



Public Works
Canada

Travaux publics
Canada

Western Region

Région de l'Ouest



MACKENZIE HIGHWAY, N.W.T. MILE 495.0 TO MILE 546.3

FINAL DESIGN SUBMISSION DECEMBER, 1974

DETAIL DESIGN DATA



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Program Manager (Civil)
Design & Construction
OTTAWA, Ontario

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Western Region

SECURITY - CLASSIFICATION - DE S

000041

OUR FILE - N/RÉFÉRENCE

9305-52-300

YOUR FILE - V/RÉFÉRENCE

000005

DATE

December, 1974

SUBJECT
OBJET

FINAL DESIGN SUBMISSION - MACKENZIE HIGHWAY
MILE 495 - 546.3 (S), DECEMBER 1974

In accordance with the D.R.C.G. meeting of December 14, 1973 and subsequently as requested by the Director of Engineering and Architecture Branch, two (2) sets of design plans with varying degrees of information were developed; one for review purposes and one for contract purposes.

Review Purposes - E.W.G.

Enclosed are twenty-four (24) copies of the narrative portion of the above-noted Design Submission. Two (2) sepia mylar copies of the plans have been forwarded under separate cover.

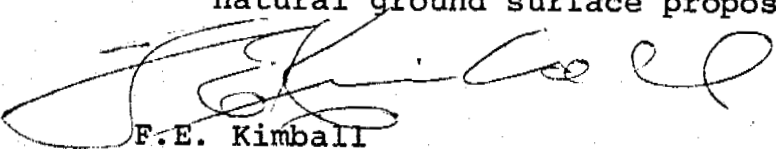
Six (6) copies of the narrative and one (1) set of sepia mylar copies of the plans have been forwarded to Mr. C. Amos of D.I.N.A. in Yellowknife. Single copies of the narrative and a single set of prints have been forwarded to D.O.E. in Edmonton and Winnipeg and E.M.R. in Calgary.

Contract Purposes - D.I.N.A.

One (1) set of sepia mylar copies of the design plans for the above-mentioned Submission have been forwarded to G.D. Reid for printing and distribution and one (1) set of prints has been forwarded to Mr. C. Amos of D.I.N.A. in Yellowknife.

Items included in the Review Set of the design plans, in addition to the information included in the Contract Set of the Design Plans are:

1. Location and nature of all off-take ditches plotted on the orthomapping.
2. Cross sections of cuts and fills over fifteen feet plotted on the Plan-Profile Mile Sheets.
3. Plan shape of every borrow area and planned location of access roads by a line marking the precise boundary of the natural ground surface proposed to be disturbed.


F.E. Kimball
Project Manager N.W.T. Roads
Western Region

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INTRODUCTION

The Final Design Submission, Mile 495 to Mile 546.3 (s), November, 1974 has been prepared as a resubmission to include the Information Omissions as observed and noted by the Project Manager in the review of the Preliminary Design Submissions, Mile 495 to 521 and Mile 521 to 547.7 (s).

Due to a recent alignment revision from Mile 497 to 502 the orthophoto mapping from Mile 498 to 501 is not available at this time. The orthophoto mapping for this section will be submitted as an insert when available.

The reader should note that this report forms part of a total design resubmission, the major portion of which is contained in separate plan form.

CHAPTER 1

REFERENCE: Letter of Direction for Preliminary
Design Submission, Miles 495 to 521,
Miles 521 to 547.7 d.d. October 4, 1974.

1. ALIGNMENT

The geotechnical information and alignment recommendations for the above segments which were submitted on August 21, 1974 are now being reviewed. Final alignment approvals will be forthcoming shortly in order that this section may be cleared by Hire North this winter.

No comment required from the Department of Public Works at this time.

2. DRAINAGE

- (a) Appendix B of the narrative accompanying the design submission indicates the drainage area for the culvert at Mile 519.3 to be 5.4 square miles while the environmental data sheets state a value of 8.4 square miles. D.O.E. assessors have estimated the size of drainage area to be 9.3 square miles. Please request your hydrology consultant to verify his information on this culvert site.

Due to the alignment revision in this area the hydrology consultant has now estimated the drainage area to be 5.2 square miles.

- (b) The streams at Miles 529 and 534 are listed as having high fishery potential, but scheduling constraints have not been noted. All future design submissions are to indicate whether or not scheduling constraints are envisaged for streams having a moderate to high fishery potential. If constraints are not thought necessary, it should be stated.

Scheduling constraints requested above are covered in Division 1, Section 2 of the draft specifications which states: "No construction activity or alteration or diversion of a stream channel will be permitted in the construction of bridges and culverts in excess of 60 inch diameter in the period from May 15 to July 15 each year.

2. DRAINAGE - cont'd

- (c) *Sufficient sediment trapping devices are to be constructed in the segment around Mile 495.5 to prevent silt from entering the lake to the west of the right-of-way.*

With the overlay construction used in this segment of the highway the Department of Public Works does not anticipate any silt entering this lake. Although some minor quantities of silt may be eroded from the sides lores of the embankment, the local natural vegetation will intercept and trap this before it approaches the lake.

- (d) *Care is to be taken during construction to ensure that sufficient culverts are installed in the segment Mile 522 to 524 to provide adequate drainage for the area upslope from the right-of-way.*

During the design process, the design team placed culverts in an effort to maintain the natural drainage system of an area as much as is possible. Additional culverts if required will be placed during construction at the field construction engineers discretion.

