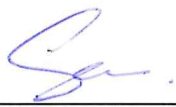


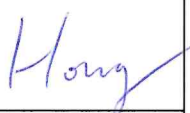
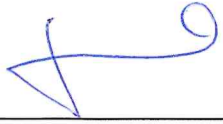
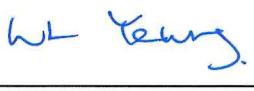
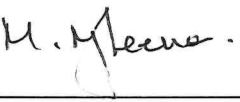
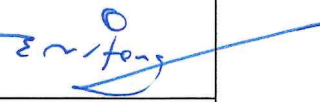


MS Reference Number:	CSHK	CET	MS	C	2024	000126
ACC Reference Number:	1701	W	000	CSC	760	000273

METHOD STATEMENT TITLE	Rev. B
Mini-Pile Installation for OYB Station (South)	

	Prepared by:	Checked by:	Reviewed by:	Reviewed by:
Signature:				
Name:	Sam Tsang	Vincent Li / <del>Nana Chung</del>	Leung Kwok Fung / Brian Wong	MH Isa / SH Cheung
Position:	Engineer	Construction Manager	<del>SM/SSO</del>	QM/ AQM
Date:	26 June 2024	26 June 2024	26/June 2024	26.6.2024
	Reviewed by:	Reviewed by:	Reviewed by:	Approved by:
Signature:				
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:	26.6.2024	26 Jun 2024	27-06-2024	

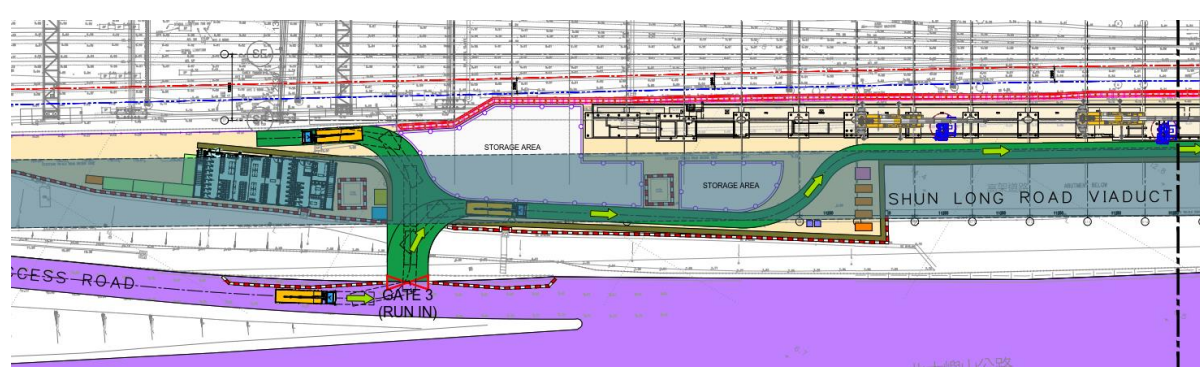
## CONTENT

1. Introduction
2. Reference Documents
3. Details of Sub-Contractor/Specialist Sub-Contractor
4. Responsibilities for Activities described within Method Statement
5. Programme and Working Hours
6. Plant, Equipment & Material
7. Traffic and Security Management
8. Construction Methods / Construction Sequence
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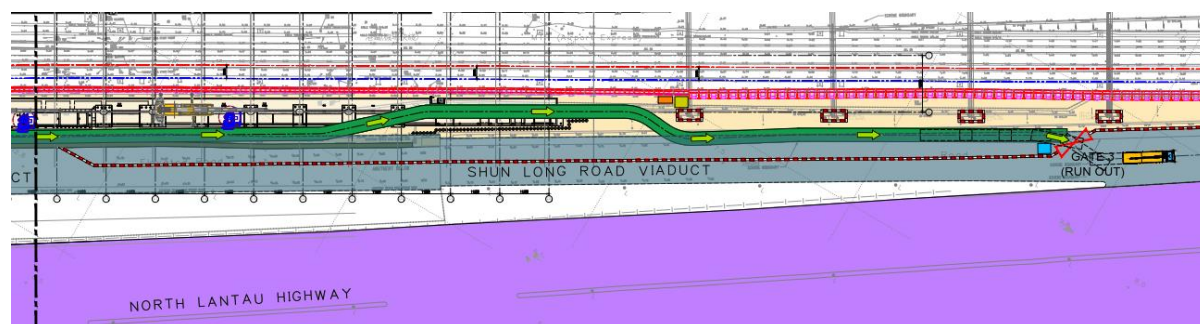
1.	<b>Introduction</b> (Overview of the operation/works)																																
	<p>Upon the predrilling works completed for Oyster Bay (OYB) Station (Southern platform), the mini-pile for Oyster Bay Station (Southern platform) will be commenced. This method statement will cover the method, sequence, logistic of the mini pile for construction and precautionary measure and other relevant arrangement. The foundation work should commence after the completion of RP fencing, I&amp;M installation with initial readings taken and agreed, predrilling and UU diversion etc. which the method statement of the above works shall be submitted separately.</p> <p>The detail of the procedures and methods contained herewith shall be reviewed periodically and updated where necessary based on the actual site condition. The principle methods as described in the following sections are subject to review during construction and may be amended if required.</p>																																
2.	<b>Reference Documents</b> (Identify relevant documents by name and reference number)																																
	(Library) Working Paper No.6 – Railway Protection General Specification for Civil Engineering Works (NEC4) (MTR Corporation Limited - 2022) Scope for Contract 1701 Materials and Workmanship Specification for Civil Engineering Works Foundation Design and Construction (GEO Publication No.1/2006) Code of Practice for Foundation 2017																																
3.	<b>Details of Sub-Contractor/Specialist Sub-Contractor</b>																																
	The works will be carried out by our subcontractor and supervise by our front-line staff such as foreman and engineer. We will also provide the full time CP (Railway Safety Rules and Requirements) on site, 1 CP will be appointed for 20 workers at same work area. RSI is not required after the works area declared as CA. CP(T) shall be provided for supervision of works less than 10m from the existing RP fencing. Besides, WPIC will be assigned to supervise the construction works at each work site.																																
4.	<b>Responsibilities for Activities described within Method Statement</b>																																
	<p>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:</p> <table><tr><th>Company</th><th>Name</th><th>Position</th></tr><tr><td rowspan="13">CSHK</td><td>Vincent Li</td><td>Construction Manager</td></tr><tr><td>Nana Chung</td><td>Assistant Construction Manager</td></tr><tr><td>Ng Chun Wah</td><td>Assistant Section Agent</td></tr><tr><td>David Lam</td><td>Senior Engineer</td></tr><tr><td>Johnson Chung</td><td>Senior Engineer</td></tr><tr><td>Sam Tsang</td><td>Engineer</td></tr><tr><td>Edmond Man</td><td>Engineer</td></tr><tr><td>Jacky Luo</td><td>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>Benny Yeung</td><td>General Foreman</td></tr><tr><td>Jacky To</td><td>Foreman</td></tr><tr><td>TBC</td><td>CP(T)</td></tr></table>	Company	Name	Position	CSHK	Vincent Li	Construction Manager	Nana Chung	Assistant Construction Manager	Ng Chun Wah	Assistant Section Agent	David Lam	Senior Engineer	Johnson Chung	Senior Engineer	Sam Tsang	Engineer	Edmond Man	Engineer	Jacky Luo	Engineer	Kingsley Zhao	Assistant Engineer	Li Man Hin	Graduate Engineer	Cheung Siu Kei	Superintendent (WPIC)	Benny Yeung	General Foreman	Jacky To	Foreman	TBC	CP(T)
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	Jacky To	Foreman																															
TBC	CP(T)																																

