CS ENERGY PROCEDURE FOR

DIGGING, EXCAVATION AND BUILDING PENETRATION CS-PTW-HAZ-04

Responsible Officer: Corporate PTW Administrator
Responsible Executive: Chief Executive Officer (CEO)

DOCUMENT HISTORY

Key Changes	Prepared By	Checked By	Approved By	Date
Rev 1 – Original Issue of Document				03/04/2001
Rev 2 – Number and name change only	PTW Committee	PTW Committee		24/06/2009
Rev 3 – Inclusion of building penetrations and updated New CS Energy formatting	PTW Committee	PTW Committee	A Brown	22/03/2012
Rev 4 – Reviewed and released as a part of PTW Changes	D Clarke	A Brown	A Brown	22/11/2012

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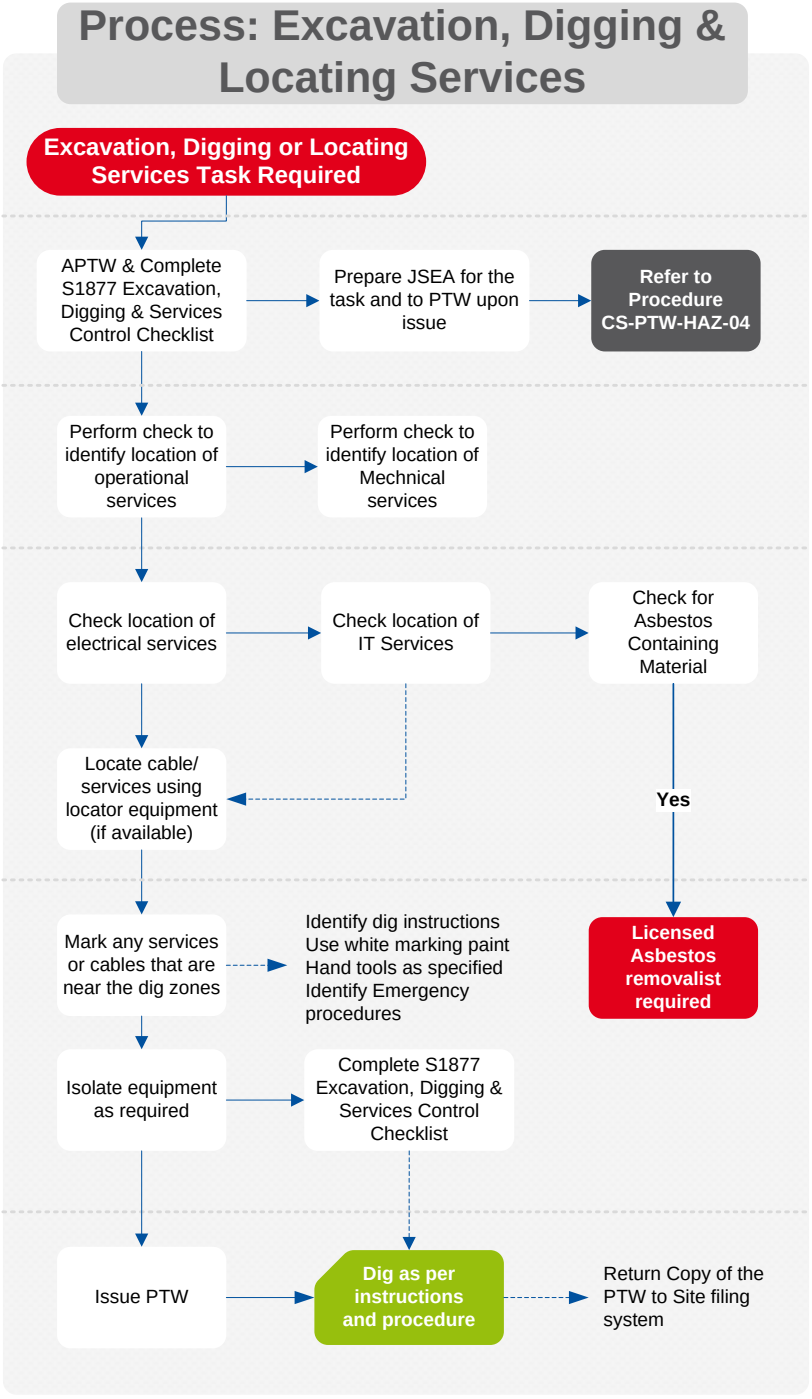

