

### 3. PROJECT DESCRIPTION AND PROPOSED CONSTRUCTION METHODOLOGY

3.1 This section presents a summary of the adopted alignment and construction methodology for the Project. The Project consists of a 1.2 km long realignment branching out from the tunnel portal near Oi Man Estate (Portal 1A) to the new North Ventilation Building, Plant Rooms and Emergency Access (NOV) in Hung Hom. The NOV will be constructed under the Shatin to Central Link – Hung Hom to Admiralty Section [SCL (HUH – ADM)] project. Minor updates to the Project, such as locations and structures, could occur during further design development and construction, and these would be updated through the monthly EM&A reporting.

#### Brief Description

3.2 As discussed in Section 2, the Cut and Cover Option was found to be the most appropriate option that can meet the Project needs, benefit the public and be constructed with proven technology, with lower costs and less programme implications. Underpinning construction method is the preferred method for the construction of HUH. Currently, a mixed fleet of Mid-Life Refurbishment (MLR) Train and SP1900 trains are running on the East Rail Line (EAL). After the completion of SCL (HUH-ADM), 9-car SP1900 or equivalent with shorter train length will be adopted.

3.3 The Project area, as illustrated in [Figure No. NEX2213/C/361/ENS/M50/502](#), is land-based only with neither marine works nor use of sea-water cooling system. A preliminary construction programme of the Project is provided in [Appendix 3.1](#), with the primary construction and operational phase elements displayed in [Table 3.1](#) and [3.2](#) below.

**Table 3.1 Construction Phase Elements**

Sections	Key Construction Items
Portal 1A (the most northern part of the project boundary) to North of Hung Hom Station (HUH)	<ul style="list-style-type: none"> <li>• Construction of a branch off track (with a trough and tunnel toward Chatham Road Interchange)</li> <li>• Construction Works Area above ground, e.g. Associated slope works at Oi Sen Path</li> <li>• Construction of Noise Mitigation Measures at Portal 1A</li> <li>• Realignment of Cheong Wan Road</li> </ul>
North of HUH to Hung Hom NOV	<ul style="list-style-type: none"> <li>• Construction of the approach tunnel</li> <li>• Construction of new platforms (at the existing HUH)</li> <li>• Construction of ventilation shafts at north and south of HUH</li> <li>• Construction works areas above ground, eg. Cooling Tower</li> <li>• Operation of one barging point with two loading ramps at Hung Hom Freight Pier (It will be constructed by Kwun Tong Line Extension (KTE) before commencement of the construction of the Project)</li> </ul>

**Table 3.2 Operational Phase Elements**

Section	Key Operational Items - Before Yr 2020 (Using existing East Rail Line tracks and station)	Key Operational Items - After Yr 2020 (after the completion of the whole SCL)
Portal 1A to north of HUH	<ul style="list-style-type: none"> <li>• Using existing MLR/SP 1900 trains</li> <li>• Using existing ballast tracks (above ground)</li> <li>• Freight train operations to cease</li> <li>• Infrequent Intercity and maintenance locomotive movements, same as the prevailing condition</li> <li>• Alignment of Ho Man Tin Siding slightly revised</li> </ul>	<ul style="list-style-type: none"> <li>• Using new 9-car trains of SP 1900, or equivalent</li> <li>• Using slab tracks at tunnel near Carmel Secondary School</li> <li>• Using new HUH platform</li> <li>• Freight train operations to cease</li> <li>• Infrequent Intercity and maintenance locomotive movements, same as the prevailing condition</li> <li>• Alignment of Ho Man Tin Siding slightly revised</li> </ul>
North of HUH to Hung Hom NOV	<ul style="list-style-type: none"> <li>• Using existing MLR/SP 1900 trains</li> <li>• Using existing ballast track (above ground)</li> <li>• Using existing EAL platform</li> <li>• Freight train operations to cease</li> <li>• Infrequent Intercity movement, same as the prevailing condition</li> <li>• Realigned Cheong Wan Road</li> <li>• New Exhaust/Intakes at HUH in operation (since Yr 2018)</li> </ul>	<ul style="list-style-type: none"> <li>• Using new 9-car trains of SP 1900, or equivalent</li> <li>• Using new slab tracks (most are underground)</li> <li>• Using new platform</li> <li>• Freight train operations to cease</li> <li>• Infrequent Intercity movement, same as the prevailing condition</li> <li>• Realigned Cheong Wan Road</li> </ul>

**Preliminary Engineering Design Considerations**

3.4 The information presented below is a summary available from the detailed design and may be subject to further adjustment due to design evolution.