5.	<b>Programme and Working Hours</b> (Start & finish date of operation/works)																														
	<p>The works is planned to commence with predrilling for the trial pile in early July 2024 and targeted to complete grouting work in late July 2024. This is to allow consent to be granted for mini pile works in late September 2024 for BD acknowledgement.</p> <p>The general working hours will be from 08:00 – 19:00 daily, from Monday to Saturday while W1 is changed into CA from OA (Operation Area). However, it may be required to carry out works from 19:00 to 23:00 and Sunday and Public Holidays in case of essential speeding up of the working process. CSHK would check internally to fulfil the Construction Noise Permit Requirement.</p> <p>If works needed to be carried out during NTH, CP(T) and WPIC are required and CSHK should check for availability and report to MTR before commencement of works.</p>																														
6.	<b>Plant, Equipment &amp; Material</b> (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. Plant permit system will be adopted ensure condition of lifting crane and appliance are checked before use. Proposed design mix and associated material submission of grouting works should be provided prior the commencement of grouting works for mini-piles.</p> <p><b>6 no. Workfront</b></p> <table border="1" data-bbox="304 1093 1406 1451"> <thead> <tr> <th>Plant / Equipment</th><th>Quantity</th></tr> </thead> <tbody> <tr> <td>Piling Rig</td><td>6</td></tr> <tr> <td>Drilling Rig (For Post-construction work)</td><td>6</td></tr> <tr> <td>Mobile Crane (45 T)</td><td>3</td></tr> <tr> <td>Air Compressor</td><td>2</td></tr> <tr> <td>Generator</td><td>2</td></tr> <tr> <td>Grout Pump Station</td><td>2</td></tr> <tr> <td>Backhoe</td><td>6</td></tr> <tr> <td>Welding machine</td><td>8</td></tr> </tbody> </table> <table border="1" data-bbox="304 1473 1393 1713"> <thead> <tr> <th>Manpower</th><th>Quantity</th></tr> </thead> <tbody> <tr> <td>General Labour</td><td>28</td></tr> <tr> <td>Driver</td><td>9</td></tr> <tr> <td>Rigger</td><td>16</td></tr> <tr> <td>Operator</td><td>12</td></tr> <tr> <td>Fire Marshall / WPIC</td><td>6</td></tr> </tbody> </table> <p>Power will be supplied through generator to the mini pile work construction area. Fire extinguisher will be placed for every piling rigs / drilling rigs since there is no fire detection system. Existing MAG shall be relocated to our proposed RP fencing under the method statement. This site setup and logistic arrangement shall be adopted after the relocation so that the ingress and egress of the Mainline via the existing MAG would not be affected to other users under <b>Figure 6.1.1</b>.</p>	Plant / Equipment	Quantity	Piling Rig	6	Drilling Rig (For Post-construction work)	6	Mobile Crane (45 T)	3	Air Compressor	2	Generator	2	Grout Pump Station	2	Backhoe	6	Welding machine	8	Manpower	Quantity	General Labour	28	Driver	9	Rigger	16	Operator	12	Fire Marshall / WPIC	6
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Rigger	16																														
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Fire Marshall / WPIC	6																														



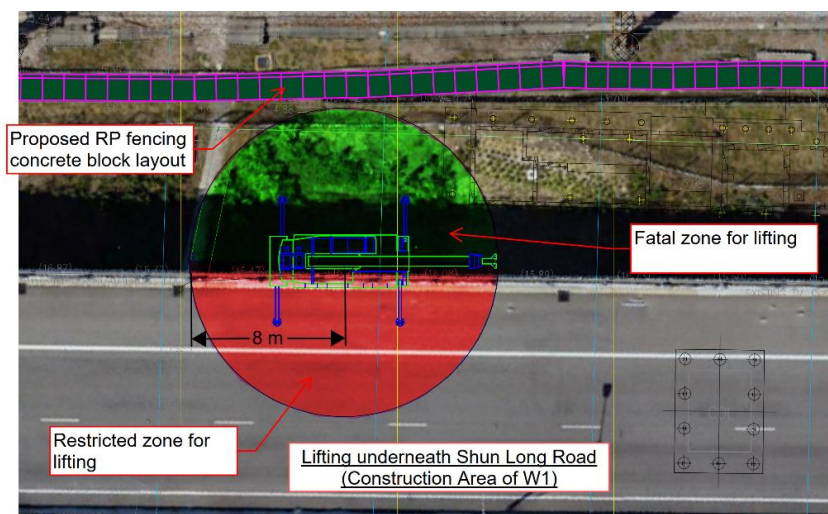


**Figure 6.1.1 Site Set up and Logistic Arrangement during Foundation Stage (Access Road Level)**

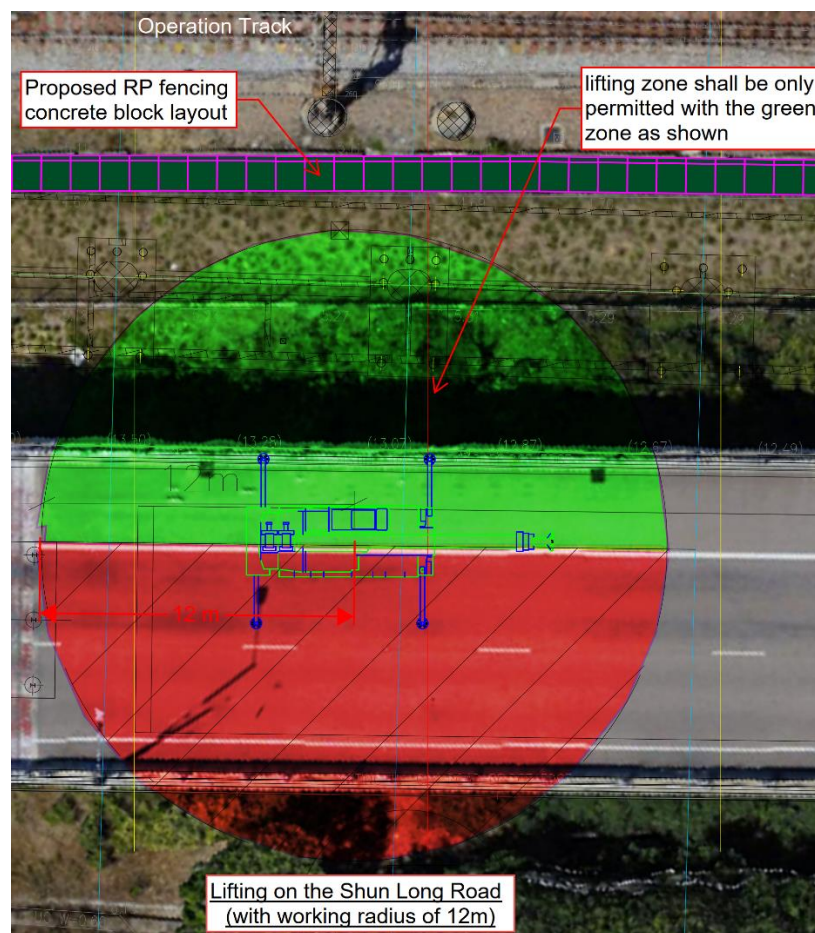


**Figure 6.1.2 Site Set up and Logistic Arrangement during Foundation and Tower Crane Erection Stage (Viaduct Level)**

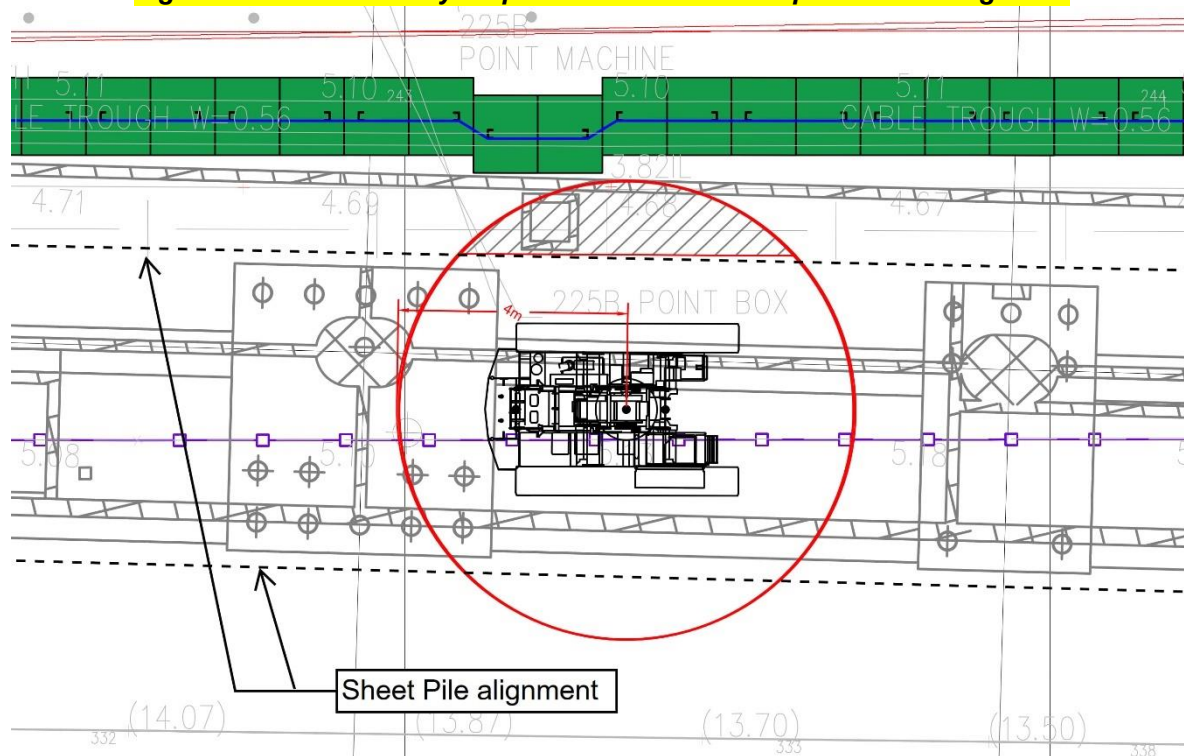
For lifting method, the 7m Height Railway Protective fencing will be installed (with an extent of at least 25m each side of piling location) before the mini-piling works for protection such as lifting of casing, rebars and other materials during piling operation. During the lifting work, banksman will supervise the movement with direction along the track and maintain the clearance from the RP fencing (with minimum 500mm). The site set up and logistic arrangement plan as shown in **Figure 6.1.1 & 6.1.2**. The lifting height should be controlled within the 7m, as protected by the fencing with working radius with at least 500mm clearance to the as-constructed RP fencing. Lifting plan as shown in **Figure 6.1.3, 6.1.3A & 6.1.3B** for lifting plans at the working area. Temporary Traffic Management Scheme at Shun Long Road by Highway Department under separate submission.



