

APPENDIX 'A'

**Wolverine Project – All Weather Access Road
Protocols for Design and Construction of All Weather Access Road
o.b.o. Yukon Zinc Corporation**

Yukon Engineering Services Inc.
May 29, 2006

PART 1 - GENERAL

1.1 Description

- .1 This section specifies requirements for clearing of areas indicated in the contract documents or as designated by Engineer.

1.2 Definition

- .1 Clearing consists of disposing of all trees, brush, scrub, embedded logs and surface debris. This work is generally regarded as machine clearing, but may require hand clearing, depending on weather conditions and terrain details.

1.3 Requirements of Regulatory Agencies

- .1 Obtain necessary burning permits from the Resource Management Officer at the local Yukon Forestry office prior to commencing of any burning activities on the site. No extra payment will be made to the Contractor for conformance with the terms of the burning permit.
- .2 Conduct operations in accordance with the applicable Land Use Permit conditions.
 - .1 The Land Use Permit may designate hand clearing adjacent to stream crossings. Strict adherence to these conditions will apply.

1.4 Protection

- .1 Protect trees, shrubs, plants and other features to remain.
- .2 Take necessary precautions to prevent fires from spreading.
- .3 Contractor is to provide a fire fighting contingency plan to the Engineer prior to commencing work.
- .4 Leave the ground undisturbed for a distance of one (1) metre around all legal survey monuments. All brush and timber in this area shall be cut and removed by hand.
- .5 Protect reference points.
- .6 Hand clear areas within 10 m of ordinary high water mark of streams.

1.5 Measurement for Payment

- .1 Clearing to be measured in hectares of plan area within limits as supplied by Engineer. Bid price per hectare is to be full compensation for machine clearing, hand clearing, piling, disposal, traffic control, site cleanup, and all work necessary and incidental to the clearing of the site as described in this specification. No additional payment to be made for compliance with the Land Use Permit.
- .2 Payment will be made on the basis of:
 - 40% for piling
 - 60% for disposal
- .3 Clearing for roadway construction projects will be measured to the limits of layout, with no deductions for areas previously cleared by others.
- .4 In the event of fire spreading beyond the disposal pile, the Contractor shall be fully responsible for fire control and costs.
- .5 In situations where assessment of completion is hampered by snow cover, the final inspection will be done after the snow melts. The Certificate of Total Performance will not be issued until final inspection.

PART 2 - EXECUTION

2.1 Traffic Control

- .1 Supply and maintain barricades and warning signs as required to protect workmen and the general public.
- .2 Traffic Control to conform to Section 02010, Traffic Control.

2.2 Clearing

- .1 Dispose of all trees, brush, scrub, embedded logs and surface debris.
- .2 All trees and brush shall be cut to a height not exceeding 150 mm above immediately adjacent ground level.
- .3 Deadfalls or windfalls which lie partially within the area to be cleared shall be considered to be wholly within the area being cleared, and shall be removed as part of the work to be carried out under the contract. The pushing of windfalls, fallen timber or brush into the area not to be cleared is not permitted.
- .4 Cut down dangerous overhanging trees, unsound branches or dangerous snags.

- .5 Trees shall be felled towards the centre of the area being cleared. Where trees cannot be felled without danger to traffic, they shall be cut in sections from the top down.

2.3 Removal and Disposal

- .1 Dispose cleared material by the following methods:
 - .1 Burning
 - .2 Chipping, which produces residue meeting requirements of this section, hauled to a disposal site approved by the Engineer or evenly distributed in layers of uniform thickness to the approval of the Engineer
 - .3 Mulching, which produces residue meeting requirements of this section, evenly distributed in layers of uniform thickness to the approval of the Engineer
- .2 Do not perform chipping or mulching in snow covered areas, unless approved by the Engineer.
- .3 Chipping or mulching residue requirements are as follows:
 - .1 Maximum dimension in any direction, 300 mm
 - .2 Ratio of maximum dimension to minimum dimension, 3:1 or greater
- .4 When disposing of debris by burning, do not utilize tires in the burning process.
- .5 In the event that Forestry regulations prohibit burning, materials to be burned may be piled until such time as the prohibitions are rescinded. Approval to pile materials and delay burning does not imply completion of the work.
- .6 Remove all trees, portions of trees, brush or scrub from existing streams or roadways.

2.4 Finished Surface

- .1 Leave ground surface in condition suitable for immediate grubbing or grading operation.

PART 1 - GENERAL

1.1 Description

- .1 This section specifies requirements for hand clearing of areas indicated in the contract documents or as designated by Engineer.