**Preferred Alignment**

3.5 The preferred alignment has been adopted as a result of a thorough review of the engineering, environmental and community impacts, as summarised in **Section 2**. The overall alignment of the SCL is shown in [Figure No. NEX2213/C/361/ENS/M50/501](#) with the generalised geological conditions and horizontal and vertical alignments illustrated in [Appendix 3.2](#).

**Major Works Area/Site Requirements and Locations**

3.6 In terms of the EIA context, works area/sites have been subdivided into “major works area/site” and “other areas”. Major works area/site refers to the integrated works item and works area/site that related to Designated Elements under EIAO (e.g. for station and railway). In terms of other works area/sites, they are further explained under Section 3.14. Major works areas for the Project are illustrated in [Figure no. NEX2213/C/361/ENS/M50/502](#), and coloured in pink. In general, there are three main areas, including the works areas for Chatham Road Interchange (CRI) and associated tunnel, HUH, Hung Hom Freight Pier Barging Point.

Works Area for CRI and Associated Tunnel

3.7 In order to minimise the potential disturbance and impact to the public and environment, the major works areas are confined within the existing East Rail Line boundary. The works area for the trough will be integrated into the construction of the tunnel, which will employ a cut and cover construction methodology as discussed in **Section 2**.

3.8 The tunnel works to the south of CRI would likely be constructed at a similar time frame with the SCL (TAW-HUH) due to their interrelationship with the SCL (TAW-HUH) tunnelling in respect to the

proposed temporary diversion of Chatham Road North. Cut-and-cover method will be adopted as the preferred construction method.

- 3.9 An existing Homantin siding (branching off from Portal 1A) will be slightly modified. The three existing tracks will be reduced to one track with a spur track approaching the Hong Kong Polytechnic University Phase 8 (HKPU Phase 8) area and the number of crossing will be reduced. The train frequency and function of the sidings will remain unchanged.

#### Works Area at HUH

- 3.10 New platforms would be constructed underneath the existing HUH. Some of the construction works can be kept under the existing podium deck, and it is expected that the environmental impacts could be much minimised. EAL can continue its operation at the existing HUH during construction phase. The assessment would be based on underpinning construction method being adopted.
- 3.11 Above ground works areas at HUH (outside podium footprint) will be limited to those for the construction of the ventilation shafts, and cooling tower. All these utility-supporting facilities will be typical small-scale reinforced-concrete structures, and thus, adverse environmental impact would not be anticipated.

#### Barging Point at Hung Hom Freight Pier

- 3.12 The Hung Hom Freight Pier is currently employed for loading and unloading of goods from freight terminal to the container barges. Owing to the similarity with the existing loading and unloading operation, the Hung Hom Freight Pier can be easily converted to barging point for C&D material. The Hung Hom Freight Pier having loading ramps, will be deployed to serve this Project, SCL (TAW – HUH), SCL (HUH – ADM) and Kwun Tong Line Extension (KTE).
- 3.13 It is anticipated that the simplest form of loading ramps with an enclosed tipping hall to be constructed, and a wheel washing facility would be provided at the site exit to minimise construction dust and noise impact. Neither marine works nor modification to the existing seawall is anticipated to be required for the Project.