**Figure 6.1.3 General layout plan & Fatal zone set-up beneath Shun Long Road (Critical)**



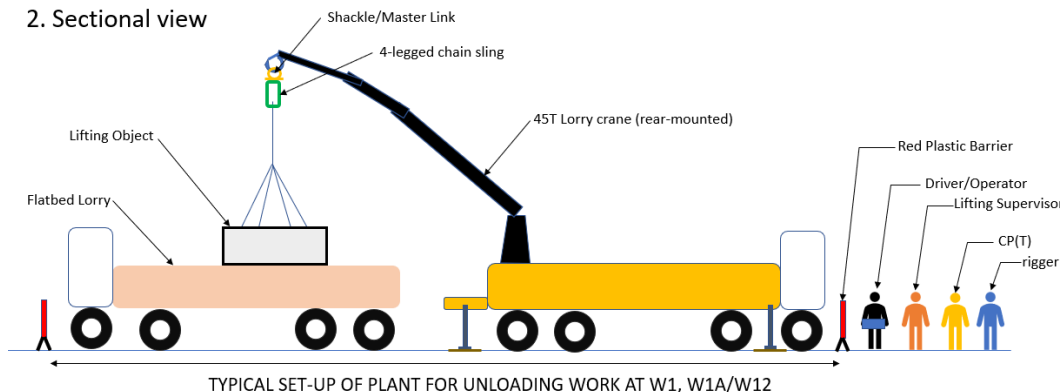
**Figure 6.1.3A General layout plan & Fatal zone set-up on Shun Long Road**



**Figure 6.1.3B Fatal zone set-up for hydraulic crawler crane within mini pile construction**



## 2. Sectional view



**Figure 6.1.4 General layout plan & Fatal zone set-up**

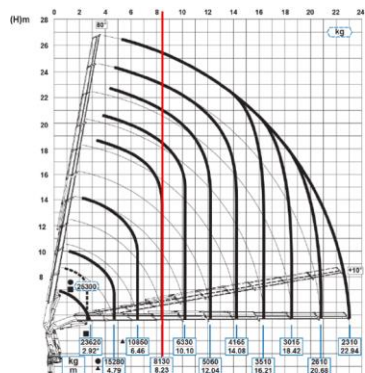
### Lifting Arrangement

Set up the overall location of mini pile construction works at W1. The weight of a bundle of T50 rebar is 2 tons, 0.47 ton for a 323 CHS casing with 6m in length with the lifting capacity of crane lorry reduced to 80% of its original SWL. Load of lifting gears must be counted as part of the lifting load. Outrigger of the crane lorry shall be full extended before lifting works. No part of the crane lorry will work beyond the water filled barrier as shown with **Figure 6.1.4**. The lifting plan and load chart as shown in **Figure 6.1.3, 6.1.3A and 6.1.5**. Fatal zone shall be fenced off by red plastic barrier. Unless otherwise mentioned, unauthorized person is forbidden to enter lifting area as refer to **Figure 6.1.4**.

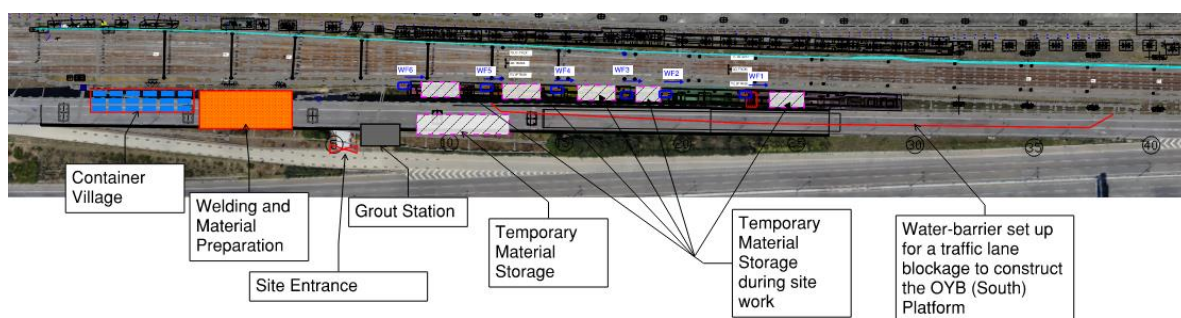
Lifting Item No.	Lifting Objective Description	Weight (T)
1	Air compressor	5.5
2	Sand Treatment Plant	2
3	Generator	4
4	A bundle of T50 rebar	2
5	A 323x10mm thk. casing (6m in length)	0.47

#### Lifting Plan for Work Area W1

MODEL: 955/9S (EFFER, ITALY)  
BOOM LENGTH: 8m  
WORKING RADIUS: 8m @ S.W.L.=8.13T  
WEIGHT OF LIFTING OBJECT: 5.5T (CRITICAL CASE)  
WEIGHT OF LA/LG: 0.3T  
TOTAL WEIGHT: 5.5+0.3=5.8T  
LIFTING CAPACITY: 5.8T/8.13T=71.34%



**Figure 6.1.5 Crane lorry lifting chart under Safe Working Load (S.W.L.)**



**Figure 6.2 Utilization Plan & Overall logistics plan**

Utilization Plan and the site set up as shown in **Figure 6.2**. No flammable materials shall be stored at 6m measured from the Railway Fence. A site demonstration of how to lift the 6m long rebar from the rebar storage area and insert into the drilled hole is required for prior approval. The traffic shall be entered the site from the site entrance as shown below through the Depot Access road and exit the

site by the site entrance or Shun Long Road. No material including plants, containers, huts etc. shall be stored within 2m plan distance from the railway fence / railway protection fence. Lifting supervisor should supervise the lifting works and LG and rigging method should be approved under the method statement and BUGN of General lifting works. Two nylon tail ropes shall be provided during lifting operation to prevent twist of the lifted rebar / casing as shown in **Figure 6.3**.



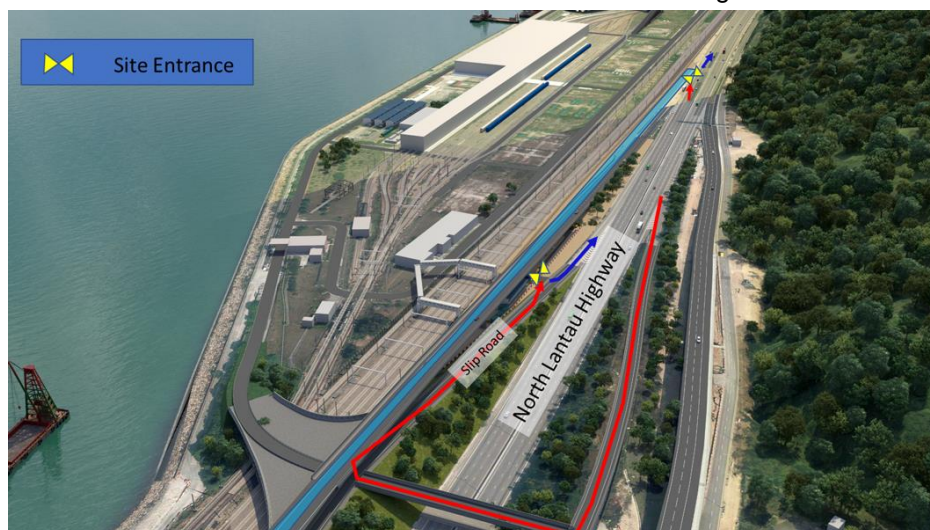
**Figure 6.3 Utilization Plan & Overall logistics plan**

## 7. Traffic and Security Management

The access to the site shall be as follows:

### **Contractor Vehicle Arrangement**

- Access to the OYB southern station structure and associated bifurcation works will be via site entrance at Depot Access Road and Shun Long Road, one traffic lane for Shun Long Road is closed with water-filled barriers hatched in blue as shown in Figure 7.1.



