



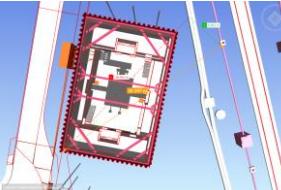
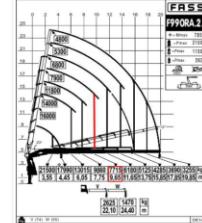
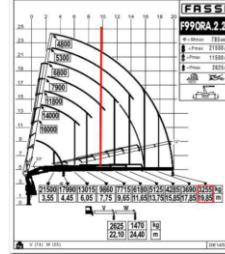
MS Reference Number:	CSHK	CET	MS	C	2024	000115
ACC Reference Number:	1701	W	000	CSC	760	000155

METHOD STATEMENT TITLE	Rev. C
Method Statement for Installation of Sheet Piles for the Temporary Underfloor Wheel Lathe	

	Prepared by:	Checked by:	Reviewed by:	Reviewed by:
Signature:				
Name:	Andy Lo	Ted Leung	Leung Kwok Fung / Hui Wai-Kwan	MH Isa / WH Lam
Position:	Engineer	Construction Manager	SM/SO	QM/QE
Date:	27/5/24	27/5/24	27/5/24	27/5/24
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Signature:				
Name:	James Ma 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:	27/5/24	27/5/24	27/5/24	27/5/24

**Document Title:** Method Statement for Excavation and Lateral Support for the Temporary Underfloor Wheel Lathe  
**Document Revision:** 22-Feb-24  
**Deadline:** 28-May-24

Item	Section	Reference	Comment	Contractor's Response					
1	SHD-Dev	7.2 Utilities detection Page 15	<p>Following the BUGN requirements, survey shall be conducted on railway equipment / facilities to ensure protection measures can be applied. Survey of railway facilities at ground level, and further detection will be conducted by the Contractor for underground utility prior to work commencement. The report for the survey for underground utility and railway facilities at ground level with protection details shall be submitted to MTR.</p>	<p>Underground Utilities Detection was carried out and Underground Utilities Survey Report was issued to MTR for reference. Within the area of construction of Temporary Underfloor Wheel Lathe Sheet Piles, only one utility was found within the area and that utility shall be abandon by another contract 1732. Therefore, with reference to the information, no existing utility is within the area of Temporary Underfloor Wheel Lathe.</p>					
2	SHD-Dev.	Appendix K Permit-to-dig	<p>A FS pipe was damaged by a contractor's excavator recently. Following the incident, the following changes have been suggested to Permit-to-Dig system:-</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">The safe distance during excavation by using machinery should be addressed on the permit to dig.</td></tr> <tr> <td style="padding: 5px;">The types of machinery and excavation methods should be specified on the permit-to-dig and the allowed operation area should be demarcated on site</td></tr> <tr> <td style="padding: 5px;">Appoint a designated engineer to approve the permit-to-dig. <b>Specific training should be provided to the responsible engineer for briefing on the permit-to-dig issuance procedure.</b></td></tr> <tr> <td style="padding: 5px;">The permit-to-dig should countersign by the designated engineer after verifying the accuracy of the permit-to-dig and the information in UU report. Work can only commence after approval from the designated engineer.</td></tr> <tr> <td style="padding: 5px; color: red;"><b>The responsible engineer should participate in the briefing for the permit-to-dig to explain the planned excavation method and sequence.</b></td></tr> </table> <p>Pls consider amending 1701 Permit-to-Dig system accordingly. Kindly clearly state the reasons why the changes are considered inapplicable otherwise.</p>	The safe distance during excavation by using machinery should be addressed on the permit to dig.	The types of machinery and excavation methods should be specified on the permit-to-dig and the allowed operation area should be demarcated on site	Appoint a designated engineer to approve the permit-to-dig. <b>Specific training should be provided to the responsible engineer for briefing on the permit-to-dig issuance procedure.</b>	The permit-to-dig should countersign by the designated engineer after verifying the accuracy of the permit-to-dig and the information in UU report. Work can only commence after approval from the designated engineer.	<b>The responsible engineer should participate in the briefing for the permit-to-dig to explain the planned excavation method and sequence.</b>	<p>Permit-to-Dig system was updated and attached in Appendix K for your reference.</p> <p>The permit to dig is issued by the Site Agent or Construction Manager. He/She is responsible to brief the Engineer for the underground utilities in the area in the Permit to Dig. The Engineer will brief the plant operators and workers in a training and sign on the Permit to Dig for record. A Chinese version method statement and layout plan will be also presented in the briefing section.</p>
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<b>The responsible engineer should participate in the briefing for the permit-to-dig to explain the planned excavation method and sequence.</b>									
3	RP	-	Please find my comments which are marked in Red in the attached returned file. (refer to Yu Sir email)	The comments are addressed and attached in the email for your reference.					
4	RP	-	<p>Figure 7.1.1 refers, please provide a layout plan showing the clearance between the sheet pile and railway facilities to justify the extent of 5m height sheet pile.</p>	<p>The figure 7.7.1 is updated to show the minimum extend of maximum 5m height sheet pile for your reference.</p>					

			The setup location of the silent piling machine and the relationship between the railway facilities shall be considered.	The setup location is around 29m, which is a screenshot captured in the Navisworks model and attached in Figure 7.7.3 for your reference. 						
5 RP	-		PA works shall be applied when the sheet pile location was 10m measure from the railway facilities.	Noted. PA works will be input in ETMS system before commencement of work within 10m from the railway facilities if necessary. This sentence also added to section 7.7 Step 3 for clarification of the works.						
6 RP	-			<p><b>3. Crane lorry lifting chart and the corresponding Safe Working Load (SWL) (WITHIN 10M ZONE FROM OHL POST)</b></p> <table border="1"> <thead> <tr> <th>Lifting Item No.</th> <th>Lifting Objective Description</th> <th>Weight (T)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Sheet Pile</td> <td>0.3 ton</td> </tr> </tbody> </table> <p><b>Lifting Plan for Lifting a Type 3 Sheet Pile 5m</b> MODEL: F990RA.2.28 (FASSI, ITALY) BOOM LENGTH: 19.85m WORKING RADIUS: 9.65m @ S.W.L.=7.715T WEIGHT OF LIFTING OBJECT: 0.3T (CRITICAL CASE) WEIGHT OF LA/LG: 0.3T TOTAL WEIGHT: 0.3+0.3=0.6T LIFTING CAPACITY: 0.6T/7.715T=8%</p> 	Lifting Item No.	Lifting Objective Description	Weight (T)	1	Sheet Pile	0.3 ton
Lifting Item No.	Lifting Objective Description	Weight (T)								
1	Sheet Pile	0.3 ton								
7 RP	-		Appendix D, proposed TUFWAL lifting plan (stage 1) refers, the operation zone for the 32T crane lorry was found intruded into the existing railway facilities which is not acceptable. The jib length shall be specified. The lifting capacity of the crane lorry shall not exceed 80% of SWL. Section showing the critical lifting works shall be provided. The collapse path of the lifting works shall not intrude to the railway facilities.	<p><b>3. Crane lorry lifting chart and the corresponding Safe Working Load (SWL)</b></p> <table border="1"> <thead> <tr> <th>Lifting Item No.</th> <th>Lifting Objective Description</th> <th>Weight (T)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Sheet Pile</td> <td>0.72 ton</td> </tr> </tbody> </table> <p><b>Lifting Plan for Lifting a Type 3 Sheet Pile 12m</b> MODEL: F990RA.2.28 (FASSI, ITALY) BOOM LENGTH: 19.85m WORKING RADIUS: 19.85m @ S.W.L.=3.255T WEIGHT OF LIFTING OBJECT: 0.72T (CRITICAL CASE) WEIGHT OF LA/LG: 0.3T TOTAL WEIGHT: 0.72+0.3=1.02T LIFTING CAPACITY: 1.02T/3.255T=31%</p> 	Lifting Item No.	Lifting Objective Description	Weight (T)	1	Sheet Pile	0.72 ton
Lifting Item No.	Lifting Objective Description	Weight (T)								
1	Sheet Pile	0.72 ton								
8			Setting out survey should be conducted in quality hold point with RISC prior to the commencement of installation.	Noted. Inspection and Testing Plan is updated accordingly.						
9			As-built survey of installed sheet piles should be conducted after piling works.	Noted. Inspection and Testing Plan is updated accordingly for the as-built record of the sheet piles installation with RISC form.						
10			Please provide the calculation of edge distance for the holes of sheet pile (12m)	Noted. Calculation for one lifting hole is attached in Appendix N. Because two lifting hole is used for safety measures, therefore two lifting holes can fulfill the lifting requirement of sheet pile.						
11			What will be using for counter weight? A bundle of sheet piles? Concrete block? Please advise the lifting arrangement.	Concrete blocks will be used and attached the setup photos for reference in Appendix P.						
12			The ground condition should be checked by ICE.	Outrigger Pad will be used with at least 3 times the square surface area of the outrigger shoe to fulfil the safety measures of lifting works.						
13			Please provide the lifting radius, LA & LG information and weight of materials, rigging method etc.	With the use of crane lorry with EN12999 qualification, the details of LA/LG will be larger than 80% of the lifting weight (720kg). The rigging method with shackles will be provided for the lifting works of sheet piles, which 2 holes will be provided and checked with calculation. For more details, please refer to Appendix D						
14			This MS not include the installation of ELS. Why the RA have the lifting works for ELS works? Please clarify.	The Method Statement only include the installation of the sheet pile. The Risk Assessment is updated accordingly.						
15			Permit to operate should be included.	Permit to Operate is attached in Appendix O for reference.						
16			Hot work permit should be included.	Noted. Hot Work Permit is attached in Appendix M for reference.						