- (e) *Steam de-icing pipes are to be installed in all culverts where icing is found to occur or where it may be reasonably anticipated. This criteria applies to the entire highway as well as the design segments being discussed.*

Wherever icing problems are recognized on the MacKenzie Highway and where no other methods of controlling the icing problem can be devised steam de-icing pipes will be installed in these culverts.

3. BORROW AREAS

- (a) *If the borrow areas proposed at Miles 495, 500.8, 519.5 and 533.5 are visible from the highway, the margins of the borrow areas are to be relocated or the areas screened so they will not be visible to the highway user.*

The borrow areas at Miles 495 and 519.5 have a good tree screen between them and the highway right-of-way hiding them from the highway user. The borrow area at Mile 500.8 has now been deleted due to an alignment revision in this area. No borrow area is being proposed at Mile 533.5.

3. BORROW AREAS - cont'd

- (b) Concern has been expressed that development of the proposed borrow area at the south end of the airstrip at Mile 533 could preclude possible use of the strip for future aviation activities. Please consult with the N.W.T. Government concerning any forecast use of the airstrip. If the strip is to be utilized the borrow area should be relocated or minimum use made of the area. This matter has been discussed by this Department with MOT and they have indicated they do not have any future plans regarding utilization of the strip.

In accordance with the Draft Specifications contained in Appendix "C" of this report the contractor is permitted to construct a maximum of two airstrips on sections of the roadway. Since these airstrips will remain after the highway construction has been completed, it is D.P.W.'s opinion that the emergency value of existing airstrips such as at Mile 533 would no longer be important.

4. SOILS

- (a) Please provide, in a separate document, a consolidation and interpretation of the experience to date of the performance of silt and clay as fill material in northern road construction and recommend formalized studies to fill identified knowledge gaps.

A separate document will be prepared as soon as the intent of this comment has been clarified.

- (b) Slope stabilization measures should be planned for the cut slopes at Mile 514.1, Stations 1199-1209 and shown as part of the Final Design Submission for this location.

The 3:1 backslopes designed for this cut are expected to provide stable slopes through this section. Due to inadequate space on the Mile Sheet Mile 514 to 515 these 3:1 backslopes are indicated in note form.

4. SOILS - cont'd

- (c) Consideration should be given to reducing the backslopes of the cut at Mile 510.8, Stations 1020-1037 to a slope of 2.5:1 or 3:1 as this may be expected to provide additional construction material.

The designed grade line as proposed through this section of the highway provides balanced earthwork. However, if during construction additional material is required these backslopes can be reduced.

5. CONSTRUCTION ACTIVITY AND CONSTRAINTS

It has been recommended that constraints be placed on construction activity in the area M504-505 between May 15 and June 30 each year. Please discuss with C.W.S. the extent and nature of the constraints necessary to protect the waterfowl nesting area at this location and submit recommendations with the Final Design Submission.

After joint consultations about the nature of the highway-waterfowl conflict in the area M504-505, D.P.W. and C.W.S. concluded that a timing constraint on construction is not necessary. However, during the construction phase of this section of highway, D.P.W. will limit access to the lake as much as possible in order to minimize disturbance of the waterfowl nesting area.

6. CAMPSITE LAYOUT

For the "Aspen Leaf" camp design, a common waste disposal field for the wash car and kitchen trailers is shown to be located in the center of the camp. It is suggested that the disposal field be placed on the periphery of the camp so that additional pits may be constructed when and if required.

A revised "Aspen Leaf" camp design with the above suggestion has been included in the Final Design Submission package for Miles 495-546.3

7. ARCHAEOLOGY

A comparison of the original Preliminary Design Submissions with the revised Preliminary Design Submissions has revealed that at the following five locations the potential for the discovery of archaeological sites has been reduced. An explanation is to be provided for these changes in site potential.

Site Location

Original Rating

Revised Rating

7. Cont'd

<u>Site Location</u>	<u>Original Rating</u>	<u>Revised Rating</u>
Miles 499-503.6	Good	Low
Miles 503.6-507	Medium	Low
Miles 511.5	High-Moderate	Low
Miles 513-514	Moderate	Low
Miles 521-522	High	Moderate

The Environmental Consultant advised that the potential for the discovery of archaeological sites were updated in the revised Preliminary Design Submission for the five portions of the Mackenzie Highway, Mile 499 to 522. For the original Preliminary Design Submissions archaeological potential was assessed mainly from proximity to known sites or travel routes and by map and airphoto evaluation. Ratings were purposely high to allow for the rough standard of assessment.

The 1973 archaeological field examination program was completed prior to submission of the revised Preliminary Design Submission, December 1973. No archaeological sites were discovered within the five highway sections rated and the ratings were lowered in accordance with conditions within the right-of-way. The moderate potential of the Saline River section, Mile 521 to Mile 522, recognizes the probability of early access routes along the valley inland areas east of Mount Clark. The archaeological consultant concurred with the reduction of the ratings of these five sections following the 1973 field season.

APPENDIX "A"

SPECIAL DITCH TREATMENT

Amended June, 1974

SPECIAL TREATMENT FOR DITCHES

Roadway and offtake ditches are often necessary elements in highway design and construction. These ditches require the removal of the vegetative cover from their respective areas, thus increasing the potential for scour erosion.

