

		TITLE:	
		Engineering Specification	
RECOMMENDED: C. Proulx	NO:	1	REV:
APPROVED: C. Malone		OF	
REV. DATE: 2002-09-12		5	
		UDS0013	

**TEMPORARY AND PERMANENT SUPPORT OF
HYDRO OTTAWA DUCT BANKS WHEN
UNDERCUT BY AN EXCAVATION**

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REVISION SHEET

<u>Revision</u>	<u>Description</u>	<u>Date</u>	<u>Initials</u>
0	Original Document	2002-09-12	cp/csm

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REFER TO HYDRO OTTAWA SPECIFICATIONS

UDS0011 Temporary Support of Existing Duct Bank – Construction Detail

UDS0012 Permanent Support of Existing Duct Bank – Construction Detail

1.0 General

In large-scale excavations involving the location of Hydro Ottawa duct banks, arrangements shall be made for supporting the duct banks in a temporary way during the excavation and in a permanent way during the backfilling operation.

Hydro Ottawa duct banks are constructed in various sizes. Generally the formations are about 630 mm wide by 630 mm high, and weight approximately 900 kg per linear metre.

Generally the duct banks are constructed with unreinforced concrete and therefore have very little ability to be self-supporting in a free span. If any excavation undermines more than 1.5 meters of duct bank, intermediate supports shall be installed under the duct bank, and a permanent support shall be installed during the backfilling operation.

2.0 Locating Ducts

Prior to excavating, Hydro Ottawa shall be notified as 738-5499 local 522. An **Hydro Ottawa Cable Locator** will be sent to the site to indicate the location of the underground duct structure. The ducts shall be located by hands, i.e. not using mechanical excavating equipment. **Arrangements shall be made to have a Hydro Ottawa Underground Inspector present while the ducts are being exposed.**

3.0 Temporary Support

The Hydro Ottawa Specification no. UDS0011 “Temporary Support of Existing Duct Bank” shows the method of support.

On shorter spans, up to approximately 3 meters, a wood-supporting beam may be adequate. On spans over 6 meters, provisions shall be made to counteract any possible torsion or horizontal deflection in the supporting beam. Such forces arise due to unequal loading at the edge of the flange by the wire rope lashing. Methods of counteracting such forces are by lateral bracing of the supporting beam or by using a box-girder as the supporting beam. In most cases, a wide flanged I-beam of acceptable strength has been adequate.

If the trench is adequately shored at the location of the supporting beam, it will be sufficient for the beam to extend 1 meter on each side of the trench limit. If the trench is not shored, the supporting beam shall extend on each side of the trench limit a distance not less than one-half of the trench depth.

In addition for an unshored trench, the wire rope lashing shall start immediately adjacent to the trench face. For a shored trench, the wire rope lashing shall start no further than 1 meter from the trench face.

The temporary support shall be installed in the presence of the Hydro Ottawa Underground Inspector.

4.0 Permanent Support

The Hydro Ottawa Specification no. UDS0012 “Permanent Support of Existing Duct Bank” shows two methods of support. The Hydro Ottawa Underground Inspector will specify if Detail A or Detail B shall apply.

In either case the backfill shall be compacted to not less than 95% of the maximum density under the duct bank. Certified test results shall be presented to the Hydro Ottawa Inspector if requested. The backfill shall be brought up as close to the ducts as possible.

Special care shall be taken to ensure that no voids exist in the concrete under the duct structure. It is suggested that the cradle support (Detail B, of drawing UDS0012) be placed in two operations.

For a period of seven days after the concrete is placed, no equipment shall be allowed to pass over the duct structure.

All forms shall be adequately braced. **The Hydro Ottawa inspector shall be present when the concrete is being placed.**

5.0 Cold Weather Concreting

At temperatures below 4°C the following conditions shall apply:

- a. The fresh concrete, prior to placing, shall be between the temperature limits of 15°C minimum to 21°C maximum.
- b. As soon as the concrete is placed, the structure shall be covered with clean dry straw, and then covered with a tarpaulin or polyethylene sheet, for a minimum of forty-eight hours. After this time the temporary support may also be removed.

6.0 Miscellaneous

All work shall be subject to the approval of the Hydro Ottawa Underground Inspector. Additional provisions may be required if Hydro Ottawa considers that the safety of their cable is jeopardized.

On smaller excavations (maximum trench of approx. 1.5 m) permanent support may consist of a concrete column from undisturbed earth up to the center of the duct structure, but this will be subject to approval by Hydro Ottawa.

To obtain exact sizes and weights of duct structures contact Hydro Ottawa at 738-5499 local 216.

Prior to the commencement of any large-scale excavation, Hydro Ottawa shall be notified of the detail of the proposed work.