



**CHECKLIST FOR CARRYING OUT EXCAVATION AND PILING WORKS IN  
CHANGI/SELETAR AIRPORT**

Check boxes when  
completed

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|---|--------------------------|
| <p>1. Before commencement of any works on site, the Work Party shall Request for and obtain existing as-built services drawing using the “REQUEST FOR INFORMATION ON UNDERGROUND SERVICES FOR TRIAL HOLES / EXCAVATION / PILING WORKS” (Form A) and purchases services drawings from other relevant agencies.</p>   | <input type="checkbox"/> |
| <ul style="list-style-type: none"> <li>• CAG Engineering &amp; Development Group, covering:             <ul style="list-style-type: none"> <li>▪ High Tension cables</li> <li>▪ External Airside and Landside Low Tension cables</li> <li>▪ Airfield lighting cables</li> <li>▪ Control cables</li> <li>▪ Water pipelines</li> <li>▪ Drainage subsoil pipes</li> <li>▪ Turf maintenance</li> <li>▪ CCTV cables</li> </ul> </li> </ul>   | <input type="checkbox"/> |
| <ul style="list-style-type: none"> <li>• Other CAG Divisions, covering             <ul style="list-style-type: none"> <li>▪ Horticulture</li> <li>▪ Airside Operations (Airside Work Permit &amp; Lane closure at airside)</li> <li>▪ Roadway Unit (Lane closure at landside)</li> <li>▪ Corporate IT and Technology (Structured cabling)</li> <li>▪ Airport Operations Management (LT cable for Airport Operations Systems at landside)</li> </ul> </li> </ul>   | <input type="checkbox"/> |
| <ul style="list-style-type: none"> <li>• Other relevant agencies, including             <ul style="list-style-type: none"> <li>▪ CAAS Aeronautical Telecommunication &amp; Engineering , covering:                 <ul style="list-style-type: none"> <li>▪ Communications</li> <li>▪ Navigation</li> <li>▪ Surveillance Services</li> </ul> </li> <li>▪ SingTel</li> <li>▪ StarHub</li> <li>▪ CAFHI</li> <li>▪ CityGas / PowerGas</li> <li>▪ PUB - Sewage pipes</li> <li>▪ Tenants concerned, where necessary</li> </ul> </li> </ul> | <input type="checkbox"/> |

Check boxes when completed

2. The Work Party shall carry out services detection on site through engaging the services of a Licensed Cable Detection Worker (LCDW). The particulars of the licensed cable detector shall be submitted to the CAG project officer and consultants in charge for endorsement. The CAG project officer and consultants shall make necessary arrangements to ensure that all related electrical services are turned on to facilitate cable detection work.
3. After LCDW has completed the detection works, the LCDW will compile a comprehensive services layout report through the Work Party to CAG Project Officer and Consultants for approval. The LCDW report will recommend suitable measures to be taken to protect all services on site, based on sound industrial practice and recommendations by the services owners. The LCDW report showing exact locations of services found shall be submitted to relevant services owners for verification.
4. The LCDW report shall also highlight all discrepancies between the services layout indicated on plans versus their actual location found on site. CAG project officer shall coordinate a meeting to sort out such discrepancies with all relevant services owners concerned.
5. The Work Party shall submit an updated excavation / piling work plan showing marking done on site, the method statement for piling, and excavation works and services protection and / or diversion scheme to CAG project officer / consultants two week in advance for approval.
6. Prior commencement of piling / excavation works, LCDW shall marked out the detected services on the piling / excavation works location using wooden pegs or different spray paints.
7. Prior commencement of piling / excavation works, the Work Party shall submit the "Application for Permit to Carry Out Piling / Excavation Works" (Form C) to CAG project officer / consultants two weeks in advance for approval.
8. Standing supervisor, workers and piling / excavator operators on site shall be briefed by the LCDW on the services layout and the above markings and warned against carrying out any excavation / piling works bounded within the marked out area unless under the direct supervision of the LCDW and with the explicit approval of the Work Party's project manager, Consultant and CAG project officer.
9. The Work Party shall implement appropriate measures as required by the LCDW, Consultant and Services' Owner to protect the services found.

Check boxes when completed

10. The Work Party shall install safety barriers to protect workers from falling into cable trenches when works is in progress or are left exposed.
11. Only Registered Excavator Operators (REO), Probational Registered Excavator Operators (PREO) and certified piling operator will be allowed to operate excavator / piling machines within the work area.
12. A competent full-time excavation/piling supervisor shall be deployed to monitor the site operations during the entire earthworks and to provide close guidance to the excavator operator.
13. The Work Party shall provide protective steel plates or conduits over exposed services positions so as to prevent damage due to movements of heavy vehicles or human traffic over them.
14. If there is High Tension cable(s) near or within the vicinity of the excavation area, the project contractor's LCDW shall positively identify the cable by injection of signal to the cable at CAG substation. CAG in-house contractor shall assist to make the cable dead. The project contractor's LCDW shall also mark out the detected High Tension cable(s) route on the ground using spray paint.
15. The contractors shall stop any excavation works if they encounter any unknown structure or obstruction. LCDW shall be on site to verify any presence of live services. Contractor has to consult CAG project/maintenance officers before proceeding further.
16. If the proposed works were to overcross comms cable ducts, the Work Party shall submit method of support and protection of these ducts to CAG, CAAS Aeronautical Telecommunication & Engineering (ATE) Division and NCS Communications Engineering Pte Ltd, Line Plant Operations Division for approval. They shall also be informed prior to the dismantling of supports and the backfilling of comms cable ducts.
17. Where the works would be carried out over the Approach Control Radar (ACR) cables, NCS Communications Engineering Pte Ltd shall be engaged for on-site standby to respond quickly to any problem
18. Excavation / piling by machine shall stop once cable slabs are exposed. Only manual excavation is allowed after the cable slabs are removed. Protection slabs over HT cables shall not be tampered with and shall be remained intact unless authorised by CAG and the Work Party's PE to remove them.

Check boxes when completed

19. If unknown services are unaccounted in the process of excavation, Work Party shall stop all works immediately at the affected area and inform the CAG project officer to help to identify these services found.

20. Where necessary, the Work Party shall plan for further cable detection checks to scan the work area for other undetected / undetectable services. Given the technical limitations of the equipment currently available, investigative detection must be carried out at each stage of the construction process. Stage by stage detection of the underground services must be considered and incorporated within the construction schedule for deep excavation works. This procedure must be implemented until services are successfully located or the effective depth of the excavation is reached. In simple terms, detection / trial holes has been carried out before the excavation / piling works, at intervals in accordance with the limitations of the detection (typically every 2 to 3 metres), until services are precisely located or the desired construction depth is achieved.