**Figure 7.1 Access to the OYB Southern Station Structure**

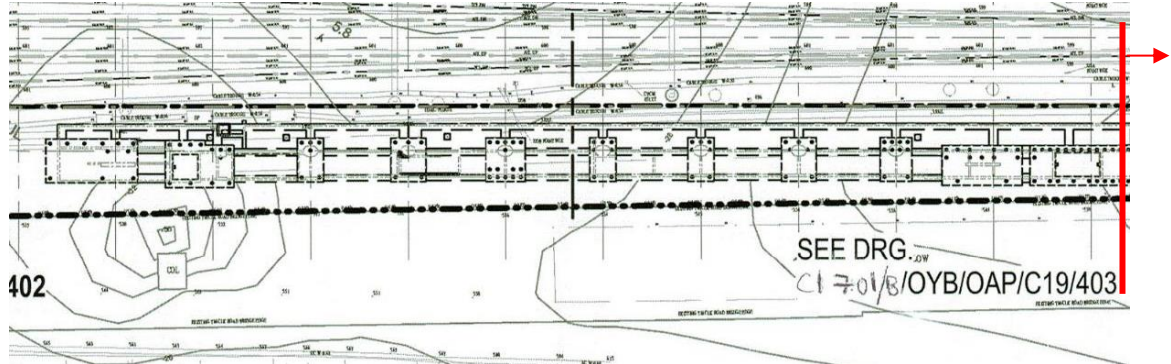
### **Worker Verification**

- 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.



## 8. Construction Methods / Construction Sequence Drawings

There are 205 mini piles at Oyster Bay Station (South) (OYB(S)). The installation of mini piles will be undertaken within CA of the OYB(S) work site. Layout plan as shown in **Figure 8.0.1 & 8.0.2**. All mini-piles are located within 10m from the proposed RP fencing and require EDOC.

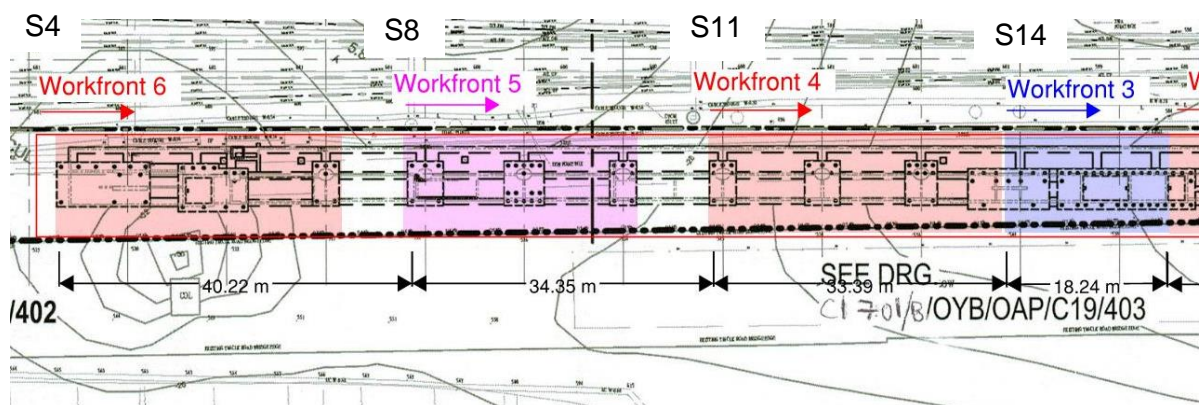


**Figure 8.0.1 – Mini-Pile Layout Plan (1)**

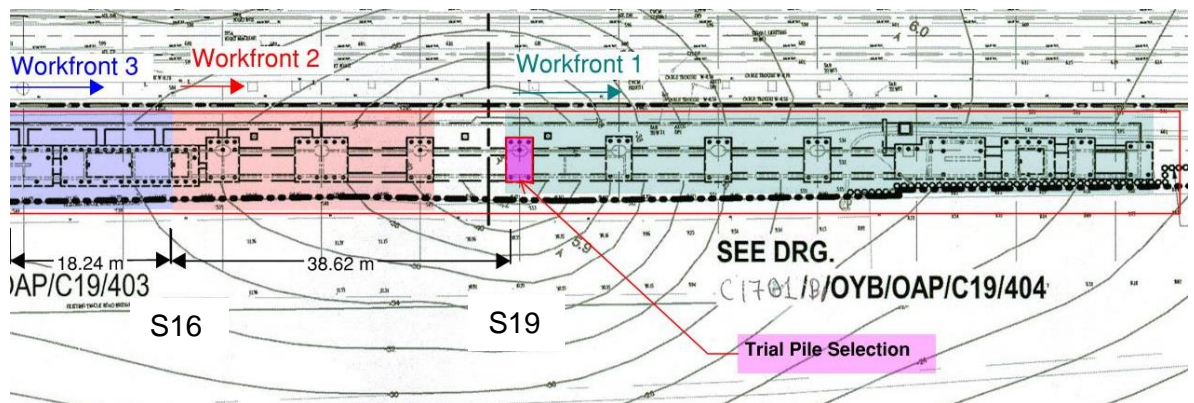


**Figure 8.0.2 – Mini-Pile Layout Plan (2)**

There shall be maximum with 6 nos. of work-front as shown in **Figure 8.0.3 & 8.0.4**, starting at Grid S19 for Workfront 1 due to the trial pile works and continue to east direction and remaining 5 work-front starting at Grid S16 for Workfront 2 to the east direction, Grid S14 to the east for Work-front 3 and Grid line S11 to the east for Work-front 4, Grid S8 to the east for Work-front 5 and Grid S4 to the east for Work-front 6. The proposed work flow may be revised subject to the actual site condition and progress. Active monitoring zone shall be provided with the Workfront shown in **Figure 8.0.3 & 8.0.4**.



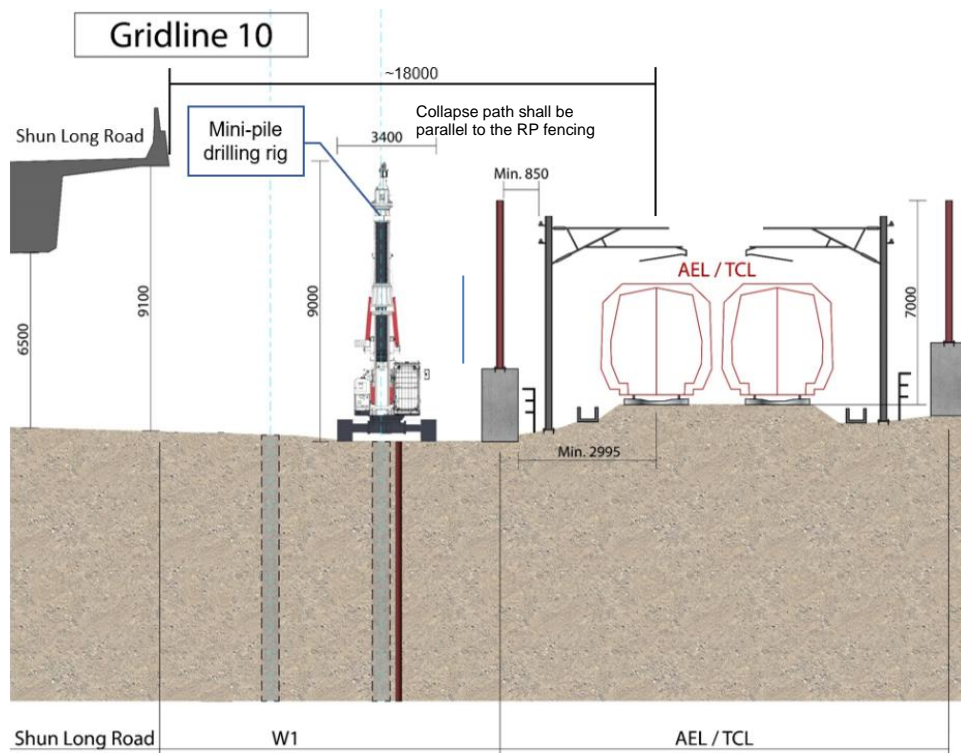
**Figure 8.0.3 – No. of work-fronts and direction of proposed work flow (1)**