17		Section 9 Environmental - Please add: - The works shall follow relevant mitigation measures as required under the Environmental Permit (EP) / EP submissions and Contractor's Environmental Management Plan (EMP)	Noted. The wordings are added in Section 9.
18		Why trial pit after commencement of piling? Wrong sequence.	Noted. The Inspection and Testing Plan is updated accordingly. The wording in the construction sequence also updated accordingly.
19		There is no welding mentioned in the work method and procedure. Please clarify.	Welding works will be carried out during the installation of sheet piles. The welding works are included in the construction sequence and risk assessment for your reference. The welding procedure and material submission for welding will be under separate submission and shall be approved before commencement of welding works.
20		What's the inspection required?	The inspection can be referred to the Inspection and Testing Plan in Appendix B.
21	Yu Sir	The Plan on Page 3	Where is the existing fence; OHL Masts and OHL ? Please indicate it clearly on the Plan.
22	Yu Sir	The Plan on Page 3	The distance of the sheet pile wall at various location to the existing fence, OHL Mast, OHL and track shall be clearly dimensioned on the Plan.
23	Yu Sir	Para. 6 on page 6	Since the piling work will be carried out by using silent piler, what is the purpose of having a Vibrator ?
24	Yu Sir	Para. 6 on page 6	Fire Marshall shall be provided since Welder is included in the Manpower list.
25	Yu Sir	Para. 7.3.1 on Page 15	Fire warden can be provided and nominated by our safety department if the construction works is within Construction Area.
26	Yu Sir	Para. 7.3.2 on Page 15	What measures will be provided to prevent the concrete fragments fly into OA area during concrete breaking?
27	Yu Sir	Para. 7.3.2 on Page 15	Water will be splashed during breaking concrete works and green net is provided to prevent the concrete affecting the Operation Area.
28	Yu Sir	Para. 7.4 on Page 16	Please confirm is Trail Pit required or not here. Cannot just say " if necessary" . If Trial Pit will be excavated, please indicate it location and size as well as safety precautionary measures will be provided.
29	Yu Sir	Para. 7.5.1 – 7.5.3 on Page 16 - 19	If there are no underground utilities along the sheet pile location in Temporary Underfloor Wheel Lathe, trial trench will not be carried out after the blinding concrete is broken. If there are any underground utilities within the sheet pile area, the trial trench is 500mm width x 2.5m depth will be carried out. For this situation, the underground utilities survey report stated that no existing underground utilities within this construction area. The underground utilities survey report was submitted (ACC Ref: 1701-W-000-CSC-810-000257), and attached in Appendix P for reference. The statement is written in Section 7.3.2
30	Yu Sir	Para. 7.6.1 on Page 20	Why excavation work shall be inspected by a CP once a week ? What is CP here stand for ?
31	Yu Sir	Para. 7.6.1 on Page 20	With reference to the Underground Utilities Survey Report (Ground-penetrating radar GPR), there is no existing underground utilities within the TUFWL sheet pile area. Therefore, UU CP will inspect the excavation works weekly and WPIC will inspection the inspection works daily.
32	Yu Sir		The cable and draw pit are within the sheet pile location. After on site and survey check, the draw pit and PVC ducts are within the sheet pile area but no cable is inside the draw pit, therefore no utilities diversion is required. Attached the location plan and site photo for reference.
33	Yu Sir		
34	Yu Sir	Appendix C	Please be alerted that before commencement of sheet piling work, all necessary monitoring instrumentation shall be installed and initial readings taken. The initial readings shall be agreed with MTR Railway Protection and joint survey with MKTR Railway Protection to agree on the Initial Readings is required.
35	Yu Sir	Para. 7.6.1 on Page 20	Briefing works will be carried out by the China State Engineer, Safety Department, and under the witness of MTR SIOW, IOW and Safety Department before commencement of works. The plant operator will be signed on the attendance to confirm his operation area during the construction works.
36	Yu Sir	Para. 7.6.1 on Page 20	During sheet piling work, how to overcome hard material if encountered ?
37	Yu Sir		High pressure water jet along the sheet pile will be carried out to solve this issue.
38	Yu Sir		How to ensure the verticality of the sheet piling work ?
39	Yu Sir		A spirit level will be used to check the verticality of the sheet pile at 0m, 4m and 8m.
40	Yu Sir		Some items in the Risk Assessment in Appendix A are not relevant to this submitted Method Statement for installation of sheet piles such as Installation of ELS; shall be revised and amended
41	Yu Sir		Noted. The risk assessment is updated accordingly.
42	Yu Sir		Appendix C is titled as Temporary Works Design, but on the Emergency Contact List attached ??
43	Yu Sir		Noted. The topic is updated to "Emergency Contact List"

35	Yu Sir	Appendix D	Appendix D is titled as Catalogue for Equipment but only a lifting plan attached . The lifting plan is incomplete as well.	Noted. The topic is updated to "Lifting Plan of Silent Piling Machine and Steel Material"
36	Yu Sir	Appendix E	Appendix E is titled as Shop Drawing but only catalogue of the silent piler attached ?	Noted. The topic is updated to the "Catalogue of Silent Piling Machine"
37	Yu Sir		1. Figure 7.1.1 on Page 14 of 47 :- The opening radius of the mobile crane is beyond the water filled barrier and encroached into the adjacent OA & track area. This is unacceptable. A shorter jib shall be adopted. Besides, before EDOC approved, no part of the jib of the crane shall encroached within 10m area from the adjacent OHL / live track.	<p>Please refer to the lifting plan below.</p> <p>1. General Layout Plan &amp; Fatal Zone Set-up for W3A (WITHIN 10M ZONE FROM OHL POST)</p> <p>1. General Layout Plan &amp; Fatal Zone Set-up for W3A For Sheet Pile Installation Works</p>
38	Yu Sir		1. Figure 7.6.2 on page 21 of 47 : Please mark up the 10m line (10m from the adjacent OHL/live track) on the plan.	<p>Noted. The 10m line is marked in Figure 7.6.2 for your reference.</p> <p>Figure 7.6.2: Showing the Height Of Sheet Piles Of Each Location.</p>
39	Yu Sir		1. Figure 7.7.3 & &7.4 on Page 24 of 47 :- The mentioned 29m distance is misleading. The closet distance between silent piling machine and the OHL Posts shall be measured from the SOP03.	This figure mainly responds to Rtc No.5 regarding the setup location of the silent piling machine. For the entire sheet piling installation works, the silent piling machine can handle the corner works without requiring any lifting during the installation of the corner sheet pile. Therefore, there is only one designated setup location, SOP01, which aligns with figures 7.7.3 and 7.7.4.

## CONTENT

1. Introduction
2. Reference Documents
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4. Responsibilities for Activities described within Method Statement
5. Programme and Working Hours
6. Plant, Equipment & Material
7. Construction Methods / Construction Sequence
8. Safety
9. Environmental
10. Quality Control
11. Appendices



1.	<b>Introduction</b> (Overview of the operation/works)
	<p>This method statement describes the proposed construction method and sequence of the construction method for the installation of sheet piles for the Temporary Underfloor Wheel Lathe. The workmanship shall comply with the working drawing and general and particular specifications in Section 2.0. This method statement covers the TUFWL area, and we note some sheet piles are located within 10m measuring from the OHL mast of the existing Underfloor Wheel Lathe, and therefore those sheet piles will NOT be commenced prior to approval of the related EDOC.</p>
2.	<b>Reference Documents</b> (Identify relevant documents by name and reference number)
	<ul style="list-style-type: none"> <li>General Specification for Civil Engineering Works (NEC4) (MTR Corporation Limited – 2022)</li> <li>Contract 1701 working drawings</li> <li>Buildings Department Approved drawings of Excavation and Lateral Support for the Temporary Underfloor Wheel Lathe (refer to <b>Appendix J</b>)</li> </ul>

<b>3.</b>	<b>Details of Sub-Contractor/Specialist Sub-Contractor</b>																												
	Sunny Wealth Civil Engineering Limited is the sub-contractor for this construction work. This contractor is responsible for installing the sheet pile for the Temporary Underfloor Wheel Lathe.																												
<b>4.</b>	<b>Responsibilities for Activities described within Method Statement</b>																												
	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="10">China State Construction Engineering (Hong Kong) Limited</td><td>Ted Leung (63452668)</td><td>Construction Manager</td></tr><tr><td>Li Yuk Wa (91287583)</td><td>Assistant Construction Manager</td></tr><tr><td>Jack Wong (97760711)</td><td>Senior Engineer</td></tr><tr><td>Andy Lo (96375991)</td><td>Engineer</td></tr><tr><td>Edward Yang (54665752)</td><td>Graduate Engineer</td></tr><tr><td>Kyle Lai (69317392)</td><td>Graduate Engineer</td></tr><tr><td>Cheung Siu Kei (90803168)</td><td>Superintendent</td></tr><tr><td>Wong Yu Fung (54239789)</td><td>Senior Foreman</td></tr><tr><td>Pun Chi Ho (56282947)</td><td>Foreman</td></tr><tr><td>Sunny Wealth Civil Engineering Limited</td><td>So Kwun Piu (92066144)</td><td>Project Manager</td></tr><tr><td></td><td>Lee Yin Hau (60960227)</td><td>Foreman</td></tr></tbody></table>	Company	Name	Position	China State Construction Engineering (Hong Kong) Limited	Ted Leung (63452668)	Construction Manager	Li Yuk Wa (91287583)	Assistant Construction Manager	Jack Wong (97760711)	Senior Engineer	Andy Lo (96375991)	Engineer	Edward Yang (54665752)	Graduate Engineer	Kyle Lai (69317392)	Graduate Engineer	Cheung Siu Kei (90803168)	Superintendent	Wong Yu Fung (54239789)	Senior Foreman	Pun Chi Ho (56282947)	Foreman	Sunny Wealth Civil Engineering Limited	So Kwun Piu (92066144)	Project Manager		Lee Yin Hau (60960227)	Foreman
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	Emergency Team contact list is enclosed so that work can be safely arranged to suspend for contingency/ reasons. Please refer to <b>Appendix C</b> .																												
<b>5.</b>	<b>Programme and Working Hours</b> (Start & finish date of operation/works)																												
	The works are scheduled to commence in late-May 2024. The general working hours will be from 08:00 – 19:00 daily, from Monday to Saturday. However, it may be required to carry out works from 19:00 to 23:00 and Sunday and Public Holidays if Noise Permit is obtained.																												

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.</p> <p>The major plants and equipment that will be deployed to carry out the works are approximately as follow, which is subject to site condition: –</p> <table border="1"><thead><tr><th><b>Plant / Equipment</b></th><th><b>Quantity</b></th></tr></thead><tbody><tr><td>45 ton crane lorry (with EN12999 qualification)</td><td>1</td></tr><tr><td>Excavator, 13 tonnage to 30 tonnage, or equivalent</td><td>1</td></tr><tr><td>Generator</td><td>2</td></tr><tr><td>Silent Piling Machine, Model SA100 or equivalent</td><td>1</td></tr><tr><td>Welding Machine</td><td>2</td></tr><tr><td>Concrete blocks</td><td>10</td></tr></tbody></table> <table border="1"><thead><tr><th><b>Manpower</b></th><th><b>Quantity</b></th></tr></thead><tbody><tr><td>CP(T) or CP(NT)</td><td>1</td></tr><tr><td>Rigger</td><td>1</td></tr><tr><td>Banksman</td><td>1</td></tr><tr><td>Plant Operator</td><td>2</td></tr><tr><td>Welder</td><td>2</td></tr><tr><td>Skilled workers</td><td>4</td></tr></tbody></table>		<b>Plant / Equipment</b>	<b>Quantity</b>	45 ton crane lorry (with EN12999 qualification)	1	Excavator, 13 tonnage to 30 tonnage, or equivalent	1	Generator	2	Silent Piling Machine, Model SA100 or equivalent	1	Welding Machine	2	Concrete blocks	10	<b>Manpower</b>	<b>Quantity</b>	CP(T) or CP(NT)	1	Rigger	1	Banksman	1	Plant Operator	2	Welder	2	Skilled workers	4
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## 7.1 Fencing and site clearance

7.1.1 Before carrying out construction works, the area will be fenced off as per the approved method statement, Installation of Water Filled Barrier at W3 and W7 Erection of Container and Site Office at W7 Site Clearance at W3 (ACC Reference Number: 1701/W/000/CSC/000053. The details can be found below. The access point is also shown in the below figure.



