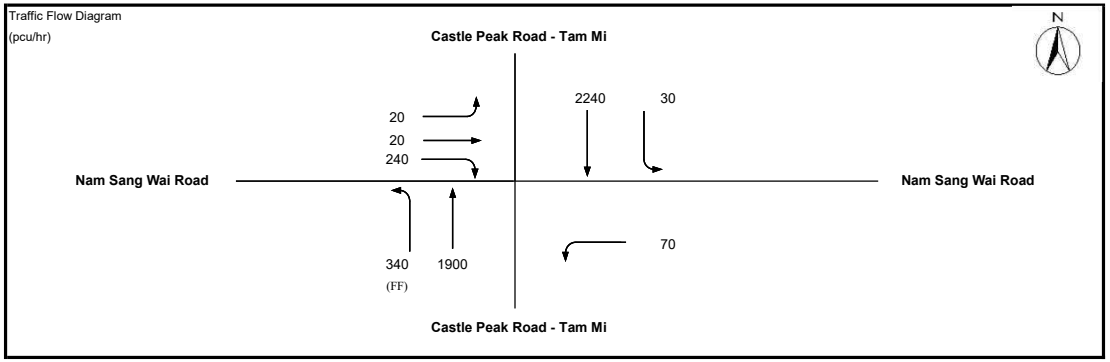
AECOM

Junction J3 - Castle Peak Road - Tam Mi / Nam Sang Wai Road	2034 AM Design Traffic Flows - Sensitivity Test (II)	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 23

J3

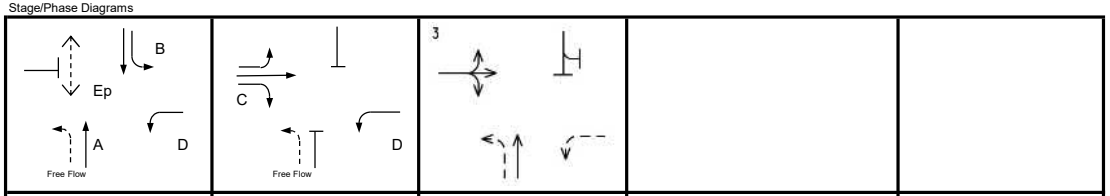
Traffic Flow Diagram

(pcu/hr)



No. of stages per cycle		N = 2	
Cycle time		C = 120	sec
Sum(y)		Y = 0.532	
Lost time		L = 10	sec
Total Flow		= 16,420	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	= 43	sec
Min. Cycle Time C_m	= L/(1-Y)	= 21	sec
Y_{ult}	= 0.9-0.0075×L	= 0.825	
$R.C._{ult}$	= $(Y_{ult}$-Y)/Yx100%	= 55.0	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	= 24	sec
Y_{max}	= 1-L/C	= 0.917	

Stage/Phase Diagrams



Stage 1	Stage 2	(Demand Dependent)		
I/G = 6	I/G = 6			

Critical Case : A,C

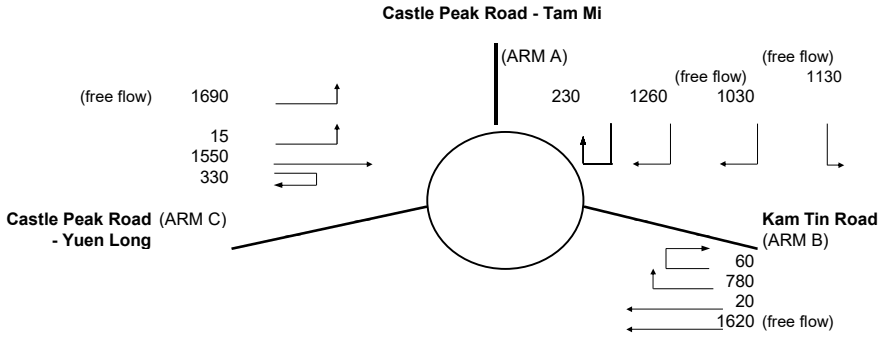
R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 55%

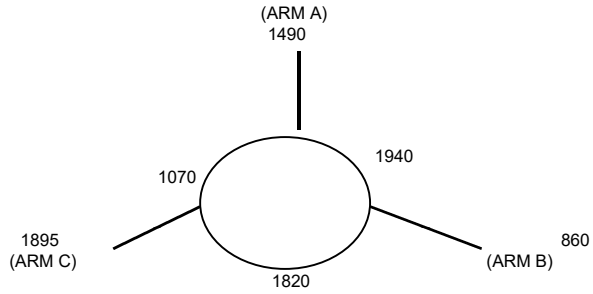
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	ADJ. SAT. FLOW	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↑	A	1	3.750	2				1		0		4120	4120		1900		1900			4120	0.461	0.461
↓	B	1	3.400	1	35			1		0	-300	1955	1655	30	612		642	5%		1652	0.389	
↓	B	1	3.400	2				0		0		4190	4190		1628		1628			4190	0.389	
↰	D	1,2	6.300	1	18			1		0		2245	2245	70			70	100%		2072	0.034	
↑↓	C	2	4.200	1	10	25	0	1		0		2035	2035	20	20	96	136	15%	71%	1912	0.071	0.071
↓	C	2	4.200	1		20	0	0		0		2175	2175			144	144		100%	2023	0.071	
Pedestrian Crossing				GM		FGM																
	Ep	1	min.	7	+	14	=	21	sec													

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J4 - Au Tau Interchange	Scenario	2034 AM Peak Hour Design Traffic Flows - Sensitivity Test (II)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	6.50	7.00	7.30
E = Entry width (m)	11.00	7.00	9.70
L = Effective length of flare (m)	22.00	1.00	50.00
R = Entry radius (m)	45.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	20.00	5.00	20.00
Q = Entry flow (pcu/h)	1490	860	1895
Qc= Circulating flow across entry (pcu/h)	1940	1820	1070
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.33	0.00	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.06	1.13	1.07
X2= V + ((E-V)/(1+2S))	9.22	7.00	9.38
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2794	2121	2842
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.71	0.60	0.72
Qe= K(F-Fc*Qc)	1504	1160	2227
DFC = Design flow/Capacity = Q/Qe	0.99	0.74	0.85

TOTAL ENTRY FLOWS = 6605 PCU

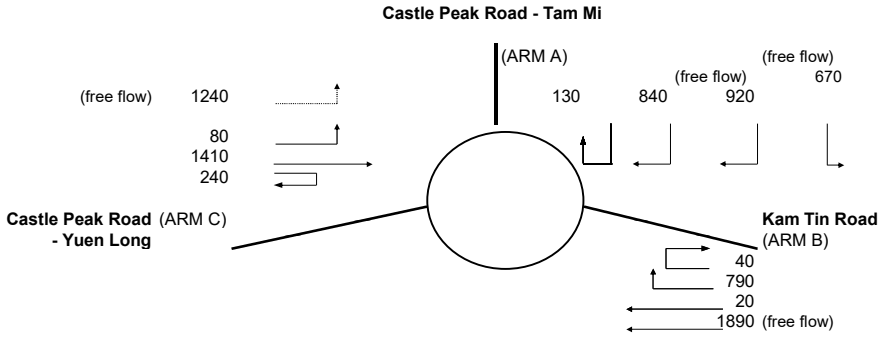
CRITICAL DFC = 0.99

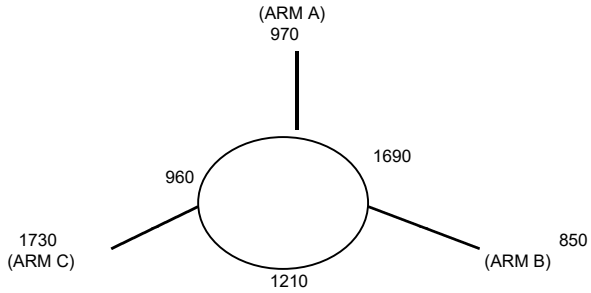
Filename : J10 - Au Tau Interchange.xlsx / DesAB_Sen_AM

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J4 - Au Tau Interchange	Scenario	2034 PM Peak Hour Design Traffic Flows - Sensitivity Test (II)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	6.50	7.00	7.30
E = Entry width (m)	11.00	7.00	9.70
L = Effective length of flare (m)	22.00	1.00	50.00
R = Entry radius (m)	45.00	100.00	100.00
D = Inscribed circle diameter (m)	65.00	65.00	65.00
A = Entry angle (degree)	20.00	5.00	20.00
Q = Entry flow (pcu/h)	970	850	1730
Qc= Circulating flow across entry (pcu/h)	1690	1210	960
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.33	0.00	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.06	1.13	1.07
X2= V + ((E-V)/(1+2S))	9.22	7.00	9.38
M = EXP((D-60)/10)	1.65	1.65	1.65
F = 303*X2	2794	2121	2842
Td= 1+(0.5/(1+M))	1.19	1.19	1.19
Fc= 0.21*Td(1+0.2*X2)	0.71	0.60	0.72
Qe= K(F-Fc*Qc)	1692	1572	2312
DFC = Design flow/Capacity = Q/Qe	0.57	0.54	0.75

TOTAL ENTRY FLOWS = 6190 PCU

CRITICAL DFC = 0.75

Filename : J10 - Au Tau Interchange.xlsx / DesAB_Sen_PM

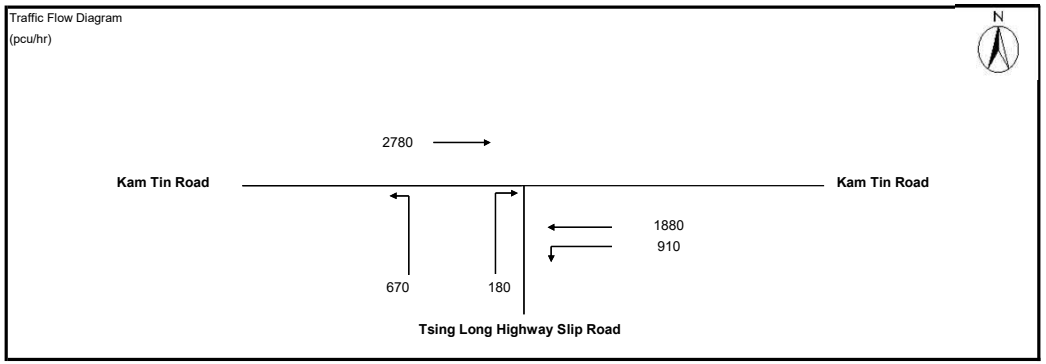
JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - Kam Tin Road / Tsing Long Highway Slip Road	2034 AM Peak Hour Design Traffic Flows - Sensitivity Test (II)	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

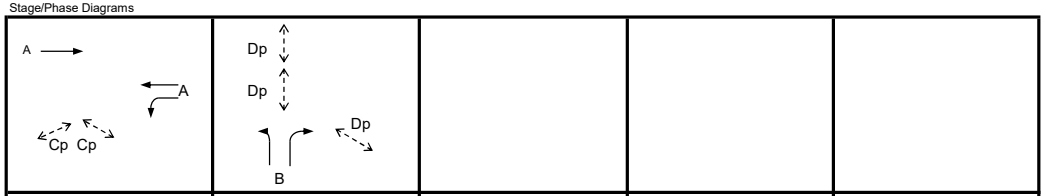
J5

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.647	
Lost time		L =	11	sec
Total Flow		=	20,960	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	61	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	31	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	26.4	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	39	sec
Y_{max}	$= 1-L/C$	=	0.908	

Stage/Phase Diagrams



I/G = 8 I/G = 5

Critical Case : A,B

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 26%

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MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
→	A	1	3.650	3				1		0		6220		2780		2780			6220	0.447	
←	A	1	3.600	2				0		0	190	4230		1880		1880			4420	0.425	
↰	A	1	3.650	1	50			1		0		1980	910			910	100%		1922	0.473	0.473
↰	B	2	3.650	2	25			1		0		4100	670			670	100%		3868	0.173	0.173
↱	B	2	3.650	2		40	0	0		0		4240			180	180		100%	4087	0.044	

Pedestrian Crossing			GM		FGM				
	Cp	1	min.	5	+	7	=	12	sec
	Dp	2	min.	5	+	10	=	15	sec

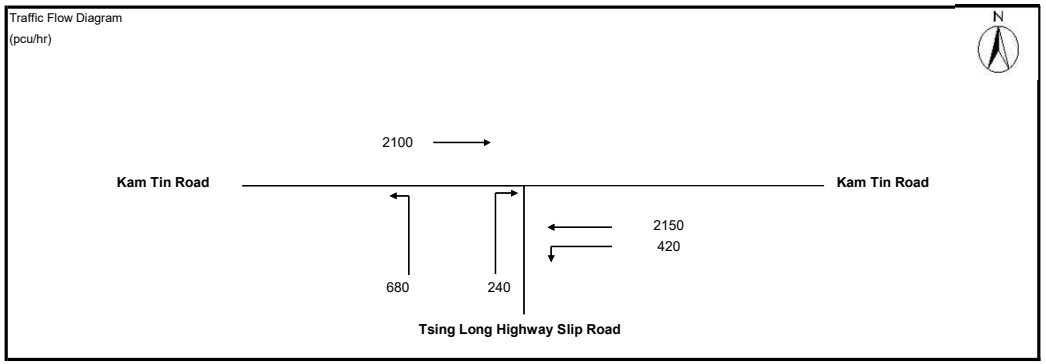
JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - Kam Tin Road / Tsing Long Highway Slip Road	2034 PM Peak Hour Design Traffic Flows - Sensitivity Test (II)	DESIGN: MKCN	CHECK: SHSN	JOB NO: -	DATE: May 21

J5

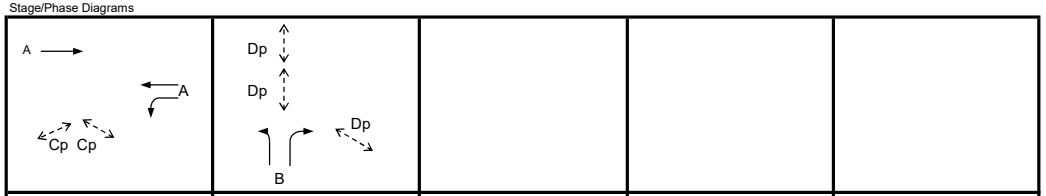
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	120	sec
Sum(y)	Y =	0.662	
Lost time	L =	11	sec
Total Flow	=	20,960	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	64	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	33	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	23.4	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	42	sec
Y_{max}	$= 1-L/C$	=	0.908	

Stage/Phase Diagrams



I/G = 8 I/G = 5

Critical Case : A,B

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 23%

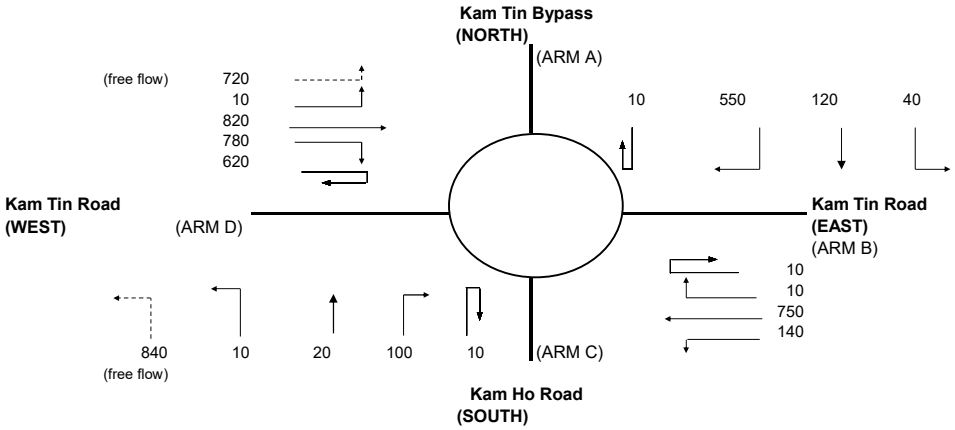
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
→	A	1	3.650	3				1		0		6220		2100		2100			6220	0.338	
←	A	1	3.600	2				0		0	190	4230		2150		2150			4420	0.486	0.486
↰	A	1	3.650	1	50			1		0		1980	420			420	100%		1922	0.218	
↰	B	2	3.650	2	25			1		0		4100	680			680	100%		3868	0.176	0.176
↱	B	2	3.650	2		40	0	0		0		4240			240	240		100%	4087	0.059	

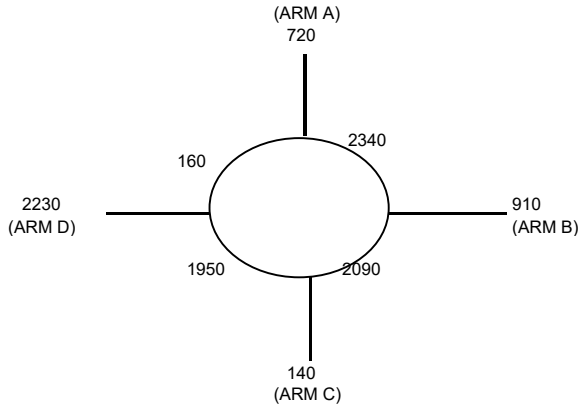
Pedestrian Crossing			GM		FGM				
	Cp	1	min.	5	+	7	=	12	sec
	Dp	2	min.	5	+	10	=	15	sec

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J6 - Kam Tin Road / Kam Tin Bypass / Kam Ho Road	Scenario	2034 AM Peak Hour Design Traffic Flows - Sensitivity Test (I)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.50	7.30	9.00	7.30
E = Entry width (m)	11.00	10.00	10.00	11.00
L = Effective length of flare (m)	15.00	12.00	1.00	13.00
R = Entry radius (m)	42.50	70.00	20.00	42.50
D = Inscribed circle diameter (m)	88.00	88.00	88.00	88.00
A = Entry angle (degree)	39.00	30.00	37.50	29.00
Q = Entry flow (pcu/h)	720	910	140	2230
Qc= Circulating flow across entry (pcu/h)	2340	2090	1950	160
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.48	0.36	1.60	0.46
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.03	0.97	1.03
X2= V + ((E-V)/(1+2S))	8.80	8.87	9.24	9.24
M = EXP((D-60)/10)	16.44	16.44	16.44	16.44
F = 303*X2	2665	2688	2799	2799
Td= 1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc= 0.21*Td(1+0.2*X2)	0.60	0.60	0.62	0.62
Qe= K(F-Fc*Qc)	1264	1485	1558	2779
DFC = Design flow/Capacity = Q/Qe	0.57	0.61	0.09	0.80

TOTAL ENTRY FLOWS = 4720 PCU

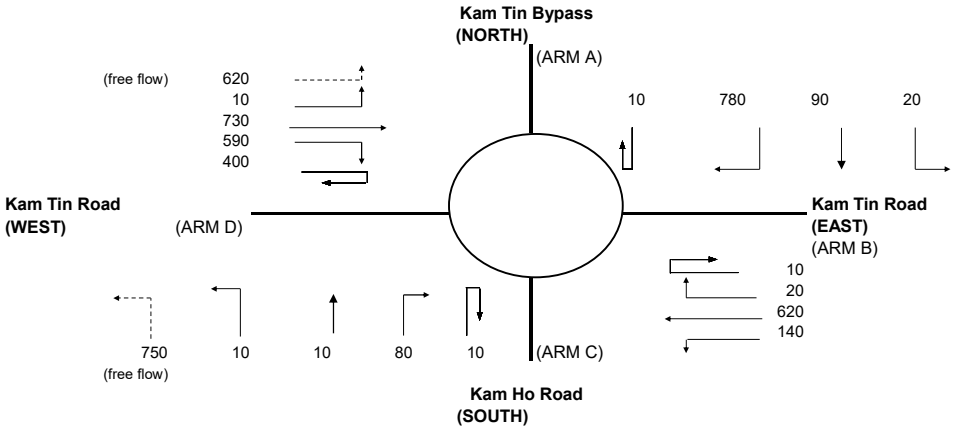
CRITICAL DFC = 0.80

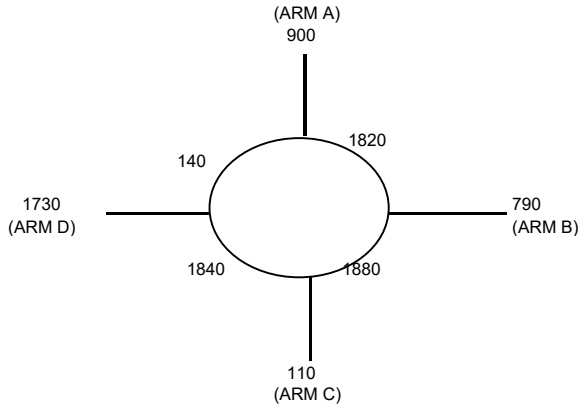
Filename : J13 - Kam Tin Road-Kam Tin Bypass-Kam Ho Road.xlsx / DesAB_Sen_AM

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J6 - Kam Tin Road / Kam Tin Bypass / Kam Ho Road	Scenario	2034 PM Peak Hour Design Traffic Flows - Sensitivity Test (I)	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.50	7.30	9.00	7.30
E = Entry width (m)	11.00	10.00	10.00	11.00
L = Effective length of flare (m)	15.00	12.00	1.00	13.00
R = Entry radius (m)	42.50	70.00	20.00	42.50
D = Inscribed circle diameter (m)	88.00	88.00	88.00	88.00
A = Entry angle (degree)	39.00	30.00	37.50	29.00
Q = Entry flow (pcu/h)	900	790	110	1730
Qc= Circulating flow across entry (pcu/h)	1820	1880	1840	140
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.48	0.36	1.60	0.46
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.03	0.97	1.03
X2= V + ((E-V)/(1+2S))	8.80	8.87	9.24	9.24
M = EXP((D-60)/10)	16.44	16.44	16.44	16.44
F = 303*X2	2665	2688	2799	2799
Td= 1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc= 0.21*Td(1+0.2*X2)	0.60	0.60	0.62	0.62
Qe= K(F-Fc*Qc)	1572	1616	1624	2792
DFC = Design flow/Capacity = Q/Qe	0.57	0.49	0.07	0.62

TOTAL ENTRY FLOWS = 4150 PCU

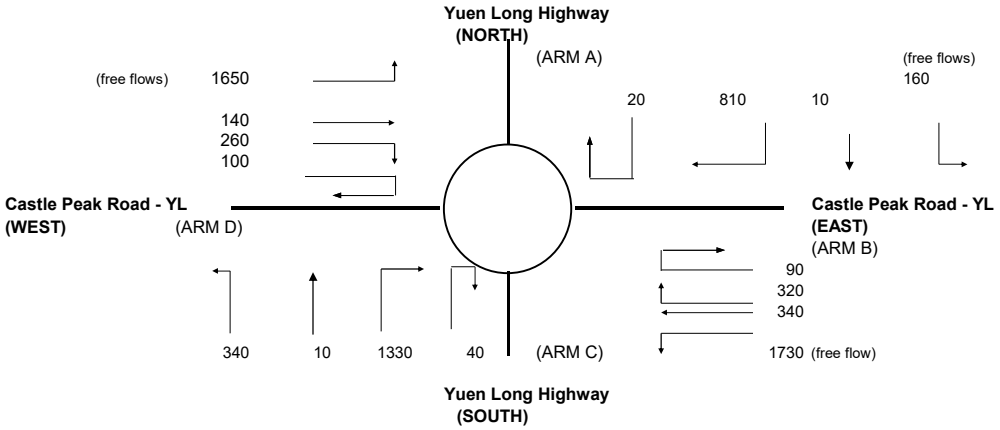
CRITICAL DFC = 0.62

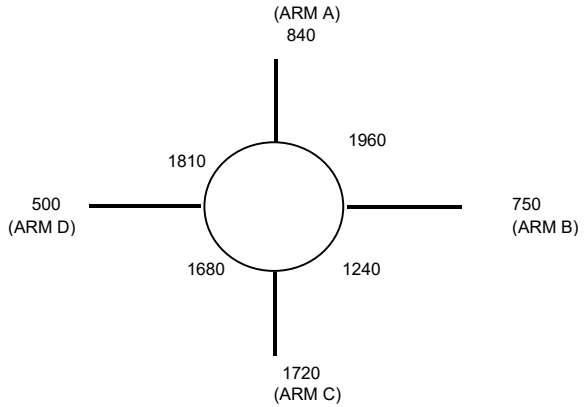
Filename : J13 - Kam Tin Road-Kam Tin Bypass-Kam Ho Road.xlsx / DesAB_Sen_PM

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J7 - Pok Oi Interchange	Scenario	2034 AM Peak Hour Design Traffic Flows - Sensitivity Test	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.30	3.70	9.00	3.50
E = Entry width (m)	7.30	7.40	12.00	7.00
L = Effective length of flare (m)	13.00	6.00	5.00	5.00
R = Entry radius (m)	21.00	25.00	25.00	25.00
D = Inscribed circle diameter (m)	110.00	80.00	110.00	80.00
A = Entry angle (degree)	35.00	50.00	45.00	45.00
Q = Entry flow (pcu/h)	840	750	1720	500
Qc= Circulating flow across entry (pcu/h)	1960	1240	1680	1810
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.12	0.99	0.96	1.12
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	0.94	0.96	0.96
X2= V + ((E-V)/(1+2S))	7.10	4.94	10.03	4.58
M = EXP((D-60)/10)	148.41	7.39	148.41	7.39
F = 303*X2	2152	1498	3038	1388
Td= 1+(0.5/(1+M))	1.00	1.06	1.00	1.06
Fc= 0.21*Td(1+0.2*X2)	0.51	0.44	0.63	0.43
Qe= K(F-Fc*Qc)	1135	893	1891	590
DFC = Design flow/Capacity = Q/Qe	0.74	0.84	0.91	0.85

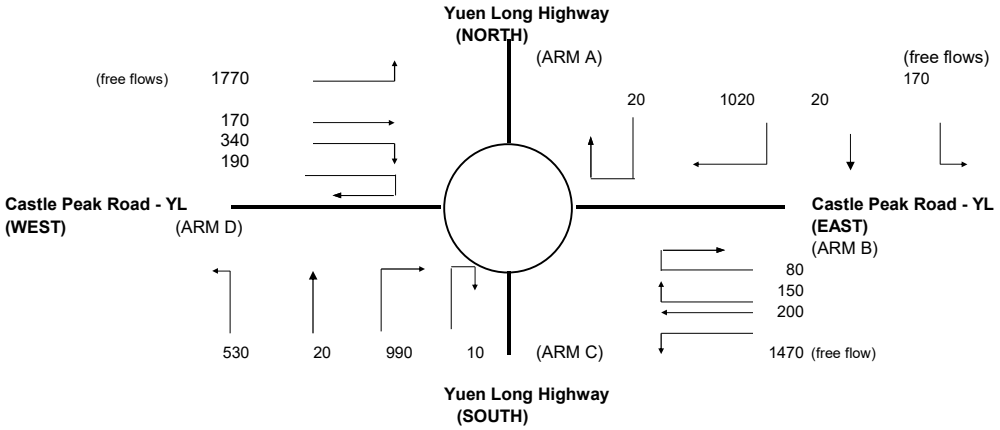
TOTAL ENTRY FLOWS = 5460 PCU

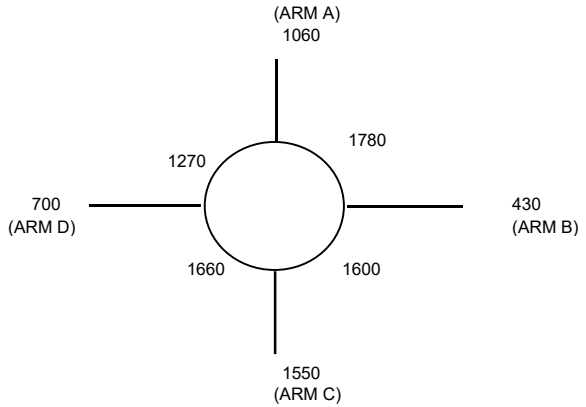
CRITICAL DFC = 0.91

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J7 - Pok Oi Interchange	Scenario	2034 PM Peak Hour Design Traffic Flows - Sensitivity Test	Project No.	Prepared By	Checked By	Date
				-	MKCN	SHSN	Mar 2024





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	6.30	3.70	9.00	3.50
E = Entry width (m)	7.30	7.40	12.00	7.00
L = Effective length of flare (m)	13.00	6.00	5.00	5.00
R = Entry radius (m)	21.00	25.00	25.00	25.00
D = Inscribed circle diameter (m)	110.00	80.00	110.00	80.00
A = Entry angle (degree)	35.00	50.00	45.00	45.00
Q = Entry flow (pcu/h)	1060	430	1550	700
Qc= Circulating flow across entry (pcu/h)	1780	1600	1660	1270
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.12	0.99	0.96	1.12
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.98	0.94	0.96	0.96
X2= V + ((E-V)/(1+2S))	7.10	4.94	10.03	4.58
M = EXP((D-60)/10)	148.41	7.39	148.41	7.39
F = 303*X2	2152	1498	3038	1388
Td= 1+(0.5/(1+M))	1.00	1.06	1.00	1.06
Fc= 0.21*Td(1+0.2*X2)	0.51	0.44	0.63	0.43
Qe= K(F-Fc*Qc)	1226	743	1903	811
DFC = Design flow/Capacity = Q/Qe	0.86	0.58	0.81	0.86

TOTAL ENTRY FLOWS = 5510 PCU

CRITICAL DFC = 0.86

Filename : J11 - Pok Oi Interchange_(with Signal).xlsm / DesAB_Sen_PM

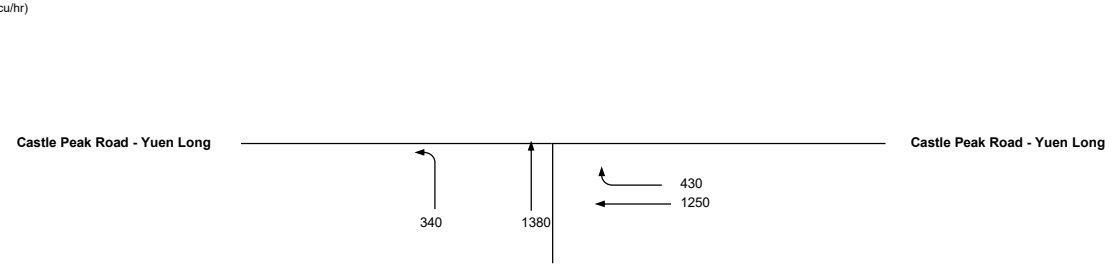
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Pok Oi Interchange (Yuen Long Highway NB Slip Road)	2034 AM Design Trafic Flows - Sensitivity Test (I)	DESIGN: 0	CHECK: 0	JOB NO:	DATE: Nov 20

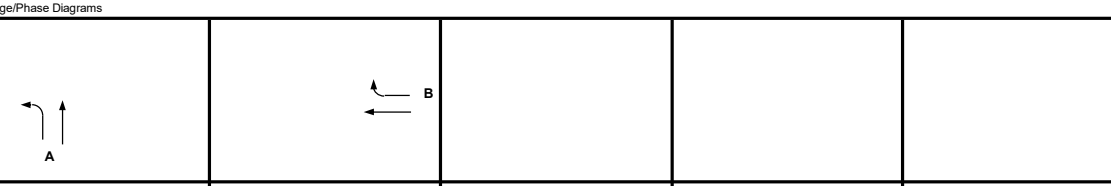
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.764	
Lost time		L =	8	sec
Total Flow		=	9,020	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	72	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	34	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.840	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	9.9	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	53	sec
Y_{max}	$= 1-L/C$	=	0.933	

Stage/Phase Diagrams



Critical Case : A,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 10%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↰	A	1	5.000	1	25			0		0		2255	340	510		850	40%		2202	0.386	
↑	A	1	5.000	1				0		0		2255		870		870			2255	0.386	0.386
↑	B	2	5.000	1				0		0		2255		853		853			2255	0.378	
↱	B	2	5.000	1		25	0	0		0		2255		397	430	827		52%	2187	0.378	0.378

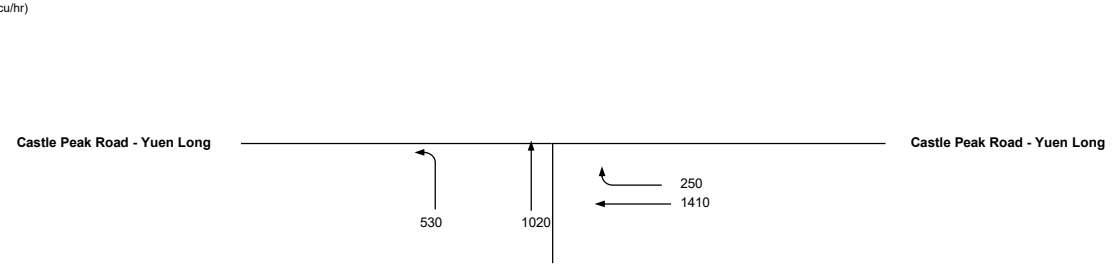
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Pok Oi Interchange (Yuen Long Highway NB Slip Road)	2034 PM Design Trafic Flows - Sensitivity Test (I)	DESIGN: 0	CHECK: 0	JOB NO:	DATE: Nov 20

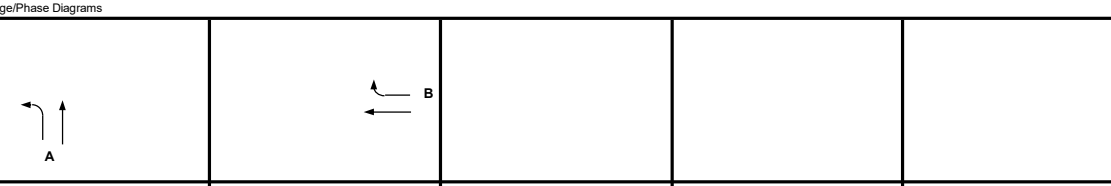
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.722	
Lost time		L =	8	sec
Total Flow		=	9,020	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	61	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	29	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.840	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	16.3	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	40	sec
Y_{max}	$= 1-L/C$	=	0.933	

Stage/Phase Diagrams



I/G = 5 I/G = 5

Critical Case : A,B

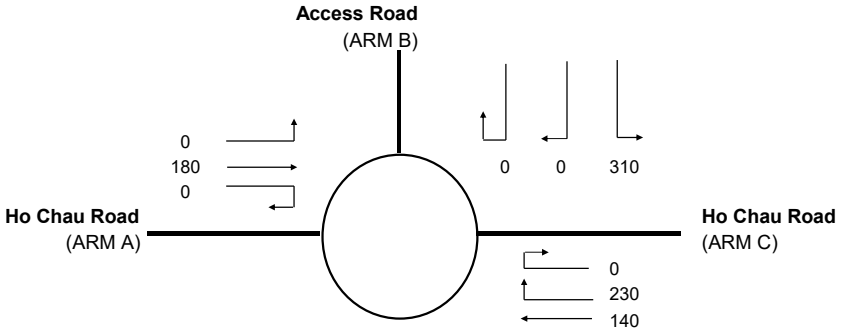
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 16%

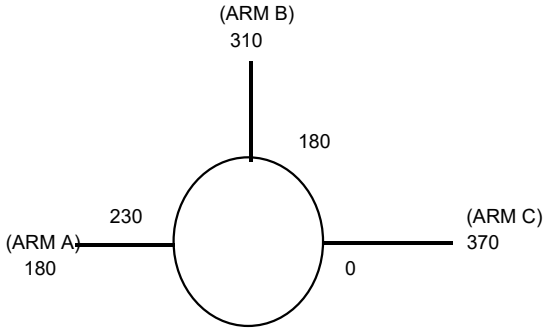
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
↰	A	1	5.000	1	25			0		0		2255	530	229		759	70%		2164	0.351	0.351
↑	A	1	5.000	1				0		0		2255		791		791			2255	0.351	
↑	B	2	5.000	1				0		0		2255		838		838			2255	0.371	0.371
↱	B	2	5.000	1		25	0	0		0		2255		573	250	823		30%	2215	0.371	

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J8 - Ho Chau Road / Access Road	Scenario	2034 AM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
							22/Mar/24





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	3.70	4.50	4.00
E = Entry width (m)	4.50	5.70	4.60
L = Effective length of flare (m)	4.50	4.00	2.50
R = Entry radius (m)	15.00	7.50	35.00
D = Inscribed circle diameter (m)	28.00	28.00	28.00
A = Entry angle (degree)	40.00	38.00	34.00
Q = Entry flow (pcu/h)	180	310	370
Qc= Circulating flow across entry (pcu/h)	230	180	0
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.28	0.48	0.38
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.95	0.89	1.01
X2= V + ((E-V)/(1+2S))	4.21	5.11	4.34
M = EXP((D-60)/10)	0.04	0.04	0.04
F = 303*X2	1276	1549	1315
Td= 1+(0.5/(1+M))	1.48	1.48	1.48
Fc= 0.21*Td(1+0.2*X2)	0.57	0.63	0.58
Qe= K(F-Fc*Qc)	1086	1279	1324
DFC = Design flow/Capacity = Q/Qe	0.17	0.24	0.28

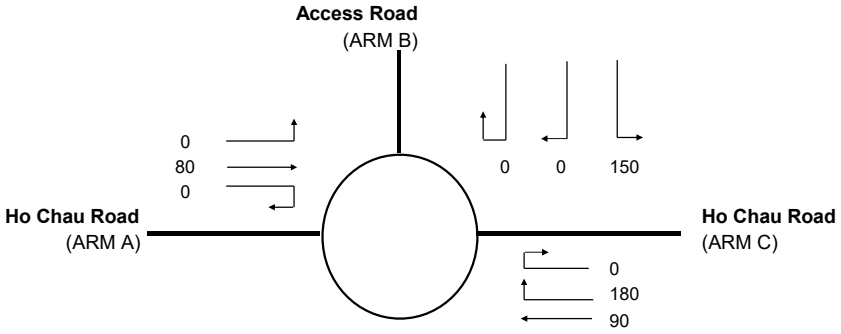
TOTAL ENTRY FLOWS = 860 PCU

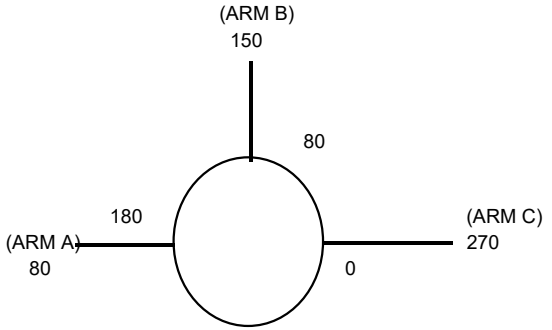
CRITICAL DFC = 0.28

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J8 - Ho Chau Road / Access Road	Scenario	2034 PM Peak Hour Design Traffic Flows	Project No.	Prepared By	Checked By	Date
							22/Mar/24





ARM	A	B	C
INPUT PARAMETERS:			
V = Approach half width (m)	3.70	4.50	4.00
E = Entry width (m)	4.50	5.70	4.60
L = Effective length of flare (m)	4.50	4.00	2.50
R = Entry radius (m)	15.00	7.50	35.00
D = Inscribed circle diameter (m)	28.00	28.00	28.00
A = Entry angle (degree)	40.00	38.00	34.00
Q = Entry flow (pcu/h)	80	150	270
Qc= Circulating flow across entry (pcu/h)	180	80	0
OUTPUT PARAMETERS:			
S = Sharpness of flare = 1.6(E-V)/L	0.28	0.48	0.38
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.95	0.89	1.01
X2= V + ((E-V)/(1+2S))	4.21	5.11	4.34
M = EXP((D-60)/10)	0.04	0.04	0.04
F = 303*X2	1276	1549	1315
Td= 1+(0.5/(1+M))	1.48	1.48	1.48
Fc= 0.21*Td(1+0.2*X2)	0.57	0.63	0.58
Qe= K(F-Fc*Qc)	1113	1335	1324
DFC = Design flow/Capacity = Q/Qe	0.07	0.11	0.20

TOTAL ENTRY FLOWS = 500 PCU

CRITICAL DFC = 0.20

Annex B

Demarcation Plan of Public and Private Road

ANNEX B1

VILLAGE ROAD

INTERNAL ROAD

PUBLIC ROAD

LEGEND

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- HO CHAU ROAD WIDENING WORKS UNDER APPROVED APPLICATION A/YL-NSW/274
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION
- PROVISION OF PUBLIC ACCESS ROAD AND INFRASTRUCTURE TO BE MANAGED AND MAINTAINED BY GOVERNMENT DEPARTMENTS

T8 24s
GIC 2 STOREYS
T7 24s
RETAIL,GIC & CARPARK 2 STOREYS
T6 24s
T5 24s
T2 24s
CLUB HOUSE
T3 24s
OUTDOOR POOL
T1 23s
PTT, RETAIL & KINDERGARTEN 2 STOREYS
SEWAGE PUMPING STATION
WETLAND
WETLAND
YUEN LONG HIGHWAY
TSING LONG HIGHWAY

N

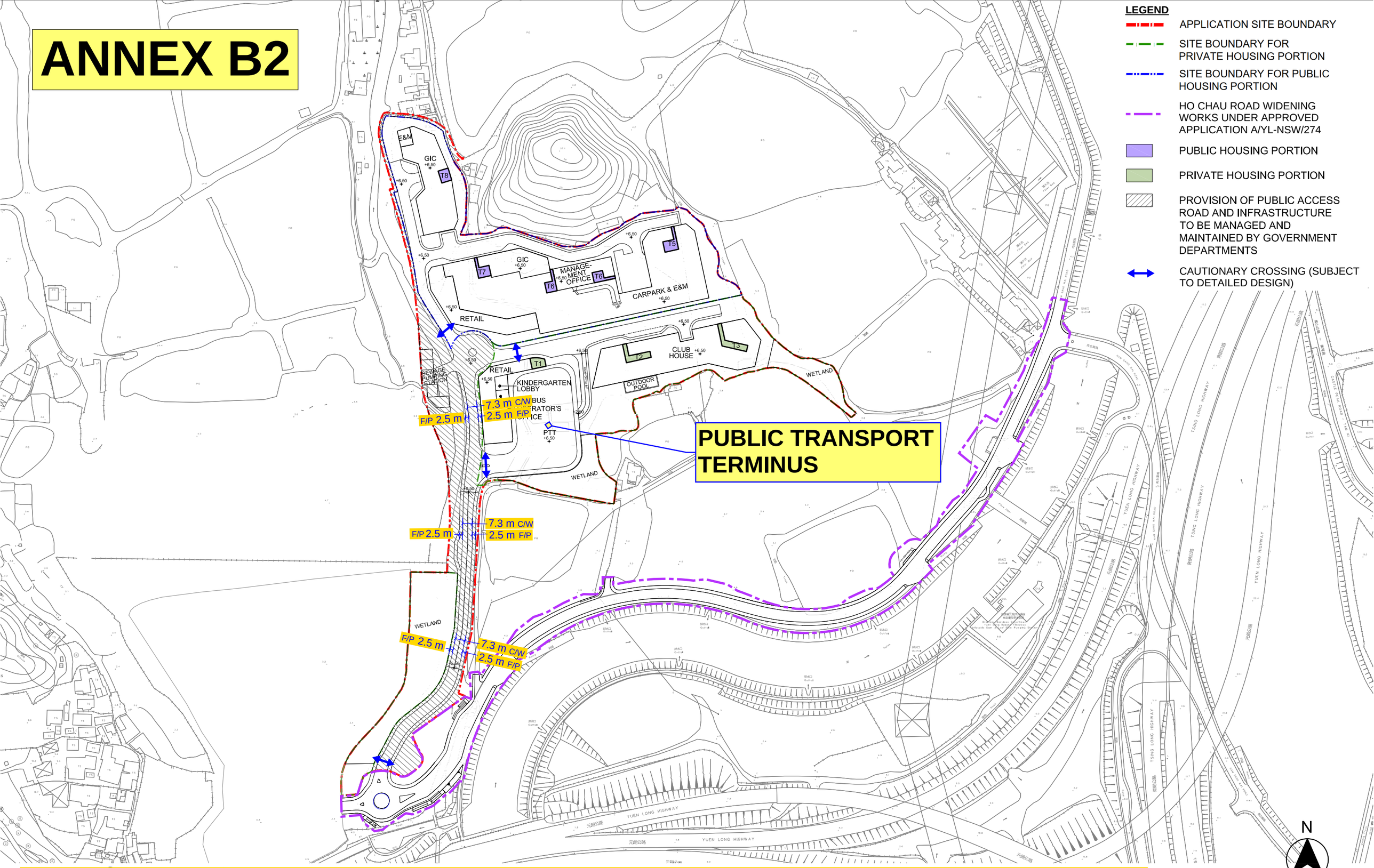
Site Demarcation Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

ANNEX B2



Annex B2 - LAYOUT PLAN OF PUBLIC ROAD WITH DIMENSIONS OF CARRIAGEWAY, FOOTPATH AND PEDESTRIAN CROSSING FACILITIES

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

ANNEX B3

Local Track Road to be managed and maintained by <u>Home Affairs Department</u> (Comments to be sought).

Public Access Road to be managed by <u>TD</u> and maintained by <u>HyD</u> (Comments to be sought).

PTI to be managed by <u>TD</u> and maintained by <u>HyD</u> (Comments to be sought).

Ho Chau Road Widening Works Under Approved Application A/YL-NSW/274

LEGEND :

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION
- PROVISION OF PUBLIC ACCESS ROAD AND INFRASTRUCTURE TO BE MANAGED AND MAINTAINED BY GOVERNMENT DEPARTMENTS
- PTI TO BE MANAGED BY TD AND MAINTAINED BY HYD (COMMENTS TO BE SOUGHT)
- PUBLIC ACCESS ROAD TO BE MANAGED BY TD AND MAINTAINED BY HYD (COMMENTS TO BE SOUGHT)
- LOCAL TRACK ROAD TO BE MANAGED AND MAINTAINED BY HOME AFFAIRS DEPARTMENT (COMMENTS TO BE SOUGHT)
- HO CHAU ROAD WIDENING WORKS UNDER APPROVED APPLICATION A/YL-NSW/274

Annex B3 - DEMARCATION OF PUBLIC ACCESS ROAD, PUBLIC TRANSPORT INTERCHANGE AND LOCAL TRACK ROAD.

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

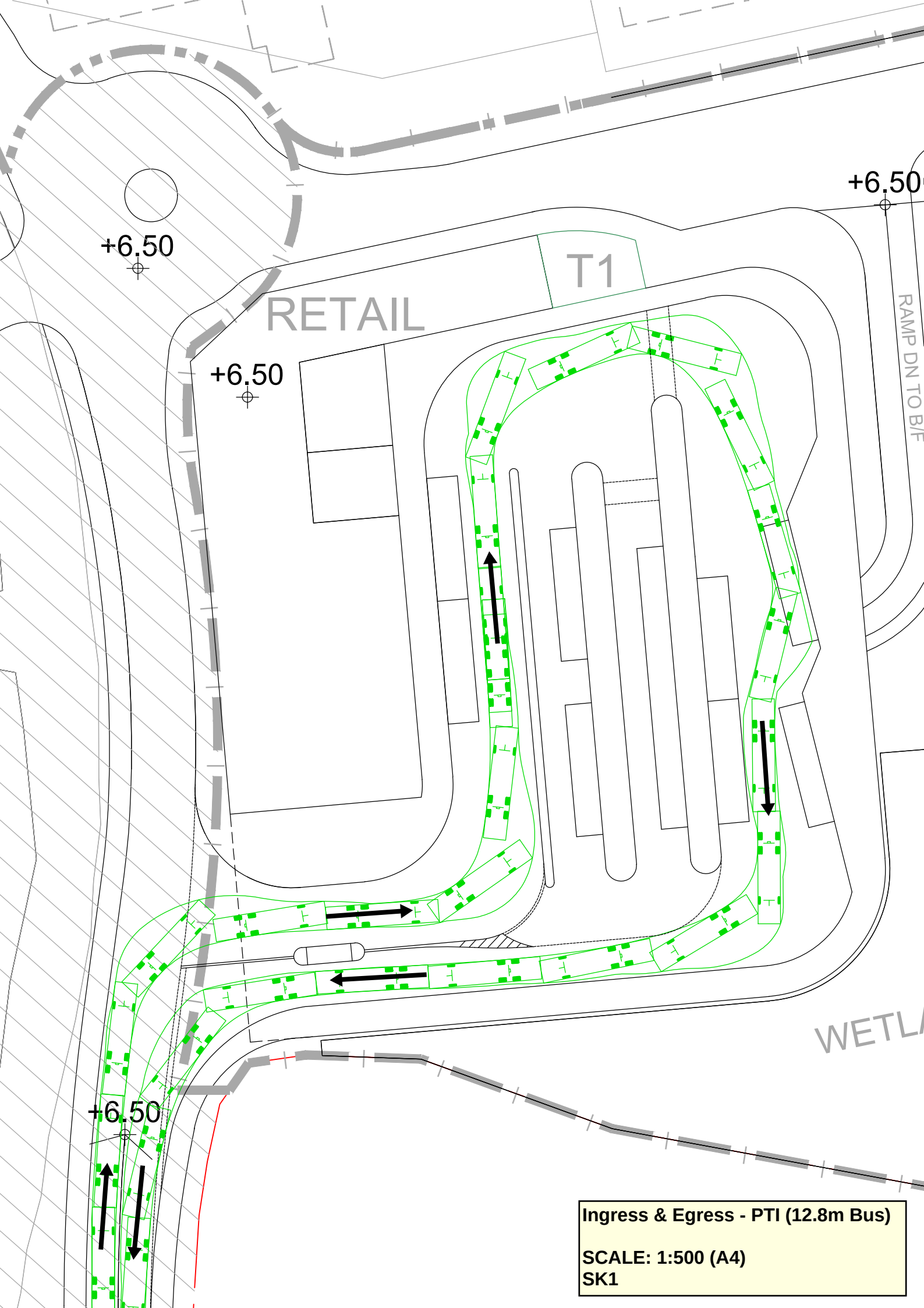
DATE : 15 MAR 2024

1 : 2500 (A3)

ARCHI+ ARCHIPLUS INTERNATIONAL LIMITED

Annex C

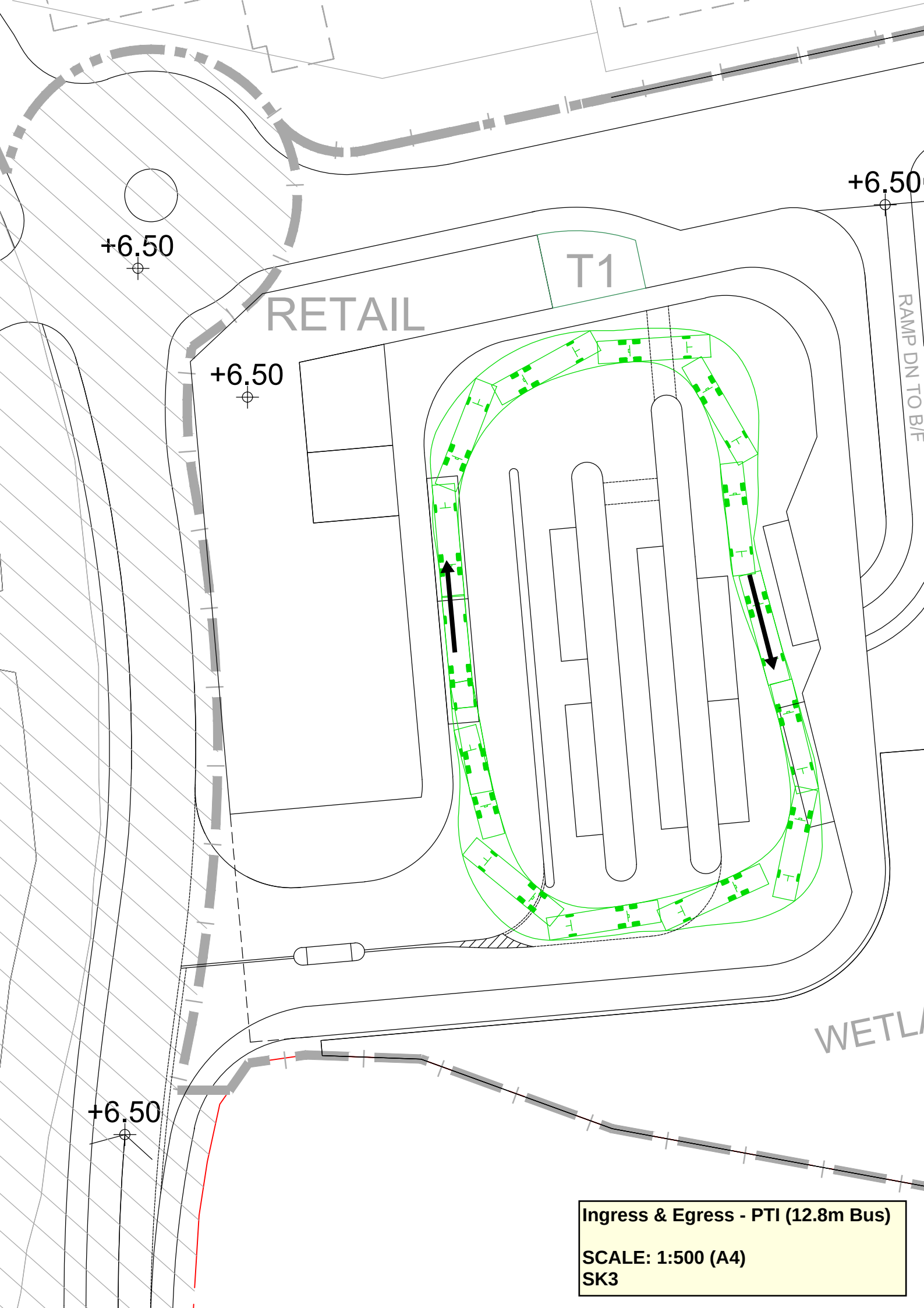
Swept Path Analysis


+6.50
+6.50
+6.50
+6.50
T1
RETAIL
RAMP DN TO B/F
WETL
Ingress & Egress - PTI (12.8m Bus)
SCALE: 1:500 (A4)
SK1



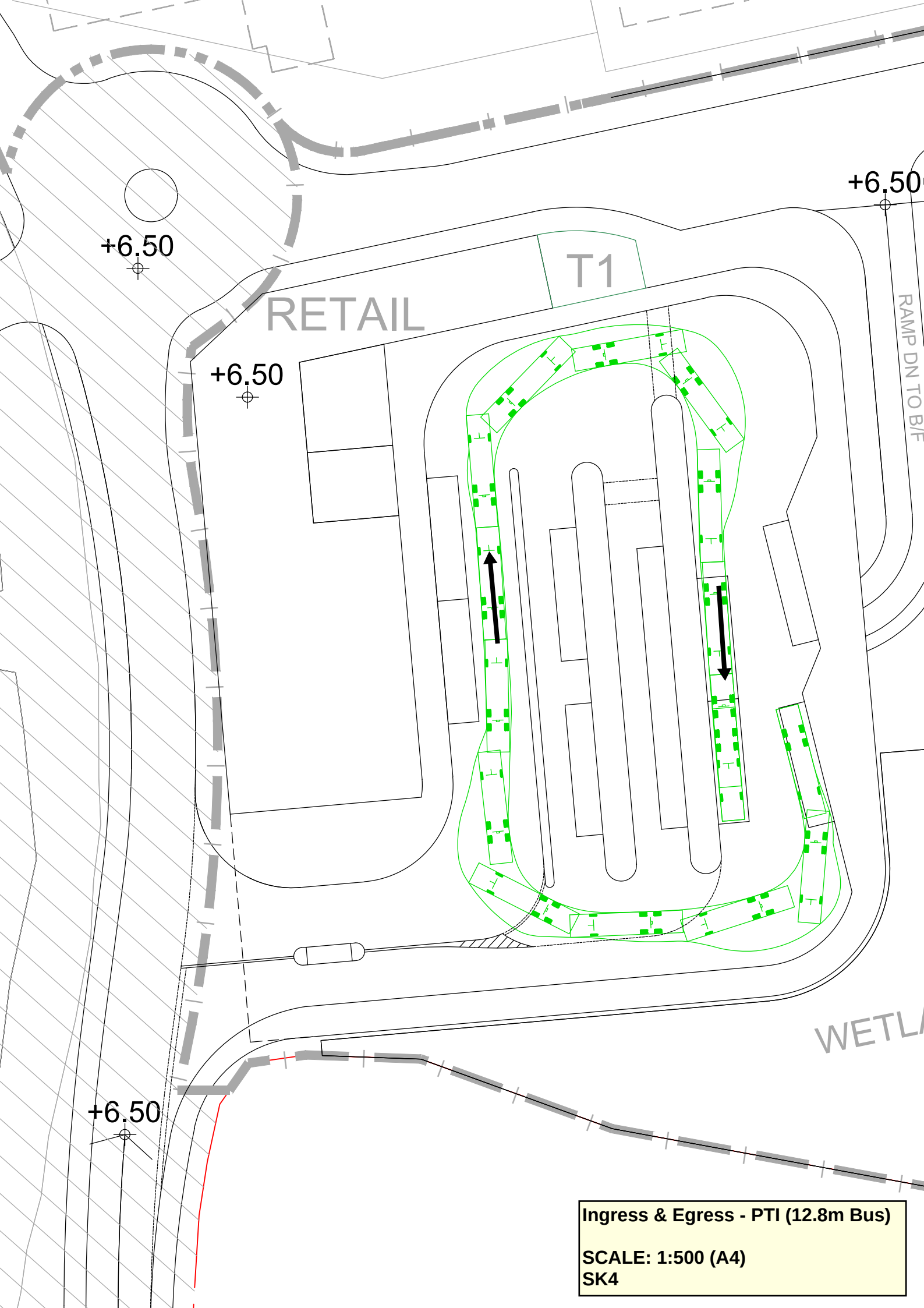
Ingress & Egress - PTI (12.8m Bus)

SCALE: 1:500 (A4)
SK2



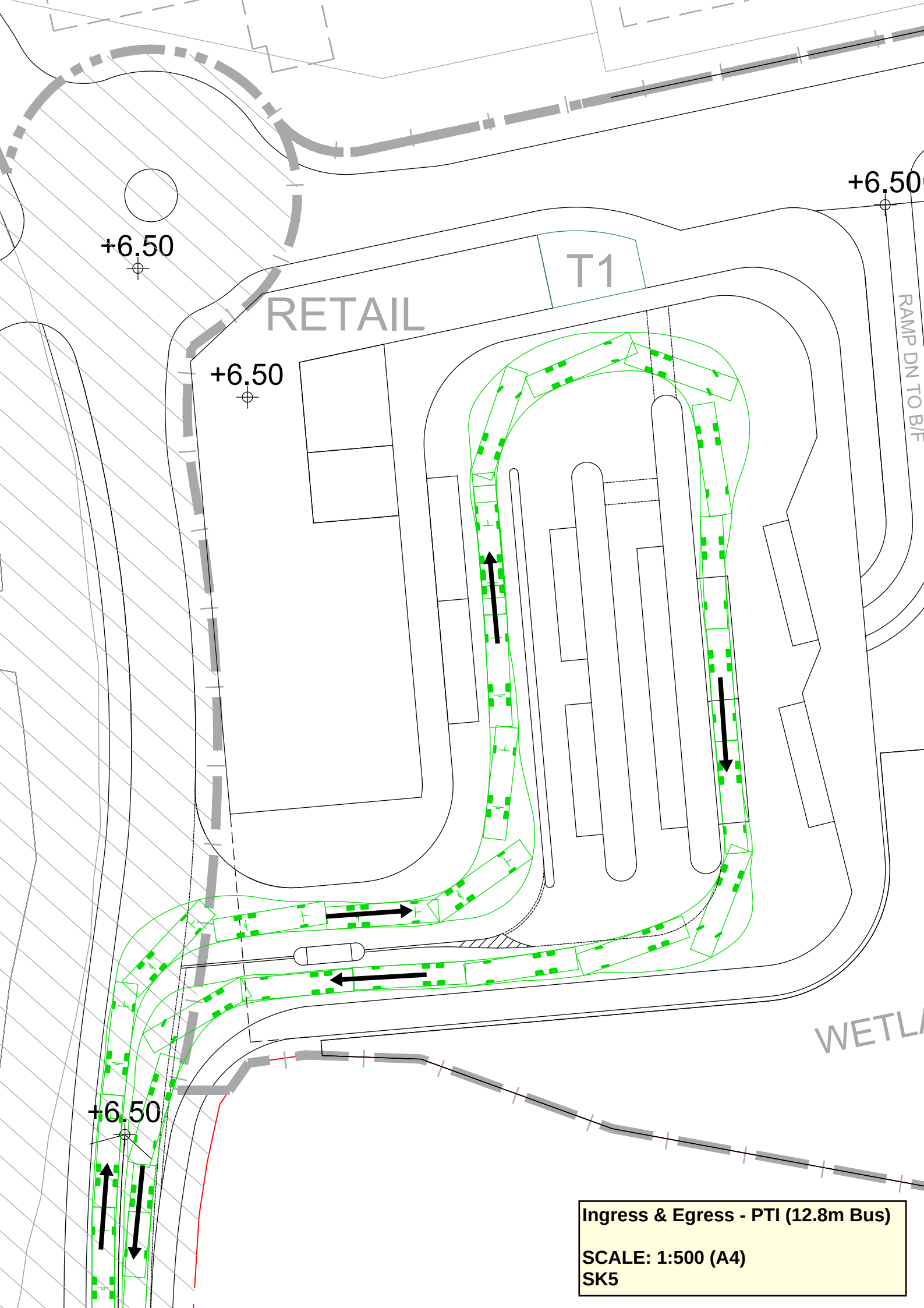
Ingress & Egress - PTI (12.8m Bus)

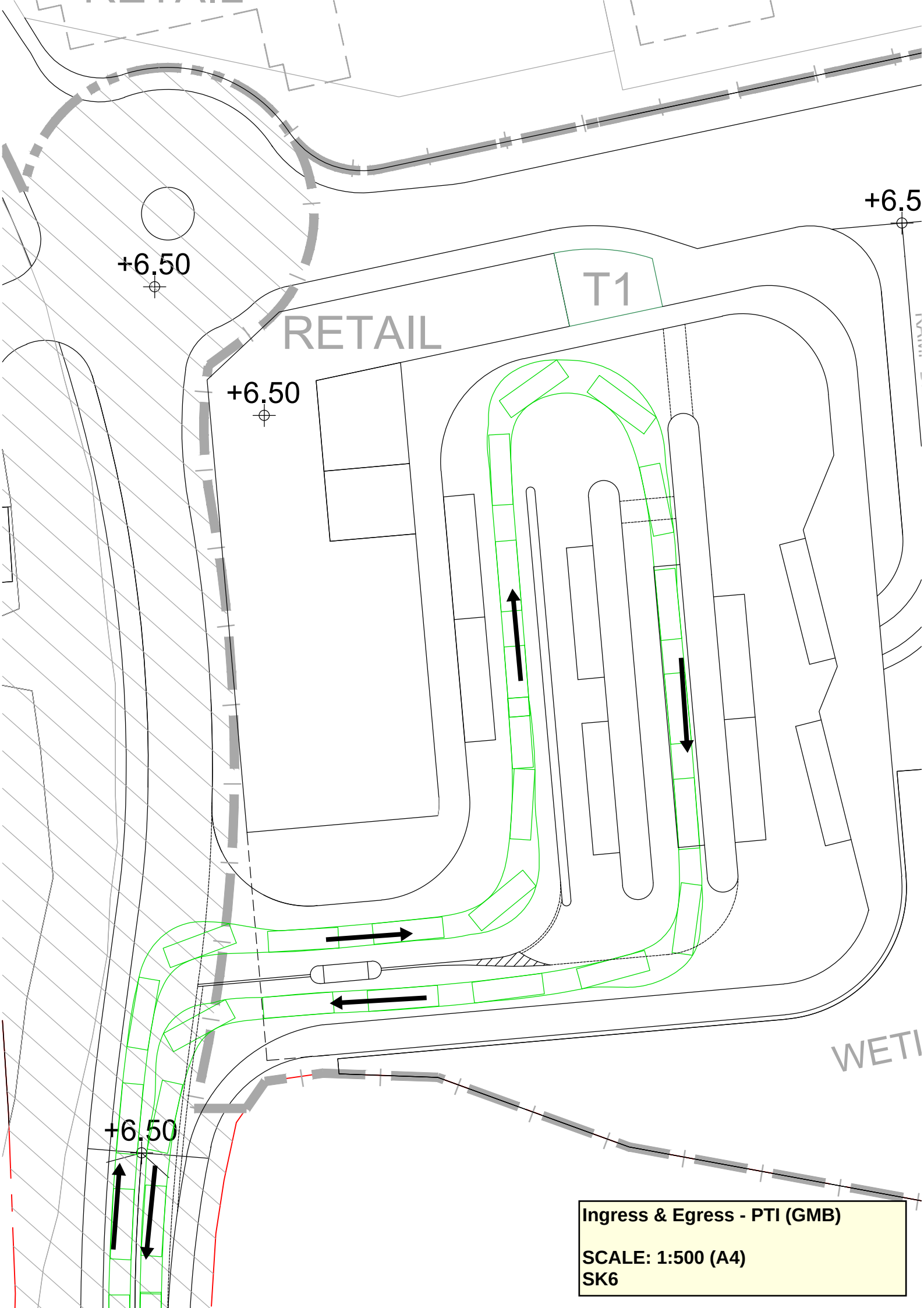
SCALE: 1:500 (A4)
SK3



Ingress & Egress - PTI (12.8m Bus)

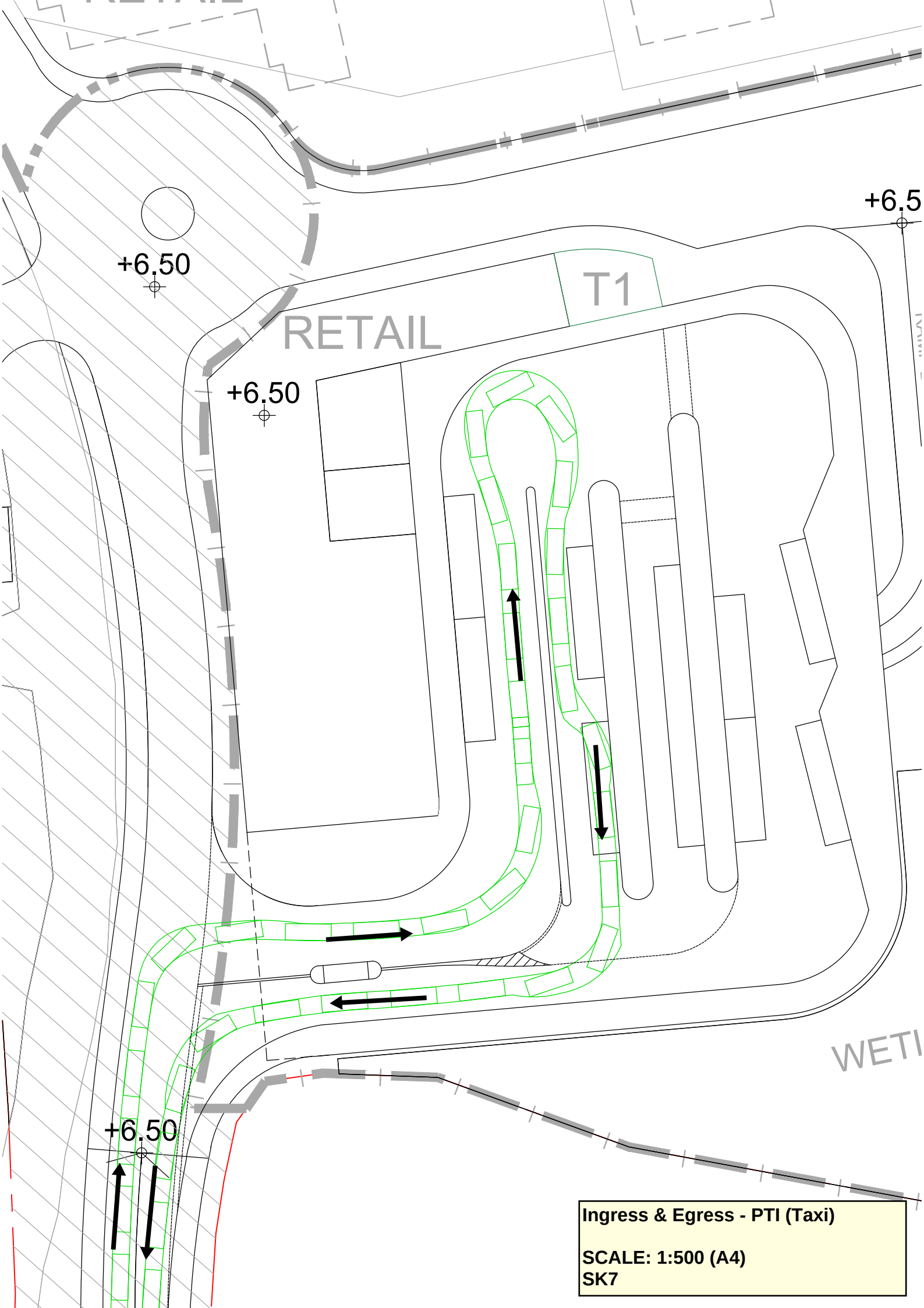
SCALE: 1:500 (A4)
SK4


+6.50
+6.50
+6.50
+6.50
T1
RETAIL
RAMP DN TO B/F
WETL
Ingress & Egress - PTI (12.8m Bus)
SCALE: 1:500 (A4)
SK5



Ingress & Egress - PTI (GMB)

SCALE: 1:500 (A4)
SK6


+6.50
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Ingress & Egress - PTI (Taxi)
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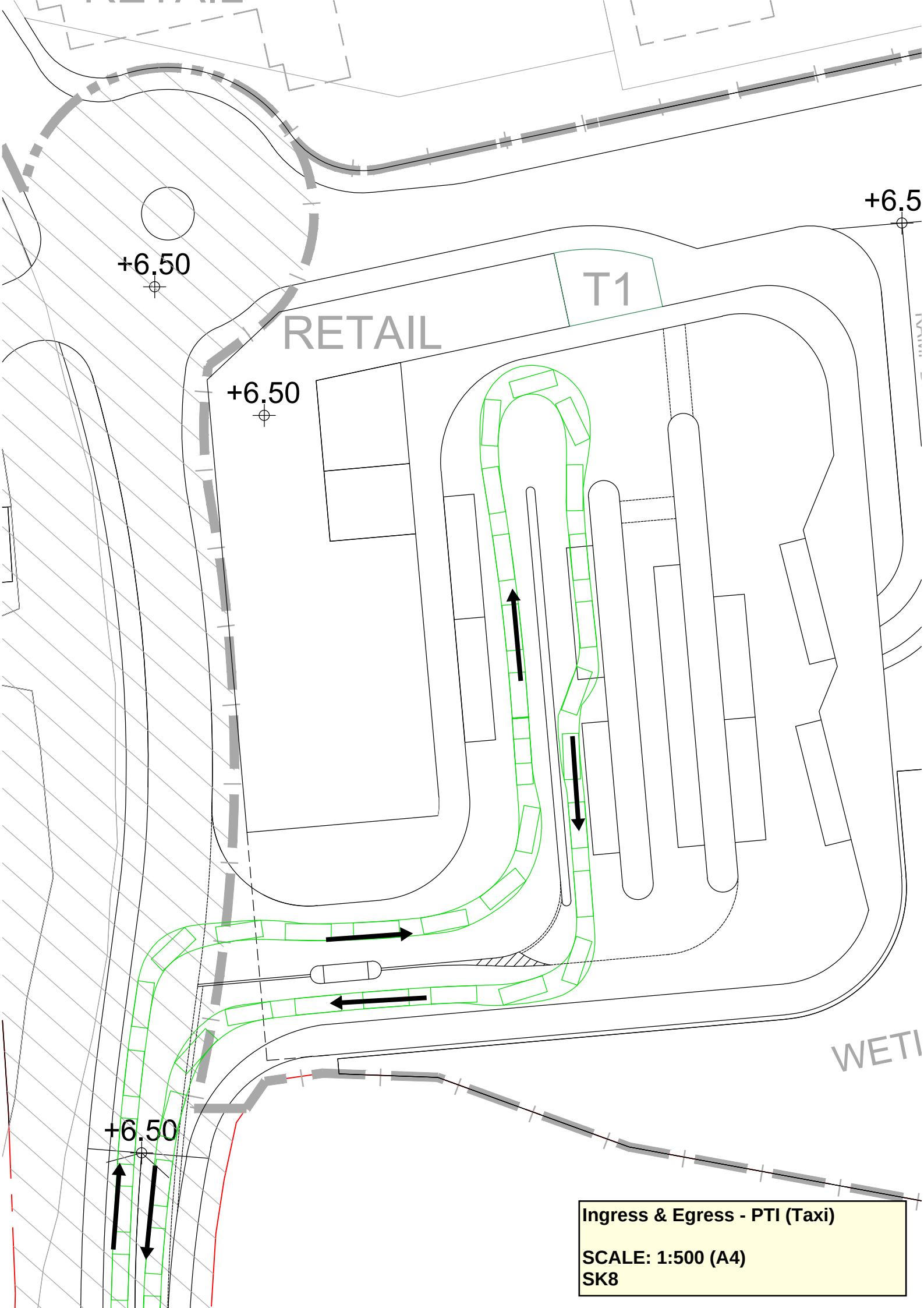
SK7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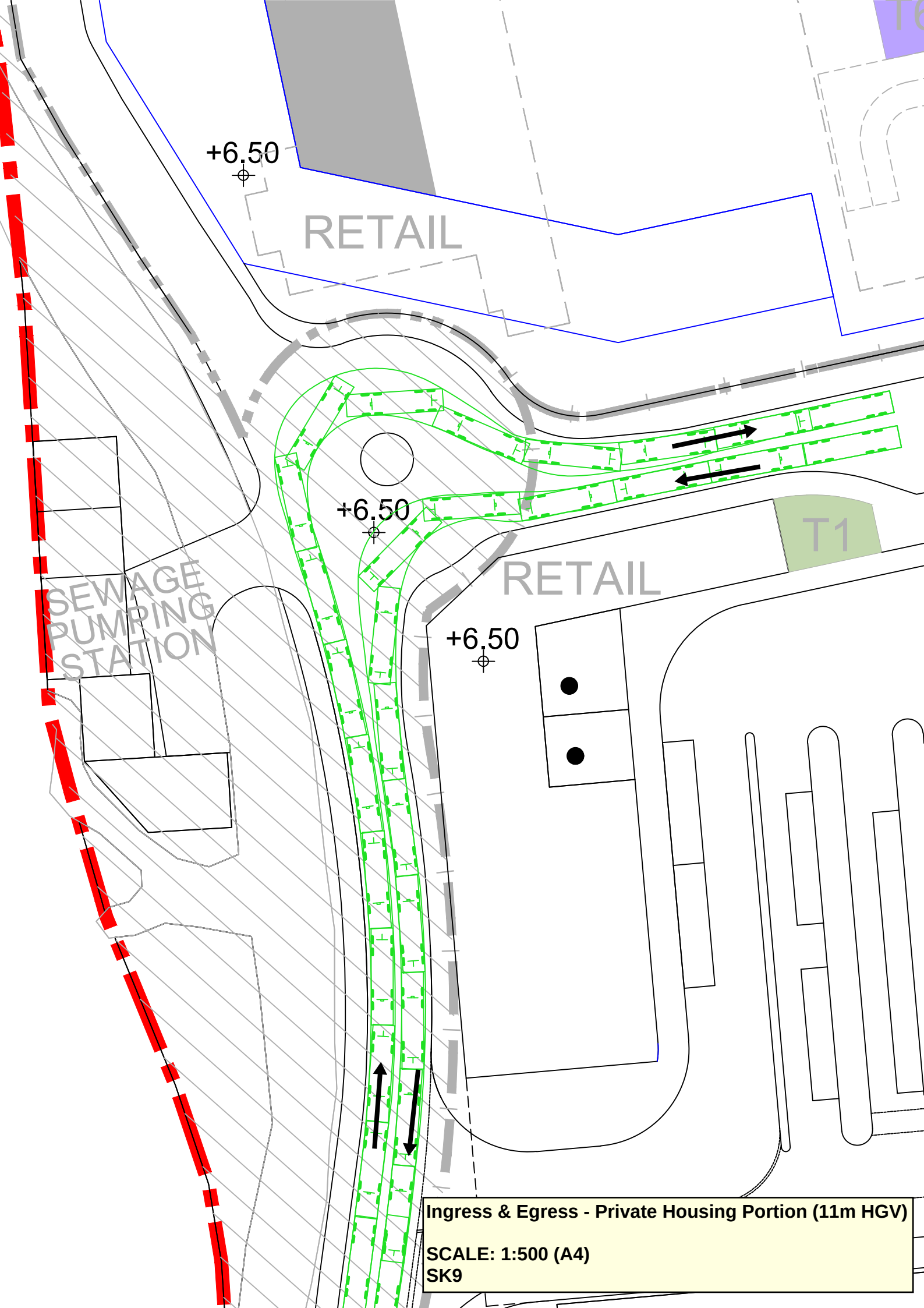
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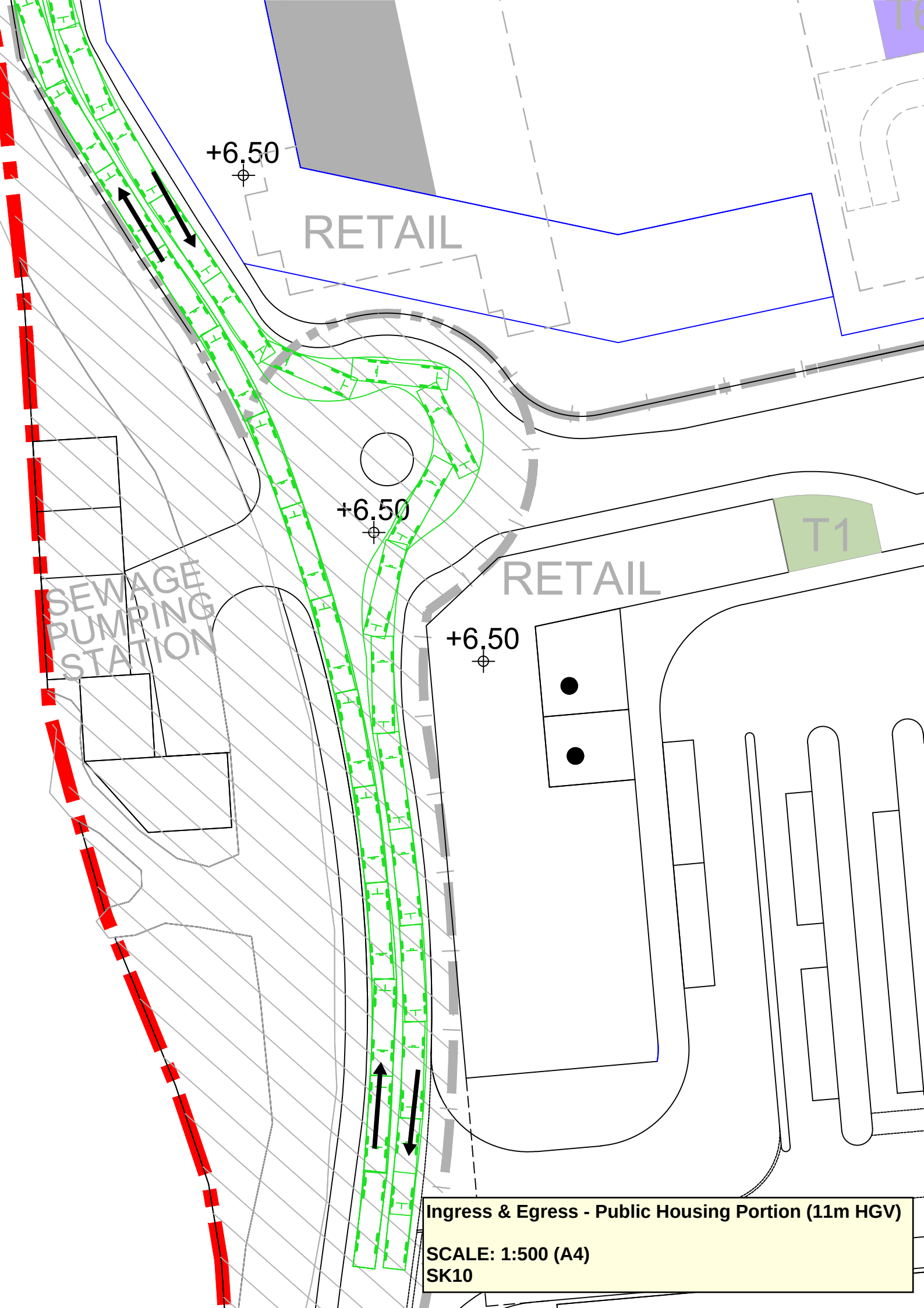
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SEWAGE PUMPING STATION
T1
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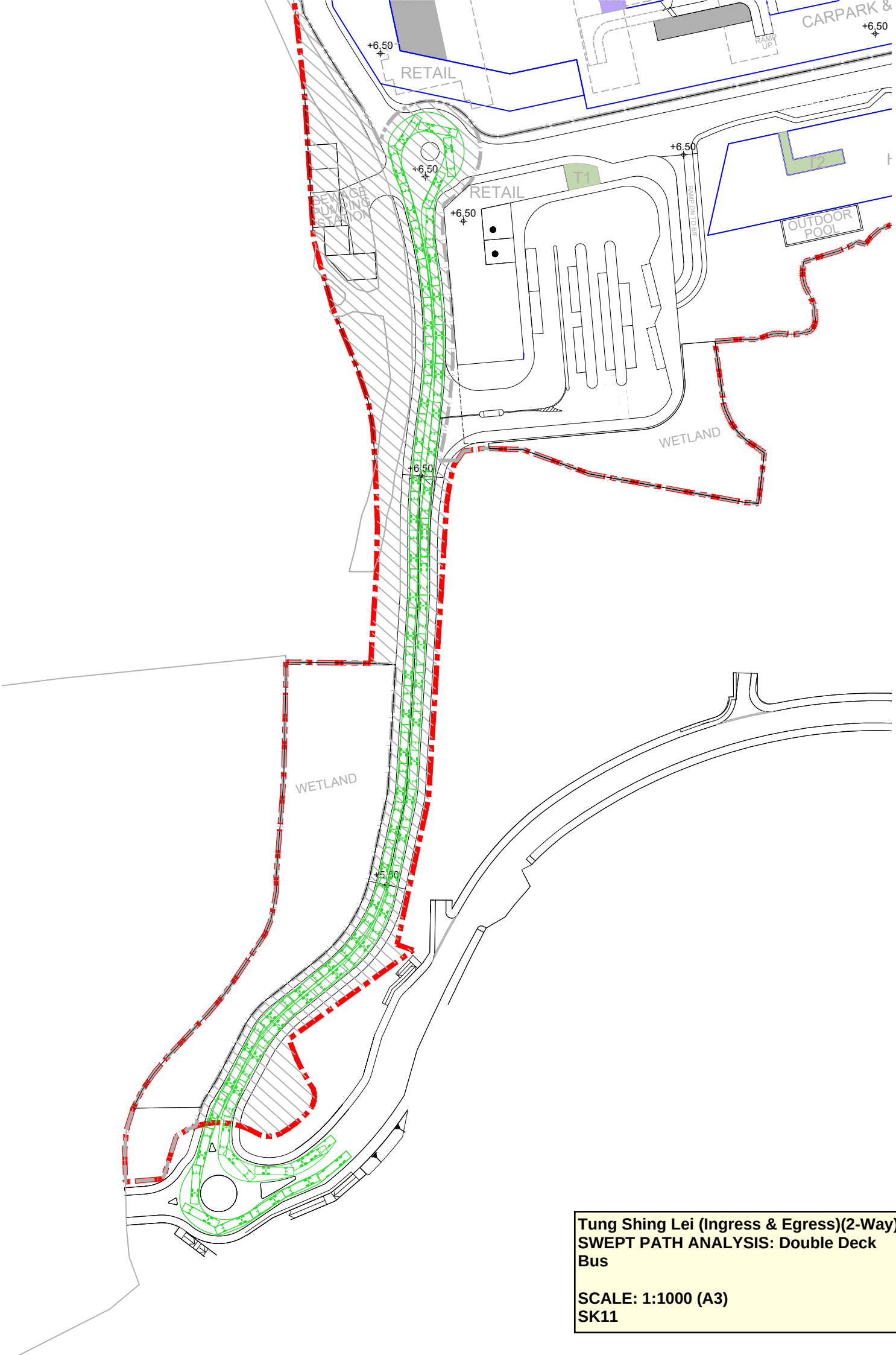

Tung Shing Lei (Ingress & Egress)(2-Way)
SWEPT PATH ANALYSIS: Double Deck Bus

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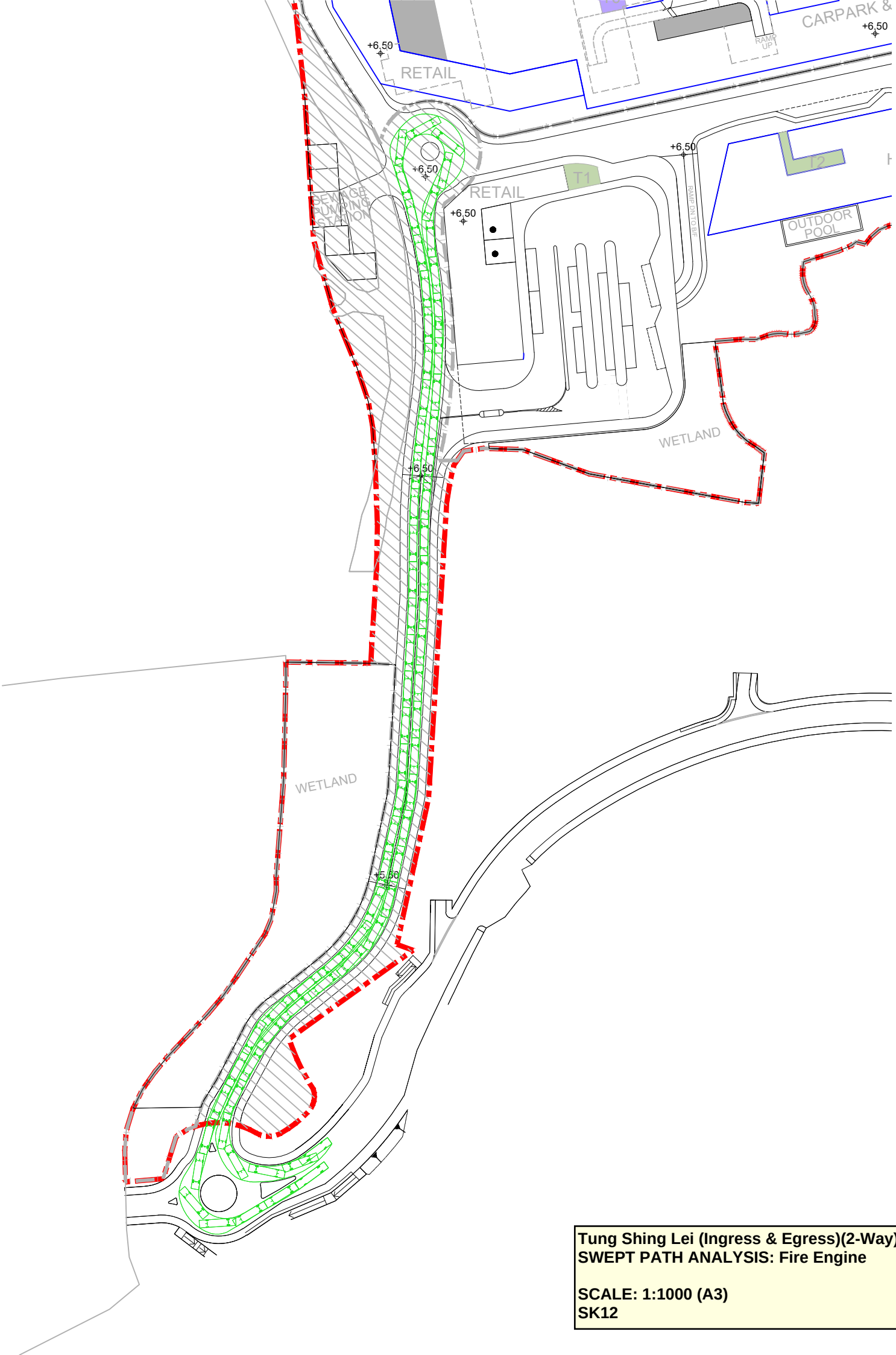

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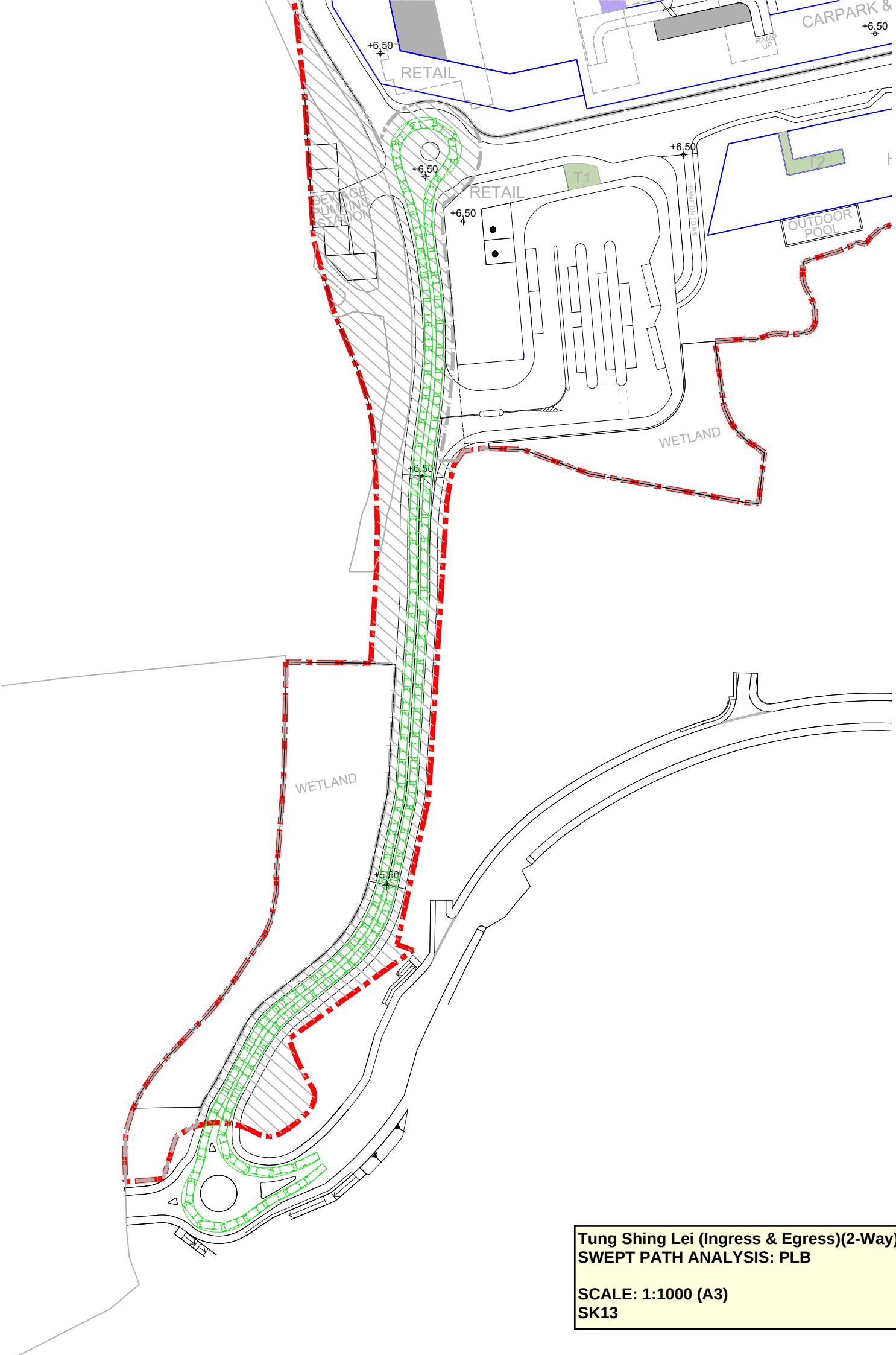

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SWEPT PATH ANALYSIS: PLB

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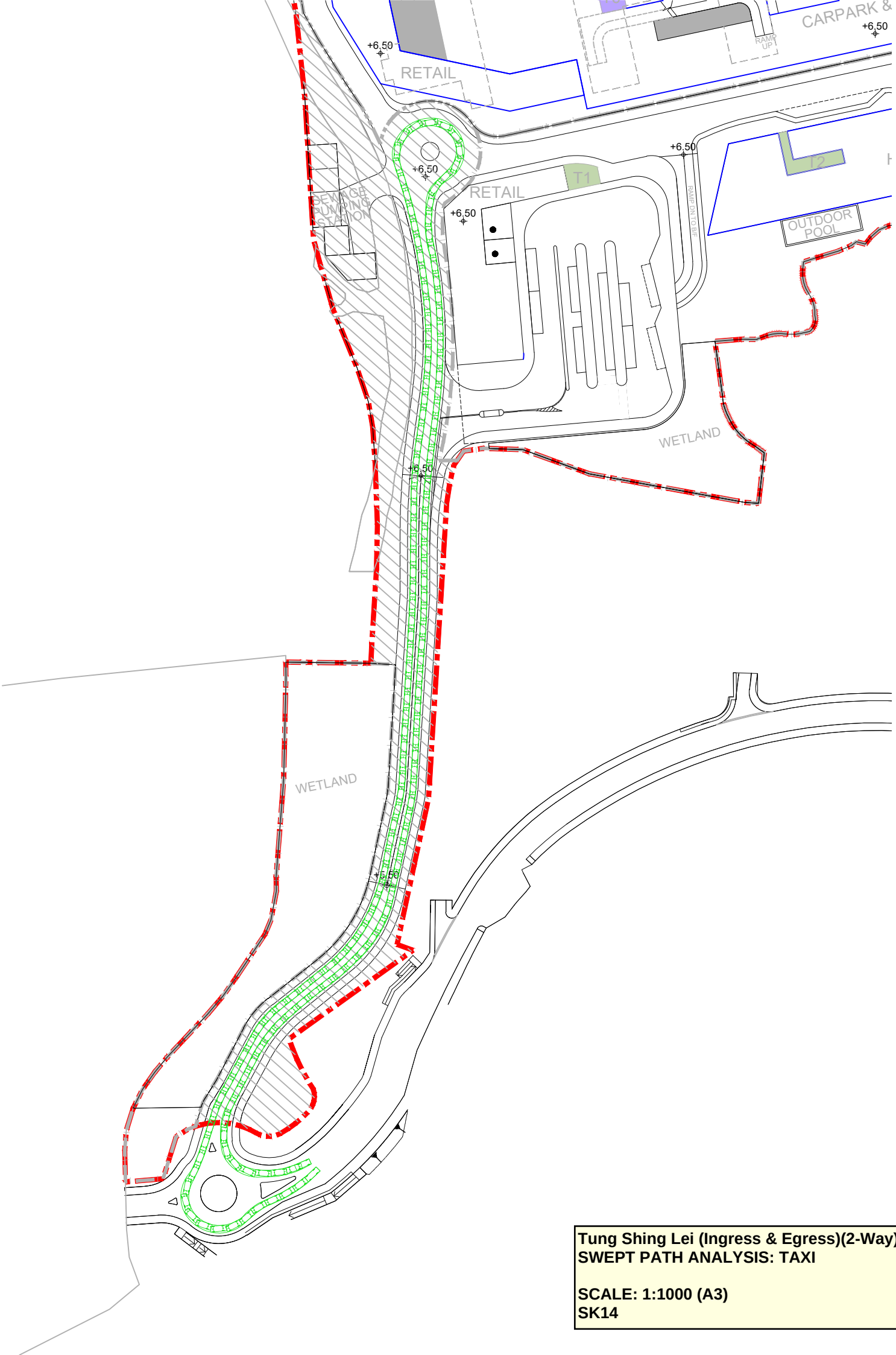

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SWEPT PATH ANALYSIS: TAXI

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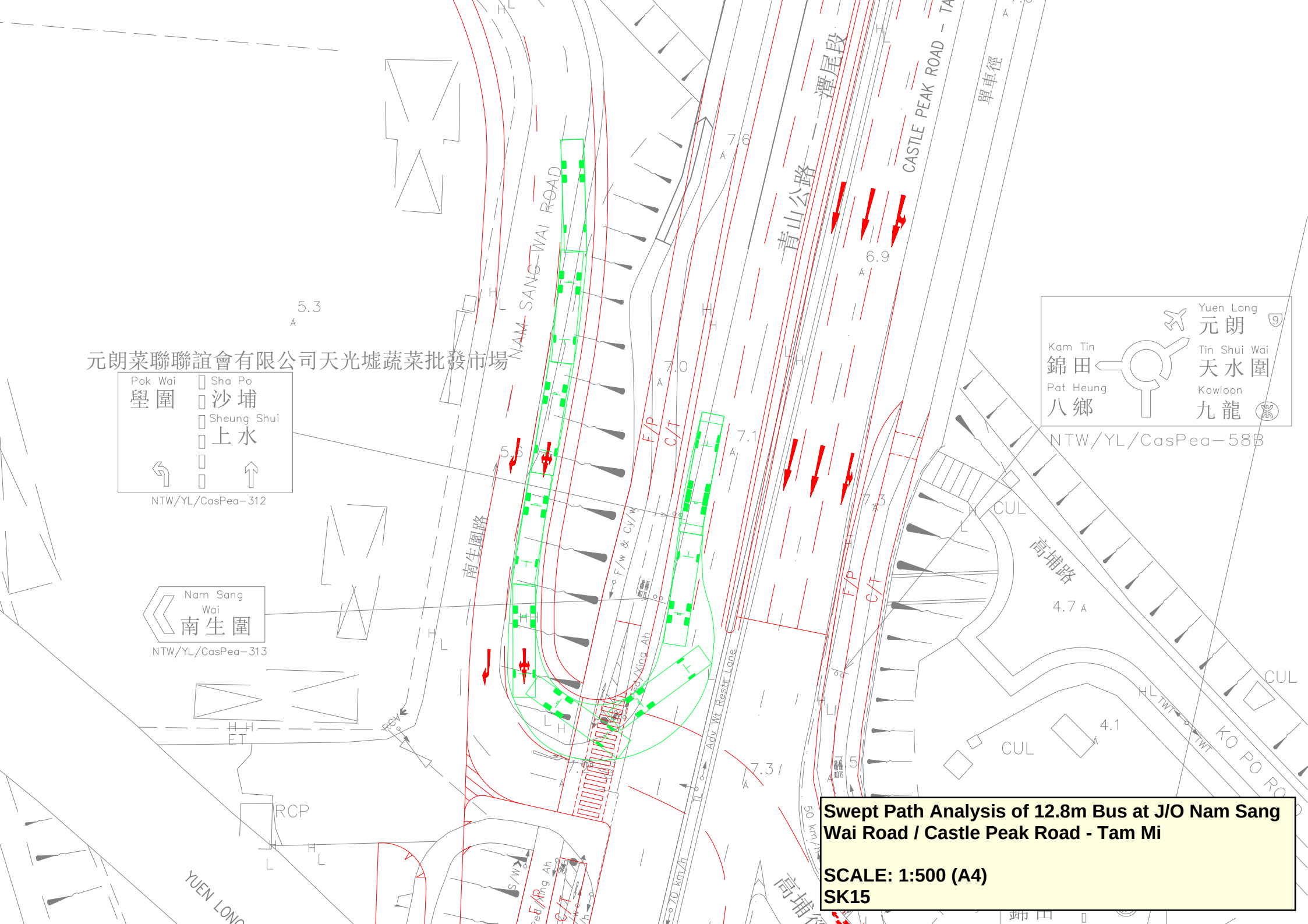

Swept Path Analysis of 12.8m Bus at J/O Nam Sang Wai Road / Castle Peak Road - Tam Mi

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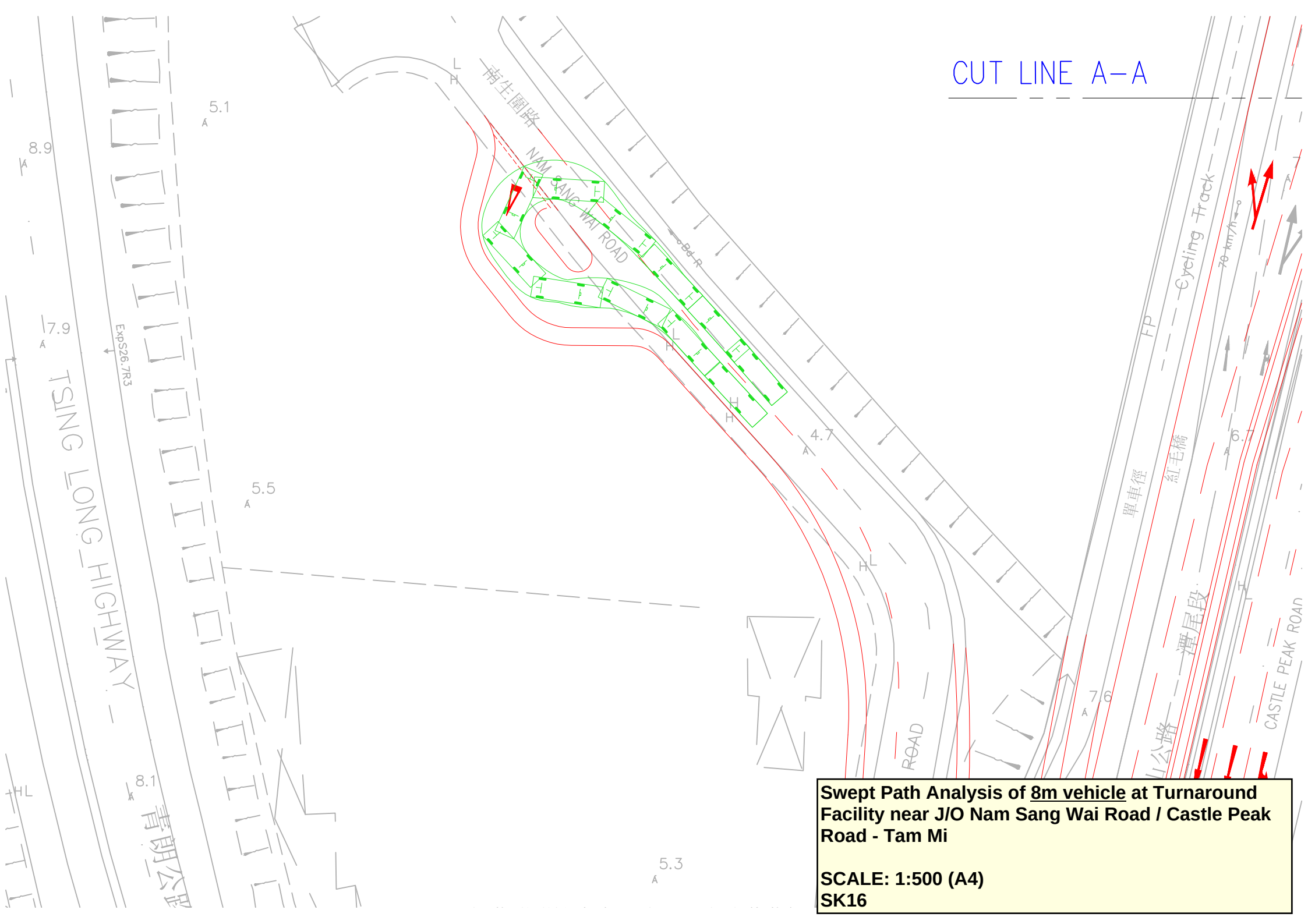

Swept Path Analysis of <u>8m vehicle</u> at Turnaround Facility near J/O Nam Sang Wai Road / Castle Peak Road - Tam Mi

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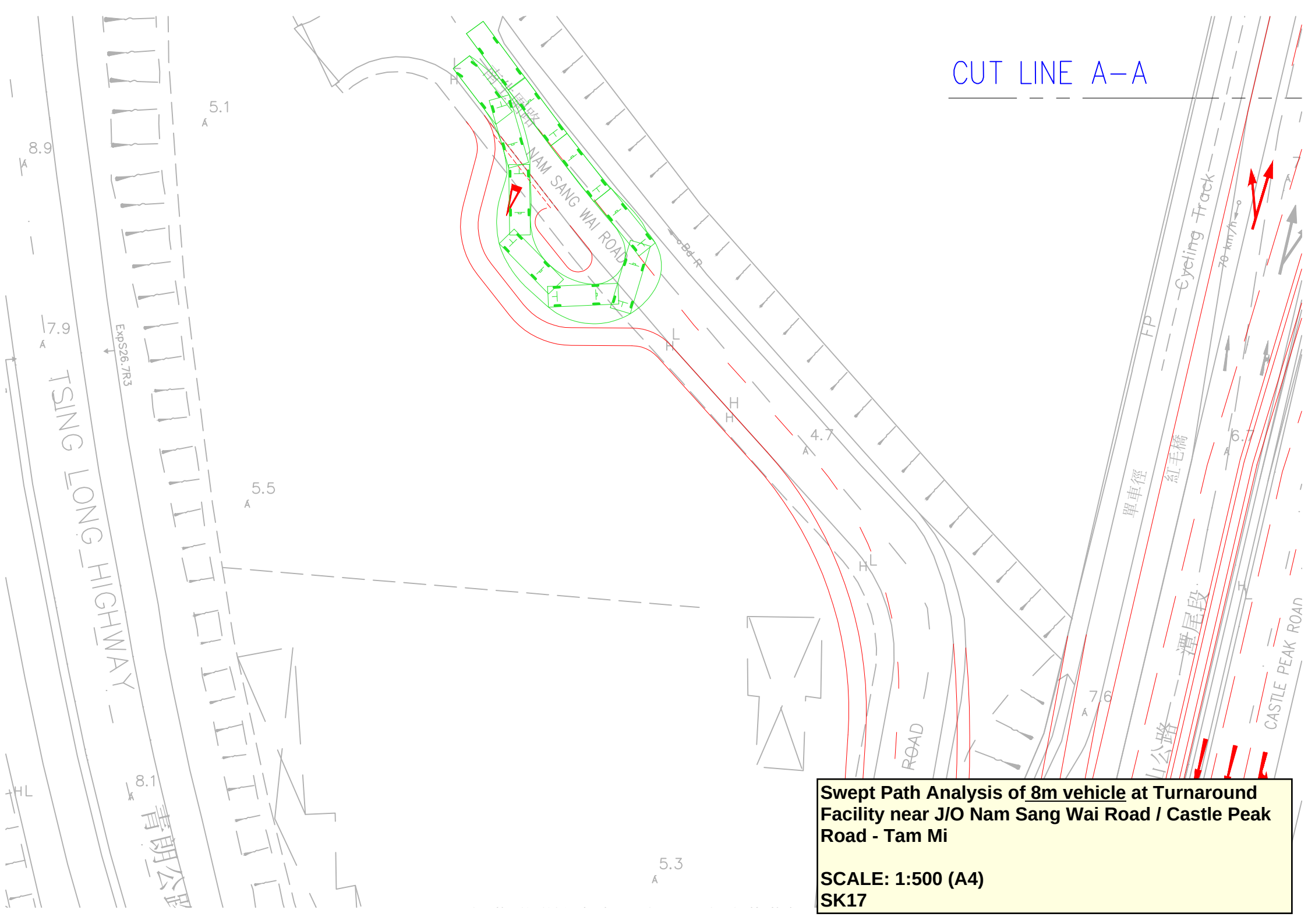

Swept Path Analysis of 8m vehicle at Turnaround Facility near J/O Nam Sang Wai Road / Castle Peak Road - Tam Mi

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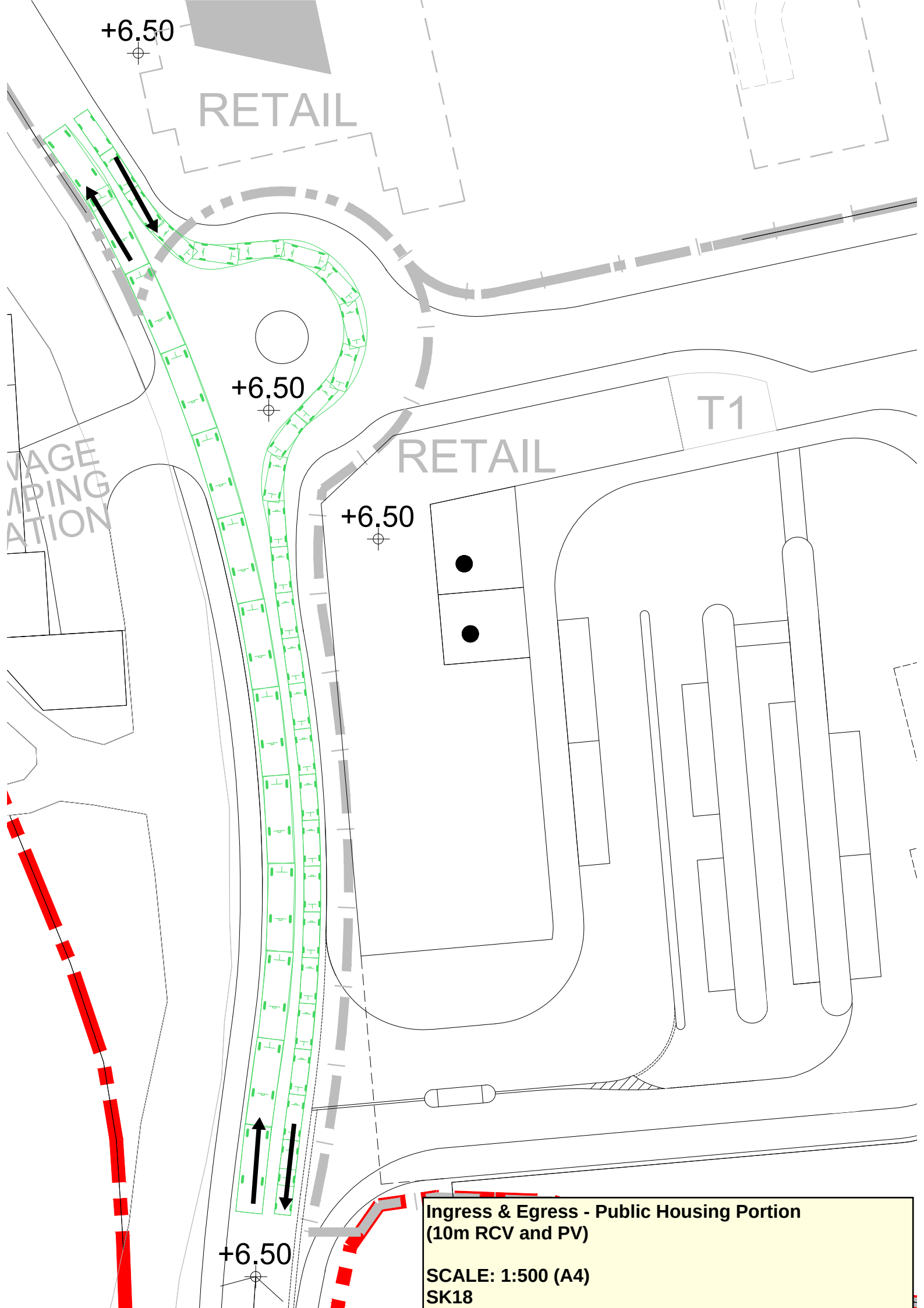
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Ingress & Egress - Public Housing Portion
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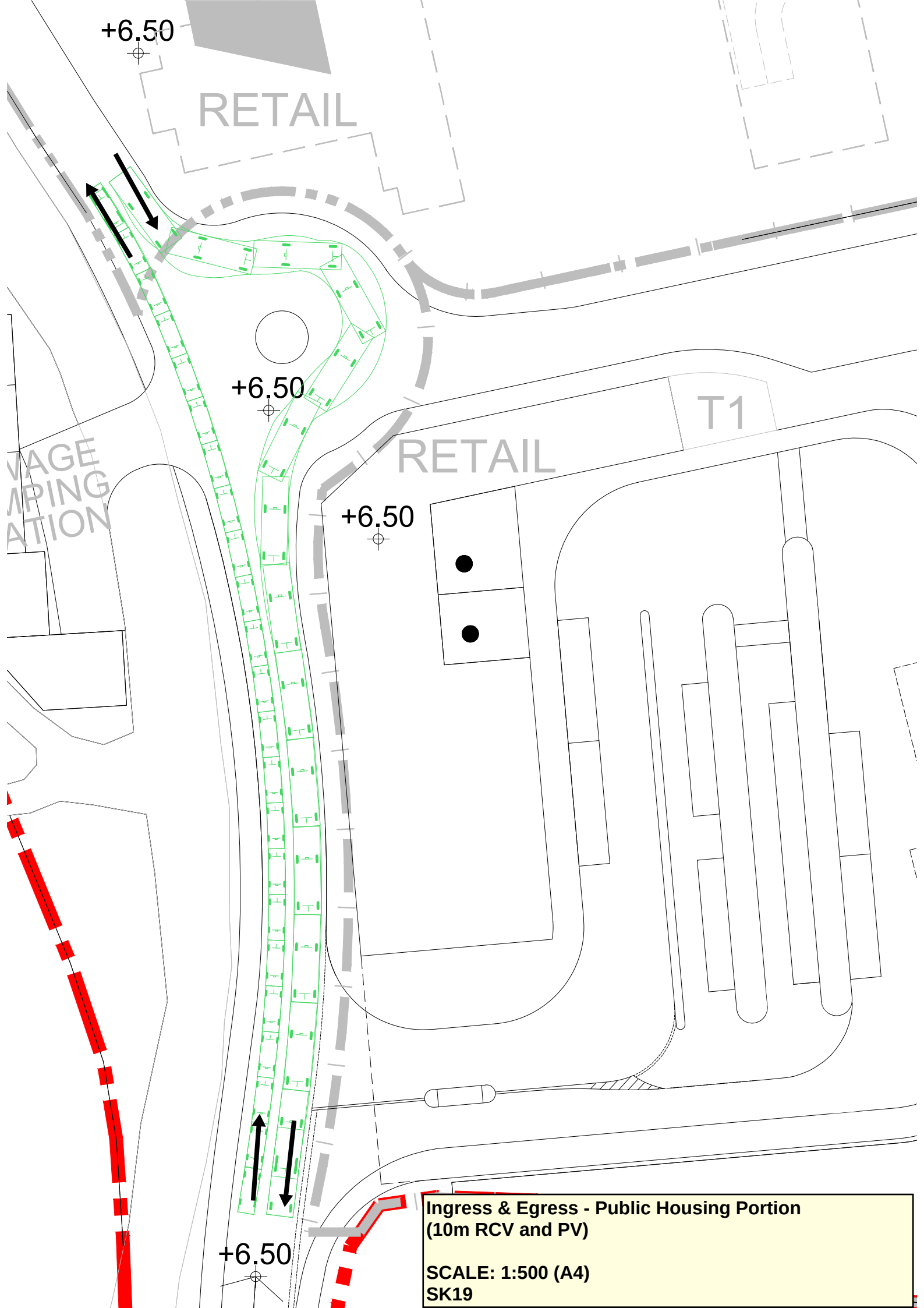
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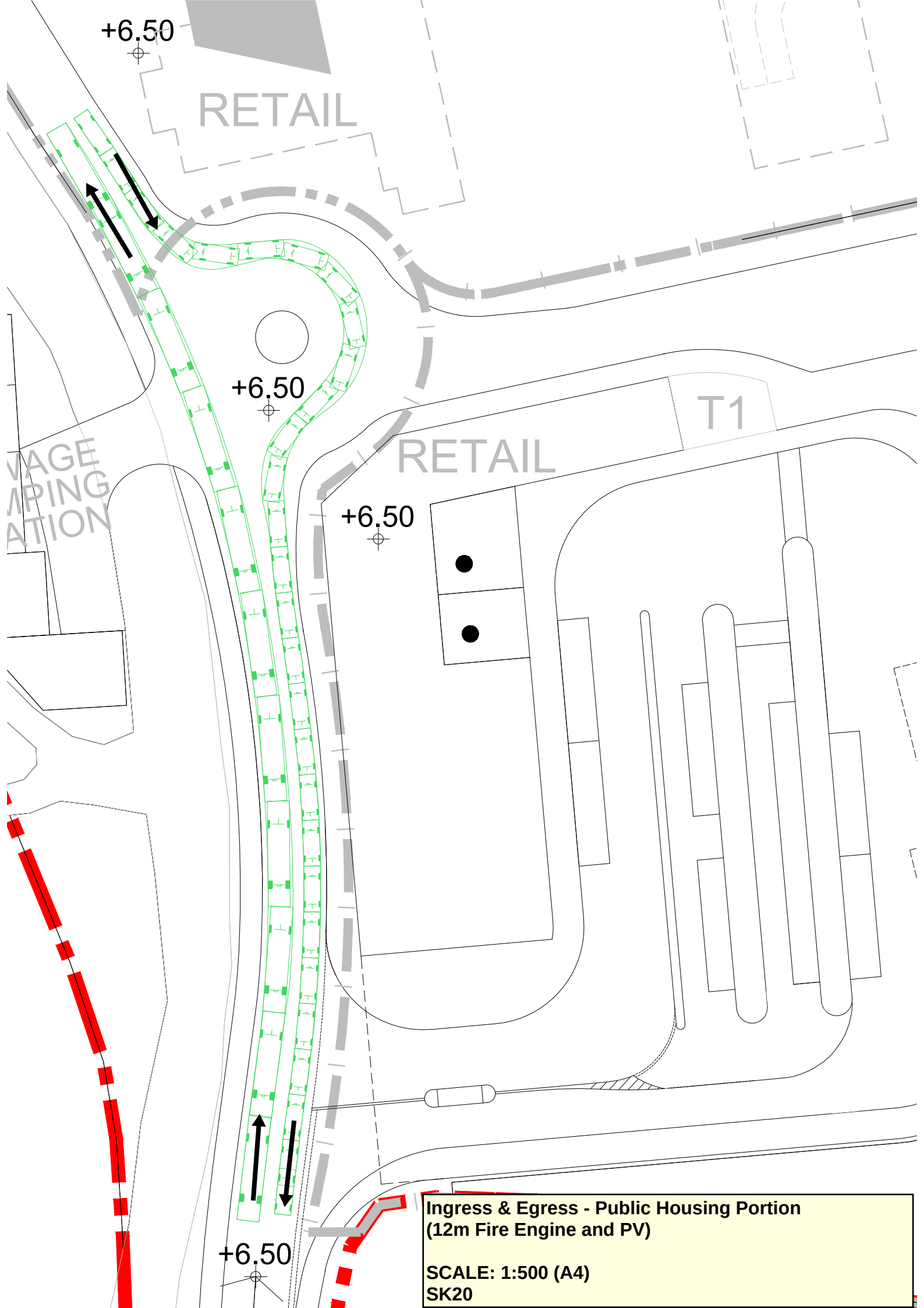
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SCALE: 1:500 (A4)
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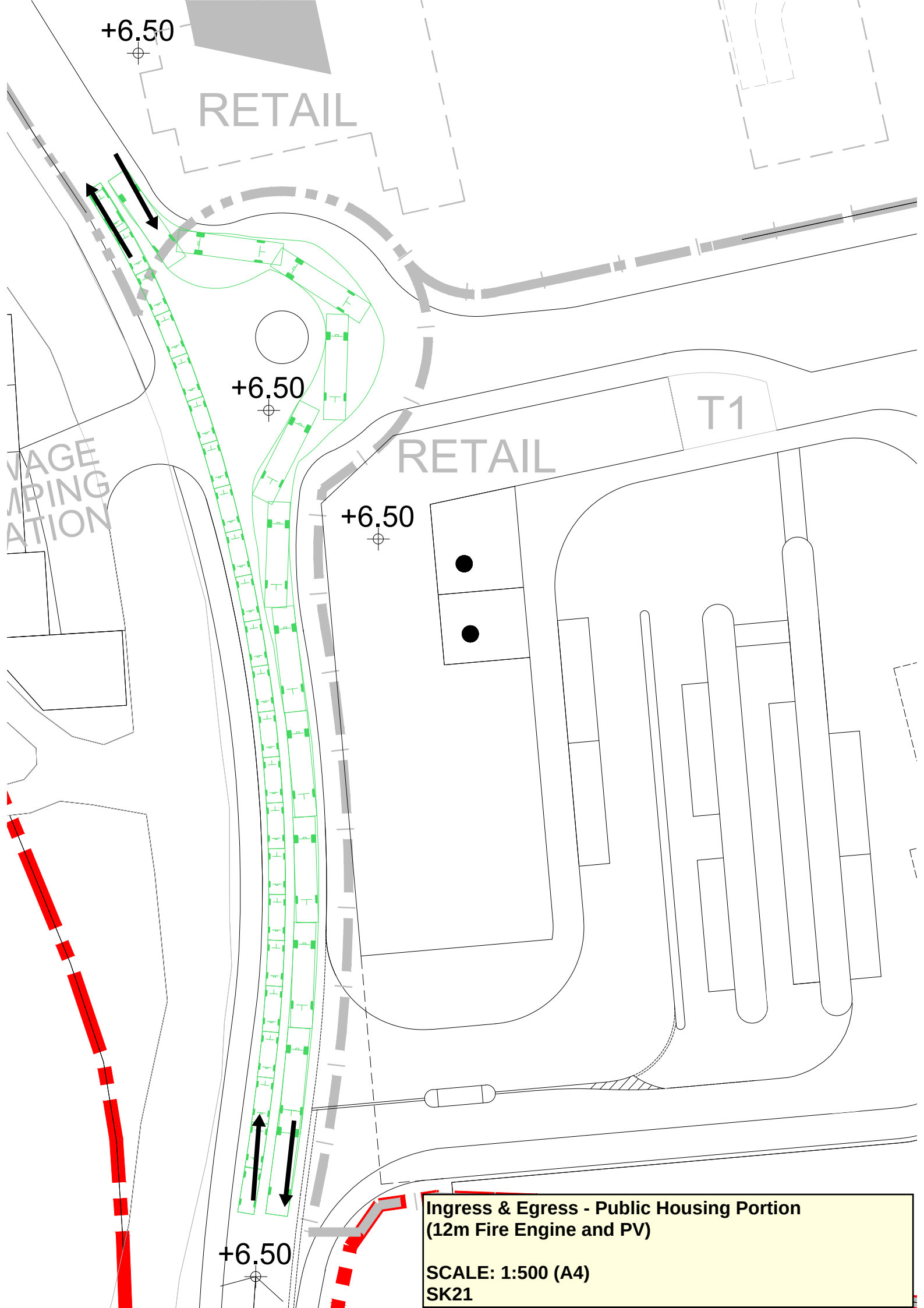
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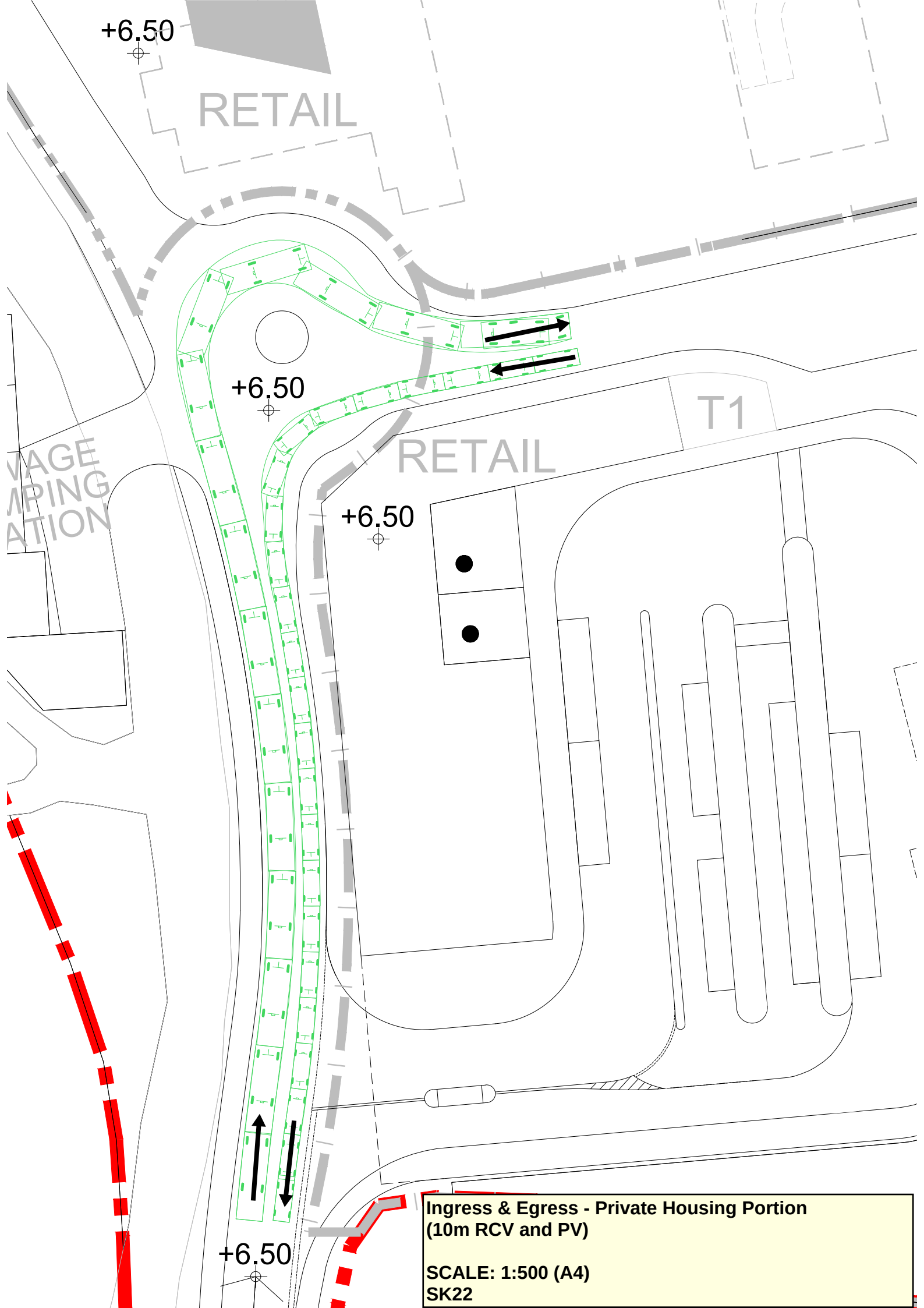
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Ingress & Egress - Private Housing Portion
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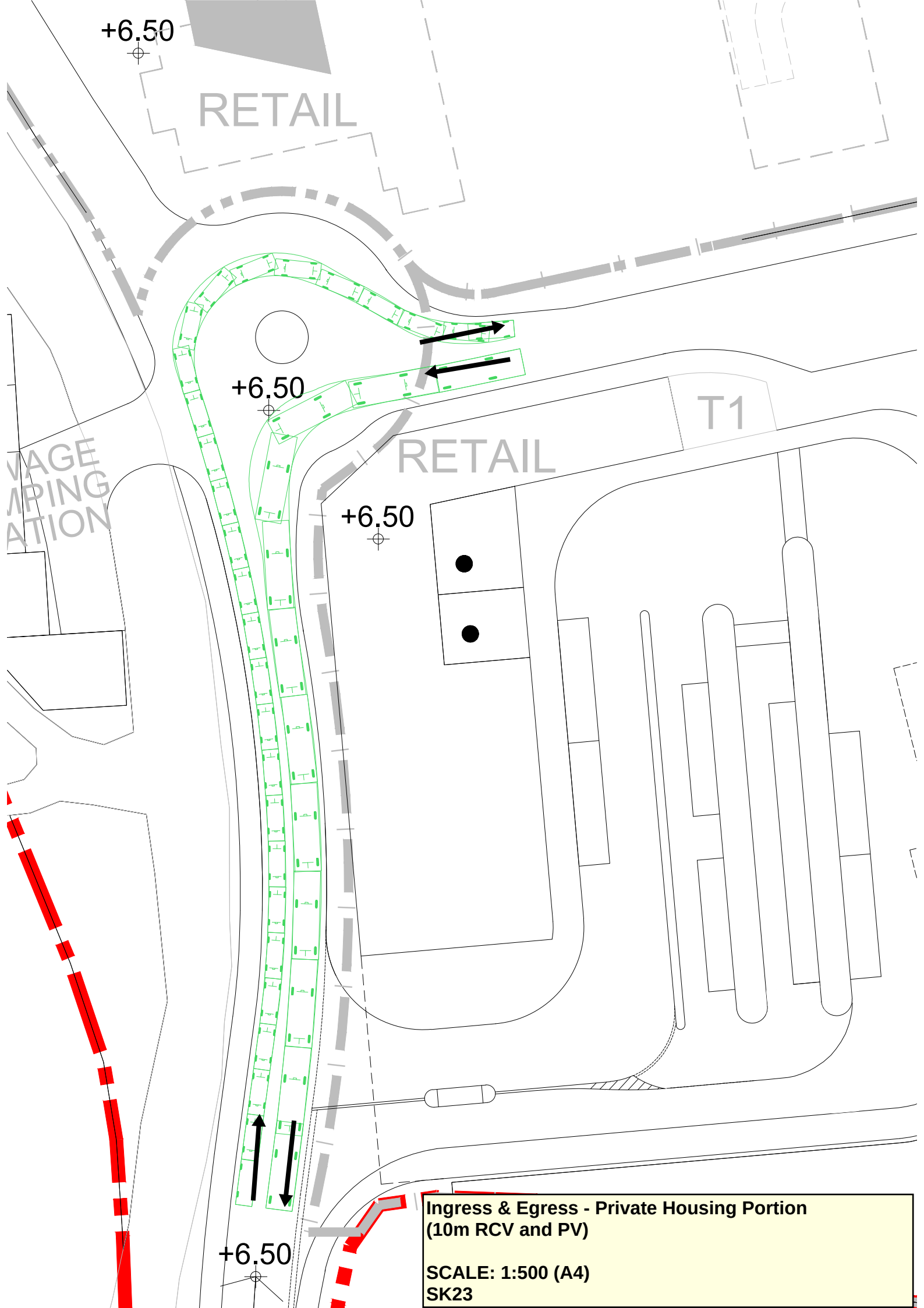
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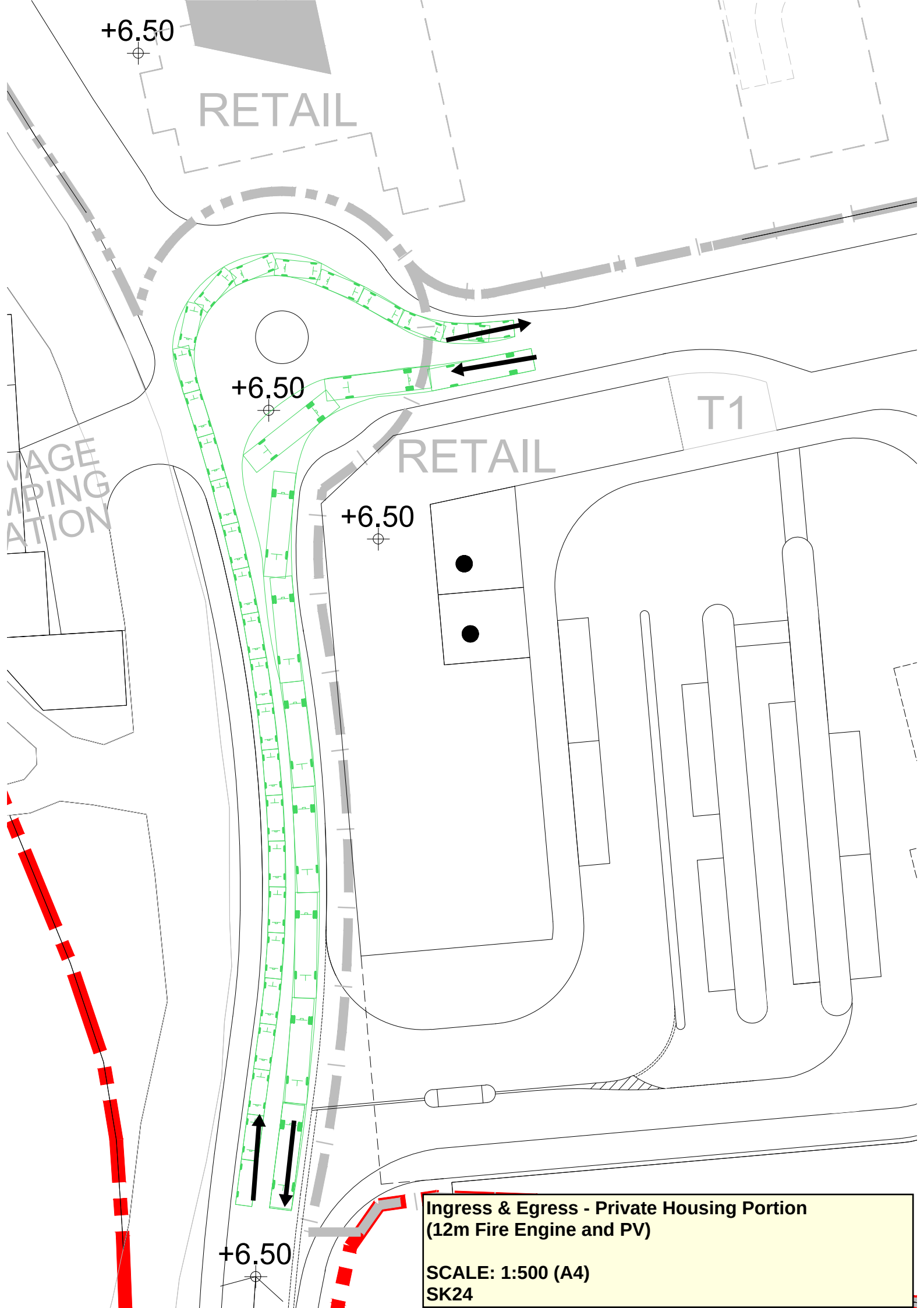
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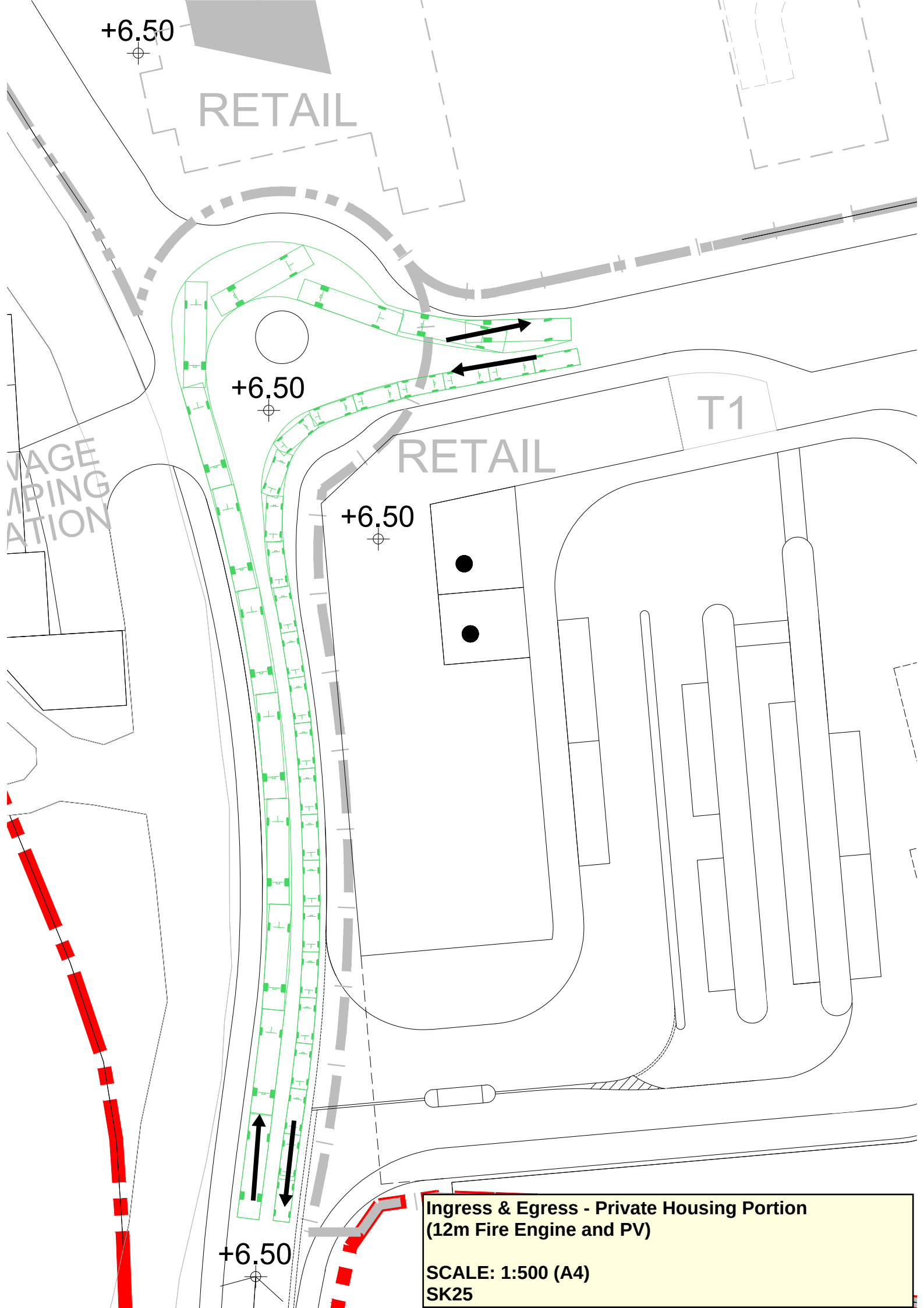
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Ingress & Egress - Private Housing Portion
(12m Fire Engine and PV)
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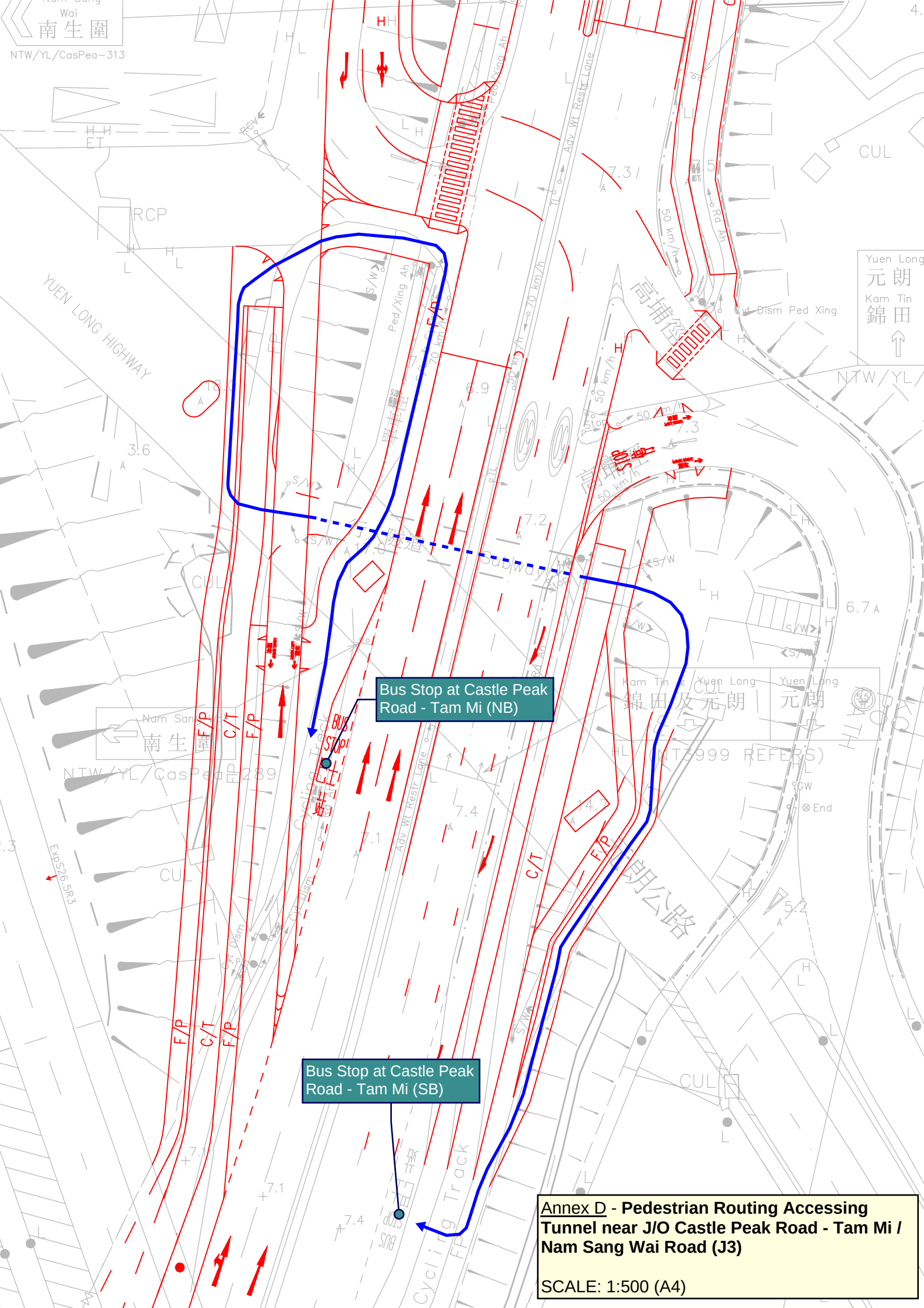
Annex D

Pedestrian Routing Accessing Tunnel near J/O Castle Peak Road – Tam Mi / Nam Sang Wai Road



Annex D - **Pedestrian Routing Accessing Tunnel near J/O Castle Peak Road - Tam Mi / Nam Sang Wai Road (J3)**

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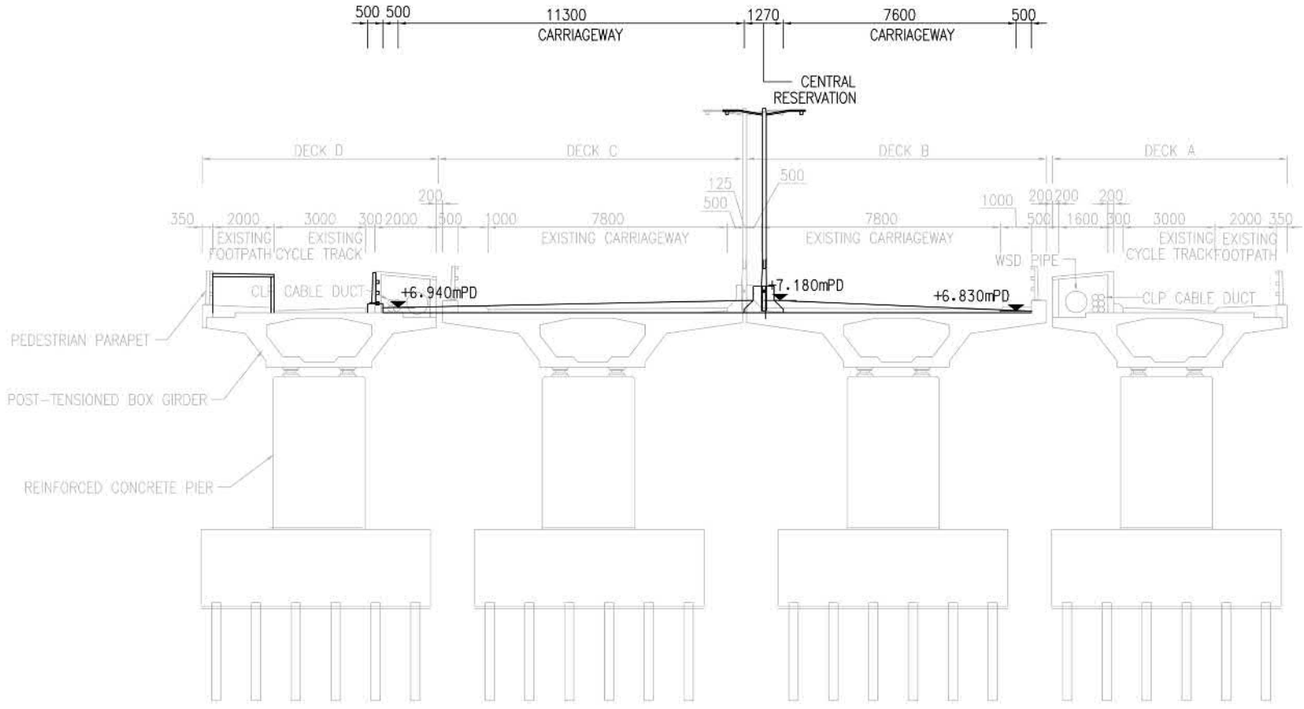
Annex E

Cross Section Drawing of Hung Mo Kiu



SECTION A-A

SCALE 1 : 100

AECOM

PROJECT

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D.115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

CLIENT

SUN HUNG KAI REAL ESTATE AGENCY LTD.