#### **Other Works Area/site within the SCL Scheme/ Project Boundary**

- 3.14 Apart from the major works areas/sites, there are other areas/sites located within the SCL scheme/project boundary at which minor activities/works for supporting the construction of the Project may occur. In general, they are classified as follows:
- Other works areas/sites – additional temporary works areas/sites would be required within SCL scheme/project boundary for the provision of site office, storage of materials, utilities, temporary traffic management scheme, temporary bridge, or temporary pedestrian bridge and silo. Apart from the landscape and visual impacts, these areas/sites would not cause any adverse environmental impacts, and they are not included as part of the major works area/site. (LVIA will be addressed comprehensively in Section 4 - LVIA chapter). These works areas/sites will normally be used for typical construction works that is not specifically bounded under EIAO legislation (e.g. general utility works, construction or demolition of superstructure, etc).
  - Off-site Area at Mong Kok Freight Terminal – The office/store layout of the current freight yards underneath MKK podium will be slightly modified. There will be neither modification nor addition to the existing three rail tracks.
  - Tree Reception Areas - All the trees affected by the construction of the Project would be compensated within the Project boundary as far as possible. However, due to the availability of on-site areas, some of the compensatory trees may need to be planted off-site. The locations of these off-site tree reception areas are yet to be decided and subject to the tree felling applications. Some possible sites that may be considered include Long Valley, Ho Sheung Heung Priority Site and along Ng Tung River. These off-site tree reception areas may also need to be shared among different railway projects including but not limited to other sections of the SCL.
  - Area linking Chatham Road North – this area will be used for construction of north approach tunnels for this Project and for SCL (TAW – HUH) and Ho Man Tin Station (HOM) for KTE. As such, the detailed descriptions and assessment of the environmental implication will be covered

in the SCL (TAW–HUH) /KTE EIA reports. The cumulative impacts from the concurrent projects will be discussed in this EIA report.

- Area linking Salisbury Road – similarly this area will be used for construction of the south approach tunnel of SCL (TAW–HUH). Detailed descriptions and assessment of the environmental implication has been covered in the SCL (TAW–HUH) EIA report, and cumulative impacts from the concurrent projects will be discussed in this EIA report.

3.15 Subject to actual site conditions and constraints, minor preparatory works could also be required to be conducted in and around the project boundary. However, these would only be short-term without inducing major environmental implications to nearby sensitive receivers. With the implementation of appropriate standard control measures and good site practices for construction works, no adverse environmental impact would be anticipated.

**Above Ground Structures**

3.16 For ease of reference, [Table 3.3](#) illustrates the above ground structure for the Project. The dimensions of these structures are illustrated in [Figure nos. NEX2213/C/361/ENS/M54/551 to 558](#).

**Table 3.3 Permanent Above-ground Structure**

Sections	Key Construction Items	Abbreviations
Portal 1A to North of HUH	Noise Mitigation Measures at Portal 1A	-
	Cheong Wan Road Viaduct	-
	Homantin Siding	-
North of HUH to Hung Hom NOV	New Hung Hom Station	HUH
	North Side Ventilation Shafts	NSVS
	South Side Ventilation Shafts	SSVS
North of HUH to Hung Hom NOV	HUH Cooling Tower	-
Off-site Area	MKK facilities	-

### **Construction Methods**

- 3.17 Major construction works include cut and cover works for tunnel and surface works, construction of superstructures including ventilation shafts, modification work to HUH podium structures as well as loading and unloading at barging point.

### ***Tunnel Construction***

- 3.18 The tunnel structure is proposed to be constructed by cut-and-cover (C&C) method in open area with a bottom-up sequence whereas the section entering the HUH deck would be built by underpinning method below the existing HUH podium. Some existing superstructures located directly above the C&C tunnel would be demolished before the construction of the tunnel.
- 3.19 The section of tunnel up to Chatham Road Interchange will require prior reprovisioning of various infrastructure and railway facilities directly affected by the alignment, and also the underpinning of piers of the Hung Hom Bypass viaduct. The cofferdam construction will use diaphragm walls, sheet pile walls, pipe pile walls or secant piles subject to the contractor's design. Significant underpinning works are also required with respect to bridge piers of Hung Hom Bypass. The foundation of the tunnels will be in the form of socketed H-piles, except where floating structures may be used. Cut and cover tunneling through the Chatham Road Interchange will require the implementation of a major temporary traffic management scheme. It is proposed that this will generally involve the use of sheet piled temporary retaining walls, except in the vicinity of existing foundations where a stiffer support system will be used.
- 3.20 For the section south of the Hong Kong Coliseum (HKC), the use of bored piles and pipe pile walls with in-situ tunnel box construction inside the temporary cofferdam is proposed. Bored piles are also used as the foundation systems for the tunnels. In addition, the existing CLP Cable Tunnel and 1650mm diameter trunk sewer will need to be protected and supported across the tunnel cofferdam.

