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Additional Information
For more information about this document, please contact Provincial Georeferencing geodesy@ontario.ca
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**Monument Construction Diagrams**

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Overview of Monument Types
Rock post type monumentation (No. A and No. C) shall be set in concrete or rock as a rock post.
Horizontal control survey monument cap No. B and bench mark monument cap No. D have been designed to fit standard threaded round iron bars. These monuments shall be installed in accordance with the specification outlined in Appendix A.

Construction of Bars
The round iron bars to which monument No. B and No. D are affixed must be 25mm in diameter, 1.5m long, standard threaded (8 threads per 25mm) and should include a nut welded to the bar as shown in Section AA of the diagrams. The purpose of this nut is to provide a seat for a threaded rubber driving head used to protect the threads during installation.

Monument Placement
To install the round iron bars a threaded rubber driving head is affixed to the top of the bar. The bar is then hammered into the ground, the rubber driving head is removed and the appropriate horizontal control or bench mark monument cap is installed as depicted in Section AA of diagram No. B and No. D.

Station Identification
All control monuments installed under contract to the Ministry of Natural Resources and Forestry shall be identified in accordance with OS79, Section 4e. Monument caps will be supplied by the Ministry.
# Appendix A – Bar Length and Marker Type Reference

## 1. Horizontal Control

<table>
<thead>
<tr>
<th>Classification</th>
<th>Type of Monumentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First order</td>
<td>i. 25 mm diameter, 3.0 m long, round iron bar threaded to receive Horizontal Control Survey Monument Cap No. B; or, ii. Horizontal Control Survey Monument No. A set in rock or concrete</td>
</tr>
<tr>
<td>Second, Third order</td>
<td>i. 25 mm diameter, 1.8 m long, round iron bar threaded to receive Horizontal Control Survey Monument Cap No. B; or, ii. Horizontal Control Survey Monument No. A set in rock or concrete</td>
</tr>
</tbody>
</table>

## 2. Vertical Control

<table>
<thead>
<tr>
<th>Classification</th>
<th>Type of Monumentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First order</td>
<td>i. 25 mm diameter, 3.0 m long, round iron bar threaded to receive Bench Mark Monument Cap No. D or, ii. Bench Mark Monument No. C set in rock or concrete</td>
</tr>
<tr>
<td>Second, Third order</td>
<td>i. 25 mm diameter, 1.8 m long, round iron bar threaded to receive Bench Mark Monument Cap No. D, or, ii. Bench Mark Monument No. C set in rock or concrete</td>
</tr>
</tbody>
</table>

Note: Threaded bars will be supplied by the contractors.
Horizontal Control Survey Monument No. A

**PLAN**

**ONTARIO CONTROL SURVEY**

NATURAL RESOURCES

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**SECTION - BB**

**LETTER STYLE** - STANDARD GOTHIC

**LETTER SIZE** - 5mm STROKE CENTRE TO STROKE CENTRE; 6mm EDGE TO EDGE FOR OUTER INSCRIPTION

3mm STROKE CENTRE TO STROKE CENTRE;
3mm EDGE TO EDGE FOR INNER INSCRIPTION

**LETTER DEPTH** 1mm

**LETTERS TAPERED 20° PER SIDE**

**MATERIAL** - BRASS OR BRONZE WITH NOT LESS THAN 83% COPPER CONTENT.

**FACE OF CAP BUFFED**

**SCALE** : FULL SIZE

**SECTION - AA**

**HORIZONTAL CONTROL SURVEY MONUMENT**

**No. A**

**DATE**

21 SEPT. 1983
Horizontal Control Survey Monument Cap No. B

Material: Brass or bronze with not less than 83% copper content. Face of cap buffed.

Letter style: Standard Gothic

Letter size: 5 mm stroke centre to stroke centre; 6 mm edge to edge for outer inscription.

Number size: 5 mm

Number depth: 1 mm

Letters tapered 20° per side.

Scale: Full size

Ontario Natural Resources Control Survey

CAP threaded (standard thread) to take 25.4 mm standard threaded rod (~8 threads per inch - minor diam. 0.8376 inch - area at root 0.0510 sq. in.)

Thermal hole for 5 mm allan screw.

5 mm allan screw

NUT welded to bar for driving head seat

25.4 mm Ø steel rod

Thermal hole for 5 mm allan screw.

SECTION A-A

SECTION B-B
Bench Mark Monument No. C

SECTION A-A

BENCH MARK MONUMENT
MINISTRY OF NATURAL RESOURCES

DATE 81 SEP 1983
Bench Mark Monument Cap No. D

Material - Brass or Bronze with not less than 83% copper content. Face of cap buffered.

Scale: Full size

Letter style - Standard Gothic
Letter size - 5 mm stroke centre to stroke centre, 6 mm edge to edge for outer inscription, 3 mm stroke centre to stroke centre, 3 mm edge to edge for inner inscription

Number size 5 mm
Number depth 1 mm
Letters tapered 20° per side

Ontario Natural Resources

Bench Mark Monument Cap

Ministry of Natural Resources

No. D

Date 22 Sept. 1983
Threaded Round Iron Bar

Horizontal Control Survey
Monument Cap No. B

Bench Mark
Monument Cap No. D

Threaded rubber driving head
to protect the threads
during installation.

25 mm diameter standard
threaded round iron bar

1.5 m