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE

A1 1 : 100

DIMENSION UNIT

MILLIMETRES

KEY PLAN

PROJECT NO.

60609253

CONTRACT NO.

SHEET TITLE

APPENDIX E - CROSS SECTION OF HUNG MO KIU

SHEET NUMBER

60609253/HYD/1007

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Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

Plot File by: Wuming.Zeng 18/07/2022
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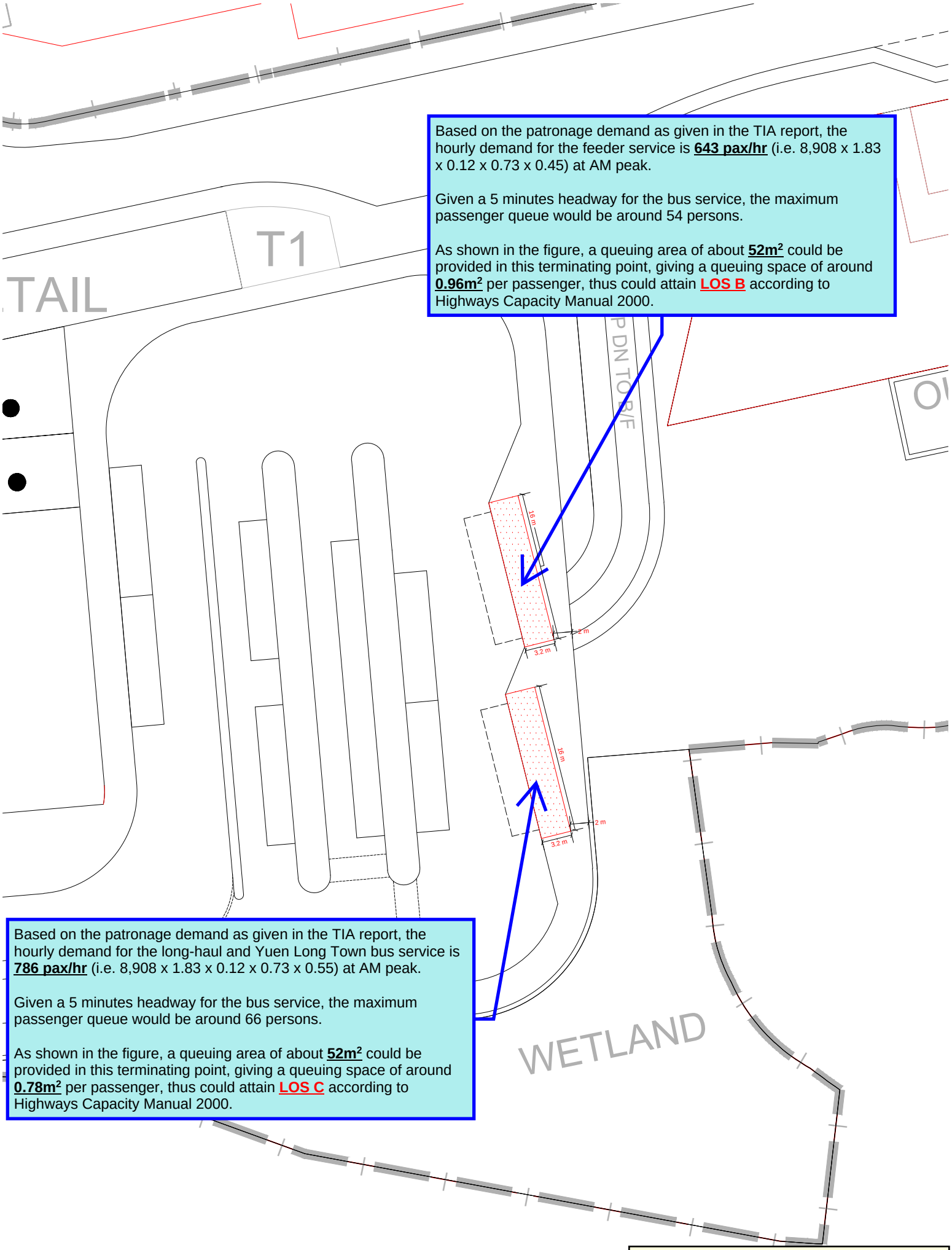
Annex F

Queueing Assessment for Bus Services at Proposed PTI



Based on the patronage demand as given in the TIA report, the hourly demand for the feeder service is **643 pax/hr** (i.e. 8,908 x 1.83 x 0.12 x 0.73 x 0.45) at AM peak.

Given a 5 minutes headway for the bus service, the maximum passenger queue would be around 54 persons.

As shown in the figure, a queuing area of about **52m²** could be provided in this terminating point, giving a queuing space of around **0.96m²** per passenger, thus could attain **LOS B** according to Highways Capacity Manual 2000.

Based on the patronage demand as given in the TIA report, the hourly demand for the long-haul and Yuen Long Town bus service is **786 pax/hr** (i.e. 8,908 x 1.83 x 0.12 x 0.73 x 0.55) at AM peak.

Given a 5 minutes headway for the bus service, the maximum passenger queue would be around 66 persons.

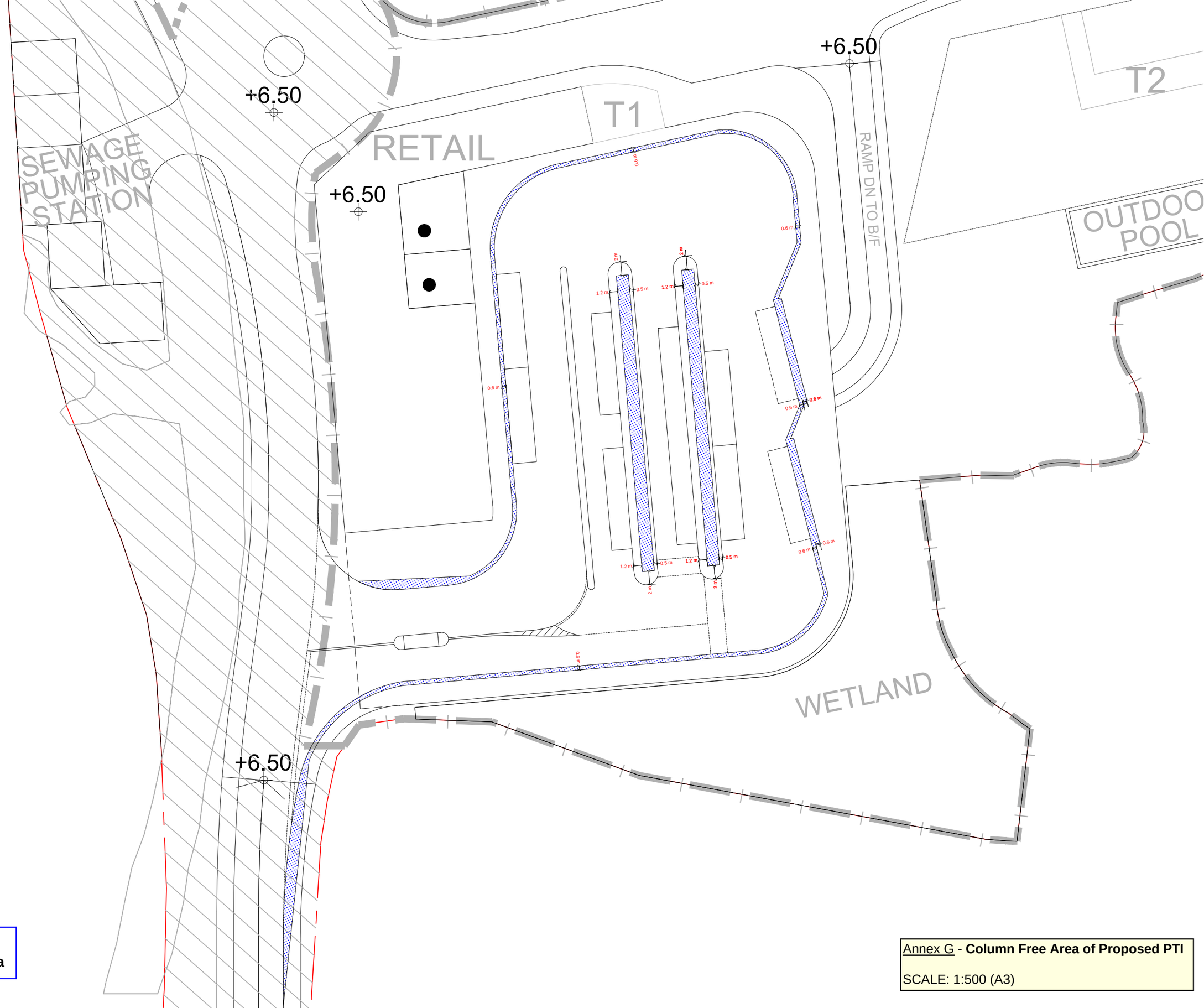
As shown in the figure, a queuing area of about **52m²** could be provided in this terminating point, giving a queuing space of around **0.78m²** per passenger, thus could attain **LOS C** according to Highways Capacity Manual 2000.

Annex F - **Queuing Assessment for Bus Services at Proposed PTI**

SCALE: 1:500 (A3)

Annex G

Column Free Area at Proposed PTI



Legend

Column-Free Area

Annex G - **Column Free Area of Proposed PTI**

SCALE: 1:500 (A3)

Appendix E

Revised Environmental Assessment

Prepared by

Ramboll Hong Kong Limited

PROPOSED LAND SHARING PILOT SCHEME FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG

ENVIRONMENTAL ASSESSMENT

Date	**January 2024**
Prepared by	**Coco MA** **Assistant Environmental Consultant**
Signed	
Approved by	**Calvin CHIU** **Senior Manager**
Signed	
Project Reference	**SHKTSLRDEI00**
Document No.	**R8162_V1.6**

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Appendix 1-1 Indicative Block Plan, Floor Plans and Sections of the Proposed Development
Appendix 1-2 Site Survey Photo Records
Appendix 1-3 Offsite Road Improvement Works
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Appendix 2-2 Results of Road Traffic Noise Impact Assessment

1. INTRODUCTION

1.1 Background

1.1.1 Public Housing and Private Housing, with Retail Facilities, GIC Facilities and Transport Terminus are proposed at various lots in D.D. 115 and adjoining Government Land, Tung Shing Lei, Yuen Long, New Territories (the Application Site) under Land Sharing Pilot Scheme (LSPS).

1.1.2 Ramboll Hong Kong Limited is commissioned by the Applicant to prepare the Environmental Assessment based on the Indicative Block Plan of the Proposed Scheme. Potential environmental noise, air quality, water quality impacts and waste implication have been discussed in this context.

1.2 The Application Site and Its Environs

1.2.1 The Application Site is currently zoned as "Residential Group (D)" ("R(D)") under Approved Nam Sang Wai Outline Zoning Plan (No. S/YL-NSW/8). The Application Site includes a tidal stream (along western side). Southern portion of the Application Site is a narrow strip of land for the provision of access road connecting to Ho Chau Road.

1.2.2 A Fung Shui knoll is located to the immediate north of the Application Site within "R(D)" zone. The Application Site is located to the north of Yuen Long Bypass Floodway and Yuen Long Highway. Shan Pin Tsuen is a small village cluster about 150m to the west of the Application Site. A planned residential development is to the immediate west of the southern portion of the Application Site. The area to the north of Fung Shui knoll, and to the east and northwest of the northern portion of the Application Site contains the existing ponds and is currently zoned "Conservation Area" ("CA"), "Undetermined" ("U") or "Village Type Development" ("V").

1.2.3 **Figure 1.1** shows the location of the Application Site and its environment.

1.3 Proposed Scheme

1.3.1 A house development was previously approved for Application Site under Section 12A planning application (No. Y/YL-NSW/4).

1.3.2 Under the current LSPS, 7 residential towers (T1 to T8, T4 omitted) of 23 to 24 storeys are proposed at the Application Site and elevated up to 100mPD to provide around 3,129 flats. T1 to T3 are private residential development whereas T5 to T8 are for public housing purpose. Public housing portion also includes retail, carparks and GIC facilities. The private housing portion includes facilities such as clubhouse (and outdoor swimming pool), kindergarten, retail, carpark & transport terminus. Yet, there is no detail available at this stage such as layout, individual uses, etc. for non-domestic uses. Uses in GIC cannot be ascertained at this stage as well. Compensation wetlands are proposed within the Application Site near the existing ponds/wetland, tidal stream and planned water pond on the adjacent sites.

1.3.3 A road section connecting from Ho Chau Road to near T1 and T7 will be designated as public road while other carriageways shown in the Proposed Scheme within the Application Site are internal roads.

1.3.4 The proponent is responsible for site formation and infrastructure works for whole LSPS development. Besides, offsite infrastructure construction or improvement works such as local road widening, junction improvement works, pipeline construction widening, etc. are required to support the proposed development and will be implemented by the proponent as well (except those committed by other planned developments).

1.3.5 It is worth noted that most of these road widening and junction improvement works presented in the Traffic Impact Assessment (TIA) Report are proposed for other already planned development and construction of some roadworks shown in TIA are in progress/ nearly completed/ completed. The only offsite improvement works for the Proposed Development includes a junction improvement to signalize the junction to allow right-turn movement from Nam Sang Wai Road eastbound to Castle Peak Road – Tam Mi southbound to reduce the detouring distance, and including addition of U-turn facility at Nam Sang Wai Road (see J3 in table below). The related road types are neither primary or district distributors, and not considered a designated project (Cat A, Schedule 2) under EIA Ordinance. The offsite infrastructure construction work may result in interim environmental impact but would be minimised by best management practice.

1.3.6 For J3 – J/O Castle Peak Road – Tam Mi/ Nam Sang Wai Road, improvement works mainly include to signalise the junction and addition of U-turn facilities (to be implemented by the proponent). They are local improvement works and would not result in increase of traffic capacity like conventional road widening project. Nearest uses include an existing wholesale market to the west and a recently built school development to the east. The school development is separated from Castle Peak Road – Tam Mi (nearest road segment under improvement works) by 20m and well meet the air quality buffer separation under HKPSG so that adverse air quality impact is not anticipated. The wholesale market is immediate to Nam Sang Wai Road currently and after improvement work, the situation will be the same with no worsened impact.

1.3.7 Other pipe laying works would also not generate any environmental impact during its operation. It is noted that the project proponent is responsible for installation of the infrastructure and site formation work of the subject site and construction of private portion of the proposed development. The offsite infrastructure construction and improvement works will be further revisited and finetuned in detailed design stage. Relevant details and implication of operational phase environmental impact will be addressed in due course in the next stage.

Table 1.1 Offsite Roadworks

Roadworks proposed by Other Planned Developments	**Planned Developments**
Proposed widening of Ho Chau Road	approved application no. A/YL-NSW/274
J1 – J/O Castle Peak Road – Tam Mi / San Tam Road	approved application no. Y/YL-NSW/3 and A/YL-NSW/274; CEDD Agreement No. CE10/2020(CE)
J2 – J/O Castle Peak Road – Tam Mi / Unnamed Access Road to Cheung Chun San Tsuen	approved application no. A/YL-KTN/604
J4 – Au Tau Interchange	CEDD Agreement No. CE10/2020(CE)
J5 – J/O Kam Tin Road / Tsing Long Highway Slip Road	roadworks completed in 2021
J6 - J/O Kam Tin Road / Kam Tin Bypass / Kam Ho Road	roadworks completed in 2021
J7 – Pok Oi Interchange	roadworks shown in LC Paper No. CB(1)276/20-21(01) & completed in 2022
Roadworks proposed by this Project	**Road and Road Type**
J3 – J/O Castle Peak Road – Tam Mi/ Nam Sang Wai Road (a junction improvement	Castle Peak Road – Tam Mi (rural road) Nam Sang Wai Road (feeder road or

proposal to signalize the junction to allow right-turn movement from Nam Sang Wai Road eastbound to Castle Peak Road – Tam Mi southbound to reduce the detouring distance) including addition of a U-turn facility at Nam Sang Wai Road	similar)

Note: Improvement works J1 to J8 are made reference to TIA report for this application

1.3.8 The Proposed Development is tentatively scheduled for completion and occupation by 2031.

1.3.9 The indicative block plan of the Proposed Scheme and sections are shown in **Appendix 1-1** Indicative Block Plan, Floor Plans and Sections of the Proposed Development.

1.4 Appraisal of Environmental Impacts

1.4.1 Onsite survey has been conducted in March 2023 to identify if there are any potential environmental pollution sources. Potential industrial noise and emission, vehicular emission, road traffic noise, railway noise, and construction phase environmental impacts are appraised below.

Industrial Noise and Emission Impact

1.4.2 Site survey was conducted to identify if there is any environmental nuisance. According to the survey map and site survey result, there is no designated industrial area within 200m from the Application Site or any industrial undertaking or chimney observed within 200m from the Application Site as well. It is understood that there are active chimneys at the rooftop of Pok Oi Hospital, but it is separated from nearest southern site boundary by around 400m. With respect to the building area of the Proposed Scheme, the separation from the chimneys of Pok Oi Hospital is up to around 700m (see **Figure 1.2** for details). There is no fluff, odour, smoke or any other criteria pollutant emission observed within the Application Site and adjacent areas. The surrounding is dominated by rural undeveloped area and villages.

1.4.3 In addition, the only fixed noise source identified within 300m from the Application Site is the Yuen Long Bypass Floodway Inflatable Dam & Low Flow Pumping Station. It is located on the south-eastern side of the Application Site at about 270m apart from the nearest towers (T1 to T3) (see **Figure 1.1**). According to the survey, no noticeable noise was observed even at location immediately next to the pumping station. Given insignificant noise strength and long separation distance, no unacceptable fixed noise impact on the Proposed Development is anticipated.

1.4.4 Therefore, industrial noise and air quality impact due to industrial operation on the Proposed Development is unlikely a concern.

1.4.5 The Proposed Development is not environmentally polluting in nature. There is no chimney stack expected other than those for emergency use (i.e. emergency generator). Air quality impact due to bus terminus operation (e.g. pollution from exhaust air outlet) will be fully addressed in later stage (e.g. submission with respect to relevant clause under lease which require submission of noise and air quality impact assessment report) by locating the exhaust air outlet away from air sensitive receivers. Tentatively, the exhaust air outlet will be facing the public road on the western side of the bus terminus so that air sensitive uses on other sides of the bus terminus will not be impacted. In addition, EPD's ProPECC PN 1/22 on Control of Air Pollution in Semi-Confined Public Transport Interchanges will be referenced and followed for the design and operation of the proposed bus terminus/ PTT such that the air quality guidelines set out in the PN are met under all conditions. For the

design and operation of the car parks, EPD's ProPECC PN2/96 on "Control of Air Pollution in Car Parks for the design and operation of the car parks" will be observed and followed. Car parks will be designed to meet the air quality guidelines set out in PN2/96. Similar principle such as locating exhaust air outlet away from air sensitive receivers as far as possible will be followed for car parks. On the other hand, noisy equipment will inevitably be provided onsite such as AC system for central air conditioned area (e.g. clubhouse and private kindergarten), mechanical ventilation for transport terminus, car park, etc. as well as other facilities that may be required for future GIC. As this is in early planning stage of the project, there is lack of detail such as type of equipment, location, orientation, etc. Nevertheless, the requirement to meet HKPSG standard (Acceptable Noise Level – 5 dB(A) or prevailing background whichever is lower) is well noted and will be specified in future document for detailed design and tender so that engineers and contractors need to strictly follow.

1.4.6 In addition, an onsite sewage pumping station (SPS) needs to be constructed within the Application Site to convey wastewater via rising main. The SPS will have a designed capacity of about 2,260 m^3/day and will be fully enclosed. Exhaust louver will be provided and equipped with de-odorization unit. In many recent SPSs, the odour removal efficiency of over 99% is targeted. Preliminarily, odour efficiency of not less than 99% (for target odour species. i.e. H_2S) is also targeted and required for the proposed SPS. In addition, the SPS will be located on the western side of the Subject Site so that its exhaust locating away from any ASRs including the planned air sensitives uses of the proposed development located to its east and southeast (say, louver facing west). **Figure 1.4** shows the tentative SPS exhaust location and nearest air sensitive receivers. The nearest air sensitive receivers maintain a separation of about 43m from tentative SPS exhaust location and also away from the exhaust. According to the site survey conducted on 19 October 2023 and 24 January 2024, there are scattered temporary structures near to the northern part of the Application Site. Most of the structures are either abandoned or for storage only while two of them are identified of suspected residential uses.. **Appendix 1-2** Site Survey Photo Recordsshows the photo records of the Site Survey. It is noted that these structures are even farther away from the SPS. "Environmental Guidance Note for Sewage Pumping Stations which is not a Designated Project" will be referenced and followed for the environmental considerations and mitigation measures to minimize any odour (and noise) impact and would therefore unlikely result in any adverse impact on the surrounding developments.

Vehicular Emission Impact

1.4.7 The Application Site is situated to the north of Yuen Long Highway and Ho Chau Road. An access road is planned to connect the Application Site from Ho Chau Road. It will be designated as public road, whereas all other roads within the proposed development are not public roads (EVA in nature). Under all circumstances, in detailed design of the project, buffer distance between these non-public roads and air sensitive uses within the proposed development will be reviewed and maximised from air planning perspective.

1.4.8 According to the Traffic Census (ATC 2022) published by Transport Department, Yuen Long Highway is classified as Expressway, which is considered as Trunk Road with respect to the HKPSG. Ho Chau Road and the proposed public access road (which serves as local access for the Application Site with no excessive traffic) are considered as Local Distributor (as confirmed by TD). According to the HKPSG, a minimum horizontal buffer separations of 20m and 5m are recommended respectively.

1.4.9 **Figure 1.3** shows the separation distance buffer zone provided. There is no air-sensitive use including openable window, fresh air intake and recreational uses in the

open space allowed within the buffer zone. The minimum separation distance complies with the required buffer distance as stipulated in the HKPSG. No significant vehicular emission impact is anticipated.

Road Traffic Noise Impact

1.4.10 The major road traffic noise source with respect to the Application Site is arising from Yuen Long Highway. The existing roadside noise barriers are of 4m and 2m high and adequate to protect habitable uses at lower floor only. As the Proposed Development consists of residential towers which are up to 24 storeys high near Yuen Long Highway, the existing noise barriers are unlikely to provide adequate protection. Thus, road traffic noise impact assessment has been conducted to address the potential noise impact that would be generated from the road traffic with necessary noise mitigation measures proposed (detailed in **Section 2**).

Railway Noise Impact

1.4.11 The existing West Rail is aligned on the southern side of the Application Site at over 500m away from the building area of the Site. Given the long separation distance, the railway noise impact due to the operation of the West Rail on the Proposed Development is unlikely to be significant.

Water Quality Impact

1.4.12 The Subject Site is located in Wetland Buffer Area (WBA) of Deep Bay Catchment. According to the sewerage/drainage impact assessment prepared separately, future wastewater generation will be discharged to public sewerage system via the proposed SPS whereas surface runoff will be discharged to public drainage system. The aforementioned connection/discharge will be implemented before operation of the proposed development. There will not be any discharge to water sensitive receivers nearby during its operation. No insurmountable water quality impact is anticipated during its operation. When compared to the existing condition with no proper drainage and sewerage system, the proposed development will eliminate pollution load to surrounding water sensitive receiver after its operation.

1.4.13 It is confirmed that there is no diversion of watercourse needed so that water quality impact during diversion is avoided.

1.4.14 There is lack of detail regarding details of work arrangement during construction phase at this stage. However, the need to drain the original pond cannot be ruled out. If so, nutrients usually sedimented at bed of pond should be dredged and sufficient time would be allowed in prior so that nutrients will be sedimented at bed before dredging. Vegetation should be removed at the same time to reduce nutrient level. Before draining of water, the nutrient level will be monitored to ensure that relevant standard under WPCO and its technical memorandum is met. Other treatment method, such as bio-decomposition (e.g. adding bacteria and enzymes with aeration to speed up decomposition process) will be adopted where necessary. Under all circumstances, future contractor is obliged to ensure that the discharged water quality would meet relevant requirement under WPCO-TM. Such requirement will be included in the future contract tender so that contractor must strictly follow.

1.4.15 According to the DIA prepared separately, existing surface runoff is discharged to flood relief path and eventually to Kam Tin River and Shan Pui River. To avoid direct discharge of surface runoff to other pond areas which may contain pollutants, adequate drainage system within the project site will be provided to collect all surface runoff arising from the Application Site. After development, the maximum water level in Kam Tin River remains unchanged. The flood depth of the drainage system would not exceed to ground level. The drainage impact is considered

insignificant. There will be no uncontrolled flood off or surface runoff to surrounding water bodies.

1.4.16 Based on the drainage arrangement mentioned above, it is likely that surrounding ponds outside site will receive less water than before *under heavy storm* when surface runoff within the project site is discharged to flood relief path before development. However, the surrounding ponds and agricultural use (if any) already receive adequate surface runoff as well under heavy storm condition and would not rely on discharge from the project site.

1.4.17 Tidal water from stream N-49 is the source for some ponds connected with it. Besides, desilted surface runoff from the project site generally provide water source for compensation ponds onsite. The collected surface runoff will pass through sand trap and oil interceptor in prior so that possible contaminants such as suspended solids and oil will be filtered already. Best practices in EPD's ProPECC PN 5/93 "Drainage Plans subject to Comment by the Environmental Protection Department" will be followed in the design of the drainage system. No adverse water quality is anticipated.

1.4.18 The proposed SPS will have designed capacity of about 2,260 m^3/day. The normal operation of the SPS is not expected to generate any water quality impact as all system will be enclosed and there will be no discharge from the SPS to surrounding water bodies. The SPS will be designed with standby pumping units so that in case of failure of the duty pump, the operation will be maintained. Moreover, sufficient retention capacity will be provided to cater for contingency situation. No by-pass discharge during emergency situation would occur.

Land Contamination

1.4.19 The Subject Site was occupied as village development before. The risk of land contamination is unlikely. Nevertheless, a more detailed review for the entire subject site (including both public and private housing areas) will be provided in later stage for substantiation (e.g. during submission with respect to relevant clause under lease which require submission of land contamination assessment). The proponent is responsible for site formation and infrastructure works for whole LSPS development. Therefore, the same will be responsible for necessary detailed land contamination review and remediation action prior to commencement of construction works. In case suspected land contamination is concluded, the relevant requirement to conduct investigation and remediation work (if necessary) will be included in future tender and necessary submissions such as contamination assessment plan/report, remediation action plan and remediation report (if necessary) for the whole LSPS development site will be submitted for approval before construction work.

Construction Phase Environmental Impact

1.4.20 Both onsite and offsite (e.g. road widening and junction improvement) construction work would result in significant environmental impact if not properly controlled and mitigated.

1.4.21 The major air quality impact during construction should be fugitive dust impact in relation to dusty activity and emission from dusty materials while there are other emissions as well such as SO_2/NO_2 due to use of diesel-powered equipment. Best management practice and practical mitigation measures will be adopted where appropriate.

1.4.22 Construction noise will be controlled with reference to relevant technical memorandum.

1.4.23 As for water quality aspect, during construction of the Proposed Development, water pollution is likely due to sediments, construction runoff and drainage, sewage effluent and liquid spillage if not mitigated. Best management practice will be adopted. No sewage effluent discharge will be allowed. ProPECC PN1/94 on construction site drainage will be observed and followed.

1.4.24 Waste generation during construction will be sorted and handled in compliance with the Waste Disposal Ordinance and regulations.

1.4.25 With adequate mitigation measures incorporated during construction of the project, no significant construction phase environmental impact is anticipated.

1.4.26 Discussion on construction phase environmental impact is also included in this report.

Environmental Impact Assessment Ordinance (EIAO) Implication

1.4.27 EIAO implication is reviewed based on prevailing Schedule 2 of the EIAO. Category P is about residential and other developments. Since the proposed development is not located within Deep Bay Buffer Zone 1 or 2, the proposed development does not constitute item P.1 regarding A residential or recreational development, other than New Territories exempted houses within Deep Bay Buffer Zone 1 or 2 as well.

1.4.28 The current sewerage connection proposal including on-site sewage pumping station also would not constitute a DP under prevailing Schedule 2 of the EIAO.

1.4.29 To summarise, the proposed development is not considered to constitute a designated project under prevailing Schedule 2 of the EIAO.

1.5 Organization of this Report

1.5.1 Based on the discussions above, it is considered that both industrial noise/emission, vehicular emission, railway noise are unlikely concern given the absence of industrial emission source, insignificant fixed noise source, adequate separation from road carriageways and well separation of railway system from the Application Site. Road traffic noise is of major concern with respect to the Application Site. In addition, construction phase environmental impact will be more thoroughly discussed in this report.

1.5.2 The organization of remaining section of this report is:

- Section 2 is a road traffic noise impact assessment;
- Section 3 includes discussion of construction phase fugitive dust, noise, water quality and waste management issues; and
- Section 4 is a concluding summary.

2. ROAD TRAFFIC NOISE IMPACT

2.1 Introduction

2.1.1 This road traffic noise impact assessment is prepared to address potential road traffic noise impact on the noise sensitive uses of the Proposed Development and to demonstrate that practical mitigation measures exists to attenuate the impact. A noise impact assessment (NIA) is expected to be required at a later stage of the project under appropriate mechanism (e.g. NIA under land lease conditions for private development portion by the Applicant, and NIA under environmental assessment study (EAS) for the public housing portion by HKHA subject to confirmation from HKHA) to ensure full compliance with relevant noise standards/criteria under HKPSG.

2.1.2 It is noted that several infrastructural works are proposed (e.g. widening of Ho Chau Road, junction improvement works, bus terminus) to cater for the subject development. Noise impact associated with these infrastructural works will be properly addressed in the NIA and EAS. In particular for bus terminus, S.4.2.14 – S.4.2.15 of Chapter 9 of HKPSG will be observed. While the bus terminus will be decked over under the current proposal, consideration will also be given to providing hanger wall/canopy at the ingress/egress to prevent direct line-of-sight to the nearby NSRs in future.

2.2 Assessment Criteria

2.2.1 Noise standards are recommended in the Hong Kong Planning Standards and Guidelines (HKPSG) for planning against noise impact from sources such as road traffic, railway and aircraft. The Proposed Development comprises residential uses, clubhouse, retail, private kindergarten, carpark, GIC and bus terminus. Carpark and bus terminus are not noise sensitive in nature. Clubhouse, retail and private kindergarten uses will be air conditioned and will not rely on opened window for ventilation. There is no additional detail for GIC. Under the HKPSG, the criterion for road traffic noise impact on domestic premises (habitable rooms) and office (which may exist in GIC) is $L_{10(1\text{-hour})}$ 70dB(A). This criterion applies to uses which rely on opened windows for ventilation. It is noted that more stringent road traffic noise criteria do apply to other uses such as education institutions (65dB(A)) and diagnostic rooms (55dB(A)). The applicable standard will be reviewed in the NIA and EAS in later stage when the intended uses are determined.

2.3 Assessment Methodology

2.3.1 In this assessment, the potential noise impact arising from nearby existing and future road carriageways on the development has been assessed based on the further finetuned layout. It involved the prediction of future noise impacts on Noise Sensitive Receivers (NSRs) arising from traffic flows along existing and future road carriageways situated within or in the vicinity of the Application Site. Calculation of predicted road traffic noise were based on the worst case peak hour traffic flows projected within a 15-year period from the target occupation date (Year 2031) of the Proposed Development. For worst-case scenario evaluation, the assessment year was chosen to be year 2046, which has the maximum forecasted traffic flow within the 15-year period. The year 2046 traffic forecast data is prepared by project traffic consultant and attached in **Appendix 2-1**. The project consultant will liaise with TD for agreement to the traffic forecast. Relevant correspondence from/to TD will be provided once available. In future NIA/EAS, traffic forecast and endorsement from TD will be incorporated.

2.3.2 The U.K. Department of Transport's procedure "Calculation of Road Traffic Noise" (CRTN) was used to predict the hourly $L_{10(1\text{-hour})}$ noise levels generated from road traffic at selected representative NSRs. Practicable environmental mitigation measures have been recommended, where necessary. The predicted noise levels were compared with the relevant HKPSG noise standards (i.e. $L_{10(1\text{-hour})}$ 70dB(A) for domestic premises, offices).

2.3.3 For road with maximum allowed speed reaching 80km/hr or above, the road surface type is assumed as pervious. For remaining roads, the surface type is assumed as impervious.

2.4 Noise Sensitive Receivers

2.4.1 All ventilation openings to rooms of noise sensitive use are assigned with noise assessment points. All assessment points were taken at 1.2m above the floor and 1m away from the façade of openable windows (which would be for ventilation purpose) of rooms of sensitive use (living rooms and bedrooms in residential towers). In addition, it is noted that there is no detailed uses and layout for the GIC at present. Nevertheless, assessment points are assigned at the façade representative of worst road traffic noise impact for assessment purpose. **Figure 2.1** illustrates the locations of the selected representative NSRs for road traffic noise impact assessment.

2.5 Noise Mitigation Measures Incorporated in the Design (Base Case Scenario)

2.5.1 The building area is concentrated on northern part of the Application Site which is further away from major road such as Yuen Long Highway. The separations between the norther part of the Application Site and Ho Chau Road/Yuen Long Highway amount to over 50m/230m.

2.5.2 The existing Yuen Long Highway has two roadside barriers of 4m high (over 400m long) and 2m high (over 130m long) respectively, which has already been incorporated in the base case scenario.

2.6 Assessment Result for Base Case Scenario

2.6.1 Appendix 2-2 shows the predicted road traffic noise impacts on the NSRs for Base Case. According to the result, the predicted noise level at all representative noise sensitive receivers at the Proposed Development comply with relevant noise standard under base scenario.

2.7 Conclusion

2.7.1 Road traffic noise impact assessment has been carried out for the Proposed Development. According to the assessment result, there is no exceedance of relevant noise standard for noise sensitive receivers of the Proposed Development. No noise mitigation measure is further recommended.

3. CONSTRUCTION PHASE IMPACTS

3.1 Introduction

3.1.1 During the construction phase of the Proposed Development, there may be potential dust, noise and water quality impacts upon the nearby sensitive receivers such as villages mainly on south to southwest sides. Other offsite construction work such as local road widening (for connection to Ho Chau Road to the south), junction improvement work, pipeline construction (375mm dia gravity sewer + 250mm dia rising main; not more than 1200mm dia for fresh water pipe and sewer, drainage pipe of more than 1200mm dia), etc. would also cause environmental impact to nearby sensitive receivers.

3.1.2 Referring to Annex E in Appendix A of Environment, Transport and Works Bureau (ETWB) Technical Circular (Works) No. 13/2003 "Guidelines and Procedures for Environmental Impact Assessment of Government Projects and Proposals", it is considered that some of the non-designated projects such as water pipes, sewers and stormwater pipes under 1200mm in diameter and outside environmental sensitive areas, major traffic signs and surveillance equipment, at-grade local roads not involving turning cul-de-sac into a link road, etc are considered of limited potential for environmental impacts provided that standard pollution control measures are incorporated during works.

3.1.3 Under all circumstances, practicable environmental mitigation measures are recommended to reduce these impacts to acceptable ranges.

3.2 Fugitive Dust Emission

3.2.1 The major air quality impact of concern during the construction phase will be the potential fugitive dust emission. The major dust emission sources during the construction phase of the Proposed Development are expected to arise from construction activities during site formation stage such as:

- Excavation resulting in exposed ground vulnerable to air erosion;
- Earth moving, loading and unloading of excavated material;
- Wind effect on material stockpiling; and
- Vehicle movements on haul roads and over the construction site.

3.2.2 There will be potential impacts from the criteria pollutants (e.g. nitrogen oxides (NOx), sulphur dioxide (SO2), and carbon monoxide (CO)). Emission from diesel trucks for the haulage of materials and construction plants will contain high percentage of smoke particulate and unburned hydrocarbons in comparison with petrol driven vehicles. However, the project comprising public and private developments would unlikely be developed in same pace. The number of construction equipment at the same time will be less. Under all circumstances, the contractor will be required to observe all relevant regulations and maintain all equipment in good condition to avoid any excessive emission. Where practicable, the applicant will request contractor to explore to make use of electric power supply to minimize air quality impact.

3.2.3 There are some villages and scattered temporary structure suspected with residential use located within 500m from the Proposed Development and considered as Air Sensitive Receivers (ASRs) and Noise Sensitive Receivers (NSRs). **Figure 3.1** shows the separation distance between the Application Site and the nearby ASRs/NSRs. The nearest existing NSR/ASR is 2 temporary structured near to the northern part of the Application Site with separation of about 5m and 19m from the nearest site

boundary. On the other hand, the nearest existing NSR/ASR among Shan Pin Tsuen (mostly temporary structure but with 1 village house) on southwest side is at least separated by 175m from the nearest site boundary. A planned residential development (air sensitive use) is to the immediate southwest of the project site as well. It is worth noting that the main building area of the project site is on the northern side which is relatively further away. The separation from site boundary of this planned residential development and the building area of the Application Site is about 90m. Therefore, there is much longer separation between the major work area and identified ASRs and will result in relatively less impact. Only the road to be formed to connect the proposed project to Ho Chau Road would be in close proximity to the planned residential development. Higher hoarding, nevertheless, will be provided along the site boundary immediate to the existing NSR/ASR near to the northern part of the Application Site and planned residential development (as also discussed under **Section 3.2.5**). Phasing programme will be devised for works nearest to the planned development to minimise the fugitive dust impact to it. The Application Site is not surrounded by NSR/ASR in close proximity on all sides. Given the project site's scale, regular environmental audit programme is recommended to ensure the efficacy of the control measures. For NSR/ASR located in close proximity, environmental monitoring station will be setup to monitor the dust impact.

3.2.4 The proposed development would involve excavation and formation work. As estimated preliminarily, there will be about 76,500 m^3 of excavated material generated. Assuming site formation and excavation would take around 1 year without phasing which should represent a more conservative scenario, it is equivalent to about 4 truckloads of excavated material generated per hour. On the other hand, there is only one planned residential development to the southwest of the Application Site identified in the surrounding and is tentatively completed by 2025, which should be before commencement of construction work of the proposed development (which is around 2027 with assumed 3 to 4 years of construction period so that tentative completion year is 2031). Since there is no concurrent project in the surrounding area, no adverse cumulative air quality impact during the construction stage will be anticipated.

Mitigation Measures for Fugitive Dust Emission

3.2.5 Fugitive dust emission arising from construction activities can be effectively suppressed by incorporating proper mitigation measures into work procedures through contractual clauses with reference to EPD's Recommended Pollution Control Clauses for Construction Contracts, where applicable, good site management, and close monitoring by the resident engineers. In addition, only approved or exempted non-road mobile machineries (including mobile generator, air compressor, crawler crane, bulldozer, and etc.) with a proper label are allowed to be used in the construction site following Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation. The contractor shall be required to follow the requirements of the Air Pollution Control (Construction Dust) Regulations. With the adaptation of good practices, it is expected that emission of construction dust can be kept at an acceptable level. Mitigation measures including but not limited to the followings with respect to superstructure construction of a building and hoarding should be implemented as appropriate:

- In the case of the superstructure construction of a building
  - Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting shall be provided to enclose the scaffolding from the ground floor level of the building, or if a canopy is provided at the first floor level, from the first floor level, up to the highest level of the scaffolding;

- Any skip hoist for material transport shall be totally enclosed by impervious sheeting; and
- Any relevant requirements set outs in Parts III and IV of Air Pollution Control (Construction Dust) Regulations shall be met.

- Except for road opening or resurfacing work, or for construction work carried out in a construction site that is completely paved or completely covered with hardcore
  - Vehicle washing facilities including a high pressure water jet shall be provided at every discernible or designated vehicle exit point;
  - The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point shall be paved with concrete, bituminous materials or hardcores;
  - Where a site boundary adjoins a road, street, service lane or other area accessible to the public or close to any air sensitive receiver including but not limited to existing NSR/ASR identified near to the northern part of the Application Site and planned development to the southwest, hoarding of not less than 2.4 m high from ground level shall be provided along the entire length of that portion of the site boundary except for a site entrance or exit.

3.2.6 The recommended dust mitigation measures are described below.

General Site Management

3.2.7 The applicant will explore to make use of electric power supply where practicably possible and as early as possible to minimize air quality impact due to use of diesel-powered equipment (e.g. generator, pump).

3.2.8 Appropriate working methods should be devised and arranged to minimise dust emissions and to ensure any installed control system and/or measures are operated and/or implemented in accordance with their design merits. No free falling of construction debris should be allowed, which should be let down by hoist or enclosed tunnel to the ground.

3.2.9 A high standard of housekeeping shall be maintained. Any piles of materials accumulated on or around the work areas shall be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas shall be carried out in a manner that does not generate fugitive dust emissions. Prior to cleaning, the materials should be handled properly to prevent fugitive dust emission. Any exposed earth shall be properly treated by compacting or hydro seeding, within 6 months after the last construction activity.

3.2.10 Frequent mist/ water spraying should be applied on dusty areas. The frequency of spraying will depend upon local conditions such as rainfall, temperature, wind speed and humidity. The amount of water spraying should be just enough to dampen the material without over-watering which could result in surface water runoff.

Vehicles and Unpaved Site Roads

3.2.11 Dust emission from unpaved roads comes predominantly from travelling of vehicles. Areas within the site where there are regular vehicle movements should have an approved hard surface. Speed controls at an upper limit of 10km/hr should be imposed and their movements should be confined to designed roadways within the site. All dusty vehicle loads should have side and tail boards covered by tarpaulin extending at least 300mm over the edges of the side and tail boards. Wheel-wash troughs and hoses should be provided at exit points of the site.

Material Stockpiling and Handling

3.2.12 The amount of stockpiling should be minimised where possible. Construction material or debris should be covered and stored inside enclosed areas. Other control measures such as enclosed or semi-enclosed windboard should be used, where applicable, to minimise dust emission. Regular watering is needed at areas such as storage piles, where there could be potential dust emission.

Pond Draining and Soil Removal

3.2.13 Other than earthwork that would likely result in fugitive dust emission, there are some small scattered ponds onsite (totalled less than 2,900 m^2) that would require draining and dredging of soil from pond. Odour usually would come from pond soil. Therefore, as long as the pond is drained, soil will be removed immediately to get rid of odour nuisance.

3.3 Construction Noise Impact

3.3.1 During the construction phase of the Proposed Development, major noise impacts would arise from piling works, operation of Powered Mechanical Equipment (PME), and construction-related traffic.

Construction Noise Criteria

3.3.2 Construction noise is controlled under the Noise Control Ordinance (NCO) which prohibits the use of powered mechanical equipment (PME) during the restricted hours (7 p.m. to 7 a.m. on normal weekdays and any time on a public holiday, including Sunday) without a valid Construction Noise Permit (CNP) from the Authority. The criteria and procedures for issuing such a permit are specified in the "Technical Memorandum on Noise From Construction Works Other than Percussive Piling" (TM1). While there is no planned construction works to be carried out during the restricted hours, TM1 should be followed in case there is any need to carry out works in such time period in future.

3.3.3 With effect from 1 November 96, the use of specified powered mechanical equipment (SPME) for carrying out construction work other than percussive piling and/ or the carrying out of prescribed construction work (PCW) within a designated area are also brought under control. The relevant technical details are provided in the "Technical Memorandum on Noise from Construction Work in Designated Areas" (TM2).

3.3.4 Percussive pilling is controlled similarly by a construction noise permit system and described in the NCO and the "Technical Memorandum On Noise From Percussive Piling" (TM3) which restrict the number of hours during which piling can be conducted. Percussive piling is prohibited between 7 p.m. and 7 a.m. and on holidays (including Sundays). Percussive piling during the daytime (i.e. between 7 a.m. and 7 p.m. on any day not being a holiday) may be carried out in accordance with the permitted hours and other conditions under a valid construction noise permit.

3.3.5 For construction works other than percussive piling, although TM1 does not provide control over daytime construction activities, noise limits as shown in below Table are set out in the "Practice Note for Professional Persons Environmental Consultative Committee" (ProPECC) PN/2 issued in 1993.

Table 3.1 Noise Limit for Daytime Construction Activities

NSR	0700 to 1900 Hours on Any Day Not Being a Sunday or General Holiday, Leq (30 min), dB(A)
Dwelling	75
School	70 (65 during examinations)

Notes:
(i) The above standards apply to uses which rely on opened windows for ventilation;
(ii) The above standards shall be viewed as the maximum permissible noise levels assessed at 1 m from the external façade.

Recommended Mitigation Measures for Construction Noise

3.3.6 Sufficient noise mitigation measures should be introduced in the development to alleviate potential noise impacts on nearby NSRs. The Contractor(s) will be required under the contract to ensure regular maintenance of all plant and equipment, and that noise generation at source would be minimized and practicable noise mitigation measures would be in use. The Contractor(s) will be required to adopt quiet type construction plants (e.g. EPD's quality powered mechanical equipment (QPME) inventory), wherever practicable. Similarly, quieter method other than percussive piling will be adopted as far as practicable for any piling works subject to ground investigation result (which usually dictates the piling method). Movable noise barriers will also be erected around noisy plants in order to minimize noise generation at source. With these measures in place noise generation due to construction activities would be minimized.

3.3.7 The following general noise mitigation measures are recommended for implementation:

- Quieter construction methods should be explored and adopted where practicable in the first place. In addition to percussive piling, quieter alternatives for other construction activities (e.g., use of non-explosive chemical agent to replace the use of breaker) should also be explored;
- Application of properly designed silencers, mufflers, acoustically dampened panels and acoustic sheds or shields, etc.;
- Use of electric-powered equipment where applicable instead of diesel-powered or pneumatic-powered equipment;
- Erecting noise enclosures/ movable noise barriers around noisy plants;
- Only well-maintained plants should be operated on-site;
- Plants should be serviced regularly during the construction programme;
- Noisy activities can be scheduled to minimize exposure of nearby NSRs to high levels of construction noise. For example, noisy activities can be scheduled for midday or at times coinciding with periods of high background noise;
- Noisy equipment such as emergency generators shall always be sited as far away as possible from noise sensitive receivers;
- Location of noise emitting plants at maximum possible distances from sensitive receivers;
- Contractual clauses for construction works; and
- Schedule of noisy operations during non-restricted hours where possible.

3.3.8 The above-mentioned noise mitigation measures and all applicable measures under "Recommended Pollution Control Clauses for Construction Contracts" published by EPD will be included in the contractual clauses for implementation by the contractor(s) during the construction stage. It will be required under contract that the contractor should comply with the noise standards set out in PN 2/93 "Noise from Construction Activities - Non-statutory Controls". With these measures in place, construction noise due to the Proposed Development can be minimized, and no significant noise impact is anticipated.

3.4 Water Quality and Construction Wastewater Impact

Water Sensitive Receiver

3.4.1 Within the 500m radius from the Subject Site (see **Figure 3.2**), there are ponds in the surrounding on northwest to northeast and east sides as well as within site, Yuen Long Bypass Floodway (YLBF) and Kam Tin River to the south and east, and a tidal stream on west side and partially within site.

3.4.2 The subject site has direct interface with the adjacent water sensitive receivers. Other water sensitive receivers (e.g. Kam Tin River) are further apart and no direct water quality impact due to the proposed development is anticipated.

Legislation and Criteria

3.4.3 The following relevant legislation and associated guidelines are applicable to the evaluation of water quality impacts associated with the Project:

- Water Pollution Control Ordinance (WPCO) (Cap. 358);
- ETWB Technical Circular (Works) No. 5/2005 Protection of natural streams/ rivers from adverse impacts arising from construction works;
- Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters;
- Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN1/94) Construction Site Drainage; and
- Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN5/93) Drainage Plans subject to Comment by the Environmental Protection Department.

Source of Construction Wastewater

3.4.4 Construction activities including laying of new pipelines to connect to existing drainage/sewerage system would inevitably have the potential to generate wastewater and affect the nearby water quality (water pond, tidal stream). Works should be carried out in such a manner so as to minimise significant impacts on local water bodies. Activities that are likely to cause water pollution include:

- Construction runoff and drainage;
- Sewage effluent from the site; and
- Liquid spillage, e.g. oil, diesel, solvents etc.

3.4.5 Construction runoff contains increased loads of sediments, other suspended solids and contaminants. Potential sources of pollution include runoff and erosion from the site surfaces, drainage channels; bentonite slurries and other grouting materials and drainage from dust suppression sprays, fuel, oil and lubricants from construction vehicles and other equipment.

Mitigation Measures

3.4.6 The good practice given in ProPECC PN 1/94 in controlling water pollution at construction site shall be implemented during the construction phase of the Proposed Development. Soil erosion from the construction site can be minimised through good on-site management practices by implementing viable erosion control measures which should be incorporated in contract clauses. The main practices provided in the above-mentioned document (i.e. ProPECC PN 1/94) are also summarized in the following paragraphs which should be enforced to prevent unacceptable construction stage impacts and for compliance with the statutory criteria.

A. Construction Site Runoff

- Exposed soil surfaces should be protected from rainfall through, for example, by covering temporarily exposed slope surfaces or stockpiles with tarpaulin and protect temporary access roads by crushed stone or gravel;
- Exposed soil areas should be minimised to reduce the potential for increased siltation and contamination of runoff;
- Minimise the time that soil surfaces are exposed;
- Slow down water run-off flowing across exposed soil surfaces;
- Channels, earth bunds or sand bag barriers should be provided on site to properly direct surface runoff through drainage systems;
- Oil interceptors are also recommended to be provided for stormwater drains near plant maintenance/ repair areas, where necessary.
- Manholes (including newly constructed ones) should be adequately covered or temporarily sealed so as to prevent slit, construction materials or debris from getting into the drainage system;
- Construction works should be programmed to minimise soil excavation works where practicable during rainy conditions;
- Drainage facilities must be adequate for the controlled release of storm flows;
- Sedimentation basins and sand traps designed in accordance with the requirements of ProPECC Note PN 1/94 should be installed at the construction site for collecting surface runoff. Perimeter channels at site boundaries should be provided where necessary to intercept surface runoff from outside the site. Silt removal facilities, channels and manholes should be maintained and deposited silt and grit should be removed regularly;
- There should be no direct discharge without treatment of construction site runoff into the nearby streams and public drains;
- The Contractor shall prepare a construction site drainage management plan with details of the construction phase drainage system proposed to be constructed; discharge location(s); and screening facilities; and
- The Contractor(s) shall apply for a discharge licence under the WPCO and the discharge shall comply with the terms and conditions of the licence throughout the construction phase.
- Construction works should be arranged so that there should be no disturbance to water quality at the nearby stream. Construction site runoff should be intercepted by drains so that there will be no direct discharge without treatment into the nearby stream and other sensitive areas.

B. Wastewater from Construction Site

- Sewage generated from the construction workforce should be contained by chemical toilets before connection to public foul sewer can be provided. The number of chemical toilets required would be subject to the capacity of the chemical toilets, and contractor's practices/ work programme. The Contractor(s) will be required to provide an estimation on the amount of sewage to be generated and to provide sufficient number of chemical toilets for construction workers. The chemical toilets should be serviced and cleaned by a specialist contractor at regular intervals. No discharge of sewage into nearby environment will be allowed during construction stage. Such requirements will be incorporated

into relevant contractual clauses of this Proposed Development for proper implementation;

- Foul water from canteens on-site, if any, should also be contained by chemical toilets before connection to public foul sewer can be provided;
- Vehicle wheel washing facilities should be provided at every site exit such that mud, debris, etc. deposited onto the vehicle wheels or body can be washed off before leaving the site area;
- Section of construction road between the wheel washing bay and the public road should be paved with backfill to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains; and
- If bentonite is used, bentonite slurry should be reconditioned and reused as far as practicable. Spent bentonite should be kept in a separate slurry collection system for disposal at a marine spoil grounds subject to obtaining a marine dumping licence from EPD. If used bentonite slurry is to be disposed of through public drainage system, it should be treated to the respective effluent standards applicable to foul sewers, storm drains or the receiving waters as set out in the WPCO Technical Memorandum on Effluent Standards in accordance with ProPECC PN 1/94.

C. Oils and Solvents

- Spillage of fuel oils or other polluting fluids should be prevented at source. It is recommended that all stocks should be stored inside proper containers and sited on sealed areas, preferably surrounded by berms;
- Regular site inspections to ensure the proper implementation of the above measures shall be carried out.

3.5 Construction Waste Disposal

Legislation

3.5.1 The principal legislation controlling waste materials in Hong Kong is the Waste Disposal Ordinance (WDO) (Cap. 354) and its subsidiary regulations.

Construction Waste Impact

3.5.2 Construction activities for the Proposed Development will generate waste materials requiring appropriate management and disposal. Likely range of waste types includes:

- Excavated C&D materials and site clearance waste;
- Wood from formwork as non-inert C&D materials;
- General refuse generated by the workforce; and
- Chemical and oily wastes due to maintenance of equipment.

3.5.3 The general waste management strategy is to avoid waste generation in the first place. If that is unavoidable, source reduction and segregation should be exercised as far as practicable and at the same time, recycling and reuse should be adopted to salvage as much as possible all the recyclable and reusable materials.

Construction Waste Disposal Measures

3.5.4 On-site sorting of construction wastes will be recommended. On-site sorting can be achieved by avoiding the generation of "mixed waste" through good site control.

3.5.5 Waste generated by construction activities should be sorted into inert C&D materials and non-inert C&D materials. The inert C&D materials which comprise soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works. The non-inert C&D materials which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled and, as the last resort, disposal of at landfills.

3.5.6 Construction wastes shall be sorted, with the inert C&D materials broken up into small pieces for disposal at public fill reception facility, and the non-inert C&D materials should be disposed of at landfill.

3.5.7 All excavated materials generated from removal and diversion of watercourse, removal and construction works in ponds and wet areas as well as the proposed decking should be collected and handled in compliance with Waste Disposal Ordinance. Excavated sediment, if any, from ponds and wet areas should be tested and classified in accordance with the ETWB TCW No. 34/2002 for determining the disposal arrangement for the sediment.

3.5.8 Chemical and oily wastes generated from the construction activities, vehicle and plant maintenance and oil interceptors should be disposed of as chemical waste in strict compliance with the Waste Disposal (Chemical Waste) (General) Regulation.

3.5.9 Waste disposal from construction site is subject to control under the Waste Disposal Ordinance.

3.6 Conclusion

3.6.1 Potential environmental impacts arising from construction activities of the Proposed Development, including dust emission, construction wastewater, noise and waste impacts have been qualitatively assessed. Potential environmental impacts are anticipated to be acceptable with the implementation of effective environmental mitigation measures. The future contractor will be required to implement the environmental audit programme and setup environmental monitoring station at location in close proximity to NSR/ASR to ensure that all environmental mitigation measures are properly provided and implemented. In conclusion, it is envisaged that construction phase environmental impacts arising from the Proposed Development would be acceptable.

4. CONCLUSION

4.1.1 Potential industrial noise and emission, vehicular emission and railway noise impacts have been evaluated and considered insignificant, due to absence of industrial emission source, remoteness and insignificance of fixed noise source, adequate separation from carriageways and long separation from railway system.

4.1.2 The Proposed Development is not environmentally polluting in nature. There is no chimney stack. However, noisy equipment will inevitably be provided onsite. As this is in early planning stage of the project, there is lack of detail such as type of equipment, location, orientation, etc. Nevertheless, the requirement to meet HKPSG standard (Acceptable Noise Level – 5 dB(A) or prevailing background whichever is lower) is well noted and will be specified in future document for detailed design and tender so that engineers and contractors need to strictly follow.

4.1.3 The potential road traffic noise impact on the Proposed Development has been assessed quantitatively. According to the assessment result, there is no exceedance of relevant noise standard for noise sensitive receivers of the Proposed Development. No noise mitigation measure is further recommended.

4.1.4 Potential environmental impacts arising from construction activities of the Proposed Development, including dust emission, construction wastewater, noise and waste impacts have been qualitatively assessed. Potential environmental impacts are anticipated to be acceptable with the implementation of effective environmental mitigation measures. In conclusion, it is envisaged that construction phase environmental impacts arising from the Proposed Development would be acceptable.

Figures

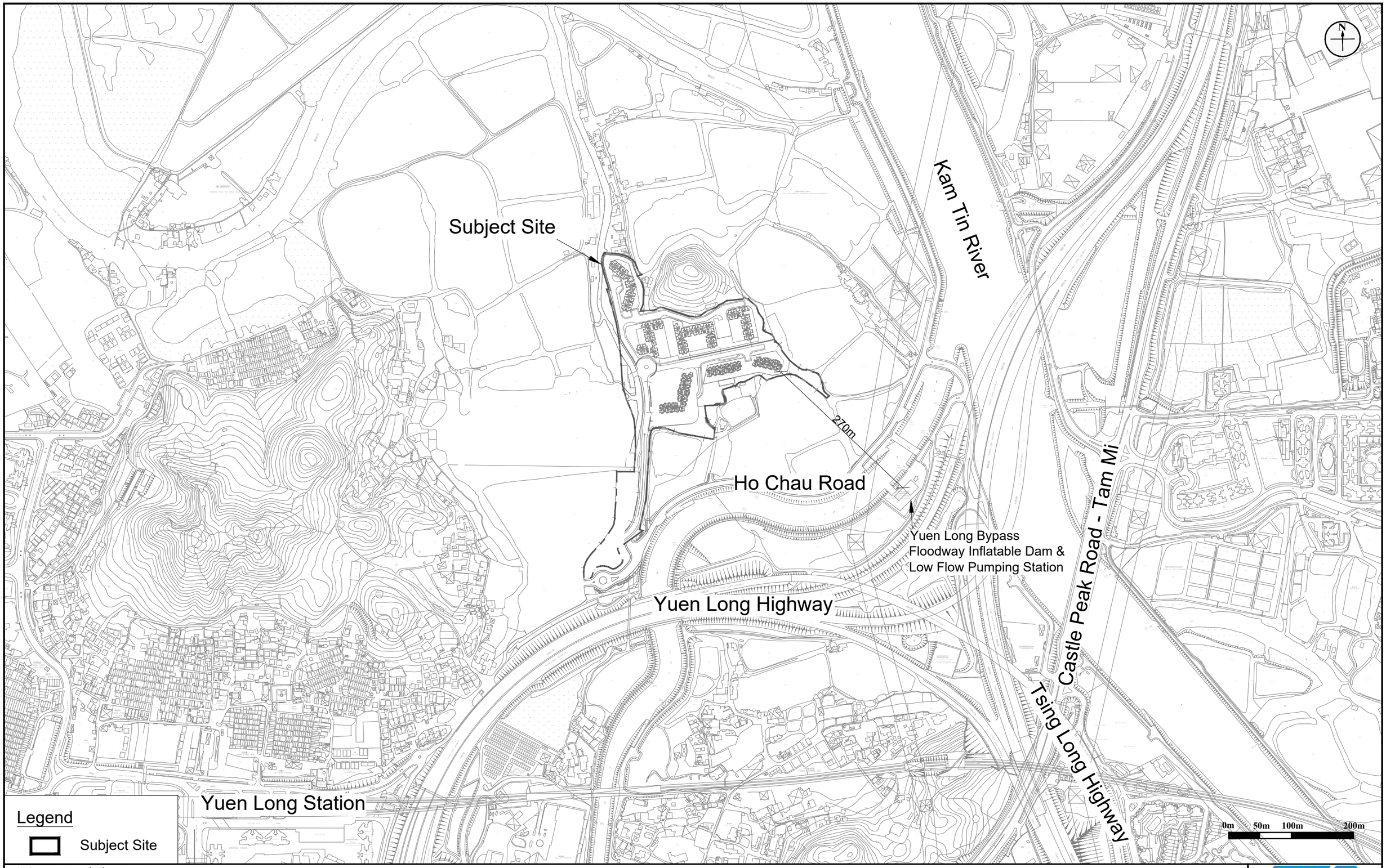

Figure: 1.1

Title: Location of the Subject Site and its Environs

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

RAMBOLL

Drawn by:	CM
Checked by:	CC
Rev.:	1.4
Date:	Apr 2024

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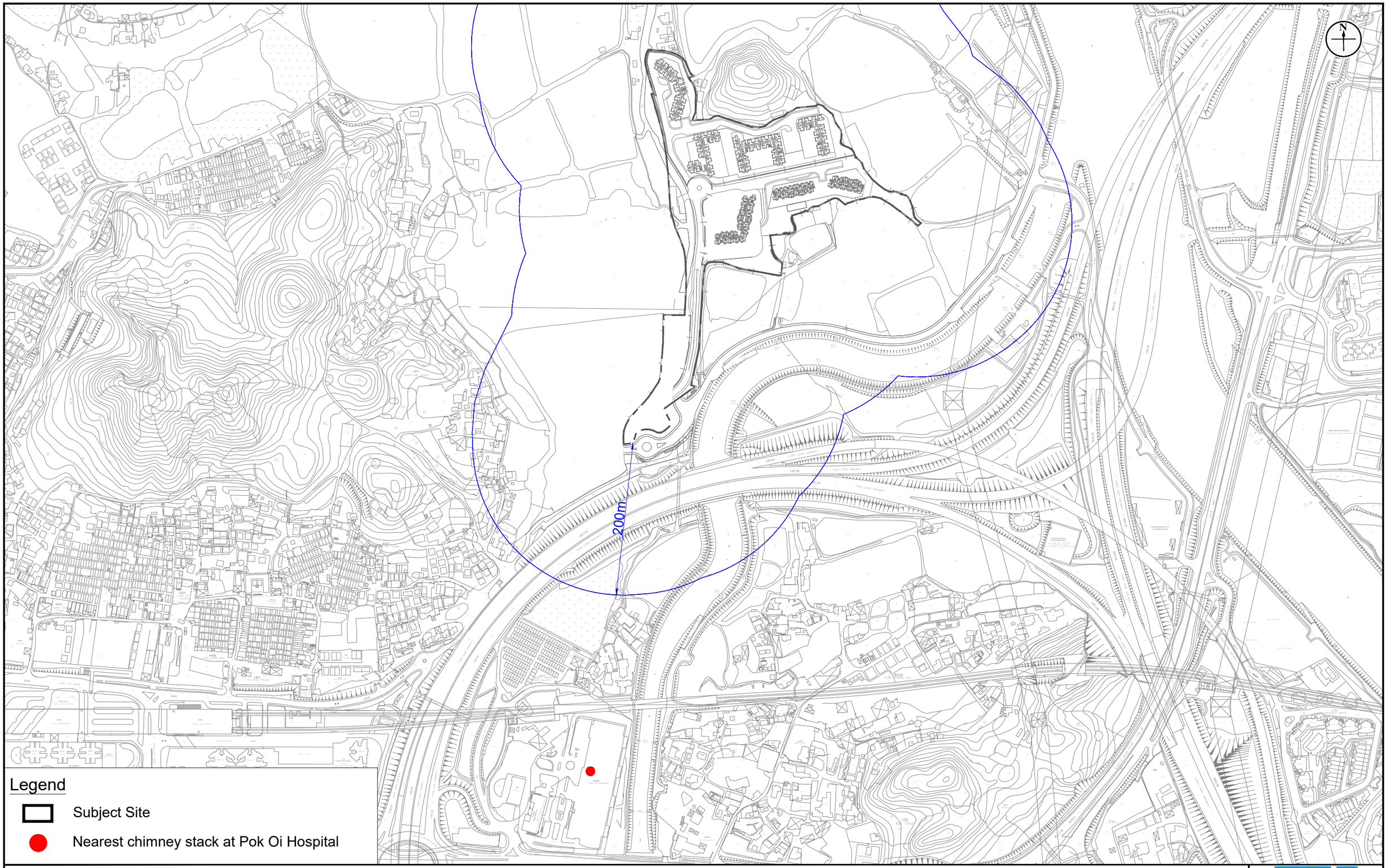

Figure: 1.2

Title: Location and Buffer Distance of Identified Chimneys

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

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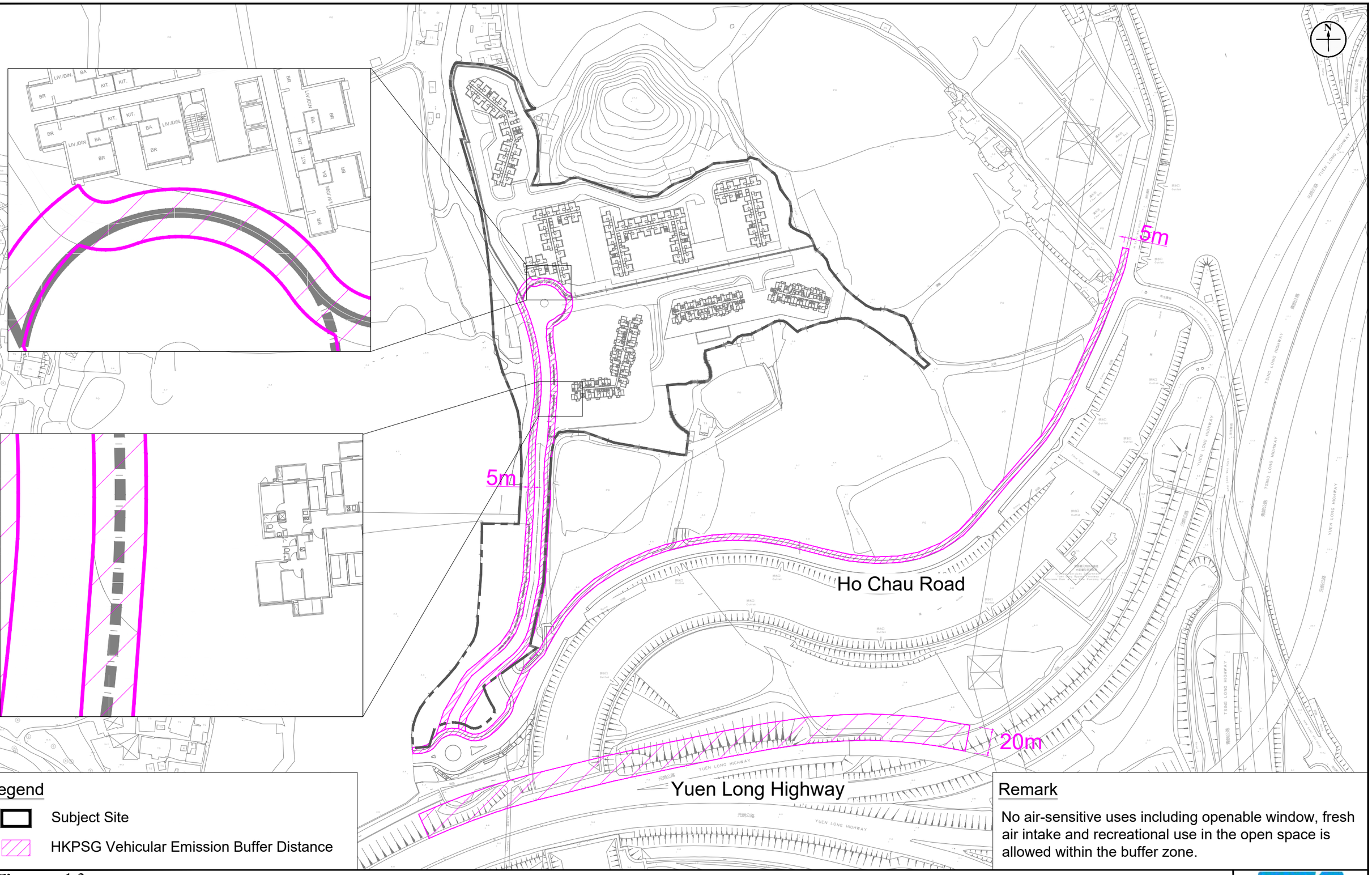

Legend

- Subject Site
- HKPSG Vehicular Emission Buffer Distance

Remark

No air-sensitive uses including openable window, fresh air intake and recreational use in the open space is allowed within the buffer zone.

Figure: 1.3

Title: HKPSG Vehicular Emission Buffer Distance for Nearby Road Network

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

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Date:	Apr 2024

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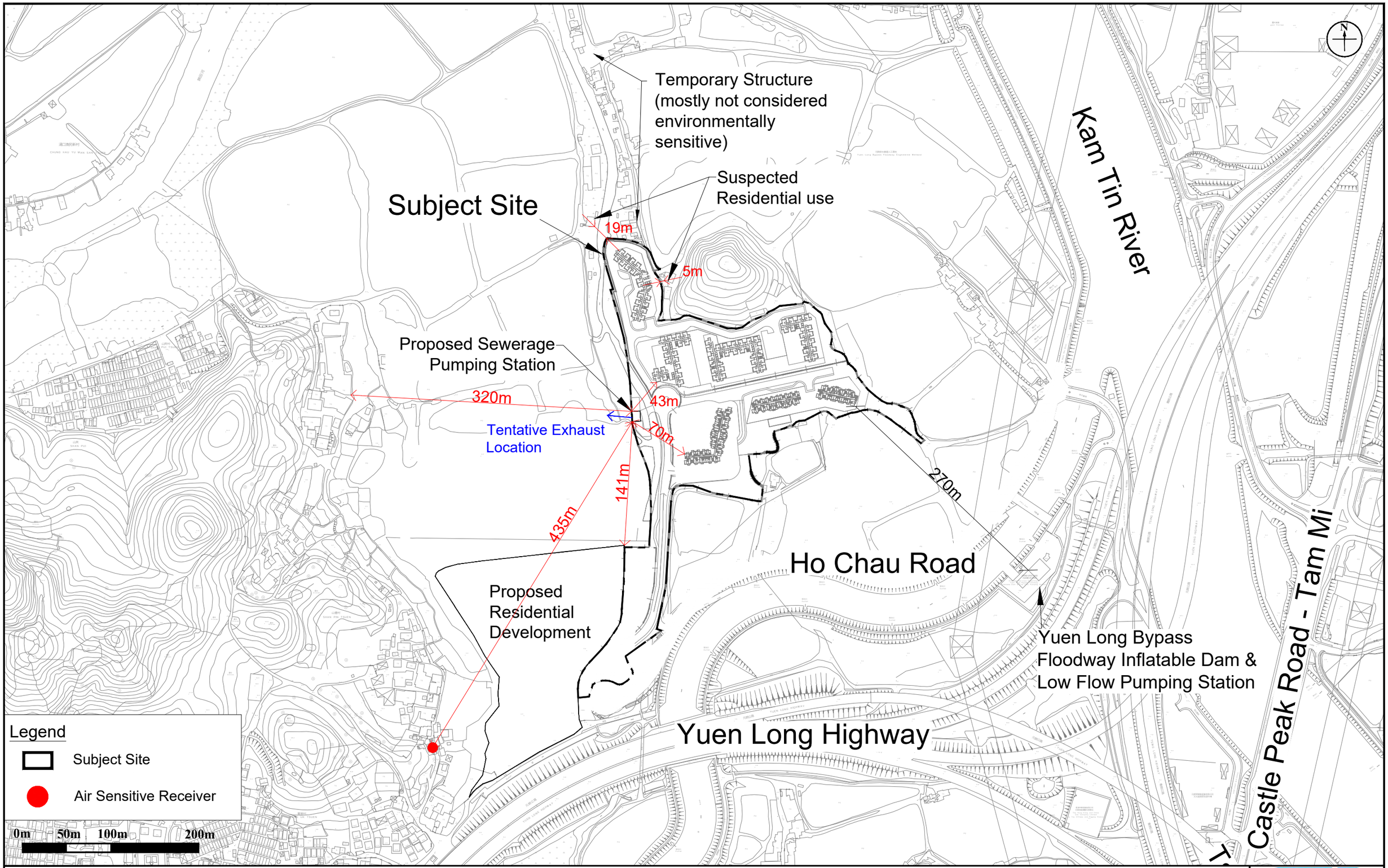

Figure: 1.4

Title: Tentative Exhaust Location of SPS and Nearby Air Sensitive Receivers

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

RAMBOLL

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Date:	Apr 2024

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Figure: 2.1		RAMBOLL
Title: Location of Representative Noise Sensitive Receiver for Road Traffic Noise Impact Assessment	Drawn by:	CM
	Checked by:	CC
Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long	Rev.:	1.4
	Date:	Apr 2024

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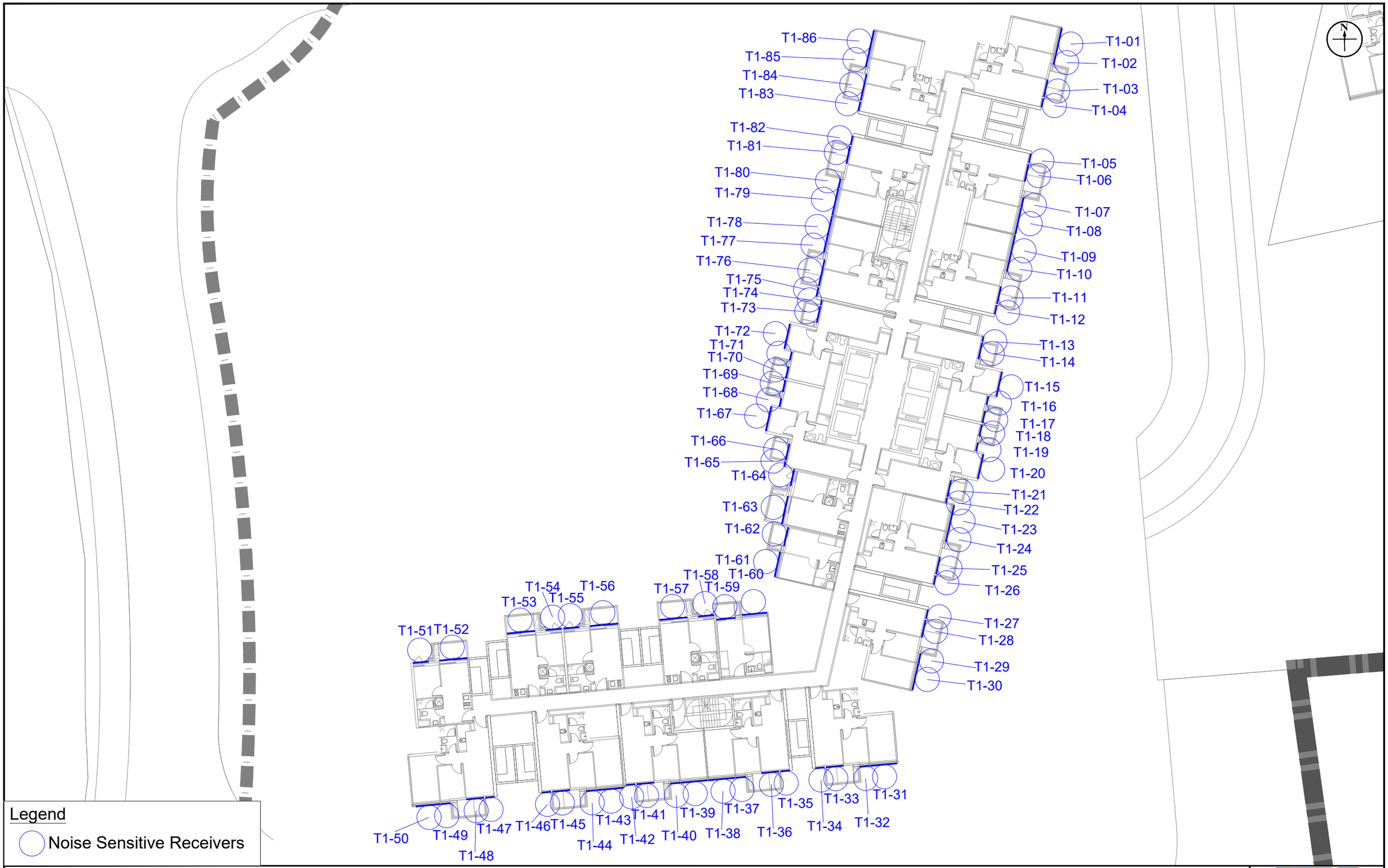

Figure:	2.1a	RAMBOLL
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Project:	Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D .115, Tung Shing Lei, Yuen Long	Rev.: 1.4 Date: Apr 2024

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Figure:	2.1b	RAMBOLL
Title:	Location of Representative Noise Sensitive Receiver for Road Traffic Noise Impact Assessment - Typical floors - Tower 2-3	Drawn by: CM Checked by: CC
Project:	Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D .115, Tung Shing Lei, Yuen Long	Rev.: 1.4 Date: Apr 2024

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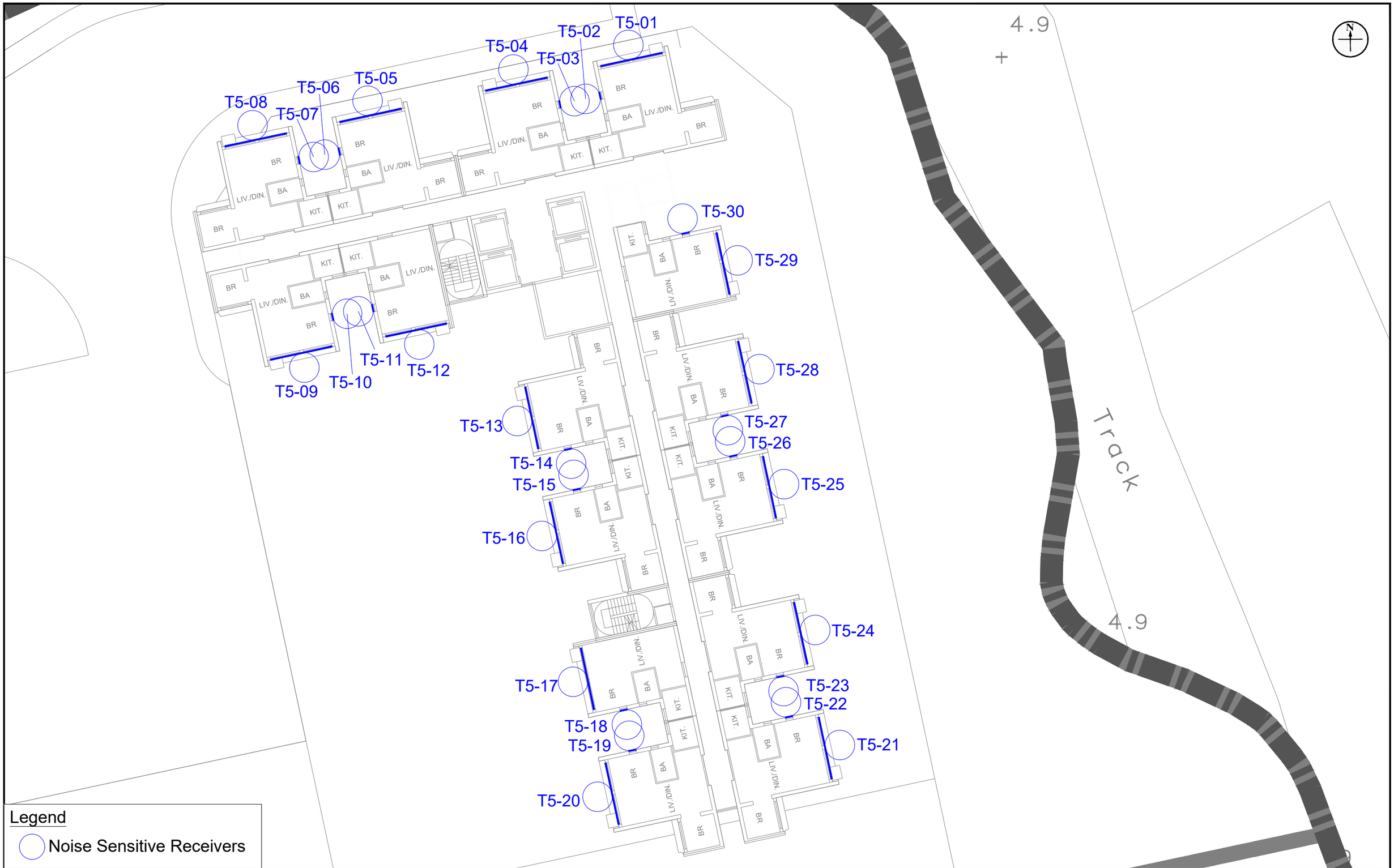

Figure: 2.1c

Title: Location of Representative Noise Sensitive Receiver for Road Traffic Noise Impact Assessment - Typical floors - Tower 5

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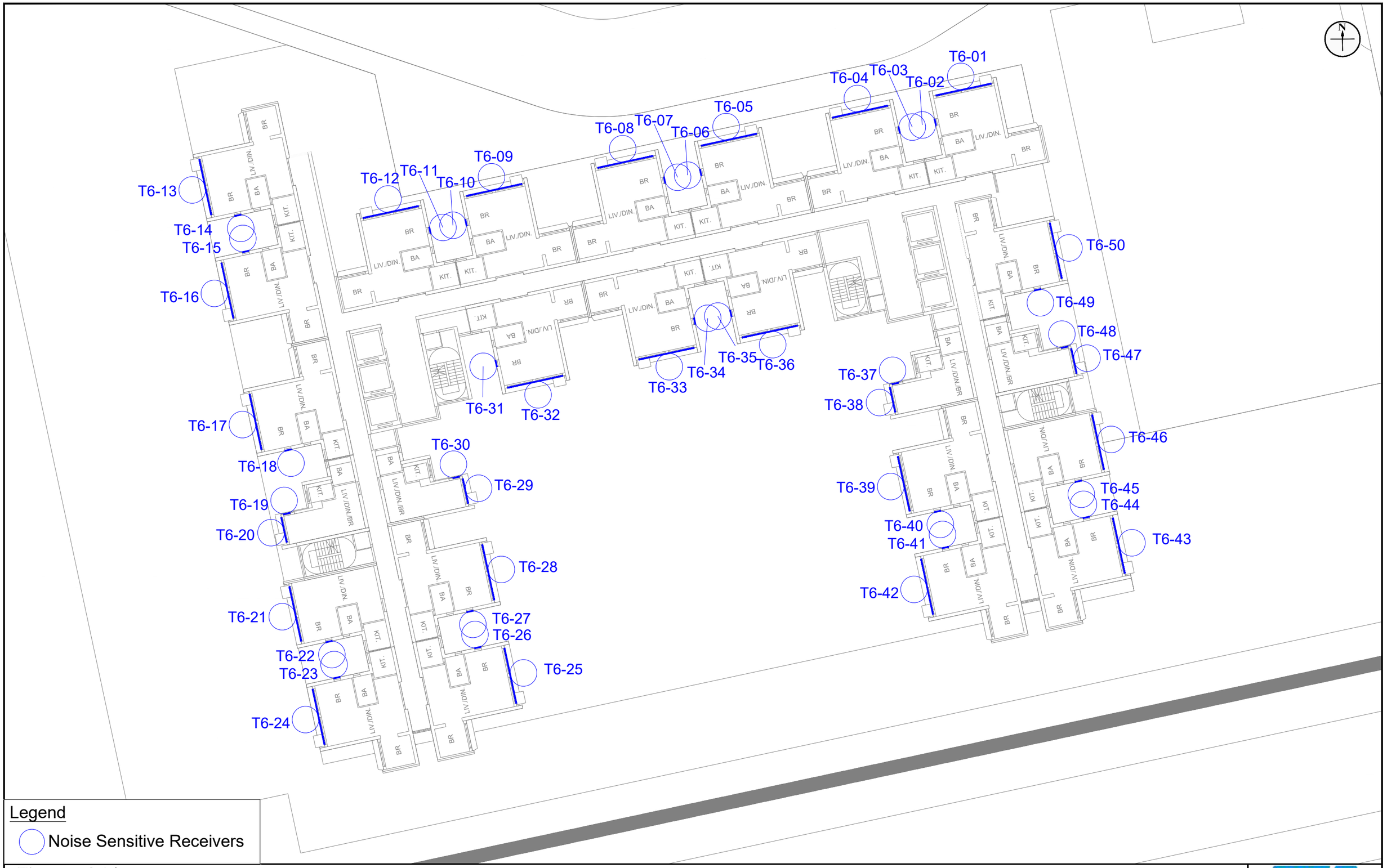

Legend

Noise Sensitive Receivers

Figure: 2.1d

Title: Location of Representative Noise Sensitive Receiver for Road Traffic Noise Impact Assessment - Typical floors - Tower 6

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D .115, Tung Shing Lei, Yuen Long

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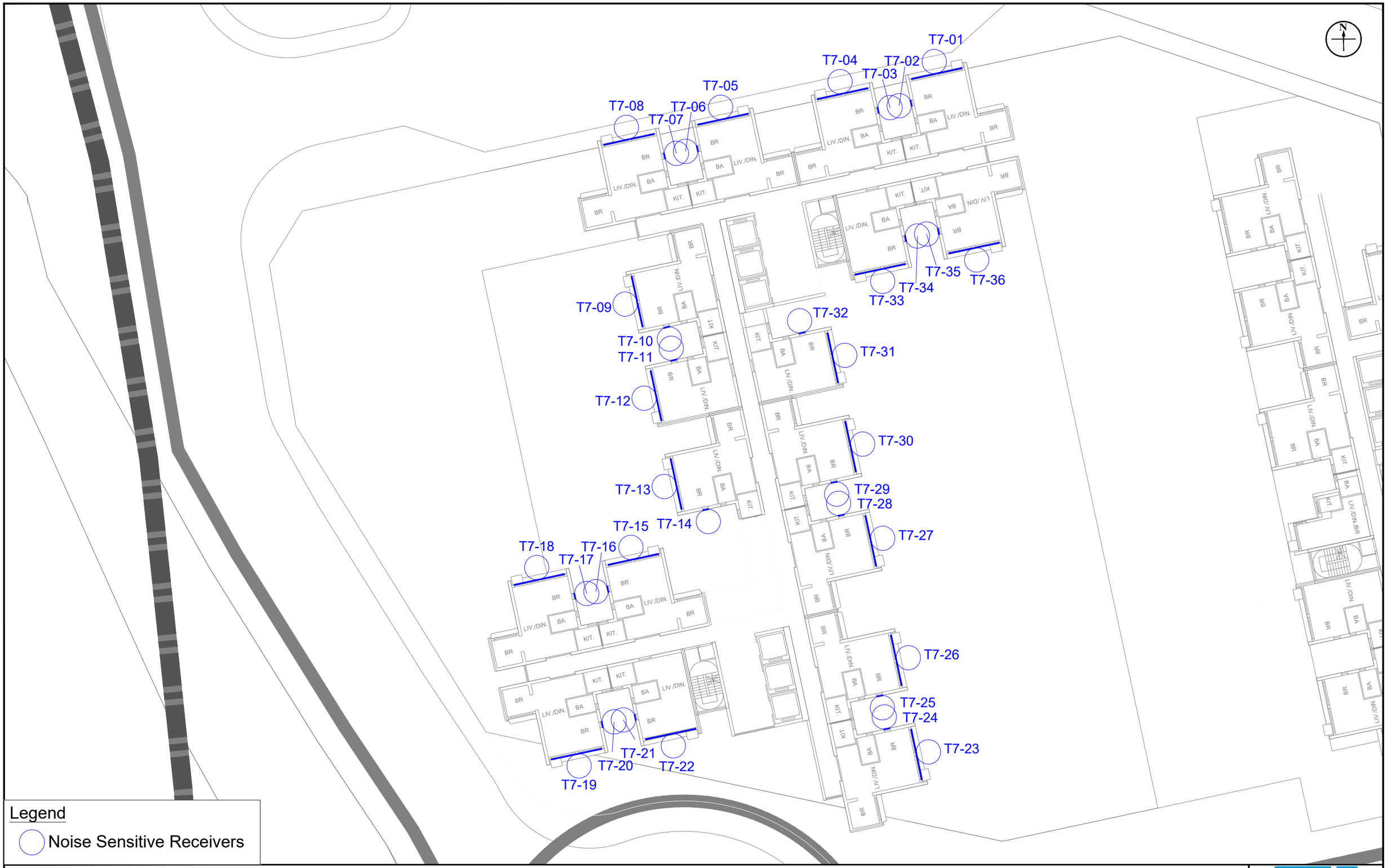

Figure: 2.1e

Title: Location of Representative Noise Sensitive Receiver for Road Traffic Noise Impact Assessment - Typical floors - Tower 7

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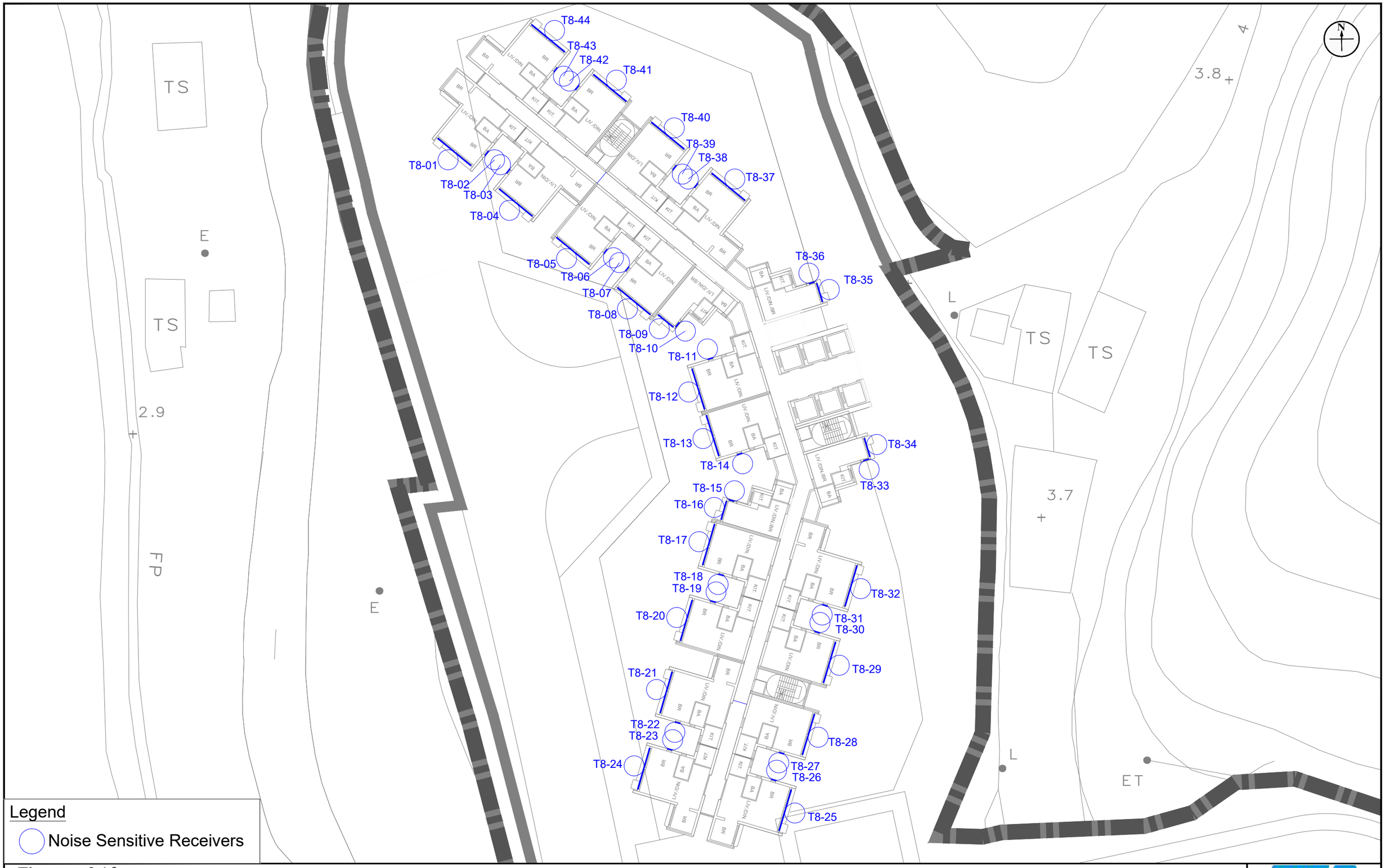

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Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D .115, Tung Shing Lei, Yuen Long	Rev.: 1.4 Date: Apr 2024

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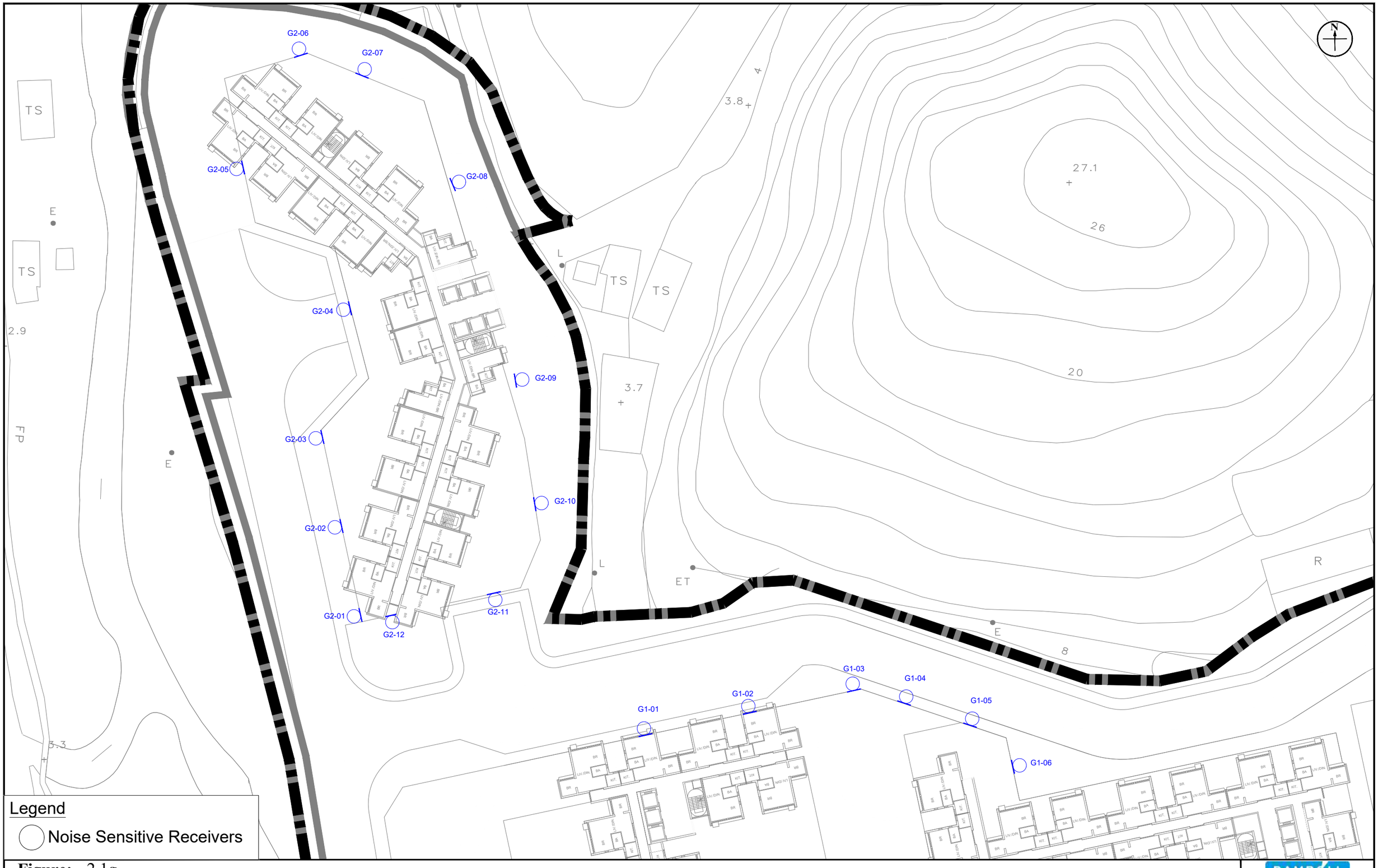

Figure: 2.1g

Title: Location of Representative Noise Sensitive Receiver for Road Traffic Noise Impact Assessment - GIC

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D .115, Tung Shing Lei, Yuen Long

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Rev.:	1.4
Date:	Apr 2024

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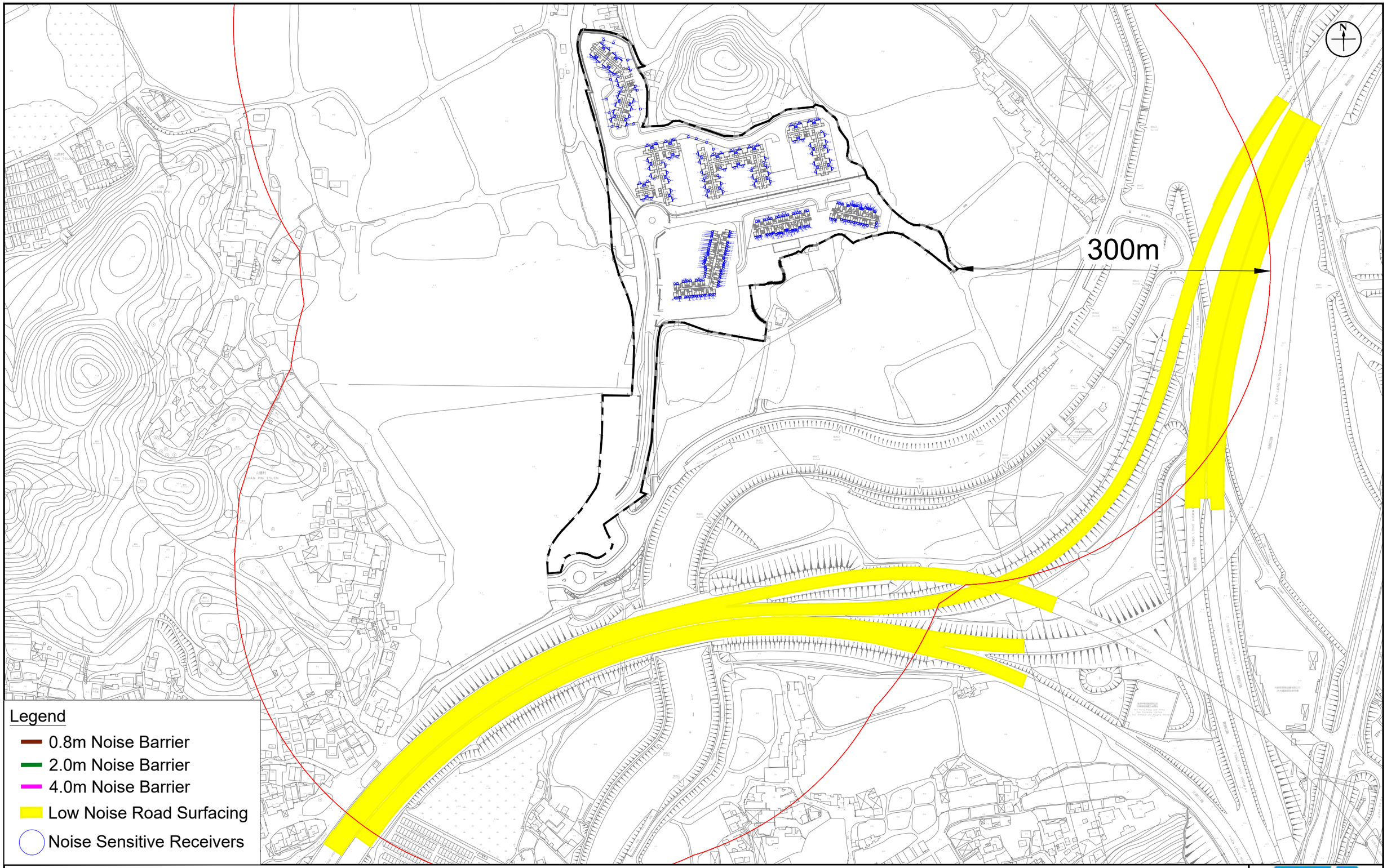

Figure: 2.1h

Title: Location of Representative Noise Sensitive Receiver for Road Traffic Noise Impact Assessment - Noise Barrier and Low Noise Road Surfacing

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D .115, Tung Shing Lei, Yuen Long

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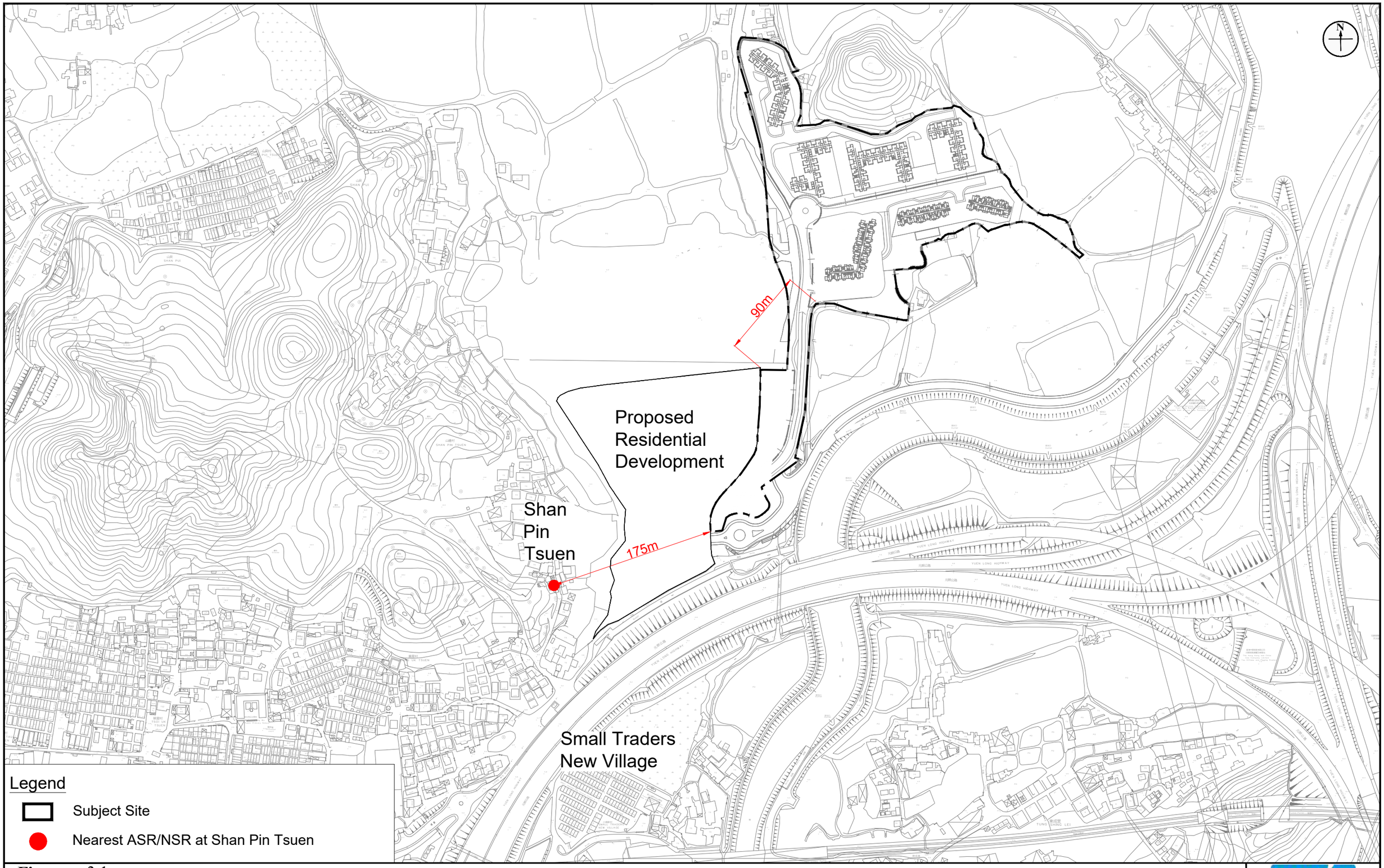

Figure: 3.1

Title: Separation Distance between the Application Site and Nearby Noise and Air Sensitive Receivers

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

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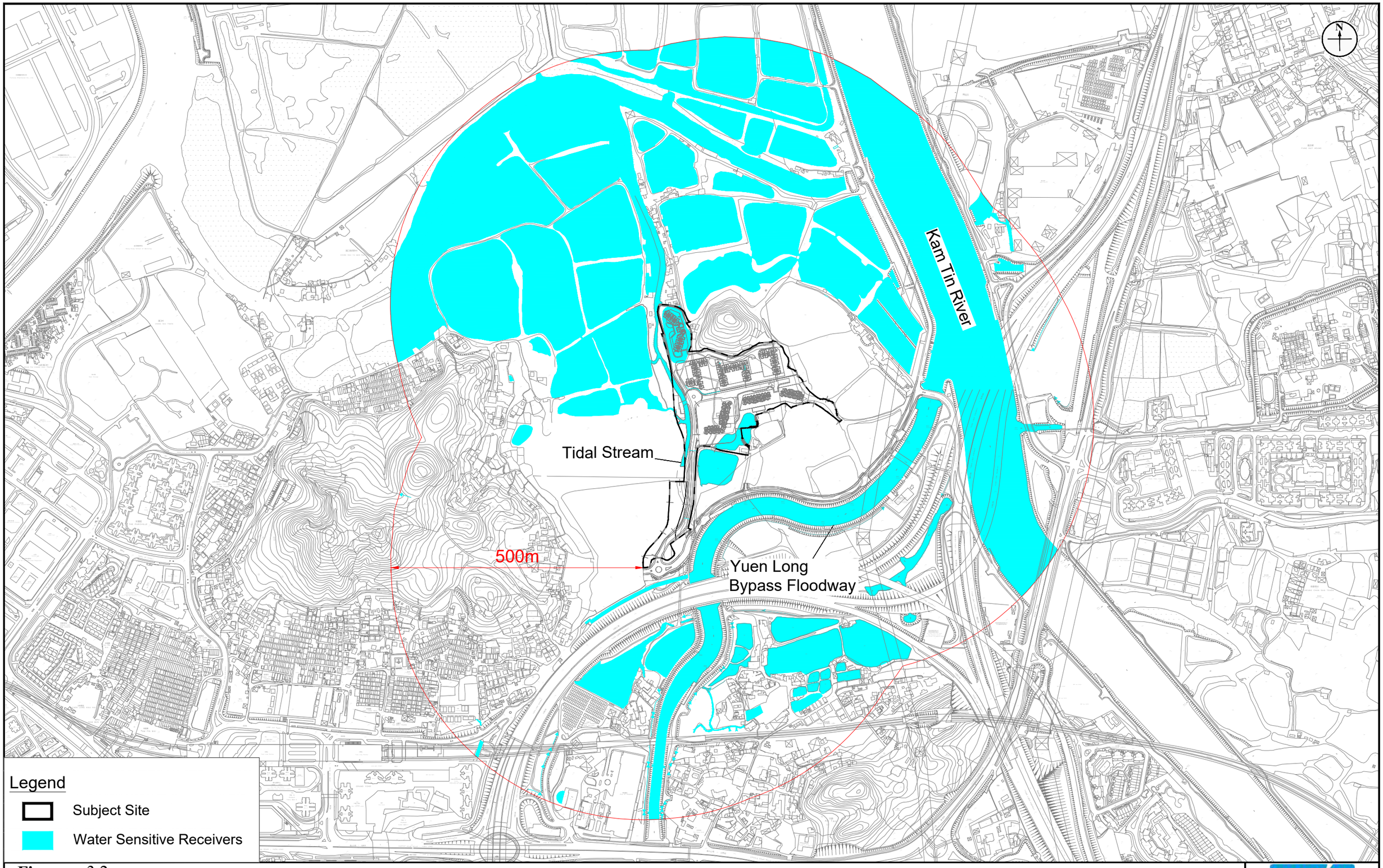

Figure: 3.2

Title: Nearby Water Sensitive Receivers

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

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Date:	Apr 2024

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Appendix 1-1 Indicative Block Plan, Floor Plans and Sections of the Proposed Development



Site Demarcation Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

ARCHI+
ARCHIPLUS INTERNATIONAL LIMITED



Indicative Block Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

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Indicative Ground Floor Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

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LEGEND :

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION
- PROVISION OF PUBLIC ACCESS ROAD AND INFRASTRUCTURE TO BE MANAGED AND MAINTAINED BY GOVERNMENT DEPARTMENTS

GIC +13.00
T8
T7
CARPARK & E&M +13.00
T6
T6
RAMP
CARPARK & E&M +13.00
T5
CARPARK & E&M +13.00
+13.00
+13.00
T1
T2
+14.00
T3
KINDER-GARTEN +11.50
VOID ABOVE PTT
YUEN LONG HIGHWAY
元朗公路
TSING LONG HIGHWAY
青朗公路

N

Indicative First Floor Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 2500 (A3)

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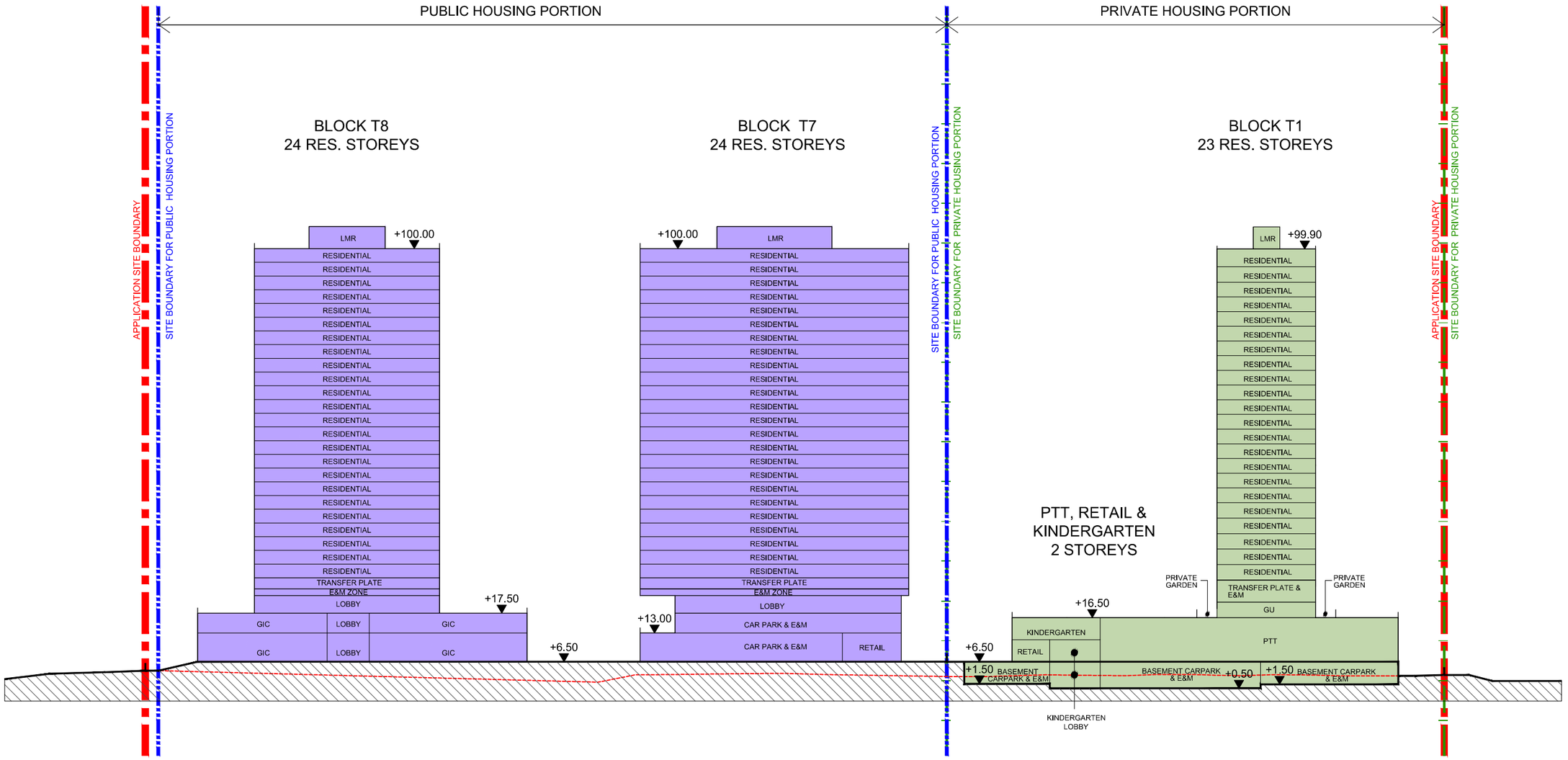
LEGEND

EXISTING SITE LEVEL



SECTION S1

Indicative Section S1

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
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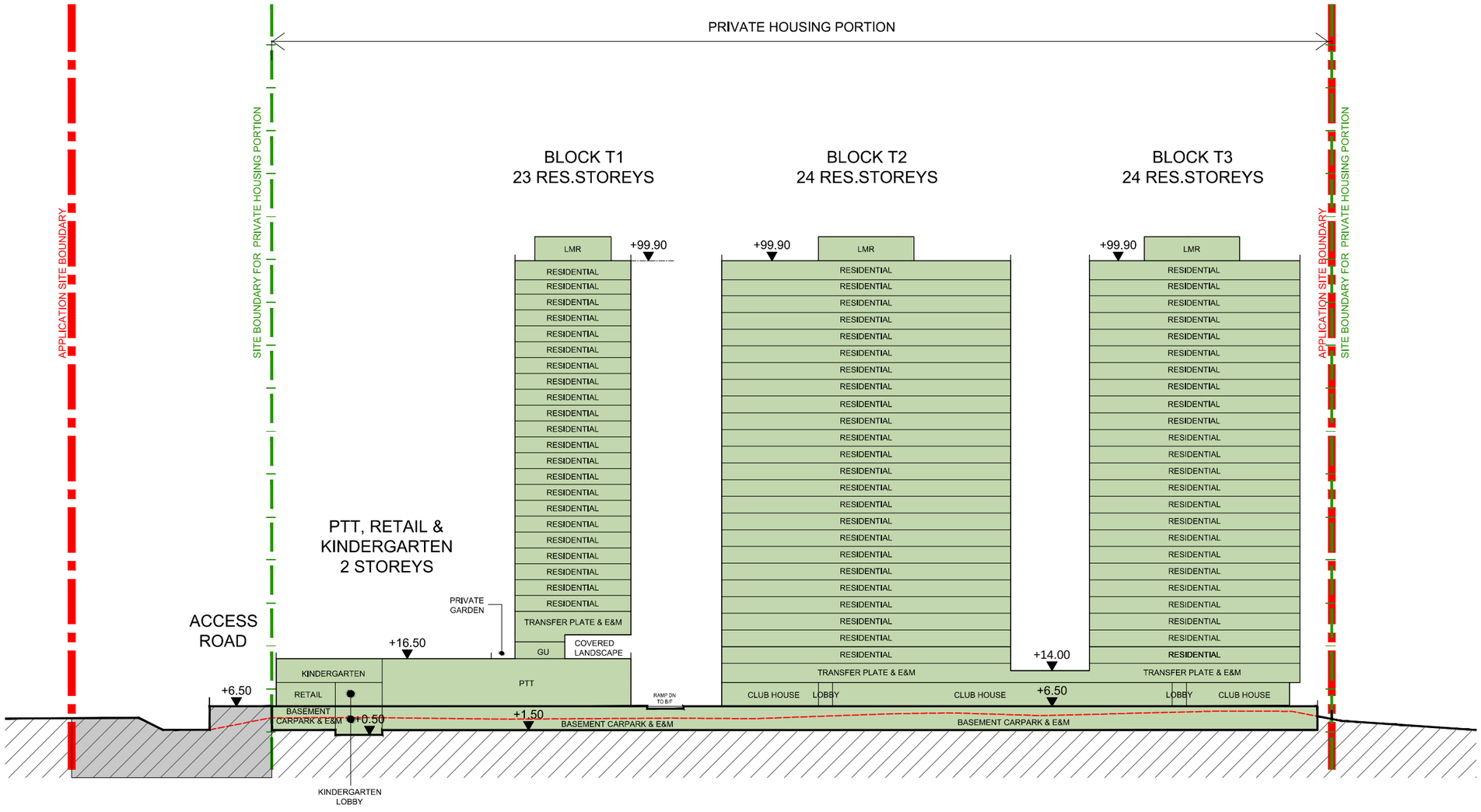
LEGEND

------ EXISTING SITE LEVEL



SECTION S2

Indicative Section S2

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
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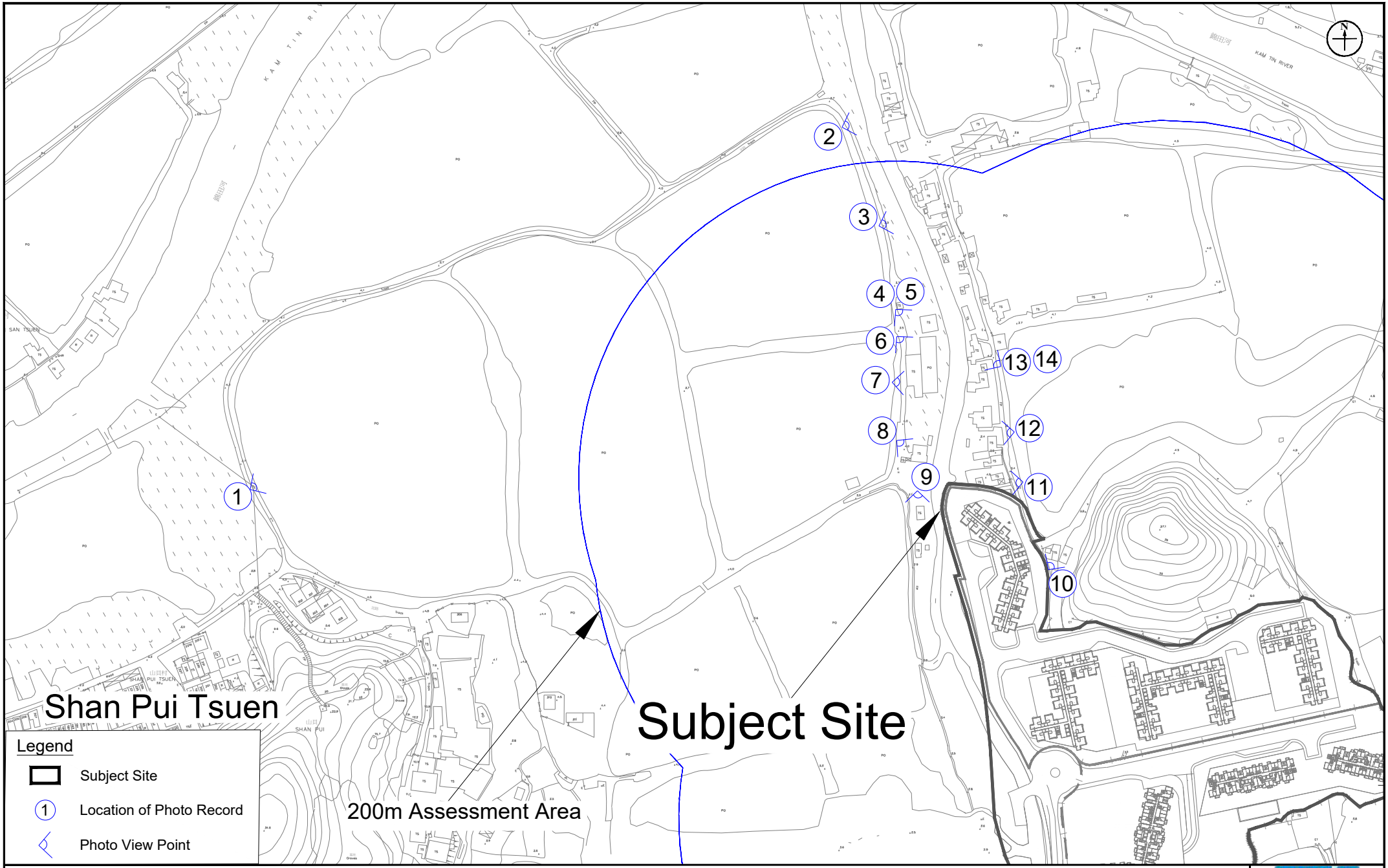
Appendix 1-2 Site Survey Photo Records



Appendix: 1.2

Title: Location of the Photo Records

Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

RAMBOLL

Drawn by:	MK
Checked by:	CC
Rev.:	1.6
Date:	Jan 2024

Q:\Projects\SHKTSLRDEI00\04 Deliverables\03 EA Report\02 Appendix\Survey Map.dwg

Site Survey Photo Record



Photo 1: Pond at the northwest of the Subject Site



Photo 2: Natural vegetation and abandon structure is located at the north of the Subject Site. No occupant is observed.



Photo 3: Natural vegetation and abandon structure are located at the north of the Subject Site. No occupant is observed in the abandon structure.



Photo 4: Temporary structures are located at the north of the Subject Site. No signs of activity are observed.



Photo 5: Temporary structures and vehicle are located at the north of the Subject Site. No operation is observed.

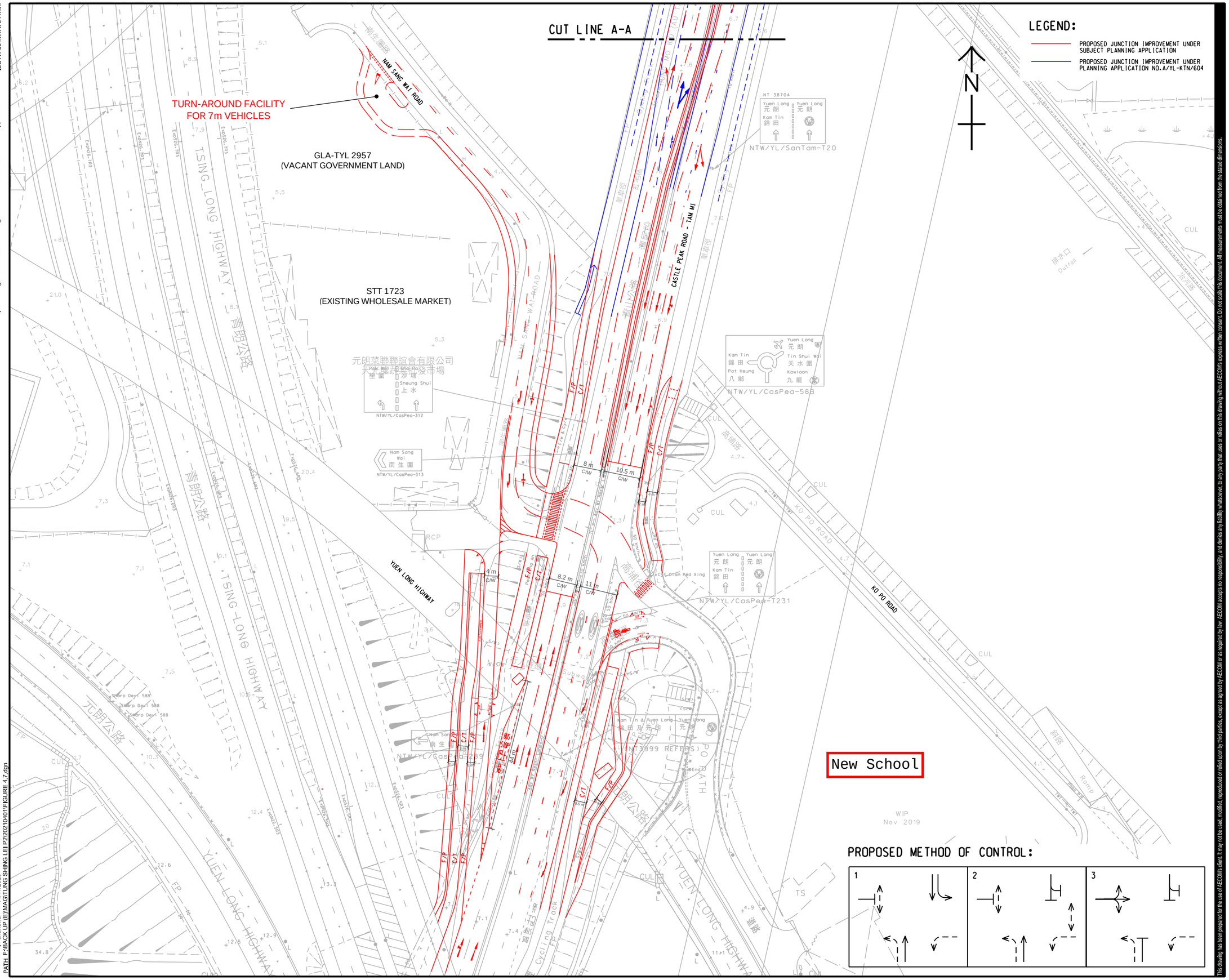


Photo 6: Temporary structures with no residential use and operation activity are observed.

	
Photo 7: Temporary structures for storage use are observed.	Photo 8: Temporary structure with residential activity is observed.
	
Photo 9: Abandon structure with no residential use is observed.	Photo 10: low-rise residential house is observed. The village type structure is located at the northeast of the Subject Site.
	