1.2 Definition

- .1 Clearing consists of hand cutting off to within 150 mm of original ground surface all trees, brush, scrub, embedded logs, surface debris and disposal.

1.3 Requirements of Regulatory Agencies

- .1 Obtain necessary burning permits from the Resource Management Officer at the local Yukon Forestry office prior to commencing of any burning activities on the site. No extra payment will be made to the Contractor for conformance with the terms of the burning permit.
- .2 Conduct operations in accordance with the applicable Land Use Permit conditions.

1.4 Protection

- .1 Protect trees, shrubs, plants and other features to remain.
- .2 Take necessary precautions to prevent fires from spreading.
- .3 Contractor is to provide a fire fighting contingency plan to the Engineer prior to commencing work.
- .4 Leave the ground undisturbed for a distance of one (1) metre around all legal survey monuments.
- .5 Protect the reference points.

1.5 Measurement for Payment

- .1 Clearing to be measured in hectares of plan area within limits as supplied by the Engineer. Bid price per hectare is to be full compensation for hand clearing, piling, disposal, traffic control, site cleanup, and all work necessary and incidental to the clearing of the site as described in this specification. No additional payment to be made for compliance with the Land Use Permit.

- .2 Payment will be made on the basis of:
 - 40% for piling
 - 60% for disposal
- .3 Clearing for roadway construction projects will be measured to the limits of layout, with no deductions for areas previously cleared by others.
- .4 In the event of fire spreading beyond the disposal pile, the Contractor shall be fully responsible for fire control and costs.
- .5 In situations where assessment of completion is hampered by snow cover, the final inspection will be done after the snow melts. The Certificate of Total Performance will not be issued until final inspection.

PART 2 - EXECUTION

2.1 Traffic Control

- .1 Supply and maintain barricades and warning signs as required to protect workmen and the general public.
- .2 Traffic Control to conform to Section 02010, Traffic Control.

2.2 Clearing

- .1 Dispose of all trees, brush, scrub, embedded logs and surface debris.
- .2 All trees and brush shall be cut to a height not exceeding 150 mm above immediately adjacent ground level.
- .3 Deadfalls or windfalls which lie partially within the area to be cleared, shall be considered to be wholly within the area being cleared, and shall be removed as part of the work to be carried out under the contract. The pushing of windfalls, fallen timber or brush into the area not to be cleared is not permitted.
- .4 Cut down dangerous overhanging trees, unsound branches or dangerous snags.
- .5 Trees shall be felled towards the centre of the area being cleared. Where trees cannot be felled without danger to traffic, they shall be cut in sections from the top down.