This scour erosion in highway ditches is dependent upon numerous factors including discharge, channel gradient, sediment in water, soil characteristics such as grain size, density, organic binder, cementation and ice content.

Some methods used in highway construction to control or prevent scour erosion are: blanketing the ditch floors with stable, free-draining granular materials, reducing the effective ditch gradient by constructing a series properly spaced ditch checks on the ditch floor and by diverting run-off water out of the ditch onto natural vegetation by using ditch blocks.

Design equations exist for open channel flow, which relate flow velocity to the gradient and cross-sectional configuration of the channel. The Manning formula, is such an equation and is commonly employed for open channel flow calculations. The formula is as follows:

$$V = (1.486/n) R^{2/3} S^{1/2} \quad (1)$$

where

V=velocity of water, in feet per second

R=hydraulic radius (water area divided by
wetted perimeter)

S=slope of channel gradient, in feet per foot.

n=Coefficient of Roughness (Manning's "n")

One of the principles followed in designing the Mackenzie Highway was to avoid excavation in permafrost wherever and whenever possible. Therefore, the use of standard engineering texts for use in non-permafrost areas was considered applicable for deriving ditch lining and ditch check spacing charts for the Mackenzie Highway.

When cuts through ice-rich permafrost areas are unavoidable it is intended to sub cut and back fill with a sufficient depth of ice-free material, which would provide soil conditions similar to non permafrost areas.

The Handbook of Steel Drainage and Highway Construction Products, second Edition, 1971, lists limiting velocities for non erosion of channels. The following tabulated Manning's "n" and limiting velocities for the general soil types found on the Mackenzie Highway right-of-way are excerpts from this Handbook.

TABLE 1

<u>Material</u>	<u>Manning "n"</u>	<u>Velocity ft./sec. For Clear Water</u>
Fine sand	.020	1.50
Silty sand	.020	1.75
Fine gravel	.020	2.50
Stiff clay	.025	3.75
Coarse gravel	.	
Well graded gravel	.025	4.00
Cobbles	.035	5.00
Shale, hard pan	.025	6.00

Using the limiting velocities as tabulated above and Manning's formula, discharge versus gradient curves were calculated for a twelve foot wide "B" type road ditch. (See figure 2).

Ditch Lining

For a given soil type a curve in Figure 2 indicates the limiting discharge for a given gradient above which scour erosion may occur. Therefore, theoretically, by lining the ditch with an adequate depth of material selected higher in the graph scour erosion should be arrested or minimized.

Ditch Checks

As an alternate to ditch lining ditch checks, within their limits, would be adequate and possibly more economical in some areas for scour prevention.

See Figure 7 of this report for a schematic explanation of ditch check theory.

Figures 3 to 6 inclusive of this report are recommended ditch check spacing charts calculated for discharges up to 20 c.f.s. over various soil types. The derivation of these ditch check spacing charts was based on the effective gradient required for non-erosion of a soil type at a given discharge.

Due to the physical limitations of the highway ditch depth the ditch check crest is one foot above the ditch floor. A forty-foot minimum spacing of ditch checks was considered to be reasonable for construction, maintenance and effectiveness.

Discharge Determination

The Rational formula developed in 1889 by sewage engineers is probably the most widely used formula for estimating discharges. The formula is:

$$Q = CiA. \quad (2)$$

where

Q = discharge in c.f.s.

C = the run-off coefficient

i = the intensity of rainfall in
inches per hour.

A = the drainage area in acres.

This approach with the following modifications was considered to be an acceptable one for small drainage areas up to about one square mile.

Bolter, Parish, Trimble, consulting engineers, have in their publication, Hydrology Study and Design of Culverts, Mile 297 to Mile 345, Mackenzie Highway, November, 1972, developed a modified Rational formula for large drainage areas in the following form:

$$Q_i = 26.7 ARr (100 - L) M \quad (3)$$

where

Q_i = maximum instantaneous discharge
- c.f.s.

A = drainage area - square mile

R = rainfall in 24 hours

r = rainfall reduction factor

L = percent water loss

M = conversion factor mean daily discharge
to maximum instantaneous.

Rationalizing the variables in the above formula as they are effected in the Mackenzie Valley small drainage areas the following empirical formula was developed for estimating small drainage area discharges:

$$Q = .584 CA \quad (4)$$

where

Q = maximum instantaneous discharge in c.f.s.

C = run-off coefficient

A = drainage area in acres.

(a) - ".584" is the resultant of 26.7, R, r, M and the conversion of square miles to acres ($\frac{1}{640}$)

"R" - 4 inches per 24 hours was considered a conservative estimate.

"r" - 1.0 was used since no appreciable reduction can be expected in small drainage areas.

"M" - a value of 3.5 was considered conservative for small drainage areas.

(b) - "C" - run-off coefficient is similar to (100-L).

Bolter, Parish, Trimble arrived at an

"L" value of 75% for large drainage areas

(550 acres and greater). The accepted

run-off coefficient for concrete and pavement is 0.8 suggesting a water loss of 20%.

It was considered conservative to use this 20% water loss for drainage areas of 45 acres and less. Joining these limits with a parabolic curve, expected water losses for intermediate drainage areas were interpolated and converted to the following run-off coefficients:

TABLE 2

Expected run-off coefficients for small drainage areas in the Mackenzie Highway

<u>Acres</u>		<u>"C"</u>
Up to 45	-	0.80
Up to 98	-	0.65
Up to 222	-	0.50
Up to 550	-	0.25

The selection of a particular type of ditch treatment or whether it is required will ultimately rest on the experience of the resident engineer.