Photo 11: Abandon structure with no residential use is observed.	Photo 12: Temporary structures are located at northeast of the Subject Site for storage use.

	
Photo 13: Temporary structures for storage use are observed.	Photo 14: Temporary structures for storage use are observed.

Appendix 1-3 Offsite Road Improvement Works



AECOM

PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

CLIENT
業主

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 複核

STATUS
階段

PRELIMINARY

SCALE 比例 A3 1 : 1000

DIMENSION UNIT 尺寸單位 METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

CONTRACT NO. 合約編號

SHEET TITLE
圖紙名稱

PROPOSED LAYOUT FOR JUNCTION OF CASTLE PEAK ROAD - TAM MI / NAM SANG WAI ROAD (J3)

SHEET NUMBER
圖紙編號

FIGURE 4.7B

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ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

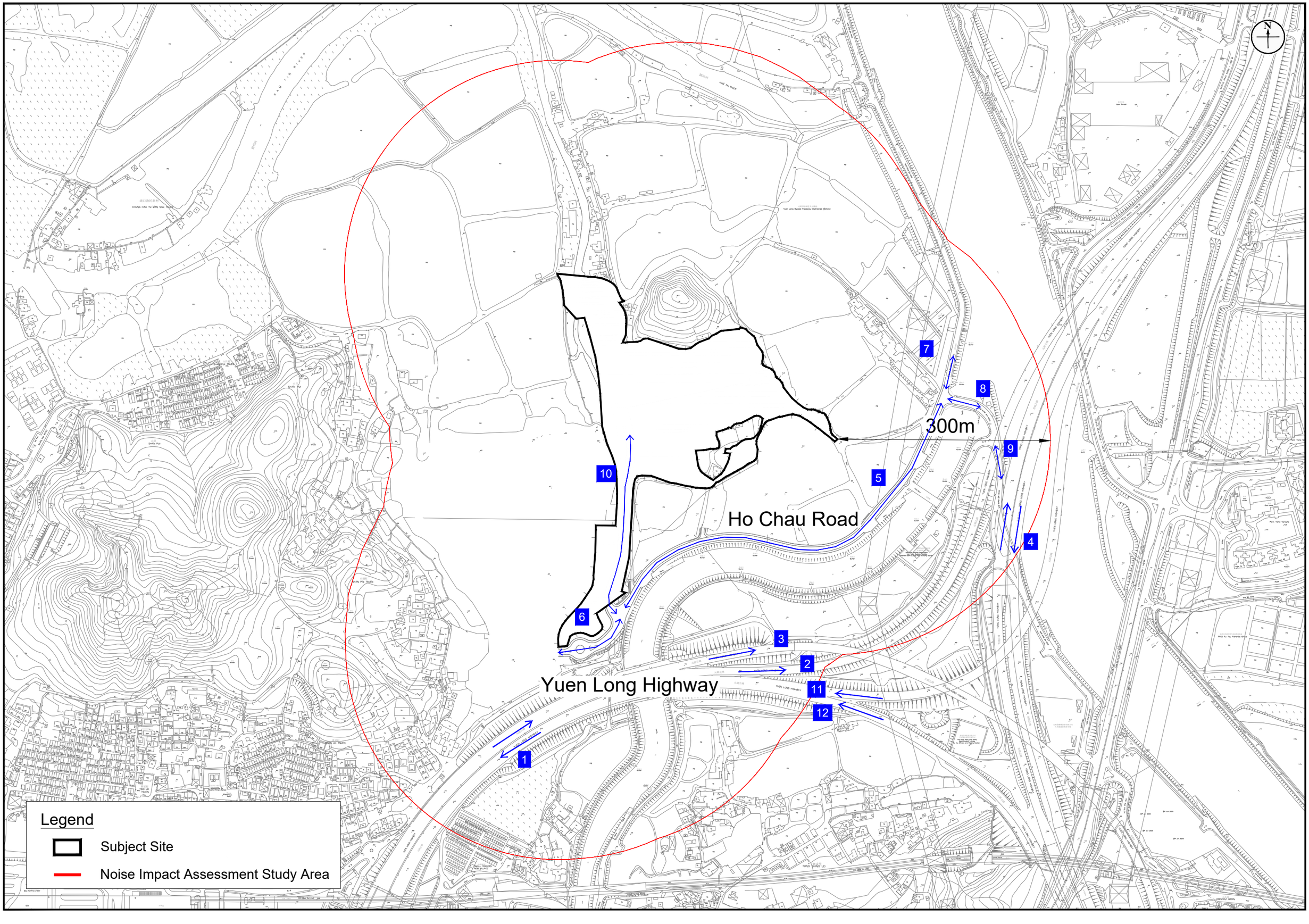
Plot File by: chancwa 14/11/2023
PATH F:\BACK UP (E)\MAG\TUNG SHING LEI P2\20210401\FIGURE 4.7.dgn

Appendix 2-1 Traffic Forecast for Year 2046

Proposed Residential Development at Tung Shing Lei, Nam Sang Wai, Yuen Long

Year 2046 Traffic Forecast

Road No.	Road Name	Direction	Speed Limit	AM Peak Traffic Flows	
				2046	HV %
1	Yuen Long Highway	NB	80	6840	37%
		SB	80	4610	41%
2	Link Road - Yuen Long Highway to San Tin Highway	NB	80	3520	42%
3	Link Road - Yuen Long Highway to Tsing Long Highway	SB	80	3050	31%
4	Tsing Long Highway	NB	100	770	42%
		SB	100	830	44%
5	Ho Chau Road	2-way	50	820	17%
6	Ho Chau Road	2-way	50	285	17%
7	Nam Sang Wai Road	2-way	50	40	50%
8	Nam Sang Wai Road	2-way	50	850	19%
9	Nam Sang Wai Road	2-way	50	850	19%
10	Access Road to Phase 2	2-way	50	520	17%
11	Link Road - San Tin Highway to Yuen Long Highway	SB	80	3470	44%
12	Link Road - Tsing Long Highway to Yuen Long Highway	NB	80	1070	31%


300m
Ho Chau Road
Yuen Long Highway
1
2
3
4
5
6
7
8
9
10
11
12
Legend
Subject Site
Noise Impact Assessment Study Area

☐Urgent ☐Return receipt ☑Expand Group ☐Restricted ☐Prevent Copy ☐Confidential

Raymond YB LEONG/DEVB

寄件者: Raymond Tak Chi LEUNG <raymondleung@td.gov.hk>
寄件日期: 2023年3月13日星期一 12:38
收件者: Raymond YB LEONG/DEVB
副本: Hao CAI/TD; Tony HL AU/DEVB
主旨: Re: LSPS/002
附件: 20230301 EPD-LSPS002_FI4.pdf

Dear Raymond,

I refer to your e-mail today.

The proposed public access road under the LSPS/002 project and the Ho Chau Road are local distributor.

Thank you.

Raymond Leung
SE/SD, TENTW, TD
Tel: 2399 2418

From: "Raymond YB LEONG/DEVB" <raymondleong@devb.gov.hk>
To: "Raymond Tak Chi LEUNG/TD" <raymondleung@td.gov.hk>, "Hao CAI/TD" <haocai@td.gov.hk>
Cc: "Tony HL AU/DEVB" <tonyau@devb.gov.hk>
Date: 13/03/2023 11:29 AM
Subject: Re: LSPS/002

Dear Raymond and Phil (TD),

I refer to item 7 of EPD's comments on the supplementary information from the applicant concerning application no. LSPS/002.

[See attachment "20230301 EPD-LSPS002_FI4.pdf"]

I should be much grateful for your advice whether the proposed public access road as well as the updated Ho Chau Road can be considered as local distributor.

Thank you.

Raymond LEONG
3841 7163

Appendix 2-2 Results of Road Traffic Noise Impact Assessment

Land Sharing Pilot Scheme – Application for Proposed Subsidized Housing and Private Housing, Tung Shing Lei, Yuen Long, N.T.
Results of Road Traffic Noise Impact Assessment (Base Case Scenario) (Exceedance Summary)

Exceedance Summary - Base Case

	TOWER 1	TOWER 2	TOWER 3	TOWER 5	TOWER 6	TOWER 7	TOWER 8	GIC
Max SPL	70	66	67	58	60	60	56	55
Total no. of units with exceedance	0	0	0	0	0	0	0	0

No. of Exceedance	
Total no. of units	3129
Total no. of units with exceedance	0
Max SPL	70
Compliance %	100.0%

Land Sharing Pilot Scheme – Application for Proposed Subsidized Housing and Private Housing, Tung Shing Lei, Yuen Long, N.T.
Results of Road Traffic Noise Impact Assessment (Base Case Scenario) (Exceedance Summary)

Result Summary (Detail)- Base Case - Tower 1

GBP Floor	*mPD, m	T1-01	T1-02	T1-03	T1-04	T1-05	T1-06	T1-07	T1-08	T1-09	T1-10	T1-11	T1-12	T1-13	T1-14	T1-15	T1-16	T1-17	T1-18	T1-19	T1-20	T1-21	T1-22	T1-23	T1-24	T1-25	T1-26	T1-27	T1-28	T1-29	T1-30	T1-31	T1-32	T1-33	T1-34	T1-35	T1-36	T1-37	T1-38	T1-39	T1-40
1/F	27.6	61	61	62	62	62	62	62	62	62	63	63	63	62	60	63	63	63	63	63	64	63	63	64	64	64	64	64	64	65	65	67	67	67	67	67	67	67	67	67	67
2/F	30.9	62	62	62	62	62	62	62	62	62	63	63	63	62	60	63	63	63	64	64	64	63	64	64	64	64	64	64	64	65	65	65	67	67	67	67	67	67	67	67	67
3/F	34.2	62	62	62	62	62	62	62	62	62	63	63	63	62	60	64	64	64	64	64	64	64	64	64	64	64	64	64	64	65	65	65	68	68	68	68	68	68	68	68	68
4/F	37.5	62	62	62	62	62	62	62	62	62	63	63	63	62	61	64	64	64	64	64	64	64	64	64	64	64	64	65	65	66	66	68	68	68	68	68	68	68	68	68	68
5/F	40.8	62	62	62	62	62	62	62	62	62	63	63	63	63	61	64	64	64	64	64	64	64	64	64	64	65	65	65	65	65	66	66	68	68	68	68	68	68	68	68	68
6/F	44.1	62	62	62	62	62	62	62	62	63	63	63	63	63	61	64	64	64	64	64	64	64	64	64	64	65	65	65	65	65	66	66	68	68	68	68	68	68	68	69	69
7/F	47.4	62	62	62	62	62	62	62	63	63	63	63	63	63	61	64	64	64	64	64	64	64	64	64	64	65	65	65	65	65	66	66	69	69	69	69	69	69	69	69	69
8/F	50.7	62	62	62	62	63	63	63	63	63	63	63	63	63	61	64	64	64	64	64	64	64	64	64	64	65	65	65	65	65	66	66	69	69	69	69	69	69	69	69	69
9/F	54	62	62	62	62	63	63	63	63	63	64	64	63	63	61	64	64	64	64	64	64	64	64	64	65	65	65	65	65	66	66	67	69	69	69	69	69	69	69	69	69
10/F	57.3	62	62	62	62	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	64	65	65	65	65	65	65	66	67	67	69	69	69	69	69	69	69	69	69
11/F	60.6	62	62	62	62	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	64	65	65	65	65	65	65	66	67	67	69	69	69	69	69	69	70	70	70	70
12/F	63.9	62	62	62	62	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	64	65	65	65	65	65	66	66	67	67	70	70	70	70	70	70	70	70	70	70
13/F	67.2	62	62	62	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	64	65	65	65	65	65	66	66	67	67	70	70	70	70	70	70	70	70	70	70
14/F	70.5	62	62	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	64	65	65	65	65	65	66	66	67	67	70	70	70	70	70	70	70	70	70	70
15/F	73.8	62	62	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	65	64	65	65	65	65	65	65	66	66	67	67	70	70	70	70	70	70	70	70	70	70
16/F	77.1	62	62	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	65	64	65	65	65	65	65	65	66	66	67	67	70	70	70	70	70	70	70	70	70	70
17/F	80.4	62	62	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	65	65	65	65	65	66	66	67	67	70	70	70	70	70	70	70	70	70	70	70
18/F	83.7	62	62	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	65	65	65	65	66	66	66	67	67	70	70	70	70	70	70	70	70	70	70	70
19/F	87	62	62	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	65	65	65	65	66	66	66	67	67	70	70	70	70	70	70	70	70	70	70	70
20/F	90.3	62	62	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	65	65	65	65	66	66	66	67	67	70	70	70	70	70	70	70	70	70	70	70
21/F	93.6	62	63	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	64	64	65	65	65	65	66	66	66	67	67	70	70	70	70	70	70	70	70	70	70	70
22/F	96.9	62	63	63	63	63	63	63	63	63	64	64	64	63	61	64	64	64	64	64	65	64	65	65	66	66	66	66	66	67	67	70	70	70	70	70	70	70	70	70	70	70
Max Noise Level, dB(A)		**62**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**64**	**64**	**64**	**63**	**61**	**64**	**64**	**64**	**64**	**64**	**65**	**64**	**65**	**65**	**66**	**66**	**66**	**66**	**66**	**67**	**67**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**
No. of Exceedance Per NSR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	

/ Non-residential unit

*** The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.**

Land Sharing Pilot Scheme – Application for Proposed Subsidized Housing and Private Housing, Tung Shing Lei, Yuen Long, N.T.
Results of Road Traffic Noise Impact Assessment (Base Case Scenario) (Exceedance Summary)

Result Su

| | TOWER 1 | | |

Result Summary (Detail)- Base Case - Tower 2

| | | TOWER 2 | | |

Result Summary (Detail)- Base Case - Tower 3

		TOWER 3																																							
GBP Floor	*mPD,m	T3-01	T3-02	T3-03	T3-04	T3-05	T3-06	T3-07	T3-08	T3-09	T3-10	T3-11	T3-12	T3-13	T3-14	T3-15	T3-16	T3-17	T3-18	T3-19	T3-20	T3-21	T3-22	T3-23	T3-24	T3-25	T3-26	T3-27	T3-28	T3-29	T3-30	T3-31	T3-32	T3-33	T3-34	T3-35	T3-36	T3-37	T3-38	T3-39	T3-40	T3-41	T3-42
1/F	16.7	61	61	60	59	58	58	58	58	40	45	49	50	57	56	56	55	55	55	36	39	54	52	52	62	62	62	62	62	62	62	62	62	63	63	63	63	63	63	63	65	64	63
2/F	20.2	61	61	61	59	59	59	59	59	40	46	50	51	57	56	56	56	56	56	36	40	55	54	54	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	65	64	64
3/F	23.7	61	61	61	59	59	59	58	59	40	46	50	50	57	56	56	56	56	57	36	40	55	54	54	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	65	64	64
4/F	27.2	61	61	61	59	59	59	58	59	40	46	50	51	57	56	56	56	56	57	36	40	55	54	54	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	65	64	64
5/F	30.7	62	61	61	59	59	59	59	59	40	46	50	51	57	56	56	56	56	57	36	40	55	54	54	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	65	64	64
6/F	34.2	62	61	61	59	59	59	59	59	40	46	50	51	57	57	56	56	56	57	36	40	55	54	54	63	63	63	63	63	63	63	63	63	63	63	64	64	64	64	64	65	64	64
7/F	37.7	62	62	61	59	59	59	59	59	40	46	51	51	57	57	57	56	56	57	36	40	55	54	54	63	63	63	63	63	63	63	64	64	64	64	64	64	64	64	64	66	64	64
8/F	41.2	62	62	61	59	59	59	59	59	40	46	51	52	57	57	57	57	56	57	36	40	55	54	54	63	63	63	63	64	64	64	64	64	64	64	64	64	64	64	64	66	64	64
9/F	44.7	62	62	61	59	59	59	59	59	40	46	51	52	58	57	57	57	57	57	36	40	55	54	54	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	66	64	64
10/F	48.2	62	62	61	60	59	59	59	59	40	46	52	52	58	57	57	57	57	57	36	40	55	54	54	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	66	64	64
11/F	51.7	62	62	61	60	60	59	59	59	40	47	52	53	58	57	57	57	57	57	36	40	55	54	54	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	66	64	64
12/F	55.2	62	62	61	60	60	60	59	60	40	47	52	53	58	57	57	57	57	57	36	40	55	54	54	64	64	64	64	64	64	64	64	64	64	64	65	65	65	65	65	66	65	64
13/F	58.7	62	62	61	60	60	60	60	60	40	47	52	53	58	57	57	57	57	57	36	40	56	53	54	64	64	64	64	64	64	64	64	64	64	64	65	65	65	65	65	66	65	64
14/F	62.2	62	62	61	60	60	60	60	60	40	47	52	53	58	57	57	57	57	57	36	40	56	53	54	64	64	64	64	64	65	65	65	65	65	65	65	65	65	65	65	67	65	64
15/F	65.7	63	62	61	60	60	60	60	60	40	47	53	53	58	57	57	57	57	57	36	40	56	53	54	64	64	64	64	65	65	65	65	65	65	65	65	65	65	65	65	67	65	64
16/F	69.2	63	62	62	60	60	60	60	60	40	47	53	53	58	57	57	57	57	57	36	40	56	53	53	64	64	64	64	65	65	65	65	65	65	65	65	65	65	65	65	67	65	64
17/F	72.7	63	62	62	60	60	60	60	60	40	47	53	53	58	57	57	57	57	57	36	40	56	53	53	64	64	64	64	65	65	65	65	65	65	65	65	65	65	65	65	67	65	64
18/F	76.2	63	62	62	60	60	60	60	60	40	47	53	53	58	57	57	57	57	57	36	40	56	53	53	64	64	65	65	65	65	65	65	65	65	65	65	65	65	65	65	67	65	64
19/F	79.7	63	62	62	60	60	60	60	60	40	47	53	54	58	57	57	57	57	57	36	40	56	53	53	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	67	65	65
20/F	83.2	63	63	62	60	60	60	60	60	40	47	53	54	58	57	57	57	57	57	36	40	56	53	53	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	67	65	65
21/F	86.7	63	63	62	60	60	60	60	60	40	47	53	54	58	57	57	57	57	57	36	40	56	53	53	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	67	65	65
22/F	90.2	63	63	62	60	60	60	60	60	41	47	53	54	58	57	57	57	57	57	37	40	56	53	53	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	67	65	65
23/F	93.7	63	63	62	60	60	60	60	60	43	48	53	54	58	57	57	57	57	57	40	42	56	53	53	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	67	65	65
24/F	97.2	63	63	62	60	60	60	60	60	47	50	54	54	58	57	57	57	57	57	45	46	56	53	53	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	67	65	65
Max Noise Level, dB(A)		**63**	**63**	**62**	**60**	**60**	**60**	**60**	**60**	**47**	**50**	**54**	**54**	**58**	**57**	**57**	**57**	**57**	**57**	**45**	**46**	**56**	**54**	**54**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**67**	**65**	**65**
No. of Exceedance Per NSR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	

/ Non-residential unit

*** The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.**

Land Sharing Pilot Scheme – Application for Proposed Subsidized Housing and Private Housing, Tung Shing Lei, Yuen Long, N.T.
Results of Road Traffic Noise Impact Assessment (Base Case Scenario) (Exceedance Summary)

Result Summary (Detail)- Base Case - Tower 5

		TOWER 5																												
GBP Floor	*mPD, m	T5-01	T5-02	T5-03	T5-04	T5-05	T5-06	T5-07	T5-08	T5-09	T5-10	T5-11	T5-12	T5-13	T5-14	T5-15	T5-16	T5-17	T5-18	T5-19	T5-20	T5-21	T5-22	T5-23	T5-24	T5-25	T5-26	T5-27	T5-28	T5-29	T5-30
1/F	26.7	42	33	33	33	33	33	33	33	50	50	50	50	50	34	34	51	52	35	35	53	58	53	55	57	57	52	54	57	57	43
2/F	29.8	42	33	33	33	33	33	33	33	50	50	50	50	50	34	34	51	52	35	35	53	58	53	55	57	57	52	54	57	57	43
3/F	32.9	42	33	33	33	33	33	33	33	51	50	50	50	50	34	34	51	52	35	35	53	58	53	55	57	57	51	54	57	57	43
4/F	36	42	33	33	33	33	33	33	33	51	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	54	57	57	43
5/F	39.1	42	33	33	32	33	33	33	33	51	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	54	57	57	43
6/F	42.2	42	33	33	32	33	33	33	33	51	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	54	57	57	43
7/F	45.3	42	33	33	32	33	33	33	33	51	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	54	57	56	43
8/F	48.4	42	33	33	32	33	33	33	33	51	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	54	57	56	43
9/F	51.5	42	33	33	32	33	33	33	33	51	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	54	57	56	43
10/F	54.6	42	33	33	32	33	33	33	33	51	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	54	57	56	43
11/F	57.7	42	33	33	32	33	33	33	33	50	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	54	57	56	43
12/F	60.8	42	33	33	32	33	33	33	33	50	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	53	57	56	43
13/F	63.9	42	33	33	32	33	33	33	33	50	50	50	50	50	34	34	51	52	35	35	53	57	53	55	57	57	51	53	57	56	43
14/F	67	42	33	33	32	33	33	33	33	50	50	50	50	50	34	34	51	52	35	35	53	57	52	55	57	57	51	53	57	56	43
15/F	70.1	42	33	33	32	32	33	33	33	50	50	50	50	50	34	34	51	52	35	35	53	57	52	55	57	57	50	53	57	56	43
16/F	73.2	42	33	33	32	32	33	33	33	50	50	50	50	50	34	34	51	52	35	35	53	57	52	55	57	57	50	53	57	56	43
17/F	76.3	42	33	33	32	33	33	33	32	50	50	50	50	50	34	34	51	52	35	35	53	57	52	55	57	57	50	53	57	56	43
18/F	79.4	42	33	33	32	32	32	33	32	50	50	50	50	50	34	34	51	52	35	35	53	57	52	55	57	57	50	53	57	56	43
19/F	82.5	42	33	33	32	32	32	32	32	50	50	50	50	50	34	34	51	52	35	35	53	57	52	55	57	57	50	53	56	56	43
20/F	85.6	42	32	33	32	32	32	32	32	50	50	50	50	50	34	34	51	52	35	35	53	57	52	55	57	57	50	53	56	56	43
21/F	88.7	42	33	33	32	32	32	32	32	50	50	50	50	50	34	34	51	52	35	35	53	57	52	55	57	57	50	53	56	56	43
22/F	91.8	42	35	35	34	34	34	34	34	50	50	50	50	50	36	36	51	52	37	36	53	57	52	55	57	57	50	53	56	56	43
23/F	94.9	42	37	37	36	36	36	36	36	50	50	50	50	50	39	39	51	52	40	39	53	57	52	55	57	57	50	53	56	56	44
24/F	98	44	40	40	38	38	38	38	38	50	50	50	50	51	43	42	51	52	44	43	53	57	52	55	57	57	51	53	56	56	45
Max Noise Level, dB(A)		**44**	**40**	**40**	**38**	**38**	**38**	**38**	**38**	**51**	**50**	**50**	**50**	**51**	**43**	**42**	**51**	**52**	**44**	**43**	**53**	**58**	**53**	**55**	**57**	**57**	**52**	**54**	**57**	**57**	**45**
No. of Exceedance Per NSR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	

/ Non-residential unit

*** The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.**

Result Summary (Detail)- Base Case - Tower 6

| | | TOWER 6 | | |

Land Sharing Pilot Scheme – Application for Proposed Subsidized Housing and Private Housing, Tung Shing Lei, Yuen Long, N.T.
Results of Road Traffic Noise Impact Assessment (Base Case Scenario) (Exceedance Summary)

Result Summary (Detail)- Base Case - Tower 7

		TOWER 7																																		
GBP Floor	*mPD, m	T7-01	T7-02	T7-03	T7-04	T7-05	T7-06	T7-07	T7-08	T7-09	T7-10	T7-11	T7-12	T7-13	T7-14	T7-15	T7-16	T7-17	T7-18	T7-19	T7-20	T7-21	T7-22	T7-23	T7-24	T7-25	T7-26	T7-27	T7-28	T7-29	T7-30	T7-31	T7-32	T7-33	T7-34	T7-35	T7-36
1/F	26.7	33	33	33	32	32	32	32	32	42	33	33	33	34	33	34	34	34	34	60	59	59	57	54	35	35	35	34	34	34	38	43	33	48	53	52	46
2/F	29.8	33	33	33	32	32	32	32	32	42	33	33	33	33	33	34	34	34	34	60	58	58	57	54	35	35	35	34	34	34	38	44	33	48	53	52	47
3/F	32.9	33	33	33	32	32	32	32	32	42	33	33	33	33	33	34	34	34	34	60	58	58	57	54	35	35	35	34	34	34	38	44	33	48	53	52	48
4/F	36	33	33	33	32	32	32	32	32	43	33	33	33	33	33	34	34	34	34	59	58	58	57	54	35	35	35	34	34	34	38	44	33	48	53	52	48
5/F	39.1	33	33	33	32	32	32	32	32	43	33	33	33	33	33	34	34	34	34	59	58	58	57	54	35	35	34	34	34	34	38	44	33	48	53	52	48
6/F	42.2	32	33	33	32	32	32	32	32	43	33	33	33	33	33	34	34	34	34	59	58	58	57	54	35	35	34	34	34	34	38	44	33	48	53	52	48
7/F	45.3	32	32	32	32	32	32	32	32	43	33	33	33	33	33	33	34	34	34	59	57	58	57	54	35	35	34	34	33	33	38	44	33	48	53	52	48
8/F	48.4	32	32	32	32	32	32	32	32	44	33	33	33	33	33	33	34	34	34	59	57	58	57	54	35	35	34	34	33	33	38	44	33	48	53	52	48
9/F	51.5	32	32	32	32	32	32	32	32	44	33	33	33	33	33	33	34	34	34	59	57	58	57	54	35	35	34	34	33	33	38	44	33	48	53	52	48
10/F	54.6	32	32	32	32	32	32	32	32	44	33	33	33	33	33	33	34	34	34	59	57	58	58	53	35	35	34	34	33	33	38	44	33	48	53	52	48
11/F	57.7	32	32	32	32	32	32	32	32	44	33	33	33	33	33	33	34	34	34	59	57	58	58	53	35	35	34	34	33	33	38	44	33	48	53	52	48
12/F	60.8	32	32	32	32	32	32	32	32	45	32	32	33	33	33	33	34	34	34	59	57	58	58	53	35	35	34	34	33	33	38	44	33	48	53	52	48
13/F	63.9	32	32	32	32	32	32	32	32	45	32	32	33	33	33	33	34	34	34	59	57	58	58	53	35	35	34	33	33	33	38	44	33	48	53	52	48
14/F	67	32	32	32	32	32	32	32	32	45	32	32	33	33	33	33	34	34	34	59	57	59	58	53	35	34	34	33	33	33	38	44	33	48	53	52	48
15/F	70.1	32	32	32	32	32	32	32	32	46	32	32	33	33	33	33	34	34	34	59	56	59	58	53	34	34	34	33	33	33	38	44	33	48	53	52	48
16/F	73.2	32	32	32	32	32	32	32	32	46	32	32	33	33	33	33	34	34	34	59	56	59	59	53	34	34	34	33	33	33	38	44	33	48	53	52	48
17/F	76.3	32	32	32	32	32	32	32	32	46	32	32	33	33	33	33	34	34	34	60	56	59	59	53	34	34	34	33	33	33	38	44	33	48	53	52	48
18/F	79.4	32	32	32	32	31	32	32	32	47	32	32	33	33	33	33	34	34	34	60	56	59	59	53	34	34	34	33	33	33	38	44	33	48	53	52	48
19/F	82.5	32	32	32	31	31	32	32	32	47	32	32	33	33	33	33	34	34	34	60	56	59	59	53	34	34	34	34	33	33	38	44	33	48	53	52	48
20/F	85.6	32	32	32	31	31	31	32	32	47	32	32	33	33	33	33	34	34	34	60	56	59	59	53	34	34	35	34	33	33	38	44	33	48	53	52	48
21/F	88.7	32	32	32	32	32	32	32	32	47	33	32	34	34	34	33	34	34	34	60	56	60	59	53	35	35	35	34	33	33	38	44	33	48	53	52	48
22/F	91.8	34	34	34	33	34	34	34	34	48	35	34	36	36	36	35	36	36	36	60	56	60	59	53	36	36	37	36	35	35	39	44	35	49	53	52	48
23/F	94.9	37	37	37	36	36	37	37	36	48	37	37	39	39	39	38	39	39	39	60	56	60	59	53	39	40	39	39	38	38	40	44	38	49	53	52	49
24/F	98	41	42	42	41	41	41	41	41	49	42	42	43	44	44	43	44	44	43	60	56	60	60	53	44	45	44	43	43	43	44	46	42	49	53	53	49
Max Noise Level, dB(A)		**41**	**42**	**42**	**41**	**41**	**41**	**41**	**41**	**49**	**42**	**42**	**43**	**44**	**44**	**43**	**44**	**44**	**43**	**60**	**59**	**60**	**60**	**54**	**44**	**45**	**44**	**43**	**43**	**43**	**44**	**46**	**42**	**49**	**53**	**53**	**49**
No. of Exceedance Per NSR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	

/ Non-residential unit

*** The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.**

Result Summary (Detail)- Base Case - Tower 8

		TOWER 8																																										
GBP Floor	*mPD, m	T8-01	T8-02	T8-03	T8-04	T8-05	T8-06	T8-07	T8-08	T8-09	T8-10	T8-11	T8-12	T8-13	T8-14	T8-15	T8-16	T8-17	T8-18	T8-19	T8-20	T8-21	T8-22	T8-23	T8-24	T8-25	T8-26	T8-27	T8-28	T8-29	T8-30	T8-31	T8-32	T8-33	T8-34	T8-35	T8-36	T8-37	T8-38	T8-39	T8-40	T8-41	T8-42	T8-43	T8-44
1/F	26.7	55	45	40	54	51	45	42	42	42	42	28	42	42	28	28	42	42	29	29	42	44	31	31	49	55	31	31	54	52	30	30	49	47	46	28	28	42	28	28	44	44	27	27	44
2/F	29.8	55	45	41	54	51	45	42	42	42	42	28	42	42	28	28	42	42	29	29	42	45	31	31	49	55	31	31	54	52	30	30	49	47	46	28	28	44	28	28	45	45	27	27	45
3/F	32.9	55	45	41	54	51	45	42	42	42	42	28	42	42	28	28	42	42	29	29	43	45	31	31	49	55	31	31	54	52	30	30	49	47	46	28	28	44	28	28	45	45	27	27	45
4/F	36	55	45	41	54	51	45	42	42	43	43	28	43	43	28	28	43	43	29	29	43	45	31	31	49	55	31	31	54	52	30	30	49	47	46	28	28	44	28	28	45	45	27	27	45
5/F	39.1	55	45	42	54	51	45	43	43	43	43	28	43	43	28	28	43	43	29	29	43	46	31	31	49	55	31	31	54	52	30	30	49	47	46	28	28	44	28	28	45	45	27	27	45
6/F	42.2	55	45	42	54	52	46	43	43	43	43	28	43	43	28	28	43	44	29	29	44	46	31	31	50	55	31	31	54	52	30	30	49	47	46	28	28	44	28	28	45	45	27	27	45
7/F	45.3	55	45	42	54	52	46	43	43	44	44	28	44	44	28	28	44	44	29	29	44	46	31	31	50	55	31	31	54	52	30	30	49	47	46	28	28	44	28	28	44	44	27	27	45
8/F	48.4	55	46	43	54	52	46	44	44	44	44	28	44	44	28	28	44	44	29	29	44	47	31	31	50	55	31	31	54	52	30	30	49	47	46	27	27	44	28	28	44	44	27	27	44
9/F	51.5	55	46	43	54	52	46	44	44	44	44	28	44	45	28	28	45	45	28	28	45	47	31	31	50	55	31	31	54	52	30	30	49	47	46	27	27	43	28	28	44	44	27	27	44
10/F	54.6	55	46	44	54	52	46	45	45	45	45	28	45	45	28	28	45	45	28	28	45	48	31	31	50	55	31	31	54	52	30	30	49	47	46	27	27	43	27	27	44	44	27	27	44
11/F	57.7	55	46	44	54	52	47	45	45	45	45	28	46	46	28	28	46	46	28	28	46	48	31	31	51	55	31	31	54	52	30	30	49	47	46	27	27	43	27	27	44	44	27	27	44
12/F	60.8	55	47	45	54	52	47	46	46	46	46	28	46	46	28	28	46	46	28	28	47	49	31	31	51	55	31	31	54	52	30	30	49	47	46	27	27	43	27	27	44	44	27	27	44
13/F	63.9	55	47	45	54	52	47	46	46	46	46	28	47	47	28	28	47	47	28	28	47	49	31	31	51	55	31	31	54	52	30	30	49	47	46	27	27	43	27	27	44	44	27	27	44
14/F	67	55	47	46	54	52	48	47	47	47	47	27	47	47	28	28	47	47	28	28	48	50	31	31	51	55	31	31	54	52	30	30	49	47	46	27	27	43	27	27	43	43	27	27	44
15/F	70.1	55	48	46	54	52	48	47	47	47	47	27	47	48	28	28	48	48	28	28	48	50	31	31	52	55	31	31	54	52	30	30	49	46	46	27	27	42	27	27	43	43	27	27	44
16/F	73.2	55	48	47	54	52	49	48	48	48	48	27	48	48	28	28	48	48	28	28	49	51	31	31	52	55	31	31	55	53	30	29	49	46	46	27	27	42	27	27	43	43	27	27	43
17/F	76.3	55	48	47	54	52	49	48	48	48	48	27	49	49	28	28	49	49	28	28	49	51	31	31	53	56	31	31	55	53	29	29	49	46	46	27	27	42	27	27	43	43	27	27	43
18/F	79.4	55	49	48	54	52	49	48	49	49	49	27	49	49	28	28	49	49	28	28	50	52	31	31	53	56	31	31	55	53	29	29	49	46	46	27	27	42	27	27	43	43	26	26	43
19/F	82.5	55	49	48	54	53	50	49	49	49	49	27	49	50	28	28	50	50	28	28	50	52	31	31	53	56	31	31	55	53	29	29	49	46	45	27	27	42	27	27	43	43	26	26	43
20/F	85.6	55	49	49	54	53	50	49	49	50	50	27	50	50	28	28	50	50	28	28	50	52	30	31	53	56	31	31	55	53	29	29	49	46	45	27	27	42	27	27	43	43	26	26	43
21/F	88.7	55	50	49	54	53	50	50	50	50	50	27	50	50	28	28	50	50	28	28	50	53	31	31	54	56	31	32	55	54	30	30	50	46	45	27	27	42	27	27	43	43	27	27	43
22/F	91.8	55	50	49	54	53	50	50	50	50	50	29	50	50	30	29	50	50	30	30	51	53	33	33	54	56	33	33	55	54	31	32	50	46	45	29	29	42	29	29	43	43	28	29	43
23/F	94.9	55	50	50	54	53	51	50	50	50	50	32	50	51	33	32	50	51	33	32	51	53	36	36	54	56	36	36	55	54	34	34	50	46	46	32	31	42	32	32	43	43	31	31	43
24/F	98	55	50	50	54	53	51	50	50	50	50	37	51	51	38	37	51	51	38	37	51	53	41	40	54	56	40	40	56	54	39	39	51	47	46	36	36	43	37	37	43	43	36	36	43
Max Noise Level, dB(A)		**55**	**50**	**50**	**54**	**53**	**51**	**50**	**50**	**50**	**50**	**37**	**51**	**51**	**38**	**37**	**51**	**51**	**38**	**37**	**51**	**53**	**41**	**40**	**54**	**56**	**40**	**40**	**56**	**54**	**39**	**39**	**51**	**47**	**46**	**36**	**36**	**44**	**37**	**37**	**45**	**45**	**36**	**36**	**45**
No. of Exceedance Per NSR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	

/ Non-residential unit

*** The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.**

Land Sharing Pilot Scheme – Application for Proposed Subsidized Housing and Private Housing, Tung Shing Lei, Yuen Long, N.T.
Results of Road Traffic Noise Impact Assessment (Base Case Scenario) (Exceedance Summary)

Result Summary (Detail) - Base Case - GIC

		GIC																	
GBP Floor	*mPD, m	G1-01	G1-02	G1-03	G1-04	G1-05	G1-06	G2-01	G2-02	G2-03	G2-04	G2-05	G2-06	G2-07	G2-08	G2-09	G2-10	G2-11	G2-12
G/F	7.7	38	38	38	39	36	37	54	54	54	41	54	34	34	36	38	39	42	45
1/F	14.2	/	/	/	/	/	/	55	55	54	49	54	48	46	46	45	45	49	52
Max Noise Level, dB(A)		**38**	**38**	**38**	**39**	**36**	**37**	**55**	**55**	**54**	**49**	**54**	**48**	**46**	**46**	**45**	**45**	**49**	**52**
No. of Exceedance Per NSR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	

/ Non-residential unit

*** The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.**

Appendix F
Revised Drainage Impact Assessment

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D 115, Tung Shing Lei Yuen Long

Drainage Impact Assessment

April 2024

Report Reference: 220014.01

AECOM

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A Master Layout Plan
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1 INTRODUCTION

1.1 Background

1.1.1 AECOM Asia Company Limited was commissioned to act as the engineering consultants for the preparation of Drainage Impact Assessment (DIA) report for the proposed public and private housing developments under Land Sharing Pilot Scheme (hereafter referred to as Proposed Development) in Tung Shing Lei.

1.1.2 The location of the Site is shown in **Figure 1.1.**



Figure 1.1 – Location plan

1.2 Objective of the Assessment

1.2.1 This DIA is prepared based on available information and requirements under Drainage Services Department (DSD) Stormwater Drainage Manual, Advice Note No. 1 – Application to Drainage Impact Assessment Process to Private Sector Projects. In order to identify, assess and mitigate potential adverse drainage impacts arising from the proposed development at the Site.

1.3 Structure of the Report

1.3.1 This DIA Report comprises the following sections after this introduction:

1.3.2 **Chapter 2** discusses the development proposal and the existing drainage characteristics in the vicinity of the Site.

1.3.3 **Chapter 3** presents the approach and criteria in carrying out this DIA.

1.3.4 **Chapter 4** examines the potential drainage impact arising from the proposed works.

1.3.5 **Chapter 5** provides consideration on operation and maintenance of the drainage system upon completion of the works.

1.3.6 **Chapter 6** summaries the conclusions and recommendation of this DIA Report.

2 DEVELOPMENT PROPOSAL AND EXISTING DRAINAGE CHARACTERISTICS

2.1 Location of the Project

2.1.1 The Site situates at the North of Ho Chau Road and at the East of N-49 Channel near Yuen Long Bypass Floodway. The master layout plan and the surroundings of the Site are shown in ***Appendix A***.

2.1.2 The existing access road and Ho Chau Road will be widened to provide access to the Site, which does not form part of the Proposed Development.

2.1.3 In this DIA, the drainage impact of the development site and the widened access road will be reviewed. To identify, assess and mitigate potential adverse drainage impacts arising from the proposed development at the Site. Locations of major drainage structures & river streams are shown in ***Appendix B***.

2.2 Existing Drainage Network

2.2.1 The total catchment area of the Site including the public housing, private housing, access road and amenity area is 5.84ha approximately. The Site is further delineated into varies sub-catchments (e.g. CAT01 to CAT15 except CAT11). From the available record, the surface runoff from the catchments uphill of the Site flow to the west by gravity and merged with the runoff from the Site. The runoff from these catchments is discharged to the N-49 Channel. The existing Sub-catchment plan of Site and the adjacent areas are shown in ***Appendix C***.

2.2.2 Catchment CAT01 to CAT15 comprised the uphill located to the North of the Site, the runoff from these catchments is discharged to the existing N-49 channel by gravity.

2.2.3 Catchment NSW_191_5B & 5C and YL_1564 comprised the areas located in the north and west of the Site, the runoff from these catchments is discharged to the existing N-49 Channel by gravity.

2.2.4 Catchment NSW_191_5A comprised the areas located in the south of the Site and the Ho Chau Road, the runoff from this catchment is discharged to the Yuen Long Bypass Floodway by gravity.

2.2.5 According to the aerial views of the orthomap in GeoInfo Map, the existing site is in rural area and almost vegetated. Existing site of development generally comprise fallow grassland and patches or vegetation. The site area were paddy fields in the past.

3 ASSESSMENT APPROACH

3.1 Technical Approach

3.1.1 InfoWorks ICM Version 2021.8.0 has been used as the modelling tool to assess the potential drainage impact arising from the Site and the proposed widened access road.

3.1.2 The design criteria and assumptions adopted for the assessment are in accordance with DSD's Stormwater Drainage Manual, Fifth Edition, 2018 (SDM) with Corrigendum No. 1/2022.

3.2 Rainfall-Runoff (RR) Model

3.2.1 The RR model describes how the rainfall transforms to direct surface runoff through the process of abstraction and routing over the catchment surface. For this performance assessment, SCS method and fixed method were adopted.

3.2.2 SCS method - The Curve Number (CN) values for the adjacent Approved Residential Development (A/YL-NSW/274) and the vicinity were collected by Land Drainage Division of DSD and would be adopted for the rural catchment in the hydraulic model. The CN values is shown in ***Appendices C and D***. Normal Antecedent moisture classes, i.e. (AMC) II condition will be adopted for the hydraulic model of this Study.

3.2.3 Fixed Method - Runoff Coefficient (C) Values for different land uses within the Site and the proposed widen road are made reference to Section 7.5.2 of the SDM and summarized in ***Table 3.1***:

Table 3.1 Runoff Types

Land Use	C Value
1. Unpaved e.g. natural grass surface	0.3
2. Paved e.g. Concrete	0.9

3.2.4 The adequacy of the drainage system is checked by using Manning or Colebrook-White equation according to Table 12 of the SDM:

$$\bar{V} = \frac{R^{1/6}}{n}\sqrt{RS_f}$$

$$\bar{V} = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R} + \frac{1.255v}{R\sqrt{32gRS_f}}\right]$$

3.2.5 The adopted roughness values are presented in ***Table 3.2***.

Table 3.2 Design Roughness Values

Classification	Roughness Coefficient	Remarks
PVC Lined Concrete Pipe	Ks = 0.3mm	Slimed
Concrete Pipe, Concrete Road Surface (Overland Flow)	Ks = 3mm	Slimed
Natural-stream channel, clean	N = 0.030	Fair
Concrete-lined channels	N = 0.016	Fair

3.2.6 Siltation

Silt depth in the stormwater drainage system is considered in the assessment. As a conservative approach, 10% (of flow area) sedimentation is adopted for the drainage system.

3.3 Assessment Criteria

3.3.1 The design criteria for this DIA are based on standards as set out in Table 10 of the SDM. The recommended design return periods based on flood levels for the various drainage systems depending on the land use, as shown below:

Table 3.3 Recommended Design Return Periods

Description	Design Return Periods
Intensively Used Agricultural Land	2 – 5 Years
Village Drainage including internal Drainage System under a polder Scheme	10 Years
Main Rural Catchment Drainage Channels	50 Years
Urban Drainage Trunk System	200 Years
Urban Drainage Branch System	50 Years

3.3.2 According to the SDM, 200-year design return period is recommended for the design of Urban Drainage Trunk System. Hence, the impact on Kam Tin River, Yuen Long Bypass Floodway and N-49 Channel for 200-year design return period will be assessed and the proposed drainage system within the site and along Ho Chau Road will be designed according to 50-year design return period.

3.3.3 Considering the Development is a residential development which is likely for occupation until end of 21st Century, climate change effect up to end of 21st Century

and design allowance are adopted. Hence, the rainfall increase percentage of 28.1% as stipulated in Table 28 of SDM is adopted in the calculation of the peak flow.

3.3.4 The boundary conditions have been extracted from the InfoWorks ICM model provided by Land Drainage Division of DSD for the development of the model. Based on the acquired information, the following boundary conditions are adopted according to "Existing Network + Proposed Land use (EP)" scenario, plus the further increase of climate change until end of 21st Century according to DSD corrigendum No. 1/2022. Details could be referred to Appendix E.

Table 3.4 Boundary Condition

Scenario	**823015835036 (Kam Tin River) Max Level**	**822342835388 (N-49) Max Level**	**SGJ1013281 (Kam Tin River) Max Flow**	**822527834420 (N-49) Max Flow**
50yr Case A	5.211 mPD	4.841 mPD	831.548 m^3/s	136.014 m^3/s
50yr Case B	5.392 mPD	5.204 mPD	706.955 m^3/s	116.552 m^3/s
200yr Case A	5.375 mPD	4.963 mPD	999.903 m^3/s	148.036 m^3/s
200yr Case B	6.148 mPD	6.114 mPD	755.761 m^3/s	109.893 m^3/s

4 POTENTIAL DRAINAGE IMPACT

4.1 Changes in Drainage Characteristics

4.1.1 The Site is proposed to be built at level +6.5mPD after site formation. A widened road is proposed at the Southern side of the Site to connect to the widened Ho Chau Road. With such development, there will be an increase in paved areas and the overland flow path for the sub-catchment would be affected. Therefore, increase in surface runoff would be expected. The proposed private housing development should have minimum 30% greenery area in accordance to Section 18 APP-152 (Practical Notes for AP/RSE/RGE), Buildings Department. Hence, it is assumed 70% area would be paved for the residential use and the remaining 30% would be unpaved area. On the other hand, it is assumed 100% area would be paved in the proposed public housing development site.

4.2 Drainage Impact

4.2.1 Upon completion of the Proposed Development, the water from the catchment at the Public Housing Site (CAT01A to CAT01E) and at the Private Housing Site (CAT02A to CAT02C) will be collected within the Site by two separate drainage system (1650mm PVC lined concrete drain). The runoff is further converted to the south via the proposed twin 1650mm PVC lined concrete drain underneath the access road. The runoff from the adjacent Approved Residential Development (A/YL-NSW/274) (CAT16A to CAT16C) would be collected by internal drainage system (e.g. 1650mm PVC lined concrete drain). The runoff would be collected by twin 2100mm PVC lined concrete drain from proposed manhole SMH08 and further convert to the Bypass Floodway. The overland flow path of CAT11 toward N-49 Channel was blocked, therefore a new u-channel with catchpit (e.g. CP-07A) is proposed to convert the flow to N-49 Channel. On the other hand, to minimize the drainage impact for the runoff on catchment NSW_191_5E, the existing discharge arrangement of catchment NSW_191_5E would be maintained by a new drainage system underneath the new access road. The catchment plans after the proposed Development are attached in ***Appendix D***.

4.2.2 The maximum water level and flood depth are summarized in ***Appendix E***. The proposed drainage scheme is shown in ***Appendix F.***

4.2.3 According to the simulation result under 200-yr flood return period. It is observed that the maximum water level in Kam Tin River remains unchanged. The maximum water level in N-49 channel is decreased. From the current hydraulic model results, it is observed that the maximum water level in Yuen Long Bypass Floodway (YLBF) node 822527834420 (adjacent to Yuen Long Highway) would be only increased from 6.206mPD to 6.207mPD with 0.001m under 200-yr flood return period. Therefore, it is expected the impact at further upstream of YLBF (e.g. between Yuen Long Highway and Castle Peak Road) which further away from the discharge point of the proposed twin 2100mm drain would be <0.001m, hence it is concluded the risk of flooding in upstream area would not be happened.

4.2.4 According to the simulation result under 50-yr flood return period. It is noted that the maximum water levels at SMH08A and SMH09 are controlled by the high-water level of the boundary condition. The maximum water levels in the proposed drainage system are significantly decreased with 0.443m to 0.452m when comparing with the existing drainage system, (e.g. SMH08A vs. SLH1004802 and SMH09 vs. SMH4048627).

4.2.5 Based on the above, it is considered that the drainage impact is insignificant after both the adjacent Approved Residential Development (A/YL-NSW/274) and Proposed Development are completed.

5 OPERATION and MAINTENANCE

5.1 Detailed Design

5.1.1 Operation and maintenance requirements should be considered in the detailed design stage in accordance with the requirement specified in the SDM. These features include manholes, and pipes, etc.

5.2 Maintenance Responsibility

5.2.1 Proposed stormwater conveyance system in terms of gravity pipes below government land are proposed to be handed over to DSD for maintenance.

5.3 Construction Consideration

5.3.1 The contractor is responsible for temporary drainage arrangement during construction and to ensure that the existing drainage system within and adjacent to the Site would not be affected at the construction stage.

5.3.2 Should any temporary blockage or diversion of the flow path be necessary for construction, the work must be carried out within the dry season(s) and the Contractor must have appropriate mitigation measures in place. Examples of appropriate mitigation measures include providing sandbags or similar to increase the in-channel capacity and to maintain flow through a given channel section through over-pumping.

5.3.3 Flow diversion should be designed in accordance with standards and recommendations established in the Drainage Service Department (DSD) Stormwater Drainage Manual (SDM), DSD Technical Circular No. 1/2017 - Temporary Flow Diversions and Temporary Works Affecting Capacity in Stormwater Drainage System, and DSD Practice Note No. 1/2017 - Design Rainfall Depth for Temporary Works within the Dry Season.

5.3.4 Proper measures shall be taken to maintain the existing drainage characteristics of the catchment areas and to minimize drainage impacts associated with the construction works. The principal drainage impacts which are associated with construction of the works have been identified as follows:

- Erosion of ground materials;
- Sediment transportation to existing downstream drainage system; and
- Obstruction to drainage systems.

5.3.5 Excavated slopes for the Site shall be protected to prevent any loose material being washed out during rainfall. Temporary protection may be in the form of placing layers of granular material and rock fill material or hard surface cover on the sloping faces of channel or tarpaulin covering.

5.3.6 Perimeter U-channels should be provided at crest of any temporary excavated slope to intercept the runoff and hence avoiding erosion to the surfaces of proposed temporary cutting.

5.3.7 Regular inspection shall be carried out to ensure integrity of the works. These inspections shall cover works under construction as well as recently completed areas.

5.3.8 No excavated materials should be left on site. If it is not possible to transport away the excavated material within the same day, the material should be covered by tarpaulin/impervious sheets. Measures shall be taken to ensure that runoff from the Site is managed so that silts and other pollution are properly intercepted.

5.3.9 In the event of extreme weather including Landslip Warning, issuance of Amber/Red/Black Rainstorm Warning, Special Flood Announcement, Typhoon Signal No. 3 or above and the like, site inspections and surveys shall be carried out by the contractor's emergency team as deemed practical and safe before and after the events to ascertain if there has been any siltation or erosion. If it is determined that any unacceptable siltation or erosion has occurred, the contractor shall rectify it immediately.

6 CONCLUSIONS AND RECOMMENDATION

6.1 Conclusions

6.1.1 This DIA is prepared to assess the potential drainage impact as a result of the proposed new drainage works for the proposed development.

6.1.2 The maximum water level at the downstream existing drainage system would be increased by 0.001m after the proposed development mainly by the increased of runoff due to changes from unpaved area to paved area.

6.1.3 Based on the hydraulic assessment, there is no adverse drainage impact to the surrounding drainage system arising from the proposed residential development at Site with proposed drainage works.

6.2 Recommendation

6.2.1 Suitable internal drainage system would be further considered during the detailed design stage to collect the drainage flow within the Site to the public drainage system.

6.2.2 The drainage facilities proposed within the Site to convey the surface runoff outside site and discharged to the terminal manholes at the proposed widen road are recommended to be undertaken by the proposed development. The stormwater drains to be laid beneath the proposed widen road which connect to the existing DSD drainage channel will be handed back to the Drainage Services Department upon completion of the drainage works.

6.2.3 The proposed private development should have minimum 30% greenery area which tally with the blue-green concept as stipulated in Section 3.2.2 of the Stormwater Drainage Manual (2018).

Appendix A

Master Layout Plan



Site Demarcation Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

ARCHI+
ARCHIPLUS INTERNATIONAL LIMITED



Indicative Block Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

ARCHI+
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Indicative Ground Floor Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

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LEGEND :

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION
- PROVISION OF PUBLIC ACCESS ROAD AND INFRASTRUCTURE TO BE MANAGED AND MAINTAINED BY GOVERNMENT DEPARTMENTS

GIC +13.00
T8
T7
CARPARK & E&M +13.00
T6
T6
RAMP
CARPARK & E&M +13.00
T5
CARPARK & E&M +13.00
+13.00
+13.00
T1
T2
+14.00
T3
KINDER-GARTEN +11.50
VOID ABOVE PTT
YUEN LONG HIGHWAY
元朗公路
TSING LONG HIGHWAY
青朗公路

N

Indicative First Floor Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 2500 (A3)

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LEGEND :

- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION



N

Indicative Basement Floor Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 2500 (A3)

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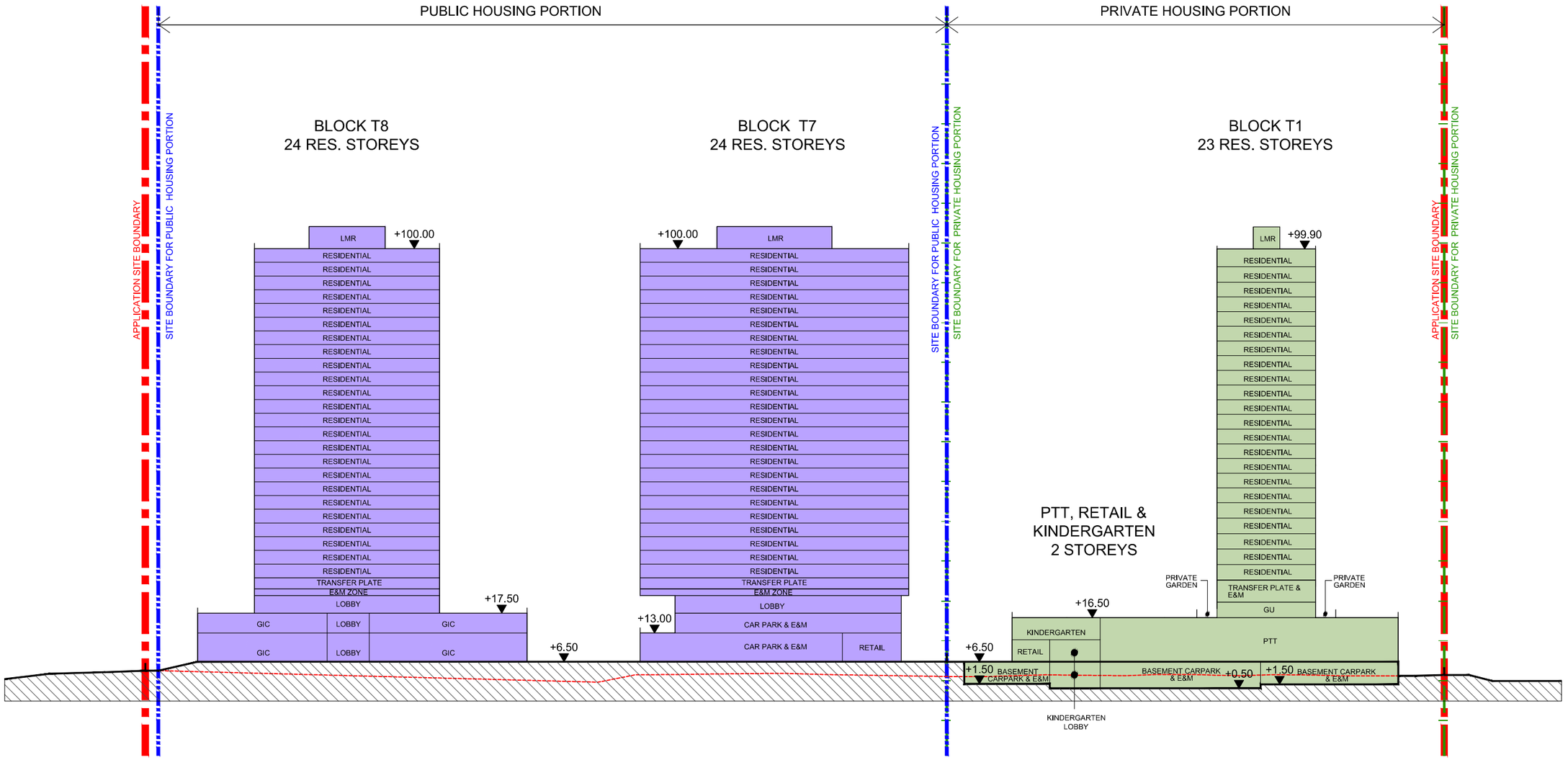
LEGEND

------ EXISTING SITE LEVEL



SECTION S1

Indicative Section S1

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 1000 (A3)

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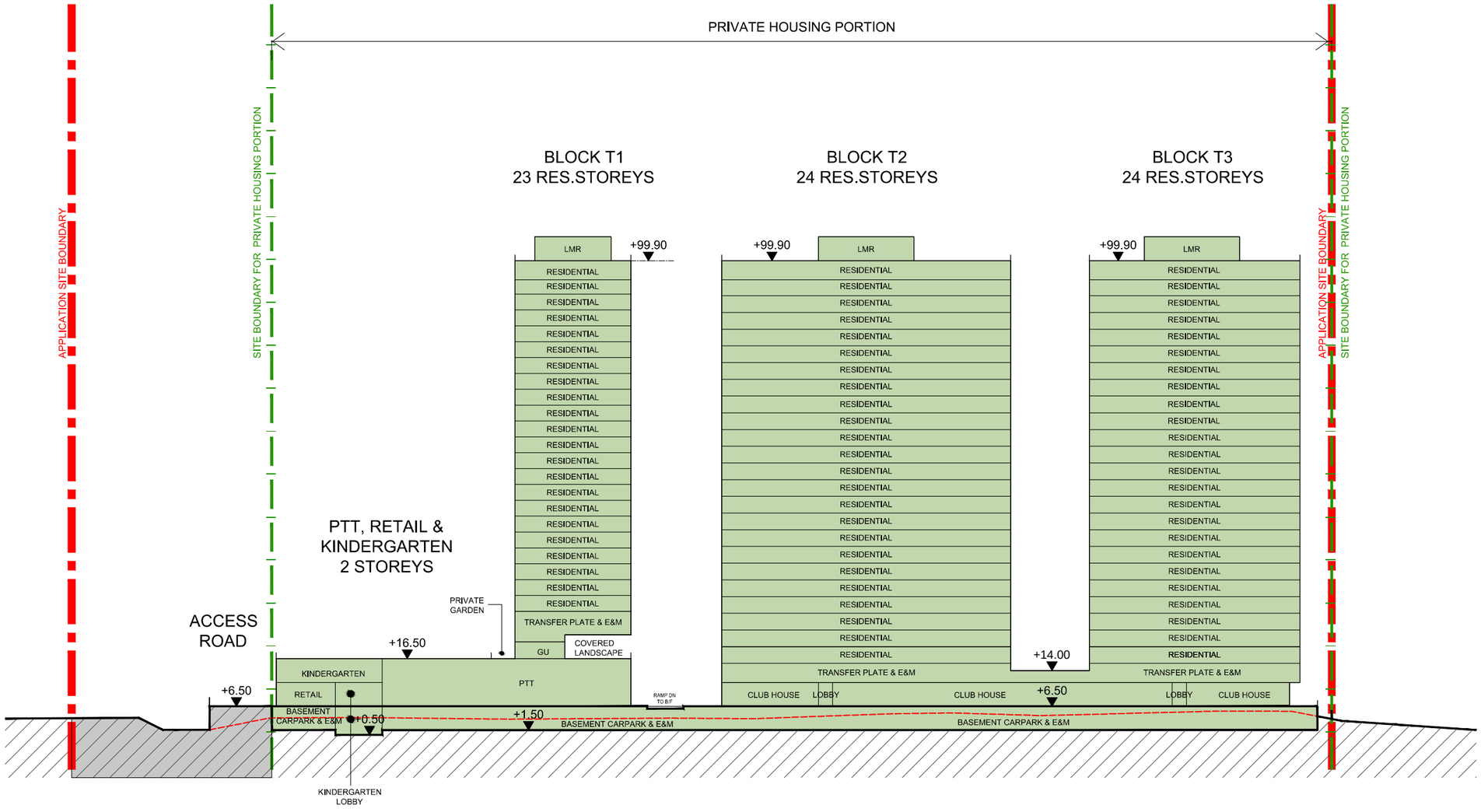
LEGEND

EXISTING SITE LEVEL



SECTION S2

Indicative Section S2

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 1000 (A3)

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Appendix B

Locations of Major Drainage Structures & River Streams

N-49 Channel

Kam Tin River

Yuen Long Bypass Floodway

Legend

- Phase 1 Development
- Phase 2 Public Development
- Phase 2 Private Development
- Public Access and Amenity
- Widen Road

Title
Locations of Major Drainage Structures & River Streams

Appendix
B

0 20 40 80 Meters

Appendix C

Existing Sub-catchment Plan

NSW_191_5C
11.47ha

N-49 Channel

Kam Tin River

CAT04
0.01ha

CAT05
0.01ha

CAT12
0.15ha

CAT03
0.02ha

CAT11
0.84ha

CAT06
0.16ha

CAT07
0.03ha

CAT01
1.98ha

CAT13
0.3ha

CAT08
0.21ha

CAT02
1.97ha

NSW_191_5B
15.79ha

CAT09
0.1ha

NSW_191_5A
5.08ha

CAT14
0.35ha

CAT15
0.3ha

CAT10
0.24ha

Yuen Long Bypass Floodway

YL_1564
5.99ha

Legend

Subcatchment

LandUse

CN = 72.82

CN = 76.45

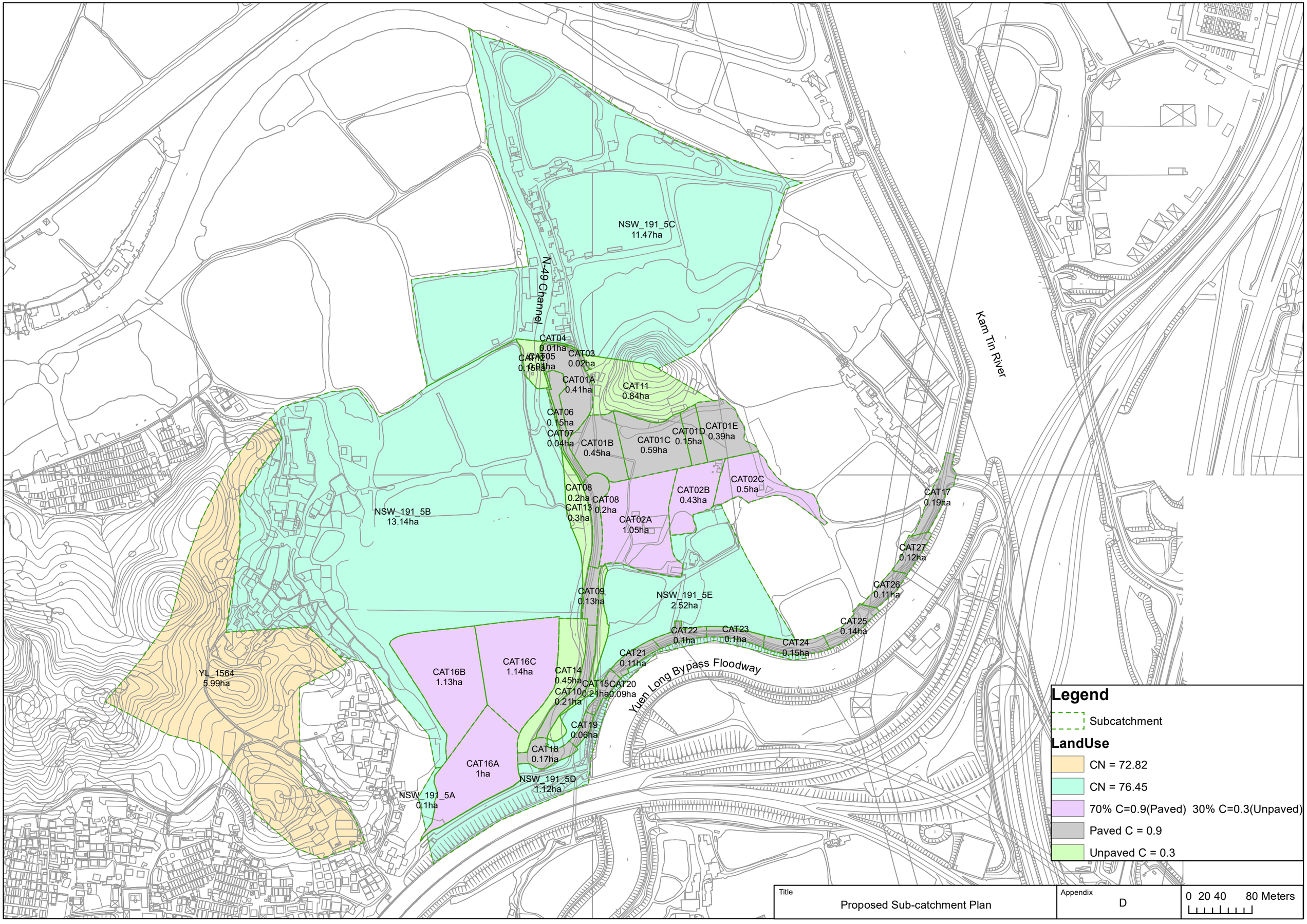
Unpaved C = 0.3

Title	Appendix
Existing Sub-catchment Plan	C

0 20 40 80 Meters

Appendix D

Proposed Sub-catchment Plan


NSW_191_5C
11.47ha
N-49 Channel
Kam Tin River
CAT04
0.01ha
CAT05
0.01ha
CAT12
0.15ha
CAT03
0.02ha
CAT01A
0.41ha
CAT11
0.84ha
CAT06
0.15ha
CAT07
0.04ha
CAT01B
0.45ha
CAT01C
0.59ha
CAT01D
0.15ha
CAT01E
0.39ha
CAT08
0.2ha
CAT13
0.3ha
CAT08
0.2ha
CAT02A
1.05ha
CAT02B
0.43ha
CAT02C
0.5ha
CAT17
0.19ha
NSW_191_5B
13.14ha
CAT27
0.12ha
CAT26
0.11ha
CAT09
0.13ha
NSW_191_5E
2.52ha
CAT22
0.1ha
CAT23
0.1ha
CAT24
0.15ha
CAT25
0.14ha
CAT21
0.11ha
YL_1564
5.99ha
CAT16B
1.13ha
CAT16C
1.14ha
CAT14
0.45ha
CAT10
0.21ha
CAT15
0.21ha
CAT20
0.09ha
Yuen Long Bypass Floodway
CAT19
0.06ha
CAT18
0.17ha
CAT16A
1ha
NSW_191_5D
1.12ha
NSW_191_5A
0.1ha
Legend
Subcatchment
LandUse
CN = 72.82
CN = 76.45
70% C=0.9(Paved) 30% C=0.3(Unpaved)
Paved C = 0.9
Unpaved C = 0.3
Title
Proposed Sub-catchment Plan
Appendix
D
0 20 40 80 Meters

Appendix E

Result of Hydraulic Model

Hydraulic Performance

Return Period
200yr Case A - With 200yr Rain (CC28.1%) + 10 yr tide CC
200yr Case B - With 10yr Rain (CC28.1%) + 200 yr tide CC
50yr Case A - With 50yr Rain (CC28.1%) + 10 yr tide CC
50yr Case B - With 10yr Rain (CC28.1%) + 50 yr tide CC
Downstream Boundary
Node: 823015835036 Kam Tin River Downstream
Node: 822342835388 N-49 Downstream
Inflow Boundary
Conduit: 822941834692.1 Bypass Floodway
Conduit: SGJ1013281.1 Kam Tin River Upstream
Roughness of the UPVC lined concrete pipe are assumed as 0.3mm (Ks Value)
Silt 10% of the flow area is allowed in model
DSD Corrigendum No. 1/2022 for CC is adopted

Table 1 - Case 200A,B for Trunk Drain

		Existing				Phase 1 & 2 Trial 4 - 2 x 2100mm drain					
Node	Ground Level (mPD)	200yr Case A Max. Level (mPD)	200yr Case B Max. Level (mPD)	Max 200-yr Level (mPD)	Flood Depth (m)	200yr Case A Max. Level (mPD)	200yr Case B Max. Level (mPD)	Max 200-yr Level (mPD)	Flood Depth (m)	Different with Extg (m)	Remark
SGJ1013281	5.408	5.414	6.169	6.169	0.761	5.416	6.169	6.169	0.761	0	KT River
823035834982	5.113	5.391	6.146	6.146	1.033	5.37	6.146	6.146	1.033	0	
823015835036	5.194	5.392	6.148	6.148	0.954	5.375	6.148	6.148	0.954	0	
822527834420	5.82	5.477	6.206	6.206	0.386	5.486	6.207	6.207	0.387	0.001	Bypass Floodway
822542834506	5.37	5.473	6.205	6.205	0.835	5.483	6.206	6.206	0.836	0.001	
822557834527	5.366	5.472	6.204	6.204	0.838	5.481	6.205	6.205	0.839	0.001	
822615834565	5.354	5.469	6.203	6.203	0.849	5.478	6.204	6.204	0.85	0.001	
822667834568	5.345	5.465	6.202	6.202	0.857	5.475	6.202	6.202	0.857	0	
822765834544	5.327	5.462	6.2	6.2	0.873	5.471	6.201	6.201	0.874	0.001	
822838834568	5.301	5.459	6.199	6.199	0.898	5.47	6.2	6.2	0.899	0.001	
822881834610	5.268	5.457	6.198	6.198	0.93	5.467	6.199	6.199	0.931	0.001	
822916834655	5.238	5.455	6.198	6.198	0.96	5.466	6.199	6.199	0.961	0.001	
822924834669	5.207	5.435	6.184	6.184	0.977	5.439	6.185	6.185	0.978	0.001	
822941834692	5.173	5.434	6.184	6.184	1.011	5.438	6.185	6.185	1.012	0.001	
822976834782	5.08	5.431	6.183	6.183	1.103	5.435	6.183	6.183	1.103	0	
822981834797	4.98	5.407	6.16	6.16	1.18	5.402	6.161	6.161	1.181	0.001	
822983834821	4.676	5.407	6.16	6.16	1.484	5.402	6.16	6.16	1.484	0	
N49-1	2.505	5.336	6.779	6.779	4.274	4.963	6.779	6.779	4.274	0	N-49
N49-2	2.559	5.33	6.754	6.754	4.195	4.963	6.754	6.754	4.195	0	
N49-3	2.68	5.271	6.52	6.52	3.84	4.963	6.52	6.52	3.84	0	
N49-4	2.732	5.216	6.301	6.301	3.569	4.963	6.301	6.301	3.569	0	
822342835388	-0.7	5.204	6.114	6.114	6.814	4.963	6.114	6.114	6.814	0	

It is noted that the impact in Bypass Flood Way is slightly increased by 1mm only. No adverse impact would be in KT River and N-49 Channel

Table 2 - Case 50A,B for Branch Drain

					Phase 1 & 2 Trial 4 - 2 x 2100mm drain						
Node	Ground Level (mPD)	50yr Case A Max. Level (mPD)	50yr Case B Max. Level (mPD)	Max 50-yr Level (mPD)	50yr Case A Max. Level (mPD)	50yr Case B Max. Level (mPD)	Max 50-yr Level (mPD)	Flood Depth (m)	Different with Extg (m)		Remark
SMH03	6.5				5.349	5.545	5.545	-0.955			
SMH04	6.5				5.345	5.512	5.512	-0.988			
SMH05	6.1				5.341	5.496	5.496	-0.604			
SMH06	5.8				5.337	5.494	5.494	-0.306			
SMH06A	6.4				5.333	5.49	5.49	-0.91			
SMH07	7				5.33	5.488	5.488	-1.512			
SMH07A	6.65				5.326	5.485	5.485	-1.165			
SMH08	6.1				5.323	5.483	5.483	-0.617			
SMH08A	5.1	5.923	5.879	5.923	5.319	5.48	5.48	0.38	-0.443		Extg refer to node SLH1004802
SMH08B	5.15				5.318	5.479	5.479	0.329			
SMH09	5.1	5.929	5.886	5.929	5.316	5.477	5.477	0.377	-0.452		Extg refer to node SMH4048627
SMH_T1	6.5				5.378	5.573	5.573	-0.927			
SMH_T2	6.5				5.358	5.555	5.555	-0.945			
SMH_T3	7.5				5.333	5.49	5.49	-2.01			

It is noted that the maximum water level is controlled by the high water level of the boundary condition
However, the maximum water levels in the proposed drainage system are similar to the maximum water level in Bypass Flood Way.

Assumption of Boundaries

	10-yr		50-yr		200-yr		Remarks
Tide adopted from DMP Review Model is	3.74	mPD	4.32	mPD	5	mPD	(Tsim Bei Tsui)
According to DSD Corridendum No. 1/2022	3.52	mPD	4.09	mPD	4.78	mPD	(Tsim Bei Tsui)
	0.47	m	0.47	mPD	0.47	m	Table 29 Mean Sea Level Rise due to CC
	0.15	m	0.2	m	0.26	m	Table 30b Storm Surge up to End 21st Century
	0.23	m	0.25	m	0.27	m	Table 31 Design Allowance in End 21st Century
with End 21st CC	4.37	mPD	5.01	mPD	5.78	mPD	
Different	**0.63**	**m**	**0.69**	**mPD**	**0.78**	**m**	Added into the Result of DMP Review Model

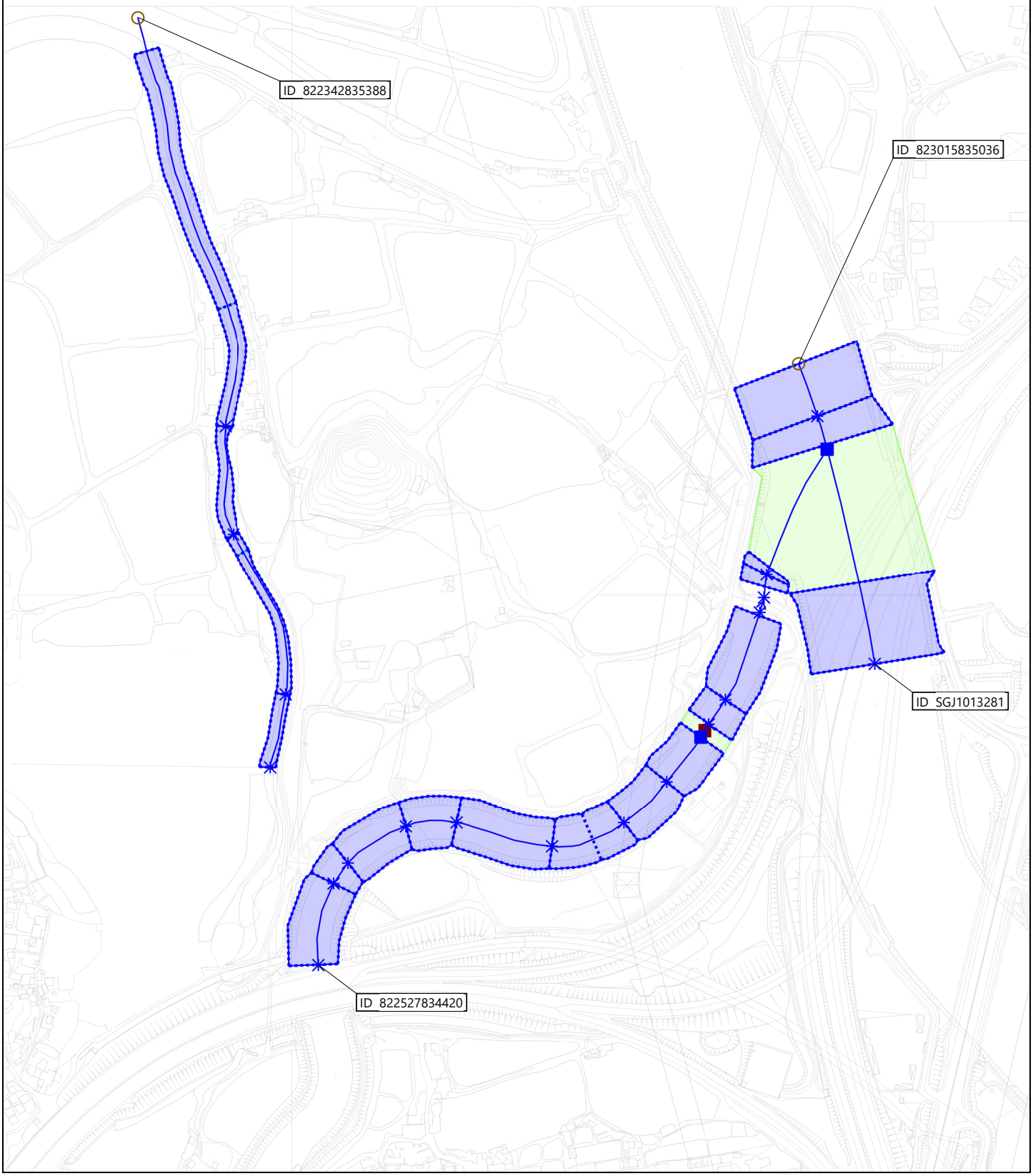
Boundary for Node: 823015835036 Kam Tin River Downstream & Node: 822342835388 N-49 Downstream

	200 yr Case A				200 yr Case B				50 yr Case A				50 yr Case B			
	from DMP Review Model		DSD Corr No. 1/222		from DMP Review Model		DSD Corr No. 1/222		from DMP Review Model		DSD Corr No. 1/222		from DMP Review Model		DSD Corr No. 1/222	
Time	823015835036	822342835388	823015835036	822342835388	823015835036	822342835388	823015835036	822342835388	823015835036	822342835388	823015835036	822342835388	823015835036	822342835388	823015835036	822342835388
Max level	**4.745**	**4.333**	**5.375**	**4.963**	**5.368**	**5.334**	**6.148**	**6.114**	**4.581**	**4.211**	**5.211**	**4.841**	**4.702**	**4.514**	**5.392**	**5.204**
00::00:00	3.74	3.74	4.37	4.37	4	4	4.78	4.78	3.74	3.74	4.37	4.37	4	4	4.69	4.69
00::00:01	3.74	3.742	4.37	4.372	4.009	4.896	4.789	5.676	3.74	3.741	4.37	4.371	4.001	4.209	4.691	4.899
00::00:02	3.74	3.746	4.37	4.376	4.018	4.991	4.798	5.771	3.74	3.745	4.37	4.375	4.003	4.294	4.693	4.984
00::00:03	3.74	3.75	4.37	4.38	4.063	4.957	4.843	5.737	3.74	3.748	4.37	4.378	4.015	4.351	4.705	5.041
00::00:04	3.741	3.751	4.371	4.381	4.169	4.93	4.949	5.71	3.741	3.749	4.371	4.379	4.03	4.357	4.72	5.047
00::00:05	3.742	3.751	4.372	4.381	4.309	4.92	5.089	5.7	3.742	3.749	4.372	4.379	4.041	4.292	4.731	4.982
00::00:06	3.744	3.749	4.374	4.379	4.444	4.905	5.224	5.685	3.743	3.747	4.373	4.377	4.067	4.255	4.757	4.945
00::00:07	3.745	3.745	4.375	4.375	4.53	4.882	5.31	5.662	3.744	3.744	4.374	4.374	4.084	4.245	4.774	4.935
00::00:08	3.746	3.743	4.376	4.373	4.711	4.869	5.491	5.649	3.744	3.742	4.374	4.372	4.125	4.257	4.815	4.947
00::00:09	3.748	3.744	4.378	4.374	4.803	4.861	5.583	5.641	3.745	3.743	4.375	4.373	4.181	4.266	4.871	4.956
00::00:10	3.75	3.745	4.38	4.375	4.866	4.862	5.646	5.642	3.747	3.744	4.377	4.374	4.239	4.266	4.929	4.956
00::00:11	3.753	3.747	4.383	4.377	4.906	4.881	5.686	5.661	3.749	3.745	4.379	4.375	4.264	4.266	4.954	4.956
00::00:12	3.756	3.748	4.386	4.378	4.94	4.897	5.72	5.677	3.751	3.746	4.381	4.376	4.284	4.27	4.974	4.96
00::00:13	3.758	3.75	4.388	4.38	4.945	4.9	5.725	5.68	3.753	3.747	4.383	4.377	4.301	4.274	4.991	4.964
00::00:14	3.761	3.753	4.391	4.383	4.963	4.913	5.743	5.693	3.755	3.749	4.385	4.379	4.313	4.276	5.003	4.966
00::00:15	3.764	3.756	4.394	4.386	4.988	4.916	5.768	5.696	3.757	3.751	4.387	4.381	4.317	4.275	5.007	4.965
00::00:16	3.768	3.759	4.398	4.389	5.005	4.911	5.785	5.691	3.76	3.754	4.39	4.384	4.321	4.274	5.011	4.964
00::00:17	3.773	3.763	4.403	4.393	5.02	4.911	5.8	5.691	3.763	3.757	4.393	4.387	4.324	4.274	5.014	4.964
00::00:18	3.777	3.767	4.407	4.397	5.033	4.916	5.813	5.696	3.766	3.76	4.396	4.39	4.326	4.275	5.016	4.965
00::00:19	3.781	3.771	4.411	4.401	5.035	4.919	5.815	5.699	3.769	3.763	4.399	4.393	4.331	4.278	5.021	4.968
00::00:20	3.786	3.775	4.416	4.405	5.036	4.923	5.816	5.703	3.773	3.766	4.403	4.396	4.338	4.28	5.028	4.97
00::00:21	3.792	3.779	4.422	4.409	5.033	4.932	5.813	5.712	3.777	3.769	4.407	4.399	4.343	4.282	5.033	4.972
00::00:22	3.798	3.783	4.428	4.413	5.027	4.94	5.807	5.72	3.781	3.772	4.411	4.402	4.349	4.286	5.039	4.976
00::00:23	3.804	3.787	4.434	4.417	5.035	4.948	5.815	5.728	3.786	3.775	4.416	4.405	4.352	4.291	5.042	4.981
00::00:24	3.809	3.79	4.439	4.42	5.037	4.955	5.817	5.735	3.79	3.778	4.42	4.408	4.352	4.295	5.042	4.985
00::00:25	3.815	3.793	4.445	4.423	5.044	4.962	5.824	5.742	3.794	3.78	4.424	4.41	4.355	4.298	5.045	4.988
00::00:26	3.82	3.796	4.45	4.426	5.054	4.968	5.834	5.748	3.798	3.782	4.428	4.412	4.361	4.302	5.051	4.992
00::00:27	3.825	3.798	4.455	4.428	5.062	4.974	5.842	5.754	3.802	3.784	4.432	4.414	4.366	4.306	5.056	4.996
00::00:28	3.83	3.8	4.46	4.43	5.071	4.98	5.851	5.76	3.805	3.785	4.435	4.415	4.372	4.31	5.062	5
00::00:29	3.835	3.801	4.465	4.431	5.078	4.985	5.858	5.765	3.808	3.787	4.438	4.417	4.379	4.315	5.069	5.005
00::00:30	3.841	3.802	4.471	4.432	5.085	4.99	5.865	5.77	3.811	3.788	4.441	4.418	4.388	4.32	5.078	5.01
00::00:31	3.845	3.803	4.475	4.433	5.095	4.996	5.875	5.776	3.815	3.789	4.445	4.419	4.398	4.325	5.088	5.015
00::00:32	3.85	3.804	4.48	4.434	5.106	5.001	5.886	5.781	3.819	3.79	4.449	4.42	4.407	4.33	5.097	5.02
00::00:33	3.854	3.805	4.484	4.435	5.117	5.008	5.897	5.788	3.822	3.79	4.452	4.42	4.415	4.334	5.105	5.024
00::00:34	3.859	3.807	4.489	4.437	5.13	5.015	5.91	5.795	3.825	3.791	4.455	4.421	4.423	4.339	5.113	5.029
00::00:35	3.862	3.808	4.492	4.438	5.139	5.022	5.919	5.802	3.827	3.792	4.457	4.422	4.431	4.343	5.121	5.033
00::00:36	3.864	3.809	4.494	4.439	5.144	5.029	5.924	5.809	3.829	3.792	4.459	4.422	4.439	4.347	5.129	5.037
00::00:37	3.866	3.81	4.496	4.44	5.146	5.036	5.926	5.816	3.83	3.793	4.46	4.423	4.443	4.351	5.133	5.041
00::00:38	3.868	3.811	4.498	4.441	5.143	5.043	5.923	5.823	3.832	3.793	4.462	4.423	4.445	4.355	5.135	5.045
00::00:39	3.87	3.813	4.5	4.443	5.14	5.05	5.92	5.83	3.834	3.793	4.464	4.423	4.443	4.36	5.133	5.05
00::00:40	3.872	3.814	4.502	4.444	5.134	5.056	5.914	5.836	3.835	3.794	4.465	4.424	4.44	4.364	5.13	5.054
00::00:41	3.875	3.815	4.505	4.445	5.128	5.062	5.908	5.842	3.835	3.794	4.465	4.424	4.434	4.368	5.124	5.058
00::00:42	3.879	3.816	4.509	4.446	5.125	5.068	5.905	5.848	3.837	3.795	4.467	4.425	4.428	4.372	5.118	5.062
00::00:43	3.884	3.817	4.514	4.447	5.121	5.074	5.901	5.854	3.838	3.796	4.468	4.426	4.421	4.376	5.111	5.066
00::00:44	3.889	3.818	4.519	4.448	5.117	5.079	5.897	5.859	3.84	3.797	4.47	4.427	4.416	4.38	5.106	5.07
00::00:45	3.894	3.82	4.524	4.45	5.116	5.085	5.896	5.865	3.841	3.798	4.471	4.428	4.412	4.383	5.102	5.073
00::00:46	3.901	3.822	4.531	4.452	5.114	5.091	5.894	5.871	3.843	3.799	4.473	4.429	4.409	4.386	5.099	5.076
00::00:47	3.908	3.823	4.538	4.453	5.113	5.096	5.893	5.876	3.846	3.8	4.476	4.43	4.406	4.389	5.096	5.079
00::00:48	3.915	3.825	4.545	4.455	5.113	5.101	5.893	5.881	3.85	3.801	4.48	4.431	4.405	4.392	5.095	5.082
00::00:49	3.92	3.827	4.55	4.457	5.113	5.106	5.893	5.886	3.853	3.802	4.483	4.432	4.403	4.394	5.093	5.084
00::00:50	3.924	3.829	4.554	4.459	5.114	5.11	5.894	5.89	3.857	3.803	4.487	4.433	4.401	4.396	5.091	5.086
00::00:51	3.928	3.831	4.558	4.461	5.115	5.114	5.895	5.894	3.861	3.805	4.491	4.435	4.4	4.398	5.09	5.088
00::00:52	3.932	3.833	4.562	4.463	5.118	5.117	5.898	5.897	3.865	3.806	4.495	4.436	4.399	4.4	5.089	5.09
00::00:53	3.936	3.835	4.566	4.465	5.121	5.121	5.901	5.901	3.869	3.807	4.499	4.437	4.398	4.401	5.088	5.091
00::00:54	3.94	3.837	4.57	4.467	5.123	5.125	5.903	5.905	3.873	3.808	4.503	4.438	4.398	4.403	5.088	5.093
00::00:55	3.944	3.839	4.574	4.469	5.125	5.128	5.905	5.908	3.877	3.809	4.507	4.439	4.399	4.404	5.089	5.094
00::00:56	3.949	3.841	4.579	4.471	5.128	5.131	5.908	5.911	3.88	3.81	4.51	4.44	4.401	4.406	5.091	5.096
00::00:57	3.953	3.844	4.583	4.474	5.13	5.134	5.91	5.914	3.882	3.812	4.512	4.442	4.402	4.407	5.092	5.097
00::00:58	3.957	3.846	4.587	4.476	5.131	5.137	5.911	5.917	3.885	3.813	4.515	4.443	4.403	4.408	5.093	5.098
00::00:59	3.961	3.848	4.591	4.478	5.132	5.14	5.912	5.92	3.887	3.815	4.517	4.445	4.403	4.409	5.093	5.099
00::01:00	3.965	3.85	4.595	4.48	5.133	5.142	5.913	5.922	3.89	3.817	4.52	4.447	4.403	4.409	5.093	5.099
00::01:01	3.97	3.852	4.6	4.482	5.134	5.144	5.914	5.924	3.893	3.818	4.523	4.448	4.403	4.41	5.093	5.1
00::01:02	3.974	3.855	4.604	4.485	5.134	5.146	5.914	5.926	3.896	3.82	4.526	4.45	4.402	4.41	5.092	5.1
00::01:03	3.979	3.857	4.609	4.487	5.134	5.149	5.914	5.929	3.898	3.822	4.528	4.452	4.401	4.411	5.091	5.101
00::01:04	3.984	3.859	4.614	4.489	5.134	5.15	5.914	5.93	3.901	3.823	4.531	4.453	4.401	4.411	5.091	5.101
00::01:05	3.988	3.861	4.618	4.491	5.134	5.152	5.914	5.932	3.904	3.825	4.534	4.455	4.4	4.411	5.09	5.101
00::01:06	3.993	3.863	4.623	4.493	5.134	5.154	5.914	5.934	3.906	3.826	4.536	4.456	4.399	4.411	5.089	5.101
00::01:07	3.997	3.866	4.627	4.496	5.135	5.155	5.915	5.935	3.909	3.827	4.539	4.457	4.398	4.411	5.088	5.101
00::01:08	4.002	3.868	4.632	4.498	5.136	5.156	5.916	5.936	3.912	3.829	4.542	4.459	4.397	4.411	5.087	5.101
00::01:09	4.007	3.87	4.637	4.5	5.138	5.158	5.918	5.938	3.915	3.83	4.545	4.46	4.396	4.411	5.086	5.101
00::01:10	4.012	3.872	4.642	4.502	5.14	5.159	5.92	5.939	3.918	3.832	4.548	4.462	4.395	4.411	5.085	5.101
00::01:11	4.017	3.875	4.647	4.505	5.142	5.159	5.922	5.939	3.921	3.833	4.551	4.463	4.394	4.411	5.084	5.101
00::01:12	4.022	3.877	4.652	4.507	5.144	5.16	5.924	5.94	3.924	3.834	4.554	4.464	4.394	4.41	5.084	5.1
00::01:13	4.027	3.88	4.657	4.51	5.147	5.161	5.927	5.941	3.929	3.836	4.559	4.466	4.394	4.41	5.084	5.1
00::01:14	4.033	3.883	4.663	4.513	5.149	5.162	5.929	5.942	3.932	3.838	4.562	4.468	4.394	4.409	5.084	5.099
00::01:15	4.039	3.885	4.669	4.515	5.152	5.162	5.932	5.942	3.936	3.839	4.566	4.469	4.394	4.409	5.084	5.099
00::01:16	4.044	3.888	4.674	4.518	5.154	5.163	5.934	5.943	3.94	3.841	4.57	4.471	4.394	4.408	5.084	5.098
00::01:17	4.05	3.891	4.68	4.521	5.157	5.164	5.937	5.944	3.944	3.843	4.574	4.473	4.394	4.407	5.084	5.097
00::01:18	4.056	3.894	4.686	4.524	5.159	5.164	5.939	5.944	3.948	3.845	4.578	4.475	4.395	4.406	5.085	5.096
00::01:19	4.062	3.897	4.692	4.527	5.161	5.165	5.941	5.945	3.952	3.847	4.582	4.477	4.395	4.406	5.085	5.096
00::01:20	4.067	3.899	4.697	4.529	5.164	5.166	5.944	5.946	3.956	3.849	4.586	4.479	4.396	4.405	5.086	5.095
00::01:21	4.072	3.902	4.702	4.532	5.166	5.166	5.946	5.946	3.961	3.851	4.591	4.481	4.396	4.404	5.086	5.094
00::01:22	4.077	3.905	4.707	4.535	5.168	5.167	5.948	5.947	3.965	3.853	4.595	4.483	4.397	4.403	5.087	5.093
00::01:23	4.082	3.908	4.712	4.538	5.169	5.168	5.949	5.948	3.97	3.855	4.6	4.485	4.398	4.402	5.088	5.092
00::01:24	4.087	3.911	4.717	4.541	5.171	5.169	5.951	5.949	3.974	3.857	4.604	4.487	4.398	4.401	5.088	5.091
00::01:25	4.093	3.914	4.723	4.544	5.173	5.169	5.953	5.949	3.979	3.859	4.609	4.489	4.399	4.401	5.089	5.091
00::01:26	4.099	3.917	4.729	4.547	5.174	5.17	5.954	5.95	3.984	3.861	4.614	4.491	4.4	4.4	5.09	5.09
00::01:27	4.105	3.92	4.735	4.55	5.175	5.171	5.955	5.951	3.988	3.863	4.618	4.493	4.401	4.399	5.091	5.089
00::01:28	4.111	3.924	4.741	4.554	5.177	5.172	5.957	5.952	3.993	3.865	4.623	4.495	4.402	4.398	5.092	5.088
00::01:29	4.117	3.927	4.747	4.557	5.178	5.173	5.958	5.953	3.998	3.867	4.628	4.497	4.403	4.398	5.093	5.088
00::01:30	4.123	3.931	4.753	4.561	5.18	5.173	5.96	5.953	4.003	3.87	4.633	4.5	4.404	4.397	5.094	5.087
00::01:31	4.128	3.934	4.758	4.564	5.181	5.174	5.961	5.954	4.008	3.872	4.638	4.502	4.405	4.396	5.095	5.086
00::01:32	4.134	3.938	4.764	4.568	5.182	5.175	5.962	5.955	4.014	3.874	4.644	4.504	4.406	4.396	5.096	5.086
00::01:33	4.14	3.941	4.77	4.571	5.184	5.176	5.964	5.956	4.019	3.877	4.649	4.507	4.407	4.395	5.097	5.085
00::01:34	4.147	3.945	4.777	4.575	5.185	5.177	5.965	5.957	4.024	3.879	4.654	4.509	4.409	4.395	5.099	5.085
00::01:35	4.153	3.948	4.783	4.578	5.187	5.178	5.967	5.958	4.029	3.882	4.659	4.512	4.41	4.394	5.1	5.084
00::01:36	4.16	3.952	4.79	4.582	5.188	5.179	5.968	5.959	4.035	3.885	4.665	4.515	4.411	4.394	5.101	5.084
00::01:37	4.167	3.955	4.797	4.585	5.19	5.18	5.97	5.96	4.04	3.887	4.67	4.517	4.413	4.393	5.103	5.083
00::01:38	4.173	3.959	4.803	4.589	5.192	5.181	5.972	5.961	4.046	3.89	4.676	4.52	4.415	4.393	5.105	5.083
00::01:39	4.18	3.962	4.81	4.592	5.194	5.182	5.974	5.962	4.052	3.893	4.682	4.523	4.417	4.393	5.107	5.083
00::01:40	4.187	3.966	4.817	4.596	5.196	5.183	5.976	5.963	4.058	3.896	4.688	4.526	4.419	4.392	5.109	5.082
00::01:41	4.193	3.97	4.823	4.6	5.197	5.184	5.977	5.964	4.063	3.899	4.693	4.529	4.42	4.392	5.11	5.082
00::01:42	4.2	3.973	4.83	4.603	5.199	5.186	5.979	5.966	4.069	3.902	4.699	4.532	4.422	4.392	5.112	5.082
00::01:43	4.207	3.977	4.837	4.607	5.201	5.187	5.981	5.967	4.075	3.905	4.705	4.535	4.424	4.392	5.114	5.082
00::01:44	4.213	3.981	4.843	4.611	5.203	5.188	5.983	5.968	4.081	3.908	4.711	4.538	4.427	4.392	5.117	5.082
00::01:45	4.221	3.984	4.851	4.614	5.205	5.189	5.985	5.969	4.087	3.911	4.717	4.541	4.429	4.392	5.119	5.082
00::01:46	4.227	3.988	4.857	4.618	5.207	5.191	5.987	5.971	4.094	3.915	4.724	4.545	4.432	4.392	5.122	5.082
00::01:47	4.234	3.992	4.864	4.622	5.209	5.192	5.989	5.972	4.1	3.918	4.73	4.548	4.435	4.392	5.125	5.082
00::01:48	4.242	3.996	4.872	4.626	5.211	5.194	5.991	5.974	4.107	3.922	4.737	4.552	4.438	4.393	5.128	5.083
00::01:49	4.249	4	4.879	4.63	5.213	5.195	5.993	5.975	4.114	3.925	4.744	4.555	4.441	4.393	5.131	5.083

00::01:50	4.257	4.004	4.887	4.634	5.215	5.197	5.995	5.977	4.121	3.929	4.751	4.559	4.444	4.394	5.134	5.084
00::01:51	4.264	4.008	4.894	4.638	5.218	5.198	5.998	5.978	4.128	3.933	4.758	4.563	4.448	4.394	5.138	5.084
00::01:52	4.272	4.012	4.902	4.642	5.22	5.2	6	5.98	4.136	3.937	4.766	4.567	4.452	4.395	5.142	5.085
00::01:53	4.28	4.016	4.91	4.646	5.223	5.201	6.003	5.981	4.144	3.942	4.774	4.572	4.456	4.396	5.146	5.086
00::01:54	4.289	4.021	4.919	4.651	5.225	5.203	6.005	5.983	4.152	3.946	4.782	4.576	4.46	4.396	5.15	5.086
00::01:55	4.297	4.025	4.927	4.655	5.228	5.205	6.008	5.985	4.161	3.951	4.791	4.581	4.464	4.398	5.154	5.088
00::01:56	4.306	4.03	4.936	4.66	5.231	5.207	6.011	5.987	4.171	3.956	4.801	4.586	4.469	4.399	5.159	5.089
00::01:57	4.316	4.035	4.946	4.665	5.234	5.209	6.014	5.989	4.181	3.962	4.811	4.592	4.475	4.4	5.165	5.09
00::01:58	4.326	4.041	4.956	4.671	5.238	5.211	6.018	5.991	4.191	3.968	4.821	4.598	4.48	4.402	5.17	5.092
00::01:59	4.337	4.047	4.967	4.677	5.242	5.214	6.022	5.994	4.202	3.975	4.832	4.605	4.487	4.404	5.177	5.094
00::02:00	4.349	4.055	4.979	4.685	5.247	5.217	6.027	5.997	4.214	3.983	4.844	4.613	4.494	4.408	5.184	5.098
00::02:01	4.362	4.065	4.992	4.695	5.252	5.221	6.032	6.001	4.227	3.995	4.857	4.625	4.502	4.413	5.192	5.103
00::02:02	4.376	4.075	5.006	4.705	5.258	5.225	6.038	6.005	4.241	4.006	4.871	4.636	4.511	4.417	5.201	5.107
00::02:03	4.392	4.078	5.022	4.708	5.265	5.225	6.045	6.005	4.257	4.01	4.887	4.64	4.522	4.416	5.212	5.106
00::02:04	4.409	4.076	5.039	4.706	5.273	5.226	6.053	6.006	4.274	4.008	4.904	4.638	4.534	4.414	5.224	5.104
00::02:05	4.426	4.073	5.056	4.703	5.28	5.229	6.06	6.009	4.291	4.003	4.921	4.633	4.545	4.413	5.235	5.103
00::02:06	4.442	4.068	5.072	4.698	5.286	5.231	6.066	6.011	4.309	3.998	4.939	4.628	4.557	4.414	5.247	5.104
00::02:07	4.458	4.07	5.088	4.7	5.291	5.234	6.071	6.014	4.326	3.999	4.956	4.629	4.569	4.415	5.259	5.105
00::02:08	4.473	4.078	5.103	4.708	5.297	5.237	6.077	6.017	4.343	4.007	4.973	4.637	4.58	4.417	5.27	5.107
00::02:09	4.488	4.087	5.118	4.717	5.304	5.241	6.084	6.021	4.359	4.019	4.989	4.649	4.591	4.42	5.281	5.11
00::02:10	4.502	4.096	5.132	4.726	5.31	5.245	6.09	6.025	4.375	4.03	5.005	4.66	4.602	4.423	5.292	5.113
00::02:11	4.515	4.102	5.145	4.732	5.315	5.249	6.095	6.029	4.39	4.038	5.02	4.668	4.612	4.426	5.302	5.116
00::02:12	4.528	4.108	5.158	4.738	5.32	5.252	6.1	6.032	4.405	4.045	5.035	4.675	4.622	4.429	5.312	5.119
00::02:13	4.541	4.114	5.171	4.744	5.324	5.256	6.104	6.036	4.419	4.052	5.049	4.682	4.631	4.432	5.321	5.122
00::02:14	4.552	4.12	5.182	4.75	5.329	5.26	6.109	6.04	4.433	4.058	5.063	4.688	4.64	4.436	5.33	5.126
00::02:15	4.565	4.126	5.195	4.756	5.333	5.263	6.113	6.043	4.447	4.065	5.077	4.695	4.648	4.439	5.338	5.129
00::02:16	4.577	4.133	5.207	4.763	5.336	5.267	6.116	6.047	4.461	4.071	5.091	4.701	4.657	4.442	5.347	5.132
00::02:17	4.589	4.139	5.219	4.769	5.34	5.27	6.12	6.05	4.475	4.077	5.105	4.707	4.665	4.446	5.355	5.136
00::02:18	4.601	4.145	5.231	4.775	5.344	5.273	6.124	6.053	4.487	4.083	5.117	4.713	4.672	4.449	5.362	5.139
00::02:19	4.613	4.15	5.243	4.78	5.348	5.277	6.128	6.057	4.498	4.088	5.128	4.718	4.68	4.452	5.37	5.142
00::02:20	4.623	4.155	5.253	4.785	5.352	5.28	6.132	6.06	4.509	4.092	5.139	4.722	4.686	4.455	5.376	5.145
00::02:21	4.632	4.16	5.262	4.79	5.356	5.284	6.136	6.064	4.519	4.096	5.149	4.726	4.692	4.458	5.382	5.148
00::02:22	4.641	4.165	5.271	4.795	5.359	5.287	6.139	6.067	4.528	4.101	5.158	4.731	4.696	4.461	5.386	5.151
00::02:23	4.652	4.17	5.282	4.8	5.362	5.291	6.142	6.071	4.536	4.105	5.166	4.735	4.7	4.464	5.39	5.154
00::02:24	4.663	4.175	5.293	4.805	5.364	5.294	6.144	6.074	4.543	4.11	5.173	4.74	4.702	4.467	5.392	5.157
00::02:25	4.674	4.181	5.304	4.811	5.365	5.297	6.145	6.077	4.547	4.115	5.177	4.745	4.702	4.47	5.392	5.16
00::02:26	4.683	4.186	5.313	4.816	5.366	5.3	6.146	6.08	4.552	4.12	5.182	4.75	4.701	4.473	5.391	5.163
00::02:27	4.691	4.19	5.321	4.82	5.367	5.303	6.147	6.083	4.555	4.125	5.185	4.755	4.7	4.476	5.39	5.166
00::02:28	4.697	4.195	5.327	4.825	5.368	5.306	6.148	6.086	4.558	4.13	5.188	4.76	4.698	4.479	5.388	5.169
00::02:29	4.702	4.2	5.332	4.83	5.368	5.308	6.148	6.088	4.56	4.134	5.19	4.764	4.696	4.482	5.386	5.172
00::02:30	4.706	4.204	5.336	4.834	5.368	5.311	6.148	6.091	4.561	4.139	5.191	4.769	4.694	4.485	5.384	5.175
00::02:31	4.71	4.208	5.34	4.838	5.368	5.314	6.148	6.094	4.563	4.143	5.193	4.773	4.691	4.488	5.381	5.178
00::02:32	4.713	4.213	5.343	4.843	5.368	5.316	6.148	6.096	4.565	4.147	5.195	4.777	4.688	4.49	5.378	5.18
00::02:33	4.717	4.217	5.347	4.847	5.368	5.318	6.148	6.098	4.569	4.15	5.199	4.78	4.686	4.492	5.376	5.182
00::02:34	4.72	4.221	5.35	4.851	5.368	5.32	6.148	6.1	4.572	4.154	5.202	4.784	4.684	4.495	5.374	5.185
00::02:35	4.723	4.225	5.353	4.855	5.367	5.322	6.147	6.102	4.575	4.157	5.205	4.787	4.682	4.497	5.372	5.187
00::02:36	4.726	4.228	5.356	4.858	5.367	5.324	6.147	6.104	4.578	4.16	5.208	4.79	4.681	4.499	5.371	5.189
00::02:37	4.729	4.232	5.359	4.862	5.366	5.325	6.146	6.105	4.579	4.163	5.209	4.793	4.68	4.5	5.37	5.19
00::02:38	4.732	4.235	5.362	4.865	5.364	5.327	6.144	6.107	4.581	4.165	5.211	4.795	4.678	4.502	5.368	5.192
00::02:39	4.734	4.239	5.364	4.869	5.363	5.328	6.143	6.108	4.581	4.168	5.211	4.798	4.677	4.504	5.367	5.194
00::02:40	4.737	4.242	5.367	4.872	5.361	5.33	6.141	6.11	4.581	4.17	5.211	4.8	4.676	4.505	5.366	5.195
00::02:41	4.739	4.245	5.369	4.875	5.36	5.331	6.14	6.111	4.581	4.173	5.211	4.803	4.674	4.506	5.364	5.196
00::02:42	4.741	4.248	5.371	4.878	5.358	5.332	6.138	6.112	4.58	4.175	5.21	4.805	4.672	4.508	5.362	5.198
00::02:43	4.742	4.251	5.372	4.881	5.356	5.332	6.136	6.112	4.58	4.176	5.21	4.806	4.67	4.509	5.36	5.199
00::02:44	4.743	4.254	5.373	4.884	5.354	5.333	6.134	6.113	4.579	4.178	5.209	4.808	4.667	4.51	5.357	5.2
00::02:45	4.744	4.257	5.374	4.887	5.352	5.333	6.132	6.113	4.578	4.18	5.208	4.81	4.664	4.511	5.354	5.201
00::02:46	4.745	4.26	5.375	4.89	5.349	5.334	6.129	6.114	4.577	4.181	5.207	4.811	4.661	4.511	5.351	5.201
00::02:47	4.745	4.262	5.375	4.892	5.347	5.334	6.127	6.114	4.577	4.183	5.207	4.813	4.657	4.512	5.347	5.202
00::02:48	4.745	4.265	5.375	4.895	5.345	5.334	6.125	6.114	4.576	4.184	5.206	4.814	4.653	4.512	5.343	5.202
00::02:49	4.745	4.267	5.375	4.897	5.343	5.334	6.123	6.114	4.575	4.186	5.205	4.816	4.649	4.513	5.339	5.203
00::02:50	4.745	4.27	5.375	4.9	5.341	5.334	6.121	6.114	4.575	4.187	5.205	4.817	4.645	4.513	5.335	5.203
00::02:51	4.744	4.272	5.374	4.902	5.339	5.334	6.119	6.114	4.574	4.189	5.204	4.819	4.641	4.514	5.331	5.204
00::02:52	4.744	4.274	5.374	4.904	5.337	5.334	6.117	6.114	4.573	4.19	5.203	4.82	4.637	4.514	5.327	5.204
00::02:53	4.743	4.277	5.373	4.907	5.335	5.333	6.115	6.113	4.572	4.191	5.202	4.821	4.634	4.514	5.324	5.204
00::02:54	4.742	4.279	5.372	4.909	5.333	5.333	6.113	6.113	4.572	4.192	5.202	4.822	4.63	4.514	5.32	5.204
00::02:55	4.742	4.281	5.372	4.911	5.331	5.332	6.111	6.112	4.572	4.193	5.202	4.823	4.627	4.514	5.317	5.204
00::02:56	4.741	4.283	5.371	4.913	5.329	5.332	6.109	6.112	4.571	4.194	5.201	4.824	4.624	4.514	5.314	5.204
00::02:57	4.74	4.285	5.37	4.915	5.328	5.331	6.108	6.111	4.57	4.195	5.2	4.825	4.621	4.514	5.311	5.204
00::02:58	4.74	4.287	5.37	4.917	5.326	5.33	6.106	6.11	4.569	4.196	5.199	4.826	4.617	4.513	5.307	5.203
00::02:59	4.739	4.289	5.369	4.919	5.324	5.329	6.104	6.109	4.567	4.197	5.197	4.827	4.614	4.513	5.304	5.203
00::03:00	4.739	4.291	5.369	4.921	5.322	5.328	6.102	6.108	4.565	4.198	5.195	4.828	4.611	4.513	5.301	5.203
00::03:01	4.738	4.293	5.368	4.923	5.321	5.327	6.101	6.107	4.562	4.199	5.192	4.829	4.609	4.512	5.299	5.202
00::03:02	4.737	4.295	5.367	4.925	5.319	5.326	6.099	6.106	4.56	4.199	5.19	4.829	4.606	4.512	5.296	5.202
00::03:03	4.736	4.297	5.366	4.927	5.318	5.325	6.098	6.105	4.557	4.2	5.187	4.83	4.603	4.511	5.293	5.201
00::03:04	4.735	4.298	5.365	4.928	5.316	5.324	6.096	6.104	4.554	4.201	5.184	4.831	4.601	4.51	5.291	5.2
00::03:05	4.733	4.3	5.363	4.93	5.315	5.323	6.095	6.103	4.551	4.202	5.181	4.832	4.599	4.51	5.289	5.2
00::03:06	4.732	4.302	5.362	4.932	5.313	5.322	6.093	6.102	4.548	4.203	5.178	4.833	4.596	4.509	5.286	5.199
00::03:07	4.73	4.303	5.36	4.933	5.311	5.321	6.091	6.101	4.545	4.204	5.175	4.834	4.594	4.508	5.284	5.198
00::03:08	4.728	4.305	5.358	4.935	5.31	5.319	6.09	6.099	4.542	4.205	5.172	4.835	4.592	4.508	5.282	5.198
00::03:09	4.726	4.307	5.356	4.937	5.308	5.318	6.088	6.098	4.539	4.206	5.169	4.836	4.59	4.507	5.28	5.197
00::03:10	4.724	4.308	5.354	4.938	5.307	5.317	6.087	6.097	4.536	4.206	5.166	4.836	4.588	4.506	5.278	5.196
00::03:11	4.722	4.309	5.352	4.939	5.305	5.316	6.085	6.096	4.533	4.207	5.163	4.837	4.586	4.505	5.276	5.195
00::03:12	4.72	4.311	5.35	4.941	5.303	5.314	6.083	6.094	4.53	4.208	5.16	4.838	4.584	4.504	5.274	5.194
00::03:13	4.717	4.312	5.347	4.942	5.302	5.313	6.082	6.093	4.527	4.208	5.157	4.838	4.581	4.503	5.271	5.193
00::03:14	4.715	4.314	5.345	4.944	5.3	5.312	6.08	6.092	4.524	4.209	5.154	4.839	4.579	4.502	5.269	5.192
00::03:15	4.712	4.315	5.342	4.945	5.299	5.31	6.079	6.09	4.521	4.209	5.151	4.839	4.577	4.501	5.267	5.191
00::03:16	4.71	4.316	5.34	4.946	5.297	5.309	6.077	6.089	4.518	4.209	5.148	4.839	4.574	4.5	5.264	5.19
00::03:17	4.707	4.317	5.337	4.947	5.296	5.308	6.076	6.088	4.515	4.21	5.145	4.84	4.571	4.499	5.261	5.189
00::03:18	4.705	4.319	5.335	4.949	5.294	5.306	6.074	6.086	4.511	4.21	5.141	4.84	4.569	4.498	5.259	5.188
00::03:19	4.702	4.32	5.332	4.95	5.293	5.305	6.073	6.085	4.508	4.21	5.138	4.84	4.567	4.497	5.257	5.187
00::03:20	4.699	4.321	5.329	4.951	5.291	5.304	6.071	6.084	4.505	4.211	5.135	4.841	4.564	4.496	5.254	5.186
00::03:21	4.696	4.322	5.326	4.952	5.289	5.302	6.069	6.082	4.502	4.211	5.132	4.841	4.562	4.495	5.252	5.185
00::03:22	4.694	4.323	5.324	4.953	5.288	5.301	6.068	6.081	4.499	4.211	5.129	4.841	4.56	4.494	5.25	5.184
00::03:23	4.691	4.323	5.321	4.953	5.286	5.3	6.066	6.08	4.496	4.211	5.126	4.841	4.557	4.492	5.247	5.182
00::03:24	4.688	4.324	5.318	4.954	5.285	5.298	6.065	6.078	4.493	4.211	5.123	4.841	4.555	4.491	5.245	5.181
00::03:25	4.685	4.325	5.315	4.955	5.283	5.297	6.063	6.077	4.49	4.211	5.12	4.841	4.553	4.49	5.243	5.18
00::03:26	4.682	4.326	5.312	4.956	5.282	5.296	6.062	6.076	4.486	4.211	5.116	4.841	4.55	4.489	5.24	5.179
00::03:27	4.679	4.327	5.309	4.957	5.281	5.295	6.061	6.075	4.483	4.211	5.113	4.841	4.548	4.488	5.238	5.178
00::03:28	4.677	4.327	5.307	4.957	5.279	5.293	6.059	6.073	4.48	4.211	5.11	4.841	4.546	4.486	5.236	5.176
00::03:29	4.674	4.328	5.304	4.958	5.278	5.292	6.058	6.072	4.477	4.21	5.107	4.84	4.544	4.485	5.234	5.175
00::03:30	4.671	4.329	5.301	4.959	5.277	5.291	6.057	6.071	4.474	4.21	5.104	4.84	4.542	4.484	5.232	5.174
00::03:31	4.668	4.329	5.298	4.959	5.275	5.289	6.055	6.069	4.471	4.21	5.101	4.84	4.54	4.483	5.23	5.173
00::03:32	4.665	4.33	5.295	4.96	5.274	5.288	6.054	6.068	4.468	4.21	5.098	4.84	4.538	4.481	5.228	5.171
00::03:33	4.662	4.33	5.292	4.96	5.272	5.287	6.052	6.067	4.464	4.209	5.094	4.839	4.536	4.48	5.226	5.17
00::03:34	4.66	4.331	5.29	4.961	5.271	5.286	6.051	6.066	4.462	4.209	5.092	4.839	4.534	4.479	5.224	5.169
00::03:35	4.657	4.331	5.287	4.961	5.27	5.285	6.05	6.065	4.459	4.208	5.089	4.838	4.532	4.478	5.222	5.168
00::03:36	4.654	4.332	5.284	4.962	5.268	5.283	6.048	6.063	4.456	4.208	5.086	4.838	4.53	4.476	5.22	5.166
00::03:37	4.652	4.332	5.282	4.962	5.268	5.282	6.048	6.062	4.453	4.208	5.083	4.838	4.528	4.475	5.218	5.165
00::03:38	4.649	4.332	5.279	4.962	5.266	5.281	6.046	6.061	4.45	4.207	5.08	4.837	4.526	4.474	5.216	5.164
00::03:39	4.647	4.332	5.277	4.962	5.265	5.28	6.045	6.06	4.447	4.207	5.077	4.837	4.524	4.472	5.214	5.162
00::03:40	4.645	4.333	5.275	4.963	5.264	5.279	6.044	6.059	4.444	4.206	5.074	4.836	4.522	4.471	5.212	5.161
00::03:41	4.642	4.333	5.272	4.963	5.262	5.277	6.042	6.057	4.441	4.206	5.071	4.836	4.521	4.47	5.211	5.16
00::03:42	4.64	4.333	5.27	4.963	5.261	5.276	6.041	6.056	4.438	4.205	5.068	4.835	4.518	4.468	5.208	5.158
00::03:43	4.638	4.333	5.268	4.963	5.26	5.275	6.04	6.055	4.436	4.204	5.066	4.834	4.517	4.467	5.207	5.157
00::03:44	4.636	4.333	5.266	4.963	5.259	5.274	6.039	6.054	4.433	4.204	5.063	4.834	4.515	4.466	5.205	5.156
00::03:45	4.633	4.333	5.263	4.963	5.258	5.273	6.038	6.053	4.43	4.203	5.06	4.833	4.513	4.464	5.203	5.154
00::03:46	4.631	4.333	5.261	4.963	5.257	5.272	6.037	6.052	4.427	4.202	5.057	4.832	4.511	4.463	5.201	5.153
00::03:47	4.629	4.333	5.259	4.963	5.256	5.271	6.036	6.051	4.424	4.202	5.054	4.832	4.509	4.462	5.199	5.152
00::03:48	4.627	4.333	5.257	4.963	5.255	5.269	6.035	6.049	4.422	4.201	5.052	4.831	4.508	4.46	5.198	5.15
00::03:49	4.625	4.333	5.255	4.963	5.253	5.268	6.033	6.048	4.419	4.2	5.049	4.83	4.506	4.459	5.196	5.149
00::03:50	4.623	4.333	5.253	4.963	5.252	5.267	6.032	6.047	4.416	4.199	5.046	4.829	4.504	4.458	5.194	5.148
00::03:51	4.621	4.333	5.251	4.963	5.251	5.266	6.031	6.046	4.414	4.199	5.044	4.829	4.502	4.456	5.192	5.146
00::03:52	4.619	4.333	5.249	4.963	5.25	5.265	6.03	6.045	4.411	4.198	5.041	4.828	4.5	4.455	5.19	5.145
00::03:53	4.617	4.333	5.247	4.963	5.249	5.264	6.029	6.044	4.408	4.197	5.038	4.827	4.499	4.454	5.189	5.144
00::03:54	4.615	4.333	5.245	4.963	5.248	5.263	6.028	6.043	4.405	4.196	5.035	4.826	4.497	4.452	5.187	5.142

00::03:55	4.613	4.333	5.243	4.963	5.247	5.262	6.027	6.042	4.403	4.195	5.033	4.825	4.495	4.451	5.185	5.141
00::03:56	4.611	4.332	5.241	4.962	5.246	5.261	6.026	6.041	4.4	4.195	5.03	4.825	4.493	4.45	5.183	5.14
00::03:57	4.609	4.332	5.239	4.962	5.246	5.26	6.026	6.04	4.398	4.194	5.028	4.824	4.491	4.448	5.181	5.138
00::03:58	4.607	4.332	5.237	4.962	5.244	5.259	6.024	6.039	4.395	4.193	5.025	4.823	4.49	4.447	5.18	5.137
00::03:59	4.605	4.332	5.235	4.962	5.243	5.258	6.023	6.038	4.393	4.192	5.023	4.822	4.488	4.446	5.178	5.136
00::04:00	4.603	4.331	5.233	4.961	5.242	5.257	6.022	6.037	4.391	4.191	5.021	4.821	4.486	4.444	5.176	5.134
00::04:01	4.601	4.331	5.231	4.961	5.241	5.256	6.021	6.036	4.388	4.19	5.018	4.82	4.485	4.443	5.175	5.133
00::04:02	4.599	4.329	5.229	4.959	5.24	5.254	6.02	6.034	4.386	4.188	5.016	4.818	4.483	4.441	5.173	5.131
00::04:03	4.596	4.326	5.226	4.956	5.239	5.252	6.019	6.032	4.383	4.184	5.013	4.814	4.481	4.438	5.171	5.128
00::04:04	4.593	4.324	5.223	4.954	5.238	5.251	6.018	6.031	4.38	4.181	5.01	4.811	4.479	4.436	5.169	5.126
00::04:05	4.59	4.322	5.22	4.952	5.236	5.25	6.016	6.03	4.376	4.179	5.006	4.809	4.476	4.435	5.166	5.125
00::04:06	4.585	4.322	5.215	4.952	5.234	5.249	6.014	6.029	4.372	4.178	5.002	4.808	4.474	4.433	5.164	5.123
00::04:07	4.581	4.322	5.211	4.952	5.232	5.248	6.012	6.028	4.367	4.178	4.997	4.808	4.471	4.432	5.161	5.122
00::04:08	4.576	4.322	5.206	4.952	5.23	5.247	6.01	6.027	4.362	4.178	4.992	4.808	4.467	4.431	5.157	5.121
00::04:09	4.57	4.321	5.2	4.951	5.229	5.245	6.009	6.025	4.357	4.177	4.987	4.807	4.464	4.429	5.154	5.119
00::04:10	4.565	4.32	5.195	4.95	5.226	5.244	6.006	6.024	4.352	4.175	4.982	4.805	4.46	4.428	5.15	5.118
00::04:11	4.558	4.319	5.188	4.949	5.224	5.243	6.004	6.023	4.346	4.173	4.976	4.803	4.456	4.426	5.146	5.116
00::04:12	4.551	4.318	5.181	4.948	5.221	5.242	6.001	6.022	4.339	4.171	4.969	4.801	4.452	4.425	5.142	5.115
00::04:13	4.544	4.317	5.174	4.947	5.218	5.24	5.998	6.02	4.333	4.17	4.963	4.8	4.448	4.423	5.138	5.113
00::04:14	4.536	4.315	5.166	4.945	5.216	5.239	5.996	6.019	4.327	4.168	4.957	4.798	4.444	4.422	5.134	5.112
00::04:15	4.528	4.314	5.158	4.944	5.213	5.237	5.993	6.017	4.32	4.166	4.95	4.796	4.44	4.42	5.13	5.11
00::04:16	4.521	4.312	5.151	4.942	5.211	5.235	5.991	6.015	4.314	4.163	4.944	4.793	4.436	4.418	5.126	5.108
00::04:17	4.512	4.311	5.142	4.941	5.208	5.234	5.988	6.014	4.307	4.161	4.937	4.791	4.431	4.416	5.121	5.106
00::04:18	4.503	4.309	5.133	4.939	5.205	5.232	5.985	6.012	4.3	4.158	4.93	4.788	4.427	4.414	5.117	5.104
00::04:19	4.493	4.307	5.123	4.937	5.202	5.231	5.982	6.011	4.293	4.155	4.923	4.785	4.422	4.412	5.112	5.102
00::04:20	4.484	4.305	5.114	4.935	5.2	5.229	5.98	6.009	4.285	4.152	4.915	4.782	4.417	4.41	5.107	5.1
00::04:21	4.473	4.303	5.103	4.933	5.197	5.227	5.977	6.007	4.276	4.148	4.906	4.778	4.413	4.407	5.103	5.097
00::04:22	4.462	4.301	5.092	4.931	5.194	5.225	5.974	6.005	4.267	4.145	4.897	4.775	4.407	4.405	5.097	5.095
00::04:23	4.45	4.299	5.08	4.929	5.191	5.223	5.971	6.003	4.257	4.141	4.887	4.771	4.402	4.402	5.092	5.092
00::04:24	4.438	4.296	5.068	4.926	5.187	5.222	5.967	6.002	4.246	4.137	4.876	4.767	4.396	4.4	5.086	5.09
00::04:25	4.425	4.294	5.055	4.924	5.184	5.22	5.964	6	4.234	4.133	4.864	4.763	4.39	4.397	5.08	5.087
00::04:26	4.411	4.291	5.041	4.921	5.181	5.218	5.961	5.998	4.221	4.129	4.851	4.759	4.383	4.395	5.073	5.085
00::04:27	4.396	4.289	5.026	4.919	5.176	5.216	5.956	5.996	4.207	4.124	4.837	4.754	4.376	4.392	5.066	5.082
00::04:28	4.382	4.286	5.012	4.916	5.172	5.214	5.952	5.994	4.193	4.12	4.823	4.75	4.369	4.389	5.059	5.079
00::04:29	4.367	4.283	4.997	4.913	5.168	5.211	5.948	5.991	4.178	4.115	4.808	4.745	4.361	4.387	5.051	5.077
00::04:30	4.353	4.28	4.983	4.91	5.163	5.209	5.943	5.989	4.163	4.111	4.793	4.741	4.353	4.384	5.043	5.074
00::04:31	4.338	4.276	4.968	4.906	5.158	5.207	5.938	5.987	4.148	4.106	4.778	4.736	4.346	4.381	5.036	5.071
00::04:32	4.324	4.273	4.954	4.903	5.153	5.205	5.933	5.985	4.132	4.101	4.762	4.731	4.338	4.378	5.028	5.068
00::04:33	4.31	4.269	4.94	4.899	5.148	5.203	5.928	5.983	4.116	4.096	4.746	4.726	4.331	4.375	5.021	5.065
00::04:34	4.296	4.264	4.926	4.894	5.144	5.2	5.924	5.98	4.1	4.091	4.73	4.721	4.324	4.372	5.014	5.062
00::04:35	4.28	4.259	4.91	4.889	5.14	5.198	5.92	5.978	4.085	4.086	4.715	4.716	4.317	4.369	5.007	5.059
00::04:36	4.266	4.254	4.896	4.884	5.136	5.196	5.916	5.976	4.069	4.081	4.699	4.711	4.31	4.366	5	5.056
00::04:37	4.25	4.249	4.88	4.879	5.132	5.193	5.912	5.973	4.054	4.075	4.684	4.705	4.304	4.363	4.994	5.053
00::04:38	4.234	4.243	4.864	4.873	5.129	5.191	5.909	5.971	4.039	4.07	4.669	4.7	4.299	4.359	4.989	5.049
00::04:39	4.22	4.237	4.85	4.867	5.126	5.189	5.906	5.969	4.025	4.065	4.655	4.695	4.293	4.356	4.983	5.046
00::04:40	4.206	4.231	4.836	4.861	5.123	5.186	5.903	5.966	4.011	4.059	4.641	4.689	4.289	4.353	4.979	5.043
00::04:41	4.192	4.226	4.822	4.856	5.121	5.184	5.901	5.964	3.997	4.054	4.627	4.684	4.285	4.35	4.975	5.04
00::04:42	4.179	4.22	4.809	4.85	5.119	5.181	5.899	5.961	3.985	4.048	4.615	4.678	4.281	4.347	4.971	5.037
00::04:43	4.166	4.214	4.796	4.844	5.117	5.179	5.897	5.959	3.973	4.043	4.603	4.673	4.278	4.344	4.968	5.034
00::04:44	4.153	4.208	4.783	4.838	5.116	5.177	5.896	5.957	3.961	4.037	4.591	4.667	4.275	4.341	4.965	5.031
00::04:45	4.141	4.202	4.771	4.832	5.115	5.174	5.895	5.954	3.95	4.032	4.58	4.662	4.272	4.338	4.962	5.028
00::04:46	4.128	4.195	4.758	4.825	5.114	5.172	5.894	5.952	3.94	4.026	4.57	4.656	4.27	4.336	4.96	5.026
00::04:47	4.116	4.189	4.746	4.819	5.113	5.169	5.893	5.949	3.93	4.02	4.56	4.65	4.268	4.333	4.958	5.023
00::04:48	4.104	4.183	4.734	4.813	5.112	5.167	5.892	5.947	3.92	4.015	4.55	4.645	4.266	4.33	4.956	5.02
00::04:49	4.093	4.177	4.723	4.807	5.111	5.165	5.891	5.945	3.91	4.009	4.54	4.639	4.265	4.328	4.955	5.018
00::04:50	4.081	4.171	4.711	4.801	5.11	5.162	5.89	5.942	3.901	4.004	4.531	4.634	4.264	4.325	4.954	5.015
00::04:51	4.07	4.164	4.7	4.794	5.109	5.16	5.889	5.94	3.891	3.998	4.521	4.628	4.264	4.323	4.954	5.013
00::04:52	4.059	4.158	4.689	4.788	5.109	5.158	5.889	5.938	3.882	3.993	4.512	4.623	4.263	4.32	4.953	5.01
00::04:53	4.049	4.152	4.679	4.782	5.108	5.155	5.888	5.935	3.873	3.987	4.503	4.617	4.263	4.318	4.953	5.008
00::04:54	4.038	4.145	4.668	4.775	5.107	5.153	5.887	5.933	3.863	3.982	4.493	4.612	4.263	4.316	4.953	5.006
00::04:55	4.027	4.139	4.657	4.769	5.106	5.151	5.886	5.931	3.854	3.977	4.484	4.607	4.263	4.314	4.953	5.004
00::04:56	4.017	4.133	4.647	4.763	5.106	5.149	5.886	5.929	3.845	3.972	4.475	4.602	4.263	4.312	4.953	5.002
00::04:57	4.007	4.126	4.637	4.756	5.105	5.147	5.885	5.927	3.837	3.967	4.467	4.597	4.263	4.31	4.953	5
00::04:58	3.996	4.12	4.626	4.75	5.104	5.144	5.884	5.924	3.829	3.961	4.459	4.591	4.263	4.308	4.953	4.998
00::04:59	3.986	4.113	4.616	4.743	5.104	5.142	5.884	5.922	3.82	3.956	4.45	4.586	4.263	4.306	4.953	4.996
00::05:00	3.975	4.107	4.605	4.737	5.103	5.14	5.883	5.92	3.813	3.951	4.443	4.581	4.263	4.304	4.953	4.994

InfoWorks Model - Inflow and Level Boundaries



Extg 50yr
Case A

ID N49-4
ground (m AD) 2.732
max level (m AD) 4.841

ID N49-3
ground (m AD) 2.680
max level (m AD) 4.841

ID N49-2
ground (m AD) 2.559
max level (m AD) 4.841

ID N49-1
ground (m AD) 2.505
max level (m AD) 4.841

ID SLH1004802
ground (m AD) 5.150
max level (m AD) 5.929

ID SMH4048627
ground (m AD) 3.960
max level (m AD) 5.923

ID 822983834821
ground (m AD) 4.676
max level (m AD) 5.232

ID 822976834782
ground (m AD) 5.080
max level (m AD) 5.264

ID 823015835036
ground (m AD) 5.194
max level (m AD) 5.211

ID 823035834982
ground (m AD) 5.113
max level (m AD) 5.208

ID 822941834692
ground (m AD) 5.173
max level (m AD) 5.267

ID SGJ1013281
ground (m AD) 5.408
max level (m AD) 5.243

ID 822924834669
ground (m AD) 5.207
max level (m AD) 5.267

ID 822916834655
ground (m AD) 5.238
max level (m AD) 5.294

ID 822881834610
ground (m AD) 5.268
max level (m AD) 5.295

ID 822838834568
ground (m AD) 5.301
max level (m AD) 5.298

ID 822765834544
ground (m AD) 5.327
max level (m AD) 5.300

ID 822615834565
ground (m AD) 5.354
max level (m AD) 5.307

ID 822667834568
ground (m AD) 5.345
max level (m AD) 5.303

ID 822542834506
ground (m AD) 5.370
max level (m AD) 5.311

ID 822557834527
ground (m AD) 5.366
max level (m AD) 5.310

ID 822527834420
ground (m AD) 5.820
max level (m AD) 5.314

Extg 50yr Case B

ID N49-4
ground (m AD) 2.732
max level (m AD) 5.216

ID N49-3
ground (m AD) 2.680
max level (m AD) 5.271

ID N49-2
ground (m AD) 2.559
max level (m AD) 5.330

ID N49-1
ground (m AD) 2.505
max level (m AD) 5.336

ID SLH1004802
ground (m AD) 5.150
max level (m AD) 5.886

ID SMH4048627
ground (m AD) 3.960
max level (m AD) 5.879

ID 822983834821
ground (m AD) 4.676
max level (m AD) 5.407

ID 822976834782
ground (m AD) 5.080
max level (m AD) 5.431

ID 823015835036
ground (m AD) 5.194
max level (m AD) 5.392

ID 823035834982
ground (m AD) 5.113
max level (m AD) 5.391

ID 822941834692
ground (m AD) 5.173
max level (m AD) 5.434

ID SGJ1013281
ground (m AD) 5.408
max level (m AD) 5.414

ID 822924834669
ground (m AD) 5.207
max level (m AD) 5.435

ID 822916834655
ground (m AD) 5.238
max level (m AD) 5.455

ID 822881834610
ground (m AD) 5.268
max level (m AD) 5.457

ID 822838834568
ground (m AD) 5.301
max level (m AD) 5.459

ID 822765834544
ground (m AD) 5.327
max level (m AD) 5.462

ID 822667834568
ground (m AD) 5.345
max level (m AD) 5.465

ID 822615834565
ground (m AD) 5.354
max level (m AD) 5.469

ID 822557834527
ground (m AD) 5.366
max level (m AD) 5.472

ID 822542834506
ground (m AD) 5.370
max level (m AD) 5.473

ID 822527834420
ground (m AD) 5.820
max level (m AD) 5.477

Extg 200yr Case A

ID N49-4
ground (m AD) 2.732
max level (m AD) 4.963

ID N49-3
ground (m AD) 2.680
max level (m AD) 4.963

ID N49-2
ground (m AD) 2.559
max level (m AD) 4.963

ID N49-1
ground (m AD) 2.505
max level (m AD) 4.963

ID SLH1004802
ground (m AD) 5.150
max level (m AD) 6.165

ID SMH4048627
ground (m AD) 3.960
max level (m AD) 6.162

ID 822983834821
ground (m AD) 4.676
max level (m AD) 5.402

ID 822976834782
ground (m AD) 5.080
max level (m AD) 5.435

ID 823015835036
ground (m AD) 5.194
max level (m AD) 5.375

ID 823035834982
ground (m AD) 5.113
max level (m AD) 5.370

ID 822941834692
ground (m AD) 5.173
max level (m AD) 5.437

ID SGJ1013281
ground (m AD) 5.408
max level (m AD) 5.416

ID 822924834669
ground (m AD) 5.207
max level (m AD) 5.438

ID 822916834655
ground (m AD) 5.238
max level (m AD) 5.464

ID 822881834610
ground (m AD) 5.268
max level (m AD) 5.465

ID 822838834568
ground (m AD) 5.301
max level (m AD) 5.468

ID 822765834544
ground (m AD) 5.327
max level (m AD) 5.470

ID 822615834565
ground (m AD) 5.354
max level (m AD) 5.476

ID 822667834568
ground (m AD) 5.345
max level (m AD) 5.473

ID 822557834527
ground (m AD) 5.366
max level (m AD) 5.479

ID 822542834506
ground (m AD) 5.370
max level (m AD) 5.481

ID 822527834420
ground (m AD) 5.820
max level (m AD) 5.484

Extg 200yr Case B

ID N49-4
ground (m AD) 2.732
max level (m AD) 6.301

ID N49-3
ground (m AD) 2.680
max level (m AD) 6.520

ID N49-2
ground (m AD) 2.559
max level (m AD) 6.754

ID N49-1
ground (m AD) 2.505
max level (m AD) 6.779

ID SLH1004802
ground (m AD) 5.150
max level (m AD) 6.547

ID SMH4048627
ground (m AD) 3.960
max level (m AD) 6.546

ID 822983834821
ground (m AD) 4.676
max level (m AD) 6.160

ID 822976834782
ground (m AD) 5.080
max level (m AD) 6.183

ID 823015835036
ground (m AD) 5.194
max level (m AD) 6.148

ID 823035834982
ground (m AD) 5.113
max level (m AD) 6.146

ID 822941834692
ground (m AD) 5.173
max level (m AD) 6.184

ID SGJ1013281
ground (m AD) 5.408
max level (m AD) 6.169

ID 822924834669
ground (m AD) 5.207
max level (m AD) 6.184

ID 822916834655
ground (m AD) 5.238
max level (m AD) 6.198

ID 822881834610
ground (m AD) 5.268
max level (m AD) 6.198

ID 822838834568
ground (m AD) 5.301
max level (m AD) 6.199

ID 822765834544
ground (m AD) 5.327
max level (m AD) 6.200

ID 822667834568
ground (m AD) 5.345
max level (m AD) 6.202

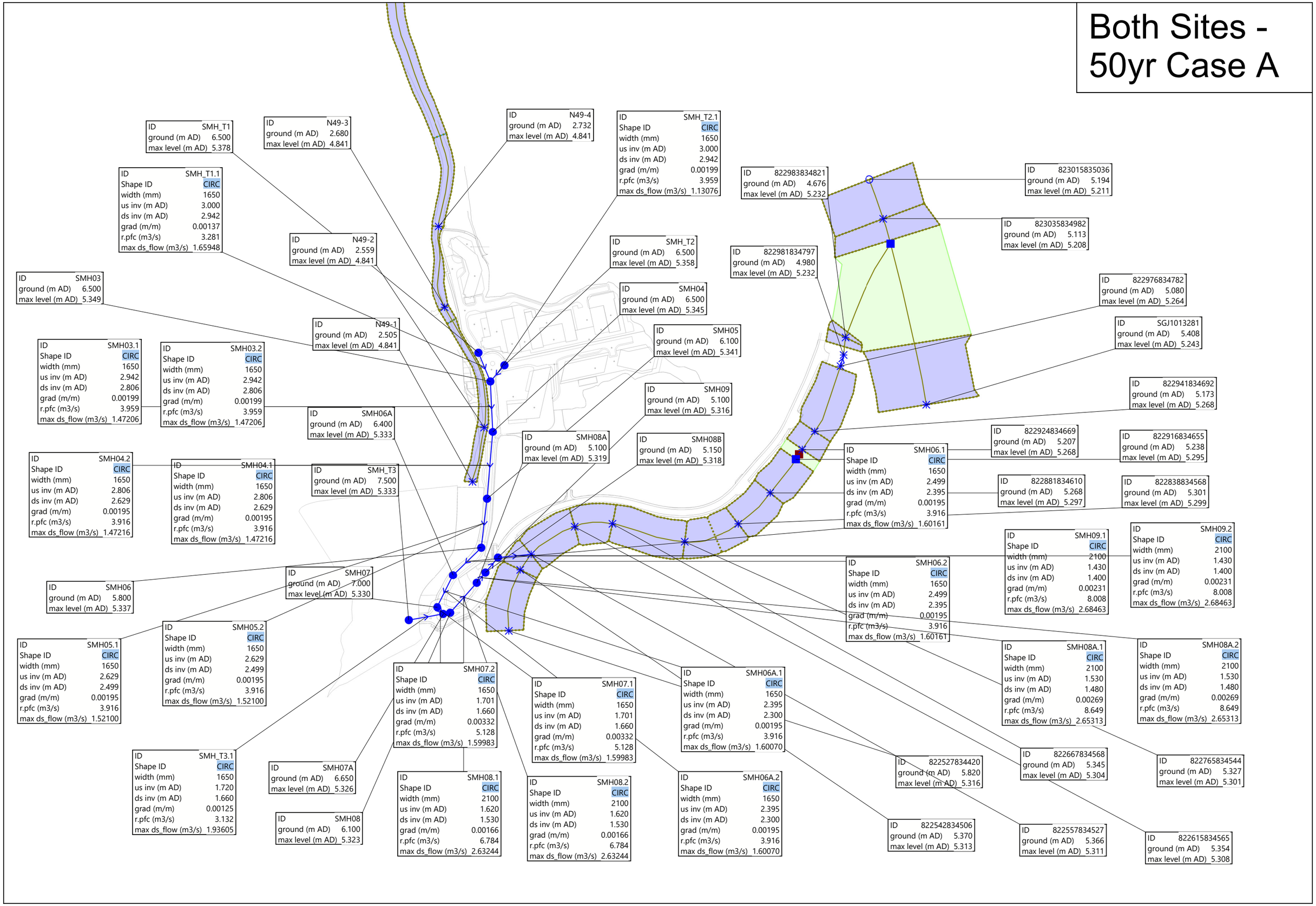
ID 822615834565
ground (m AD) 5.354
max level (m AD) 6.203