Figure 7.1.1: It shows the arrangement of the water-filled barrier at W3A and W3C (extracted from Method Statement – Installation of Water-Filled Barrier at W3 and W7 Erection of Container and Site Office at W7 Site Clearance at W3)

- 7.1.2 Site clearance for above ground will be carried out with the use of grab lorry, as per the approved method statement, Installation of Water Filled Barrier at W3 and W7 Erection of Container and Site Office at W7 Site Clearance at W3 (ACC Reference Number: 1701/W/000/CSC/000053).

## 7.2 Utilities detection

- 7.2.1 Utilities detection and Ground Penetrating Radar (GPR) survey will be carried out after the area was fenced off and after the obstacle above ground are cleared. The details of carrying out utilities detection shall follow the approved Method Statement for General Underground Utility Survey for Construction Area (ACC Reference Number: 1701/W/000/CSC/760/000095). Based on the master drawings of all utilities, it shows that only one cable in this area.

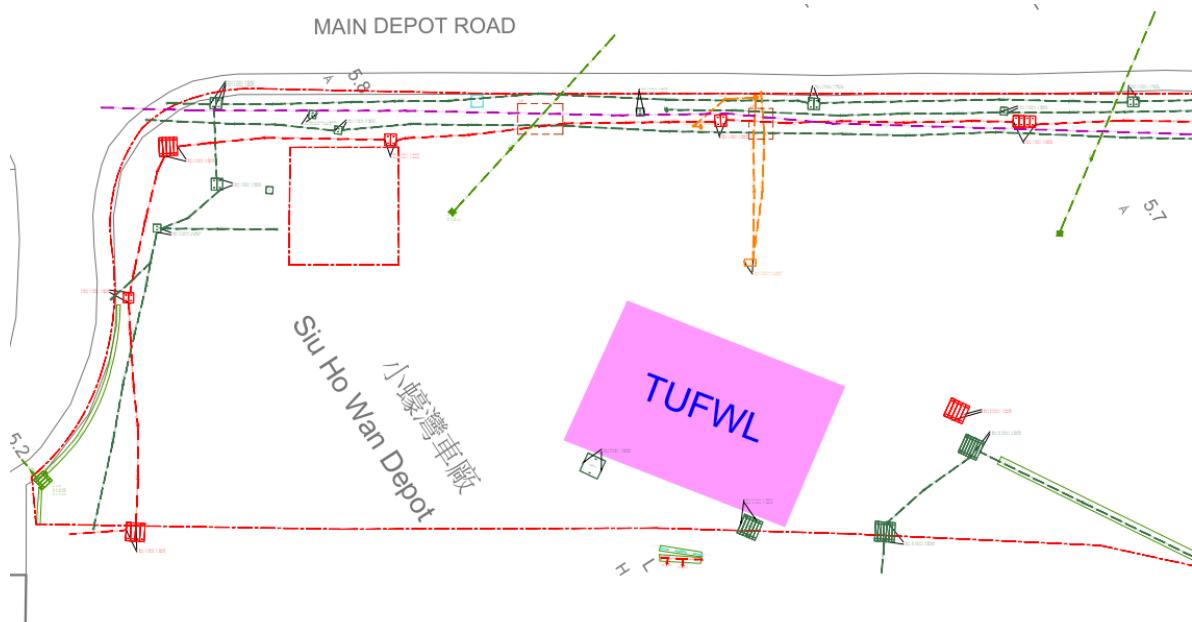


Figure 7.2.1: Underground Utilities around Temporary Underfloor Wheel Lathe

### 7.3 Breaking Existing Concrete and Trial Trench (if necessary)

- 7.3.1 Breaking the existing concrete with the use of excavator and hydraulic breaker. As per the approved method statement, Installation of Water Filled Barrier at W3 and W7 Erection of Container and Site Office at W7 Site Clearance at W3 (ACC Reference Number: 1701/W/000/CSC/000053).
- 7.3.2 If there are no underground utilities along the sheet pile location in Temporary Underfloor Wheel Lathe, trial trench will not be carried out after the blinding concrete is broken. If there are any underground utilities within the sheet pile area, the trial trench is 500mm width x 2.5m depth will be carried out. For this situation, the underground utilities survey report stated that no existing underground utilities within this construction area. The underground utilities survey report was submitted (ACC Ref.: 1701-W-000-CSC-810-000257), and attached in Appendix P for reference.

### 7.4 Abandoned existing utility by other contract 1732

- 7.4.1 No Underground utility diversion will be carried out within the location of the Temporary Underfloor Wheel Lathe. Referring to RFI 028(Temporary Underfloor Wheel Lathe – Obstruction of Existing Antenna Tower and Diversion details of existing E&M Drawpits) (attached in Appendix L) response from MTR, one existing cable and drawpit (highlighted in yellow) and drawpit are within this construction area of sheet pile will be abandoned by Contract 1732 or Contract 1701.

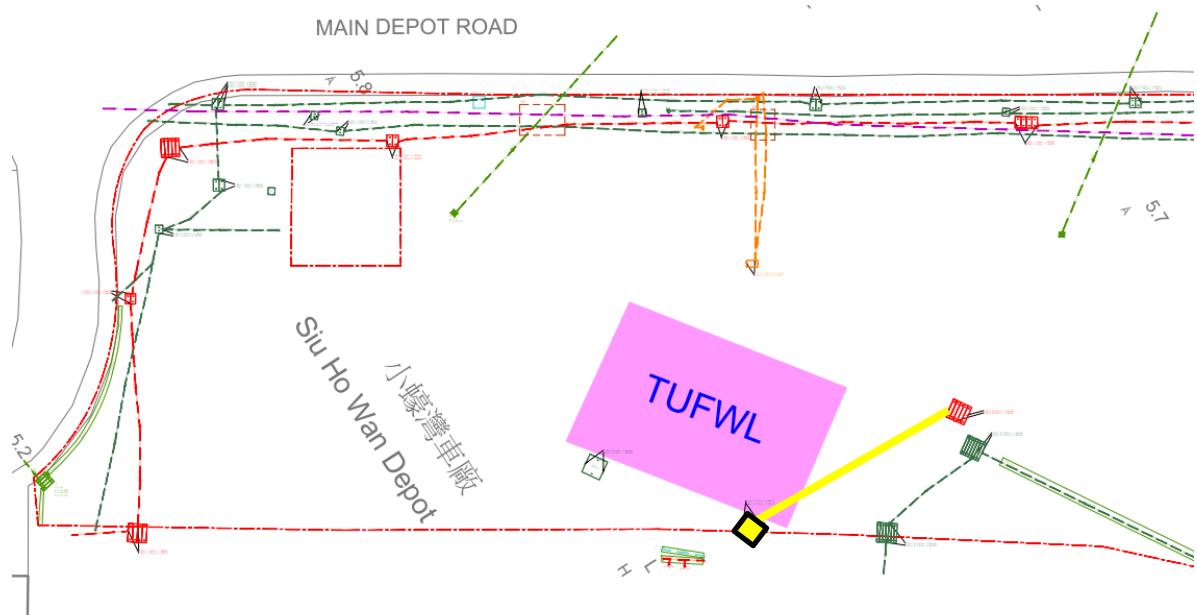


Figure 7.4.1 : Underground Utilities around Temporary Underfloor Wheel Lathe

## 7.5 Instrumentation and Monitoring Plan

7.5.1 Setting up instrumentation monitoring plan and taking initial readings as per the working drawings 1701-W-SHD-OAP-C06-051 and 1701-W-SHD-OAP-C06-052 attached in **Appendix I**. The method statement for setting up instrumentation monitoring will be under a separate submission, which is Method Statement for Instrumentation and Monitoring Works at Operations Area (OA) (ACC Reference Number 1701/W/000/CSC/760/000122) and Method Statement for Instrumentation and Monitoring Works at Construction Area (CA) (ACC Reference Number 1701/W/000/CSC/760/000138). For those works on the existing live track, another document Edoc will be submitted to the Railway and Protection Department. For those standpipe and piezometer, it will be installed at the location which are 10 meters far away from the existing live tracks.