### ***Hung Hom Station (HUH) Construction***

- 3.21 During the construction of the new HUH platforms, to maintain existing traffic flow along Cheong Wan Road and large thoroughfare necessary for the HKC spectators, the podium deck is required to be maintained whenever possible. Thus, underpinning schemes for this area have been proposed.
- 3.22 For the underpinning schemes at HUH, underpinning by pipe pile wall and bottom-up method, column collar method and in sequences are proposed. The majority of underpinning works relates to the existing foundations and columns throughout the existing HUH footprint. A significant proportion of the piles and pile caps are required to be demolished to facilitate the station construction, and therefore extensive underpinning works for the podium columns will be necessary.
- 3.23 In the area at the south end of the HUH, the proposed Excavation and Lateral Support (ELS) system is subject to contractor's design. It could be diaphragm wall, sheet pile walls, secant piles, pipe pile wall etc. In the central part of the station, diaphragm walling is proposed due to insufficient space for constructing both temporary wall and permanent station wall in respect of horizontal alignment constraints relative to existing foundations. In the north end of the station, a short section of pipe pile wall is proposed due to the presence of the mid-level footbridge which imposes a significant headroom constraint. After the underpinning works for the footbridge pier, the ground level has to be lowered down for constructing diaphragm wall. In-situ end wall is required adjacent to the proposed box culvert diversion in the north fan area.
- 3.24 SCL (TAW-HUH) Modification works to the existing HUH podium structure would be carried out to introduce openings for new escalators, lifts and stairs and also to provide sufficient headroom for the Mid-Level Walkway, E&M provisions and also works resulting from the re-configuration and removal of existing columns of the Freight Terminal. The modification works would only involve minor excavation work of which most are carried out in an enclosed environment to minimize the disturbance to the public and railway operations.

### ***Other Works***

- 3.25 Apart from the above construction works, there are some supporting works, including demolition works, pile removal, stormwater drain and culvert diversion and other associated works.

- 3.26 The existing storm water drainage network serving (a) the HKC and the associated podium deck area (b) the existing HUH complex (c) the existing PTI and Taxi drop-off area at the podium level, are all connected to the existing culvert laid underground of the freight yard area, via the storm water manhole network distributed throughout the area. It is proposed to divert the section of the upstream culvert which passes through the SCL footprint.
- 3.27 Ventilation shafts will be built at the north and south of HUH podium edge for the operational tunnel and station ventilation. The construction areas for these superstructures would be limited and all structures are reinforced concrete in nature. The ventilation shafts associated with the tunnel ventilation plant room is envisaged to be excavated by cut-and-cover method. A sheet pile wall is proposed as the temporary cofferdam wall.
- 3.28 Homantin Siding, the former livestock sidings area, located at the south side of Chatham Road Interchange would be reserved for railway reprovisioning works. Only minor excavation works, e.g. realignment of the existing rail track and relocation of the crossing would be carried out.

#### ***Barging Point at Hung Hom Freight Pier***

- 3.29 The Hung Hom freight pier will be converted into a temporary barging point with two loading ramps for spoil disposal. This pier is to serve this Project, SCL (HUH-ADM), SCL (TAW-HUH) and KTE. The establishment of this barging point would involve solely land-based works and there would be no construction of marine structures. It is intended that the considerable spoil quantities generated from the excavation works for the station cofferdam, as well as the cut and cover works for the approach tunnels, will be disposed of by barges. No stockpiles area would be provided for the barging point, all excavated spoils would be delivered from the construction sites by barge or truck every day. The disposal scheme will be that the spoil is to be taken to sites within the Mainland for disposal.

#### **Construction Programme**

- 3.30 The construction works would commence in mid 2012 and the overall Project completion is anticipated to be in 2018.

#### **Concurrent Projects**

- 3.31 Four groups of concurrent projects in the vicinity of the SCL have been illustrated in [Figure No. NEX2213/C/361/ENS/M50/503](#) and identified as having genuine interfacing issues. These are:
- SCL (HUH - ADM);
  - SCL (TAW - HUH);
  - KTE; and
  - Improvement Works for Viaducts.