ID 822557834527
ground (m AD) 5.366
max level (m AD) 6.204

ID 822542834506
ground (m AD) 5.370
max level (m AD) 6.205

ID 822527834420
ground (m AD) 5.820
max level (m AD) 6.206

Both Sites - 50yr Case A



Both Sites - 50yr Case B

ID	SMH_T1
ground (m AD)	6.500
max level (m AD)	5.573

ID	N49-3
ground (m AD)	2.680
max level (m AD)	5.271

ID	N49-4
ground (m AD)	2.732
max level (m AD)	5.216

ID	SMH_T2.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.00519

ID	SMH_T1.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00137
r.pfc (m3/s)	3.281
max ds_flow (m3/s)	1.48533

ID	N49-2
ground (m AD)	2.559
max level (m AD)	5.330

ID	SMH_T2
ground (m AD)	6.500
max level (m AD)	5.555

ID	SMH03
ground (m AD)	6.500
max level (m AD)	5.545

ID	SMH04
ground (m AD)	6.500
max level (m AD)	5.512

ID	N49-1
ground (m AD)	2.505
max level (m AD)	5.336

ID	SMH05
ground (m AD)	6.100
max level (m AD)	5.496

ID	SMH03.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.31484

ID	SMH03.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.31484

ID	SMH09
ground (m AD)	5.100
max level (m AD)	5.477

ID	SMH06A
ground (m AD)	6.400
max level (m AD)	5.490

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	5.480

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	5.479

ID	SMH04.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.806
ds inv (m AD)	2.629
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.31543

ID	SMH04.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.806
ds inv (m AD)	2.629
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.31543

ID	SMH_T3
ground (m AD)	7.500
max level (m AD)	5.490

ID	822983834821
ground (m AD)	4.676
max level (m AD)	5.407

ID	823015835036
ground (m AD)	5.194
max level (m AD)	5.392

ID	823035834982
ground (m AD)	5.113
max level (m AD)	5.391

ID	822981834797
ground (m AD)	4.980
max level (m AD)	5.407

ID	822976834782
ground (m AD)	5.080
max level (m AD)	5.431

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	5.414

ID	822941834692
ground (m AD)	5.173
max level (m AD)	5.435

ID	SMH06.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.43303

ID	822924834669
ground (m AD)	5.207
max level (m AD)	5.435

ID	822916834655
ground (m AD)	5.238
max level (m AD)	5.456

ID	822881834610
ground (m AD)	5.268
max level (m AD)	5.458

ID	822838834568
ground (m AD)	5.301
max level (m AD)	5.460

ID	SMH09.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	8.008
max ds_flow (m3/s)	2.37934

ID	SMH09.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	8.008
max ds_flow (m3/s)	2.37934

ID	SMH07
ground (m AD)	7.000
max level (m AD)	5.488

ID	SMH06
ground (m AD)	5.800
max level (m AD)	5.494

ID	SMH06.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.43303

ID	SMH05.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.35992

ID	SMH05.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.35992

ID	SMH07.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.43196

ID	SMH07.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.43196

ID	SMH06A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.43252

ID	SMH08A.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	8.649
max ds_flow (m3/s)	2.36004

ID	SMH08A.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	8.649
max ds_flow (m3/s)	2.36004

ID	SMH_T3.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.720
ds inv (m AD)	1.660
grad (m/m)	0.00125
r.pfc (m3/s)	3.132
max ds_flow (m3/s)	1.73013

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	5.485

ID	SMH08.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	6.784
max ds_flow (m3/s)	2.35613

ID	SMH08.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	6.784
max ds_flow (m3/s)	2.35613

ID	SMH06A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.43252

ID	SMH08
ground (m AD)	6.100
max level (m AD)	5.483

ID	822527834420
ground (m AD)	5.820
max level (m AD)	5.478

ID	822667834568
ground (m AD)	5.345
max level (m AD)	5.467

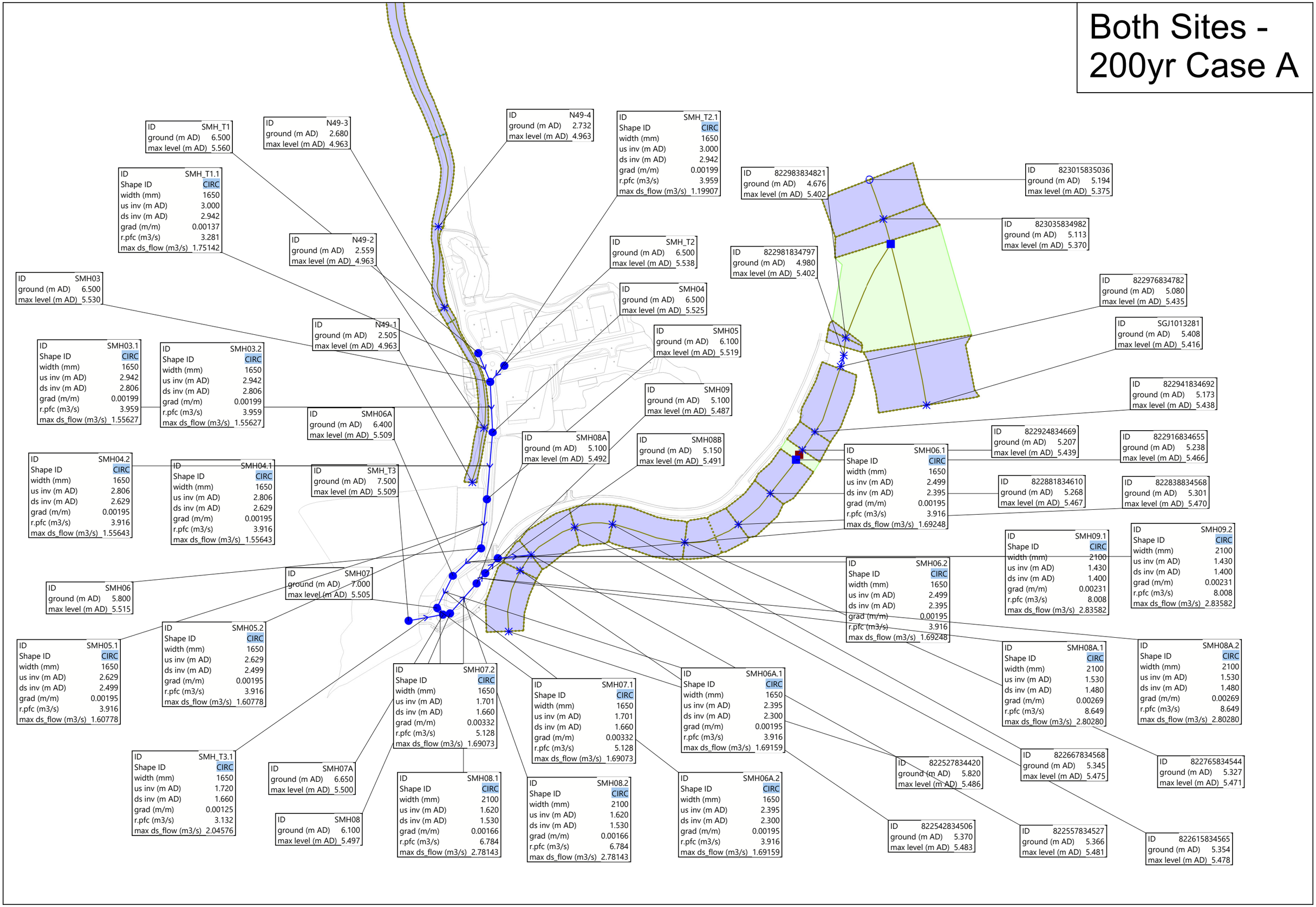
ID	822765834544
ground (m AD)	5.327
max level (m AD)	5.463

ID	822542834506
ground (m AD)	5.370
max level (m AD)	5.474

ID	822557834527
ground (m AD)	5.366
max level (m AD)	5.473

ID	822615834565
ground (m AD)	5.354
max level (m AD)	5.470

Both Sites - 200yr Case A



Both Sites - 200yr Case B

ID	SMH_T1
ground (m AD)	6.500
max level (m AD)	6.322

ID	N49-3
ground (m AD)	2.680
max level (m AD)	6.520

ID	N49-4
ground (m AD)	2.732
max level (m AD)	6.301

ID	SMH_T2.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.00386

ID	SMH_T1.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00137
r.pfc (m3/s)	3.281
max ds_flow (m3/s)	1.48383

ID	N49-2
ground (m AD)	2.559
max level (m AD)	6.754

ID	SMH_T2
ground (m AD)	6.500
max level (m AD)	6.307

ID	SMH03
ground (m AD)	6.500
max level (m AD)	6.299

ID	SMH04
ground (m AD)	6.500
max level (m AD)	6.271

ID	N49-1
ground (m AD)	2.505
max level (m AD)	6.779

ID	SMH05
ground (m AD)	6.100
max level (m AD)	6.243

ID	SMH03.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.31197

ID	SMH03.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.31197

ID	SMH09
ground (m AD)	5.100
max level (m AD)	6.208

ID	SMH06A
ground (m AD)	6.400
max level (m AD)	6.218

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	6.208

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	6.208

ID	SMH04.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.806
ds inv (m AD)	2.629
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.31074

ID	SMH04.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.806
ds inv (m AD)	2.629
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.31074

ID	SMH_T3
ground (m AD)	7.500
max level (m AD)	6.218

ID	SMH06.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.35510

ID	822983834821
ground (m AD)	4.676
max level (m AD)	6.160

ID	823015835036
ground (m AD)	5.194
max level (m AD)	6.148

ID	823035834982
ground (m AD)	5.113
max level (m AD)	6.146

ID	822981834797
ground (m AD)	4.980
max level (m AD)	6.161

ID	822976834782
ground (m AD)	5.080
max level (m AD)	6.183

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	6.169

ID	822941834692
ground (m AD)	5.173
max level (m AD)	6.185

ID	822924834669
ground (m AD)	5.207
max level (m AD)	6.185

ID	822916834655
ground (m AD)	5.238
max level (m AD)	6.199

ID	822881834610
ground (m AD)	5.268
max level (m AD)	6.199

ID	822838834568
ground (m AD)	5.301
max level (m AD)	6.200

ID	SMH09.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	8.008
max ds_flow (m3/s)	2.21641

ID	SMH09.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	8.008
max ds_flow (m3/s)	2.21641

ID	SMH07
ground (m AD)	7.000
max level (m AD)	6.216

ID	SMH06.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.35510

ID	SMH06
ground (m AD)	5.800
max level (m AD)	6.221

ID	SMH05.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.38362

ID	SMH05.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.38362

ID	SMH07.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.35733

ID	SMH07.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.35733

ID	SMH06A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.35764

ID	SMH08A.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	8.649
max ds_flow (m3/s)	-1.64606

ID	SMH08A.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	8.649
max ds_flow (m3/s)	-1.64606

ID	SMH_T3.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.720
ds inv (m AD)	1.660
grad (m/m)	0.00125
r.pfc (m3/s)	3.132
max ds_flow (m3/s)	1.72972

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	6.213

ID	SMH08.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	6.784
max ds_flow (m3/s)	2.31337

ID	SMH08.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	6.784
max ds_flow (m3/s)	2.31337

ID	SMH06A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.35764

ID	SMH08
ground (m AD)	6.100
max level (m AD)	6.212

ID	822527834420
ground (m AD)	5.820
max level (m AD)	6.207

ID	822667834568
ground (m AD)	5.345
max level (m AD)	6.202

ID	822765834544
ground (m AD)	5.327
max level (m AD)	6.201

ID	822542834506
ground (m AD)	5.370
max level (m AD)	6.206

ID	822557834527
ground (m AD)	5.366
max level (m AD)	6.205

ID	822615834565
ground (m AD)	5.354
max level (m AD)	6.204

The Proposed public and private housing developments under Land Sharing Pilot Scheme, Tung Shing Lei, Yuen Long

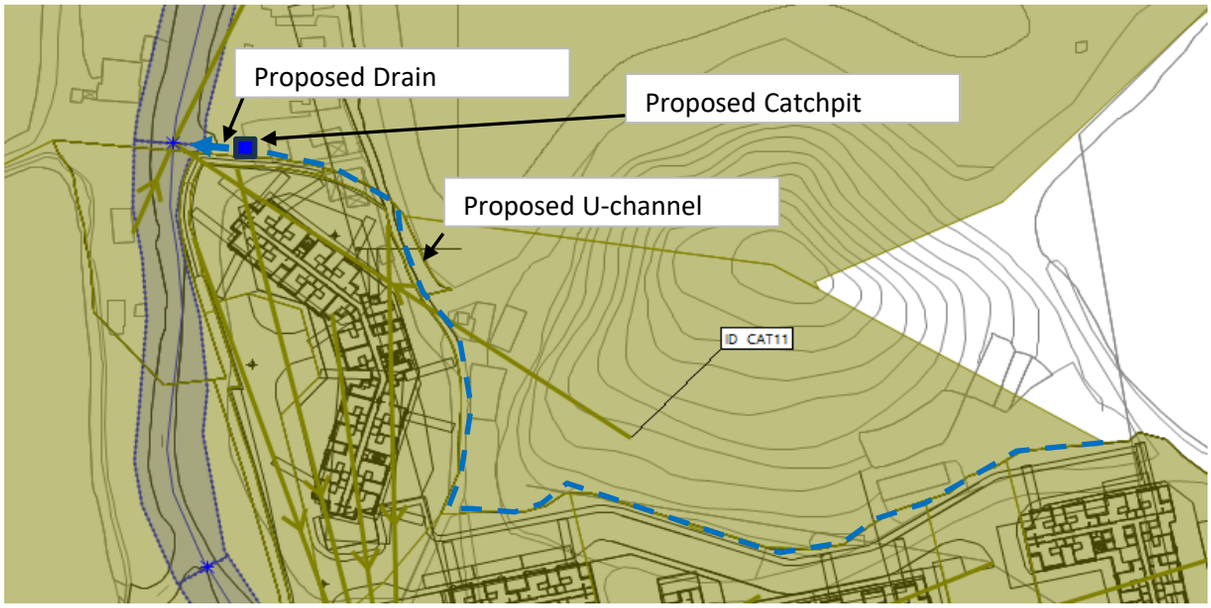
Hydraulic Check for Proposed Drainage System adjacent to Site (CAT11)

Design Parameters				
Design storm		50	year return period	(Yuen Long Area)
Storm constants	a	451.3		
	b	2.46		
	c	0.337		
Highest Point	=	26	mPD	
Lowest Point (Inlet)	=	2.5	mPD	
Average Slope	H	7.83	m/100m	
Length of flow	L	300	m	
Inlet time $t_0=0.14465L/H^{0.2}A^{0.1}$	t_0	11.65	min	(Part of Sub-catchment NSW_191_5B)
Catchment area	A_P	8400	m^2	
Catchment area (Paved)	A_{paved}	0	m^2	(C = 0.9)
Catchment area (Unpaved)	$A_{unpaved}$	8400	m^2	(C = 0.3)
Runoff coef.	C_P	0.30		(Weighted C Value)
Peak Runoff				
Time of concentration	t_c	=	t_0	
		=	11.65	min
Inetnsity	i	=	$a / (t_c + b)^c$	
		=	184.97	mm/hr
Peak runoff	Q_p	=	0.278 C i A	
		=	**0.130**	m^3/s
with 28.1% increase by Climate Change		=	**0.166**	m^3/s
Hydraulic Capacity of Proposed Surface Channel (Manning Equation)				
Size	W	=	500	mm
	D	=	500	mm
Area	A	=	0.223	m^2
Wetted Perimeter	P	=	1.285	m
Hydraulic Radius	R	=	0.174	m
Slope [Decimal]	s	=	0.004	(1:250)
Manning's Roughness	n	=	0.016	For Fair Concrete Channel
Full Flow Velocity	v	=	1.230	m/s
Full Flow Discharge	Q	=	0.275	m^3/s
10% reduction in flow area		=	**0.247**	m^3/s
		>	Peak runoff Q_p	**OK**

The Proposed public and private housing developments under Land Sharing Pilot Scheme, Tung Shing Lei, Yuen Long

Hydraulic Check for Proposed Drainage System adjacent to Site (CAT11)

Hydraulic Capacity of Proposed Drains (Colebrook-White Equation)					
Surface roughness	k_s		0.3	mm	PVC Lined Concrete Pipe (Slimed)
kinematic viscosity	v		1.14	mm^2/s	
Frictional gradient	S_f	1 in	250		
Trial pipe size	D		=	450	mm
Hydraulic radius	R = D/4		=	0.1125	m
Mean velocity (Colebrook-White)		$\bar{V}$	=	$-\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R}+\frac{1.255v}{R\sqrt{(32gRS_f)}}\right]$	
			=	1.38	m/s
Capacity provided		Q	=	V x Cross Section Area of Drain	
			=	**0.219**	m^3/s
10% reduction in flow area			=	**0.197**	m^3/s
			>	Peak runoff Q_p	**OK**



The Proposed public and private housing developments under Land Sharing Pilot Scheme, Tung Shing Lei, Yuen Long

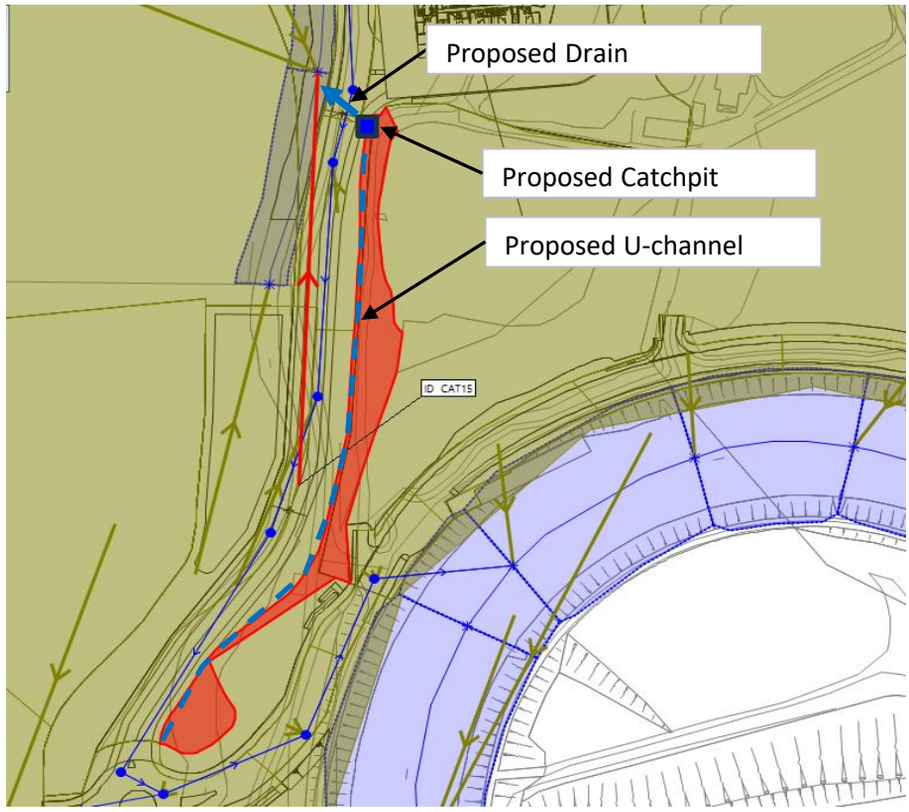
Hydraulic Check for Proposed Drainage System adjacent to Site (CAT15)

Design Parameters				
Design storm		50	year return period	(Yuen Long Area)
Storm constants	a	451.3		
	b	2.46		
	c	0.337		
Highest Point	=	4	mPD	
Lowest Point (Inlet)	=	3.5	mPD	
Average Slope	H	0.25	m/100m	
Length of flow	L	200	m	
Inlet time $t_0=0.14465L/H^{0.2}A^{0.1}$	t_0	17.72	min	(Part of Sub-catchment NSW_191_5B)
Catchment area	A_P	2150	m^2	
Catchment area (Paved)	A_{paved}	0	m^2	(C = 0.9)
Catchment area (Unpaved)	$A_{unpaved}$	2150	m^2	(C = 0.3)
Runoff coef.	C_P	0.30		(Weighted C Value)
Peak Runoff				
Time of concentration	t_c	=	t_0	
		=	17.72	min
Inetnsity	i	=	$a / (t_c + b)^c$	
		=	163.94	mm/hr
Peak runoff	Q_p	=	0.278 C i A	
		=	**0.029**	m^3/s
with 28.1% increase by Climate Change		=	**0.038**	m^3/s
Hydraulic Capacity of Proposed Surface Channel (Manning Equation)				
Size	W	=	300	mm
	D	=	300	mm
Area	A	=	0.080	m^2
Wetted Perimeter	P	=	0.771	m
Hydraulic Radius	R	=	0.104	m
Slope [Decimal]	s	=	0.004	(1:250)
Manning's Roughness	n	=	0.016	For Fair Concrete Channel
Full Flow Velocity	v	=	0.875	m/s
Full Flow Discharge	Q	=	0.070	m^3/s
10% reduction in flow area		=	**0.063**	m^3/s
		>	Peak runoff Q_p	**OK**

The Proposed public and private housing developments under Land Sharing Pilot Scheme, Tung Shing Lei, Yuen Long

Hydraulic Check for Proposed Drainage System adjacent to Site (CAT15)

Hydraulic Capacity of Proposed Drains (Colebrook-White Equation)					
Surface roughness	k_s		0.3	mm	PVC Lined Concrete Pipe (Slimed)
kinematic viscosity	v		1.14	mm^2/s	
Frictional gradient	S_f	1 in	250		
Trial pipe size	D		=	300	mm
Hydraulic radius	R = D/4		=	0.075	m
Mean velocity (Colebrook-White)		$\bar{V}$	=	$-\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R}+\frac{1.255v}{R\sqrt{(32gRS_f)}}\right]$	
			=	1.07	m/s
Capacity provided		Q	=	V x Cross Section Area of Drain	
			=	**0.075**	m^3/s
10% reduction in flow area			=	**0.068**	m^3/s
			>	Peak runoff Q_p	**OK**



Yuen Long Bypass Floodway

Legend (Flood Depth) (mm)

MAXHAZDEPT

- 0.001 - 0.300
- 0.301 - 0.600
- 0.601 - 0.900
- 0.901 - 1.200
- >1.200

Title	Appendix	
Flood Extent Map (Existing) 50yr	FEM_01	0 15 30 60 Meters

Yuen Long Bypass Floodway

Legend (Flood Depth) (mm)

MAXHAZDEPT

- 0.001 - 0.300
- 0.301 - 0.600
- 0.601 - 0.900
- 0.901 - 1.200
- >1.200

Title	Appendix	
Flood Extent Map (Both Site) 50yr	FEM_02	0 15 30 60 Meters

Appendix F

Proposed Drainage Works

Proposed 1:250 450mm Drain

CP-07A
GL: 3.7mPD

Proposed 1:250 500mm U-channel

SMH_T1
GL: 6.5mPD

SMH_T2
GL: 6.5mPD

SMH03
GL: 6.5mPD

N-49 Channel to be maintained

SMH04
GL: 6.5mPD

Proposed 1:250 300 Drain

CP-11A
GL: 4mPD

Proposed 1:250 300mm U-channel

SMH05
GL: 6.1mPD

Yuen Long Bypass Floodway

SMH06
GL: 5.8mPD

SMH09
GL: 5.1mPD

SMH08B
GL: 5.15mPD

Twin 2100mm Drain Connect
to Yuen Long Bypass Floodway
with Outfall

SMH06A
GL: 6.4mPD

SMH08A
GL: 5.1mPD

SMH07
GL: 7mPD

SMH08
GL: 6.1mPD

SMH_T3
GL: 7.5mPD

SMH07A
GL: 6.65mPD

Legend

- Node
- Conduit

Title	Appendix	
Proposed Drainage Works	F	0 10 20 40 Meters

Summary of Proposed Drainage Works

Manhole Schedule

Manhole No.	Ground Level (mPD)	TYPE
SMH03	6.5	Manhole
SMH04	6.5	Manhole
SMH05	6.2	Manhole
SMH06	6	Manhole
SMH06A	5.8	Manhole
SMH07	7	Manhole
SMH07A	6.65	Manhole
SMH08	6.1	Manhole
SMH08A	5.1	Manhole
SMH08B	5.15	Manhole
SMH09	5.1	Manhole
SMH_T1	6.5	Manhole
SMH_T2	6.5	Manhole
SMH_T3	7.5	Manhole
CP-07A	3.7	Catchpit
CP-11A	4	Catchpit

Pipeline Schedule

Upstream Manhole	Downstream Manhole	Pipe Diameter (mm)	US invert level (mPD)	DS invert level (mPD)	Material
SMH03	SMH04	2 x 1650	2.942	2.806	Concrete Pipe with UPVC Lining
SMH04	SMH05	2 x 1650	2.806	2.629	Concrete Pipe with UPVC Lining
SMH05	SMH06	2 x 1650	2.629	2.499	Concrete Pipe with UPVC Lining
SMH06	SMH06A	2 x 1650	2.499	2.395	Concrete Pipe with UPVC Lining
SMH06A	SMH07	2 x 1650	2.395	2.3	Concrete Pipe with UPVC Lining
SMH07	SMH07A	2 x 1650	1.701	1.66	Concrete Pipe with UPVC Lining
SMH07A	SMH08	2 x 2100	1.66	1.62	Concrete Pipe with UPVC Lining
SMH08	SMH08A	2 x 2100	1.62	1.53	Concrete Pipe with UPVC Lining
SMH08A	SMH08B	2 x 2100	1.53	1.48	Concrete Pipe with UPVC Lining
SMH08B	SMH09	2 x 2100	1.48	1.43	Concrete Pipe with UPVC Lining
SMH09	Connect to YLBF (Adjust to Node 822557834527)	2 x 2100	1.43	1.4	Concrete Pipe with UPVC Lining
SMH_T1	SMH03	1650	3	2.942	Concrete Pipe with UPVC Lining
SMH_T2	SMH03	1650	3	2.942	Concrete Pipe with UPVC Lining
SMH_T3	SMH08	1650	1.72	1.66	Concrete Pipe with UPVC Lining
CP-07A	Connect to N-49 Channel (adjacent to Node N49-4)	450	1.18	1.1	Concrete Pipe with UPVC Lining
CP-11A	Connect to N-49 Channel (adjacent to Node N49-2)	300	1.38	1.3	Concrete Pipe with UPVC Lining

U-channel Schedule

Upstream Catchpit	Downstream Catchpit	U channel (mm)	US invert level (mPD)	DS invert level (mPD)	Material
-	CP-07A	500	2.308	1.18	Concrete
-	CP-11A	300	2.26	1.38	Concrete

Appendix G

Result of Hydraulic Model for Approved Residential Development (A/YL-NSW/274) Only and LSPS Only

A/YL-NSW/274 Site Only - 50yr Case A

ID	N49-3
ground (m AD)	2.680
max level (m AD)	4.841

ID	N49-4
ground (m AD)	2.732
max level (m AD)	4.841

ID	N49-2
ground (m AD)	2.559
max level (m AD)	4.841

ID	N49-1
ground (m AD)	2.505
max level (m AD)	4.841

ID	SMH_T3
ground (m AD)	7.500
max level (m AD)	5.326

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	5.315

ID	SMH09
ground (m AD)	5.100
max level (m AD)	5.313

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	5.315

ID	822983834821
ground (m AD)	4.676
max level (m AD)	5.232

ID	823015835036
ground (m AD)	5.194
max level (m AD)	5.211

ID	823035834982
ground (m AD)	5.113
max level (m AD)	5.208

ID	822981834797
ground (m AD)	4.980
max level (m AD)	5.232

ID	822976834782
ground (m AD)	5.080
max level (m AD)	5.264

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	5.243

ID	822941834692
ground (m AD)	5.173
max level (m AD)	5.267

ID	822924834669
ground (m AD)	5.207
max level (m AD)	5.267

ID	822916834655
ground (m AD)	5.238
max level (m AD)	5.294

ID	822881834610
ground (m AD)	5.268
max level (m AD)	5.296

ID	822838834568
ground (m AD)	5.301
max level (m AD)	5.298

ID	SMH09.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	8.008
max ds_flow (m3/s)	2.17217

ID	SMH08A.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	8.649
max ds_flow (m3/s)	2.10896

ID	SMH_T3.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.720
ds inv (m AD)	1.660
grad (m/m)	0.00125
r.pfc (m3/s)	3.132
max ds_flow (m3/s)	1.93644

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	5.319

ID	SMH08
ground (m AD)	6.100
max level (m AD)	5.318

ID	SMH08.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	6.784
max ds_flow (m3/s)	2.06705

ID	822527834420
ground (m AD)	5.820
max level (m AD)	5.315

ID	822667834568
ground (m AD)	5.345
max level (m AD)	5.303

ID	822765834544
ground (m AD)	5.327
max level (m AD)	5.300

ID	822542834506
ground (m AD)	5.370
max level (m AD)	5.312

ID	822557834527
ground (m AD)	5.366
max level (m AD)	5.310

ID	822615834565
ground (m AD)	5.354
max level (m AD)	5.307

A/YL-NSW/274 Site Only - 50yr Case B

ID	N49-3
ground (m AD)	2.680
max level (m AD)	5.271

ID	N49-4
ground (m AD)	2.732
max level (m AD)	5.216

ID	N49-2
ground (m AD)	2.559
max level (m AD)	5.330

ID	N49-1
ground (m AD)	2.505
max level (m AD)	5.336

ID	SMH_T3
ground (m AD)	7.500
max level (m AD)	5.486

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	5.478

ID	SMH09
ground (m AD)	5.100
max level (m AD)	5.474

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	5.478

ID	822983834821
ground (m AD)	4.676
max level (m AD)	5.407

ID	823015835036
ground (m AD)	5.194
max level (m AD)	5.392

ID	823035834982
ground (m AD)	5.113
max level (m AD)	5.391

ID	822981834797
ground (m AD)	4.980
max level (m AD)	5.407

ID	822976834782
ground (m AD)	5.080
max level (m AD)	5.431

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	5.414

ID	822941834692
ground (m AD)	5.173
max level (m AD)	5.434

ID	822924834669
ground (m AD)	5.207
max level (m AD)	5.435

ID	822916834655
ground (m AD)	5.238
max level (m AD)	5.455

ID	822881834610
ground (m AD)	5.268
max level (m AD)	5.457

ID	822838834568
ground (m AD)	5.301
max level (m AD)	5.460

ID	SMH09.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	8.008
max ds_flow (m3/s)	1.92729

ID	SMH08A.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	8.649
max ds_flow (m3/s)	1.88636

ID	SMH_T3.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.720
ds inv (m AD)	1.660
grad (m/m)	0.00125
r.pfc (m3/s)	3.132
max ds_flow (m3/s)	1.73031

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	5.481

ID	SMH08
ground (m AD)	6.100
max level (m AD)	5.480

ID	SMH08.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	6.784
max ds_flow (m3/s)	1.84915

ID	822527834420
ground (m AD)	5.820
max level (m AD)	5.477

ID	822667834568
ground (m AD)	5.345
max level (m AD)	5.466

ID	822765834544
ground (m AD)	5.327
max level (m AD)	5.462

ID	822542834506
ground (m AD)	5.370
max level (m AD)	5.474

ID	822557834527
ground (m AD)	5.366
max level (m AD)	5.472

ID	822615834565
ground (m AD)	5.354
max level (m AD)	5.469

A/YL-NSW/274 Site Only - 200yr Case A

ID	N49-3
ground (m AD)	2.680
max level (m AD)	4.963

ID	N49-4
ground (m AD)	2.732
max level (m AD)	4.963

ID	N49-2
ground (m AD)	2.559
max level (m AD)	4.963

ID	N49-1
ground (m AD)	2.505
max level (m AD)	4.963

ID	SMH_T3
ground (m AD)	7.500
max level (m AD)	5.502

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	5.488

ID	SMH09
ground (m AD)	5.100
max level (m AD)	5.484

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	5.488

ID	822983834821
ground (m AD)	4.676
max level (m AD)	5.402

ID	823015835036
ground (m AD)	5.194
max level (m AD)	5.375

ID	823035834982
ground (m AD)	5.113
max level (m AD)	5.370

ID	822981834797
ground (m AD)	4.980
max level (m AD)	5.402

ID	822976834782
ground (m AD)	5.080
max level (m AD)	5.435

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	5.416

ID	822941834692
ground (m AD)	5.173
max level (m AD)	5.438

ID	822924834669
ground (m AD)	5.207
max level (m AD)	5.438

ID	822916834655
ground (m AD)	5.238
max level (m AD)	5.465

ID	822881834610
ground (m AD)	5.268
max level (m AD)	5.466

ID	822838834568
ground (m AD)	5.301
max level (m AD)	5.468

ID	SMH09.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	8.008
max ds_flow (m3/s)	2.29302

ID	SMH08A.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	8.649
max ds_flow (m3/s)	2.22684

ID	SMH_T3.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.720
ds inv (m AD)	1.660
grad (m/m)	0.00125
r.pfc (m3/s)	3.132
max ds_flow (m3/s)	2.04613

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	5.493

ID	SMH08
ground (m AD)	6.100
max level (m AD)	5.491

ID	SMH08.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	6.784
max ds_flow (m3/s)	2.18316

ID	822527834420
ground (m AD)	5.820
max level (m AD)	5.484

ID	822667834568
ground (m AD)	5.345
max level (m AD)	5.473

ID	822765834544
ground (m AD)	5.327
max level (m AD)	5.470

ID	822542834506
ground (m AD)	5.370
max level (m AD)	5.481

ID	822557834527
ground (m AD)	5.366
max level (m AD)	5.480

ID	822615834565
ground (m AD)	5.354
max level (m AD)	5.477

A/YL-NSW/274 Site Only - 200yr Case B

ID	N49-3
ground (m AD)	2.680
max level (m AD)	6.520

ID	N49-4
ground (m AD)	2.732
max level (m AD)	6.301

ID	N49-2
ground (m AD)	2.559
max level (m AD)	6.754

ID	N49-1
ground (m AD)	2.505
max level (m AD)	6.779

ID	SMH_T3
ground (m AD)	7.500
max level (m AD)	6.215

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	6.205

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	6.206

ID	SMH09
ground (m AD)	5.100
max level (m AD)	6.206

ID	822983834821
ground (m AD)	4.676
max level (m AD)	6.160

ID	823015835036
ground (m AD)	5.194
max level (m AD)	6.148

ID	823035834982
ground (m AD)	5.113
max level (m AD)	6.146

ID	822981834797
ground (m AD)	4.980
max level (m AD)	6.160

ID	822976834782
ground (m AD)	5.080
max level (m AD)	6.183

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	6.169

ID	822941834692
ground (m AD)	5.173
max level (m AD)	6.184

ID	822924834669
ground (m AD)	5.207
max level (m AD)	6.184

ID	822916834655
ground (m AD)	5.238
max level (m AD)	6.198

ID	822881834610
ground (m AD)	5.268
max level (m AD)	6.199

ID	822838834568
ground (m AD)	5.301
max level (m AD)	6.200

ID	SMH09.2
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	8.008
max ds_flow (m3/s)	-2.67182

ID	SMH08A.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	8.649
max ds_flow (m3/s)	-2.12356

ID	SMH_T3.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.720
ds inv (m AD)	1.660
grad (m/m)	0.00125
r.pfc (m3/s)	3.132
max ds_flow (m3/s)	1.73044

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	6.210

ID	SMH08
ground (m AD)	6.100
max level (m AD)	6.210

ID	SMH08.1
Shape ID	CIRC
width (mm)	2100
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	6.784
max ds_flow (m3/s)	1.98840

ID	822527834420
ground (m AD)	5.820
max level (m AD)	6.207

ID	822667834568
ground (m AD)	5.345
max level (m AD)	6.202

ID	822765834544
ground (m AD)	5.327
max level (m AD)	6.200

ID	822542834506
ground (m AD)	5.370
max level (m AD)	6.205

ID	822557834527
ground (m AD)	5.366
max level (m AD)	6.205

ID	822615834565
ground (m AD)	5.354
max level (m AD)	6.203

PnP Site only - 50yr Case A

ID	SMH_T1
ground (m AD)	6.500
max level (m AD)	5.362

ID	N49-3
ground (m AD)	2.680
max level (m AD)	4.841

ID	N49-4
ground (m AD)	2.732
max level (m AD)	4.841

ID	SMH_T2.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.13068

ID	SMH_T1.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00137
r.pfc (m3/s)	3.281
max ds_flow (m3/s)	1.65939

ID	N49-2
ground (m AD)	2.559
max level (m AD)	4.841

ID	SMH_T2
ground (m AD)	6.500
max level (m AD)	5.348

ID	822983834821
ground (m AD)	4.676
max level (m AD)	5.232

ID	823015835036
ground (m AD)	5.194
max level (m AD)	5.211

ID	823035834982
ground (m AD)	5.113
max level (m AD)	5.208

ID	822981834797
ground (m AD)	4.980
max level (m AD)	5.232

ID	SMH03
ground (m AD)	6.500
max level (m AD)	5.347

ID	SMH04
ground (m AD)	6.500
max level (m AD)	5.347

ID	822976834782
ground (m AD)	5.080
max level (m AD)	5.264

ID	N49-1
ground (m AD)	2.505
max level (m AD)	4.841

ID	SMH05
ground (m AD)	6.100
max level (m AD)	5.338

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	5.243

ID	SMH03.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	0.00391

ID	SMH03.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	0.00391

ID	SMH09
ground (m AD)	5.100
max level (m AD)	5.314

ID	822941834692
ground (m AD)	5.173
max level (m AD)	5.267

ID	SMH06A
ground (m AD)	6.400
max level (m AD)	5.331

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	5.318

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	5.316

ID	822924834669
ground (m AD)	5.207
max level (m AD)	5.267

ID	822916834655
ground (m AD)	5.238
max level (m AD)	5.295

ID	SMH06.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.60171

ID	822881834610
ground (m AD)	5.268
max level (m AD)	5.296

ID	822838834568
ground (m AD)	5.301
max level (m AD)	5.299

ID	SMH09.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	4.268
max ds_flow (m3/s)	1.71847

ID	SMH09.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	4.268
max ds_flow (m3/s)	1.71847

ID	SMH06
ground (m AD)	5.800
max level (m AD)	5.335

ID	SMH07
ground (m AD)	7.000
max level (m AD)	5.327

ID	SMH06.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.60171

ID	SMH05.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.52112

ID	SMH05.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.52112

ID	SMH07.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.59995

ID	SMH07.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.59995

ID	SMH06A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.60080

ID	SMH08A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	4.611
max ds_flow (m3/s)	1.68626

ID	SMH08A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	4.611
max ds_flow (m3/s)	1.68626

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	5.324

ID	SMH08.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	3.615
max ds_flow (m3/s)	1.66521

ID	SMH08.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	3.615
max ds_flow (m3/s)	1.66521

ID	SMH06A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.60080

ID	822527834420
ground (m AD)	5.820
max level (m AD)	5.315

ID	822667834568
ground (m AD)	5.345
max level (m AD)	5.304

ID	822765834544
ground (m AD)	5.327
max level (m AD)	5.301

ID	SMH08
ground (m AD)	6.100
max level (m AD)	5.322

ID	822542834506
ground (m AD)	5.370
max level (m AD)	5.312

ID	822557834527
ground (m AD)	5.366
max level (m AD)	5.311

ID	822615834565
ground (m AD)	5.354
max level (m AD)	5.308

PnP Site only - 50yr Case B

ID	SMH_T1
ground (m AD)	6.500
max level (m AD)	5.558

ID	N49-3
ground (m AD)	2.680
max level (m AD)	5.271

ID	N49-4
ground (m AD)	2.732
max level (m AD)	5.216

ID	SMH_T2.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.00511

ID	SMH_T1.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00137
r.pfc (m3/s)	3.281
max ds_flow (m3/s)	1.48524

ID	N49-2
ground (m AD)	2.559
max level (m AD)	5.330

ID	SMH_T2
ground (m AD)	6.500
max level (m AD)	5.540

ID	822983834821
ground (m AD)	4.676
max level (m AD)	5.407

ID	823015835036
ground (m AD)	5.194
max level (m AD)	5.392

ID	823035834982
ground (m AD)	5.113
max level (m AD)	5.391

ID	822981834797
ground (m AD)	4.980
max level (m AD)	5.407

ID	SMH03
ground (m AD)	6.500
max level (m AD)	5.530

ID	SMH04
ground (m AD)	6.500
max level (m AD)	5.530

ID	822976834782
ground (m AD)	5.080
max level (m AD)	5.431

ID	N49-1
ground (m AD)	2.505
max level (m AD)	5.336

ID	SMH05
ground (m AD)	6.100
max level (m AD)	5.495

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	5.414

ID	SMH03.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	0.00371

ID	SMH03.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	0.00371

ID	SMH09
ground (m AD)	5.100
max level (m AD)	5.476

ID	822941834692
ground (m AD)	5.173
max level (m AD)	5.435

ID	SMH06A
ground (m AD)	6.400
max level (m AD)	5.489

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	5.480

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	5.479

ID	822924834669
ground (m AD)	5.207
max level (m AD)	5.435

ID	822916834655
ground (m AD)	5.238
max level (m AD)	5.455

ID	SMH06.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.43345

ID	822881834610
ground (m AD)	5.268
max level (m AD)	5.457

ID	822838834568
ground (m AD)	5.301
max level (m AD)	5.460

ID	SMH09.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	4.268
max ds_flow (m3/s)	1.52987

ID	SMH09.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	4.268
max ds_flow (m3/s)	1.52987

ID	SMH06.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.43345

ID	SMH07
ground (m AD)	7.000
max level (m AD)	5.487

ID	SMH06
ground (m AD)	5.800
max level (m AD)	5.493

ID	SMH05.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.36039

ID	SMH05.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.36039

ID	SMH08A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	4.611
max ds_flow (m3/s)	1.51033

ID	SMH08A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	4.611
max ds_flow (m3/s)	1.51033

ID	SMH07.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.43234

ID	SMH07.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.43234

ID	SMH06A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.43291

ID	822527834420
ground (m AD)	5.820
max level (m AD)	5.477

ID	822667834568
ground (m AD)	5.345
max level (m AD)	5.466

ID	822765834544
ground (m AD)	5.327
max level (m AD)	5.462

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	5.484

ID	SMH08.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	3.615
max ds_flow (m3/s)	1.49176

ID	SMH08.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	3.615
max ds_flow (m3/s)	1.49176

ID	SMH06A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.43291

ID	822542834506
ground (m AD)	5.370
max level (m AD)	5.474

ID	822557834527
ground (m AD)	5.366
max level (m AD)	5.473

ID	822615834565
ground (m AD)	5.354
max level (m AD)	5.470

ID	SMH08
ground (m AD)	6.100
max level (m AD)	5.483

PnP Site only - 200yr Case A

ID	SMH_T1
ground (m AD)	6.500
max level (m AD)	5.538

ID	N49-3
ground (m AD)	2.680
max level (m AD)	4.963

ID	N49-4
ground (m AD)	2.732
max level (m AD)	4.963

ID	SMH_T2.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.19904

ID	SMH_T1.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00137
r.pfc (m3/s)	3.281
max ds_flow (m3/s)	1.75140

ID	N49-2
ground (m AD)	2.559
max level (m AD)	4.964

ID	SMH_T2
ground (m AD)	6.500
max level (m AD)	5.530

ID	822983834821
ground (m AD)	4.676
max level (m AD)	5.402

ID	823015835036
ground (m AD)	5.194
max level (m AD)	5.375

ID	823035834982
ground (m AD)	5.113
max level (m AD)	5.370

ID	822981834797
ground (m AD)	4.980
max level (m AD)	5.402

ID	SMH03
ground (m AD)	6.500
max level (m AD)	5.528

ID	SMH04
ground (m AD)	6.500
max level (m AD)	5.528

ID	822976834782
ground (m AD)	5.080
max level (m AD)	5.435

ID	N49-1
ground (m AD)	2.505
max level (m AD)	4.964

ID	SMH05
ground (m AD)	6.100
max level (m AD)	5.517

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	5.416

ID	SMH03.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	0.00396

ID	SMH03.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	0.00396

ID	SMH09
ground (m AD)	5.100
max level (m AD)	5.485

ID	822941834692
ground (m AD)	5.173
max level (m AD)	5.438

ID	SMH06A
ground (m AD)	6.400
max level (m AD)	5.507

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	5.491

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	5.490

ID	822924834669
ground (m AD)	5.207
max level (m AD)	5.438

ID	822916834655
ground (m AD)	5.238
max level (m AD)	5.465

ID	SMH06.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.69291

ID	822881834610
ground (m AD)	5.268
max level (m AD)	5.467

ID	822838834568
ground (m AD)	5.301
max level (m AD)	5.469

ID	SMH09.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	4.268
max ds_flow (m3/s)	1.81535

ID	SMH09.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	4.268
max ds_flow (m3/s)	1.81535

ID	SMH06.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.69291

ID	SMH07
ground (m AD)	7.000
max level (m AD)	5.503

ID	SMH06
ground (m AD)	5.800
max level (m AD)	5.513

ID	SMH05.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.60819

ID	SMH05.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.60819

ID	SMH08A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	4.611
max ds_flow (m3/s)	1.78168

ID	SMH08A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	4.611
max ds_flow (m3/s)	1.78168

ID	SMH07.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.69125

ID	SMH07.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.69125

ID	SMH06A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.69206

ID	822527834420
ground (m AD)	5.820
max level (m AD)	5.485

ID	822667834568
ground (m AD)	5.345
max level (m AD)	5.474

ID	822765834544
ground (m AD)	5.327
max level (m AD)	5.471

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	5.498

ID	SMH08.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	3.615
max ds_flow (m3/s)	1.75980

ID	SMH08.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	3.615
max ds_flow (m3/s)	1.75980

ID	SMH06A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.69206

ID	SMH08
ground (m AD)	6.100
max level (m AD)	5.496

ID	822542834506
ground (m AD)	5.370
max level (m AD)	5.482

ID	822557834527
ground (m AD)	5.366
max level (m AD)	5.481

ID	822615834565
ground (m AD)	5.354
max level (m AD)	5.478

PnP Site only - 200yr Case B

ID	SMH_T1
ground (m AD)	6.500
max level (m AD)	6.318

ID	N49-3
ground (m AD)	2.680
max level (m AD)	6.520

ID	N49-4
ground (m AD)	2.732
max level (m AD)	6.301

ID	SMH_T2.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	1.00383

ID	SMH_T1.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	3.000
ds inv (m AD)	2.942
grad (m/m)	0.00137
r.pfc (m3/s)	3.281
max ds_flow (m3/s)	1.48380

ID	N49-2
ground (m AD)	2.559
max level (m AD)	6.754

ID	SMH_T2
ground (m AD)	6.500
max level (m AD)	6.303

ID	822983834821
ground (m AD)	4.676
max level (m AD)	6.160

ID	823015835036
ground (m AD)	5.194
max level (m AD)	6.148

ID	823035834982
ground (m AD)	5.113
max level (m AD)	6.146

ID	822981834797
ground (m AD)	4.980
max level (m AD)	6.161

ID	SMH03
ground (m AD)	6.500
max level (m AD)	6.295

ID	SMH04
ground (m AD)	6.500
max level (m AD)	6.295

ID	822976834782
ground (m AD)	5.080
max level (m AD)	6.183

ID	N49-1
ground (m AD)	2.505
max level (m AD)	6.779

ID	SMH05
ground (m AD)	6.100
max level (m AD)	6.241

ID	SGJ1013281
ground (m AD)	5.408
max level (m AD)	6.169

ID	SMH03.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	0.00934

ID	SMH03.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.942
ds inv (m AD)	2.806
grad (m/m)	0.00199
r.pfc (m3/s)	3.959
max ds_flow (m3/s)	0.00934

ID	SMH09
ground (m AD)	5.100
max level (m AD)	6.208

ID	822941834692
ground (m AD)	5.173
max level (m AD)	6.184

ID	SMH06A
ground (m AD)	6.400
max level (m AD)	6.219

ID	SMH08A
ground (m AD)	5.100
max level (m AD)	6.207

ID	SMH08B
ground (m AD)	5.150
max level (m AD)	6.208

ID	822924834669
ground (m AD)	5.207
max level (m AD)	6.185

ID	822916834655
ground (m AD)	5.238
max level (m AD)	6.199

ID	SMH06.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.33313

ID	822881834610
ground (m AD)	5.268
max level (m AD)	6.199

ID	822838834568
ground (m AD)	5.301
max level (m AD)	6.200

ID	SMH09.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	4.268
max ds_flow (m3/s)	-1.40518

ID	SMH09.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.430
ds inv (m AD)	1.400
grad (m/m)	0.00231
r.pfc (m3/s)	4.268
max ds_flow (m3/s)	-1.40518

ID	SMH06
ground (m AD)	5.800
max level (m AD)	6.222

ID	SMH07
ground (m AD)	7.000
max level (m AD)	6.217

ID	SMH06.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.499
ds inv (m AD)	2.395
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.33313

ID	SMH08A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	4.611
max ds_flow (m3/s)	-1.07645

ID	SMH08A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.530
ds inv (m AD)	1.480
grad (m/m)	0.00269
r.pfc (m3/s)	4.611
max ds_flow (m3/s)	-1.07645

ID	SMH05.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.39146

ID	SMH05.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.629
ds inv (m AD)	2.499
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.39146

ID	SMH07.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.33480

ID	SMH07.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.701
ds inv (m AD)	1.660
grad (m/m)	0.00332
r.pfc (m3/s)	5.128
max ds_flow (m3/s)	1.33480

ID	SMH06A.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.33529

ID	822527834420
ground (m AD)	5.820
max level (m AD)	6.207

ID	822667834568
ground (m AD)	5.345
max level (m AD)	6.202

ID	822765834544
ground (m AD)	5.327
max level (m AD)	6.201

ID	SMH07A
ground (m AD)	6.650
max level (m AD)	6.215

ID	SMH08.1
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	3.615
max ds_flow (m3/s)	1.46798

ID	SMH08.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	1.620
ds inv (m AD)	1.530
grad (m/m)	0.00166
r.pfc (m3/s)	3.615
max ds_flow (m3/s)	1.46798

ID	SMH06A.2
Shape ID	CIRC
width (mm)	1650
us inv (m AD)	2.395
ds inv (m AD)	2.300
grad (m/m)	0.00195
r.pfc (m3/s)	3.916
max ds_flow (m3/s)	1.33529

ID	822542834506
ground (m AD)	5.370
max level (m AD)	6.206

ID	822557834527
ground (m AD)	5.366
max level (m AD)	6.205

ID	822615834565
ground (m AD)	5.354
max level (m AD)	6.204

ID	SMH08
ground (m AD)	6.100
max level (m AD)	6.213

Appendix G
Revised Sewerage Impact Assessment

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

Sewerage Impact Assessment

April 2024

AECOM Asia Co. Ltd.

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1. INTRODUCTION

1.1 Background

1.1.1 The Application Site is located at various lots in D.D. 115, Tung Shing Lei, Yuen Long. The Application Site is currently zoned "Residential (Group D)" "R(D)" on the approved Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8 and covers a site area of approximately 57,055m^2.

1.1.2 The site location plan for the Proposed Development is shown in **Figure 1.** AECOM Asia Co. Ltd. (AECOM) has been commissioned to carry out a Sewerage Impact Assessment (SIA) to appraise the likely sewerage impact generated by the Proposed Development and provide mitigation measures, if necessary.

1.2 Objective of this Submission

1.2.1 This SIA report aims to assess the existing sewerage system, estimate the sewage flow generated from the Proposed Development, and suggest mitigation measures required to the existing sewerage network.

1.2.2 The main objectives of this assessment include the followings:

- Identify the scope of the development
- Identify the existing and planned sewerage network in the vicinity of the development
- Outline the methodology adopted in this assessment
- Determine the sewage flow of the development
- Recommend mitigation measures or upgrade works where appropriate due to the development.

2. DEVELOPMENT PROPOSAL

2.1 The Proposed Development

2.1.1 The Application Site has an area of approximately 45,676m^2 with a Domestic Floor Area (GFA) of about 143,579m^2. The indicative development schedule is summarized in **Table 1** below. For assessment purpose, person-per-flat is taken as 2.8 for Public Housing and 2.5 for Private Housing. The design year of population intake for both Public Housing and Private Housing is 2031.

Table 1 – Development Schedule

Site Area (m^2)	~ 45,676
Proposed Domestic GFA (m^2)	~ 143,579
Public Housing Portion (m^2)	~ 93,400
Private Housing Portion (m^2)	~ 50,179
No. of Units	3,129
Public Housing Portion(1)	1,868
Private Housing Portion	1,261
Person-per-flat Ratio	
Public Housing Portion	2.8
Private Housing Portion	2.5
Residential Population	8,384
Public Housing Portion(1)	5,231
Private Housing Portion	3,153
GIC GFA (m^2)	~ 4,670
GIC Employee Density (Person/m^2) (2)	0.033
GIC Employees	155
Clubhouse GFA (m^2)	~ 2,250
Clubhouse F&B Employee Density (Person/m^2)(3)	0.051
Clubhouse F&B Employees	23
Clubhouse Personal Service Employee Density (Person/m^2)(2)	0.033
Clubhouse Personal Service Employees	60
Retail GFA (m^2)	~ 2,445
Public Housing Portion (m^2)	~ 1,200
Private Housing Portion (m^2)	~ 1,245
Retail Employee Density (person/m^2)(3)	0.051
Retail Employees	125
Kindergarten GFA (m^2)(4)	1,000
No. of Student	160
No. of Staff and Teacher	11

Remark for Table 1:

(1) As per Housing Department's comment, for Public Housing, 10% increase in the number of units (2,055) and population (5,755) will be included for assessment purpose.

(2) A density of 3.3 employees per 100 m^2 GFA (for Community, Social & Personal Services) is adopted in accordance with the results of the "Commercial and Industrial Floor Space Utilization Survey" conducted by the Planning Departing in 2004/2005.

(3) A density of 5.1 employees per 100 m^2 GFA (for Restaurants, Private Commercial) is adopted in accordance with the results of the "Commercial and Industrial Floor Space Utilization Survey" conducted by the Planning Departing in 2004/2005.

(4) It is anticipated that the kindergarten area is 1,000 m^2. For assessment purpose, 8 classes are assumed in the kindergarten. A maximum of 160 students (max class size 20) and 11 staff and teacher (Staff and teacher to student ratio 1:15) are adopted in accordance with Operation Manual for Pre-primary Institutions published by Education Bureau and Social Welfare Department.

3. SEWERAGE SYSTEM OF THE APPLICATION SITE

3.1 Existing Sewerage System

3.1.1 The Application Site is presently unsewered. The nearest public sewerage network is at Castle Peak Road – Yuen Long collecting sewage from the Au Tau and Shap Pat Heung areas to a sewage pumping station to the south of Pok Oi Hospital namely “Au Tau Sewage Pumping Station” (ATSPS).

3.1.2 The ATSPS currently has a design capacity of approximately 10,700 m^3/day. Sewage collected by the ATSPS will be ultimately discharged to the San Wai Sewage Treatment Works (SWSTW) for treatment and disposal.

4. SEWERAGE IMPACT ASSESSMENT

4.1 Design Assumption

4.1.1 10% increase in design numbers of population had been assumed in the sewage generation estimation for the proposed Public Housing development.

4.1.2 This SIA had been carried out following the assumptions and criteria set out in the “EPD/TP1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning Version 1.0” (GESF), published by Environmental Protection Department (EPD).

4.2 Sewage Flow of Proposed Development

4.2.1 The volume of sewage that will be generated by the Proposed Development is approximately 2,708.4m^3/day (ADWF) upon full occupation including 10% increase in design numbers of population. The sewage discharge is anticipated to be discharge at year 2031 which is same as the population intake year. The design assumptions are presented in **Table 2** below. The detailed estimation is presented in **Appendix A**.

Table 2 - Estimated Sewage Flow

Unit Flow Factor (m^3/head/day)(2)	
Domestic – Public Housing Portion	0.27
Domestic – Private Housing Portion	0.27
GIC	0.28
Clubhouse F&B(3)	1.58
Clubhouse Personal Service	0.28
Retail (3)	1.58
Kindergarten Student	0.04
Kindergarten Staff and Teacher	0.28
Child Care Centre Employees	0.28
Average Dry Weather Flow (ADWF) (m^3/day)	
Domestic – Public `Housing Portion	1,553.58
Domestic – Private Housing Portion	851.31
GIC	43.4
Clubhouse	53.1
Retail	197.5
Kindergarten Student	6.4
Kindergarten Staff and Teacher	3.08
Child Care Centre Employees	0
Total ADWF	2,708.41
Peak Flow	
Peaking Factor (4)	4
Backwash Flow for Swimming Pool	0.0158
Peak Flow (m^3/sec)	0.141

Remark for Table 2:

(1) Refer to Table 1 for the design population calculation.
(2) Unit Flow Factors are extracted from GESF, according to each type of flow.
(3) 20% Clubhouse GFA and 100% Retail GFA are assumed to be for Food & Beverage (F&B) purpose.
(4) According to GESF Table T-5, peaking factor of 4 is appropriate for contributing population ranging from 5,000 – 10,000.

4.3 Proposed Sewerage System

4.3.1 It is proposed that sewage generated from the Proposed Development will be discharged to the ATSPS. The estimated sewage generated from the Proposed Development is 2,708.4m^3/day (ADWF), or a peak flow of 0.141m^3/s with a peaking factor of 4 (for sewer design with population 10,000 – 50,000) including 10% increase in design numbers of population. Assessment of proposed sewerage system is shown in **Appendix B**. The flow is equal to approximately 25.43% of the current capacity of ATSPS. It is envisaged that this small increase will not lead to overloading the ATSPS and the subsequent sewerage network. The assessment on the capacity of Au Tau SPS is including in **Appendix C**.

4.3.2 Sewage generated from the public and private housing site will be discharged to the proposed sewage pumping station by gravity PE sewer sizing DN375. The sewage flow will then be pumped from the proposed pumping station to ATSPS through the proposed 2 nos. of rising mains of Proposed Development (See **Appendix B** for the hydraulic calculations for rising mains). The proposed DN375 gravity PE sewer will be handed over to government for maintenance upon connection of sewer from the public housing site. The design capacity of the proposed sewage pumping station is 2,708.4m^3/day.

4.4 Consideration of Avoiding Emergency Discharge

4.4.1 In the event of emergency, such as power outage or equipment failure, it is essential to provide measures to prevent flooding and deploy tankers to transport away the sewage from proposed SPS to nearby existing sewerage to further increase the buffer time for emergency storage.

4.4.2 In order to minimize the risk of emergency discharge of sewage into the receiving water body, a number of precautionary measures have been taken into account in the design of the SPS. These measures include:

- Provision of dual power supply;
- Provision of standby equipment; and
- Provision of onsite storage of raw sewage.

4.5 Dual Power Supply to Eliminate the Risk of Power Failure

4.5.1 The electrical system of the proposed sewage pumping station is proposed to receive two incoming supplies. Such dual supply configuration is to achieve a reliable power supply for continuous operation of the pumps and auxiliary equipment. Also, the arrangement for the two power sources to be fed by two different ring circuits is desirable.

4.6 Provision of onsite storage and tanker away of raw sewage

4.6.1 An equalization tank will be provided in case of failure of the sewage pumping station or power failure as it is expected that the plant operation could normally be resumed. An emergency response procedure will be prepared during detailed design stage. The emergency storage in sewage pumping station will store the sewage. In case power shortage occurs at the SPS, tanker would be deployed to transport the sewage away from SPS to the nearby existing sewerage system. The detailed design will investigate and incorporate all practicable precautionary measures to minimize the likelihood of such an event.

4.6.2 As a result, precautionary measures such as routine/ regular checking of equipment, provision of dual power supply, provision of standby equipment, 24-hour monitoring on the operation of the sewage pumping station, installing remote control and monitoring system (SCADA) to allow off-site monitoring and provision of emergency storage will be provided. Hence, with the implementation of above preventive measures, the possibility of sewage overflow from sewage pumping station will be extremely low.

5. EVALUATION OF THE SEWAGE DISPOSAL SCHEME AND RECOMMENDATIONS

5.1 Regional sewerage strategy

5.1.1 The Application Site falls within the catchment of proposed SPS. Discharge of sewage via the rising main to the Au Tau SPS, which will lead to Lung Tin SPS, Ha Tsuen SPS and subsequently to San Wai STW, is a feasible option and is in line with Government's sewage disposal strategies.

5.2 Maintenance

5.2.1 The proposed pumping station and 2 nos. of rising mains with 250 mm diameter would serve the Proposed Development under subject application. The proposed works is recommended to be handed over to government for maintenance subject to the agreement from DSD for the maintenance matrix at the detailed design stage. Prior to successful handover, the Applicant shall be responsible for the implementation of the required sewerage works and taking up the maintenance responsibility of the proposed works up to the Testing and Commissioning Stage. Details design of the proposed works and the maintenance matrix will be submitted to relevant departments for agreement at the detailed design stage.

5.2.2 The proposed sewerage system will be handed over to government for maintenance. The detailed design of the proposed sewerage system will be submitted to relevant government departments for approval before the commencement of the construction works.

6. CONCLUSION

6.1.1 The estimated sewage generated in terms of Average Dry Weather Flow, from the Proposed Development is about 2,708.4m^3/day including 10% increase in design numbers of population. The flow is equal to approximately 25.31% of the current capacity of ATSPS. It is unlikely that the ATSPS will be overloaded.

6.1.2 As revealed by hydraulic assessment results, the proposed sewage discharge scheme is feasible. No significant impact on sewerage conveyance system is anticipated.

6.1.3 Subjected to the updated sewerage connection to Au Tau SPS at detailed design stage. A detailed design for the sewerage connection will be submitted to DSD for approval.

END OF TEXT

Figures

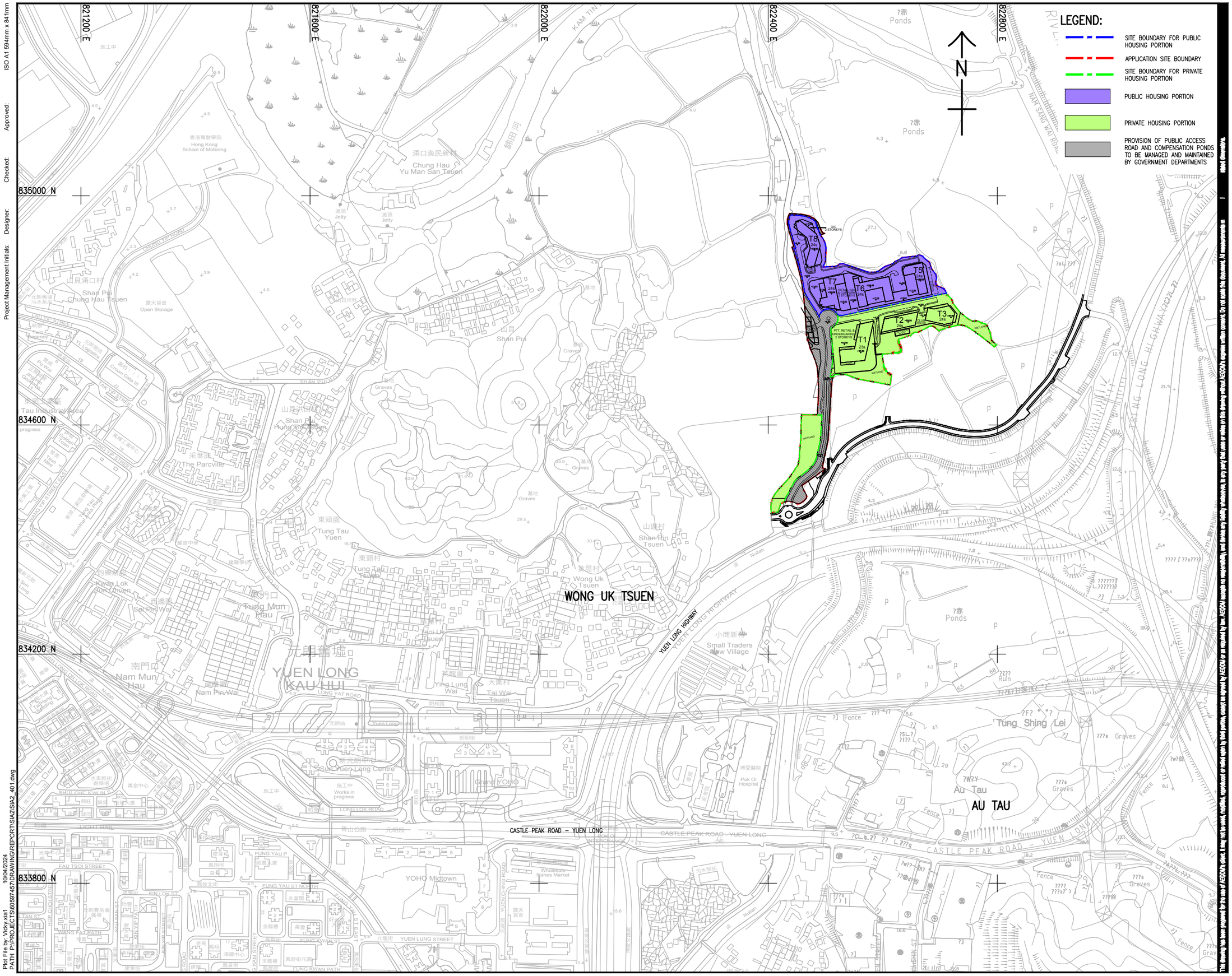
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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10/04/2024

AECOM

PROJECT

PROPOSED RESIDENTIAL DEVELOPMENT IN VARIOUS LOTS (TO BE KNOWN AS LOT 1696) IN D.D. 115 AT TUNG SHING LEI,YUEN LONG

CLIENT

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK

STATUS

SCALE / **DIMENSION UNIT**

A3 1 : 6000 METRES

KEY PLAN

PROJECT NO. / **CONTRACT NO.**

60597457

SHEET TITLE

LOCATION PLAN

SHEET NUMBER

60597457/SIA2/FIGURE 1

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Designer:

Project Management Initials:

822300 E

822550 E

822800 E

835000 N

834750 N

834500 N

N

LEGEND:

- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION
- PROVISION OF PUBLIC ACCESS ROAD, AMENITY AND INFRASTRUCTURE TO BE MANAGED AND MAINTAINED BY GOVERNMENT DEPARTMENTS

T8 24s +100.00 +17.50 +6.50

GIC 2 STOREYS

T7 24s +100.00 +17.50 +13.00

RETAIL,GIC & CARPARK 2 STOREYS

T6 24s +100.00 +17.50 +13.00

T5 24s +100.00 +17.50 +6.50

T3 24s +93.90 +14.00 +6.50

T2 24s +93.90 +6.50

CLUB HOUSE

OUTDOOR POOL

T1 23s +93.90 +8.50

PTT, RETAIL & KINDERGARTEN 2 STOREYS +16.50

PRIVATE GARDEN

SEWAGE PUMPING STATION +6.50

WETLAND

16.50

35.50

山邊村 SHAN PIN TSUEN

YUEN LONG HIGHWAY 元朗公路

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PROPOSED RESIDENTIAL DEVELOPMENT IN VARIOUS LOTS (TO BE KNOWN AS LOT 1696) IN D.D. 115 AT TUNG SHING LEI,YUEN LONG

CLIENT

CONSULTANT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE A3 1 : 2500

DIMENSION UNIT METRES

KEY PLAN

PROJECT NO. 60597457

CONTRACT NO.

SHEET TITLE

PROPOSED MASTER LAYOUT PLAN

SHEET NUMBER

60597457/SIA2/FIGURE 2

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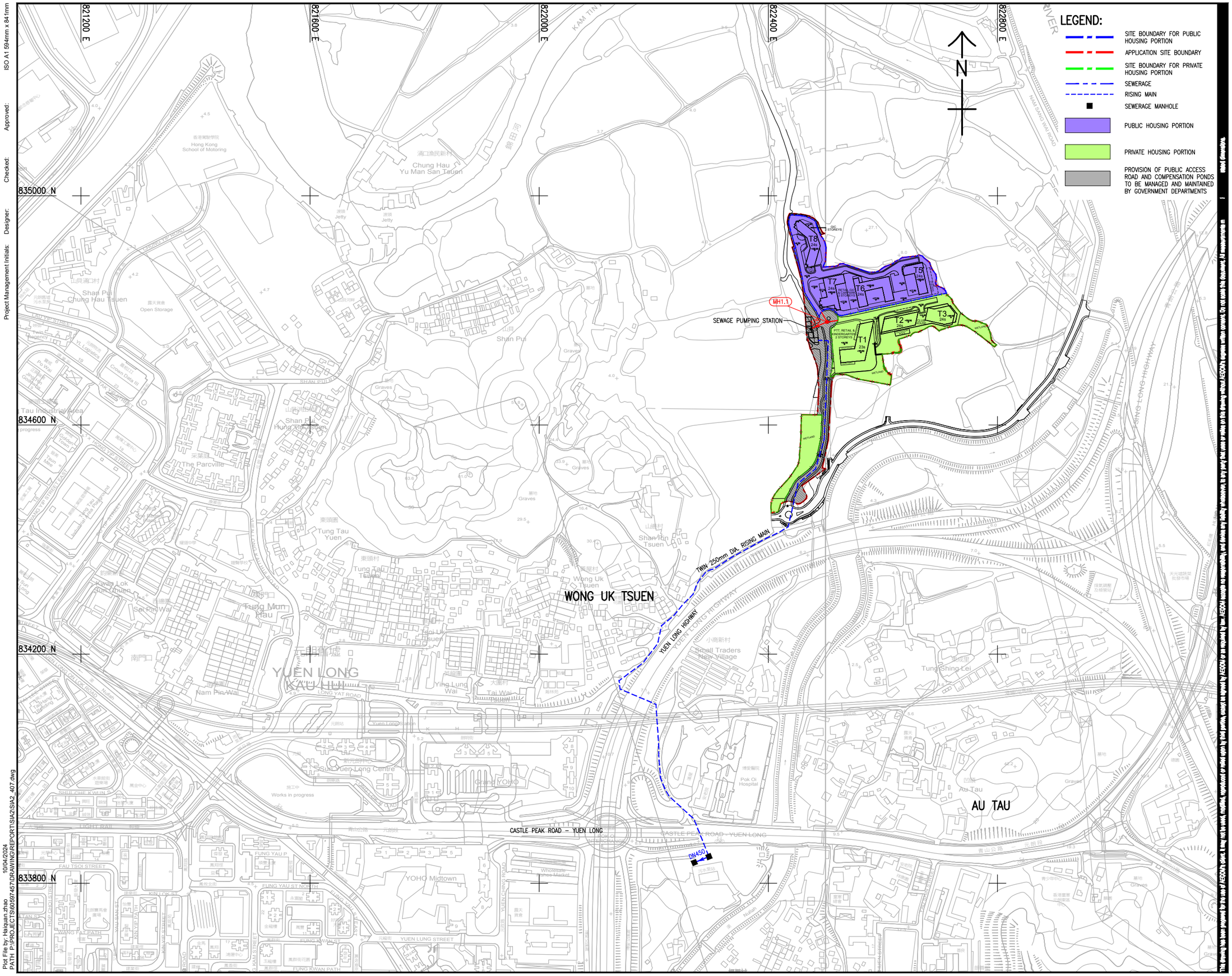

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PROPOSED RESIDENTIAL DEVELOPMENT IN VARIOUS LOTS (TO BE KNOWN AS LOT 1696) IN D.D. 115 AT TUNG SHING LEI,YUEN LONG

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I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE

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DIMENSION UNIT

METRES

KEY PLAN

PROJECT NO.

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CONTRACT NO.

SHEET TITLE

LOCATION PLAN

SHEET NUMBER

60597457/SIA2/FIGURE 3

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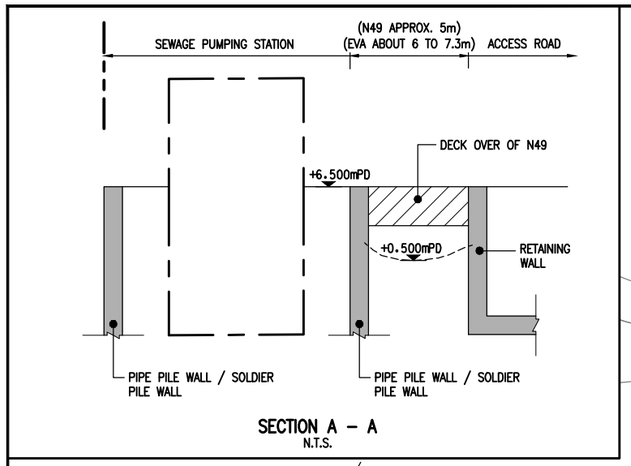

SECTION A – A
N.T.S.

822400 E

822500 E

822300 E

834600 N

834300 N

Phase 1

T7
24s

RETAIL, GIC & CARPARK
2 STOREYS

T6
24s

SEWAGE PUMPING STATION

PTT, RETAIL & KINDERGARTEN
2 STOREYS

PRIVATE GARDEN

T1
23s

T2
24s

OUTDOOR POOL

RAMP DN TO BF

WETLAND

WETLAND

Ramp

Track

Bamboo

Outlet

Electric Box

+6.50

+13.00

+17.50

+100.00

+16.50

+99.90

+2.50

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PROJECT

PROPOSED RESIDENTIAL DEVELOPMENT IN VARIOUS LOTS (TO BE KNOWN AS LOT 1696) IN D.D. 115 AT TUNG SHING LEI,YUEN LONG

CLIENT

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I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE

A1 1 : 600

DIMENSION UNIT

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PROJECT NO.

60597457

CONTRACT NO.

SHEET TITLE

MASTER LAYOUT PLAN

SHEET NUMBER

60597457/SIA2/408

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Appendix A
Sewerage Generation Calculation

Proposed Land Sharing Pilot Scheme Development for a Site at Various Lots in DD115, Tung Shing Lei, Yuen Long 1/31/2024

Sewerage Impact Assessment - Sewage Generation Estimation 60597457

Development Type	GFA (m^2)	Avg. Unit Size (m^2)	No. of Units[3]	Person/Unit	Person/m^2	Population[3]	Flow Type Description	Flow Type Abbreviation	UFF (m^3/head/day)	ADWF (m^3/day)
Private Residential	50,179	39.79	1,261	2.5	0.063	3,153	Domestic - Private R2	R2	0.27	851.31
Outdoor Swimming Pool[4]				/			Backwash (m^3/sec)	/	/	0.0158
Public Housing[3]	93,400	45.5	2,055	2.8	0.062	5,754	Domestic - Public Rental	R1	0.27	1,553.58
Kindergarten - Students[2]	1,000			/		160	School Student	SS	0.04	6.40
Kindergarten - Teachers[2]	1,000			/		11	Commercial - Community, Social & Personal Services	J11	0.28	3.08
GIC	4,670		/		0.033	155	Commercial - Community, Social & Personal Services	J11	0.28	43.40
Clubhouse - F&B[1]	450		/		0.051	23	Commercial - Restaurants & Hotels	J10	1.58	36.34
Clubhouse - Personal Services[1]	1,800		/		0.033	60	Commercial - Community, Social & Personal Services	J11	0.28	16.80
Retail[1]	2,445		/		0.051	125	Commercial - Restaurants & Hotels	J10	1.58	197.50
Child Care Centre (CCC)	0		/		0.033	0	Commercial - Community, Social & Personal Services	J11	0.28	0.00
					Total Population	**9,441**			**Total ADWF (m^3/day)**	**2,708.41**
									Total PWWF (m^3/day)	**13,542.07**

Note 1: Assuming 20% of clubhouse and 100% retail GFA to be of food & beverages nature. Person/m^2 information extracted from CIFSUS (PlanD, 2005)

Note 2: It is anticipated that the kindergarten area is 1,000 m^2. For assessment purpose, 8 classes are assumed in the kindergarten, with 20 students each class.

Note 3: Assuming 10% increase of Public Housing numbers of units and population as per Housing Depatment's comment.

Note 4: Please find the swimming pool's sewage calculation as follows:

Area of Pool =	227	m^2	
Assuming Depth of Pool =	1.5	m	
Volume of Pool =	341	m^3	
Turnover Rate =	6	hr	GS for Swimming Pool Water Treatment Installation (ArchSD, 2012)
Assuming Surface Loading Rate of Filter =	20	$m^3/m^2/hr$	
Filter Area Required =	340.5/6/20		
=	2.8	m^2	
Assuming Backwash Duration =	3	min/d	
Assuming Backwash Flow Rate =	20	$m^3/m^2/hr$	
Design Backwash Flow =	20 x 2.84 ÷ 3600		
=	0.0158	m^3/sec	

Appendix B
Hydraulic Calculation of Proposed Sewer and Rising Mains

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Proposed Land Sharing Pilot Scheme Development for a Site at Various Lots in DD115, Tung Shing Lei, Yuen Long

SIA - External Sewers

Project No.	60597457
Date	1/31/2024
By	0

Manhole		Ground																						
U/S	D/S	Cover Level		Invert Level		Invert Depth		Size	Length	Grad	Material	k_s	Velocity	Time of Flow	Capacity	Direct Discharge	Flow from Upstream	Total Average Flow	Contributing Population	Peaking Factor Incl. Storm	Catchment Inflow Factor	Total Peak Flow	Percentage Capacity	Factor of Safety	Remarks	Cover
		U/S mPD	D/S mPD	U/S mPD	D/S mPD	U/S m HIDE	D/S m HIDE	mm	m	1 in		mm	m/s	min	m^3/s	m^3/day ADWF	m^3/day ADWF	m^3/day ADWF				m^3/s PWWF	%		Manhole Type U/S	U/S (m)
MH1.1	SPS	6.50	6.50	3.00	2.78	3.50	3.73	375	27.0	120	PE100	0.15	1.79	0.25	0.1982	0.00	2708.41	2708.41	10031.00	4.0	1.0	0.1412 (1)	71.24%	1.40	E1	3.13

Notes:

1. The total peak flow is including swimming pool Design Backwash Flow = 2708 x 4.0 /24/60/60 + 0.0158

AECOM	Project: Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long			
Consulting Engineers Tower 2, Grand Central Plaza 138, Shatin Rural Committee Road Shatin, New Territories, Hong Kong	Drawing Ref N/A	Calculated by	Checked by	Page
	Subject			Date 15 Dec 2023

Rising Main Design

Total Estimated Sewage	=	2708.41	m^3/day	
Peaking Factor	=	4		(Contributing Population = 2708.41 /0.27
Design Flow	=	125.39	L/s	= 10031.15
	=	0.125	m3/s	10000 - 25000 people)
Assume Inner Diameter,	=	250	mm	
Flow Area	=	0.0491	m^2	
Velocity	=	2.554	m/s	

1) The twin rising mains is proposed and the velocity of one pipe is within the range of 1m/s to 3m/s, the diameter of the rising main is found to be acceptable.
2) Only one rising main will be in operation at a time.

Appendix C
Au Tau Sewage Pumping Station Information (Provided by DSD) and Capacity Assessment

From: ssdau@dsd.gov.hk
Sent: Tuesday, 12 October 2021 14:04
To: Mak, Samson
Cc: Wong, Ben; Yuen, Ming Chung; Wan, Willie
Subject: [EXTERNAL] Re: [Internet] [No. LSPS/002] Land Sharing Pilot Scheme Application in Various Lots in D.D. 115 and adjoining Government Land, Ho Chau Road, Yuen Long, N.T. (near Tung Shing Lei) - Request for Information

Dear Samson,

Your requested information as follows. Please be reminded that the information shall be solely used for this project.

Au Tau SPS
Designed ADWF: 10,700 m3/day
Designed peak flow: 410 L/s
Current average daily flow: approx. 800 m3/day

Regards,

Samitone Au
EME/ST1/3/2
Drainage Services Department
Tel: 28916269 / 91033179



From: "Mak, Samson" <samson.mak@aecom.com>
To: "ssdau@dsd.gov.hk" <ssdau@dsd.gov.hk>
Cc: "Yuen, Ming Chung" <ming.yuen@aecom.com>, "Wan, Willie" <Willie.Wan@aecom.com>, "Wong, Ben" <ben.wong@aecom.com>
Date: 28/09/2021 14:52
Subject: [Internet] [No. LSPS/002] Land Sharing Pilot Scheme Application in Various Lots in D.D. 115 and adjoining Government Land, Ho Chau Road, Yuen Long, N.T. (near Tung Shing Lei) - Request for Information
Serial No.:

==========
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Dear Mr. Au

Further to the captioned LSPS application and further to our previous letters to you (dated: 2021/03/23 and 2021/07/23; letter soft copies attached for ease of reference), much appreciated if you can furnish us with the information on the design capacity and current flow rates of the Au Tau Sewage Pumping Station.

Should you have any further queries, please feel free to reach me at 3922 8591.
Many thanks!

Best regards,
Samson Mak
Graduate Engineer, Land Supply / Municipal
D +852 3922 8591
samson.mak@aecom.com

AECOM
11/F, Tower 2, Grand Central Plaza
138 Shatin Rural Committee Road
Shatin, New Territories, Hong Kong
aecom.com

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[attachment"20210110121.pdf" deleted by Sanitone SD AU/ST1/DSD/HKSARG] [attachment"20210044101.sent.pdf" deleted by Sanitone SD AU/ST1/DSD/HKSARG]

Capacity Assessment on Au Tau Sewage Pumping Station

According to the information from DSD, the design ADWF of Au Tau SPS is 10,700m^3/d.

- Current daily flow approx. = 800 m^3/d. (Refer to Appendix C of SIA)
- ADWF of the proposed development is 2,708.41 m^3/d. (Refer to Appendix B of SIA)
- ADWF of other planned development is 3,300 m^3/d.

Total = 6808.41m^3/d < 10,700m^3/d

Appendix H
Revised Water Supply Impact Assessment

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long

Water Supply Impact Assessment

June 2024

AECOM Asia Co. Ltd.

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1.2 OBJECTIVE OF THIS SUBMISSION 1
2. DEVELOPMENT PROPOSAL 1
2.1 THE PROPOSED DEVELOPMENT 1
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Appendix W1 Water Demand & Hydraulic Calculation

1. INTRODUCTION

1.1 Background

1.1.1 The Application Site is located at various lots in D.D. 115, Tung Shing Lei, Yuen Long. The Application Site is currently zoned "Residential (Group D)" "R(D)" on the approved Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8 and covers a site area of approximately 57,055m^2.

1.1.2 The site location plan for the Proposed Development is shown in **Figure 1**. AECOM Asia Co. Ltd. (AECOM) has been commissioned to carry out a Water Supply Impact Assessment (WSIA) to review the water supply for the Proposed Development and provide mitigation measures, if necessary.

1.2 Objective of this Submission

1.2.1 The Water Supply Impact Assessment assess the existing and water supply system, estimate the water demand of the Proposed Development, and suggest mitigation measures required to the existing water supply network.

1.2.2 The main objectives of this assessment include the followings:

- Identify the scope of the development
- Identify the existing and planned water supply network in the vicinity of the development
- Outline the methodology adopted in this assessment
- Determine the water demand of the development
- Recommend mitigation measures or upgrade works where appropriate due to the development.

2. DEVELOPMENT PROPOSAL

2.1 The Proposed Development

2.1.1 The Application Site has an area of approximately 57,055m^2 with a Domestic Gross Floor Area (GFA) of about 143,579m^2. The indicative development schedule is summarized in **Table 1** below for technical assessment purpose. The design year of population intake for both Public Housing and Private Housing is 2031.

2.1.2 10% increase in design numbers of population had been assumed in the water demand generation estimation for the proposed Public Housing development.

Table 1 - Development Schedule

Site Area (m^2)	~ 45,676
Proposed Domestic GFA (m^2)	~ 143,579
Public Housing Portion (m^2)	~ 93,400
Private Housing Portion (m^2)	~ 50,179
No. of Units	3,129
Public Housing Portion(1)	1,868
Private Housing Portion	1,261
Person-per-flat Ratio	
Public Housing Portion	2.8
Private Housing Portion	2.5
Residential Population	8,384
Public Housing Portion(1)	5,231
Private Housing Portion	3,153
GIC GFA (m^2)	~ 4,670
GIC Employee Density (Person/m^2)(2)	0.033
GIC Employees	155
Clubhouse GFA (m^2)	~ 2,250
Clubhouse F&B Employee Density (Person/m^2)(3)	0.051
Clubhouse F&B Employees	23
Clubhouse Personal Service Employee Density (Person/m^2)(2)	0.033
Clubhouse Personal Service Employees	60
Retail GFA (m^2)	~ 2,445
Public Housing Portion (m^2)	~ 1,200
Private Housing Portion (m^2)	~ 1,245
Retail Employee Density (person/m^2)(3)	0.051
Retail Employees	133
Kindergarten GFA (m^2)(4)	1,000
No. of Student	160
No. of Staff and Teacher	11

Remark for Table 1:

(1) As per Housing Department's comment, for Public Housing, 10% increase in the number of units (3,153) and population (5,231) will be included for assessment purpose.

(2) A density of 3.3 employees per 100 m^2 GFA (for Community, Social & Personal Services) is adopted in accordance with the results of the "Commercial and Industrial Floor Space Utilization Survey" conducted by the Planning Departing in 2004/2005.

(3) A density of 5.1 employees per 100 m^2 GFA (for Restaurants, Private Commercial) is adopted in accordance with the results of the "Commercial and Industrial Floor Space Utilization Survey" conducted by the Planning Departing in 2004/2005.

(4) It is anticipated that the kindergarten area is 1,000 m^2. For assessment purpose, 8 classes are assumed in the kindergarten. A maximum of 160 students (max class size 20) and 20 staff and teacher (Staff and teacher to student ratio 1:8) are adopted in accordance with Operation Manual for Pre-primary Institutions published by Education Bureau and Social Welfare Department.

3. WATER SUPPLY SYSTEM OF THE APPLICATION SITE

3.1 Existing Water Supply System

3.1.1 Layout of the existing water supply system in vicinity of the Application Site is shown on **Figure 3**. The area falls within the supply zone of Au Tau Water Treatment Works (ATWTW) via Au Tau Fresh Water Reservoir. The output of ATWTW is 250 MLD.

3.1.2 The Application Site locates within the supply zone of the Au Tau Fresh Water Service Reservoir (ATFWSR). The storage capacity of ATFWSR is about 25,384m^3. The ATFWSR is located at about 1.5 km away to the south-east of the Application Site. A 900mm distribution main is running underneath Yau Shin Street in close vicinity of Castle Peak Road. There are also a few 80mm and 50mm mains within the site. In vicinity of the Application Site, no flushing water main can be identified.

4. WATER SUPPLY STUDY

4.1 Water Demand

4.1.1 Assumptions are made for the mean daily unit fresh and flushing water demands for various classes of consumer for this assessment. For planning purpose, R1 residential type for public housing development, R2 residential type for private housing development, school type, community, social & personal services type have been used for different users in the estimation; and service trades approach had been adopted for retail population. A summary table of the mean daily unit demands is shown in **Table 2**. The calculation can be found in **Appendix W1**. It is anticipated that population intake will commence in 2031.

Table 2 – Estimated Water Demand

Supply	Flow Type	Unit Demand (L/h/d)		Total Demand (m^3/d)
		Domestic	Non-Domestic	
Fresh Water	R1	230	-	1,203
Flushing Water	R1	70	-	366
Fresh Water	R2	300	-	946
Flushing Water	R2	70	-	221
Fresh Water	Service Trades	-	40	335
Fresh Water	School	-	25	5
Flushing Water	School	-	25	5
Fresh Water	GIC	-	280	43
Total Fresh Water Demand:				2,532
Total Flush Water Demand:				592
Total Water Demand:				3,166

Remark for Table 2:

(1) Refer to Table 1 for the design population calculation.

4.2 Hydraulic Review of Existing Water Mains

4.2.1 The capacity of ATFWSR is 25,384 m^3 and the estimated water consumption of the Proposed Development is 2,554 m^3/d (including 10% increase in design numbers of population), which is approximately 10% of the FWSR capacity. Therefore, the proposed development would not post any significant impact to ATFWSR.

4.2.2 An existing 900 mm diameter distribution main is running underneath Yau Shin Street near Castle Peak Road. The required water consumption is equivalent to 2.40% of the existing 900mm distribution main. The hydraulic checking for the existing water mains is shown in **Appendix W1**.

4.3 Proposed Water Supply System

4.3.1 To provide water supply to the Proposed Development, a new 400mm diameter watermain is required to be branched off from the existing fresh water mains for supply of fresh water. The proposed connection to effect water supply to the Proposed Development is shown on **Figure 4**. The hydraulic calculation is shown in **Appendix W1.** The existing DN100 salt water main at Wong Uk Tsuen to be used for supplying flushing water to the proposed development is shown on **Figure 5**".

4.3.2 The hydraulic capacity of the proposed water supply arrangement was checked for the normal case and fire-fighting case. **Appendix W1** refers.

4.3.3 The existing distribution mains within the Application Site are proposed to be abandoned. Please refer to **Figure 3** for the proposed abandonment of water mains.

4.3.4 The water supply connections point for the Application Site should be subject to the detail design at later stage and comment from WSD.

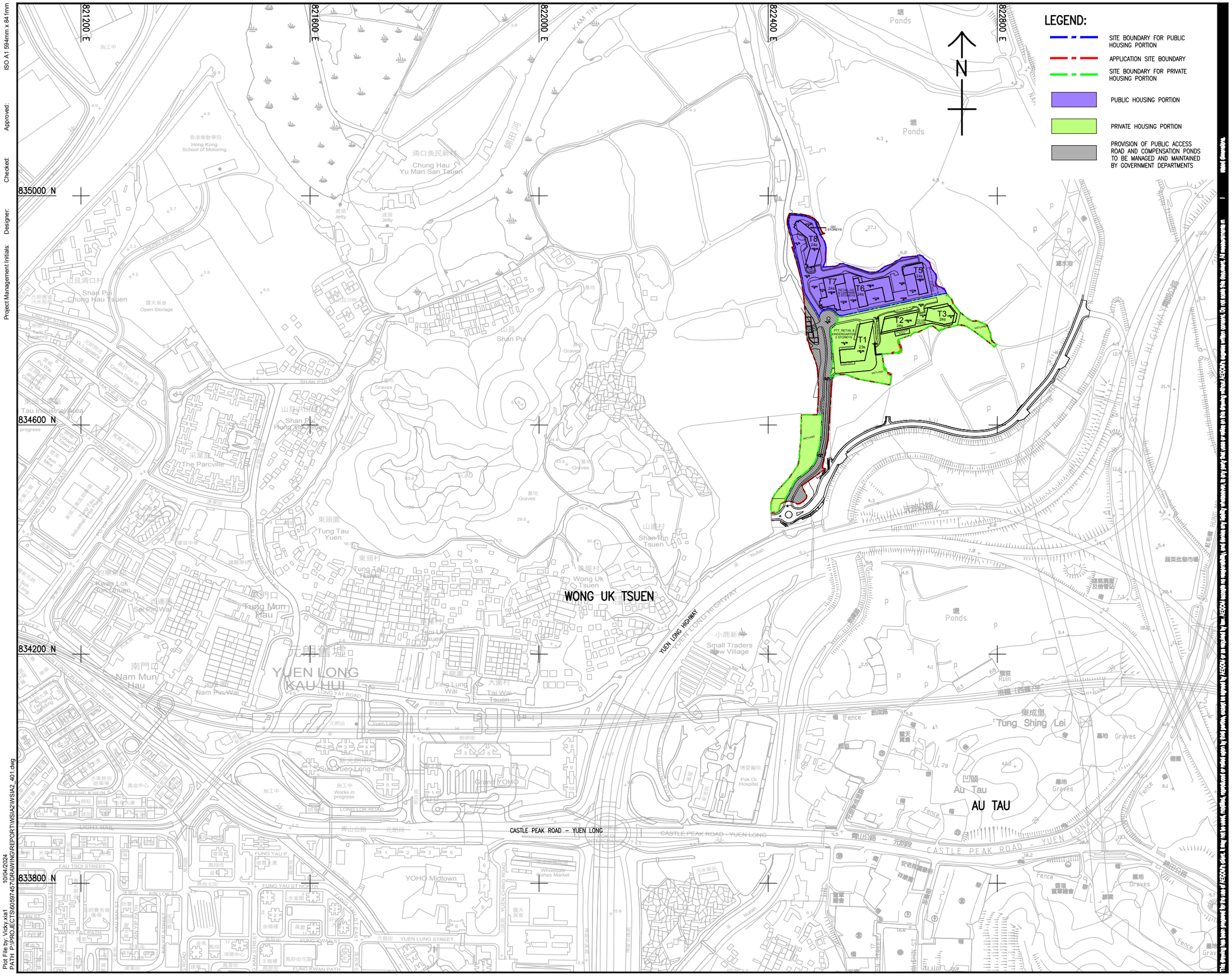
4.3.5 Since the Application Site is located at low elevation, no additional pumping facilities will be required for the water supply to the Proposed Development. However, new reticulation system within the Application Site will be required. There should be separate reticulation system for potable and flushing water supply, and with separate connection points to the existing system.

5. CONCLUSION

5.1 The Proposed Development is located at the water supply zone of Au Tau Fresh Water Service Reservoir (ATFWSR) and there is existing salt water supply at Wong Uk Tsuen.

5.2 Based on the above assessment, the existing 900mm diameter fresh water distribution main running underneath Yau Shin Street near Castle Peak Road is adequate to meet the fresh water demand required for the Application Site. It is proposed that a new 400mm diameter fresh water main to connect the existing water supply system. It is also proposed to use the DN100 salt water main at Wong Uk Tsuen for supplying flushing water to the Proposed Development. As such, the Proposed Development is considered to be acceptable in water supply terms."

Figures



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PROJECT
項目

PROPOSED RESIDENTIAL DEVELOPMENT IN VARIOUS LOTS (TO BE KNOWN AS LOT 1696) IN D.D. 115 AT TUNG SHING LEI,YUEN LONG

CLIENT
業主

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工程顧問公司

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ISSUE/REVISION
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I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 審核

STATUS
階段

SCALE
比例

A3 1 : 6000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60597457

CONTRACT NO.
合約編號

SHEET TITLE
圖紙名稱

LOCATION PLAN

SHEET NUMBER
圖紙編號

60597457/WSIA2/FIGURE 1

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Checked:
Designer:
Project Management Initials:
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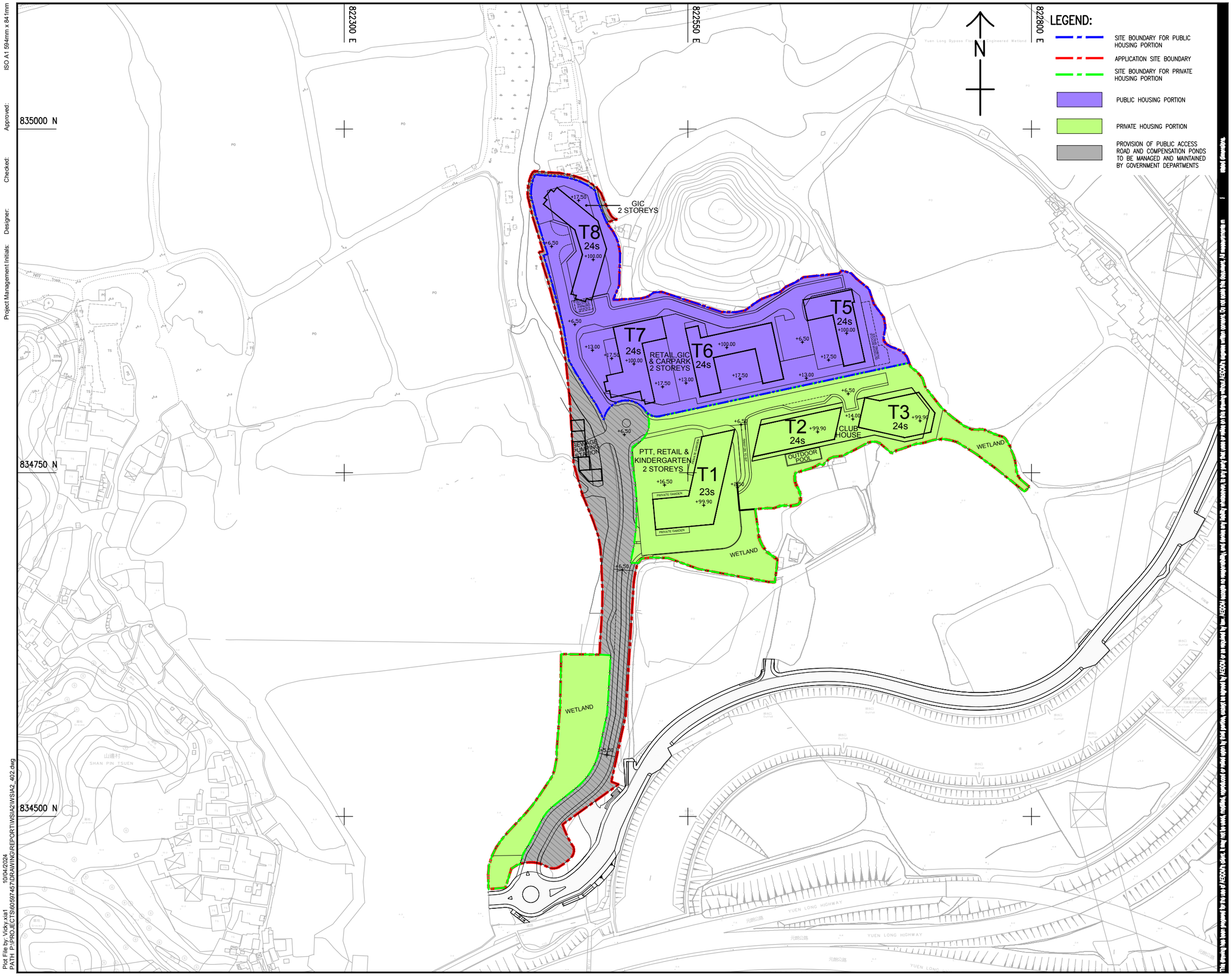

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PROPOSED RESIDENTIAL DEVELOPMENT IN VARIOUS LOTS (TO BE KNOWN AS LOT 1696) IN D.D. 115 AT TUNG SHING LEI,YUEN LONG

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STATUS

SCALE A3 1 : 2500

DIMENSION UNIT METRES

KEY PLAN

PROJECT NO. 60597457

CONTRACT NO.

SHEET TITLE

PROPOSED MASTER LAYOUT PLAN

SHEET NUMBER

60597457/WSIA2/FIGURE 2

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Designer:

Project Management Initials:

822300 E

822550 E

822800 E

835000 N

834750 N

834500 N

N

LEGEND:

- SITE BOUNDARY FOR SUBSIDIZED HOUSING DEVELOPMENT
- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE DEVELOPMENT
- EXSITING WATER MAIN
- EXISTING WATER MAIN TO BE ABANDONED
- PUBLIC HOUSING PORTION
- PRIVATE HOUSING PORTION
- PROVISION OF PUBLIC ASSESS ROAD AND COMPENSATION PONDS TO BE MANAGED AND MAINTAINED BY GOVERNMENT DEPARTMENTS

GIC
2 STOREYS

T8
24s

T7
24s

RETAIL,GIC
& CARPARK
2 STOREYS

T6
24s

T5
24s

T2
24s

CLUB
HOUSE

OUTDOOR
POOL

T3
24s

PTT, RETAIL &
KINDERGARTEN
2 STOREYS

T1
23s

SEWAGE
PUMPING
STATION

WETLAND

WETLAND

WETLAND

15.50

15.50

山邊村
SHAN PIN TSUEN

YUEN LONG HIGHWAY

元朗公路

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SCALE

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DIMENSION UNIT

METRES

KEY PLAN

PROJECT NO.

60597457

CONTRACT NO.

SHEET TITLE

EXISTING WATER SUPPLY LAYOUT

SHEET NUMBER

60597457/WSIA2/FIGURE 3

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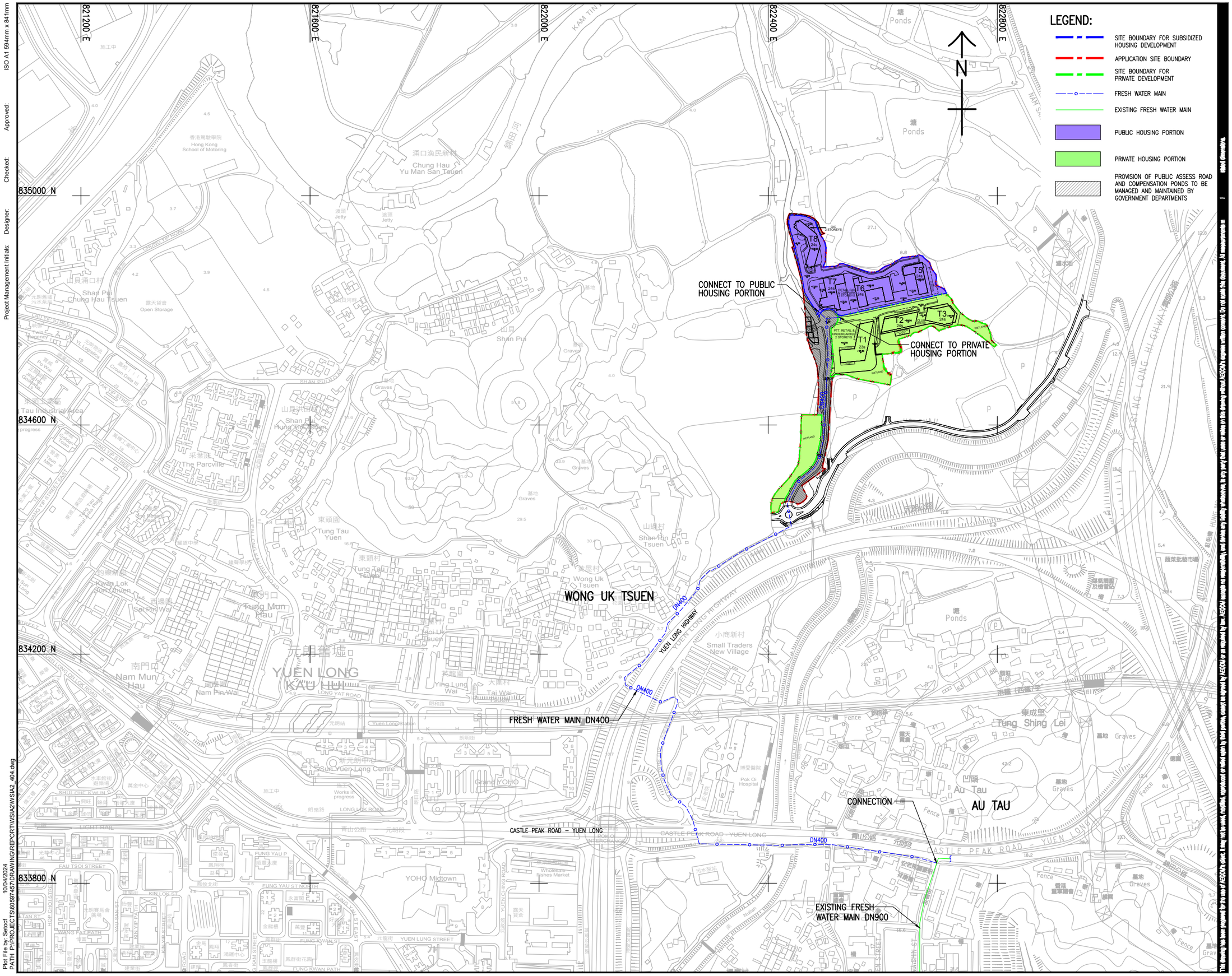

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DIMENSION UNIT

METRES

KEY PLAN

PROJECT NO.

60597457

CONTRACT NO.

SHEET TITLE

PROPOSED FRESH WATER EXTERNAL LAYOUT

SHEET NUMBER

60597457/WSIA2/FIGURE 4

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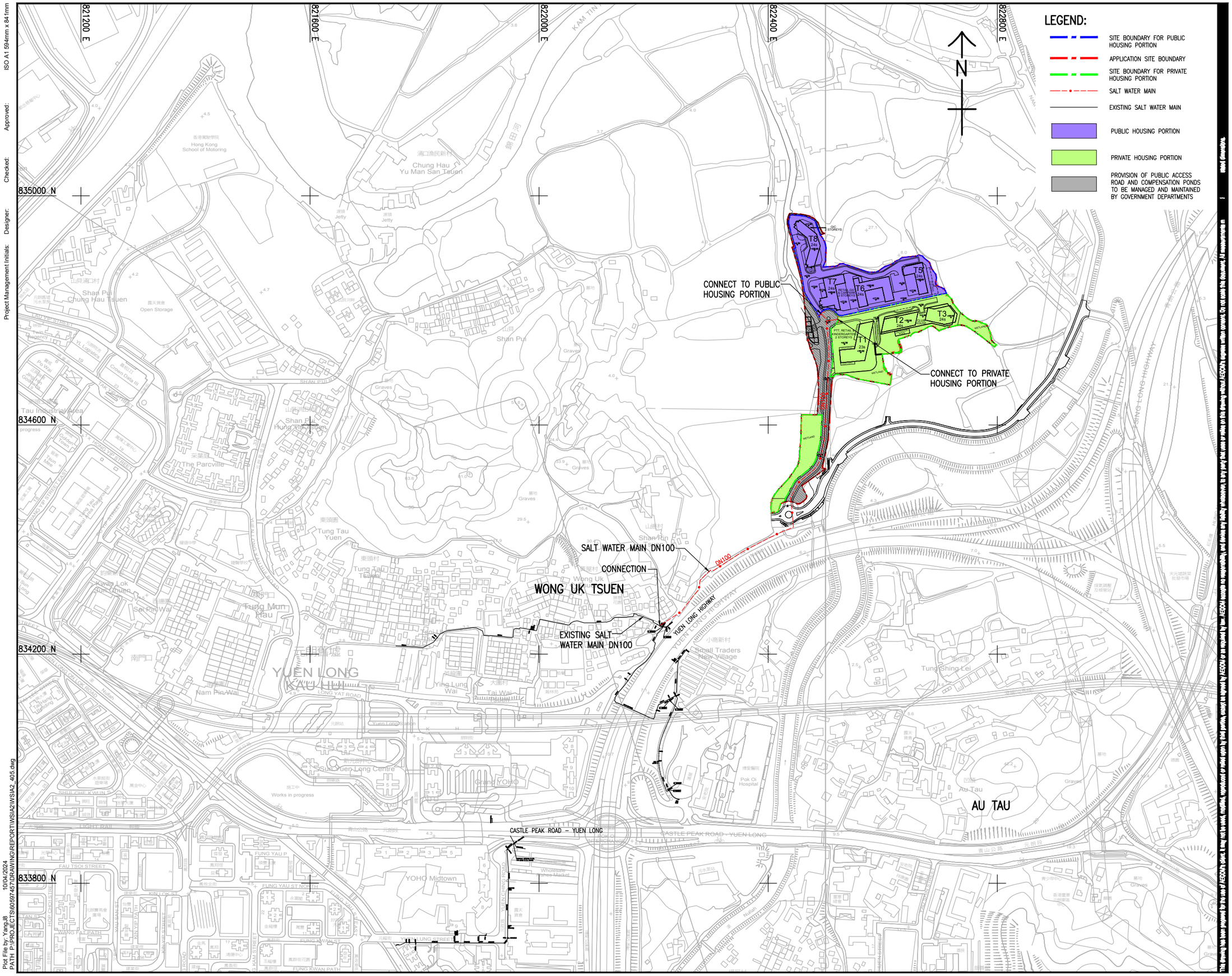

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SCALE A3 1 : 6000

DIMENSION UNIT METRES

KEY PLAN

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CONTRACT NO.

SHEET TITLE

PROPOSED SALT WATER MAIN EXTERNAL LAYOUT

SHEET NUMBER

60597457/WSIA2/FIGURE 5

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Appendix W1
Water Demand & Hydraulic Calculation

Proposed Land Sharing Pilot Scheme Development at Various Lots in DD115, Tung Shing Lei, Yuen Long 7/21/2023

WSIA - Water Demand Estimation for Fresh Water

Development Type	GFA (m^2)	Avg. Unit Size (m^2)	No. of Units[2]	Person/Unit	Person/m^2	Population[2]	Fresh Water UDD (L/head/day)	Daily Fresh Water Demand (m^3/day)	Flush Water UDD (L/head/day)	Daily Flush Water Demand (m^3/day)
Private Residential	50,179	39.79	1,261	2.5	0.063	3,153	300	946	70	221
Public Housing[2]	93,400	50.00	1,868	2.8	0.056	5,231	230	1,203	70	366
Kindergarten[1]	1,000			/		180	25	5	25	5
GIC	4,670		/		0.033	154	280	43	/	/
Child Care Centre (CCC)	0		/		0.033	0	280	0	/	/
				Total Residential Population		**8,384**				
Retails: Service Trades for a Population of	8,384			/			40	335	/	
							Total Fresh Water Demand (m^3/day)	**2,532**	**Total Flush Water Demand (m^3/day)**	**591**

Note 1: It is anticipated that the kindergarten area is 1,000 m^2. For assessment purpose, 8 classes are assumed in the kindergarten, with 20 students each class.

Note 2: Assuming 10% increase of Public Housing numbers of units and population as per Housing Depatment's comment.

Hydraulic Analysis by Flow Velocity

Fresh Water:

Nominal Diameter of existing fresh water mains =	900	mm	
=	0.9	m	
Pipe Area =	0.636	m^2	
Assuming that the flow velocity of watermain =	3.0	m/s	WSD Manual of Mainlaying Practice Cl 1.2.1
The flow capacity of watermain =	1.909	m^3/s	
The water demand of the proposed development is equivalent to	**1.89%**	**of the existing water main**	
Estimated Fresh Water Demand for Proposed Development =	2,532	m^3/day	
=	0.029	m^3/s	
Peaking Factor for Fresh Water Distribution Mains =	3		
Required Peak Flow Rate for Proposed Development =	0.088	m^3/s	
To supply water for the Proposed Development,			
Nominal Diameter of Proposed Pipe Size =	**400**	**mm**	
=	0.4	m	
Pipe Area =	0.126	m^2	
Assuming that the flow velocity of watermain =	2.0	m/s	WSD Manual of Mainlaying Practice Cl 1.2.1
The flow capacity of watermain =	0.251	m^3/s	
Factor of Safety =	**2.86**		
=>	**OK**		

Proposed Land Sharing Pilot Scheme Development at Various Lots in DD115, Tung Shing Lei, Yuen Long 7/21/2023

WSIA - Water Demand Estimation for Fresh Water

Hydraulic Analysis by Flow Velocity under Fire-fighting Case

Fresh Water:	Nominal Diameter of existing fresh water mains =	900	mm	
	=	0.9	m	
	Pipe Area =	0.636	m^2	
	Assuming that the flow velocity of watermain =	3.0	m/s	WSD Manual of Mainlaying Practice Cl 1.2.1
	The flow capacity of watermain =	1.909	m^3/s	
	Fire-fighting Requirement =	6,000	m^3/day	
	The water demand of the proposed development is equivalent to	**5.53%**	**of the existing water main**	
	Estimated Fresh Water Demand for Proposed Development =	2,532	m^3/day	
	=	0.029	m^3/s	
	Peaking Factor for Fresh Water Distribution Mains =	3		
	Additional Flow under Fire-fighting Case =	0.069	m^3/s	
	Required Peak Flow Rate for Proposed Development under Fire-fighting Case =	0.157	m^3/s	
	To supply water for the Proposed Development under Fire-fighting Case,			
	Nominal Diameter of Proposed Pipe Size =	**400**	**mm**	
	=	0.4	m	
	Pipe Area =	0.126	m^2	
	Assuming that the flow velocity of watermain =	2.0	m/s	WSD Manual of Mainlaying Practice Cl 1.2.1
	The flow capacity of watermain =	0.251	m^3/s	
	Factor of Safety =	**1.60**		
	=>	**OK**		

Appendix I
Revised Geotechnical Planning Review Report

Geotechnical Planning Review Report

Land Sharing Pilot Scheme
Proposed Subsidized Housing and Private Housing Development at Various Lots in D.D. 115, Tung Shing Lei, Yuen Long, the New Territories

April 2024

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Quality information

Prepared by	Checked by	Verified by	Approved by
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Revision History

Revision	Revision date	Details	Authorized	Name	Position
-					

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4. Site reconnaissance....5
5. Screening....6
6. Site formation / Foundation / ELS works....7
7. Conclusion....10

Figures

Figure 1	**Site location plan**

Appendix

Appendix A	**Site formation plans**
Appendix B1	**Slope Information System (SIS) data sheet and corresponding information (Associated Work_ Sewage Pipe)**
Appendix B2	**Slope Information System (SIS) data sheet and corresponding information (Junction J3)**

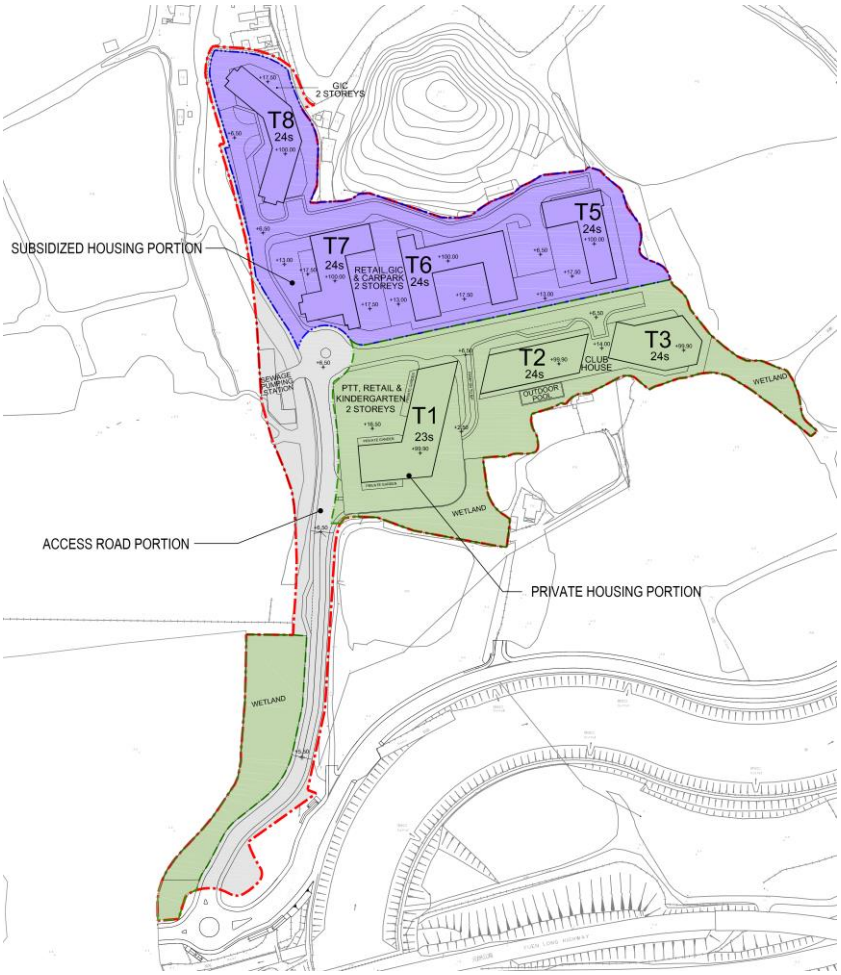
1. Introduction

1.1 Background

1.1.1 The Application Site (the Site) is located at various lots in D.D. 115, Tung Shing Lei, Yuen Long. The Application Site is currently zoned "Residential (Group D)" ("R(D)") on the approved Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8 and covers a site area of approximately 58,978m^2.

1.1.2 Part of the Application Site is the subject of an approved rezoning application under Town Planning Board (TPB) Application No. Y/YL-NSW/4 (i.e. hereafter referred to as the Approved Scheme). Under the Approved Scheme, TPB has agreed to rezone part of the Application Site from "R(D)" to "R(D)1" zone to facilitate the implementation of the residential development.

1.1.3 The Applicant now proposes a subsidized and private housing development at the subject site (i.e. hereafter referred to as the Proposed Development / Proposed Scheme) under the Land Sharing Pilot Scheme (LSPS), which was put forward in the 2018 Policy Address as part of Government's multi-pronged strategy to increase land and housing supply in the short-to-medium term.



1.1.4 AECOM was commissioned by the Applicant as his civil consultant in support of the application.

1.2 Scope of this report

1.2.1 In this report, the following items will be discussed:

- review site geology, available GI records and aerial photographs;
- identify any features or hazards that might affect the proposed development; and
- review the schematic site formation works from geotechnical point of view

2. Site information

2.1 Site information and topography

2.1.1 The Site is bounded by Ho Chau Road to the south and Kam Tin River to the east and the western side of the Site is within schedule area no.2. (**figure 1**)

2.1.2 In general, the Site is a flat ground with the level various from +3.50 mPD to +8.0 mPD. The site topography is relatively flat with a small natural hillside is near the northern boundary of the site about 20 m high.

2.1.3 The hillside is covered in dense vegetation and the site area is mostly open area comprising bare soil or shallow vegetation/scrub. At the southwest corner of the site the land use was formerly fishpond.

2.2 Geology

2.2.1 The published geology map sheet (**figure 1**) indicates the site is mostly underlain by metasiltstone of the Mai Po Member which outcrops as the small hill to north of the site. To the south of the site, granodiorite is indicated and to the east of the site metamorphosed tuff is indicated to occur. On the flat terrain surrounding the small hill, superficial deposits comprising colluvium of the Chek Lap Kok Formation are shown to cover most of the site with some intertidal deposits of the Hang Hau Formation shown to the northwest and southwest of the site. Faults are shown crossing the site with two NNE-SSW trending thrust faults traversing through the western and eastern peripheries of the site. The Site is just within scheduled area no.2, indicating possible marble subcrop.

2.3 Existing Ground Investigation Data

2.3.1 There are no existing GI within the site. but the nearest GI generally indicate surficial alluvium with occasional fill and marine deposits to between 5m and 10m depth, followed by weathered tuff to between 25m and 35m depth.

2.4 Existing Man-made Features

2.4.1 According to the Slope information system, there is no registered features are identified within the study area.

2.5 Landslide History, Incident Records and Boulder Hazards

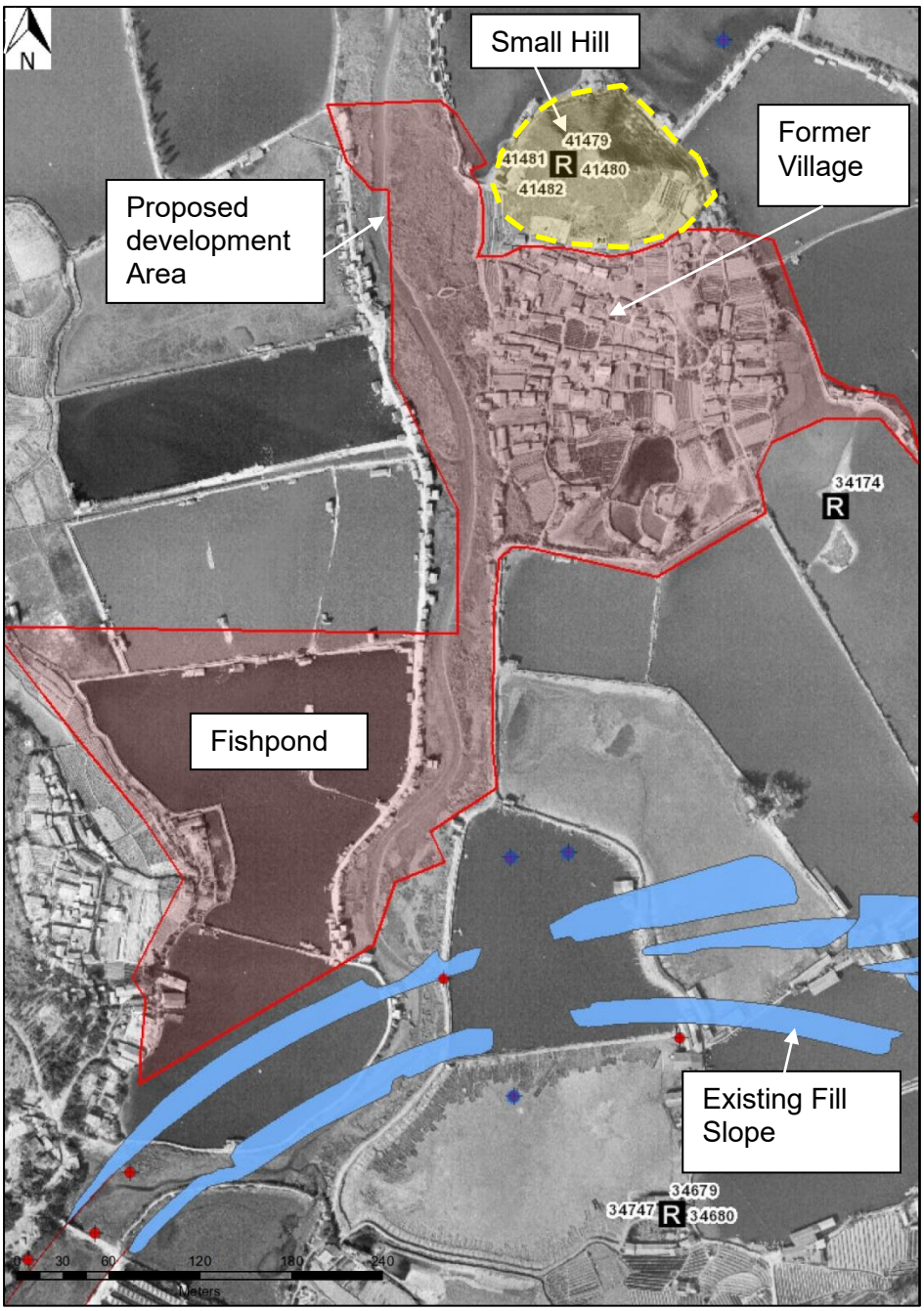
2.5.1 No landslides or incidents are recorded according to GEO’s GInfo database and no Historical landslides are recorded. There is no significant boulder hazard according to GEO’s boulder field inventory and no significant boulder clusters or large individual boulders could be observed from air photos.

3. Aerial Photograph Interpretation

3.1 API

3.1.1 In 1963, most of the site is the location of a small village with numerous small dwellings and horticultural land use. The site is surrounded by fishponds. Over the next three decades by 1993 the village decreases in size and some of the dwellings become abandoned or demolished. By 2005, some of the former fishponds to the south and east have reverted to fields. By 2010, most of the village dwellings have been demolished and removed from the site leaving a partially vegetated open space. By 2012, most vegetation has gone from the site and open space to the east of the site and the ground is highly reflective indicating bare soil or perhaps some fill placement. The present-day site is similar as an apparent bare soil open area.

3.1.2 No significant landslides, boulders, boulder clusters, erosion or other forms of distress and instability could be observed form the review of air photos.



1963 Air Photo

4. Site reconnaissance

4.1 Site reconnaissance

4.1.1 No site inspection of the adjacent hillside to the north of the site was possible to the dense vegetation.

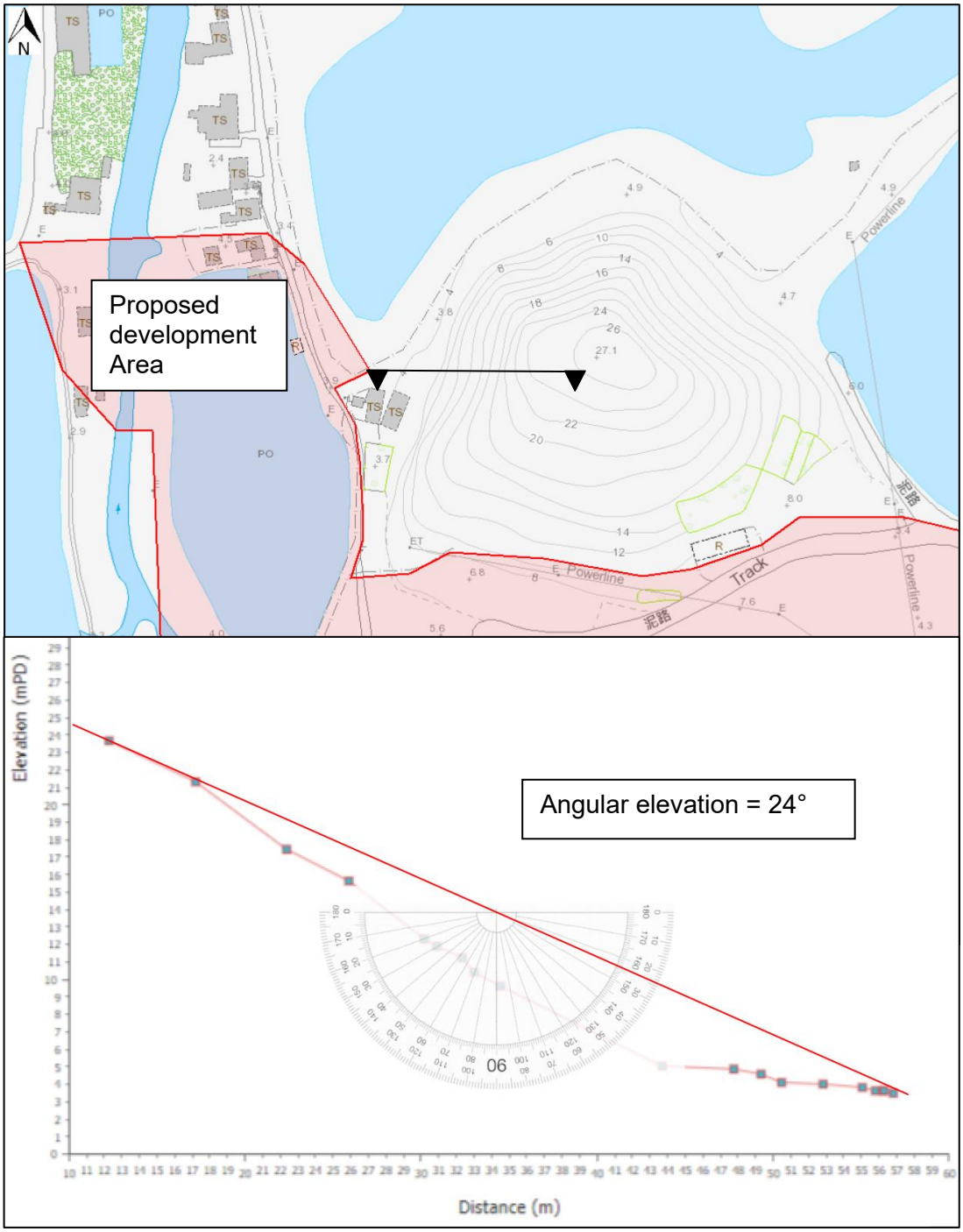
5. Screening

5.1 Screening

5.1.1 According to GEO Report 138 (2017), the north-western portion of the site satisfies the Alert Criteria in that it is:

a) A new development site involving provision of Group 1 to 3 facilities (residential housing) and involves a significant population at risk.

b) There is natural terrain outside the site, but within the same catchment, that is at an angular elevation of 20° or more from the site and there is ground sloping at more than 15° within 50 m horizontally upslope of the site boundary, with a credible flow path to the site.



6. Site formation / Foundation / ELS works

6.1 Schematic site formation works

6.1.1 According to the schematic site formation layout (appendix A), the schematic road and site formation level will be at +5.5mPD to +6.50mPD. New slopes / retaining walls will be proposed to support the level difference between existing ground and proposed formation level. The location of new features is shown in **Appendix A**.

6.1.2 The junction improvement works will be required at junction J3. The works will involve the widening of existing roads and re-provision of footpath and cycle track. The new retaining walls and modification works for existing slope and subway will be required. The works are shown in **Appendix A**.

6.2 Schematic Foundation works

6.2.1 In view of the site is generally flat, there will not be much unbalanced soil load acting on the building and cause extra cost to its foundation.

6.2.2 According to the geological map sheet, the bedrock maybe meta-Siltstone, Granodiorite or Tuff. Driven or machine-bored pile foundation founded on cat. 1c Granodiorite or Tuff or cat. 2 meta-Siltstone will be technically feasible for heavily loaded structures.

6.2.3 However, in view of the possible existence of the cavities within the Site, the project specific GI drilled holes shall be carried out to determine the extent and the class of marble features for detailed foundation design prior to the finalisation of general building plans (GBP) for the site according to PNAP APP 61.

6.3 Schematic ELS works

6.3.1 Temporary excavation and lateral support works may be required for construction of pile cap, conventional temporary pile wall with multi-layer of struts system is technically feasible scheme for ELS works.

7. Works Effect on Existing Features

7.1 Existing Geotechnical Feature

7.1.1 Major geotechnical features in the vicinity and their Slope Information System (SIS) together with proposed actions are summarized as below.

Table 7.1 Summary of the existing geotechnical features (Associated Work_ Sewage Pipe)

Feature No.	Type of Wall	Wall/Slope Dimensions (max. Height x Length)	Angle (deg)	Maintenance responsibility
Outside the site (associated works required),				
6NW-B/F154	Soil Fill Slope	5(H) x 280(L)	30	HyD
6NW-B/FR155	Soil Fill Slope & Retaining Wall	Slope: 5(H) x 270(L) Wall: 1.6(H) x 60(L)	30 90	HyD
Outside the site (associated works not required),				
6NW-B/F153	Soil Fill Slope	5(H) x 340(L)	30	HyD
6NW-B/F156	Soil Fill Slope	4.8(H) x 80(L)	30	HyD
6NW-B/R69	Retaining Wall	4(H) x 136(L)	90	HyD
6NW-B/R84	Retaining Wall	6(H) x 75(L)	90	HyD
6NW-B/FR86	Soil Fill Slope & Retaining Wall	Slope: 3.8(H) x 102(L) Wall: 4.3(H) x 39(L)	35 90	HyD

7.1.2 The drainage pile will be installed under the feature no. 6NW-B/F154 & 6NW-B/FR155 by pipe jacking. No bulk excavation and percussive construction works will be carried out at the feature. The slope is unlikely be affected by the development. Copies of the slope features' Slope Information System (SIS) data sheets and corresponding information are enclosed in **Appendix B1.**

Table 7.2 Summary of the existing geotechnical features (Junction J3)

Feature No.	Type of Wall	Wall/Slope Dimensions (max. Height x Length)	Angle (deg)	Maintenance responsibility
Outside the site (associated works required),				
6NE-A/C95	Soil Cut Slope	3(H) x 50(L)	50	HyD
6NE-A/C96	Soil Cut Slope	3(H) x 53(L)	35	HyD
6NE-A/C102	Soil Cut Slope	7(H) x 85(L)	38	HyD & Route 3 (CPS) Co. Ltd.
6NE-A/F99	Soil Fill Slope	4(H) x 35(L)	28	HyD
6NE-A/F100	Soil Fill Slope	4(H) x 13(L)	26	HyD
6NE-A/F112	Soil Fill Slope	3(H) x 140(L)	40	HyD
6NE-A/R48	Retaining Wall	3(H) x 6(L)	90	HyD
6NE-A/R49	Retaining Wall	3(H) x 8(L)	90	HyD

7.1.3 The features (6NE-A/F99, 6NE-A/F100, 6NE-A/R48 & 6NE-A/R49) to be abandoned by backfill. Portion of the features (6NE-A/C95, 6NE-A/C96, 6NE-A/C102 & 6NE-A/F112) will be modified to cooperate with development. Copies of the slope features' Slope Information System (SIS) data sheets and corresponding information are enclosed in **Appendix B2.**

8. Conclusion

8.1 Conclusions

8.1.1 According to the previous sections of this report, site formation works shall be technically feasible.

8.1.2 NTHS and NTHMW

- According to GEO Report 138 (2017), the site is subject to potential natural terrain hazards according to the geometry of the adjacent hillside and proximity to high consequence facilities within the proposed development, and thus a NTHS is required.
- However, the hillside is small (20 m high), generally gently sloping (<20°) where adjacent to proposed development apart from the west-facing open hillslope catchment (locally up to 30°). No existing landslides, HLC, incident reports, or other evidence of past instability are recorded. No significant boulders are recorded or observed from air photos. Thus, it is considered that the potential natural terrain hazards are not severe and subject to ground truthing, it is considered that mitigation works, if necessary, will be minimal.