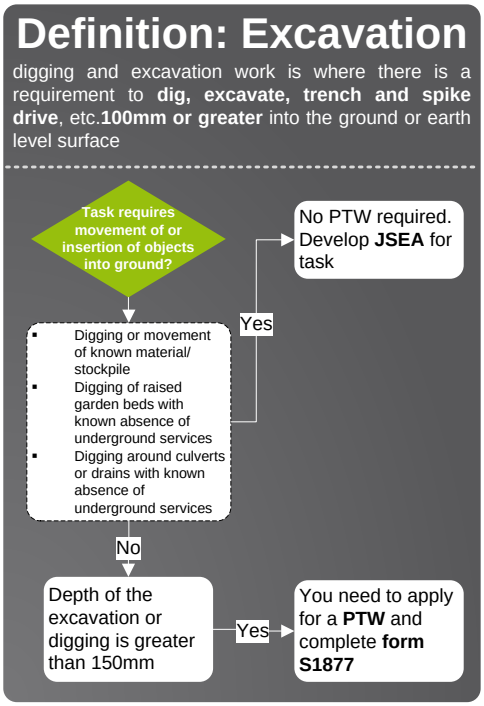

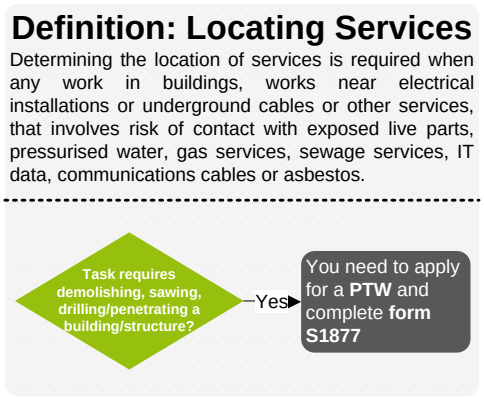

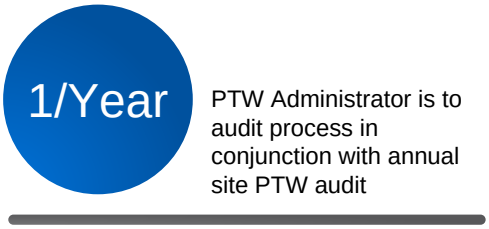

2 PURPOSE

To ensure that all excavation and digging work is planned, critical services are identified and the progress of work controlled. The issue of an **S1877 Excavation, Digging and Building penetrations Control Checklist (Authorisation)** will:

- Minimise risk to personnel; and
- Prevent damage to existing underground and overhead services and structures.

It provides for a safe system of work by identification and subsequent control of work hazards associated with work requiring excavations, digging and wall/structure penetrations.

The content of this procedure applies to all CS Energy sites and is applicable to CS Energy personnel and external contractors.

3 SCOPE

This procedure applies to any work location where excavation, digging or penetrating is required on CS Energy's sites to prevent the risk of injury or illness. It seeks to ensure that standards prescribed in the *Work Health and Safety Act 2011* and *Regulations 2011* legislation are satisfied.

This procedure shall be read in conjunction with the requirements of other site specific procedures:

- CS-PTW-01 – Permit To Work (PTW) Manual

4 RESPONSIBILITIES AND ACCOUNTABILITIES

4.1 Corporate PTW Administrator

Corporate PTW Administrator is responsible for ensuring that:

- This procedure is reviewed every 2 years.

4.2 Site PTW Administrator

Site PTW Administrator is responsible for ensuring that:

- This procedure is complied with during normal business conditions; and
- An audit of this process is completed annually as a part of the annual PTW site review.

4.3 Site Manager

Site Managers are responsible for:

- Implementation of this procedure;
- Ensuring sufficient resources are provided to effectively conduct working at heights; and
- Provision of appropriate training.

4.4 Superintendents and Supervisors

Superintendents and Supervisors are responsible for:

- monitoring compliance with this procedure and the risk control measures being implemented by the work party members;

- provision of appropriate training and other support to all personnel in application of this procedure;
- conducting and/or assisting personnel with JSEAs; and
- authorisation of a completed JSEA where the residual risk is moderate.

4.5 Permits to Work Officer

The PTWO must ensure:

- The PTW 'Hazards' section, Digging, Excavation or Building penetrations, is selected for any work scope that involves these activities;
- The Digging, Excavation and Building penetrations Control Checklist is attached to the PTW prior to the transfer of the PTW to the OIC; and
- A copy of the Digging, Excavation and Building penetrations Control Checklist is retained with the PTW documentation.

