Shatin to Central Link

Construction & Demolition Material Management Plan (Revision G)

Submission to EPD under SCL Environmental Permit conditions:

(i) EP-438/2012/A (Condition 2.11) for “Tai Wai to Hung Hom Section” (12/7/2012)

(ii) EP-437/2012 (Condition 2.9) for “Mong Kok East to Hung Hom Section” (22/3/2012)

(iii) EP-436/2012 (Condition 2.9) for “Hung Hom to Admiralty Section” (22/3/2012)

September 2012

MTR

MTR Corporation Limited

Shatin to Central Link

Construction and Demolition Material Management Plan

(Revision G, September 2012)

Certified by: Richard Kwan 

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Date: 12 September 2012

MTR Corporation Limited

Shatin to Central Link

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(Revision G, September 2012)

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Date: 11/9/2012

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APPENDIX A

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1. INTRODUCTION

Purpose

The purpose of this management plan (C&DMMP) is to provide an estimate of the quantities of construction and demolition (C&D) materials to be generated from construction activities under the Shatin to Central Link project (the SCL). It also outlines measures to minimize the generation of and maximize the reuse of inert C&D material as far as possible. The purpose of this submission is to fulfill the following conditions under the Environmental Permits issued by EPD for the SCL :

(i) EP-438/2012/A (2.11) for "Tai Wai to Hung Hom Section" (12/7/2012);

(ii) EP-437/2012 (2.9) for "Mong Kok East to Hung Hom Section" (22/3/2012);

(iii) EP-436/2012 (2.9) for "Hung Hom to Admiralty Section" (22/3/2012).

Background of the Project

The SCL is one of the ten large-scale infrastructure projects announced by the Chief Executive in his 2007-2008 Policy Address, targeting commencement of construction by 2010. In mid-2008 the Executive Council requested the MTR Corporation to proceed with further planning and design for this line.

The SCL is a 17km extension of the existing Ma On Shan Line (MOL) (EAL) from Tai Wai Station via Hing Keng, Diamond Hill, Kai Tak, To Kwa Wan, Ma Tau Wai and Ho Man Tin to Hung Hom, and link up with the existing West Rail Line (WRL)/ Kowloon Southern Link (KSL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS), and an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Exhibition Station (EXH) and terminate at Admiralty Station (ADM) with realignment of the existing EAL tracks from the tunnel portal near Oi Man Estate to HUH.

The MTR Corporation Ltd. (MTRCL) is the implementation agent of the Project, which Preliminary Design phase has been completed. The Project has now entered into Detailed Design phase since early 2010. The SCL project was gazetted on 26 November 2010, followed by its first Gazette Amendment on 15 July 2011 and 2nd Gazette Amendment on 11 November 2011 and the Scheme was approved by the Chief Executive in Council on 27 March 2012. Project funding was approved on 11 May 2012. Construction contracts are being tendered and it is anticipated that they will be progressively awarded from 3rd quarter of 2012.

The general alignment plan for the SCL is shown in **Figure 1.1 in Appendix B.**

2. SCOPE OF THE PROJECT

The SCL is a Designated Project under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO).

The scope of construction works for SCL will include the following:

(i) a railway of approximately 11km long from Tai Wai to Hung Hom;
(ii) seven railway stations at Hin Keng, Diamond Hill, Kai Tak, To Kwa Wan, Ma Tau Wai, Ho Man Tin and Hung Hom;
(iii) stabling sidings at the former Hung Hom Freight Yard and associated launching/retrieval tracks;
(iv) construction and operation of an approximately 1.2 km realigned and modified railway from Portal 1A near Oi Man Estate to the new ventilation building in Hung Hom Station; the associated new platforms at Hung Hom Station; the associated ventilation shafts, cooling tower and other associated works; noise mitigation measures at Portal 1A; modification works on the existing Homantin Siding and Mong Kok Freight Terminal; and the operation of the integrated Hung Hom Station;
(v) realignment of the existing Cheong Wan Road;
(vi) construction and operation of an approximately 6 km underground railway from Hung Hom to Admiralty; the associated Exhibition Station and the integrated Admiralty Station; the overrun tunnel to the southwest of integrated Admiralty Station; the associated ventilation buildings, ventilation shafts, smoke extraction facilities and other associated works;
(vii) temporary reclamation totalling approximately 2.2 ha. at Hung Hom landfall and Causeway Bay Typhoon Shelter; and the replacement of Hung Hom Bypass fender piles;
(viii) reclamation works and dredging works in Victoria Harbour for the cross-harbour section of the railway;
(ix) associated ventilation building, ventilation shafts, emergency access, emergency escape access and emergency egress point; and
(x) supporting works areas, access roads, barging facilities and temporary explosive magazine during the construction of the Project.

3. IMPLEMENTATION PROGRAMME

The envisaged works programme for the SCL project are shown in **Figure 3.1 in Appendix B**. The construction contracts for SCL are scheduled to be progressively awarded as from 2012 and completed by 2020.

4. CONTRACT STRATEGY

The present contract strategy is to divide SCL into 15 major construction contracts. The works package will comprise the following:

1101	Ma On Shan Line Modification Works (1)
1102	Hin Keng Station and Approach Structures
1103	Hin Keng to Diamond Hill Tunnels
1106	Diamond Hill Station
1107	Diamond Hill to Kai Tak Tunnels
1108	Kai Tak Station and Associated Tunnels
1108A	Kai Tak Barging Point Facilities
1109	Stations and Tunnels in Kowloon City
1111	Hung Hom North Approach Tunnels
1112	Hung Hom Station and Stabling Sidings
1121	Cross Harbour Tunnels
1122	SCL Overrun Tunnel
1123	Exhibition Station and Western Approach Tunnel
1126	Provisioning of Harbour Road Sport Centre and Wan Chai Swimming Pool
1128	SOV to Admiralty

Note (1) Only noise cover at Mei Tin Road is included in this C&DMMP.

There are also construction works which are entrusted to the HKSAR's Central to Wanchai By-Pass Project (CWB), from which the quantities of spoil generated are not accounted for in this C&DMMP.

The various SCL stations, stabling sidings and tunnels are depicted in **Figures 5.1 to 5.21 in Appendix B**. The various SCL construction contracts are delineated in **Figure 5.22 in Appendix B**.

5. MANAGEMENT OF C&D MATERIAL

5.1 Estimate of C&D Material

The total volume of C&D material to be generated during the course of SCL construction is estimated to be 6.53 M m³ based on the latest design schemes. The materials generated include 5.163 M m³ of soft inert materials, wet spoil recovered from TBM excavation and during diaphragm wall / bored pile installation, Grade III or below granite, Grade II or above rock, and artificial hard materials (i.e. concrete and asphalt debris), as well as 1.243 M m³ of sediment and 0.124 M m^3 of non-inert C&D wastes. **Figures 6.1 to 6.3 in Appendix B** show the entire alignment into the geological profiles, based on the available SI information. The summary of the C&D material situation is shown in **Table 6.1 in Appendix A. Tables 6.2 to 6.16 in Appendix A** give a further breakdown of the half-yearly C&D material generated during the envisaged construction period.

The total quantities of C&D materials to be generated from different sections of the SCL have also been presented as far as practicable for comparison with the SCL EIA Reports, see table below. However, considering the interface and complexity of SCL (TAW-HUH) and SCL (MKK-HUH) especially at Hung Hom area, it would not be pragmatic to segregate the C&D materials into two quantities. Comparison of the combined quantity in SCL (TAW-HUH) and SCL (MKK-HUH) EIA Reports with the C&DMMP has therefore been made.

It should be noted that this C&DMMP (Rev. G) document is prepared with prevalent project profile in 2012, which is in variance to the former SCL C&DMMP (Rev. F) edition that was approved by PFC in August 2011. Therefore there will be a variance of the total C&D material generation as detailed in this document with the amalgamated quantities reported in all the approved SCL EIA's. This variance is attributed by, in the main:-

- deletion of the Diamond Hill Stabling Sidings;
- addition of the Hung Hom Stabling Sidings; and
- recently approved / submitted Sediment Quality Reports verifying sediment quantities on various works sections

Generation of C&D Materials and Sediment presented in C&DMMP and EIA Reports

(x1000m^3)

Works Area	Soft inert	Rock	AHM	Non-inert	TOTAL C&D (excl. non-inert)	Sediment
SCL (TAW-HUH) and SCL (MKK-HUH)						
C&DMMP Rev G	3490	453	125	92	4068	302
EIA Reports for SCL (TAW-HUH) and SCL (MKK-HUH) (1)	3858	454	96	NA (1)	4408	378
Difference between C&DMMP Rev G and EIA Reports	-368	-1	29	NA (1)	-340	-76
SCL (HUH-ADM)						
C&DMMP Rev G	767	216	111	31	1094	941
EIA Report for SCL (HUH-ADM)	762	225	110	30	1097	842
Difference between C&DMMP Rev G and EIA Report	5	-9	1	1	-3	99
Total Quantities in C&DMMP Rev G	**4257**	**669**	**236**	**123**	**5162**	**1243**
Total Quantities in EIA Reports(2)	**4620**	**679**	**206**	**NA (1)**	**5505**	**1220**
Total Difference between C&DMMP Rev G and EIA Reports	**-363**	**-10**	**30**	**NA (1)**	**-343**	**23**

Notes:

(1) The amount of non-inert materials was not presented in SCL (TAW-HUH) EIA Report. Therefore, direct comparison between these documents is not made here.

(2) EIA Reports for SCL (TAW-HUH), SCL (MKK-HUH) and SCL (HUH-ADM).

A reduction of 0.34 Mm^3 (excluding non-inert materials) was achieved in SCL (TAW-HUH) and SCL (MKK-HUH) due to abovementioned attribution. There is only minor increase of 0.03 Mm^3 artificial hard materials due to the review of design as a whole.

The quantities of C&D materials to be generated in SCL (HUH-ADM) are similar to that presented in EIA Report for SCL (HUH-ADM). Minor reduction of 0.003 Mm^3 was achieved.

The overall reduction of 0.343 Mm^3 C&D material to be generated has also been notified PFC in a meeting on 21 June 2012.

As the total quantities of C&D materials to be generated are reduced and there is no significant increase of each type of C&D materials, the findings and recommendations on waste management in approved EIA Reports are still valid. Besides, mitigation measures to reduce and reuse C&D materials

would be explored throughout the construction stage.

5.2 Mitigation Measures to Reduce C&D Material Generated

In general, the combination of the urban setting and the nature of the physical constraints have limited the available options for the stations and tunnels construction. Also, opportunities were taken to maximize the use of TBM and Drill & Blast tunnels for most of the length of SCL as the two construction methods can substantially minimize C&D materials when comparing with cut & cover tunnels.

Majority of the C&D materials comes from the cut and cover sections at Kai Tak & EXH station, and also the Hung Hom Stabling Sidings, which is unavoidable. The drill and blast tunnel sections in Lion Rock and ADM overrun also contribute a high percentage of the C&D materials.

All possible measures including the following to negate / minimize the generation of C&D materials have been explored and implemented:-

- Reduction of the size and the number of offline plant rooms, during Preliminary Design stage;
- Minimization of the overall size of stations, plant buildings, and tunnel box sections through effective structural scheming for plan building and tunnel layout;
- Adoption of tunneling construction techniques that may minimize the amount of excavation as far as possible;
- Various alignment options were explored with optimization to minimize the tunnel lengths without compromising the alignment design criteria;
- The cut-and-cover excavation areas including underground stations, launching and retrieval shafts, HHS, ventilation shafts etc, have been reviewed and optimized to the minimum necessary to ensure the viable construction as well as safe operation of an urban railway line;
- Design development at preliminary design stage has replaced the cut-and-cover tunnel sections between Choi Hung and south of Prince Edward Road East with TBM bored tunnels;
- Realignment options at Diamond Hill were adopted under the SCL DIH Standalone Scheme during preliminary design development, which would result in reduction of interface with the KTL DIH Station, Tates

Cairn tunnel viaducts, approach ramps, and CLP Tai Hom Substation, and hence avoiding the need for substantial underpinning works and hence excavation;

- Both bored tunnel and immersed tube (IMT) options have been considered for the cross harbour tunnel section. The bored tunnel option has been rejected due to a high project risk as a new tunnelling technique employing saturation diving techniques is involved and a deeper cross harbour tunnel is required. As a result of deeper cross harbour section, the HUH station has to be excavated further down and the underground north approach tunnel connecting the HUH station and the existing at-grade EAL would have to be extended further by 1.2km from HMT freight yard to the north of Waterloo Road. Thus, a conventional IMT option is selected as the risk and construction technique are well understood and the amount of excavation works in HUH is reduced;
- The preferred alignment of IMT is one which is as shallow as possible to minimise the extent of dredging whilst still remaining beneath the central marine fairway and the existing sea bed;
- Various tunnelling methodologies for the section from HUH station to Chatham Road north have been investigated. However the study concludes that tunnelling by boring or mining techniques are not feasible due to insufficient soil cover for tunnels boring under Chatham Road north embankment, the presence of complex geological stratum combined with high groundwater table and the obstruction of major underground utilities. Hence only cut and cover tunnel is the viable option.

5.3 Measures to Maximize Re-use of C&D Material Generated

The underground nature of SCL and the scale of structures involved and also the lack of stockpile areas limit the re-use potential of the generated C&D materials. The following measures have been identified to maximize the re-use of C&D materials generated:-

- Excavations for SCL structures will generate inert construction and demolition material comprising excavated earth, wet spoil, broken rock, and building debris. Inert C&D material may be re-used as backfill material in reinstatement works for the SCL project itself. It is anticipated that more than 1.132 M m^3 of suitable excavated soft inert

material (solid) and 0.154 M m^3 of granite rock can be temporarily stored for the purpose.

- Other than for the SCL project, the priority of re-use of suitable excavated spoil (surplus) will be as backfill locally in Hong Kong. Only if there are no possible uses for excavated spoil in Hong Kong shall it be disposed of at local public fill or in the Mainland. The status of re-use options under discussion with Government are as follows:

  i. Delivery of <500mm rock and soft material to reclamations for **Hong Kong Zhuhai Macau Bridge (HZMB) and Tuen Mun–Chek Lap Kok Link (TMCLKL)** projects. The current plan for HZMB is to import 23.44 M tonnes (13.01 M m^3, bulk volume) soft materials and 8.53 M tonnes (4.27 M m^3, bulk volume) rock materials from MTR projects during 2012 to 2014, while the demand from TMCLKL is 5.94 M tonnes (3.30 M m^3, bulk volume) soft materials and 1.76 M tonnes (0.88 M m^3, bulk volume) rock materials from 2013 to 2015. Coordination between HZMB/TMCLKL and MTR railway projects (i.e. SCL, XRL, KTE, WIL, and SIL(E)) regarding fill requirements has commenced form December 2011 on a monthly basis, and the share of contribution of re-used C&D materials from these railway projects to meet HZMB/TMCLKL's fill requirements is continually updated based on more accurate excavation and fill programmes and more precisely calculated C&D material quantities being available. Based on the above information, HZMB's fill requirement from SCL can be met from 2013 to 2014, and some of the HZMB fill demand can also be met by other new railway projects from 2012 onwards. Therefore it is anticipated that SCL's contribution to HZMB will be 4.24 M tonnes (2.12 M m^3, in-situ volume) of surplus soft C&D materials, and 0.44 M tonne (0.16 M m^3, in-situ volume) of surplus rock materials from 2013 to 2014. For TMCLKL, SCL can contribute 1.63 M tonnes (0.82 M m^3, in-situ volume) of surplus soft C&D materials and 0.89 M tonne (0.33 M m^3, in-situ volume) of surplus rock materials from 2014 to 2015. It should be noted that HZMB will not receive rock materials above 250mm, however rock materials generated from the SCL with size reduced to <250mm can be accepted as public fill. For the TMCLKL project, it should be noted from the above spoil contributions to TMCLKL project that the feasibility of realizing such

re-use is subject to assurance from TMCLKL that their project programme is of reasonably high certainty. Any change in status of HZMB or TMCLKL projects, and with the necessary fall-back action if required, will be reviewed on monthly basis. In the event that HZMB or TMCLKL cannot take up the surplus fill from SCL, HyD/MTRCL will explore alternative disposal outlets in Mainland such as Taishan or other local projects including WDII and CWB for acceptance of the fill.

ii. Discussion was commenced with the **Wanchai Development Phase II and Central to Wanchai Bypass projects (WDII / CWB)**, which have indicated a need for import general fill and rock fill of 3.78 M tonnes and 1.92 M tonnes respectively from 2010 to early 2016. Since the fill requirements are relatively small and scattered over the project period, fill contribution from SCL has been discounted at the time of writing this report. Possible disposal from SCL to these projects will be considered subject to further discussion and site coordination as to availability and programme match of spoils generation.

iii. Of particular concern is the requirement of rock fill (for temporary seawall construction) and reclamation spoil for the construction of the remaining sections of the SCL tunnels within the Causeway Bay Typhoon Shelter (CBTS). The current agreed strategy with HyD (Major Works) is for the construction of the SCL tunnels after completion of the CWB project within CBTS. The aforesaid materials are therefore likely to be required between the period of Year Q1 2016 to Q1 2018. The durations of the filling operation however are short with two of the temporary reclamation sections, namely, SCL2 and SCL3 filling operations requiring 30 and 51 days respectively. The estimated quantities are, for SCL2 (rockfill - 34,545 m^3 / general fill - 52,500 m^3) and for SCL3 (rockfill - 47,995 m^3 / general fill - 150,600 m^3). The quantities of re-usable materials based on the programmed TBM and EXH output rates for SCL Phase 2 works on Hong Kong Island cannot satisfy the required fill rate. General fill and rock sources for SCL2 and

SCL3 will therefore need to be imported, and this is likely to be acquired from Fill Banks and/or other alternative sources.

iv. Coordination with **Central Kowloon Route (CKR)** underway aiming to deliver suitable surplus excavation materials for their backfilling. CKR's current planning is to import general fill and rockfill from 2012 to 2015. However, as these fill requirements can be met by the project's own surplus fill generation over the period such that only a *net* 0.07 M tonnes of general fill will need to be imported in 2012, hence fill contribution from SCL has been discounted at the time of writing this report. Any precise arrangement for CKR will need to be further explored during subsequent detailed design stage.

v. **Table 6.17 in Appendix A** gives a breakdown of the SCL surplus C&D materials to be disposed of during the envisaged construction period. Half-yearly breakdowns of fill requirements from the HZMB/TMCLKL, WDII, CWB, and CKR projects are also shown for matching purpose and for estimation of the possible re-use of surplus C&D materials as outlined in paragraphs (i), (ii) and (iv) above.

vi. Apart from the re-use of the 0.154 M m^3 of rock as backfill for the SCL project, rock recycling at local crushing facilities is also being considered. Flexibility would be allowed for contractors to deliver good quality rock to local quarries. It is anticipated that approximately 80% of the surplus rock material (i.e. 1.12 M tonnes or 413,000 m^3) can be recycled as such and that in turn would substantially reduce or avoid the need for re-use at local projects and disposal to Mainland. However such arrangement is subject to agreement with Government and that local rock crushing facilities are available. As to the suitability of rock to be delivered to the quarry and recycled as aggregates, coordination will be made with the quarry to ensure that the acceptance requirements of rock for the re-cycling to aggregates will be complied. Site records will be kept for the type of rock materials being excavated together with the implementation of trip ticket system for tracking the relevant delivery to the rock crushing facility for processing into

aggregates.

vii. Artificial hard materials, comprising 0.213 M m^3 of broken concrete and 0.023 M m^3 of broken asphalt, are anticipated to be generated from demolition of building structures and road works and traffic diversion. In particular, the 0.023 M m^3 of broken asphalt, if adequately sorted and with stockpiling land available, is considered to be suitable for re-use on site.

5.4 Disposed C&D Material

It is estimated that 0.550 M m^3 (1.243 M m^3 of marine sediments excluded) of the surplus C&D material will be disposed off-site. This surplus comprises 0.189 M m^3 of soft inert C&D material, 0.024 M m^3 of rock, 0.213 M m^3 of artificial hard material (broken concrete), and 0.124 M m3 of non-inert C&D waste. The above residual figures assume that other excavated C&D materials will be re-used for all backfilling, reclamation or other earth filling activities on site as described in Section 5.3. It is worth noting that the re-use of the C&D materials in SCL has resulted in reductions of imported general fill and rock fill from 2.399 M m^3, to 1.113 M m^3, and hence the amount of off-site disposal can be significantly reduced. For the disposal of C&D material, to Public Fill Reception Facilities (PFRF), Trip Ticket Systems will be implemented within the various construction contracts in accordance with DEVB TC(W) No. 6/2010.

5.5 Storage and Collection of C&D Material

The Contractor shall prepare and implement a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of C&D material to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project which would be reviewed regularly.