8.1.3 In addition, the following works shall be considered:

- Project specified ground investigation field works prior to the finalisation of GBP;
- Geotechnical instrumentation shall be provided and monitored during the construction works to ensure the adjoin ground and structures will not be adversely affected.

8.1.4 Geotechnical Assessment Report and detailed design and works proposal of associated works at adjacent features shall be submitted before construction stage.

Figures

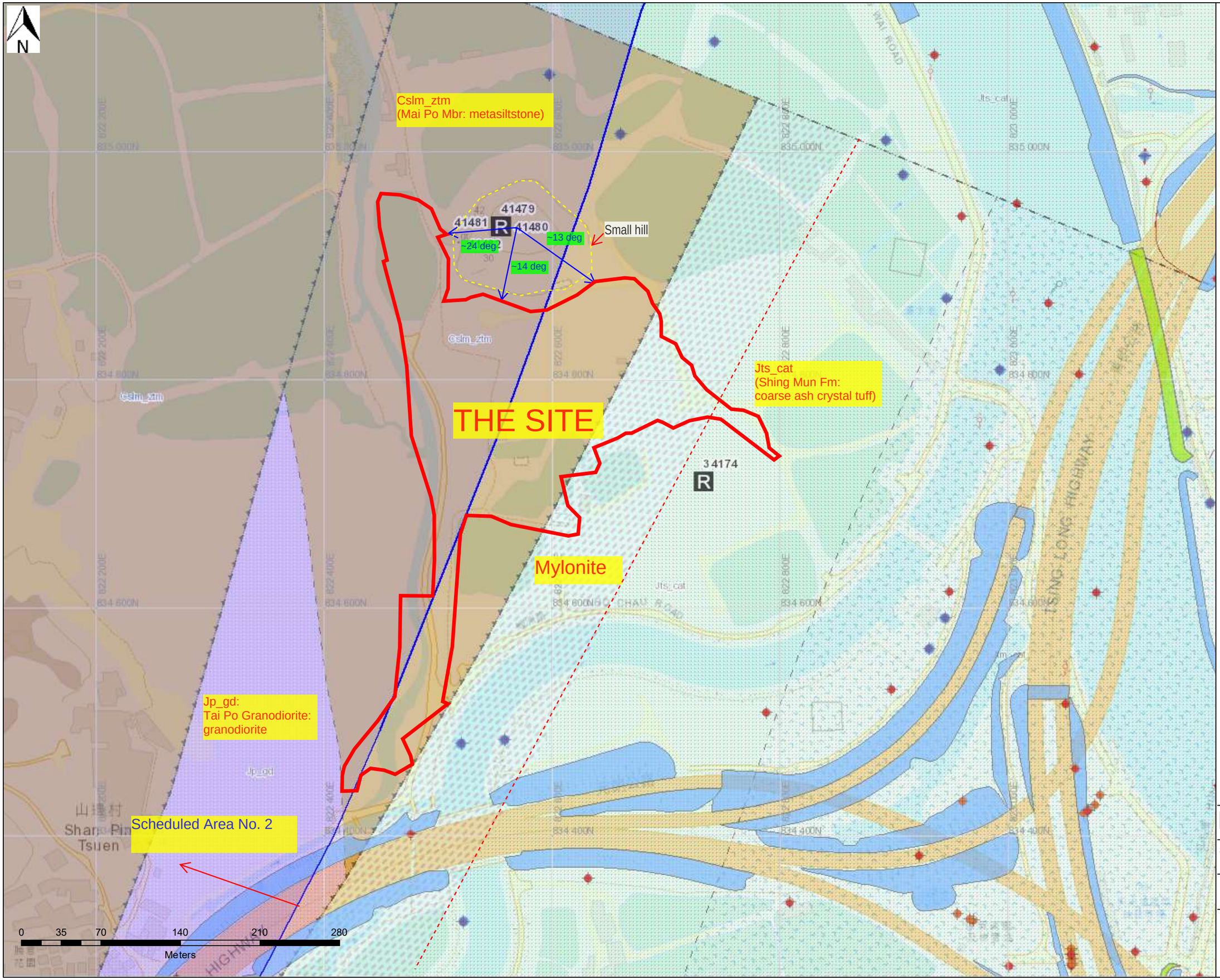


Figure 1

Scale 1:3,000

Site location Plan

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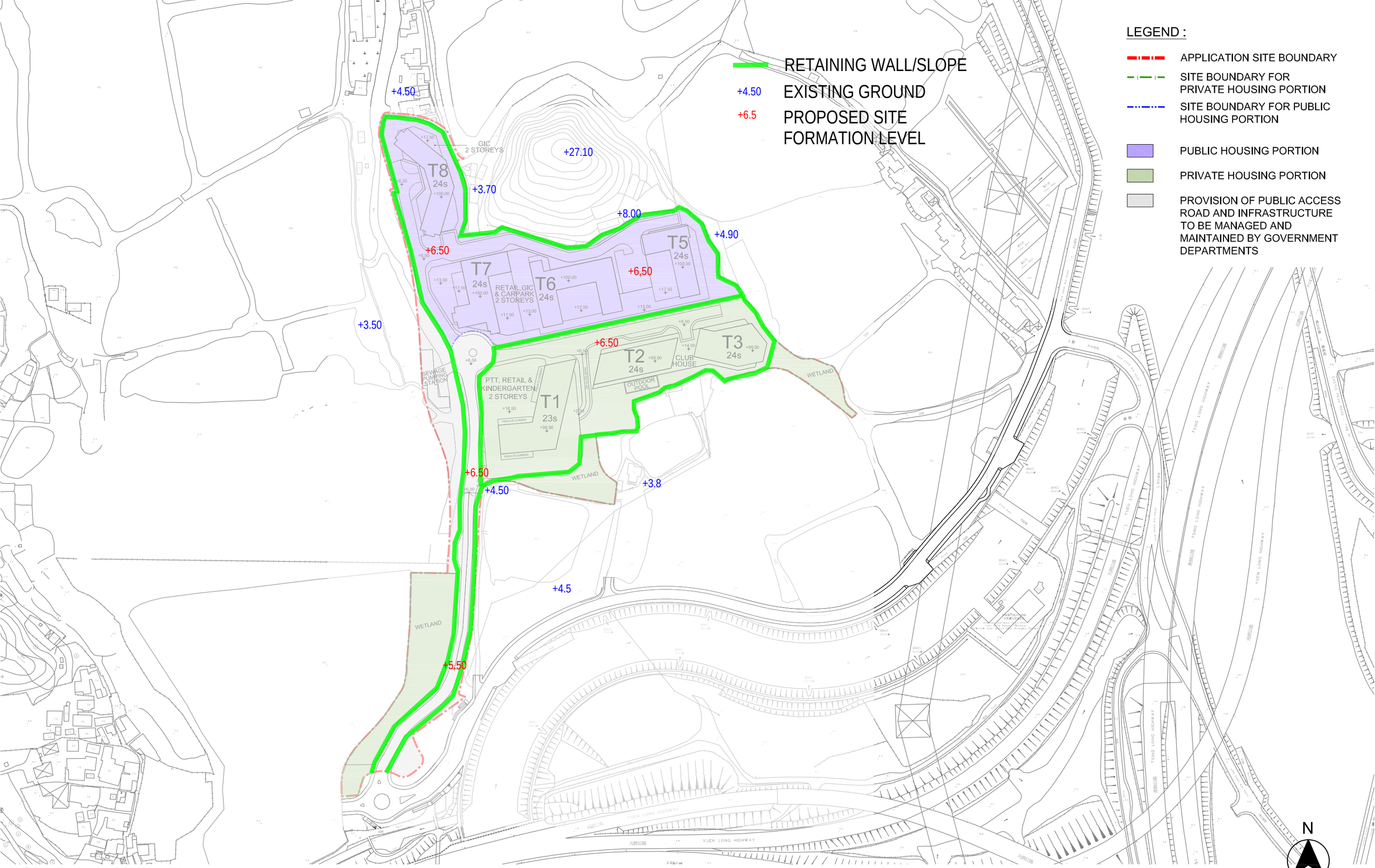
Appendix A

Site Formation Works Layout



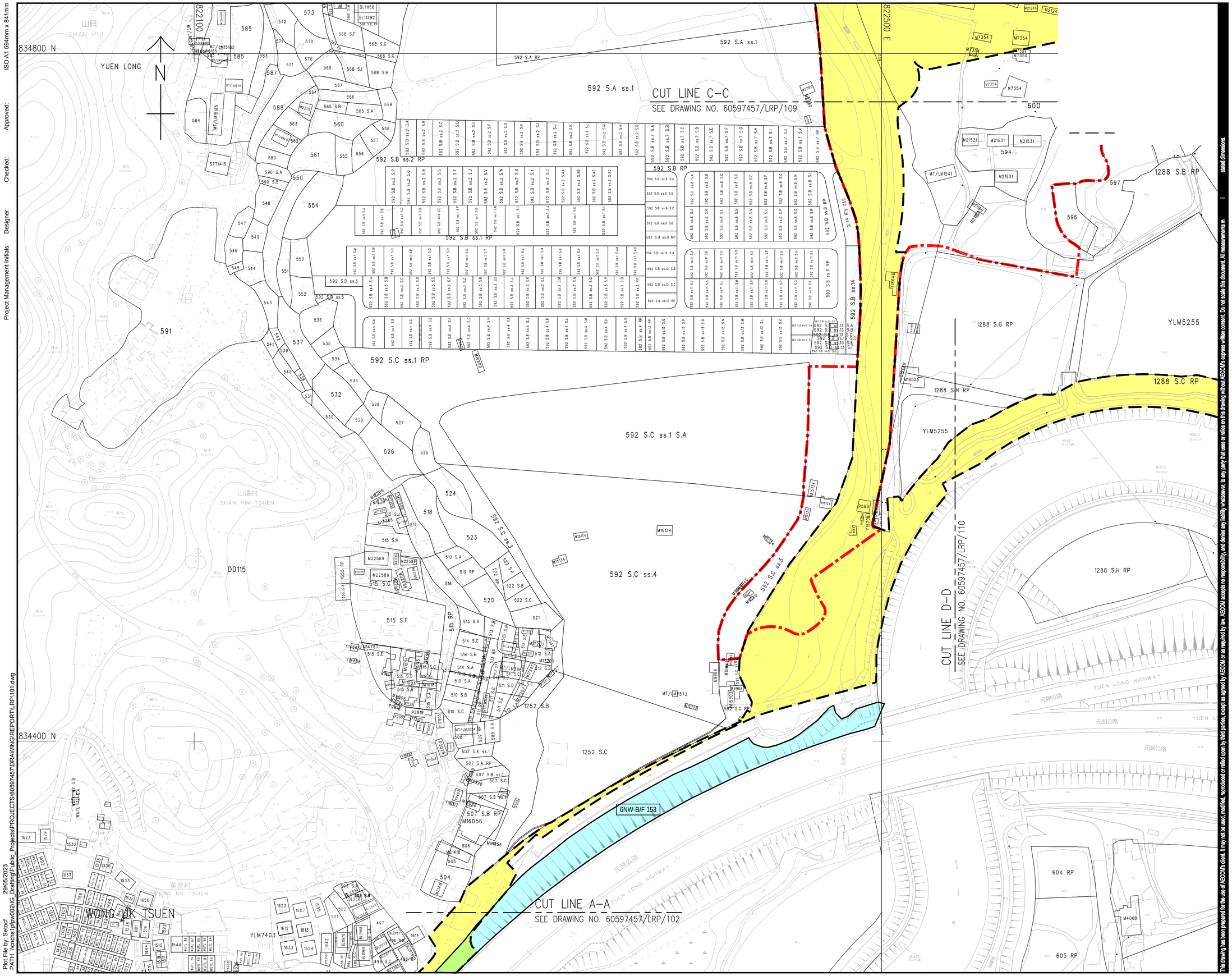
Site Demarcation Plan

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

ARCHI+
ARCHIPLUS INTERNATIONAL LIMITED



Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

Plot File by: Setocf 29/05/2023
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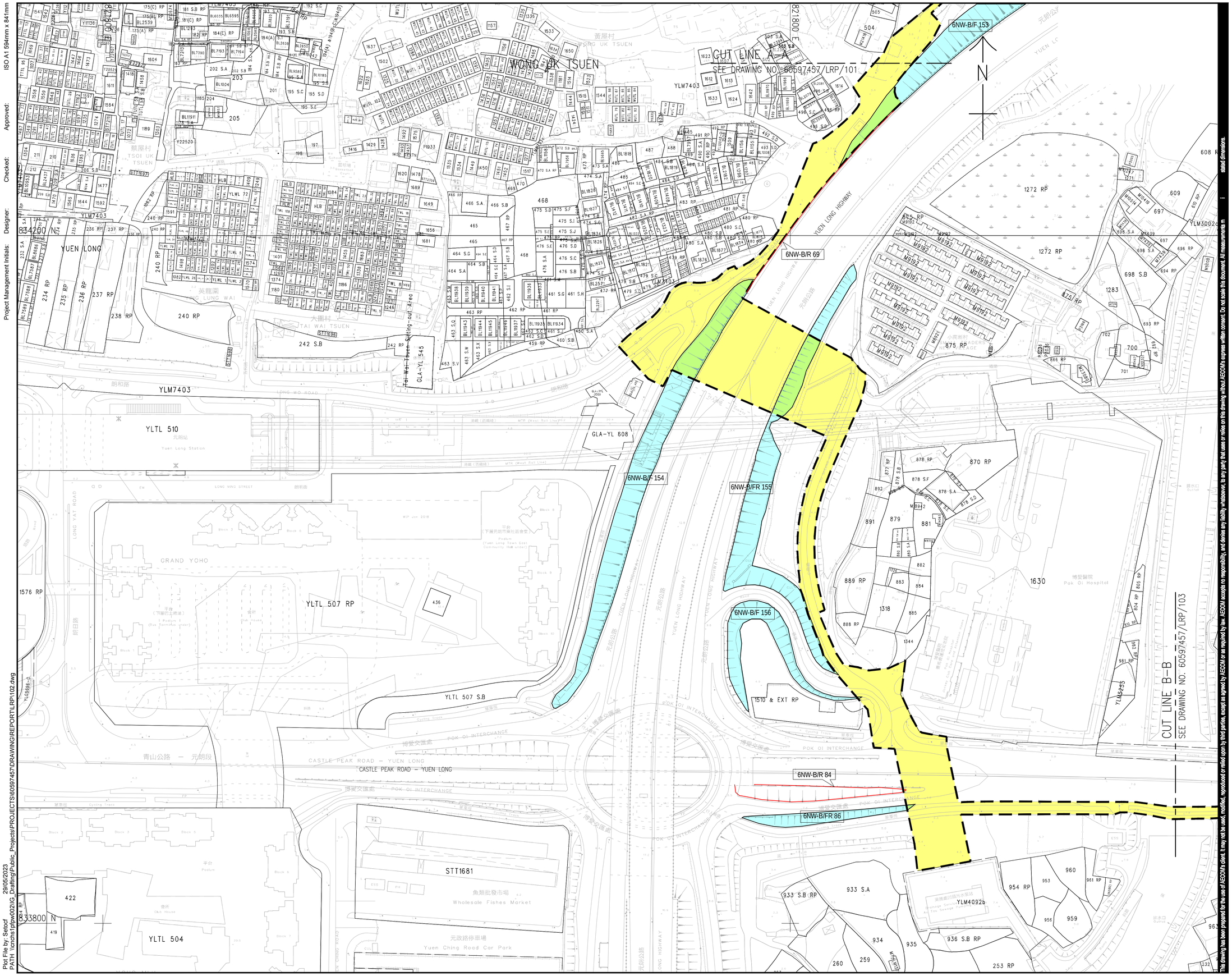

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

Plot File by: Setocf 29/05/2023
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ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

LEGEND:

PROPOSED SLOPE MODIFICATION

PROPOSED EXTENSION OF SUBWAY

PROPOSED RETAINING WALL

EXISTING REGISTERED CUT SLOPE

EXISTING REGISTERED FILL SLOPE

EXISTING REGISTERED RETAINING WALL

Slope modification

Extension of subway

6NE-A/C 96

6NE-A/F 99

6NE-A/R 48

6NE-A/F 100

6NE-A/R 49

6NE-A/C 102

6NE-A/C 95

6NE-A/F 112

PROPOSED METHOD OF CONTROL:

1

2

Plot File by: chanowa 25/4/2023
PATH: F:\BACK UP (E)\MAGITUNG SHING LEI P2\2021040\1\FIGURE 4.7.dgn

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AECOM

PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

CLIENT
業主

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 複核

STATUS
階段

PRELIMINARY

SCALE
比例

A3 1 : 1000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

CONTRACT NO.
合約編號

SHEET TITLE
圖紙名稱

PROPOSED LAYOUT FOR JUNCTION OF CASTLE PEAK ROAD - TAM MI / NAM SANG WAI ROAD (J3)

SHEET NUMBER
圖紙編號

FIGURE 4.7

Appendix B1

Slope Information System (SIS) data sheet and corresponding information (Associated Work_ Sewage Pipe)

BASIC INFORMATION

Location: YUEN LONG HIGHWAY , HSR(W2)

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 822106 Northing : 834041

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with heavy traffic density

Distance of Facility from Crest (m): 1.2

Facility at Toe: Railway, tramway

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 2

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 4 Length (m): 280 Average Angle (deg): 30
(1) Max. Height (m): 7 Length (m): 280 Average Angle (deg): 32

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 07-01-2015

Data Source: EI(HyD)

Slope Part Drainage: (1) Position: On slope Size(mm): 300
(2) Position: Toe Size(mm): 300
(3) Position: Toe Size(mm): 300

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A
Slope Part (2)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

(1) Utilities Type: Sewer/Drain Size(mm): 300 Location: On slope Remark: N/A
(2) Utilities Type: Sewer/Drain Size(mm): 300 Location: On crest Remark: N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Railway, tramway

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with heavy traffic density

Distance from Crest(m): 1.2
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

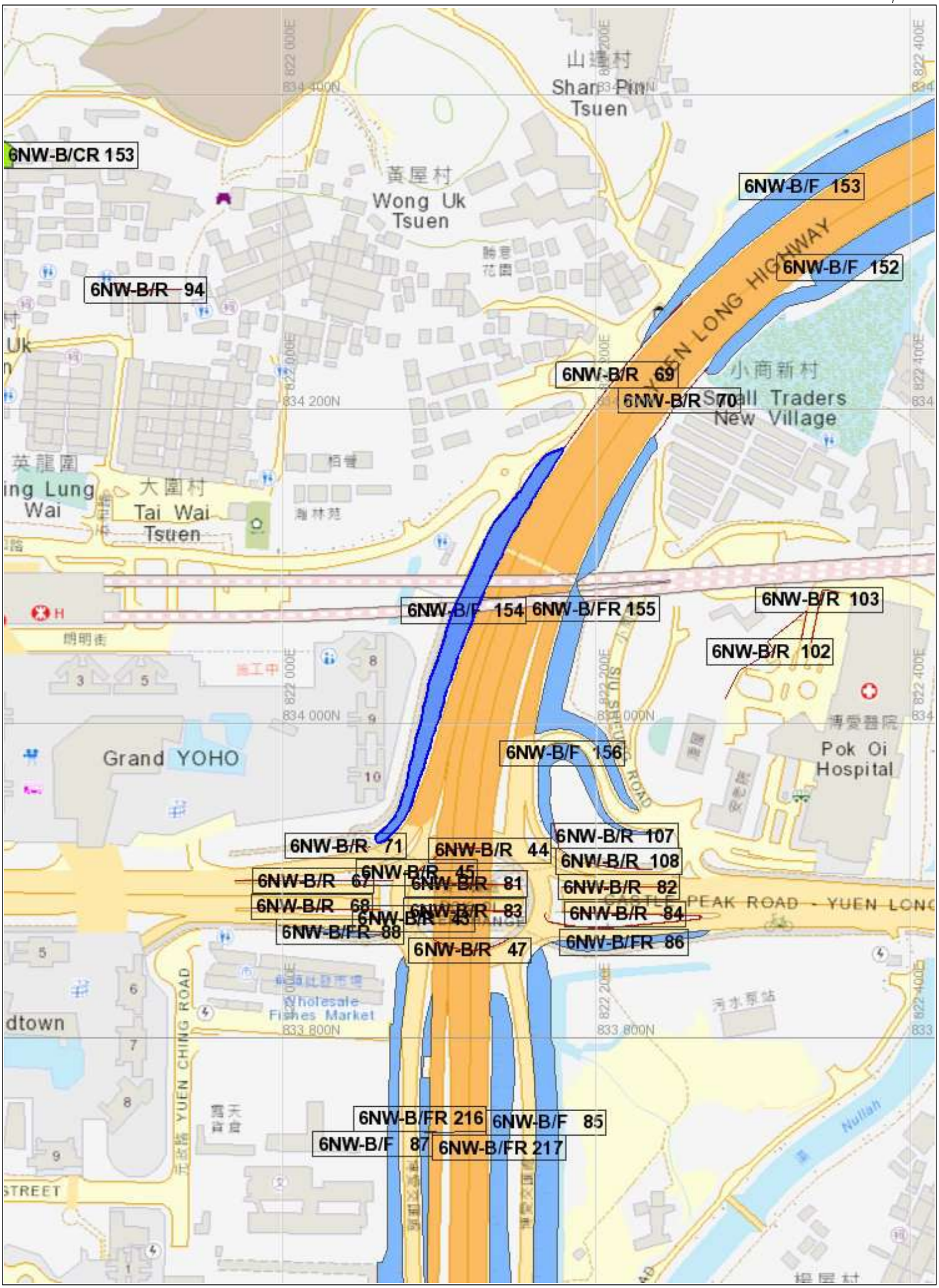
PHOTO







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6NW-B/R 94
6NW-B/F 153
6NW-B/F 152
6NW-B/R 69
6NW-B/R 70
6NW-B/F 154
6NW-B/FR 155
6NW-B/R 103
6NW-B/R 102
6NW-B/F 156
6NW-B/R 71
6NW-B/R 44
6NW-B/R 107
6NW-B/R 108
6NW-B/R 67
6NW-B/R 81
6NW-B/R 82
6NW-B/R 68
6NW-B/R 83
6NW-B/R 84
6NW-B/FR 88
6NW-B/R 47
6NW-B/FR 86
6NW-B/FR 216
6NW-B/F 85
6NW-B/F 87
6NW-B/FR 217
Sharp Pin Tsuen
Wong Uk Tsuen
Tai Wai Tsuen
Grand YOHO
Pok Oi Hospital
Wholesale Fishes Market
YUEN LONG HIGHWAY
PEAK ROAD - YUEN LONG
YUEN CHING ROAD

BASIC INFORMATION

Location: YUEN LONG HIGHWAY

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 822189 Northing : 834065

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with heavy traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with moderate traffic density

Distance of Facility from Toe (m): 1.5

Consequence-to-life Category: 2

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 5 Length (m): 270 Average Angle (deg): 30
(1) Max. Height (m): 2.7 Length (m): 270 Average Angle (deg): 30

WALL PART

(1) Max. Height (m): 1.6 Length (m): 60 Face Angle (deg): 90

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 01-02-2018

Data Source: Project Office

Slope Part Drainage: (1) Position: On slope Size(mm): 225
(2) Position: Toe Size(mm): 600

Wall Part Drainage: (1) Position: Crest Size(mm): 300

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A
Slope Part (2)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

Wall Part (1)
Type of Wall: Wall Material: Concrete Wall Location: Wall at toe
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

SERVICES

N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Road/footpath with moderate traffic density

Distance from Toe(m): 1.5
Type of Crest Facility: Road/footpath with heavy traffic density

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

PHOTO

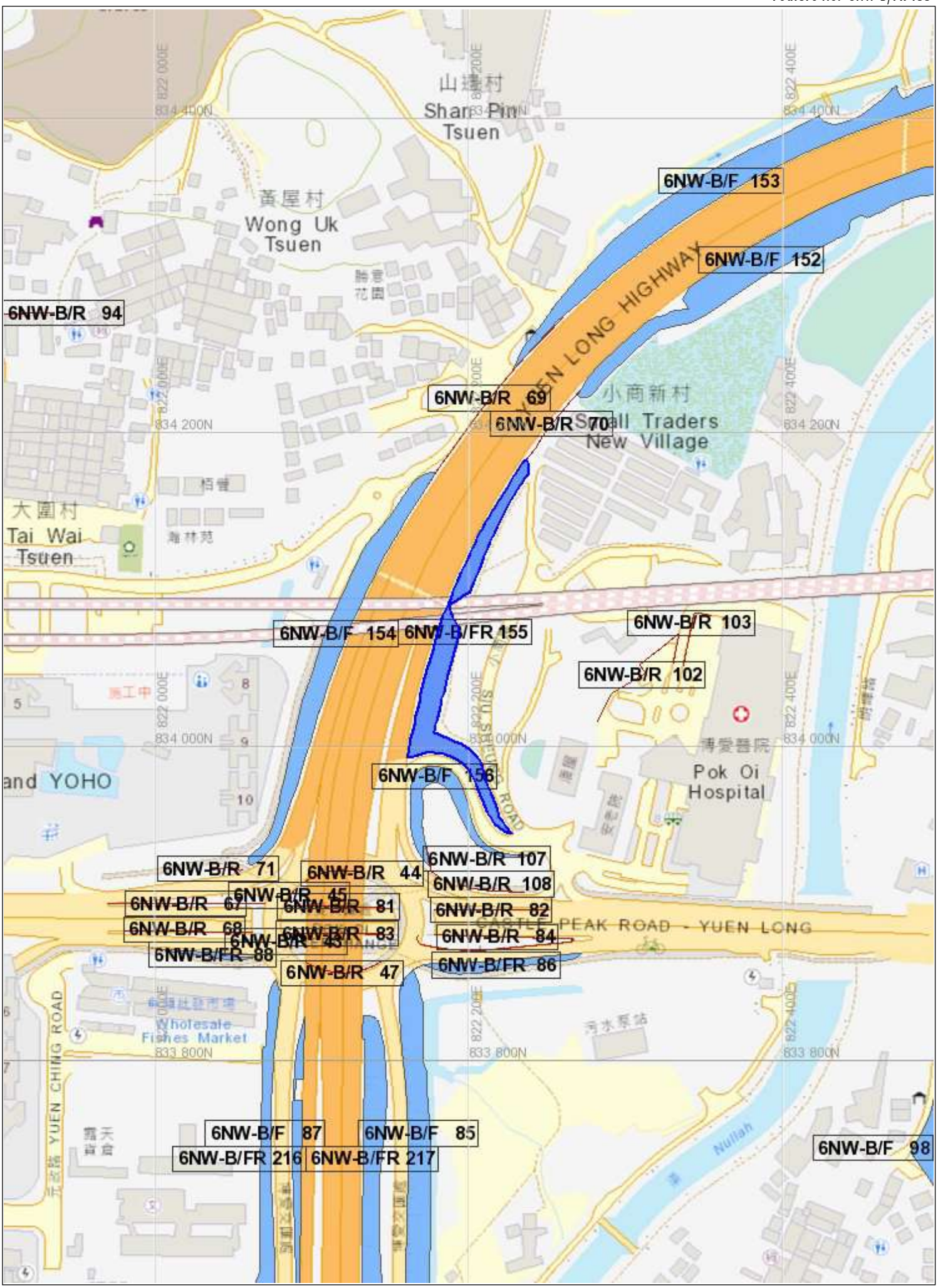











山邊村
Shan Pin Tsuen
黃屋村
Wong Uk Tsuen
小商新村
Small Traders New Village
大圍村
Tai Wai Tsuen
Pok Oi Hospital
Wholesale Fishes Market
YUEN LONG HIGHWAY
TUEN MUN CASTLE PEAK ROAD - YUEN LONG
YUEN CHING ROAD
6NW-B/R 94
6NW-B/F 153
6NW-B/F 152
6NW-B/R 69
6NW-B/R 70
6NW-B/F 154
6NW-B/FR 155
6NW-B/R 103
6NW-B/R 102
6NW-B/F 156
6NW-B/R 71
6NW-B/R 44
6NW-B/R 45
6NW-B/R 67
6NW-B/R 81
6NW-B/R 68
6NW-B/R 83
6NW-B/FR 88
6NW-B/R 47
6NW-B/R 107
6NW-B/R 108
6NW-B/R 82
6NW-B/R 84
6NW-B/FR 86
6NW-B/F 87
6NW-B/F 85
6NW-B/FR 216
6NW-B/FR 217
6NW-B/F 98

BASIC INFORMATION

Location: YUEN LONG HIGHWAY SLIP ROAD, HSR

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 822353 Northing : 834355

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with heavy traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Remote area or abandoned facilities

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 2

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 5 Length (m): 340 Average Angle (deg): 30

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 06-01-2012

Data Source: EI(HyD)

Slope Part Drainage: (1) Position: Toe Size(mm): 300
(2) Position: Toe Size(mm): 225

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Remote area or abandoned facilities

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with heavy traffic density

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

PHOTO










6NE-A/F 67
6NE-A/F 66
6NE-A/F 64
6NW-B/F 153
6NW-B/F 152
6NW-B/R 69
6NW-B/R 70
6NW-B/FR 155
6NW-B/F 154
6NW-B/R 103
6NW-B/R 102
6NW-B/F 156
6NW-B/R 107
TSUEN LONG HIGHWAY
SHA TSUI ROAD
Shan Pin Tsuen
Hong Uk Tsuen
Small Traders New Village
Pok Oi Hospital
822 200E
822 400E
822 600E
834 600N
834 400N
834 200N
834 000N

BASIC INFORMATION

Location: Adjacent to Slip Road connecting Yuen Long Highway near Pok Oi Hospital

Date of Formation: post-1977

Date of Construction/ Modification: 08-11-2017

Approximate Coordinates: Easting : 822183 Northing : 833981

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with heavy traffic density

Distance of Facility from Crest (m): 1.2

Facility at Toe: Lightly-used open area/facilities

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 2

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 4.8 Length (m): 60 Average Angle (deg): 30
(1) Max. Height (m): 4.5 Length (m): 80 Average Angle (deg): 30

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 17-06-2019
Data Source: Project Office
Slope Part Drainage: (1) Position: Toe Size(mm): 225

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: 1 Min. Berm Width (m): 1.2
Weepholes: Size (mm): N/A Spacing (m): N/A
Slope Part (2)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: 1 Min. Berm Width (m): 0.6
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Lightly-used open area/facilities

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with heavy traffic density

Distance from Crest(m): 1.2
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

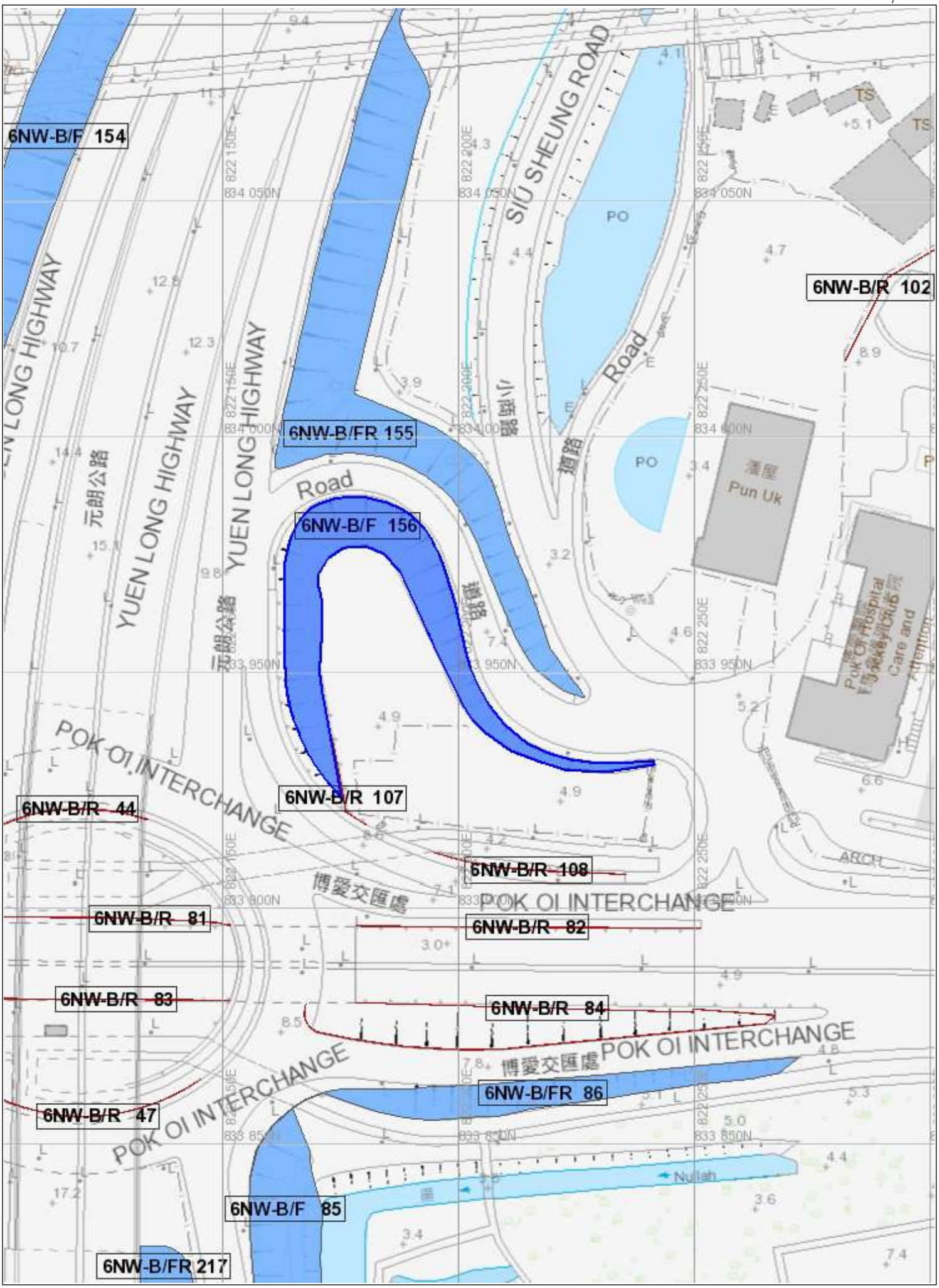
PHOTO










6NW-B/F 154
6NW-B/FR 155
6NW-B/F 156
6NW-B/R 102
6NW-B/R 107
6NW-B/R 44
6NW-B/R 108
6NW-B/R 81
6NW-B/R 82
6NW-B/R 83
6NW-B/R 84
6NW-B/FR 86
6NW-B/R 47
6NW-B/F 85
6NW-B/FR 217
YUEN LONG HIGHWAY
SIU SHEUNG ROAD
POK OI INTERCHANGE
Pun Uk
Nullah

BASIC INFORMATION

Location: YUEN LONG HIGHWAY , HSR(W2)

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 822221 Northing : 834231

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with heavy traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Railway platform and sheltered public waiting area

Distance of Facility from Toe (m): 3

Consequence-to-life Category: 1

Remarks: N/A

SLOPE PART

N/A

WALL PART

(1) Max. Height (m): 4 Length (m): 136 Face Angle (deg): 90

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 08-10-2012
Data Source: EI(HyD)
Slope Part Drainage: N/A

Wall Part Drainage: (1) Position: Crest Size(mm): 275

SLOPE PART

N/A

WALL PART

Wall Part (1)
Type of Wall: Wall Material: Concrete Wall Location: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): 65 Spacing (m): 2.2

SERVICES

(1) Utilities Type: Cable Size(mm): 0 Location: Toe Remark: Size cannot be determined
(2) Utilities Type: Cable Size(mm): 0 Location: On crest Remark: Size cannot be determined
(3) Utilities Type: Electricity Size(mm): 0 Location: Toe Remark: Size cannot be determined
(4) Utilities Type: Sewer/Drain Size(mm): 0 Location: Toe Remark: Size cannot be determined
(5) Utilities Type: Sewer/Drain Size(mm): 2500 Location: On crest Remark: N/A
(6) Utilities Type: Water Main Size(mm): 80 Location: Toe Remark: N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Railway platform and sheltered public waiting area

Distance from Toe(m): 3
Type of Crest Facility: Road/footpath with heavy traffic density

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

PHOTO










山邊村
Shan Pin Tsuen
黃屋村
Wong Uk Tsuen
勝意花園
YUEN LONG HIGHWAY
小商新村
Small Traders New Village
6NW-B/F 153
6NW-B/F 152
6NW-B/R 69
6NW-B/R 70
6NW-B/F 154
6NW-B/FR 155
6NW-B/R 103
6NW-B/R 102
6NW-B/F 156
SIU SHEUNG ROAD
博愛醫院
Pok Oi Hospital
822 400E
822 200E
834 4
834 2
834 0

BASIC INFORMATION

Location: AT POK OI INTERCHANGE OF YUEN LONG HIGHWAY , YL

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 822211 Northing : 833870

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Lightly-used open area/facilities

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with heavy traffic density

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 2

Remarks: N/A

SLOPE PART

N/A

WALL PART

(1) Max. Height (m): 6 Length (m): 75 Face Angle (deg): 90

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 23-12-2013
Data Source: EI(HyD)
Slope Part Drainage: N/A

Wall Part Drainage: (1) Position: Crest Size(mm): 225

SLOPE PART

N/A

WALL PART

Wall Part (1)
Type of Wall: Wall Material: Concrete Wall Location: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

SERVICES

N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: N/A

Section No: 1-1
Height(m):
Type of Toe Facility: Road/footpath with heavy traffic density

Distance from Toe(m): 0
Type of Crest Facility: Lightly-used open area/facilities

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

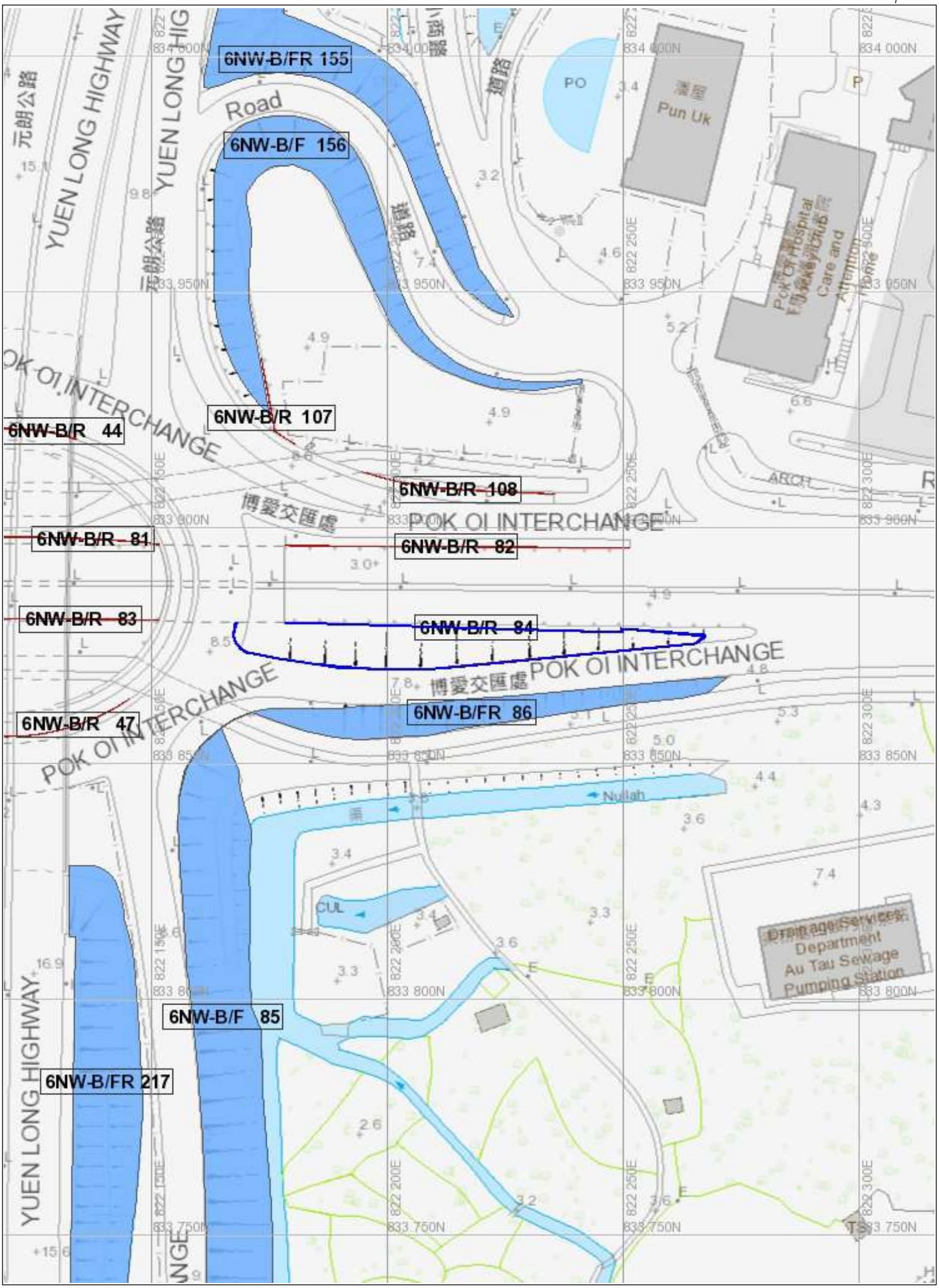
PHOTO







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6NW-B/F 156
6NW-B/R 107
6NW-B/R 44
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6NW-B/R 81
6NW-B/R 82
6NW-B/R 83
6NW-B/R 84
6NW-B/FR 86
6NW-B/R 47
6NW-B/F 85
6NW-B/FR 217
YUEN LONG HIGHWAY
POK OI INTERCHANGE
博愛交匯處
Road
Pun Uk
Nullah
CUL
Drainage Services Department
Au Tau Sewage Pumping Station

BASIC INFORMATION

Location: POK OI INTERCHANGE, HSR

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 822203 Northing : 833859

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with moderate traffic density

Distance of Facility from Crest (m): 1

Facility at Toe: Road/footpath with low traffic density

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 2

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 3.8 Length (m): 102 Average Angle (deg): 35

WALL PART

(1) Max. Height (m): 4.3 Length (m): 39 Face Angle (deg): 90

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 06-04-2011
Data Source: EI(HyD)
Slope Part Drainage: (1) Position: Toe Size(mm): 300

Wall Part Drainage: (1) Position: Toe Size(mm): 300

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

Wall Part (1)
Type of Wall: Wall Material: Concrete Wall Location: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

SERVICES

(1) Utilities Type: Cable Size(mm): 0 Location: On crest Remark: Size cannot be determined
(2) Utilities Type: Cable Size(mm): 0 Location: Toe Remark: Size cannot be determined
(3) Utilities Type: Electricity Size(mm): 0 Location: On crest Remark: Size cannot be determined
(4) Utilities Type: Electricity Size(mm): 0 Location: On slope Remark: Size cannot be determined
(5) Utilities Type: Electricity Size(mm): 0 Location: Toe Remark: Size cannot be determined
(6) Utilities Type: Sewer/Drain Size(mm): 375 Location: On crest Remark: N/A
(7) Utilities Type: Telecom Size(mm): 0 Location: Toe Remark: Size cannot be determined

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Road/footpath with low traffic density

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with moderate traffic density

Distance from Crest(m): 1
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

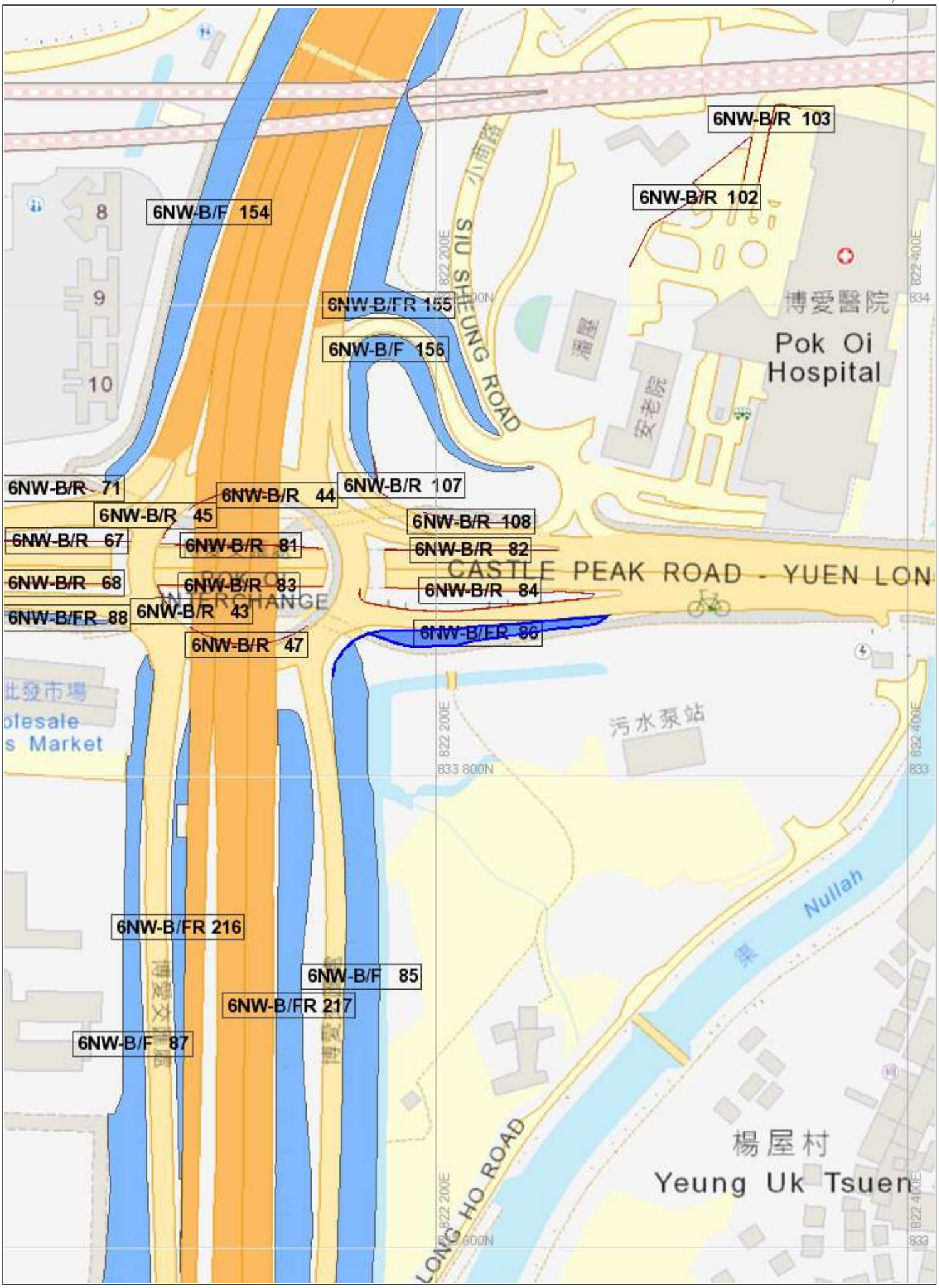
PHOTO







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6NW-B/R 102
6NW-B/F 154
6NW-B/FR 155
6NW-B/F 156
SIU SHEUNG ROAD
博愛醫院
Pok Oi Hospital
6NW-B/R 71
6NW-B/R 44
6NW-B/R 107
6NW-B/R 45
6NW-B/R 108
6NW-B/R 67
6NW-B/R 81
6NW-B/R 82
CASTLE PEAK ROAD - YUEN LON
6NW-B/R 68
6NW-B/R 83
6NW-B/R 84
POK OI INTERCHANGE
6NW-B/FR 88
6NW-B/R 43
6NW-B/FR 86
6NW-B/R 47
批發市場
olesale
s Market
污水泵站
6NW-B/FR 216
6NW-B/F 85
6NW-B/FR 217
6NW-B/F 87
LONG HO ROAD
楊屋村
Yeung Uk Tsuen
822 200E
822 400E
833 800N
834
833

Appendix B2

Slope Information System (SIS) data sheet and corresponding information (Junction J3)

BASIC INFORMATION

Location: CASTLE PEAK ROAD - TAM MI, YL

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 823176 Northing : 834226

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with very heavy traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with low traffic density

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 1

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 3 Length (m): 50 Average Angle (deg): 50

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 10-09-2010
Data Source: EI(HyD)
Slope Part Drainage: (1) Position: Toe Size(mm): 300

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 80 Chunam: 0 Shotcrete: 0 Other Cover: 20
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): 80 Spacing (m): 1.5

WALL PART

N/A

SERVICES

(1) Utilities Type: Cable Size(mm): 0 Location: Toe Remark: Size cannot be determined
(2) Utilities Type: Electricity Size(mm): 0 Location: On crest Remark: Size cannot be determined
(3) Utilities Type: Electricity Size(mm): 0 Location: Toe Remark: Size cannot be determined
(4) Utilities Type: Telecom Size(mm): 0 Location: On crest Remark: Size cannot be determined
(5) Utilities Type: Water Main Size(mm): 150 Location: On crest Remark: N/A
(6) Utilities Type: Water Main Size(mm): 700 Location: On crest Remark: N/A
(7) Utilities Type: Water Main Size(mm): 150 Location: On crest Remark: N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Road/footpath with low traffic density

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with very heavy traffic density

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

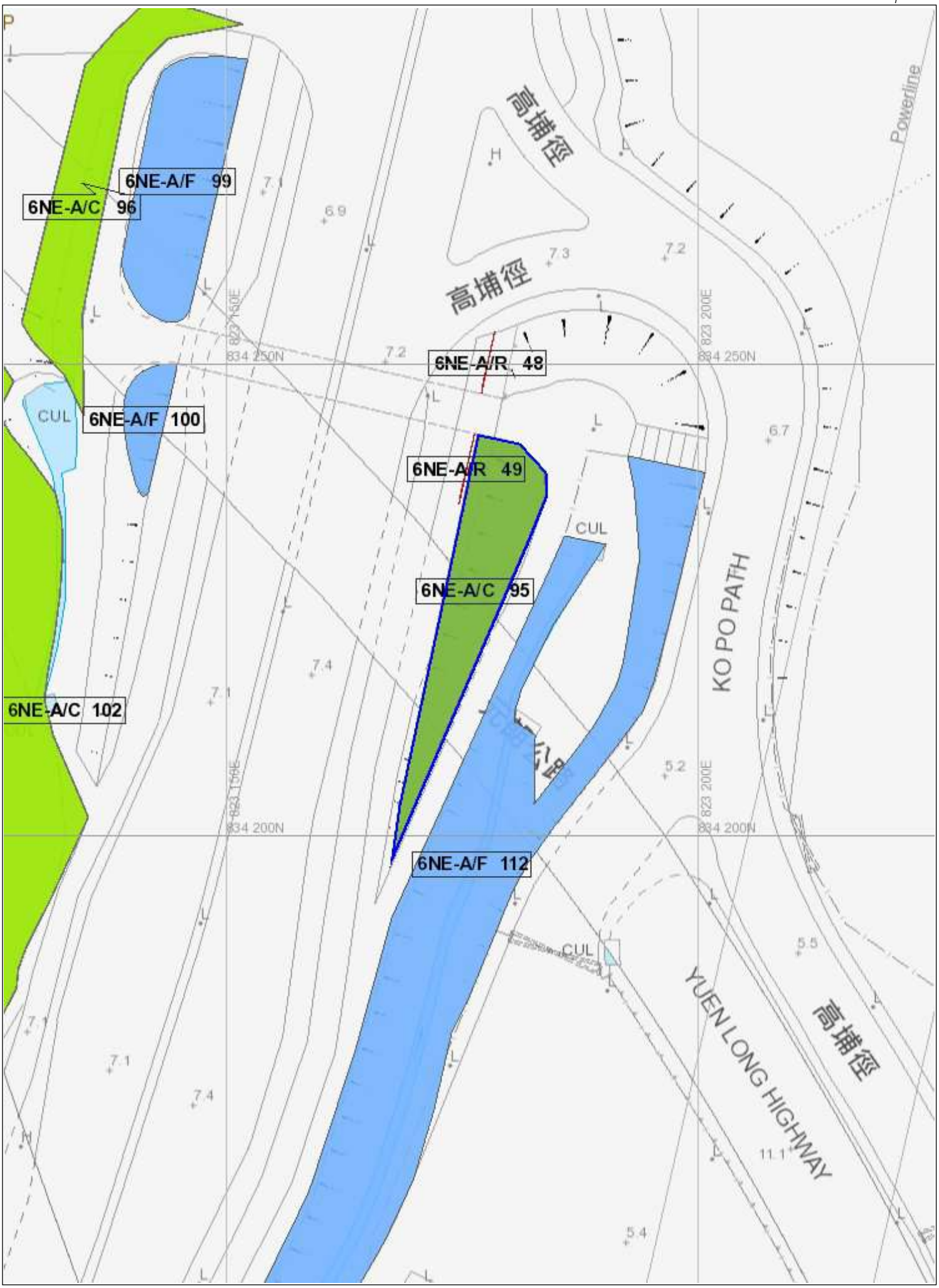
PHOTO







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6NE-A/C 96
6NE-A/F 100
6NE-A/R 48
6NE-A/R 49
6NE-A/C 95
6NE-A/C 102
6NE-A/F 112
高埔徑
高埔徑
KO PO PATH
YUEN LONG HIGHWAY
高埔徑
Powerline
CUL
CUL
CUL
834 250N
834 200N
823 200E

BASIC INFORMATION

Location: CASTLE PEAK ROAD - TAM MI, YL

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 823137 Northing : 834280

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: District open space

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with low traffic density

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 3

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 3 Length (m): 53 Average Angle (deg): 35

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 06-04-2011

Data Source: EI(HyD)

Slope Part Drainage: (1) Position: Crest Size(mm): 300
(2) Position: Toe Size(mm): 225

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 5 Chunam: 0 Shotcrete: 0 Other Cover: 95
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

(1) Utilities Type: Cable Size(mm): 0 Location: Toe Remark: Size cannot be determined
(2) Utilities Type: Gas Size(mm): 0 Location: On slope Remark: Size cannot be determined
(3) Utilities Type: Gas Size(mm): 0 Location: Toe Remark: Size cannot be determined
(4) Utilities Type: Gas Size(mm): 0 Location: On crest Remark: Size cannot be determined
(5) Utilities Type: Telecom Size(mm): 0 Location: Toe Remark: Size cannot be determined

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Road/footpath with low traffic density

Distance from Toe(m): 0
Type of Crest Facility: District open space

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

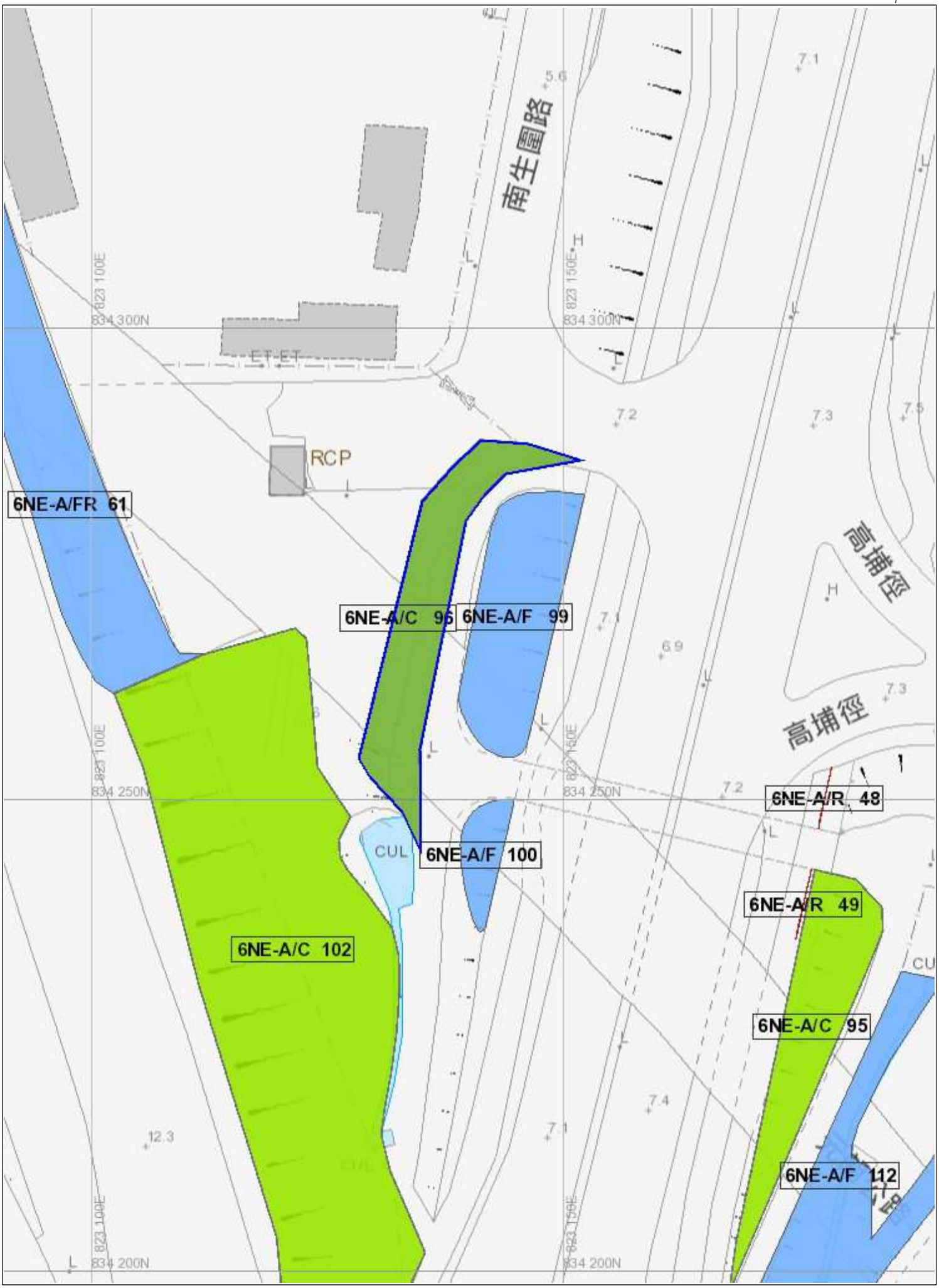
PHOTO










南生圍路
高埔徑
高埔徑
RCP
ET ET
CUL
CUL
6NE-A/FR 61
6NE-A/C 96
6NE-A/F 99
6NE-A/R 48
6NE-A/F 100
6NE-A/R 49
6NE-A/C 102
6NE-A/C 95
6NE-A/F 112
834 300N
834 250N
834 200N

BASIC INFORMATION

Location: CASTLE PEAK ROAD - TAM MEI

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 823121 Northing : 834231

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with heavy traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Bus shelter

Distance of Facility from Toe (m): 3

Consequence-to-life Category: 1

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 7 Length (m): 85 Average Angle (deg): 38

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Mixed Feature Party: ROUTE 3 (CPS) CO. LTD. Agent: N/A
Mixed Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 24-02-2017
Data Source: EI (HyD)
Slope Part Drainage: N/A

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

(1) Utilities Type: Gas Size(mm): 0 Location: On slope Remark: N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Bus shelter

Distance from Toe(m): 3
Type of Crest Facility: Road/footpath with heavy traffic density

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

PHOTO



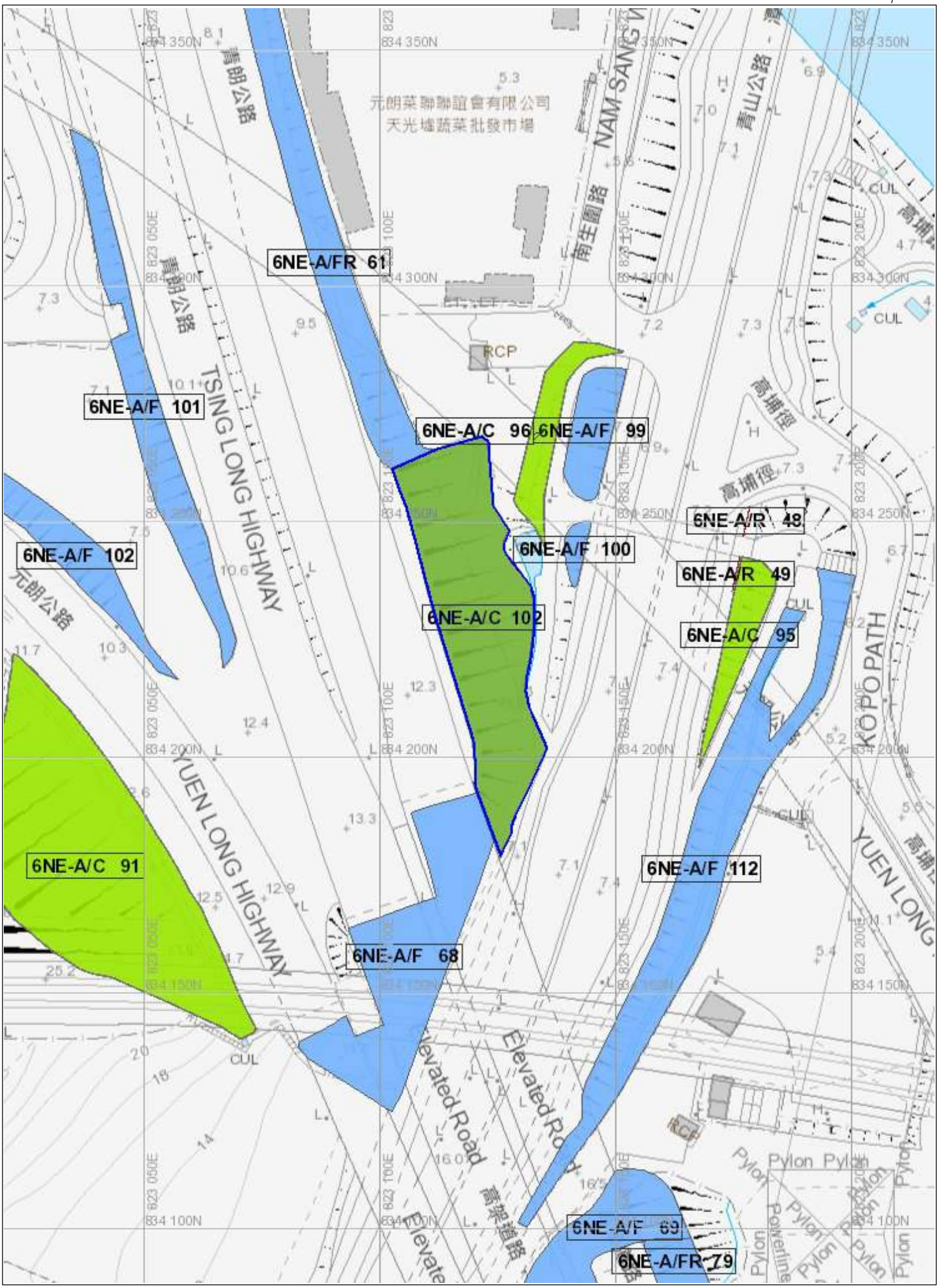








Feature No. 6NE-A/C 102



BASIC INFORMATION

Location: CASTLE PEAK ROAD - TAM MI, YL

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 823145 Northing : 834271

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with low traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with low traffic density

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 3

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 4 Length (m): 35 Average Angle (deg): 28

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 14-04-2010
Data Source: EI(HyD)
Slope Part Drainage: (1) Position: Toe Size(mm): 400

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 60 Chunam: 0 Shotcrete: 0 Other Cover: 40
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

(1) Utilities Type: Electricity Size(mm): 0 Location: On crest Remark: Size cannot be determined
(2) Utilities Type: Sewer/Drain Size(mm): 0 Location: On crest Remark: Size cannot be determined
(3) Utilities Type: Water Main Size(mm): 0 Location: On crest Remark: Size cannot be determined

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Road/footpath with low traffic density

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with low traffic density

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

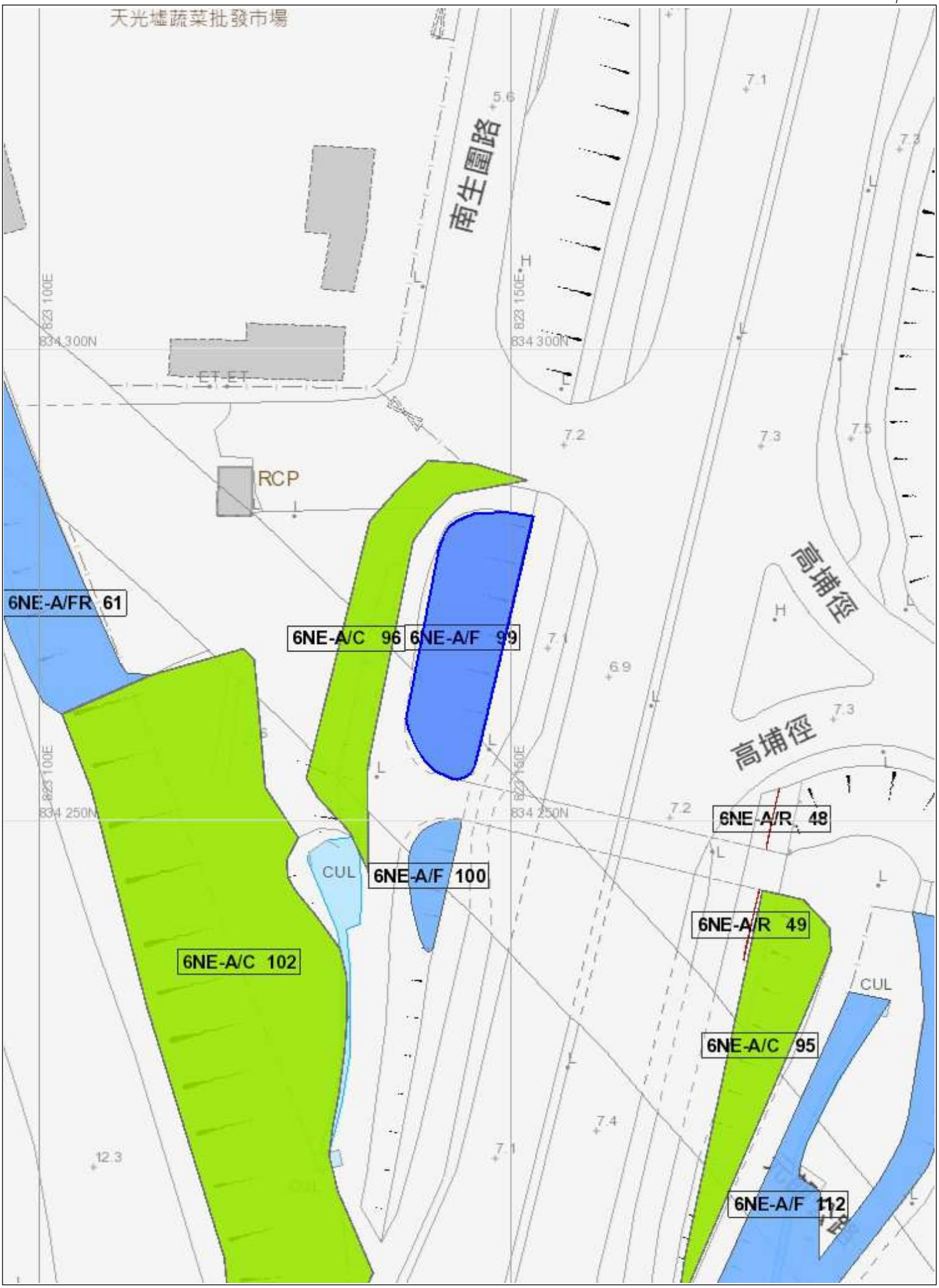
PHOTO







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南生圍路
高埔徑
高埔徑
RCP
ET-ET
CUL
CUL
6NE-A/FR 61
6NE-A/C 96
6NE-A/F 99
6NE-A/F 100
6NE-A/C 102
6NE-A/R 48
6NE-A/R 49
6NE-A/C 95
6NE-A/F 112
823 100E
834 300N
823 150E
834 300N
823 100E
834 250N
823 150E
834 250N

BASIC INFORMATION

Location: CASTLE PEAK ROAD - TAM MI, YL

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 823141 Northing : 834243

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with low traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with low traffic density

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 3

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 4 Length (m): 13 Average Angle (deg): 26

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 14-04-2010
Data Source: EI(HyD)
Slope Part Drainage: (1) Position: Toe Size(mm): 300

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 70 Chunam: 0 Shotcrete: 0 Other Cover: 30
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Road/footpath with low traffic density

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with low traffic density

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:
Sign of Distress:

Criterion D satisfied:
Non-routine maintenance required:
Note:

Masonry wall/Masonry facing:
Note:

Consequence category (for critical section):
Observations: N/A
Emergency Action Required:
Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A
Action By: N/A
Further Study:
Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:
Action By: N/A
Non-routine Maintenance:
Action By: N/A

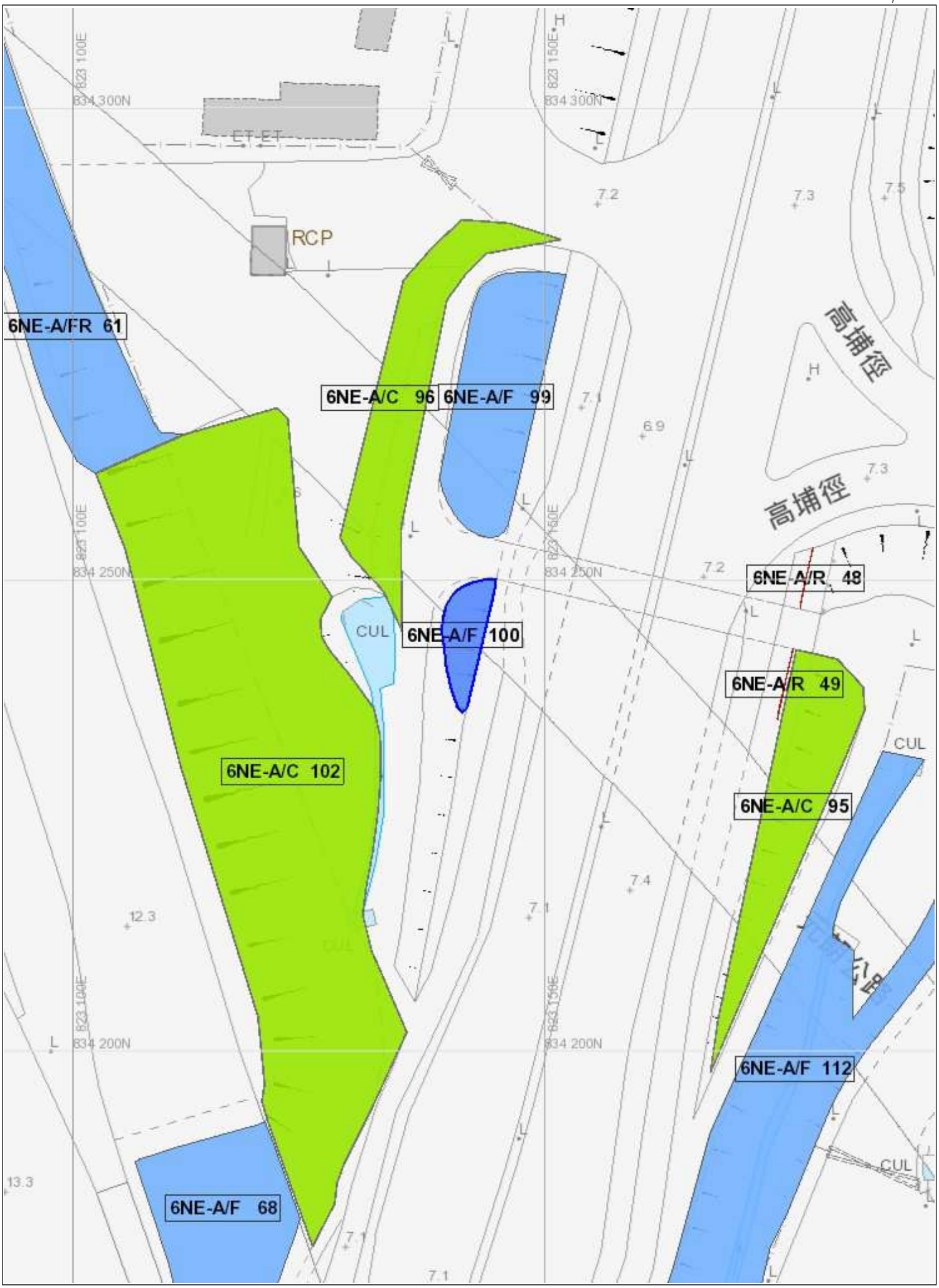
PHOTO







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6NE-A/C 96
6NE-A/F 99
6NE-A/F 100
6NE-A/R 48
6NE-A/R 49
6NE-A/C 102
6NE-A/C 95
6NE-A/F 112
6NE-A/F 68
RCP
CUL
高埔徑
高埔徑
834 300N
834 250N
834 200N
823 100E
823 150E

BASIC INFORMATION

Location: CASTLE PEAK ROAD - TAM MI, YL

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 823164 Northing : 834167

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with very heavy traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Lightly-used open area/facilities

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 1

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 3 Length (m): 140 Average Angle (deg): 40

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 10-09-2010

Data Source: EI(HyD)

Slope Part Drainage: (1) Position: On slope Size(mm): 225
(2) Position: Toe Size(mm): 300

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

(1) Utilities Type: Cable Size(mm): 0 Location: On crest Remark: Size cannot be determined
(2) Utilities Type: Electricity Size(mm): 0 Location: Toe Remark: Size cannot be determined
(3) Utilities Type: Electricity Size(mm): 0 Location: On crest Remark: Size cannot be determined
(4) Utilities Type: Electricity Size(mm): 0 Location: On slope Remark: Size cannot be determined
(5) Utilities Type: Gas Size(mm): 0 Location: On crest Remark: Size cannot be determined
(6) Utilities Type: Sewer/Drain Size(mm): 0 Location: On crest Remark: Size cannot be determined
(7) Utilities Type: Telecom Size(mm): 0 Location: On crest Remark: Size cannot be determined
(8) Utilities Type: Water Main Size(mm): 80 Location: On crest Remark: N/A
(9) Utilities Type: Water Main Size(mm): 700 Location: On crest Remark: N/A
(10) Utilities Type: Water Main Size(mm): 1400 Location: Toe Remark: N/A
(11) Utilities Type: Water Main Size(mm): 300 Location: Toe Remark: N/A

STAGE 1 STUDY REPORT

Inspected On:
Weather:
District: MW

Section No: 1-1
Height(m):
Type of Toe Facility: Lightly-used open area/facilities

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with very heavy traffic density

Distance from Crest(m): 0
Consequence Category:
Engineering Judgement:

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category:
Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

PHOTO










6NE-A/F 57
6NE-A/F 60
6NE-A/F 58
6NE-A/F 59
6NE-A/FR 61
6NE-A/F 101
6NE-A/F 102
6NE-A/F 99
6NE-A/C 96
6NE-A/R 48
6NE-A/F 100
6NE-A/R 49
6NE-A/C 102
6NE-A/C 95
6NE-A/C 91
6NE-A/F 112
6NE-A/F 68
6NE-A/R 28
6NE-A/F 69
6NE-A/FR 79
6NE-A/F 71
6NE-A/F 104
6NE-A/C 30
6NE-A/R 6
6NE-A/FR 70
6NE-A/F 72
6NE-A/F 22
6NE-A/F 106
6NE-A/F 74
大光墟蔬菜批發市場
施工中
Works in progress
YUEN LONG HIGHWAY
山水盈
Crescent
墓地
德園

BASIC INFORMATION

Location: CASTLE PEAK ROAD - TAM MI, YL

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 823178 Northing : 834250

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with low traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with low traffic density

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 3

Remarks: N/A

SLOPE PART

N/A

WALL PART

(1) Max. Height (m): 3 Length (m): 6 Face Angle (deg): 90

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 16-07-2010
Data Source: EI(HyD)
Slope Part Drainage: N/A

Wall Part Drainage: (1) Position: Toe Size(mm): 300

SLOPE PART

N/A

WALL PART

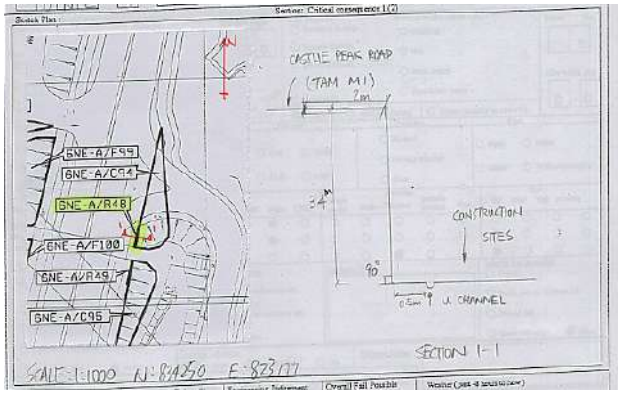
Wall Part (1)
Type of Wall: Wall Material: Concrete Wall Location: Retaining wall with level platform
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

SERVICES

(1) Utilities Type: Cable Size(mm): 0 Location: On crest Remark: Size cannot be determined
(2) Utilities Type: Cable Size(mm): 0 Location: Toe Remark: Size cannot be determined
(3) Utilities Type: Sewer/Drain Size(mm): 0 Location: On crest Remark: Size cannot be determined
(4) Utilities Type: Telecom Size(mm): 0 Location: Toe Remark: Size cannot be determined
(5) Utilities Type: Water Main Size(mm): 150 Location: Toe Remark: N/A

STAGE 1 STUDY REPORT

Inspected On: 08-02-2003
Weather: Mainly Fine
District: MW



Section No: 1-1
Height(m): H1 : 3 , H2 : 3
Type of Toe Facility: Road/footpath with low traffic density

Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with low traffic density

Distance from Crest(m): 0
Consequence Category: 2
Engineering Judgement: U

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category: 2
Engineering Judgement: U

Sign of Seepage:	Slope : N/A Wall : No sign of seepage
Criterion A satisfied:	N
Sign of Distress:	Slope : N/A Wall : N/A
Criterion D satisfied:	N
Non-routine maintenance required:	N
Note:	N/A
Masonry wall/Masonry facing:	N
Note:	N/A
Consequence category (for critical section):	2
Observations:	N/A
Emergency Action Required:	N
Action By:	N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D:	N/A
Action By:	N/A
Further Study:	N
Action By:	N/A

OTHER EXTERNAL ACTION

Check / repair Services:	N
Action By:	N/A
Non-routine Maintenance:	N
Action By:	N/A

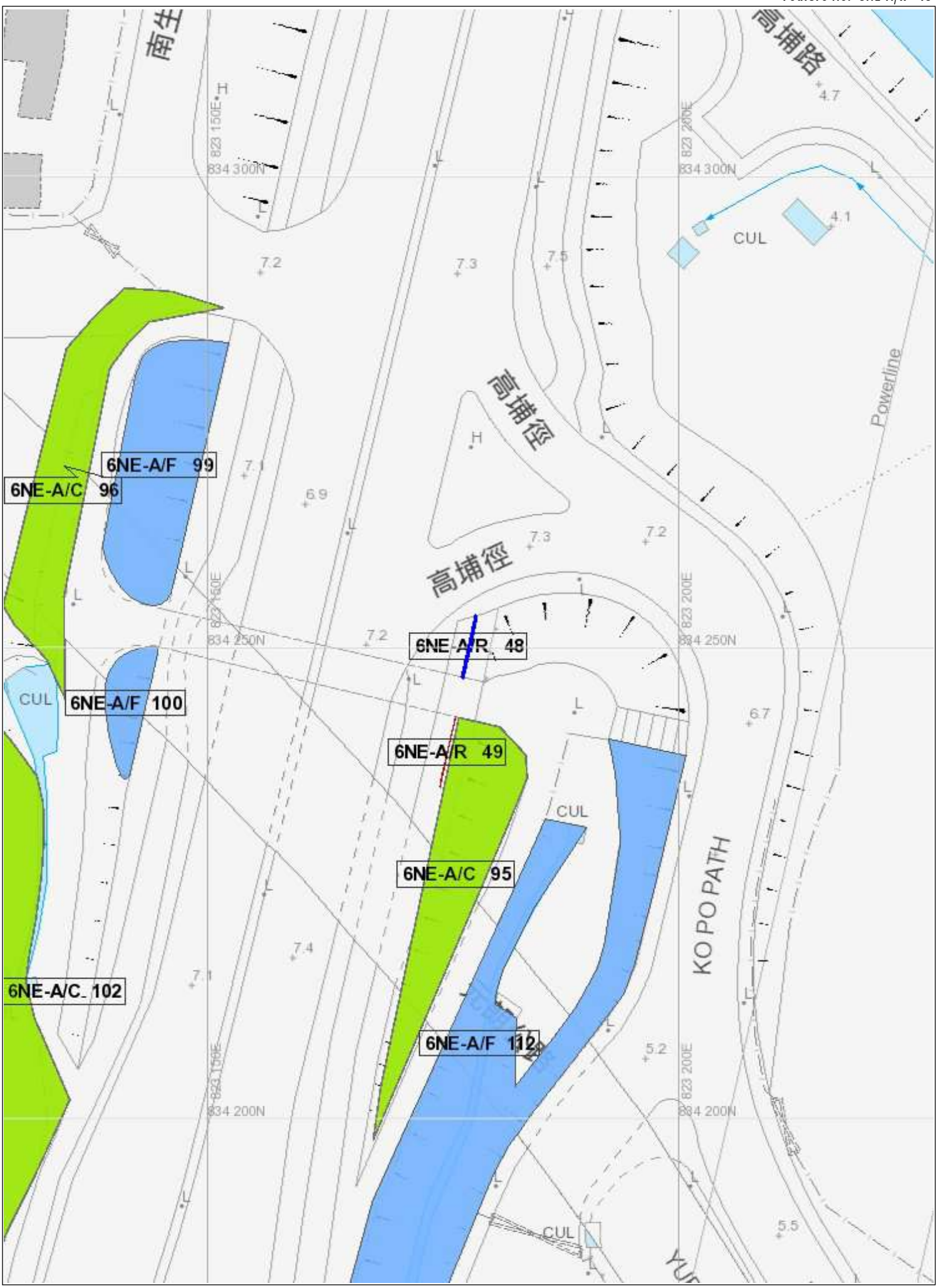
PHOTO










南生
高埔路
高埔徑
高埔徑
Powerline
KO PO PATH
6NE-A/F 99
6NE-A/C 96
6NE-A/F 100
6NE-A/R 48
6NE-A/R 49
6NE-A/C 95
6NE-A/C 102
6NE-A/F 112
CUL
CUL
CUL
CUL
823 150E
834 300N
823 200E
834 300N
823 150E
834 250N
823 200E
834 250N
823 150E
834 200N
823 200E
834 200N
7.2
7.3
7.5
4.7
4.1
7.1
6.9
7.3
7.2
7.2
6.7
7.4
7.1
5.2
5.5

BASIC INFORMATION

Location: SUBWAY OF CASTLE PEAK ROAD - TAM MI NEAR HUNG MO KIU, YUEN LONG

Date of Formation: post-1977

Date of Construction/ Modification:

Approximate Coordinates: Easting : 823176 Northing : 834240

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with low traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with low traffic density

Distance of Facility from Toe (m): 1

Consequence-to-life Category: 3

Remarks: N/A

SLOPE PART

N/A

WALL PART

(1) Max. Height (m): 3 Length (m): 8 Face Angle (deg): 90

MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 30-12-2005
Data Source: EI(HyD)
Slope Part Drainage: N/A

Wall Part Drainage: (1) Position: Toe Size(mm): 325

SLOPE PART

N/A

WALL PART

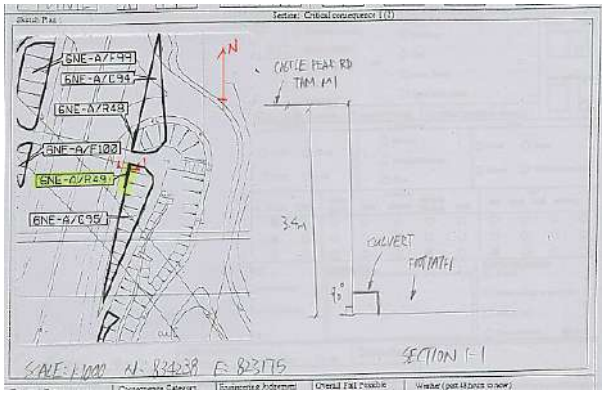
Wall Part (1)
Type of Wall: Wall Material: Concrete Wall Location: Retaining wall with level platform
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

SERVICES

(1) Utilities Type: Electricity Size(mm): 0 Location: On slope Remark: Size cannot be determined

STAGE 1 STUDY REPORT

Inspected On: 08-02-2003
Weather: Mainly Fine
District: MW



Section No: 1-1
Height(m): H1 : 3 , H2 : 3
Type of Toe Facility: Road/footpath with low traffic density

Distance from Toe(m): 1
Type of Crest Facility: Road/footpath with low traffic density

Distance from Crest(m): 0
Consequence Category: 2
Engineering Judgement: U

Section No: 2-2
Type of Toe Facility:

Distance from Toe(m):
Type of Crest Facility:

Distance from Crest(m):
Consequence Category: 2
Engineering Judgement: U

Sign of Seepage:	Slope : N/A Wall : No sign of seepage
Criterion A satisfied:	N
Sign of Distress:	Slope : N/A Wall : N/A
Criterion D satisfied:	N
Non-routine maintenance required:	N
Note:	N/A
Masonry wall/Masonry facing:	N
Note:	N/A
Consequence category (for critical section):	2
Observations:	N/A
Emergency Action Required:	N
Action By:	N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D:	N/A
Action By:	N/A
Further Study:	N
Action By:	N/A

OTHER EXTERNAL ACTION

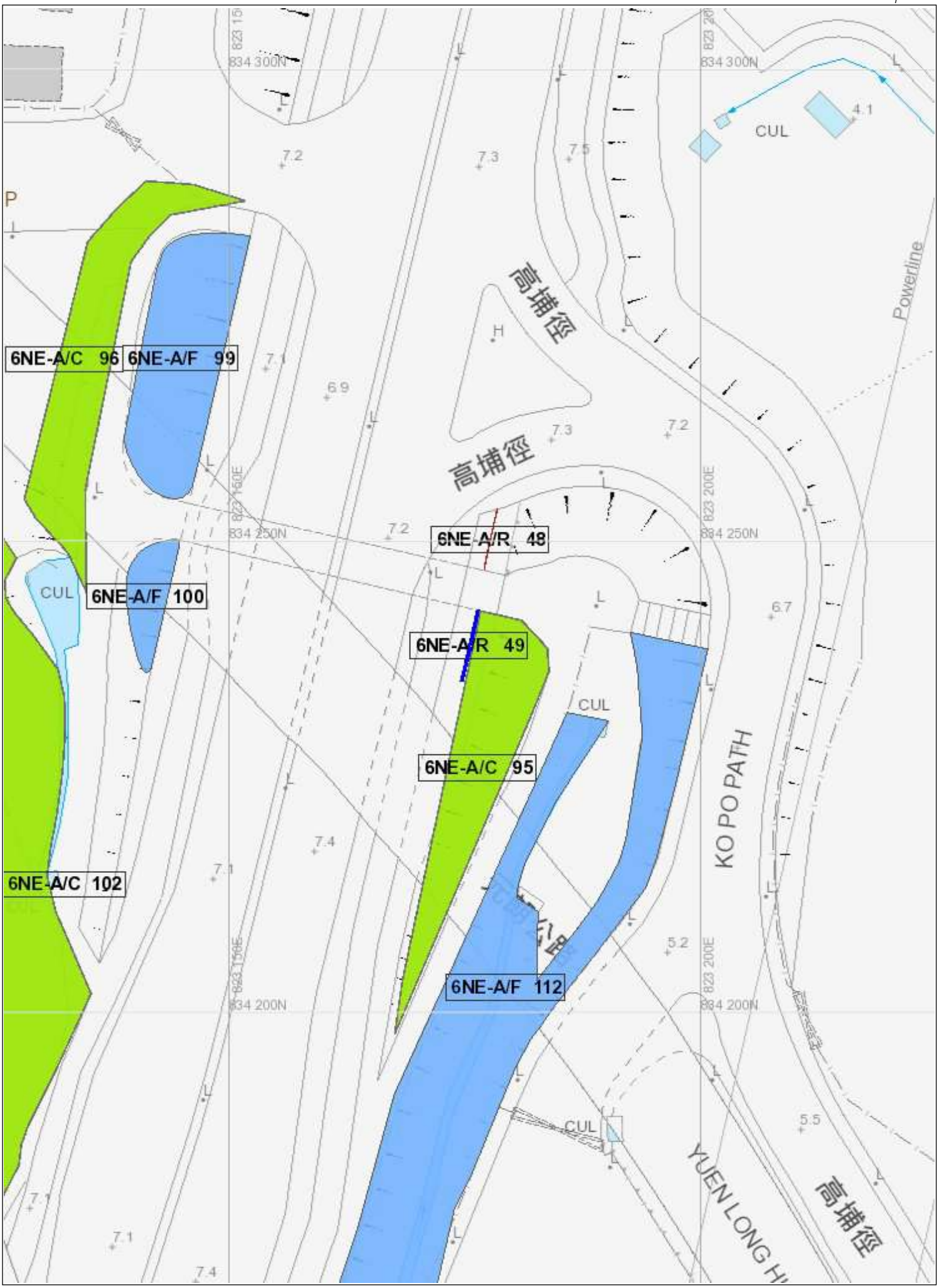
Check / repair Services:	N
Action By:	N/A
Non-routine Maintenance:	N
Action By:	N/A

PHOTO





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6NE-A/F 99
6NE-A/F 100
6NE-A/C 102
6NE-A/R 48
6NE-A/R 49
6NE-A/C 95
6NE-A/F 112
高埔徑
高埔徑
KO PO PATH
YUEN LONG H
高埔徑
Powerline
CUL
CUL
CUL
CUL
834 300N
834 250N
834 200N
823 150E
823 200E

Appendix J
Revised Ecological Impact Assessment

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Yuen Long, the New Territories

Ecological Impact Assessment Report

January 2024

Ecosystems Limited
生態系統顧問有限公司

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Email 電郵: info@ecosystems-ltd.com

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1. INTRODUCTION

1.1.1 This Ecological Impact Assessment (EcoIA) is prepared for the application of proposed public and private housing development under the Land Sharing Pilot Scheme (LSPS) in various lots at Tung Shing Lei, Yuen Long (Hereafter the "Project" and the "Application Site") (**Figure 1**). The Application Site is approximately 6 hectares in area size and located at "Residential (Group D)" Zone under the approved Nam Sang Wai Outline Zoning Plan (OZP) – S/YL-NSW/8.

1.1.2 As part of Government's multi-pronged strategy to increase land and housing supply in the short-to-medium term, the Chief Executive (CE) put forward a proposed framework of LSPS in the 2018 Policy Address and outlined further details in 2019 Policy Address. Subsequently, the LSPS was launched in May 2020 to receive applications.

1.1.3 This EcoIA comprises two major components, i.e. ecological baseline information and impact assessment. The ecological baseline information for impact assessment was established by both literature review and ecological surveys. As the Application Site is within the Wetland Buffer Area (WBA), a 12-month ecological survey was conducted between Nov 2019 and Oct 2020, to fulfill the requirements stipulated in the Town Planning Board Planning Guideline No. 12C. Other than the 12-month ecological survey, specific flight line surveys for breeding ardeid from Tung Shing Lane Egretry and a new egretry at Kam Po Road were also conducted in 2019, 2020 and 2021.

2. LEGISLATION & GUIDELINES

2.1.1 The relevant legislation and associated guidelines related to this EcoIA include:

- Forests and Countryside Ordinance (Cap. 96A) and its subsidiary legislation, the Forestry Regulations;
- Wild Animals Protection Ordinance (Cap. 170);
- Country Parks Ordinance (Cap. 208) and its subsidiary legislation;
- Environmental Impact Assessment Ordinance (Cap. 499) and the associated Technical Memoranda; and
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) and its subsidiary legislation.

2.1.2 Where relevant, this EcoIA also takes into account the following guidelines and standards:

- Hong Kong Planning Standards and Guidelines (HKPSG) Chapter 10, "Conservation";

- Town Planning Board Planning Guideline No. 12C – Application for Developments Within Deep Bay Area;
- PELB Technical Circular 1/97 Works Branch Technical Circular 4/97 "Guidelines for Implementing the Policy on Off-site Ecological Mitigation Measures";
- EIAO Guidance Note No. 6/2010 - Some Observations on Ecological Assessment from the Environmental Impact Assessment Ordinance Perspective;
- EIAO Guidance Note No. 7/2010 – Ecological Baseline Survey for Ecological Assessment; and
- EIAO Guidance Note No. 10/2010 – Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys.

2.1.3 This EcoIA also makes reference to the following Mainland legislation:

- List of State Protected Wild Animals, promulgated by the State Council 國家重點保護野生動物名錄;
- List of State Protected Wild Plants, promulgated by the State Council 國家重點保護野生植物名錄.

2.1.4 Other international conventions and guidelines that are relevant to this EcoIA include the followings:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES"): This Convention regulates international trade in animal and plant species considered to be at risk from such trade. The main categories of species relevant to Hong Kong are Appendices I and II. Species listed in Appendix I are species threatened with extinction that are or may be affected by trade; species listed in Appendix II are those that, while not necessarily under current threat of extinction, may become threatened unless trade is subject to strict regulation. Hong Kong's obligations under this Convention are enforced via the Protection of Endangered Species of Animals and Plants Ordinance.
- IUCN: The World Conservation Union maintains, through its Species Survival Commission, a Red List of globally threatened species of wild plants and animals (see http//www.redlist.org). The Red List is considered the authoritative publication to classify species as critically endangered, endangered, vulnerable, or lower-risk.

3. METHODOLOGY

3.1 Application Site and Study Area

3.1.1 The Application Site **(Figure 1)** is situated to the north of Yuen Long Highway and Yuen Long Bypass Floodway, to the west of the Tsing Long Highway, and to the north-west of the Au Tau roundabout, Yuen Long.

3.1.2 It is located within the Wetland Buffer Area (WBA) as defined under Town Planning Board Guideline No. 12C (TPB Guideline No. 12C) "Application for Developments within Deep Bay Area" (**Figure 2**), but is beyond the Wetland Conservation Area (WCA) which is relatively more ecologically sensitive.

3.1.3 The Application Site is largely left vacant and is currently dominated by wasteland habitat. However, there are also a pond, portions of an abandoned pond and a tidal meander, small area of developed area within the Application Site. While the pond to the north of the Application Site is engaged in a Fishpond Management Agreement and was maintained with certain level of activities, it might not be operating for commercial farming based upon on site observations during the ecological surveys over the past years. The abandoned pond was abandoned long time ago and no fish-culture operations were observed. Due to its close proximity to Yuen Long Highway and some village settlements nearby, the existing environment within and near the Application Site has endured a certain level of disturbance from human activities in nearby villages.

3.1.4 The Study Area covers a 500m distance from the Application Site boundary (**Figure 1**), which is for the purposes of assessing off site ecological impacts. Within the Study Area, there were a wooded knoll to the north of the Application Site, abandoned ponds to the east and mitigation wetlands managed by AFCD to the northeast.

3.2 Literature Review

3.2.1 The following available literature covering the Study Area and its vicinity was reviewed:

- EIA-004/1998 Yuen Long Bypass Floodway - Feasibility Study
- EIA-063/2002 – Yuen Long and Kam Tin Sewerage and Sewage Disposal Stage 1 Packages 1A-1T and 1B-1T - Kam Tin Trunk Sewerage Phase I and II
- EIA-159/2008 Construction of Cycle Tracks and the associated Supporting Facilities from Sha Po Tsuen to Shek Sheung River
- EIA-269/2021 Yuen Long Barrage Scheme
- Planning application No. A/YL-NSW/223 (Withdrawn)
- Planning application No. Y/YL-NSW/4
- Planning application No. A/YL-NSW/172

- Planning application No. A/YL-NSW/224
- Planning application No. A/YL-NSW/233
- Planning application No. A/YL-NSW/274
- Planning application No. A/YL-NSW/241
- Planning application No. Y/YL-NSW/3
- Planning application No. A/YL-NSW/242
- Planning application No. A/YL-NSW/275
- Planning application No. A/YL-KTN/268 (Withdrawn)
- The Terrestrial Biodiversity Survey conducted by HKU
- Annual reports and other publications of The Hong Kong Bird Watching Society
- Porcupine! – Newsletter of Division of Ecology & Biodiversity of University of Hong Kong
- Hong Kong Biodiversity – Newsletter of the Department of Agriculture, Fisheries and Conservation
- AFCD publications
- A new species of firefly from Hong Kong – *Pteroptyx maipo* Ballantyne, 2011 (Yiu 2011)
- *Pteroptyx maipo* Ballantyne, a new species of bent-winged firefly (*Coleoptera: Lampyridae*) from Hong Kong, and its relevance to firefly biology and conservation (Ballantyne *et al*. 2011)

3.3 Ecological Survey Methodology

3.3.1 The baseline ecological surveys covered a period of 12 months from November 2019 to October 2020. The surveys included habitat mapping, vegetation, mammal, bird, herpetofauna, butterfly, odonate, firefly, and aquatic fauna.

3.3.2 Besides, specific surveys on flight behavior of breeding ardeid at Tung Shing Lane Egretry were conducted in 2019 and 2020 (between April and July in both years). In 2021 Tung Sing Lane Egretry was abandoned and a new egretry was found at Kam Po Road (over 2 km from the Application Site), additional surveys were thus conducted between May and August 2021 to record the flight behavior of ardeids at the new egretry. Survey methodology of each survey item is described in the following sections.

Habitat and Vegetation

3.3.3 Habitats within the Study Area were mapped based on aerial photos and ground truthing. Walk-over surveys were conducted at representative areas of each habitat type. Vascular plant species in each habitat type were identified (with the aid of binoculars when necessary) and their relative abundance were recorded, with special attention to rare and protected species. Color photographs were taken of all habitats encountered on site and of ecological features of special importance. Habitat map of the Study Area was produced at the

suitable scale using GIS software. Nomenclature of vascular plant species followed Hong Kong Herbarium (2020), whilst their rarity in Hong Kong followed Corlett *et al*. (2000) and Yip *et al*. (2010) where applicable.

Mammal

3.3.4 Mammals within the Study Area were surveyed by active search. All sightings, tracks, and signs of mammals found within the Study Area were recorded. As some mammal species are nocturnal, night surveys were also conducted with spotlight. Nomenclature of mammal followed Agriculture, Fisheries and Conservation Department (AFCD 2020).

Bird

3.3.5 Birds within the Study Area were surveyed quantitatively using transect count method (**Figure 2a**). All birds seen or heard were identified and their abundance recorded by habitat. Birds encountered outside survey transects but within the Study Area were also recorded in order to produce a complete species list. Signs of breeding (e.g. nests, recently fledged juveniles) were also recorded. As some birds (e.g., owls, nightjars) are nocturnal, night surveys were conducted. Nocturnal birds were identified by active searching using spot-light and by their calls. Ornithological nomenclature in this report followed AFCD 2020.

3.3.6 Tung Shing Lane Egretry is located at the periphery of the 500m Study Area (**Figure 2b**). Flight path surveys were conducted simultaneously at 3 vantage points (see **Figure 2b**) to determine the flight behavior of breeding ardeid from the egretry within ardeid breeding season (between April and July) in 2019 and 2020. The flight path surveys were undertaken continuously for 1.5 hours either before sunset or in the morning. The flight paths of ardeid individuals taking off from Tung Shing Lane Egretry were recorded by making reference to land features. The focus was on birds carrying out long-distance flights from the egretry. Flights involving short hops from point to point (such as among different trees) were not considered as flight paths.

3.3.7 Tung Shing Lane Egretry was abandoned in 2021. However, a new egretry at Kam Po Road, which is over 2km from the Application Site, was reported in 2021 (**Figure 2c**). Flight path surveys for the new egretry were therefore conducted between May and August 2021. Five vantage points including near the new egretry and along Kam Tin River Drainage Channel were simultaneously adopted for the survey.

Three dry season flight path surveys were conducted at the same vantage points on **Figure 2b** except the one to the south of Yuen Long Highway (i.e., the surveys were conducted within the Application Site and at Kam Tin River Drainage Channel) between December 2019 and February 2020. The flight path surveys were undertaken continuously for 1.5 hours before sunset from the vantage points

(**Figure 2b**). Particular attention was paid to large-sized species such as waterbirds, but also included other species of conservation importance.

3.3.8 The ardeid night roost surveys at Kam Tin River Drainage Channel near Yuen Long Highway were surveyed at evenings in December 2019, February 2020, April 2020, June 2020, August 2020 and October 2020, with number, species, and the time when the ardeids returned to the roost recorded. Surveys were commenced one hour before sunset and conducted near the night roost (**Figure 2b**).

3.3.9 Evening surveys were conducted to investigate the number and distribution of Great Cormorants roosting at Nam Sang Wai (**Figure 3a**). Surveys were conducted three times between December 2019 and February 2020. All surveys started approximately one hour before sunset to permit counting of all roosting sites before it became too dark to accurately count the number of birds, although care was taken to avoid underestimating numbers on days when birds were still arriving at the start of the count. During the surveys, all groups of trees providing suitable conditions for roosting cormorants were observed and total number of birds seen in each group of trees was recorded.

Herpetofauna

3.3.10 Herpetofauna within the Study Area were surveyed by active search. All reptiles and amphibians sighted were recorded. As herpetofauna are mostly nocturnal, night surveys were carried out. Potential microhabitats of herpetofauna such as wall, fallen logs, litter, channel/nullah, fishpond margins, underneath of stones or other materials, artificial container (e.g., pots) were searched during surveys to locate cryptic or secretive herpetofauna species. Amphibians were also identified by their calls during night surveys. Nomenclature of amphibian followed AFCD (2020).

Butterfly and Odonata

3.3.11 Dragonflies and butterflies within the Study Area were surveyed quantitatively using transect method (**Figure 2a**). Dragonflies and butterflies observed were identified and their abundance recorded by habitat. Dragonflies and butterflies encountered outside survey transects but within the Study Area were also recorded in order to produce a complete species list. Nomenclature of butterfly and odonate followed AFCD (2020).

Firefly

3.3.12 Firefly surveys were conducted monthly between April and October 2020 mainly followed the land-based transects (**Figure 2a**), and boat surveys were conducted in Kam Tin River Meander (**Figure 2a**). The surveys conducted both within and beyond the 500m Study Area. The firefly surveys were started shortly after sunset and continued until 90 minutes after sunset when the fireflies were most active. During the survey, any firefly observed was identified to the species level, where

possible. The abundance and distribution of fireflies, in particular Bent-winged Firefly, were recorded.

3.3.13 Night time light intensity measurements were conducted in parallel to firefly night survey. Whenever firefly was recorded, the background light would be recorded using a light intensity meter at the same time. The light intensity meter had the lowest detection limit down to 0.01 lux. Each measurement was taken at the point of the firefly occurred, if possible, otherwise, the closest location to the firefly was chosen which avoided light source (e.g. street light) to take the measurement.

Aquatic fauna

3.3.14 Aquatic fauna (such as fish and invertebrates) at the six sampling locations (**Figure 2a**) within the Study Area were studied by active searching and direct observation. All aquatic fauna found were identified to the lowest possible taxonomic level with their relative abundance recorded, and the nomenclature for fish followed Lee *et al*. (2004), while those for the macro-invertebrates followed Dudgeon (2003).

3.3.15 Terrestrial fauna survey transects along with aquatic sampling locations (i.e. A, B, C, D, E and F), are shown in **Figure 2a**, while the vantage points of flight behavior and roosting of ardeids are shown in **Figure 2b** and **2c**. Survey schedule of the 12-month survey programme is shown in **Table 3.1**.

Table 3.1 Ecological Survey Programme

Habitat	2019		2020									
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct
Habitat / Vegetation			D					D				
Bird	D	D/N	D	D/N	D	D/N	D/N	D	D	D/N	D	D/N
Flight-Line Survey (Wintering Birds)		D	D	D								
*Flight-Line Survey (Breeding Ardeid)						D	D	D	D			
Great Cormorants Night Roost		E	E	E								
Ardeid Night Roost		E		E		E		E		E		E
Mammal		D/N		D/N		D/N	D/N			D/N		D/N
Herpetofauna		D/N		D/N		D/N	D/N			D/N		D/N
Butterfly and Odonata			D			D		D		D		D
Firefly						N	N	N	N	N	N	N
Aquatic fauna			D					D				

Note: D: Day time; N: Night/evening Time; D/N: Day time and Night/evening Time: E: Evening
* flight-line surveys for Tung Shing Lane Egretry were also conducted in the breeding season of 2019 and 2020 (from April to July of both years), and for the new egretry at Kam Po Road were conducted between May and August 2021

3.3.1 Survey data is shown in **Appendix A** to **Appendix I** of this report. Data recorded within the Application Site and those recorded outside the Application Site are presented in separate columns.

4. ECOLOGICAL BASELINE

4.1 Literature Review

4.1.1 The Application Site entirely falls within the **Wetland Buffer Area (WBA)** but outside **Wetland Conservation Area (WCA)** (**Figure 2a**).

4.1.2 WCA comprises the existing and contiguous, active or abandoned fishponds in the Deep Bay Area. According to the Town Planning Board Guidelines for Application for Developments within Deep Bay Area, the planning intention of WCA is to conserve the ecological value of the fishponds which form an integral part of the wetland ecosystem in the Deep Bay Area. A buffer area of about 500 m along the landward boundary of the WCA is designated as WBA. The planning intention of WBA is to protect the ecological integrity of the fishponds and wetlands within the WCA and to prevent development that would have a negative off-site impact on the ecological value of those fishponds.

4.1.3 Development or redevelopment in the WBA would require an ecological impact assessment to demonstrate there would not be negative impacts on the ecological value of the WCA, unless the ecological impact assessment can demonstrate that the negative impacts could be mitigated through positive measures.

4.1.4 **Tung Shing Lane Egretry** – It is the nearest egretry, which is located at approximately 0.5 km southeast from the Application Site. This egretry was first reported in 2001. It is located at several trees on fishpond bunds and near village houses in Tung Shing Lane village. The TSL Egretry was the third largest egretry in 2018 census, with 84 nests which accounted for 7.8% of the total number of the nests in Hong Kong in that year (Anon 2019). However, hard pruning of trees within the nesting area in previous years was noted in the egretry in May 2019, while Typhoon Mangkhut resulted in thinning of vegetation in the same egretry (Anon 2020). According to the census data provided by HKBWS the number of ardeid nests in TSL Egretry decreased by 22.6% from 2018 to 2019 (Anon 2020). Two ardeid species were recorded nesting in this egretry between 2015 and 2020, including Little Egret and Chinese Pond Heron **(Table 4.1).**

4.1.5 Other recognized sites of conservation importance in Northwest New Territories include the Mai Po Inner Deep Bay Ramsar Site, Mai Po Nature Reserve, Mai Po Marshes SSSI, Mai Po Village SSSI Egretry and Shan Pui River Egretry, which are all away from the 500m Study Area.

Table 4.1 Nesting Populations of Ardeid from Tung Shing Lane Egretry between 2015 and 2020 (data extracted from Anon. 2015, 2016, 2017, 2018, 2020a and 2020b.)

Year	Little Egret	Chinese Pond Heron	Total nests (% of total in HK)
2015	30	47	77 (5.4%)
2016	20	41	61 (4.9%)
2017	21	61	82 (6.6%)
2018	49	35	84 (7.8%)
2019	27	38	65 (4.0%)
2020	16	20	36 (1.9%)

4.1.6 **Flight Behavior of Breeding Ardeids** - Among the relevant studies within the Study Area or nearby, the flight paths of the Tung Shing Lane egretry were studied or mapped in the EcoIAs for Planning Applications Y/YL-NSW/3, Y/YL-NSW/4, A/YL-NSW/241, A/YL-NSW/224, A/YL-NSW/233, A/YL-NSW/242, A/YL-NSW/274 and A/YL-NSW/275. The Application Site boundary of the present Study is similar to the boundary of the Planning Application Y/YL-NSW/4.

4.1.7 The EcoIA for Planning Application Y/YL-NSW/3, Y/YL-NSW/4, A/YL-NSW/241 and A/YL-NSW/233 adopted the same set of flight path data, which was conducted between May 2013 and June 2013. According to the EcoIA for the approved Planning Application No. A/YL-NSW/233, approximately 70% of all recorded birds from Tung Shing Lane egretry flew towards north, whilst 30% flew towards east and west. To the north of Yuen Long Highway, six major flight-lines (totally 74 individuals of bird) were recorded.

4.1.8 A verification survey was conducted in July and August 2018 for the Planning Application No. A/YL-NSW/274. The results also showed that the ardeids from Tung Shing Lane Egretry still mainly flew a general northward direction (i.e. flying across the Yuen Long Highway and the Yuen Long Bypass Floodway) with occasional individuals landing at the ponds in front of the egretry or flying westward to Yuen Long Town direction. The findings were consistent with those reported from the previous survey in 2013.

4.1.9 **Great Cormorant Roost at Nam Sang Wai** - A number of Great Cormorant Roosts at Nam Sang Wai were identified. The cormorants roosts were mainly in exotic trees such as *Eucalyptus* spp. The proposed development is highly unlikely to impose significant impacts on the roost site, which lies approximately 500m away (**Figure 3a**). The Great Cormorant roost is also separated from the Application Site by a section of Kam Tin River Meander and other habitats.

4.1.10 **Kam Tin River Drainage Channel**) – It is located at approximately 200m east of the Application Site. In order to avoid flooding affecting the development at Yuen Long south, the Government implemented

this large river training project along the original Kam Tin River, which included straightening a section of original Kam Tin River lying to the north of Castle Peak Road, breaking and merging fishponds in Nam Sang Wai with Shan Pui River Drainage Channel before entering Inner Deep Bay near the northern tip of the Nam Sang Wai Site. Kam Tin River Drainage Channel meets Shan Pui River Drainage Channel at the northern tip of Nam Sang Wai and eventually drains into the Deep Bay which is about 1km further north. The channel has a trapezoidal cross-section, and the further downstream section has a rubble protected embankment. Many mangroves were planted at the margin and the lower course of Kam Tin River Drainage Channel. The channel now also provides foraging opportunities for waterbirds. Night roosts of ardeids are located about 200m and 300m east of the Application Site at Kam Tin River Drainage Channel **(Figure 2b).**

4.1.11 **Yuen Long Bypass Floodway Mitigation Wetland** – It was created to compensate for the loss of fishponds and agricultural land due to the river training of original Kam Tin River. A piece of compensation wetland was created from three abandoned fishponds to provide wetland habitat to birds, amphibians and dragonflies. A total of about 260 plant, 159 birds, 110 butterflies, 40 odonate, 31 herpetofauna and 16 mammal species were recorded during the monitoring programme of AFCD since 2006 (AFCD, pers. comm.). Breeding of Little Grebe *Tachybaptus ruficollis* and White-breasted Waterhen *Amaurornis phoenicurus* were observed in the mitigation wetland. Most of the Application Site is separated from the Mitigation Wetland by a knoll, but small part of the Application Site is just next to it.

4.1.12 **Firefly Habitat in Nam Sang Wai** Mai Po Bent-winged Firefly *Pteroptyx maipo* was recorded, together with another area in Lut Chau, in Nam Sang Wai during the ecological survey for the Planning Application "Proposed Comprehensive Development with Wetland Enhancement, Public Park and Residential Development, Nam Sang Wai and Lut Chau" (Planning Application No. A/YL-NSW/242). The species was recorded at the mangroves surrounding Lut Chau and along the Kam Tin River Drainage Channel and at the southern end of NSW. Since its first description in 2011, the species is currently known from the Deep Bay area and in Mainland China, and appears to be restricted to intertidal grassland and mangrove habitats. The reported location of this species in the southwestern corner of Nam Sang Wai is to the northwest of the Application Site and lies within the 500m Study Area, near the junction of the Kam Tin River meander and the Shan Pui River Drainage Channel (**Figure 3a**).

4.1.13 Lowland wetland habitats (including isolated meander and fishponds) near Shan Pui Tsuen to the north of the Application Site are zoned as "**Conservation Area**". The zoning is to protect and retain the existing natural landscape, ecological or topographical features of the area for conservation, education and research purposes. According to the planning intention, there is a general presumption against

development in this zone. In general, only developments that are needed to support the conservation of the existing natural landscape or scenic quality of the area or the essential infrastructure project with overriding public interest may be permitted.

4.1.14 **Species of Conservation Importance** - Species of conservation importance reported from literature were reviewed. Among those studies, the EIA "Construction of Cycle Tracks and the associated Supporting Facilities from Sha Po Tsuen to Shek Sheung River" (EIA-159/2008), EcoIA for Planning Application No. A/YL-NSW/275, EcoIA for Planning Application No. Y/YL-NSW/3, EcoIA for Planning Application No. A/YL-NSW/241, EcoIA for Planning Application No. A/YL-NSW/242 (mainly focused on Kam Tin River Drainage Channel), EcoIA for Planning Application No. A/YL-KTN/268 and EcoIA for Planning Application No. A/YL-NSW/274 were considered most relevant as their study areas partially overlapped with the Study Area of the present study, and also relatively updated (EcoIA for No. A/YL-NSW/274 has also incorporated survey data from EcoIA for No. Y/YL NSW/4). The ecological surveys of these previous studies were conducted between November 2016 and March 2017, and January 2011, August 2018 and November 2019 and June 2020 respectively.

4.1.15 Among the relevant studies, 103 species of conservation importance were recorded. The species of conservation importance reported by these EcoIA are presented in **Table 4.2**.

Table 4.2 Species of Conservation Importance Previously Recorded near the Study Area

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/2008	A/YL-NSW/275	A/YL-NSW/274	A/YL-NSW/242	A/YL-NSW/241	Y/YL-NSW/4	Y/YL-NSW/3	AFCD		
Plant											
Prince's Feather	*Persicaria orientalis*			X						-	Very rare. Found in Sha Po, Yuen Long.
Bird											
Asian Barred Owlet	*Glaucidium cuculoides*			X						Class 2 Protected Animal of China; Appendix 2 of CITES	Uncommon resident. Widely distributed in woodland throughout Hong Kong.
Besra	*Accipiter virgatus*	X								Class 2 Protected Animal of China; Appendix 2 of CITES	Scarce resident. Found in Tai Po Kau, Deep Bay area, Chek Lap Kok, Cheung Chau, Soko Islands.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/ 2008	A/YL-NSW/ 275	A/YL-NSW/ 274	A/YL-NSW/ 242	A/YL-NSW/ 241	Y/YL-NSW/ 4	Y/YL-NSW/ 3	AFCD		
Black Kite	*Milvus migrans*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): (RC); Appendix 2 of CITES	Common resident and winter visitor. Widely distributed in Hong Kong.
Black-crowned Night Heron	*Nycticorax nycticorax*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): (LC)	Common resident and winter visitor. Widely distributed in Hong Kong.
Black-faced Spoonbill	*Platalea minor*	X	X	X	X		X			Class 2 Protected Animal of China; China Red Data Book Status: (Endangered); Fellowes et al. (2002): PGC; IUCN Red List Status: ED; Red List of China's Vertebrates: (Endangered)	Common winter visitor. Found in Deep Bay area.
Black-headed Gull	*Chroicocephalus ridibundus*	X	X	X	X	X		X	X	Fellowes et al. (2002): PRC	Common winter visitor. Found in Deep Bay area, Tolo Harbour, Starling Inlet, Victoria Harbour.
Black-winged Stilt	*Himantopus himantopus*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): RC	Common passage migrant. Found in Deep Bay area, Long Valley, Kam Tin.
Bluethroat	*Luscinia svecica*		X	X						Fellowes et al. (2002): LC	Common passage migrant and winter visitor. Widely distributed in wet agricultural areas throughout Hong Kong.
Bonelli's Eagle	*Aquila fasciata*	X								China Red Data Book Status: (Rare);Fellowes et al. (2002): (RC); Appendix 2 of CITES; Red List of China's Vertebrates: (Vulnerable)	Scarce resident. Found in Deep Bay area, Hong Kong Island, Lamma Island, Lantau Island, Castle Peak, Sha Lo Tung.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/2008	A/YL-NSW/275	A/YL-NSW/274	A/YL-NSW/242	A/YL-NSW/241	Y/YL-NSW/4	Y/YL-NSW/3	AFCD		
Chinese Grosbeak	*Eophona migratoria*			X			X			Fellowes et al. (2002): LC	Uncommon winter visitor. Found in Kam Tin, Nam Chung, Shek Kong, Deep Bay area. Ho Chung, Lam Tsuen, Hok Tau, Island House, Kowloon Park.
Chinese Pond Heron	*Ardeola bacchus*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): PRC,(RC)	Common resident. Common resident. Widely distributed in Hong Kong.
Cinnamon Bittern	*Ixobrychus cinnamomeus*					X		X	X	Fellowes et al. (2002): LC	Scarce passage migrant. Found in Deep Bay area, Long Valley, Tai Yuen (Sheung Shui), Pui O.
Collared Crow	*Corvus torquatus*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): LC; IUCN Red List Status: Vulnerable	Uncommon resident. Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen.
Common Greenshank	*Tringa nebularia*	X	X	X	X	X		X	X	Fellowes et al. (2002): RC	Abundant passage migrant and winter visitor. Found in Deep Bay area.
Common Kestrel	*Falco tinnunculus*	X		X			X			Class 2 Protected Animal of China; Appendix 2 of CITES	Common autumn migrant and winter visitor. Widely distributed in Hong Kong
Common Redshank	*Tringa totanus*			X	X					Fellowes et al. (2002): RC	Common passage migrant. Found in Deep Bay area.
Crested Serpent Eagle	*Spilornis cheela*		X	X			X			China Red Data Book Status: (Vulnerable);Fellowes et al. (2002): (LC); Appendix 2 of CITES	Uncommon resident. Widely distributed in shrublands on hillsides throughout Hong Kong.
Eastern Buzzard	*Buteo japonicus*	X	X	X			X			Appendix 2 of CITES	Common winter visitor. Widely distributed in Hong Kong.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/2008	A/YL-NSW/275	A/YL-NSW/274	A/YL-NSW/242	A/YL-NSW/241	Y/YL-NSW/4	Y/YL-NSW/3	AFCD		
Eastern Cattle Egret	*Bubulcus coromandus*		X	X	X	X	X	X	X	Fellowes et al. (2002): (LC)	Resident and common passage migrant. Widely distributed in Hong Kong.
Eastern Imperial Eagle	*Aquila heliaca*			X						Class 1 Protected Animal of China; China Red Data Book Status: (Vulnerable);Fellowes et al. (2002): GC;IUCN Red List Status: Vulnerable; Appendix 2 of CITES; Red List of China's Vertebrates: (Endangered)	Common winter visitor. Found in Deep Bay area, Ma Tso Lung.
Eastern Marsh Harrier	*Circus spilonotus*	X								Fellowes et al. (2002): LC; Appendix 2 of CITES	Common winter visitor and passage migrant. Found in Deep Bay area, Starling Inlet area, Kadoorie Farm & Botanic Garden, Mount Austin.
Eurasian Hobby	*Falco subbuteo*			X						Class 2 Protected Animal of China; Fellowes et al. (2002): (LC); Appendix 2 of CITES	Uncommon passage migrant. Widely distributed in marshes, agricultural land and lightly wooded hills throughout Hong Kong.
Eurasian Spoonbill	*Platalea leucorodia*	X		X						Class 2 Protected Animal of China; China Red Data Book Status: (Vulnerable),Fellowes et al. (2002): LC; Appendix 2 of CITES	Uncommon passage migrant. Widely distributed in marshes, agricultural land and lightly wooded hills throughout Hong Kong.
Golden-headed Cisticola	*Cisticola exilis*			X		X		X	X	Fellowes et al. (2002): LC	Scarce winter visitor. Widely distributed in grassland throughout Hong Kong.
Great Cormorant	*Phalacrocorax carbo*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): PRC	Common winter visitor. Widely distributed in coastal areas throughout Hong Kong.
Great Egret	*Ardea alba*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): PRC,(RC)	Common resident and winter visitor. Widely distributed in Hong Kong.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/2008	A/YL-NSW/275	A/YL-NSW/274	A/YL-NSW/242	A/YL-NSW/241	Y/YL-NSW/4	Y/YL-NSW/3	AFCD		
Greater Coucal	*Centropus sinensis*		X	X			X			Class 2 Protected Animal of China; China Red Data Book Status: (Vulnerable)	Common resident. Widely distributed in Hong Kong.
Greater Spotted Eagle	*Clanga clanga*	X								China Red Data Book Status: (Rare);Fellowes et al. (2002): GC;IUCN Red List Status: Vulnerable; Appendix 2 of CITES; Red List of China's Vertebrates: (Endangered)	Scarce winter visitor. Found in Deep Bay area.
Grey Heron	*Ardea cinerea*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): PRC	Common winter visitor. Found in Deep Bay area, Starling Inlet, Kowloon Park, Cape D'Aguilar.
Grey-headed Lapwing	*Vanellus cinereus*	X	X	X	X		X	X		Fellowes et al. (2002): LC	Scarce winter visitor. Found in Kam Tin, Tsim Bei Tsui, Lo Wu, Tai Long Wan, Shuen Wan, Castle Peak coast, Chek Lap Kok
Heuglin's Gull	*Larus fuscus*				X					Fellowes et al. (2002): LC	Common winter visitor and passage migrant. Found in Deep Bay area, Cape D'Aguilar.
Intermediate Egret	*Egretta intermedia*		X	X	X					Fellowes et al. (2002): RC	Common passage migrant. Found in Deep Bay area, Tai Long Wan, Starling Inlet, Tai O, Cape D'Aguilar.
Japanese Quail	*Coturnix japonica*			X						Fellowes et al. (2002): LC;IUCN Red List Status: NT	Scarce passage migrant and winter visitor. Found in Long Valley, Mai Po, Kam Tin, Lam Tsuen, Tin Shui Wai.
Lesser Coucal	*Centropus bengalensis*			X						Class 2 Protected Animal of China; China Red Data Book Status: (Vulnerable)	Common resident. Widely distributed in Hong Kong.
Little Egret	*Egretta garzetta*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): PRC,(RC)	Common resident. Widely distributed in coastal area throughout Hong Kong.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/2008	A/YL-NSW/275	A/YL-NSW/274	A/YL-NSW/242	A/YL-NSW/241	Y/YL-NSW/4	Y/YL-NSW/3	AFCD		
Little Grebe	*Tachybaptus ruficollis*		X	X		X	X	X	X	Fellowes et al. (2002): LC	Common resident. Found in Deep Bay area.
Little Ringed Plover	*Charadrius dubius*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): (LC)	Common winter visitor and passage migrant. Widely distributed in freshwater areas throughout Hong Kong.
Marsh Sandpiper	*Tringa stagnatilis*		X	X	X	X	X	X	X	Fellowes et al. (2002): RC	Common winter visitor and passage migrant. Found in Deep Bay area, Shuen Wan, Long Valley, Kam Tin, Sai Kung.
Pacific Golden Plover	*Pluvialis fulva*				X					Fellowes et al. (2002): LC	Common winter visitor. Found in Deep Bay area, Chek Lap Kok, Long Valley.
Pacific Swift	*Apus pacificus*		X	X						Fellowes et al. (2002): (LC)	Common spring migrant and summer visitor. Widely distributed in Hong Kong.
Pied Avocet	*Recurvirostra avosetta*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): RC	Abundant winter visitor. Found in Deep Bay area.
Pied Kingfisher	*Ceryle rudis*	X	X	X		X	X	X	X	Fellowes et al. (2002): (LC)	Uncommon resident. Widely distributed in lakes and ponds throughout Hong Kong.
Purple Heron	*Ardea purpurea*			X						Fellowes et al. (2002): RC	Uncommon passage migrant. Found in Deep Bay area.
Red-billed Starling	*Spodiopsar sericeus*	X		X		X	X	X	X	Fellowes et al. (2002): GC	Common winter visitor. Widely distributed in Hong Kong
Red-throated Pipit	*Anthus cervinus*					X		X	X	Fellowes et al. (2002): LC	Common passage migrant and winter visitor. Widely distributed in dry agricutural areas throughout Hong Kong.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/2008	A/YL-NSW/275	A/YL-NSW/274	A/YL-NSW/242	A/YL-NSW/241	Y/YL-NSW/4	Y/YL-NSW/3	AFCD		
Spotted Redshank	*Tringa erythropus*		X	X	X	X		X	X	Fellowes et al. (2002): RC	Abundant in winter and spring. Found in Deep Bay area.
Striated Heron	*Butorides striata*									Fellowes et al. (2002): (LC)	Present all year, locally uncommon in summer and scarce in winter. Widely distributed in Hong Kong.
Swinhoe's Snipe	*Gallinago megala*			X						Fellowes et al. (2002): LC	Uncommon passage migrant. Found in Long Valley.
Temminck's Stint	*Calidris temminckii*				X					Fellowes et al. (2002): LC	Uncommon winter visitor. Widely distributed in Deep Bay area fishponds.
White-cheeked Starling	*Spodiopsar cineraceus*	X		X		X	X	X	X	Fellowes et al. (2002): PRC	Common winter visitor. Found in Deep Bay area, Kam Tin, Long Valley.
White-shouldered Starling	*Sturnia sinensis*	X	X	X		X	X	X	X	Fellowes et al. (2002): (LC)	Common passage migrant. Found in Kam Tin, Deep Bay area, Po Toi Island, Long Valley, Victoria Park, Ho Chung, Ma Tso Lung, Mui Wo, Lam Tsuen Valley.
White-throated Kingfisher	*Halcyon smyrnensis*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): (LC)	Common resident. Widely distributed in coastal areas throughout Hong Kong
Wood Sandpiper	*Tringa glareola*	X	X	X	X	X	X	X	X	Fellowes et al. (2002): LC	Common passage migrant and winter visitor. Widely distributed in wetland area throughout Hong Kong.
Yellow Bittern	*Ixobrychus sinensis*		X	X			X			Fellowes et al. (2002): (LC)	Uncommon summer visitor and passage migrant. Found in Deep Bay area, Chek Keng, Tai Long Wan.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/ 2008	A/YL-NSW/ 275	A/YL-NSW/ 274	A/YL-NSW/ 242	A/YL-NSW/ 241	Y/YL-NSW/ 4	Y/YL-NSW/ 3	AFCD		
Zitting Cisticola	*Cisticola juncidis*	X	X	X		X		X	X	Fellowes et al. (2002): LC	Common passage migrant and winter visitor. Widely distributed in grassland throughout Hong Kong.
Mammal											
Leopard Cat	*Prionailurus bengalensis*								X	China Red Data Book Status: (Vulnerable); (Cap. 170);Red List of China's Vertebrate: (Vulnerable)	Uncommon. Widely distributed in forested areas throughout Hong Kong, except Lantau Island.
Small Asian Mongoose	*Herpestes javanicus*		X				X		X	(Cap. 170);Red List of China's Vertebrate: (Vulnerable)	Uncommon. Found in N.T. countryside area
East Asian Porcupine	*Hystrix brachyura*								X	Fellowes et al. (2002): PGC; (Cap. 170)	Very Common. Widespread throughout most of Hong Kong, but no record was found on Lantau Island.
Ryukyu Mouse	*Mus caroli*								X	-	Rare. Recent records have been found in Mai Po Nature Reserve and the Hong Kong Wetland Park.
Small-toothed Ferret Badger	*Melogale moschata*								X	(Cap. 170)	Common. Widely distributed in forested areas throughout Hong Kong.
Short-nosed Fruit Bat	*Cynopterus sphinx*		X						X	China Red Data Book Status: (Indeterminate); (Cap. 170)	Very Common. Widely distributed in urban & forested areas throughout Hong Kong.
Chinese Horseshoe Bat	*Rhinolophus sinicus*								X	(Cap. 170)	Very Common. Widely distributed in forested areas throughout Hong Kong.
Lesser Bent-winged Bat	*Miniopterus pusillus*								X	Fellowes et al. (2002): (LC); (Cap. 170)	Uncommon. Widely distributed in forested areas throughout Hong Kong.
Japanese Pipistrelle	*Pipistrellus abramus*		X			X	X	X	X	(Cap. 170)	Very Common. Widely distributed throughout Hong Kong.
Lesser Yellow Bat	*Scotophilus kuhlii*								X	Fellowes et al. (2002): (LC); (Cap. 170)	Uncommon. Widely distributed in forested areas throughout Hong Kong.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/ 2008	A/YL-NSW/ 275	A/YL-NSW/ 274	A/YL-NSW/ 242	A/YL-NSW/ 241	Y/YL-NSW/ 4	Y/YL-NSW/ 3	AFCD		
Lesser Bamboo Bat	*Tylonycteris pachypus*								X	China Red Data Book Status: (Rare); Fellowes et al. (2002): (LC); (Cap. 170)	Very Common. Widely distributed in forested areas throughout Hong Kong.
Small Indian Civet	*Viverricula indica*								X	Class 2 Protected Animal of China; (Cap. 170);Red List of China's Vertebrate: (Vulnerable)	Very Common. Widely distributed in forested areas throughout Hong Kong, except Lantau Island.
Butterfly											
Grey Scrub Hopper	*Aeromachus jhora*								X	-	Rare. Yung Shue O, Kuk Po, Tai Lam, Sha Lo Tung
Paintbrush Swift	*Baoris farri farri*								X	-	Rare. Deep Water Bay, Shing Mun, Lam Tsuen, Fung Yuen, Wu Kau Tang, Lai Chi Wo
Colon Swift	*Caltoris bromus*								X	-	Very Rare
Dark Brown Ace	*Halpe porus*								X	Fellowes et al. (2002): LC	Very Rare/Species of Conservation Concern. Lam Tsuen, Tsiu Hang, Lung Kwu Tan, Ho Sheung Heung
Common Awl	*Hasora badra*					X		X	X	Fellowes et al. (2002): LC	Very Rare. Wu Kau Tan, Lai Chi Wo, Hong Kong Wetland Park
Pale Palm Dart	*Telicota colon*					X		X	X	Fellowes et al. (2002): LC	Rare. Widely distributed in grassland and shrubland throughout Hong Kong
Grass Demon	*Udaspes folus*						X		X	-	Rare. Widely distributed in agricultural field throughout Hong Kong
Forget-me-not	*Catochrysops strabo*								X	-	Very Rare/Species of Conservation Concern. Pui O, Tai Po Kau, Fung Yuen, Shing Mun, Sha Lo Wan
Metallic Cerulean	*Jamides alecto*								X	-	Very Rare. Victoria Peak, Fung Yuen, Chuen Lung, Mui Wo
Tiny Grass Blue	*Zizula hylax*								X	-	Very Rare/Species of Conservation Concern. Lung Kwu Tan, Fung Yuen, Sha Lo Wan
Danaid Eggfly	*Hypolimnas misippus*					X		X	X	Fellowes et al. (2002): LC	Uncommon. Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/2008	A/YL-NSW/275	A/YL-NSW/274	A/YL-NSW/242	A/YL-NSW/241	Y/YL-NSW/4	Y/YL-NSW/3	AFCD		
Glassy Bluebottle	*Graphium cloanthus*								X	Fellowes et al. (2002): LC	Uncommon. Tai Po Kau, Shing Mun, Cloudy Hill, Kadoorie Farm and Botanic Garden, Lam Tsuen, Lai Chi Hang, Tai Lam Wu
Common Albatross	*Appias albina darada*								X	Fellowes et al. (2002): LC	Rare. Shing Mun, Tai Po Kau, Tai Mo Shan, Lung Kwu Tan, Kat O
Tailed Sulphur	*Dercas verhuelli*								X	-	Rare. Widely distributed throughout Hong Kong
Small Cabbage White	*Pieris rapae*								X	-	Rare. Shek Mun Kap, Fan Lau, Ngong Ping, Kam Tin, Ho Chung, Luk Keng, Tuen Mun Ash Lagoon
Odonate species											
Four-spot Midget	*Mortonagrion hirosei*								X	Fellowes et al. (2002): GC; IUCN Red List Status: NT	Common. Double Island, Luk Keng, Mai Po Marshes, Nam Chung, Sam A Tsuen and Sha Po.
Blue Sprite	*Pseudagrion microcephalum*								X	Fellowes et al. (2002): LC	Common. Kai Kuk Shue Ha, Kau Sai Chau, Lai Chi Wo, Mai Po, Mui Wo, River Jhelum and Tung Ping Chau
Coastal Glider	*Macrodiplax cora*					X		X	X	Fellowes et al. (2002): LC	Common. Hong Kong Wetland Park, Kam Tin, Lai Chi Wo, Nim Wan and Luk Keng
Mangrove Skimmer	*Orthetrum poecilops*								X	Fellowes et al. (2002): GC; IUCN Red List Status: VU	Uncommon. Double Island, Lai Chi Wo, Nam Chung, So Lo Pun, Yim Tso Ha (Starling Inlet), Yung Shue au and Yung Shue O.
Blue Chaser	*Potamarcha congener*		X							Fellowes et al. (2002): LC	Common. Widely distribute in marsh throughout Hong Kong
Ruby Darter	*Rhodothemis rufa*					X		X	X	Fellowes et al. (2002): LC	Common. Widely distribute in ponds and marshes throughout Hong Kong
Sapphire Flutterer	*Rhyothemis triangularis*								X	Fellowes et al. (2002): LC	Common. Widely distribute in weedy ponds, sluggish rivers and marshes
Scarlet Basker	*Urothemis signata*		X			X		X	X	Fellowes et al. (2002): LC	Common. Common in areas containing abandoned fish ponds throughout Hong Kong

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/2008	A/YL-NSW/275	A/YL-NSW/274	A/YL-NSW/242	A/YL-NSW/241	Y/YL-NSW/4	Y/YL-NSW/3	AFCD		
Emerald Cascader	*Zygonyx iris*								X	Fellowes et al. (2002): PGC	Abundant. Widely distribute in moderately clean, rapidly flowing forested streams throughout Hong Kong
Reptile											
Reeves' Turtle	*Chinemys reevesii*								X	China Red Data Book Status: (Conservation Dependent); Fellowes et al. (2002): GC;IUCN Red List Status: EN; Appendix 2 of CITES;(Cap. 170)	Widespread in the territory. Used to be a common species but sightings have been rare in recent years. Found in most local reservoirs.
Common Rat Snake	*Ptyas mucosus*		X			X		X	X	China Red Data Book Status: (Endangered); Fellowes et al. (2002): PRC; Appendix 2 of CITES; Red List of China's Vertebrates: (Endangered)	Widely distributed throughout Hong Kong.
Buff-striped Keelback	*Amphiesma stolatum*								X	Fellowes et al. (2002): LC	Distributed in lowland in central and northern New Territories and Lantau Island.
Copperhead Racer	*Coelognathus radiatus*					X				China Red Data Book Status: (Endangered); Fellowes et al. (2002): PRC; Red List of China's Vertebrates: (Endangered)	Widely distributed throughout Hong Kong.
Chinese Water Snake	*Enhydris chinensis*								X	China Red Data Book Status: (Least Concern); Red List of China's Vertebrates: (Vulnerable)	Distributed in freshwater or brackish wetlands in central and northern New Territories
Indo-Chinese Rat Snake	*Ptyas korros*								X	China Red Data Book Status: (Endangered); Fellowes et al. (2002): PRC; Red List of China's Vertebrates: (Vulnerable)	Widely distributed throughout Hong Kong.