4.6 Officer in Charge (OIC)

The OIC must ensure safe assessment, control implementation and overall safe Digging, Excavation and Building penetrations practices in accordance with this procedure. They must ensure:

- The Digging, Excavation and Building penetrations Control Checklist is attached to the PTW prior to the transfer of the PTW to the OIC; and
- The Digging, Excavation and Building penetrations Control Checklist is completed and authorised as specified before work begins.

4.7 Person in Charge of Work (PICW)

The PICW must ensure compliance with the safe assessment, control implementation and overall safe Digging, Excavation and Building penetration practices in accordance with this corporate procedure and the Digging, Excavation and Building penetrations Control Checklist for the job.

4.8 Work Party

Employees and contractors shall:

- Utilize the appropriate equipment provided for Digging, Excavation and Building penetrations;
- Use safe access and egress (e.g. ladders) for means of access only into trenches and excavations;
- Perform visual inspections digging and excavation equipment before use;
- Ensure Digging, Excavation and Building penetration requirements are followed when work is being performed;
- Report to OIC/PICW if any damage to the plant or services occurs immediately; and
- Report and tag as "out of service" any faulty or defective equipment.

4.9 Engineers, Plant Operators or Electrical Supervisors

Engineers, Plant Operators and Electrical Supervisors shall:

- Approve Digging, Excavation and Building penetration plan as specified on Digging, Excavation and Building penetrations Control Checklist

- Assess the desired located to undertake the activity and approve/clear of any services (underground or in wall) through the use of site drawings etc.

4.10 Health and Safety Specialist

Health and Safety Specialist shall:

- Provide advice on excavation and digging industry trends and issues.

5 WHAT IS DIGGING, EXCAVATION AND BUILDING PENETRATION?

Digging and Excavation work is:

For the purposes of this procedure digging and excavation work is where there is a requirement to:

- Dig;
- Excavate;
- Trench; and
- Spike drive, etc.

100mm or greater into the ground or earth level surface.

Building penetrations work is:

Determining the location of services is required when any work in buildings, works near electrical installations or underground cables or other services, that involves risk of contact with exposed live parts, pressurised water, gas services, sewage services, IT data, communications cables or asbestos.

Examples of such work include:

- Removing a sheet of plasterboard from a stud wall and thus creating a risk of contact with exposed live parts e.g. an electrical item such as a general-purpose outlet;
- Cutting a water pipe in a building where there could be an electrical cable next to the water pipe;
- Excavating or trenching the ground in proximity to underground services;
- Digging holes where an electrical cable, gas line, water pipe, communication cable or sewage line could be buried;
- Drilling, cutting or removal of materials that contain asbestos fibres; and
- Cutting or penetration through walls.

6 REQUIREMENTS FOR DIGGING, EXCAVATION & BUILDING PENETRATION WORK

All activities that involve *Digging, Excavation or Building penetrations* shall be work controlled by a *Permit to Work* using the *Permit to Work system*. Where the PTW system is not applicable, a risk assessment process should be conducted (JSEA) and appropriate controls implemented.

Completion of the S1877 Digging, Excavation and Building penetrations Control Checklist is required to ensure control measures are implemented. The Control Checklist will assist with the identification of the location of live services and can be referred to as part of the JSEA prepared for the work.

The OIC/Contractor Supervisor/PICW/Work Party are to supply details on the Control Checklist for:

- The approximate location of the work and type of work being performed;
- The work method to be used;
- The width of the excavation for in ground services;

- The depth of the excavation for in ground services;
- The location of the work in relation to walls, columns, floors, ceilings, cladding, plant and cable trays that support or conceal services; and
- The need for Safety Observers to be present.

The checklist requires sign-off by qualified persons who are able to locate services, including telecommunications, electricity and gas. The qualified person will advise if there are services in the location, and conduct searches of records and other information (plant drawings, photos, dial before you dig 1100) to ensure that the area is safe for work to commence. The qualified person may locate cables, pipes and other services by using a suitable, calibrated service locating equipment.

The work party is to mark out on the ground or wall the location of the services. This is to be done using marking paint (as per the table in Appendix 1).

