



MS Reference Number:	CSHK	CET	MS	C	2024	000056
ACC Reference Number:	1701	W	000	CSC	760	000138

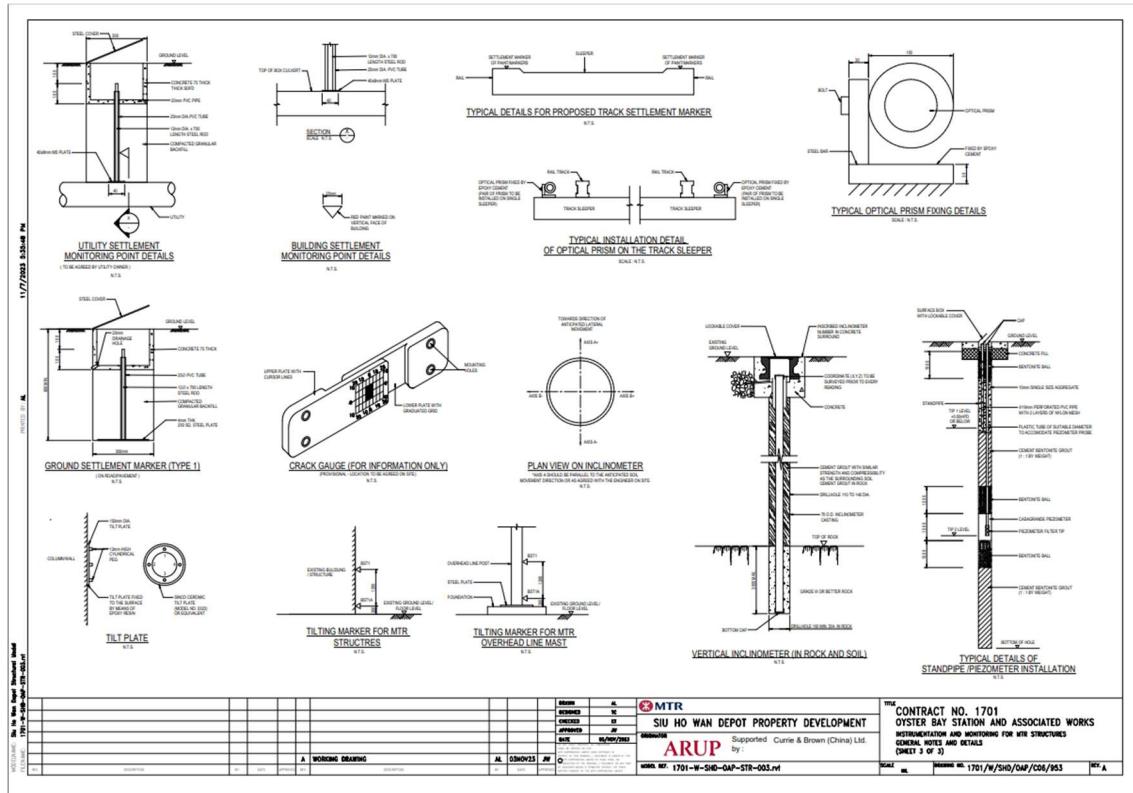
METHOD STATEMENT TITLE	Rev. A
Method Statement for Instrumentation and Monitoring Works at Construction Area (CA)	

	Prepared by:	Checked by:	Reviewed by:	Reviewed by:
Signature:				
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-Mar-2024	21-Mar-2024	21-Mar-2024	21-Mar-2024
	Reviewed by:	Reviewed by:	Reviewed by:	Approved by:
Signature:				
Name:	MH Isa / 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-Mar-2024	21-Mar-2024	21-Mar-2024	21-Mar-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. Revisions to this document from the first approved submission are shown hi-lighted in yellow.</p> <p>The Construction Area (CA) such as W1, W3, W7, W11 and W12 may require the RSI and EDOC in accordance with the BUGN2023/21 (issue/Rev:1.0), RSR and EDOC procedure. This method statement described the I&M installation works details in CAs.</p>  <p>This method statement included the type, sequence and installation details of instrumentation points.</p>  <p>The instrument types as follows:</p> <ul style="list-style-type: none"> ● Ground Settlement Marker (GS) ● Utility Settlement Marker (UT) ● Building Settlement Marker (BS)

	<ul style="list-style-type: none">● Tilting Marker (TM)● Vibration Marker (VM)● 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 – Instructions TO Tenders10. 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="12">CSHK</td><td>Vincent Li</td><td>Construction Manager</td></tr><tr><td>Nana Chung</td><td>Assistant Construction Manager</td></tr><tr><td>David Lam</td><td>Senior Engineer</td></tr><tr><td>Johnson Chung</td><td>Senior Engineer</td></tr><tr><td>Kingsley Zhao</td><td>Assistant Engineer</td></tr><tr><td>Li Man Hin</td><td>Graduate Engineer</td></tr><tr><td>Cheung Siu Kei</td><td>Superintendent (WPIC)</td></tr><tr><td>Wong Yu Fung</td><td>Senior Foreman</td></tr><tr><td>Ng Ho Lun</td><td>Senior Foreman</td></tr><tr><td>Pun Chi Ho</td><td>Foreman</td></tr><tr><td>Luk Si Sun</td><td>Mechanic & authorized electrician</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	David Lam	Senior Engineer	Johnson Chung	Senior Engineer	Kingsley Zhao	Assistant Engineer	Li Man Hin	Graduate Engineer	Cheung Siu Kei	Superintendent (WPIC)	Wong Yu Fung	Senior Foreman	Ng Ho Lun	Senior Foreman	Pun Chi Ho	Foreman	Luk Si Sun	Mechanic & authorized electrician	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 works will be carried on day time from 08:00 am to 07:00 pm, Monday to Saturday.</p>																																																						
6.	<p>Plant, Equipment & Material (Identify type, model and specification of MAJOR plant & equipment)</p> <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>All statutory forms/certificates of Lifting Appliances (LA) and Lifting Gear (LG) must be valid.</p> <p>Before operation of the plant, CSHK will arrange a plant inspection with MTR CWBU inspector, if they are in good working condition, CSHK will submit the plant permit and permit to lift of the plant.</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 Crane Lorry</td><td>2</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 Level (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><tr><td>Track Monitoring Marker (TS)</td><td></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 Crane Lorry	2	Crane Lorry	2	Total Station (TS16A-1")	6	Digital Level (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	Track Monitoring Marker (TS)	
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	Optical Prism	1000
	Epoxy resin	800
	Building Settlement Marker (BS)	
	Marker/ Paint	700
	Crack Gauge	600
	Standpipe and Piezometer (SP), Inclinometer (IN)	
	PVC Pipe, 6m length	140
	Backfilling materials 25kg	140

Actual Quantity are approximate only, actual quantity will be changed subject to the site conditions.

