



MS Reference Number:	CSHK	CET	MS	C	2024	000107
ACC Reference Number:	1701	W	000	CSC	760	000122

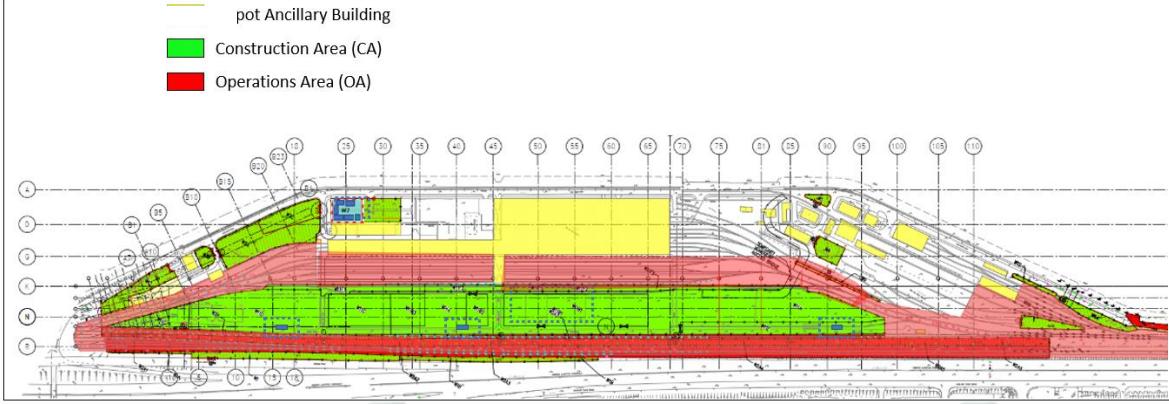
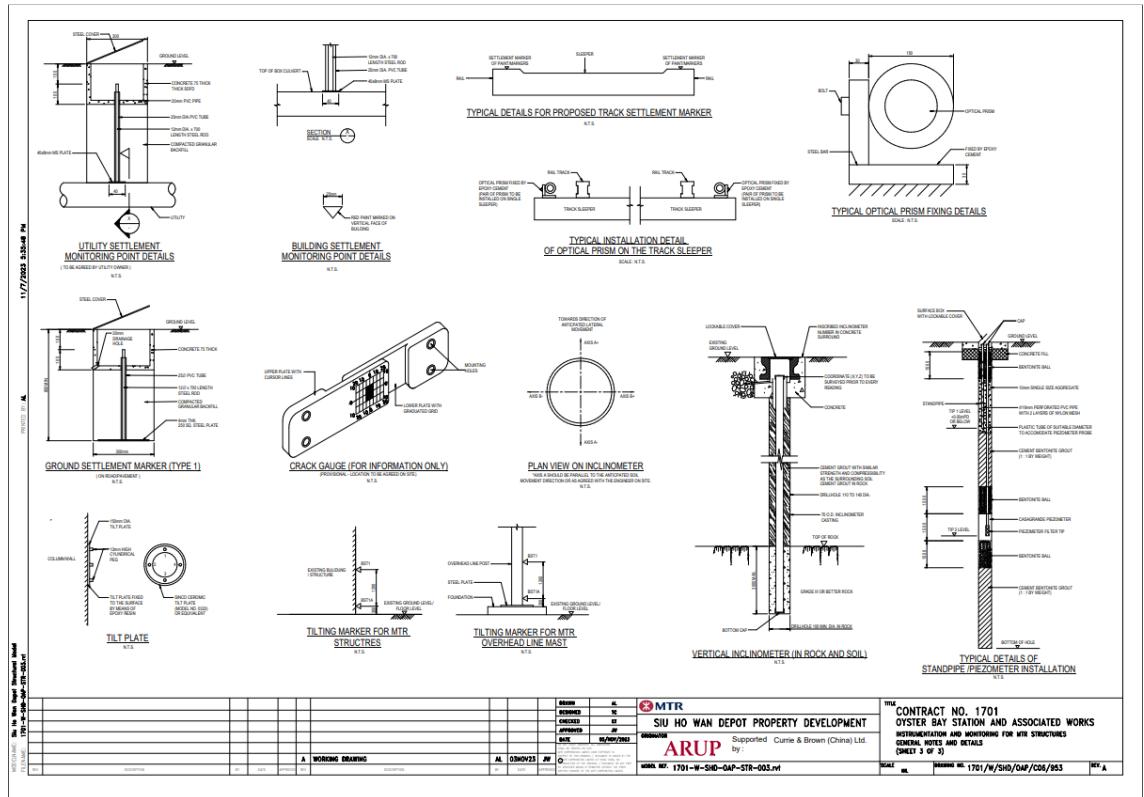
METHOD STATEMENT TITLE	Rev. D
Method Statement for Instrumentation and Monitoring Works at Operations Area (OA)	

	Prepared by:	Checked by:	Reviewed by:	Reviewed by:
Signature:	SS	P.P.SY	WL	TP
Name:	David Lam	Vincent Li	Leung Kwok Fung / Hui-Wai-Kwan	MH Isa / WH Lam
Position:	Senior Engineer	Construction Manager	SM/SO	QM/QE
Date:	21/5/2024	21/5/2024	21/5/2024	21/5/2024
	Reviewed by:	Reviewed by:	Reviewed by:	Approved by:
Signature:	James Ma / Iris Ho	Le Yeung	WL	Eric Fong
Name:	James Ma / Iris Ho	Yeung Wai Lun	Paul Freeman/ Mark McGleenon	Eric Fong
Position:	EM/EO	A. Project Director	Sr. Project Director / A. Project Director	Project Director
Date:	21/5/2024	21/5/2024	21/5/2024	22/5/2024

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1.	Introduction (Overview of the operation/works)
	<p>According to the working drawing and BD approval drawing instrumentation and monitoring shall be installed before commencement of the piling works. The instrumentation monitoring (I&M) points should be installed in influence zone that may be affected during construction work. The regular settlement monitoring will be conducted during construction period. Since most of the I&M points are located in the Operations Area (OA), this method statement mainly covered instrumentation monitoring in OA the such as Mainline Bifurcation, OYB Station, SPS, L-Shape Ramp and Drainage & Sewerage Construction Works. Method statement for installation at CA shall be submitted separately. Refer to the layout plan as below. Amendments to this Method Statement to address comments of previous versions are shown highlighted in yellow.</p>  <p>This method statement will show type, sequence and method of installation instrumentation monitoring at OA, the I&M in Construction Areas (CAs) would be submitted separately.</p> 

	<p>According to the working drawings, the instrument types as follows:</p> <ul style="list-style-type: none">● Ground Settlement Marker (GS)● Utility Settlement Marker (UT)● Building Settlement Marker (BS)● Tilting Marker (TM)● Vibration Marker (VM)● Track Monitoring Marker (TS)● Standpipe and Piezometer (SP)● Inclinometer (IN)● Crack Gauge																										
2.	Reference Documents (Identify relevant documents by name and reference number)																										
	<ol style="list-style-type: none">1. PNAP APP-24 – Railway Protection under Railways Ordinance, Mass Transit Railway (Land Resumption and Related Provisions) Ordinance and Area Number 3 of the Scheduled Areas in Schedule 5 to the Buildings Ordinance2. PNAP APP-137 – Ground-borne Vibrations and Ground Settlements Arising from Pile Driving and Similar Operations3. PNRC 14 – Railway Protection under Railways Ordinance, Mass Transit Railway (Land Resumption and Related Provisions) Ordinance and Area Number 3 of the Scheduled Areas in Schedule 5 to the Buildings Ordinance4. MTRCL-New Works Design Standards Manual - Section 3-Railway Engineering5. Hong Kong Transport Services Business Unit Requirements and information for contractor6. Hong Kong Transport Services Unit Railway Safety Rules7. MTRCL Working Paper No.6-Railway Protection- Revision B-December 20228. MTRCL Contract 1701 Oyster Bay Station and Associated Works-(S2) Scope-Vol 4 (Book 4 of 9) Appendix AM-Clients Rules and Procedures for Working Within or Adjacent to the Railway9. MTRCL Contract 1701 Oyster Bay Station and Associated Works – Contract Data																										
3.	Details of Sub-Contractor/Specialist Sub-Contractor																										
	Sub-contractor procurement is ongoing and shall be provided separately once awarded.																										
4.	Responsibilities for Activities described within Method Statement																										
	CSHK is responsible to inspect and carry out the construction works. The following persons, as listed in the table below, will attend the specific tool-box talk and be responsible for the activities:																										
	<table border="1"><thead><tr><th>Company</th><th>Name</th><th>Position</th></tr></thead><tbody><tr><td rowspan="11">CSHK</td><td>Vincent Li</td><td>Construction Manager</td></tr><tr><td>Nana Chung</td><td>Assistant Construction Manager</td></tr><tr><td>Johnson Chung</td><td>Senior Engineer</td></tr><tr><td>David Lam</td><td>Senior Engineer</td></tr><tr><td>Jacky Luo</td><td>Engineer</td></tr><tr><td>M.H. Li</td><td>Graduate Engineer</td></tr><tr><td>Kingsley Chao</td><td>Assistant Engineer</td></tr><tr><td>CHEUNG Siu Kei</td><td>Superintendent</td></tr><tr><td>WONG Yu Fung</td><td>Senior Foreman</td></tr><tr><td>Leung Ho Kit</td><td>Survey Manager</td></tr><tr><td>Lau Yu Tat</td><td>Senior Surveyor</td></tr></tbody></table>	Company	Name	Position	CSHK	Vincent Li	Construction Manager	Nana Chung	Assistant Construction Manager	Johnson Chung	Senior Engineer	David Lam	Senior Engineer	Jacky Luo	Engineer	M.H. Li	Graduate Engineer	Kingsley Chao	Assistant Engineer	CHEUNG Siu Kei	Superintendent	WONG Yu Fung	Senior Foreman	Leung Ho Kit	Survey Manager	Lau Yu Tat	Senior Surveyor
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5.	Programme and Working Hours (Start & finish date of operation/works)																																																				
	<p>The working hours for OAs as follow:</p> <p>Mainline: 3 Nos of NTH per week (2:00am to 4:00am); Test Track: 3 night time (Friday^Saturday, Saturday^Sunday and one on weekday) per week or NPH subject to Depot Schedule; Depot track: NTH (2:00am to 4:00am)/ NPH (11:00am to 3:00pm) daily; Actual working hours would be changed depended on the Depot Schedule.</p>																																																				
6.	Plant, Equipment & Material (Identify type, model and specification of MAJOR plant & equipment)																																																				
	<p>All plants and equipment will be inspected prior to the mobilization on site to ensure that they are in good working condition and comply with the current regulations.</p> <p>The major plants, equipment and materials will be deployed to carry out the works are as follow: -</p> <table border="1"><thead><tr><th>Plant / Equipment</th><th>Quantity</th></tr></thead><tbody><tr><td>Drilling rigs</td><td>6</td></tr><tr><td>12V/ 24V Battery Operated Handheld Drilling Machine</td><td>10</td></tr><tr><td>Hand Excavation Tools</td><td>24</td></tr><tr><td>Cable Detection Equipment</td><td>4</td></tr><tr><td>50 Ton Mobile Crane</td><td>1</td></tr><tr><td>Crane Lorry</td><td>2</td></tr><tr><td>Total Station (TS16A-1")</td><td>6</td></tr><tr><td>Digital Levels (LS15)</td><td>18</td></tr><tr><td>Water Level Meter</td><td>12</td></tr><tr><td>Portable Tilt Meter</td><td>6</td></tr><tr><td>Portable Inclinometer Meter</td><td>6</td></tr><tr><td>Portable Vibration Sensor</td><td>6</td></tr><tr><td>Surveying Poles, 2.15m length (extendable)</td><td>12</td></tr></tbody></table> <table border="1"><thead><tr><th>Materials</th><th>Quantity</th></tr></thead><tbody><tr><td>Ground Settlement Marker (GS)</td><td></td></tr><tr><td>12mm dia. steel rod welded on 250x250x4mm thick steel plate</td><td>800</td></tr><tr><td>25mm dia. PVC sleeve</td><td>800</td></tr><tr><td>300 x 300 hinged cast iron cover</td><td>800</td></tr><tr><td>Utility Settlement Marker (UT)</td><td></td></tr><tr><td>12mm dia. steel rod welded on 40x40x8mm thick steel plate</td><td>100</td></tr><tr><td>25mm dia. PVC sleeve</td><td>100</td></tr><tr><td>300 x 300 hinged cast iron cover</td><td>100</td></tr><tr><td>Marker/ Paint</td><td>100</td></tr><tr><td>Tilting Marker (TM)</td><td></td></tr><tr><td>Survey Tag</td><td>600</td></tr></tbody></table>	Plant / Equipment	Quantity	Drilling rigs	6	12V/ 24V Battery Operated Handheld Drilling Machine	10	Hand Excavation Tools	24	Cable Detection Equipment	4	50 Ton Mobile Crane	1	Crane Lorry	2	Total Station (TS16A-1")	6	Digital Levels (LS15)	18	Water Level Meter	12	Portable Tilt Meter	6	Portable Inclinometer Meter	6	Portable Vibration Sensor	6	Surveying Poles, 2.15m length (extendable)	12	Materials	Quantity	Ground Settlement Marker (GS)		12mm dia. steel rod welded on 250x250x4mm thick steel plate	800	25mm dia. PVC sleeve	800	300 x 300 hinged cast iron cover	800	Utility Settlement Marker (UT)		12mm dia. steel rod welded on 40x40x8mm thick steel plate	100	25mm dia. PVC sleeve	100	300 x 300 hinged cast iron cover	100	Marker/ Paint	100	Tilting Marker (TM)		Survey Tag	600
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	<u>Track Monitoring Marker (TS)</u>	
	Optical Prism	1000
	Epoxy resin	800
	<u>Building Settlement Marker (BS)</u>	
	Marker/ Paint	700
	Crack Gauge	600
	<u>Standpipe and Piezometer (SP), Inclinometer (IN)</u>	
	PVC Pipe, 6m length	140
	Backfilling materials 25kg	140