The S1877 Excavation, Digging & Building penetrations Control Checklist with work instructions is to be issued to the work party as part of the PTW process. Any safe work methods, service protection or temporary support requirements, site drawings, special requirements are to be provided by the relevant Operations, Site Asbestos Officer, Mechanical, Electrical, IT/Communications Officer and are to be included in the JSEA.

Note:
Where a **critical service** is identified the minimum requirement for hazard identification and risk control is a documented JSEA. Isolation of potential damaging energy sources shall be considered as a **primary** risk control.

6.1 How to Control Digging, Excavation and Building Penetration Work

All activities that involve *Digging, Excavation or Building Penetrations* shall be work controlled by a *Permit to Work* using the *Permit to Work system*. Where the PTW system is not applicable, a risk assessment process should be conducted (JSEA) and appropriate controls implemented.

Completion of the S1877 – Digging, Excavation and Building Penetration Control Checklist and associated JSEA is required to ensure control measures are implemented that prevent:

- A person falling into an excavation;
- A person being trapped by the collapse of an excavation;
- A person working in an excavation being struck by a falling object;
- A person working in an excavation being exposed to an airborne contaminant;
- The placement of excavated material;
- Digging, excavation or penetration that comes into contact with a critical underground or in wall services, hazardous material or plant;
- Adjacent building, routes or roads that could become unstable as a result of the excavation work;
- Nearby traffic or thoroughfare hazards;
- Run-off of soils and materials onto roads and into drains and creek/catchment areas; and
- Interaction with unidentified Electrical cables, asbestos containing material and gas pipes.

6.2 Planning to Excavate or Dig

OIC is responsible undertake all necessary investigations and approvals regarding excavations and underground services prior to excavation or digging work commencing on site.
Documenting this is achieved by completing the S1877 Excavation, Digging and Services Control Checklist.

6.3 Health Safety and Environment Controls

Prior to an excavation or digging activity being initiated on site (refer to Section 5) an S1877 Excavation, Digging and Building Penetration Control Checklist and relevant JSEA for the work is to be completed by an OIC as part of the PTW process.
Prior to excavation work commencing the following control measures are to be implemented where applicable;

- The ground or walls are to be marked (e.g. pressure paint spray) to indicate safe areas where excavations can be undertaken and to clearly mark in a different way/colour, any services traversing the general excavation area or building work area.
- Planning and relevant measures are to be taken to ensure the stability of nearby buildings, adjoining structures, routes, roads and the edges of excavations, relative to the excavation work.
- All excavations and trenches over 1.5 metres in depth, are to be approved by a Competent Person (Refer to Section 9) and where entry is required, are to be either shored, battered back or benched unless a geo-Technical engineer confirms in writing it is stable.
- All excavations and trenches less than 1.5 metres in depth with unstable rock or soil and where access is required shall be shored, battered back or benched in a manner approved by a Competent Person.

6.3.1 Shielding Controls

Installation and removal of shoring is to take place from outside the trench in accordance with the requirements of the shoring manufacturer or engineer where relevant.

- Non-proprietary shoring is to be designed by a suitably qualified engineer, and installed by trained personnel only after a Competent Person has inspected the trench, assessed the shoring and approved the use of the shoring.
- Battering is to be at an angle of 45° or less to the horizontal and start no higher than 1.5 metres above the bottom of the trench or excavation, unless a geo-technical engineer has approved a greater batter angle in writing.
- Each bench cut into the side of the excavation or trench shall be no higher than it is wide and step dimensions are to be no greater than 1.5 metres unless a geo-technical engineer has approved a greater height or dimension in writing.

6.3.2 Environmental Controls

Soil run off controls are to be erected and put in place to prevent soil run-off onto roadways and footpaths and into drains, creeks and other catchment areas (e.g. include silt fences, drain covers/sieves and warning signage.

6.3.3 Supervision

A Competent Person shall supervise all personnel involved in trenching where access into the trench is required.
No person is to **work alone** in an excavation or trench that is greater than 1.5 metres deep.

6.3.4 Barricading and Covers Controls

Wherever practicable, controls such as the following are to be erected to exclude entry to any excavation or trench where the public or workers not involved in the activity may be at risk due to its location and accessibility:

- 900mm high barricades or hoardings, and
- Signage (**Danger - Do Not Enter**) hung independently or from barriers/hoardings;
- Where practicable, barricades and signs are to be used at safe distances from edges to protect unattended excavations that cannot be practically covered;
- Barricading around an open excavation should encompass spoil piles and earthmoving plant in close proximity to edges where practicable.
- Covers are to be placed on unattended excavations where practicable on site.