2.3 Removal and Disposal

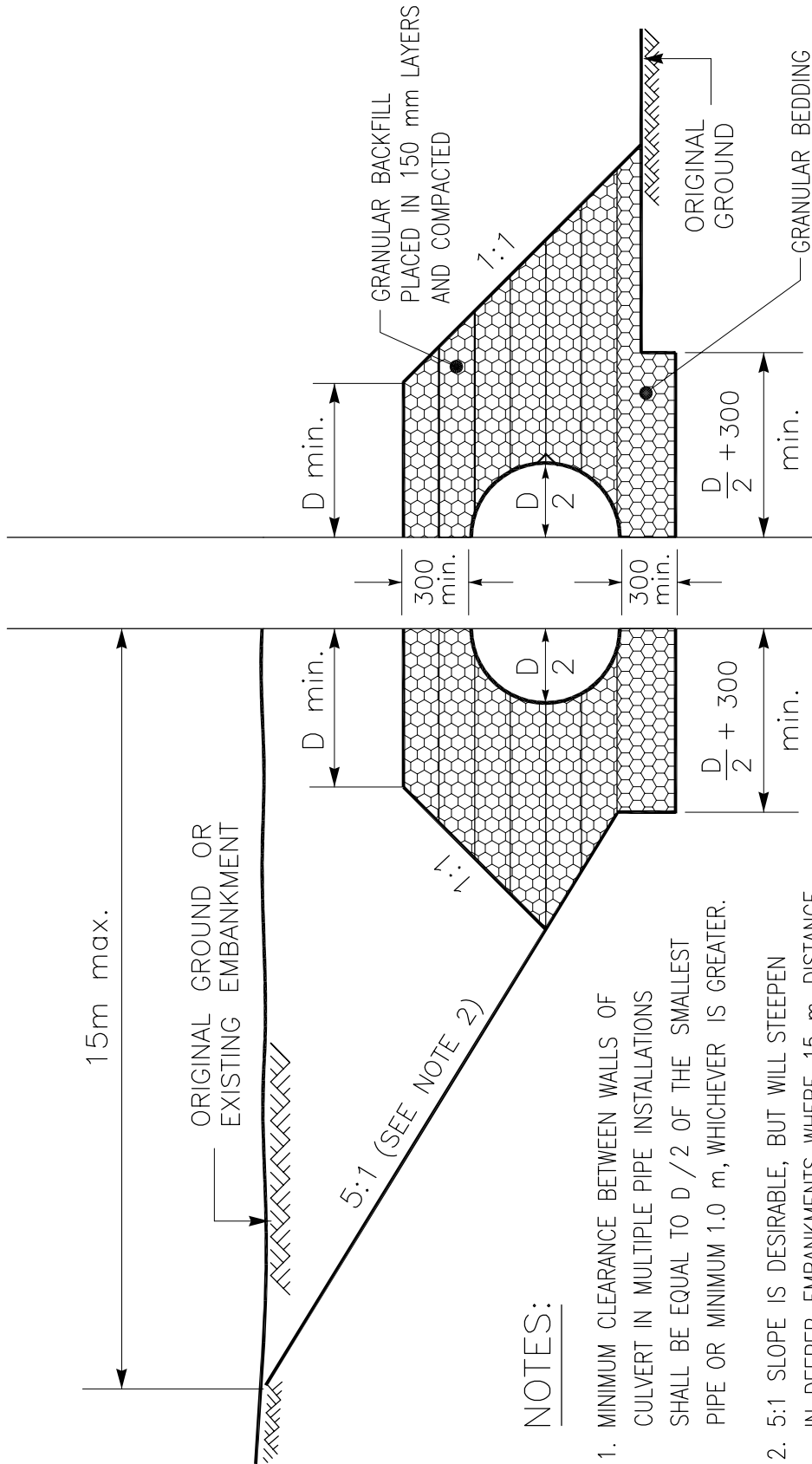
- .1 Dispose cleared material by the following methods:
 - .1 Burning

- .2 Chipping, which produces residue meeting requirements of this section, hauled to a disposal site approved by the Engineer or evenly distributed in layers of uniform thickness to the approval of the Engineer
- .3 Mulching, which produces residue meeting requirements of this section, evenly distributed in layers of uniform thickness to the approval of the Engineer
- .2 Do not perform chipping or mulching in snow covered areas, unless approved by the Engineer.
- .3 Chipping or mulching residue requirements are as follows:
 - .1 Maximum dimension in any direction, 300 mm
 - .2 Ratio of maximum dimension to minimum dimension, 3:1 or greater
- .4 When disposing of debris by burning, do not utilize tires in the burning process.
- .5 In the event that Forestry regulations prohibit burning, materials to be burned may be piled until such time as the prohibitions are rescinded. Approval to pile materials and delay burning does not imply completion of the work.
- .6 Remove all trees, portions of trees, brush or scrub from existing streams or roadways.

2.4 Finished Surface

- .1 Leave ground surface in condition suitable for immediate grubbing or grading operation.

Φ
CULV. CULV.



FILL

CUT

NOTES:

1. MINIMUM CLEARANCE BETWEEN WALLS OF CULVERT IN MULTIPLE PIPE INSTALLATIONS SHALL BE EQUAL TO D / 2 OF THE SMALLEST PIPE OR MINIMUM 1.0 m, WHICHEVER IS GREATER.
2. 5:1 SLOPE IS DESIRABLE, BUT WILL STEEPEN IN DEEPER EMBANKMENTS WHERE 15 m DISTANCE FROM CULVERT CENTERLINE IS GOVERNING FACTOR
3. ALL DIMENSIONS IN mm UNLESS NOTED OTHERWISE.