#Above numbers of materials are estimated only.

7. Construction Methods / Construction Sequence Drawings

4 Arrangement for Works within Operations Areas (OAs)

- 4.1 For the drilling works, trial pit, GS, UT construction works, the area will be fenced off by waterfilled barriers (without panel) before commencing any works to prevent any impact to track operation (All trial pit, GS & UT to be excavated by hand dig method).
- 4.2 All site staffs should wear the required PPE such as safety helmet, reflective vest and safety boots.
- 4.3 CP(T) shall be appointed to escort all transportation inside the SHD.
- 4.4 CP(T) shall be appointed to provide pre-work safety briefing at worksite and WPIC to brief the works for all workers at worksite before commence the works.
- 4.5 CP(T) need provide works Notice to Depot and obtain approval in advance. The report duty to Depot before works.
- 4.6 For those who carried out works within OAs, should have railway qualification of RSI and be supervised by CP(T).
- 4.7 Demarcate and barricade the operation zone with standard track side works plastic red banner fixed at the reflective cones at both ends and in between work and the barricaded area.
- 4.8 For works within track, authority shall be sought in prior commencement of any operation.
- 4.9 CP(T) shall coordinate with DYM when using west level crossing to the works areas.
- 4.10 CP(T) shall responsible for measuring height of vehicle to ensure the height of vehicles with materials/ plants is within 4m height restriction before allowing vehicles use west level crossing.
- 4.11 Large plants transportation shall be carried out in NTH.
- 4.12 If the GS/ UT construction works cannot be done in a one day, temporary backfill with sandbag, waterfilled barrier (without panel)/ fencing for physical separation and additional warning lights are required where necessary.
- 4.13 Fuel filling services for drilling rig should be carried out in night time. To minimize the risk, keep volume of the fuel tank enough for the next day's work only. The adequate firefighting tools/materials will be provided on Site. No fuel shall be left within Mainline (OA) when not attended.
- 4.14 Keep the works area tidy daily
- 4.15 CP(T) ensure no any materials/ waste left in the OAs.
- 4.16 Inform to DYM before leave daily.
- 4.17 Apart from CP, WPIC will be assigned for the installation works.

Reference shall be made to the Traffic and Security Management Plan, which includes the arrangement of CP(T)'s within the OA, which has been submitted separately.



5 Access Route

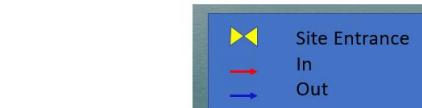
Plant and material deliver to site shall be via west gate and west level crossing in the initial stage when the vehicular bridge is not ready. Vehicles will be escorted by escort car with CP(T) after enter to the depot, or from East gate when the vehicular bridge is open for use.
(Details please refer to submission "Traffic Management Plan")



For Mainline, shall be from North Lantau Highway via Depot Slip Road.



RAILWAY PROTECTION FENCING INSTALLATION (NTH) LOGISTIC OF RP FENCING

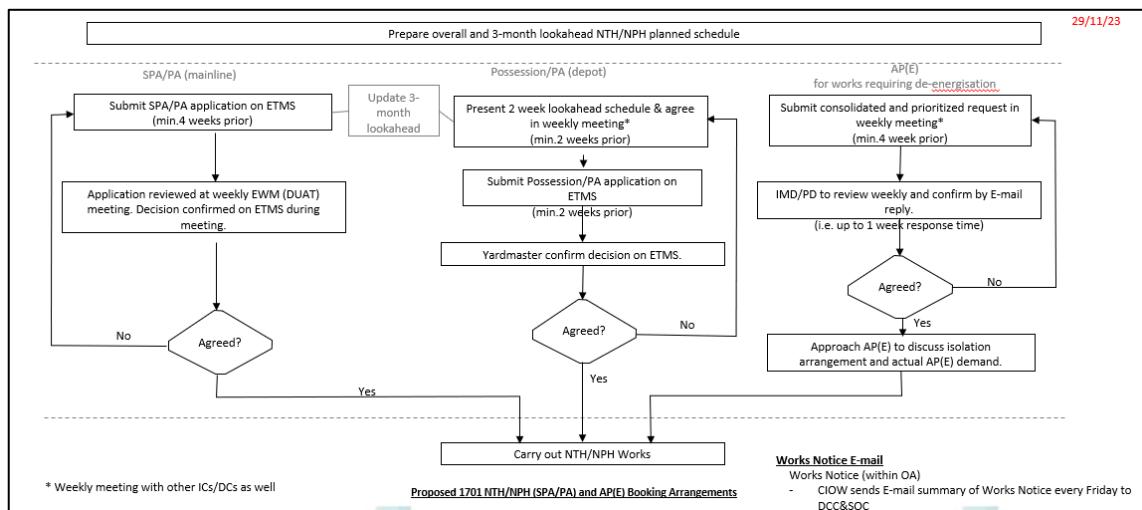


小蠅灣車廠物業發展
Siu Ho Wan Depot Property Development



(Details please refer to submission "Traffic Management Plan")

6 ETMS (Engineering Works & Traffic Information Management System)



When Work Area within Depot and Mainline, CSHK would submit the NTH/NPH (SPA/PA) and AP(E) application with programme to MTR via ETMS accordingly.

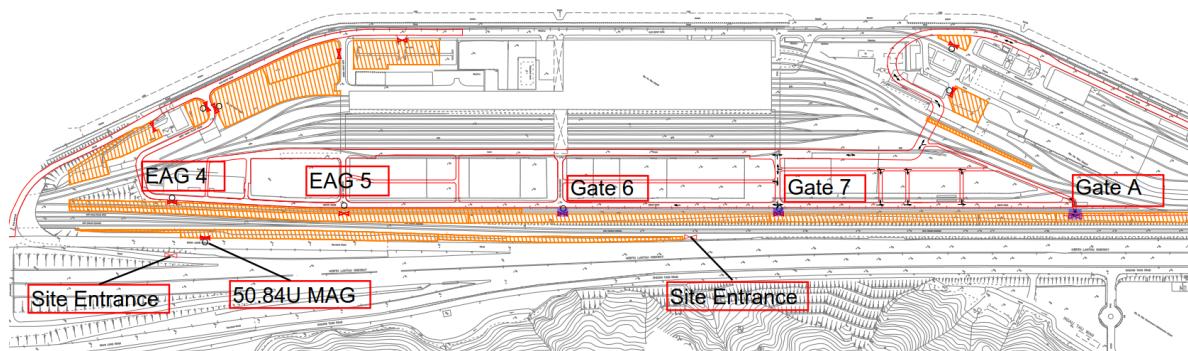
7 Test Track Crossing Arrangement

While the proposed gates 6, 7 and A are not ready, we will use the existing gates EAG 4, 5 & 50.84U MAG to access the works area for carrying out the monitoring marker installation and preparation.

For Test Track and Bifurcation Area (area between Test Track and Mainline), the access shall be via existing gates no. EAG 4 & 5, and liaise with Depot Control and TC.

For Mainline, the access should be used 50.84U MAG and liaise with OCC and TC.

Location of Level Crossing



The proposed gate no. 6, 7 and A crossing arrangements as follows:



- 7.1 CP(T) should stand by at each Proposed Access Gate to manage the access control, operate the gate manually and keep the corresponding Gate Key.
- 7.2 There are 3 pairs of Gates with 6 CP(T) provided at: CP(T) — 1 at Gate 6A; CP(T) — 2 at Gate 7A; CP(T) — 3 at Gate AA; CP(T) — 4 at Gate 6B; CP(T) — 5 at Gate 7B; CP(T) — 6 at Gate AB;
- 7.3 CP(T) — 1 should be shall be report to the DYM before commencement of works and he/she is single point of contact with DYM/ EPIC. He /she should also communicate with CP(T) — 2, CP(T) — 3, CP(T) — 4, CP(T) — 5 and CP(T) — 6 and ensure that the open/ close of all access gates are synchronized.
- 7.4 Each group will be CP(T), WPIC, 3 to 4 nos of workers
- 7.5 Access gates can only be opened for access in the designated timeslot of Depot Schedule each day.
- 7.6 Vehicles/ workers crossing Test Track must be led by CP(T).
- 7.7 Physical barriers (water-filled barriers without panel) will be used for demarcated the works area to ensure CSHK workers will not be able to go from the work site on/ near test track

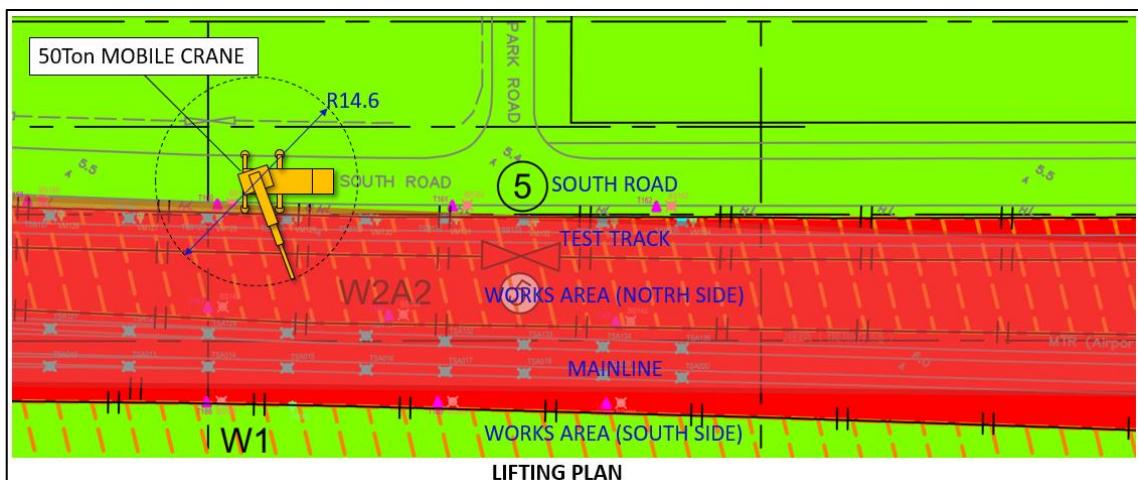
into the on mainline area (Permissions from MTR OCC TC are required via DCC prior to the commencement of the work on/ near test track).