6.3.5 Exclusion Zones

Particular zones may need to be identified for excavation work for the following hazards:

- Machinery is not to be located in or near excavations and trenches where exhaust fumes may contaminate below ground atmospheres that workers are required to access.
- All heavy machinery / mobile plant / equipment shall be stored at least 2 metres from the edges of the excavation or trench.
- Any debris and spoils are to be kept at least 1 metre from the edges of an excavation or trench.

6.3.6 Access and Egress

A safe means of access and egress is to be provided into excavations and trenches requiring access. Where a trench cannot simply be walked into by workers, ladders providing a safe access and egress are to be placed in every 9 metre length of trench where workers are required to work. Ladders should also extend at least one metre above the edge of the trench.
No personnel shall be present in an excavation while that part is being mechanically dug.

6.3.7 Working at Heights Controls

Where a person is exposed to a fall risk that could cause injury into an excavation, a S1972 Working at Heights Control Checklist is to be completed for the PTW job and working at height controls as per the **Working with Heights Procedure** (CS-PTW-HAZ-02) are to be implemented.

6.3.8 Hot Work Controls

Where hot work is to be undertaken in the excavation work area, a S0010 Hot Work Control Checklist is to be completed for the PTW job and controls are to be implemented as per the **Hot Work Procedure** (CS-PTW-HAZ-01).

6.3.9 Atmospheric Contaminant Controls

Any excavation greater than **2 metres** or where an OIC identifies during the work planning process that a trench or excavation may contain, or has the potential to contain an unsafe atmosphere shall be assessed for Confined Space requirements and appropriate controls implemented, such as but not limited to ensuring that atmospheric testing is undertaken. Refer to the **Confined Space Entry Procedure** (CS-PTW-HAZ-03).
Use S1890 Atmospheric Testing Sheet to document completed atmospheric testing and attached the PTW.

6.3.10 Underground or Building Services Controls

Only hand tools (i.e. shovels, picks, crow-bars, etc) are to be used when digging within 1.5 metres of a gas line a risk assessment is to be performed, suitable control measures put in place and documented in a JSEA for the task. Assess the appropriate use of Powered machinery or equipment such as jackhammers when undertaking digging activities. This requirement may also be extended to other underground services as deemed appropriate for specific excavation activities.
Following the completion of excavation and trenching work, personnel responsible for coordinating or supervising the work are to ensure that site drawings and underground service maps are accurately updated.

6.3.11 Electrical Cables

Live cables create a hazard when excavation, demolition, repair or drilling occurs around them. Injury may occur if:

- The sheath of a cable and the conductor insulation are penetrated by a sharp object; or
- A cable is crushed or bent severely enough to cause internal contact between the conductors or the sheathing and one or more of the conductors.

Injuries resulting from damage to live electricity cables are usually caused by electric shock, the explosive effects of arcing current, and by any associated fire or flames.

6.3.12 Asbestos

Damage or penetration of any material containing asbestos creates a major health risk to anyone in the area and to ensure this is identified before work starts the site asbestos officer shall be consulted and the site asbestos register reviewed to ensure that there is no asbestos material in the area or that the correct procedures are adhered to if asbestos material is identified.
Appropriate controls are to be implemented as per Asbestos Management Plan (CS-OHS-43) if the job requires the disturbance or penetration of Asbestos containing material (ACM).

6.4 Contact or Damage to Underground Services

In the event of an underground service being contacted or damaged during excavation activities, the following is to be undertaken:

6.4.1 Contact or Arcing with an underground or in wall electrical cable

Should contact be made with an underground cable or arcing occur between the cable and an item of plant and/or employee, the following actions shall be taken:

- All work should cease immediately.
- Operator should remain inside cabin. If it is essential to leave the cab or operators station due to fire or other life-threatening reasons, jump clear of the equipment. Do not touch the equipment and ground at the same time. When moving away from the equipment, the operator should hop slowly, shuffle or jump away from the plant (with feet together) until at least 10 m from the nearest part of the plant item.
- Warn all other personnel / public to keep at least 10 m clear from equipment. Do not touch any part of the equipment or load and do not attempt to approach or re-enter the vehicle until the relevant authorities have determined the site is safe.
- Facilitate First Aid treatment and seek medical aid as required.
- Advise your organisations emergency contact and request they immediately notify the relevant authorities.