Transportation Engineering Branch

DRAWING TITLE

**TYPICAL
CULVERT
INSTALLATION**

designed: YTG

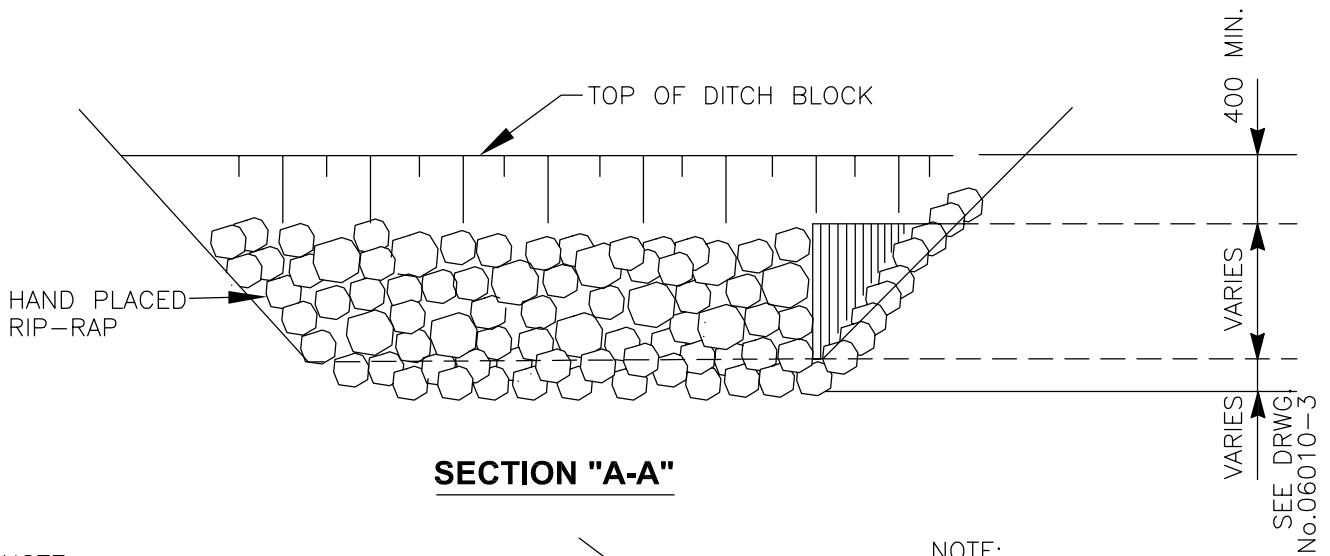
drawn: ysd

app'd:

date: Mar. 2003

scale: N.T.S.