Storage of materials on site may induce adverse environmental impacts if not properly managed. Storage or stockpiling of C&D material is not anticipated as the C&D materials generated would be removed from site immediately; however, should any temporary storage or stockpiling of C&D material is required, recommendations to minimize the impacts include:

- Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution;
- Maintain and clean storage areas routinely;
- Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and
- Different locations shall be designated to stockpile each material to enhance reuse.

Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimise the potential adverse impacts:

- Remove waste in timely manner;
- Waste collectors shall only collect wastes prescribed by their permits;
- Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers;
- Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28);
- Waste shall be disposed of at licensed waste disposal facilities; and
- Maintain records of quantities of waste generated, recycled and disposed.

It is recommended that specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas (if required) for the sorted materials. The materials could be segregated according to the categories as shown below:

- Excavated materials suitable for reuse at other concurrent projects or rock crushing facilities;
- Excavated materials for delivery to PFRFs;
- Sediments for delivery to sea disposal; and
- Non-inert C&D materials for delivery to landfills.

5.6 Disposal Method

(a) Public Fill Proposal

In the absence of active reclamation sites in Kowloon and the New Territories that are accessible by road, public fill is presently trucked to temporary fill banks at Tseung Kwan O Area 137 (TKO137) and Tuen Mun Area 38 (TM38). TKO137 is equipped with primary crushers to produce 200mm size material, for use on government contracts. Disposal to these fill banks will also be considered as a fall back in the event of difficulties in disposal to primary sites.

It is estimated that 0.213 M m^3 of public fill will be disposed of at the Public Fill Reception Facilities. It is proposed to dispose these soft public fill materials by trucks to the TM38 or TKO137, as directed by CEDD.

It is estimated that 0.213 M m^3 of C&D artificial hard material (broken concrete) generated along SCL will be disposed of at the Public Fill Reception Facilities. The quantities of artificial hard materials may vary depend on the quality but are anticipated to be relatively small especially during the initial period of the project, therefore it is deemed feasible to be disposed via land transport. It is proposed to dispose these hard materials by trucks to the TM38 or TKO137, as directed by CEDD.

(b) Disposal to Mainland by CEDD Vessels

As relevant surplus C&D materials are identified to be suitable for re-use at the HZMB/TMCLKL projects, there is currently no envisaged allocation of the SCL C&D material to be disposed of at Mainland China. However, disposal of surplus C&D materials to Mainland China would remain to be an alternative in the event of difficulties in disposal to primary sites.

In the event that C&D material are to be delivered to the Mainland, the SCL C&DMMP which was approved by PFC in August 2011 notes that:-

- Rock material disposed of at Mainland will be no larger than 250mm and free of marine mud, reinforced steels or bituminous material. The moisture content of excavated spoil will not be higher than 25% of the dry density of the material, which can be achieved by treatment with lime or by mixing with drier spoil. The facilities required to mix lime with wet spoil have not yet been identified.

- Delivery of public fill to designated reclamation sites in the Mainland is permitted under a Co-operation Agreement on Cross Boundary Marine Dumping. MTR is discussing transport of SCL surplus spoil with CEDD who has an ongoing contract for management of the temporary fill banks and barging to Tai Shan, Mainland, and it is understood that CEDD is currently preparing an extension of their barging contract from 2010 to 2012. Also, to facilitate direct disposal to the Mainland by CEDD vessels at the barging points provided under the SCL project, the minimum berthing place will be erected at 100m long with minimum water depth to be –5mPD. Locations of proposed barging points are indicated in **Figure 6.4 in Appendix B**, and these are under discussion with CEDD. In addition, the arrangement for delivery of public fill from MTRCL's barging points to Taishan as well as the supervision and quality control measures will be implemented in accordance with the endorsed PFC Paper No. 8/2010 (Rev. C).

(c) Landfill Disposal

Non-inert C&D materials, estimated to be 0.124 M $m^{3,}$ are proposed to be disposed at government landfills. Agreement has been obtained from EPD that the North East New Territories Landfill (NENT) is designated to receive such C&D waste.

(d) Open Sea / Confined Marine Disposal

It is estimated that 1.243 M m^3 of marine sediments will be generated along SCL. Based on the latest SCL Sediment Quality Reports (SQR's) approved by EPD or under submission, this total quantity comprises 0.472 M m^3 of Type 1 (Open Sea); 0.042 M m^3 of Type 1 (Designated Site); 0.695 M m^3 of Type 2 (Confined Disposal); and 0.035 M m^3 of Type 3 (Special Treatment and Disposal) marine sediments, as generated from sea dredging or excavation in reclaimed land. It is proposed to dispose these

sediments by barges in designated open sea / confined marine disposal areas, subject to agreement with Marine Fill Committee (MFC). Details on handling and disposal methods of sediment shall be referred to the Sediment Management Plan.

6. SUMMARY

The C&DMMP for SCL presents the details of estimated quantities of C&D materials generated in the construction; the measures to reduce the C&D materials generated; the measures to maximize reuse of C&D materials and the envisaged programme for the disposal of surplus C&D materials. It is estimated that 6.53 M m^3 of C&D materials will be generated in SCL to facilitate the construction of station boxes and tunnels. It is anticipated that more than 72 % of the C&D materials generated can be reused for backfilling and earth filling works for the SCL and other projects such as the HZMB / TMCLKL, subject to confirmation of intake periods and quantities, and for recycling of rock and broken asphalt, whilst the rest will be disposed of in local Public Fill / Landfill / Mainland areas. Excavated marine sediments will not be reused and it is proposed to be transported to open sea / confined marine disposal sites, subject to agreement by MFC. Management of marine sediments will be handled in accordance with the ETWB TC(W) 34/2002 "Management of Dredged/Excavated Sediment". Submissions have already been made to Marine Fill Committee and EPD(DASO) in this respect. The summary of the disposal arrangement for surplus C&D material is shown in **Table 7.1 in Appendix A**.

7. RECOMMENDATION

The C&DMMP (Rev F) was approved by the Public Fill Committee (PFC) and Marine Fill Committee (MFC) on 12 August 2011. This C&DMMP (Rev G) incorporating all current updated information is submitted for fulfilling the SCL Environmental Permits' Conditions under the various SCL EPs issued on 22 March 2012 and 12 July 2012.

It is expected that the SCL construction contracts will be awarded progressively from 2012 for construction. It is recommended that the appointed contractors should propose individual waste management plans

aimed at minimizing the generation of C&D materials / waste during construction of the various components of the railway works.

APPENDIX A

Table 6.1	**Summary of Overall C&D Material Situation**
Tables 6.2 to 6.16	**Breakdown of Half-yearly C&D Material Generation**
Table 6.17	**Breakdown of Surplus C&D Material Disposal**
Table 7.1	**Summary of C&D Disposal**

Table 6.1: Summary of overall C&D material situation

(All quantities are in-situ volumes)

SCL Contract No.	Soft Inert Materials			Granite Rock [v]		Artificial Hard Materials		Sediments	Non Inert C&D Waste	TOTAL
	In-situ Public Fill	Wet Spoil (TBM)	Wet Spoil (D-Wall, Bored / Pipe Piling)	Grade II or above	Grade III or below	Broken Concrete	Broken Asphalt			
	(x 1,000 m ^{3})	(x 1,000 m ^{3})	(x 1,000 m ^{3})	(x 1,000 m ^{3})	(x 1,000 m ^{3})	(x 1,000 m ^{3})	(x 1,000 m ^{3})	(x 1,000 m ^{3})	(x 1,000 m ^{3})	(x 1,000 m ^{3})
1101	0	0	0	0	0	0	0	0	0	0
1102	62	0	6	0	0	0	0	0	1	69
1103	99	122	33	274	68	0	1	0	12	609
1106	225	0	143	27	7	5	5	0	18	430
1107	545	0	27	0	0	31	7	0	14	624
1108	731	0	0	0	0	13	0	45	15	804
1108A	0	0	0	0	0	0	0	34	0	34
1109	702	57	115	60	16	10	5	129	19	1114
1111	204	0	14	0	0	2	2	36	4	263
1112	391	0	14	1	0	44	0	57	9	516
1121	135	0	13	0	0	74	0	869	4	1096
1122	0	0	0	145	36	0	0	0	0	182
1123	428	0	48	28	7	15	3	56	12	597
1126	8	0	0	0	0	0	0	0	0	8
1128	89	46	0	0	0	19	0	16	15	185
Total C&D generated	**3619**	**225**	**412**	**535**	**135**	**213**	**23**	**1243**	**124**	**6530**
Re-used within SCL Project	1132	0	0	123	31	0	23	0	0	1309
Total Surplus C&D Material	2487	637		413	104	213	0	1243	124	5221
Total Surplus to be Disposed / Re-used in Other Projects	2936			394	99	0	0	0	0	3429
Total Surplus to be Disposed Offsite	189			19	5	213	0	1243	124	1792
Total Import [iv]	802	NA		311		NA	NA	NA	NA	1113
Proposed Disposal Sites	1) To HZMB/TMCLKL (i) 2) To TM38 or TKO137 as directed by CEDD 3) To Mainland (iii)	1) To HZMB/TMCLKL (i) 2) To TM38 or TKO137 as directed by CEDD 3) To Mainland (iii)		1) To HZMB/TMCLKL (i) 2) To TM38 or TKO137 as directed by CEDD 3) To Mainland (iii) 4) To be recycled at local crushing facilities (ii)		To TM38 or TKO137 as directed by CEDD		To open sea disposal, confined marine disposal, or special treatment & disposal, as directed by MFC	North East New Territories Landfill (NENT)	

Note (i) Intake of material by HZMB is in 2012~2014, and intake of material by TMCLKL is in 2013~2015
Latest quantities & programme are based on discussion with HZMB/TMCLKL and CEDD in PFCC Meeting in early 2012

Note (ii) Proposal to recycle suitable rock in local crushing facilities for batching plant and other uses yet to be confirmed with Government.

Note (iii) Mainland refers to Taishan or other designated receptor site in Mainland, as directed by CEDD.

Note (iv) Tentative sources of soft inert fill and rock fill are proposed to be from Fill Banks and/or other alternative sources.

Note (v) All rock are granite, except for ADM overrun tunnel under Contract 1122, of which some rock may be volcanic subject to detailed SI.

Table 6.2: Half-yearly C&D Materials Generation Figures for Contracts 1101

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Noise Barrier at Mei Tin Road																	
Soft Inert Materials																	**0.00**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)																	**0.00**
Grade III or better Rock																	**0.00**
Artificial Hard Materials																	**0.00**
Sediments																	**0.00**
Non inert C&D Material																	**0.00**
		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	0.00

Table 6.3: Half-yearly C&D Materials Generation Figures for Contracts 1102

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Hin Keng Station and Approach Structures																	
Soft Inert Materials			**14.86**	**14.86**	**16.26**	**16.26**											**62.25**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)			1.44	1.44	1.44	1.44											**5.76**
Grade III or better Rock																	**0.00**
Artificial Hard Materials			0.50	0.50													**1.00**
Sediments																	**0.00**
Non inert C&D Material					0.28	0.28	0.28	0.28	0.28								**1.38**
		0.00		33.60		35.96		0.55		0.28		0.00		0.00		0.00	70.38

Table 6.4: Half-yearly C&D Materials Generation Figures for Contract 1103

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Hin Keng to Diamond Hill Tunnels																	
Soft Inert Materials		7.64	43.77	43.77	1.41	1.41	0.29	0.29	0.00	0.00							**98.57**
Wet Spoil (TBM)		0.00	0.00	0.00	54.90	54.90	6.10	6.10	0.00	0.00							**122.00**
Wet Spoil (D-Wall/Piling)		0.00	0.00	0.00	15.06	15.06	1.67	1.67	0.00	0.00							**33.48**
Grade III or better Rock		0.00	30.29	30.29	48.12	48.12	89.97	89.97	2.62	2.62							**342.00**
Artificial Hard Materials		1.43	0.28	0.28	0.00	0.00	0.00	0.00	0.00	0.00							**2.00**
Sediments		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							**0.00**
Non inert C&D Material		1.04	1.99	1.99	1.99	1.99	1.99	0.95	0.00	0.00							**11.96**
		10.11		152.69		242.97		199.01		5.23		0.00		0.00		0.00	610.01

Table 6.5: Half-yearly C&D Materials Generation Figures for Contract 1106

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Diamond Hill Station																	
Soft Inert Materials		41.76	114.06	36.54	8.20	3.36	5.69	15.63	0.00	0.00							225.24
Wet Spoil (TBM)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00
Wet Spoil (D-Wall/Piling)		0.00	14.26	14.26	57.05	57.05	0.00	0.00	0.00	0.00							142.63
Grade III or better Rock		18.12	9.79	0.73	0.79	0.79	1.92	1.92	0.06	0.06							34.17
Artificial Hard Materials		7.56	2.70	0.71	0.00	0.00	0.00	0.00	0.00	0.00							10.96
Sediments		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00
Non inert C&D Material		2.86	2.45	2.05	2.05	2.05	2.05	2.05	2.05	0.00							17.63
		70.29		197.55		131.35		29.26		2.18		0.00		0.00		0.00	430.63

Table 6.6: Half-yearly C&D Materials Generation Figures for Contract 1107

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Diamond Hill to Kai Tak Tunnels																	
Soft Inert Materials		26.41	112.25	122.08	120.33	138.15	12.32	13.82									545.37
Wet Spoil (TBM)		0.00	0.00	0.00	0.00	0.00	0.00	0.00									0.00
Wet Spoil (D-Wall/Piling)		0.00	2.68	2.68	9.37	9.37	1.34	1.34									26.76
Grade III or better Rock		0.00	0.00	0.00	0.00	0.00	0.00	0.00									0.00
Artificial Hard Materials		26.00	5.00	5.00	0.00	0.00	0.00	0.00									36.00
Sediments		0.00	0.00	0.00	0.00	0.00	0.00	0.00									0.00
Non inert C&D Material		0.00	2.77	2.77	2.77	2.77	2.77	0.00									13.84
		52.41		255.23		282.75		31.58		0.00		0.00		0.00		0.00	621.98

Table 6.7: Half-yearly C&D Materials Generation Figures for Contract 1108

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Kai Tak Station and Associated Tunnels																	
Soft Inert Materials		**43.42**	**172.95**	**172.95**	**150.48**	**150.48**	**20.13**	**20.13**									**730.52**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)																	**0.00**
Grade III or better Rock																	**0.00**
Artificial Hard Materials		9.31	1.84	1.84													**13.00**
Sediments			17.86	14.74	4.91	4.91	1.40	1.40									**45.24**
Non inert C&D Material		2.48	2.48	2.48	2.48	2.48	2.48										**14.87**
		55.21		387.14		315.74		45.54		0.00		0.00		0.00		0.00	803.63

Table 6.8: Half-yearly C&D Materials Generation Figures for Contract 1108A

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Kai Tak Barging Point Facilities																	
Soft Inert Materials																	**0.00**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)																	**0.00**
Grade III or better Rock																	**0.00**
Artificial Hard Materials																	**0.00**
Sediments		34.43															**34.43**
Non inert C&D Material																	**0.00**
		34.43		0.00		0.00		0.00		0.00		0.00		0.00		0.00	34.43

Table 6.9 Half-yearly C&D Materials Generation Figures for Contract 1109

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Sung Wong Toi and To Kwa Wan Stations and Tunnels																	
Soft Inert Materials		16.42	95.49	95.49	189.94	189.94	46.62	46.62	10.77	10.77							702.05
Wet Spoil (TBM)		0.00	0.00	0.00	11.40	11.40	17.10	17.10	0.00	0.00							57.00
Wet Spoil (D-Wall/Piling)		0.00	8.49	8.49	33.30	33.30	13.00	13.00	2.68	2.68							114.95
Grade III or better Rock		0.00	1.98	1.98	26.44	26.44	9.41	9.41	0.17	0.17							76.00
Artificial Hard Materials		7.88	2.06	2.06	1.50	1.50	0.00	0.00	0.00	0.00							15.00
Sediments		30.32	36.64	40.74	11.71	7.95	0.99	0.99	0.00	0.00							129.34
Non inert C&D Material		2.85	2.85	2.85	2.85	2.85	2.85	1.11	1.11	0.00							19.30
		57.47		299.12		550.50		178.19		28.35		0.00		0.00		0.00	1113.64

Table 6.10: Half-yearly C&D Materials Generation Figures for Contract 1111

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Hung Hom North ApproachTunnels																	
Soft Inert Materials			27.08	20.73	25.95	25.95	38.51	38.51	13.52	13.52							203.78
Wet Spoil (From TBM)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00
Wet Spoil (From D-Wall)			1.43	1.09	1.75	1.75	3.15	3.15	1.09	1.09							14.49
Grade III or better Granite			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00
Artificial Hard Materials			0.34	0.34	1.73	1.73	0.00	0.00	0.00	0.00							4.13
Sediments			7.51	5.64	6.91	6.91	4.37	4.37	0.23	0.23							36.19
Non inert C&D Material			0.37	0.37	0.62	0.62	0.63	0.63	0.62	0.62							4.46
		0.00		64.91		73.91		93.32		30.92		0.00		0.00		0.00	263.06

Table 6.11: Half-yearly C&D Materials Generation Figures for Contract 1112

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Hung Hom Station and Stabling Sidings																	
Soft Inert Materials			**68.76**	**56.41**	**121.49**	**121.49**	**10.82**	**10.82**			**0.44**	**0.44**					**390.65**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)			5.60	4.04	2.08	2.08											**13.80**
Grade III or better Rock			0.40	0.41	0.40	0.40	0.03										**1.64**
Artificial Hard Materials			14.68	14.68	6.69	6.69	2.10										**44.82**
Sediments			11.80	8.87	8.87	8.87	8.87	8.87	0.36	0.36							**56.85**
Non inert C&D Material			1.85	1.07	2.45	2.45	0.82				0.02						**8.64**
		0.00		188.56		283.93		42.31		0.72		0.89		0.00		0.00	516.41

Table 6.12: Half-yearly C&D Materials Generation Figures for Contract 1121

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Cross Harbour Tunnels																	
Soft Inert Materials									**15.68**	**17.24**	**32.83**	**32.83**	**18.40**	**18.40**			**135.39**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)									1.97	1.97	2.84	2.84	1.54	1.54			**12.70**
Grade III or better Rock																	**0.00**
Artificial Hard Materials					5.40	5.40			10.47	10.47	10.48	10.48	10.47	10.47			**73.64**
Sediments								87.00	193.22	193.22	197.84	197.84					**869.14**
Non inert C&D Material										1.10	1.10	1.10	1.10				**4.40**
		0.00		0.00		10.80		87.00		445.35		490.19		61.93		0.00	1095.27

Table 6.13: Half-yearly C&D Materials Generation Figures for Contract 1122

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
SCLOverrun Tunnel																	
Soft Inert Materials																	**0.00**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)																	**0.00**
Grade III or better Rock					9.47	9.47	18.95	18.95	32.78	32.78	20.42	20.42	9.22	9.22			**181.68**
Artificial Hard Materials																	**0.00**
Sediments																	**0.00**
Non inert C&D Material																	**0.00**
		0.00		0.00		18.95		37.90		65.57		40.83		18.43		0.00	181.68

Table 6.14: Half-yearly C&D Materials Generation Figures for Contract 1123

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
EXH Station and Western Approach Tunnels																	
Soft Inert Materials					**5.89**	**5.89**	**44.02**	**44.02**	**58.65**	**58.65**	**58.65**	**58.65**	**41.09**	**41.09**	**5.89**	**5.89**	**428.37**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)					0.65	0.65	4.89	4.89	6.52	6.52	6.52	6.52	4.57	4.57	0.65	0.65	**47.60**
Grade III or better Rock					0.91	0.91	3.82	3.82	3.94	3.94	3.94	3.94	3.79	3.79	0.91	0.91	**34.63**
Artificial Hard Materials					4.26	4.26	4.26	4.26									**17.04**
Sediments					0.91	0.91	7.00	7.00	5.57	5.57	5.74	5.74	8.01	7.61	1.31	0.91	**56.28**
Non inert C&D Material						1.06	1.06	1.06	2.93	1.06	1.06	1.06	1.06	1.06	1.06		**12.42**
		0.00		0.00		26.29		130.09		153.35		151.82		116.62		18.17	596.35

Table 6.15: Half-yearly C&D Materials Generation Figures for Contract 1126

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
Provisioning of Harbour Road Sport Centre and Wan Chai Swimming Pool																	
Soft Inert Materials					**1.60**	**1.60**	**2.40**	**2.40**									**8.01**
Wet Spoil (TBM)																	**0.00**
Wet Spoil (D-Wall/Piling)																	**0.00**
Grade III or better Rock																	**0.00**
Artificial Hard Materials																	**0.00**
Sediments																	**0.00**
Non inert C&D Material					0.04	0.04	0.04	0.04									**0.16**
		0.00		0.00		3.28		4.89		0.00		0.00		0.00		0.00	8.17