- Initiate the emergency management plan and incident investigation process.

6.4.2 Contact or Damage to Gas Assets

Should contact or damage be made to gas piping or assets, the following actions should be taken:

- All work should cease immediately.
- Operator is to shut down the plant or equipment UNLESS this process may provide an ignition source for any escaping gas. It is essential to leave the cab or operator station, trench or enclosure and maintain an exclusion perimeter due to the risk of explosion or fire. Do not attempt to use any instrument which may provide an ignition source near the gas escape. This may include mobile phones, two way radios, etc.
- Facilitate First Aid treatment and seek medical aid as required.
- Advise your organisations emergency contact and request they immediately notify the relevant authorities.
- Warn all other personnel / public to keep clear from the worksite and equipment. DO NOT attempt to approach or re-enter or start the vehicle until the relevant authorities have determined the site is safe.
- Initiate the emergency management plan and incident investigation process.

6.4.3 Contact or Damage to Sewerage Assets

Should an incident occur involving sewerage assets, the following actions should be taken

- All work should cease immediately.
- Operator should remove contaminated clothing immediately.
- Shower or wash down with copious amounts of clean water.
- Use eye wash if eyes are contaminated.
- If wastewater is ingested, advice from a doctor should be sought immediately regarding a dose of *immunoglobin* which can prevent Hepatitis A.
- If a person develops symptoms of nausea, vomiting, diarrhoea or fever then a doctor should be consulted immediately.
- Initiate your emergency plan and incident investigation process.

7 INSTALLING OR MODIFICATION OF UNDERGROUND SERVICES

Where new underground services are located on site, on landowner controlled areas, or where the path of an underground service is modified in any way, the following measures are to be implemented to provide future warning to those who may excavate or dig in the area

- The new services are to be entrenched in or filled in with sand or friable soil free of sharp stone, and colour coded marker tape and/or wire is to be located approximately 200mm above the service.
- The underground services are to be identified via the marker tape/wire colours and requirements as detailed in Appendix 1.
- On completion of all excavation work that has involved the installation or modification of site services, updates of all site service drawings to ‘As Built’ status is to take place.
- Refer to the AS/NZS 3000:2000 Wiring Rules for more details.

8 CONTRACTOR MANAGEMENT

CSE OIC's will provide contractors undertaking excavation and digging work all relevant prescribed information about underground services prior to work commencing. The CSE OIC or Principal Representative is to provide the contractor with details of CSE's Excavation and Digging Documentation and associated forms.
The CSE OIC is to monitor the contractor's methods of work and the implementation of the proposed controls to ensure that CSE's standards for managing excavation and digging activities are achieved by undertaking regular visual inspections of the excavation work area.
CSE OIC's should request and review the following information:

- JSEA/Work Method Statement for any work involving excavation work greater than 1.5m deep that identifies and details controls for excavation collapse, falling objects, being struck by machinery, falling into the excavation and inhaling or being exposed to impurities in the air
- Request training and competency evidence of all those contracted workers who will be involved in the work and those operating earthmoving machinery (i.e. copies of current certificates, etc)
- Details of a competent person who will be directly involved in the supervision of the work and inspection of the excavation where the OIC will not fill this role
- Request earthmoving machinery inspection and maintenance details (i.e. registers/log books/inspection records etc.).

9 TRAINING AND COMPETENCY

Refer to CS-PTW-SOP-02 Training and Authorisation in the PTW System

All personnel shall receive general training contained in the site induction in the requirements of this procedure including excavation and digging requirements (e.g. when controls are needed).

Excavator/Earth Moving Equipment Operators

All persons operating excavators and earth moving machinery are to possess the appropriate licences/certification for the specific plant items that they are to be operating on the site.

Service Location Personnel

Service location personnel are to be instructed in relation to the use of service location devices be familiar with the manufacturer's requirements and experienced with respect to the services that they are routinely required to search for and locate.

Competent Person

A Competent Person for the use, installation, inspection, and placement of sheeting or timber shoring for the shoring of a trench, is a person who

a) either
   i. has at least 3 years practical experience in trenching work, including the shoring of trenches, and a sound understanding of the technical principles involved in trenching work; or
   ii. is a geo-technical engineer; and
b) has acquired, through training, qualifications or experience the knowledge and skills to do the work in a safe way, including
   i. sound knowledge of relevant Australian Standards and of Advisory Standards, Industry Codes of Practices and other relevant legislation; and
   ii. sound knowledge of, and competence in, the risk management process for trenching work, including
c) hazard identification and risk assessment for trenching work; and

d) measures to control exposure to risks from trenching work, including shoring systems; and

e) safe work practices and procedures for trenching; and

f) how to plan and prepare trenching work; and

g) how to identify the location of underground services; and

h) how to identify soil types and other factors that affect the safety of a trench.