#### SCL (HUH-ADM) – Proponent as MTR

- 3.32 SCL (HUH-ADM) comprises of an approximately 6 km extension of the EAL including a rail harbour crossing from Hung Hom across the harbour to Admiralty on Hong Kong Island. The project will also include the construction of a new station near the Hong Kong Convention and Exhibition Centre (HKCEC) i.e. the Exhibition Station. The existing MTR Freight Operations Building at south of HUH will be demolished to facilitate the construction of SCL (HUH-ADM) rail works and the associated ventilation building, ventilation shafts, smoke extraction facilities.

#### SCL (TAW – HUH) – Proponent as MTR

- 3.33 The SCL (TAW – HUH) is an approximately 11km long extension of the Ma On Shan Line (MOL) from Tai Wai through new stations at Hin Keng (HIK), Diamond Hill (DIH), Kai Tak (KTA), To Kwa Wan (TKW), Ma Tau Wai (MTW), Ho Man Tin (HOM) and connects the West Rail Line at the HUH. Most of these sections would be underground except for a section at Hin Keng, and another section at Hung Hom. Open cut methods will be employed for the construction of most of the station and ventilation building structures etc.
- 3.34 To support the SCL operation, three options for stabling sidings have been developed, including using only the Diamond Hill CDA Site (namely DHS), only the former Hung Hom Freight Yard (namely HHS) or a combination of both sites. Subsequent investigation for the preferred sites

concluded that the option of combination of DHS and HHS was found to be not preferred and was not pursued further. In this EIA Report, the stabling sidings in DHS which is presented in the EIA Report of SCL (TAW-HUH) is assumed and hence cumulative environmental impacts associated with the SCL (TAW-HUH) with the DHS option have been assessed. The potential environmental impacts associated with the HHS together with cumulative impacts from other projects have been assessed and presented in another standalone EIA under the EIA Study Brief No. ESB-233/2011. In that standalone EIA for SCL (HHS), the potential cumulative environmental impacts from the Project and HHS, including landscape and visual, construction dust, airborne noise, groundborne noise, water quality, waste management and land contamination, have been assessed/addressed. Adoption of the stabling sidings in DHS or HHS would be subject to the findings of detailed engineering and EIA studies.

- 3.35 The SCL (TAW-HUH) will interchange with the KTE at HOM and the SCL (MKK – HUH) and SCL (HUH – ADM) at HUH. The construction works is tentatively scheduled to commence in 2012 and completed in 2018.

KTE – Proponent as MTR

- 3.36 This project consists of an approximately 3km extension of the existing Kwun Tong Line from Yau Ma Tei (YMT) Station to a new railway station at Whampoa and with an interchange with the SCL (TAW-HUH) at the proposed HOM. The rail alignment is underground and the ventilation shafts and station entrances are above ground-structures. The construction works are tentatively scheduled to commence at early 2011 and be completed by 2015.
- 3.37 The project includes the construction of the running line from YMT through proposed HOM to Whampoa Station (WHA) and the HOM and WHA along with their associated structures. The construction of HOM is likely to interface and be concurrent with the construction of this Project.
- 3.38 A rock crushing plant and one barging point with two loading ramps located at Hung Hom Freight Pier are required to be constructed and operated during the construction of KTE. The crushed rock materials would be transported to the tipping halls of the barging point by trucks and then unloaded to the barges. The crushed rock would be transported to the tipping halls of the barging point by trucks and then unloaded to the barges. During the construction of SCL, the barging facilities would be shared among this Project, SCL (HUH – ADM), SCL (TAW – HUH) and KTE. The operation of the rock crushing plant is also likely to be interface and be concurrent with the construction of SCL (MKK-HUH).