Figure 2

LIMITING CHANNEL GRADES FOR THE DESIGN OF "B" TYPE DITCHES

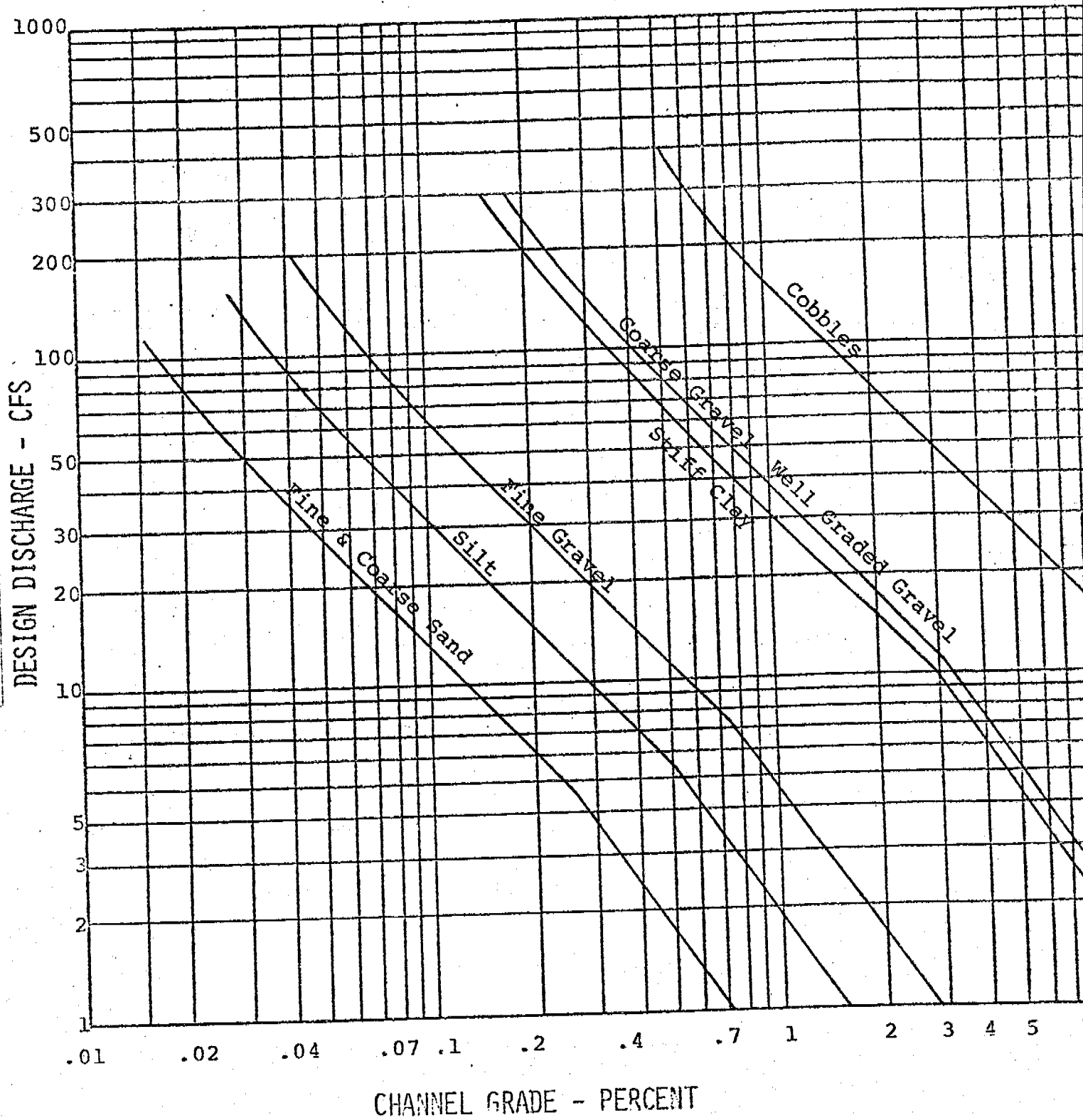


Figure 3

DITCH CHECK SPACING

(DESIGN DISCHARGE - 3 CFS)

