	ANC Foster Pty Ltd Safety Management System		Doc No:	EXCAVATION
			Initial Issue Date	27 Apr 2010
EXCAVATION WORK			Revision Date:	Initial Version
			Revision No.	0
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Purpose

The purpose of this training program is to protect employees from safety hazards that may be encountered during work in trenches and excavations.

Scope

When work is performed on a non-owned or operated site, the operator's program shall take precedence; however, this document covers ANC Foster employees for basic awareness purposes that addresses all items and shall be used when an operator's program doesn't exist.

Procedure

General

It is a requirement that, in relation to excavation work, an adequate system of safety, involving shoring, earth retention equipment or other appropriate measures, is in place to control risks to health and safety arising from one or more of the following:

- The fall or dislodgment of earth and rock;
- The instability of the excavation or any adjoining structure;
- The inrush of water;
- The placement of excavated material; or
- The instability due to persons or plant working adjacent to the excavation.

If a system of shoring is used, it is required that an adequate supply of shoring equipment and material is provided and used to prevent a fall or dislodgment of earth, rock or other material that forms the side of or is adjacent to the excavation work.


A shoring system is not required if, having regard to the nature and slope of the side of the excavation and other relevant circumstances, there is no reasonable likelihood of a fall or dislodgment of earth, rock or other material from a height of more than 1.5 metres (measured vertically) that may bury, trap or strike a person who is in the excavation.

Caissons and cofferdams are of sound construction and secured in position to prevent movement.

Competent Person Duties

Any of the following excavation work is carried out only under the supervision of a competent person:

- Work at a depth of 1 metre or more;
- Work in tunnels
- Work on caissons and cofferdams; and
- Compressed air work.

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Inspecting Trench and Protective Systems

- Excavation work at a depth of 1 metre or more must be inspected by a competent person at the intervals determined during the risk assessment for the work.

Safe Access/Egress

- There must be a safe means of access to and egress from excavations.

Utilities and Pre-work Site Inspection

The location of underground installations shall be determined before excavation.

Excavation shall be done in a manner that does not endanger the underground installations or the employees engaged in the work. Utilities left in place shall be protected by barricades, shoring, suspension or other means as necessary to protect employees.

Protection of the Public

Barricades, walkways, lighting and posting shall be provided as necessary for the protection of the public prior to the start of excavation operations.

Guardrails, fences, or barricades shall be provided on excavations adjacent to walkways, driveways and other pedestrian or vehicle thoroughfares. Warning lights or other illumination shall be maintained as necessary for the safety of the public and employees from sunset to sunrise.

Wells, holes, pits, shafts and all similar hazardous excavations shall be effectively barricaded or covered and posted as necessary to prevent unauthorized access. All temporary excavations of this type shall be backfilled as soon as possible.

Protection Against Falls

Walkways or bridges protected by standard guardrails shall be provided where employees and the general public are permitted to cross over excavations. Where workers in the excavation may pass under these walkways or bridges, a standard guardrail and toe board shall be used.


Protection of Workers in Excavations

Exposure to Vehicular Traffic

Employees exposed to vehicular traffic shall be provided with, and shall wear vests or other suitable garments marked with or made of reflectorized or high-visibility material. Warning vests worn by flagmen shall be red or orange, and shall be of reflectorized material if worn during night work.

Employee Exposure to Falling Loads

No employee shall be permitted underneath loads (or where loads may fall) handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles provide adequate protection for the operator during loading and unloading operations.

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Warning System for Mobile Equipment

A warning system shall be used when mobile equipment is operated adjacent to the edge of an excavation if the operator does not have a clear and direct view of the edge of the excavation. The warning system shall consist of barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

Hazardous Atmospheres

The atmosphere shall be tested for air contaminants (oxygen, flammable gases, etc.) in excavations if a hazardous atmosphere exists or could reasonably be expected to exist. A hazardous atmosphere could be expected, for example, in excavations in landfill areas, in excavations in areas where hazardous substances are stored nearby, or in excavations near or containing gas pipelines.

Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or forced ventilation of the workspace.

Forced ventilation will be provided where necessary to ensure the atmosphere is safe.

When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, continuous air monitoring will be performed. The device used for atmospheric monitoring shall be equipped with an audible and visual alarm.

Atmospheric testing will be performed using a properly calibrated direct reading gas monitor. Direct reading gas detector tubes or other acceptable means may also be used to test potentially toxic atmospheres.

Personal Protective Equipment

All employees working in trenches or excavations shall wear approved hard-hats and steel toed shoes or boots.

Employees exposed to flying fragments, dust, or other materials produced by drilling, sawing, sanding, grinding and similar operations shall wear approved safety glasses with side shields.

Employees exposed to hazards produced by, or performing, welding, cutting, or brazing operations shall wear approved spectacles or a welding faceshield or helmet.


Employees entering bell-bottom pier holes or other similar deep and confined footing excavations shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

Employees shall wear approved gloves or other suitable hand protection.

Employees using, or working in the immediate vicinity of, hammer drills, masonry saws, jackhammers or similar high noise producing equipment shall wear suitable hearing protection.

Protection from Hazards Associated with Water Accumulation

Employees shall not work in excavations that contain or are accumulating water unless precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions taken must include inspection

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by a competent person before work begins, special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water or use of safety harnesses and lifelines.

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operation shall be monitored by a competent person trained in the use of the equipment.

If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation. Precautions shall also be taken to provide adequate drainage of the area adjacent to the excavation.

The competent person shall inform workers of the precautions or procedures that are to be followed if water accumulates or is accumulating in an excavation.

Stability Requirements

It is a requirement that no excavation work that is likely to reduce the stability of any part of a building or structure is commenced or continued unless adequate measures are adopted, both before and during the excavation work, to prevent a risk to the health and safety of a person from the collapse of the building or structure or any part of it.

It is a requirement that:

- Adequate measures are taken in the immediate vicinity of excavation work so as to prevent the fall of mobile plant or materials into the excavation; and
- No materials are placed, stacked or moved near the edge of excavation work so as to endanger a person present below.

It is also a requirement that, in relation to excavation work, an adequate system of safety is in place to control risks to health and safety arising from unplanned contact with electricity cables, gas mains and other utility services.

Protection of Employees from Falling Objects and Loose Rocks or Soil


It is a requirement that adequate measures are taken in the immediate vicinity of excavation work so as to prevent the collapse of the work. In particular, it is a requirement that no materials are placed, stacked or moved near the edge of excavation work so as to cause the collapse of the work.

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of:

- Scaling to remove loose material;
- Installation of protective barricades, such as wire mesh or timber, at appropriate intervals on the face of the slope to stop and contain falling material; or
- Benching sufficient to contain falling material.

Excavation personnel shall not be permitted to work above one another where the danger of falling rock or earth exists.

Employees shall be protected from excavated materials, equipment or other materials that could pose a hazard by falling or rolling into excavations.

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Materials piled, grouped or stacked near the edge of an excavation must be stable and self-supporting.

Daily Inspection

The competent person shall conduct daily inspections of excavations, adjacent areas, and protective systems for evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when the trench will be or is occupied by employees.

Where the competent person finds evidence of a situation that could result in a possible cave-in, failure of protective systems, hazardous atmosphere, or other hazardous conditions, exposed employees shall be immediately removed from the hazardous area until precautions have been taken to assure their safety.

Training

All personnel involved in trenching or excavation work shall be trained in the requirements of this program and regulatory requirements.

Training shall be performed before the employee is assigned duties in excavations.

Training records shall include the date(s) of the training program, the instructor(s) of the training program, a copy of the written material presented, and the names of the employee(s) to whom the training was given.