7. Construction Methods / Construction Sequence Drawings	
	<p>1 <u>Arrangement for Works within Construction Areas (CAs)</u></p> <p>1.1 For the drilling works, pit excavation the works area is required fence off by plastic barriers before commence.</p> <p>1.2 All site staffs should wear the required PPE such as safety helmet, reflective vest and safety boots.</p> <p>1.3 CP(T) shall be appointed to escort all transportation inside the SHD.</p> <p>1.4 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.</p> <p>1.5 CP(T) shall report to depot before works could commence (if needs).</p> <p>1.6 For those who carried out works within 10m from boundary of OAs, should have railway qualification of RSI and be supervised by CP(T). For easy identify on site, the 10m extent will be set.</p> <p>1.7 Demarcate and barricade the operation zone with reflective cone and work within the barricaded area.</p> <p>1.8 If the works will be affected operation of track, authority shall be sought in prior commencement of any operation.</p> <p>1.9 CP(T) shall coordinate with DYM when using west level crossing to the works areas.</p> <p>1.10 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.</p> <p>1.11 Large plants transportation shall be carried out in NTH.</p> <p>1.12 If the GS/ UT construction works affected the access road, the temporary cover may be required.</p> <p>1.13 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 fire fighting tools/materials will be provided on Site. (if needs).</p> <p>1.14 Keep the works area tidy daily.</p> <p>1.15 CP(T) ensure no any materials/ waste left in the boundary of OAs.</p> <p>1.16 Inform to DYM before leave daily (if needs).</p> <p>1.17 Apart from CP, WPIC will be assigned for the installation works (if needs).</p> <p>Details of traffic and security plan, and the control of movement in and out of the CA, shall refer to the separate submission.</p>

2 Access Route

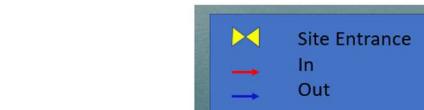
Plant and material deliver to works area W3, W7, W11 and W12 shall be via west gate and west level crossing in the initial stage when the vehicular bridge is not ready. Vehicles will be escorted by escort car with CP(T) after enter to the depot, or from East gate when the vehicular bridge is open for use.



For W1, shall be from North Lantau Highway via Depot Slip Road.



RAILWAY PROTECTION FENCING INSTALLATION (NTH) LOGISTIC OF RP FENCING

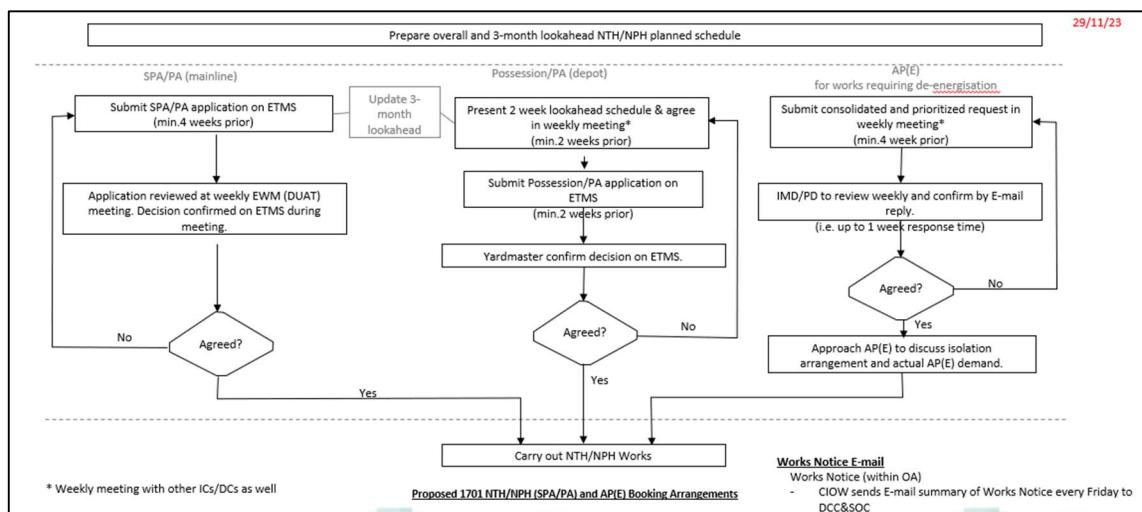


小蠅灣車廠物業發展
Siu Ho Wan Depot Property Development



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

3 ETMS



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

4 Worker Verification

- All workers will be picked up at designated area such as Tung Chung Station.
- During boarding the shuttle bus, hand-held facial recognition will be performed to verify the worker's qualification.
- The facial recognition system will check if the person has passed the RSI and possesses a green card.
- List of workers shall be submitted for MTR for registration before starting of works, the list shall be updated weekly and available for MTR as requested.



Uniform and Safety Equipment: All workers shall wear PPE and the standard uniform and safety helmet for easy recognition by security guards and DYM.

<p>Contract 1701 中國建築工程(香港)有限公司 Contractor: _____ Name: _____ Green Card no.: _____ MTR COM028 : _____ MTR RS: _____ Site Induction Training: _____ Expiry date: _____</p>	<p>辨別安全帽之顏色 Identify the color of the safety helmet</p>  <p>普通工人 General Worker (藍色) (Blue) 管理人員 Management (紅色) (Red) 埋碼員/訊號員 Rigger or Signaler (橙色) (Orange)</p>
Template of Label for Safety Helmet	Identify the color for the Safety Helmet



5 Preparation Works

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

5.1 General

- 5.1.1 All works before commencement must contact DYM to get approval first.
(When the works involves existing railway facilities and or within 10m distance from Railway tracks; EDOC also required)
- 5.1.2 Identify all existing MTR's facilities/ equipment/ materials (e.g. pipeline, ducting and trough) at or within installation area during the site condition survey. After that, the identified existing MTR's facilities/ equipment/ materials will be fenced off/ protected/ isolated/ relocated/ diverted before start the construction works.

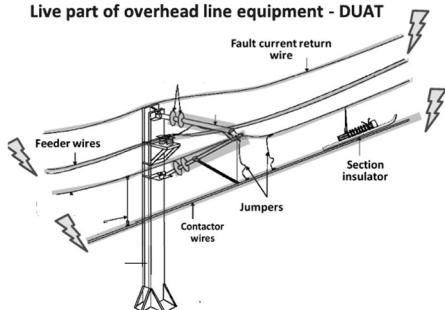
- 5.1.3 Site clearance will be carried out after the proposed installation locations confirmed.