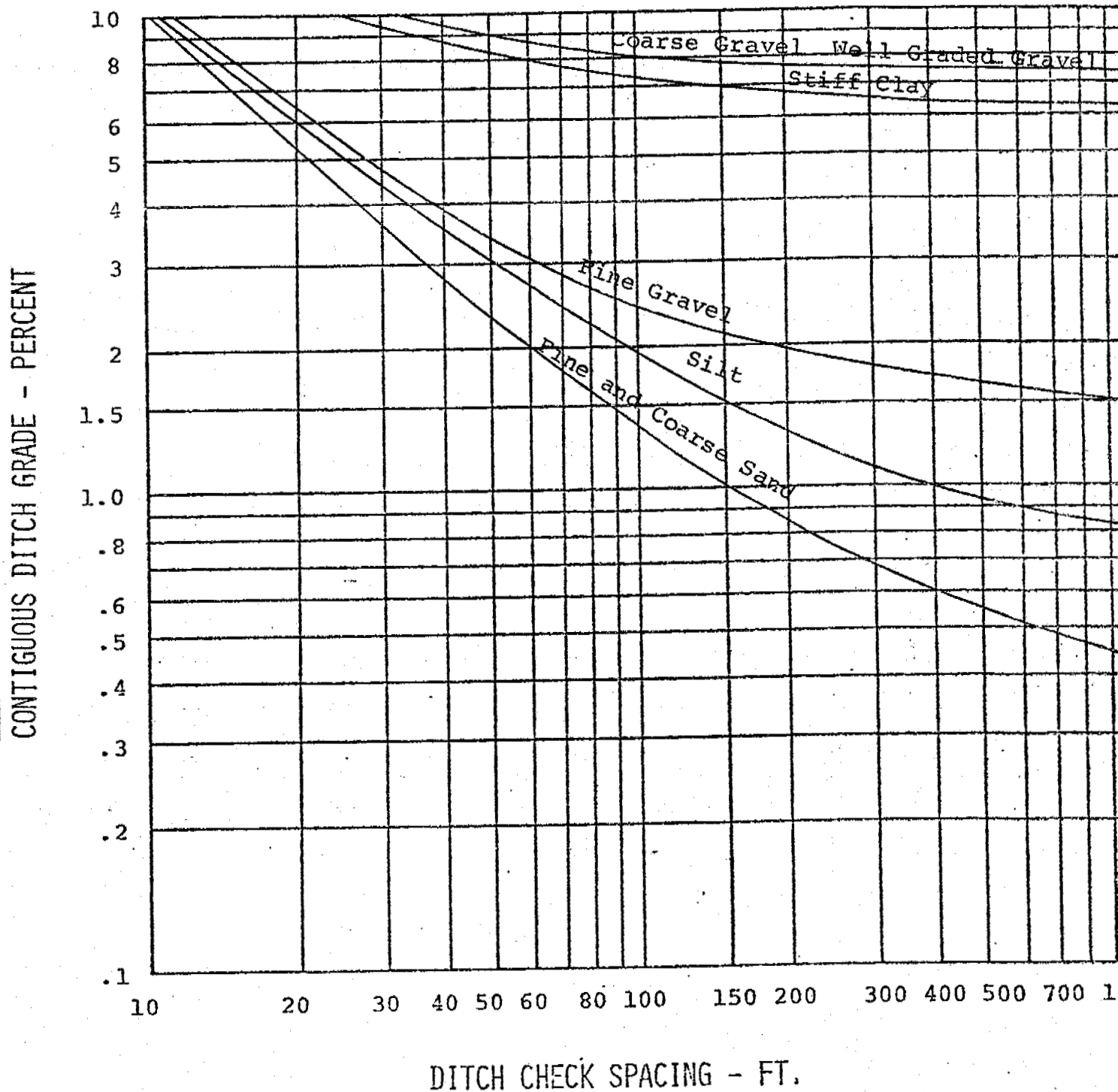
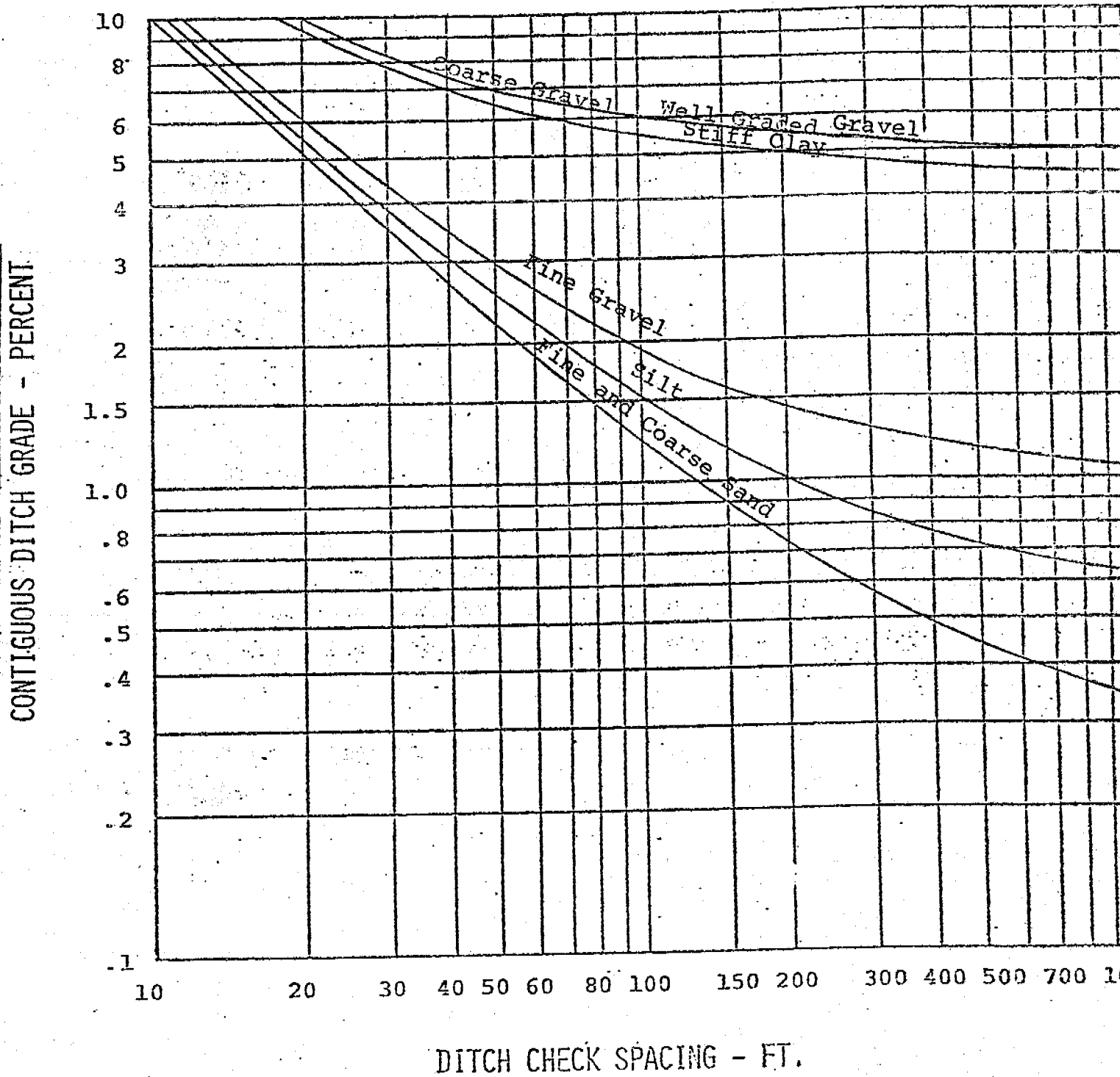