10 EXCAVATION, DIGGING AND BUILDING PENETRATION CHECKLIST

Refer to Appendix 1 – Graphic of S1877 Excavation, Digging and Building Penetration Control Checklist. The Excavation, Digging and Building Penetration checklist is to be completed for PTW jobs to support/complement the JSEA. The Control Checklist assists with compliance of CS Energy's CS-PTW-HAZ-04 Excavation, Digging and Building penetrations procedure.

11 PTW AUDITING AND REVIEW PROCESS

Compliance with the CS-PTW-HAZ-04 Excavation, Digging and Building Penetrations procedure will be reviewed in conjunction with the audit and review requirements of the PTW system as outlined in the Audit and Review Process for the PTW System procedure

12 PROCEDURE REVIEW

The CS Energy CS-PTW-HAZ-04 Excavation, Digging and Building Penetrations procedure will be reviewed on an as needs basis (e.g. following legislative change, new information, relevant incident, HSMS review etc.)

13 DEFINITIONS

Term	Definition
Battering Back	Means the process of removing material around a trench or excavation such that the walls are sloped back at an angle rather than vertical
Benching	Means the process of removing material around a trench or excavation such that the walls are stepped or benched back rather than vertical
Competent Person	A person who has through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly the specified task.
Digging	any activity involving the use of hand tools or the insertion of objects into the ground, (e.g. driving a picket or boring of holes), whereby earth, rock, sand, soil or other material is moved or displaced at a depth exceeding 150mm **Note:** This does not include the digging or movement of material stockpiles such as coal and topsoil, the digging of raised garden beds, cleaning of culverts around drains to the natural ground shape, etc.
Excavating	any activity that results in a hole in the earth or face of the earth greater than 150mm deep after a material has been moved or removed
Excavation	a hole in the earth, or a face of earth, formed after rock, sand, soil or other material is removed. Examples ▪ a trench, ditch, shaft, well, tunnel, pier hole or cutting. ▪ a hole drilled in the earth

Term	Definition
Geo-Technical Engineer	means a person who: a) is a registered professional engineer under the Professional Engineers Act 1988, and b) holds a professional engineering qualification relevant to Geo-Technology (including a civil engineer).
OIC	Officer in Charge of a PTW Job

14 REFERENCES

Reference No	Reference Title	Author
"B/D/11/19582"	Procedure - CS-PTW-01 - Permit to Work (PTW) Manual	Corporate PTW Committee
"B/D/11/19573"	Procedure - CS-PTW-HAZ-01 - Hot Work	Corporate PTW Committee
"B/D/11/19581"	Procedure - CS-PTW-HAZ-02 - Working at Heights	Corporate PTW Committee
"B/D/11/39828"	Procedure - CS-PTW-HAZ-03 - Working in Confined Spaces	Corporate PTW Committee
"B/D/11/19583"	Procedure - CS-PTW-SOP-02 - Training and Authorisation of Roles in the PTW System	Corporate PTW Committee
"B/D/11/30939"	Procedure - CS-OHS-11 - Job Safety and Environmental Analysis (JSEA)	H&S
"B/D/11/36152"	Form - Digging Excavation and Building Penetration Control Checklist	Corporate PTW Committee
"B/D/11/36145"	Form - S0010 - Hot Work Control Checklist	Corporate PTW Committee
"B/D/12/2876"	Form - S1972 - Working at Height Control Checklist	Corporate PTW Committee
	Queensland Work Health and Safety Regulations 2011	Queensland Government
AS 1345	Identification of the Contents of Pipes, Conduits and Ducts	
AS 2700	Colour Standards for General Purposes	
AS 2648.1	Underground Marking Tape – Part 1: Non-Detectable Tape	
AS 3000	Wiring Rules	

15 APPENDIX

Appendix 1 – Graphic of S1877 – Excavation, Digging and Building Penetration Control checklist

Click HERE to access document in TRIM – ("B/D/11/36152")

Excavation, Digging and Building Penetration Control Checklist

Form S1877
Ver. 2 (20.03.12)

Complete this form to gain authorisation to digging, excavation or penetration building work on site.