drwg: 06010-1

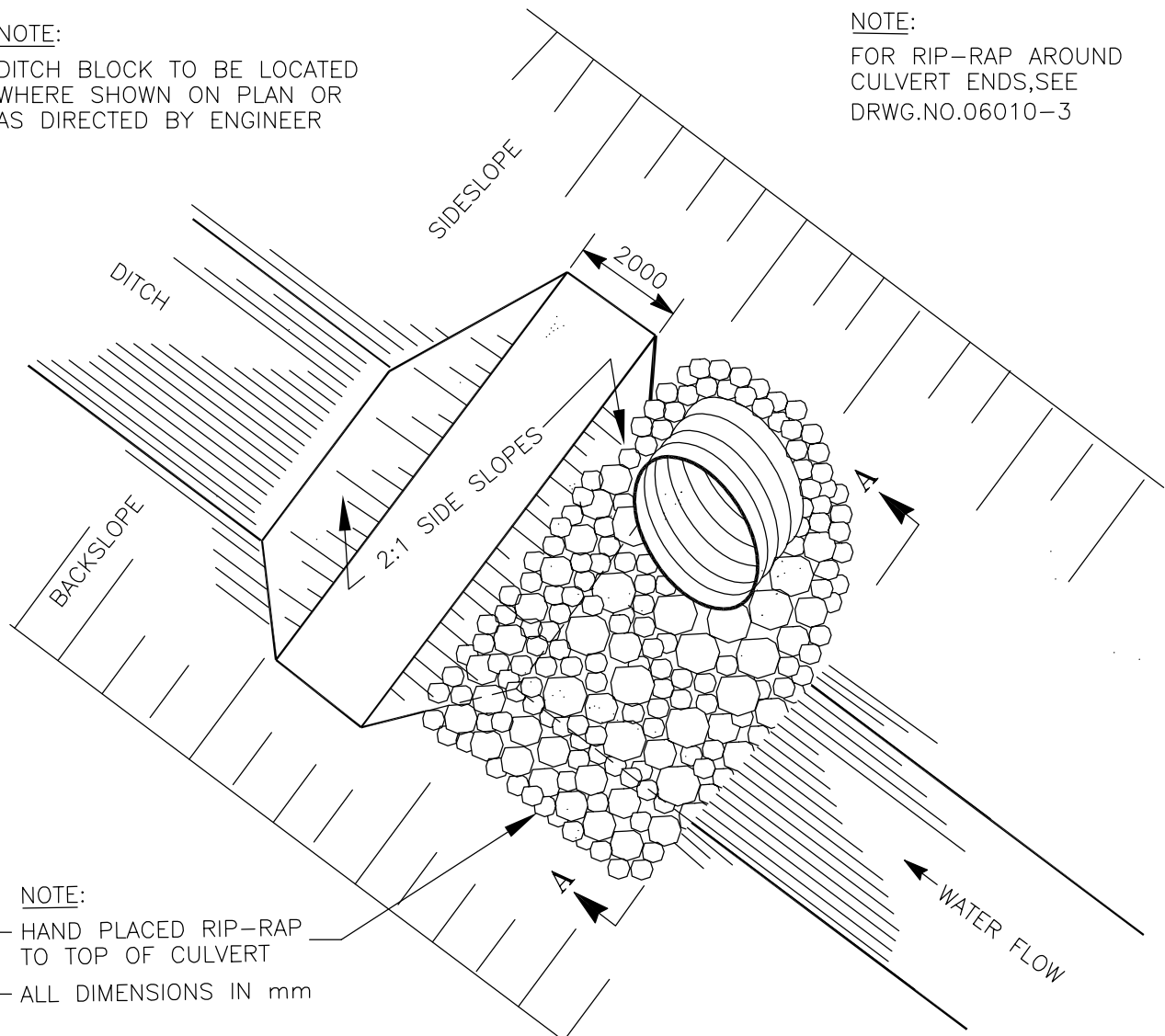



NOTE:

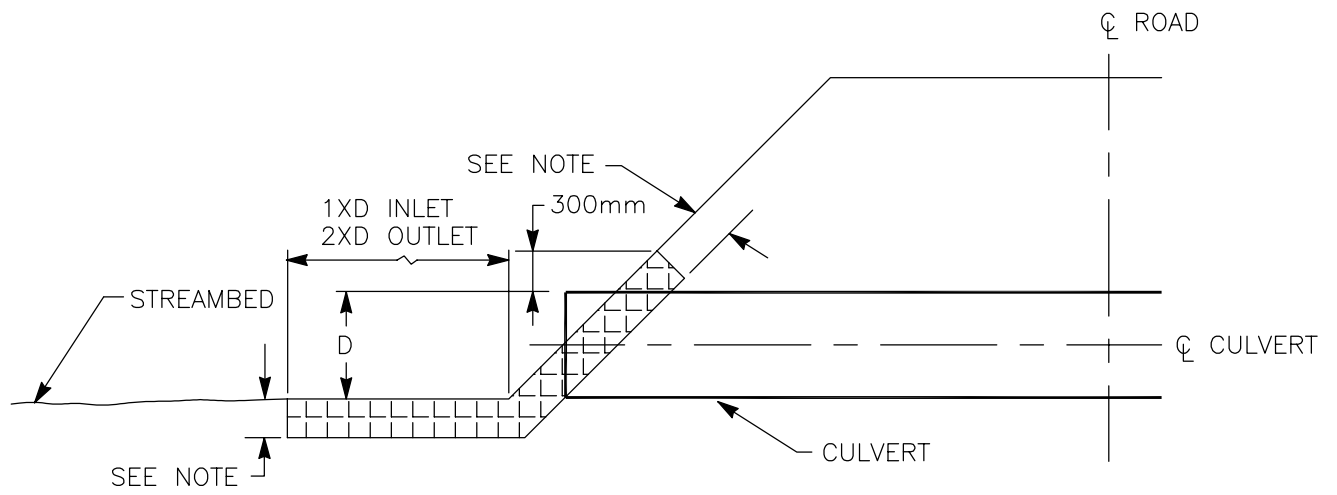
DITCH BLOCK TO BE LOCATED WHERE SHOWN ON PLAN OR AS DIRECTED BY ENGINEER

NOTE:

FOR RIP-RAP AROUND CULVERT ENDS, SEE DRWG.NO.06010-3



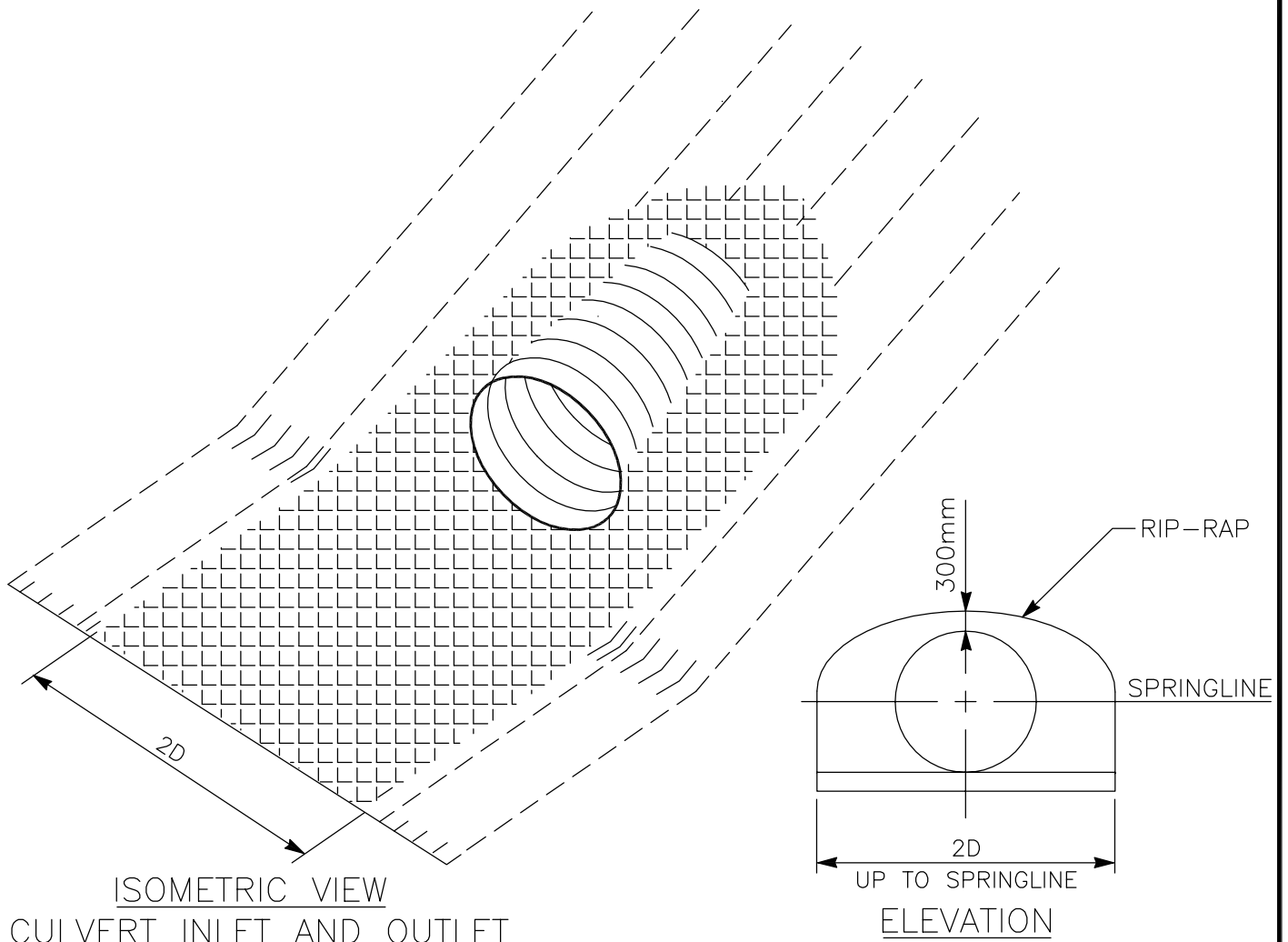
 <p>Transportation Engineering Branch</p>	<p>DRAWING TITLE</p> <p>TYPICAL DITCH BLOCK WITH CULVERT</p>	<p>designed: YTG</p>
	<p>drawn: ysd</p>	<p>app'd:</p>
<p>date: Mar. 2003</p>	<p>scale: NTS</p>	<p>drwg: 06010-2</p>



SECTION
CULVERT INLET AND OUTLET

NOTE:

THICKNESS 300mm (D SMALLER THAN 1400mm)
 THICKNESS 600mm (D=1400mm-2000mm)



Yukon
Highways and Public Works

Transportation Engineering Branch

DRAWING TITLE:

TYPICAL
HAND PLACED RIP-RAP
CULVERT END TREATMENT

designed:	Y.T.G.
drawn:	ysd
app'd:	
date:	Mar. 2003
scale:	N.T.S.
drwg:	06010-3

HAND-PLACED RIP-RAP QUANTITIES (m³)

DIAMETER (mm.)	SIDE- SLOPE	THICKNESS (mm.)	INLET QUANTITY	OUTLET QUANTITY	DITCH BLOCK (300mm.)	TOTAL QUANTITIES	
						WITHOUT BLOCK	WITH BLOCK
400	3.1	300	0.3	0.4	1.3	0.7	2.0
600			0.6	0.9	2.1	1.5	3.6
800			1.1	1.5	3.0	2.6	5.6
1000			1.7	2.4	4.0	4.1	8.1
1200			2.5	3.4	5.2	5.9	11.1
1400	2.1	600	5.5	7.9	6.4	13.4	19.8
1600			7.2	10.3	7.7	17.5	25.2
1800			9.2	13.1	9.2	22.3	31.5
2000			11.3	16.1	10.7	27.4	38.1
2200			13.7	19.5	12.4	33.2	45.6

NOTE:
SEE DRAWING 06010-2 AND 06010-3 FOR TYPICAL
HAND-PLACED RIP-RAP TREATMENT.



