Appendix B - Section 7.0 of the Ontario Guideline for excavation in the vicinity of Bell Network

7. Excavation

7.0 Precautions to Take Before Commencing Excavation

7.0.1 Never excavate without the locate sheet on site. It is required to determine the location and type of network that is within the path of excavation

7.0.2 Always hand-dig to fully expose the Bell Network and never use mechanical equipment when crossing the network or encroaching within one meter on either side of the locate field marks

7.0.3 Never assume the depth of the underground network as the depth may vary even across short distances. The contractor/excavator must hand-dig to the full depth of the excavation exposing the indicated Bell Network

7.0.4 At no time is a contractor/excavator allowed to reposition, dismantle, or tamper with any Bell Network

7.1 Test Holes

7.1.0 Never assume the depth of the underground network

7.1.1 The contractor/excavator must dig test holes to expose the underground network on all sides whenever crossing it or working within the tolerance zone parallel to Bell's Network. The test holes must be left open along the entire length of the excavation until the work operation has been completed

7.2 Commencing Excavation

Once test holes have been completed and the identified network, as depicted on the locate, has been fully exposed, excavation with mechanical equipment can take place in accordance with the following procedures:

7.2.0 Mechanical excavation equipment should only be used in parallel to the exposed Bell Network and must not be used closer than 0.3 metres (1 foot) in any direction from the exposed network

7.2.1 The contractor/excavator must exercise extreme caution when working around Bell cables

7.2.2 Small, hand-held jackhammers or other hand tools may be used to break concrete or asphalt on road and or sidewalk surfaces as long as they are used carefully. Concrete below the road surface layers should be removed with **extreme caution.** On occasion, Bell's network may be encased in the roadbed, road base, or underlying materials

7.2.3 **Road saws should not be used to cut across locate field marks** as the depth of the network may vary even across short distances. Saw cuts must be made outside of the tolerance zone. The contractor/excavator can then hand tunnel from the side towards the locate field marks, to determine the location and depth of the network

7.2.4 Mechanical excavating equipment should only be used with extreme caution to remove broken asphalt or concrete

7.3 Vacuum Excavation

7.3.0 Locates must be obtained prior to commencing any excavation including vacuum excavation. This equipment can only be used by qualified operators who are trained in its safe use in the vicinity of the Bell Network

7.3.1 Approved vacuum excavation may be used as an alternative to hand-digging to the full depth of excavation. Vacuum-excavation is recognized by Bell for being a safe excavation method (refer to the locate request centre web site for additional information)

7.3.2 Guidelines/Requirements

- The maximum water pressure to be used in the vicinity of buried Bell Network during excavation shall not exceed 17250 kPa (2500 psi). Within the tolerance zone the water pressure shall be reduced to a maximum of 10350 kPa (1500 psi)
- The wand shall never remain motionless during excavation. Aiming directly at the network must be avoided at all times. A distance of 20 cm (8") shall be maintained between the end of the pressure wand nozzle, the network, and/or the subsoil
- All pressure measurements are to be taken at the vacuum excavation machine, truck or pump

- The nozzle must never be inserted into the subsoil while excavating above the network
- Only use vacuum excavation equipment that has been specifically designed for use around buried network
- An alternating multi-stream neoprene tipped nozzle must be used with the vacuum excavation unit to ensure that a concentrated stream of water is not directed at the buried network
- A device capable of stopping the excavation on demand, such as a trigger or valve, must be installed on the wand
- **If heated water is used during excavation, the temperature of the water shall never exceed 115 F (45 C)**

7.3.3 The use of high pressure water equipment in an occupied duct is not permitted

7.4 Frozen Ground Excavation

Using Hydro Vacuum is a Canadian Common Ground Alliance practice. The preferred method for excavating within the tolerance zone around any underground utility in frozen ground, is to use a hydrovac with heated water not exceeding 45C at the wand tip. Conventional excavation methods pose a risk to buried facilities if the facility is surrounded by frozen ground. The use of conventional mechanical excavation equipment can not only damage plant via direct contact but can also move the frozen ground encasing plant; potentially causing damage

7.5 Directional Bores / Torpedoes and Trenchless Excavation

Directional bores and torpedoes are excellent excavation tools but working with them involves certain risks. Because the equipment operator cannot visually follow the progress of the tools, contractor/excavators are required to:

- Dig test pits to the full depth of the excavation to expose all of the Bell Network in the path of boring/torpedoing equipment
- Expose the top and sides and then hand tunnel underneath to ensure that there are no conflicts with the work operation
- Leave all test pits open to monitor the equipment's progress
- Backfill once the boring or torpedoing work is finished

7.6 Use of Heavy Equipment

- No heavy equipment can be permitted on top of Bell manholes and structures without going through Bell Engineering for a proper load bearing protection plan. Contact your local Bell Engineering area prime for further information

- No heavy vibrating equipment can be used within 10 metres of a Bell manhole/structure. All work operations must be sent to Bell Engineering for a proper protection drawing/plan
- When a Bell manhole lid has been removed, there can be no driving with any type of equipment over the Bell infrastructure, this could result in a damage

7.7 Supporting Underground Structures

7.7.0 Never undermine the Bell Network. Cables may be encased in heavy concrete or clay tile structures and the unsupported weight of these may cause the network to collapse or slide down into the excavation site

- Operational guidelines for supporting underground structures can be obtained from the Bell Engineering team

7.7.1 When trenching parallel and in proximity to Bell's network, the contractor/excavator is required to place supports along the entire length of the excavation area to prevent the network from collapsing

7.7.2 When blasting in proximity to Bell's network:

- Bell Engineering must to be notified prior to the blasting operation. Overhead and underground networks must be identified and protected within the blast area
- Operational guidelines for blasting can be obtained from the Bell Engineering team

7.8 Backfilling

- Excavation where the Bell Network has been exposed must be backfilled with clean fill or granular material
- Always backfill to provide support under the Bell Network
- Never leave sharp materials near the network, as this could eventually wear through the protective outer layer and cause service failures in the future
- Backfilling should be performed without using tamping equipment directly on the exposed Bell Network