Improvement Works for Viaducts associated with the Project

- 3.39 Improvement works for viaducts associated with Project include:
- Upgrading of vehicular parapets for Cheong Wan Road; and
  - Upgrading of vehicular parapets for Chatham Road Slip Road Bridge.
- 3.40 In terms of the upgrading of the Cheong Wan Road parapets, concrete will be used for Cheong Wan Road Bridge for maintenance reasons. Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS) submission has been made.
- 3.41 Upgrading of vehicular parapets for Chatham Road Slip Roads will be added to both sides of the bridge deck. Thus additional widths will be added to the sides while the kerb line is kept unchanged. The existing profile barrier along the edge of the footpath will be also maintained. Details of the cladding and finishing will be developed at the detailed design stage and the final design will be submitted separately to the Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS) for approval.

Central Kowloon Route (CKR) - Proponent as Highways Department (HyD)

- 3.42 The proposed Central Kowloon Route (CKR) comprises a dual 3-lane trunk road across central Kowloon linking West Kowloon in the west to the proposed Kai Tak Development in the east. Since the alignment within the Project boundary will be deep underground, there will be no anticipated cumulative impact with the Project.

Proposed 132kV Cable Circuits Connecting with Ho Man Tin KCRC Substation and Tsim Sha Tsui Substation (Hung Hom Side)

- 3.43 The proposed cable connects Ho Man Tin KCRC Substation and Tsim Sha Tsui Substation. Initially, it runs underneath the Chatham Road North Interchange and then along the Chatham Road North, Winslow Street and Cheong Tung Road and eventually to the Hung Hom Bay Substation.
- 3.44 The proposed cable duct along the existing footpaths and carriageways will be constructed mainly by open trenching method except for the proposed no-dig cable duct crossing underneath Chatham Road North Interchange. The section potentially causing minor and limited disturbance to the environment will be constructed by trenchless method and no potential environmental impact will be anticipated. For other sections, to minimize any disturbance to the surrounding environment, the construction works will be conducted in phases. The construction works will only involve minor and limited excavation works, and no adverse environmental impact will be expected. Therefore, it is anticipated that there will be no cumulative impact with the Project.

Summary of Concurrent Projects

- 3.45 The potential cumulative impacts of the identified concurrent projects during the construction and operation of the Project are summarised in [Table 3.4](#) below.

**Table 3.4 Summary of Concurrent Projects**

Project	Tentative Start	Tentative Finish	Construction Phase <sup>[1]</sup> Impact	Operational Phase <sup>[1]</sup> Impact
SCL (HUH – ADM)	2012	2020	Cumulative dust and ground-borne noise impact at Hung Hom Station	Not anticipated (Not a worst-case)
SCL (TAW – HUH)	2012	2018	Cumulative dust and air-borne noise impact at Hung Hom Freight Pier, Hung Hom Station and Chatham Road South Section	Cumulative ground-borne noise impact at Noise Sensitive Receiver (NSR) around Hung Hom Station
Kwun Tong Line Extension	2011	2015	Cumulative dust and air-borne noise impact at Hung Hom Freight Pier and Chatham Road South Section	Not anticipated (Good ventilation shaft design would be carried out by KTE to avoid any cumulative visual impact)
Central Kowloon Route (CKR)	Under Review (Planned to be commenced construction works in early 2015)		Deep underground – not anticipated	Deep underground – not anticipated

<b>Project</b>	<b>Tentative Start</b>	<b>Tentative Finish</b>	<b>Construction Phase <sup>[1]</sup> Impact</b>	<b>Operational Phase <sup>[1]</sup> Impact</b>
Proposed 132kV Cable Circuits Connecting with Ho Man Tin KCRC Substation and Tsim Sha Tsui Substation (Hung Hom Side)	2012	2016	Trenchless cable duct construction and limited open trenching cable duct construction – negligible	Not anticipated

Note: [1] Construction/Operation phase of the Project.

#### **Continuous Public Involvement**

- 3.46 After the Executive Council approved the further planning and preliminary design of SCL by the MTR Corporation in March 2008, the Government and the MTR subsequently visited the District Councils and consulted local communities on the Project. Extensive public consultation, including roving exhibitions, public and professional forums, seminars, was conducted to further collect views from the public on the new links.
- 3.47 The majority of the public agreed that there is an overriding public need for the SCL and urged for early completion of this infrastructure. Having considered the views of the public, as well as all other engineering and environmental factors, it is proposed that the Project is to be implemented as described above.