8 Transportation Arrangement

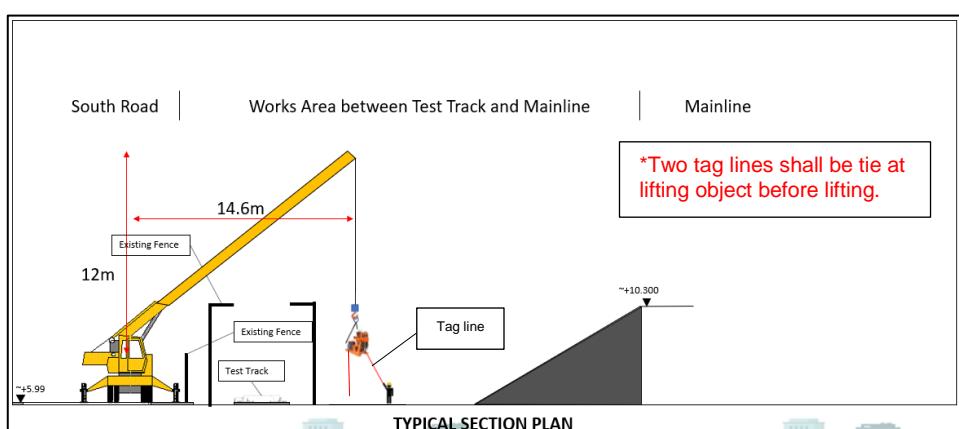
For standpipe, piezometer located in the operations area (OAs) between test track and mainline, drilling rigs is required. There are few delivery methods were as follows:

8.1 Lifting Operation at South Road (Method 1) (The lifting plan will be submitted separately)

50 Ton mobile crane would be adopted to transplant the drilling rig to work area. The actual size may vary slightly suit the available the arranged plant. Also, the lifting operation will be submitted to MTR for approval before start. The lifting operation included ground condition checking, lifting plan with calculation. The typical lifting plan, section plan and calculation as follows:



8.2 The 50 Ton mobile crane will setup at the South Road at Night Time. The ground conditions shall be checked by ICE for the 50 Ton mobile crane lifting operation and submit to MTR.



8.3 Lifting Weight Calculation, check the lifting object weight included LAGA weights, ensure the weight not more than the 80% Capacity of Mobile Crane.

	Shaft-shaft Power Output	Water-cooled Gasoline Engine	Water-cooled Diesel Engine	Air-cooled Diesel (Downdraft)
OVERALL DIMENSIONS				
Width	42" (107 cm)	42" (107 cm)	42" (107 cm)	42" (107 cm)
Length	96" (244 cm)	105" (267 cm)	96" (244 cm)	96" (244 cm)
Height	57" (145 cm)	57" (145 cm)	57" (145 cm)	57" (145 cm)
WEIGHT Net				
HQ2.7" 8" Hyd Head	2510 lbs (1140 kg)	3165 lbs (1440 kg)	3395 lbs (1590 kg)	3220 lbs (1460 kg)
HQ2.7" Hyd Head	2390 lbs (1090 kg)	3045 lbs (1380 kg)	3185 lbs (1450 kg)	3110 lbs (1410 kg)
WEIGHT Gross				
HQ2.7" 8" Hyd Head	2920 pounds	3575 pounds	3715 pounds	3690 pounds
HQ2.7" Hyd Head	2500 pounds	3460 pounds	3525 pounds	3440 pounds
WEIGHT				
HQ2.7" 8" Hyd Head	3270 lbs (1450 kg)	3865 lbs (1750 kg)	4005 lbs (1820 kg)	3930 lbs (1780 kg)
HQ2.7" 8" Hyd Head	3150 lbs (1400 kg)	3750 lbs (1700 kg)	3900 lbs (1760 kg)	3815 lbs (1730 kg)
CUBIC DISPLACEMENT				
Cooled for Export	160 cu ft (4.5 cu m)	175 cu ft (5 cu m)	170 cu ft (5 cu m)	170 cu ft (5 cu m)

	11 m	14.6 m	18.2 m	21.8 m	26.4 m	29.8 m	32.8 m	36.1 m	39.7 m	43.3 m	46.8 m	50 m
2.5	79	114	150	187	223	259	295	331	367	403	439	475
3.5	54.3	64.4	65.2	66.5	38.9	31.9	28.9	25.9	22.9	19.8	16.3	3.5
4.5	44	36.9	36.9	36.9	37.4	31	25.8	23.3	20.6	17.1	13.3	4.5
5	32.2	30.5	30.8	30.8	31	28.9	24.9	20.1	16.1	12.1	8.1	5
6	23	22.8	23.1	23.3	23.6	23.6	23.6	23.6	23.6	23.6	23.6	6
7	17	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	7
8	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	8
9	10.8	11	10.9	10.7	10.4	9.7	9.4	8.4	7.1	6.2	5	9
10	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	10
11	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	11
12	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	12
13	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	13
14	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	14
15	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	15
16	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	16
17	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	17
18	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	18
19	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	19
20	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	20
21	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	21
22	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	22
23	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	23
24	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	24
25	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	25
26	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	26
27	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	27
28	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	28
29	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	29
30	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	30
31	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	31
32	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	32
33	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	33
34	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	34
35	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	35
36	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	36
37	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	37
38	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	38
39	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	39
40	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	40

CALCULATION

Drilling rig weight = 1.4 tons

Crane lorry lifting capacity = 13.4 tons @14.6 m

Calculation

80% of Capacity = 10.72 tons

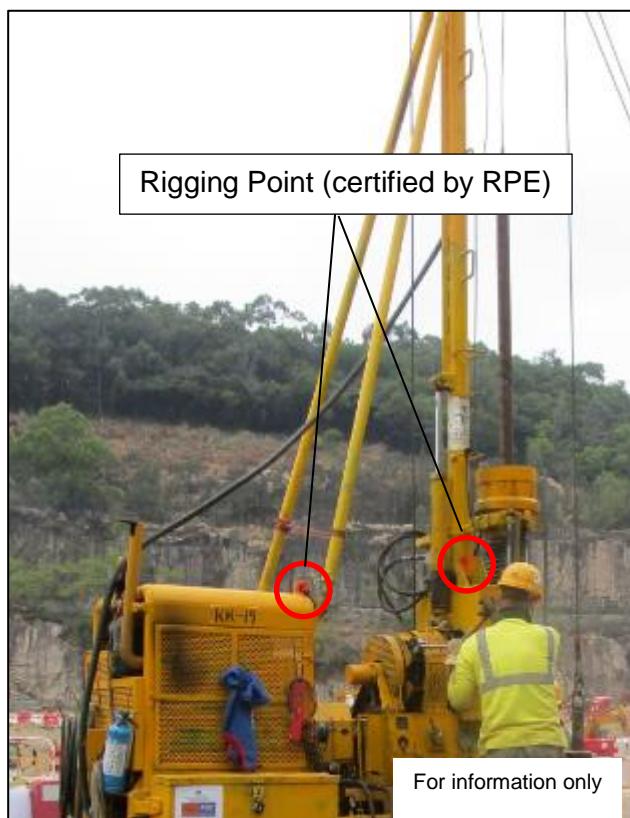
10.72 tons > 13.4 tons OK!

8.4 Contingency Plan

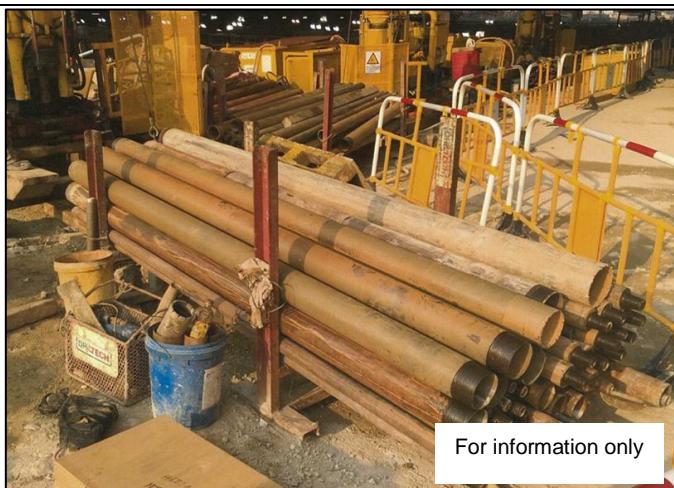
Emergency team and a spare lifting crane will be on standby in the event of lifting crane failure or breakdown.

(The details will be included in the separate submission for the lifting plan)

8.4.1 Rigging point of drilling rig.



8.4.2 Except drilling rig, water tank(empty) and casing (maximum 6m length) with hanger would be deliver to works area by mobile crane. The valid LALG certificates would be provided.



8.4.3 Limitation of the Mobile Crane (following configuration will be set)

- Inclined Angle
- Boom Length
- Swing Angle
- Loading Radius

8.4.4 Drilling Rod Installation





8.4.5 Procedure for Raising of Rig Mast

8.4.5.1 Once the drill is in place, the operator will perform the inspection with the checklist "Drill Weekly Checklist."

鑽探機每周檢查表 Drilling Rig Weekly Inspection Checklist			
地盤名稱: Name of Site:	1701	檢查日期: Date of Inspection:	
機械編號: Plant No.:		檢查員名稱: Name of Checker:	
項目 Item	檢查部份 Part to be inspected	正常 Normal	不正常 Abnormal
1	引擎 (包括檢查潤滑油) Engine & Grease		
2	鑽機頭 (包括上落及轉動) Drill head R.P.M.		
3	科簡 (包括校準塔把及剎停塔把) Winch & Stopper		
4	皮帶 Gear belt		
5	耦合器接器 (包括皮帶) Coupler & Belt		
6	機身及前後移動 Rig horizontal movement		
7	油壓泵及油箱 Hydraulic pump & oil		
8	氣油缸及油箱 Pump & diesel tank		
9	電池及電器部分 Battery & switches		
10	油量錶及油掣 Hydraulic meter & switches		
11	利簡用威也及滑重架滑輪 Winch wire ropes & pulley		
12	自動 CHUCK 及手動 CHUCK Automatic & manual "Chuck"		
13	尾軸 (包括連接部分) Mast support		
14	機器防 (有轉動部分) Machine guard for rotating part		
15	標示清楚 (緊急停止制、停機熄火) Clear labels (Emergency Stop, Switch off)		
16	證書 (表格 4 及 5) Certificates (Form 4 & 5)		

檢查員簽名確認:
Signature of Checker: _____
檢查員姓名:
Name of Checker: _____

8.4.5.2 The hydraulic mast cylinder must be completely depressurized, confirmed by the position of the mast raise/lower lever and visual inspection by the operator. The two backstay legs should be fixed in designed position of the drilling rig.



8.4.5.3 Others stand near the drilling rig during mast raising operation should not allowed. The operator raises the mast slowly by increase the pressure of the mast hydraulic cylinder, and monitor two backstay legs remain fixed in right position.