Figure 4

DITCH CHECK SPACING

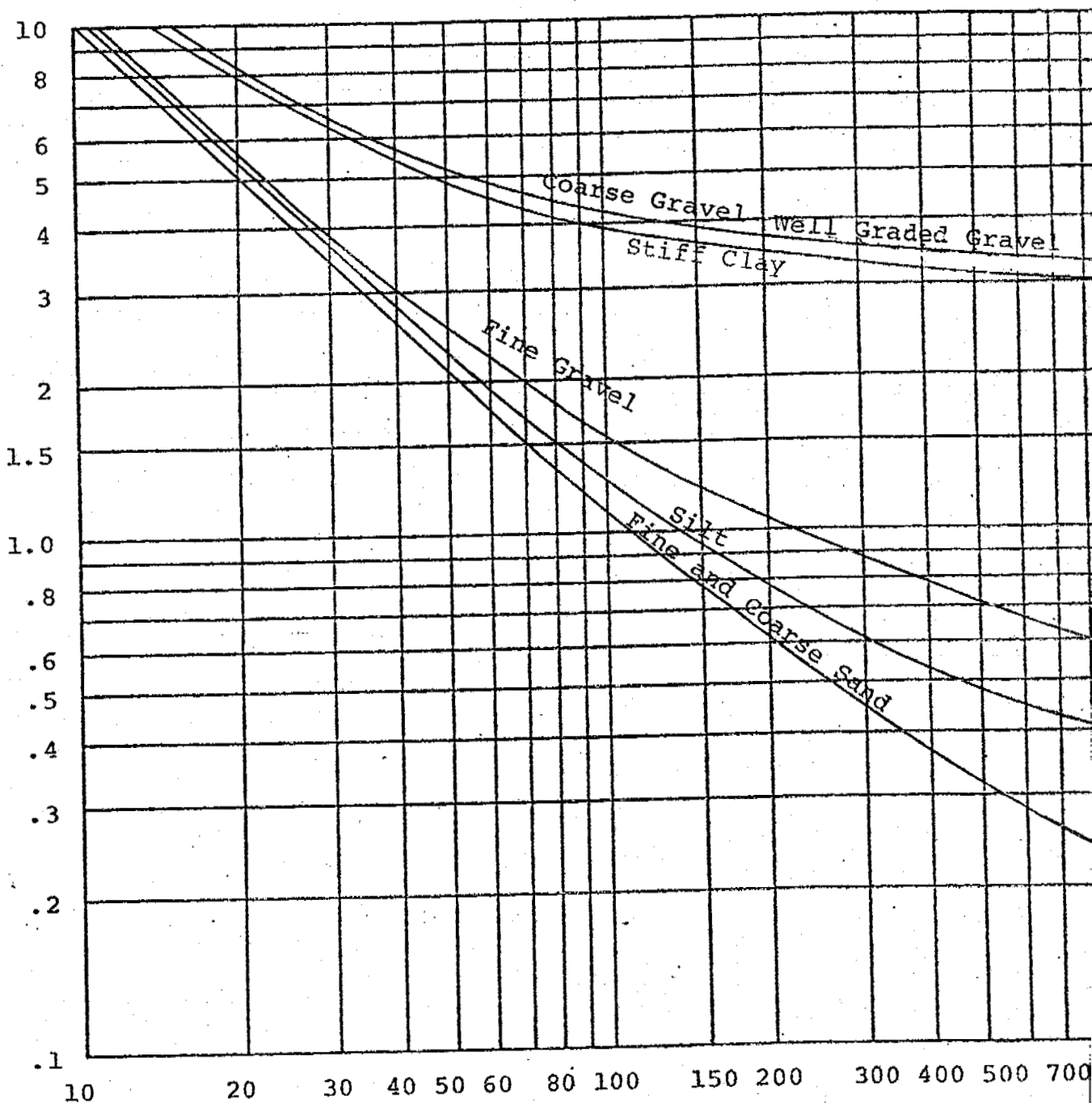
(DESIGN DISCHARGE - 5 CFS)