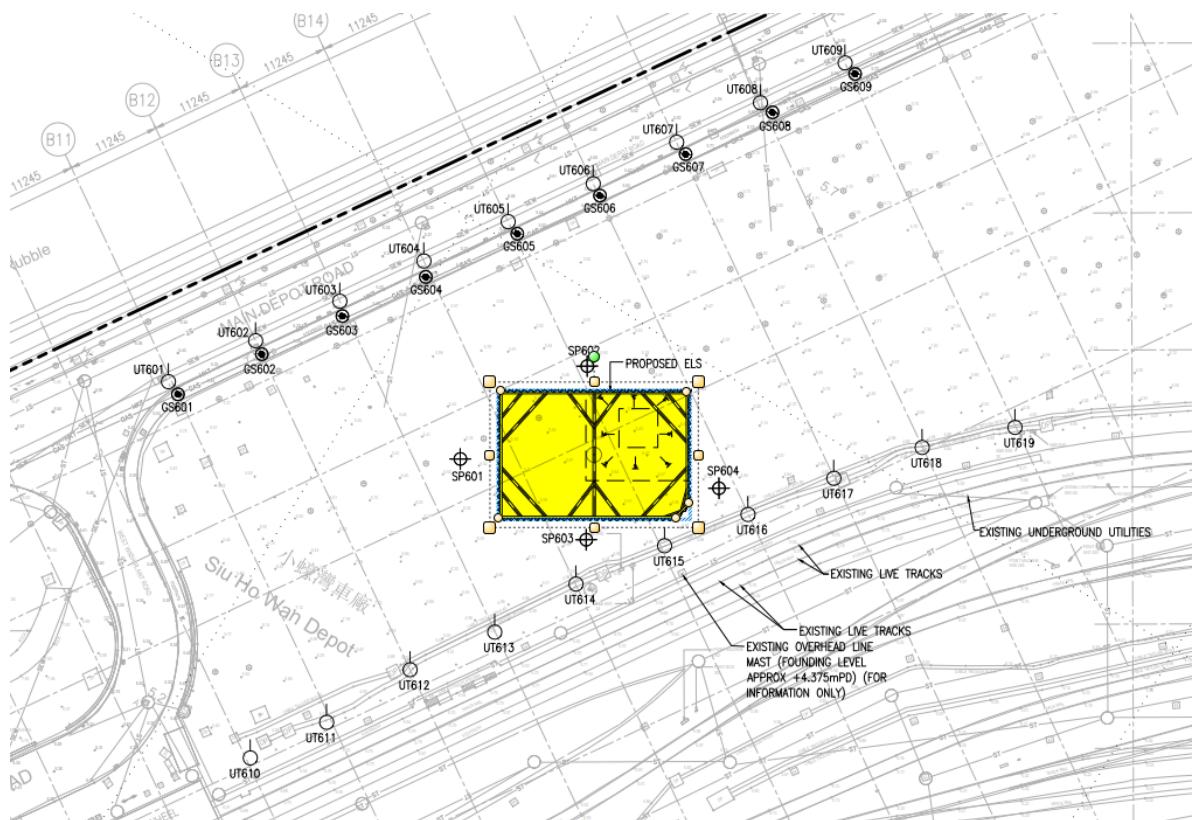
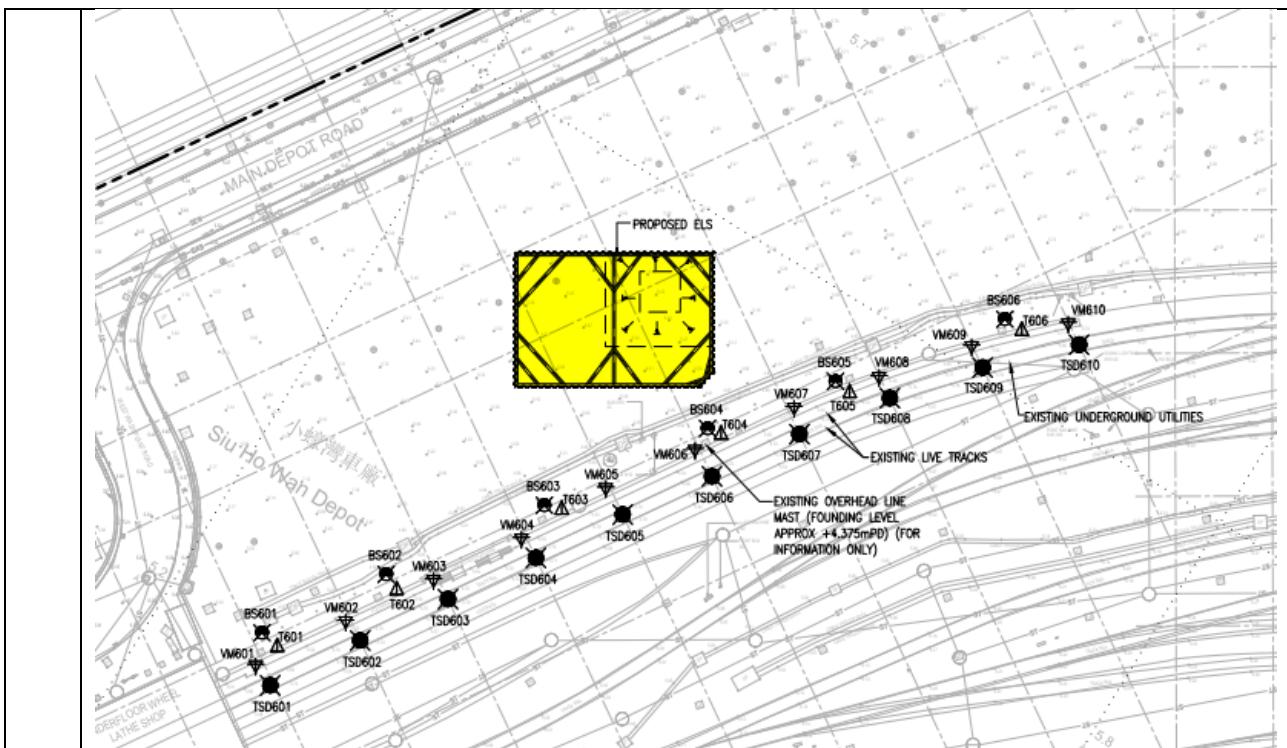


Figure 7.5.1: Geotechnical Instrumentation And Take Initial Readings Monitoring Layout Plan For ELS Works – AB22T (For Non-Railway Structures)



**Figure 7.5.2: Geotechnical Instrumentation And Take Initial Readings Monitoring Layout Plan For ELS Works – AB22T (For Railway Structures)**

7.5.2 AAA Levels will be used for the monitoring works in drawings no. C1701/B/SHD/OAPMC06/011, Geotechnical Instrumentation and Monitoring General Notes (AB22T) (For non-railway structures), and C1701/B/SHD/OAPMC06/012, Geotechnical Instrumentation and Monitoring General Notes (AB22T) (For railway structures)

11. THE MOVEMENT AND VIBRATION LIMITS SHALL BE THOSE STIPULATED IN TABLE BELOW.  
MOVEMENT LIMITS IN TABLE BELOW IS FOR THE ACCUMULATED MOVEMENT OF ALL ACTIVITIES ON SITE.

MONITORING STATION	ALERT	ALARM	ACTION
GROUND SETTLEMENT (GS601-GS609)	12mm	18mm	25mm
STANDPIPE AND PIEZOMETER (SP601 TO SP604) (WATER DRAW DOWN AND RISE UP)	0.5m	0.7m	1m
UTILITY SETTLEMENT (UMP601 TO UMP618)	12m	18m	25m

\*NOTE: THE AAA LEVELS SHALL BE MEASURED FROM THE LOWEST MEASURED HISTORICAL GROUNDWATER RECORD (i.e. +1.36mPD).

**Figure 7.5.3: AAA Values extracted from the drawing C1701/B/SHD/OAP/C06/011, Geotechnical Instrumentation and Monitoring General Notes (AB22T) (For non-railway structures)**

AAA LEVEL FOR MONITORING  
(FOR MTR STRUCTURES)

INSTRUMENT (AT MTR STRUCTURES)	ALERT	ALARM	ACTION
SETTLEMENT MARKER (TSD401-TSD410, BS601-BS606)	10mm	14mm	20mm
BUILDING TILTING MARKER (T601-T606)	1:2000	1:1428	1:1000
VIBRATION MONITORING (OVERHEAD POWER LINE MAST, SIGNALLING AND TELECOMMUNICATION FURNITURE OF RAILWAY)	5mm/s	7mm/s	10mm/s
VIBRATION MONITORING (AT-GRADE RAILWAU STRUCTURE AND TRACK)	7.5mm/s	10.5mm/s	15mm/s

MOVEMENT LIMITS IN TABLE ABOVE IS FOR THE ACCUMULATED MOVEMENT OF ALL ACTIVITIES ON SITE.

Figure 7.5.4: AAA Values extracted from the drawing C1701/B/SHD/OAP/C06/012, Geotechnical Instrumentation and Monitoring General Notes (AB22T) (For railway structures)

7.5.3 A monitoring sequence can be found and will be used for the monitoring works in drawings no. C1701/B/SHD/OAP/C06/011, Geotechnical Instrumentation and Monitoring General Notes (AB22T) (For non-railway structures), and C1701/B/SHD/OAP/C06/012, Geotechnical Instrumentation and Monitoring General Notes (AB22T) (For railway structures)

MONITORING FREQUENCY  
(EXCEPT MTR STRUCTURES)

INSTRUMENT TYPE	DEPTH	PURPOSE	MINIMUM FREQUENCY OF MONITORING		
			BACKGROUND MONITORING	STANDARD MONITORING	ACTIVE MONITORING
GROUND SETTLEMENT MARKER	ON GROUND SURFACE	TO MONITOR GROUND SETTLEMENT	MONTHLY	WEEKLY	DAILY
UTILITY SETTLEMENT MARKER	ON SELECTED UTILITIES	TO MONITOR UTILITY	MONTHLY	WEEKLY	DAILY
GROUND WATER MONITORING	ON GROUND SURFACE	TO MONITOR GROUND WATER LEVEL	MONTHLY	WEEKLY	DAILY

Figure 7.5.5: Monitoring Frequency extracted from the drawing C1701/B/SHD/OAP/C06/011, Geotechnical Instrumentation and Monitoring General Notes (AB22T) (For non-railway structures)



MONITORING FREQUENCY  
(FOR MTR STRUCTURES)

INSTRUMENT TYPE	DEPTH	PURPOSE	MINIMUM FREQUENCY OF MONITORING		
			BACKGROUND MONITORING	STANDARD MONITORING	ACTIVE MONITORING
BUILDING SETTLEMENT MARKER	ON SELECTED BUILDING & STRUCTURES	TO MONITOR BUILDING STRUCTURES	MONTHLY	WEEKLY	DAILY
TILT PLATE	ON SELECTED BUILDING & STRUCTURES	TO MONITOR TILTING OF STRUCTURES	MONTHLY	WEEKLY	DAILY
VIBRATION MONITORING	ON SELECTED BUILDING & STRUCTURES	TO MONITOR VIBRATION	MONTHLY	WEEKLY	DAILY
SETTLEMENT MONITORING AT RAILWAY STRUCTURES	ON EXISTING TRACK & RAILWAY STRUCTURES	TO MONITOR STRUCTURE MOVEMENT	MONTHLY	WEEKLY	DAILY

Figure 7.5.6: Monitoring Frequency extracted from the drawing C1701/B/SHD/OAP/C06/012, Geotechnical Instrumentation and Monitoring General Notes (AB22T) (For railway structures)

## 7.6 Pre-work Protection

7.6.1 The lifting procedure will be suspended when there is a train passing through the existing TUFWL trackwork.

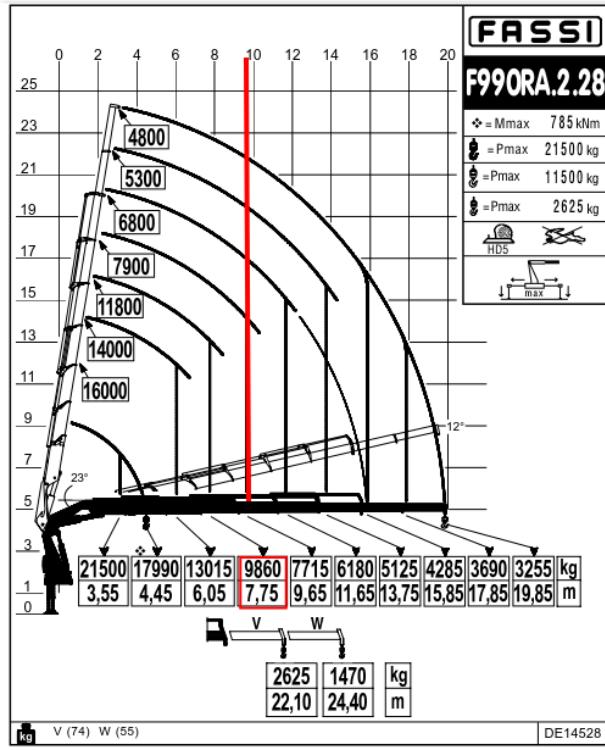
7.6.2 All lifting works with crane lorry will be placed on the location which is at least around 16 meters (9.65m of crane lifting radius and 6.38m away from the OHL post in Figure 1.1) away from the OHL post under the supervision of CP(T) and WPIC on site, so as to minimise the effect on OHL Post or consequence of any accident of lifting works. The detailed lifting plan is attached in Appendix D.

7.6.3 Welding works will be carried out for this construction work. All equipment will be placed in a designated location for these dangerous goods. The maximum quantity of the acetylene cylinder is 4 and no smoking is allowed near that storage area. The location will be coordinated with MTR representatives in W3A zone for ensuring it can fulfil the storage requirement.