- 8.4.5.4 Once the mast is in the designed position, the operator should hold the pressure of mast hydraulic cylinder to secure and lock the mast in place and instruct the assistant to insert the safety pin to lock the position of mast. Then, tighten the two backstay leg bolts. After the operator checks and confirms the mast position, he will release the mast hydraulic lifting cylinder pressure and the mast lifting procedure is basically completed.



- 8.4.5.5 Drilling works may proceed after general condition checking.

8.4.6 Procedure for Lowering of Rig Mast

- 8.4.6.1 The operator should hold the mast in position by increase the pressure of the hydraulic cylinder slowly, so that there is no tension on the mast backstay legs. The operator shall then instruct the assistant to loosen the bolts of the two mast backstay legs.
- 8.4.6.2 Remove the safety pin after the bolts of the mast backstay legs.



- 8.4.6.3 The monitoring mast legs should be placed at the designed position. After visual inspection by the operator, the rig mast can resume mast lowering operations until it is in a horizontal position.



8.4.7 Lifting Method for the Loose Materials

Double tagline attached at the lifting objects before lifting.

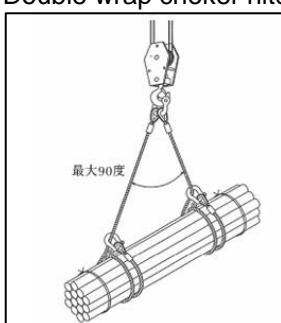
Method 1

For rigging stabilization, the tiedown straps will be used to tie the drill casings with hanger together; connect the hook with anchoring point is secured (the anchoring point must be structurally sound tested and examined by a competent examiner).



Method 2

Prevent slipping or displacement of any loose objects or loads during lifting.
Double wrap choker hitch method will be adopted.



8.5 Track Trolley (Method 2)

Track trolleys are to be used for the transportation of dismantled drilling rig parts near the existing building AB23. The transportation and set-up of drill rig is as follow:

- a. One bay of wire mesh fence will be fenced off by water barrier near AB23 and then temporarily removed to form the temporarily access to Test Track.
- b. The track trolleys will then be loaded on Test Track.
- c. The parts of drilling rig will be loaded on the track trolleys and transported to the required location between Test Track and mainline.
- d. The wire mesh will be reinstalled after the transportation of parts each day.



- e. The drilling rig will be assembled on site and certified by RPE. After that, the drilling rig is ready to work.

f. The temporary access and routing of track trolley refer to Appendix Track Trolley



8.6 Manual Handling (Method 3)

For easy manual handling, the drilling rig will be dismantled into small parts (drilling rigs, water tank (empty) and casing with hanger), and materials/ casing will be divided into small sizes. The small parts of the drilling rig will be transported to bifurcation area via the existing gate no. 4 & 5. The drilling rig will be assembled on site and certified by RPE. After that, the drilling rig is ready to work.

The largest part weight of the drilling rigs should be ~200kg, and min. 6 nos. of workers to carrying.

Similar activities photo records as follows:



Figure 8.6.1 – Handling Method



Figure 8.6.2 – Assembling the Drilling 1

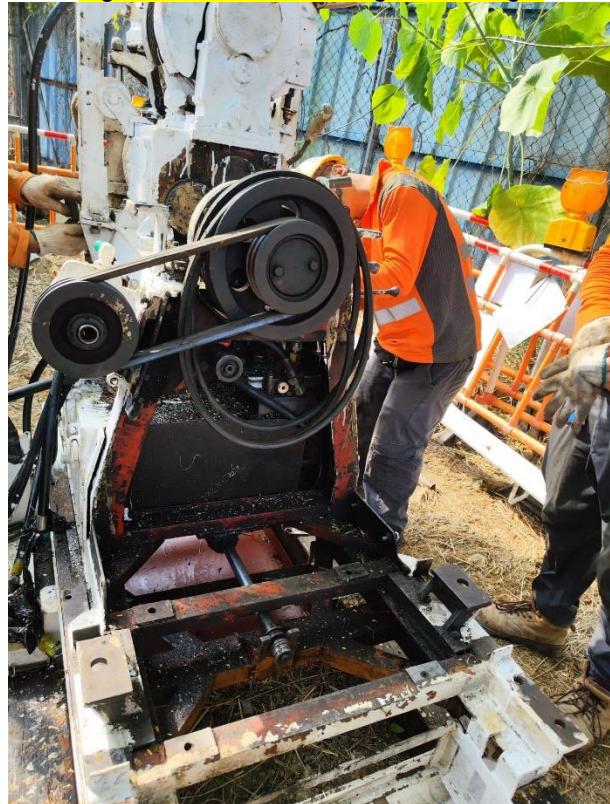


Figure 8.6.3 – Assembling the Drilling 2



Figure 8.6.4 – Assembling the Drilling 3

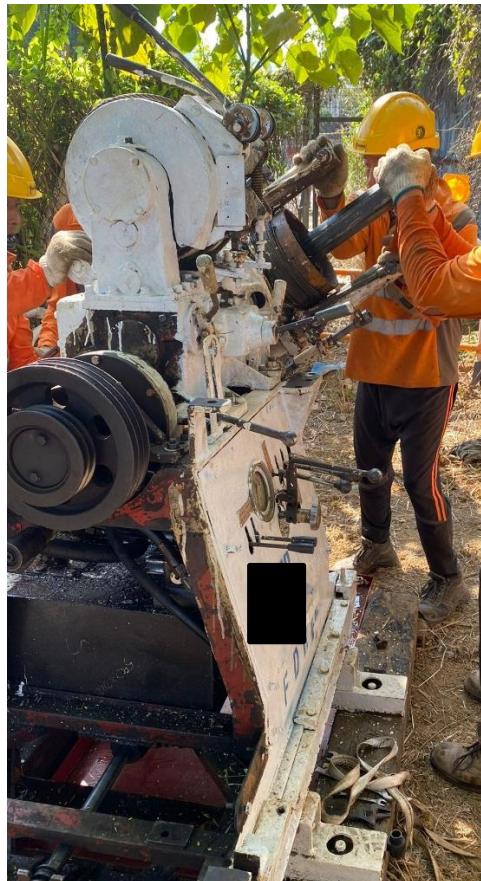


Figure 8.6.5 – Assembling the Drilling 4

The above lifting arrangement shall be submitted separately and EDOC, BUGN would be applied accordingly after the method statement is approved.

9 Preparation Works

Before commencement of the installation, the following works shall be completed.

9.1 Site Clearance

Site clearance will be carried out after the proposed locations confirmed.

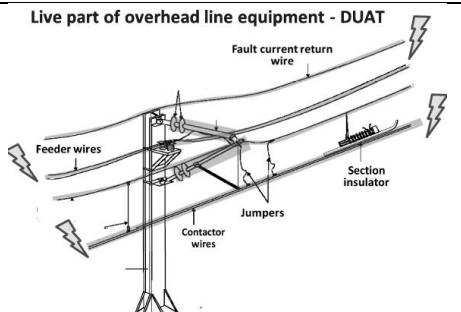
9.2 Setting Out

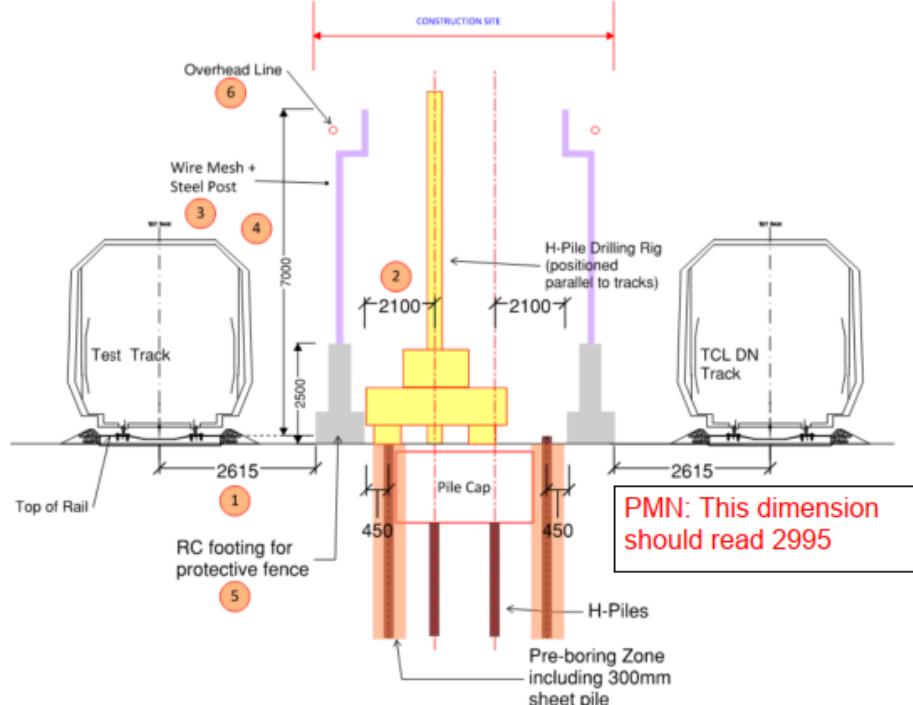
9.2.1 The location of each monitoring point will be set out at the co-ordinates shown on the Construction Drawings or as agreed with MTR's representative on site.

9.2.2 Once the location has been set out a joint inspection will be held with MTR's representative on site and other stakeholders such as Utility Company or the land owner's/ occupier's representatives to agree the location prior to further execution. At locations where the proposed monitoring point is unlikely to or dangerous to access for either installation or later monitoring works, relocation shall be considered. Alternatively, safe access to the location will be constructed.

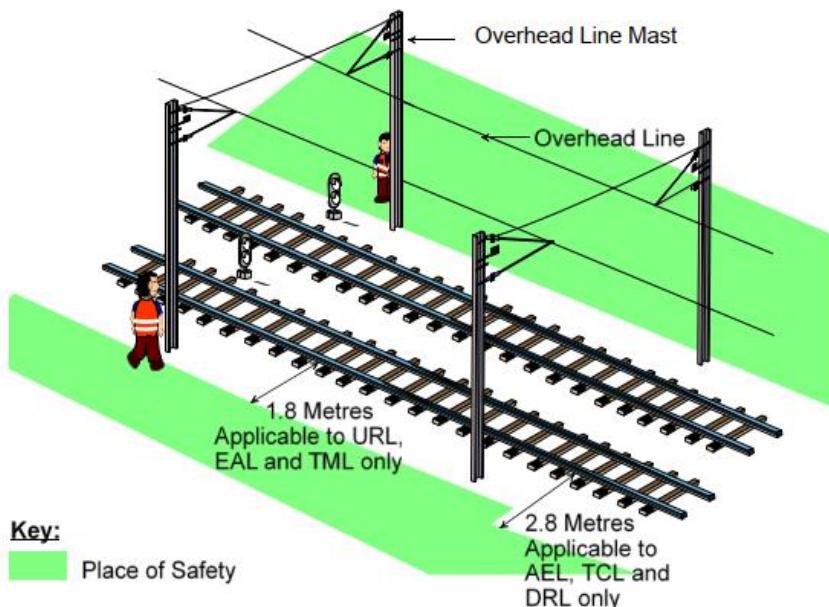
9.2.3 Referring to the railway safety requirements and construction drawings, if the proposed monitoring point is close to the OHL mast/track, CSHK will further verify the site conditions with MTR's representative onsite to ensure that the proposed location meets the minimum safety distance and take relative precautions, such as de-energize, isolation, relocation...

Live part of overhead line equipment - DUAT		Minimum Safety Distance
Voltage	Minimum Safety Distance	
Traction 1500V d.c.	2m	
Traction 750V d.c.		
Traction 25000V a.c.	2.75m	





Extract from Working Paper No. 6 Railway Protection



Ensure the works follow to RSR "Place of Safety"

For our works next to TCL and AEL shall be keep 2.8m from the existing tracks zone.