**Figure 8.0.4 – No. of work-fronts and direction of proposed work flow (2)**

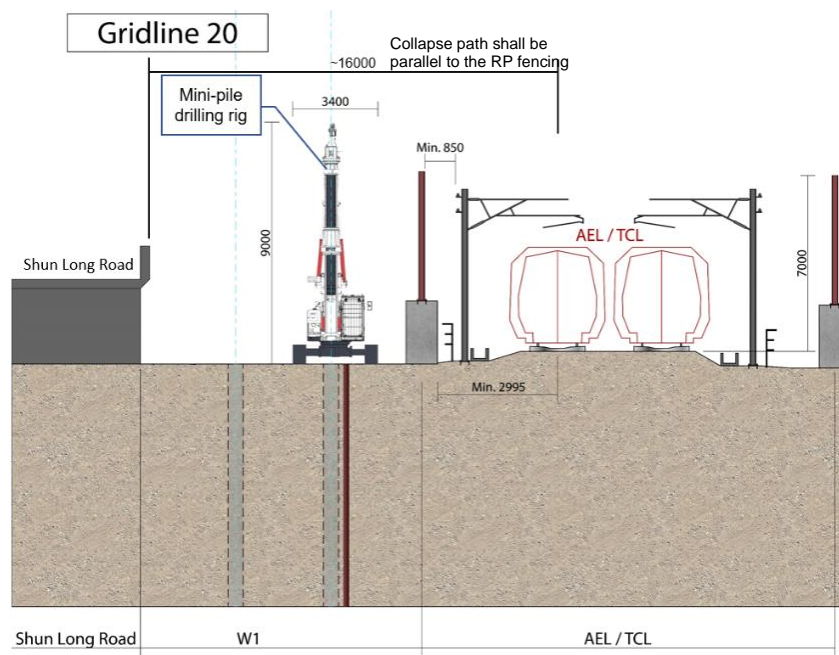
Those piles located within 10m of the railway protection fence will be subject to approval of an Engineering Document (EDOC) prior to works commencing due to potential of the works to impact on the operational railway. Those piles subject to an EDOC will also be limited to the use of 6m high casings.

**Figure 8.0.5** and **Figure 8.0.6** show the relationship for mini-pile installation and the existing track works.



**Figure 8.0.5 – Section A – A (G.L. S10)**

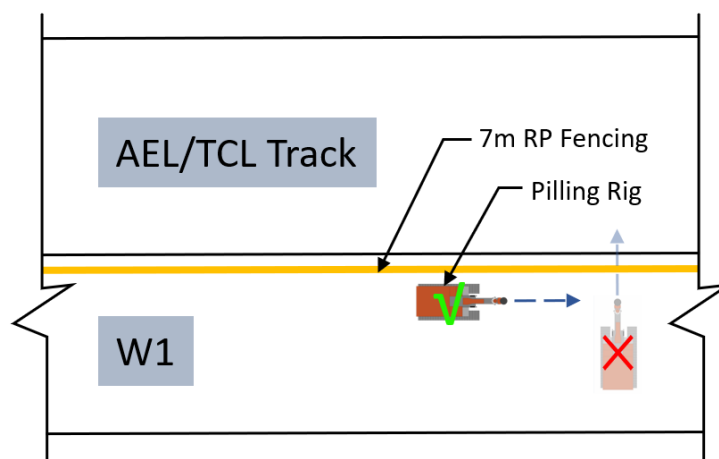




**Figure 8.0.6 – Section B – B (G.L. S20)**

The collapse path shall be parallel to the RP fencing so that the collapse of piling rig would not affect the proposed RP fencing works by 1701.

Common materials to be lifted are steel casing and bar for mini-pile. Lifting plan refers to separate method statement for General Lifting Plan. Considering the failure of clamping the steel casing during drilling, the sitting orientation of the drilling rig should parallel with AEL/TCL Track. That way, even if the steel casing falls down, it falls to the side instead of falling towards AEL/TCL Track. (referring to Figure 8.0.7)

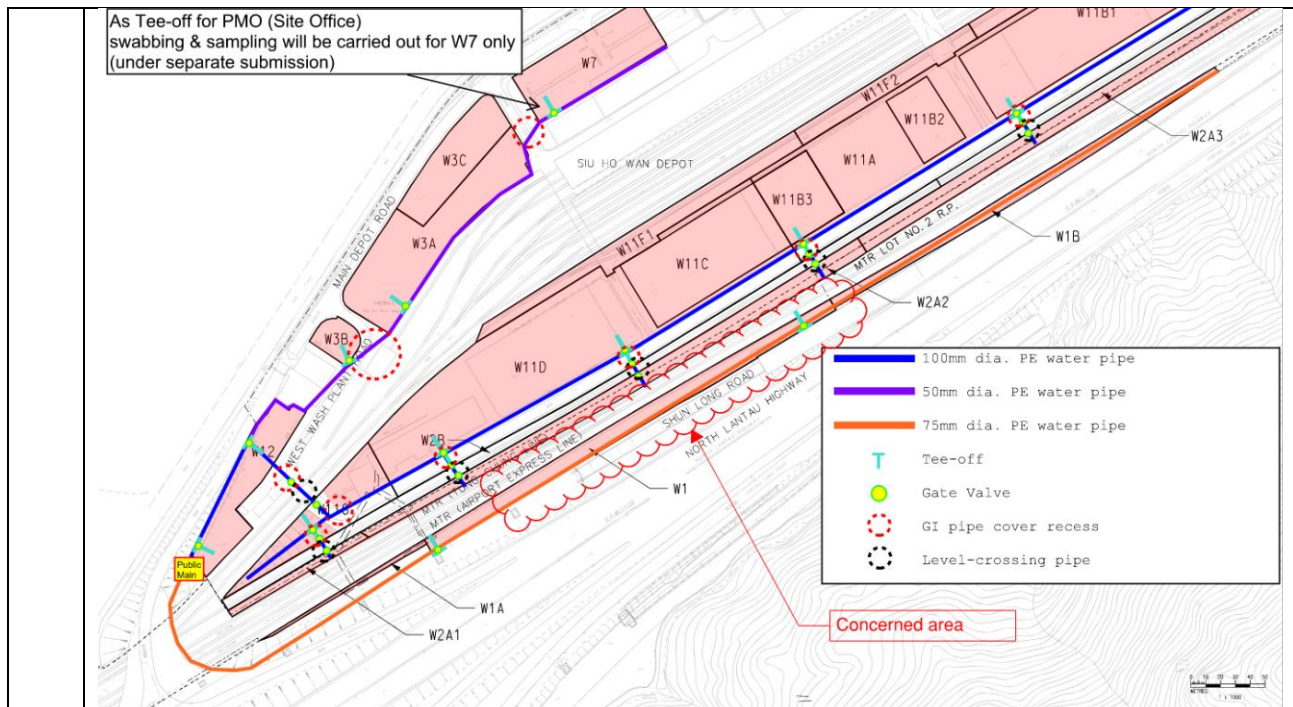


**Figure 8.0.7 – Orientation of Piling Rig**

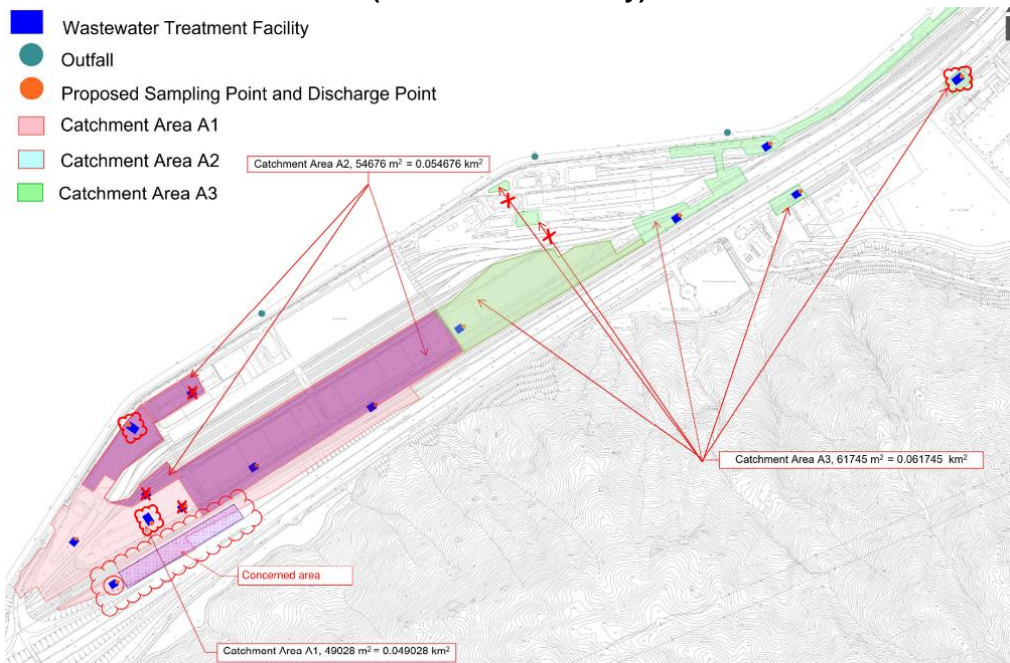
**Temporary water supply & Temporary sewerage treatment plan**

The water supply shall be provided by the public main near Tai Ho Interchange as shown in Figure 8.0.8. The sewerage treatment plan with discharging point as shown in Figure 8.0.9. Both of works are submitted under separate method statement submission.