5.2 Setting Out

- 5.2.1 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.
- 5.2.2 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.



5.2.3 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 condition with the MTR representative onsite to ensure that the proposed location meets the minimum safety distance and take relative precautions, such as de-energize, isolation, or relocation.

Live part of overhead line equipment - DUAT		Minimum Safety Distance								
		<table border="1"><thead><tr><th>Voltage</th><th>Minimum Safety Distance</th></tr></thead><tbody><tr><td>Traction 1500V d.c.</td><td>2m</td></tr><tr><td>Traction 750V d.c.</td><td></td></tr><tr><td>Traction 25000V a.c.</td><td>2.75m</td></tr></tbody></table>	Voltage	Minimum Safety Distance	Traction 1500V d.c.	2m	Traction 750V d.c.		Traction 25000V a.c.	2.75m
Voltage	Minimum Safety Distance									
Traction 1500V d.c.	2m									
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Traction 25000V a.c.	2.75m									
										

Minimum Safety Distance for Track

Test Track/ Mainline	2995mm from the center of track
Depot Track	2615mm from the center of track

5.3 Cable Detection

UU detection will be carried out before start of the works. For details, please refer to separate submission.

5.4 Trial Pit

Trial Pits will be carried out accordance with Permit-to-Dig System before start of the works. The details please refer to separate submission.

5.5 Utility Diversion/ Abended Works

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

5.6 Temporary Drainage System Supply

Wetsep will be set up when fencing/ waterfilled barriers once installed. Proposed locations please refer to Appendix D – Proposed Discharge Points.

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



6 Lifting Arrangement

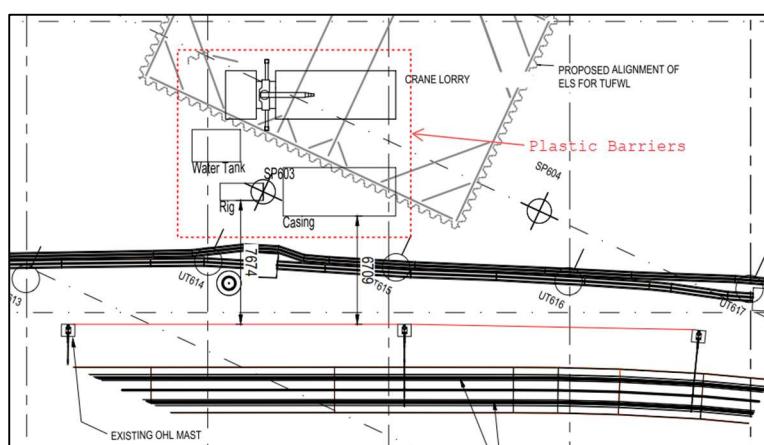
6.1 Lifting Procedure

6.1.1 Check the ground conditions for the crane lorry;

6.1.2 Apply the Permit-to-Lift (e.g. Lifting Plan, 80% of Lifting Capacity checking);

Siu Ho Wan Depot Property Development Contract 1701 - Oyster Bay Station and Associated Works (小瀝灣車廠物業發展-小瀝灣站及相關建造工程(合約編號: 1701)		Permit-to-Lift 吊運操作許可證	
Part A-Basic Information 甲部-基本資料			
Sub-Con / Dept 分判商 / 部門		Date 日期	
Location 位置		Distant with the overhead cable 與架空電纜距離	Meter 米
Railway Protection Area Restriction: No lifting operation within 6m of RPA 鐵路保護範圍內勿進行吊運操作: 距離至多六米			
Description of Lifting Works: 吊運工作內容			
Type of Crane 起重機類別:	<input type="checkbox"/> Crawler 履帶式	<input type="checkbox"/> Hydraulic 液壓式	<input type="checkbox"/> Crane Lorry-EN12999
Model 型號:		Serial No. 編號:	
Name of Operator: 操作員姓名		License No.: 執照號碼	
Name of Signaler: 訊號員姓名		Name of Rigger: 吊索工姓名	
Lifting Gears: 吊運工具		SWL: 安全操作負重	
1) ID Mark 識別號碼		SWL: 安全操作負重	
2) ID Mark 識別號碼		SWL: 安全操作負重	
3) ID Mark 識別號碼		SWL: 安全操作負重	
4) ID Mark 識別號碼		SWL: 安全操作負重	
5) ID Mark 識別號碼		SWL: 安全操作負重	

6.1.3 After approved, fence off the lifting area by plastic barriers.



6.1.4 Lift the rig and equipment to works area.

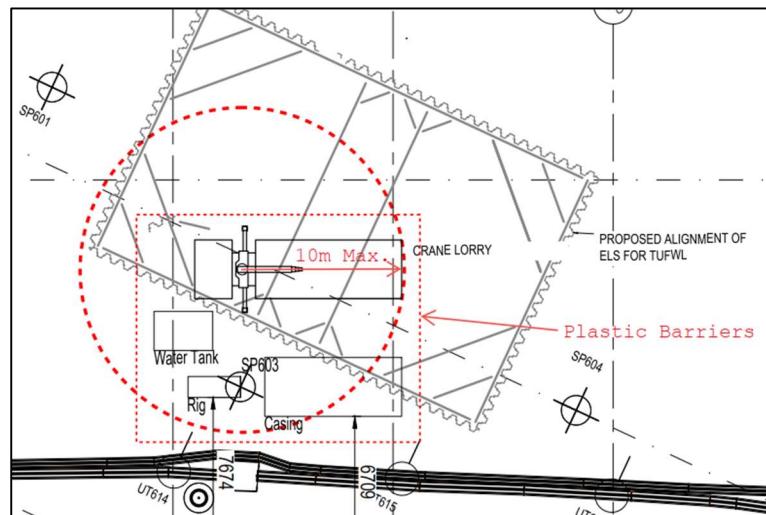
6.1.5 Lifting Capacity Checking Details (Sample)