9.3 Cable Detection

UU detection will be carried out before start of the works. For details, please refer to separate submission ACC no. 1701-W-000-CSC-760-000095.

9.4 Trial Pit

Trial Pits will be carried out in accordance with Permit-to-Dig System before start of the works. For details, please refer to separate submissions ACC no. 170-W-000-CSC-760-000115.

9.5 Utility Diversion/ Abandoned Works

Any utility required to diversion or abandoned will be carried out with relevant approved EDOC prior to start the instrumentation installation works.

9.6 Temporary Drainage System Supply

Wetsep will be set up when fencing/ waterfilled barriers (without panel) once installed. Proposed locations please refer to Appendix D – Proposed Discharge Points

9.7 Lifting Operation

The operator of crane lorry/ mobile crane shall ensure a clear and unrestricted view of the load carried in prior to lifting works. The ground condition where lifting crane to be sit shall be checked to ensure to have adequate bearing capacity and the lifting load shall not exceed 80% of the safe lifting load of the lifting crane. Lifting supervisor will be engaged and the lifting zone will be fenced off. Lifting work required to lift above, over and in the close vicinity of the railway tracks and OHL, the relevant approved EDOC shall be followed.

9.8 Pre-construction survey, Survey and UU detection will be carried out and completed before the commencement of the works, survey of existing MTR equipment at ground level. Reports to be submitted to MTR, showing the protections applying to the MTR equipment.

10 Waterfilled Barriers

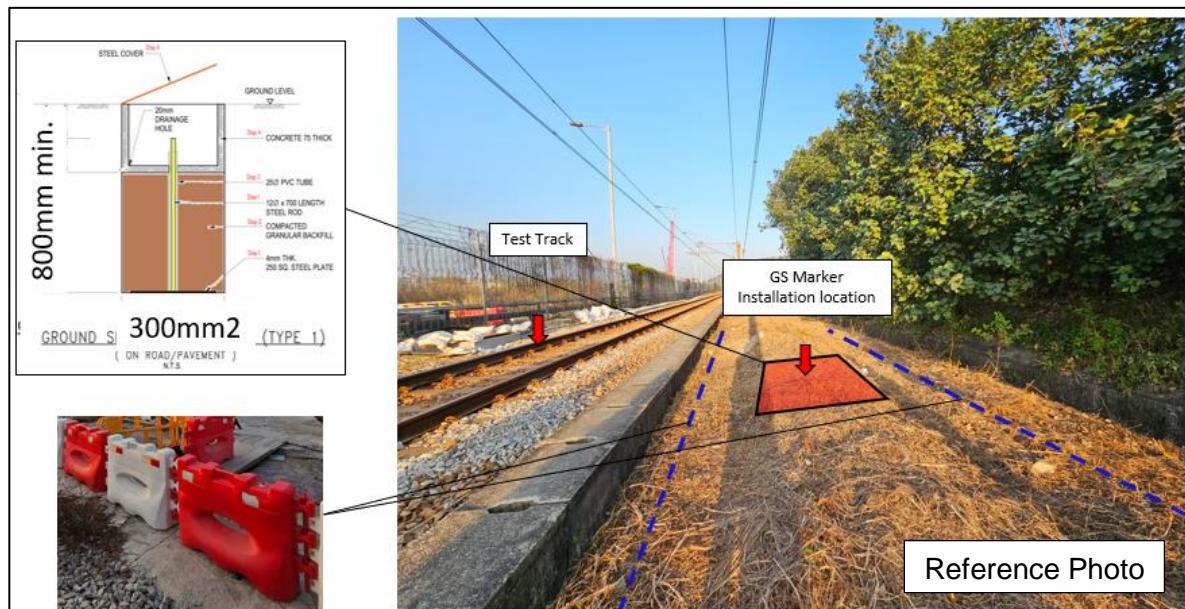
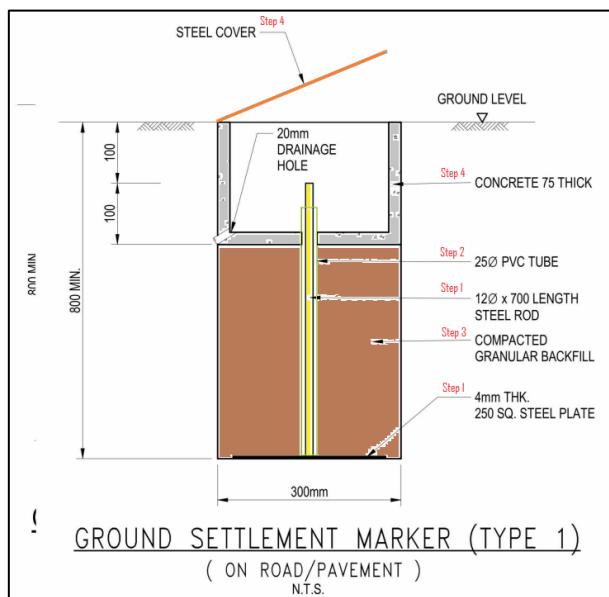
Some works area will be fenced off by waterfilled barriers (without panel), and the waterfilled barriers will be left inside the OAs during I&M construction periods. Details, please refer to Appendix C.



11 Installation Procedure

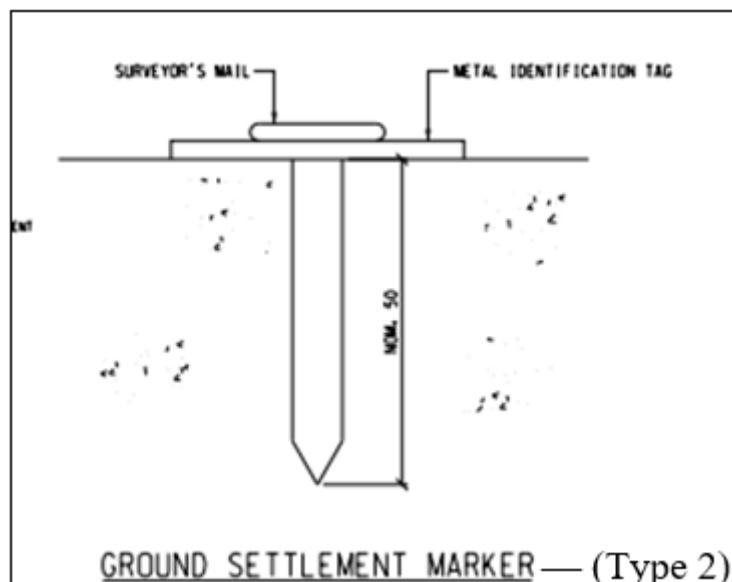
The following are the installation sequence and method for different type I&M installation

11.1 Ground Settlement Marker (GS) – Type 1

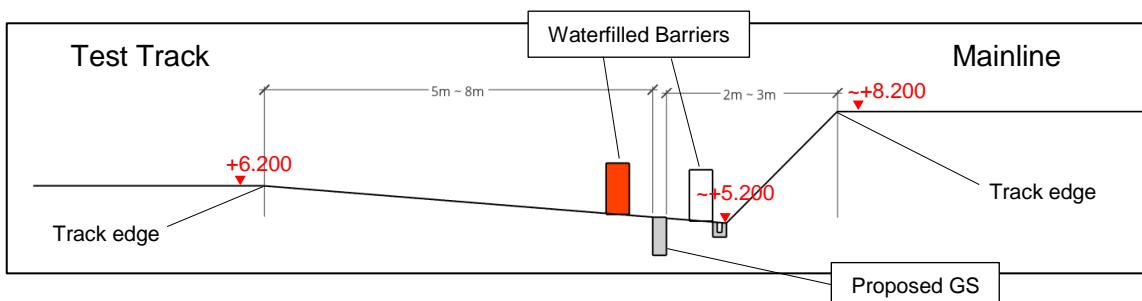


- 11.1.1 Fence off the works area before commencing the works by waterfilled barriers (**without panel**). Arrangement shall be agreed with MTR/ DYM before starting work.
- 11.1.2 Deliver the ground settlement markers (A 12mm dia. mild steel rod with 250mm SQ. x 4mm THK steel plate) on site.
- 11.1.3 Place the ground settlement marker into hand excavated 300mm SQ. x 800mm(H) hole.
- 11.1.4 Install Dia. 25mm PVC sleeve on the ground settlement marker and leaving the rod protruding approximately 100mm above the PVC sleeve top.
- 11.1.5 Backfill the excavated pit with granular backfill with well compacted;

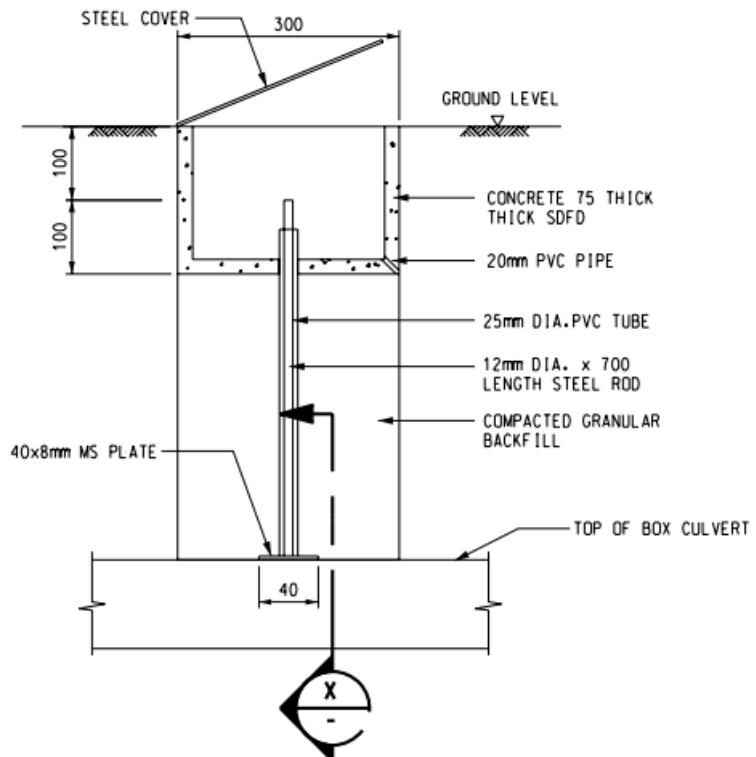
- 11.1.6 A temporary cover plate will be provided to prevent a tripping hazard when the completed GS has been installed.
- 11.1.7 The pre-casted 75mm thick concrete box will be casted on factory and delivered to site first.
- 11.1.8 Deliver to works area and then install the pre-casted 75mm thick concrete box with cover. After than remove the waterfilled barrier.
- 11.1.9 If the GS construction works cannot complete in one day, the excavated pit will be temporarily backfilled with sand bags, waterfilled barrier (without panel)/ fencing for physical separation and additional warning lights where necessary.
- 11.1.10 The waterfilled barriers will be removed when the GS has been installed. The waterfilled barriers will be maintained during construction period, Subject to liaison with MTR and DYM.
- 11.1.11 If the proposed GS located at pavement, the nail details (Type 2) will be adopted.