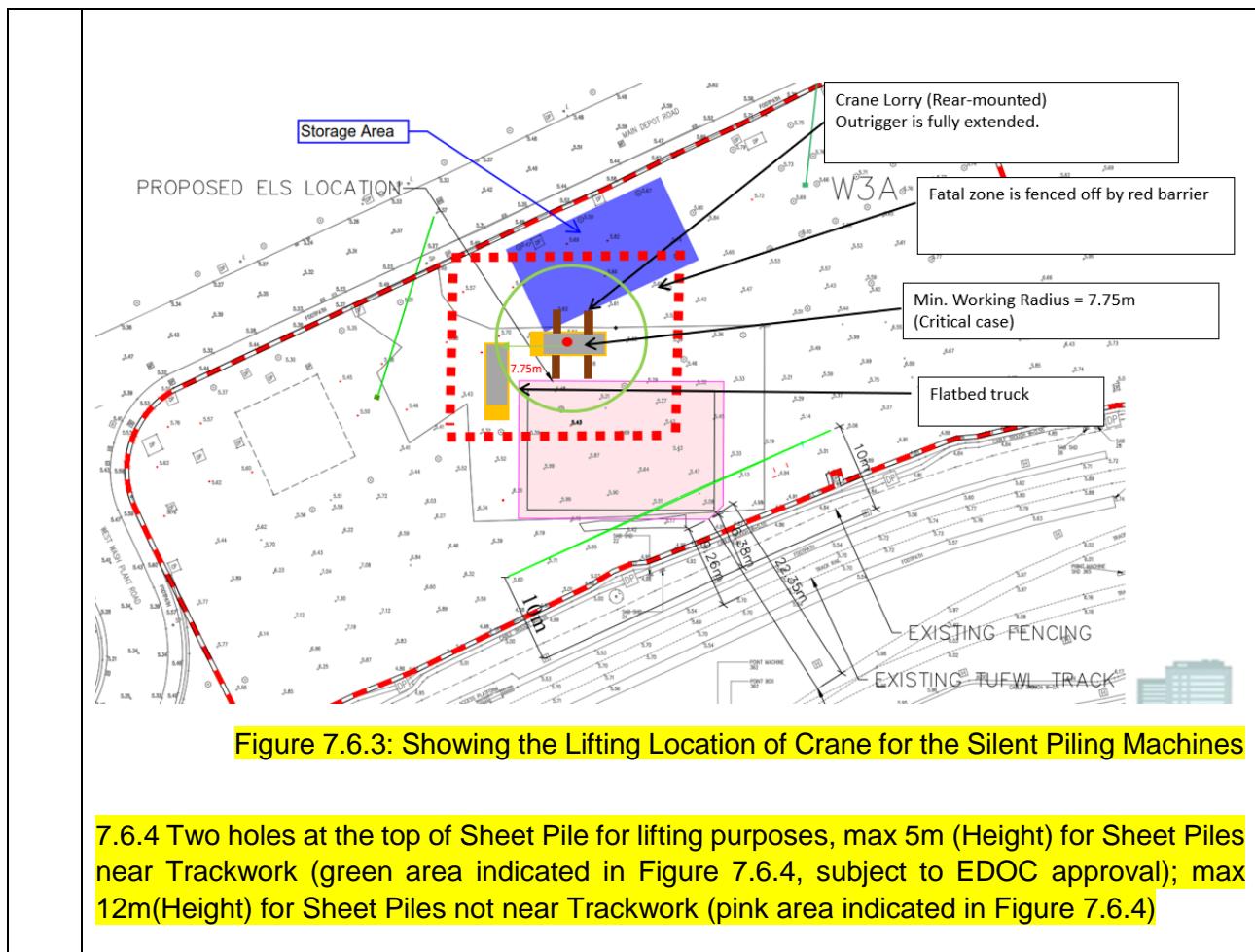




**Figure 7.6.1:** Showing the Lifting Location of Crane for the Silent Piling Machines and Power Units (around 6.1 ton each)



**Figure 7.6.2:** Showing the Crane Catalogue and Lifting Chart (extracted from Appendix F)



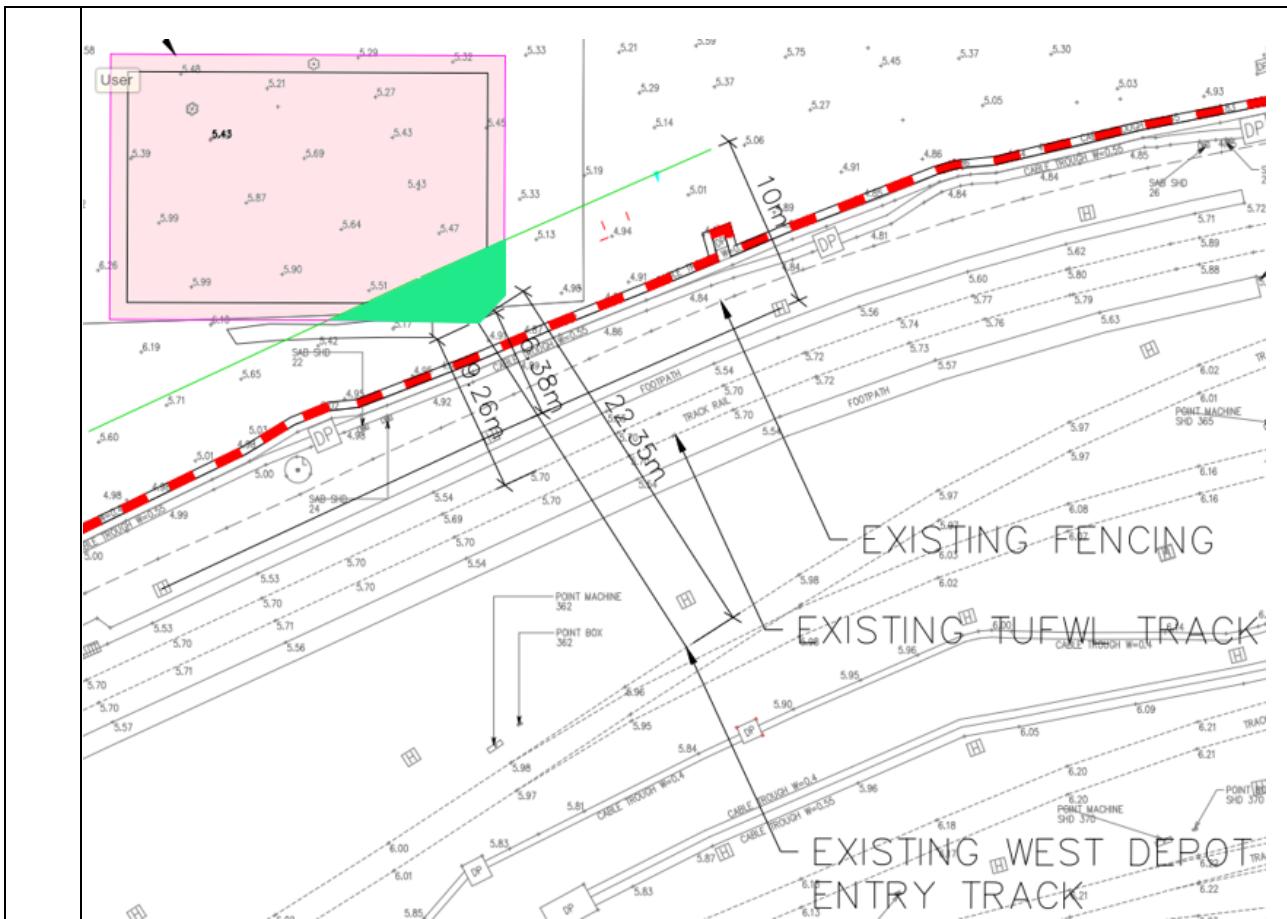


Figure 7.6.4: Showing the Height of Sheet Piles Of Each Location.



Figure 7.6.5: Double holes for lifting works for enhancing the lifting procedure. Detailed calculations can be found in Appendix N.

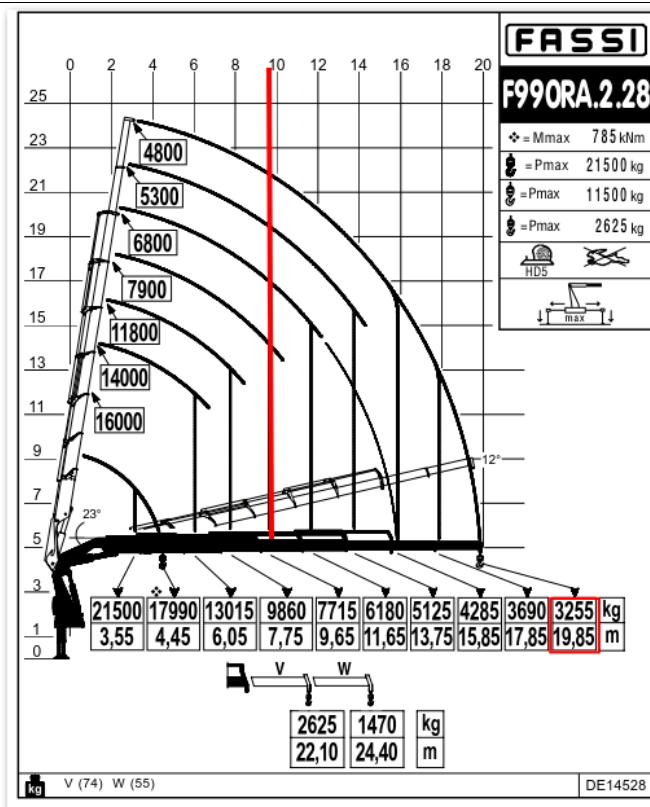


Figure 7.6.6: Showing the Crane Catalogue and Lifting Chart for Lifting a 12meter Sheet Pile (extracted from Appendix F)

### 1. Typical Detail of Sheet Pile Installation Works

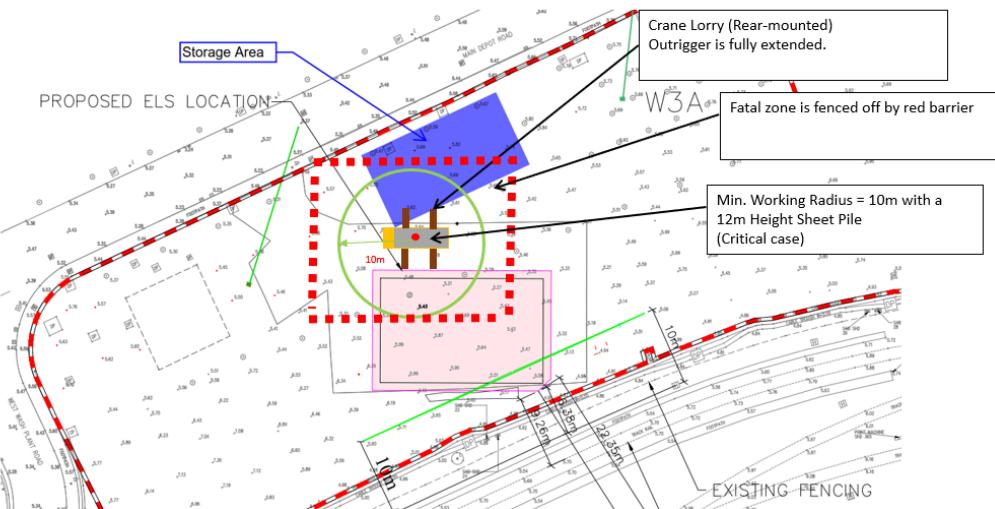


Figure 7.6.7: Typical Lifting Plan for Sheet Piling Installation Works.