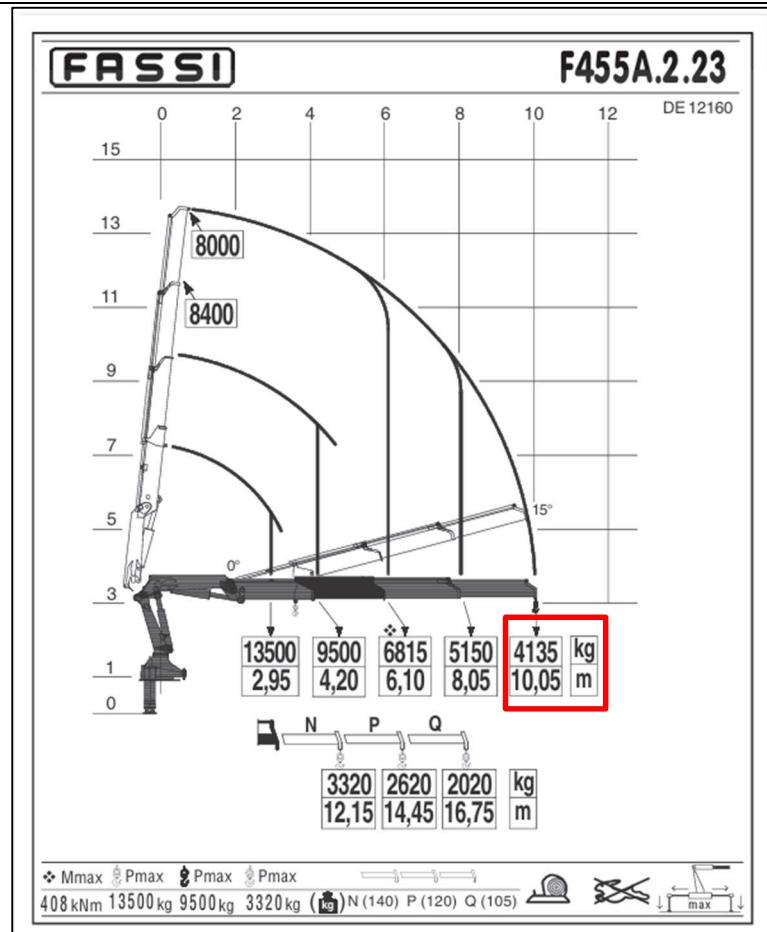
Weight of Rig : 1460 kg

Capacity of Crane Lorry : 4135 kg @ 10.05m

80% Capacity of Crane Lorry: 3308 kg

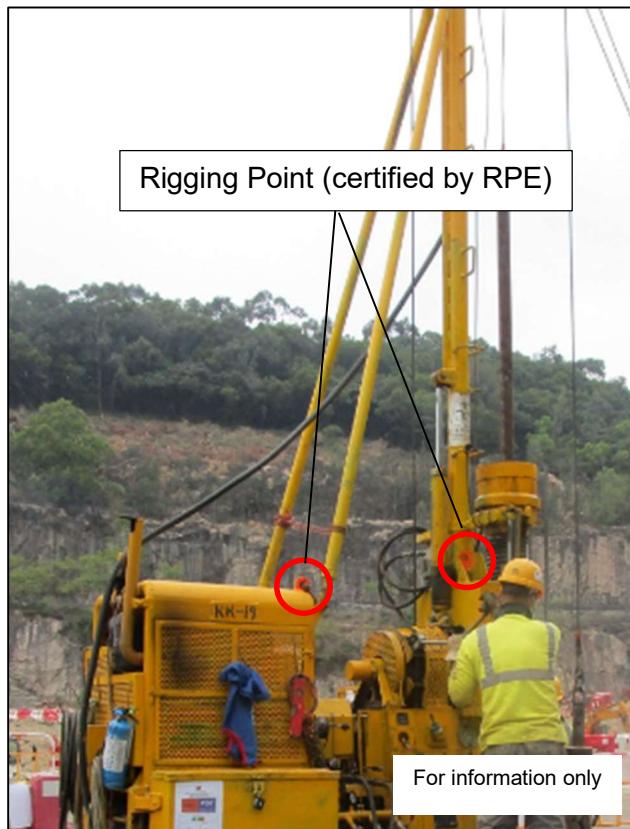
3308 > 1460 OK!





OVERALL DIMENSIONS				
Width	42" (107 cm)	42" (107 cm)	42" (107 cm)	42" (107 cm)
Length	96½" (244 cm)	103" (261 cm)	103" (261 cm)	96½" (244 cm)
Height	57" (145 cm)	57" (145 cm)	57" (145 cm)	57" (145 cm)
APPROX. WEIGHT Net				
HQ 3-7' 8" Hyd. Head	2510 lbs (1140 Kg)	3165 lbs (1440 Kg)	3305 lbs (1500 Kg)	3230 lbs (1460 Kg)
NQ 3" Hyd. Head	2390 lbs (1086 Kg)	3045 lbs (1380 Kg)	3185 lbs (1450 Kg)	3110 lbs (1410 Kg)
For Domestic Shipment				
HQ 3-7' 8" Hyd. Head	2920 pounds	3575 pounds	3715 pounds	3640 pounds
NQ 3" Hyd. Head	2500 pounds	3460 pounds	3600 pounds	3525 pounds
For Export				
HQ 3-7' 8" Hyd. Head	3210 lbs (1459 Kg)	3865 lbs (1755 Kg)	4005 lbs (1820 Kg)	3930 lbs (1783 Kg)
NQ 3" Hyd. Head	3100 lbs (1409 Kg)	3750 lbs (1700 Kg)	3890 lbs (1765 Kg)	3815 lbs (1730 Kg)
CUBIC DISPLACEMENT				
Crated for Export	160 cu ft (4.5 cu m)	175 cu ft (5 cu m)	175 cu ft (5 cu m)	170 cu ft (4.8 cu m)

6.2 Rigging point of drilling rig.



6.3 Except drilling rig, water tank(empty) and casing with hanger would be deliver to works area by crane lorry. The valid LALG certificates would be provided.



6.4 Lifting Method for the Loose Materials

Double tagline attached at the lifting objects before lifting.

Method 1

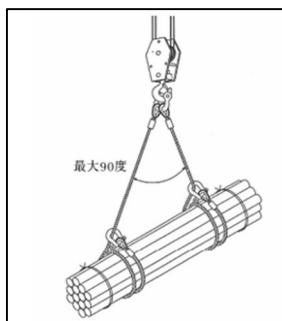
For rigging stabilization, the tiedown straps will be used to tie the drill casings (maximum length is 6m) with hanger together; connect the hook with anchoring

point is secured (the anchoring point must be structurally sound tested and examined by a competent examiner).



Method 2

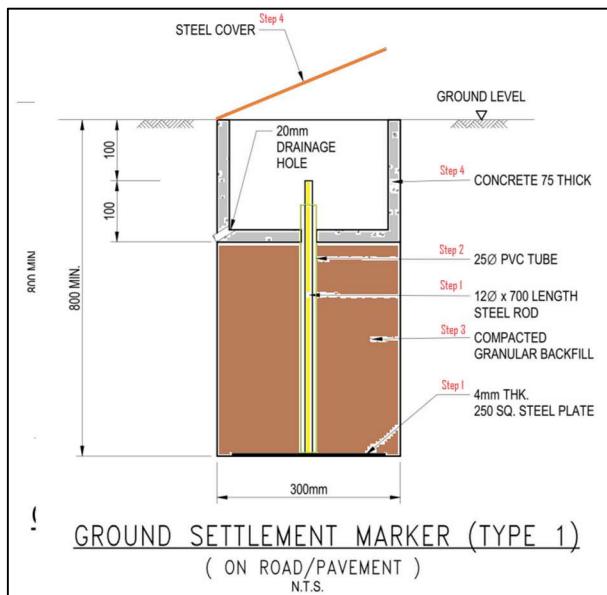
Prevent slipping or displacement of any loose objects or loads during lifting.
Double wrap choker hitch method will be adopted.