11.1.12 Cross Section at G.L. 14 – 15, Q - R



11.2 Utility Settlement Marker (UT)



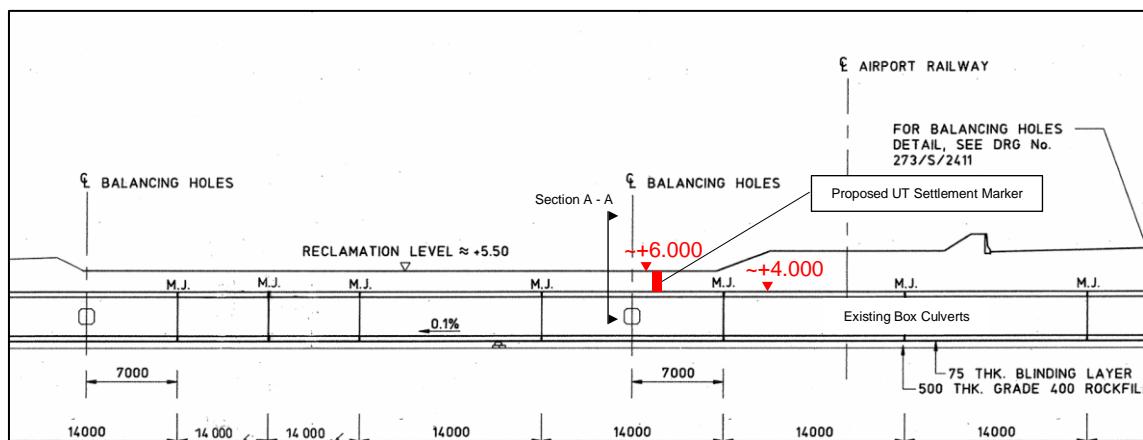
UTILITY SETTLEMENT
MONITORING POINT DETAILS

(TO BE AGREED BY UTILITY OWNER)

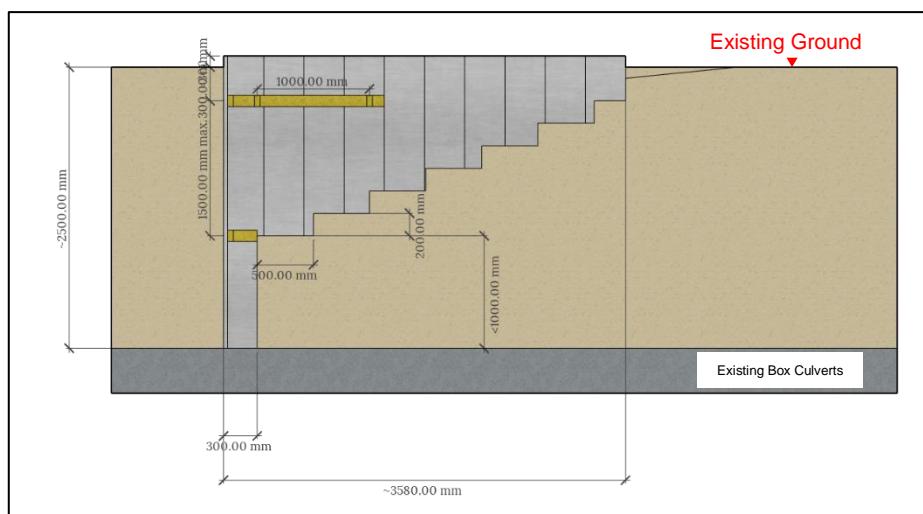
N.T.S.

- 11.2.1 The installation Details similar to GS Settlement Marker (For details please, refer to 15.1 Ground Settlement Marker (GS)).
- 11.2.2 For Box Culvert.
- 11.2.3 Typical Temporary Trench ELS Arrangement (approximate 2.5 depth) will be applied as below.

11.2.4 Cross Section at G.L. 124 – 125, P – R

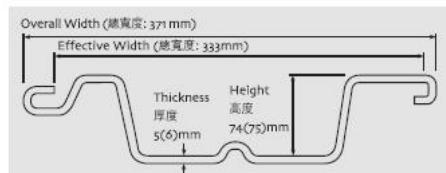


11.2.5 Section A – A



11.2.6 Steel Plate Details

輕型鋼板樁 (SK-LSP-3B)



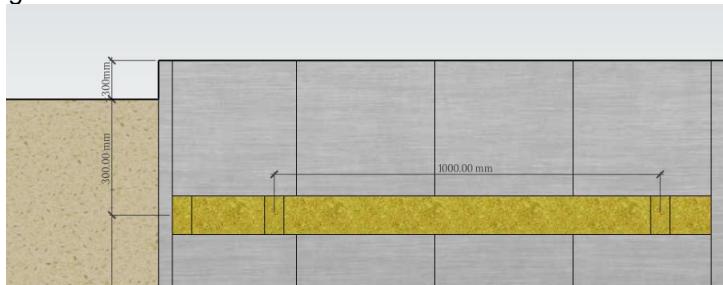
SK-LSP-3B

型號	厚度 (mm)	有效寬度 (mm)	高度 (mm)	截面面數 (cm ²)	單位重量(千克/米) (kg/m)	慣性力矩 Ix-Cm4
SK-LSP-3B	5.0	333	74	27.51	21.6	212
	6.0	333	75	33.01	25.9	254
型號	厚度 (mm)	截面模數 $Zx\text{-cm}^3$	回轉半徑 $ix\text{-cm}$	每平方米重量 Kg/m ²	每平方米慣性力矩 $ix\text{-cm}^4/m$	截面模數 $Zx\text{-cm}^3/m$
SK-LSP-3B	5.0	57.0	2.77	64.8	636	171
	6.0	68.0	2.78	7.77	762	204

11.2.7 Excavation Sequence

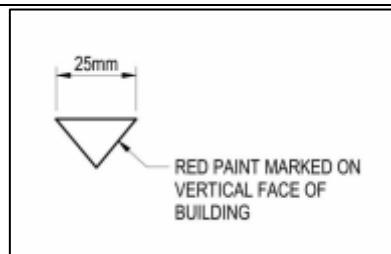
- 11.2.7.1 Setting out the proposed location of the UT settlement marker.
- 11.2.7.2 Fence off the works area with waterfilled barriers (**without panel**).
- 11.2.7.3 Excavate the trench and form the step, the trench depth not more than 1.2m depth. Also, the step raiser is ~200mm and tread is ~500mm.

- 11.2.7.4 Install the steel plate, and install the strut at the 300mm from existing ground



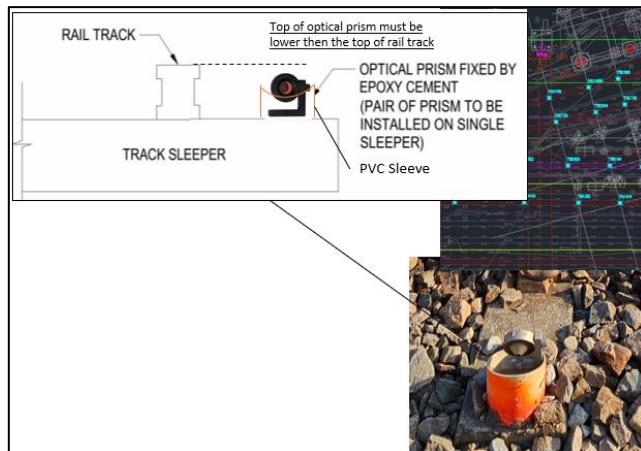
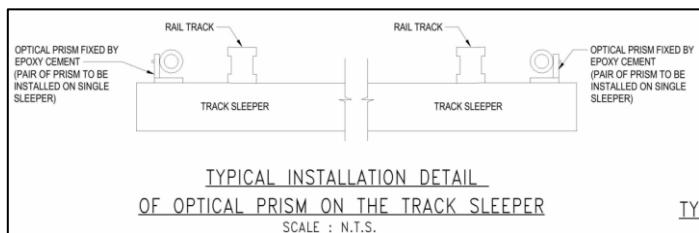
- 11.2.7.5 Further excavate, and the depth not more 1500mm from the first strut, and install second struct.
- 11.2.7.6 Final, excavate to the proposed level, and the depth not more than 1000mm.
- 11.2.7.7 **The Temporary Works Design Scheme with calculation are certified by ICE.**

- 11.2.8 **For Cable Trough**
Paint marker details will be adopted

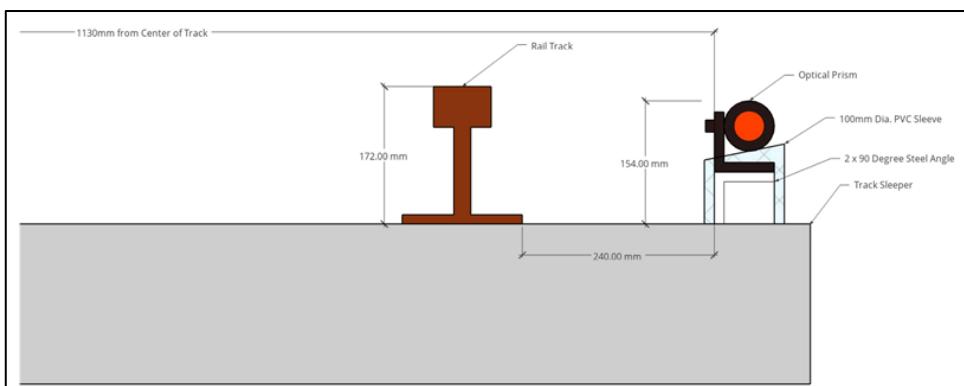


11.3 Settlement Monitoring at Railway Structure (TS)

11.3.1 Type 1 – Optical Prism Installation Details



- 11.3.2 Agreed the location with MTR's representatives on site.
- 11.3.3 Optical prisms are fixed onto the track sleeper by epoxy cement in accordance with the required locations.
- 11.3.4 Provide the PVC sleeve with fluorescent color to protect the optical prisms.

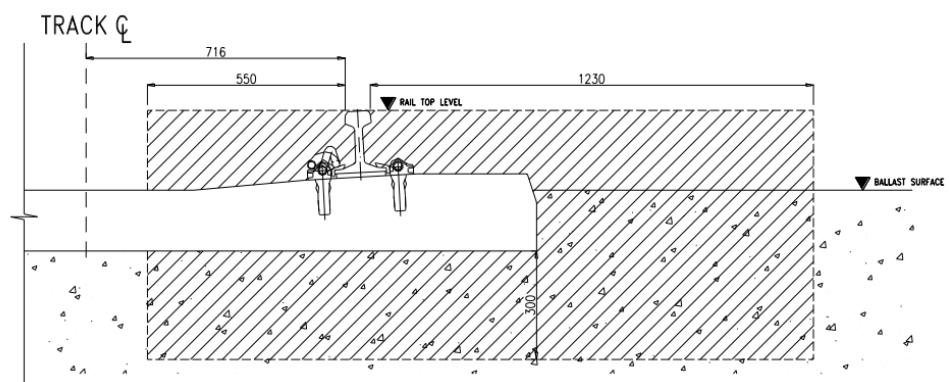


11.3.5 The paint settlement marker will be painted on the sleeper beside the Optical Prism for the necessary manual survey cross checking of the reading from the Optical Prism. This marker can be used as a reference point to replace the Optical Prism in case damaged and for initial/ regular joint survey for Railway Protection purpose.

11.3.6 Waiver Application

Refer to Operations Engineering Standard No. S/NT-saf/DS/01(01), the proposed optical prism located in the clearance zone for ballast maintenance.

 CLEARANCE ZONE

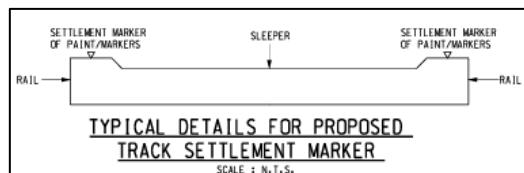


NOTE:

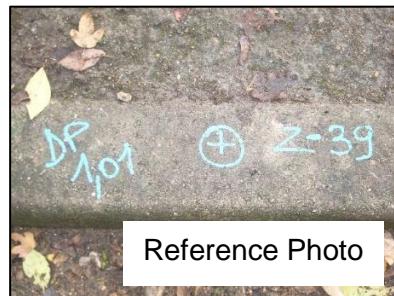
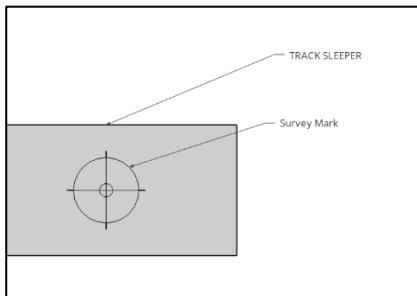
1. ALL DIMENSIONS ARE IN MM EXCEPT WHERE SHOWN OTHERWISE.