DITCH CHECK SPACING

(DESIGN DISCHARGE - 10 CFS)

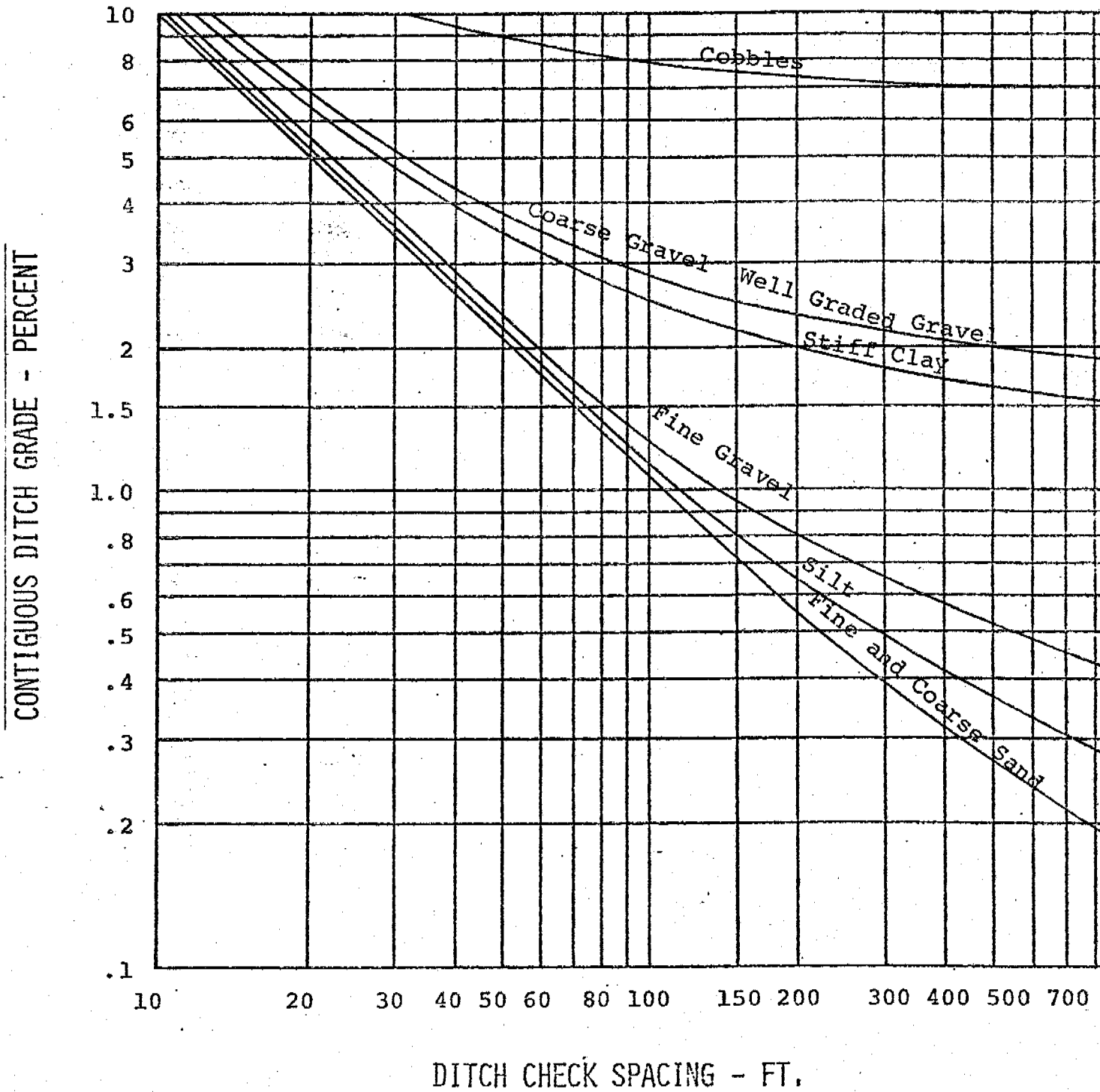
CONTIGUOUS DITCH GRADE - PERCENT



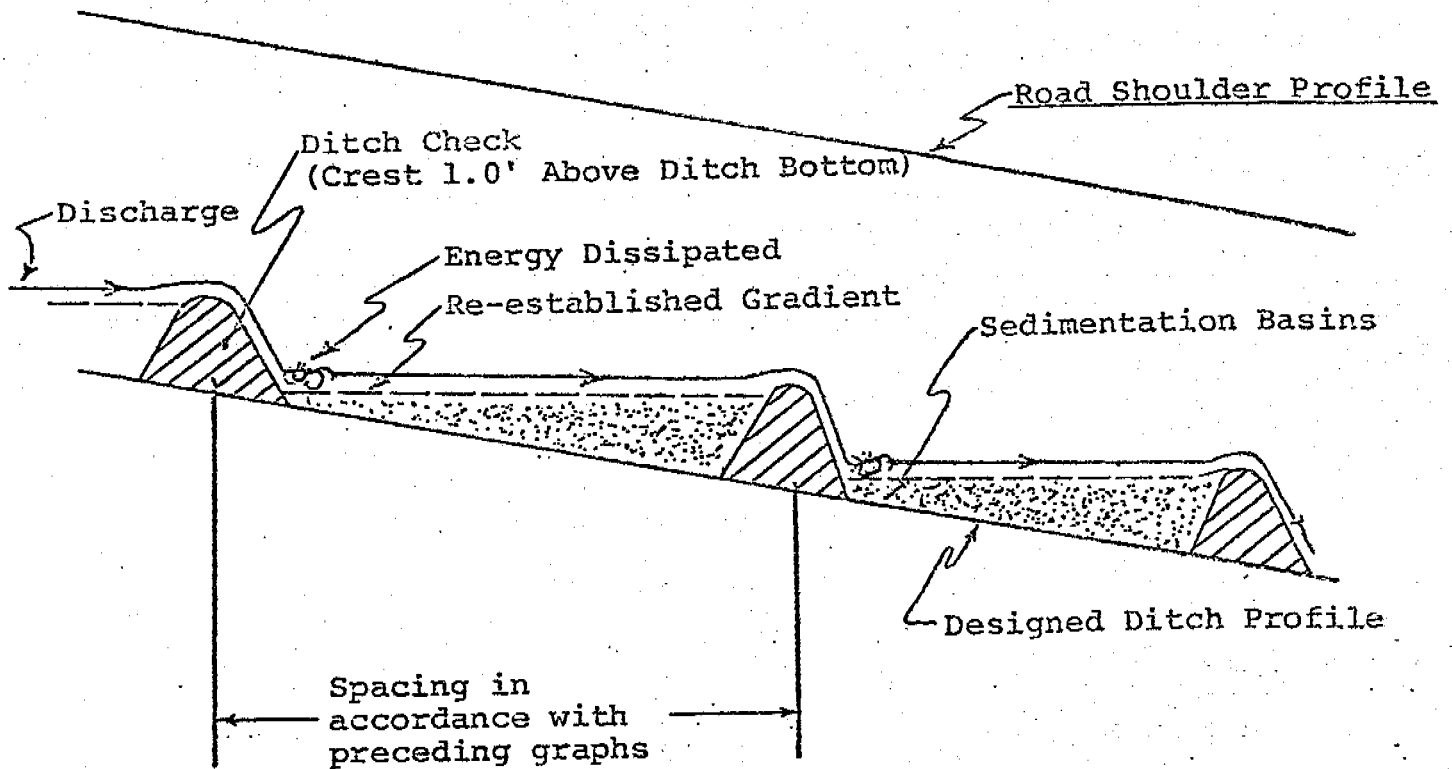
DITCH CHECK SPACING - FT.

Figure 6

DITCH CHECK SPACING
(DESIGN DISCHARGE ~ 20 CFS)



DITCH CHECKS



- The ditch checks will be constructed with non-erodible materials.

APPENDIX "B"

HYDROLOGY SUMMARY

TABLE 2
HYDROLOGY SUMMARY

MILE 495 to MILE 545

Part 1

MILE	496.8	499.3	499.8	504.9	507.9	508.3
Drainage Area (A) Total (sq. miles)	13.7	2.0	16.0	16.7	9.2 *	9.2 *
Q _{hwm} (c.f.s.)	170	70	570	450	78	57
Drainage Area (A _e) EFFECTIVE (sq. miles)	2.0	0.5	1.5	-	-	-
Relief (feet)	50	50	50	-	-	-
(100 - L) Water Retained for Runoff	.19	.19	.19	-	-	-
Rainfall (inches in 24 hours)	3.5	3.5	3.5	-	-	-
M Ratio	4.12	4.6	4.16	-	-	-
Q _e (c.f.s.)	146	41	111	-	-	-
Drainage Area (A _{lc}) LAKE CONTROL (sq.mi.)	11.7	1.5	14.5	16.7	9.2	9.2