**Figure 8.0.8 Temporary water supply plan  
(For information only)**



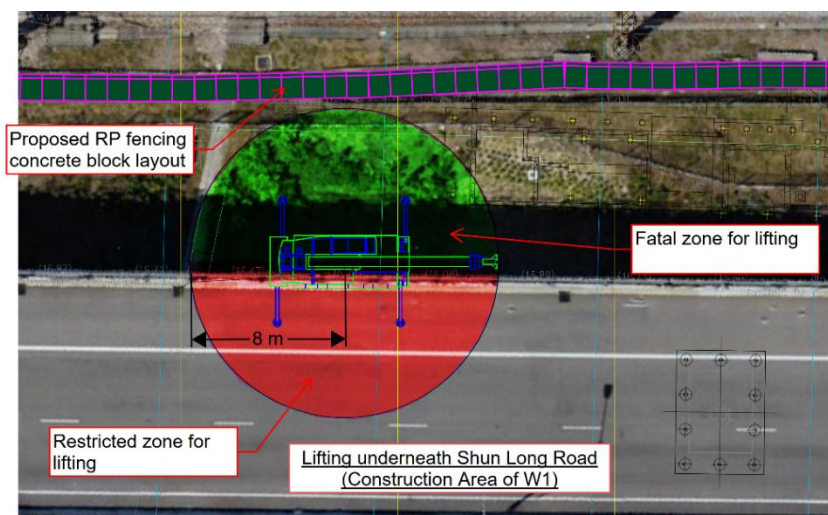
**Figure 8.0.9 Wastewater Treatment Facilities and Proposed Discharge Points  
(For information only)**

### Pre-Work Protection

The lifting procedure will be suspended if the RP fence is damaged or incompleteness of RP fence with an extent of at least 25m from each side of piling location or under strong wind condition and unfavourable weather as summarized in the hazard Log on the EDOC.

All movement of lifting works will be supervised by lifting supervisor in order to maintain the clearance (with minimum 500mm) from the RP fencing so as to minimise the effect on OHL post or consequence of any accident of lifting works. The lifting details are described in **Figure 8.0.10**.

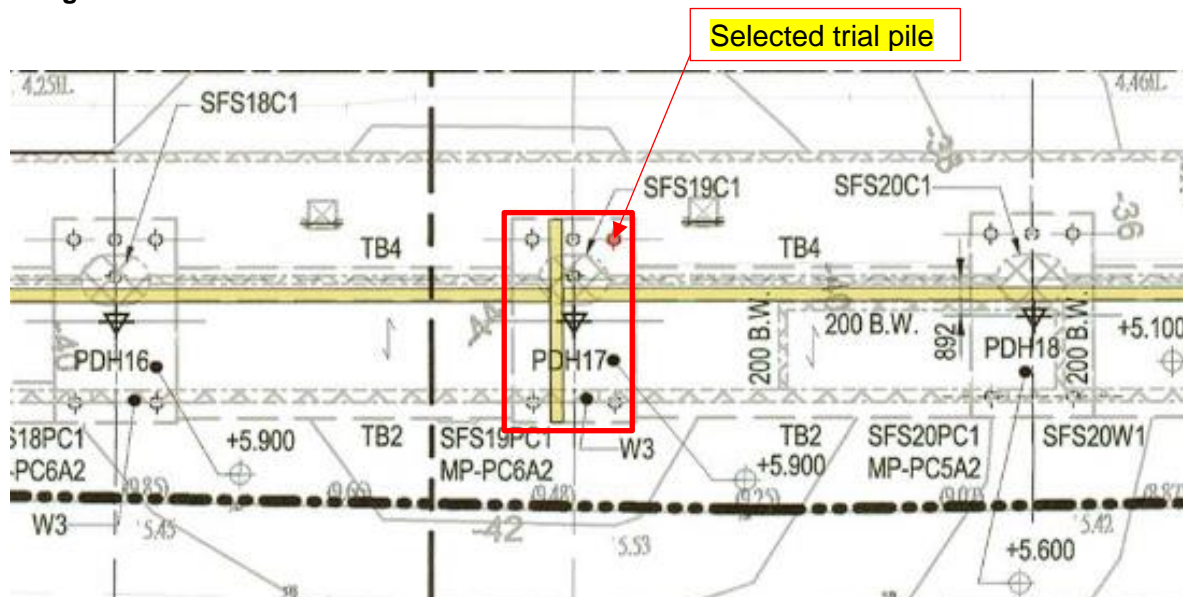
Welding works will be carried out for this construction work within the Construction Area (C.A.). All equipment will be placed in a designated location for these dangerous goods. Fire safety equipment such as fire extinguisher at each work front and face mask for the workers shall be provided on site. The maximum quantity of the acetylene cylinder is 4 sets and no smoking is allowed near that storage area. The location will be coordinated with MTR representatives in W1 zone for ensuring it can fulfil the storage requirements.



**Figure 8.0.10 Lifting plan for Mini Pile**

### 8.1 Trial Pile

Trial piles for mini piles are required to be completed prior to commencing with the remainder of the works. The selected trial pile by the Building Department is **SFS19PC1-MP6** shall be carried out to verify the design assumptions before commencement of any mini-piles. Pre-drilling at mentioned pile shall be selected with PDH17 shown in **Figure 8.1.1** with detail shown for the selected trial pile in **Figure 8.1.2**.

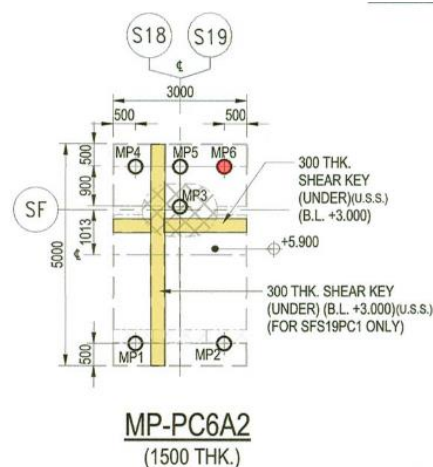


**Figure 8.1.1 – Layout plan for the Trial Pile (SFS19PC1-MP6)**  
**(Drawing No. C1701/B/OYB/OAP/C19/404 Rev.B)**

- Predrilling shall be completed for all piles within the same pile group prior to commencement of pile construction of the pile group in accordance with PNAP APP-18 and carried out such



that the toe of every pile is within 5m distance from a pre-drilling hole as shown in the approved plan.



**Figure 8.1.2 Foundation Pile Detail Type MP-PC6A2  
(Drawing No. C1701/B/OYB/OAP/C19/011 Rev.B)**

- Predrilling shall be sunk at least 5m into Category 1(c) or better rock with total core recovery not less than 85% and with uniaxial compressive strength (UCS) not less than 25MPa or Point load index (PLI/50) not less than 1MPa (i.e. Category 1(c) in Table 2.1 or Code of Practice for Foundation 2017) or the designed rock socket length of the nearest pile, whichever is deeper. The number of tests conducted should be such that there is at least 1 such test performed on rock specimen taken within 5m of every installed pile. Testing should be carried out by a laboratory accredited under the HOKLAS. (Under separate submission on "Predrilling Works at CAs 10m away nearest track" and "Predrilling works within 10m from nearest track".)
- 3 point load tests shall be carried out at each pre-drill location.
- All pre-drill holes shall be backfilled by tremie method with a grout of strength with 30MPa.
- Pre-drilling shall be carried out with Standard Penetration Tests (SPT) shall be carried out at 2m intervals. Termination criteria of SPT as follows: 1. The SPT-N value is equal to or larger than 50, and 2. Grade V or better material (determined by Class 4 or better soil sample obtained by SPT liner or equivalent) is encountered.
- The record of predrilling works for trial pile should be submitted to BD for completion.