7 Installation Details

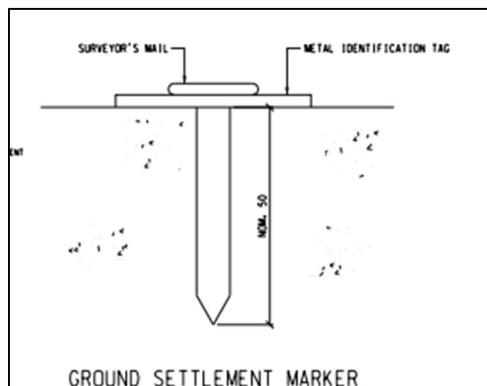
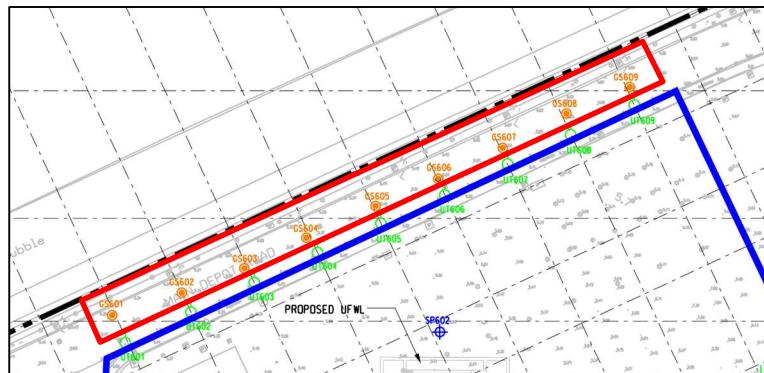
The following are the installation sequence and method for different type I&M installation

7.1 Ground Settlement Marker (GS)



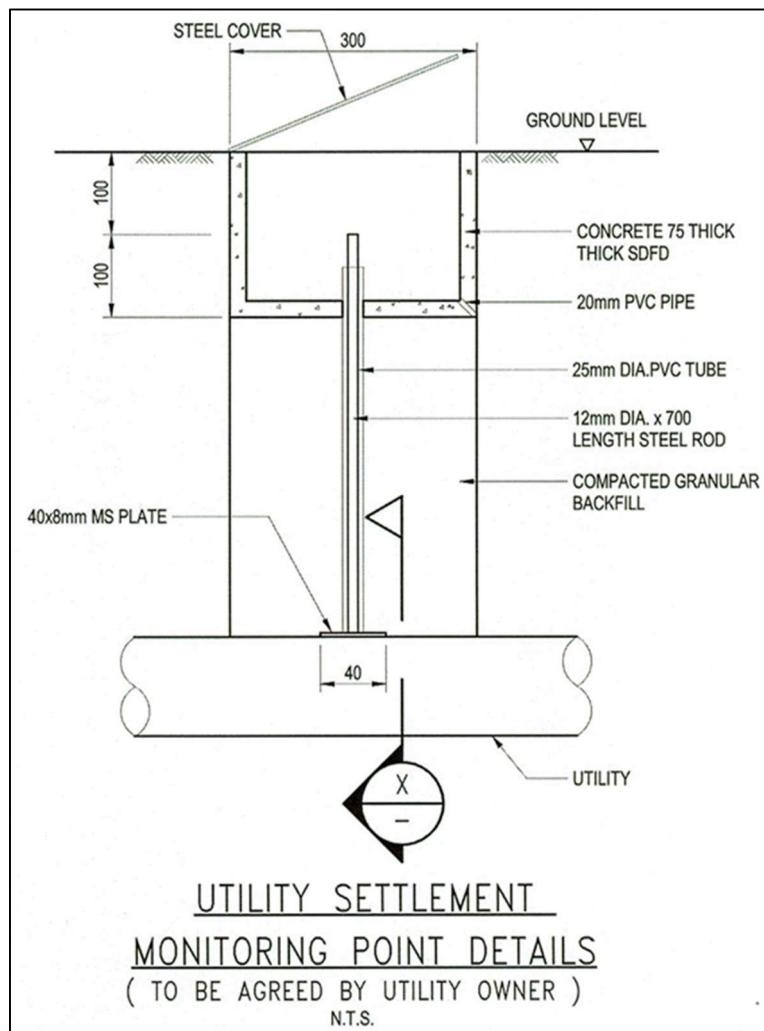
- 7.1.1 Fence off the works area before **commencing** the works by plastic barriers.
- 7.1.2 Deliver the ground settlement markers (A 12mm dia. mild steel rod with 250mm SQ. x 4mm THK steel plate) on site.
- 7.1.3 Place the ground settlement marker into hand excavated 300mm SQ. x 800mm(H) hole.
- 7.1.4 Install Dia. 25mm PVC sleeve on the ground settlement marker and leaving the rod protruding approximately 100mm above the PVC sleeve top.
- 7.1.5 Backfill the excavated pit with granular backfill with well compacted
- 7.1.6 **Temporary cover plate will be provided should any incomplete holes be left unattended.**
- 7.1.7 Construct the **precast** concrete box with hinged steel cover. The concrete box size is 300 SQ. x 200mm (H) with 75mm wall thk. And then remove the waterfilled barrier.
- 7.1.8 The plastic barriers will be removed after installation completed.
- 7.1.9 If the GS construction works cannot complete in one day, the waterfilled barriers/ fencing for physical separation and additional warning lights are required where necessary.