Transportation Engineering Branch

DRAWING TITLE

CULVERT INSTALLATIONS
HAND-PLACED
RIP-RAP QUANTITIES

designed: YTG

drawn: ysd

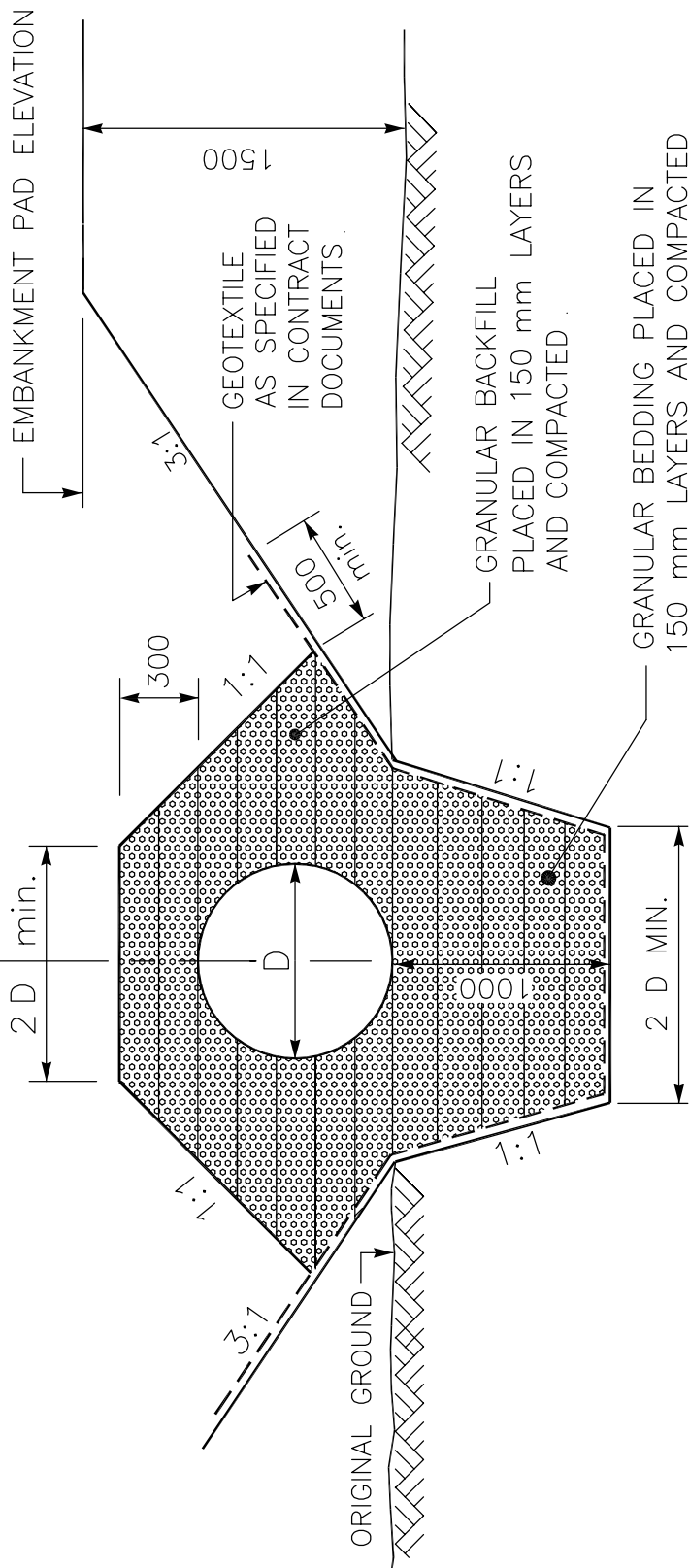
app'd:

date: Mar. 2003

scale: N.T.S.