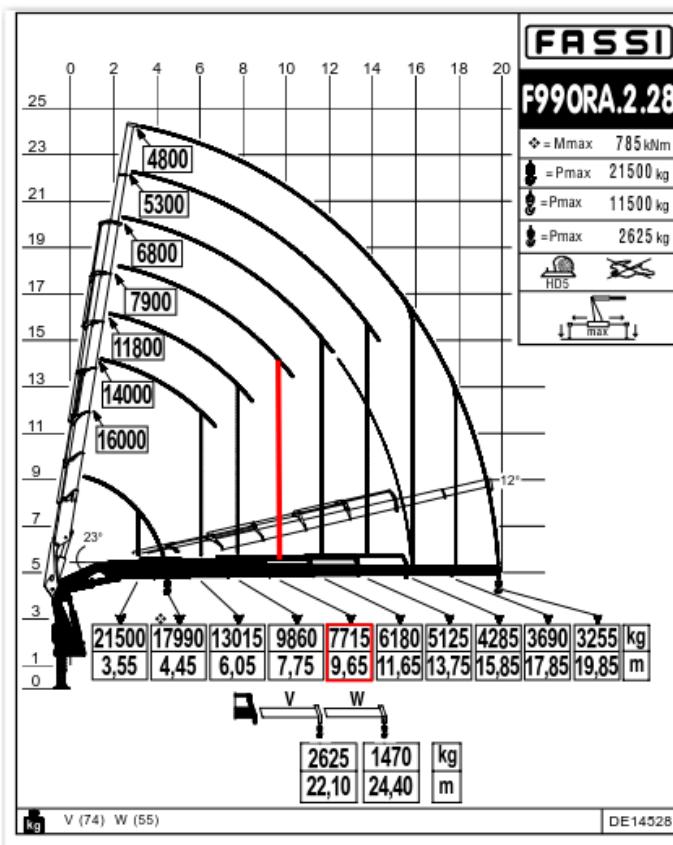


Figure 7.6.8: Showing the Crane Catalogue and Lifting Chart for Lifting a maximum 5 meter Sheet Pile with EDOC approval (extracted from Appendix F)

## 7.7 Construction Works of Installation of Sheet Piles for Temporary Underfloor Wheel Lathe

Step 1. The ELS alignments will be set by surveyors, including the coordinates stated in the approved BD drawings.

Step 2. The ELS construction works shall follow the approved ELS design (attached in **Attachment J**). Permits to dig will be approved before any installation works of sheet piles. The permit to dig is attached in **Appendix K**.

Step 3. The silent piling machine and its counterweights (i.e. 5nos. of 1 meter cube concrete blocks on 2 sides) will be lifted to the starting point no.1 of ELS works by Crane (Figure 7.7.2 refers). The details of the lifting plan in **Appendix D** and the installation of the sheet pile sequence can be found in Figure 7.7.1 below. If the sheet pile location is within 10m measures from the railway facilities (i.e. orange colour in Figure 7.7.1), PA works and Edoc shall be used to cover the construction works.

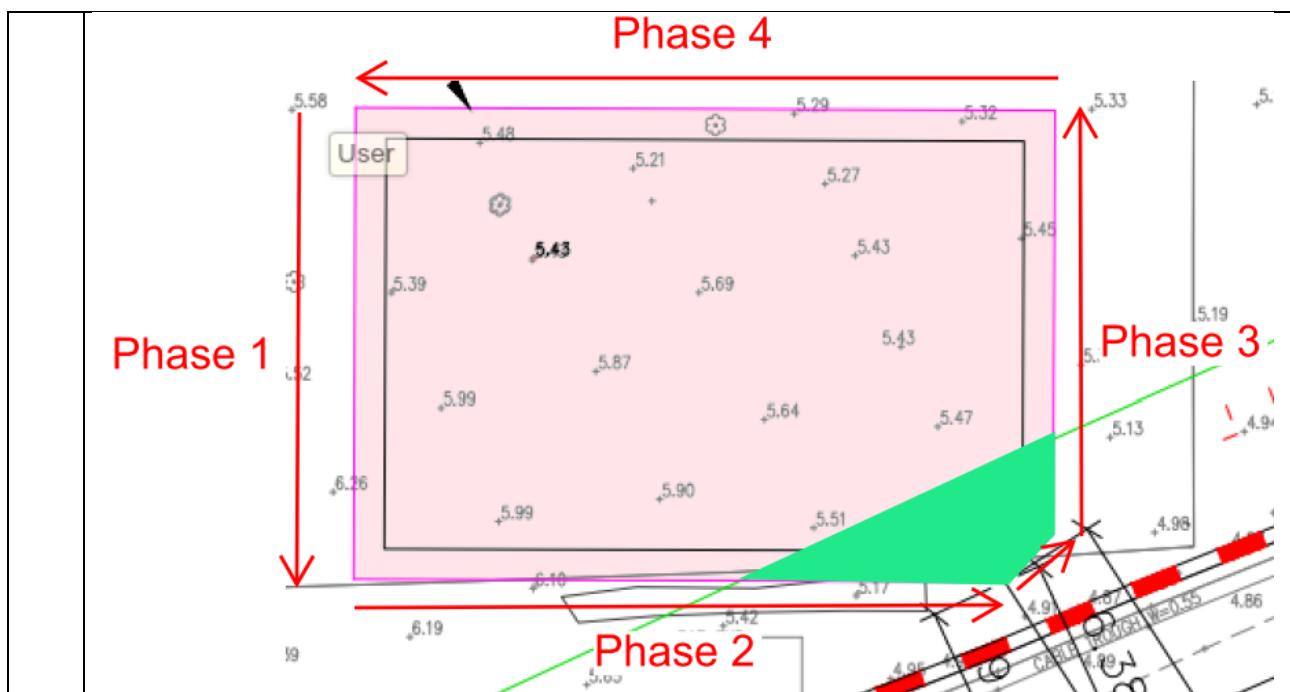


Figure 7.7.1: Installation of Sheet Pile Stage from Phase 1 to Phase 4 indicated in figure above. The green lines identified the 10m area from the adjacent OHL or live track

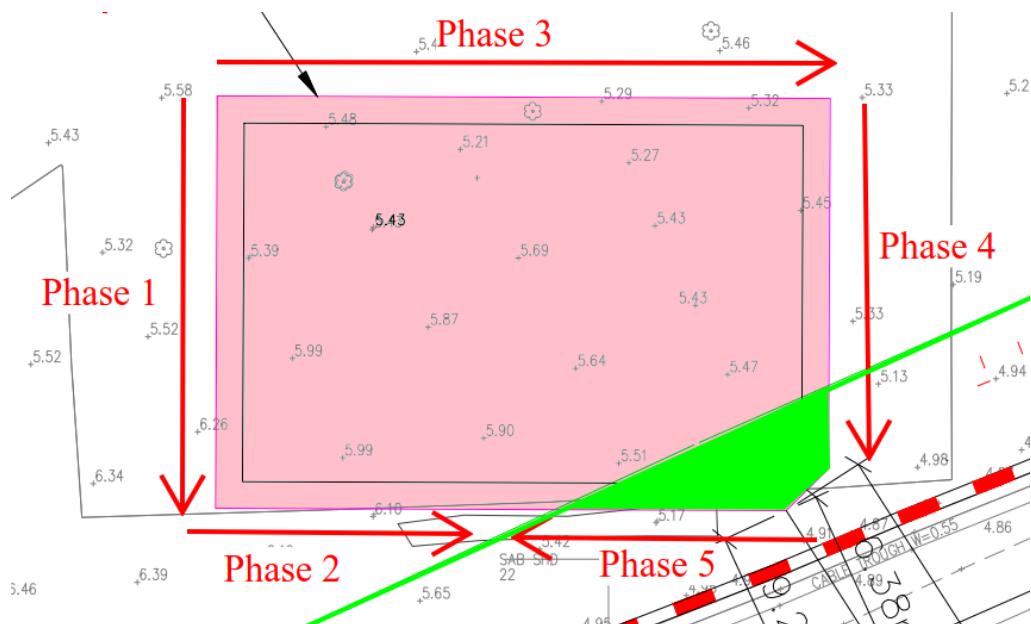
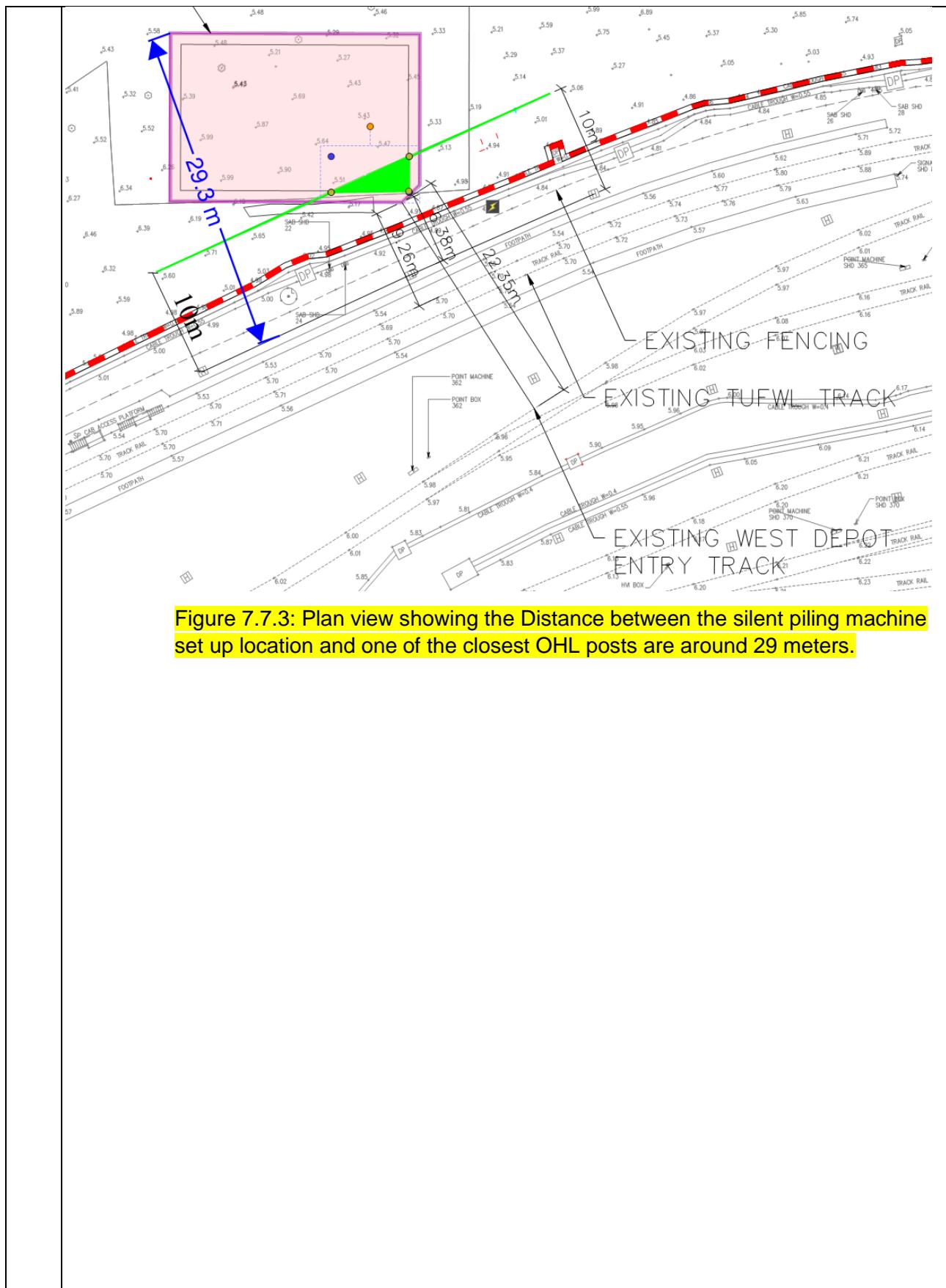


Figure 7.7.2: Alternative Approach for Installation of Sheet Pile Stage from Phase 1 to Phase 5 indicated in the figure above if the EDOC is not approved when completed Phase 2 in Figure 7.7.2. The green lines identified the 10m area from the adjacent OHL or live track.