Table 6.16: Half-yearly C&D Materials Generation Figures for Contract 1128

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
	(x 1000 m^3)																
SOV to Admiralty																	
Soft Inert Materials							**2.75**	**2.75**	**20.82**	**20.82**	**17.49**	**17.49**	**3.50**	**3.50**			**89.11**
Wet Spoil (TBM)									**0.77**	**0.77**	**14.72**	**14.72**	**7.56**	**7.56**			**46.10**
Wet Spoil (D-Wall/Piling)																	**0.00**
Grade III or better Rock																	**0.00**
Artificial Hard Materials									**9.43**	**9.43**							**18.86**
Sediments									**6.15**	**6.43**	**1.50**	**1.50**					**15.58**
Non inert C&D Material							**0.06**	**0.06**	**0.00**	**1.65**	**1.65**	**1.65**	**3.65**	**2.00**	**2.00**	**2.00**	**14.71**
		0.00		0.00		0.00		5.61		76.27		70.72		27.77		4.00	184.37

SUMMARY FOR SCL

	2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
Soft Inert Materials	**0.00**	**135.65**	**649.23**	**562.84**	**641.54**	**654.53**	**183.55**	**194.98**	**119.43**	**121.00**	**109.41**	**109.41**	**62.99**	**62.99**	**5.89**	**5.89**	**3619.32**
Wet Spoil (TBM)	**0.00**	**0.00**	**0.00**	**0.00**	**66.30**	**66.30**	**23.20**	**23.20**	**0.77**	**0.77**	**14.72**	**14.72**	**7.56**	**7.56**	**0.00**	**0.00**	**225.10**
Wet Spoil (D-Wall/Piling)	**0.00**	**0.00**	**33.90**	**32.00**	**120.70**	**120.70**	**24.05**	**24.05**	**12.26**	**12.26**	**9.36**	**9.36**	**6.11**	**6.11**	**0.65**	**0.65**	**412.16**
Grade III or better Rock	**0.00**	**18.12**	**42.46**	**33.41**	**86.14**	**86.14**	**124.10**	**124.07**	**39.58**	**39.58**	**24.36**	**24.36**	**13.01**	**13.01**	**0.91**	**0.91**	**670.13**
Artificial Hard Materials	**0.00**	**52.18**	**27.40**	**25.41**	**19.57**	**19.57**	**6.36**	**4.26**	**19.90**	**19.90**	**10.48**	**10.48**	**10.47**	**10.47**	**0.00**	**0.00**	**236.47**
Sediments	**0.00**	**64.75**	**73.82**	**69.99**	**33.31**	**29.55**	**22.63**	**109.63**	**205.54**	**205.82**	**205.09**	**205.09**	**8.01**	**7.61**	**1.31**	**0.91**	**1243.05**
Non inert C&D Material	**0.00**	**9.22**	**14.76**	**13.58**	**15.52**	**16.57**	**15.01**	**6.17**	**6.98**	**4.42**	**3.83**	**3.81**	**5.81**	**3.06**	**3.06**	**2.00**	**123.77**
																	6529.99

Table 6.17

(All Figures are Weight in M tonnes)

1. SCL Half-Yearly Surplus Disposal

	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	
SOFT INERT (incl spoils)						0.27	1.37	1.19	1.42	1.44	0.22	0.23					0.06	0.06			6.26
ROCK						0.05	0.11	0.09	0.23	0.23	0.34	0.33									1.39

2. Options for Re-use in Local Projects

(2A) HZMB + HKLR Project

Fill Type	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
Public Fill Required						0.85	5.69	10.14	6.50	0.26											23.44
Public Fill (SCL Contribution)							1.37	1.19	1.42	0.26											4.24
Rock Fill Required					0.49	2.24	3.63	1.78	0.37	0.01											8.53
Rock Fill (SCL Contribution)							0.11	0.09	0.23	0.01											0.44

(2B) WD II Project

Fill Type	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
Public Fill Required		0.29		0.02	0.03	0.67	0.65	0.09	0.07	0.33	0.25	0.00	0.05	0.02							2.46
Rock Fill Required		0.16				0.40	0.05		0.12	0.04											0.76

(2C) CWB Project

Fill Type	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
Public Fill Required	0.23	0.39					0.26					0.05	0.39								1.32
Rock Fill Required	0.83	0.11		0.08			0.08	0.06													1.16

(2D) CKR Project

Fill Type	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
Public Fill Required					0.04	0.04															0.07

(2E) TMCLKL Project

Fill Type	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
Public Fill Required							1.75		1.75		2.44										5.94
Public Fill (SCL Contribution)										1.18	0.22	0.23									1.63
Rock Fill Required							0.63	0.63	0.50												1.76
Rock Fill (SCL Contribution)										0.22	0.34	0.33									0.89

Note: 1. 4.26 M tonnes of public fill and 0.44 M tonne of rock fill will be disposed from SCL to HZMB from 2013 to 2014. Remaining HZMB demand between 2012 and 2014 will be mostly met by other new railway projects (i.e. XRL/KTE/SIL). Note that rock if reduced to 250mm down and be accepted as public fill by HZM

2. Demands from WD II, CWB and CKR are sporadic between 2012 and 2016 and re-use of SCL C&D materials as filling materials in these projects are discounted in this report. Possible disposal from SCL to these projects will be considered subject to future site allocation.

3. 1.64 M tonnes of public fill and 0.89 M tonne of rock fill can be disposed from SCL to TMCLKL from 2014 to 2015. Note that rock if reduced to 250mm down and be used as public fill. Note also quantities are currently for planning purpose only due to the high programme uncertainty of TMCLKL.

4. Part of Grade II or above rock to HZMB and TMCLKL can be recycled in local crushing facilities if such option is feasible.

(3) Net Balance of Spoil to be Disposed by CEDD Barges to Tai Shan / to Public Fill Reception Facilities

Fill Type	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
Public Fill						0.27											0.06	0.06			0.39
Rock Fill						0.05															0.05

Note: 5. Part of Grade II or above rock to CEDD can be recycled in local rock crushing facilities if such option is feasible.

(4) Net Import Fill Requirement of SCL from TKO 137

Fill Type	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		Sub-Total
Public Fill													0.37	0.37	0.40	0.40			0.03	0.03	1.60
Rock Fill													0.05	0.05	0.25	0.25	0.12	0.12			0.84

Table 7.1: Summary of C&D Disposal *(All quantities are in-situ volumes)*

C&D Material		C&D material generated from SCL Project (m^3)	Reused within the SCL Project (m^3)	Surplus C&D material (m^3)						
				Total surplus C&D material (m^3)	Breakdown of surplus C&D material					
					To be reused in other local projects	To be recycled in Rock Crushing Plant	To Mainland Note (4)	To Public Fill Reception Facilities	To Landfill	To Open Sea / Confined Marine
Soft Inert C&D Material (1)		4,256,600	1,132,300	3,124,300	2,935,500			188,800		
Granite Rock (2)	Grade II or above	536,100	123,100	413,000	394,000	Note (3)		19,000		
	Grade III or below	134,100	30,800	103,300	98,600			4,700		
Artificial Hard Material	Broken concrete	213,200		213,200				213,200		
	Broken asphalt (5)	23,100	23,100							
Sub-total for inert C&D material		5,163,100	1,309,300	3,853,800	3,428,100			425,700		
Sediments		1,243,049		1,243,049						1,243,049
Non-inert C&D waste		123,800		123,800					123,800	
Total		6,529,949	1,309,300	5,220,649	3,428,100			425,700	123,800	1,243,049

Note:

(1) To be received by HZMB from 2013 to 2014. Demand from TMCLKL is currently for planning purpose only due to high programme uncertainty.

(2) All rocks are granite, except for ADM overrun tunnel, of which some rock may be volcanic subject to detailed SI.

(3) It is assumed 80% of surplus rock can be recycled in local rock crushing facilities if such option is feasible. Preliminary liaison has been made with CEDD regarding the potential delivery of surplus rock to the Anderson Road Quarry in 2010. Further coordination with the quarry on the details of the delivery will be made by the future Contractor.

(4) Disposal to Mainland is an alternative in the event delivery to the HZMB/TMCLKL cannot be realized and as directed by CEDD.

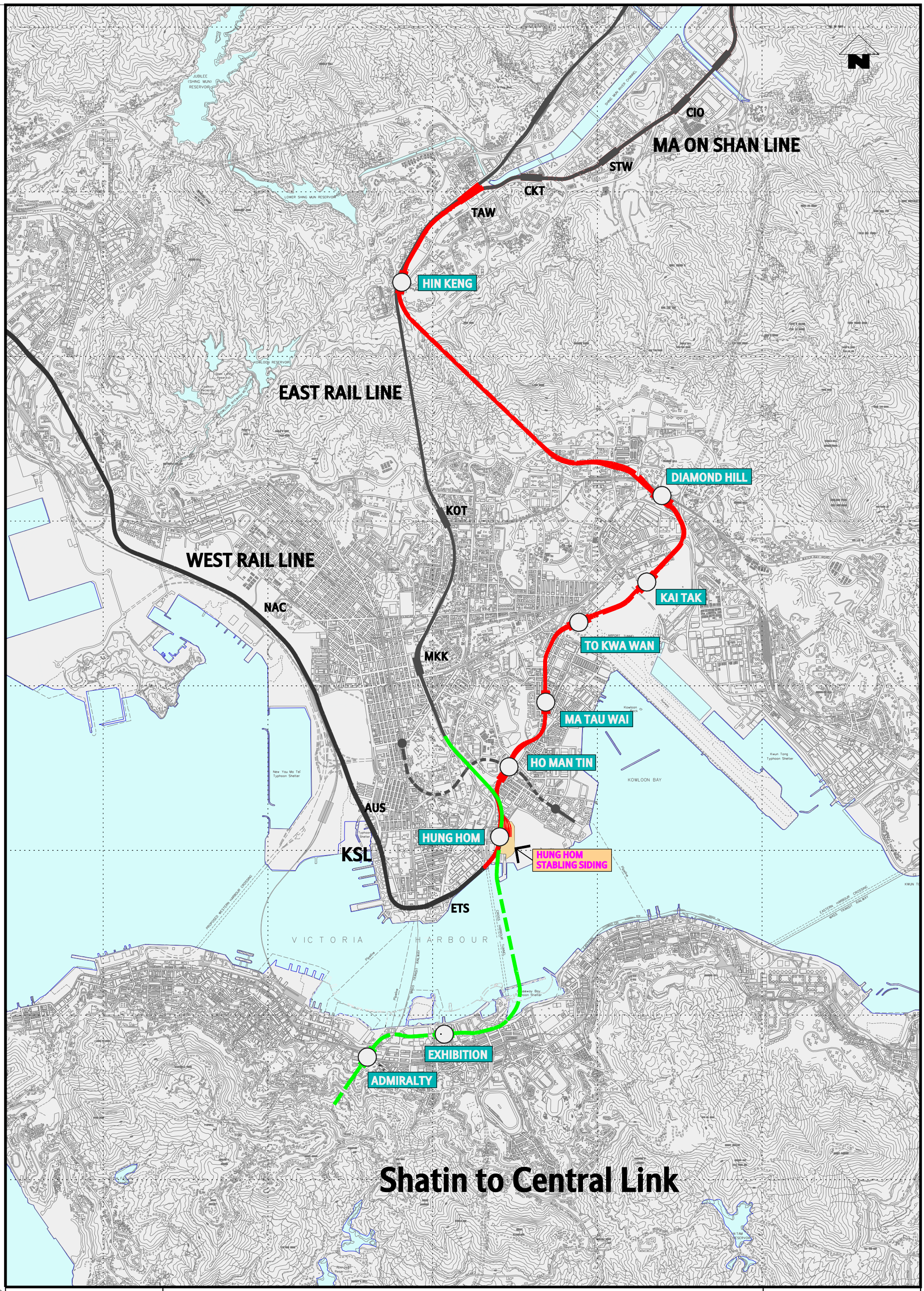
(5) Artificial hard material consisting of broken asphalt to be recycled.

Quantities of Dredged / Excavated Sediments (in 1,000m^3)

SQR Coverage	SQR Status	Type 1 (OS)	Type 1 (DS)	Type 2	Type 3	Land or Sea-based	Total
EWL (Kai Tak & Ho Man Tin)	Approved 8-Jun-12	157.1	7.8	9.7	0.0	Land-based	174.6
EWL (Kai Tak Barging Point)	Approved 29-Jul-11; Resubmitted on 22 August 2012	0.1	0.0	16.3	18.0	Sea-based	34.4
NSL Phase 1 (Hung Hom Station & Approach Tunnels)	Submitted 13-Jun-12	65.6	0.0	27.4	0.0	Land-based	93.0
NSL Phase 2 (IMT)	Submitted 16-May-12	202.1	33.7	616.6	16.7	Sea-based	869.1
NSL Phase 2 (HK Island, Exhibition, & SOV)	Submitted 8-Dec-11	47.0	0.0	24.9	0.0	Land-based	71.9
	Total	**471.9**	**41.5**	**694.9**	**34.7**		**1,243.0**

APPENDIX B

Figure 1.1	**SCL General Alignment Plan**
Figure 3.1	**SCL Summary Project Programme**
Figures 5.1 to 5.16	**SCL Station General Layout Plans and Sections**
Figures 5.17 to 5.21	**SCL Tunnel Layouts and Construction Methods**
Figure 5.22	**SCL Works Contracts Allocation Plan**
Figure 6.1 to 6.3	**SCL Geological Profiles**
Figure 6.4	**SCL Barging Point Locations**



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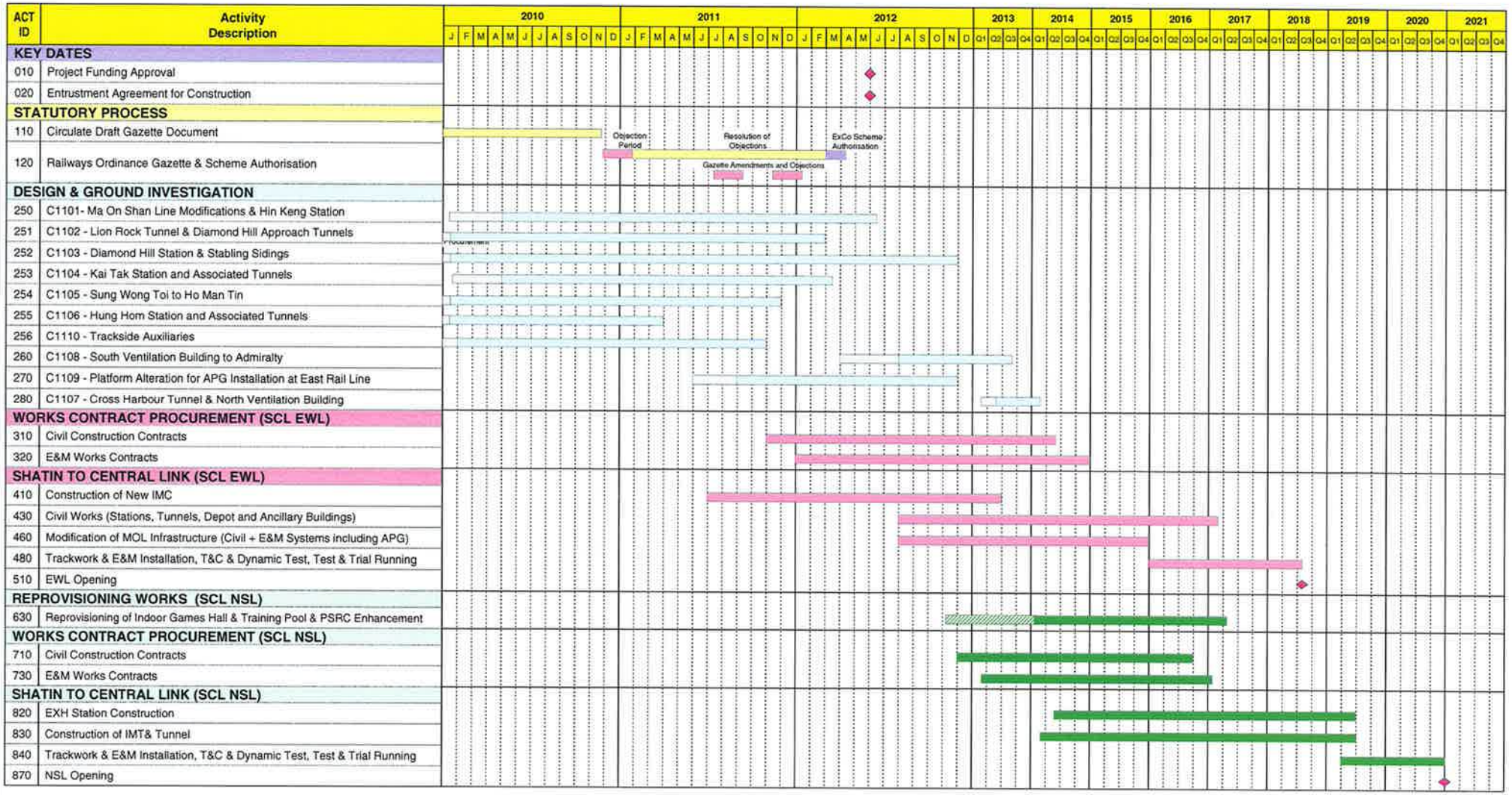
Shatin to Central Link
沙田至中環綫

SCL GENERAL ALIGNMENT PLAN

FIGURE NO.

FIG 1.1



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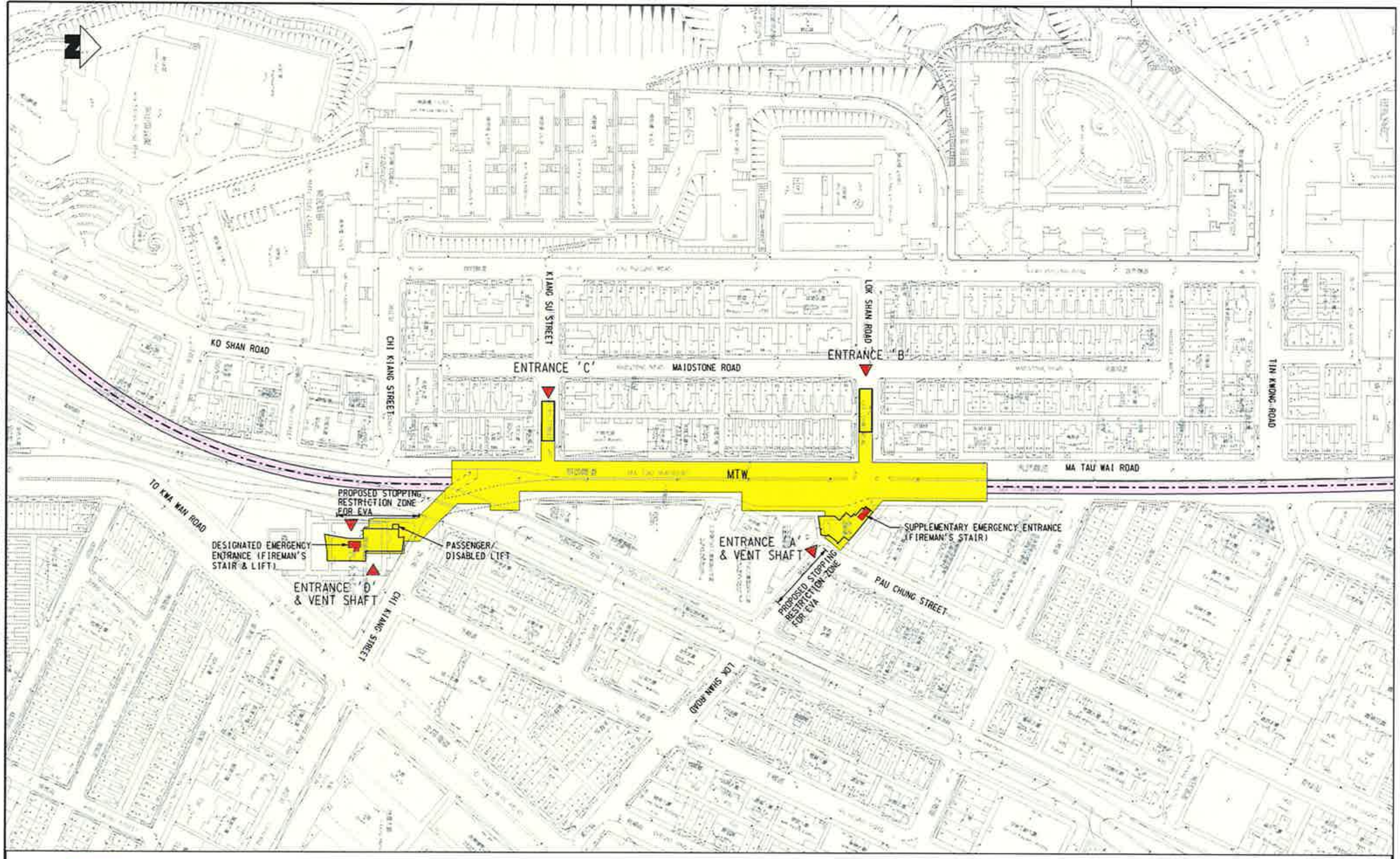
SHATIN TO CENTRAL LINK PROJECT SUMMARY PROGRAMME

FIGURE NO.