Common name	Scientific name	Literature								Protection status / Conservation level	Distribution and Rarity
		EIA-159/ 2008	A/YL-NSW/ 275	A/YL-NSW/ 274	A/YL-NSW/ 242	A/YL-NSW/ 241	Y/YL-NSW/ 4	Y/YL-NSW/ 3	AFCD		
Many-banded Krait	*Bungarus multicinctus*								X	China Red Data Book Status: (Vulnerable); Fellowes et al. (2002): PRC;Red List of China's Vertebrates: (Endangered)	Widely distributed in New Territories, Hong Kong Island and Lantau Island.
Chinese Cobra	*Naja atra*								X	China Red Data Book Status: (Vulnerable); Fellowes et al. (2002): PRC; Appendix 2 of CITES; Red List of China's Vertebrates: (Vulnerable)	Common and widely distributed in Hong Kong.
Four-clawed Gecko	*Gehyra mutilata*								X	Red List of China's Vertebrates: (Vulnerable)	Widely but thinly distributed throughout Hong Kong.
Chinese Soft-shelled Turtle	*Pelodiscus sinensis*					X				China Red Data Book Status: (Vulnerable); Fellowes et al. (2002): GC; IUCN Red List Status: Vulnerable;(Cap. 170); Red List of China's Vertebrates: (Endangered)	Locally found in reservoirs and fishponds in Deep Bay area.
Amphibian											
Chinese Bullfrog	*Hoplobatrachus chinensis*								X	Class 2 Protected Animal of China; Fellowes et al. (2002): PRC; Red List of China's Vertebrates: (Endangered)	Widely distributed in Lantau Island and New Territories.

4.1.16 Besides the above-listed species of conservation importance, Eurasian Otter *Lutra lutra* is the most significant terrestrial mammal species known to occur in the Deep Bay area. This species occurs in a variety of lowland wetland habitats in the Deep Bay area. However, given the existing human activities in the wetlands and disturbed nature of other habitats in the Study Area, it is likely to be very uncommon in the Application Site or Study Area. The nearest record of the species was at the confluence area of Kam Tin River Drainage Channel and Shan Pui River Drainage Channel (B&V 2021).

4.1.17 Another species of conservation importance which was not recorded in the abovementioned literature, is a fish species of conservation importance, i.e. *Gobiopterus macrolepis*, recorded in the EIA study of Yuen Long Barrage (B&V 2021), which is endemic to China and is restricted to the Pearl River Delta (Cheng 1965). The species was observed in large schools of up to over a thousand individuals, staying near reedbed edges in Nam Sang Wai, and along channel margins at lower section of Yuen Long Nullah (approximately 50-100 individuals sighted), Shan Pui River Drainage Channel, Kam Tin River Drainage Channel and the lower Yuen Long Bypass Floodway. Therefore, it is rather widespread in suitable habitats e.g. channel within the present Study Area. It is listed as Vulnerable in the context of China (Jiang *et al.* 2016). Ecology and distribution of this species in Hong Kong and the wider Pearl River Delta region is however unknown.

4.2 Ecological Survey Results

Habitat and Vegetation

4.2.1 The Study Area covers 14 types of habitat, including abandoned agricultural land, abandoned pond, active agricultural land, channel, developed area, grassland/shrubland, meander, mitigation wetland, plantation, pond, reedbed, tidal marsh, wasteland and woodland **(Figure 4)**. The Application Site comprised five habitats, namely abandoned pond, pond, wasteland, meander, and developed area. The habitats within the Application Site and the Study Area are shown in **Table 4.3** and **Figure 4**. Photos of the habitats are presented in **Figure 5**. Plant species and their relative abundance within each habitat are listed in **Appendix A**.

Table 4.3 Habitats recorded within the Study Area

Habitat	Application Site (ha)	Study Area (incl Application Site) (ha)
Abandoned Agricultural Land	-	0.42
Abandoned Pond	0.23	17.21
Active Agricultural Land	-	0.42
Channel	-	17.68
Developed Area	0.21	46.11
Grassland / Shrubland	-	1.96
Meander	0.16	5.22
Mitigation Wetland	-	8.96
Plantation	-	23.38
Pond	0.46	23.89
Reedbed	-	4.65
Tidal Marsh	-	1.37
Wasteland	4.50	15.59
Woodland	-	4.93
Total	**5.56**	**171.81**

4.2.2 Abandoned Agricultural Land - Small patches of abandoned agricultural land are located to the south of the Application Site. As the agricultural land patches are not actively farmed, they were dominated by naturally colonized weeds and invasive climber *Brachiaria mutica* and *Mikania micrantha*.

4.2.3 Active Agricultural Land - Patches of actively farmed agricultural land were observed in the south and the west of the Application Site. Agricultural crops and fruit trees were planted by villagers.

4.2.4 Abandoned pond - Abandoned ponds were identified within the Study Area as well as the Application Site. These abandoned ponds were of various conditions depending on their duration of abandonment. Drying out of water was observed in the abandoned ponds having longer duration of abandonment. While for those abandoned ponds with shorter duration of abandonment, water was retained but degradation was observed at the pond bund. Both hydrophilic species (such as *Brachiaria mutica* and *Typha angustifolia*) and weedy species (such as *Bidens alba* and *Panicum maximum*) were commonly found in these abandoned ponds.

4.2.5 Notably, there were six aggregated abandoned ponds located to the immediate east to the Application Site. As found during the 12-month survey, these abandoned ponds were of very low water level with some parts of the pond bed exposed. The abandonment of fish farming practice left a wet bare ground which favoring the colonization of weedy species such as *Ageratum conyzoides, Cynodon dactylon* and *Mikania micrantha* and hydrophilic species such as *Brachiaria mutica, Alternanthera philoxeroides* and *Alternanthera sessilis*. Overall, these abandoned ponds were largely dominated by an exotic hydrophilic species *Brachiaria mutica* with a generally low ecological value. All of these abandoned ponds were under a condition with low/without water coverage with vegetation established on pond bed and bunds and were apparently not suitable for fish farming. There was also neither fish farming facilities nor management activities for fishpond operation observed, too. During recent site visits in 2021, it was observed that weedy vegetation were cleared in these ponds and there were shallow water inside. An ecological enhancement study at six ponds to the east of the Application Site is underway and will end in March 2023. Four ponds were served as trials and two as control. Water level management were conducted at the trial ponds to enhance the feeding opportunities of waterbirds. Other management practices include clearance of weedy vegetation as needed.

4.2.6 Channel - Yuen Long Bypass Floodway (YLBF) and Kam Tin River Drainage Channel were the two major channelized watercourses in the Study Area, which were located to the south and east of the Application Site respectively. Both YLBF and Kam Tin River Drainage Channel were widened, straightened and deepened to increase water

flow capacity and alleviate flood risk. The bed and bank of YLBF were lined with grasscrete and a series of in-channel ponds were built along the dry weather flow channel. Water levels in YLBF were maintained by a fabridam at the confluence between YLBF and Kam Tin River Drainage Channel. The regular vegetation management of the channels resulted in low botanical diversity.

4.2.7 Developed area - Within the Study Area, this habitat type is composed of villages, areas of open storage and light industry, along with extensive road infrastructure. These habitats were heavily modified and suffered from high levels of disturbance by anthropogenic factors and a low fauna and flora diversity, containing a large number of exotic plant species.

4.2.8 Grassland/shrubland - Some areas of grassland/shrubland were found on the slopes of the hills to the west of the Application Site, which are also occupied by large numbers of graves. There were high levels of disturbance and anthropogenic clearance. Their floristic structures were relatively simple, species diversity was low. Exotic species were commonly found in these areas.

4.2.9 Meander - Meanders were identified within the Application Site and Study Area. Apart from the east-west running Kam Tin River Meander (located to the north of the Application Site) and the smaller north-south running meander partially falling within the Application Site (which joined Kam Tin River Meander), there were also a small fraction of meander at the eastern bank of Kam Tin River Drainage Channel that was close to the northeastern edge of the Study Area. These meanders were generally subject to the tidal influence of Kam Tin River Drainage Channel or Shan Pui River Drainage Channel. Species tolerant of tidal fluctuation such as *Sonneratia* spp. or native mangrove spp. were found there. The section of Meander within the Application Site was about 8 – 10 m wide. A very low diversity of flora dominated by common and exotic species were recorded.

4.2.10 Mitigation wetland - Several mitigation wetlands were found within and in the vicinity of the Study Area, including YLBF Mitigation Wetland to the north, Sha Po Marsh to the east and Mitigation Wetlands as compensation for Route 3 construction to the south. The former two were actively managed by AFCD and a private developer respectively. Sha Po Marsh was a brackish habitat established mainly to compensate for the habitat loss of the globally threatened odonate species Four-spot Midget *Mortonagrion hirosei*. The Sha Po Marsh also supported other wetland dependent flora and fauna. In addition, two mitigation ponds were created at the entrance of the development for other impacted species.

4.2.11 Plantation - Plantation within the Study Area was mainly found to the south of YLBF and as roadside planting along the Yuen Long Highway, along Kam Tin River Drainage Channel and as small stands to the

west of the Application Site. Plantations were generally low in ecological value due to the domination of exotic species and the location which is primarily selected for screening or aesthetic reasons. Typical species included *Acacia confusa.*

4.2.12 Pond - Ponds were mainly found in the areas to the north, northwest and the south of the Application Site. These ponds were under maintenance for fish farming, aerators could be observed in this habitat for the provision of oxygen to the cultivated fishes. Vegetation could be found at the bunds of the ponds e.g. *Ficus hispida*, *Ludwigia erecta* etc.

4.2.13 Reedbed - Two patches of reedbed were found within the Study Area. One patch was near Shan Pui Village bounded by the northwest boundary of the Study Area, another patch was located immediately to the west of the Application Site. This habitat was generally dominated by reed *Phragmites australis*.

4.2.14 The reedbed at the northwest boundary was largely dominated by reed *Phragmites australis,* with occasional presence of exotic species *Typha angustifolia* and weeds.

4.2.15 The reedbed at the west of the Application Site was of ponds in nature. Due to the abandonment of the pond maintenance, these ponds were dried off leaving a wet ground for the growth of vegetation, weedy species such as *Bidens alba, Brachiaria mutica*, *Ipomoea cairica* and *Leucaena leucocephala* formed an extensive cover in this habitat. However, colonization of reed *Phragmites australis* was noted recently in this habitat, forming a co-dominant population with the weeds. Besides, individuals of mature invasive mangrove *Sonneratia* spp. were also observed in this patch of reedbed. This patch of reedbed was previously reported with Black-faced Spoonbill sightings during the 2013 surveys). However, as mentioned, pond maintenance had been ceased for some years according to the past surveys and aerial photos, degradation and vegetation colonization was noted. It is not a suitable habitat for Black-faced Spoonbill to use anymore.

4.2.16 Tidal Marsh - Small patch of tidal marsh was found along the Kam Tin River Meander. The marshy vegetation in this habitat was periodically influenced by tidal actions, and was dominated by reed *Phragmites australis*, mangrove such as *Kandelia obovata* and mangrove-associate such as *Derris trifoliata*.

4.2.17 Wasteland - Wasteland within the Study Area was mainly situated inside, and immediately to the south and the west of the Application Site. This habitat was dominated by ruderal vegetation. Plant species in this habitat type were typical of primary stages of vegetative succession, and those colonizing areas of bare or disturbed ground. Vegetation species typically found within this degraded habitat were

mostly exotic weed species, including *Brachiaria mutica*, *Bidens alba*, *Wedelia trilobata* and self-sown trees in the form of the weedy exotic *Leucaena leucocephala*.

4.2.18 Woodland - A small stand of woodland was found at the hilltop located to the west of the Application Site bounded by the west boundary of the Study Area. This habitat consisted of trees with an average height of 6 to 10 meters. These trees formed a thin canopy, light gaps can be occasionally found in this habitat. Both native (such as *Macaranga tanarius* var. *tomentosa* and *Tetradium glabrifolium*) and exotic tree species (such as *Acacia auriculiformis* and *Casuarina equisetifolia*) were found at the canopy. While the underestorey was dominated by *Miscanthus sinensis*. Climber such as *Ipomoea cairica* and *Pueraria montana* var. *thomsonii* were also found in this habitat. Graves were observed within the woodland and this indicated the woodland was subjected to anthropogenic disturbance.

4.2.19 Another patch of woodland was also located in a knoll, to the immediate north of the Application Site. Trees in this woodland reached 7 to 12 meters, comprising of species including *Macaranga tanarius* var. *tomentosa* and *Melia azedarach*. Shrubs such as *Litsea rotundifolia* var. *oblongifolia* and *Psychotria asiatica* and climbers such as *Hypserpa nitida* and *Phyllanthus reticulatus* could also be found in the understorey.

4.2.20 The Application Site was largely left vacant and was currently dominated by wasteland habitat. There was an abandoned pond located on the southern boundary of the Application Site. Part of this abandoned pond was within the Application Site, and was abandoned long time ago and no fish-culture operations were observed during the ecological surveys). There was also a pond located at the northwest corner of the Application Site. While the pond to the north of the Application Site is engaged in a Fishpond Management Agreement and was maintained with certain level of activities, it might not be operating for commercial farming based upon on site observations during the ecological surveys over the past years. This pond (only about 0.46ha) is also much smaller than most of other ponds in the area that are still maintaining active fish farming practices. Complete drain down to expose the pond bottom or removal of pond bottom sediment were not observed during the ecological surveys in the past years. It is therefore considered as semi-active with comparatively lower ecological value when compared with ponds fully operated for fish farming in which complete drain down would occur. Along the western boundary, there was a section of tidal meander which was partly inside the Application Site. There were also small areas of developed areas mainly as access road and village houses within the Application Site.

4.2.21 A full list of flora species recorded within the Study Area during survey and their relative abundance within each habitat is provided in

Appendix A. A total of 374 plant species were recorded within the Study Area. 188 nos. of plant species are native and 173 nos. are known to be exotic to Hong Kong, and the remaining 13 species are of uncertain origin. No flora species of conservation importance recorded within the Application Site, while one flora species of conservation importance, *Persicaria orientalis*, was recorded outside the Application Site but within the Study Area. The overall floral diversity was low.

4.2.22 *Araucaria heterophylla, Casuarina equisetifolia, Dimocarpus longan*, *Lagerstroemia speciosa, Litchi chinensis, Michelia* x *alba*, *Mimosa diplotricha, Ocimum basilicum, Phytolacca acinosa, Terminalia catappa* and *Typha angustifolia* are exotic to Hong Kong and not considered of conservation importance, despite being considered rare/ very rare by Corlett et al. (2000), listed as Vulnerable by IUCN (2019), considered as Vulnerable/Endangered in Threatened Species List of China's Higher Plants, considered as Vulnerable in China Plant Red Data Book, listed in Category II in State Protection and/or listed under Cap. 96 Forests and Countryside Ordinance.

4.2.23 *Coccinia grandis* and *Rhododendron* spp. are cultivated, and hence they are not considered as species of conservation importance despite being considered very rare by Corlett *et al*. (2000) or listed under Cap. 96 Forests and Countryside Ordinance.

4.2.24 Individuals of *Persicaria orientalis* were found situated in the wasteland outside the Application Site but within the Study Area during the dry season survey on 20th March 2020, but no *Persicaria orientalis* was found during the wet season survey on 9th June 2020. As the wasteland was heavily grown with weeds during the wet season survey, it is believed that weeds had been overgrown and those individuals of *Persicaria orientalis* were not found anymore. *Persicaria orientalis* is a native herb which is considered as very rare in Hong Kong (Corlett *et al*. 2000).

Mammal

4.2.25 A total of 4 mammal species was recorded within the Study Area (**Appendix B**). Japanese Pipistrelle *Pipistrellus abramus* and Small Asian Mongoose *Herpestes javanicus* are considered as species of conservation importance. Locations of the mammal species of conservation importance are shown in **Figure 6a**. Among the 4 mammal species, only one mammal species Japanese Pipistrelle was recorded flying through the Application Site. Most of the recorded species are common and widespread in Hong Kong.

Bird

4.2.26 A total of 91 bird species was recorded within the Study Area, while 35 bird species were considered as species of conservation importance (**Table 4.4**). Among the recorded species, 43 bird species were recorded within the Application Site, and 9 of them were considered as species of conservation Importance (also see **Table 4.4**). Bird recorded in the Application Site were mostly disturbance tolerant species **(Appendix C)**.

Table 4.4 List of Bird Species of Conservation Importance Recorded during the Survey Period

Species	Conservation and Protection Status[1]	Abundance recorded in:	
		Application Site	Outside Application Site)
Asian Barred Owlet *Glaucidium cuculoides*	CITES(II); CSMPS(II); Cap.586	1	1
Black Kite *Milvus migrans*	(RC); CITES(II); CSMPS(II); Cap.586	5	20
Black-crowned Night Heron *Nycticorax nycticorax*	(LC)	-	9
Black-faced Spoonbill *Platalea minor*	PGC; RLCV(EN); IUCN(EN); CSMPS(II)	-	1
Black-winged Kite *Elanus caeruleus*	RLCV(NT); CITES(II); (LC)	-	1
Black-winged Stilt *Himantopus himantopus*	RC	-	149
Bluethroat *Luscinia svecica*	LC	-	1
Chinese Pond Heron *Ardeola bacchus*	PRC (RC)	8	103
Collared Crow *Corvus torquatus*	LC; RLCV(NT); IUCN(VU)	-	9
Collared Scops Owl *Otus lettia*	CITES(II); CSMPS(II); Cap.586	-	1
Common Greenshank *Tringa nebularia*	RC	-	35
Common Redshank *Tringa totanus*	RC	-	16
Crested Serpent Eagle *Spilornis cheela*	(LC); RLCV(NT); CITES(II); CSMPS(II); Cap.586	-	1
Eastern Buzzard *Buteo japonicus*	CSMPS(II); CITES(II); Cap.586	1	2
Eurasian Teal *Anas crecca*	RC	-	19
Great Cormorant *Phalacrocorax carbo*	PRC	11	240
Great Egret *Ardea alba*	PRC (RC)	-	41
Greater Coucal *Centropus sinensis*	CSMPS(II)	-	9
Grey Heron *Ardea cinerea*	PRC	2	104
Grey-headed Lapwing *Vanellus cinereus*	LC	-	13

Species	Conservation and Protection Status[1]	Abundance recorded in:	
		Application Site	Outside Application Site)
Intermediate Egret *Ardea intermedia*	RC	-	1
Little Egret *Egretta garzetta*	PRC (RC)	8	177
Little Grebe *Tachybaptus ruficollis*	LC	-	13
Little Ringed Plover *Charadrius dubius*	(LC)	-	4
Marsh Sandpiper *Tringa stagnatilis*	RC	-	25
Northern Shoveler *Spatula clypeata*	RC	-	333
Pied Avocet *Recurvirostra avosetta*	RC	-	199
Pied Kingfisher *Ceryle rudis*	(LC)	-	4
Purple Heron *Ardea purpurea*	RC	-	2
Spotted Redshank *Tringa erythropus*	RC	-	6
White-shouldered Starling *Sturnia sinensis*	(LC)	10	12
White-throated Kingfisher *Halcyon smyrnensis*	(LC)	-	5
Wood Sandpiper *Tringa glareola*	LC	-	65
Yellow Bittern *Ixobrychus sinensis*	(LC)	2	2
Zitting Cisticola *Cisticola juncidis*	LC	-	1

Notes:

1. Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
   a. Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global Concern; GC = Global Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
   b. Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; EN = Endangered.
   c. Conservation status by IUCN (2002): NT = Near Threatened; EN = Endangered.
   d. Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
   e. Protection status by CITES (2020): II = Listed in CITES Appendix II.
   f. All wild birds in Hong Kong are protected under Cap. 170 Wild Animals Protection Ordinance.
   Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.

4.2.27 No breeding and nesting behavior were observed in the Application Site. Two active nests of White-shouldered Starling were found in

developed area habitat near Shan Pin Tsuen. White-shouldered Starling were observed flew to and return from northeast direction. There was no observation that White-shouldered Starling flew to and return from the Application Site.

4.2.28 Two ardeid night roosts were found within the 500m Study Area and surveyed during the survey period between 2019 and 2020 (**Figure 2b**). The maximum counts of the two ardeid night roosts were both less than 30 individuals of ardeids. Most of the roosting ardeids were Little Egret. However, it was observed that no egrets roosted at the one to the western side of Kam Tin River Drainage Channel in 2021.

4.2.29 A winter roost of Great Cormorant was present in plantations about 500m to 800m to the northwest of the Application Site. Around 4,560 individuals (maximum count) of Great Cormorant were found roosting there (**Figure 6b**).

Flight Path Survey

4.2.30 The survey confirmed that Tung Shing Lane egretry was still active in 2019 and 2020, a total of 306 and 288 flight observations was made in 2019 and 2020, respectively. The observed flight directions of ardeid took off from Tung Shing Lane Egretry were similar in both 2019 and 2020, with the majority flying a general northward direction (flying across Yuen Long Highway and the Yuen Long Bypass Floodway) with much smaller number flying eastward to Kam Tin River Drainage Channel and westward to Yuen Long Town directions, with occasional individuals landing at the ponds in front of the egretry (**Figures 6c** and **6d**). These observations were consistent with those reported from the literature reviewed.

4.2.31 For the breeding ardeid towards northern direction, after passing Yuen Long Highway, their flying directions had some variations. **Figures 6e** and **6f** present the numbers and percentages of the flying directions of the breeding ardeid (**Zones A** to **I**) . These zones covered all recorded flight directions. One of the zones (Zone D) covered the knoll to the north of the Application Site, which most ardeid avoided, and the remaining directions were approximately evenly divided into three zones (to the west of the knoll) and 5 zones (to the east of the knoll). Those breeding ardeid showed a strong tendency flying towards the direction of Kam Tin River Drainage Channel while would avoid the knoll to the north of the Application Site. As shown on **Figures 6e** and **6f**, after passing Yuen Long Highway, the largest proportion of flight directions was in the most eastern direction (i.e. Zone I) in both 2019 and 2020 (120 and 168 individuals respectively, or 39.22% and 58.33% respectively), and it was observed that most of the ardeids flew along Kam Tin River Drainage Channel after leaving Zone I. Only very low percentage of flight observation was recorded toward the knoll to the north of the Application Site (i.e. Zone D, with 2 individuals in both 2019 and 2020).

4.2.32 For the remaining zones, the percentages showed variations between the results of 2019 and 2020. In 2019, more individuals utilized Zones A, E, F and G and much less used Zones B, C, H. In 2020, however, no ardeid was recorded in the direction of Zone A, and the variations of percentages of ardeid among Zones B, C, E, F, G and H were much smaller.

4.2.33 However, no breeding of ardeids in Tung Shing Lane Egretry was found in 2021. On the other hand, a new egretry was recorded in Kam Po Road in 2021, which is over 2km from the Application Site. Flight-line surveys were hence conducted between May and August 2021 to determine if the proposed development would affect the breeding ardeids in the new egretry. The results showed that the breeding ardeids in Kam Po Road egretry mainly flew towards northwest direction along Kam Tin River Drainage Channel for foraging, and some minor flight observations were recorded flying eastern, western and southern directions (**Figure 6g**). Decreasing number of ardeids from the new egretry along Kam Tin River Drainage Channel was observed, likely because some ardeids landed in the wetlands in the vicinity of Kam Tin River Drainage Channel. There was no record of breeding ardeids which took off from the new egretry and flew through the Application Site.

4.2.34 Regarding the winter flight path survey, a total of 167 flight observation was recorded between December 2019 and February 2020, which are summarized as 6 flight-lines (**Figure 6h**). Most of the flight lines were observed along the Kam Tin River Drainage Channel (about 52 %) and along Kam Tin River Drainage Channel first then turned to northwest directions (about 34% from three minor flight lines), while only a minor (about 12%) and an occasional (about 2 %) flight lines were observed flying through the Application Site at its western side and eastern side respectively (**Figure 6h**). Given the location of the Application Site is at the edge of the major Deep Bay wetland area, the paucity of wetland habitat to the south and presence of a knoll to north of the site, there was no major bird flight path over the Application Site as expected.

Herpetofauna

4.2.35 Six species of reptile and six species of amphibian were recorded within the Study Area (**Appendix D & E**). Among the amphibian and reptile, no species were of conservation importance.

Odonate

4.2.36 Twenty-nine species of odonate were recorded within the Study Area, of which seventeen species were recorded within the Application Site (**Appendix G**). Among all of the twenty-nine species, only three species were of conservation importance, including Blue Chaser, Ruby Darter and Scarlet Basker, and none of them was found within

the Application Site.

Butterfly

4.2.37 Forty-five species of butterfly were recorded within the Study Area, of which ten species were recorded within the Application Site (**Appendix F**). Among all forty-five species, four species are of conservation importance, including Common Awl, Danaid Eggfly, Metallic Cerulean and Swallowtail, none of them were recorded within the Application Site.

Firefly

4.2.38 Firefly surveys were conducted monthly between April and October 2020 within and beyond the 500m Study Area. Two species of firefly were recorded i.e. Mai Po Bent-winged Firefly and *Pyrocoelia* sp. (**Appendix H**). Only *Pyrocoelia* sp. was recorded within the Application Site (**Figure 6i**). The firefly species of conservation importance i.e. Bent-winged Firefly was recorded northwest of the Application Site near Kam Tin River Meander south of Nam Sang Wai (**Figure 6i**). Only the firefly within the 500m Study Area is shown in **Appendix H** and **Figure 6i**.

4.2.39 The overall range of background light intensity recorded during the firefly survey was 0.03 – 0.65 lux. The range of the ambient light intensity when Mai Po Bent-winged Firefly was recorded is between about 0.04 lux to 0.47 lux, where at least a single individual was recorded. A total of 13 individuals were recorded during a single occasion during the entire survey period with the ambient light intensity of 0.28 lux.

Aquatic Fauna

4.2.40 A total of 9 aquatic species was recorded within the Study Area (**Appendix I**). Large numbers of Nile Tilapia were observed in Kam Tin River Drainage Channel and were found in all 6 sampling locations. All species were common in Hong Kong and no species of conservation importance were recorded within the Study Area.

4.2.41 Locations of the non-bird species of conservation importance recorded within the Study Area are shown in **Figure 6a**. Details of observations, protection status, distribution and commonness of the species of conservation importance are shown in **Table 4.16.**

4.3 Evaluation of Habitats and Species of Conservation Importance

4.3.1 The ecological importance of habitats within the Study Area are evaluated in accordance with the criteria stipulated in Annex 8 of TM-EIAO (**Tables 4.6 to 4.15**).

4.3.2 In accordance with Table 3, Annex 8 of the TM-EIAO, the ecological value of species recorded within the Study Area was assessed in terms of protection status (e.g. fauna protected under WAPO (except birds), and flora and fauna protected under regional/global legislation/conventions), species distribution (e.g. endemic), and rarity (e.g. rare or restricted).

4.3.3 Flora or fauna species protected by the following laws/regulations, listed under the following conventions and/or endemic to Hong Kong were considered to be species of conservation importance and are shown in **Table 4.16**. However, this excludes exotic weeds, escaped cultivars or captive species, vagrants and introduced species which have lower ecological value. Species which are classified by IUCN as Near Threatened (NT), Least Concern (LC), Data Deficient (DD), or Not Evaluated (NE), and not covered by any other laws/regulations/conventions are not considered of conservation importance in the present EcoIA.

- The International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species;
- China Plant Red Data Book;
- China Species Red List;
- China Red Data Book of Endangered Animals;
- Category I or II protected species in mainland China;
- Threatened Species List of China's Higher Plants (Qin *et al*. 2017);
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- Forestry Regulations (Cap. 96A) which are subsidiary legislation of the Forests and Countryside Ordinance (Cap. 96);
- Wild Animals Protection Ordinance (Cap. 170) (except birds as all wild birds are protected under the ordinance but their conservation importance is not equal);
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586);
- PRC Wild Animal Protection Law;
- Plant species considered 'Rare' or 'Very Rare' listed by Corlett *et al*. (2000) or Yip *et al*. (2010) where applicable; and
- Fauna species considered of concern in Fellowes *et al*. (2002).

Table 4.6 Evaluation of Abandoned and Active Agricultural Land within the Study Area

Criterion	Description
Naturalness	Man-made
Size	Small in Study Area. Not present in the Application Site.
Diversity	Very low species diversity and structural complexity
Rarity	2 bird species of conservation importance
Re-creatability	Readily re-created
Fragmentation	Fragmented within the Study Area
Ecological linkage	Limited linkages with habitats of ecological significance
Potential value	Limited due to high levels of human influence
Nursery/breeding ground	No known significant nursery or breeding ground
Age	Unknown
Abundance/richness of wildlife	Low abundance and diversity of wildlife.
Overall ecological value	Low

Table 4.7 Evaluation of Abandoned Pond, Pond and Mitigation Wetland within the Study Area

Criterion	Description		
	Abandoned Pond	Pond	Mitigation Wetland
Naturalness	Man-made origin, Some might be semi-natural, dependent on the duration of abandonment	Man-made	Semi-natural. Most are man-made origin
Size	Relatively large within the Study Area but small in Hong Kong context. Very small within the Application Site	Relatively large within the Study Area but small in Hong Kong context. Small within the Application Site.	Small within the Study Area and in Hong Kong context. Not present in the Application Site.
Diversity	Low plant species diversity and structural complexity. Low to moderate faunal diversity	Low plant species diversity and structural complexity. Moderate faunal diversity	Supports low plant diversity and moderate fauna diversity
Rarity	10 bird species of conservation importance (among them, only 3 species i.e., Black Kite, Chinese Pond Heron, and Little Egret, were found within Application Site), Scarlet Basker, Ruby Darter, Japanese Pipistrelle and Small Asian Mongoose	10 bird species of conservation importance (among them, only Black Kite, Chinese Pond Heron, Great Cormorant, Grey Heron, Little Egret, Yellow Bittern were found within Application Site)	10 bird species of conservation importance
Re-creatability	Recreation feasible	Readily re-created	Readily re-created
Fragmentation	Some fragmentation,	Some fragmentation, both	Fragmented from other

Criterion	Description		
	Abandoned Pond	**Pond**	**Mitigation Wetland**
	both within Study Area and from other areas of pond/abandoned pond	within Study Area and from other areas of pond	mitigation wetlands
Ecological linkage	Linkages with other high-value habitats in Deep Bay area for those remaining active and closer to WCA, but not significant for those dry/overgrown, or outside WBA and isolated by developed area such as highways.		
Potential value	Value would be improved if fish farming is resumed or protected and managed for wildlife, especially if linkage with other ponds /habitat in the area established. Those adjacent to mitigation wetlands have higher potential value.	Value would be improved if protected and managed for wildlife, especially if linkage with other ponds/ habitat in the area established. Ponds at the northernmost of Study Area have higher potential value given location and size. Ponds isolated by wasteland and urban area have lower potential value.	Some potential for enhancement with habitat management for wildlife.
Nursery/breeding ground	No significant nursery or breeding ground known	No significant nursery or breeding ground known. Tung Shing Lane Egretry is located at several trees on pond bunds and near village houses in Tung Shing Lane village.	No significant nursery or breeding ground known
Age	Unknown Aerial photo review revealed that in the last decade all the abandoned ponds within Application Site and to the east of the Application Site maintained in a condition with low/without water coverage	Unknown	At least a decade
Abundance/ richness of wildlife	Low to moderate	Moderate to high	The YLBF Mitigation Wetland is known to support moderate abundance of wetland fauna
Overall ecological value	Low to Moderate value for those retaining normal pond size, given the conditions of these abandoned ponds, which have either dry up or overgrown by vegetation, and their lower ecological values for waterbirds when compared with traditional fishponds with drain down practices and their potential value if properly managed. Lower value if small in size i.e., Low for the	Moderate value for those actively operated for commercial fish farming. Lower value if the operation effort is lower i.e., Low – Moderate for the one at the northwest corner of the Application Site).	Moderate value

Criterion	Description		
	Abandoned Pond	Pond	Mitigation Wetland
	one partially within the Application Site at southern boundary) and/or isolated from other wetlands.		

Table 4.8 Evaluation of Channel and Meander within the Study Area

Criterion	Description	
	Channel	Meander
Naturalness	Entirely man-made habitat, Kam Tin River Drainage Channel and the outer section of YLBF under influence of natural tidal flow.	Originated from streams, subject to human modifications and/or under influence of natural tidal flow.
Size	Moderate for YLBF and Kam Tin River Drainage Channel, small for other channels. Not present in the Application Site.	Varied. Kam Tin River Meander relatively large while others for irrigation of crops or modified stream generally small. Few sections of a small tidal meander are within the Application Site.
Diversity	Floral diversity low. Faunal diversity low to moderate	Floral and faunal diversity low
Rarity	21 bird species of conservation importance, Scarlet Basker, Blue Chaser and Japanese Pipistrelle	8 bird species of conservation importance (among these only one species, i.e. Chinese Pond Heron, was found within the Application Site), Scarlet Basker and Ruby Darter
Re-creatability	Easily recreated	Readily re-created
Fragmentation	Not fragmented for YLBF and Kam Tin River Drainage Channel	Limited fragmentation
Ecological linkage	For YLBF, high linkage with Kam Tin River Drainage Channel, less so with Inner Deep Bay	Directly or indirectly connected with Kam Tin River Drainage Channel or Shan Pui River Drainage Channel. Minor ecological linkage with the adjacent habitats
Potential value	Limited potential for further increase in value due to constraints imposed by artificial/concrete bank structures and management regime	Very little potential without re-engineering
Nursery/breeding ground	Not a significant nursery or breeding ground but these major channels are presumed to be a foraging area for breeding ardeids and common smaller waterbirds	Not known
Age	Varied. About 10 to 20 years	Mostly less than 20 years
Abundance/richness of wildlife	Low to moderate diversity and low abundance of wetland-associated fauna	Low abundance and diversity of wildlife
Overall ecological value	Moderate for YLBF and Kam Tin River Drainage Channel, Low for other channels inside Study Area	Low to moderate for Kam Tin River Meander Low for other meander including the small tidal meander with few sections within the Application Site

Table 4.9 Evaluation of Developed Area within the Study Area

Criterion	Description
Naturalness	Entirely man-made
Size	Large within the Study Area but small in Application Site
Diversity	Very low habitat complexity. Poor species diversity and structural complexity.
Rarity	8 bird species of conservation importance (among them, only one species, i.e. White-shouldered Starling, was found within Application Site), Japanese Pipistrelle, and Danaid Eggfly
Re-creatability	Readily re-created
Fragmentation	N/A
Ecological linkage	No significant linkages with other habitats of ecological importance
Potential value	Low
Nursery/breeding ground	No known as significant nursery or breeding ground
Age	N/A
Abundance/richness of wildlife	Low abundance and diversity of wildlife
Overall ecological value	Very low (for both areas beyond and within the Application Site)

Table 4.10 Evaluation of Grassland/Shrubland within the Study Area

Criterion	Description
Naturalness	Natural but maintained by human influences
Size	Small in Study Area. Not present in the Application Site.
Diversity	Very low species diversity and structural complexity
Rarity	4 bird species of conservation importance
Re-creatability	Readily re-created
Fragmentation	Fragmented from other areas of grassland/shrubland
Ecological linkage	Limited linkages with habitats of ecological significance
Potential value	Limited due to high levels of human influence
Nursery/breeding ground	No known as significant nursery or breeding ground
Age	Unknown
Abundance/richness of wildlife	Low abundance and diversity of wildlife
Overall ecological value	Low

Table 4.11 Evaluation of Plantation within the Study Area

Criterion	Description
Naturalness	Planted for amenity and visual purposes. Dominated by exotic species.
Size	Small in Study Area. Not present in the Application Site.
Diversity	Low flora and fauna diversity
Rarity	6 bird species of conservation importance, Common Awl and Blue Chaser
Re-creatability	Readily re-created
Fragmentation	Highly fragmented by developed area and roads
Ecological linkage	No significant linkages with habitats of ecological significance
Potential value	Limited potential due to disturbance and high proportion of exotic species
Nursery/breeding ground	Not a nursery or breeding ground of significance

Criterion	Description
Age	Unknown. Likely to have been planted following infrastructure works
Abundance/richness of wildlife	Low abundance and diversity of species, comprise mainly widespread and disturbance tolerant species
Overall ecological value	Low

Table 4.12 Evaluation of Reedbed and Tidal Marsh within the Study Area

Criterion	Description	
	Reedbed	Tidal Marsh
Naturalness	Semi-natural	Natural habitat established by wetland plants at channel margins
Size	Small in Study Area, limited between the Application Site and villages to the west. Not present in the Application Site	Small in Study Area, Not a common habitat in Hong Kong's context. Not present in the Application Site.
Diversity	Very low species diversity and structural complexity	Low to moderate
Rarity	9 bird species of conservation importance	5 bird species of conservation importance
Re-creatability	Readily re-created	Difficult to recreate
Fragmentation	No fragmentation observed within the Study Area	Not severely fragmented but rather small in size; might imply a high edge effect
Ecological linkage	Potentially linked to adjacent active fishponds, Kam Tin River Meander, and the reedbed in Nam Sang Wai.	Hydrologically and functionally linked with adjacent channels (Shan Pui River Drainage Channel) and some linkages to the reedbed and ponds nearby
Potential value	Limited due to high levels of human influence	Moderate to high if human disturbances nearby (primarily artificial light) could be minimized for the survival of Mai Po Bent-winged Firefly
Nursery/breeding ground	No known significant nursery or breeding ground	Breeding ground of Mai Po Bent-winged Firefly
Age	Unknown	At least over 30 to 50 years judging from previous aerial photographs
Abundance/richness of wildlife	Low abundance and diversity of wildlife	Low to moderate
Overall ecological value	Low to moderate	Moderate

Table 4.13 Evaluation of Wasteland within the Study Area

Criterion	Description
Naturalness	Colonising habitat on areas of bare ground or former agricultural land. Land has previously been adapted by anthropogenic changes and is now subject to very early stage vegetative succession.
Size	Occupies the majority of the Application Site and moderate size within the Study Area
Diversity	Low faunal and floral diversity
Rarity	1 plant species of conservation importance *Persicaria orientalis,* 7 bird species of conservation importance (all found both within and outside Application Site), Swallowtail and Japanese Pipistrelle

Criterion	Description
Re-creatability	Readily re-created
Fragmentation	Limited fragmentation
Ecological linkage	No significant functional or ecological linkage with other habitats.
Potential value	Low
Nursery/breeding ground	Not known as significant nursery or breeding ground
Age	Unknown
Abundance/richness of wildlife	Low floral and faunal diversity and abundance
Overall ecological value	Low (for both areas beyond and within the Application Site)

Table 4.14 Evaluation of Woodland within the Study Area

Criterion	Description
Naturalness	Semi-natural habitat dominated by self-sown exotic tree species, with human disturbance
Size	Small size in Study Area. Not present in the Application Site
Diversity	Low to moderate floral diversity but low faunal diversity
Rarity	2 bird species of conservation importance and Metallic Cerulean
Re-creatability	Readily re-created but trees need time to mature
Fragmentation	Highly fragmented by developed areas and roads
Ecological linkage	No significant linkages with habitats of ecological significance
Potential value	Limited potential for direct increase in habitat value unless more diverse vegetative community can develop
Nursery/breeding ground	No significant nursery/ breeding record
Age	Formed within the last few decades
Abundance/richness of wildlife	Low abundance and diversity of species, comprise mainly widespread and disturbance tolerant species
Overall ecological value	Low

Table 4.15 Evaluation of the Application Site

Criterion	Description
Naturalness	Habitats inside were either man-made (pond), man-made origin (abandoned pond), modified (meander), or highly disturbed (developed area and wasteland) habitats
Size	Total 5.56 ha. Dominated by wasteland (4.50 ha), and included a small pond (0.46ha, which is smaller than most of active fishponds), fractions of an abandoned pond (0.23 ha) and meander (0.16ha), and small area of developed area (0.21 ha)
Diversity	Low species diversity inside the Application Site. Dominated by wasteland habitat, of low structural complexity.
Rarity	9 bird species of conservation importance and Japanese Pipistrelle
Re-creatability	All habitats inside are readily re-created
Fragmentation	Limited fragmentation within the Application Site.
Ecological linkage	Currently no significant functional or ecological linkage with other habitats.
Potential value	Limited due to high levels of human influence
Nursery/breeding ground	No known significant nursery or breeding ground
Age	Varied

Criterion	Description
Abundance/richness of wildlife	Low abundance of wildlife
Overall ecological value	**Low** as dominated by wasteland habitat (which is of low ecological value). Other habitats present are all small in size and not of special ecological value. Abandoned pond within Application Site is considered as of **low ecological value** which is lower than other abandoned ponds in the Study Area due to the small size. Pond, due to its smaller size and lower level of management when compared with those operated for fully active fish farming, would be of **low to moderate ecological value** (lower than other ponds in the Study Area). The small tidal meander partially falls within the Application Site is also of **low ecological value**. The developed area is also small in size and of **very low ecological value**.

Table 4.16 Evaluation of Species of Conservation Importance Recorded in the Study Area

Number	Species / species groups	Location	Protection Status / Level of concern [1 2,3]	Distribution in HK [1]	Rarity [1]
Flora					
1	*Persicaria orientalis*	Outside Application Site: Wasteland	-	-	Very Rare
Fauna					
2	Japanese Pipistrelle *Pipistrellus abramus*	Outside Application Site: Abandoned Pond, Channel, Developed Area, Wasteland Inside Application Site: Wasteland	WAPO	Widely distributed throughout Hong Kong	Very common
3	Small Asian Mongoose *Herpestes javanicus*	Outside Application Site: Abandoned Pond	WAPO; Red List of China's Vertebrate: (Vulnerable)	Found in N.T. countryside area	Uncommon
4	Northern Shoveler *Anas clypeata*	Outside Application Site: Channel	WAPO; Level of Concern: RC	Mainly found in Deep Bay area	Common winter visitor
5	Little Grebe *Tachybaptus ruficollis*	Outside Application Site: Abandoned Pond, Channel, Pond	WAPO; Level of Concern: LC	Found in Deep Bay area	Common resident
6	Yellow Bittern *Ixobrychus sinensis*	Outside Application Site: Meander, Pond Inside Application Site: Abandoned Pond	WAPO; Level of Concern: (LC)	Found in Deep Bay area, Chek Keng, Tai Long Wan	Uncommon summer visitor and passage migrant
7	Black-crowned Night Heron *Nycticorax nycticorax*	Outside Application Site: Abandoned Ponds, Meander, Mitigation Wetland	WAPO; Level of Concern: LC	Widely distributed in Hong Kong	Common resident and winter visitor
8	Chinese Pond Heron *Ardeola bacchus*	Outside Application Site: Abandoned Agricultural Land, Abandoned Pond, Channel, Developed Area, Meander, Plantation, Pond, Reedbed, Tidal Marsh, Wasteland Inside Application Site: Abandoned Pond, Meander, Wasteland	WAPO; Level of Concern: PRC, (RC)	Widely distributed in Hong Kong	Common resident
9	Purple Heron *Ardea purpurea*	Outside Application Site: Abandoned Pond, Mitigation Wetland	WAPO; Level of Concern: RC	Found in Deep Bay area	Uncommon passage migrant

Number	Species / species groups	Location	Protection Status / Level of concern [1 2,3]	Distribution in HK [1]	Rarity [1]
10	Grey Heron *Ardea cinerea*	Outside Application Site: Channel, Developed Area, Mitigation Wetland, Pond, Reedbed, Wasteland Inside Application Site: Abandoned Pond, Wasteland	WAPO; Level of Concern: PRC	Main found in Deep Bay area	Common winter visitor, uncommon in summer;
11	Great Egret *Ardea alba*	Outside Application Site: Abandoned Pond, Channel, Meander, Mitigation Wetland, Pond, Reedbed, Tidal Marsh	WAPO; Level of Concern: PRC	Widely distributed in Hong Kong	Common resident and winter visitor
12	Little Egret *Egretta garzetta*	Outside Application Site: Abandoned Agricultural Land, Abandoned Pond, Active Agricultural Land, Channel, Developed Area, Meander, Mitigation Wetland, Plantation, Pond, Reedbed, Tidal Marsh, Wasteland Inside Application Area: Abandoned Pond, Wasteland	WAPO; Level of Concern: PRC, (RC)	Widely distributed in coastal area throughout Hong Kon	Common resident
13	Intermediate Egret *Egretta intermedia*	Outside Application Site: Reedbed	WAPO; Level of Concern: RC	Found in Deep Bay area, Tai Long Wan, Starling Inlet, Tai O, Cape D'Aguilar	Common passage migrant
14	Black-faced Spoonbill *Platalea minor*	Outside Application Site: Channel	WAPO; Class 2 Protected Animal of PRC; China Red Data Book: Endangered IUCN: Endangered Level of Concern: PGC	Mainly found in Deep Bay area	Common winter visitor
15	Great Cormorant *Phalacrocorax carbo*	Outside Application Site: Abandoned Pond, Channel, Mitigation Wetland, Pond, Reedbed	WAPO; Level of Concern: PRC	Widely distributed in coastal areas throughout Hong Kong	Common winter visitor
16	Crested Serpent Eagle *Spilornis cheela*	Outside Application Site: Grassland/Shrubland	WAPO; Appendix 2 of CITES; Class 2 Protected Animal of PRC; Level of Concern: LC	Widely distributed in shrublands on hillsides throughout Hong Kong	Uncommon resident
17	Black Kite *Milvus migrans*	Outside Application Site: Channel, Developed Area, Grassland/Shrubland, Mitigation Wetland, Plantation, Pond, Wasteland, Woodland Inside Application Site: Abandoned Pond, Wasteland,	WAPO; Appendix 2 of CITES; Class 2 Protected Animal of PRC; Level of Concern: (RC)	Widely distributed in Hong Kong	Common in Hong Kong;
18	Collared Scops Owl	Outside Application Site:	WAPO;	Widely	Common

Number	Species / species groups	Location	Protection Status / Level of concern [1,2,3]	Distribution in HK [1]	Rarity [1]
	Otus lettia	Woodland	Class 2 Protected Animal of China; Appendix 2 of CITES	distributed in shrubland throughout Hong Kong.	resident
19	Asian Barred Owlet *Glaucidium cuculoides*	Outside Application Site: Wasteland Inside Application Site: Wasteland	WAPO; Class 2 Protected Animal of China; Appendix 2 of CITES	Widely distributed in woodland throughout Hong Kong.	Uncommon resident.
20	Black-winged Stilt *Himantopus himantopus*	Outside Application Site: Abandoned Pond, Channel	WAPO; Level of Concern: RC	Mainly found in Deep Bay area	Common winter visitor
21	Pied Avocet *Recurvirostra avosetta*	Outside Application Site: Channel	WAPO; Level of Concern: RC	Mainly found in Deep Bay area	Common winter visitor
22	Grey-headed Lapwing *Vanellus cinereus*	Outside Application Site: Channel	WAPO; Level of Concern: LC	Found in Kam Tin, Tsim Bei Tsui, Lo Wu, Tai Long Wan, Shuen Wan, Castle Peak coast, Chek Lap Kok	Scarce winter visitor
23	Little Ringed Plover *Charadrius dubius*	Outside Application Site: Channel	WAPO; Level of Concern: (LC)	Widely distributed in freshwater areas throughout Hong Kong	Common winter visitor and passage migrant;
24	Marsh Sandpiper *Tringa stagnatilis*	Outside Application Site: Channel	WAPO; Level of Concern: RC	Found in Deep Bay area, Shuen Wan, Long Valley, Kam Tin, Sai Kung	Common winter visitor and passage migrant
25	Common Redshank *Tringa totanus*	Outside Application Site: Channel	WAPO; Level of Concern: RC	Found in Deep Bay area	Common passage migrant
26	Common Greenshank *Tringa nebularia*	Outside Application Site: Channel	WAPO; Level of Concern: RC	Found in Deep Bay area, Shuen Wan, Long Valley, Kam Tin, Sai Kung	Common winter visitor and passage migrant
27	Wood Sandpiper *Tringa glareola*	Outside Application Site: Channel	WAPO; Level of Concern: LC	Widely distributed in wetland area throughout Hong Kong	Common passage migrant and winter visitor
28	Spotted Redshank *Tringa erythropus*	Outside Application Site: Channel	WAPO; Level of Concern: RC	Found in Deep Bay area.	Abundant in winter and spring.
29	White-throated kingfisher *Halcyon smyrnensis*	Outside Application Site: Channel, Developed Area, Grassland/Shrubland, Meander,	WAPO; Level of Concern: LC	Widely distributed in coastal	Common resident

Number	Species / species groups	Location	Protection Status / Level of concern [1 2,3]	Distribution in HK [1]	Rarity [1]
		Reedbed		areas throughout Hong Kong	
30	Pied Kingfisher *Ceryle rudis*	Outside Application Site: Channel, Mitigation Wetland, Pond	WAPO; Level of Concern: LC	Widely distributed in lakes and ponds throughout Hong Kong	Uncommon resident
31	Greater Coucal *Centropus sinensis*	Outside Application Site: Abandoned Pond, Developed Area, Meander, Mitigation Wetland, Plantation, Reedbed, Tidal Marsh	WAPO; Class 2 Protected Animal of China; China Red Data Book Status: (Vulnerable)	Widely distributed in Hong Kong.	Common resident.
32	Collared Crow *Corvus torquatus*	Outside Application Site: Developed Area, Plantation, Reedbed, Tidal Marsh	WAPO; IUCN: Vulnerable; Level of Concern: LC	Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen	Uncommon resident
33	Zitting Cisticola *Cisticola juncidis*	Outside Application Site: Abandoned Pond	WAPO; Level of Concern: LC	Widely distributed in grassland throughout Hong Kong	Common passage migrant and winter visitor
34	White–shouldered Starling *Sturnia sinensis*	Outside Application Site: Developed Area, Shrubland/Grassland, Wasteland Inside Application Site: Developed Area, Wasteland	WAPO; Level of Concern: LC	Found in Kam Tin, Deep Bay area, Po Toi Island, Long Valley, Victoria Park, Ho Chung, Ma Tso Lung, Mui Wo, Lam Tsuen Valley	Common passage migrant
35	Bluethroat *Luscinia svecica*	Outside Application Site: Plantation	WAPO; Level of Concern: LC	Widely distributed in wet agricultural areas throughout Hong Kong.	Common passage migrant and winter visitor.
36	Black-winged Kite *Elanus caeruleus*	Outside Application Site: Pond	WAPO; RLCV(NT); CITES(II); (LC)	Found in Ha Tsuen, Deep Bay area.	Occasional visitor.
37	Eurasian Teal *Anas crecca*	Outside Application Site: Channel, Meander	WAPO; RC	Found in Deep Bay area, Shuen Wan, Tai Lam Chung Reservoir, Victoria Harbour, Urban Park.	Common winter visitor.
38	Eastern Buzzard *Buteo japonicus*	Outside Application Site: Mitigation Wetland, Wasteland	WAPO; CSMPS(II); CITES(II);	Widely distributed in Hong Kong.	Common winter visitor.

Number	Species / species groups	Location	Protection Status / Level of concern [1 2,3]	Distribution in HK [1]	Rarity [1]
		Inside Application Site: Wasteland	Cap.586		
39	Scarlet Basker *Urothemis signata signata*	Outside Application Site: Abandoned Pond, Channel, Meander	Level of Concern: LC	Common in areas containing abandoned fishponds throughout Hong Kong	Common
40	Ruby Darter *Rhodothemis rufa*	Outside Application Site: Meander	Level of Concern: LC	Widely distribute in ponds and marshes throughout Hong Kong	Common
41	Blue Chaser *Potamarcha congener*	Outside Application Site: Channel, Plantation	Level of Concern: LC	Widely distribute in marsh throughout Hong Kong	Common.
42	Metallic Cerulean *Jamides alecto*	Outside Application Site: Woodland	Nil	Victoria Peak, Fung Yuen, Chuen Lung, Mui Wo	Very Rare.
43	Swallowtail *Papilio xuthus*	Outside Application Site: Wasteland	Nil	Kap Lung, Ma On Shan, Tai Tam, Sha Lo Wan, Kat O, Lung Kwu Tan, Wu Kau Tang, Lung Kwu Chau	Rare.
44	Common Awl *Hasora badra*	Outside Application Site: Plantation	Level of Concern: LC	Wu Kau Tan, Lai Chi Wo, Hong Kong Wetland Park	Very Rare
45	Danaid Eggfly *Hypolimnas misippus*	Outside Application Site: Developed Area	Level of Concern: LC	Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang	Uncommon

1: AFCD website (2020), 2: Wang (1998)

3. Level of Concern follows Fellowes *et al*. 2002: LC = local concern; RC = regional concern; PRC = potential regional concern; GC = global concern. Letters in parentheses indicate that the assessment is based on restrictedness in breeding and/or roosting sites rather than in general occurrence

5. IMPACT IDENTIFICATION AND PREDICTION

5.1 General

5.1.1 The Application Site is divided into two portions i.e. the northern portion is for public housing development, while the southern portion is for private development (refer to the Planning Statement). The proposed development is thus a residential project with the following project elements:

- 7 residential buildings with 23 to 24 domestic storeys;

- Non-domestic block consists of transport terminus, retail, G/IC facilities and residential carpark at basement;
- Other associated landscape areas;
- necessary accesses and EVA;
- A sewage pumping station

5.1.2 The potential impacts associated with the proposed development include:

- Direct habitat loss, either permanent or temporary, which may occur on-site and/or off-site, due to site formation and construction works within the Application Site or in off-site works areas;
- Direct impacts to flora and fauna species, in particular those of conservation importance, arising from mortality;
- Disturbance impacts to surrounding habitats and fauna during construction;
- Water quality impact due to construction site runoff;
- Disturbance impacts to surrounding fauna, habitats and recognized sites of conservation importance during operation;
- Potential disturbance to flight paths of ardeids and other large-sized birds;
- Potential bird collision or road-kill; and
- Night-time light impacts.

5.2 Impact Evaluation Criteria

5.2.1 The significance of ecological impacts has been evaluated based primarily on the criteria set out in Table 1 of Annex 8 of the TM-EIAO:

- Habitat quality;
- Species affected;
- Size/abundance of habitats/species affected;
- Duration of impacts;
- Reversibility of impacts; and
- Magnitude of environmental changes.

5.2.2 This assessment is based on the **Indicative Block Plan** submitted under the current Application. Estimates of habitat loss and identification of areas to be affected by development have been made as accurate as practicable.

5.3 Construction Phase

Direct Impact – Temporary Habitat Loss During Construction Phase

5.3.1 There will be direct impact on wasteland, abandoned pond, pond and developed area within the Application Site during the construction phase. The latest design has avoided any impacts on the meander. According to the latest layout plan, there would be neither channelization nor modification of the sections of meander within the Application Site, and construction works will not encroach onto the meander. Therefore, direct impact on the meander is not anticipated. A sewage pumping station (SPS) is proposed at the western edge of the Application Site within the existing wasteland habitat. The SPS is relatively small in size and elongated in shape with no encroachment upon the meander. A short section of maintenance access would be provided to span over the meander to link up the SPS and the Public Access Road within the Application Site. The temporary works area for this maintenance access would also be decking over the meander. No foreseeable major temporary works and no modification on the meander is required. As there would be no construction works encroaching upon the meander, no temporary or permanent loss of the meander or any wetland habitat is anticipated due to the project.

5.3.2 The ecological values of wasteland and developed area are considered as low and very low respectively. Although the abandoned pond and pond within the Application Site will be encroached during construction, those wetlands are of low bird usage and low or low to moderate ecological value as they are either without drain-down and/or with observed degradation (such as overgrown at the bottom or pond bund). Based on results from ecological surveys, the Application Site would be of limited value as a foraging ground for either breeding ardeids at Tung Shing Lane Egretry or wintering waterbirds. Hence, the ecological values of abandoned pond and pond within the Application Site are considered lower than similar habitats in the area. The estimated area of each habitat type within the Application Site is summarized in **Table 5.1**.

Table 5.1 Estimated Habitat Loss for the Proposed Development

Habitat	Approx. Size within Application Site (ha)	Ecological value
Abandoned pond	0.23*	Low
Developed area	0.21	Very low
Pond	0.46*	Low to moderate
Wasteland	4.50	Low
Total	**5.54#**	

* compensation wetlands with the same area will be provided during operation phase
# meander of 0.16 ha will not be encroached

5.3.3 Due to the low or very low ecological values of wasteland and developed area, the potential impact due to loss of these two types of habitats within the Application Site during construction phase is

considered **negligible**. Mitigation for the loss of wasteland habitat and developed area during the construction phase is not required.

5.3.4 The ecological values for both the abandoned pond and the pond are lower than other similar habitats in the Study Area (i.e. low for the abandoned pond and low to moderate for the pond) due to their smaller sizes and/or lower management level. They are also of low waterbird usage (i.e. only 8 species of waterbirds, total 26 individuals) due to lack of complete pond drain down practice and/or overgrown of vegetation inside or along the bunds.

5.3.5 The tentative construction period envisioned at this stage is approximately 7.5 years. While the construction programme will be developed during the detailed design stage, there will be a duration of temporary loss of the abandoned pond partially within the Application Site before the completion of the new compensation wetland areas which would mitigate the loss of the wetland habitats. Besides, as the affected abandoned pond is partly within the site boundary, it will also potentially cause temporary habitat loss for the remaining portion outside the site boundary if the entire abandoned pond is drained for construction works. According to the tentative construction methodology envisioned at this stage, this abandoned pond would be temporarily drained, followed by construction of fence wall, and the portion outside of the Application Site would be filled up after completion of the fence wall. The temporary abandoned pond loss area would be about 0.05 ha which is minor and will be reinstated upon completion of construction. The portion of the abandoned pond within the site boundary and the pond would be in dry condition during the construction phase (i.e., before the compensation wetlands are provided). Nevertheless, these two on-site pond and abandoned pond are of low to moderate and low ecological value with low bird usage. Given the low usage of waterbird and the small area sizes, the habitat loss of abandoned pond and pond during construction phase is considered **minor** and mitigation is not required (For the impact of permanent habitat loss and associated mitigation, it is discussed in the operation phase impact in below sections).

5.3.6 According to the current construction planning, there will be neither off-site works area nor temporary access for the construction works. Besides, there are no high value habitats immediately adjacent to the Application Site. Temporary diversion of the meander or temporary habitat loss in the meander is not expected at this stage.

Fragmentation (habitats)

5.3.7 Fragmentation is the appearance of discontinuities in habitat that render it lowered attractiveness to flora or fauna or isolate populations of a species, potentially leading to reduced viability of a population. This is most easily seen in infrastructural links, where roads and rail lines break up habitat into smaller units, but also arises from

disturbance impacts, where organisms avoid certain areas due to secondary impacts from nearby development. Where these prevent mobility of organisms, fragmentation has occurred.

5.3.8 Fragmentation of habitats may occur during construction phase, resulting in the loss of ecological linkages between patches of habitats or habitats assemblages, especially in the cases where construction of the development cuts through one habitat or between two areas of similar habitat with significant migration of fauna. With regard to the current Project however, there is little potential for habitat fragmentation. Currently the Application Site is dominated by low value wasteland, besides the differences on habitat types with adjacent areas, movement of non-volant fauna (e.g. mammal, herpetofauna) through the Application Site is also limited under the existing condition due to the low value habitat, the fence along the site boundary, as well as roads along to the south of the site.

5.3.9 For birds, in particular waterbirds, due to the lack of sizable wetland habitat within the Application Site suitable for species that normally occur in significant numbers in Inner Deep Bay (larger ardeids, ducks, waders, Black-faced Spoonbill), the waterbird usage of the Application Site was low as described above. In addition, the location of the Application Site is at the fringe of the Deep Bay wetland area, with limited areas of low value wetlands to the south and west, and not likely to have considerable ecological linkages with the Inner Deep Bay wetland area.

5.3.10 Hence, the potential impact due to habitat fragmentation is ranked as **insignificant**, while It is considered that potential impacts (loss of ecological linkage) on the Inner Deep Bay wetland ecosystem as a result of this development would be **negligible**.

Fragmentation (flight-lines)

5.3.11 Typical flight-lines involve routes followed between feeding and roosting areas or between feeding and breeding areas. Development located on a flight-line may result in a decrease in the suitability of a foraging, breeding or roosting site by preventing movement between sites. In an extreme case, this may lead to the total abandonment of one or both sites. There may also be an increased risk of mortality by collision with structures constructed on or close to a flight-line. The proposed development might potentially have fragmentation impact on flight-lines of breeding ardeids at egretries or other waterbirds (e.g. Great Cormorant).

5.3.12 In fact, no breeding ardeid was recorded in Tung Shing Lane Egretry in 2021. A decreasing trend of the breeding ardeid at Tung Shing Lane Egretry was observed over the past years (the nests number has

decreased from 84 to 36 from 2018 to 2020, and the percentage in Hong Kong has also decreased from 7.8% to 1.9%, see **Table 4.1**), and it was abandoned in 2021. The possibility of recolonization of abandoned egretry is generally low according to the history of other abandoned egretries in Hong Kong.

5.3.13 Among the flight directions recorded during the ardeid breeding season, around 12% passed through the area with tower buildings on the proposed layout in both 2019 and 2020 (**Figure 8a** and **8b**). The majority of flight directions were towards Kam Tin River Drainage Channel direction i.e. about 58.82% in 2019 and 64.93% in 2020 (**Figure 8a** and **8b**), respectively. Other studies also reported ardeids have the tendency to follow waterways to reach their feeding grounds (see AEIAR-175/2013 & AEIAR-215/2017).

5.3.14 Annual variations on the flight directions and respective percentages of ardeids were observed in other egretry flight studies (e.g. Tai Tong egretry from AEIAR-215/2017, in which flight-line surveys were conducted at the same egretry for more than one breeding season). This indicated the flight directions of breeding ardeids from egretry are not fixed. As observed from the present flight-line survey, the egrets detoured to avoid the knoll to the north of the Application Site. Both indicated that breeding ardeids are able to adjust their flight directions.

5.3.15 Indeed, the proportion of breeding ardeids from Tung Shing Lane Egretry passing through the Application Site was relatively small (i.e. ~12% of the ardeids took off from the egretry). With the existing knoll to the north of the Application Site, observations revealed that the ardeids would avoid the knoll already. For the proposed development layout of the residential towers, only a relatively small proportion of breeding ardeids would need to slightly adjust their departure direction from the egretry even in the conservative scenario that the egretry will resume. There is sufficient space between the egretry and the buildings for the ardeids to make minor adjustments at their flight directions, and then continue to reach their foraging grounds outside the Application Site with minimal influence. For the scenario that the Tung Shing Lane Egretry would not resume, there would be no impacts on the ardeids.

5.3.16 While the major flight-line of wintering birds was along Kam Tin River, only one minor flight line was recorded at the western side of the Application Site where landscape areas, preserved meander and created wetlands ponds are located under the current proposed layout. Besides, one occasional flight line was recorded at the eastern side of the Application Site. The proposed development within the Application Site is hence not posing a threat to the flight-line of wintering birds.

5.3.17 Hence, the potential fragmentation impacts to breeding ardeids at Tung Shing Lane egretry and other waterbirds from the proposed development are considered **minor**.

5.3.18 Potential impacts to the breeding ardeids from the new egretry at Kam Po Road are not expected, as the observed flight-lines towards northwest direction (i.e. Application Site) were mostly along Kam Tin River Drainage Channel, no ardeids taking off from the new egretry were observed flying through the Application Site. In addition, as the new egretry is over 2 km from the Application Site and there are abundant suitable wetland habitats near the egretry, the potential impacts to the flight-line of breeding ardeids are not expected.

Indirect Impacts – Construction Noise

5.3.19 The potential response of waterbirds to noise disturbance varies from minor responses like head turning scanning to behavioural changes like taking flight, reducing feeding/roosting time or increasing agonistic behaviour, depending on the sensitivity of the waterbirds and the level of disturbance. In general, high level of disturbance could cause deterioration of habitat quality and decrease of bird usage as well as subsequent decrease in wildlife density of the sensitive wetland habitats in the vicinity of the noise sources of high intensity. Hence, the birds might move away to areas which are less disturbed and within their noise tolerances or reduce the foraging efficiency of birds that remain in the affected area. While the sensitivity of waterbirds to the same level of noise disturbance varies among different species, resident species are typically more tolerant of disturbance than migrant birds (Klein *et al*. 1995). As such, the noise disturbance from construction activities of this Project on waterbirds that are present all year round (e.g. resident ardeids) are expected to be less significant than the disturbance impacts on migratory/overwintering waterbirds given the generally higher tolerance of residents to disturbance.

While in many instances higher level of stimuli from construction works, e.g. construction noise, would cause greater level of disturbance, waterbirds were found to be especially prone to the intrusion of human activities into the wetland habitats and high level of irregular construction noise (Cutts *et al*. 2008 & 2013). In general, construction noise of above background noise level is likely to cause low to moderate level of disturbance that would trigger some degree of responses for waterbirds (Cutts *et al*. 2008 & 2013). While intrusion of workers into the nearby wetland outside the Application Site is not expected, the traditional piling works for the proposed development may pose more disturbance when comparing with other quieter construction procedures, including site clearance/formation, superstructure or other quieter demolition/foundation methods.

5.3.20 Habitats potentially impacted by the Project involve open wetland habitats which include the abandoned ponds to the east and south of the Application Site, the tidal meander, reedbed and ponds to the northwest, and potentially Nam Sang Wai area to the north, Kam Tin River Drainage Channel to the east and the YLBF to the south. In addition, the YLBF Mitigation Wetland lies to the northeast of the Application Site.

5.3.21 The abandoned ponds to the east and south are not separated by any physical barriers from the Application Site. Though these ponds were found to support very low numbers of waterbirds due to the abandoned conditions (either filled without draining down or in dry and overgrown condition). However, given appropriate management, these ponds have the potential to support a higher diversity and abundance of wetland birds. Given the above, potential disturbance impacts due to construction works with higher noise disturbance (such as piling) to these ponds are assessed on a precautionary basis (i.e. assuming with proper management), and is considered to be **minor to moderate** if unmitigated.

5.3.22 Though isolated from the Application Site by other habitats, given the relatively higher diversity and abundance of overwintering waterbirds recorded in the Kam Tin River Drainage Channel or the wetland habitats with higher waterbird diversity in the vicinity, the impact from construction works with higher noise disturbance (such as piling) is considered **minor to moderate** for migratory/overwintering waterbirds and **minor** for the more tolerant waterbirds that are present all year if unmitigated.

5.3.23 The YLBF is near to the Application Site, and could provide a foraging habitat for low numbers of waterbirds when the water level is low. It should however be noted that YLBF was designed for drainage purposes and would often be in high water level during wet season, and the waterbird usage inside the channel would be limited. The small section of tidal meander, though has potential for low densities of wetland-dependent birds, had no significant records of waterbird usage and is of low ecological value. Hence, indirect impacts from construction phase are considered to be **minor**.

5.3.24 The majority of the YLBF mitigation wetland to the northeast of the Application Site is separated from the Application Site by the abandoned ponds and the existing knoll, and hence would not be subject to significant indirect disturbance impact. The only exception is the western most pond within the mitigation wetland, which is near the northwestern end of the Application Site and therefore near Tower T8 of the proposed development (refer to **Figure 10**). Likewise, there are a small meander, some existing houses, and existing ponds to the further northwest of Tower T8 outside the Application Site. In addition, there are reedbeds and a strip of wasteland sitting outside the Application Site on the western bank of the small meander, opposite

to Tower T7. While the small meander and the strip of wasteland are of low ecological value and could act as a buffer, the reedbed, ponds, and the pond inside mitigation wetland are of low to moderate or moderate ecological value and might be subject to potential disturbance from the Project. Hence, indirect disturbance impact is ranked as **minor to moderate** for the most western pond inside the mitigation wetland, and the ponds and reedbeds to the northwest and west of the Application Site. Considerations should be given to minimize disturbance caused by construction works.

For potential disturbance to Tung Shing Lane egretry due to piling works, the egretry has been abandoned in 2021 and is located about 0.5 km to the southeast of the Application Site. Within this separating distance, there are some existing closer sources of disturbance to this egretry in between including the highways, railways, village houses and other existing development e.g. Pok Oi Hospital and Long Shin Estate. It is therefore considered that the potential piling activities would not be the major source of disturbance comparing to these existing disturbance sources regardless of which piling methods to be employed. Besides, it should be noted that there was no ardeid observed at Tung Shing Lane Egretry. The potential disturbance impact to the egretry would be **minor** with the proposed measures recommended in the following sections.

While the indirect disturbance impacts of other general construction activities, due to the low noise level and the distance from the Application Site to the other wetlands (such as Nam Sang Wai, Kam Tin River Drainage Channel as well as Deep Bay area), potential impacts to the waterbirds roosting and/ or feeding to that area are not expected.

Indirect Impacts – Dust

5.3.25 Dust will increase during construction phase, and might temporarily reduce the abundance and distribution of fauna in habitats adjacent to the works area.

5.3.26 Unmitigated construction works create significant levels of dust under certain weather conditions due to the construction vehicles and the phenomenon of wind-blown dust from works areas. This dust would be deposited on nearby habitats, which can cause vegetation damage and, as a secondary effect, have an impact on fauna such as insects and birds. Impacts from dust deposition of these types will, however, be temporary and reversible, and standard construction best practices as mitigation measures can be implemented to negate harmful impacts. Dust deposition impacts arising from the Project, therefore, considered **insignificant**.

Indirect Impacts – Light Glare

5.3.27 If the construction site has strong lightings or flood light, there may be light glare impacts to nocturnal wildlife in the vicinity during any night time construction. However, according to the current construction methodology, no night time construction works for the Project is planned. The construction site would only have limited lighting for security purpose. The impacts due to increased night-time light during construction will therefore be **insignificant**. Implementation of good site practices would still be recommended to further minimise the potential of artificial lighting/glare impacts as much as possible.

5.3.28 While there are no planned night-time works under this Project and the impacts of construction lighting/glare disturbance are considered insignificant for fauna species of conservation importance in the vicinity of the Application Site, ardeids habitually return to the night roost at every evening at around an hour before sunset and the construction activities (mainly construction noise and lighting for security) would potentially briefly interfere with the night roosts. However, the night roosts of the ardeids at Kam Tim River are located more than 200m from the Application Site **(Figure 2b).** Moreover, existing street lights and constant traffic on both Yuen Long Highway and Castle Peak Road are already existing light sources much closer to these night roosts. The cormorant night roosts in Nam Sang Wai are of longer separation distances from the Application Site, and similarly the cormorants mainly return to their night roost near sunset. Hence, the potential impact due to light on the night roosts for ardeids and cormorants is considered **insignificant**.

Indirect Impacts – Water Quality and Site Run-off

5.3.29 Construction activities during the construction phase could generate surface run-off containing lubricants, chemicals and pollutants. The water bodies of the most concern include abandoned ponds, ponds, mitigation wetlands, channels and meanders and, ultimately, the Inner Deep Bay area into which they flow into. Construction runoff is potentially destructive to aquatic communities, which could be adversely affected should there be negative impacts on prey species.

5.3.30 Sediments may enter waterbodies via run-off, particularly during periods of heavy rain. This can lead to high turbidity from soil particles (which can block the gills of aquatic organisms) and eutrophication as a result of nutrient enrichment. Aquatic macrophytes may be reduced as a result of reduced light penetration or increased free-floating algae populations following eutrophication. Severe eutrophication can lead to oxygen depletion and the impoverishment of aquatic communities, as well as animals that prey on them (e.g. waterbirds). Such effects appeared in the construction phase of a project, though can also occur in the operation phase.

5.3.31 Construction site run-off, inappropriate stock piling of construction materials, and incorrect handling of construction chemicals may lead to indirect impact on water quality in the surrounding aquatic habitats (e.g. the meander within the Application Site and YLBF) and associated fauna. Site run-off may carry sediments and lead to temporary increases in local suspended solids for a short period of time. Chemical pollution (especially oil) would have higher impact to aquatic species subject to the quantity. The potential impact is ranked as **minor to moderate** if unmitigated. Potential impact due to site run-off will be minimized and controlled by routine construction site water quality control measures such as implementation of good site practice.

Impacts on recognized sites and species of conservation importance

Recognized sites of conservation importance

5.3.32 The Application Site falls within the WBA. The Application Site is also adjacent to WCA (where some areas also zoned as "Conservation Area" ("CA")). Other recognized sites of conservation importance (e.g. Mai Po Inner Deep Bay Ramsar Site, Mai Po Nature Reserve, SSSI, Shan Pui River egretry, and Tung Shing Lane egretry) are all far away and will not be affected.

5.3.33 However, the wetland habitats in Deep Bay area in particular those inside WCA (some also zoned as "Conservation Area" ("CA")) serve as important feeding/roosting ground for migratory and overwintering waterbirds. The indirect disturbance in particular noise could cause the deterioration of habitat quality and decrease of bird usage as well as subsequent decrease in wildlife density of the sensitive wetland habitats within the recognized sites of conservation importance in the vicinity of the works area. The sensitivity of the wetland habitats would generally be considered higher during the peak visiting period of the migratory and overwintering birds i.e. dry season given the greater number of species of conservation importance affected.

5.3.34 Amongst the wetland habitats within the Study Area, of particular note is the Kam Tin River Drainage Channel and WCA located within the Study Area but separated from the Application Site by other habitats. The wetland habitats in these two areas supported a relatively greater diversity and abundance of migratory and overwintering waterbirds observed within the Study Area. The impacts of construction disturbance on the two areas are considered **minor to moderate** during dry season and **minor** during wet season if unmitigated. Mitigation measures are detailed in **Sections 6.3.1** to **6.3.5** below.

Species of conservation importance

5.3.35 As the plant species of conservation importance i.e. *Persicaria orientalis* was recorded away from the Application Site, no direct impacts to this plant species are expected.

5.3.36 Bird species of conservation importance found within the Application Site included Yellow Bittern, Chinese Pond Heron, Grey Heron, Little Egret, Great Cormorant, Black Kite, Eastern Buzzard, Asian Barred Owlet and White-shouldered Starling. As birds are very mobile and there are more suitable habitats for the recorded bird species of conservation importance in the vicinity as well as the Deep Bay area, the ecological impacts are considered **minor**, taken consideration of the habitat size and quality (i.e. low ecological value) as well as disturbance when compared with the Deep Bay area.

5.3.37 The Nam Sang Wai area is an important roosting site for Great Cormorants. In winter, large roosting aggregations of Great Cormorants on the gum trees in the Nam Sang Wai fishpond area were often seen after feeding at Inner Deep Bay. However, no roosting Great Cormorant was recorded within the Application Site, so that no direct impacts to roosting habitat of Great Cormorant are expected. Potential indirect impacts on the roosting site have been addressed in the sections above.

5.3.38 Besides the bird species of conservation importance recorded within the Application Site, only Japanese Pipistrelle were recorded flying through the Application Site, no breeding bats or sign of breeding were recorded within the Application Site. Due to their mobility and commonness in Hong Kong, potential impacts to this species is not expected. Another mammal species of conservation importance i.e. Small Asian Mongoose was recorded outside the Application Site and potential impacts to this species are also not expected. Eurasian Otter were not recorded within the Study Area. It is a semi-aquatic mammal which forages in water and nest on land. Recent records have only been found in the Mai Po Inner Deep Bay Ramsar Site and nearby region. Wandering individual might be possible but the chance entering the Application Site would be very low due to the condition and disturbance of the Application Site. Hence, potential impacts from habitat loss and fragmentation on Eurasian Otter are considered **minor**.

5.3.39 As there will be no night works during construction phase, potential impacts of construction lighting/glare disturbance to the light-sensitive fauna including the endemic Bent-winged Firefly, the ardeid night roost next to Kam Tin River Drainage Channel, the Great Cormorant roosting in Nam Sang Wai and the mammal species of conservation importance in the vicinity of the Application Site have been addressed in the sections on night-time light above.

5.3.40 The other species of conservation importance including the butterfly and dragonfly, were recorded away from the Application Site, will not be affected significantly.

5.4 Operational Phase

Direct Impacts – Permanent Habitat Loss During Operation

5.4.1 Operational phase direct impacts would be the habitats lost permanently after the completion of construction. Under the proposed development, about 0.69ha of area (mostly currently as wasteland and a fraction of existing abandoned pond) will be used for creating compensation wetlands to mitigate the permanent loss of abandoned pond and pond. Other than the loss of abandoned pond and pond, there will be no other habitat loss during operational phase. In fact, the current design has avoided any loss of the meander. Therefore in terms of area size, the total area occupied by project elements (i.e. buildings, infrastructures, etc.) during operation phase will be smaller than the works area during construction phase.

5.4.2 Among the habitats permanently lost, the ecological value of wasteland and developed area are considered as low and very low respectively. Due to the low or very low ecological values of wasteland and developed area, the potential impact due to loss of these two types habitats within the Application Site is considered **minor**. Mitigation for the loss of wasteland habitat or developed area is not required. In addition, some areas of wasteland habitat will be converted to compensation wetlands (see below).

5.4.3 For the loss of abandoned pond and pond, both the ecological values of the abandoned pond and the pond are lower than other similar habitats in the Study Area (i.e., low for the abandoned pond and low to moderate for the pond) due to their smaller sizes and/or lower management level. They are also of low waterbird usage (i.e., only 8 species of waterbirds, total 26 individuals all in the pond habitat; none in the abandoned pond habitat) due to lack of complete pond drain down practice and/or overgrown of vegetation inside or along the bunds. The impact of abandoned pond loss is ranked as **minor** and the impact of pond loss is ranked as **minor to moderate** given their location within WBA. Mitigation is therefore recommended to compensate for the loss of wetland. Ponds of similar total size to those loss abandoned ponds within Application Site will be provided during the operational phase.

Fragmentation to wetland habitats

5.4.4 The Application Site is located within WBA and dominated by wasteland habitat, and the proposed development will only affect limited wetlands (pond and fraction of abandoned pond which are small in individual sizes). Linkages between the existing wetlands of Inner Deep Bay, which are mostly continuous and to the north or northeast, will not be significantly affected by the proposed development due to its location, the lack of wetland habitat and suitability for species that normally occur in significant numbers in Inner Deep Bay. It is considered that the impacts from fragmentation

to the Inner Deep Bay wetland ecosystem as a result of this development would be **minor**.

Fragmentation to flight-line of waterbirds

5.4.5 As discussed in the construction phase impact, Tung Shing Lane egretry was abandoned in 2021, chance of recolonization to this egretry is considered low. In fact, according to the flight-line surveys conducted in the breeding season of 2019 and 2020, the breeding ardeids passed through the Application Site was low and due to the manoeuvrability of waterbirds, the potential fragmentation impacts to breeding ardeids from Tung Shing Lane egretry and other waterbirds from the proposed development are considered **minor**. Besides, potential impacts to breeding ardeids from the new egretry at Kam Po Road over 2 km away are not anticipated.

Indirect Impacts – Human Disturbance

5.4.6 During the operational phase, there may be indirect disturbance impacts to wildlife in the surrounding habitats due to an increased in human activity caused by residents inside the Application Site. The proposed residential development will provide 3,129 units to serve a population of about 8,384. The proposed development is however a residential project which is of low disturbance nature. Although, the reedbed and mitigation wetland were located to west and north of the Application Site, respectively, the reedbed will be separated by wasteland and meander from the proposed layout, while the mitigation wetland is separated by an existing knoll. Moreover, human activities will mainly be indoors and noise from residential houses will be screened by landscape area of the Application Site. The latest design of the development would not have any dedicated paths/roads leading the residents to the nearby sensitive habitats (e.g. reedbed and mitigation wetland (the mitigation wetlands indeed are not open to general public without prior arrangement/approval)) directly. Also, residential development by nature has much lower disturbance impacts than other undesired uses to be encouraged to be replaced as listed in the TPB PG 12-C. Hence, it is anticipated that any impacts of increased disturbance to these sites will be **minor**.

5.4.7 Landscape area will be established at the periphery of the Application Site. The landscape area will be composed of planting of trees or vegetation at the fringe forming a buffer which is anticipated to screen out any potential noise, traffic and other human disturbance. The landscape area will help to act as a buffer between the proposed development and adjacent land uses.

5.4.8 Although the YLBF is located close to the Application Site, it only provides foraging habitat for low numbers of waterbirds during periods of low water level. Indirect impacts from operational phase are

considered to be low, especially given the vehicular traffic would be limited on the vehicle road and there is a level difference between the road and YLBF; and the width of YLBF i.e., about 50m wide.

Indirect Impacts – Water Quality

5.4.9 There could be potential indirect impacts to the water quality of the surrounding waterbodies from surface run-off and pollution events from the development and their associated infrastructure. This nonpoint pollution, such as stormwater washed off from areas of hardstanding, roads and landscape area may have various impacts to the local aquatic environment. Magnitude of impacts would be dependent upon the pollution type and quantity of pollutant. Increased stormwater runoff may also lead to increased siltation if there are areas with bare soils.

5.4.10 The proposed development however is a residential development and pollutants on road surface would be very limited, and significant bare grounds will be unlikely. The built-in structures of the drain system within the Application Site such as sand trap could also help isolate and collect sediment and pollutants. Point pollution would not be an issue for the proposed development as the sewerage will collect all domestic effluent and organic load. It is anticipated that any impacts of water quality changes will be **insignificant**.

Indirect Impacts – Light Glare

5.4.11 There are potential concerns on potential light impact on the Cormorant night roost in Nam Sang Wai, the Mai Po Bent-winged Firefly habitat at Shan Pui River and Kam Tin River Meander, and night roost of ardeids at Kam Tin River Drainage Channel.

5.4.12 The habitats of Cormorant night roost and Mai Po Bent-winged Firefly are located at Nam Sang Wai, about 500m from the Application Site, the potential of such an impact would be remote given the long separation distances.

5.4.13 In fact, an existing driving school which provides night time training course is located in the vicinity of the firefly habitat, which indicated that the existing tree rows along Kam Tin River Meander provided shielding effect for the firefly habitat. The firefly habitat is also partially shielded from the residential blocks of the Application Site by the existing tree rows along Kam Tin River Meander and a knoll to the north of the Application Site. The light assessment also indicates that there would be no significant changes of the light intensity due to the proposed development (see **Appendix J**). Given the long distance from the Application Site, the lower heights of the mangrove trees, and the shielding, the potential of being influenced by lighting is considered **minor**.

5.4.14 For the Cormorant night roost, in addition to the long distance and the existing overnight light level caused by the developed area, there are also many known examples of bird night roost/nesting locations located much closer to existing light sources, including the ardeids night roost at Kam Tin River Drainage Channel adjacent to highways, the egretries at Mai Po Village and Tai Po, and also the Collared Crow in Shuen Wan Restored Landfill. The potential of light impact on the cormorant night roost in Nam Sang Wai is considered **minor**.

5.4.15 Nevertheless, a night-time light impact assessment has been conducted to assess whether the habitats for Firefly and Great Cormorant night-roost would be significantly affected by the light intensity generated by the Project during night-time. The night-time light impact assessment consists of night-time ambient light intensity measurements and light modelling. The details are presented in **Appendix J**.

5.4.16 The measurement results revealed that the majority of existing areas that are further away from local light sources i.e. lamp posts, the measured ambient light intensity was in the range of 0.04 – 0.47 lux when Maipo Bent-winged Firefly was recorded. This finding is in line with those surveys in other similar studies such as A/YL-NSW/242 in which 0.01 – 0.49 Lux light intensity was recorded in firefly habitat (AEC, 2016). Similar approach was also conducted in the study A/YL-NSW/274. The measured light intensity was in the range of 0.00 – 0.70 Lux in A/YL-NSW/274. As reported in A/YL-NSW/274, under different sky or weather conditions, the ambient light intensity at the firefly habitat and cormorant night roost could vary by about 0.3 Lux.

5.4.17 The predicted increase in night-time light contributed by the Project was based on a reasonable worst-case scenario (details refer to **Appendix J**). From the simulation results, the simulation predicted a minor increase in light intensity of 0.00 – 0.03 lux generated by the proposed development which is far below the natural variation measured during the field measurement. The predicted increase in light intensity contributed by the Project is the highest (0.03 lux) at two points which only occupied a tiny portion (~2%) of the total area of the firefly habitat. For the rest of the eastern portion, the increase is ranged from 0.01 to 0.02 lux which occupied about 50% of the firefly habitat. For the further west side of the firefly habitat (about 50% of the total area), the predicted increase in light intensity due to the Project is about 0.00 lux. **Appendix J** presents the details of the light simulation.

5.4.18 It can be seen that the natural variation on the ambient light intensity due to different sky conditions is larger than the predicted increase in light intensity contributed by the Project. It is therefore considered that the Project would not cause adverse impacts on the Mai Po Bent-

winged Firefly and Great Cormorant night roost in term of night-time artificial light.

5.4.19 There is an existing highway viaduct with overnight traffic lighting near the Application Site and the wildlife in the surrounding areas would be tolerant with night-time light. For the night roost of the ardeids at Kam Tin River Drainage Channel, is located at a position slightly below the Yuen Long Highway viaduct and about 200m away from the Application Site. Since the Yuen Long Highway viaduct is located between this night roost and the Application Site and very close to the night roost, the night roost is largely within the shadow zone of the viaduct such that the viaduct could block most light to this night roost from the Application Site. Moreover, there are already existing street lights on both the viaduct and Castle Peak Road and constant traffic which are much closer existing light sources to this night roost. The potential light impact on the night roost of the ardeids at Kam Tin River Drainage Channel is considered **minor**.

Indirect Impacts – Bird Collision

5.4.20 Bird collision risk would be more prominent when the building consists of extensive reflective glass façade such that the birds flying nearby are confused by the reflected image inside the glass which is normally the image of the sky and/or nearby environment. Considering that the current residential development would not have extensive glass façade, the potential bird collision impact is considered **minor**.

Impacts on recognized sites and species of conservation importance

Recognized sites of conservation importance

5.4.21 The Application Site is located within WBA and is adjacent to the WCA. However, the proposed development will not affect the ecological integrity of the wetlands within WCA or cause direct habitat loss in WCA, only small area within WBA will be lost permanently and is considered insignificant. While the habitats in WCA will be separated by landscape area from the Application Site. The potential impacts to the recognized sites of conservation importance are considered insignificant as the operational phase disturbance (e.g. noise, human disturbance) will be very limited.

Species of conservation importance

5.4.22 The Study Area already subjected to human disturbance, the fauna within the Study Area are habituated to human disturbance. No additional ecological impacts are expected further to the evaluation as in construction phase.

6. MITIGATION OF ECOLOGICAL IMPACTS

6.1 General

6.1.1 According to the principles in the TM-EIAO Annex 16 and EIAO Guidance Note 3/2010, ecological impacts on important habitats and the associated wildlife caused by the proposed Project should be avoided, minimized and mitigated where practicable.

6.1.2 The potential impacts arising from the construction and operation of the Project have been assessed. Since most of the potential ecological impacts are of low or insignificant levels (except for the disturbance arised from piling), specific ecological mitigation measures are not required for most impacts.

6.2 Avoidance

6.2.1 The Application Site is located inside the boundary of WBA and is near WCA (**Figure 2a**). The Project also has avoided habitats of higher ecological values, or other natural habitats. Only man-made/disturbed habitats of very low and low ecological value, including developed area, wasteland, pond and abandoned pond will be affected.

6.3 Minimization

Piling Methods and Programme

The exact construction methodology for foundation works would be subject to detailed GI in the later stage of the Project. Quieter piling methods would be considered. While the technology of percussive pilling has advanced and the noise generated has significantly reduced, further at-source mitigation measures could be explored in the detailed design stage. For example, a custom-made capsule / enclosure could be installed close to the pilling rig to reduce the impulsive noise.

6.3.1 Nevertheless, further details on the methodology and programme of the construction works will be provided in the detailed design stage. The objectives are to propose and formulate construction methods/procedures and programme which could minimize the potential noise disturbance impacts to the sensitive wetland areas within the Study Area to an acceptable level. The ecological considerations would include working hours, piling methods, types of screening and the efficiency of noise reduction, etc.

6.3.2 **Working hours:** The methodology of construction works will consider the disturbance to sensitive large waterbirds and assess the noise levels of different construction works e.g., piling and excavation. The suitable hours for relatively noisy operations would be identified with reference to the observable level of bird activities which is often higher in the early morning and near sunset.

6.3.3 **Piling methods:** Traditional steel hammer percussive piling would be avoided. Quieter piling methods e.g., hydraulic hammer, which would emit moderate level of noise would be assessed. Low noise piling method e.g., bored piling would be considered but it would depend on whether the ground condition is suitable for this type of piling.

6.3.4 **Types of screening:** Various types of noise screening could be used to reduce the noise at source. For example, noise reduction capsule applicable at the piling head, U-shape noise shield surrounding the piling rig, movable temporary noise barrier around the piling locations etc.

6.3.5 This report will be separately submitted to relevant authorities (e.g. AFCD) for agreement prior to the commencement of any piling works.

Site Hoarding and Good Site Practices

6.3.6 Site hoarding would be erected along the construction site boundary. Together with general good site practices which would be undertaken during the construction phase, potential disturbance to the wildlife inhabiting nearby areas could be minimized.

6.3.7 To minimise the contamination of wastewater discharge, accidental chemical spillage and construction site run-off, the below general good practices should be adopted:

- The good site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” should be followed to minimize surface runoff;
- Surface run-off from construction sites should be discharged into storm drains via adequately designed sand / silt removal facilities such as sand traps, silt traps and sedimentation basins;
- Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms;
- Good construction and site management practices should be observed to ensure that litter, fuels and solvents do no enter the storm water drains;
- Chemical toilets should be provided within the construction site and properly maintained. All effluent discharged from the construction site should comply with the standards stipulated in the “Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters” (TM-DSS)

Landscape Area within the Application Site

6.3.8 The proposed landscape area at the periphery of the Application Site is a building set back from the Wetland Conservation Area. This proposed landscape area would also serve as a buffer to shield

potential noise, traffic and other human disturbance from the Application Site to the surrounding environment during the operational phase.

6.4 Compensation

6.4.1 A total of about 0.23 ha of abandoned pond and about 0.46 ha of pond (i.e., total of 0.69ha) within the Application Site will be lost due to the proposed development. Although the affected pond and abandoned pond are of lower ecological value than other similar habitats in the area, compensation should be provided to achieve the no net loss principle requirement under TPB PG No. 12C. In order to compensate for the wetland loss, three wetland areas (in the form as ponds) would be recreated within the Application Site during the operational phase (**Figure 9**). The total pond areas to be recreated (i.e., about 0.69 ha) would be not less than the loss. The purposes of the compensation wetlands would consider beneficial functions including but not limited to e.g., provision for wildlife, educational demonstration and/or water polishing etc.

6.4.2 Examples for nature-educational demonstration may be information kiosks to provide useful information such as plant species, ecological functions etc.

6.4.3 Wetland areas for compensation will be provided mainly at the edge of the Application Site, which can also together with the landscape planting (refer to **Figure 10** and the landscape plan) provide a wetland and visual buffer to the WCA to comply with the TPB PG-No. 12C. There are three zones of compensation wetlands including the following which are further discussed in subsequent paragraphs. All of these created wetlands are proposed with soft substrate in order to have better ecological function. The ecological considerations and conceptual design of the three proposed ponds are shown in **Appendix K** and **L** for reference respectively.

- Compensation Wetland C at the southwest near the main entrance of the Site (approx. 0.40ha)
- Compensation Wetland D at the south (approx. 0.17 ha); and
- Compensation Wetland E at the southeast (approx. 0.12 ha)

Table 6.1 Areas of the Affect Abandoned Pond/Pond vs Compensation Wetlands

Habitat/ Compensation Wetland	Area (ha)	Ecological value/ Habitat types
Abandoned pond	0.23	Low
Pond	0.46	Low to moderate
TOTAL	**0.69**	
Compensation Wetland C	0.40	Pond with floating plants
Compensation Wetland D	0.17	Pond with emergent plants

Habitat/ Compensation Wetland	Area (ha)	Ecological value/ Habitat types
Compensation Wetland E	0.12	Reedbed
TOTAL	**0.69**	

6.4.4 ***Compensation Wetland C*** – It is noted that a landscape area with natural habitat and water feature has been proposed to the eastern portion of the application site under the approved planning application A/YL-NSW/274. This landscape area with natural habitat and water feature is aimed to respect the flightpath of breeding ardeids from Tung Shing Lane Egretry. In order to achieve a better ecological synergy with this landscape area, it is proposed to provide compensation wetland adjoining this landscape area.

6.4.5 The compensation wetland would be designed to receive part of the surface runoff from the Application Site. Water depth of the compensation wetland would be in the order of about 1m. Native vegetation species (mainly floating plants such as *Nymphaea* spp., and/or other native species e.g., *Adina pilulifera*, *Commelina diffusa* and *Impatiens chinensis*) would be considered to be planted within this compensation wetland, and could benefit fauna inhabiting waterbodies of moderate depth. Perching structures for small sized birds would also be provided. This compensation wetland would be designed to ensure that the runoff would be retained to allow the particulates to settle before discharge. By achieving this, the surface runoff would be suitably polished before reusing for irrigation. Suitable landscape planting would also be implemented around this compensation wetland to discourage access by residents so as to minimize disturbance. However, maintenance staff would be allowed to enter into this compensation wetland to conduct necessary maintenance work.

6.4.6 ***Compensation Wetland D*** – the southern site boundary adjoins the WCA. The habitats adjoining the southern site boundary include a few small abandoned ponds (including the outside portion of the abandoned pond lying on Application Site boundary), and wasteland as shown in the habitat map.

6.4.7 It is proposed to recreate compensation wetland in this area to achieve a better synergy with the neighboring habitats. The compensation wetland would be designed to receive part of the surface runoff from the development within the Application Site. Water depth of the compensation wetland would range from about 1m to about 0.5m, and would provide habitats for typical freshwater associated fauna such as odonates. Typical marsh / pond species such as *Cyperus* spp. and other emergent freshwater plants suitable for perching by odonates would be considered to be planted within this compensation wetland. Similar to Compensation Wetland C, this compensation wetland would be designed to ensure that the runoff

would be retained and suitable landscape planting would also be implemented around this compensation wetland.

6.4.8 ***Compensation Wetland E*** – the southeastern corner of the Application Site is surrounded by a patch of larger abandoned ponds. Hence, it is proposed to recreate a compensation wetland in this area to achieve a better synergy with the neighboring habitats. The compensation wetland would be designed to receive part of the surface runoff from the development within the Application Site. Water depth of the compensation wetland would be about 0.5m and reeds would be planted. By providing a reedbed in this location, cryptic reed-associated species could be benefited.

6.4.9 The total area of these three compensation wetlands is about 0.69 ha which is not less than the total area size of the pond and abandoned pond to be affected. The three compensation wetlands can provide different habitat types including pond with floating aquatic plants, pond with emergent plants, and reedbed, and could enhance the habitat diversity in the Application Site and have synergy effects with surrounding habitats and landscape area under other project (i.e. the landscape area with natural habitat and water feature under the approved planning application A/YL-NSW/274). These ponds are strategically located along the western and southeast sides of the Application Site boundary, serving as ecological corridors and could offer ecological linkage with neighboring habitats adjoining the site (see **Figure 10**). With the better ecological functions provided by these ponds, the impact from the loss of the small areas of pond and abandoned pond could be fully mitigated. Depending on their locations, these compensation wetlands could be implemented in tandem with the construction programme for respective portions of the Application Site namely the access road, private housing site and public housing site. The compensation wetlands will be implemented as soon as the land is available upon approval. Details of the construction programme will be provided in the detailed design stage.

6.4.10 In order to maintain the ecological functions of the proposed compensation wetlands in the long run, a Habitat Creation and Management Plan (HCMP) for the compensation wetlands will need to be developed during the detailed design stage. A tentative coverage of the HCMP is given below for reference.

Table 6.2 Outlines of Key Items of HCMP

Key Sections in HCMP	Outline Content to be Further Developed
Objectives	• Presents the keys objectives of the HCMP • Describes site conditions such as location, boundary, topography, hydrology etc.

Key Sections in HCMP	Outline Content to be Further Developed
	• Summarises / updates habitat evaluation, species of conservation importance, impact evaluation
Mitigation Objectives	• Proposes management goals and objectives of the compensation wetlands, for both construction and operational phases • Recommends suitable targets (e.g. habitat condition targets) for the compensation wetlands • Measures to minimize disturbance
Detailed Design and Construction Methods	• Design for water sources • Design for hydrology and water level • Recommend vegetation species • Construction programme
Management Strategy	• Interface with the other areas of the development • Review the feasibility for nature-educational demonstration activities and propose where appropriate. All nature-educational demonstration activities will be organised and controlled to minimise interfering the functions of the wetlands. • Management and funding arrangement
Monitoring	• Monitoring of water level and water quality • Monitoring of the habitat quality • Monitoring of wildlife use including bird, dragonfly and amphibians (no specific monitoring target would be proposed)

6.5 Precautionary Measures

Standard Construction Best Practices

6.5.1 It is suggested to follow standard construction site good practices for site runoff, dust and noise e.g., covering temporarily exposed soil surfaces or stockpiles with tarpaulin, preparation of site drainage management plan, vehicle wheel washing facilities etc.

Good Practice for Light Glare

6.5.2 Although mitigation measures would not be required for the potential light glare impact, it is recommended to avoid orientating any external flood light, if any, towards the firefly habitat and Great Cormorant night roost in Nam Sang Wai during both construction and operational phases as a precautionary measure.

6.6 Residual Impacts

6.6.1 After the implementation of mitigation measures, the identified impacts (mainly compensation for loss of small areas of abandoned pond and pond, and construction noise disturbance) would be mitigated to an acceptable level. No significant residual impact is identified.

Table 6.3 Summary of Construction Phase and Operational Phase Impacts and Mitigation

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
Construction Phase – Direct Impacts										
Habitat loss during construction	Works areas within the Application Site	Habitats inside the works areas: Wasteland, Pond, Abandoned pond, Developed area	Ecological value of developed area: very low; Abandoned pond, and wasteland: low; Pond: low to moderate	Low abundance and diversity of wildlife	Abandoned pond: 0.23 ha; pond: 0.46 ha; developed area: 0.21 ha; wasteland: 4.50 ha	During construction	Not reversible	Low	Negligible for wasteland and developed area; Minor for abandoned pond and pond	Not required for construction phase (*_compensation wetlands of the same area as the affected wetlands will be provided during operation phase_)
	Construction works of the proposed development	Meander within the Application Site, Portion of the affected abandoned pond outside Application Site	Ecological value of Abandoned pond and meander: low	Low abundance and diversity of wildlife	Portion of abandoned pond outside the site: 0.05 ha Meander: 0.16ha	During construction	Reversible for the remaining pond outside the site or any meander to be diverted	Low	Not identified (as no diversion of meander is needed) Minor temporary loss for the abandoned pond	No
Fragmentation (habitats)	The proposed development	Adjacent habitats; Wetland of Deep Bay area	Ecological value of Abandoned pond: low	Low abundance and diversity of wildlife	Abandoned pond: 0.23 ha	Permanent	Not reversible	Low	Insignificant for adjacent habitats; negligible for Deep Bay wetland	No

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
Fragmentation (flight-lines of waterbirds)	Construction of high-rise buildings	Waterbirds in particular breeding ardeids	Vary with habitat types	Waterbirds in particular breeding ardeids	Around 12% ardeids from TSL egretry passed through the tower buildings of the proposed layout in 2019 and 2020, but TSL egretry was abandoned in 2021	Permanent	Not reversible	Low	Minor	No
Impacts on Species of conservation importance	Construction works	Bird species of conservation importance found within the Application Site	Vary	Yellow Bittern, Chinese Pond Heron, Grey Heron, Little Egret, Great Cormorant, Black Kite, Eastern Buzzard, Asian Barred Owlet and White-shouldered Starling	9 species and 48 individuals	Temporary	Reversible	Low	Minor	No
	Construction works	Other fauna species of conservation importance in the Application Site	Low	Japanese Pipistrelle	5 individuals were recorded flying within the Application Site	Temporary	Reversible	Low	Minor	No
Construction Phase – Indirect Impacts										
Construction noise	Construction works	Sensitive habitats near the works area	Vary with habitat types	Mainly waterbirds	Vary	Temporary	Reversible	Moderate	Abandoned ponds to the east and south, reedbeds to the west, ponds to the northwest, &	Consider using quieter piling methods during detailed design stage, and/or construction programme to have the superstructure of some towers

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
									the westernmost pond in mitigation wetland : minor to moderate; Tidal meander: minor Kam Tin River Drainage Channel: Minor to Moderate for migratory/over wintering waterbirds, minor for resident waterbirds; Tung Shing Lane Egretry: minor	completed first. Details of methodology and programme of construction works should be submitted to relevant authorities (e.g. AFCD) for agreement prior any piling works.
Dust	Construction works	Sensitive habitats near the works area	Vary with habitat types	Fauna in habitats adjacent to the works area	Vary	Temporary	Reversible	Low	Insignificant	No (Standard construction best practices will still be implemented)
Light glare	Works area	Sensitive habitats near the works area	Vary	Nocturnal fauna including firefly, night roost of ardeids and Great Cormorant	Vary	Temporary	Reversible	Insignificant	Insignificant	No (precautionarily avoiding orientating any external flood light, if any, towards the firefly habitat and Great Cormorant night roost)

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
Water quality and site run-off	Construction works	Wetland habitats (e.g. meander and channel)	Vary	Aquatic fauna and wetland dependent species	Vary	Temporary	Reversible	Moderate	Minor to moderate	Follow routine water quality mitigation measures; standard good site practices
Impacts on recognized sites of conservation importance	Construction works	WCA, mitigation wetland	Vary	Wetland species	Vary	Temporary	Reversible	Low	Minor to moderate during dry season and minor during wet season if unmitigated.	Addressed in the above measures including construction noise mitigation.
	Construction works	Roosting site for Great Cormorants.	Vary	Great Cormorant roost	4560 individuals (maximum count) of Great Cormorants that roosting there	Temporary	Reversible	Low	No impact anticipated	No
Impacts on Species of conservation importance	Construction works	Plant species of conservation importance found within the Study Area	Low	*Persicaria orientalis*	Scarce	Temporary	Reversible	Low	No impact anticipated	No
	Construction works	Bird species of conservation importance	Vary	35 Species of Conservation Importance recorded	35 species and 1624 individuals	Temporary	Reversible	Low	Minor	No

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
		found within the Study Area		within the Study Area						
	Construction works	Other fauna species of conservation importance in the Study Area	Vary	9 species of conservation importance including Japanese pipistrelle, Small Asian Mongoose, Blue Chaser, Ruby Darter, Scarlet Basker, Common Awl, Danaid Eggfly, Metallic Cerulean and Swallowtail	Vary	Temporary	Reversible	Low	Minor	No
Operational Phase – Direct Impacts										
Permanent habitat loss during operation	Potential development	Area occupied by project elements (No additional habitat loss during operational phase)	Ecological value of developed area: very low; Abandoned pond, meander and wasteland: low; Pond: low to moderate	Low abundance and diversity of wildlife	Abandoned pond: 0.23 ha; Pond: 0.46 ha developed area: 0.21 ha; wasteland: 4.50 ha (within the Application Site, 0.69 ha will be used for on-site compensation wetlands)	Permanent	Not reversible	Low	Minor for waste land and developed area; minor for abandoned pond; minor to moderate for pond.	Not required for wasteland and developed area, and compensation wetlands of the same size as the affected wetlands will be provided for the loss of abandoned pond and pond
Fragmentation (habitats)	The proposed development	Wetland within Deep Bay	Ecological value of Abandoned pond: low	Low abundance and diversity of wildlife	Abandoned pond: 0.69 ha	Permanent	Not reversible	Insignificant	Minor	No

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
Fragmentation (flight path of waterbirds)	Construction of high-rise buildings	Waterbirds	Vary with habitat types	Waterbirds	Around 12% ardeids from TSL egretry passed through the tower buildings of the proposed layout in 2019 and 2020, but TSL egretry was abandoned in 2021	Permanent	Not reversible	Low	Minor	No
Operational Phase – Indirect Impacts										
Human disturbance	The proposed development	Sensitive habitats near the residential area	Vary with habitat types	Terrestrial fauna including those species of conservation importance	Vary	Temporary	Reversible	Low	Minor	No
Water quality	The proposed development	Wetland habitats (e.g. meander, channel)	Vary	Aquatic fauna and wetland dependent species	Vary	Temporary	Reversible	Insignificant	Insignificant	No
Light glare	The proposed development	Sensitive habitats near the potential development area	Vary	Nocturnal fauna including firefly and night roosting sites of ardeids and Great Cormorant	Vary	Temporary	Reversible	Low	Minor for firefly habitat Minor for cormorant night roost Minor for ardeids night roost	No (precautionarily avoiding orientating any external flood light, if any, towards the firefly habitat and Great Cormorant night roost)
Bird collision	The proposed development	N/A	N/A	Birds	Vary	Permanent	Not reversible	Low	Minor	No
Impacts on recognized sites of	The proposed	Small area within WBA	Vary	Wetland species	Vary	Permanent	Not reversible	Low	Insignificant	No

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
conservation importance	development									
Impacts on species of conservation importance	The proposed development	Fauna species of conservation importance found within the Application Site	Vary	Wetland species	Vary	Permanent	Not reversible	Low	No impact anticipated	No

7. CUMULATIVE IMPACT

7.1.1 The Application Site will cause loss of pond and abandoned pond of about 0.69 ha which could be fully compensated. The current Project would not contribute to cumulative wetland loss within the WBA.

7.1.2 It is the general practice for EcoIA to consider confirmed (i.e. approved) concurrent projects that are within the 500m Assessment Area. For those planning projects which were within the 500m Assessment Area but withdrawn or no approval status, it is considered not appropriate to include those projects as concurrent projects for the purpose of this cumulative impact assessment.

7.1.3 The combination of various concurrent developments (other planned and committed development projects) in the area may potentially lead to cumulative impacts, particularly on habitat loss, increased road use and disturbance impacts. For planning projects which were within the 500m Assessment Area, the approved projects will be included for the purpose of assessing the cumulative impacts. The concurrent projects in the area identified in accordance with the best available information include the following:

Residential Development – Approved Planning Application A/YL-NSW/274

7.1.4 This project is located adjacent to the current Project. It is a residential development with 5 nos. of 19 storeys tower and 2 nos. of 6 storeys tower. This proposed development would not cause any wetland loss as it is currently wasteland habitat only. A landscape area with natural habitat and water feature is proposed on the northeast corner of this development mainly to retain flight lines for ardeids from Tung Shing Lane Egretry. A light assessment conducted for this project showed that the predicted increase in light intensity by this project would be +0.01 Lux at the nearest point of the known Mai Po Bent-winged Firefly habitat is Nam Sang Wai and there would be no significant increase (i.e., +0.00 Lux) in light level for the majority of the firefly habitat extent. In view of the minor increase contributed by this project, no significant cumulative night time light impact to the firefly habitat is anticipated.

Shopping mall cum hotel at Lot 1743 S.C RP (Part) in D.D. 107 to the South of Wing Kei Tsuen, Yuen Long (Rezoning Application No. Y/YL-NSW/3)

7.1.5 Y/YL-NSW/3 is located about 450m to the northeast of the Application Site and isolated by landmass as well as the Kam Tin River Drainage Channel. No habitat with significant ecological value will be impacted or lost in this project. Disturbance from this project will also be limited

as human activities would be mainly indoors (shopping mall and hotel) and contained by the buildings.

Proposed Comprehensive Development of an Outlet Mall with Commercial Uses (Including "Shop and Services" and "Eating Place"). "Agricultural Uses" (Commercial Fish Ponds), "Excavation of Land" and "Filing of Land" in "Other Specified Uses" annotated "Comprehensive Development in include Wetland Restoration Area", Lots 8 PR (Part), 14 S.B RP (Part), 45 and 1740 S.A RP in D.D. 107 and Adjoining Government Land, to the South of Pok Wai and Wing Kei Tsuen, Yuen Ling (Planning Application No. A/YL-NSW/241)

7.1.6 A/YL-NSW/241 is also located far away to the northeast of the Application Site outside of the Study Area and isolated by landmass as well as the Kam Tin River Drainage Channel. No habitat with significant ecological value will be impacted or lost in this project, but wetlands (as commercial fishponds) will be created from the existing dry land area within the Application Site of A/YL-NSW/241, and therefore the wetland area inside WBA will be increased after the implementation of this project. Disturbance from this project will also be limited as human activities would be mainly indoors (shopping mall) and contained by the buildings.

Existing and Planned Developments in Kam Tin North

7.1.7 An approved comprehensive residential development of approx. 28 ha in total lies to the south/southeast of the current Project outside the WBA and also outside the Study Area (Application No. A/YL-KTN/118-2). One of the potential ecological impacts from the approved project relate to the globally threatened dragonfly Four-spot Midget *Mortonagrion hirosei*, the loss of a large area of fish ponds and some loss of grassland/shrubland, and resultant impacts on a number of wetland-dependent fauna and flora of conservation importance. To mitigate for these, Sha Po Marsh, which is of importance to the dragonfly, had been proposed and successfully implemented. In addition, ponds had been provided at the Marsh, at the entrance of the development and at the Mitigation Meander east of Kam Tin Drainage Channel for other impacted species. In total, the mitigation wetland area under the approved scheme is approx. 12 ha of permanent wetland and approx. 1.3 ha of temporary wetland. In addition, building heights have been carefully considered to minimize potential impact on bird flight lines.

An approved residential development project lies west of the Kam Tin River Drainage Channel (Application No. A/YL-KTN/319-2). This project (now completed as The Riva) involves buildings of up to 23 storeys and is sandwiched between Ko Po Road to the north and Kam Tin Road to the south outside of the Study Area. Habitats impacted

comprise largely open storage and patches of waste ground or grassland/shrubland.

7.1.8 No wetland was lost as a result of the Project and no particular ecological mitigation measures are proposed.

Disturbance

The proposed development under Approved Application No. A/YL-NSW/274 involves the development of 5 blocks of 19-storey tower and 2 blocks of 6-storey tower. A/YL-NSW/274 is located closer to the present Application and has a higher potential on cumulative disturbance impacts. The implementation time frame of A/YL-NSW/274 is not certain, but alternative quieter piling methods would be employed. Concurrent piling works of two developments would be unlikely. Other construction disturbance caused by the development works of A/YL-NSW/274 would be low in magnitude and will be resolved by the mitigation measures recommended under its EcoIA study. Impacts during the construction phase of the Project will also be mitigated by measures recommended in Section 6 of this report. Hence the cumulative impact from these is not anticipated to be significant.

For the potential cumulative impacts from the operational phase, noise, dust and human activities will not be significant as both applications are residential development and most activities of residents will be indoors. The firefly habitat and Great Cormorant night roost in Nam Sang Wai is situated to the north of the Application Site outside of the 500m Study Area. The night-time lighting from the approved application No. A/YL-NSW/274 will mainly be the domestic indoor lighting, hence, any spillover light would not be considered significant. There would not be external and directional night time light source pointing toward the firefly habitat. Hence, cumulative night-time lighting from two developments is not anticipated to be significant.

7.1.9 The proposed low-density development under Approved Application No. A/YL-NSW/274 is situated about 500m to the north of the Tung Shing Lane Egretry. A/YL-NSW/274 would not cause any loss of wetland. Although the current development would cause loss of abandoned ponds, the loss could be compensated within the current development site, no net loss of wetland is anticipated. Currently, both sites are mainly covered by wasteland and to some extent disturbed by human activities. The flight lines of breeding ardeids from Tung Shing Lane Egretry would be minimized and mitigated by provision of landscape area at the northeast corner of the Application Site and reduction of building height of A/YL-NSW/274. Hence it is not anticipated to have significant cumulative impacts.

Fragmentation

7.1.10 The potential of cumulative fragmentation caused by the above mentioned concurrent proposed developments on habitats is remote, as these concurrent projects, while outside and far away from the Application Site, are mostly located at existing developed areas or separated from each other. The residential development of the present Project would isolate a small, abandoned pond within an enclave area of the Application Site. Under the current landscape master plan, the surrounding area of this remnant pond within the Application Site would be landscape planting area which could provide ecological linkage to wildlife using this remnant pond. Cumulative fragmentation impact is thus considered to be minor.

Water quality

7.1.11 During the operational phase, the surface water run-off of the above mentioned concurrent proposed developments will pass into respective stormwater drainage systems which will prevent most run-off from entering and affecting nearby streams and ultimately Inner Deep Bay similar to other normally operating stormwater drainage systems in the area. Ecological impact would be minor.

7.1.12 In summary, these concurrent projects are either over 500m distance from the Application Site, or the separation from the site afforded by the Yuen Long Highway and Kam Tin River Drainage Channel, the potential of cumulative impacts are mostly low. There will be no wetland loss from all these concurrent projects (and wetlands are even created in some projects). For the nearest concurrent project, quieter piling method would be employed for A/YL-NSW/274, and thus unlikely to have cumulative impact. Other impacts from these concurrent projects will be respectively mitigated and reduced to low levels. Cumulative impacts are not predicted.

8. CONCLUSIONS

8.1.1 Information on the ecological baseline conditions of the Application Site was collected through literature review and surveys, and they were integrated into the present EcoIA to support the application.

8.1.2 Within the Application Site, the abandoned pond, pond, wasteland and developed area will be lost directly, but the meander will not be impacted. Due to the domination by wasteland of low ecological values, and small sizes of other habitats (developed area of 0.21 ha, abandoned pond of 0.23 ha, and pond of 0.46 ha) the potential impact due to loss of those habitats within the Application Site is considered minor or minor to moderate. However, compensation wetlands with the same size to those lost abandoned pond and pond within Application Site will be provided during the operational phase.

8.1.3 Tung Shing Lane egretry was abandoned in 2021, and chance of recolonization to this egretry is considered low. In fact, the breeding ardeids previously passed through the Application Site was also low due to avoidance of the existing knoll and preference over the Kam Tin River, given the manoeuvrability of waterbirds, the potential fragmentation impacts to waterbirds including breeding ardeids from Tung Shing Lane Egretry from the proposed development are considered minor.

8.1.4 This application would satisfy the requirements listed in Town Planning Board Guidelines No. 12C (TPB PG-No. 12C). First, since compensation wetlands including three fed by rainwater will be provided to mitigate the loss of abandoned pond and pond within the Application Site, the proposed development will not incur any net loss in wetland area or function at any scale and therefore will comply with the "no net loss in wetland" guideline stipulated in TPB PG-No. 12C. Second, this EcolA demonstrates that the proposed development would not have significant disturbance impacts to the surroundings including wetlands inside WCA, and will provide wetland and visual buffer from the WCA, and is thus in line with the intention of WBA.