**Figure 7.7.3: Plan view showing the Distance between the silent piling machine set up location and one of the closest OHL posts are around 29 meters.**

Step 4. The sheet pile will be lifted by Crane to its location, and it will be dismantled the lifting tools after the sheet piles are nearly installed to its toe level to avoid working at height works. For the first sheet pile, pitch the sheet pile and start pressing in with the use of the counter weights (ie FSP III sheet piles) The details in Figure 7.7.6 Step 2 below. When four to five sheet piles installed, the counter weight can be removed due to the sheet pile can be installed with the presence of installed sheet piles. The details of the silent piling machine can be found below. Install sheet pile wall to toe level by silent pile method. Welding works will be carried out for the connection works of the sheet pile



Figure 7.7.5: Silent Piling Machine and its installation figure

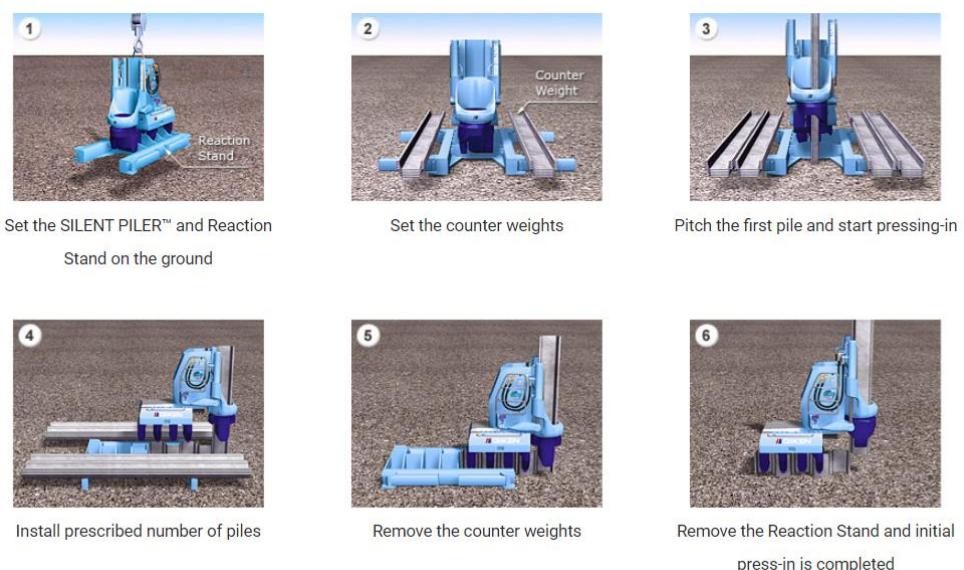


Figure 7.7.6: Installation Methodology of Piling with Silent Piling Machine for the first few Sheet Piles with Counter Weights

Step 5. The counterweight can be removed due to the sheet pile can be installed with the presence of installed sheet piles. The details of the silent piling machine can be found below. Install sheet pile wall to toe level by silent pile method.



Figure 7.7.7: The Lifting 3D Model in Stage 2 of Removal Counter Weight and Its Counter Weight with Crane. The Lifting Plan is attached in Appendix D

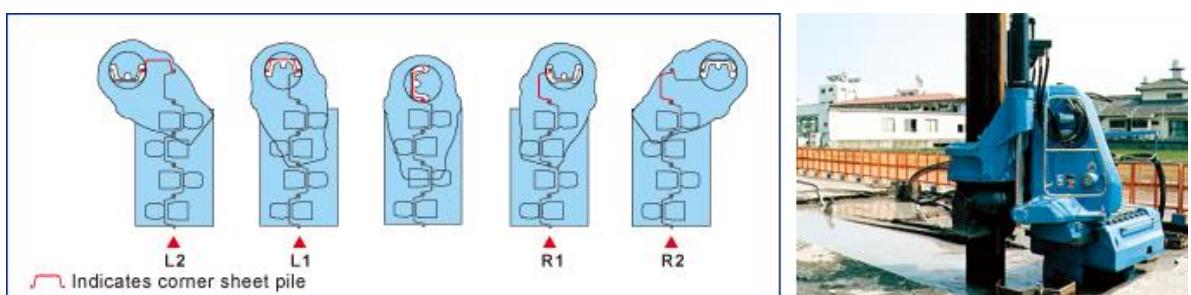


Figure 7.7.8: Installation Methodology of Piling with Silent Piling Machine

Step 6. Install the sheet piles to toe level followed by sequence progressively from Phase 1, 2, 3 and finally to Phase 4 (Figure 7.7.10 to 7.7.13 refers). As referred to in step 4 above, NO lifting work is required for the silent piling machine during the transition from Phase 2 to 3 which is nearest to the adjacent track, which the silent piling machine can carry out installation sheet pile works at the corner. Lifting works are required only for the sheet piles only. Welding works for the connection of sheet piles will be carried out, and the construction details can be found in the typical details of Excavation and Lateral Support – AB22T drawings.