#### Post-construction proof drilling

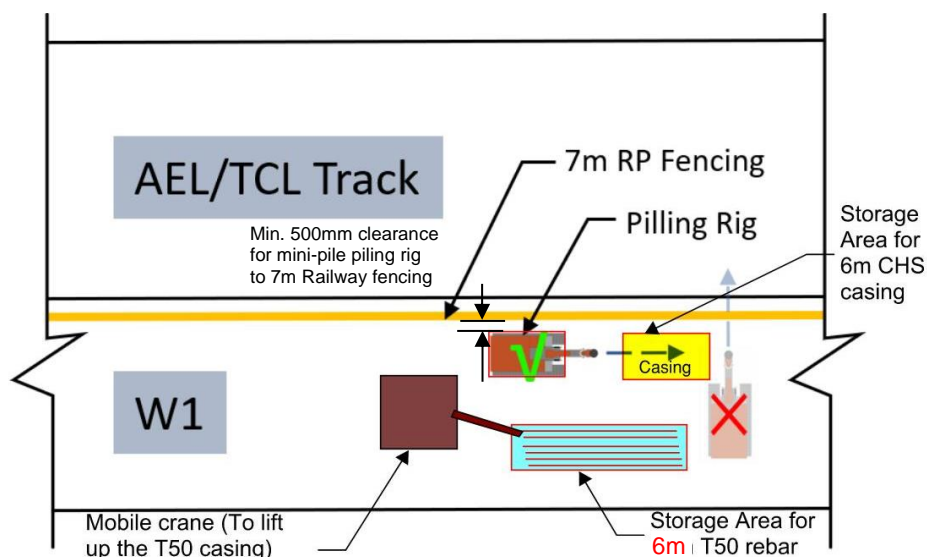
- 2 additional proof drill holes shall be conducted for 100 or less pile and 1% of the number of piles or site with more than 100 piles.
- The proof drill holes should be sunk to at least 5m below the as-built top level of the rock socket of the nearest pile or to the as-built bottom level of the rock socket, whichever is deeper, to verify the rockhead profile and hence assess the adequacy of the socketed length of these piles.

#### **8.2 Procedures of Mini-Pile Construction**

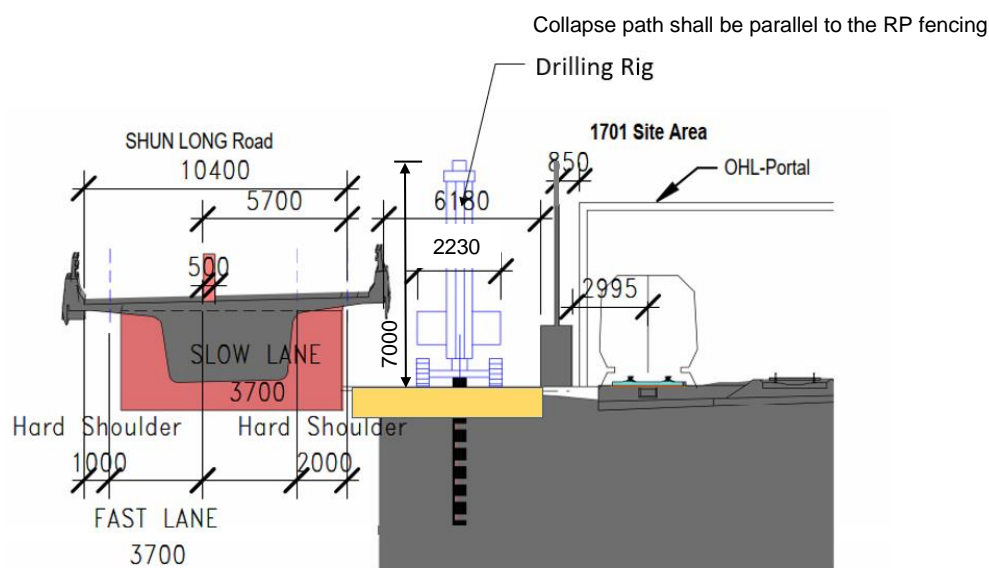
- The exact location of mini-pile should be set out and conduct inspection pit under separate submission with Utilities Detection Report under the construction area under separate method statement. Permit to dig shall be submitted before drilling. No 2 pile shall be constructed simultaneously within 10m plan distance. 50 ton crawler crane shall be adopted for lifting work within work-front. (Refer to separate method statement for general lifting work).



- Setting out plan as shown in **Figure 8.2.1**.
- A grade S275 mild steel permanent casing shall follow the drill bit down to bedrock level, and the casing shall not be withdrawn. Full penetration butt weld will be the connection of the permanent steel casings under the BD approved drawings.
  - Construction tolerances are as follows:  
Setting out tolerance at top of mini-pile to be  $\pm 15\text{mm}$  and inclination tolerance to be 1:100 from the longitudinal pile axis. The tolerances will be closely monitored by setting out survey and spirit level checking with joint inspection prior to the grouting work commence.
  - After reaming of the rock socket to the required depth, the hole shall be flushed with clean water to remove any debris.
  - Grout tubes shall be tied to the whole length of the reinforcement which shall consist of 5 nos. T50 high yield steel bars with 6m of length per each rebar with staggering of couplers must be minimum 200mm as per approved BD drawing. 20mm clearance between the bars shall be achieved by spacers and continuity of reinforcement shall be achieved by using couplers in a staggered arrangement along the full length of the pile. Sitting plan for the rebar please refer to **Figure 8.2.1** as shown below. For the location within the abutment of the existing viaduct after Gridline S10, the lifting radius should keep at least 200mm clearance as shown to **Figure 8.2.2**.
  - During installation and drilling for the mini-pile, verticality, inclination and alignment of the mini-piles should be closely monitored. **Small eyes safety green net shall be mounted at the RP fence facing W1 site are to prevent spread of muddy water into Mainline.** Method statement shall be submitted for approval prior to commencement of the works. Records of test result shall be submitted to Project Manager prior to concreting and results shall satisfy the allowable tolerances and dimension.
  - Advance casing to 300mm below bedrock level or such other depths as required to avoid caving of soil at the interface of soil and sound bedrock during cleaning of the rock socket whilst maintaining verticality check.



**Figure 8.2.1 – Set up of sitting plan by Reaction Piles (For information only)**



**Figure 8.2.2 – Sectional drawings for the location of viaduct & work area W1 for mini-pile**

- h. Form the rock socket of minimum 240mm diameter to the founding level as required using down the hole drilling method with air as the flushing medium or other method approved by Project Manager.
- i. The 5 numbers T50 high yield bars shall be placed centrally in the hole and couplers shall be used to extend the reinforcement. No more than 3 couplers shall be placed at the same level. Coupler shall be submitted with another material submission (ACC Reference No. **1701-W-000-CSC-775-000252**) and the installation method shall be approved under separate submission under BD approval list.
- j. The mini-pile shall be tremie grouted under water in one continuous operation. Cement gout is pumped by pressure from the top of the hole and displacing water upwards form the bottom.
- k. Adequate safety precautions shall be taken during construction of piles in close proximity of the existing buildings. Safety precautionary measures should be submitted to Project Manager before commencement of works.

### **8.3 Reaction Pile (For proof tension load test of mini-pile)**

Due to insufficient area for carrying out pile load testing, reaction pile shall be proposed.

- Post-construction proof drilling shall be conducted with at least 2 number of drill holes to verify the quality of the rock forming of rock socket.
- Selection of proof-tension load test by Building Authority after submission of BA14. For the method statement of loading test, we shall submit under separate submission.
- With reference to the Code of Practice for Foundation 2017, under Section 8.4, the general procedure of the pile load compression test,
  - (a) The pile should be load tested at the cut-off level with no allowance for group effect;
  - (b) The test load should be applied in 2 equal increments up to the design pile capacity under working load, then released and reapplied in 4 equal increments up to twice the design pile capacity under working load and maintained for at least 72 hours before removal;
  - (c) The load at each incremental stage should be held for a period of 10 minutes or longer until the rate of settlement is less than 0.05 mm in 10 minutes;

- (d) The test load should be measured by a calibrated load measuring device and also by a calibrated pressure gauge in the hydraulic system;
- (e) For piles resisting axial load with a diameter or least lateral dimension not exceeding 750 mm, the test is deemed to be unsatisfactory if any of the following conditions apply:
  - (i) the maximum settlement at the head of the pile during the test exceeds the value