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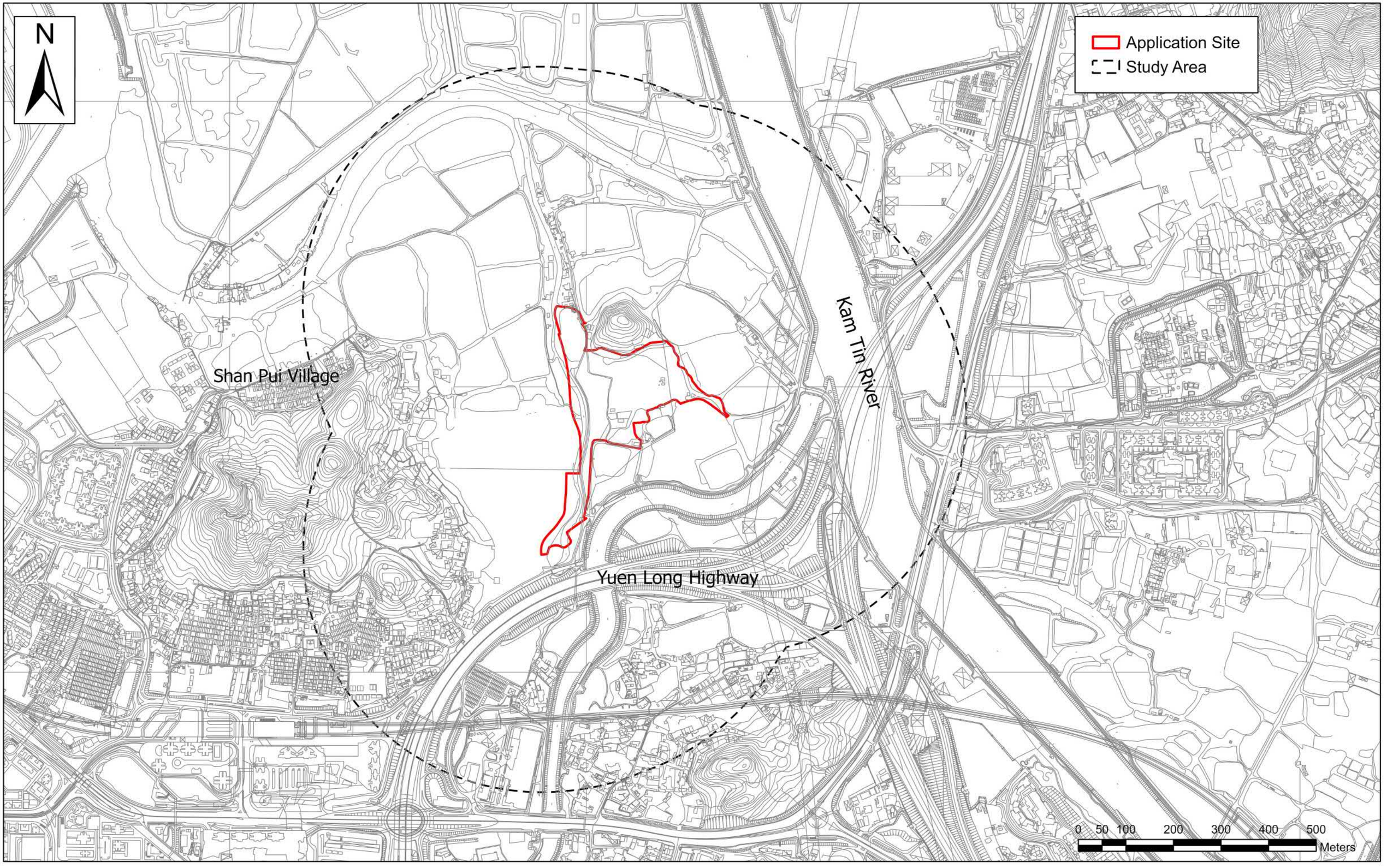

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Figure 1 Application Site and Study Area

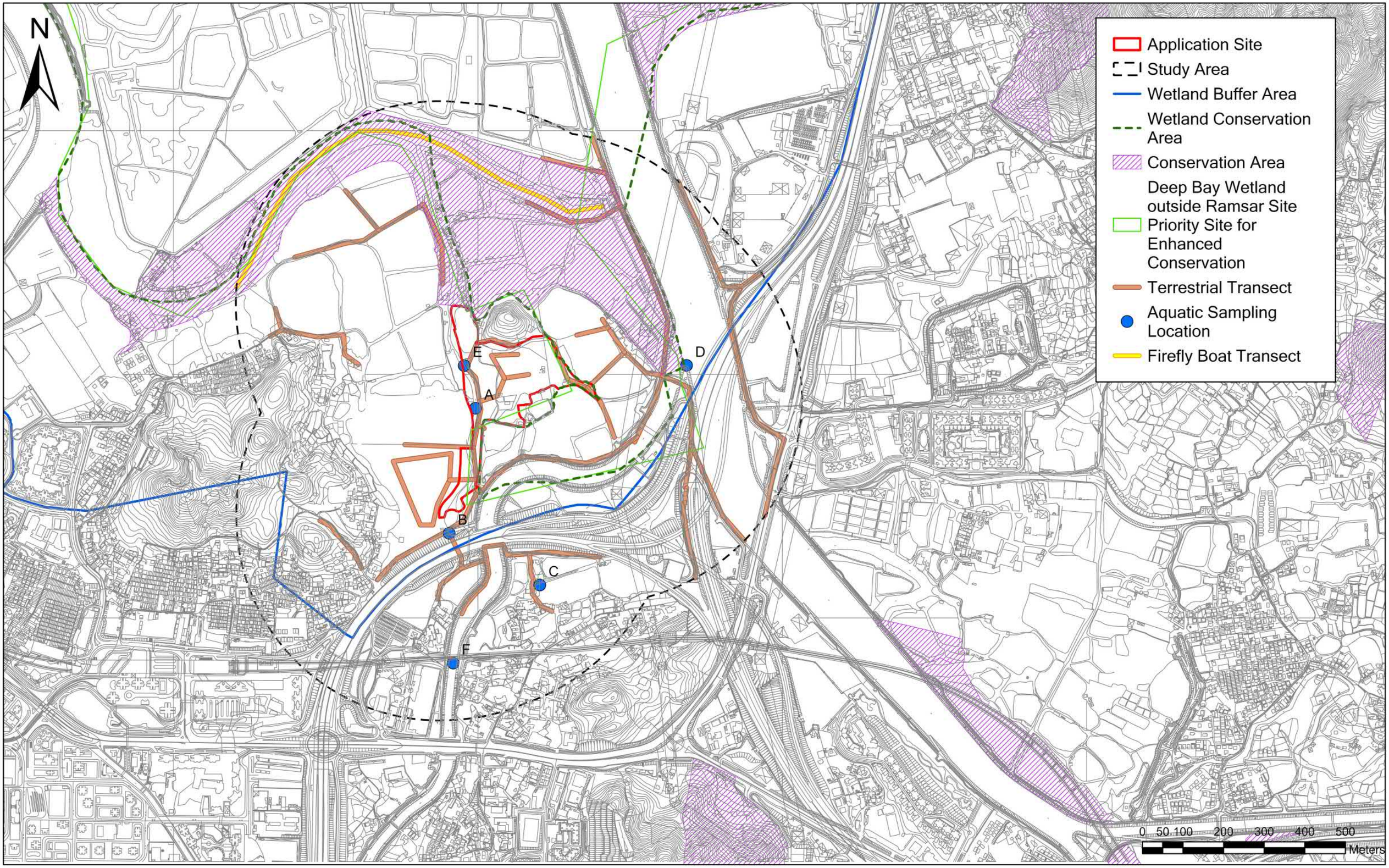

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Figure 2a Recognized Sites of Conservation Importance and Survey Transects and Sampling Points
(Locations of Egretries and Flightline Vantage Point are Excluded)

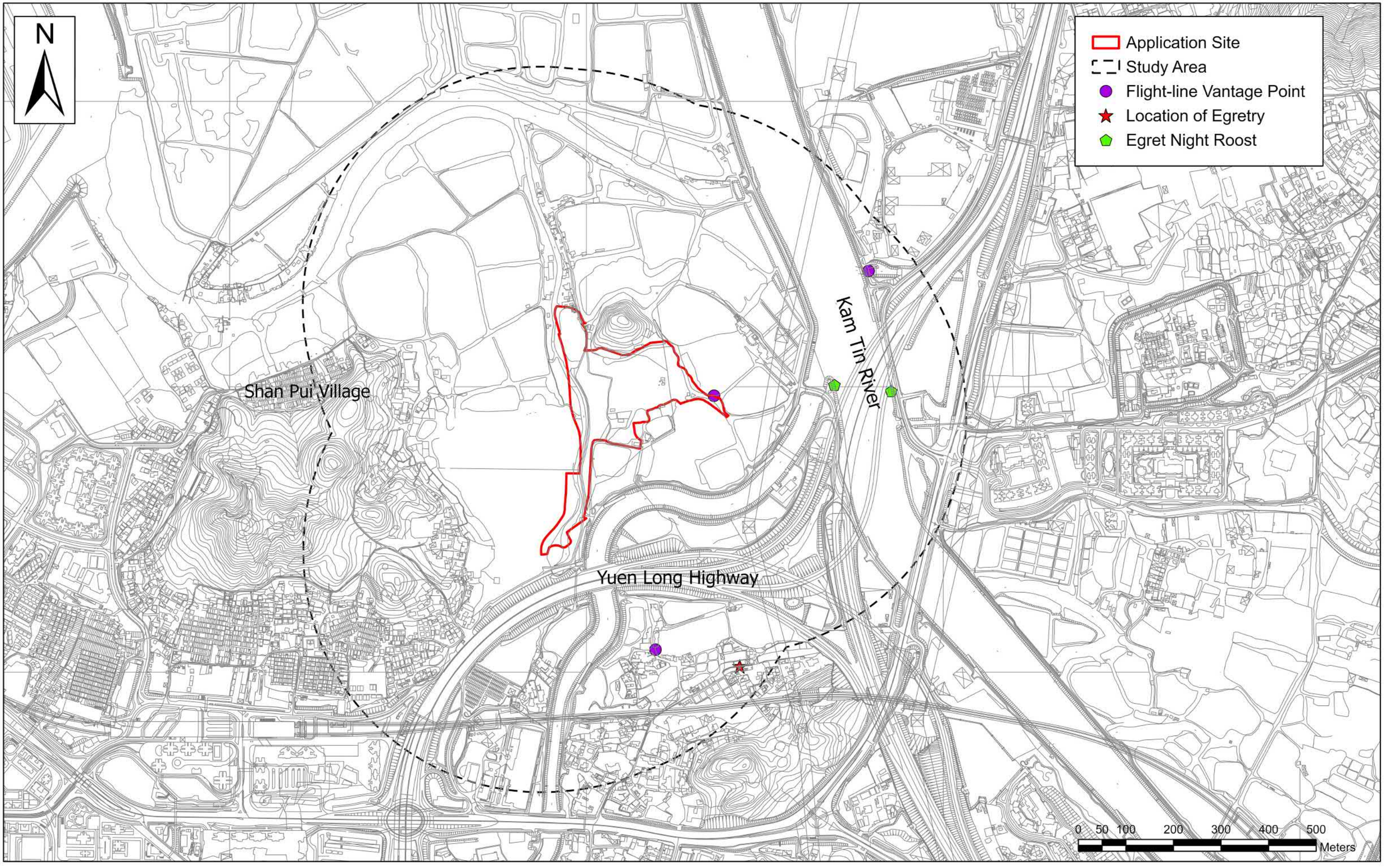

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Figure 2b Location of Tung Shing Lane Egretry and Flight-line Vantage Point

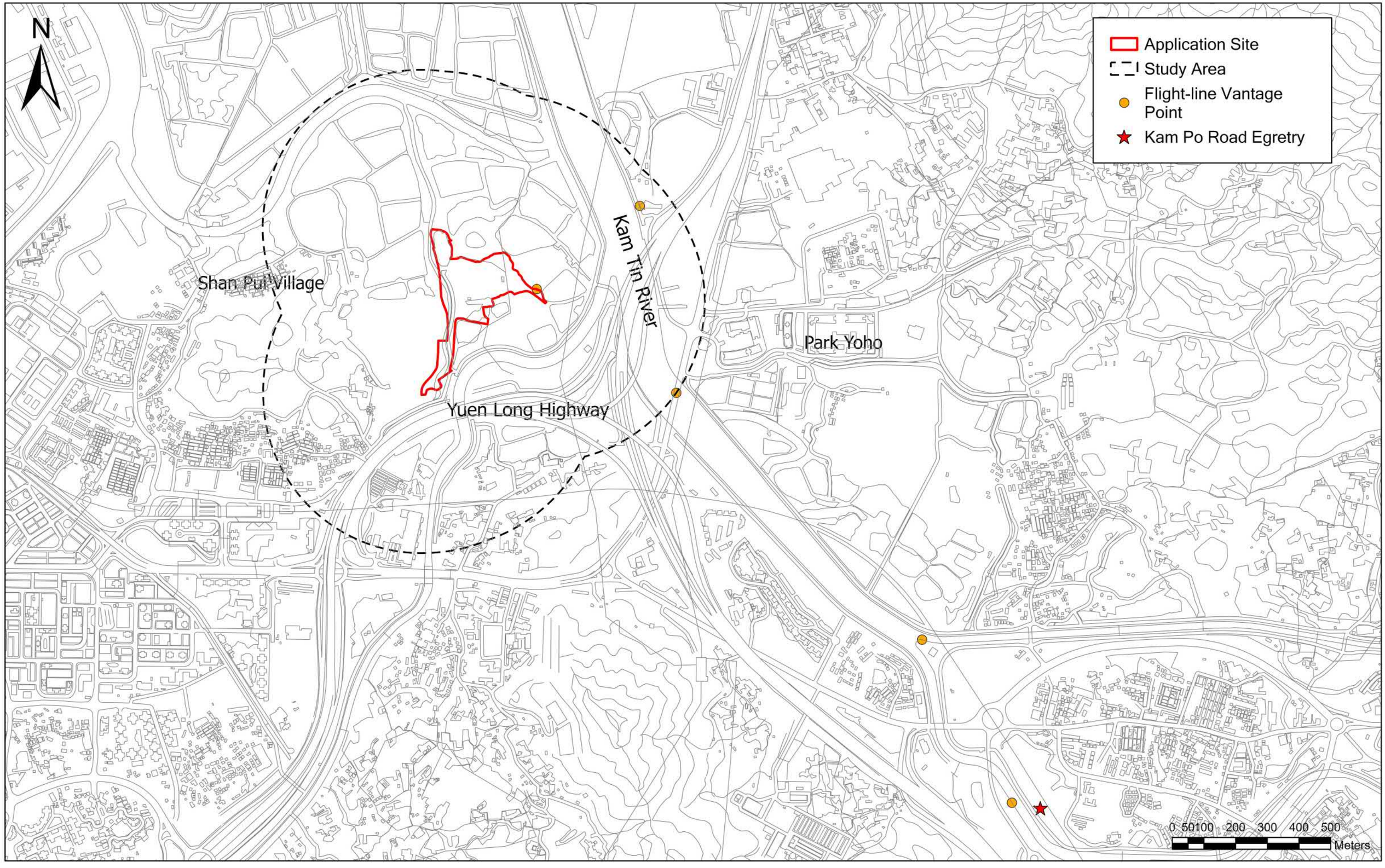

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Figure 2c Location of Kam Po Road Egretry and Flight-line Vantage Point

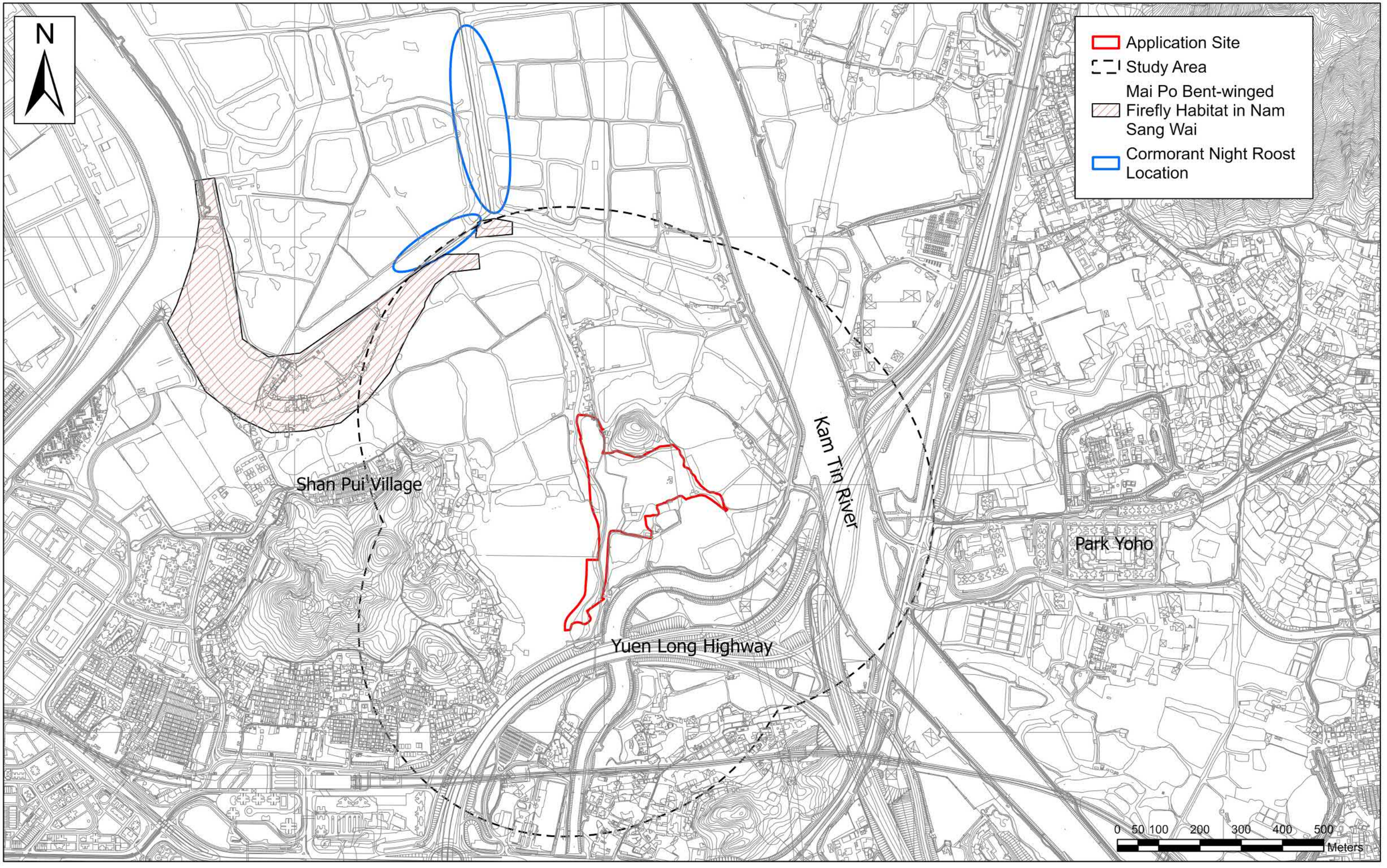

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Figure 3 Location of Cormorant Roost and Firefly Habitat in Nam Sang Wai (from reviewed literature)

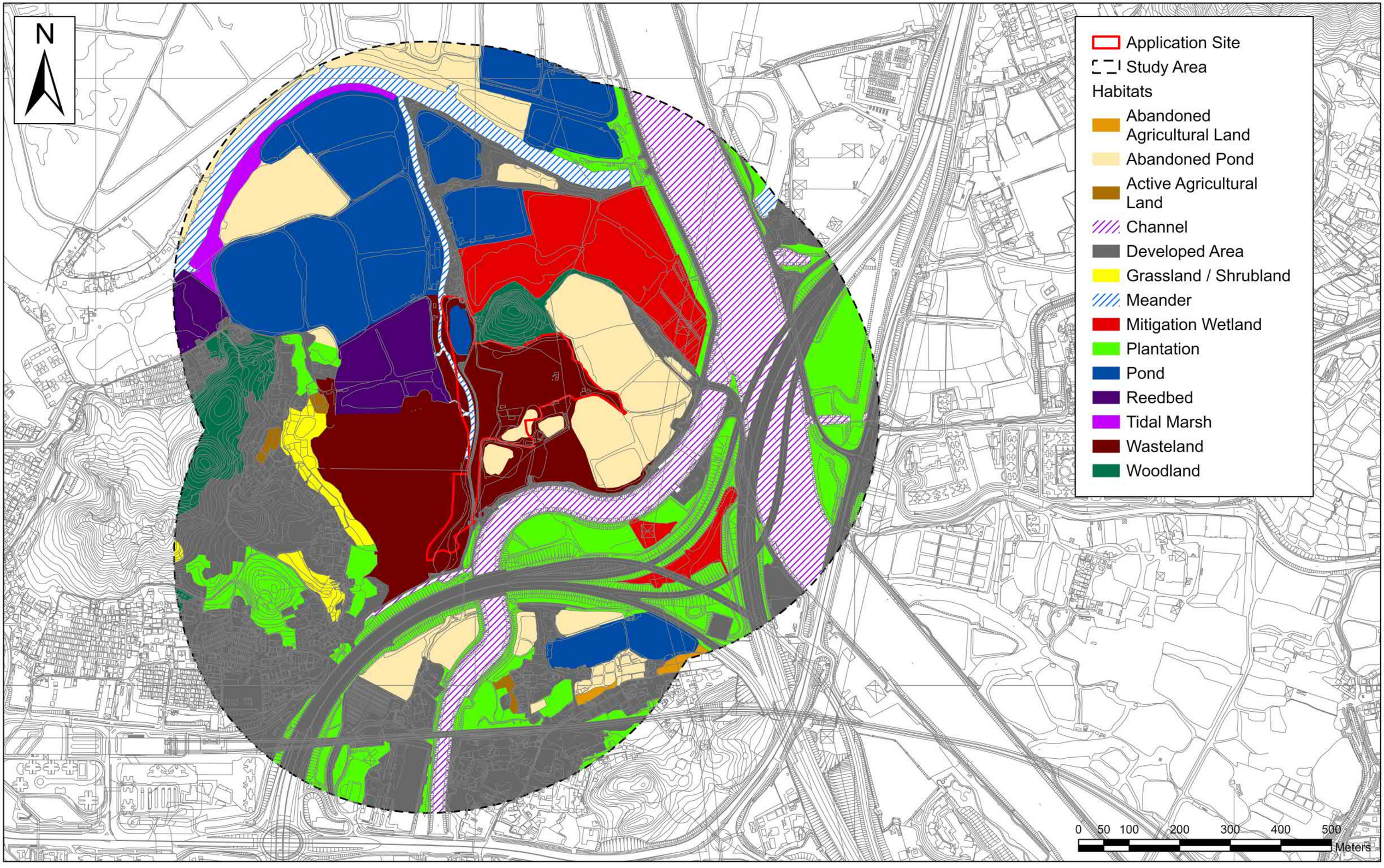

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Figure 4 Habitat Map

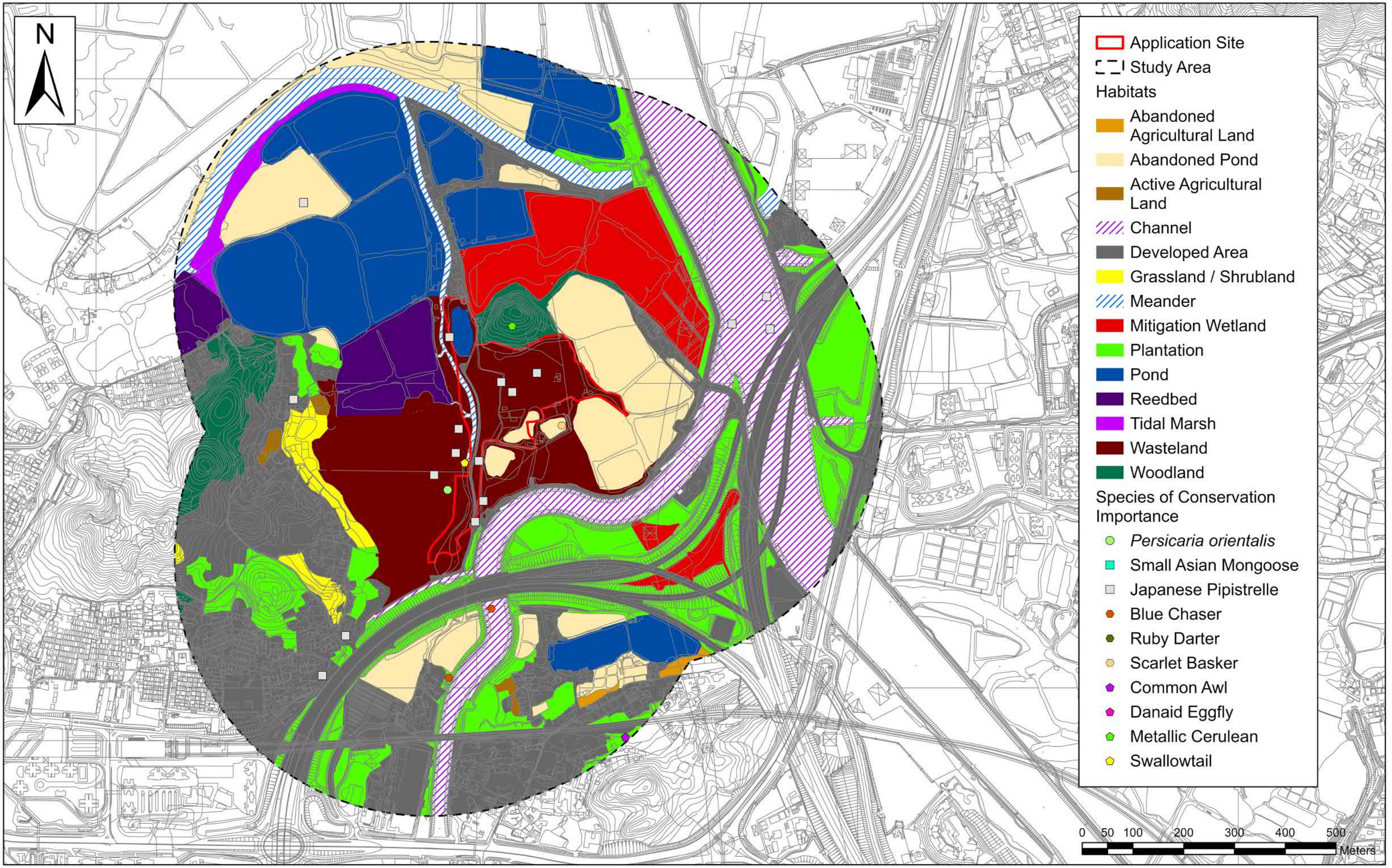

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Figure 6a Locations of Non-avifauna Species of Conservation Importance

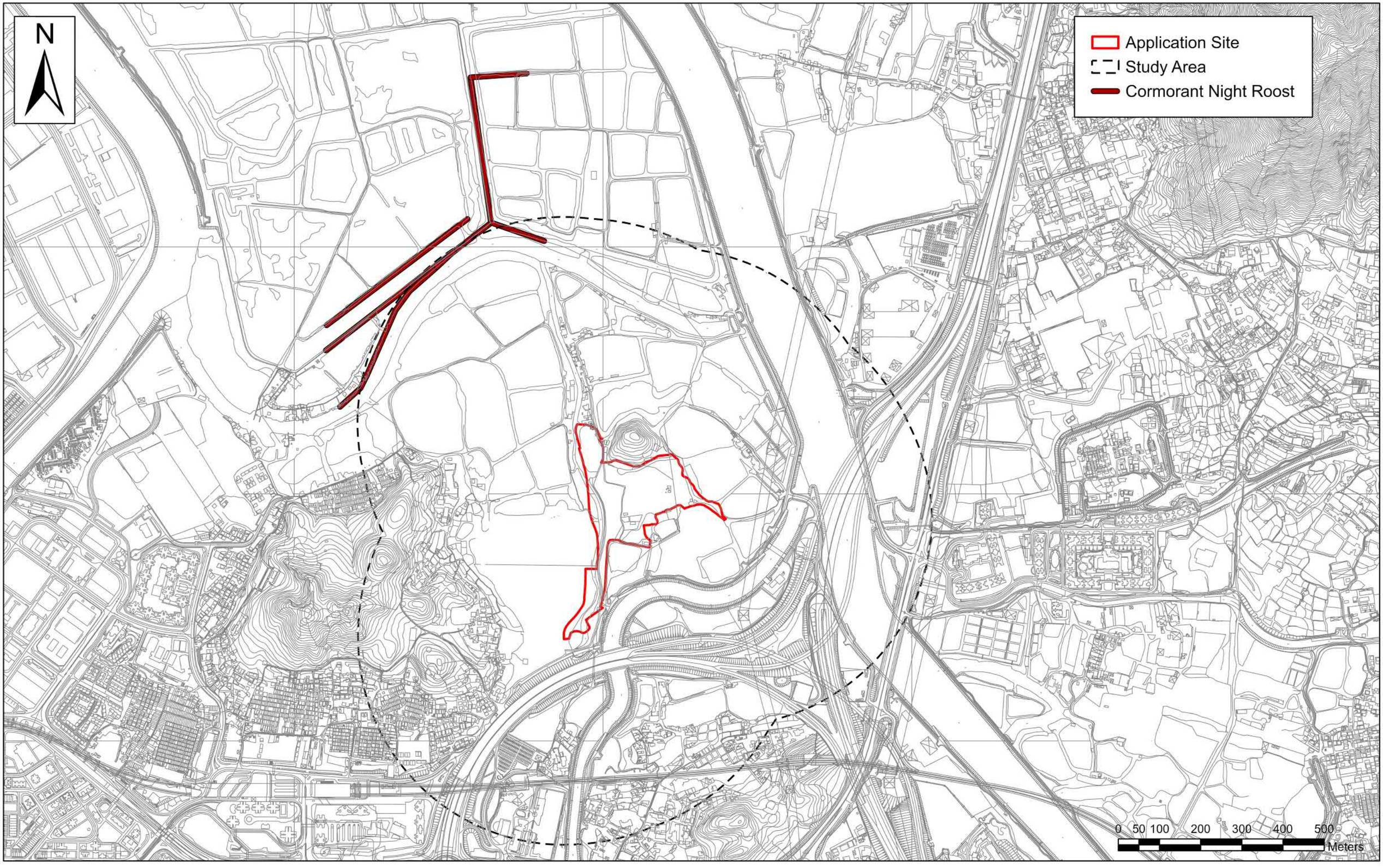

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Figure 6b Locations of Great Cormorant Night Roost

N

Application Site
Study Area
Location of Egretry
General Flight Direction 2019

251 ind.
(82.03%)

17 ind.
(5.56%)

36 ind.
(11.76%)

2 ind.
(0.65%)

0 50 100 200 300 400 500
Meters

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Figure 6c General Ardeid Flight Direction from Tung Shing Lane Egretry in 2019

N

Application Site
Study Area
Location of Egretry
General Flight Direction 2020

227 ind.
(78.82%)

12 ind.
(4.17%)

49 ind.
(17.01%)

0 50 100 200 300 400 500
Meters

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Figure 6d General Ardeid Flight Direction from Tung Shing Lane Egretry in 2020

N

Application Site
Study Area
Location of Egretry
Flight Zone 2019

11 ind. (3.59%)
2 ind. (0.65%)
22 ind. (7.19%)
32 ind. 10.46%
28 ind. (9.15%)
9 ind. (2.94%)
120 ind. 39.22%
1 ind. (0.33%)
26 ind. (8.50%)

A
B
C
D
E
F
G
H
I

0 50 100 200 300 400 500
Meters

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Figure 6e Flight Zone Analysis in 2019

N

Application Site
Study Area
Location of Egretry
Flight Zone 2020

0 ind. (0%)
4 ind. (1.39%)
17 ind. (5.90%)
2 ind. (0.69%)
9 ind. (3.13%)
9 ind. (3.13%)
14 ind. (4.86%)
4 ind. (1.39%)
168 ind. 58.33%

A
B
C
D
E
F
G
H
I

0 50 100 200 300 400 500
Meters

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Figure 6f Flight Zone Analysis in 2020

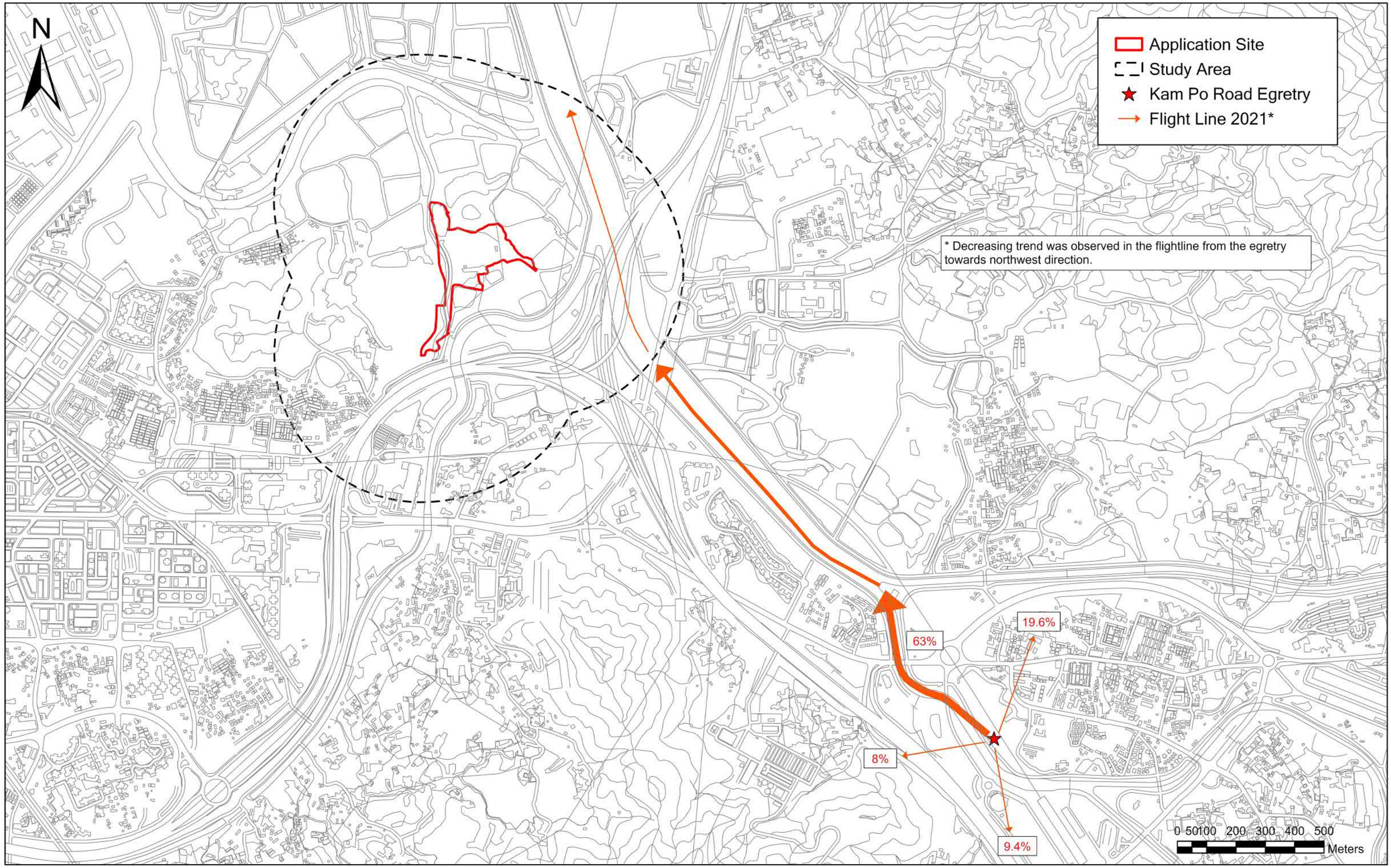

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Figure 6g Flight Observation from Kam Po Road Egretry in 2021

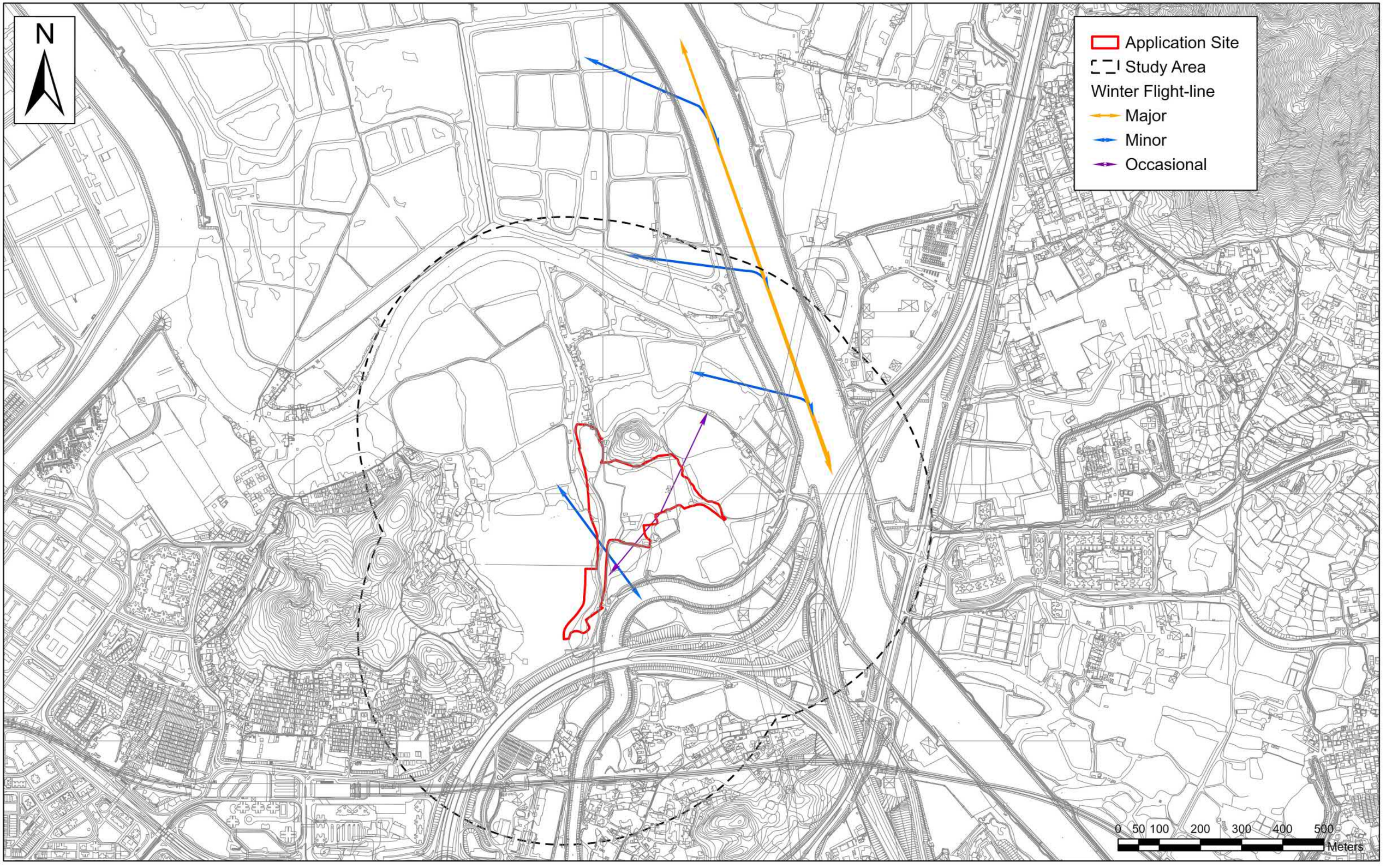

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Figure 6h Winter Flight-line

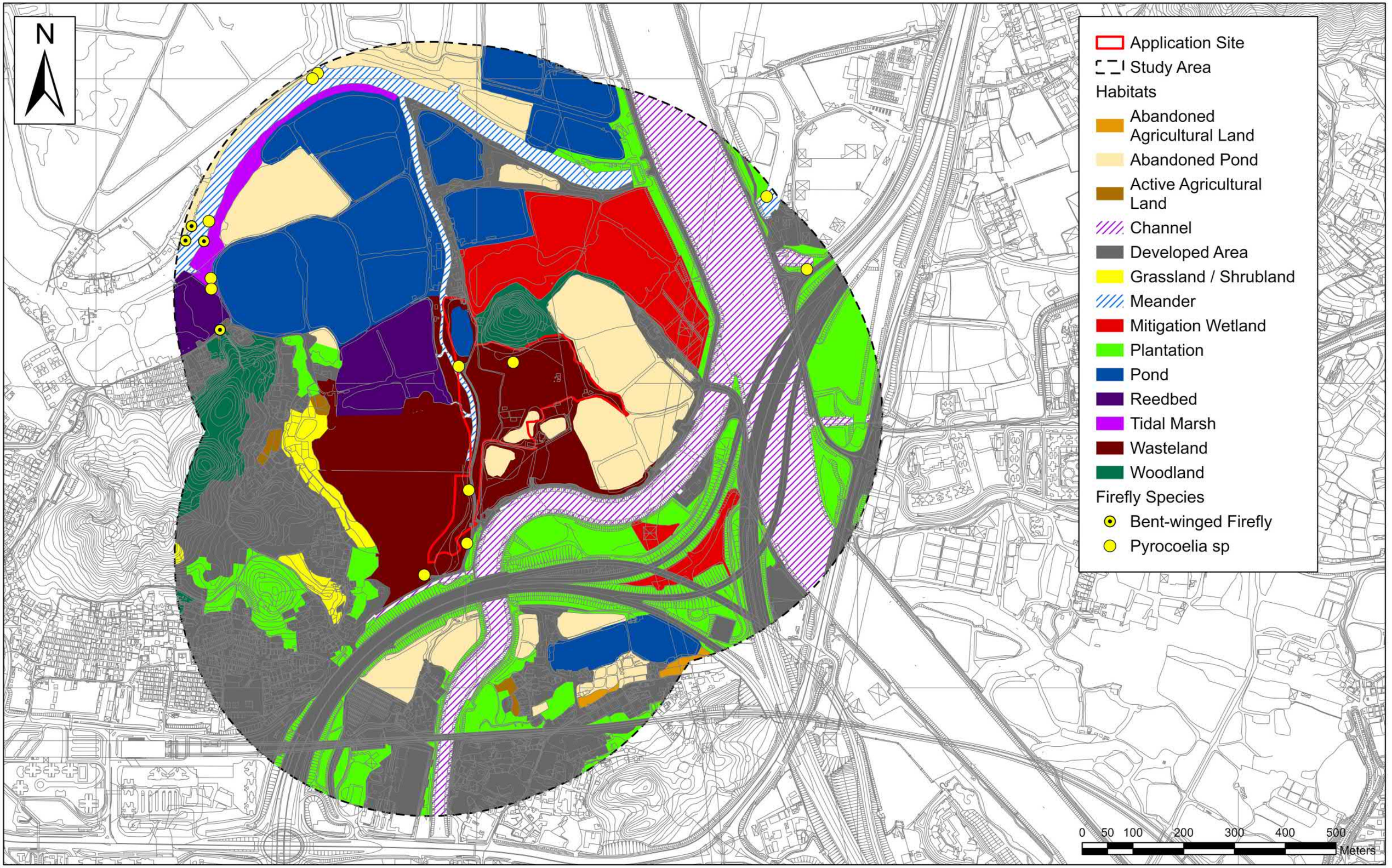

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Figure 6i Locations of Firefly within the Study Area

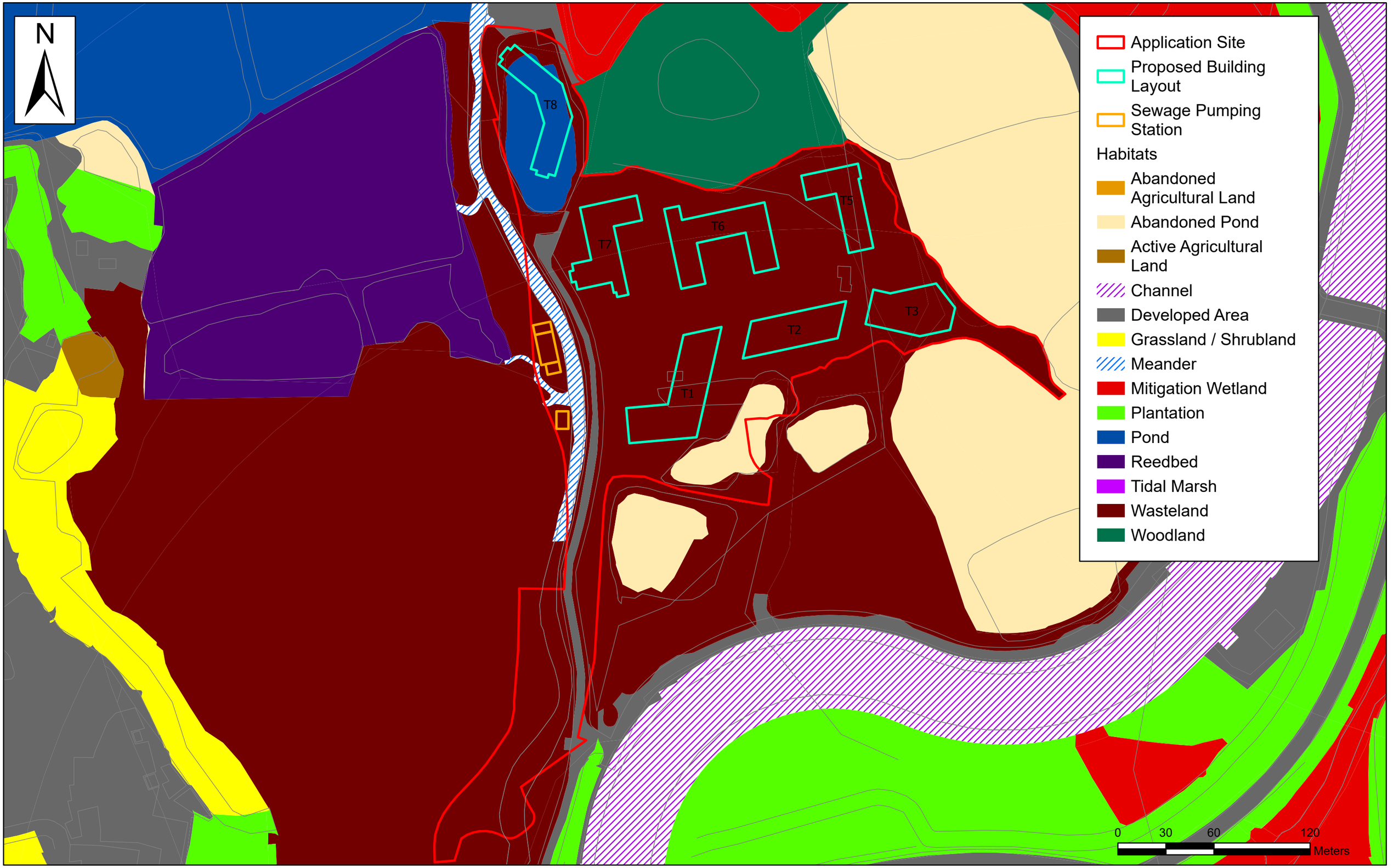

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Figure 7 Proposed Building Layout Overlaid with Habitat Map

N

Application Site
Study Area
Proposed Building Layout
Flight Zone 2019
I
II
III
IV

26 ind.
(8.50%)

37 ind.
(12.09%)

8 ind.
(2.61%)

180 ind.
(58.82%)

T1
T2
T3
T5
T6
T7
T8

0 20 40 80 120 160 200
Meters

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Figure 8a Flight Zone Analysis with Proposed Building Layout 2019

N

2 ind.
(0.69%)

31 ind.
(10.76%)

7 ind.
(2.43%)

183 ind.
(64.93%)

T1
T2
T3
T5
T6
T7
T8

Application Site
Study Area
Proposed Building Layout
Flight Zone 2020
I
II
III
IV

0 20 40 80 120 160 200
Meters

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Figure 8b Flight Zone Analysis with Proposed Building Layout 2020

N

Application Site
Proposed Building Layout
Compensation Wetland

T8
T7
T6
T5
T3
T2
T1

Compensation Wetland E
Compensation Wetland D
Compensation Wetland C

0 50 100 200 Meters

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Figure 9 Proposed Building Layout and Compensation Wetland

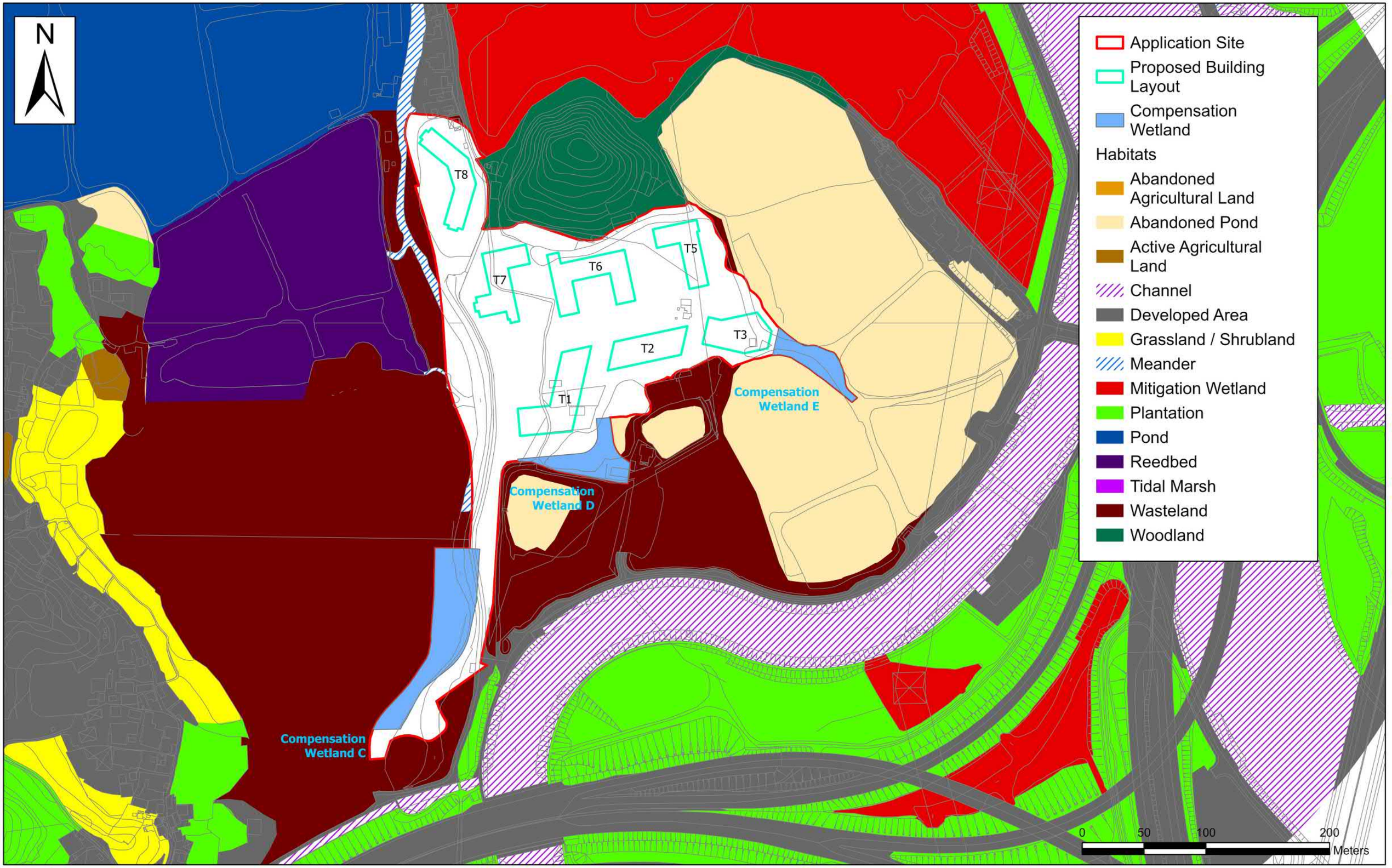

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Figure 10 Proposed Building Layout, Compensation Wetland and Habitats outside Application Site

Appendix A Plant Species recorded within the Study Area

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2,3,4,5,6]	Application Site					Study Area													
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Abelmoschus esculentus	咖啡黃葵	Herb	Exotic	-	-										S									
Acacia auriculiformis	耳果相思	Tree	Exotic	-	-									S	O	O			C					O
Acacia confusa	台灣相思	Tree	Exotic	-	-										O	O			S					
Acacia mangium	大葉相思	Tree	Exotic	-	-									S										
Acanthus ilicifolius	老鼠簕	Shrub	Native	Common	-								S	O			S							
Acanthus ilicifolius var. *xiamenensis*	廈門老鼠簕	Shrub	Native	-	-								S											
Achyranthes aspera	土牛膝	Herb	Native	Common	-													S						
Acmella uliginosa	沼生金鈕扣	Herb	Unknown	-	-			S		O			O		S	C			C	C			O	
Acrostichum aureum	鹵蕨	Herb	Native	Restricted	-													S						
Agave americana	龍舌蘭	Herb	Exotic	-	-							S			S					S				
Ageratum conyzoides	藿香薊	Herb	Exotic	Common	-					C		C	O		C	C			C	C			C	
Ageratum houstonianum	熊耳草	Herb	Exotic	Common	-					C	S	S			O	O			S				O	
Aglaia odorata var. *microphyllina*	小葉米仔蘭	Shrub	Exotic	-	-										S			S						
Alangium chinense	八角楓	Tree	Native	Common	-																			C
Aleurites moluccana	石栗	Tree	Exotic	-	-										S				S					
Allamanda schottii	黃蟬	Shrub	Exotic	-	-							S												
Alocasia macrorrhizos	海芋	Herb	native	Very common	-		S			S	S	O	O	S	C	S		S	S	S	S		S	O
Alpinia galanga	紅豆蔻	Herb	native	Restricted	-										S									
Alpinia zerumbet	豔山薑	Herb	native	Very common	-													S						

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area												
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Alternanthera philoxeroides	空心莧	Herb	Exotic	Common	-								O					O					O	
Alternanthera sessilis	蝦鉗菜	Herb	native	Common	-			S		O		S	C	C	O	S			S				O	
Alysicarpus vaginalis	鏈莢豆	Herb	native	Very common	-								O											
Amaranthus blitum	凹頭莧	Herb	native	-	-											O			O					
Amaranthus viridis	綠莧	Herb	native	Very common	-					O		S	S		S	O			O				O	
Ampelopsis heterophylla var. *kulingensis*	牯嶺蛇葡萄	Climber	native	Common	-														S					O
Ananas comosus	鳳梨	Herb	Exotic	-	-																			O
Aporusa dioica	銀柴	Tree	Native	Very common	-																			O
Araucaria heterophylla	異葉南洋杉	Tree	Exotic	-	IUCN Red List: Vulnerable [2]										S				S					
Artemisia indica	五月艾	Herb	Native	-	-							C				O			O					
Artocarpus heterophyllus	菠蘿蜜	Tree	Exotic	-	-		S				S				O	S								O
Asystasia micrantha	小花十萬錯	Herb	Exotic	-	-										O			S	O	S			S	
Atalantia buxifolia	酒餅簕	Shrub	Native	Common	-																			O
Averrhoa carambola	楊桃	Tree	Exotic	-	-							S												
Axonopus compressus	地毯草	Herb	Exotic	Common	-																			
Bambusa sp.	竹屬	Herb	-	-	-										S									O
Bauhinia purpurea	紅花羊蹄甲	Tree	Exotic	-	-									S	S									
Bauhinia variegata	宮粉羊蹄甲	Tree	Exotic	-	-										O				C					
Bauhinia x *blakeana*	洋紫荊	Tree	Native	-	-										S									
Begonia cucullata var. *hookeri*	四季秋海棠	Herb	Exotic	-	-														O					
Benincasa hispida var. chieh-qua	節瓜	Climber	Exotic	-	-							S			S									

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						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Bidens alba	白花鬼針草	Herb	Exotic	Very common	-	O	O	C	C	C	C	S	C	C	C	S	S	S	C	S	O		C	O
Bidens pilosa	鬼針草	Herb	Exotic	Very common	-										O	S			S				S	
Bischofia javanica	秋楓	Tree	Native	Common	-								S		C	S	S		S					C
Blechnum orientale	烏毛蕨	Herb	Native	Very common	-							S							S					O
Blumea megacephala	東風草	Herb	Native	Common	-																		S	
Boehmeria nivea	苧麻	Shrub	Exotic	Restricted	-						S	O		S					S	O				O
Bombax ceiba	木棉	Tree	Exotic	-	-										S	S			S					
Bothriochloa bladhii	臭根子草	Herb	Native	Very common	-			O		C		S	O	S	S	S							C	
Brachiaria mutica	巴拉草	Herb	Exotic	Common	-	C	C		C	C	C	S	C	O	O	C	C	O	C	O	O		C	
Bridelia tomentosa	土蜜樹	Shrub	Native	Very common	-					S	S		S	S	O	O		S	S				S	O
Broussonetia papyrifera	構樹	Tree	Native	Very common	-										O	O							O	
Caesalpinia pulcherrima	洋金鳳	Shrub	Exotic	-	-													S						
Calliandra haematocephala	朱纓花	Shrub	Exotic	-	-							O			O	S			O					
Callistemon rigidus	紅千層	Tree	Exotic	-	-										S				S					
Cardamine flexuosa	彎曲碎米薺	Herb	Native	Common	-							S												
Carica papaya	番木瓜	Tree	Exotic	-	-						S	S			S	S			S					
Caryota mitis	短穗魚尾葵	Tree	Exotic	-	-							S			S									
Casuarina equisetifolia	木麻黃	Tree	Exotic	Rare	-											O			O					S
Catharanthus roseus	長春花	Shrub	Exotic	-	-							S			O								S	
Celosia argentea	青葙	Herb	Native	Very common	-					S			S										O	
Celtis sinensis	朴樹	Tree	Native	Common	-					S				S	S			S	S				O	S

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area													
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Celtis timorensis	假玉桂	Tree	Native	Restricted	-										S	O			O					
Cenchrus echinatus	蒺藜草	Herb	Exotic	Common	-					O		S			S									
Centotheca lappacea	假淡竹葉	Herb	Native	Common	-														S					S
Chamaecrista mimosoides	含羞草决明	Herb	Native	Common	-															S				
Chenopodium ficifolium	小藜	Herb	Native	Restricted	-					S			S										O	
Chloris barbata	孟仁草	Herb	Native	Very common	-										S				O					
Chloris gayana	非洲虎尾草	Herb	Exotic	-	-											S			C					
Cinnamomum burmannii	陰香	Tree	Native	-	-							S			C			S	C					
Cinnamomum camphora	樟	Tree	Native	Common	-										S									S
Citrus limonia	黎檬	Tree	Exotic	-	-										S	S							S	
Citrus reticulata	柑橘	Tree	Exotic	-	-										S									
Citrus reticulata Blanco	四季桔	Shrub	Exotic	-								S												
Citrus sinensis	甜橙	Tree	Exotic	-	-							S			S									
Clausena lansium	黃皮	Tree	Exotic	-	-							S			S			S	S					O
Cleistocalyx nervosum	水翁	Tree	Native	Common	-										S									
Cleome rutidosperma	皺子白花菜	Herb	Exotic	Restricted	-							S	S		S				S	S			S	
Clerodendrum chinense	重瓣臭茉莉	Shrub	Native	Common	-										S									

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						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Clerodendrum cyrtophyllum	大青	Shrub	Native	Common	-																			S
Clerodendrum sp.	大青屬	Shrub	-	-	-										S									
Clerodendrum splendens	紅龍吐珠，龍吐珠藤	Shrub	Exotic	-	-							O			C				S					
Clerodendrum thomsonae	龍吐珠	Shrub	Exotic	-	-										S				O					
Coccinia grandis	紅瓜	Climber	Native	Very rare	-										S				O					
Cocculus orbiculatus	木防己	Climber	Native	Common	-					S				S	S			O	C				S	
Codiaeum variegatum	變葉木	Shrub	Exotic	-	-							S			S									
Coleus scutellarioides	五彩蘇	Herb	Exotic	-	-							S												
Colocasia esculenta	芋	Herb	Exotic	-	-						S				S									
Commelina diffusa	節節草	Herb	Native	Common	-					O		C	C	O	C		O			S			O	
Conyza canadensis	小蓬草，小白酒草	Herb	Exotic	Very common	-								S											
Cordyline fruticosa	朱蕉	Shrub	Exotic	-	-							S												
Crassocephalum crepidioides	野茼蒿	Herb	Exotic	Common	-					S														
Cratoxylum cochinchinense	黃牛木	Tree	native	Very common	-										S									C
Cuphea hyssopifolia	細葉萼距花	Shrub	Exotic	-	-							S			S									
Cuscuta campestris	田野菟絲子	Herb	Native	-	-	S	O			O	S		S	S	S	O			S	S			O	S
Cuscuta chinensis	菟絲子	Herb	Native	Common	-						C	C			C									
Cyclosorus acuminatus	漸尖毛蕨	Herb	Native	Very common	-						S								S					
Cyclosorus interruptus	間斷毛蕨	Herb	Native	Common	-						O		O					S						
Cyclosorus parasiticus	華南毛蕨	Herb	Native	Very common	-							S			S				S					O

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						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Cynodon dactylon	狗牙根	Herb	native	Very common	-					C	O	O	C		S			O					C	
Cyperus difformis	異型莎草	Herb	native	Very common	-								C										O	
Cyperus distans	疏穗莎草	Herb	native	Common	-								O											
Cyperus haspan	畦畔莎草	Herb	native	Common	-								S											
Cyperus imbricatus	疊穗莎草	Herb	Native	Common	-					S			C											
Cyperus involucratus	風車草	Herb	Exotic	Restricted	-						O		O	O					S					
Cyperus iria	碎米莎草	Herb	Native	Common	-								C											
Cyperus malaccensis	茳芏	Herb	Native	Common	-									C			O							
Cyperus rotundus	香附子	Herb	Native	Very common	-					S			C		S								O	
Cyperus surinamensis	蘇里南莎草	Herb	Exotic	-	-					O														
Dactyloctenium aegyptium	龍爪茅	Herb	Native	Common	-										S								S	
Dalbergia benthamii	兩廣黃檀	Climber	Native	Common	-																			C
Delonix regia	鳳凰木	Tree	Exotic	-	-										S				S					
Derris trifoliata	魚藤	Climber	Native	Common	-								S	C				O				S		
Desmodium heterocarpon	假地豆	Shrub	Native	Very common	-					S														
Desmodium tortuosum	南美山螞蝗	Herb	Exotic	Common	-					C													C	
Desmodium triflorum	三點金	Herb	Native	Very common	-					O														
Desmos chinensis	假鷹爪	Shrub	Native	Common	-										S									C
Digitaria spp.	馬唐屬	Herb	-	-				S		C			O		S					S			O	

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						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Dimocarpus longan	龍眼	Tree	Exotic	Restricted	Threatened Species List of China's Higher Plants: Vulnerable [3] China Plant Red Data Book: Vulnerable [4] State Protection (Category II) [5]		S				S	S			C	O			O				O
Dioscorea bulbifera	黃獨	Climber	Native	Common	-										S				O				
Dracaena fragrans	巴西鐵樹	Shrub	Exotic	-	-										S			S	O				
Dracaena sanderiana	辛氏龍樹	Shrub	Exotic	-	-										S							S	
Duranta erecta	假連翹	Climber	Exotic	-	-													S					
Duranta repens `Variegata`	花葉假連翹	Shrub	Exotic	-	-										S								
Dypsis lutescens	散尾葵	Shrub	Exotic	-	-										S				S				
Echinochloa crusgalli var. austrojaponensis	小果稗	Herb	native	-	-					O			S		S				S			O	
Echinochloa glabrescens	硬稃稗	Herb	native	-	-								O										
Eclipta prostrata	鱧腸	Herb	Native	Common	-					S			S					O					S	
Eichhornia crassipes	鳳眼藍	Herb	Exotic	Common	-									S						S			
Elephantopus tomentosus	白花地膽草	Herb	Native	Common	-																	S	
Eleusine indica	牛筋草	Herb	Native	Very common	-					O	S		S		S								
Eleutherococcus trifoliatus	白簕	Climber	Native	Restricted	-										S				S				O
Embelia laeta	酸藤子	Climber	Native	Very common	-																		O
Emilia sonchifolia	一點紅	Herb	Native	Very common	-					S		S			S							S	
Epipremnum aureum	綠蘿	Climber	Exotic	-	-								S										

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						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Eragrostis tenella	鯽魚草	Herb	Native	Very common	-										S								
Eriobotrya japonica	枇杷	Tree	Exotic	-	-										S				O				
Eucalyptus citriodora	檸檬桉	Tree	Exotic	-	-										S				O				
Eucalyptus robusta	大葉桉	Tree	Exotic	-	-										C				C				
Eucalyptus sp.	桉屬	Tree	Exotic	-	-														O				
Eucalyptus urophylla	尾葉桉	Tree	Exotic	-	-																		S
Euphorbia bifida	細齒大戟	Herb	Native	Common	-										S				S				
Euphorbia heterophylla	白苞猩猩草	Herb	Exotic	Restricted	-					C												S	
Euphorbia hirta	飛揚草	Herb	Exotic	Very common	-					S	O	O	S		S							O	
Euphorbia hypericifolia	通奶草	Herb	Native	Common	-					O			C									C	
Euphorbia thymifolia	千根草	Herb	Native	Very common	-					O					S	S						C	
Eurya nitida	細齒葉柃	Shrub	Native	Very common	-																		S
Fagraea ceilanica	灰莉	Shrub	Exotic	-	-													S					
Fallopia multiflora	何首烏	Herb	Native	Restricted	-										S								
Ficus benjamina	垂葉榕	Tree	Exotic	-	-										O	S		S		S			
Ficus carica	無花果	Tree	Exotic	-	-							S											
Ficus hirta	粗葉榕	Shrub	Native	Common	-										S								O
Ficus hispida	對葉榕	Shrub	Native	Very common	-					S		S	S	S	S	O	S		S	O			O
Ficus microcarpa	榕樹	Tree	Native	Common	-					S					C			S	C					S
Ficus microcarpa `Golden Leaf`	黃榕	Shrub	Exotic	-	-										S								
Ficus pumila	薜荔	Climber	Native	Very common	-							S	S		S				S			S	S

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						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Ficus religiosa	菩提樹	Tree	Exotic	Common	-										S									
Ficus subpisocarpa	筆管榕	Tree	Native	-	-						S		S	S						S				
Ficus tinctoria subsp. gibbosa	斜葉榕	Tree	Native	Restricted	-									S	S									
Ficus virens var. *sublanceolata*	黃葛樹	Tree	Native	Common	-										O				S	S				
Fimbristylis aestivalis	夏飄拂草	Herb	Native	Restricted	-								C											
Fimbristylis dichotoma	兩歧飄拂草	Herb	Native	Very common	-										O				S					
Flueggea virosa	白飯樹	Shrub	Native	Common	-					S	S		S	S	S				S				S	
Glochidion eriocarpum	毛果算盤子	Shrub	Native	Very common	-											S								
Gnaphalium pensylvanicum	匙葉鼠麴草	Herb	Native	-	-					S			S										S	
Gomphrena celosioides	銀花莧	Herb	Native	Restricted	-					O			S											
Hedychium coronarium	薑花	Herb	Exotic	-	-							S												
Hedyotis acutangula	金草	Herb	Native	Very common	-											S								
Hedyotis corymbosa	傘房花耳草	Herb	Native	Very common	-										S									
Hedyotis hedyotidea	牛白藤	Shrub	Native	Very common	-										S				S				S	
Helianthus annuus	向日葵	Herb	Exotic	-	-										S									
Hibiscus rosa-sinensis	朱槿	Shrub	Exotic	-	-							S			S			S						
Hibiscus tiliaceus	黃槿	Tree	Native	Very common	-										S				S					
Hippeastrum vittatum	花朱頂蘭	Herb	Exotic	-	-						S													
Hydrocotyle verticillata	銅錢草	Herb	Exotic	-	-										S									
Hylocereus undatus	量天尺	Herb	Exotic	-	-							S												
Hypserpa nitida	夜花藤	Climber	Native	Very common	-																			C

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						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Ilex asprella	梅葉冬青	Shrub	Native	Very common	-																			S
Imperata cylindrica	大白茅	Herb	Native	Very common	-			O		O	S		S	S	O			O	S				O	
Ipomoea aquatica	蕹菜	Herb	Exotic	Very common	-						O	O	S					O						
Ipomoea batatas	番薯	Herb	Exotic	-	-						O													
Ipomoea cairica	五爪金龍	Climber	Exotic	Very common	-	S	O	C	C	O	O	O	C		C	C	C		O		S		C	O
Ipomoea mauritiana	七爪龍	Climber	Exotic	Restricted	-														S					
Ipomoea nil	牽牛	Climber	Exotic	Common	-					S			O	S									O	
Ipomoea pes-caprae	厚藤	Herb	Native	Common	-									S										
Ipomoea triloba	三裂葉薯，三裂葉牽牛	Herb	Native	-	-					C	S	S	S		C	O		S					C	
Ischaemum barbatum	粗毛鴨嘴草	Herb	Native	Very common	-										C				S					
Ixeris polycephala	多頭苦買菜	Herb	Native	-	-								S											
Ixora chinensis	龍船花	Shrub	Native	Restricted	-										S			S	S					
Jatropha integerrima	全緣葉麻瘋樹	Shrub	Exotic	-	-													S						
Jatropha podagrica	佛肚樹	Shrub	Exotic	-	-							S												
Juniperus chinensis cv. *Kaizuca*	龍柏	Tree	Exotic	-	-										S	S								
Justicia gendarussa	小駁骨	Shrub	Native	Common	-													S						
Kalanchoe pinnata	落地生根	Herb	Exotic	Common	-							S			S					S				
Kalanchoe tubiflora	洋吊鍾	Herb	Exotic	-	-						S													
Kandelia obovata	秋茄樹，水筆仔	Shrub	Native	Very common	-								S	S								S		

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Kyllinga nemoralis	單穗水蜈蚣	Herb	Native	Very common	-							S			S								
Kyllinga polyphylla	水蜈蚣	Herb	Exotic	Common	-					O		S	S		S			S		S			O	
Lagerstroemia speciosa	大花紫薇	Tree	Exotic	-	Cap. 96A [6]										S			S	S					
Lantana camara	馬纓丹	Shrub	Exotic	Very common	-					S	O	O	S		S			S	O				S	
Lemna minor	浮萍	Herb	Native	Common	-								S							S				
Leonurus japonicus	益母草	Herb	Native	Restricted	-					S		S												
Leptochloa chinensis	千金子	Herb	Native	Very common	-													S						
Leptochloa fusca	雙稃草	Herb	Native	-	-								S											
Leucaena leucocephala	銀合歡	Tree	Exotic	Common	-		S		C	O	O	O	O	C	C	S	O	O	C	S			C	O
Ligustrum sinense	山指甲	Tree	Native	Common	-										S	S			S					o
Lindernia crustacea	母草	Herb	Native	Restricted	-							S							S					
Lindernia rotundifolia	圓葉母草	Herb	Exotic	-									C					S						
Liquidambar formosana	楓香	Tree	Native	Common	-													S						
Liriope spicata	山麥冬	Herb	Native	Very common	-																			s
Litchi chinensis	荔枝	Tree	Exotic	Restricted	Threatened Species List of China's Higher Plants: Endangered [3] China Plant Red Data Book: Vulnerable [4] State Protection (Category II) [5]										S					S				
Litsea glutinosa	潺槁樹	Tree	Native	Very common	-					S					S				S				S	C

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area													
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Litsea monopetala	假柿木薑子	Tree	Native	Restricted	-					S														S
Litsea rotundifolia var. *oblongifolia*	豺皮樟	Shrub	Native	Very common	-																			C
Livistona chinensis	蒲葵	Tree	Exotic	-	-										O				S					
Lophostemon confertus	紅膠木	Tree	Exotic	-	-										S				S					
Loropetalum chinense f. *rubrum*	紅花檵木	Shrub	Exotic	-	-										S									
Ludwigia erecta	美洲水丁香	Herb	Exotic	-	-															O			O	
Ludwigia hyssopifolia	草龍	Herb	Native	-	-						S	S	S		S									
Ludwigia octovalvis	毛草龍	Herb	Native	Common	-								S											
Ludwigia perennis	細花丁香蓼	Herb	Native	Restricted	-								S											
Lycopersicon esculentum	番茄	Herb	Exotic	-	-							S												
Lygodium japonicum	海金沙	Herb	Native	Very common	-										S			S	S	S				
Macaranga tanarius var. *tomentosa*	血桐	Tree	Native	Common	-	S	S			S			S	S	S	S			O	S			S	C
Macroptilium atropurpureum	紫花大翼豆	Herb	Exotic	Common	-					S					S								S	
Macroptilium lathyroides	大翼豆	Herb	Exotic	Common	-					S					S								S	
Mallotus paniculatus	白楸	Tree	Native	Very common	-														S					
Malvastrum coromandelianum	賽葵	Shrub	Native	Common	-					C			S		S				S				C	
Malvaviscus penduliflorus	垂花懸鈴花	Shrub	Exotic	-	-							S							S					
Mangifera indica	芒果	Tree	Exotic	-	-							S			S	S			S					S
Manihot esculenta	木薯	Shrub	Exotic	-	-					S	S	S			S									
Markhamia stipulata	貓尾木	Tree	Exotic	-	-										S	O			C					
Melaleuca cajuputi subsp. *cumingiana*	白千層	Tree	Exotic	-	-										S				S					

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area													
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Melastoma malabathricum	野牡丹	Shrub	Native	Common	-											S								S
Melia azedarach	苦楝	Tree	Exotic	Common	-					S			S	S	S		S	S	O				S	C
Melinis repens	紅毛草	Herb	Exotic	Very common	-									C	S				S					
Merremia hederacea	魚黃草	Climber	Native	Restricted	-								O							S			S	
Michelia x *alba*	白蘭	Tree	Exotic	-	Cap. 96A [6]										S									S
Microcos nervosa	破布葉	Shrub	Native	Common	-					S		S			O				S					
Microstegium ciliatum	剛莠竹	Herb	Native	Very common	-					O			O		S	S			S					S
Mikania micrantha	薇甘菊	Herb	Exotic	Very common	-	S	C		C	C	C	C	C		S	S	O	S	C	S	S		C	O
Millettia nitida	亮葉崖豆藤	Climber	Native	Very common	-																			S
Mimosa diplotricha	巴西含羞草	Herb	Exotic	Rare	-					O			S							S			C	
Mimosa pudica	含羞草	Herb	Exotic	Very common	-					O	S	S	S		S	S			S				C	
Mirabilis jalapa	紫茉莉	Herb	Exotic	-	-							S												
Miscanthus floridulus	五節芒	Herb	Native	Common	-					S			S	S	C		C		C	S			O	O
Miscanthus sinensis	芒	Herb	Native	Very common	-								S	S			S	S	S		S			C
Momordica charantia	苦瓜	Climber	Exotic	-	-							S												
Morus alba	桑	Tree	Native	Common	-		S			S				S	O				O				S	
Murraya paniculata	九里香	Tree	Exotic	-	-										S				S					
Musa acuminata cv. *Cavendishii*	香蕉	Herb	Exotic	-	-						S	S			S									
Musa x *paradisiaca*	大蕉	Herb	Exotic	-	-					S		S	S							S				
Myosoton aquaticum	鵝腸菜	Herb	Native	Common	-							S												

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area												
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Nandina domestica	南天竺	Shrub	Exotic	-	-														S					
Nelumbo nucifera	蓮	Herb	Exotic	-	-															S				
Nephrolepis auriculata	腎蕨	Herb	Native	Common	-													S						
Nerium oleander	夾竹桃	Shrub	Exotic	-	-										S			S						
Neyraudia reynaudiana	類蘆	Herb	Native	Very common	-								S	O		S			O					
Nymphoides cristatum	水皮蓮	Herb	Native	-	-								S											
Ocimum basilicum	羅勒，薰尊、九層塔	Herb	Exotic	Very rare	-							S												
Oenanthe javanica	水芹	Herb	Native	Restricted	-							S												
Oplismenus compositus	竹葉草	Herb	Native	Very common	-										O			S	O					O
Osmanthus fragrans	桂花	Tree	Exotic	-	-							S			S									
Oxalis corniculata	酢漿草	Herb	Native	Very common	-					S					S				C				C	S
Oxalis debilis subsp. *corymbosa*	紅花酢漿草	Herb	Exotic	Common	-					O					S			S	S				O	
Pachira aquatica	瓜栗	Tree	Exotic	-	-										S									
Paederia scandens	雞矢藤	Climber	Native	Very common	-	S	S	O		S	O	O	S		S	S		O	C				S	
Panicum maximum	大黍	Herb	Exotic	Common	-			C	O	C	C	O	C	C	C	O	C		C	S	S		C	O
Panicum repens	鋪地黍	Herb	Native	Very common	-								O											
Parthenocissus dalzielii	爬牆虎	Climber	Exotic	-	-										S				S					
Paspalum conjugatum	兩耳草	Herb	Native	Common	-					S	S	S	S		O	S			S				O	
Paspalum distichum	雙穗雀稗	Herb	Native	Common	-								S											
Paspalum urvillei	絲毛雀稗	Herb	Exotic	Common	-					O			O											

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area												
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Passiflora foetida	龍珠果	Climber	Exotic	Very common	-		S						S		S				S				O	S
Passiflora suberosa	南美西番蓮	Climber	Exotic	Common	-													S						
Pennisetum alopecuroides	狼尾草	Herb	Native	Common	-						S	S			S								S	
Pennisetum polystachion	牧地狼尾草	Herb	Exotic	Very common	-								S											
Pennisetum purpureum	象草	Herb	Exotic	Very common	-					O	S		S		S				O					
Peperomia obtusifolia	鈍葉豆瓣綠	Herb	Exotic	-	-										S									
Persicaria barbata	毛蓼	Herb	Native	Common	-								S							S				
Persicaria chinensis	火炭母	Herb	Native	Common	-						O	O			S				S				S	o
Persicaria lapathifolia	大馬蓼	Herb	Native	Common	-								S											
Persicaria orientalis	**紅蓼**	**Herb**	**Native**	**Very rare**	**-**																		**S**	
Persicaria sp.	春蓼屬	Herb	Unknown	-	-										S									
Phragmites australis	蘆葦	Herb	Native	Very common	-	C	O		S				C				C	C		O	C	C		
Phragmites vallatorius	卡開蘆	Herb	Native	Very common	-	O							S											
Phyllanthus debilis	銳尖葉下珠	Herb	Unknown	-	-										O									
Phyllanthus emblica	餘甘子	Tree	Native	Very common	-										O									
Phyllanthus reticulatus	小果葉下珠	Shrub	Native	Common	-										S									c
Phyllanthus tenellus	纖梗葉下珠	Herb	Unknown	-	-										O									

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area													
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Phyllanthus urinaria	葉下珠	Herb	Native	Common	-					S													O	
Physalis angulata	苦蘵	Herb	Native	Restricted	-					S			S		S								O	
Phytolacca acinosa	商陸	Herb	Exotic	Rare	-										S									
Pilea microphylla	小葉冷水花	Herb	Exotic	Very common	-									C	S									
Piper sarmentosum	假蒟	Herb	Native	Restricted	-										S				S					
Plantago major	車前草	Herb	Native	Very common	-										S								S	
Platycladus orientalis	側柏	Tree	Exotic	-	-										O									
Plectranthus amboinicus	到手香	Herb	-	-	-										S									
Plumeria rubra	雞蛋花	Tree	Exotic	-	-							S			S									
Portulaca oleracea	馬齒莧	Herb	Native	Very common	-										S								O	
Pouzolzia zeylanica	霧水葛	Herb	Native	Common	-					S					S				S				S	
Praxelis clematidea	假臭草	Herb	Exotic	Very common	-					O														
Prunus persica	桃	Tree	Exotic	-	-							S			S									
Psidium guajava	番石榴	Tree	Exotic	Common	-		S					S			S								S	
Psychotria asiatica	九節	Tree	Native	Very common	-														S					O
Pteris semipinnata	半邊旗	Herb	Native	Very common	-																			S
Pteris vittata	蜈蚣草	Herb	Native	Very common	-										S				S					
Pueraria lobata var. *montana*	葛麻姆	Climber	Native	Common	-						O	O			O		S		O				O	
Pueraria lobata var. *thomsonii*	粉葛	Climber	Exotic	-	-								O		C	O					O			o
Pueraria phaseoloides	三裂葉野葛	Climber	Native	Very common	-																		S	

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area												
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Pycreus polystachyos	多枝扁莎	Herb	Native	Very common	-								O										
Pyrostegia venusta	炮仗花	Climber	Exotic	-	-										O								
Ranunculus sceleratus	石龍芮	Herb	Native	Restricted	-								S										
Rhaphiolepis indica	石斑木	Shrub	Native	Very common	-										O								
Rhododendron spp.	杜鵑屬	Shrub	-	-	Cap 96A [6]													S					
Ricinus communis	蓖麻	Shrub	Exotic	Restricted	-							S	S									S	
Rosa chinensis	月季花	Shrub	Exotic	-	-										S								
Ruellia coerulea	蘭花草	Herb	Exotic	-	-										S			S					
Rumex japonicus	羊蹄	Herb	Native	Restricted	-					S			S										
Rumex trisetifer	長刺酸模	Herb	Native	Common	-								S							S		S	
Saccharum officinarum	甘蔗	Herb	Exotic	-	-							S			S								
Sanchezia nobilis	黃脈爵床	Shrub	Exotic	-	-													S					
Sansevieria trifasciata	虎尾蘭	Herb	Exotic	-	-										S								
Sapium sebiferum	烏桕	Tree	Native	Common	-					S			S		S				S				
Schefflera arboricola	鵝掌藤	Climber	Exotic	-	-										S			S	C				
Scleria ciliaris	緣毛珍珠茅	Herb	Native	Very common	-																		s
Scoparia dulcis	野甘草	Herb	Exotic	Common	-					S	S	S			S							O	
Sesbania cannabina	田菁	Herb	Exotic	Common	-								S										
Sesbania javanica	沼生田菁	Herb	Native	-	-					S			S									O	
Sida acuta	黃花稔	Herb	Native	Common	-																	S	
Sida rhombifolia	白背黃花稔	Shrub	Native	Common	-					O			S		S							C	

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area												
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Smilax china	金剛藤	Climber	Native	Very common	-													S					o
Solanum americanum	少花龍葵	Herb	Exotic	-	-					O			S		S			S	S				O	
Solanum torvum	水茄	Shrub	Exotic	Common	-					S		S	S		S								O	
Soliva anthemifolia	裸柱菊，座地菊	Herb	Exotic	Restricted	-																		S	
Sonchus arvensis	苣荬菜	Herb	Native	Very common	-										S									
Sonchus oleraceus	苦苣菜	Herb	Exotic	Very common	-					S			S										O	
Sonneratia sp.	海桑屬	Tree	Exotic	-	-				O				S	C			O							
Spathodea campanulata	火焰樹	Tree	Exotic	-	-										O									
Spermacoce remota	光葉豐花草	Herb	-	-	-			S		S		S	S		O								O	
Spermacoce sp.	豐花草屬	Herb	-	-	-					S														
Sporobolus fertilis	鼠尾粟	Herb	Native	Very common	-					S			S		S				O				S	
Stephania longa	糞箕篤	Climber	Native	Common	-					S					S				S					S
Sterculia lanceolata	假蘋婆	Tree	Native	Very common	-										S									O
Stromanthe sanguinea	紫背竹芋	Herb	Exotic	-	-							S												
Strophanthus divaricatus	羊角拗	Climber	Native	Common	-																			o
Syagrus romanzoffiana	皇后葵	Tree	Exotic	-	-										S									
Synedrella nodiflora	金腰箭	Herb	Exotic	Very common	-					O														
Syngonium podophyllum	合果芋	Herb	Exotic	-	-										S				S					
Syzygium jambos	蒲桃	Tree	Exotic	Common	-										S				S					
Syzygium myrtifolium	長紅木	Shrub	-	-														S						

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area													
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Tabernaemontana divaricata	狗牙花	Shrub	Exotic	-	-													S						
Tadehagi triquetrum	葫蘆茶	Shrub	Native	Very common	-											S								
Terminalia catappa	欖仁樹	Tree	Exotic	Very rare	-										S									
Terminalia mantaly	小葉欖仁	Tree	Exotic	-	-													S						
Tetradium glabrifolium	楝葉吳茱萸	Tree	Native	Common	-																			s
Thevetia peruviana	黃花夾竹桃	Shrub	Exotic	-	-										S									
Thysanolaena latifolia	粽葉蘆	Herb	Native	Common	-								S											
Tinospora sinensis	中華青牛膽	Climber	Native	Common	-																			S
Torenia fournieri	藍豬耳	Herb	Exotic	-	-								S											
Toxocarpus wightianus	弓果藤	Climber	Native	Very common	-																			O
Trema tomentosa	山黃麻	Shrub	Native	Common	-														S				S	
Tridax procumbens	羽芒菊	Herb	Exotic	Very common	-			S					S	S	S				C				S	
Trigonotis peduncularis	附地菜	Herb	-	-	-																		S	
Typha angustifolia	水燭	Herb	Exotic	Rare	-								C											
Urena lobata	肖梵天花	Herb	Native	Common	-					S					S								O	
Urena procumbens	梵天花	Shrub	Native	Common	-																			S
Verbena officinalis	馬鞭草	Herb	Native	Restricted	-							S							O					
Vernonia cinerea	夜香牛	Herb	Native	Very common	-					S					S								S	
Wedelia trilobata	三裂葉蟛蜞菊	Herb	Exotic	Common	-	S	C			O	C	S	C	C	O	S		S	C				C	S
Youngia japonica	黃鵪菜	Herb	Native	Very common	-										O				S		S			

Scientific name	Chinese name	Growth form	Origin	Rarity in HK [1]	Protection/Conservation status [2 3 4 5 6]	Application Site					Study Area													
						AP	Po	DA	Me	WI	AbAl	AcAl	AP	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	WO
Zanthoxylum nitidum	兩面針	Climber	Native	Very common	-														S					S
Zanthoxylum piperitum	胡椒木	Shrub	Exotic	-	-													S						
Zanthoxylum scandens	花椒簕	Climber	Native	Common	-																			o
Zingiber officinale	薑	Herb	Exotic	-	-							S												
Total species number						10	16	11	8	90	43	89	109	40	203	51	17	60	125	36	10	3	98	74

Notes:

1. Corlett *et al*. (2000). Hong Kong vascular plants: distribution and status.
2. International Union of Conservation for Nature. (2019). The IUCN Red List of Threatened Species. Version 2019-2.
3. Qin *et al*. (2017). Threatened Species List of China's Higher Plants.
4. Fu & Chin (1992). China Plant Red Data Book – Rare and Endangered Plants.
5. State Forestry Administration & Ministry of Agriculture. (1999). List of Wild Plants under State Protection (Part 1).
6. Cap. 96 Forests and Countryside Ordinance.

- **Species in bold are considered of conservation importance.**
- *Coccinia grandis* and *Rhododendron* spp. are cultivated therefore not considered species of conservation importance, despite being considered very rare by Corlett et al. (2000) or listed under Cap. 96 Forests and Countryside Ordinance.
- *Araucaria heterophylla, Casuarina equisetifolia, Dimocarpus longan, Lagerstroemia speciosa, Litchi chinensis, Michelia* x *alba, Mimosa diplotricha, Ocimum basilicum, Phytolacca acinosa, Terminalia catappa , Typha angustifolia* are exotic to Hong Kong and not considered of conservation importance, despite being considered rare/ very rare by Corlett et al. (2000), listed as Vulnerable by IUCN (2019), listed as endangered/ vulnerable in Threatened Species List of China's Higher Plants, listed as vulnerable in China Plant Red Data Book, listed under Category II in the List of Wild Plants under State Protection (Part 1), and/ or listed under Cap. 96 Forests and Countryside Ordinance.

Abbreviations:

- Habitats: AbAl: abandoned agricultural land; AcAl: active agricultural land; AP: abandoned pond; Ch: channel; DA: developed area; G/S: grassland/shrubland; Me: meander; MW: mitigation wetland; Pl: plantation; Po: pond; Re: Reedbed; TM: Tidal marsh; Wl: wasteland; Wo: woodland**;** Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix B Mammal Species Recorded within the Study Area

Common Names	Scientific Names	Rarity (AFCD Assessment), Distribution in Hong Kong	Conservation status	Application Site	Study Area *(excluding Application Site)*			
				WI	AP	Ch	DA	WI
Domestic Dog	*Canis lupus familiaris*	Common, Widely distributed in forested areas throughout Hong Kong.	-				5	
Domestic Cat	*Felis catus*	Uncommon, Widely distributed in urban and forested areas throughout Hong Kong.	-				6	
Japanese Pipistrelle	***Pipistrellus abramus***	**Very Common, Widely distributed throughout Hong Kong.**	**(Cap. 170)**	**5**	**8**	**5**	**4**	**5**
Small Asian Mongoose	***Herpestes javanicus***	**Uncommon, Found in N.T. countryside area**	**(Cap. 170); Red List of China's Vertebrate: (Vulnerable)**		**1**			
Total				5	9	5	15	5

Notes:

1. AFCD (2020). Hong Kong Biodiversity Database.
2. Cap. 170 Wild Animals Protection Ordinance.

Abbreviations:

- Habitats: AbAl : abandoned agricultural land; AcAl: active agricultural land; AP: abandoned pond; Ch: channel; DA: developed area; G/S: grassland/shrubland; Me: meander; MW: mitigation wetland; Pl: plantation; Po: pond; Re: Reedbed; TM: Tidal marsh; Wl: wasteland; Wo: woodland; Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix C Bird Species Recorded within the Study Area

Remarks: all wild bird species are protected under Cap. 170 Wild Animals Protection Ordinance in Hong Kong[2]

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	Wl	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	Pl	Po	Re	T M	Wl	W o
Asian Barred Owlet	***Glaucidium cuculoides***	**Uncommon resident. Widely distributed in woodland throughout Hong Kong.**	**Class 2 Protected Animal of China; Appendix 2 of CITES**					1												**1**	
Black Kite	***Milvus migrans***	**Common resident and winter visitor. Widely distributed in Hong Kong.**	**Fellowes et al. (2002): (RC); Appendix 2 of CITES**		4			1				**2**	**1**	**2**		**1**	**9**	**1**			**1**	3
Black-crowned Night Heron	***Nycticorax nycticorax***	**Common resident and winter visitor. Widely distributed in Hong Kong.**	**Fellowes et al. (2002): (LC)**							**3**					**3**	**3**						
Black-faced Spoonbill	***Platalea minor***	**Common winter visitor. Found in Deep Bay area.**	**Class 2 Protected Animal of China;China Red Data Book Status: (Endangered);Fellowes et al. (2002): PGC;**									**1**										

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	Wl	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	Pl	Po	Re	T M	Wl	W o
			IUCN Red List Status: EN																			
Black-winged Kite	***Elanus caeruleus***	**Occasional visitor. Found in Ha Tsuen, Deep Bay area.**	**China Red Data Book Status: (Vulnerable);Fellowes et al. (2002): LC; Appendix 2 of CITES**															**1**				
Black-winged Stilt	***Himantopus himantopus***	**Common passage migrant. Found in Deep Bay area, Long Valley, Kam Tin.**	**Fellowes et al. (2002): RC**							**3**		**146**										
Bluethroat	***Luscinia svecica***	**Common passage migrant and winter visitor. Widely distributed in wet agricultural areas throughout Hong Kong.**	**Fellowes et al. (2002): LC**														**1**					
Chinese Pond Heron	***Ardeola bacchus***	**Common resident. Common resident. Widely distributed in Hong Kong.**	**Fellowes et al. (2002): PRC,(RC)**		**3**		**1**	**4**	**2**	**1**		**76**	**5**		**2**		**2**	**9**	**1**	**1**	**4**	
Collared Crow	***Corvus torquatus***	**Uncommon resident. Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen.**	**Fellowes et al. (2002): LC; IUCN Red List Status: Vulnerable**										**5**				**2**		**1**	**1**		
Collared Scops Owl	***Otus lettia***	**Common resident. Widely distributed in shrubland throughout Hong Kong.**	**Class 2 Protected**																			1

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	WI	Ab Al	AP	Ac Al	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	Wo
			Animal of China; Appendix 2 of CITES																			
Common Greenshank	***Tringa nebularia***	**Abundant passage migrant and winter visitor. Found in Deep Bay area.**	**Fellowes et al. (2002): RC**									**35**										
Common Redshank	***Tringa totanus***	**Common passage migrant. Found in Deep Bay area.**	**Fellowes et al. (2002): RC**									**16**										
Crested Serpent Eagle	***Spilornis cheela***	**Uncommon resident. Widely distributed in shrublands on hillsides throughout Hong Kong.**	**China Red Data Book Status: (Vulnerable);Fellowes et al. (2002): (LC); Appendix 2 of CITES**											**1**								
Eastern Buzzard	***Buteo japonicus***	**Common winter visitor. Widely distributed in Hong Kong.**	**Appendix 2 of CITES**					1								**1**					**1**	
Eurasian Teal	***Anas crecca***	**Common winter visitor. Found in Deep Bay area, Shuen Wan, Tai Lam Chung Reservoir, Victoria Harbour, Urban Park.**	**Fellowes et al. (2002): RC**									**17**			**2**							
Great Cormorant	***Phalacrocorax carbo***	**Common winter visitor. Widely distributed in coastal areas throughout Hong Kong.**	**Fellowes et al. (2002): PRC**		**11**					**200**		**21**				**2**		**8**	**9**			

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	Wl	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	Pl	Po	Re	T M	Wl	W o
Great Egret	***Ardea alba***	**Common resident and winter visitor. Widely distributed in Hong Kong.**	**Fellowes et al. (2002): PRC,(RC)**							**1**		**28**			**4**	**1**		**2**	**4**	**1**		
Greater Coucal	***Centropus sinensis***	**Common resident. Widely distributed in Hong Kong.**	**Class 2 Protected Animal of China;China Red Data Book Status: (Vulnerable)**							**1**			**1**		**2**	**2**	**1**		**1**	**1**		
Grey Heron	***Ardea cinerea***	**Common winter visitor. Found in Deep Bay area, Starling Inlet, Kowloon Park, Cape D'Aguilar.**	**Fellowes et al. (2002): PRC**		1			1				**82**	**2**			**13**		**5**	**1**		**1**	
Grey-headed Lapwing	***Vanellus cinereus***	**Scarce winter visitor. Found in Kam Tin, Tsim Bei Tsui, Lo Wu, Tai Long Wan, Shuen Wan, Castle Peak coast, Chek Lap Kok**	**Fellowes et al. (2002): LC**									**13**										
Intermediate Egret	***Egretta intermedia***	**Common passage migrant. Found in Deep Bay area, Tai Long Wan, Starling Inlet, Tai O, Cape D'Aguilar.**	**Fellowes et al. (2002): RC**																**1**			
Little Egret	***Egretta garzetta***	**Common resident. Widely distributed in coastal area throughout Hong Kong.**	**Fellowes et al. (2002): PRC,(RC)**		**4**			**4**	**6**	**3**	**1**	**119**	**8**		**5**	**2**	**7**	**16**	**4**	**2**	**4**	
Little Grebe	***Tachybaptus ruficollis***	**Common resident. Found in Deep Bay area.**	**Fellowes et al. (2002): LC**							**1**		**1**						**11**				

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	WI	Ab Al	AP	Ac Al	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	Wo
Little Ringed Plover	***Charadrius dubius***	**Common winter visitor and passage migrant. Widely distributed in freshwater areas throughout Hong Kong.**	**Fellowes et al. (2002): (LC)**									**4**										
Marsh Sandpiper	***Tringa stagnatilis***	**Common winter visitor and passage migrant. Found in Deep Bay area, Shuen Wan, Long Valley, Kam Tin, Sai Kung.**	**Fellowes et al. (2002): RC**									**25**										
Northern Shoveler	***Anas clypeata***	**Abundant winter visitor. Found in Deep Bay area.**	**Fellowes et al. (2002): RC**									**333**										
Pied Avocet	***Recurvirostra avosetta***	**Abundant winter visitor. Found in Deep Bay area.**	**Fellowes et al. (2002): RC**									**199**										
Pied Kingfisher	***Ceryle rudis***	**Uncommon resident. Widely distributed in lakes and ponds throughout Hong Kong.**	**Fellowes et al. (2002): (LC)**									**2**				**1**		**1**				
Purple Heron	***Ardea purpurea***	**Uncommon passage migrant. Found in Deep Bay area.**	**Fellowes et al. (2002): RC**							**1**						**1**						
Spotted Redshank	***Tringa erythropus***	**Abundant in winter and spring. Found in Deep Bay area.**	**Fellowes et al. (2002): RC**									**6**										
White-shouldered Starling	***Sturnia sinensis***	**Common passage migrant. Found in Kam Tin, Deep Bay area, Po Toi Island, Long Valley, Victoria Park, Ho Chung, Ma Tso Lung, Mui Wo, Lam Tsuen Valley.**	**Fellowes et al. (2002): (LC)**			6		4					**3**	**5**							**4**	

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	Wl	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	Pl	Po	Re	T M	Wl	W o
White-throated Kingfisher	***Halcyon smyrnensis***	**Common resident. Widely distributed in coastal areas throughout Hong Kong**	**Fellowes et al. (2002): (LC)**									**1**	**1**	**1**	**1**				**1**			
Wood Sandpiper	***Tringa glareola***	**Common passage migrant and winter visitor. Widely distributed in wetland area throughout Hong Kong.**	**Fellowes et al. (2002): LC**									**65**										
Yellow Bittern	***Ixobrychus sinensis***	**Uncommon summer visitor and passage migrant. Found in Deep Bay area, Chek Keng, Tai Long Wan.**	**Fellowes et al. (2002): (LC)**		2										**1**			**1**				
Zitting Cisticola	***Cisticola juncidis***	**Common passage migrant and winter visitor. Widely distributed in grassland throughout Hong Kong.**	**Fellowes et al. (2002): LC**							**1**												
Asian Brown Flycatcher	*Muscicapa latirostris*	Common passage migrant and winter visitor. Widely distributed in Hong Kong.	-														1					
Asian Koel	*Eudynamys scolopaceus*	Common resident. Widely distributed in Hong Kong.	-		1								1		2	1	6					
Azure-winged Magpie	*Cyanopica cyanus*	Introduced resident. Found in Mai Po.	-										7									
Barn Swallow	*Hirundo rustica*	Abundant passage migrant and summer visitor. Widely distributed in Hong Kong.	-	2	4	1	1	11				1	42	16			8	3	5	5	11	
Black Drongo	*Dicrurus macrocercus*	Common summer visitor. Widely distributed in open area throughout Hong Kong.	-		4			1					5	2		1	3				1	1
Black-collared Starling	*Gracupica nigricollis*	Common resident. Widely distributed in Hong Kong.	-		4		1	19	2		1	11	38	18		5	44	6			19	5

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	WI	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	Pl	Po	Re	T M	WI	W o
Black-throated Laughingthrush	*Garrulax chinensis*	Common resident. Widely distributed in woodland and shrubland throughout Hong Kong	-														2					
Black-winged Cuckooshrike	*Coracina melaschistos*	Scarce passage migrant and winter visitor. Widely distributed in woodland throughout Hong Kong.	-											2								
Blue Whistling Thrush	*Myophonus caeruleus*	Common resident. Widely distributed in shrubland and woodland throughout Hong Kong.	-											1								1
Brown Shrike	*Lanius cristatus*	Common passage migrant. Widely distributed in open areas throughout Hong Kong.	-									1		1								
Chinese Blackbird	*Turdus mandarinus*	Common winter visitor. Widely distributed in Hong Kong.	-														2					
Chinese Bulbul	*Pycnonotus sinensis*	Abundant resident. Widely distributed in Hong Kong.	-	2	6	18	3	6	5		8	4	70	15		7	64	4	17	1	6	13
Cinereous Tit	*Parus cinereus*	Common resident. Widely distributed in Hong Kong.	-		1		1		1		1		20	6		4	37	1				7
Common Kingfisher	*Alcedo atthis*	Common passage migrant and winter visitor. Widely distributed in wetland habitat throughout Hong Kong.	-		2		1		1			6			1			6	1			
Common Moorhen	*Gallinula chloropus*	Common resident. Found in Deep Bay area, Shuen Wan, Starling Inlet.	-		1							1										

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	WI	Ab AI	AP	Ac AI	Ch	D A	G/ S	M e	M W	PI	Po	Re	T M	WI	W o
Common Myna	*Acridotheres tristis*	Uncommon resident. Found in Mai Po, Sheung Uk Tsuen, Sheung Shui, Kam Tin, Shek Kong, Ping Shan, Mong Tseng.	-			2							18									
Common Sandpiper	*Actitis hypoleucos*	Common passage migrant and winter visitor. Widely distributed in wetland area throughout Hong Kong.	-									26			1							
Common Snipe	*Gallinago gallinago*	Common passage migrant and winter visitor. Found in Long Valley, Chau Tau, Sai Kung.	-																	2		
Common Tailorbird	*Orthotomus sutorius*	Common resident. Widely distributed in Hong Kong.	-		4		1	5	5	2	1	4	33	14	4	1	38	3	12		5	1
Crested Myna	*Acridotheres cristatellus*	Common resident. Widely distributed in Hong Kong.	-		9	1	11	20				23	80	35	4	8	74	6	11		20	3
Daurian Redstart	*Phoenicurus auroreus*	Common winter visitor. Widely distributed in Hong Kong.	-		1			2	1		1	3	4	1		2	11		2		2	
Dusky Warbler	*Phylloscopus fuscatus*	Common passage migrant and winter visitor. Widely distributed in shrubland and waterside vegetation throughout Hong Kong.	-		2			4	2			10	8	2	6	3	8	1	6	2	4	
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Common passage migrant and winter visitor. Widely distributed in agricultural fields and marsh edges throughout Hong Kong.	-														1					
Eurasian Collared Dove	*Streptopelia decaocto*	Found in Mai Po, Tsim Bei Tsui, Fung Lok Wai.	-		2			2					2	1					1		2	

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	WI	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	PI	Po	Re	T M	WI	W o
Eurasian Magpie	*Pica pica*	Common resident. Widely distributed in Hong Kong	-			1							1			1	4					2
Eurasian Tree Sparrow	*Passer montanus*	Abundant resident. Widely distributed in Hong Kong.	-			15	3					1	129	40			30	1				2
Fork-tailed Sunbird	*Aethopyga christinae*	Common resident. Widely distributed in Hong Kong.	-						1				2				3					
Garganey	*Anas querquedula*	Common passage migrant. Found in Deep Bay area, Long Valley, Kam Tin.	-									2										
Grey Wagtail	*Motacilla cinerea*	Common passage migrant and winter visitor. Widely distributed in hill streams throughout Hong Kong.	-				1					4	2									
Hair-crested Drongo	*Dicrurus hottentottus*	Common passage migrant and summer visitor. Widely distributed in wooded area throughout Hong Kong.	-											7								
House Swift	*Apus nipalensis*	Abundant spring migrant and locally common resident. Widely distributed in Hong Kong.	-					1				1	21	1		7	4				1	1
Japanese White-eye	*Zosterops japonicus*	Abundant resident. Widely distributed in Hong Kong.	-	4	16		7		7		9	8	127	69		13	151	7	9			8
Large Hawk Cuckoo	*Hierococcyx sparverioides*	Common passage migrant and summer visitor. Widely distributed in woodland throughout in Hong Kong.	-																			1
Large-billed Crow	*Corvus macrorhynchos*	Common resident. Widely distributed in Hong Kong	-		1	1		2				2	4	5							2	1

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	WI	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	PI	Po	Re	T M	WI	W o
Little Bunting	*Emberiza pusilla*	Common passage migrant and winter visitor. Widely distributed in open area throughout Hong Kong.	-		1																
Long-tailed Shrike	*Lanius schach*	Common resident. Widely distributed in open areas throughout Hong Kong.	-		2			5	1		1		4	1		7			1		5	
Masked Laughingthrush	*Garrulax perspicillatus*	Abundant resident. Widely distributed in shrubland throughout Hong Kong.	-			1	4		3		5	6	10	27		3	36	1	2			3
Olive-backed Pipit	*Anthus godlewskii*	Common passage migrant and winter visitor. Widely distributed in Hong Kong.	-					1									7				1	
Oriental Magpie Robin	*Copsychus saularis*	Abundant resident. Widely distributed in Hong Kong.	-		1	3	2		2		1	9	29	9	2	1	22		2	2		2
Pallas's Leaf Warbler	*Phylloscopus proregulus*	Common winter visitor. Found in woodland throughout Hong Kong.	-									1	3	1			6					
Pintail Snipe	*Gallinago stenura*	Common passage migrant. Found in Long Valley, Chau Tau, Ha Tsuen.	-														1					
Plain Prinia	*Prinia inornata*	Common resident. Widely distributed in grassland throughout Hong Kong.	-		3		2	3	2	2	1	15	2	1		5	3	1	7	3	3	
Plaintive Cuckoo	*Cacomantis merulinus*	Uncommon summer visitor. Widely distributed in open area throughout Hong Kong.	-						1					1		1						
Red Turtle Dove	*Streptopelia tranquebarica*	Uncommon passage migrant. Found in Deep Bay area, Cheung Chau, Po Toi, Lantau Island, Hong Kong Island.	-					1													1	

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	Wl	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	Pl	Po	Re	T M	Wl	W o
Red-billed Blue Magpie	*Urocissa erythroryncha*	Common resident. Widely distributed in woodland edges throught Hong Kong	-						1			1					4					
Red-whiskered Bulbul	*Pycnonotus jocosus*	Abundant resident. Widely distributed in Hong Kong.	-	2	14	30	4	4	26		6	4	139	105	5	7	104	5	14	2	4	15
Savanna Nightjar	*Caprimulgus affinis*	Uncommon resident and passage migrant. Widely distributed in Hong Kong.	-										3									
Scaly-breasted Munia	*Lonchura punctulata*	Common resident. Widely distributed in Hong Kong	-		4	3		39				18	22	17		1	18		10		39	
Scarlet Minivet	*Pericrocotus speciosus*	Common resident. Found in Tai Po Kau, the Peak, Lam Tsuen, Cape D'Aguilar Road, Peel Rise, Shing Mun.	-						1								2					
Scarlet-backed Flowerpecker	*Dicaeum cruentatum*	Common resident. Widely distributed in wooded area throughout Hong Kong.	-														3					
Spotted Dove	*Spilopelia chinensis*	Abundant resident. Widely distributed in Hong Kong.	-		3	10	3	17	1	1	1	1	63	37		8	21	3	10		17	10
Stejneger's Stonechat	*Saxicola stejnegeri*	Common passage migrant and winter visitor. Widely distributed in open cultivated fields throughout Hong Kong.	-		1								1						1			
White Wagtail	*Motacilla alba*	Common passage migrant and winter visitor. Widely distributed in Hong Kong.	-		1	3			3			24	7	3			12	2	1	3		2
White-breasted Waterhen	*Amaurornis phoenicurus*	Common resident. Widely distributed in wetland throughout Hong Kong.	-		2		3					7	1		1	1	2		1			
Yellow-bellied Prinia	*Prinia flaviventris*	Common resident. Widely distributed in Hong Kong.	-		4		10	23	4		5	14	33	22		17	23	1	17	1	23	5

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	Wl	Ab Al	AP	Ac Al	Ch	D A	G/ S	M e	M W	Pl	Po	Re	T M	Wl	W o
Yellow-browed Warbler	*Phylloscopus inornatus*	Common winter visitor. Found in woodland throughout Hong Kong.	-									8	16	5		2	26					2
Total				10	119	95	59	182	78	220	42	1408	973	474	46	133	803	106	153	27	182	89

Notes

1. AFCD (2020). Hong Kong Biodiversity Database.
2. Cap. 170 Wild Animals Protection Ordinance.
3. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
4. Convention on International Trade in Endangered Species of Wild Flora and Fauna (2019). Appendices I, II and III.
5. Fellowes *et al*. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong.
    - For conservation status listed by Fellowes *et al*. (2002), letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
6. International Union of Conservation for Nature. (2019). The IUCN Red List of Threatened Species. Version 2020-1.
7. Jiang, Z. G., Jiang, J. P., Wang, Y. Z., Zhang, E., Zhang, Y. Y., Li, L. L., ... & Dong, L. (2016). Red list of China's vertebrates
8. List of State Protected Wild Animals, promulgated by the State Council
9. Zheng and Wang (1998). China Red Data Book of Endangered Animals: Aves.

Abbreviations:

- Conservation Status in Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern
- Habitats: AbAl : abandoned agricultural land; AcAl: active agricultural land; AP: abandoned pond; Ch: channel; DA: developed area; G/S: grassland/shrubland; Me: meander; MW: mitigation wetland; Pl: plantation; Po: pond; Re: Reedbed; TM: Tidal marsh; Wl: wasteland; Wo: woodland; Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix D Reptile Species Recorded within the Study Area

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Study Area			
				AbAl	DA	G/S	Pl
Changeable Lizard	*Calotes versicolor*	Widely distributed throughout Hong Kong.	-		1	1	
Four-clawed Gecko	*Gehyra mutilata*	Widely but thinly distributed throughout Hong Kong.	-		1		
Chinese Gecko	*Gekko chinensis*	Widely distributed throughout Hong Kong.	-				1
Bowring's Gecko	*Hemidactylus bowringii*	Distributed throughout Hong Kong.	-		22		1
Long-tailed Skink	*Eutropis longicaudata*	Widely distributed throughout Hong Kong.	-		2		
Chinese Skink	*Plestiodon chinensis*	Widely distributed throughout Hong Kong.	-	1			
Total				1	26	1	2

Notes:

1. AFCD (2020). Hong Kong Biodiversity Database.
2. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
3. Convention on International Trade in Endangered Species of Wild Flora and Fauna (2019). Appendices I, II and III.
4. Fellowes *et al*. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong.
    - For conservation status listed by Fellowes *et al*. (2002), letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
5. Jiang, Z. G., Jiang, J. P., Wang, Y. Z., Zhang, E., Zhang, Y. Y., Li, L. L., ... & Dong, L. (2016). Red list of China's vertebrates
6. Zhao, E. (1998). China red data book of endangered animals: Amphibia and Reptilia.

Abbreviations:

- Habitats: AbAl : abandoned agricultural land; AcAl: active agricultural land; AP: abandoned pond; Ch: channel; DA: developed area; G/S: grassland/shrubland; Me: meander; MW: mitigation wetland; Pl: plantation; Po: pond; Re: Reedbed; TM: Tidal marsh; Wl: wasteland; Wo: woodland; Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix E Amphibian Species Recorded within the Study Area

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Study Area						
				AP	Ch	DA	MW	Pl	Po	Wl
Asian Common Toad	*Duttaphrynus melanostictus*	Widely distributed in Hong Kong.	-			27	1	2		2
Asiatic Painted Frog	*Kaloula pulchra*	Widely distributed in Hong Kong.	-			6				1
Paddy Frog	*Fejervarya limnocharis*	Widely distributed in Hong Kong.	-			1	2			
Gunther's Frog	*Hylarana guentheri*	Widely distributed throughout Hong Kong.	-				3			1
Brown Tree Frog	*Polypedates megacephalus*	Widely distributed throughout Hong Kong.	-	5	1	3	4	1	3	
Greenhouse frog	*Eleutherodactylus planirostris*	-	Exotic			4	3			
				5	1	41	13	3	3	4

Notes:

1. AFCD (2020). Hong Kong Biodiversity Database.
2. Fellowes *et al*. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong.
    - For conservation status listed by Fellowes *et al*. (2002), letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
3. Jiang, Z. G., Jiang, J. P., Wang, Y. Z., Zhang, E., Zhang, Y. Y., Li, L. L., ... & Dong, L. (2016). Red list of China's vertebrates
4. List of State Protected Wild Animals, promulgated by the State Council

Abbreviations:

- Habitats: AbAl : abandoned agricultural land; AcAl: active agricultural land; AP: abandoned pond; Ch: channel; DA: developed area; G/S: grassland/shrubland; Me: meander; MW: mitigation wetland; Pl: plantation; Po: pond; Re: Reedbed; TM: Tidal marsh; Wl: wasteland; Wo: woodland; Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix F Butterfly Species Recorded within the Study Area

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	WI	AbAI	AP	AcAI	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	Wo
Common Awl	***Hasora badra***	**Very Rare. Wu Kau Tan, Lai Chi Wo, Hong Kong Wetland Park**	**Fellowes et al. (2002): LC**														1					
Swallowtail	***Papilio xuthus***	**Rare. Kap Lung, Ma On Shan, Tai Tam, Sha Lo Wan, Kat O, Lung Kwu Tan, Wu Kau Tang, Lung Kwu Chau**	**-**																		1	
Danaid Eggfly	***Hypolimnas misippus***	**Uncommon. Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang**	**Fellowes et al. (2002): LC**										1									
Metallic Cerulean	***Jamides alecto***	**Very Rare. Victoria Peak, Fung Yuen, Chuen Lung, Mui Wo**	**-**																			1
Common Hedge Blue	*Acytolepis puspa*	Common. Widely distributed throughout Hong Kong	-										1									1
Angled Castor	*Ariadne ariadne*	Common. Widely distributed throughout Hong Kong	-	1	1	1			2	2			3	1		1	1				4	
Formosan Swift	*Borbo cinnara*	Common. Widely distributed in open grassland and abandoned field throughout Hong Kong	-																	1		
Lemon Emigrant	*Catopsilia pomona*	Common. Widely distributed throughout Hong Kong	-										8	1			4					1
Common Mime	*Chilasa clytia*	Common. Widely distributed throughout Hong Kong	-					1						1		1						
Rustic	*Cupha erymanthis*	Very Common. Widely distributed throughout Hong Kong	-										1									
Common Mapwing	*Cyrestis thyodamas*	Common. Widely distributed in woodland area throughout Hong Kong	-														1					

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	WI	AbAl	AP	AcAl	Ch	DA	G/S	Me	MW	PI	Po	Re	TM	WI	Wo
Plain Tiger	*Danaus chrysippus*	Uncommon. Lung Kwu Tan, Tong Fuk, Tai Ho, Tung Chung, Pak Tam Chung	-						1				2					1			1	
Common Tiger	*Danaus genutia*	Common. Widely distributed throughout Hong Kong	-														2				1	
Red-base Jezebel	*Delias pasithoe*	Very Common. Widely distributed throughout Hong Kong	-														4					
Common Indian Crow	*Euploea core*	Common. Widely distributed throughout Hong Kong	-										1	3		1	2	1				
Common Grass Yellow	*Eurema hecabe*	Very Common. Widely distributed throughout Hong Kong	-			4		8	2		1	1	9	1		1	4				8	1
White-edged Blue Baron	*Euthalia phemius*	Common. Widely distributed in woodland and agricultural field throughout Hong Kong	-										1	1								
Large Faun	*Faunis eumeus*	Common. Widely distributed in woodland throughout Hong Kong.	-														2					
Common Jay	*Graphium doson*	Common. Widely distributed throughout Hong Kong	-											1							3	
Common Bluebottle	*Graphium sarpedon*	Very Common. Widely distributed throughout Hong Kong	-									1	2									
Great Orange Tip	*Hebomoia glaucippe*	Common. Widely distributed throughout Hong Kong	-										1									
Purple Sapphire	*Heliophorus epicles*	Common. Widely distributed throughout Hong Kong	-																		1	
Red Ring Skirt	*Hestina assimilis*	Common. Widely distributed in woodland throughout Hong Kong.	-														1					

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	Wl	AbAl	AP	AcAl	Ch	DA	G/S	Me	MW	Pl	Po	Re	TM	Wl	Wo
Great Egg-fly	*Hypolimnas bolina*	Common. Widely distributed throughout Hong Kong	-		1	2	2	1	1	1	1		13	2	2	3	11				2	2
Ceylon Blue Glassy Tiger	*Ideopsis similis*	Very Common. Widely distributed throughout Hong Kong	-														1					
Grey Pansy	*Junonia atlites*	Common. Widely distributed in abandoned grassland and abandoned agricultural field throughout Hong Kong	-										1			1						
Long-tailed Blue	*Lampides boeticus*	Common. Widely distributed in abandoned field throughout Hong Kong	-														1				1	
Banded Tree Brown	*Lethe confusa*	Common. Widely distributed in woodland throughout Hong Kong	-										1									
Dark Evening Brown	*Melanitis phedima*	Uncommon. Widely distributed in woodland throughout Hong Kong	-																		4	
Dark Brand Bush Brown	*Mycalesis mineus*	Very Common. Widely distributed throughout Hong Kong	-			4		1					11	5		3	10				2	1
South China Bush Brown	*Mycalesis zonata*	Common. Widely distributed in woodland throughout Hong Kong	-										1									
Quaker	*Neopithecops zalmora*	Uncommon. Shek Mun Kap, Fan Lau, Tung Chung, Fung Yuen, Wu Kau Tang, Pak Tam Chung	-																			3
Common Sailer	*Neptis hylas*	Very Common. Widely distributed throughout Hong Kong	-										2								2	
Lime Butterfly	*Papilio demoleus*	Common. Widely distributed throughout Hong Kong	-											1			2					

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	Wl	AbAl	AP	AcAl	Ch	DA	G/S	Me	MW	Pl	Po	Re	TM	Wl	Wo
Red Helen	*Papilio helenus*	Very Common. Widely distributed throughout Hong Kong	-										1			1						
Great Mormon	*Papilio memnon*	Very Common. Widely distributed throughout Hong Kong	-						2		1		1	2			2					1
Paris Peacock	*Papilio paris*	Very Common. Widely distributed throughout Hong Kong	-										1	1								
Common Mormon	*Papilio polytes*	Very Common. Widely distributed throughout Hong Kong	-			4	2	2	2		1		17	6	2	2	17	2	1		2	6
Spangle	*Papilio protenor*	Very Common. Widely distributed throughout Hong Kong	-										6				3				1	1
Common Straight Swift	*Parnara guttata*	Common. Widely distributed in grassland throughout Hong Kong	-																	1		
Indian Cabbage White	Pieris canidia	Very Common. Widely distributed throughout Hong Kong	-			2	3	8	7		2	4	28	14	3	5	24		1		4	1
Pale Grass Blue	Pseudozizeeria maha	Very Common. Widely distributed throughout Hong Kong	-			4		3				3	49	2			24				9	5
Black Prince	Rohana parisatis	Common. Widely distributed throughout the woodland in Hong Kong	-			1							1									
Common Five-ring	Ypthima baldus	Very Common. Widely distributed in grassland throughout Hong Kong	-			1							2									1
Lesser Grass Blue	Zizina otis	Common. Widely distributed throughout Hong Kong	-										1				6					
Total				1	2	23	7	24	17	3	6	9	166	42	7	19	123	4	2	2	46	25

Notes:

1. AFCD (2020). Hong Kong Biodiversity Database.

Abbreviations:

- Conservation Status in Fellowes *et al.* (2002): LC = Local Concern
- Habitats: AbAl : abandoned agricultural land; AcAl: active agricultural land; AP: abandoned pond; Ch: channel; DA: developed area; G/S: grassland/shrubland; Me: meander; MW: mitigation wetland; Pl: plantation; Po: pond; Re: Reedbed; TM: Tidal marsh; Wl: wasteland; Wo: woodland; Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix G Odonate Species Recorded within the Study Area

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	Wl	AbAl	AP	AcAl	Ch	DA	G/S	Me	MW	Pl	Po	Re	TM	Wl	Wo
Blue Chaser	***Potamarcha congener***	**Common. Widely distribute in marsh throughout Hong Kong**	**Fellowes et al. (2002): LC**									1					2					
Ruby Darter	***Rhodothemis rufa***	**Common. Widely distribute in ponds and marshes throughout Hong Kong**	**Fellowes et al. (2002): LC**							1					2							
Scarlet Basker	***Urothemis signata***	**Common. Common in areas containing abandoned fish ponds throughout Hong Kong**	**Fellowes et al. (2002): LC**							7		1			2							
Amber-winged Glider	*Hydrobasileus croceus*	Common. Widely distribute in forested areas throughout Hong Kong	-																		1	
Asian Amberwing	*Brachythemis contaminata*	Abundant. Widely distribute in weedy ponds and sluggish streams	-		1		1	5		1		19	8			1			2	5	6	
Asian Pintail	*Acisoma panorpoides*	Common. Widely distribute in marshes and weedy ponds throughout Hong Kong	-						3		3					2						
Blue Dasher	*Brachydiplax chalybea*	Common. Widely distribute in marshes and weedy ponds throughout Hong Kong	-		1					1			1		2	2					2	
Blue Percher	*Diplacodes trivialis*	Abundant. Widespread, especially in late summer, when it	-										2			1						

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*												
				AP	Po	DA	Me	WI	AbAl	AP	AcAl	Ch	DA	G/S	Me	MW	Pl	Po	Re	TM	WI	Wo
		can be found almost everywhere in Hong Kong																				
Common Blue Skimmer	*Orthetrum glaucum*	Abundant. Widely distributed in streams, conduits, drainage channels, seepages and road gutters throughout Hong Kong.	-		3					3												
Common Bluetail	*Ischnura senegalensis*	Abundant. Widely distribute in all wetland habitats except fast flowing rivers throughout Hong Kong	-		2			20	1	2	1	2	2		3		6				2	
Common Flangetail	*Ictinogomphus pertinax*	Common. Widely distribute in ponds throughout Hong Kong	-		2					2												
Common Red Skimmer	*Orthetrum pruinosum*	Abundant. Widely distribute in slow streams, ponds, rain puddles and irrigation conduits	-		2				6	2	6	3										
Crimson Darter	*Crocothemis servilia*	Abundant. Widely distribute in cultivated areas, ponds and marshes throughout the New Territories	-			1	1	2					5		2	1					3	
Crimson Dropwing	*Trithemis aurora*	Abundant. Widely distribute in marshes, ponds, streams and ornamental ponds throughout Hong Kong	-										2									

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	Wl	AbAl	AP	AcAl	Ch	DA	G/S	Me	MW	Pl	Po	Re	TM	Wl	Wo
Evening Skimmer	*Tholymis tillarga*	Common. Widely distribute in marshes, weedy ponds and tanks throughout Hong Kong	-		4	4				4			6						1	1	1	
Green Skimmer	*Orthetrum sabina*	Abundant. Widely distribute in all wetland habitats throughout Hong Kong	-					2	6		6	1	5	1	1	1	2		1	2	3	
Lesser Emperor	*Anax parthenope*	Common. Aberdeen Country Park, Au Tau, Fung Yuen, Hok Tau Reservoir, Lamma Island, Lung Tsai Ng Yuen, Sha Lo Tung, South Lamma, Tung Chung Bay and Tung Ping Chau	-		3					3		2										
Orange-tailed Sprite	*Ceriagrion auranticum*	Abundant. Widely distribute in ponds and marshes throughout Hong Kong	-												1	1	3				1	
Pale-spotted Emperor	*Anax guttatus*	Common. Widely distribute in ponds and sluggish streams throughout Hong Kong	-																		1	
Pied Percher	*Neurothemis tullia*	Common. Widely distributed in swampy areas and marshes through out Hong Kong	-																		2	
Pied Skimmer	*Pseudothemis zonata*	Common. Widely distribute in woodlands adjacent to reservoirs, sluggish streams, ponds, tanks	-		2			1	1	2	1	6					1					

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	Wl	AbAl	AP	AcAl	Ch	DA	G/S	Me	MW	Pl	Po	Re	TM	Wl	Wo
		and marshes throughout Hong Kong																				
Red-faced Skimmer	*Orthetrum chrysis*	Abundant. Widely distribute in pools and marshy areas adjacent to flowing streams throughout Hong Kong.	-						3		3											
Regal Pond Cruiser	*Epophthalmia elegans*	Common. Widely distribute in reservoirs and large ponds throughout Hong Kong	-		1					1												
Russet Percher	*Neurothemis fulvia*	Common. Widely distribute in cultivated areas and streams throughout Hong Kong	-						4		4											
Saddlebag Glider	*Tramea virginia*	Abundant. Widely distribute in trees adjacent to ponds and lakes throughout Hong Kong	-			1	1					1	1								2	
Variegated Flutterer	*Rhyothemis variegata arria*	Common. Widely distribute in marshes, ponds and tanks throughout Hong Kong	-	10	22	3	1	17		32		4	20	2			10	2	4	15	4	
Wandering Glider	*Pantala flavescens*	Abundant. Widely distribute in all wetland habitats throughout Hong Kong	-	3	10	2		45	1	13	1	19	61	15	20	24	13		4	2	49	2
Wandering Midget	*Agriocnemis pygmaea*	Common. Widely distribute in marshes and weedy margins of ponds throughout Hong Kong	-		1					1												
Yellow Featherlegs	*Copera marginipes*	Abundant. Widely distribute in streams throughout Hong Kong	-		1					1												

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site					Study Area *(excluding Application Site)*													
				AP	Po	DA	Me	Wl	AbAl	AP	AcAl	Ch	DA	G/S	Me	MW	Pl	Po	Re	TM	Wl	Wo
Total				13	55	11	4	92	25	75	25	59	113	18	33	33	37	2	12	25	77	2

Notes:

1. AFCD (2020). Hong Kong Biodiversity Database.

Abbreviations:

- Conservation Status in Fellowes *et al.* (2002): LC = Local Concern
- Habitats: AbAl : abandoned agricultural land; AcAl: active agricultural land; AP: abandoned pond; Ch: channel; DA: developed area; G/S: grassland/shrubland; Me: meander; MW: mitigation wetland; Pl: plantation; Po: pond; Re: Reedbed; TM: Tidal marsh; Wl: wasteland; Wo: woodland; Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix H Abundance of Firefly recorded within the Study Area

Month	Apr		May		Jun		Jul		Aug		Sep		Oct	
Habitat	Bent-winged Firefly	Pyro sp.	Bent-winged Firefly	Pyro sp.	Bent-winged Firefly	Pyro sp.	Bent-winged Firefly	Pyro sp.	Bent-winged Firefly	Pyro sp.	Bent-winged Firefly	Pyro sp.	Bent-winged Firefly	Pyro sp.
Meander (Me)	4	6						1						
Tidal Marsh (TM)			1			1		2						
Abandoned Pond (AP)								1						
Developed Area (DA)							1							
Wasteland (Wl)								10		1				
Plantation (Pl)												1		
Total count	**4**	**6**	**1**	**0**	**0**	**1**	**1**	**14**	**0**	**1**	**0**	**1**	**0**	**0**

Appendix I Aquatic Fauna recorded within the Study Area

Species Name	Common Name	Relative Abundance at Sampling Locations						Conservation Status
		A	B	C	D	E	F	
Fish								
Channa maculata	Spotted snakehead				+		+	-
Clarias gariepinus	North African catfish		+					-
Ctenopharyngodon idellus	Grass carp				+		+	-
Hypophthalmichthys nobilis	Big Head Carp				+		+	-
Oreochromis niloticus	Nile tilapia	+	++	+	+++	+	+++	-
Periophthalmus cantonensis	Mudskipper				+++		+	-
Invertebrate								
Perisesarma bidens	Sesarmine crab				++		+++	-
Pomacea canaliculata		++		++		++		-
Uca arcuata	Fiddler crab				+++			-

Appendix J – Night-Time Glare Impact Assessment for Firefly and Great Cormorant Night Roost in Nam Sang Wai

1 Introduction

1.1.1 The Mai Po Bent-winged Firefly habitat and Great Cormorant night roost in Nam Sang Wai (**Figure 3a** of the current EcoIA refers) are considered as two light sensitive receivers partially within the Assessment Area. The Mai Po Bent-winged Firefly habitat is located slightly closer to the Proposed Development than the Great Cormorant night roost, although it should be noted that the extent of both is indicative only and could change from time to time. There are two nos. of night roost of ardeids identified on both sides of Kam Tin River (**Figure 2b** of the current EcoIA refers). However, ardeid night roost is not considered as a sensitive site under the current light assessment compared with the former two. With reference to the locations of the two night roost, there are existing light sources in the vicinity i.e. the light along Yuen Long Highway. And it is also not uncommon for ardeids to choose some relatively urbanised locations as their night roost.

1.1.2 A night-time glare impact assessment has been conducted to illustrate the night-time artificial light impact on the fireflies and Great Cormorant night roost in Nam Sang Wai. This Technical Note presents the results of night-time ambient light intensity measurements and light modelling to simulate the potential change on the night-time ambient light environment at the southern part of Nam Sang Wai near Yuen Long Town, due to the Proposed Development.

2 Locations of Habitats for Firefly and the Cormorant Night Roost

2.1 Mai Po Bent-winged Firefly

2.1.1 Mai Po Bent-winged Firefly (*Pteroptyx maipo*)[1] mainly occurs around the Deep Bay Ramsar Site and the Wetland Conservation Area (WCA). This species was found to be associated with mangrove fringed intertidal water courses (Yiu, 2012)[2]. A recent EcoIA also revealed the distribution of this species in Nam Sang Wai (AEC, 2016)[3].

2.1.2 While relevant studies on the impact of artificial light on firefly are limited in Hong Kong, a certain degree of behavioural response by the Mai Po Bent-winged Firefly against an experimental artificial light set up at night was recorded by Yiu in 2012 in Tin Shui Wai. The experiment showed that this firefly species started to flash at about 35 minutes after sunset when the ambient light intensity dropped to about 0.2 lux (Yiu, 2012). The number of flashing reduced when there were light sources nearby.

2.1.3 In the EcoIA for the Proposed Development at Nam Sang Wai & Lut Chau (Application No. A/YL-NSW/242) (AEC, 2016), light intensity measurements at sites used by this firefly (including Nam Sang Wai, Tin Shui Wai and Hong Kong Wetland Park) showed that the light intensity range where this firefly occurred and actively flashing was 0.01 – 0.49 lux. Another EcoIA for the Proposed Development at Fung Lok Wai (Application No. A/YL-LFS/224) (Environ, 2013)[4],

[1] Mai Po Bent-winged Firefly (*Pteroptyx maipo*) was first discovered as an unidentified firefly species in the mangrove of Hong Kong Wetland Park in 2003 by AFCD. This species is currently not known to occur elsewhere outside Hong Kong and thus it is regarded as an endemic species in Hong Kong and considered to be of conservation importance.

[2] Yiu V. (2012) Effect of artificial light on firefly flashing activity. Insect News – Hong Kong Entomological Society Newsletter No. 4, 2012

[3] AEC (2016) Proposed Comprehensive Development with Wetland Enhancement at Nam Sang Wai and Lut Chau – Ecological Impact Assessment (Application No. A/YL-NSW/242)

[4] Environ (2013) S.16 Application (Ref: A/YL-LFS/224) Proposed Comprehensive Residential Development with a Wetland Nature Reserve in "Other Specified Uses" Annotated "Comprehensive Development and Wetland Enhancement Area" Zone at Lot 1457 R.P. in DD123 and Adjoining Government Land Fung Lok Wai, Lau Fau Shan, Yuen Long – Ecological Impact Assessment

which conducted light intensity measurements between April and September 2012 at Fung Lok Wai; and between July and September in Tsim Bei Tsui and Sheung Pak Nai, showed that the light intensity range where the firefly occurred and actively flashing was 0.05 – 0.33 lux. Whilst the areas with high number of firefly flashing were as high as 0.32 lux. In the EcoIA for the Proposed Development at Tung Shing Lei (Application No. A/YL-NSW/274), the measures light intensity was in the range of 0.00 – 0.7 Lux at the accessible locations within the two habitats. The measured light intensity under clear sky night was mostly within the range 0.10 – 0.20 Lux while that for an overcast sky was 0.30 – 0.50 Lux. According to the measurement result of A/YL-NSW/274, under different sky or weather conditions, the ambient light intensity at the 2 habitats could vary by about 0.3 Lux.

2.1.4 The current EcoIA also conducted ecological survey for fireflies and measured the background light intensity when fireflies were recorded. The detailed survey results refer to the EcoIA.

2.2 Cormorant Night Roost

2.2.1 The cormorants roosted mainly in exotic trees such as *Eucalyptus* spp. It is located about 500m away from the Application Site and is at the periphery or beyond the 500m Assessment Area (**Figure 3a** of the current EcoIA refers). The Great Cormorant roost is also separated from the Application Site by a section of Old Kam Tin River and other habitats.

3 Study Site for Night-time Light Impact Assessment & Existing Environs

3.1.1 **Figure 1** shows the locations of the firefly habitat and the existing environs in the vicinity. The closest distance of the habitat from the Application Site boundary is about 437m. Therefore, it is within the 500m Assessment Area.

3.1.2 The firefly habitat along a meander located at the south-western corner of Nam Sang Wai could be broadly divided into the eastern and western portions. The eastern portion mainly consists of abandoned ponds, the existing village Chung Hau Yu Man San Tsuen, narrow paved and unpaved roads, patchy grasslands and fruit trees grown by villagers, etc. The western portion consists of an extensive marshy area covered by mangrove trees and reeds and is in proximity to the existing Hong Kong School of Motoring's Yuen Long Driving School (YLDS). An access footpath separating the eastern and western portions connect the Nam Sang Wai Jetty and a store.

3.1.3 There is an existing residential development named The Parcville which is located in proximity to the firefly habitat. This residential development is of 13 – 15 storeys, accommodating about 1,618 units and has a separation distance of about 350m from the firefly habitat (closer than that from the Application Site boundary).

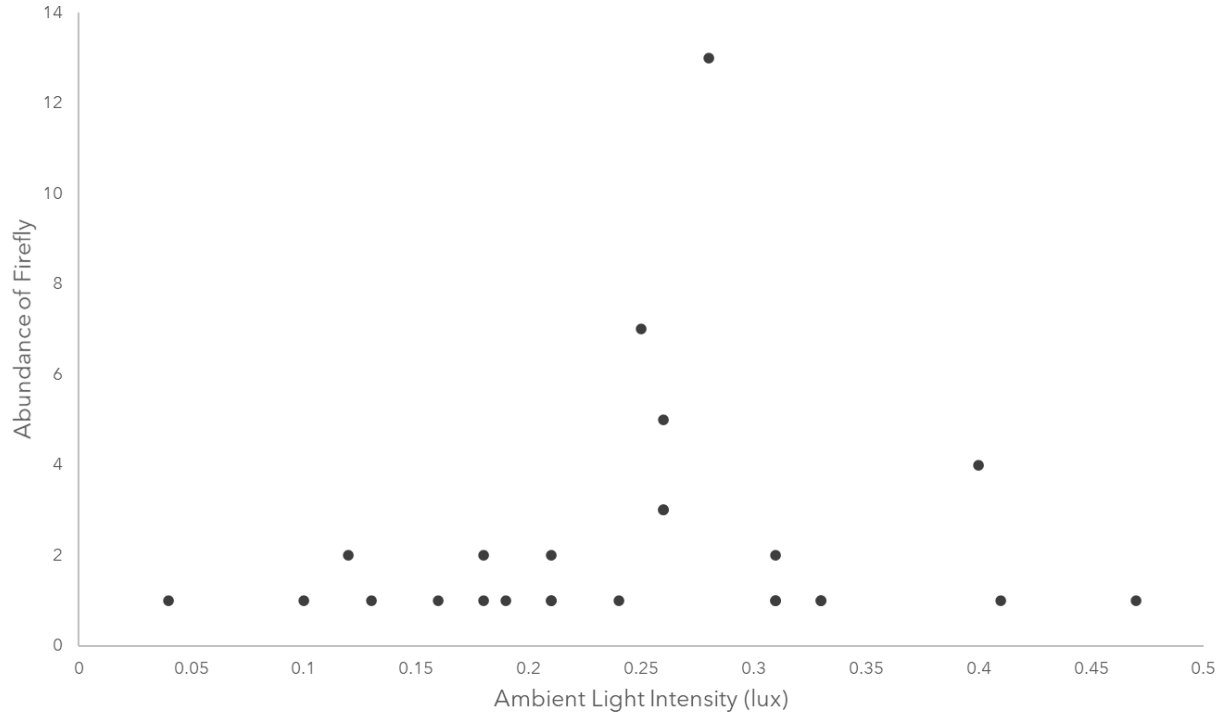
3.1.4 Besides, the Hong Kong School of Motoring's (HKSM) Yuen Long Driving School (YLDS) is located right adjacent to and on the opposite side of the firefly habitat. According to the mobile app of YLDS, this facility offers training sessions for learner drivers and would operate till 2230 during weekdays, Saturdays and public holidays, and 1830 during Sundays.

4 Night-Time Light Intensity Measurement Results

4.1.1 Night-time light intensity measurements were conducted in parallel to firefly night survey between Apr – Oct 2020 at the accessible locations within the habitat. Whenever firefly was recorded, the background light would be recorded using a light intensity meter[5] at the same time. Details of the night-time light intensity measurement methodology refers to the EcoIA. The measurements were conducted during night surveys each starting at approximately 30 minutes after sunset and lasted for about 1.5 hours. The light intensity meter had the lowest detection limit down to 0.01 lux, they were facing upward during the measurements.

4.1.2 The overall range of background light intensity recorded during the firefly survey was 0.03 – 0.65 Lux. A total of two firefly species i.e. Mai Po Bent-winged Firefly and *Pyrocoelia* sp. were recorded. The background light intensity when Mai-po Bent-winged Firefly was recorded are presented in **Plate 4.1** below:

Plate 4.1 Ambient light intensity when Mai Po Bent-winged Firefly was recorded



4.1.3 The range of the ambient light intensity when Mai Po Bent-winged Firefly was recorded is between about 0.04 Lux to 0.47 Lux, where a single individual was recorded. A total of 13 individuals

[5] TES-1334A

were recorded during a single occasion during the entire survey period (Apr – Oct 2020). The ambient light intensity at this occasion was 0.28 Lux.

4.1.4 The distribution of Mai Po Bent-winged Firefly within the Assessment Area is provided in Figure 6e of the EcoIA. Apart from Mai Po Bent-winged Firefly, another species i.e., *Pyrocoelia* sp. was also recorded during the survey but this species is not considered to be of conservation importance.

5 Light Intensity Simulation – Reasonable Worst-Case Scenario

5.1.1 The DIALux software[6] has been adopted to simulate the light intensity that would be emitted by the Proposed Development onto the two habitats. This software was adopted in a previously approved planning application in Fung Lok Wai (Application No. A/YL-LFS/224) and Tung Shing Lei (Application No. A/YL-NSW/274). The approach of the current light intensity simulation is also similar to the approach adopted in this approved planning application.

5.1.2 It should be noted that it is very unlikely for every room of a residential building to have their lights switched on at the same time at night. Site observations conducted in the Approved Planning Application No. A/YL-NSW/274 also found that, during night-time (i.e., within 2 hours after sunset), only about 10-30% of the flat units in The Parcville (i.e. residential development of similar development intensity as the Proposed Development but at a closer distance from Nam Sang Wai) were with lights turned on, and most of those units had only either the living rooms or the bedrooms with light turned on. Also, depending on the locations within the firefly habitat, majority of the lower storeys of residential buildings was screened off by the trees/vegetation/physical barriers nearby.

5.1.3 Building height adopted in the simulation model follow the building layout plan and as below:

Input Parameter	Nos. of Storey[1]	Approximate Main Roof Level (mPD)[2]
Residential Block	T1 – 23 storeys	T1 – 99.9
	T2 – 24 storeys	T2 – 99.9
	T3 – 24 storeys	T3 – 99.9
	T5 – 24 storeys	T5 – 100.0
	T6 – 24 storeys	T6 – 100.0
	T7 – 24 storeys	T7 – 100.0
	T8 – 24 storeys	T8 – 100.0

Note:
[1] Tower 4 (T4) is omitted deliberately.

[2] Ground level is 6.5 mPD.

5.1.4 In order to quantify a reasonable worst-case light intensity generated by the Proposed Development, the following key assumptions have been adopted. The design parameters and building sections

[6] DIALux is widely adopted for the quantification of light intensity generated by different lighting schemes, including indoor and outdoor lighting schemes.

showing the environ between the Proposed Development and Nam Sang Wai are given in **Figure 1 and 3** respectively.

- Only lighting in the units that facing north and northwest are considered in the model as the light from other directions would be completely blocked by the building itself.
- For every unit facing north and northwest in all 7 residential towers, lighting in the living room and one bedroom would be turned on.
- An average light intensity of 300 lux[7] below the lighting fixture within those living rooms and bedrooms are adopted, which is a very conservative assumption as compared to actual measurements of only about 100 – 150 lux for residential development.
- Two small knolls, one at the south of Shan Pui Tsuen (about 60m tall) and another one to the north of the Application Site (about 25m tall) had been incorporated into the model, the dimension reflects the contour in the base map.
- Total number of floors of all towers follows the building plan.
- To account for building envelope reflection, a 20%[8] – 30%[9] reflectance can be assumed. For the current simulation, the building envelope adopted 30% reflectance.
- Ceiling 60%[10] reflectance.
- Floor 10%[11] reflectance.
- 78% transmittance[12] has been assumed for the glass panes to reflect the current design parameter.
- All blinds are open, which is also a very conservative assumption.

5.1.5 As a reasonable worse case, outdoor and security lighting are not included in the simulation. It is because that considered the separation (i.e., about 437m) between the nearest night-time light sensitive receivers i.e., the Mai Po Bent-winged Firefly habitat, the vegetation of existing topography as well as the tree planting along the fringe of the proposed development would act as effective physical barriers which would be able to screen out the outdoor and security lighting on the ground floor and lower storeys.

5.1.6 The light simulation model had also considered the local topography including the knoll behind Shan Pui Tsuen and the knoll at the north side of the proposed development. These topography features may help screen off the potential light impact from the nearby residential developments.

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[7] Typical measurements suggested a 150 lux for living room and less than 100 lux for bedrooms. In addition, reference also stated that the light intensity of general household ranges from 50 – 300 lux. (cont'd in next page)

- J. Holton, "Strategy Guideline: High Performance Residential Lighting", U.S. Department of Energy (February 2012).
- "Recommended Light Levels (Illuminance) for Outdoor and Indoor Venues", National optical Astronomy Observatory.
- "IESNA Lighting Handbook", Illuminating Engineering Society of North America.
- EN12464-1:2011, "Light and Lighting – Lighting of Work Places".

[8] BEAM Plus New Buildings Version 2.0 (09.2019).

[9] https://www.dial.de/en/DIALUX/

[10] BEAM Plus New Buildings Version 2.0 (09.2019).

[11] *Ibid.*

[12] Double glazing clear glass window with 78% transmittance adopted in the model as a reasonable worst case (reference: https://www.archibiz.com.sg/wp-content/uploads/2018/01/SYP-Catalogue-Architectural-Glass-2017.pdf). Transmittance of less than 50% should not be used for windows to comply with the requirements of the Residential Thermal Transfer Value (RTTV) requirements in Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014 (BD, 2014).

5.1.7 Two potential points of interest within the firefly habitat i.e., Point A and Point B are anticipated to be receiving higher degree of light as their locations are the nearest to the proposed development (**Figure 1** refers). Simulation results from DIALux are given in **Figure 2a – c**. It shows that the increase in light intensity contributed by the Proposed Development is the highest (0.03 lux) at the southern section of Nam Sang Wai (Point B), which only occupied a tiny portion (about 2%) of the total area of the firefly habitat. The rest of the eastern half of the firefly habitat, the increase is about 0.01 – 0.02 lux. For the western half of the firefly habitat, the increase is negligible (0.00 lux) which occupied about 50% of the firefly habitat.

5.1.8 This simulation is based on a reasonable worst-case in which all the flats that are facing north and northwest side towards the firefly habitat would have lights on in the living room and one bedroom and ALL the blinds/curtains are open. This is a very conservative approach because, in reality, a considerable number of the flats would not have lights on or have the blinds/curtains closed.

6 Evaluation and Conclusion

6.1.1 **Section 4** has discussed that the existing ambient night-time light intensity at the south of Nam Sang Wai was in the order of 0.03 – 0.65 lux at areas away from local light sources. While the range of the ambient light intensity when the concerned Mai Po Bent-winged Firefly could be recorded was 0.04 – 0.47 lux. According to the measurement in the same location conducted for approved planning application A/YL-NSW/274, the variation in light intensity during nights with different sky conditions could be up to about 0.3 lux. The light intensity simulation exercise conducted for the current Proposed Development adopted a similar approach and adopted the same software as previously approved planning applications (Application No. A/YL-LFS/224 and Application No. A/YL-NSW/274). The current simulation predicted a minor increase in light intensity of 0.00 – 0.03 lux generated by the Proposed Development which is far below the natural variation measured during the field measurement. For night roost of Great Cormorant, the predicted increase in light intensity is also minor (0.00 – 0.02 lux) (**Figures 2a – c** refer). Such increase is considered to be minor for the night roost when considering the natural fluctuation due to different sky conditions.

6.1.2 Besides, previous studies as summarised in **Section 2** have also concluded that Mai Po Bent-winged Firefly appeared to be well adapted to ambient light intensity from 0.05 to 0.32[13] which is within the range of the current ambient light measurement results in the firefly habitat in Nam Sang Wai. The natural fluctuation in night-time light intensity due to different weather conditions is also much higher than the predicted increase of 0.00 – 0.03 lux in light intensity generated by the Proposed Development.

6.1.3 It should be noted that all the outdoor and security lights are situated at ground level and lower storeys. There would not be large outdoor advertisement boards nor flood light directing towards the north and northwest where the concerned night-time light sensitive receivers i.e., the Mai Po Bent-winged Firefly and other wetland habitats are located. Considering the distance between the proposed development and the concerned night-time light sensitive receivers is over 430m, the vegetation of existing topography as well as the tree planting currently proposed along the edge of

[13] Environ (2013) S.16 Application (Ref: A/YL-LFS/224) Proposed Comprehensive Residential Development with a Wetland Nature Reserve in "Other Specified Uses" Annotated "Comprehensive Development and Wetland Enhancement Area" Zone at Lot 1457 R.P. in DD123 and Adjoining Government Land Fung Lok Wai, Lau Fau Shan, Yuen Long – Ecological Impact Assessment

the Application Site would be able to act as physical barriers to screen out these outdoor and security light sources.

6.1.4 It is therefore considered that the Proposed Development would not cause significant impacts on the Mai Po Bent-winged Firefly and Great Cormorant night roost in Nam Sang Wai in term of night-time artificial light. Although mitigation measures are not required in terms of artificial light during night-time, it is recommended for the Proposed Development to avoid orientating any external flood light towards the firefly habitat in Nam Sang Wai to minimise any potential disturbance.