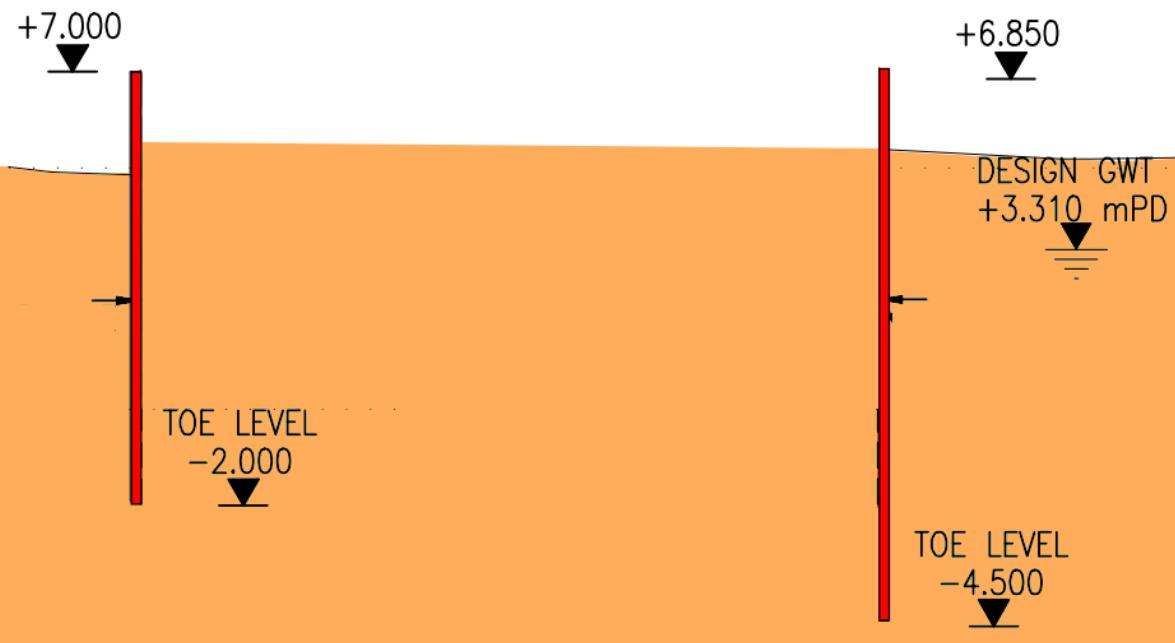


Figure 7.7.9: Installation of Sheet Pile to Toe Level

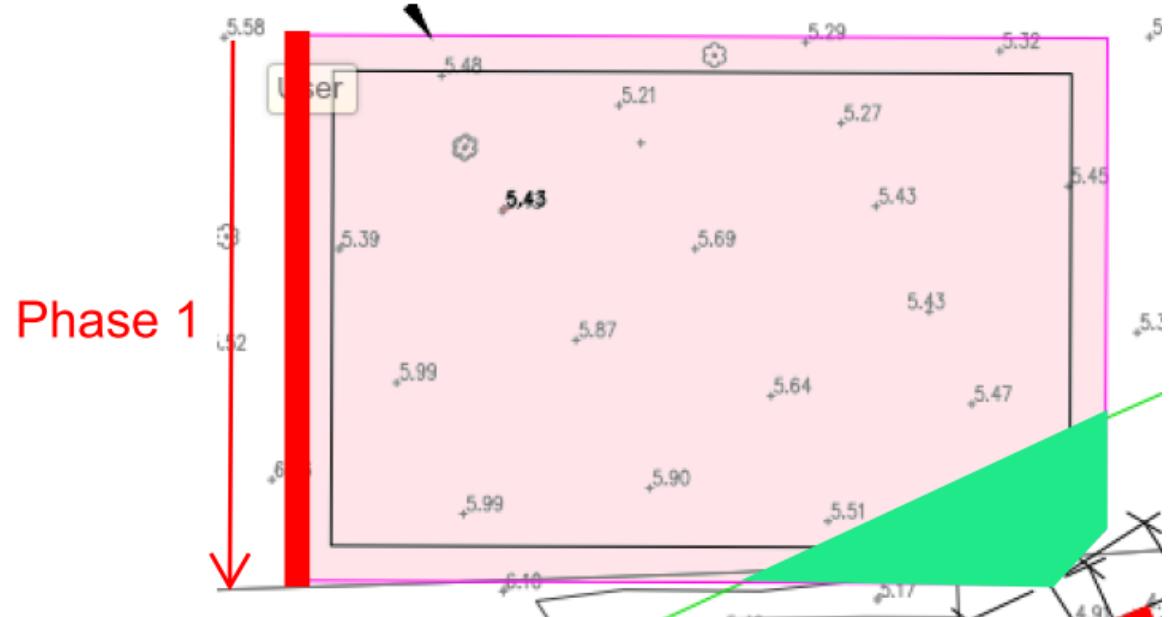


Figure 7.7.10: Lifting of Sheet Pile at Phase 1

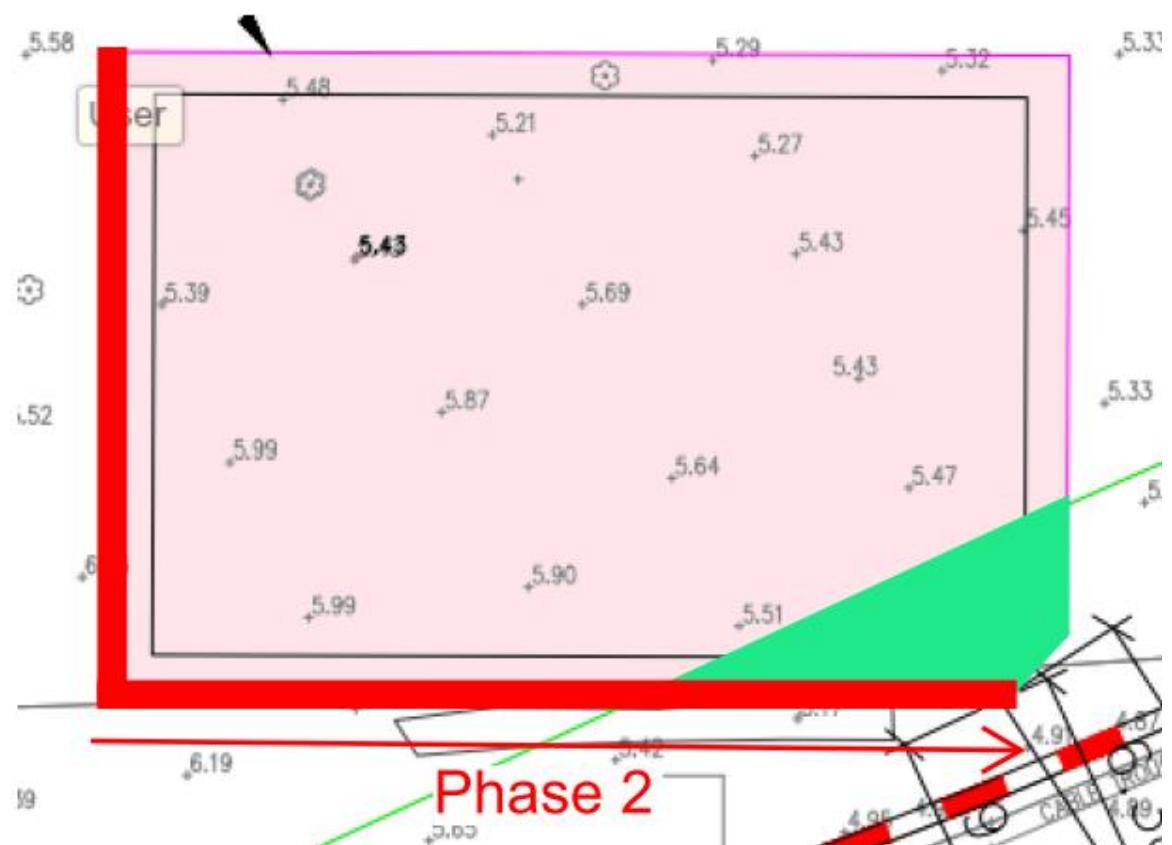


Figure 7.7.11: Lifting of Sheet Pile at Phase 2

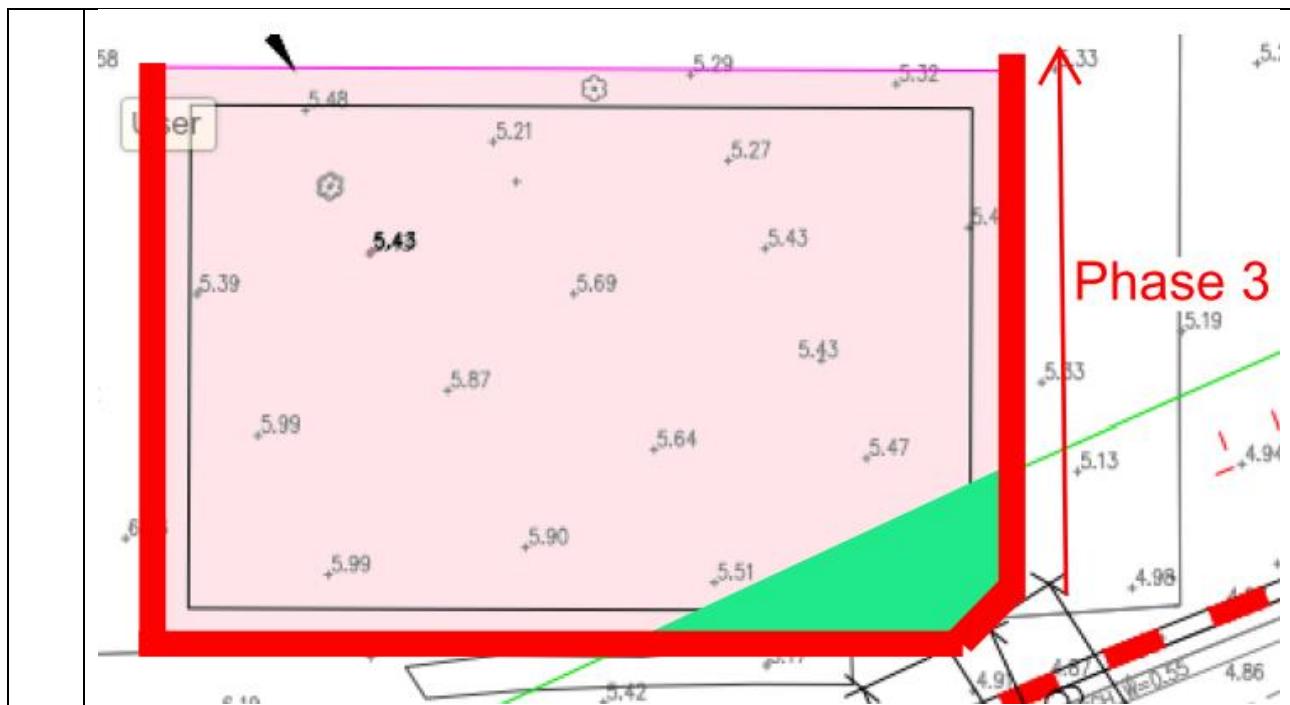


Figure 7.7.12: Lifting of Sheet Pile at Phase 3



Figure 7.7.13: Lifting of Sheet Pile at Phase 4

Step 7. Remove the silent piling machine with the use of a crane and place it in the stockpile area.

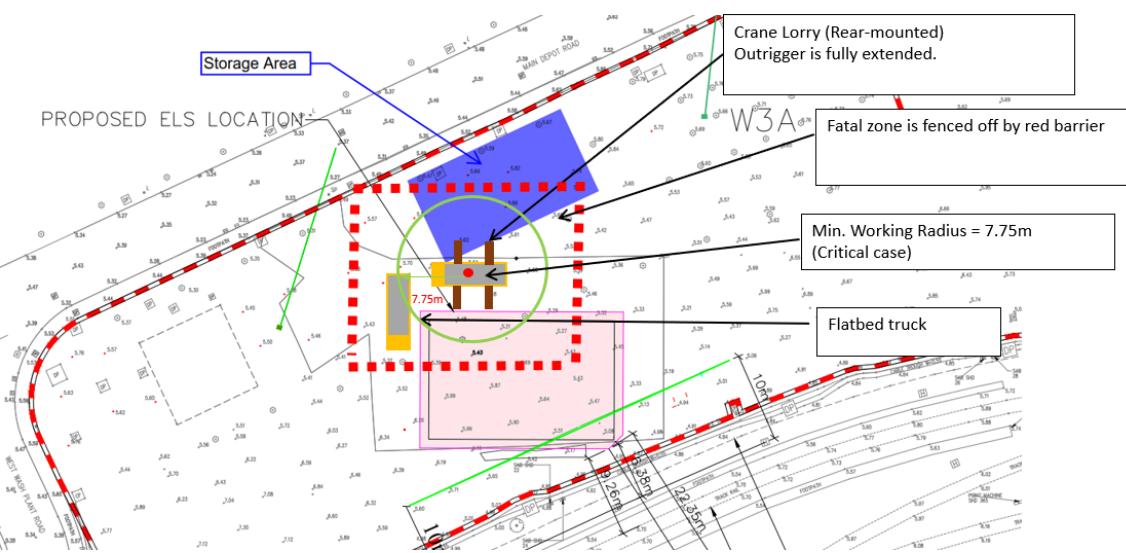


Figure 7.7.14: Lifting Stage 7 of Removal Silent Piling Machine to Stockpile Area.  
Details can be found in the Appendix D – Lifting Plan.

## 8. Safety (Risk Assessments)

- 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 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 C.

The risk for the works shall be assessed and the Risk Assessment Analysis is shown in **Appendix A**.



<b>9.</b>	<b>Environmental</b> (Environmental aspect & impact identification as well as mitigation measures)
	<ul style="list-style-type: none"><li>● 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.</li><li>● ULSD diesel will be used in all PME.</li><li>● Plant with QPME label will be employ, if available.</li><li>● All chemicals will be placed on drip tray.</li><li>● For excavated materials, water spray will be carried out during the work to prevent dust generation.</li><li>● All regulated NRMM should display a NRMM label.</li><li>● Wastewater will discharge to designed discharge point via the wetsep.</li><li>● The works shall follow relevant mitigation measures as required under the Environmental Permit (EP) / EP submissions and Contractor's Environmental Management Plan (EMP)</li></ul>
<b>10.</b>	<b>Quality Control</b> (Inspection and Test Plan including hold points)
	<p>Refer to Appendix 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 (Appendix 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>
<b>11.</b>	<b>Appendices</b> (Identify and include additional information in the submission package)



- Appendix A – Risk Assessment
- Appendix B – Inspection and Test Plan (ITP)
- Appendix C – Emergency Contact List
- Appendix D – Lifting Plan of Silent Piling Machine and Steel Material
- Appendix E – Catalogue of Silent Piling Machine
- Appendix F – Catalogue for Crane lorry, with EN12999 qualification(or equivalent)
- Appendix G – Catalogue of Excavator, 13 tonnage to 30 tonnage (or equivalent)
- Appendix H – Programme
- Appendix I – Instrumentation and Monitoring Plan
- Appendix J – BD approved ELS design – Stage 1
- Appendix K – Permit to Dig
- Appendix L – Underground Utilities Survey Report
- Appendix M – Hot Work Permit
- Appendix N – Lifting Hole Calculation
- Appendix O – Permit to Operate
- Appendix P – Concrete blocks set up for counterweight of the silent piling machine**