drwg: 06010-4

SYMMETRICAL
ABOUT ϕ PIPE



NOTE:
ALL DIMENSIONS IN mm
UNLESS NOTED OTHERWISE



Transportation Engineering Branch

DRAWING TITLE

**TYPICAL CULVERT
INSTALLATION
MUSKEG SECTION
TYPE I**

designed: YTG

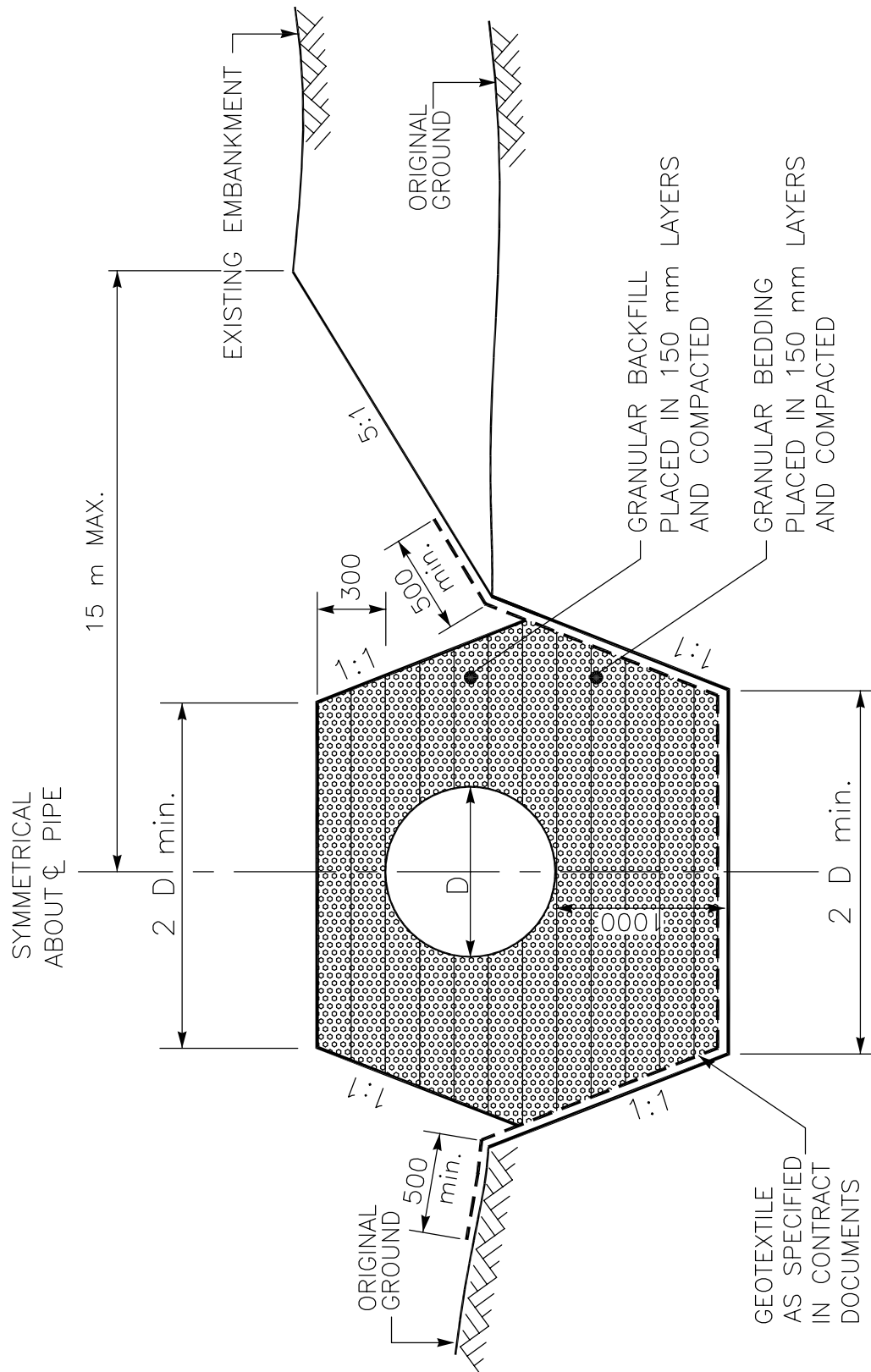
drawn: ysd

app'd:

date: Mar. 2003

scale: N.T.S.

drwg: 06010-6



NOTE:
 ALL DIMENSIONS IN mm
 UNLESS NOTED OTHERWISE



Transportation Engineering Branch

DRAWING TITLE

**TYPICAL CULVERT
 INSTALLATION
 MUSKEG SECTION
 TYPE II**

designed:	YTG
drawn:	ysd
app'd:	
date:	Mar. 2003
scale:	N.T.S.
drwg:	06010-7