FIGURES

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N

NAM SANG WAI ROAD

NAM SANG WAI

LEEMAN HYDRAULIC TECHNOLOGY CO LTD

CHINA DYING HOLDING LTD

DAIDO BUILDING MATERIAL LTD

SHAN PUI RIVER

HONG KONG SCHOOL OF MOTORING

MEANDER

POINT A

POINT B

520m

CHUNG HAU YU MAN SAN TSUEN

SHAN PUI TSUEN

PROJECT SITE

TWIN REGENCY

YUEN LONG LOGISTICS CENTRE

CROWN DATA CENTRE III

THE PARCVILLE

KNOLL

YUEN LONG HIGHWAY

WONG UK TSUEN

0 50 100 150 200 250
METRES

LEGEND

- PROJECT SITE
- 500m ASSESSMENT AREA
- NAM SANG WAI BOUNDARY
- MAI PO BENT-WINGED FIREFLY HABITAT IN NAM SANG WAI (INDICATIVE) (AEC, 2016)
- GREAT CORMORANT NIGHT ROOST IN NAM SANG WAI (INDICATIVE)
- THE PARCVILLE
- WETLAND CONSERVATION AREA
- WETLAND BUFFER AREA

Rev	Description	By	Date
G	SEVENTH ISSUE	GL	07/23
F	SIXTH ISSUE	GL	01/23
E	FIFTH ISSUE	GL	12/22
D	FOURTH ISSUE	GL	01/22

Consultant

ARUP

Project Title

FEASIBILITY OF A SITE IN VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES FOR APPLICATION UNDER LAND SHARING PILOT SCHEME

Drawing title

HABITATS OF MAI PO BENT-WINGED FIREFLY AND GREAT CORMORANT NIGHT ROOSTS IN NAM SANG WAI

Drawing no.	Rev.
FIGURE 1	G

Drawn	Date	Checked	Approved
GL	07/23	IW	FC

Scale	Status
1:5000 @A3	PRELIMINARY

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Printed by : 7/10/2023
Filename : \\global\EastAsia\HKG\Group\CIENV\env\project\Tung Shing Lei Phase 2\13 Drawing Deliverables\Light assessment\20230602 layout update\Figure 1 - Habitats of MaiPo Bent-wonged Firefly in Nam Sang Wai.dgn

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LEGEND

- PROJECT SITE
- MAI PO BENT-WINGED FIREFLY HABITAT IN NAM SANG WAI
- GREAT CORMORANT NIGHT ROOST IN NAM SANG WAI (INDICATIVE)

Rev	Description	By	Date
C	THIRD ISSUE	GL	07/23
B	SECOND ISSUE	GL	01/23
A	FIRST ISSUE	GL	12/22

Consultant

ARUP

Project Title

FEASIBILITY OF A SITE IN VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES FOR APPLICATION UNDER LAND SHARING PILOT SCHEME

Drawing title

PREDICTED LIGHT INTENSITY (LUX) CAUSED BY TOWER 1,2,3 DURING NIGHT TIME (NORTH AND NORTHWEST - FACING LIGHT ONLY)

Drawing no.	Rev.
FIGURE 2a	C

Drawn	Date	Checked	Approved
GL	07/23	EL	FC

Scale	Status
AS SHOWN	PRELIMINARY

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Printed by : 7/10/2023
Filename : \\global\EastAsia\HKG\Group\CIENV\env\project\Tung Shing Lei Phase 2\13 Drawing Deliverables\Light assessment\20230706 site boundary update\Figure 2a - Predicted Light Intensity (lux) Caused by Tower 1,2,3).dgn

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LEGEND

- PROJECT SITE
- MAI PO BENT-WINGED FIREFLY HABITAT IN NAM SANG WAI
- GREAT CORMORANT NIGHT ROOST IN NAM SANG WAI (INDICATIVE)

Rev	Description	By	Date
C	THIRD ISSUE	GL	07/23
B	SECOND ISSUE	GL	01/23
A	FIRST ISSUE	GL	12/22

Consultant

ARUP

Project Title

FEASIBILITY OF A SITE IN VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES FOR APPLICATION UNDER LAND SHARING PILOT SCHEME

Drawing title

PREDICTED LIGHT INTENSITY (LUX) CAUSED BY TOWER 5,6 DURING NIGHT TIME (NORTH AND NORTHWEST - FACING LIGHT ONLY)

Drawing no.	Rev.
FIGURE 2b	C

Drawn	Date	Checked	Approved
GL	07/23	EL	FC

Scale	Status
AS SHOWN	PRELIMINARY

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Printed by : 7/10/2023
Filename : \\global\EastAsia\HKG\Group\CIEN\project\Tung Shing Lei Phase 2\13 Drawing Deliverables\Light assessment\20230706 site boundary update\Figure 2b - Predicted Light Intensity (lux) Caused by Tower 5,6,7.dgn

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LEGEND

- PROJECT SITE
- MAI PO BENT-WINGED FIREFLY HABITAT IN NAM SANG WAI
- GREAT CORMORANT NIGHT ROOST IN NAM SANG WAI (INDICATIVE)

Rev	Description	By	Date
C	THIRD ISSUE	GL	07/23
B	SECOND ISSUE	GL	01/23
A	FIRST ISSUE	GL	12/22

Consultant

ARUP

Project Title

FEASIBILITY OF A SITE IN VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES FOR APPLICATION UNDER LAND SHARING PILOT SCHEME

Drawing title

PREDICTED LIGHT INTENSITY (LUX) CAUSED BY TOWER 7 8 DURING NIGHT TIME (NORTH AND NORTHWEST - FACING LIGHT ONLY)

Drawing no.	Rev.
FIGURE 2c	C

Drawn	Date	Checked	Approved
GL	07/23	EL	FC

Scale	Status
AS SHOWN	PRELIMINARY

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Printed by : 7/10/2023
Filename : \\global\EastAsia\HKG\Group\CIEN\Y\env\project\Tung Shing Lei Phase 2\13 Drawing Deliverables\Light assessment\20230706 site boundary update\Figure 2c - Predicted Light Intensity (lux) Caused by Tower 8_9_10.dgn

APPENDICES



Site Demarcation Plan

TUNG SHING LEI "R(D)" ZONE

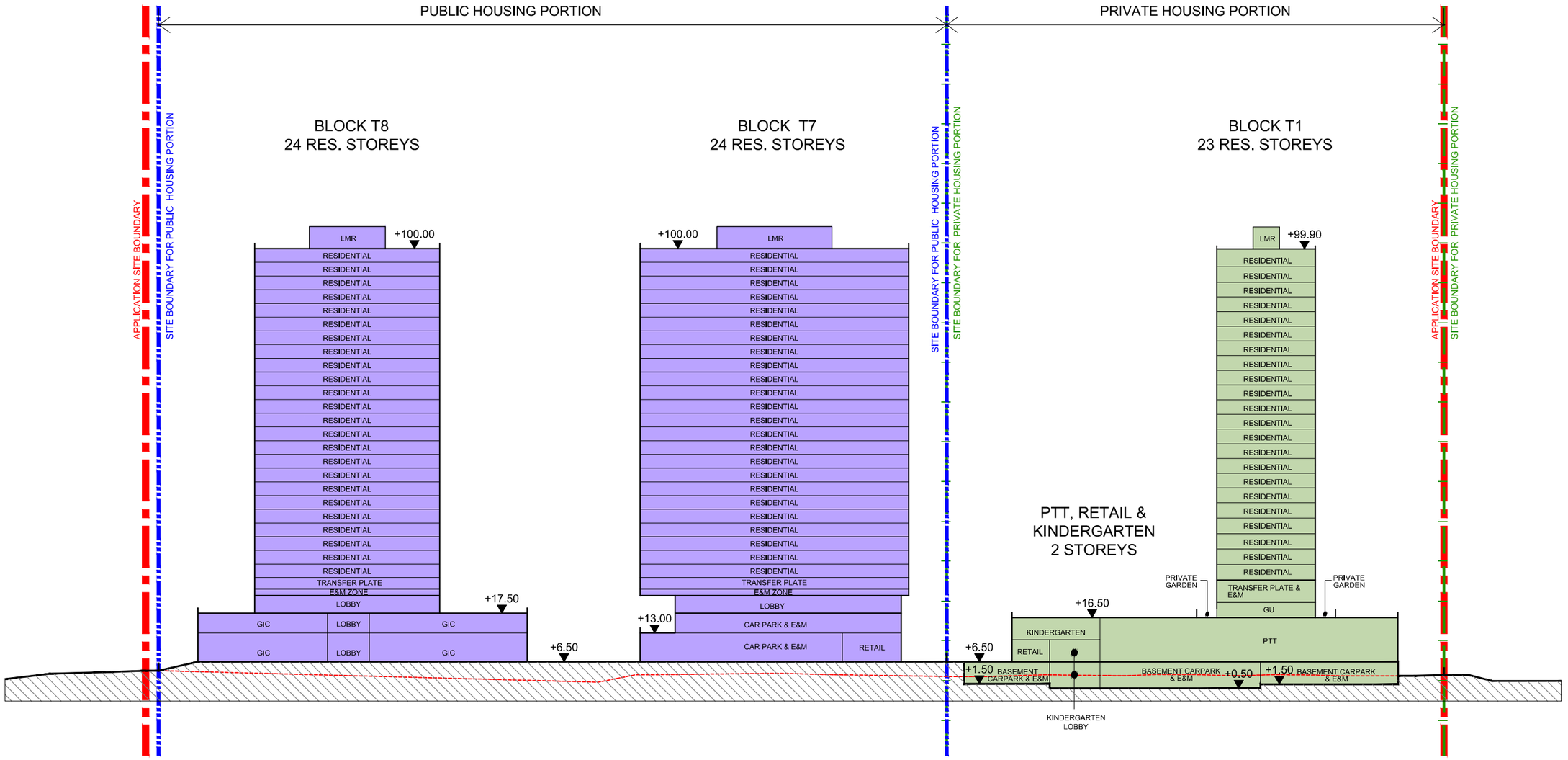
PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 15 MAR 2024
1 : 2500 (A3)

ARCHI+
ARCHIPLUS INTERNATIONAL LIMITED

LEGEND

------ EXISTING SITE LEVEL



SECTION S1

Indicative Section S1

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 30 OCT 2023
1 : 1000 (A3)

ARCHI+
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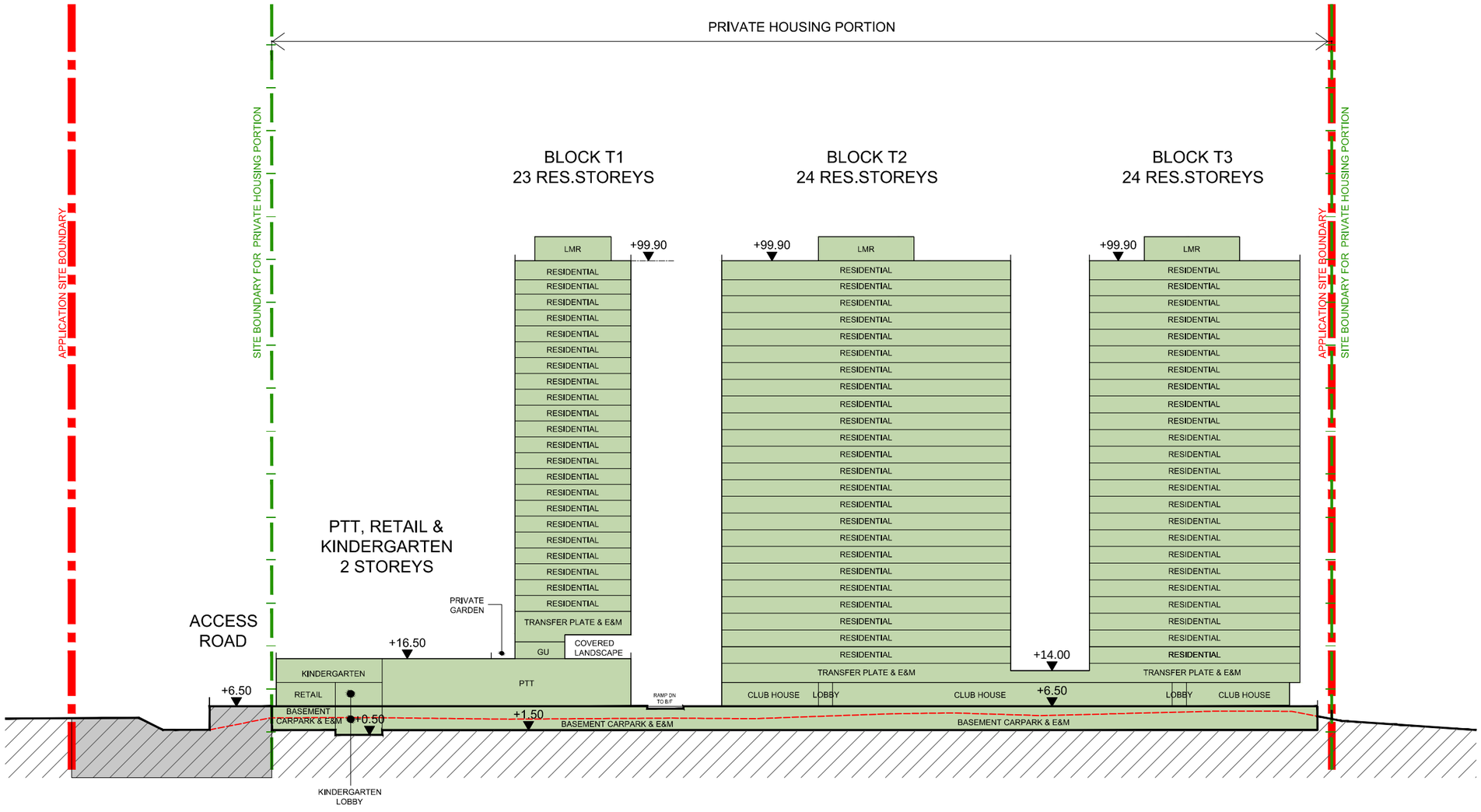
LEGEND

EXISTING SITE LEVEL



SECTION S2

Indicative Section S2

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 1000 (A3)

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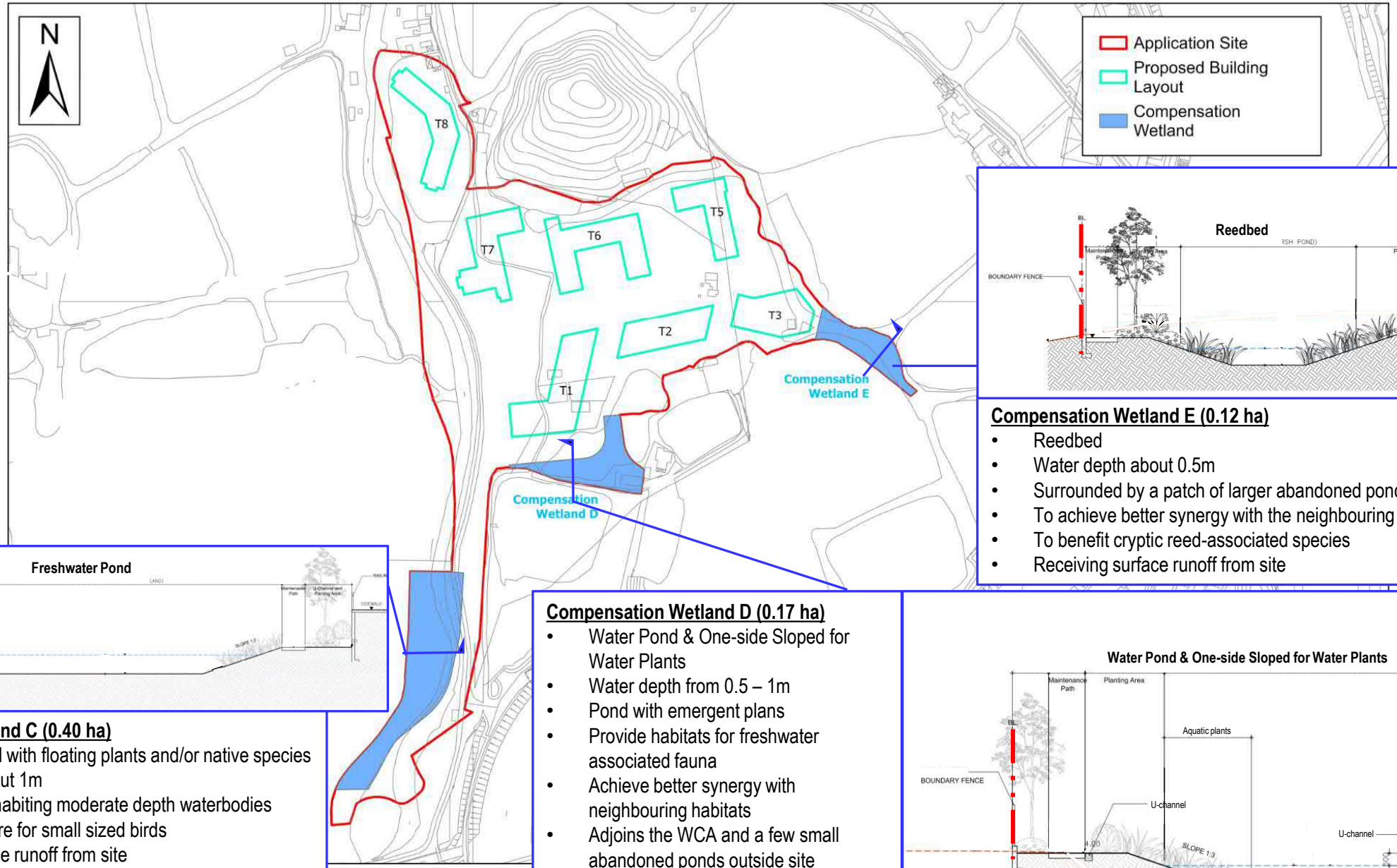
APPENDIX K – Summary of Preliminary Ecological Considerations of the Compensation Wetlands

Total Size (0.69 ha)	Design considerations	Construction	Operation approach	Long term management approach
Compensation Wetland C (0.40 ha)	• Form – Retention pond with soft substrate bottom • Water depth about 1m • Vegetation – terrestrial native species at pond edge; floating plants • Ecology – Benefit fauna inhabiting moderate depth waterbodies; perching structures for small sized birds	• Excavate and compact in-situ soil to form pond bottom • Suitable waterproofing as necessary • Rainwater as the water source	• Collect stormwater runoff from the private development site • Replenish water from retention tank as necessary • Overflow to N49	• Low maintenance • Occasional removal of debris/dead plants from water • Occasional trimming or removal of invasive vegetation
Compensation Wetland D (0.17 ha)	• Form – Retention pond with soft substrate bottom • Water depth around 0.5 – 1m • Vegetation – Emergent plants • Ecology – Provide habitats for freshwater associated fauna; adjoins the WCA and a few small abandoned ponds outside site boundary to achieve better synergy of habitats	• Excavate and compact in-situ soil to form pond bottom • Suitable waterproofing as necessary • Rainwater as the water source	• Collect stormwater runoff from the private development site • Overflow to retention tank for irrigation • Potential visual amenity for residents	• Regular checking of water quality and potential artificial aeration as necessary • Regular removal of debris/ dead plants from water • Regular trimming or removal of invasive vegetation
Compensation Wetland E (0.12 ha)	• Form – Freshwater reedbed (water depth about 0.5m) • Vegetation – Reeds • Ecology – Benefit cryptic reed-associated species; surrounded by a patch of larger abandoned ponds to achieve better synergy of habitats	• Excavate and compact in-situ soil • Pond mud might be required for reeds • Allow stormwater to fill up the pond • Planting of reed and aid the establishment in the early stage if necessary	• Collect stormwater runoff from the private development site • Overflow to retention tank for irrigation • Self-operational; require minimal operational intervention	• Cutting overgrown reed • Removal of invasive vegetation

Note: A Habitat Creation and Management Plan will be developed for all the compensation wetlands during the detailed design stage. The information in this appendix will be subject to further review and potential changes.

Appendix L – Conceptual Design of the Compensation Wetlands



Compensation Wetland E (0.12 ha)

- Reedbed
- Water depth about 0.5m
- Surrounded by a patch of larger abandoned ponds
- To achieve better synergy with the neighbouring habitats
- To benefit cryptic reed-associated species
- Receiving surface runoff from site

Compensation Wetland C (0.40 ha)

- Freshwater pond with floating plants and/or native species
- Water depth about 1m
- Benefit fauna inhabiting moderate depth waterbodies
- Perching structure for small sized birds
- Receiving surface runoff from site
- Water reusing for irrigation

Compensation Wetland D (0.17 ha)

- Water Pond & One-side Sloped for Water Plants
- Water depth from 0.5 – 1m
- Pond with emergent plans
- Provide habitats for freshwater associated fauna
- Achieve better synergy with neighbouring habitats
- Adjoins the WCA and a few small abandoned ponds outside site boundary
- Receiving surface runoff from site

Proposed Land Sharing Pilot Scheme for a Site at Various Lots in D.D. 115, Yuen Long, the New Territories – Wetland Creation Scheme

1. BACKGROUND

1.1 The Application Site is located within the Wetland Buffer Area (WBA), which is approximately 6 hectares in size and on "Residential (Group D)" Zone under the approved Nam Sang Wai Outline Zoning Plan (OZP) – S/YL-NSW/8.

1.2 About 0.23 ha of abandoned pond (low ecological value) and about 0.46 ha of pond (low to medium ecological value) (i.e., a total of 0.69ha) within the Application Site will be lost due to the proposed development. The affected pond and abandoned pond are of lower ecological value than other similar habitats in the region, given their small sizes, being isolated from other similar habitats, and lack of proper management, the ecological impact due to their permanent loss is considered as **minor** and **minor to moderate** respectively and mitigation is recommended to compensate the loss of wetland during operational phase. Compensation should also be able to achieve the no net loss of wetland principle under TPB PG No. 12C. In order to compensate for the wetland loss, three wetland units (in the form as managed pond, and reedbed with expected higher overall ecological value than the existing habitats) would be recreated within the Application Site during the operational phase. The purposes of the proposed wetlands would consider beneficial functions including but not limited to e.g., provision for wildlife habitats, educational demonstration and/or water polishing etc.

2. SITE CHARACTERISTICS

2.1 As discussed in baseline sections of the EcoIA, the Application Site is entirely located within Wetland Buffer Area (WBA). The Application Site is largely left vacant and is currently dominated by wasteland habitat. However, there are also a pond, portions of an abandoned pond, sections of a tidal meander, and small area of developed area within the Application Site.

2.2 Though the pond at the northern end of the Application Site is reported to have engaged in a Fishpond Management Agreement, based upon on site observations during the ecological surveys over the past years, it might not be operated for commercial fish farming and thus not be managed at the same level as normal commercial fishponds. The abandoned pond was abandoned long time ago and has been fully overgrown by vegetations. Due to its close proximity to Yuen Long Highway and some village settlements nearby, the existing environment within and near the Application Site has endured a certain level of disturbance from human activities in nearby villages.

3. LINKAGE WITH NEARBY HABITATS

3.1 In order to rationalize the strategy for implementing the creation of wetlands inside the Application Site, it is required to have an overview of the surrounding habitats. As the northern, eastern and southern sides of the Application Site are within the WCA boundary, which is intended for wetland conservation, synergistic effects between the proposed wetlands within the Application Site and the wetlands within the WCA might

occur.

3.2 As shown in the habitat map of the EcoIA (**Figure A**), the area adjoining the eastern side of the Application Site is abandoned pond, but it was observed that weedy vegetation was cleared in these ponds and there was shallow water inside since 2021. An ecological enhancement study at six ponds to the east of the Application Site is underway. Four ponds were served as trials and two as control. Water level management were conducted at the trial ponds to enhance the feeding opportunities of waterbirds. Other management practices include clearance of weedy vegetation as needed.

3.3 Habitats adjoining the south and southwestern side of the Application Site are wasteland, abandoned pond and meander, which have their respective ecological values of low, low to medium, and medium respectively.

3.4 Habitats adjoining the west side of the Application Site are meander, wasteland and reedbed which have their respective ecological values of low to medium, low, and low to medium respectively. Habitats adjoining the northern side of the Application Site are woodland, and mitigation wetland which have their respective ecological values of low, and medium respectively.

4. RATIONALES FOR PROVIDING THE WETLAND HABITATS

4.1 According to the EcoIA, the small area size 0.69ha of abandoned pond and pond within the Application Site only supported low waterbird usage (i.e., only 8 species of waterbirds (**Table 4.1**)), and hence the direct impact due to the permanent loss of 0.23ha of abandoned pond during operational phase is considered as **minor** while that of the semi-active pond is considered as **minor to moderate**. Mitigation for the permanent loss of the semi-active pond by provisions of compensation wetland is recommended. Compensation should also be able to achieve the principle of no net loss of wetland under TPB PG No. 12C.

4.2 After reviewing the neighboring habitats adjoining the Application Site, the proposed habitats for the compensation wetland within the Application Site would follow the wetland habitat types found in the vicinity of the Application Site. The ecological value of different wetland habitats within the Study Area specified in the EcoIA is shown in **Table 4.2**. The designs of the proposed habitats in the compensation wetland are also aimed to attract the waterbirds found during the baseline survey as specified in the EcoIA. In addition, as shown on Landscape Master Plan, about 5-10m at the periphery of the Application Site is a building set back from the WCA. This proposed landscape area together with the compensation wetland along the periphery of the Application Site would also serve as a wetland and visual buffer for the surrounding environment during the operational phase.

4.3 As the proposed project is a housing development, elements with education purpose for the residents would be incorporated in the present wetland design. Examples for education demonstration include kiosks to provide nature conservation information such as plant species, ecological functions etc. to the residents.

4.4 Due to the site constraints, wetland areas for compensation will be provided mainly at

the edge of the Application Site, which can also together with the landscape planting to provide a wetland and visual buffer to the WCA to comply with the TPB PG-No. 12C.

Table 4.1 Waterbird Species Recorded within the Abandoned Pond and Pond within the Application Site during the Baseline Survey for EcoIA

No.	Species
1	Great Cormorant
2	Little Egret
3	Chinese Pond Heron
4	Yellow Bittern
5	Common Kingfisher
6	White-breasted Waterhen
7	Grey Heron
8	Common Moorhen

Table 4.2 Ecological Value of Different Wetland Habitats within the Study Area according to the EcoIA

Wetland habitat	Within / Outside Application Site	Ecological value
Abandoned Pond	Within and outside	Within: Low, outside: low to medium
Channel	Outside	Medium
Meander	Within and outside	Within: low, outside: low to medium
Mitigation wetland	Outside	Medium
Pond	Within and outside	Within: Low to medium, outside: Medium
Reedbed	Outside	Low to medium
Tidal marsh	Outside	Medium

5. PRELIMINARY DESIGN

5.1 The compensation wetland will include three proposed wetland units, which are further discussed in subsequent paragraphs. All of these compensation wetlands are proposed with soft substrate in order to have better ecological function. The schematic designs of the three proposed wetland units are shown in **Figure C to E** for reference.

- Compensation Wetland C at the southwest near the main entrance of the Site (approx. 0.40ha);
- Compensation Wetland D at the south (approx. 0.17 ha); and
- Compensation Wetland E at the southeast (approx. 0.12 ha)

5.2 ***Compensation Wetland C*** – It is noted that a landscape area with natural habitat and water feature has been proposed to the eastern portion of the application site under the approved planning application A/YL-NSW/274. This landscape area with natural habitat and water feature is aimed to respect the flightpath of breeding ardeids from Tung Shing Lane Egretry. In order to achieve a better ecological synergy with this

landscape area, it is proposed to provide a managed pond (i.e. Wetland C) adjoining this landscape area.

5.3 The compensation wetland would be designed to receive part of the surface runoff from the Application Site. Water depth of the compensation wetland would be in the order of about 1m. Native vegetation species (mainly floating plants such as *Nymphaea* spp., and/or other native species e.g., *Adina pilulifera*, *Commelina diffusa* and *Impatiens chinensis*) would be considered to be planted within this compensation wetland, and could benefit fauna inhabiting waterbodies of moderate depth. Perching structures for small sized birds would also be provided. This compensation wetland would be designed to ensure that the runoff would be retained to allow the particulates to settle before discharge. By achieving this, the surface runoff would be suitably polished before reusing for irrigation. Suitable landscape planting would also be implemented around this compensation wetland to discourage access by residents so as to minimize disturbance. However, maintenance staff would be allowed to enter into this compensation wetland to conduct necessary maintenance work.

5.4 ***Compensation Wetland D*** – the southern site boundary adjoins the WCA. The habitats adjoining the southern site boundary include a few small, abandoned ponds (including the outside portion of the abandoned pond lying on Application Site boundary), and wasteland as shown in the habitat map.

5.5 It is proposed to recreate a managed pond (i.e., Wetland D) in this area to achieve a better synergy with the neighboring habitats. The compensation wetland would be designed to receive part of the surface runoff from the development within the Application Site. Water depth of the compensation pond would range from about 1m to about 0.5m, and would provide habitats for typical freshwater associated fauna such as odonates. Typical marsh / pond species such as *Cyperus* spp. and other emergent freshwater plants suitable for perching by odonates would be considered to be planted within this compensation wetland. Similar to Wetland C, this compensation wetland would be designed to ensure that the runoff would be retained, and suitable landscape planting would also be implemented around this compensation wetland.

5.6 ***Compensation Wetland E*** – the southeastern corner of the Application Site is surrounded by a patch of larger abandoned ponds. Hence, it is proposed to recreate a reedbed (i.e., Wetland E) in this area to achieve a better synergy with the neighboring habitats. The compensation wetland would be designed to receive part of the surface runoff from the development within the Application Site. Water depth of the compensation wetland would be about 0.5m and reeds would be planted. By providing a reedbed in this location, cryptic reed-associated species could be benefited.

5.7 A summary of preliminary ecological considerations of the proposed wetlands is shown in **Table 5.1**. The total area of these three compensation wetlands is about 0.69 ha which is the same as the total area size of the pond and abandoned pond to be affected. The three compensation wetlands can provide different habitat types including pond with floating aquatic plants, pond with emergent plants, and reedbed, and could enhance the habitat diversity in the Application Site and have synergy effects with surrounding habitats and landscape area under other project (i.e., the landscape area with natural habitat and water feature under the approved planning application A/YL-NSW/274). These proposed wetlands are strategically located along the western and

southeast sides of the Application Site boundary, serving as ecological corridors and could offer ecological linkage with neighboring habitats adjoining the site (see **Figure A**). With the better ecological functions provided by these wetlands, the impact from the loss of the small areas of pond and abandoned pond could be fully compensated in accordance with TPB PG No. 12C. Depending on their locations, these compensation wetlands could be implemented in tandem with the construction programme for respective portions of the Application Site namely the access road, private housing site and public housing site. The compensation wetlands will be implemented as soon as the land is available upon approval. Details of the construction programme will be provided in the detailed design stage.

Table 5.1 Summary of Preliminary Ecological Considerations of the Compensation Wetland

Total Size (0.69 ha)	Design considerations	Construction	Operation approach	Long term management approach
Compensation Wetland C (0.40 ha)	• Form – Retention pond with soft substrate bottom • Water depth about 1m • Vegetation – Terrestrial native species at pond edge; floating plant • Ecology – Benefit fauna inhabiting moderate depth waterbodies; perching structures for small sized birds	• Excavate and compact in-situ soil to form pond bottom • Suitable waterproofing as necessary • Rainwater as the water source	• Collect stormwater runoff from the private development site • Replenish water from retention tank as necessary • Overflow to N49	• Low maintenance • Occasional removal of debris/dead plants from water • Occasional trimming or removal of invasive vegetation
Compensation Wetland D (0.17 ha)	• Form – Retention pond with soft substrate bottom • Water depth about 0.5 – 1m • Vegetation – Emergent plants • Ecology – Provide habitats for freshwater associated fauna; adjoins the WCA and a few small abandoned ponds outside site boundary to achieve better synergy of habitats	• Excavate and compact in-situ soil to form pond bottom • Suitable waterproofing as necessary • Rainwater as the water source	• Collect stormwater runoff from the private development site • Overflow to retention tank for irrigation • Potential visual amenity for residents	• Regular checking of water quality and potential artificial aeration as necessary • Regular removal of debris/dead plants from water • Regular trimming or removal of invasive vegetation
Compensation Wetland E (0.12 ha)	• Form – Freshwater reedbed (water depth ~0.5m) • Vegetation – Reeds • Ecology – Benefit cryptic reed-associated species; surrounded by a patch of larger abandoned ponds to achieve better synergy of habitats	• Excavate and compact in-situ soil • Pond mud might be required for reeds • Allow stormwater to fill up the pond • Planting of reed and aid the establishment in the early stage if necessary	• Collect stormwater runoff from the private development site • Overflow to retention tank for irrigation • Self-operational; require minimal operational intervention	• Cutting overgrown reed • Removal of invasive vegetation

5.8 In order to maintain the ecological functions of the proposed compensation wetlands in the long run, a Habitat Creation and Management Plan (HCMP) for the compensation ponds will need to be developed during the detailed design stage. An outline of the content of the HCMP is presented in **Table 5.2**.

Table 5.2 Outline of Key Items in the Habitat Creation and Management Plan

Key Sections in HCMP	Outline Content to be Further Developed
Objectives	• Presents the keys objectives of the HCMP • Describes site conditions such as location, boundary, topography, hydrology etc. • Summarises / updates habitat evaluation, species of conservation importance, impact evaluation
Mitigation Objectives	• Proposes management goals and objectives of the compensation ponds, for both construction and operational phases • Recommends suitable targets (e.g. habitat condition targets) for the compensation wetlands
Detailed Design and Construction Methods	• Design for water sources (mainly from rain water and surface runoff) • Design for hydrology and water level • Recommend vegetation species
Management Strategy	• Interface with the other areas of the development • Review the feasibility for nature-educational demonstration activities and propose where appropriate. All nature-educational demonstration activities will be organised and controlled to minimise interfering the functions of the wetlands.
Monitoring	• Monitoring of water level and water quality • Monitoring of the habitat quality • Monitoring of wildlife use including bird, dragonfly and amphibians (no specific monitoring target would be proposed)

6. EXPECTED ECOLOGICAL FUNCTIONS

Habitats

6.1 Three wetland habitat types (i.e., abandoned pond, pond, and meander) are identified within the Application Site, but only abandoned pond and pond will be lost due to the proposed development. Mitigation measure is recommended for the permanent loss during operational phase according to the EcoIA though the respectively low and low to medium ecological value of the wetland habitats that supported low diversity and abundance of waterbirds. Compensation should also achieve the no net loss principle requirement under TPB PG No. 12C.

6.2 The abandoned pond and pond within the Application Site are of low, and low to medium ecological value, respectively. It is expected that the three proposed wetland

types i.e. pond with floating aquatic plants, pond with emergent plants, and reedbed will all have at least low to medium ecological value given that appropriate management strategy can be applied.

6.3 With the implementation of the proposed wetlands for compensation purpose, the overall ecological value of the original two wetland types (i.e., abandoned pond and pond) within the Application Site will be increased from low / low to medium to at least low to medium. As the Application Site is located at the fringe of the Wetland Buffer Area and is considered as remotely connected to Deep Bay Area, the compensation ponds can act as slight enhancement to the overall ecological value of the region. **Table 6.1** summarizes the wetland habitats and the corresponding ecological value before and after the compensation.

Table 6.1 Summary of Wetland Habitat Loss vs. Compensation

Habitat	Area (ha)	Ecological value	Impact
Before compensation			
Abandoned pond	0.23	Low	Will be lost
Pond	0.46	Low to medium	Will be lost
After compensation			
Pond with floating aquatic plant (C)	C: 0.40	At least low to medium	Positive ecological impact
Pond with emergent plant (D)	D: 0.17	At least low to medium	Positive ecological impact
Reedbed (E)	E: 0.12	At least low to medium	Positive ecological impact

Waterbirds and Other Fauna

6.4 Given lack of significant pond drain down practice and overgrown of vegetation inside or along the bunds within the abandoned pond and pond of the Application Site, only 8 species of waterbirds were recorded during the baseline survey. The wetland creation aims to provide ecological functions as well as suitable habitats for waterbirds including the 8 recorded species.

6.5 **Table 6.2** shows the preferred habitat for the waterbirds recorded within the abandoned pond and pond of the Application Site. The proposed managed ponds and reedbed can provide suitable habitats for these waterbird species.

6.6 Besides, the compensation wetlands can also provide habitats for dragonfly and amphibians. With planting of aquatic plants and reed and the soft substrate water bodies, there will be perching spots for dragonfly adults and habitats for their nymphs. Wetlands with aquatic plants could also attract insects and provide feeding habitats for amphibians.

6.7 With the provision of the 3 wetland units of a total 0.69 ha, and the ecological functions as habitats for waterbirds and other fauna, the permanent habitat loss impact could be compensated and the no net loss principle requirement under TPB PG No. 12C can also be fulfilled.

Table 6.2 The Preferred Habitat for the Waterbirds Recorded within the Abandoned Pond and Pond of the Application Site

No.	Species	Preferred habitat		Remark
		Managed pond	Reedbed	
1	Great Cormorant	✓		The tree buffer next to managed pond provides roosting location
2	Little Egret	✓		
3	Chinese Pond Heron	✓		
4	Yellow Bittern		✓	
5	Common Kingfisher	✓		
6	White-breasted Waterhen		✓	
7	Grey Heron	✓		
8	Common Moorhen	✓	✓	

7. MANAGEMENT

7.1 The Compensation Wetlands will be maintained and managed together with the future private residential portion, with reference to the approaches demonstrated in Sha Po Marsh. Contractor with experience in wetland construction, management and wetland planting will be appointed to carry out the works for the construction and establishment. Appropriately qualified specialists with wetland design and management experience will be responsible for supervising implementation, management, and monitoring of the Compensation Wetlands.

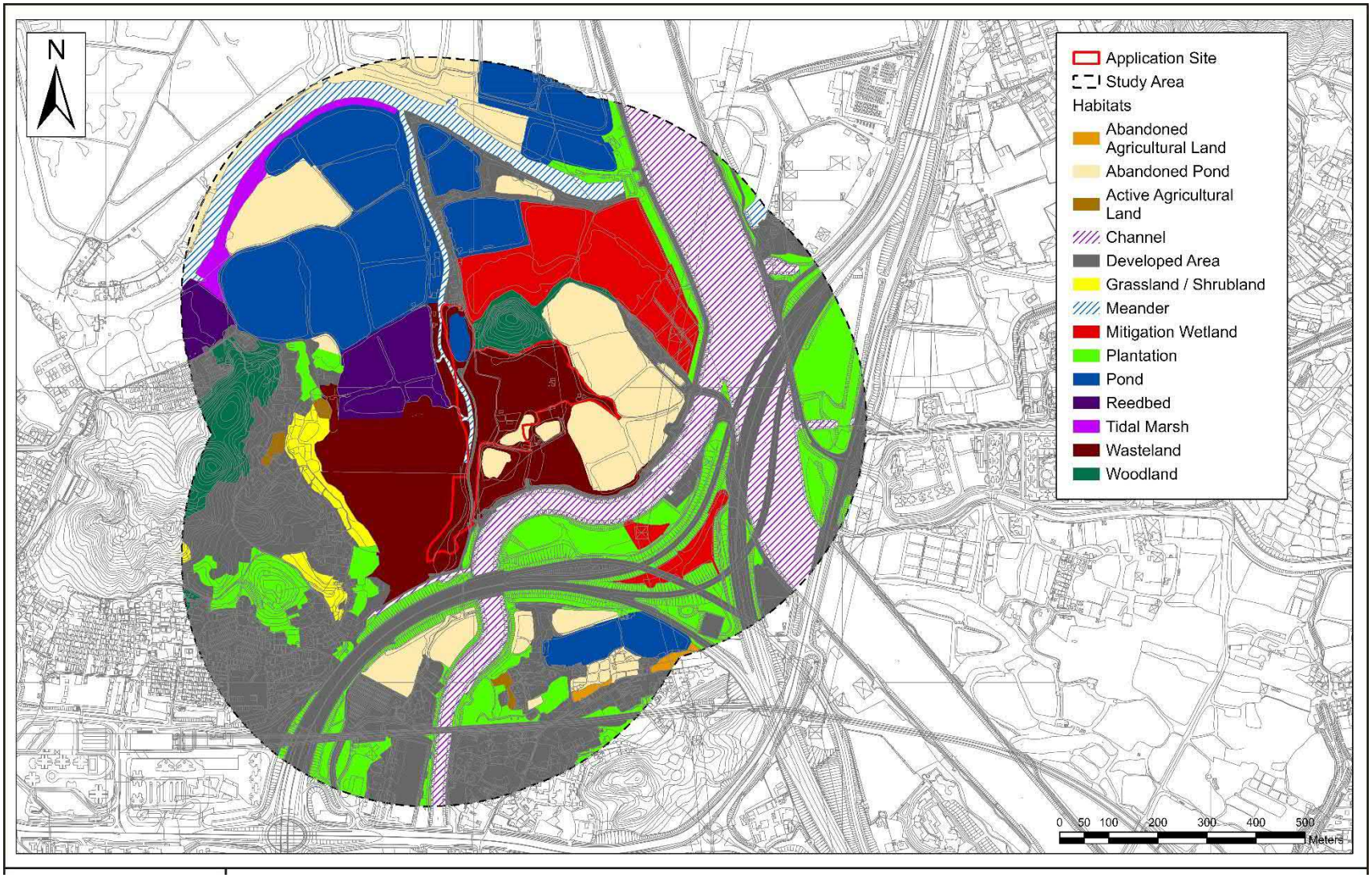


Figure A Application Site and Surrounding Habitats (from EcoIA)

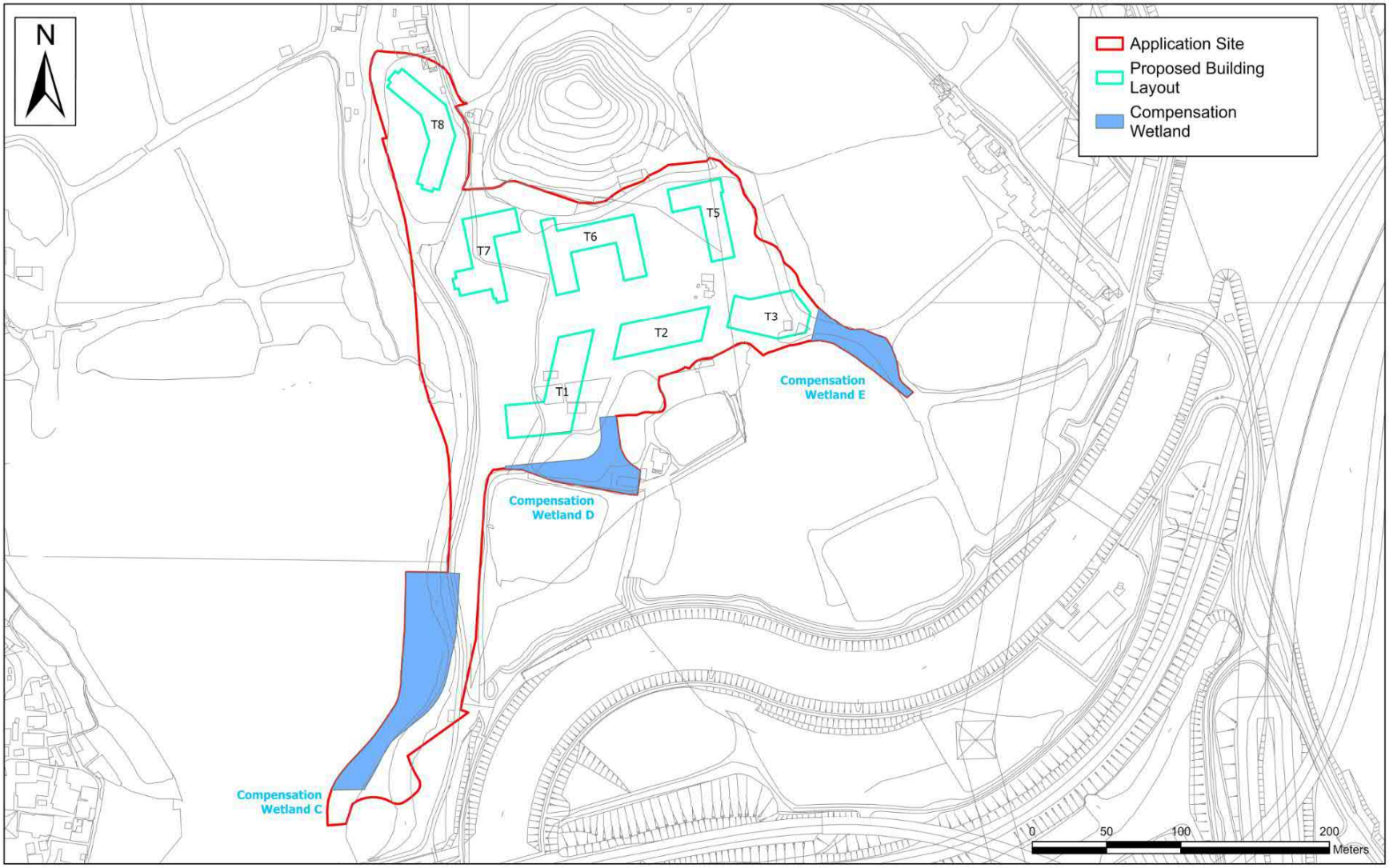


Figure B Locations and Layout of the Proposed Compensation Wetland Units

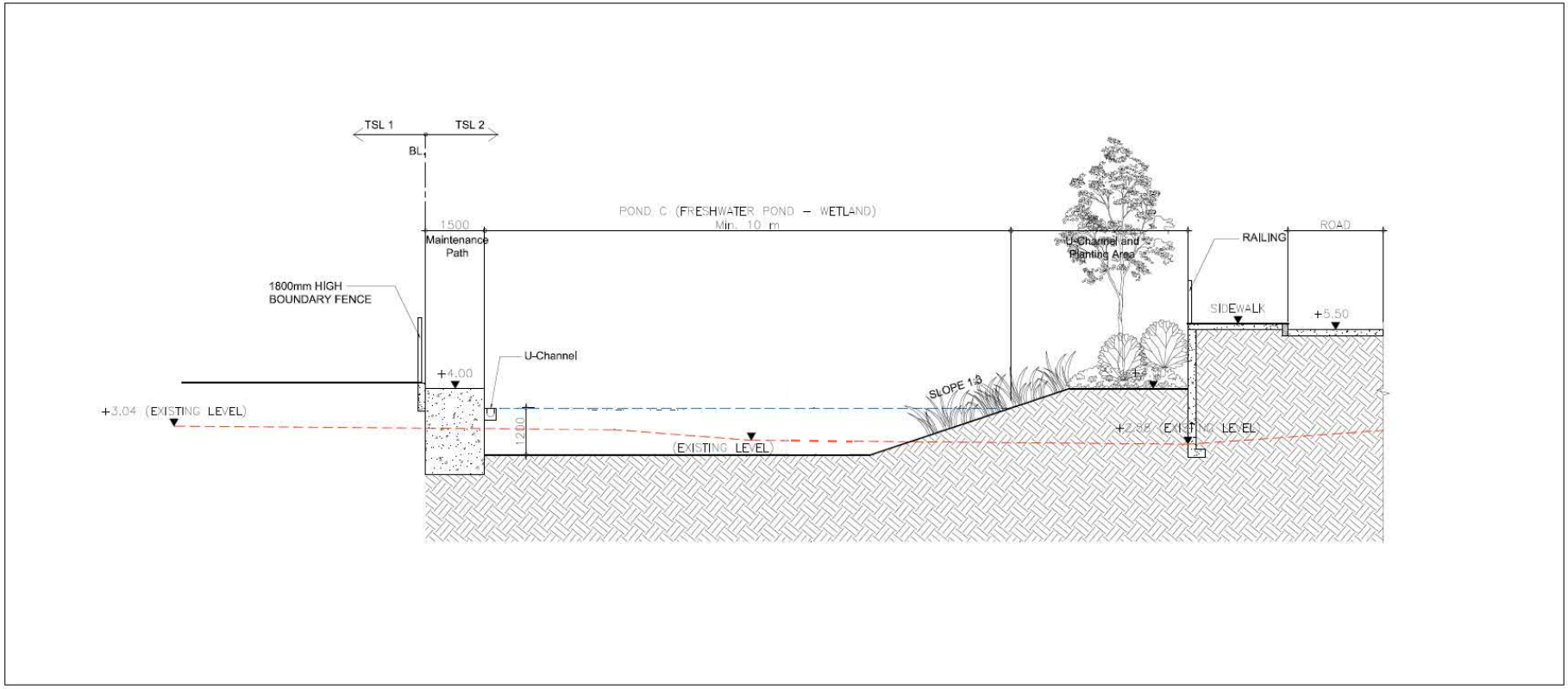


Figure C Proposed Section of Compensation Wetland C

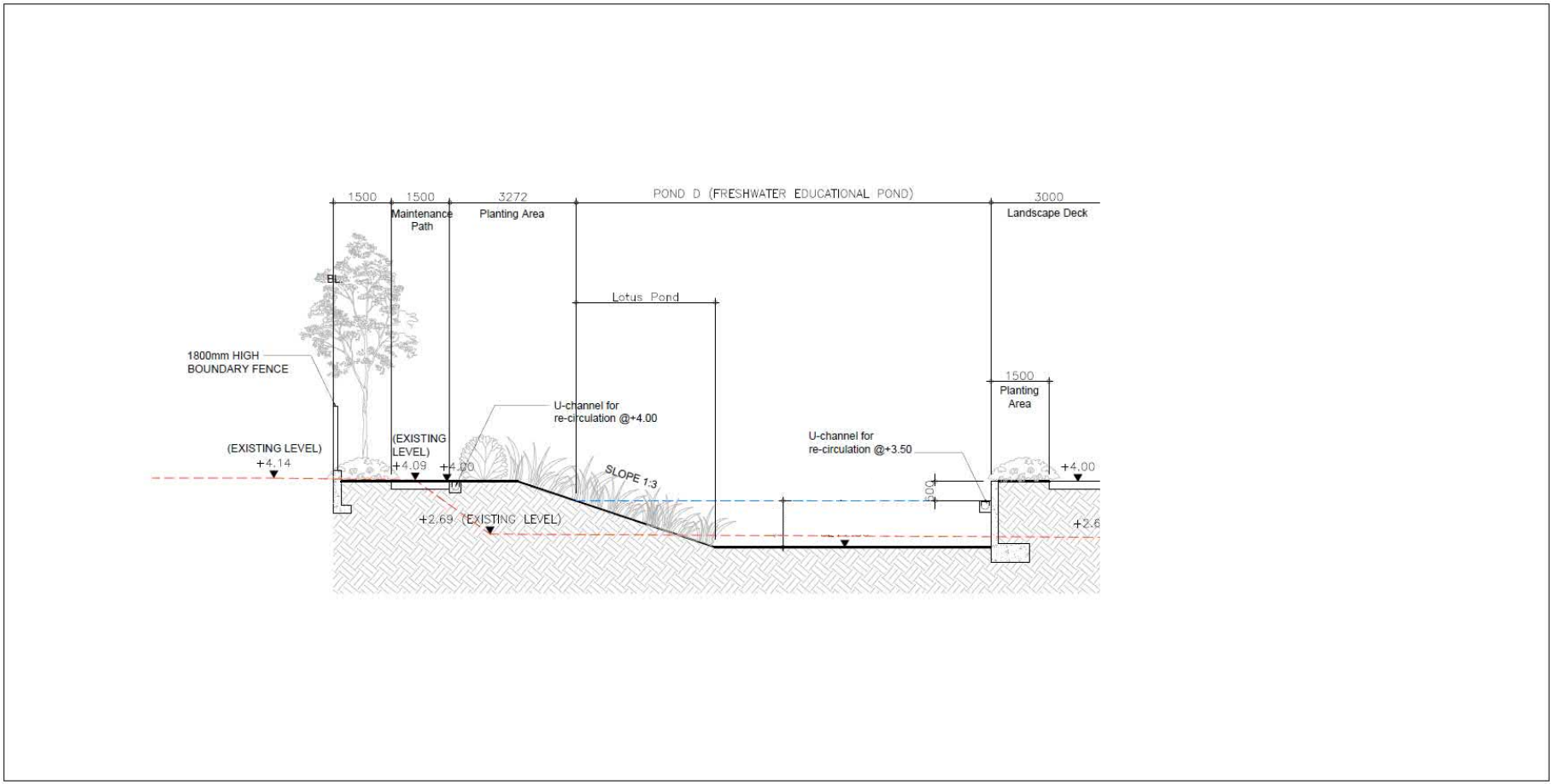


Figure D Proposed Section of Compensation Wetland D

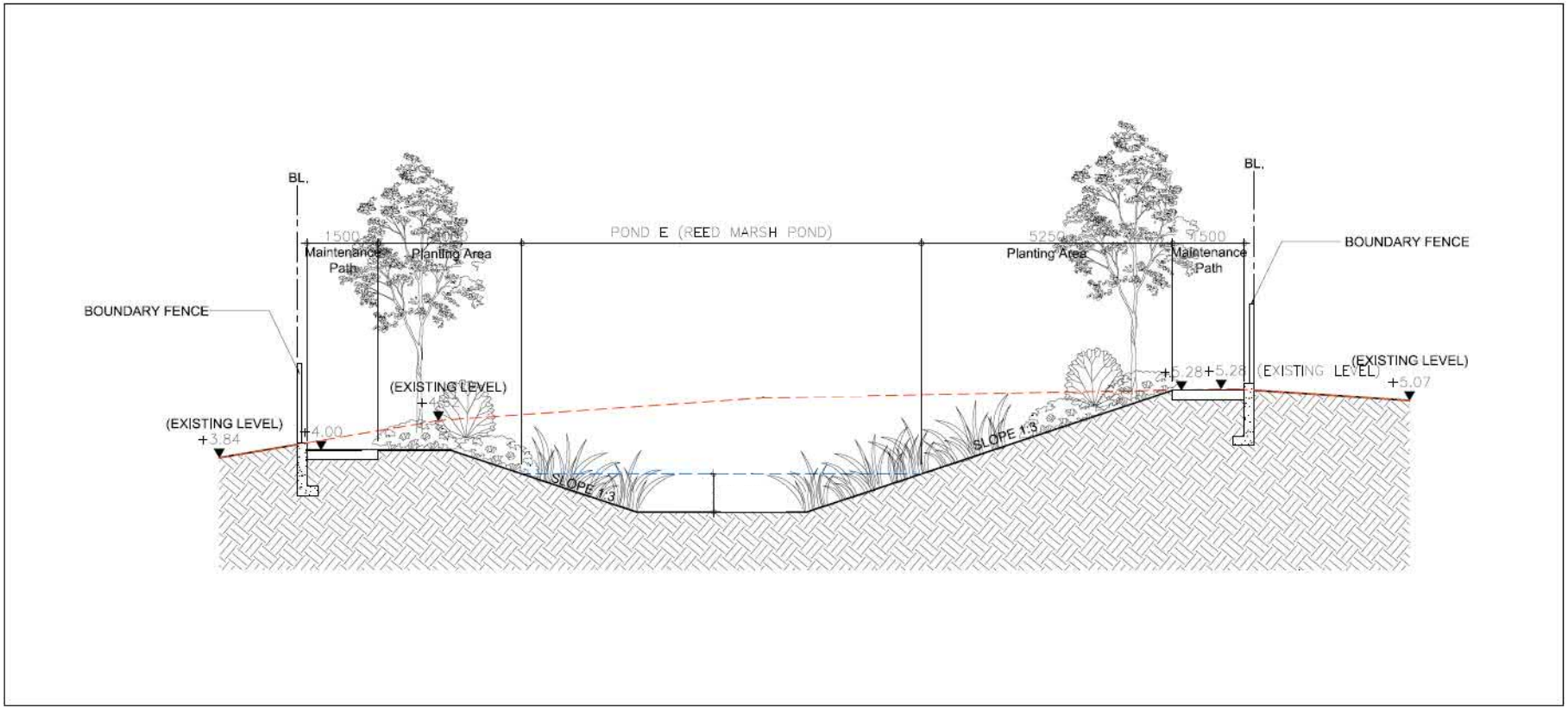


Figure E Proposed Section of Compensation Wetland E

S

Appendix K
Correspondence with Towngas and CLP

From: Mak Kit K.W. <kit.mak@towngas.com>
Sent: Monday, February 20, 2023 9:22 AM
To: Chan Kai Lok <kailok@shkp.com>
Cc: Lam Alfred H.M. <alfred.lam@towngas.com>
Subject: RE: Tung Shing Lei Land Sharing Pilot Scheme (TSL2)

Dear Lok,
Refer to our gas network plan provide previously, the nearest gas source (Medium Pressure) is located at Castle Peak Road – Yuen Long.
Extension of the existing medium pressure gas main and a gas governor kiosk for stepping down the gas pressure from medium pressure to low pressure will be required.
We have passed your information to our network planning for their study.

Should you have further questions, please feel free to contact us.

Regards
Kit Mak (Tel: 2963 3038)

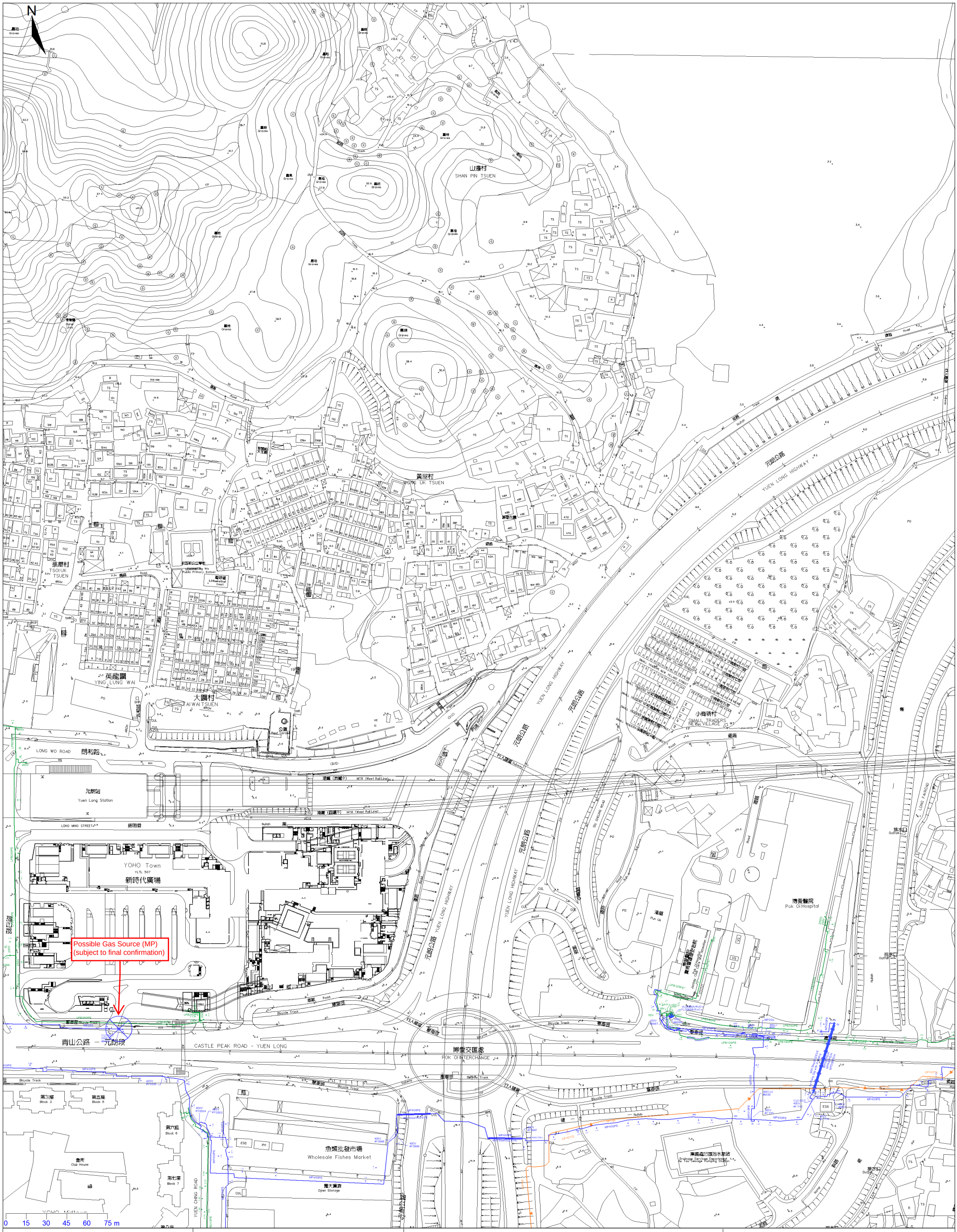
From: kailok@shkp.com <kailok@shkp.com>
Sent: Monday, February 20, 2023 9:09 AM
To: Lam Alfred H.M. <alfred.lam@towngas.com>
Subject: RE: Tung Shing Lei Land Sharing Pilot Scheme (TSL2)

Hi Alfred,

As discussed, could you confirm the gas supply availability for captioned sites?

Thanks,

Lok



煤氣 Towngas

香港中華煤氣有限公司
The Hong Kong and China Gas Company Limited

比例：1 : 2500

圖例：

LPA	現有低壓 A 管道 (2.0 千帕以下)
LPB	現有低壓 B 管道 (2.0–7.5 千帕)
MP	現有中壓管道 (7.5–240 千帕)
IPA	現有次高壓 A 管道 (240–400 千帕)
IPB	現有次高壓 B 管道 (400–700 千帕)
HP	現有高壓管道 (700 千帕以上)
PE	設有可探索警告帶的聚乙烯管道
IPB*	現有次高壓 B 管道 (暫以較低壓力運作)
HP*	現有高壓管道 (暫以較低壓力運作)
PE*	沒有可探索警告帶的聚乙烯管道
RP / iPit	備用管道 / 保留管道檢測井
	擬建/在建管道

	鋼蓋板
	冷凝液罐
	無鬃管的冷凝液罐 / 放散點
	閥門
	球閥井
idp	清管井
RPIT	立管井
CP	陰極保護裝置
	大約埋深(米)
	管網通訊導管
TT BS RS WT	TT:鞍型旁通 / BS:塞氣馬鞍 RS:鞍型三通 / WT:華士三通

[注意：鞍型管件埋深，比管道淺約５０毫米]

圖則顯示的管道位置只作參考之用。其實際位置和深度仍須以人手開挖探孔確定。在煤氣管道設施附近施工期間，必須要加倍小心。

檢查日期： Feb 20 2023

座標 xy (822132,834213)

圖則上的地圖資料乃得到 (C)香港地政總署署長 准許翻印。
在未得到香港中華煤氣有限公司批准前，不可翻印此圖則的全部或部分內容。

From: Fung, Lok Man <lm.fung@clp.com.hk>
Sent: Tuesday, February 21, 2023 2:54 PM
To: Chan Kai Lok <kailok@shkp.com>
Cc: Kwong, Ka Fung <kf.kwong@clp.com.hk>; Fung, Lok Man <lm.fung@clp.com.hk>
Subject: Tung Shing Lei Land Sharing Pilot Scheme (LSPS) - TSL2

Dear Lok,

Please find our preliminary tee-off point for your reference.

Please note that it may be amended according to the detailed supply arrangement including tee-off point, cable route etc.

Regards,
L.M. Fung

Planning & Design – Yuen Long
North Region
CLP Power Hong Kong Ltd.
Tel: 2678 2183

From: kailok@shkp.com <kailok@shkp.com>
Sent: Tuesday, February 21, 2023 2:24 PM
To: Fung, Lok Man <lm.fung@clp.com.hk>
Subject: Tung Shing Lei Land Sharing Pilot Scheme (LSPS) - TSL2

Hi Fung Sir,

As discussed yesterday, please advise the preliminary power supply cut-off point for our reference.

Many Thanks,

Lok

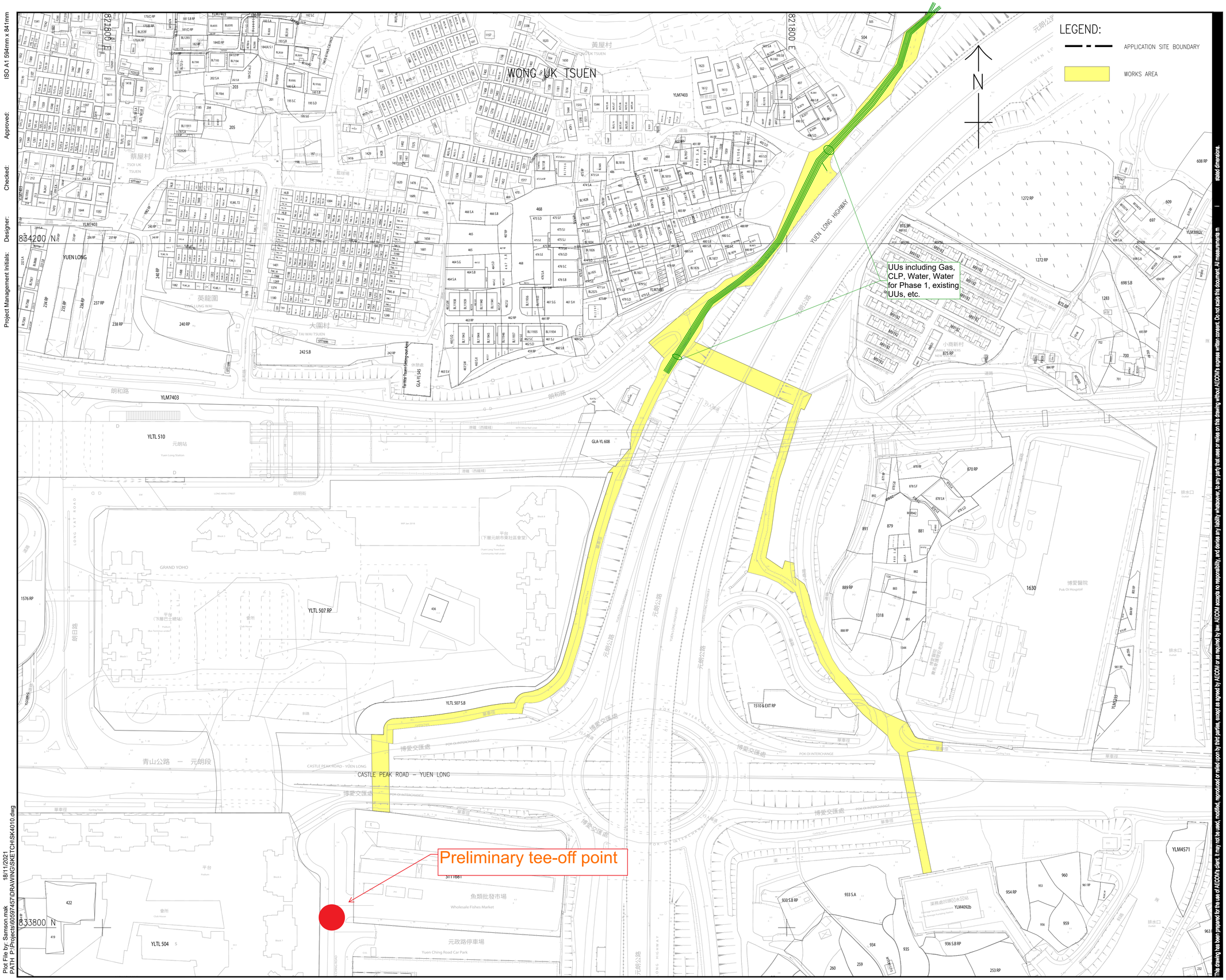
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



Plot File by: Samson.mak
PATH P:\Projects\60597457\DRAWING\SKETCH\SK4010.dwg
18/11/2021

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AECOM

PROJECT
項目

PROPOSED LAND SHARING PILOT SCHEME DEVELOPMENT AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, NEW TERRITORIES

CLIENT
業主

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核准

STATUS
情況

SCALE 比例
A3 1 : 2000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60597457

AGREEMENT NO. 協議編號

SHEET TITLE
圖紙名稱
LAND REQUIREMENT PLAN
LOCATION PLAN

SHEET NUMBER
圖紙編號
60597457/SK4010

Attachment A
Calculation of Development Site Area, Increased Domestic GFA and No. of Units

Calculation of Development Site Area, Increased Domestic GFA and No. of Units

	Applicant Land with approval	**Applicant land without approval**	**Government Land** (**Figure A** indicates the demarcation of government land within Development Site)		**Total**
Development Site Area (about) = Site area for Private Development + Site area for Public Housing Development = 24,301 m^2 + 21,375 m^2 = 45,676 m^2	30,160m^2	**6,828m^2**	G-land **Contributing** to Increased Domestic GFA Calculation for the 70:30 split and counted towards the minimum threshold: G-Land a: 206m^2 (1) G-land b: 114m^2 (1) G-Land c: 6,330m^2 (1) G-Land d: 1,077m^2 (1) G-Land g: 961m^2 (1)	**8,688m^2**	**45,676m^2**
Approved / Permitted Domestic PR	0.34 (2)	n/a	n/a		-
Approved / Permitted Domestic GFA (about)	10,150m^2 (3)	n/a	n/a		10,150m^2
Proposed Domestic PR (about)	3.14 (4)				
Total proposed Domestic GFA (about)	143,579m^2				
Increased Domestic GFA (about)	133,429m^2 (5) *(increased of no less than 50,000m^2 complied with as per criteria of LSPS)*				
	70% of the Increase of GFA assigned to Public Housing		**30% of the Increase of GFA assigned to Private Housing**		
	93,400.3m^2		40,028.7m^2		
No. of Units	1,868 (6)		1,004 (6) or 1,261 (7)		
Total No. of Units	2,872 (7) or 3,129 (8) *(at least 1,000 additional housing units complied with as per criteria of LSPS (i.e. 2,815 (6) or 3,072 (7) additional units))*				

Remarks:

(1) G-Land a (i.e. 206m^2), G-Land b (i.e. 114m^2), G-land c (i.e. 6,330m^2), G-Land d (i.e. 1,077m^2) and G-Land g (i.e. 961m^2), which are (i) for rationalisation of site boundary; and (ii) not sizeable to be alienated for separate development, are included as part of the Development Site boundary. These pieces of G-Land will contribute to the increased domestic GFA and shared at the 70:30 split, and counted towards the minimum threshold of increased domestic GFA of 50,000m^2 and additional 1,000 flats

(2) Refers to the approved PR under Application No. Y/YL-NSW/4

(3) According to approved Application No. Y/YL-NSW/4, a total of 57 nos. of units was approved.

(4) Based on the Development Site Area of about 45,676m^2 (exact plot ratio of 3.1434)

(5) Equals to total proposed GFA - approved GFA

(6) Based on average flat size of 50m^2 as per criteria of LSPS

(7) Based on average flat size of 39.8m^2 for private housing development under the proposed scheme

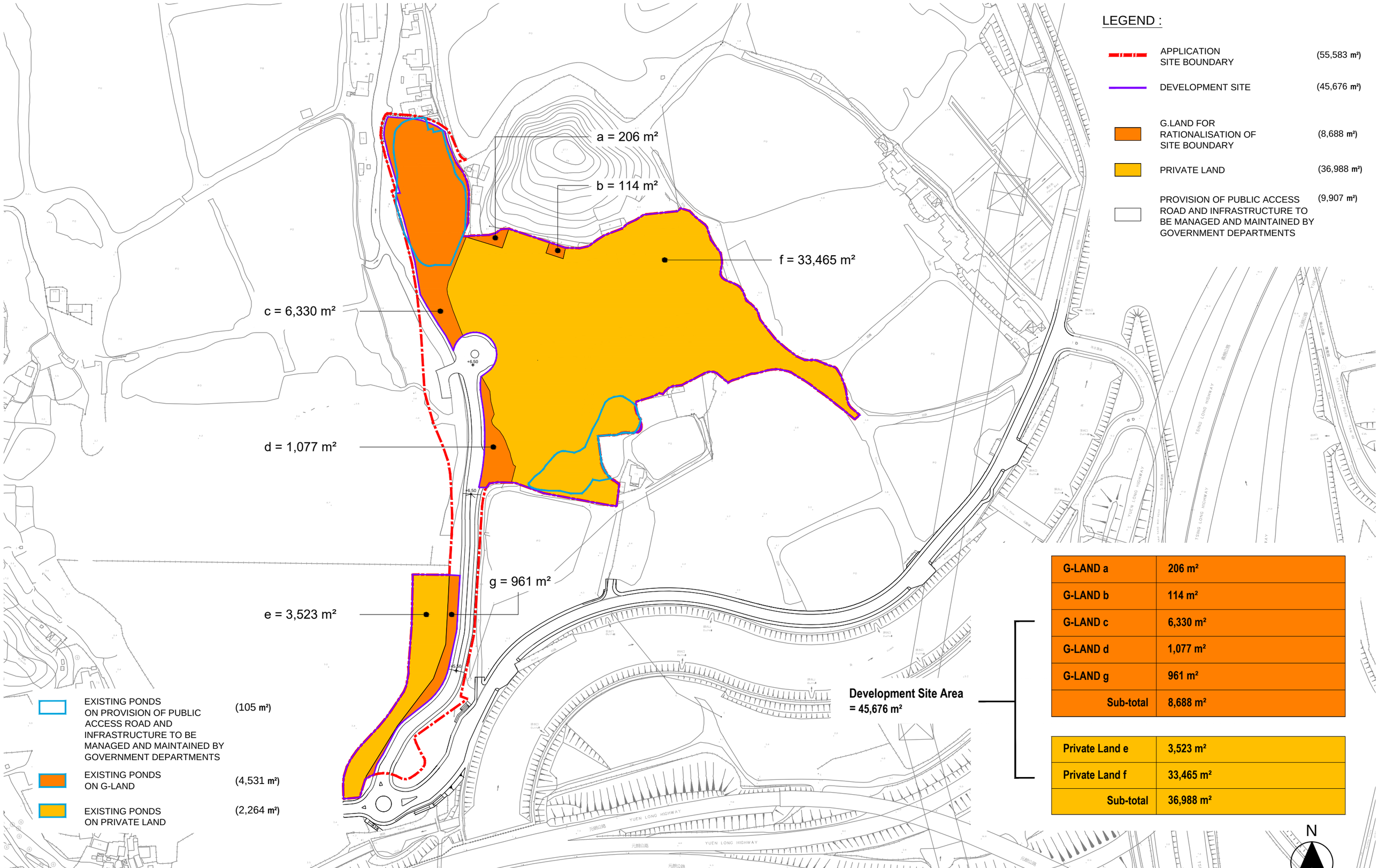

Figure A: Landholding and Government Land Diagram

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 2500 (A3)

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Attachment B
Indicative Internal Layout Plans

SK - 02 | INDICATIVE

Carpark Layout Assessment
(High-end parking standard & 10% increase in flat production)

REVISED ITEM

1. G/F Lobby, transformer room & switch room provided in each domestic block at G/F

2. E&M for carpark & retail added

PUBLIC HOUSING

G/F
- 156 Private Car Parking Spaces (INCL.Visitors)
- 14 Motorcycle Parking Spaces
- 274 Bicycle Parking Spaces
- 8 LGV & Light Bus Loading & Unloading Bay
- 8 "Shared-use coaches/ buses and M/HGV Loading & Unloading Bay

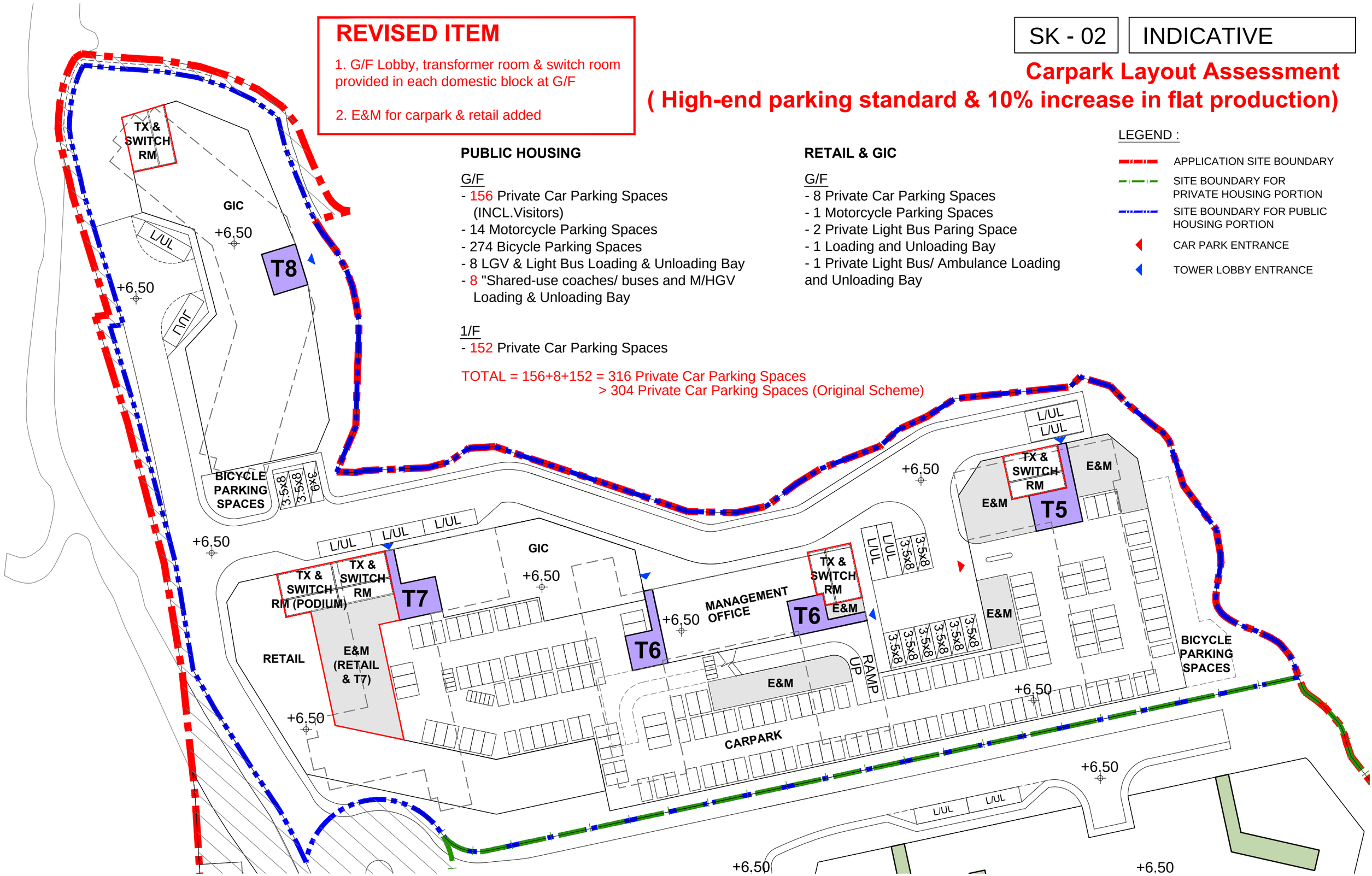
1/F
- 152 Private Car Parking Spaces

TOTAL = 156+8+152 = 316 Private Car Parking Spaces
> 304 Private Car Parking Spaces (Original Scheme)

RETAIL & GIC

G/F
- 8 Private Car Parking Spaces
- 1 Motorcycle Parking Spaces
- 2 Private Light Bus Paring Space
- 1 Loading and Unloading Bay
- 1 Private Light Bus/ Ambulance Loading and Unloading Bay

LEGEND :
- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- CAR PARK ENTRANCE
- TOWER LOBBY ENTRANCE



Ground Floor Plan (Public Housing Portion) w/ Indicative Carpark Layout (for reference only; layout and car parking provision subject to change at detailed design stage)

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 750 (A3)

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REVISED ITEM

1. Only one ramp provided & three carpark buildings connected by driveway.

SK - 03 | INDICATIVE

Carpark Layout Assessment
(High-end parking standard & 10% increase in flat production)

PUBLIC HOUSING

G/F
- 156 Private Car Parking Spaces (INCL.Visitors)
- 14 Motorcycle Parking Spaces
- 274 Bicycle Parking Spaces
- 8 LGV & Light Bus Loading & Unloading Bay
- 8 "Shared-use coaches/ buses and M/HGV Loading & Unloading Bay

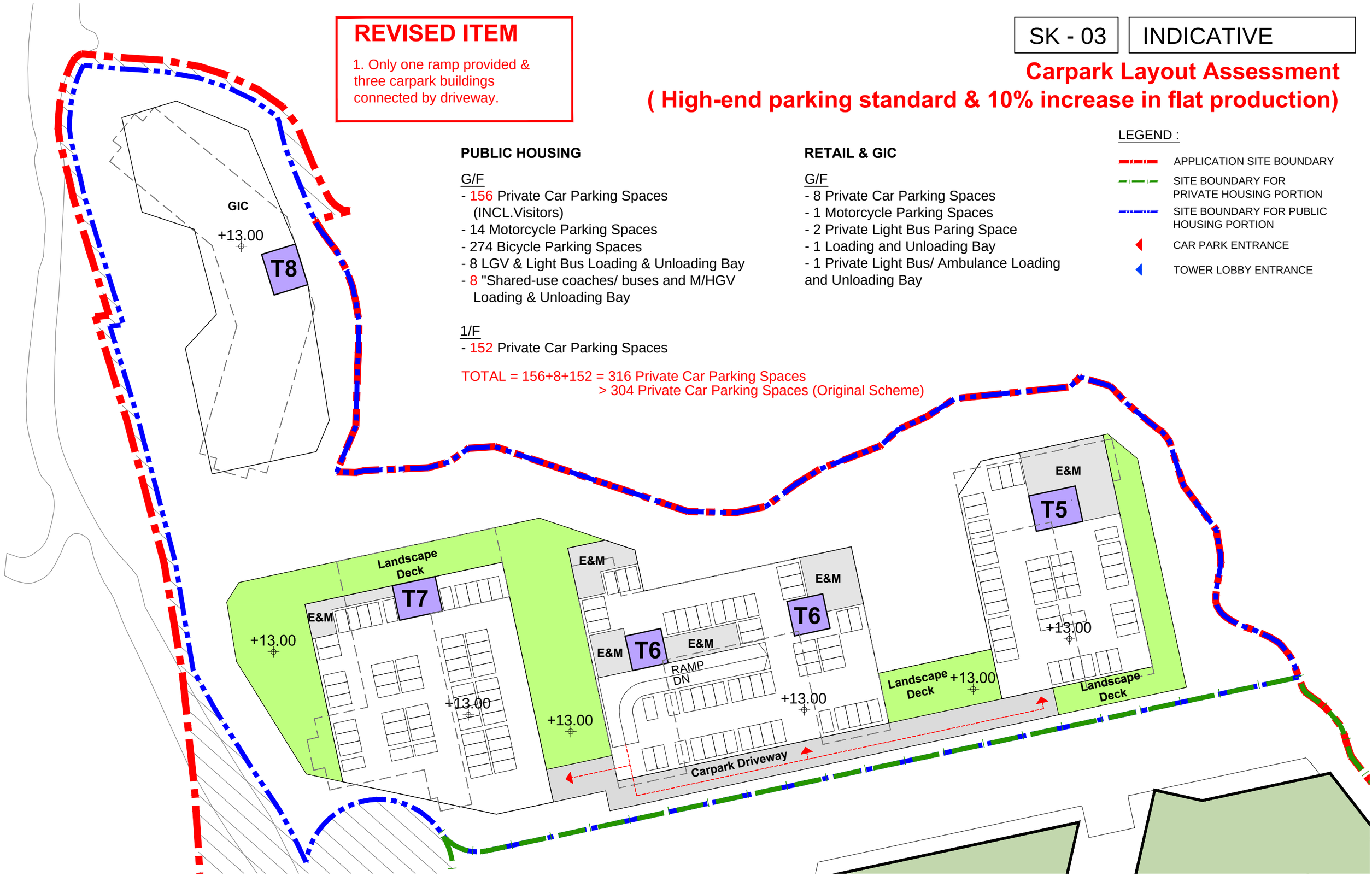
1/F
- 152 Private Car Parking Spaces

TOTAL = 156+8+152 = 316 Private Car Parking Spaces
> 304 Private Car Parking Spaces (Original Scheme)

RETAIL & GIC

G/F
- 8 Private Car Parking Spaces
- 1 Motorcycle Parking Spaces
- 2 Private Light Bus Paring Space
- 1 Loading and Unloading Bay
- 1 Private Light Bus/ Ambulance Loading and Unloading Bay

LEGEND :
- APPLICATION SITE BOUNDARY
- SITE BOUNDARY FOR PRIVATE HOUSING PORTION
- SITE BOUNDARY FOR PUBLIC HOUSING PORTION
- CAR PARK ENTRANCE
- TOWER LOBBY ENTRANCE



First Floor Plan (Public Housing Portion) w/ Indicative Carpark Layout (for reference only; layout and car parking provision subject to change at detailed design stage)

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 750 (A3)

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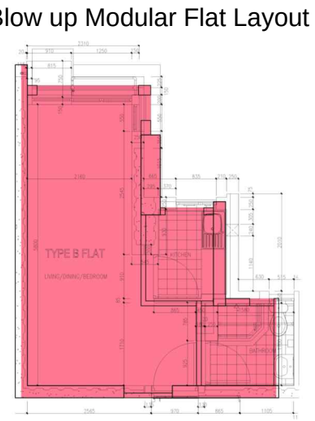
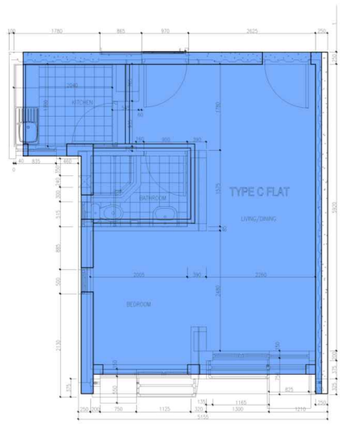
SK - 01 | INDICATIVE

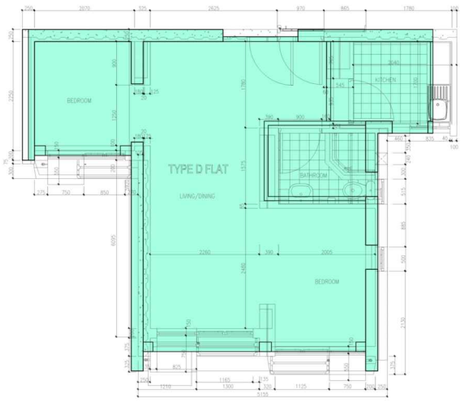
Blow up Modular Flat Layout



2-Person/ 3-Person



1-Bedroom Flat



2-Bedrooms Flat

REVISED ITEM

1. Corridor end w/ openable window.

2. Structural wall of Modular flat aligned.

3. Lift cores are NOT attached to wall of domestic units.

4. Original T6 & T7 and T9 & T10 combined.

TOTAL NOS. OF UNIT ACHIEVED BASED ON CURRENT LAYOUT = 1920 UNITS
> 1868 UNITS (No. of Units under Proposed Scheme)

Master Layout Plan (Public Housing Portion) w/ Indicative Tower Layout (for reference only; layout and car parking provision subject to change at detailed design stage)

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115,
TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 750 (A3)

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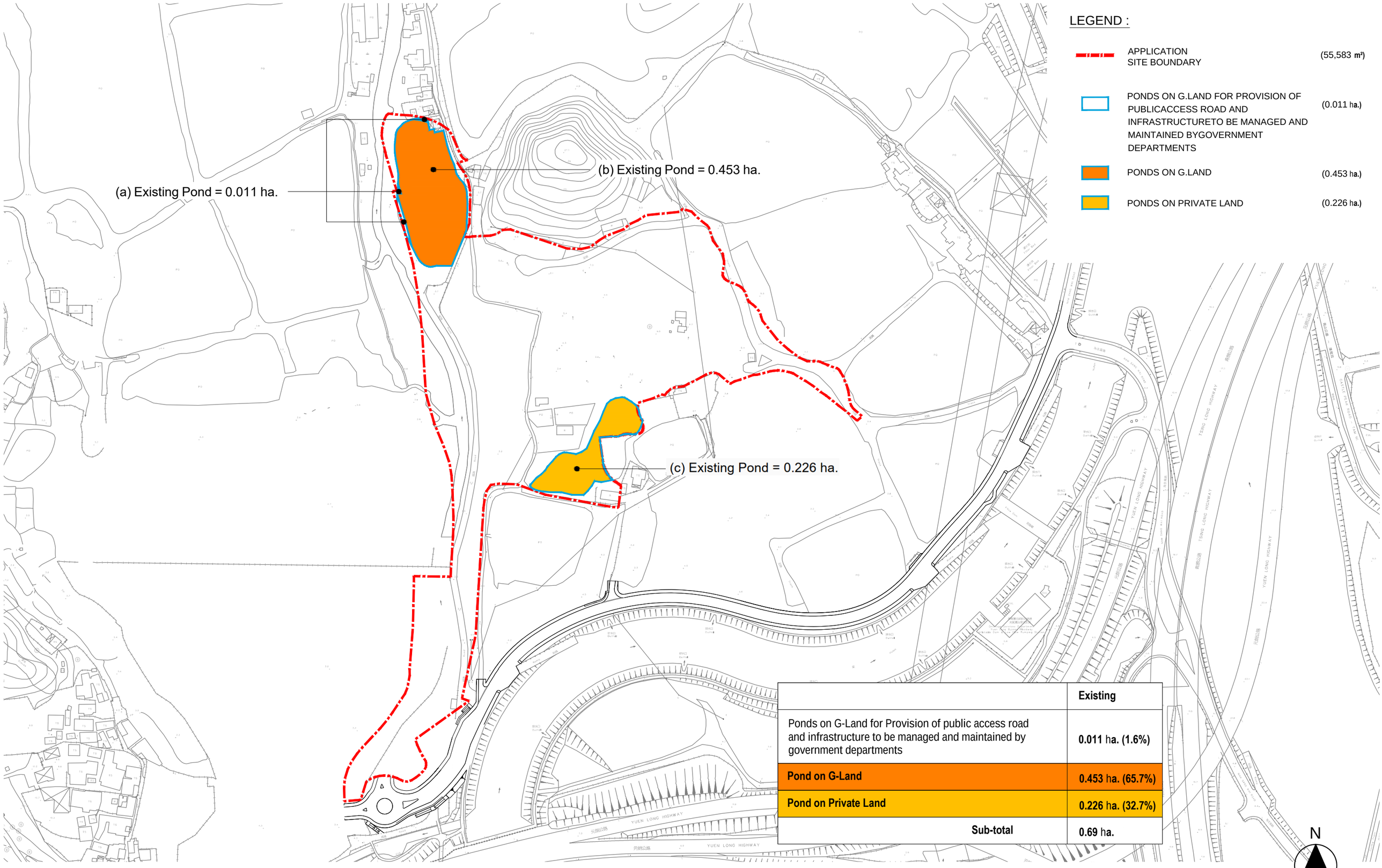
Attachment C
Land Status of Existing and Compensation Wetlands within Application Site



LEGEND :

	APPLICATION SITE BOUNDARY	(55,583 m²)
	PONDS ON G.LAND FOR PROVISION OF PUBLICACCESS ROAD AND INFRASTRUCTURETO BE MANAGED AND MAINTAINED BYGOVERNMENT DEPARTMENTS	(0.011 ha.)
	PONDS ON G.LAND	(0.453 ha.)
	PONDS ON PRIVATE LAND	(0.226 ha.)

	Existing
Ponds on G-Land for Provision of public access road and infrastructure to be managed and maintained by government departments	**0.011** ha. **(1.6%)**
Pond on G-Land	**0.453** ha. **(65.7%)**
Pond on Private Land	**0.226** ha. **(32.7%)**
Sub-total	**0.69** ha.

Location of Existing Ponds Diagram

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 2500 (A3)

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LEGEND :

	APPLICATION SITE BOUNDARY	(55,583 m²)
	PONDS ON G.LAND FOR PROVISION OF PUBLICACCESS ROAD AND INFRASTRUCTURETO BE MANAGED AND MAINTAINED BYGOVERNMENT DEPARTMENTS	(0 ha.)
	PONDS ON G.LAND	(0 ha.)
	PONDS ON PRIVATE LAND	(0.69 ha.)

(a) Compensation Pond = 0.404 ha.

(b) Compensation Pond = 0.167 ha.

(c) Compensation Pond = 0.119 ha.

	Existing	Compensation
Ponds on G-Land for Provision of public access road and infrastructure to be managed and maintained by government departments	**0.011** ha. **(1.6%)**	**0** ha.
Pond on G-Land	**0.453** ha. **(65.7%)**	**0** ha.
Pond on Private Land	**0.226** ha. **(32.7%)**	**0.69** ha. **(100%)**
Sub-total	**0.69** ha.	**0.69** ha.

N

Location of Compensation Ponds Diagram

TUNG SHING LEI "R(D)" ZONE

PROPOSED LAND SHARING PILOT SCHEME (LSPS) FOR A SITE AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, THE NEW TERRITORIES

DATE : 05 JUL 2023
1 : 2500 (A3)

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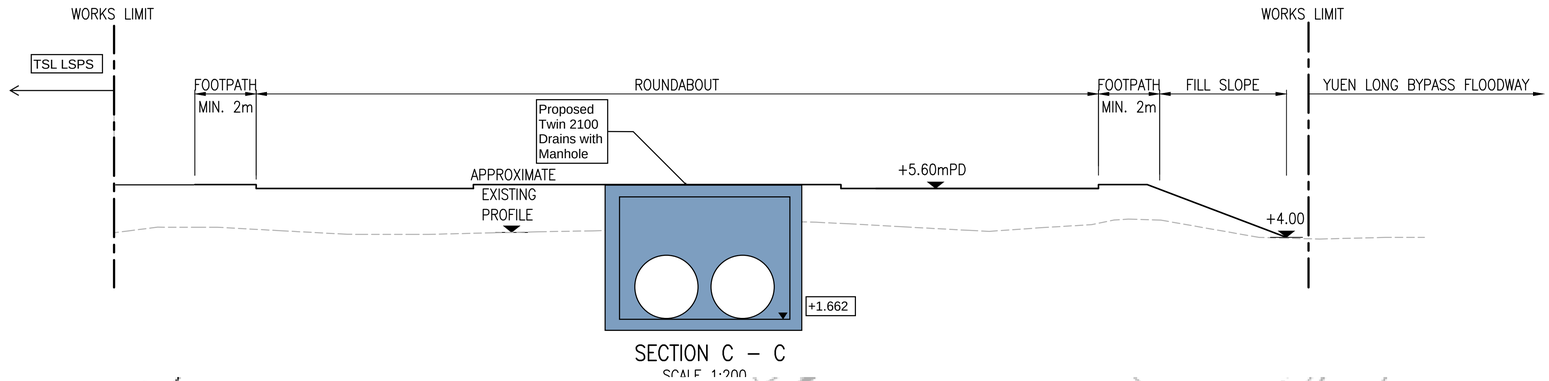
Attachment D
Indicative Section Plans for Drainage, Sewerage & Water works)

NOTE:

1. FOR GENERAL NOTES AND LEGEND REFER TO 60612020/HCR/1002.



SECTION C – C
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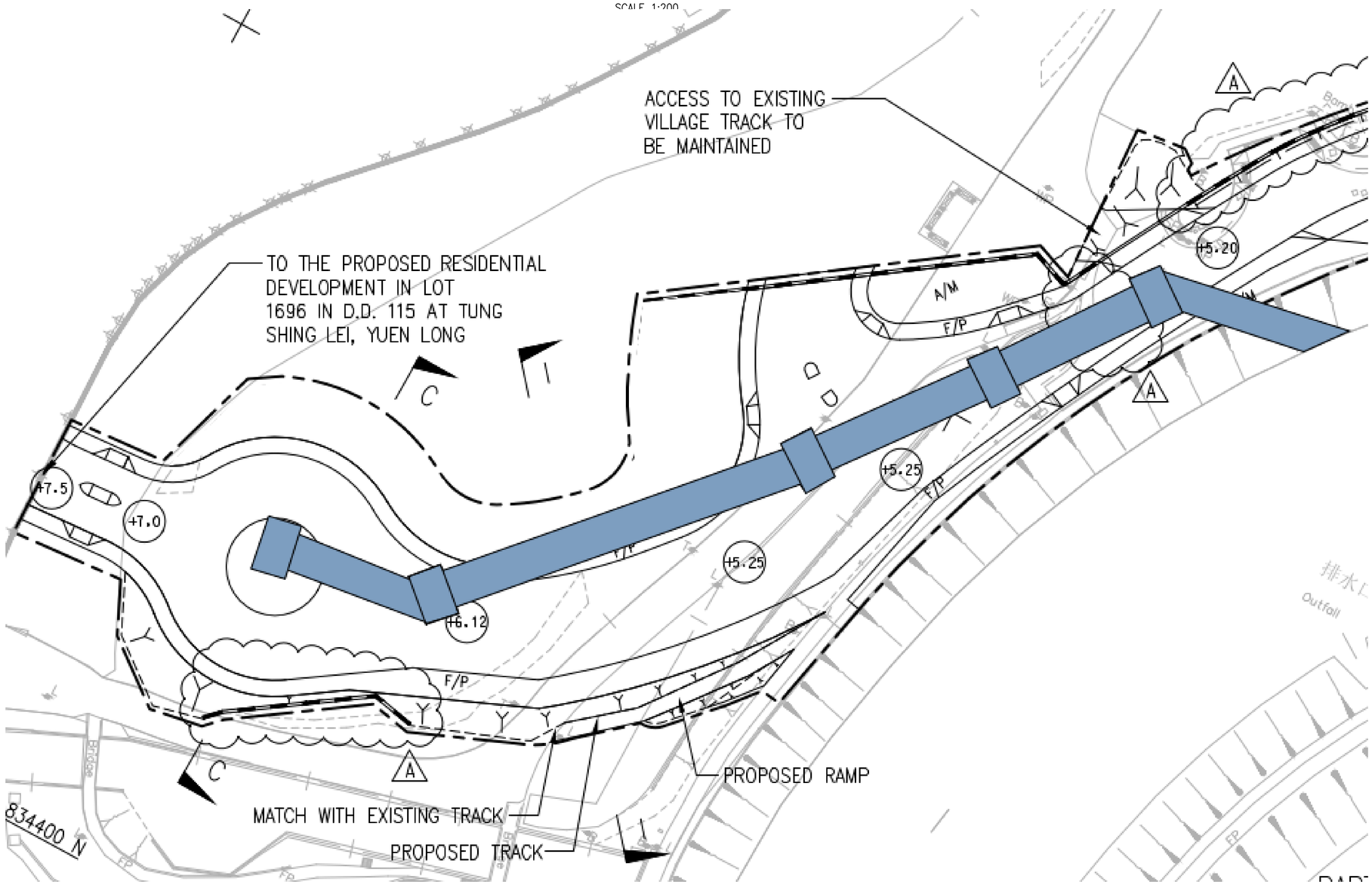

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AECOM

PROJECT 項目

PROPOSED RESIDENTIAL DEVELOPMENT IN VARIOUS LOTS (TO BE KNOWN AS LOT 1696) IN D.D. 115 AT TUNG SHING LEI, YUEN LONG

CLIENT 業主

SUN HUNG KAI REAL ESTATE AGENCY LTD. 新鴻基地產代理有限公司

CONSULTANT 工程顧問公司

AECOM Asia Company Ltd.
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SUB-CONSULTANTS 分判工程顧問公司

ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 複核
A	SEP. 23	2ND SUBMISSION	MCY
-	JUN. 23	1ST SUBMISSION	MCY

STATUS 階段

SCALE 比例 A1 AS SHOWN

DIMENSION UNIT 尺寸單位 MILLIMETRES

KEY PLAN 索引圖

PROJECT NO. 項目編號 60612020

CONTRACT NO. 分約編號

SHEET TITLE 圖紙名稱

HO CHAU ROAD WIDENING WORKS - ROAD SECTIONS

SHEET 2 OF 2

SHEET NUMBER 圖紙編號

60612020/HCR/1102A

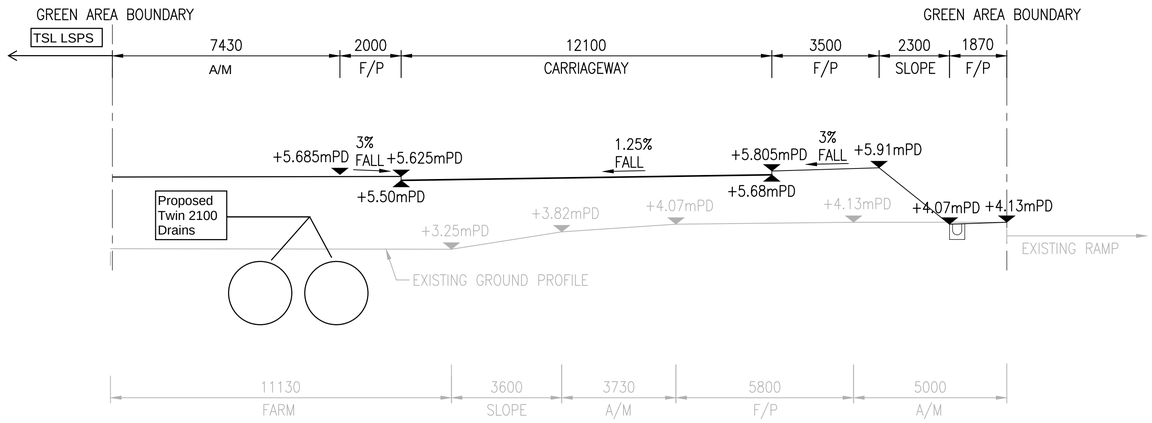
ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:

Plot File by: ZHANGWRS 18/09/2023
PATH: P:\PROJECTS\60612020\DRAWINGS\SUBMISSION\HCR\HCR_1102.dwg

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

LEGEND:

GREEN AREA BOUNDARY
PROPOSED GROUND PROFILE
EXISTING GROUND PROFILE



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AECOM

PROJECT
項目

PROPOSED RESIDENTIAL DEVELOPMENT IN VARIOUS LOTS (TO BE KNOWN AS LOT 1696) IN D.D. 115 AT TUNG SHING LEI, YUEN LONG

CLIENT
業主

SUN HUNG KAI REAL ESTATE AGENCY LTD. 新鴻基地產代理有限公司

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ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核核

STATUS
用途

SCALE
比例

A1 AS SHOWN

DIMENSION UNIT
尺寸單位

MILLIMETRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60612020

CONTRACT NO.
合約編號

SHEET TITLE
圖紙名稱

SECTION

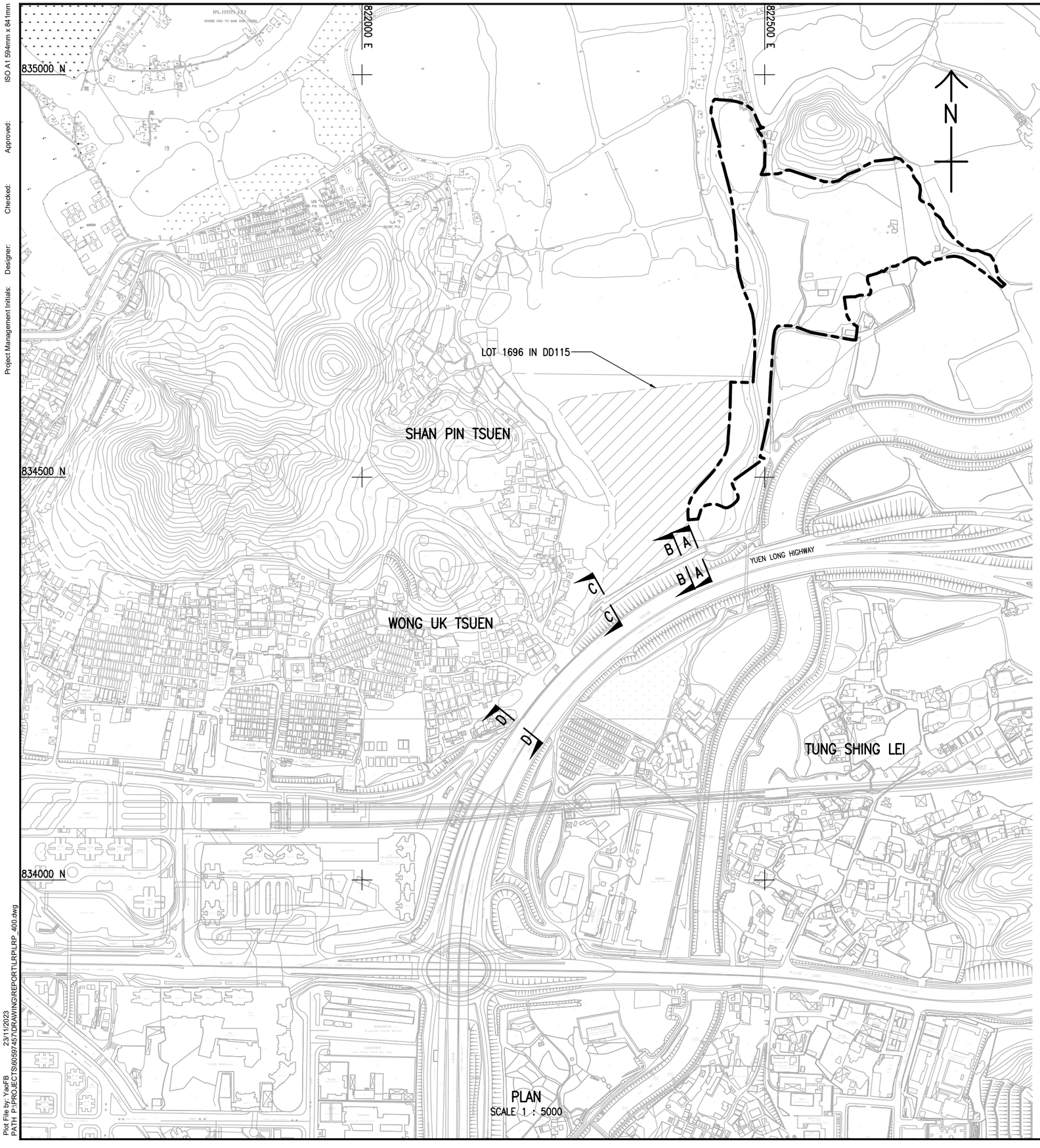
SHEET NUMBER
圖紙編號

60612020/HCR/1104

Plot File by: ZHANGWRS 10/11/2023
PATH: P:\PROJECTS\60612020\DRAWINGS\SUBMISSION\HCR\HCR_1104.dwg

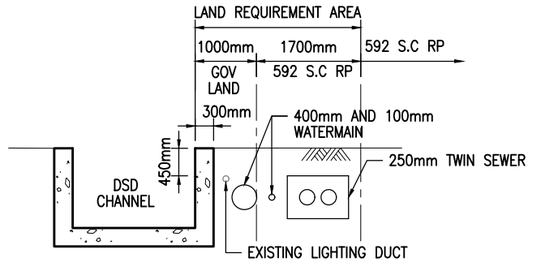
ISO A1 594mm x 841mm

Project Management Initials: Designer: Checked: Approved:



PLAN
SCALE 1 : 5000

LEGEND:
- SITE BOUNDARY
- LOT 1696 IN DD115



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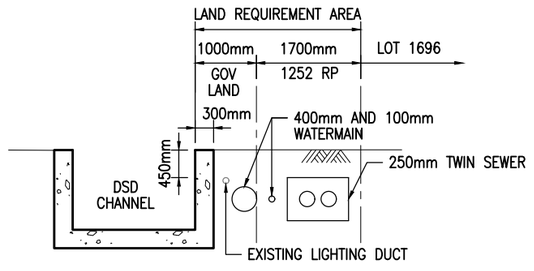

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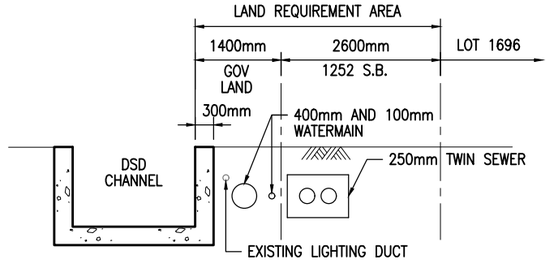

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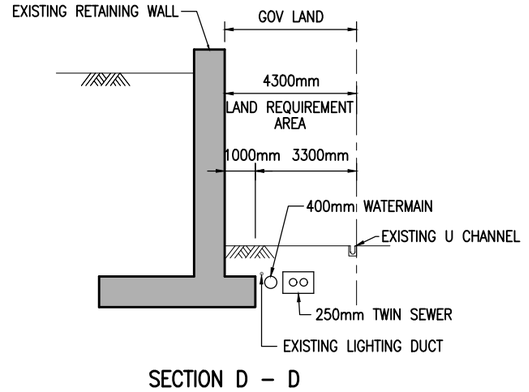

SECTION D – D
SCALE 1 : 200

AECOM

PROJECT

PROPOSED LAND SHARING PILOT SCHEME DEVELOPMENT AT VARIOUS LOTS IN D.D. 115, TUNG SHING LEI, YUEN LONG, NEW TERRITORIES

CLIENT

CONSULTANT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK

STATUS

SCALE
A3 AS SHOWN

DIMENSION UNIT
METRES

KEY PLAN

PROJECT NO.
60597457

AGREEMENT NO.

SHEET TITLE
DETAILS

SHEET NUMBER
60597457/LRP/400

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23/11/2023

Explanatory Statement, would be submitted to the Committee for consideration prior to gazetting under section 5 of the Town Planning Ordinance.

Fanling, Sheung Shui and Yuen Long East District

Agenda Item 4

Section 12A Application

[Open Meeting (Presentation and Question Sessions Only)]

Y/YL-NSW/7 Application for Amendment to the Approved Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8, To rezone the application site from "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" to "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area 1", Various Lots in D.D. 104 and adjoining Government land, Wing Kei Tsuen, Nam Sang Wai, Yuen Long
(RNTPC Paper No. Y/YL-NSW/7B)

Presentation and Question Sessions

26. The following representatives from the Planning Department (PlanD) and the applicants' representatives were invited to the meeting at this point:

PlanD

Mr Anthony K.O. Luk	- District Planning Officer/Fanling, Sheung Shui and Yuen Long East (DPO/FSYLE)
Mr Kimson P.H. Chiu	- Senior Town Planner/Fanling, Sheung Shui and Yuen Long East (STP/FSYLE)

Mr Gary T.L. Lam	- Town Planner/Fanling, Sheung Shui and Yuen Long East
Mr Davy L.Y. Lam	- Town Planning Graduate/Fanling, Sheung Shui and Yuen Long East

Applicants' Representatives

KTA Planning Limited	- Mr Kenneth To - Ms Pauline Lam - Ms Kitty Wong - Mr Faith Lai
LWK & Partners (HK) Limited	- Mr Ho Sun
ADI Limited	- Ms Elsa Kwong
Binnies Hong Kong Limited	- Mr Colin Chan
CTA Consultants Limited	- Mr Horace Mak
Ecosystems Limited	- Mr Vincent Lai - Mr Oscar So
Ramboll Hong Kong Limited	- Mr Henry Ng

27. The Chairman extended a welcome and explained the procedures of the meeting. He then invited PlanD's representatives to brief Members on the background of the application.

28. With the aid of a PowerPoint presentation, Mr Kimson P.H. Chiu, STP/FSYLE, briefed Members on the background of the application, the proposed rezoning of the application site (the Site) from "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" ("OU(CDWRA)") to "OU(CDWRA)1" to facilitate a proposed comprehensive residential development with government, institution and community (GIC) and retail block, as well as a wetland restoration area (WRA) with

relaxation of plot ratio (PR) and building height (BH) restrictions, departmental and public comments, and the planning considerations and assessments as detailed in the Paper. PlanD had no in-principle objection to the application.

29. The Chairman then invited the applicants' representatives to elaborate on the application. With the aid of a PowerPoint presentation, Ms Kitty Wong, the applicants' representative, made the following main points:

The Rezoning Proposal

(a) the proposal was for rezoning the Site from "OU(CDWRA)" to "OU(CDWRA)1" sub-zone to relax the PR restriction from 0.4 to 1.5 (domestic) plus 0.048 (non-domestic) and relax the BH restriction from 6 storeys including car park to 15 storeys excluding basement car park for a comprehensive residential development with community/supporting facilities and a WRA. There would be no change to the planning intention as well as the schedule of Column 1 and 2 uses of the "OU(CDWRA)" zone;

The Site and Planning Context

(b) the western part of the Site had been occupied by brownfield operations, abutting the wetland area to the west, since 1988. While the northern part was formed and vacant, there was an abandoned pond in the central part of the Site;

(c) all private lots within the Site were owned by the applicants;

(d) the area where the Site was located had been zoned "OU(CDWRA)" since 2001 with the planning intention to provide incentive for restoration of degraded wetlands adjoining existing fish ponds through comprehensive residential and/or recreational development to include WRA. It was also intended to phase out existing sporadic open storage and port back-up uses on degraded wetlands. Any new buildings should be located farthest away

from Deep Bay;

(e) the Site and its surrounding area, located strategically within the Northern Metropolis (NM), had been undergoing gradual transformation in recent years. The Site would be well served by existing and planned strategic road network and large-scale transport infrastructural projects, such as Au Tau Station (370m from the Site) of MTR Northern Link (NOL) Phase 2 and Route 11, etc.;

(f) the Site was in close proximity to various committed and planned developments such as the planned public housing development at Sha Po with a maximum PR of 6.7 and BH of 185mPD (about 260m from the Site). The proposed development intensity was considered compatible with the planned developments in the vicinity of the Site;

Key Development Parameters and Design Merits

(g) the proposed development would have a domestic PR of not more than 1.5 and a non-domestic PR of 0.048, a site coverage of not more than 15% and a BH of not more than 15 storeys (on top of 2-level basement), providing seven residential towers with 1,997 units with an average size of about 48.9m^2;

(h) retail/dining facilities (gross floor area (GFA) of about 900m^2) and privately-operated GIC facilities (GFA of 2,200m^2), including a 6-classroom kindergarten and a 100-place child care centre, would be provided to serve future residents and the neighbourhood;

(i) the Site was located within the Wetland Buffer Area (WBA), and the proposed development and the indicative scheme were in line with the planning intention of the "OU(CDWRA)" zone as well as the "no net loss in wetland" principle under the Town Planning Board Guidelines No. 12C for Developments within Deep Bay Area (TPB PG-No. 12C) in achieving the conservation objectives of wetland ecosystem in the Deep Bay Area;

(j) there were previously approved applications for comprehensive/residential developments with similar or higher development intensity within the WBA in the vicinity of the Site, as well as in Tung Shing Lei and other areas in Nam Sang Wai and Mai Po;

(k) to enhance the ecological function of the Site, a WRA of about 20,200m^2 (about 31% of the development site area) and planting buffer ranging from 6m to 30m from the adjacent wetland and/or WRA with the Site would be provided. Buildings would be dispositioned farthest away from Deep Bay within the Site to ensure adequate buffer from the Wetland Conservation Area (WCA). Appropriate landscaping treatment (including green roof) would also be incorporated to soften the visual appearance of the structures and minimise any visual impact. Wind/visual corridors of at least 15m in width would be allowed within the Site to improve air and/or visual permeability;

(l) in response to the Transport Department's comments, a new circular bus route from the proposed development to Kam Sheung Road Station was proposed and the bus lay-by would be maintained and managed by the applicants. The detailed design would be explored at s.16 application stage;

(m) the proposed development would still be subject to various development controls under separate regimes, e.g. submission of Environmental Impact Assessment (EIA) report under the EIA Ordinance (EIAO), s.16 application, land exchange application and general building plan submissions;

Ecological Enhancement

(n) the Ecological Impact Assessment (EcoIA) was conducted for a one-year period covering both the wet and dry seasons;

(o) the abandoned pond within the Site was about 11,900m^2 and was physically separated from the wetland in the WCA to the immediate west of the Site by brownfield operations. The applicants proposed a WRA comprising

two commercial fishponds of about 20,200m^2 which would be located adjoining the existing wetland in WCA to the west of the Site, representing an increase in area of 8,300m^2 and an enhancement in quality of the wetland area;

(p) the applicants were willing to commit to the construction and the long-term management and maintenance of the commercial fishponds, and would engage local fish farmers to undertake the daily operation and management; and

(q) the Agriculture, Fisheries and Conservation Department (AFCD) had no objection to the findings of the EcoIA and the proposed mitigation measures recommended therein.

30. As the presentations of PlanD's representative and the applicants' representative were completed, the Chairman invited questions from Members.

WRA

31. Two Members raised the following questions:

(a) whether there was precedent case which involved the provision of WRA as part of the development proposal (such as Park Yoho);

(b) how the proposed commercial fishponds as compared to traditional fishponds could achieve the function of the WBA, whether the applicants had assessed the possibility of engaging fish farmers/operators for the management of the proposed commercial fishponds, and the fallback scenario if such arrangement could not be taken forward; and

(c) AFCD's comments on the applicants' WRA proposal.

32. In response, Mr Anthony K.O. Luk, DPO/FSYLE, with the aid of some PowerPoint slides, made the following main points:

(a) there were several planning applications approved within the WBA, including a comprehensive commercial development to the south of the Site with provision of wetland restoration (No. A/YL-NSW/241). The proposed development under that application had not yet commenced. Besides, there was a completed residential development (Park Yoho) with WRA covered by a planning permission, which provided brackish marsh habitat for damselflies and butterflies, located to the southwest of the Site across San Tin Highway, but the development was located outside the WBA;

(b) there were wetland enhancement projects in the form of commercial fishponds operating under the Fishpond Management Agreement (MA) in the Northwest New Territories (NWNT). Fishpond operators were required to drain down the fishponds to a certain water level in order to provide a suitable habitat for waterbirds to forage and roost;

(c) according to the EcoIA submitted by the applicants in accordance with TPB PG-No. 12C, the overall ecological value of the abandoned pond within the Site was "low to medium". Although the proposed development would lead to direct loss of part of the abandoned pond, the proposed WRA would result in a net increase in wetland area within the Site and hence, complying with the "no-net-loss in wetland" principle under TPB PG-No. 12C. As stated in TPB PG-No. 12C, higher bird usage was observed to correlate with ponds contiguous to each other and with a greater and continuous area compared to fragmented and isolated ponds. Hence, the proposed WRA with fishponds located at the southwestern part of the Site that would achieve an extension of a continuous area of fishponds to its west could improve the ecological function. The Director of Agriculture, Fisheries and Conservation (DAFC) had no objection to the application and had no adverse comment on the EcoIA and the Wetland Restoration and Creation Scheme (WRCS) in the form of commercial fishponds, as well as its long-term management as proposed by the applicants; and

(d) in view of the above, the proposed development could fulfil the

"no-net-loss in wetland" principle in terms of area and function, and was considered in line with the TPB PG-No. 12C. In addition, the proposed development was a designated project under the EIAO and the applicants were required to obtain an Environmental Permit (EP) in accordance with the EIAO.

33. Mr Kenneth To, the applicants' representative, with the aid of some PowerPoint slides, supplemented the following main points:

(a) apart from Park Yoho, there was another comprehensive residential development with a completed WRA comprising ponds and marshes within the WBA in Wo Sang Wai, Mai Po;

(b) the area to the immediate west and south of the Site fell within the "Conservation Area" zone and the WCA, and had been occupied by traditional commercial fishponds which were still in operation for a long period of time. As such, it was proposed to have a WRA comprising commercial fishponds at the southwestern part of the Site to enhance the ecological function and linkages with the existing ponds within the adjoining WCA; and

(c) the operation of the commercial fishponds would make reference to the conservation friendly operation adopted in the MA in the NWNT under the New Nature Conservation Policy (NNCP), such as annual partial/full drain-down to provide more feeding opportunities for waterbirds. This practice had been adopted by the fishponds in the vicinity of the Site and was thus considered suitable for the operation of the proposed WRA. The future fishpond operator could apply for funding support from the Environmental and Conservation Fund for carrying out conservation friendly fishpond operation.

34. To supplement, Mr Vincent Lai, the applicants' representative, said that the commercial fishponds proposed for the WRA were traditional fishponds. Their ecological value had long been recognised as an example of prudent use of wetland under which fish

culture practice coexisted in harmony with bird conservation as recommended in the Study on Ecological Value of Fish Ponds in the Deep Bay Area (the Study) completed by PlanD in 1997. The MA arrangement with funding support was to further encourage the fishpond operators to adopt a traditional and ecologically sustainable operation mode in managing their fishponds, such as extending the time of/more frequent drain-down of ponds to prolong the time for feeding of birds and prohibit the use of lethal bird deterring device at their ponds.

35. In response to a Member's enquiry on whether the MA arrangement was confirmed to be adopted for the proposed commercial fishponds, Mr Kenneth To and Ms Pauline Lam, the applicants' representatives, said that the applicants would submit a detailed maintenance and management (M&M) plan at the s.16 application stage. The applicants would decide at land exchange stage on whether to adopt the MA in the NWNT under the NNCP or put forward a private MA with the future fishpond operator(s).

36. In response to the Chairman's further enquiry on whether there were similar previous cases that upon approval of rezoning, the implementation of WRA was governed by planning conditions under the subsequent approved s.16 planning applications, Mr Anthony K.O. Luk, DPO/FSYLE, said that as mentioned in the Paper, the applicants had submitted a WRCS with the EcoIA providing information on the wetland creation and long-term management of the WRA. Should the current rezoning application and the subsequent s.16 application for the proposed comprehensive development with WRA be approved by the Board, the planning permission of the latter would be subject to approval conditions, which could include the submission and implementation of a Habitat Creation and Management Plan with funding arrangement proposal to ensure the long-term maintenance and management of the WRA to the satisfaction of the Director of Environmental Protection and DAFC. Such arrangement was similar to some previous planning permissions where WRA was required in tandem with the residential development.

NM Development Strategy (NMDS) and the Overall Planning Context

37. A Member asked how the proposed scheme could echo with the planning principles of the NMDS in expanding the environmental capacity and achieving carbon neutrality, such as provision of air ventilation corridor to ensure wind permeability, landscape design to ensure greenery, measures to minimise excavation for the construction of the

proposed basement carpark and hence adverse impact on the environment.

38. In response, Mr Anthony K.O. Luk, DPO/FSYLE, with the aid of some PowerPoint slides, said that upon rezoning, the applicants would be required to submit a detailed development scheme at the s.16 application stage and further demonstrate the technical feasibility and acceptability of proposed development as well as infrastructural capacity. Taking air ventilation as an example, according to the Air Ventilation Assessment – Expert Evaluation (AVA-EE) submitted, the annual and summer prevailing winds were mainly from the east and the south or southwest, respectively. Considering the surrounding context, the west of the Site mainly comprised fishponds and open areas without developments whereas some low-rise structures and village houses were located at Pok Wai Village and Wing Kei Tsuen to the northeast and east of the Site. Optimal building disposition was proposed in the indicative scheme to facilitate the penetration of annual and summer prevailing winds. The AVA-EE demonstrated that the proposed development would unlikely generate significant adverse air ventilation impact on the surrounding environment with the implementation of the proposed mitigation measures. In that regard, CTP/UD&L, PlanD had no objection to the current application.

39. Mr Kenneth To, the applicants' representative, said that the subject application was for rezoning the Site to "OU(CDWRA)1" with higher PR and BH restrictions for the proposed low-to-medium rise comprehensive residential development with a WRA of not less than 31% of the development site area. The development scheme proposed in the application, including the car park design, could be refined at the s.16 application stage to incorporate elements to complement the planning principles of NMDS, while at the same time fulfilling relevant government departments' requirements.

40. A Member raised the following questions:

(a) the consideration and reference of development parameters of surrounding developments (including Park Yoho) for the proposed development parameters in the application; and

(b) considering that the Site was located within the ambit of NMDS in close proximity to Shenzhen, which was already well developed, what the value

of wetland in Deep Bay Area was, and whether there was any scope to increase the development intensity of the Site and the surrounding area to promote economic growth while striking a balance for conservation of the wetland.

41. In response, Mr Kenneth To and Ms Pauline Lam, the applicants' representatives, made the following points:

(a) reference was made to the development parameters of the planned/committed developments in the vicinity of the Site, including an approved hotel development (application No. Y/YL-NSW/3) with a PR of 1.5; the planned public housing development at Sha Po with a PR of 6.7 and a BH of about 185mPD; Park Yoho with a PR of 1.25 and BH of 11 to 17 storeys; a comprehensive residential developments south of Park Yoho (application No. A/YL-KTN/604) with a PR of 1.254 and BH of 12 to 18 storeys; another comprehensive residential development further south (application No. A/YL-KTN/663) with a PR of 1.67 and a BH of 62.2mPD; the Land Sharing Pilot Scheme (LSPS) at Tung Shing Lei with a PR of 3.23, as well as a comprehensive residential development to the further south (application No. A/YL-NSW/274) with a PR of 2.29 and a BH of 75mPD. For Wetland Seasons Bay to the west of the Site close to Hong Kong Wetland Park, the PR was 1.5 and the BH was 15 storeys;

(b) while the planned public housing development at Sha Po was of higher development intensity (PR of 6.7), Park Yoho and the comprehensive developments nearby were of lower development intensity as they were approved before the planning of the said public housing development;

(c) the LSPS at Tung Shing Lei and its adjacent comprehensive residential development (application No. A/YL-NSW/274) were of higher development intensity than that of the subject application, as the two developments were closer to Yuen Long Town Centre and further away from Deep Bay Area; and

(d) as about 31% of the development site area would be reserved as a WRA, a higher PR for the proposed development would result in higher BH, larger building bulk and less building separation. Having taken into account the site context and the location of being within the WBA, a PR of 1.5 was considered compatible with the surroundings and was therefore appropriate for the Site.

42. In response, Mr Anthony K.O. Luk, DPO/FSYLE, with the aid of TPB PG-No. 12C (Figure A – Deep Bay Wetland Conservation and Buffer Areas Boundaries), made the following main points:

(a) areas within the WCA were designated with conservation zonings including "Conservation Area", "Site of Specific Science Interest" and "Other Specified Uses" annotated "Comprehensive Development and Wetland Enhancement Area". Fishponds providing feeding grounds for birds were within those areas and there was a general presumption against development in those zones;

(b) according to the principles laid down in TPB-PG No. 12C, the planning intention of the WCA was to conserve the ecological value of the fish ponds which formed an integral part of the wetland ecosystem in the Deep Bay Area. The WBA was designated as a buffer zone to protect the WCA. Development within the WBA which would help to remove the existing open storage use and/or to restore some of the fishponds and would not have adverse ecological impacts on the WCA might be allowed, such as those previous applications approved within the WBA to the south of the Site as previously mentioned;

(c) an example of striving for co-existence of development and conservation was the San Tin Technopole proposed under the NDMS;

(d) Park Yoho was approved in 2012 at the time when the area was still under a more rural setting, while the proposed public housing development at Sha Po was only approved by the Board and gazetted in 2023, benefitting from

the improvement in transport infrastructure and connectivity of the area from the implementation of NOL Phase 2; and

(e) there were other planning applications under processing within the WBA. PlanD would continue to follow the principles established under TPB-PG No. 12C when striking a balance between development and conservation of ecological integrity of Deep Bay wetland ecosystem.

Environmental Impacts during Construction Stage

43. In response to a Member's enquiry about the ways to minimise impact on the environment during construction phase of the proposed development, Mr Vincent Lai, the applicants' representative, made the following points:

(a) in terms of development programme, it was planned to construct the commercial fishponds for the WRA first during the wet season given the lower bird abundance during that period of time. This would also allow the WRA to serve as a buffer between the works area of the residential portion and fishponds outside the Site. While the construction methodology or foundation works of the residential portion would be subject to further study, it was envisaged that quieter piling methods instead of traditional percussive piling would be adopted with a view to minimising the disturbances. Also, the piling works for towers located closest to the fishponds outside the Site and the proposed WRA should be planned to be conducted during the wet season where feasible; and

(b) during the operation phase, the fishponds in the WRA and the 30m planting buffer in the western portion of the Site would provide screening effects and serve as a buffer to shield any potential noise and disturbance from the Site to the surrounding environment, including the WCA.

Au Tau Station of NOL

44. Two Members raised the following questions:

(a) the target completion date of Au Tau Station of NOL noting that the tentative completion year of the proposed development was 2028; and

(b) the pedestrian connectivity to the future Au Tau Station.

45. In response, Mr Anthony K.O. Luk, DPO/FSYLE, made the following main points:

(a) the planned Au Tau Station was part of MTR NOL Phase 2 which was expected for completion in 2034. As the proposed development was targeted to complete by 2028, the transport demand of which would rely on road network before the commissioning of Au Tau Station; and

(b) the future Au Tau Station could be accessible from the Site via the existing footbridge over and underpass across San Tam Road, San Tin Highway and Castle Peak Road-Tam Mi.

46. As Members had no further question to raise, the Chairman said that the hearing procedures of the application had been completed. The Board would further deliberate on the application in the absence of the applicants' representatives and inform the applicants of the Board's decision in due course. The Chairman thanked PlanD's representatives and the applicants' representatives for attending the meeting. They left the meeting at this point

[Mrs Vivian K.F. Cheung, Ms Jane K.C. Choi, Miss Winnie W.M. Ng and Ms Clara K.W. U left the meeting during the question and answer session.]

Deliberation Session

47. The Chairman remarked that under the subject application, the proposed rezoning only involved relaxation of PR and BH restrictions without changing the planning intention of the subject "OU(CDWRA)" zone. The proposed comprehensive residential development with WRA was in line with the planning intention of phasing out the existing brownfield uses at the Site with the provision of WRA to restore the wetland function and improve the

existing degraded environment. The proposed relaxation of PR and BH restrictions, as PlanD's representative had explained, had taken account of the changes in planning circumstances of the area in recent years, such as the implementation of MTR NOL and its Au Tau Station, which would create capacity for development of higher intensity, e.g. the planned public housing development in Sha Po, and facilitate the transformation of this part of Nam Sang Wai area into a medium-rise residential neighbourhood. According to the EcoIA submitted by the applicants and agreed by DAFC, the ecological value of the habitats at the Site was very low to low. That said, the applicants came up with a planning merit by proposing a net increase of wetland, from the about 11,900m^2 of existing abandoned pond to not less than 20,200m^2 of commercial fishponds, with an improved layout, enhanced function and better operation under the rezoning proposal. Upon rezoning of the Site and to take forward the proposed development, the applicants would be obliged to submit a comprehensive development scheme with more details under a s.16 application, and approval conditions could be imposed to ensure that the proposed WRA would be properly implemented and sustained in the long run. Also, the proposed development was subject to the provision of EIAO that the applicants was required to submit an EIA report and apply for an EP. Relevant government departments had no comment on/objection to the application and PlanD had no in-principle objection to the proposed rezoning.

48. A Member supported the WRA under the proposal and considered that the rezoning application could be agreed to facilitate the restoration of wetland in the area.

49. Another Member expressed that some issues regarding the proposed scheme could only be addressed with more details in the s.16 application stage, and such approach could not facilitate a comprehensive evaluation of the proposal at the current s.12A application stage and might pre-empt the Board's decision on whether the Site could be developed with higher intensity. In particular, the Member had the following observations:

(a) according to the indicative layout, the part of the Site currently occupied by brownfield operations was proposed as WRA while the existing abandoned fishpond would be developed, and whether such arrangement was appropriate in terms of wetland conservation;

(b) the ecological function of the proposed WRA and whether the MA for

securing the operation of the commercial fishponds in a conservation friendly manner could be realised; and

(c) the proposed development might cause blockage of air paths in the area.

50. The Chairman drew Members' attention that the planning intention of "OU(CDWRA)1" zone was to provide incentive for the restoration of degraded wetlands adjoining existing fish ponds through comprehensive residential and/or recreational development to include wetland restoration area. There was no general presumption against development within this zone. Under the established statutory planning mechanism, planning applications should be considered based on the planning intention of the relevant land use zoning as laid down on the statutory plan, as well as the relevant considerations on latest planning circumstances, technical feasibility and infrastructural capacity. For the subject application, even if the rezoning was agreed by the Board, the applicants would still need to submit a comprehensive development scheme for the Board's consideration and approval conditions could be imposed to ensure that the major issues and elements of the scheme could be duly addressed and implemented. For instance, an approval condition on the conservation and management plan for the proposed WRA could be imposed and the applicants would be obliged to fulfil all requirements and conditions imposed by the relevant government departments in order to fulfil the condition. The proposed development was also subject to the requirements under other relevant regimes, including the submission of an EIA report under EIAO, applications for land exchange/lease modification and under both of which the details of the management of the WRA could be formulated and scrutinised.

51. A Member raised concern on the lack of comprehensive planning for the area and hence, the basis for the approval of rezoning applications of this kind. Without the benefit of a comprehensive planning and review, it was uncertain how the PR and BH of the Site could be determined in relation to its surrounding developments and approval of the application and similar applications for relaxation of development restrictions might result in sporadic developments that might overstrain the infrastructure capacity, provisions of GIC facilities as well as the environmental capacity of the area. Besides, the Committee could only rely on AFCD's comments regarding the ecological aspect of the rezoning proposal and the proposed scheme. Another Member opined that the statutory plans had already provided the land use framework for development of individual planning scheme area, which were

formulated based on development strategies at territorial level, and formed the basis for assessment of planning applications. Hence, approval of individual applications would not result in piecemeal developments.

52. The Chairman supplemented that as explained in the Policy Address and the relevant Action Agenda, the Government would take the lead in the development of the NM, which extended across some 30,000 ha of land in the New Territories. For major development nodes in NM, including Lau Fau Shan, San Tin, the New Territories North and Lo Wu/Man Kam To, the Government was conducting planning studies to formulate land use and development proposals, and would take forward the development proposals. Given the private land ownership and site conditions of other areas, developments therein were primarily privately initiated. As per a Member's view above, land use and development framework for each planning scheme area had already been established under extant statutory plans. Taking the subject application as an example, the planning framework for the Site was already established under the subject "OU(CDWRA)" on the OZP, i.e. comprehensive development with the provision of WRA. Applications involving any deviations from the provisions under the OZP, such as the subject application for relaxation of PR and BH restrictions, would be processed in accordance with the established statutory planning mechanism. PlanD and relevant government departments, including AFCD and Environmental Protection Department, would carefully consider the development proposals from different policy angles, as well as strategic planning and technical feasibility points of view, and offer professional comments for the Board's consideration. Members concurred with the aforesaid considerations were of the view that the current rezoning application could be agreed.

53. After deliberation, the Committee decided to agree in-principle to the application for rezoning the Site to "OU(CDWRA)1" with higher permissible PR and BH for the proposed comprehensive residential development. The relevant proposed amendments to the OZP, together with the revised Notes and Explanatory Statement, would be submitted to the Committee for consideration prior to gazetting under section 5 of the Town Planning Ordinance.

Attachment VII of
RNTPC Paper No. 4/24

Provision of Major Community Facilities and Open Space in Nam Sang Wai OZP

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG) Requirements	Requirement based on OZP planned population	Provision		Surplus/ Shortfall against OZP planned provision
			Existing Provision	Planned Provision (including Existing Provision)	
District Open Space	10 ha per 100,000 persons[#]	2.85 ha	0 ha	8.75 ha	+5.90 ha
Local Open Space	10 ha per 100,000 persons[#]	2.85 ha	0.13 ha	7.40 ha	+4.55 ha
Sports Centre	1 per 50,000 to 65,000 persons[#] (assessed on a district basis)	0	0	0	0
Sports Ground/ Sport Complex	1 per 200,000 to 250,000 persons[#] (assessed on a district basis)	0	0	0	0
Swimming Pool Complex – standard	1 complex per 287,000 persons[#] (assessed on a district basis)	0	0	0	0
District Police Station	1 per 200,000 to 500,000 persons (assessed on a regional basis)	0	0	0	0
Divisional Police Station	1 per 100,000 to 200,000 persons (assessed on a regional basis)	0	0	0	0

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG) Requirements	Requirement based on OZP planned population	Provision		Surplus/ Shortfall against OZP planned provision
			Existing Provision	Planned Provision (including Existing Provision)	
Magistracy (with 8 courtrooms)	1 per 660,000 persons (assessed on a regional basis)	0	0	0	0
Community Hall	No set standard	N.A	0	0	N.A.
Library	1 district library for every 200,000 persons (assessed on a district basis)	0	0	0	0
Kindergarten/ Nursery	34 classrooms for 1,000 children aged 3 to under 6	17 classrooms	0 classroom	14 classroom	-3 classrooms
Primary School	1 whole-day classroom for 25.5 persons aged 6-11 (assessed by EDB on a district/school network basis)	41 classrooms	0 classroom	0 classroom	-41 classrooms[&]
Secondary School	1 whole-day classroom for 40 persons aged 12-17 (assessed by EDB on a territory-wide basis)	31 classrooms	0 classroom	0 classroom	-31 classrooms[&]

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG) Requirements	Requirement based on OZP planned population	Provision		Surplus/ Shortfall against OZP planned provision
			Existing Provision	Planned Provision (including Existing Provision)	
Hospital	5.5 beds per 1,000 persons (assessed by Hospital Authority on a regional/cluster basis)	159 beds	732 beds	732 beds	+573 beds
Clinic/Health Centre	1 per 100,000 persons (assessed on a district basis)	0	0	0	0
Child Care Centre	100 aided places per 25,000 persons[#] (assessed by SWD on a local basis)	114 places	0 place	100 place	-14 places [~]
Integrated Children and Youth Services Centre	1 for 12,000 persons aged 6-24[#] (assessed by SWD on a local basis)	0	0	0	0
Integrated Family Services Centre	1 for 100,000 to 150,000 persons[#] (assessed by SWD on a service boundary basis)	0	0	0	0

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG) Requirements	Requirement based on OZP planned population	Provision		Surplus/ Shortfall against OZP planned provision
			Existing Provision	Planned Provision (including Existing Provision)	
District Elderly Community Centres	One in each new development area with a population of around 170,000 or above[#] (assessed by SWD)	N.A.	0	0	N.A.
Neighbourhood Elderly Centres	One in a cluster of new and redeveloped housing areas with a population of 15,000 to 20,000 persons, including both public and private housing[#] (assessed by SWD)	N.A	0	1	N.A.
Community Care Services (CCS) Facilities	17.2 subsidised places per 1,000 elderly persons aged 65 or above[#] (assessed by SWD on a district basis)	98 places	3 places	5 places	-93 places [~]
Residential Care Homes for the Elderly	21.3 subsidised beds per 1,000 elderly persons aged 65 or above[#] (assessed by SWD on a cluster basis)	122 beds	165 beds	165 beds	+43 beds [~]

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG) Requirements	Requirement based on OZP planned population	Provision		Surplus/ Shortfall against OZP planned provision
			Existing Provision	Planned Provision (including Existing Provision)	
Pre-school Rehabilitation Services	23 subvented places per 1,000 children aged 0 – 6[#] (assessed by SWD on a district basis)	22 places	0 place	0 place	-22 places [~]
Day Rehabilitation Services	23 subvented places per 10,000 persons aged 15 or above[#] (assessed by SWD on a district basis)	52 places	0 place	0 place	-52 places [~]
Residential Care Services	36 subvented places per 10,000 persons aged 15 or above[#] (assessed by SWD on a cluster basis)	81 places	0 place	0 place	-81 places [~]
Community Rehabilitation Day Centre	1 centre per 420,000 persons[#] (assessed by SWD on a district basis)	0	0	0	0
District Support Centre for Persons with Disabilities	1 centre per 280,000 persons[#] (assessed by SWD on a district basis)	0	0	0	0
Integrated Community Centre for Mental Wellness	1 standard scale centre per 310,000 persons[#] (assessed by SWD on a district basis)	0	0	0	0

Note :
The planned resident population is about 28,500. If including transients, the overall planned population is about 29,000. All population figures have been adjusted to the nearest hundred.

Remark :

The requirements exclude planned population of transients.

& The deficit in provision is based on OZP planned population while according to the Education Bureau (EDB), general speaking, the provision of public sector primary school places is planned on a district basis and the public sector secondary school places is on a territory-wide basis. Under the prevailing mechanism, EDB will make reference to the school-age population projections, which are compiled based on the population projections updated regularly by the Census and Statistics Department, and take into account the actual number of students at various levels as well as the latest demographic changes (including the number of newly-arrived children from the Mainland) in estimating the future demand for school places and related resources. EDB will consider factors such as the latest projections, other factors that may affect the demand for school places in certain districts, different options to increase the supply of school places in particular districts, the prevailing education policies (including to enhance teaching and learning environment through reprovisioning) etc. before deciding whether it is necessary to allocate school premises for setting up new school(s) or reprovisioning of existing school(s).

~ The deficit in provision is based on OZP planned population while the Social Welfare Department (SWD) adopts a wider spatial context/cluster in the assessment of provision for such facility. In applying the population-based planning standards, the distribution of welfare facilities, supply in different districts, service demand as a result of the population growth and demographic changes as well as the provision of different welfare facilities have to be considered. As the HKPSG requirements for these facilities are a long-term goal, the actual provision will be subject to consideration of the SWD in the planning and development process as appropriate. The Government has been adopting a multi-pronged approach with long-, medium- and short-term strategies to identify suitable sites or premises for the provision of more welfare services which are in acute demand.