FIG 3.1

FULL SIZE A1



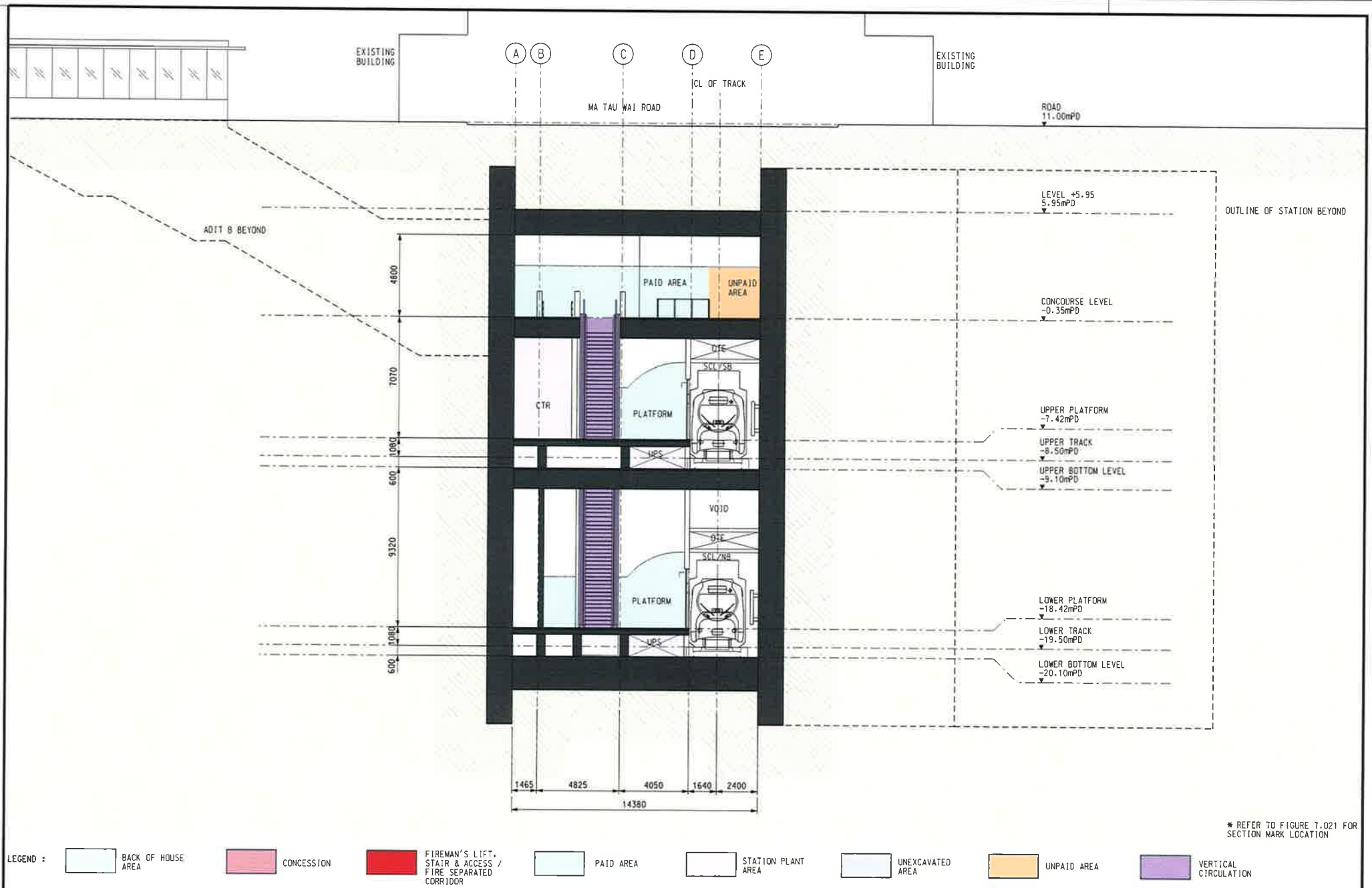
LEGEND : PROPOSED STATION FOOTPRINT; PROPOSED STATION ALIGNMENT

MTR Shatin to Central Link 沙田至中環綫

MTW STATION GENERAL LAYOUT PLAN

FIGURE NO. FIG 5.1

FULL SIZE A1



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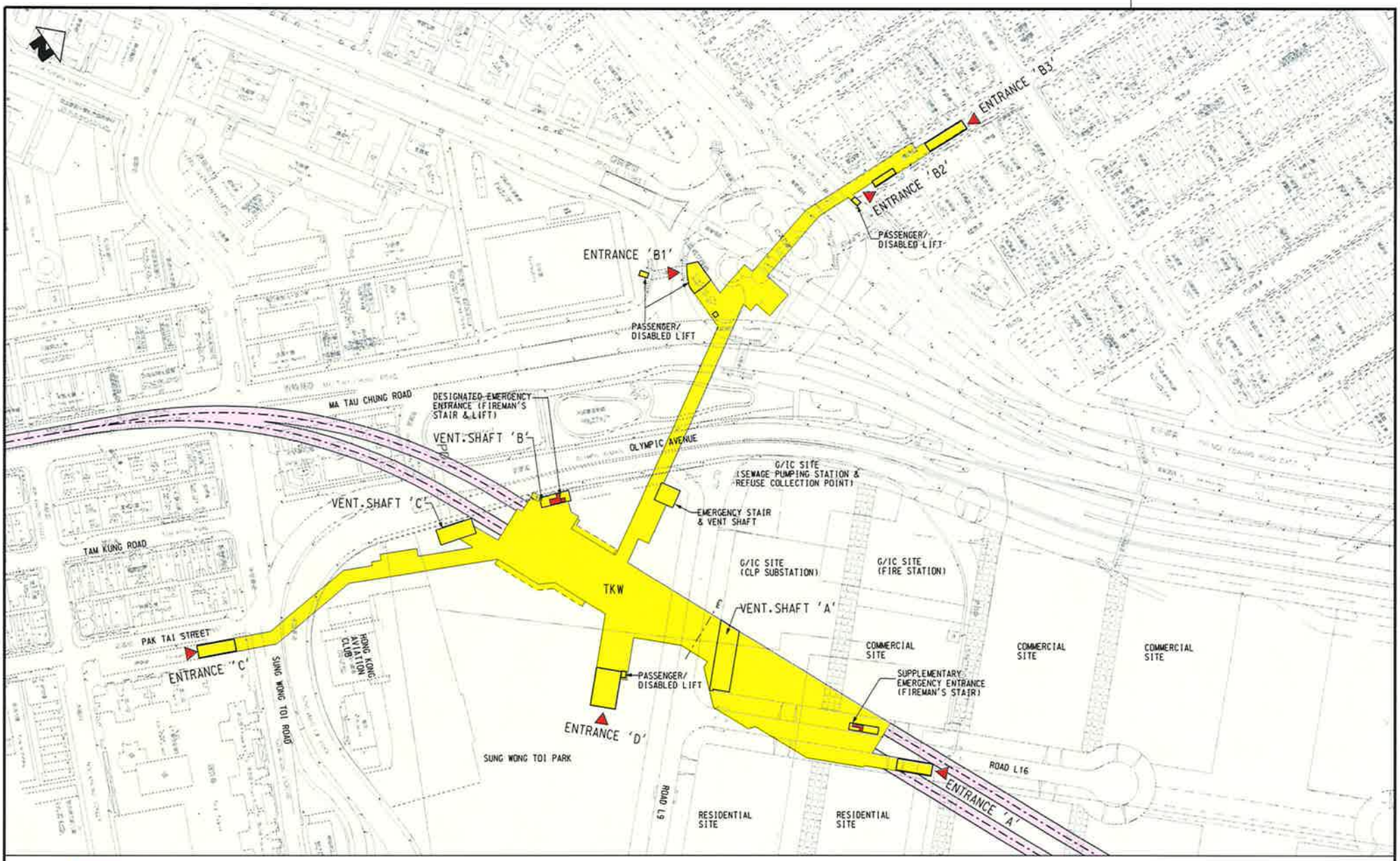
Shatin to Central Link
沙田至中環綫

MTW STATION GENERAL SECTION

FIGURE NO.

FIG 5.2

FULL SIZE A1



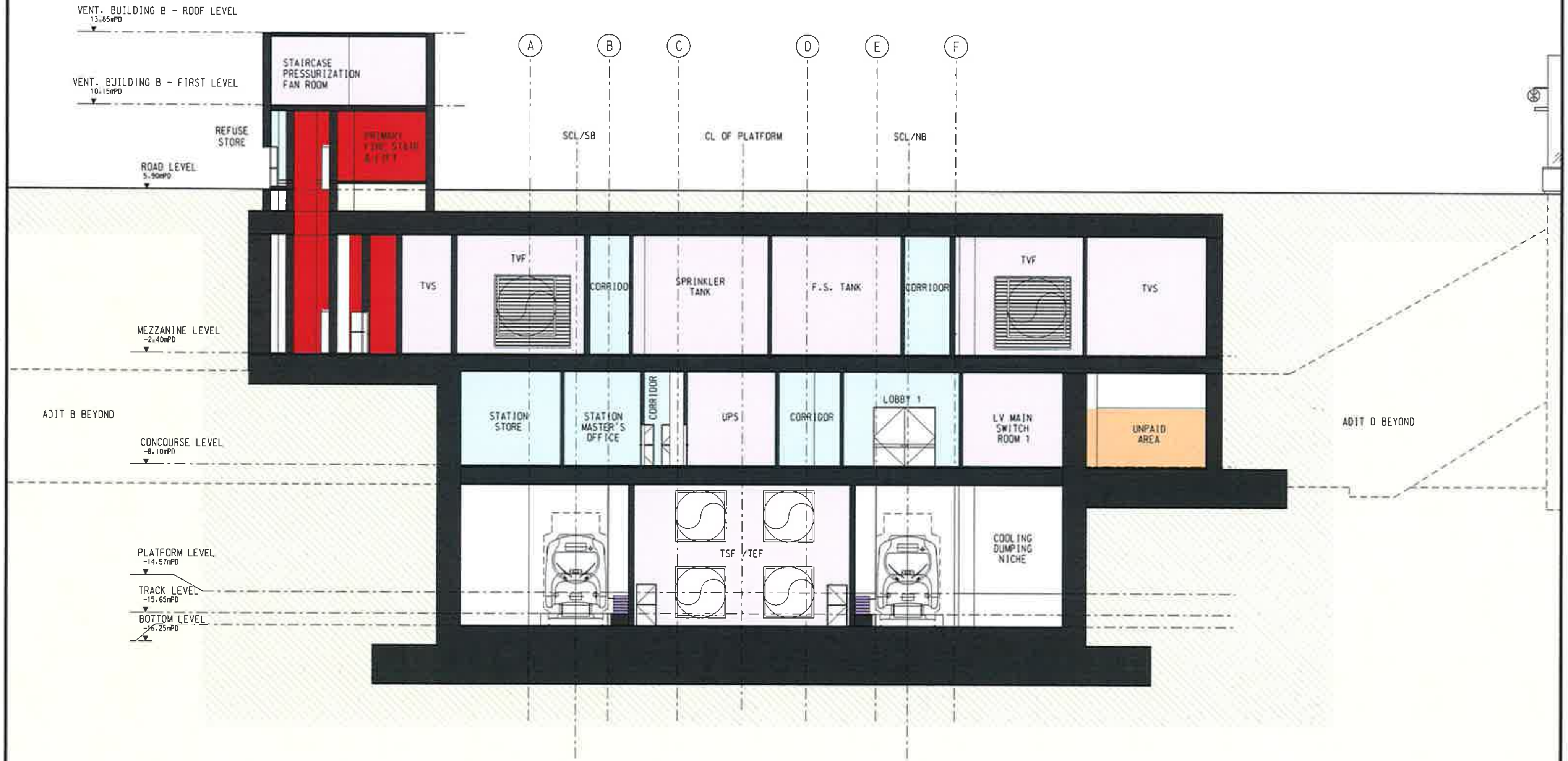
MTR
Shatin to Central Link
沙田至中環綫

TKW STATION GENERAL LAYOUT PLAN

FIGURE NO.

FIG 5.3

FULL SIZE A1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VENT. BUILDING B - FIRST LEVEL
10.15mPD
REFUSE STORE
ROAD LEVEL
5.90mPD
MEZZANINE LEVEL
-2.40mPD
ADIT B BEYOND
CONCOURSE LEVEL
-8.10mPD
PLATFORM LEVEL
-14.57mPD
TRACK LEVEL
-15.65mPD
BOTTOM LEVEL
-16.25mPD
STAIRCASE PRESSURIZATION FAN ROOM
A
B
C
D
E
F
SCL/SB
CL OF PLATFORM
SCL/NB
TVS
TVF
CORRIDOR
SPRINKLER TANK
F.S. TANK
CORRIDOR
TVF
TVS
STATION STORE
STATION MASTER'S OFFICE
CORRIDOR
UPS
CORRIDOR
LOBBY 1
LV MAIN SWITCH ROOM 1
UNPAID AREA
ADIT D BEYOND
TSF /TEF
COOLING DUMPING NICHE

* REFER TO FIGURE 8.002 FOR SECTION MARK LOCATION.

LEGEND : BACK OF HOUSE AREA | CONCESSION | FIREMAN'S LIFT, STAIR & ACCESS / FIRE SEPARATED CORRIDOR | PAID AREA | STATION PLANT AREA | UNEXCAVATED AREA | UNPAID AREA | VERTICAL CIRCULATION

MTR Shatin to Central Link 沙田至中環綫

TKW STATION GENERAL SECTION

FIGURE NO.

FIG 5.4

FULL SIZE A1

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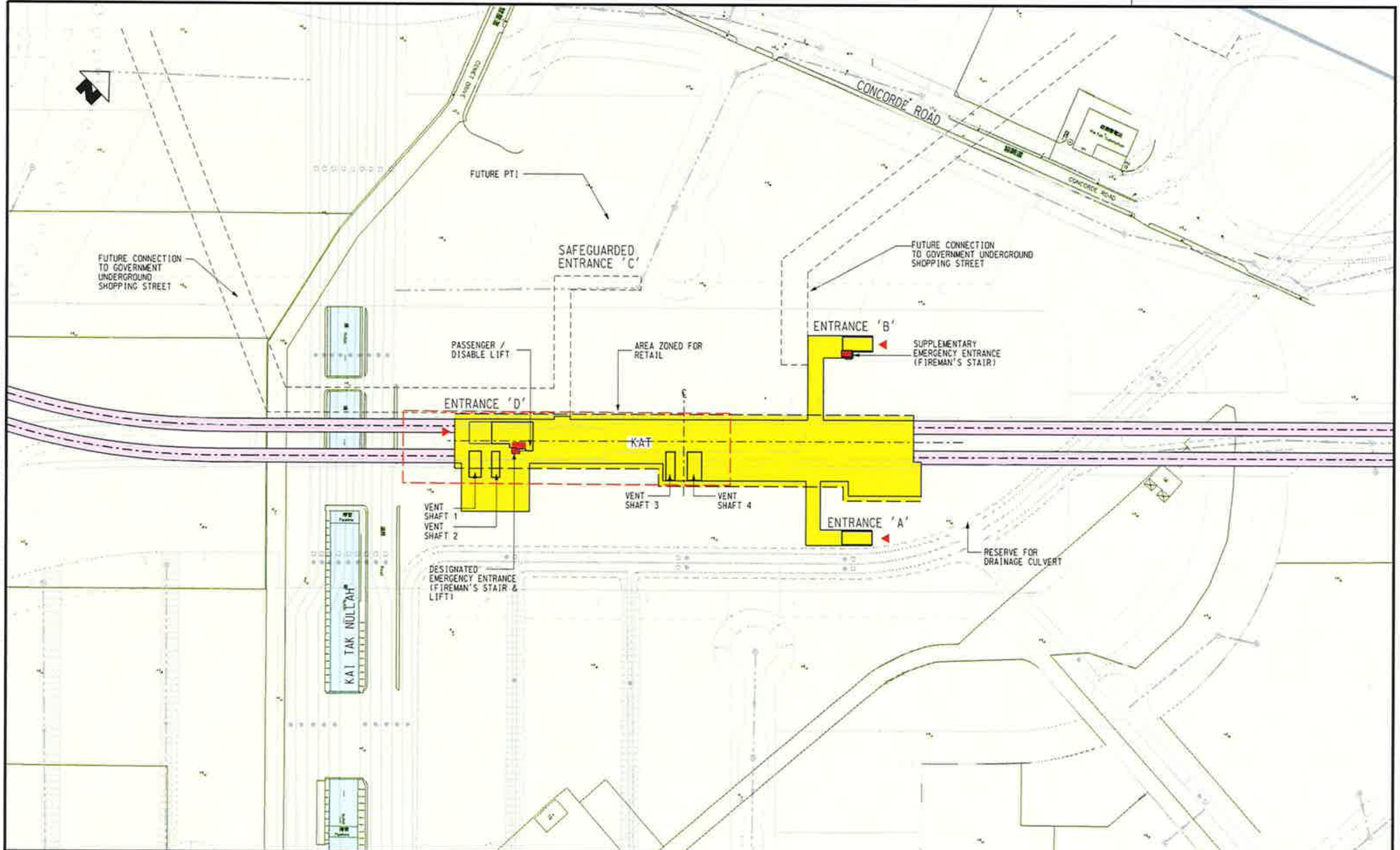

LEGEND : PROPOSED STATION FOOTPRINT; PROPOSED STATION ALIGNMENT

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KAT STATION GENERAL LAYOUT PLAN

FIGURE NO. FIG 5.5

FULL SIZE A1

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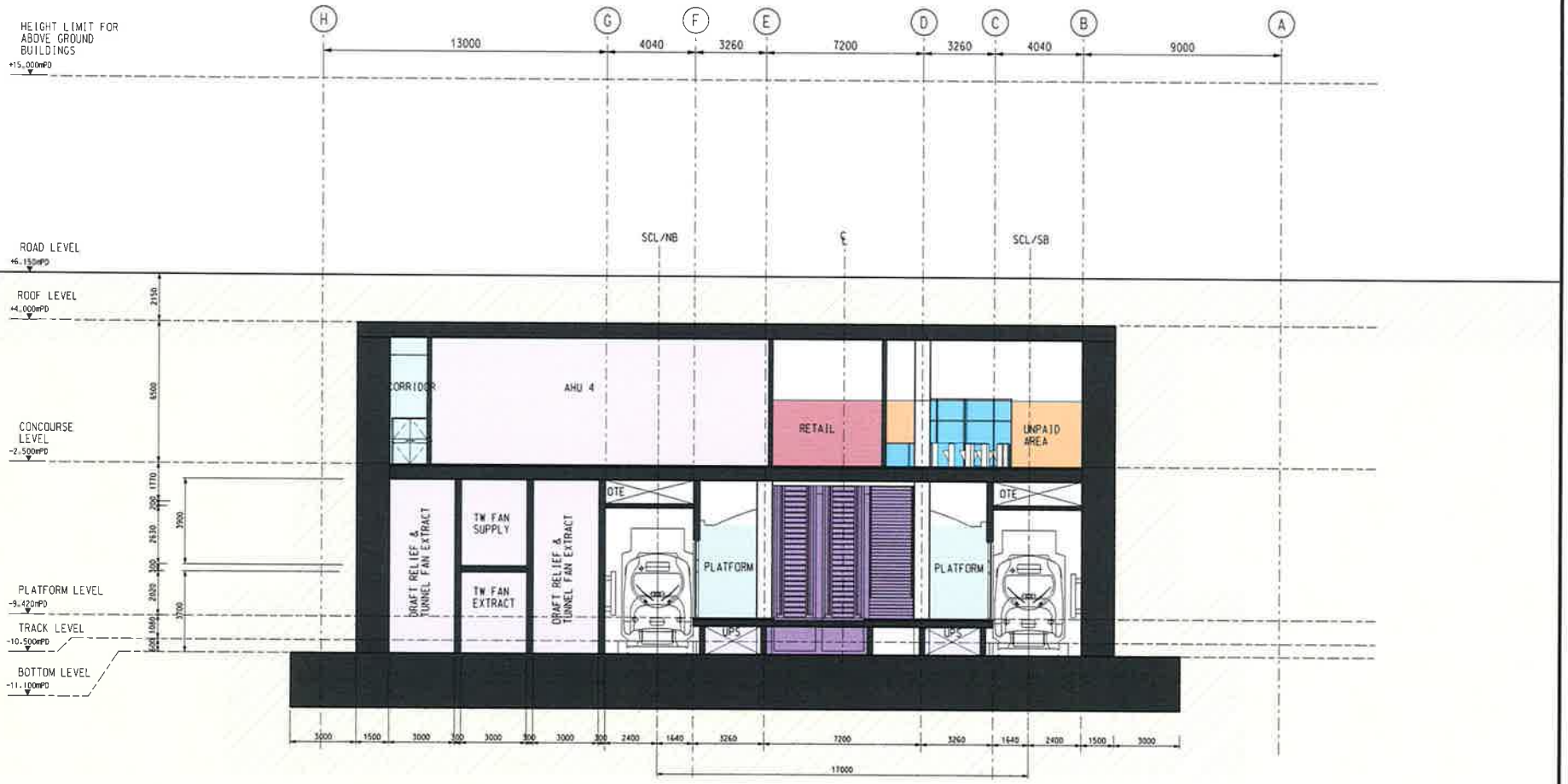