7.1.10 If the proposed GS located near/ at pavement, the pin details will be adopted.



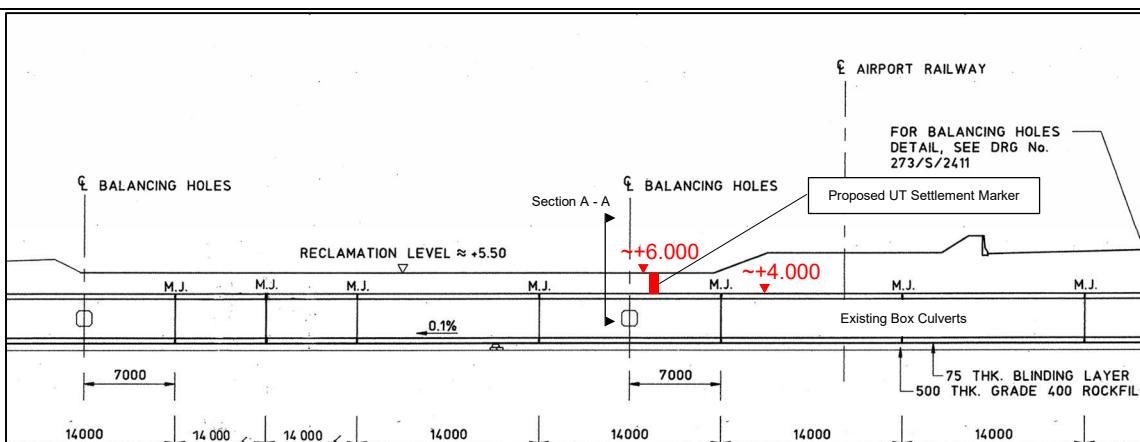
Reference Photo

7.2 Utility Settlement Marker (UT)

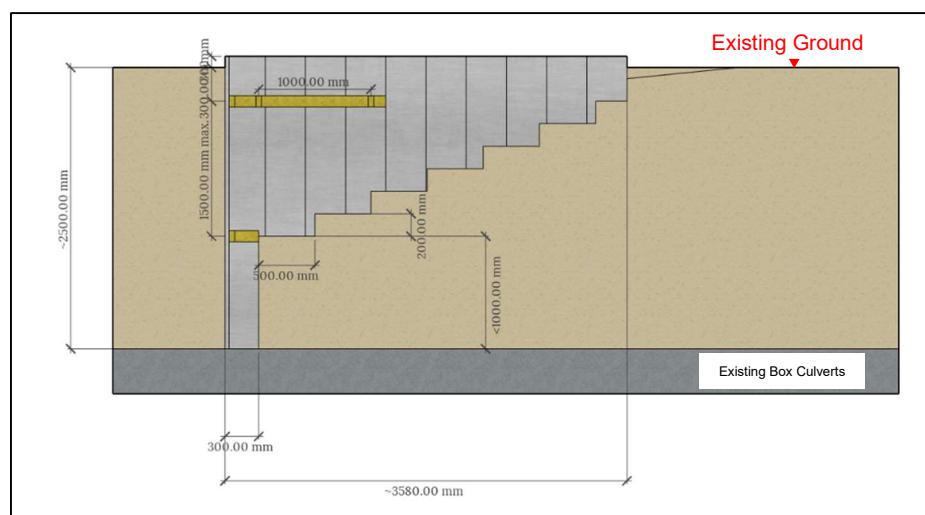


- 7.2.1 The installation details similar to GS Settlement Marker (Details please refer to 7.1 Ground Settlement Marker (GS)).
- 7.2.2 Typical **reference** Temporary Support Arrangement (approximate 2.5m depth).

(Appendix I, Indicative Design Scheme only, the certified design with calculation for Contract 1701 will be submitted separately.)
- 7.2.3 Cross Section at G.L. 124 – 125, P – R (Example)



7.2.4 Section A – A



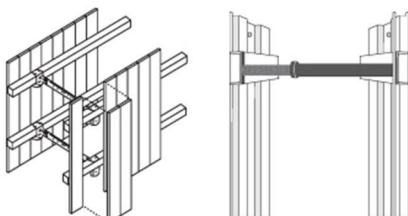
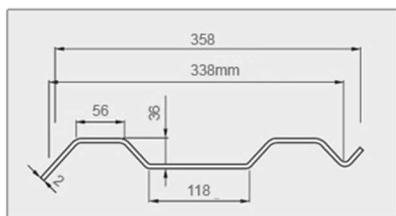
7.2.5 Steel Plate Details

Corrugated Trench Retaining Steel Plate (SK-338)



This reveals one kind of new Corrugated Trench retaining steel plate. Its corrugated folding design can bear the pressure from two sides so as to stabilize the earth nearby. Every retaining steel plate has a row of higher or lower holes so that workers can adjust the position of the framework swiftly in order to save time.

Size: 2mm x 338mm x 6.5 Kg/M



Corrugated Trench Retaining Steel Plate stay straighter and last longer than timber sheathing; they are cost effective, environmental friendly which minimized the operation and installation cost for easily fixing and extracting by hand through special designed pin and shackle connection in the hole provided.

Advantage of using trench sheeting

1. Lower material cost
2. Saves time and labour
3. Uniform strength increase safety
4. Special rib design allows lightweight Trench plate to resist deformation under load
5. Stay straighter and longer
6. Lesser timber use for environmental issues

7.2.6 Excavation Sequence

7.2.6.1 Setting out the proposed location of the UT settlement marker.

7.2.6.2 Fence off the works area with waterfilled barriers.

7.2.6.3 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.

7.2.6.4 Install the steel plate, and install the struct at the 300mm from existing ground.



7.2.6.5 Further excavate, and the depth not more 1500mm from the first struct, and install second struct.

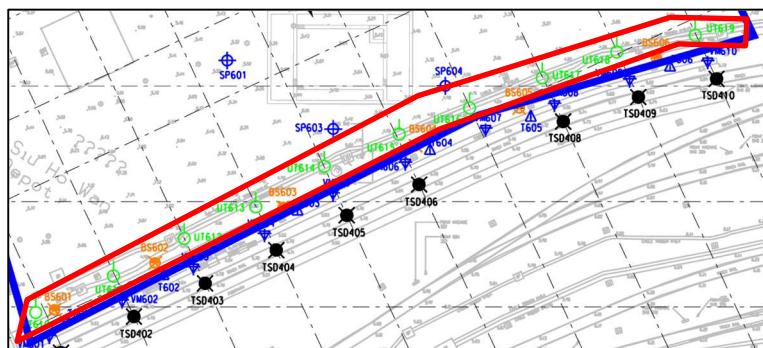
7.2.6.6 Final, excavate to the proposed level, and the depth not more than 1000mm.



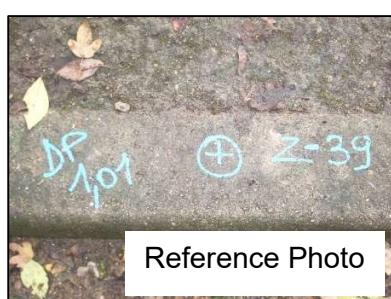
7.2.6.7 A reference temporary Works Design Scheme with calculation is attached in Appendix I. Specific ICE certified temporary works designs, for use on 1701, shall be submitted separately.