The waiver application form E1 - "Application for Dispensation for Infringement to the Structure Gauge/ Kinematic Envelope" was be prepared accordingly.

11.3.7 Type 2 – Paint Settlement Marker Details



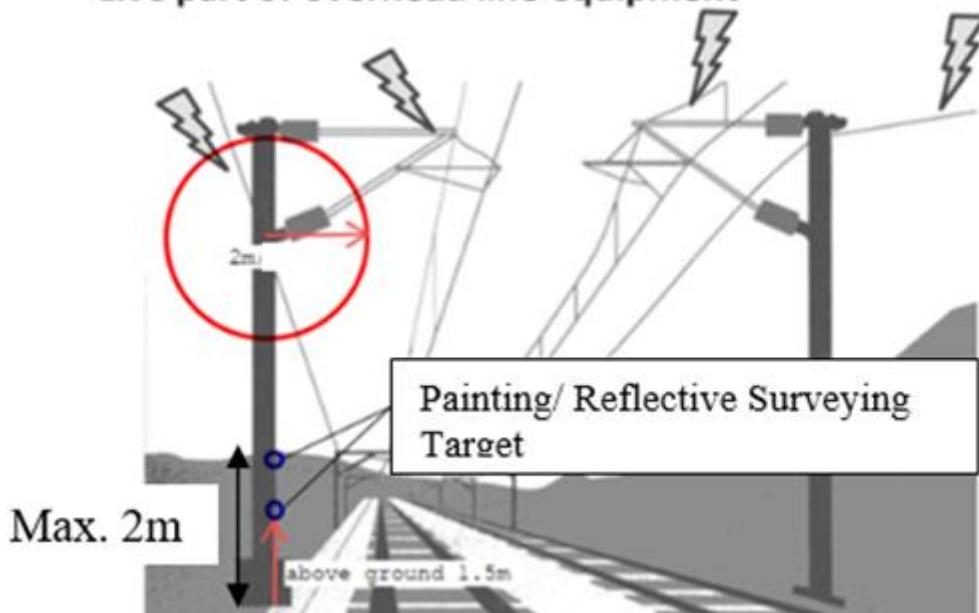
Clean the surface of proposed survey marker location. Then, paint the survey marking on the track sleeper as following figure:



11.4 Building Settlement Point (BS)



- 11.4.1 To verify the site conditions with MTR/ DYM representative onsite to ensure that the proposed location meet the min. safety distance from live cable.

Live part of overhead line equipment

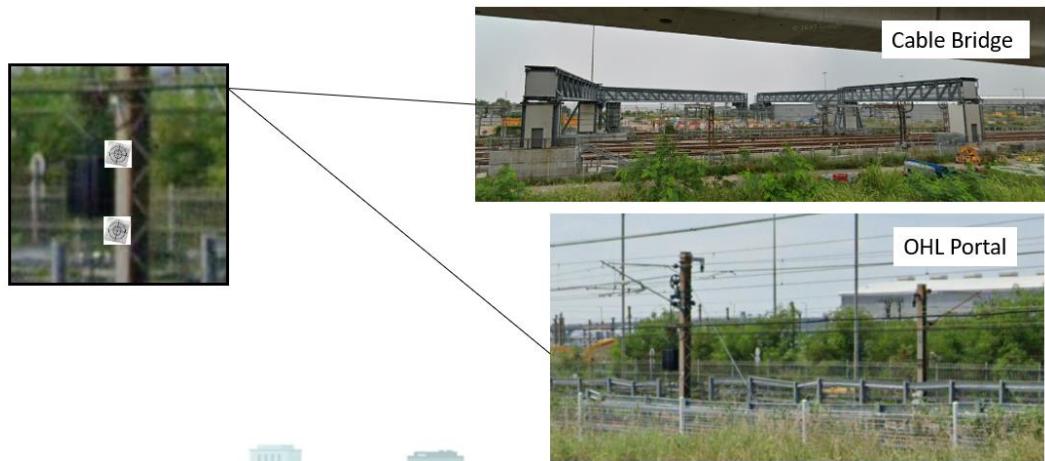
- 11.4.2 Painting/ Reflective Surveying Target would be used, actual depend on the surface of the existing structure;
- 11.4.3 A position of survey marker should be located on vertical surface of the existing structure with height approximate 1.5m above existing ground level, and not more than 2m (Max.).

11.5 Vibration Monitoring Point (VM)

- 11.5.1 The vibration monitoring device will be put on the firm ground or pavement during monitoring. For the exact locations, they shall be agreed with MTR/ DYM representatives.
- 11.5.2 For the vibration monitoring points within track area, the sensors will be placed on the desired locations with an extended connection cable from the device and reaching to the nearby non-track zone then surveyor can access for monitoring.

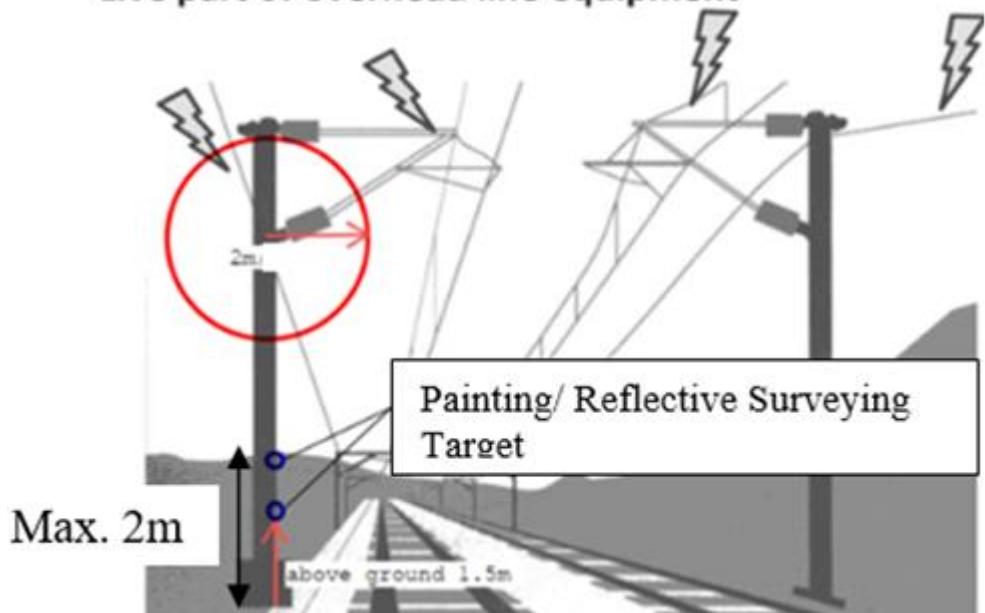
11.6 Tilting Marker (TM)

Instrumentation and Monitoring Works at Operations Area (OA) INSTALLATION DETAILS - TILTING MARKER



- 11.6.1 To verify the site conditions with MTR/ DYM representative onsite to ensure that the proposed location meet the min. safety distance from live cable.

Live part of overhead line equipment



- 11.6.2 The vertical surface at the installation locations shall be prepared such that any dirt, grease and loose or flaking material shall be removed and cleaned.
11.6.3 The reflective surveying target would be adopted.

11.7 Standpipe and Piezometer (SP)

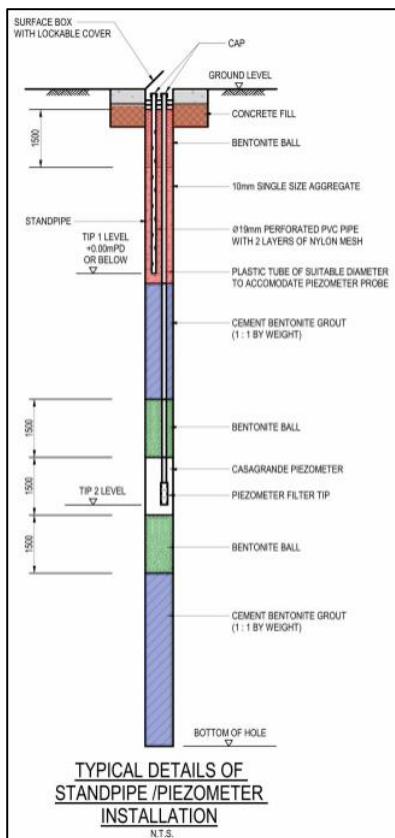
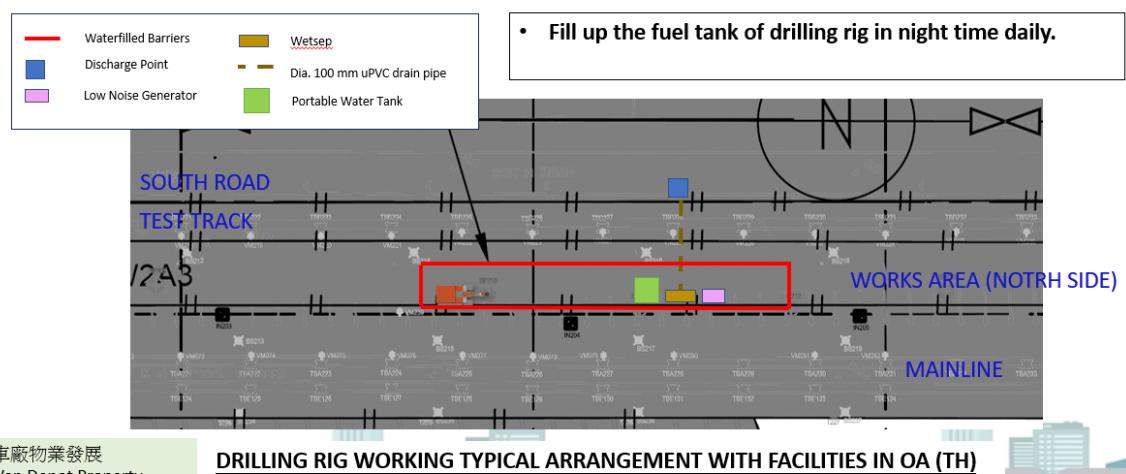


Photo of Drilling Rig

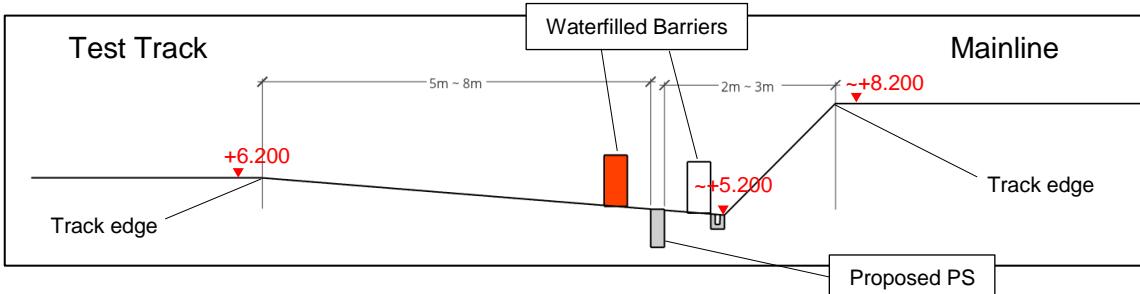
Instrumentation and Monitoring Works at Operations Area (OA)