* REFER TO FIGURE 9.002 FO SECTION MARK LOCATION

LEGEND :

- BACK OF HOUSE AREA
- CONCESSION
- FIREMAN'S LIFT, STAIR & ACCESS / FIRE SEPARATED CORRIDOR
- PAID AREA
- STATION PLANT AREA
- UNEXCAVATED AREA
- UNPAID AREA
- VERTICAL CIRCULATION

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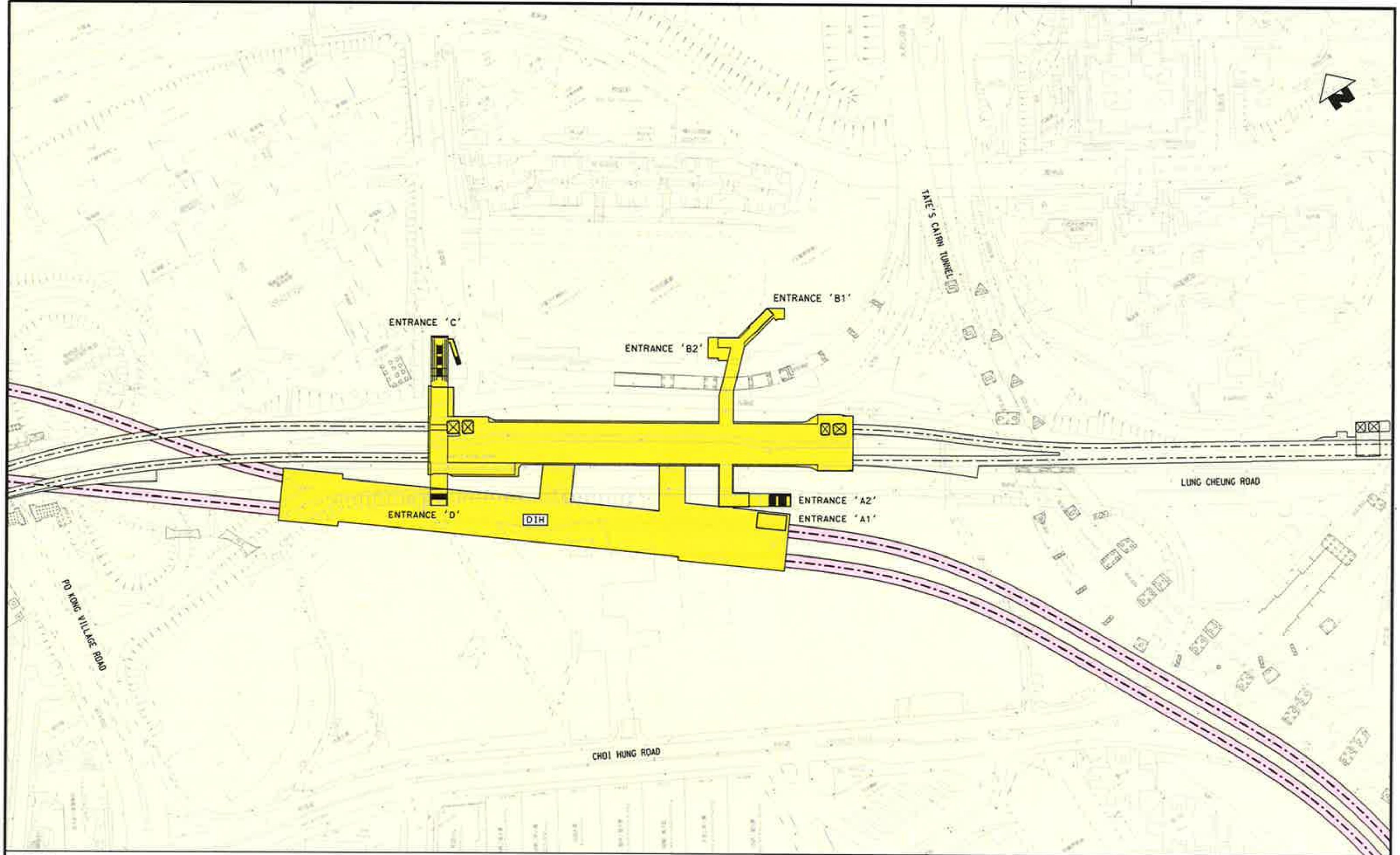
沙田至中環綫

KAT STATION GENERAL SECTION

FIGURE NO.

FIG 5.6

FULL SIZE A1



LEGEND

PROPOSED STATION FOOTPRINT

PROPOSED STATION ALIGNMENT

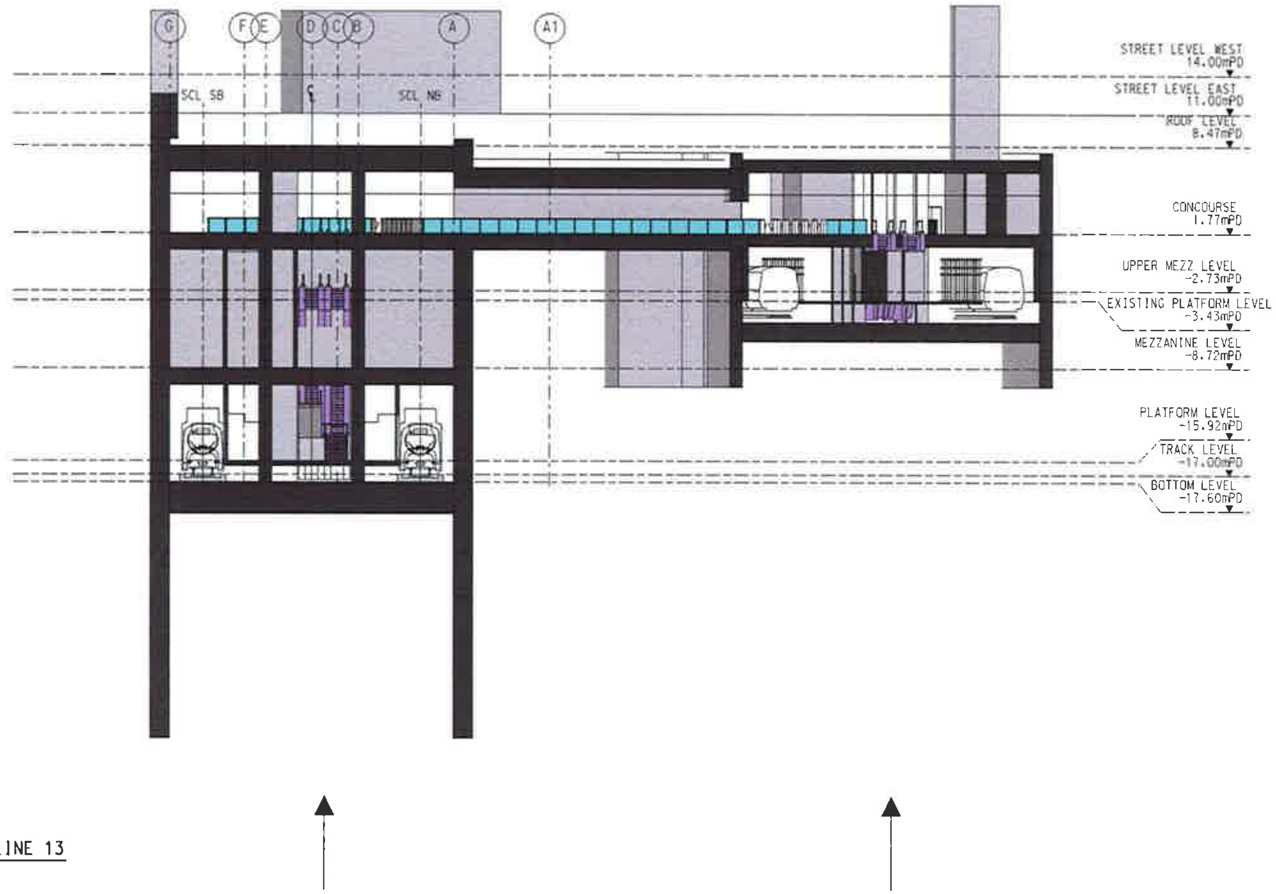
MTR Shatin to Central Link 沙田至中環綫

DIH STATION GENERAL LAYOUT PLAN

FIGURE NO.

FIG 5.7

FULL SIZE A1



1 CROSS SECTION AT GRIDLINE 13

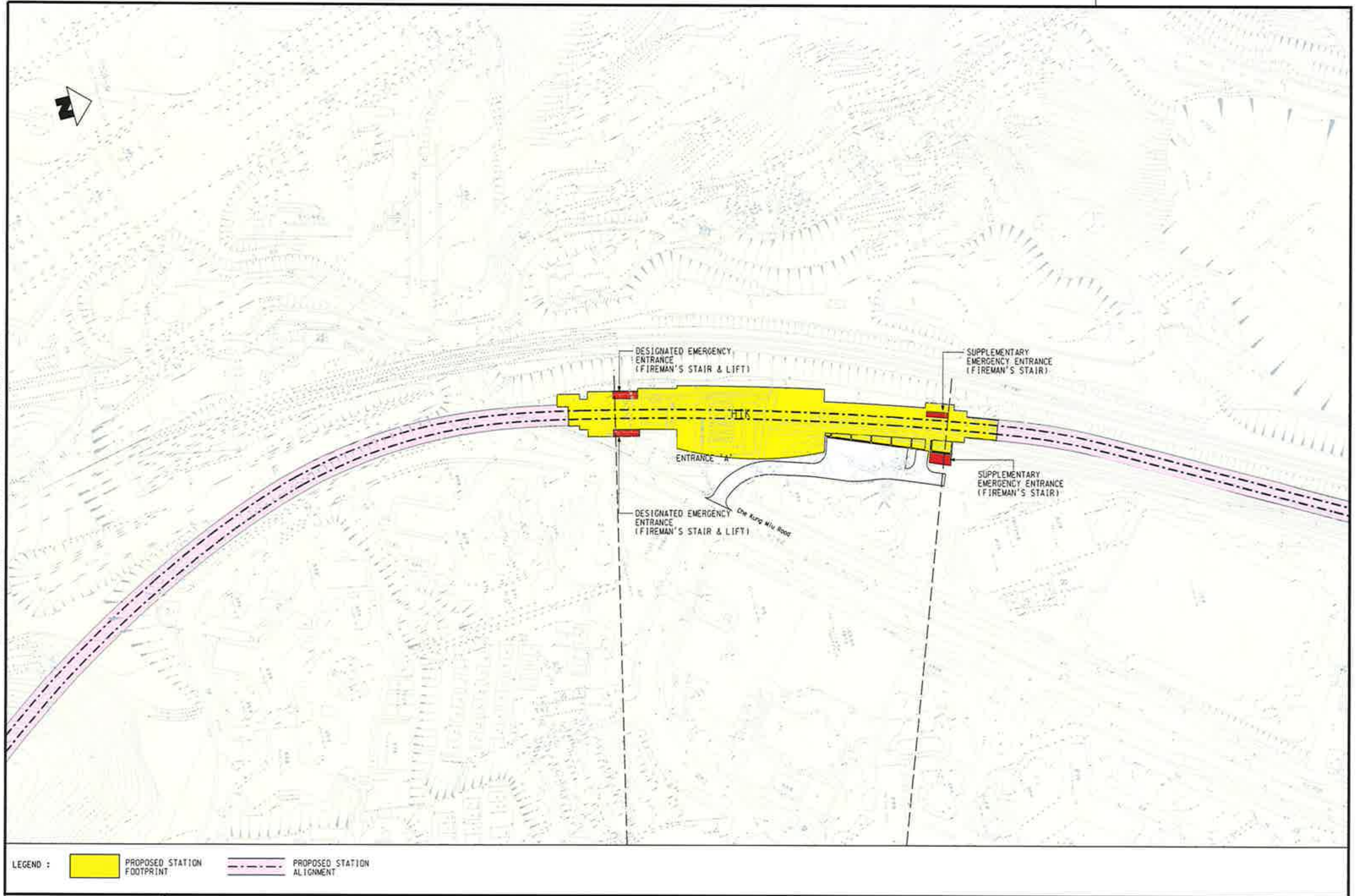
Shatin to Central Link
沙田至中環綫

DIH STATION GENERAL SECTION

FIGURE NO.

FIG 5.8

FULL SIZE A1

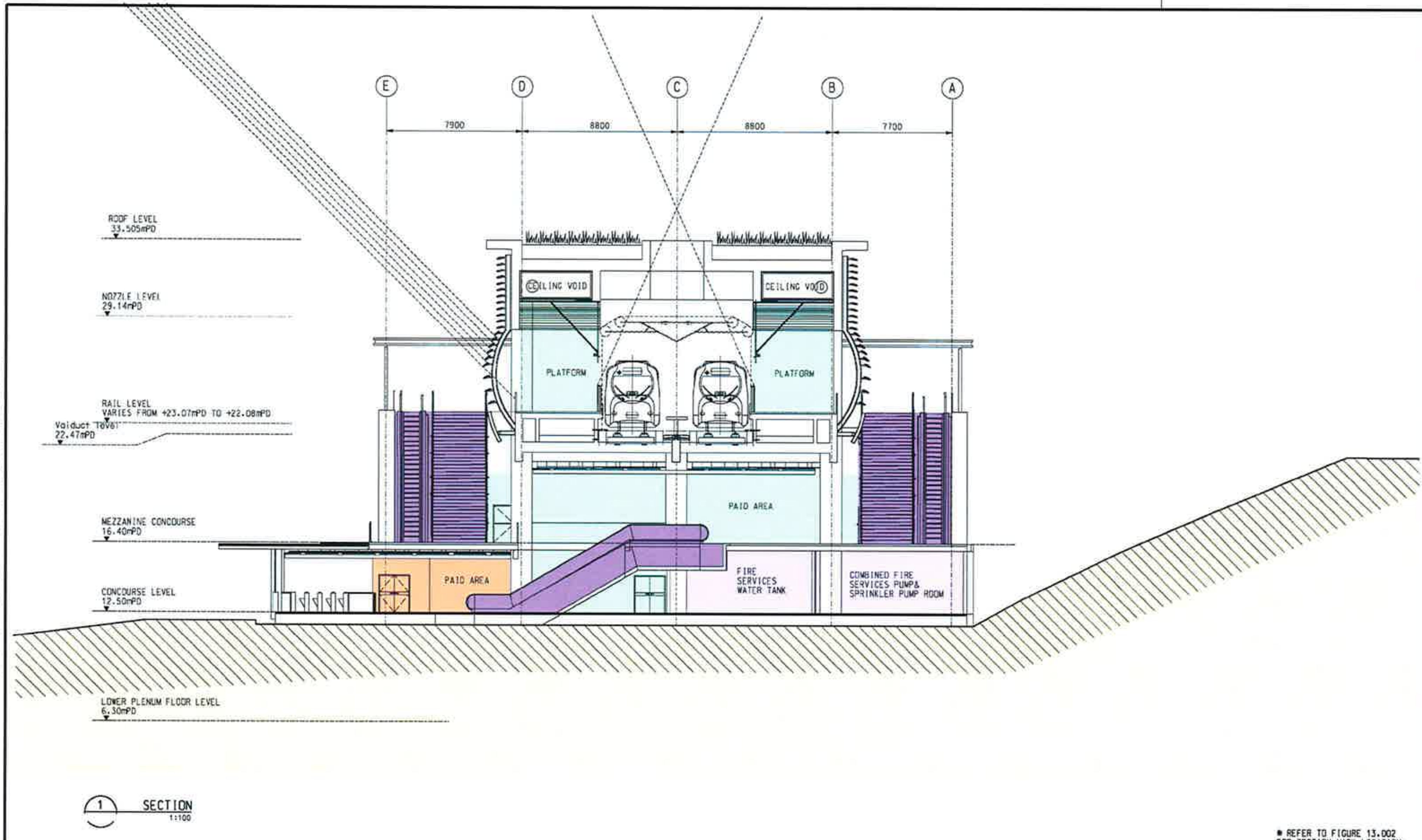


MTR Shatin to Central Link 沙田至中環綫

HIK STATION GENERAL LAYOUT PLAN

FIGURE NO. FIG 5.9

FULL SIZE A1



1 SECTION 1:100

* REFER TO FIGURE 13.002 FOR SECTION MARK LOCATION.

LEGEND :

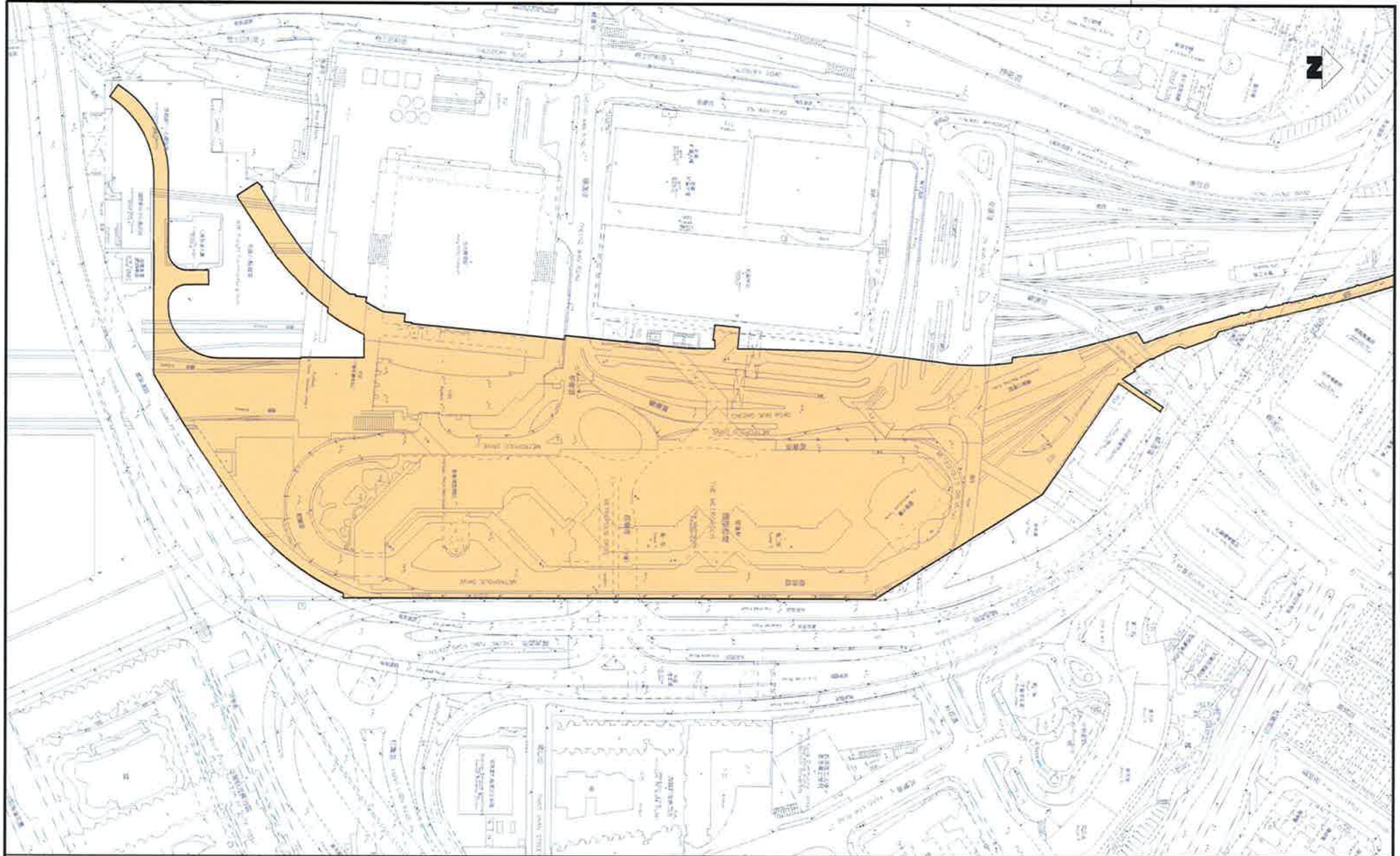
- BACK OF HOUSE
- CONCESSION
- FIREMAN'S LIFT, STAIR & ACCESS / FIRE SEPARATED CORRIDOR
- PAID AREA
- STATION PLANT
- UNEXCAVATED AREA
- UNPAID AREA
- VERTICAL CIRCULATION