Part 1: Work Details

Print OIC Name:	PTW No.	Date: / /
Location:	Contactor performing the work	

Scope of Work to be Performed:

Part 2: Work Type

Excavation:	☐ Trenching	☐ Ground Ripping	☐ Post Holes
	☐ Drilling	☐ Foundation	☐ Other: .....
Driving of:	☐ Picket	☐ Pin	☐ Pipe
	☐ Electrode	☐ Spike	☐ Nail
Building Work:	☐ Demolishing	☐ Sawing	☐ Drilling/penetrating into walls, ceilings, floors

All Authorisations must be signed before work commences and a Permit to Work must be obtained and made available at the work site during the work activities.

Part 3: Authorisation

Operations Service Locator	Gas, Air, Tailings, Slurry, Process Water Lines	☐ Area Clear ☐ Conditions Apply
Print Applicant Name:	Applicant Signature:	Date: / /
Mechanical Service Locator	Water, Sewerage, Storm Water	☐ Area Clear ☐ Conditions Apply
Print Applicant Name:	Applicant Signature:	Date: / /
Electrical Service Locator	HV, MV, LV, Electrical Cables, O/H lines & Aerials	☐ Area Clear ☐ Conditions Apply
Print Applicant Name:	Applicant Signature:	Date: / /
IT Service Locator	Telephone, Fibre Optic Cables, Network Cables	☐ Area Clear ☐ Conditions Apply
Print Applicant Name:	Applicant Signature:	Date: / /
Asbestos Management Officer	Asbestos Containing Material in the surrounds	☐ Area Clear ☐ Conditions Apply

Appendix 2 – Underground Service Identification (AS 2648.1)

Underground Service	Tape Colour
Gas	Yellow
Water	Green
Communications	White
Fire-fighting/Fire systems	Red
Sewerage	Cream
Reclaimed Water	Purple
Electricity	Orange

Note:
Identification colours for other underground services should be of a bright colour. Guidance may be obtained from AS 1345 and AS 2700

Note:
The use of the colour canary yellow to identify pipelines containing gases is adopted in AS/NZS 2648.1, as this is the colour commonly used in Australia to identify gas pipes by gas supply authorities and users. It should be noted however, that AS 1345 specifies a colour of light beige for this purpose, this being the internationally agreed colour.

Summary of Underground Service Marking Tape Requirements (From AS 2648.1)
Detection: Wire lines or traces may also be located with marker tape to enable easy service detection as well as a visual marker to identify service location.
Tape Width: The minimum nominal width is to be 75mm. Preferred nominal widths are 100mm and 150mm.
Marking: Warning lettering printed in the tape is to be black in colour and of a minimum size of 25mm. The text is to be repeated at intervals of not more than 1m.
Tear Resistance: Longitudinal direction – not less than 3.0 N.
Transverse direction: not less than 3.5 N.

Note:
Additional requirements in relation to tape properties are included within AS 2648.1

Appendix 3 – What to look for during onsite inspection for underground services?

Prior to any excavation work, check at least 100 m along the road or footpath in each direction and around nearby corners for indications of existing services. These include:

- ☐ Indicators or markers for underground services
- ☐ Drainage pits and manhole covers
- ☐ Damaged footpaths, driveways or depressions which may indicate the presence of a trench
- ☐ Cables running up a pole
- ☐ Overhead cables near the worksite
- ☐ Control cabinets
- ☐ No overhead wires to a building or premise
- ☐ Above ground connection cabinets
- ☐ Light poles without an overhead service
- ☐ Service pits for gas, water, electricity, communications, sewerage and drainage connections
- ☐ Down pipes or vent poles
- ☐ Underground storage tank fill points and venting systems
- ☐ Kerb markings
- ☐ Water valves
- ☐ Fire hydrants and plugs
- ☐ Sprinkler systems
- ☐ Trap doors or access-covers
    - ○ Access to Underground electricity substations
    - ○ Access to cable jointing pits or tunnels
    - ○ Access to sewerage or stormwater trunks
    - ○ Underground gas regulators, syphons and valve assemblies
    - ○ Access to shafts
- ☐ Domestic service pits
- ☐ Gas or water metres
- ☐ Electricity pillars and metre boxes
- ☐ Any other signs out of character with the surrounding area

Note:
If such indications exist, the service shall be located by hand or another approved method.