7.2.7 UT for Above Ground Utility

Clean the surface of proposed survey marker location. Then, paint the survey marking on the proposed location.

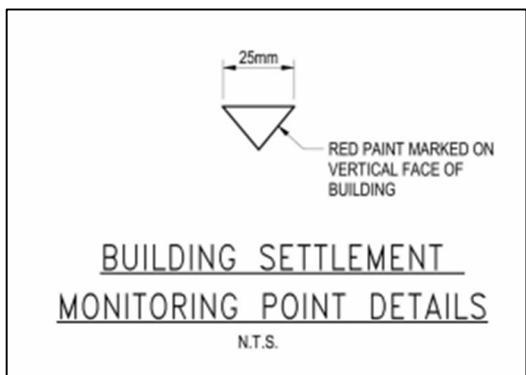


Reference Photo



Reference Photo

7.3 Building Settlement Point (BS)



Painting/ Reflective Surveying Target



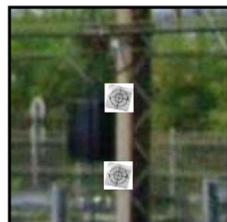
- 7.3.1 Painting/ Reflective Surveying Target would be used, actual depend on the surface of the existing structure;
- 7.3.2 A position of survey marker should be located on vertical surface of the existing structure with height approximate 1.5m above existing ground level.

7.4 Vibration Monitoring Point (VM)

- 7.4.1 The vibration monitoring device will be put on the firm ground or pavement during monitoring.

7.5 Tilting Marker (TM)

INSTALLATION DETAILS - TILTING MARKER

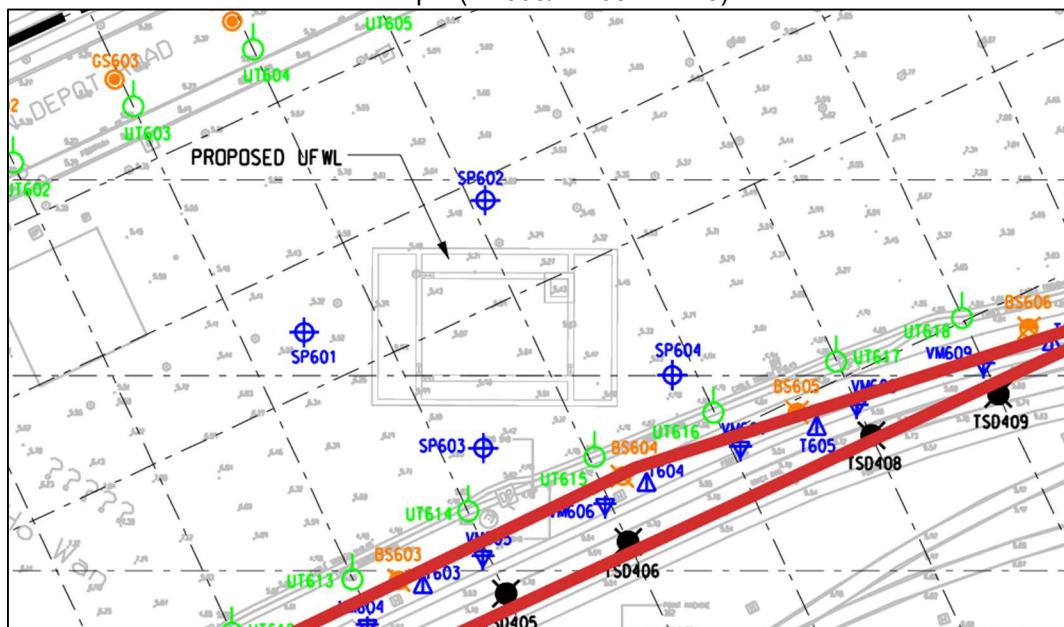


- 7.5.1 The vertical surface at the installation location shall be prepared such that any dirt, grease and loose or flaking material shall be removed and cleaned.
- 7.5.2 After that install the reflective surveying target on the surface.
- 7.5.3 If any Installation of Tilting Markers are located on existing SHD buildings, then EDOC approval may required.

7.6 Standpipe and Piezometer (SP)

- 7.6.1 Temporary fence off the works area by plastic barriers.
 - 7.6.2 Setup the site facilities e.g. wastewater discharge, toilet, wetsep, generator etc
 - 7.6.3 Install temporary casing to the proposed level by drilling rig with coring method.
 - 7.6.4 Clean the hole, then measure the depth with MTR's representatives.
 - 7.6.5 Backfill to proposed level with cement bentonite grout and bentonite ball.
 - 7.6.6 Install the Piezometer to proposed level then backfill with cement bentonite grout and bentonite ball.
 - 7.6.7 Install standpipe to proposed level then backfill with 10mm single size aggregate. After that, backfill with bentonite ball.
 - 7.6.8 Remove the temporary casing.
 - 7.6.9 Construct the surface box with lockable cover next working day.
- 7.6.10 Site Arrange within 10m from boundary of OAs

Example (SP603/SP 604 at W3)



7.7 Drilling Rod Installation



Maximum length of each drilling rod is 6m

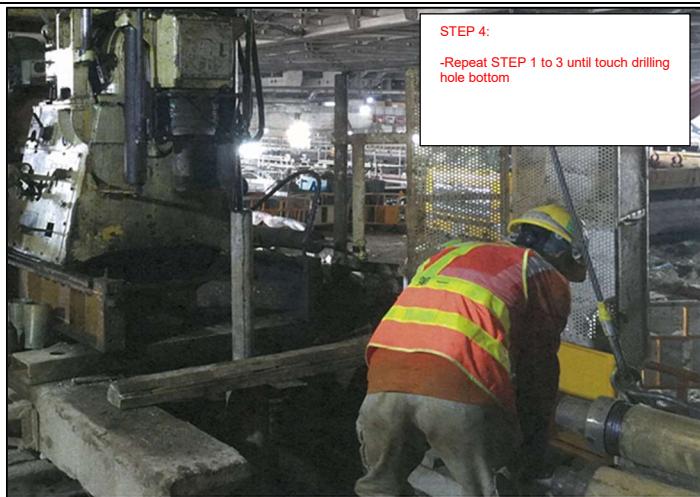


Drill Hole Numbering Label will be provided for easily identified on site



STEP 3:

- Repeat procedure of STEP 1 and
- Screwed into installed drilling rod by manual handing



7.8 Procedure for Raising of Rig Mast

7.8.1 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	備註 Remark
1	引擎 (包括檢查潤油) Engine & Grease			
2	鑽機頭 [包括上落及轉動] Drill head R.P.M.			
3	料筒 [包括拉桿塔把及剎停塔把] Winch & stopper			
4	波箱 Gear box			
5	轉動聯接器 (包括皮帶) Coupler & Belt			
6	機身及前後移動 Rig horizontal movement			
7	油壓泵及油箱 Pump & oil tank			
8	電池及電器部分 Battery & switches			
10	油壓錶及油壓掣 Hydraulic meter & switches			
11	吊索繩及油箱繩 Winch wire ropes & pulley			
12	自動 CHUCK 及手動 CHUCK Automatic & manual "chuck"			
13	尾鉤 (包括連接部分) Mast support			
14	護罩(所有轉動部分) Machine guard for rotating part			
15	標示清楚 (緊急停止制, 停機切斷) 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: _____

7.8.2 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.