MTR
Shatin to Central Link
沙田至中環綫

HIK STATION GENERAL SECTION

FIGURE NO.
FIG 5.10

FULL SIZE A1



LEGEND

PROPOSED DEPOT FOOTPRINT

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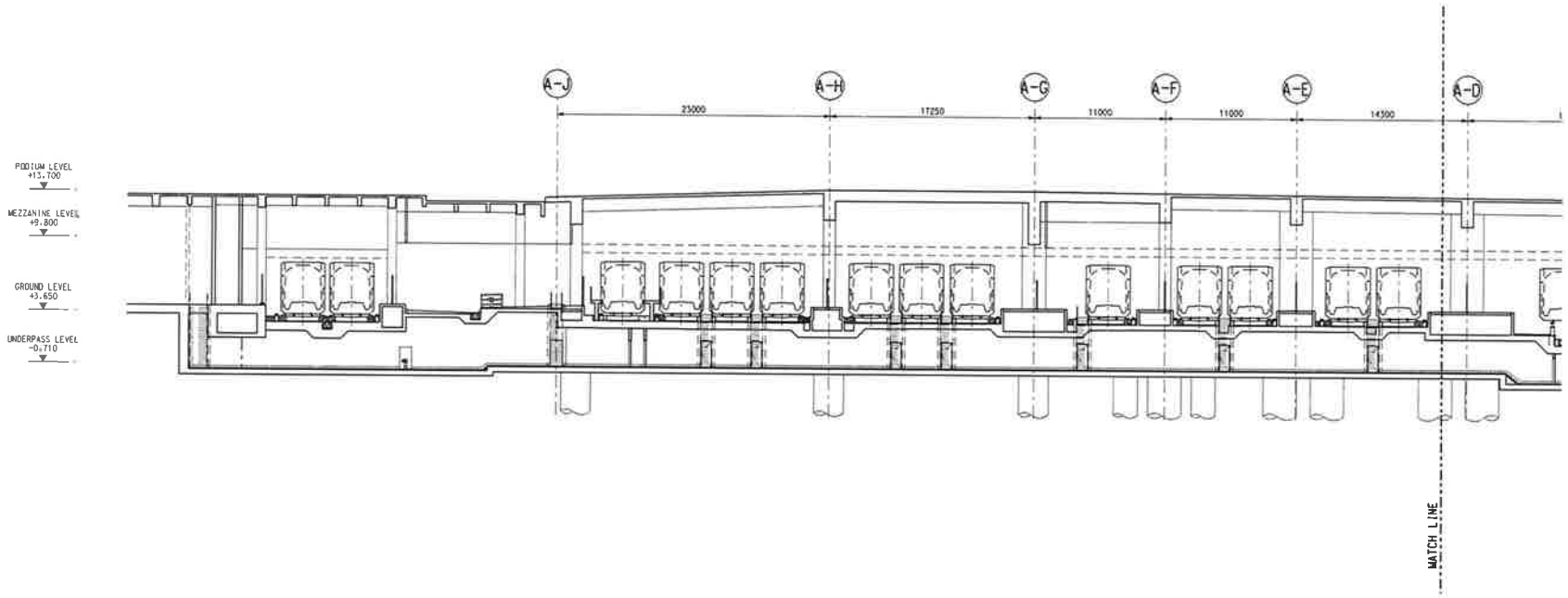
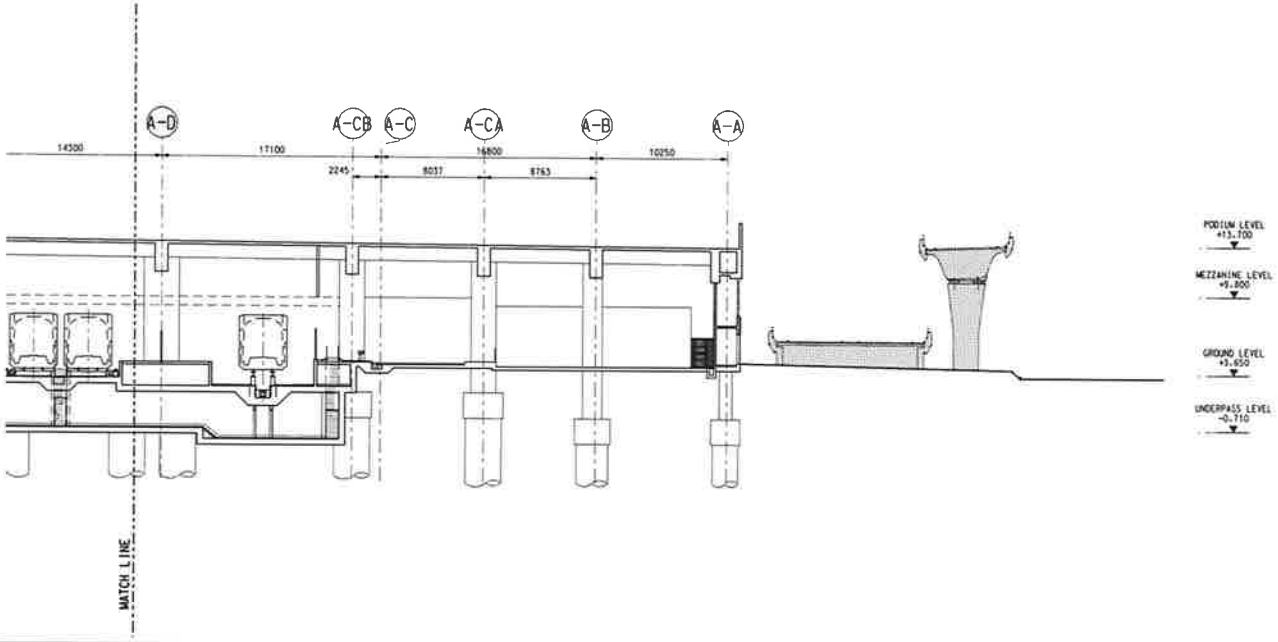
Shatin to Central Link
沙田至中環綫

HHS STABLING SIDINGS GENERAL LAYOUT PLAN

FIGURE NO.
FIG 5.11

FULL SIZE A1





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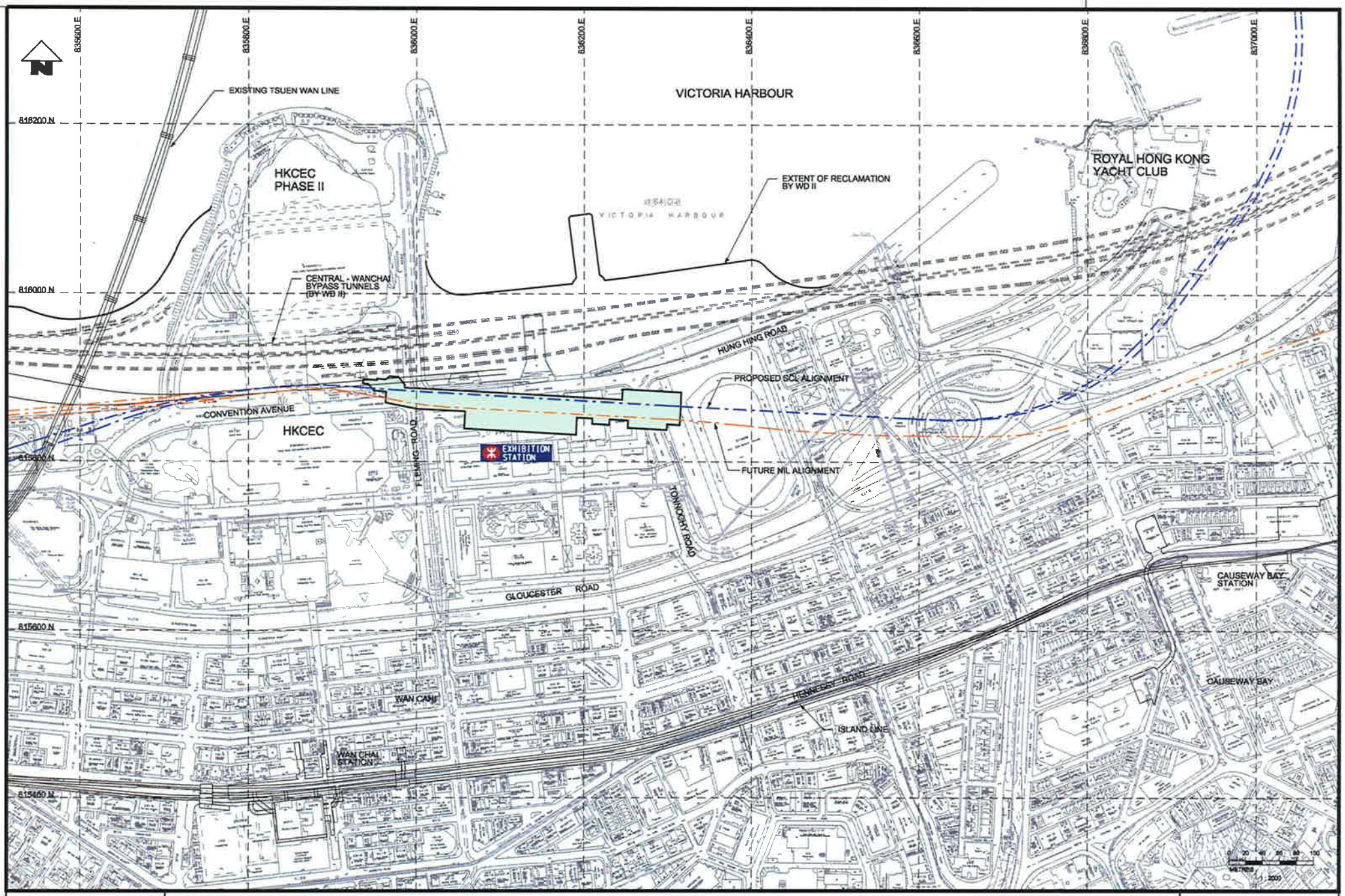
HHS STABLING SIDINGS GENERAL SECTION

FIGURE NO.

FIG 5.12

FULL SIZE A1



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EXH STATION GENERAL LAYOUT PLAN

FIGURE NO.

FIG 5.13

FULL SIZE A1

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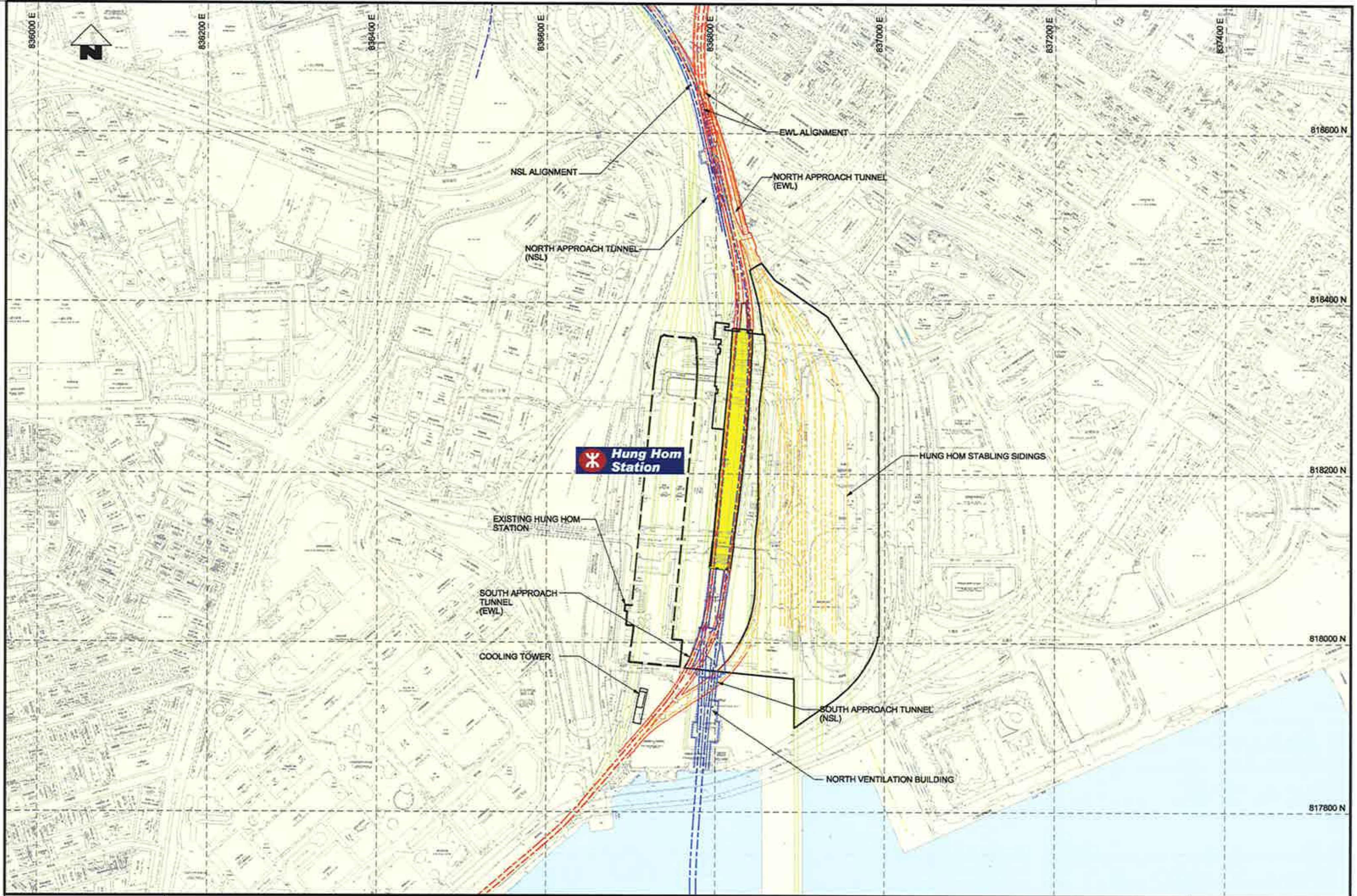
Shatin to Central Link
沙田至中環綫

EXH STATION GENERAL SECTION

FIGURE NO.
FIG 5.14

FULL SIZE A1



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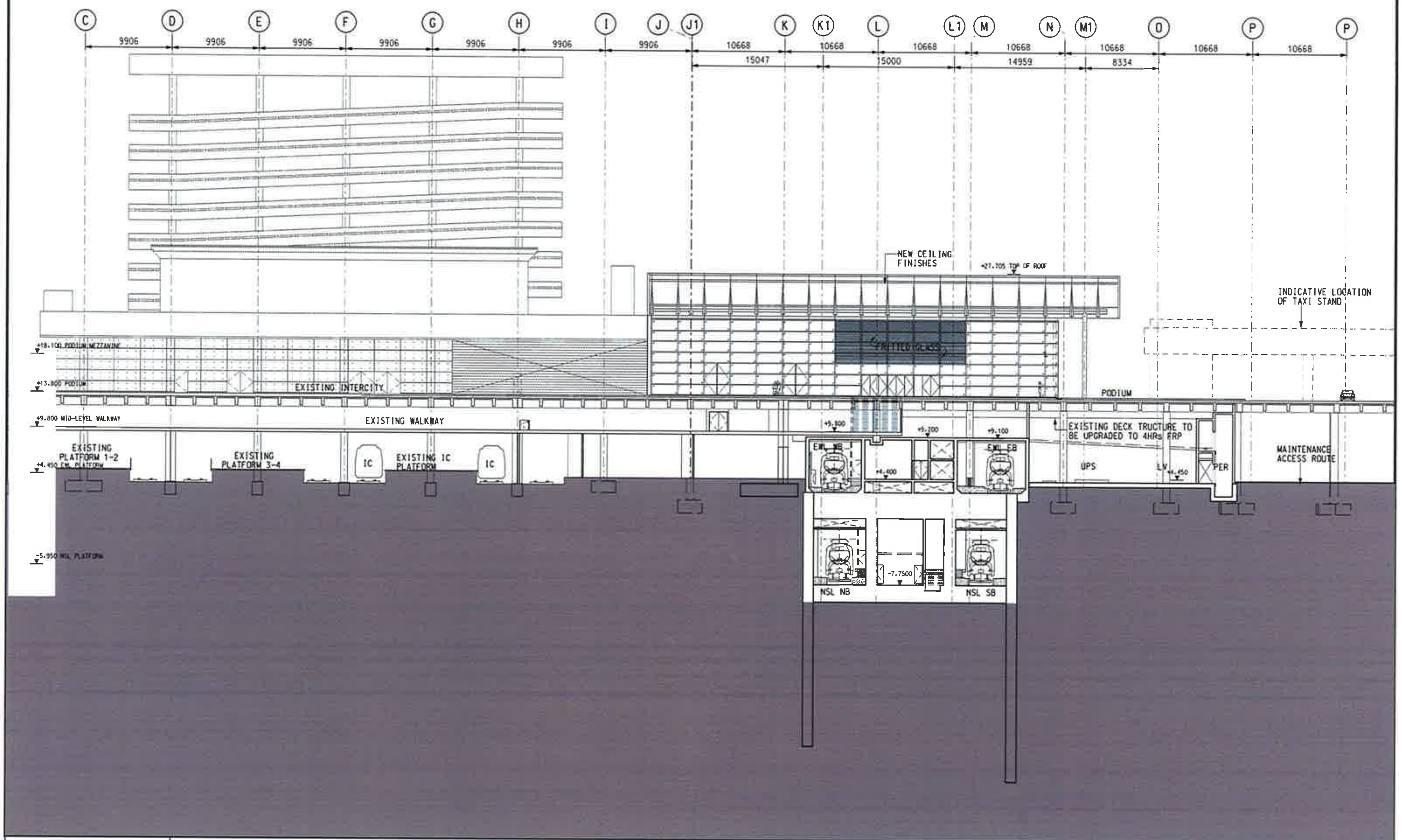
Shatin to Central Link
沙田至中環綫

HUH STATION GENERAL LAYOUT PLAN

FIGURE NO.
FIG 5.15

FULL SIZE A1



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15047 15000 14959 8334
NEW CEILING FINISHES
+27.705 TOP OF ROOF
INDICATIVE LOCATION OF TAXI STAND
FRITTED GLASS
+18.100 PODIUM MEZZANINE
+13.800 PODIUM
EXISTING INTERCITY
PODIUM
+9.800 MID-LEVEL WALKWAY
EXISTING WALKWAY
EXISTING DECK TRUCTURE TO BE UPGRADED TO 4HRs FRP
EXISTING PLATFORM 1-2
+4.450 EWL PLATFORM
EXISTING PLATFORM 3-4
IC
EXISTING IC PLATFORM
EWL WB
EWL EB
+4.400
UPS
LV
+4.450
PER
MAINTENANCE ACCESS ROUTE
-5.950 NSL PLATFORM
-7.7500
NSL NB
NSL SB

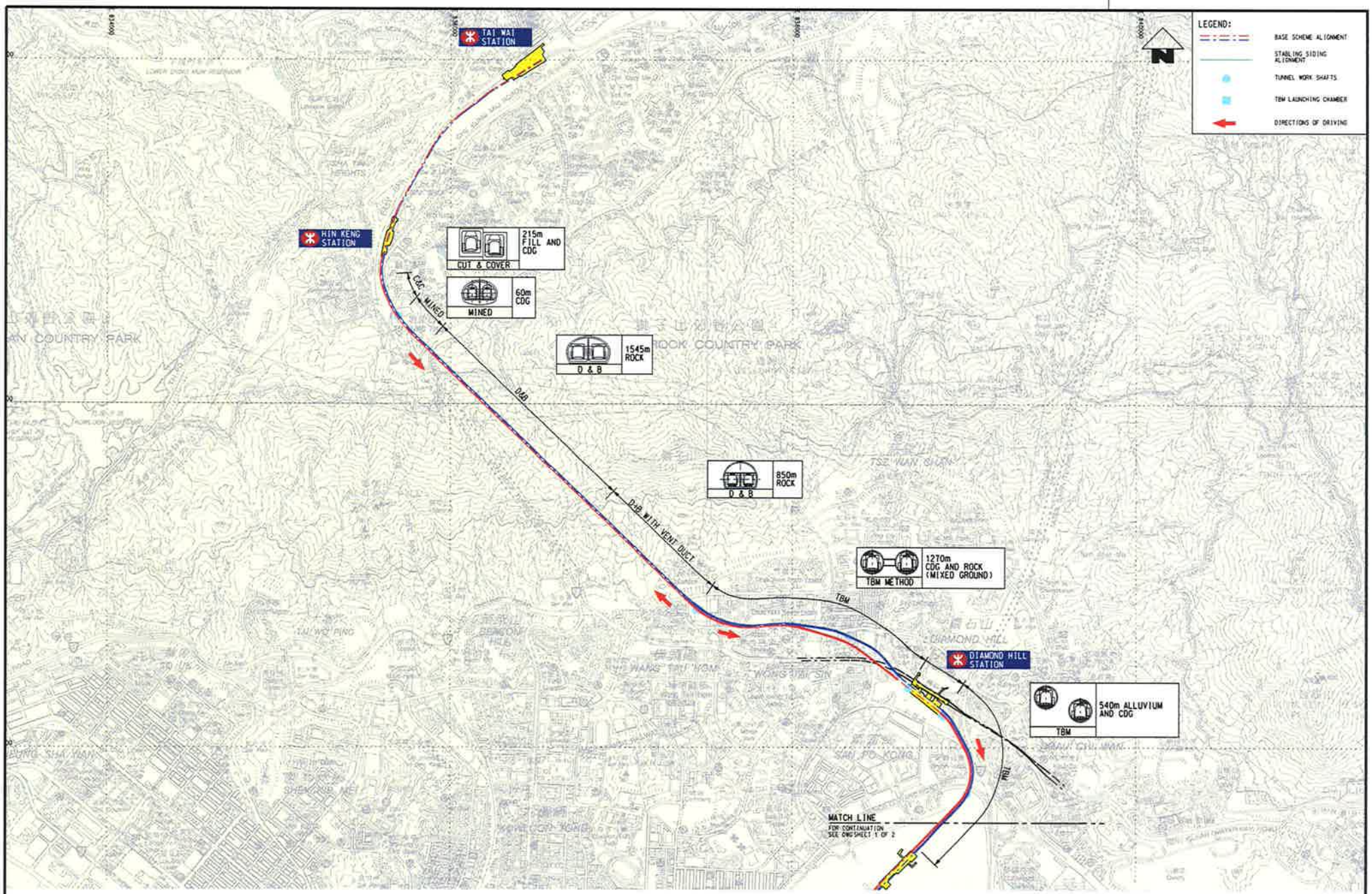
MTR Shatin to Central Link 沙田至中環綫

HUH STATION GENERAL SECTION

FIGURE NO.