INSTALLATION DETAILS – STANDPIPE AND PIEZOMETER & INCLINOMETER



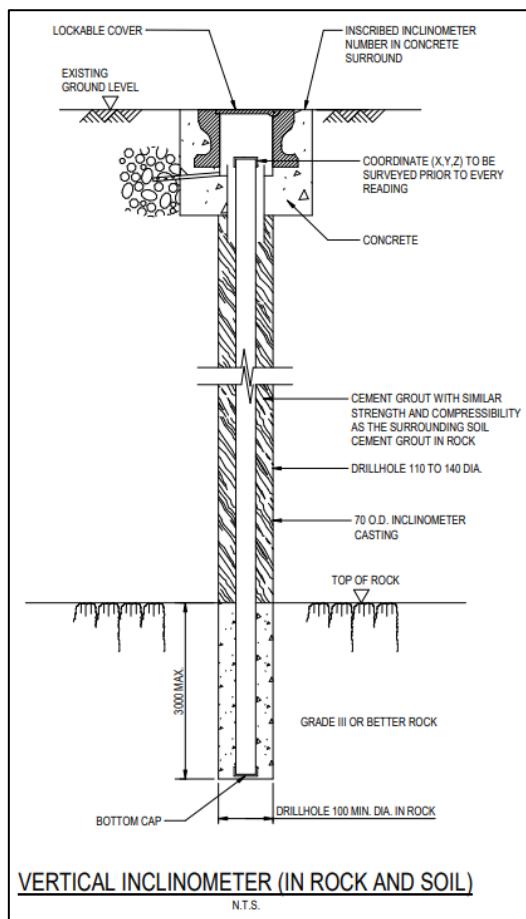
- 11.7.1 The plant and material transportation shall follow the relevant EDOC and the relevant safety / Railway Protection requirements similar to Pre-drilling work shall be followed during the operation of the drilling work.
- 11.7.2 To verify the site conditions with MTR onsite to ensure that the proposed location meet the min. safety distance from live cable.

Cross Section at G.L. 14 – 15, Q - R



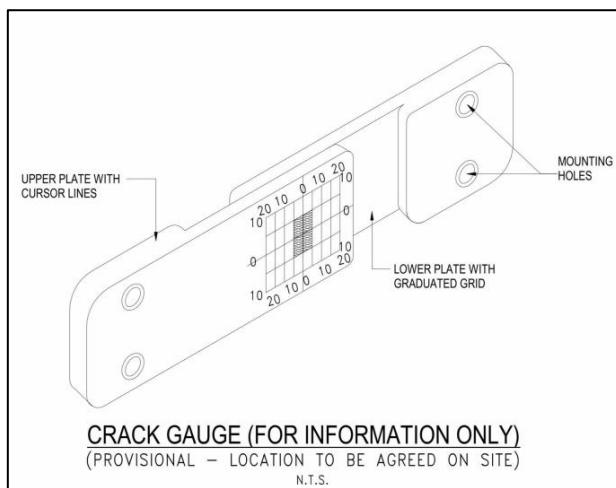
- 11.7.3 Temporary fence off the works area by waterfilled barriers (without panel).
- 11.7.4 Setup the site amenity facilities e.g. wastewater discharge, toilet, Wetsep, generator.....;
- 11.7.5 Install temporary casing to the proposed level by drilling rig with coring method.
- 11.7.6 Clean the hole, then measure the depth with MTR/ DYM representatives.
- 11.7.7 Backfill to proposed level with cement bentonite grout and bentonite ball.
- 11.7.8 Install the Piezometer to proposed level then backfill with cement bentonite grout and bentonite ball.
- 11.7.9 Install Standpipe to proposed level then backfill with 10mm single size aggregate. After that, backfill with bentonite ball.
- 11.7.10 Remove the temporary casing.
- 11.7.11 Construct the surface box with lockable cover.

11.8 Inclinometer (IN)



- 11.8.1 The plant and material transportation shall follow the relevant EDOC and the relevant safety / Railway Protection requirements similar to Pre-drilling work shall be followed during the operation of the drilling work.
- 11.8.2 Site setup as same as the 15.7 Standpipe and Piezometer (SP) installation.
- 11.8.3 Install temporary casing to the proposed level by drilling rig with coring method.
- 11.8.4 Clean the hole, then measure the depth with MTR's representatives.
- 11.8.5 Install the 70mm dia. inclinometer casting to proposed level then backfill with cement grout.
- 11.8.6 Remove the temporary casing.
- 11.8.7 Construct the surface box with lockable cover.

11.9 Crack Gauge



11.9.1 A crack gauge will be installed on required locations, the crack gauge will be bond on the crack of the structures/ buildings by screws or epoxy.

11.10 Maintenance Regime

11.10.1 All construction material shall be stored in designated area agreed with MTR. Stacking of material over 2m shall be avoided.

11.10.2 Removal of unnecessary construction materials / rubbish daily.

11.10.3 Coordinate with T&ES to conduct structure gauge check (after the proposed location setting out).

11.10.4 WPIC to ensure all instrument follow the approved drawings (including the fixing details) and do not infringe structural gauge. Independent check shall be conducted by the WPIC/IMC.

11.10.5 Post-construction inspection by WPIC/IMC and WPIC/MTR CM Team to examine workmanship and ensure all new parts are securely fixed / properly installed.

11.10.6 Proper installation method shall be adopted for the prism such that the integrity of the sleepers shall not be deteriorated.

11.10.7 Regular check and maintenance for the instrumentation device shall be carried out as per BD drawings.

11.10.8 Use tool record sheet to record all the tools used for construction during each Possession Hour period PA works.

11.10.9 CP(T) to check the tool record sheet (with photo record) and ensure that all tools used in construction at track area are cleared away from the track area and do not leave at the track.

11.10.10 Thorough check through track areas to ensure clearance by CP(T). Line clear form to be submitted to YM.

12 Installation Location

Details, please refer to Appendix C – Instrumentation and Monitoring Layout Plan.

13 Monitoring

13.1 Initial Reading

The initial readings of the monitoring locations shall be taken as the consistence readings obtained from one independent level. Initial readings will be undertaken jointly with Engineer and MTR RP or his representatives on site and submitted to the AP/ RGE and the relevant Government Departments, where required.

	<p>13.2 Methodology After the survey control checked, and accepted by MTR survey team. We carrying out the below process: Setting out the instrumentation points; Carrying out the post-construction test for each instrumentation; Joint survey for the as-built records, when the instrumentation points once completed; After that, the one-set reading will be taken in continuous three days;</p> <p>Intermediate sight method will be adopted for settlement marker reading; Mobile Tiling Meter will be adopted for TM; Mobile Inclinometer will be adopted for IN; Mobile Water Leveler will be adopted for SP; Mobile Vibration Sensor will be adopted for VM;</p> <p>#Details please refer to ACC Ref. No. 1701-W-000-CSC-760-000048 – Method Statement for General Site Survey Works</p>
13.3 Monitoring Monitoring shall be carried according to the frequency listed below:	<ul style="list-style-type: none">• Active monitoring: Daily• Standard monitoring: Weekly• Background Monitoring: Bi-weekly <p>The “Alert”, “Alarm” and “Action Response Value” details please refer to Appendix B – Construction Drawing.</p> <p>An emergency reporting ladder for any abnormal readings or AAA Value Exceedance is shown in Appendix F.</p> <p>All instrumentation device including the surveying station shall be checked, and valid calibration certificates shall be provided before taking readings.</p> <p>Government Bench Mark surveying stations for surveying monitoring work shall be provided.</p>
8. Safety (Risk Assessments)	<ol style="list-style-type: none">1 All workers on site shall obtain RSI before works, and supervised by CP(T).2 All workers shall attend a site-specific induction course conducted by the Safety Department. The Safety Officer shall explain the necessary safety requirements and the Site Agent/Foreman/Engineer in charge of the work shall explain the system of work to his supervisors and workers.3 All workers shall be equipped with reflective vests and safety helmets during operation. All workers must go through a briefing by the Site Agent/ Safety Officer/ Safety Supervisor before commencement of any works. All workers on site shall obtain an approved "Mandatory Basic Safety Training Certificate".4 A pre-meeting will be arranged before commencement of the work among Foreman/Site Agent, MTR's representatives and Safety Department to brief the nature of works, the safety aspects and the requirements laid down in the Safety Plan.5 Safety helmets fitted with chin straps must be worn within the site, safety boots, hearing protectors (if needed), high visibility jackets/ sashes, reflective vests, goggles, gloves and full body harnesses for work at height will be provided to all staff working on site. Warning signs and barriers will be erected where necessary.6 Particular care needs to be taken when working on or near busy roads. No works will be undertaken unless safe access, including approved and fully implemented TTAs where necessary. The voltage of any handheld power tools should not exceed 110V and preferably be less than 24V.

	<p>7 Any emergency situation shall be reported to CSHK's site supervisors (i.e. Site Agent/ Foreman/ Engineer, etc.) and Safety Department for prompt response. The emergency contact list is shown in Appendix E.</p> <p>8 Plastic sheet or similar thing must not be erected as sun-shield on site.</p> <p>9 Sun-shield umbrella must be used with 3 ropes fixed, and the sun shield umbrella will be removed if not attended.</p>
9.	Environmental (Environmental aspect & impact identification as well as mitigation measures)
	<ul style="list-style-type: none">● The works shall follow relevant mitigation measures as required under the Environmental Permit (EP) / EP submission and Contractor's Environmental Management Plan (EMP).● Works should be carried out during 07:00 to 19:00 on normal working days. No PME will be used after 07:00 pm on normal working days and on Sundays and public holiday with unless with a valid construction noise permit.● Only regulated NRMM with approved NRMM label to be used on site.● ULSD diesel will be used in all PME.● Plant with QPME label will be employ, if available.● All chemicals will be placed on drip tray.● For excavated materials, water spray will be carried out during the work to prevent dust generation.● Any wastewater produced during the work will be treated prior to disposal.



10.	Quality Control (Inspection and Test Plan including hold points)
	<p>Refer to Appendix G for Inspection and Test Plan.</p> <p>To ensure the attainment of the required standard of works, the methods of working and the required works standards/ acceptance criteria are defined in the method statement, inspection & test plans, and are communicated to relevant staff and workers carrying out the works. Day to day routine inspections of the works will be carried out by the Construction Team Leader, Site Engineers and Foreman as appropriate, to ensure that all works are performed following the requirements of these documents.</p> <p>Specific quality checks shall be carried out in accordance with the approved Inspection & Test Plan with "Hold Points" at critical elements for confirmation of compliance before proceeding further.</p> <p>Request for Inspection and Survey Check (RISC) shall be issued to the MTR Inspection Team following inspection of the works by the CSHK's project team. The Inspection & Test Plan for the works (Appendix G) will identify all Hold Points and Witness Points.</p> <p>Following the Inspection & Test carried out, inspection and or test records are to be prepared to indicate whether the specified requirements have been met. Records of Inspection and testing will be maintained and kept available for inspection and final handover as appropriate.</p>
11.	Appendices (Identify and include additional information in the submission package)
	<p>Appendix A – Risk Assessment & Hazard Log</p> <p>Appendix B – Construction Drawing</p> <p>Appendix C – Instrumentation and Monitoring Layout Plan</p> <p>(Coordinate with Latest Working Drawing will be submitted separately)</p> <p>Appendix D – Proposed Discharge Points</p> <p>Appendix E – Emergency Contact List</p> <p>Appendix F – Emergency Reporting Ladder for Abnormal AAA</p> <p>Appendix G – Inspection and Test Plan (ITP)</p> <p>Appendix H – Catalogue</p> <p>(Mobile Crane Details with Lifting Plan, instrumentation equipment and certificates will be submitted separately)</p> <p>Appendix I – Temporary Works Design Drawing</p> <p>Appendix J – Temporary Access and Routing of Track Trolley</p> <p>Appendix K – Response to Comment</p>