- 7.8.3 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.



- 7.8.4 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.



- 7.8.5 Drilling works may proceed after general condition checking.

7.9 Procedure for Lowering of Rig Mast

7.9.1 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.

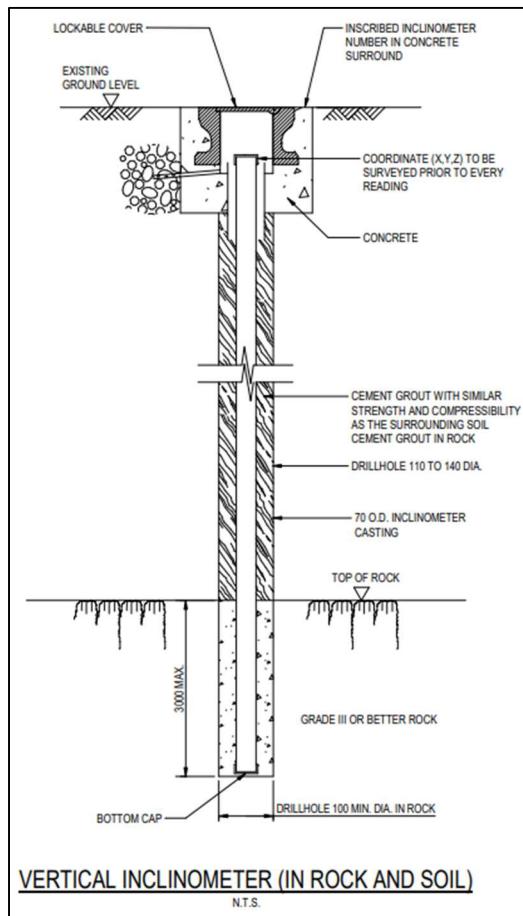
7.9.2 Remove the safety pin after the bolts of the mast backstay legs.



7.9.3 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

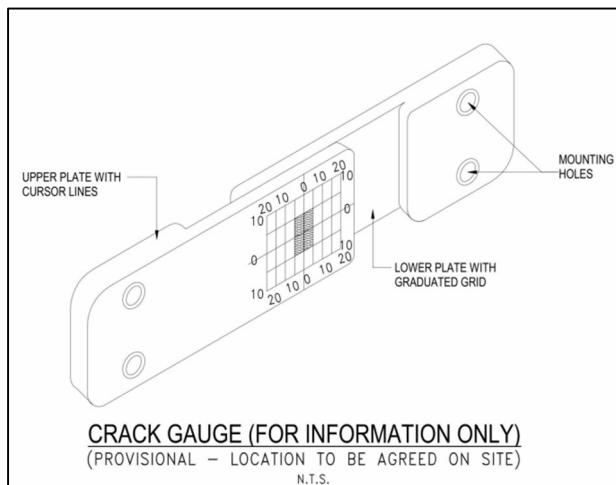


7.10 Inclinometer (IN)



- 7.10.1 Site setup as same as the 7.6 Standpipe and Piezometer (SP) installation.
- 7.10.2 Install temporary casing to the proposed level by drilling rig with coring method.
- 7.10.3 Clean the hole, then measure the depth with MTR's representatives.
- 7.10.4 Install the 70mm dia. inclinometer casing to proposed level then backfill with cement grout.
- 7.10.5 Remove the temporary casing.
- 7.10.6 Construct the surface box with lockable cover next working day.

7.11 Crack Gauge



7.11.1 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.

8 Installation Location

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

9 Monitoring

4.1 Initial Reading

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

4.2 Methodology

After the survey control checked, and accepted by MTR. 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 three-set reading will be taken in continuous three days;

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 Senor will be adopted for VM;

#Details please refer to ACC Ref. No. 1701-W-000-CSC-760-000048 – Method Statement for General Site Survey Works

4.3 Monitoring

Monitoring shall be carried according to the frequency listed below:

- 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>
8.	Safety (Risk Assessments)
	<ol style="list-style-type: none">1 All works inside the CA within 10m of the OA boundary require all workers to be RSI trained and supervised by a 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.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.8 The operator of crane lorry shall ensure a clear and unrestricted view of the load carried in prior to lifting works.9 Plastic sheet or similar thing must not be erected as sun-shield on site.10 Sun-shield umbrella must be used with 3 ropes fixed, and the sun shield umbrella will be removed if not attended.
9.	Environmental (Environmental aspect & impact identification as well as mitigation measures)
	<ul style="list-style-type: none">● General work should be carried out during normal working hours (07:00 am to 07:00 pm). No works using PME will be carried out after 07:00 pm on Sunday and public holiday without valid construction noise permit.● ULSD diesel will be used in all PME.● Plant with QPME label will be employ, if available.● All chemicals will be placed on drip try.● For excavated materials, water spray will be carried out during the work to prevent dust generation.● All regulated NRMM should display a NRMM label.

	<ul style="list-style-type: none">● Any wastewater produced during the work will be treated prior to disposal.● The works shall follow relevant mitigation measures as required under the Environmental Permit (EP)/ EP submission and Contractor's Environmental Management Plan (EMP).
10.	Quality Control (Inspection and Test Plan including hold points) Refer to Appendix G for Inspection and Test Plan. 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. 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. Request for Inspection and Survey Check (RISC) shall be issued to the MTR's 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. 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.
11.	Appendices (Identify and include additional information in the submission package) Appendix A – Risk Assessment & Job Hazard Analysis Appendix B – Construction Drawing Appendix C – Instrumentation and Monitoring Layout Plan (Coordinate with Latest Working Drawing will be submitted separately) Appendix D – Proposed Discharge Points Appendix E – Emergency Contact List Appendix F – Emergency Reporting Ladder for Abnormal AAA Appendix G – Inspection and Test Plan (ITP) Appendix H – Catalogue (instrumentation equipment and certificates will be submitted separately) Appendix I – Reference Temporary Works Design Scheme with Calculation