FIG 5.16

FULL SIZE A1



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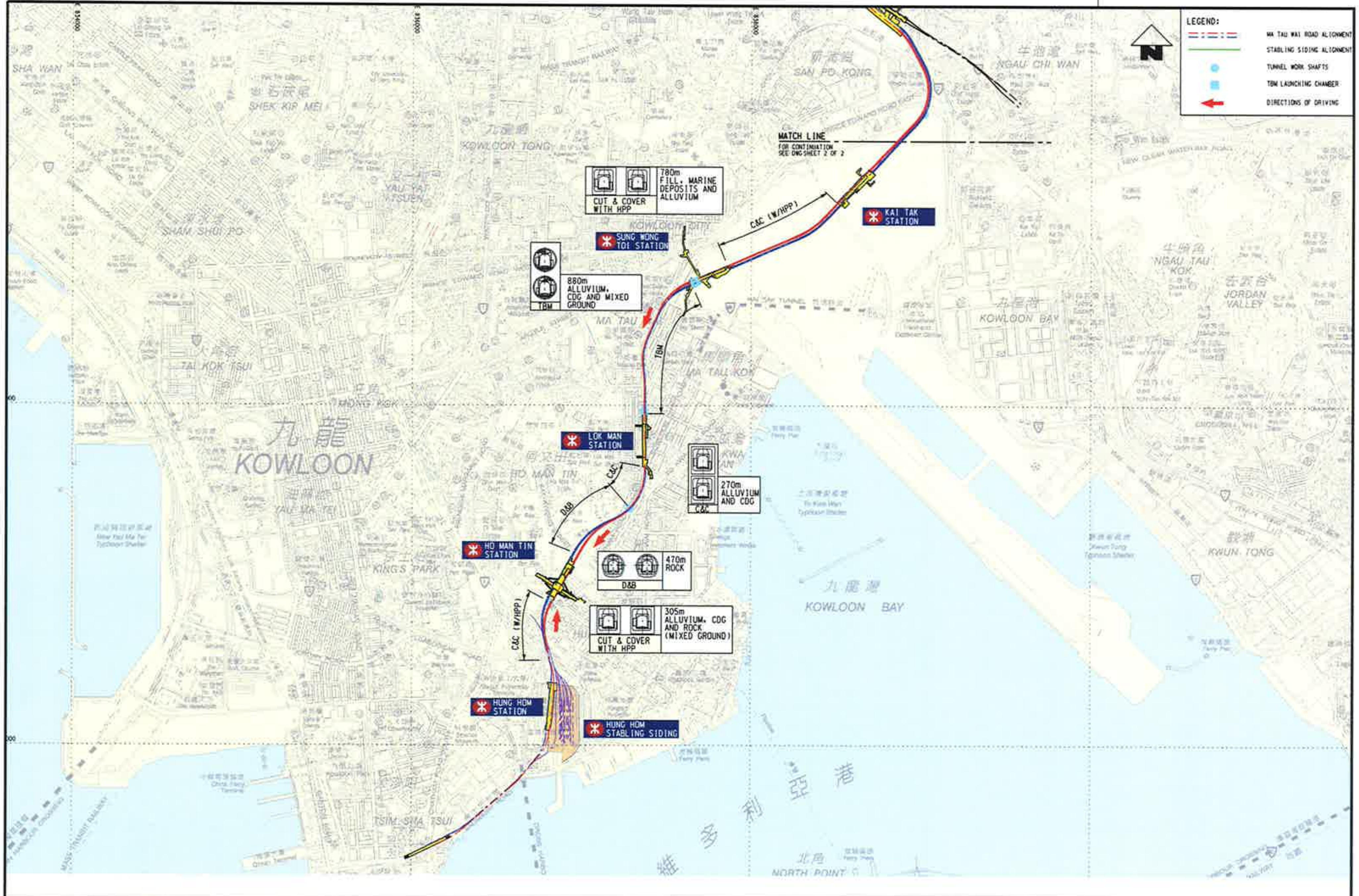
Shatin to Central Link
沙田至中環綫

EWL TUNNEL LAYOUT AND CONSTRUCTION METHODS (SHEET 1 OF 2)

FIGURE NO.

FIG 5.17

FULL SIZE A1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STABLING SIDING ALIGNMENT
TUNNEL WORK SHAFTS
TBM LAUNCHING CHAMBER
DIRECTIONS OF DRIVING
MATCH LINE
FOR CONTINUATION SEE DWG SHEET 2 OF 2
KAI TAK STATION
C&C (W/HPP)
CUT & COVER WITH HPP
780m FILL, MARINE DEPOSITS AND ALLUVIUM
SUNG WONG TOI STATION
TBM
880m ALLUVIUM, CDG AND MIXED GROUND
LOK MAN STATION
C&C
270m ALLUVIUM AND CDG
D&B
470m ROCK
HO MAN TIN STATION
CUT & COVER WITH HPP
305m ALLUVIUM, CDG AND ROCK (MIXED GROUND)
HUNG HOM STATION
HUNG HOM STABLING SIDING
九龍
KOWLOON
KOWLOON BAY
SHA WAN
SHEK KIP MEI
KOWLOON TONG
SAN PO KONG
NGAU CHI WAN
YAU YAT TSUEN
SHAM SHUI PO
MA TAU
MA TAU KOK
TAI KOK TSUI
MONG KOK
HO MAN TIN
YAU MA TEI
KING'S PARK
TSIM SHA TSUI
NGAU TAU KOK
JORDAN VALLEY
KWUN TONG
NORTH POINT
維多利亞港
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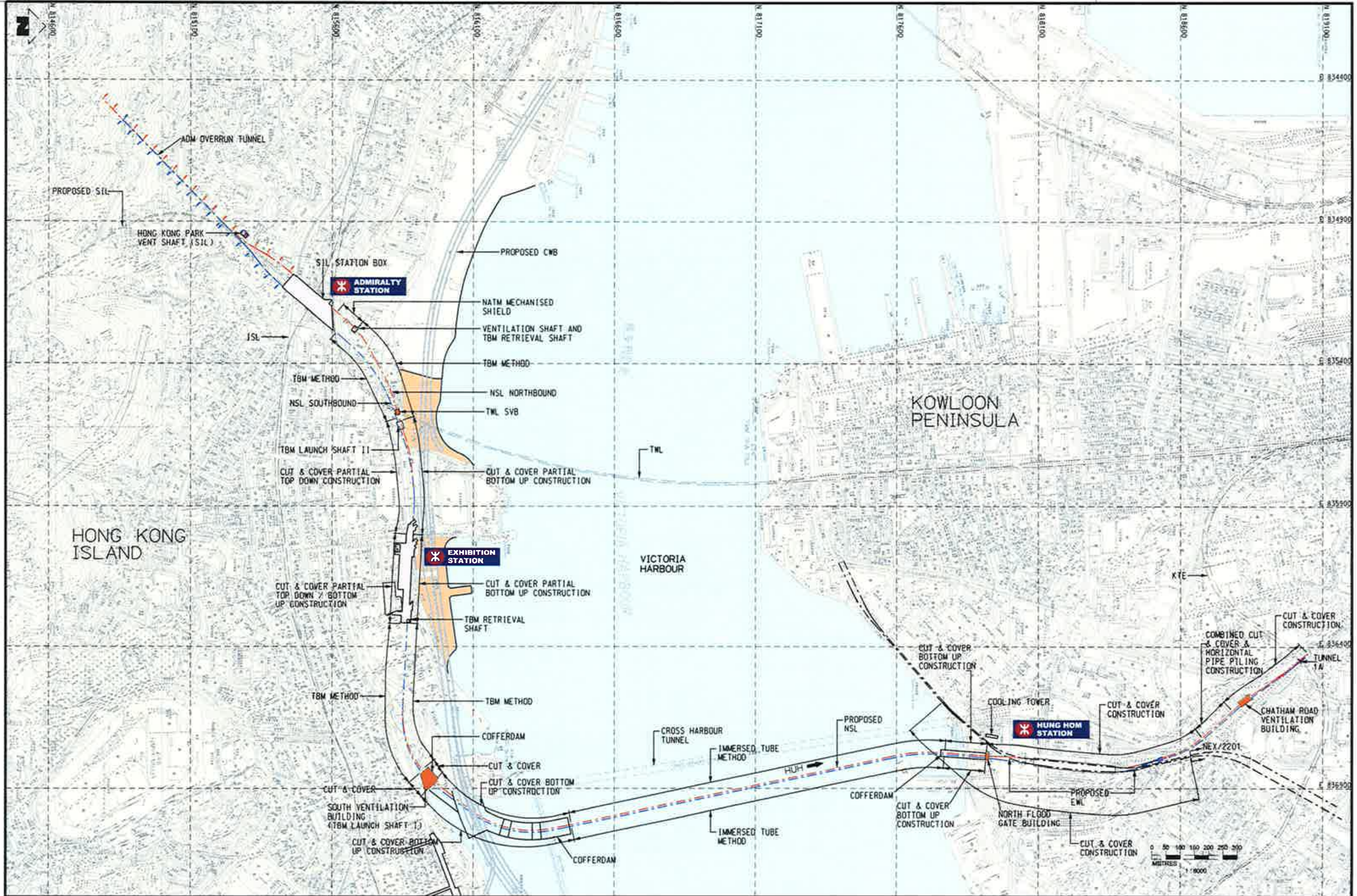
EWL TUNNEL LAYOUT AND CONSTRUCTION METHODS (SHEET 2 OF 2)

FIGURE NO.

FIG 5.18

FULL SIZE A1


ADM OVERRUN TUNNEL
PROPOSED SIL
HONG KONG PARK VENT SHAFT (SIL)
SIL STATION BOX
ADMIRALTY STATION
PROPOSED CWB
NATM MECHANISED SHIELD
VENTILATION SHAFT AND TBM RETRIEVAL SHAFT
ISL
TBM METHOD
NSL NORTHBOUND
NSL SOUTHBOUND
TWL SVB
TBM LAUNCH SHAFT II
TWL
CUT & COVER PARTIAL TOP DOWN CONSTRUCTION
CUT & COVER PARTIAL BOTTOM UP CONSTRUCTION
KOWLOON PENINSULA
HONG KONG ISLAND
EXHIBITION STATION
VICTORIA HARBOUR
KTE
CUT & COVER PARTIAL TOP DOWN / BOTTOM UP CONSTRUCTION
TBM RETRIEVAL SHAFT
CUT & COVER CONSTRUCTION
COMBINED CUT & COVER & HORIZONTAL PIPE PILING CONSTRUCTION
TUNNEL 1A
CUT & COVER BOTTOM UP CONSTRUCTION
COOLING TOWER
HUNG HOM STATION
CHATHAM ROAD VENTILATION BUILDING
COFFERDAM
CUT & COVER
CUT & COVER BOTTOM UP CONSTRUCTION
CROSS HARBOUR TUNNEL
PROPOSED NSL
IMMERSED TUBE METHOD
HUH
NEX/2201
SOUTH VENTILATION BUILDING (TBM LAUNCH SHAFT I)
PROPOSED EWL
NORTH FLOOD GATE BUILDING
METRES 1:8000

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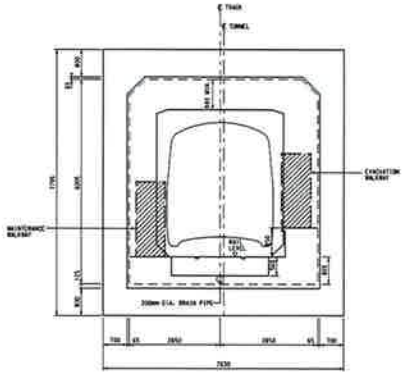
NSL TUNNEL LAYOUT AND CONSTRUCTION METHODS

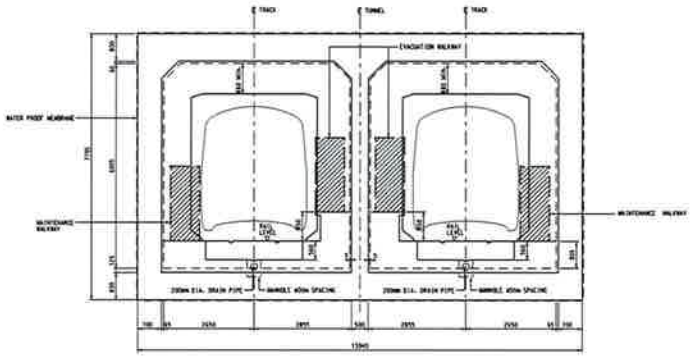
FIGURE NO.

FIG 5.19

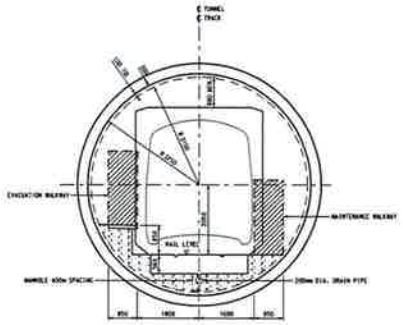
FULL SIZE A1



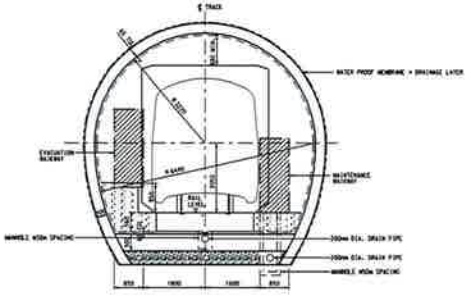
SINGLE TRACK RECTANGULAR TUNNEL



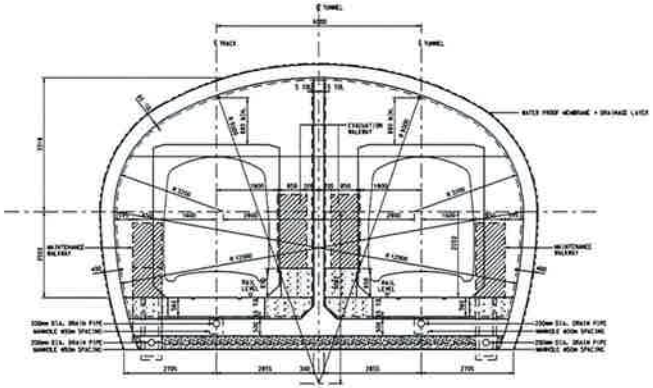
TWIN TRACK RECTANGULAR TUNNEL



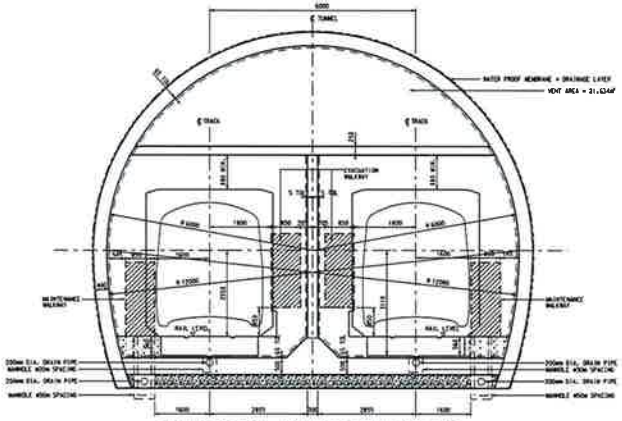
TBM/SHIELD BORED TUNNEL



SSM/D+B SINGLE TRACK TUNNEL



TWIN TRACK DRILL AND BLAST TUNNEL



TWIN TRACK DRILL AND BLAST TUNNEL WITH VENT

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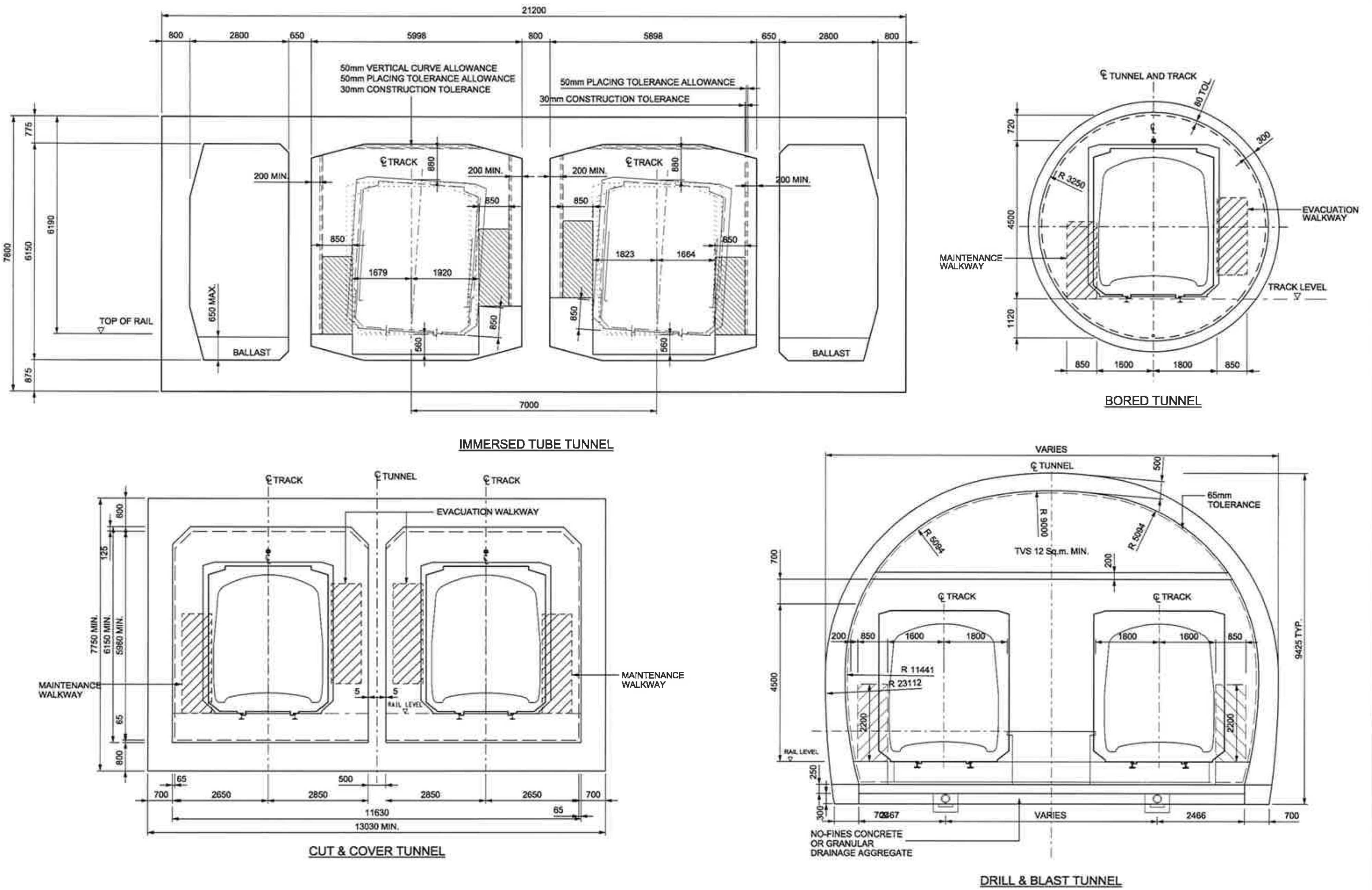
EWL TUNNEL TYPICAL SECTIONS

FIGURE NO.