$$\frac{2WL}{AE} + \frac{D}{120} + 4\text{mm},$$

where

**W** is the design pile capacity under working load in kN;

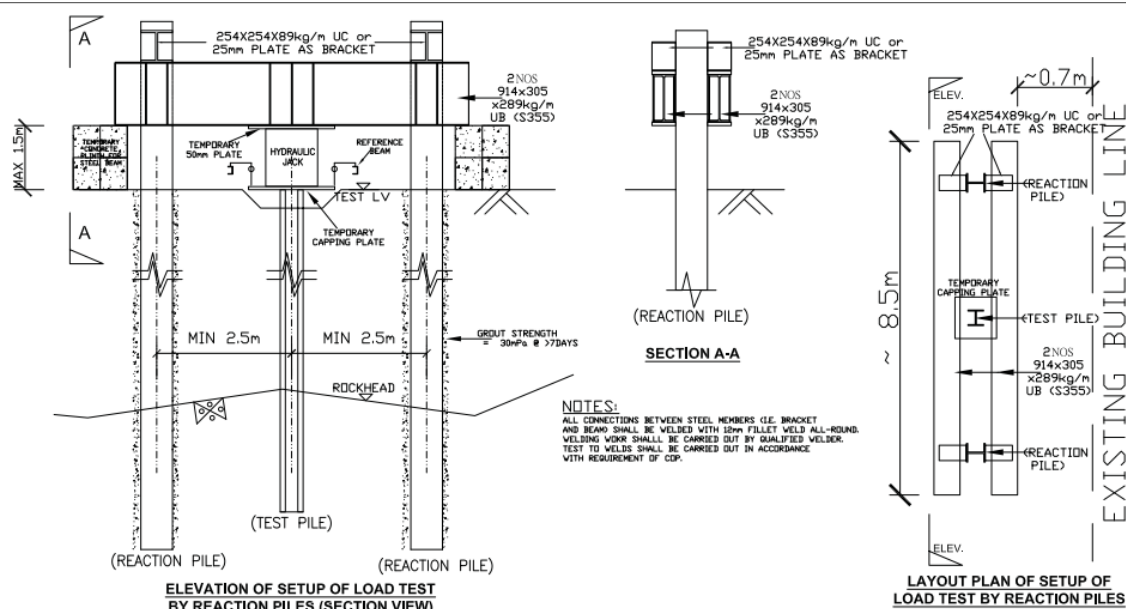
L is the length of the pile in mm (For piles with rock sockets, L should be measured to the centre of the rock socket. For piles without rock sockets, L may generally be measured to the pile toe;

**A** is the cross-section area of the pile in mm<sup>2</sup> ;

**E** is the Young's modulus for the material of the pile in kN/mm<sup>2</sup> ; and

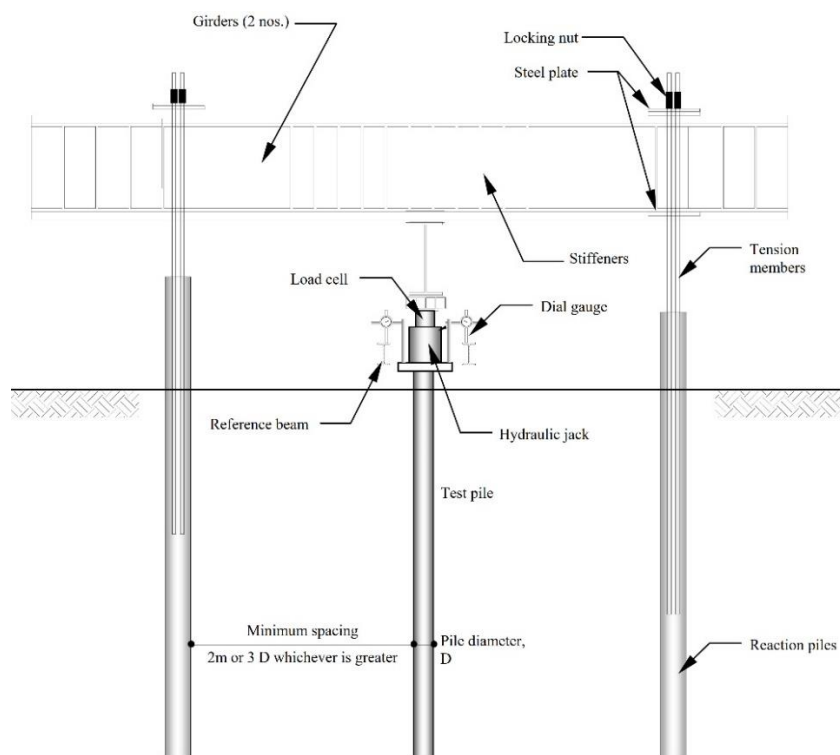
**D** is the least lateral dimension of the pile in mm;

- (ii) when the rate of recovery after the removal of the maximum test load is less than 0.1 mm/hour observed in a period of not less than 15 minutes, the residual settlement at the head of the pile exceeds the greater of the following:  
D/120 + 4 mm; and  
25% of the maximum pile head settlement during the test;
- (f) In calculating the elastic compression/extension of the test pile, the following should be considered for mini-piles: The contribution from steel bars, cement grout and steel casing along the whole length L.



**Figure 8.3.1 – Set up of Load Test by Reaction Piles (For information only)**  
**(Design for the detailed set-up shall be under separate submission)**





**Figure 8.3.2 – Set up of the Compression Test using Reaction Piles from GEO Pub No.1/2006**

## 9. Safety (Risk Assessments)

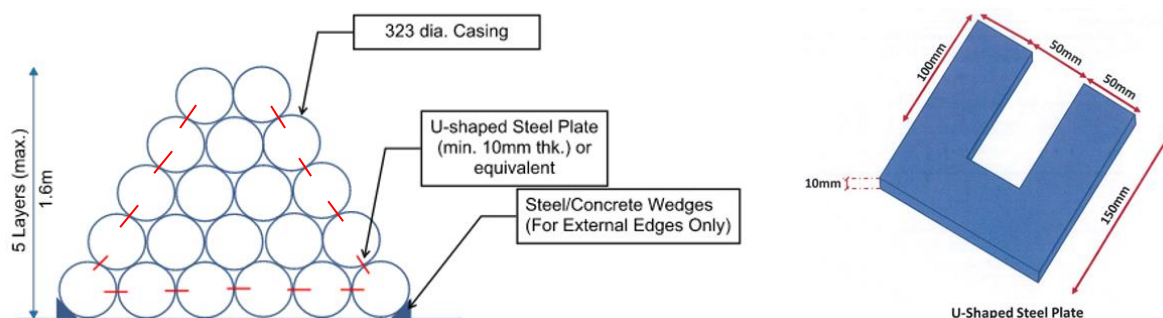
Risk Assessment attached in **Appendix A** has been prepared for all general activities. Specific safety procedures and precautions have been developed for all site operatives to follow. The Construction Manager together with the RSO, will supervise the implementation and make adjustment according to the actual site operations, in order to maintain a safe and amicable working environment.

### Plant

- No part of the mobile crane/crane lorry will work beyond the water filled barrier and the maximum lifting load shall be <80% of Safety Working Load (SWL).
- Load of lifting gears must be counted as part of the lifting load.
- For any lifting operation by crane lorry, the mobile crane / crane lorry outriggers must be fully extended and the unsafe zone will be fenced off.

### Material

Stacking of steel casing should be arranged as below figure.



**Figure 9.0.1 – Stacking of steel casing with steel plate**

- The steel casing shall be stored underneath Shun Long Road where is far from the mainline. Temporary material storage area shall provide 2 wedges for each side. U-shaped steel plate shall be used for one side only as shown in MS Figure 9.0.1.

#### **Smoke Arrangement**

- All workers can only smoke at the smoking area that demarcated by CSHK refer to Figure below.

#### **Risk Assessment**

##### **Facilities for Smoke Area**

- Cigarette Butt Receptacle
- Fire Extinguisher
- Sand Bucket



All the potential hazards, consequences and mitigations will be analysed in the risk assessment attached in the **Appendix A**.

#### **10. Environmental** (Environmental aspect & impact identification as well as mitigation measures)

- Works should be carried out during 0700 to 1900 on normal working days. No PME will be used after 1900 on normal working days and Sundays and public holiday with unless with a valid construction noise permit (CNP).
- The works shall follow relevant mitigation measures as required under the Environmental Permit (EP) / EP submission and *Contractor's* Environmental Management Plan (EMP).
- ULSD diesel will be used in all PME.
- Plant with QPME label will be employed, if available.
- All chemicals will be placed on drip trays.
- For site clearance, water spray will be carried out during the work to prevent dust generation.
- Waste water treatment and discharge will be installed on site. The details shall refer to the separate Method statement which will be submitted separately.

	<ul style="list-style-type: none"> <li>- Only regulated NRMM with approved NRMM label to be used on site.</li> <li>- Air compressors capable of supplying compressed air at 500 kPa or above must be affixed with noise emission labels.</li> </ul>
<b>11.</b>	<b>Quality Control</b> (Inspection and Test Plan including hold points)
	<p>Refer to <b>Appendix B</b> 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 &amp; 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 &amp; 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 RSS following inspection of the works by the CSHK's project team. The Inspection &amp; Test Plan for the works (<b>Appendix B</b>) will identify all Hold Points and Witness Points.</p> <p>Following the Inspection &amp; 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> <p>All materials used should be approved by Project Manager.</p>
<b>12.</b>	<b>Appendices</b> (Identify and include additional information in the submission package)
	<p>Appendix A - Risk Assessment</p> <p>Appendix B - Inspection and Test Plan (ITP)</p> <p>Appendix C - Catalogue for Equipment</p> <p>Appendix D – Drawings of Mini-pile Works (For information only)</p> <p>Appendix E – Response to Comment</p>