FIG 5.20

FULL SIZE A1



IMMERSED TUBE TUNNEL
50mm VERTICAL CURVE ALLOWANCE
50mm PLACING TOLERANCE ALLOWANCE
30mm CONSTRUCTION TOLERANCE
50mm PLACING TOLERANCE ALLOWANCE
30mm CONSTRUCTION TOLERANCE
℄ TRACK
200 MIN.
TOP OF RAIL
650 MAX.
BALLAST
BORED TUNNEL
℄ TUNNEL AND TRACK
80 TOL
R 3250
EVACUATION WALKWAY
MAINTENANCE WALKWAY
TRACK LEVEL
CUT & COVER TUNNEL
℄ TUNNEL
EVACUATION WALKWAY
MAINTENANCE WALKWAY
RAIL LEVEL
7750 MIN.
6150 MIN.
5960 MIN.
13030 MIN.
DRILL & BLAST TUNNEL
VARIES
65mm TOLERANCE
R 9000
R 5094
TVS 12 Sq.m. MIN.
R 11441
R 23112
9425 TYP.
NO-FINES CONCRETE OR GRANULAR DRAINAGE AGGREGATE

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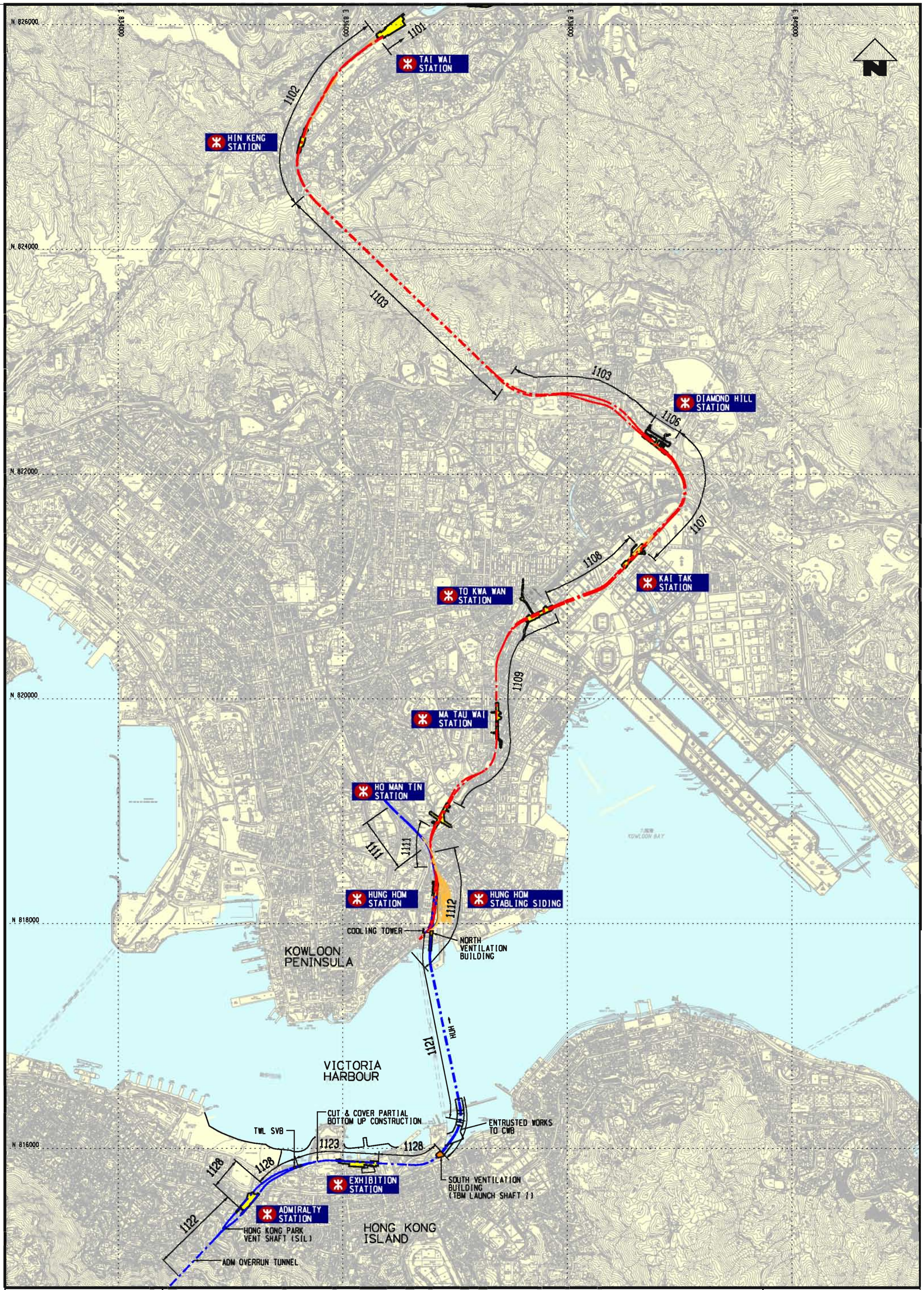
NSL TUNNEL TYPICAL SECTIONS

FIGURE NO.
FIG 5.21

FULL SIZE A1

UserWorkspace C:\Program Files\Bentley\V85\Workspace\users\SCL\ucf, UserRef C:\Program Files\Bentley\V85\Workspace\projects\.pcf
PRINTED BY: od50907 29/10/09 11:26:13
MODELNAME: Default



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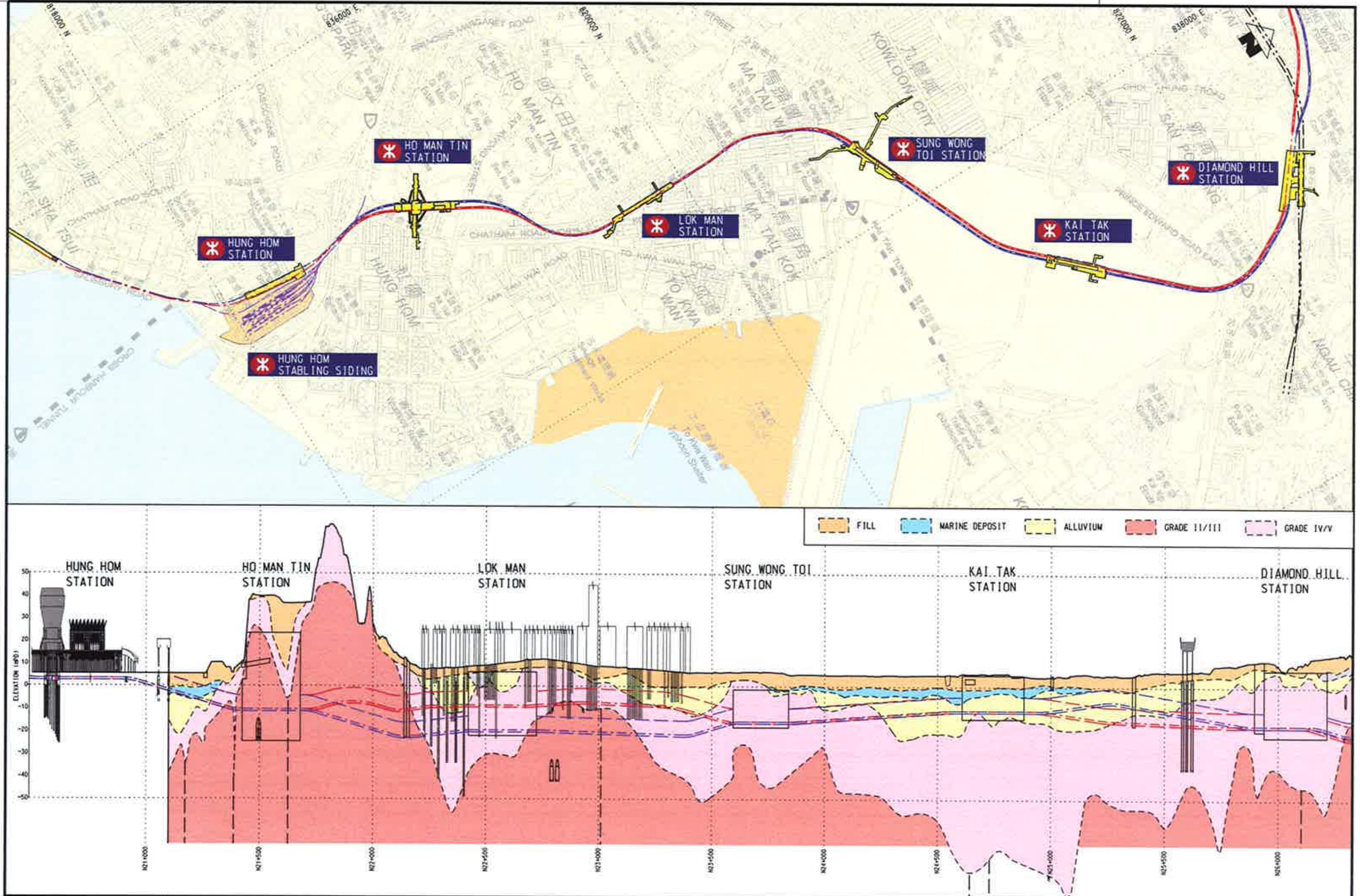
SCL - WORKS CONTRACTS ALLOCATION PLAN

FIGURE NO.

FIG 5.22



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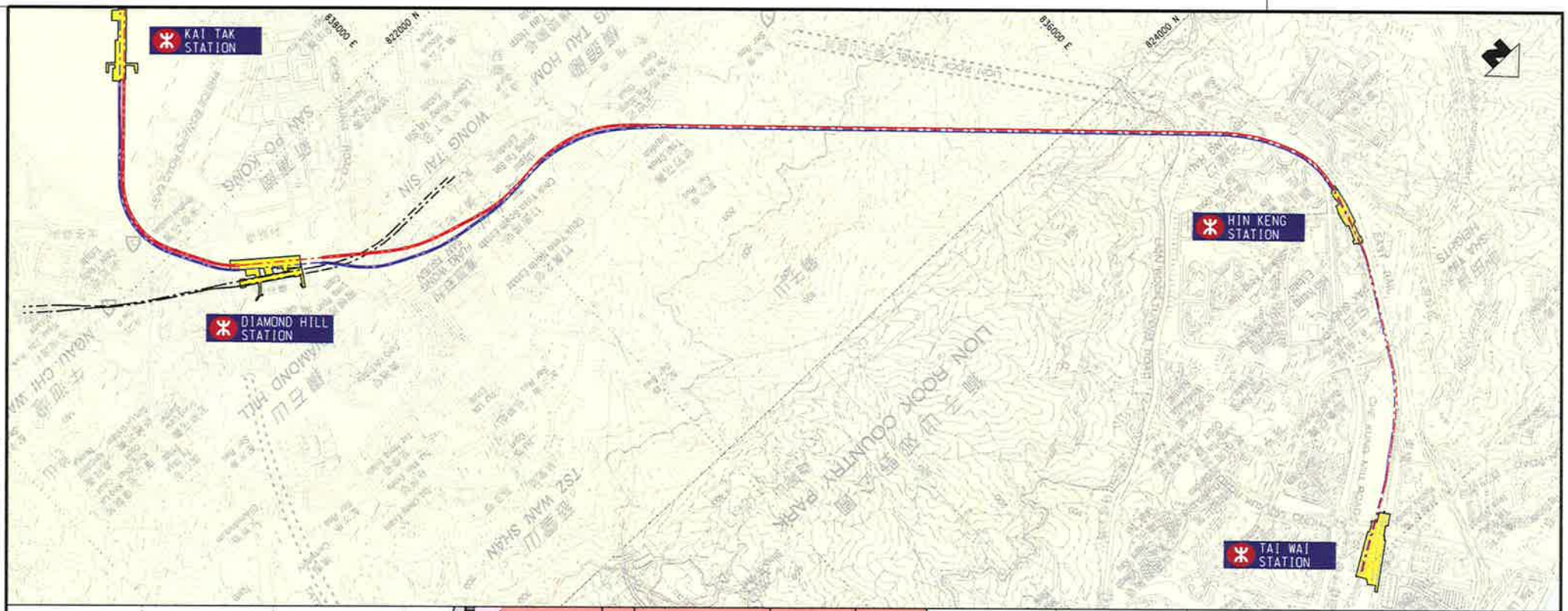
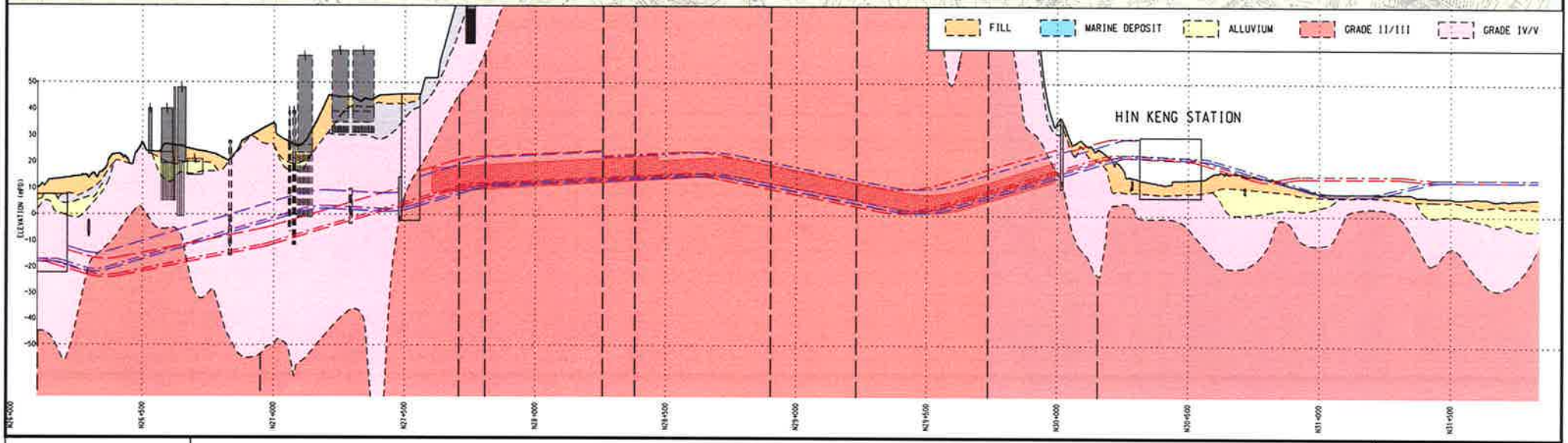
EWL GEOLOGICAL PROFILES (SHEET 1 OF 2)

FIGURE NO.
FIG 6.1

FULL SIZE A1





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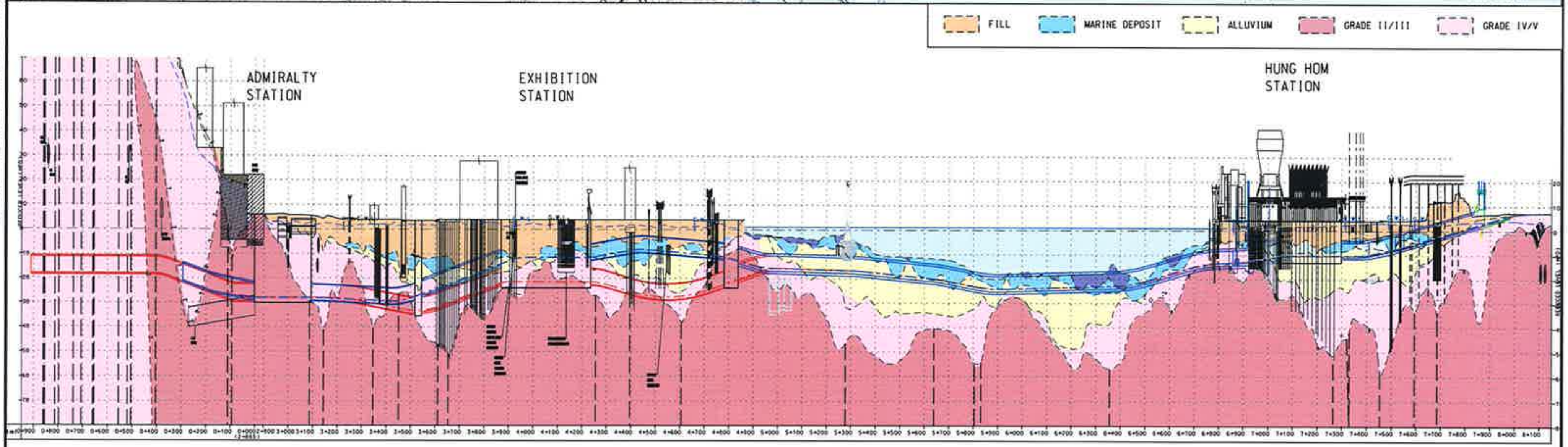
EWL GEOLOGICAL PROFILES (SHEET 2 OF 2)

FIGURE NO.

FIG 6.2

FULL SIZE A1



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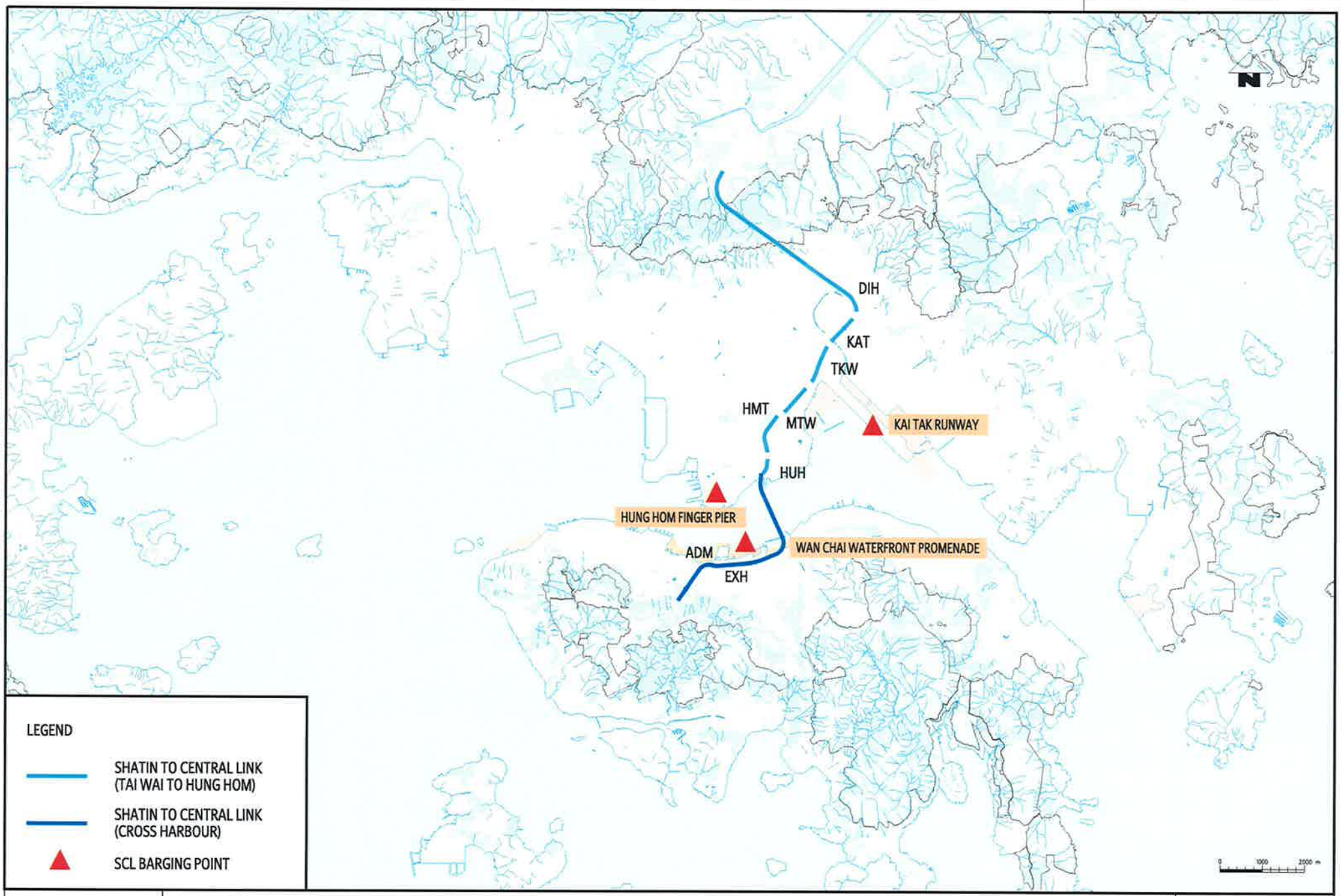
NSL GEOLOGICAL PROFILES

FIGURE NO.

FIG 6.3

FULL SIZE A1



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SCL BARGING POINT LOCATIONS

FIGURE NO.

FIG 6.4

FULL SIZE A1