Relief (feet)	1400	50	1500	1550	1150	1150
(100 - L)	.26	.19	.26	.26	.24	.24
Rainfall (inches in 24 hours)	3.5	3.5	3.5	3.5	3.5	3.5
Q _{lc} (c.f.s.)	284	27	352	406	206	206
Drainage Area (A _m) MUSKEG (sq. miles)	-	-	-	-	-	-
Q _m (c.f.s.)	-	-	-	-	-	-
Q rational (c.f.s.) (Q _e + Q _{lc} + Q _m)	430	68	463	406	206	206
Q design (c.f.s.)	430	70	570	450	210	210

* Mile 507.9 is an outlet channel for lake which also drains to Mile 508.3.

TABLE 2
HYDROLOGY SUMMARY

MILE 495 to MILE 545

Part 2

MILE	509.8	511.1	514.3	515.7	516.0	517.9
Drainage Area (A) Total (sq. miles)	4.8	2.1	4.9	1.2	4.0	1.2
Q _{hwm} (c.f.s.)	364	210	290	77	430	175
Drainage Area (A _e) EFFECTIVE (sq. miles)	4.8	2.1	4.9	1.2	4.0	0.6
Relief (feet)	1100	650	1500	1250	1650	550
(100 - L) Water Retained for Runoff	.24	.22	.26	.25	.27	.22
Rainfall (inches in 24 hours)	3.5	3.5	3.5	3.5	3.5	3.5
M Ratio	3.9	4.11	3.89	4.18	3.97	4.40
Q _e (c.f.s.)	430	177	460	117	400	54
Drainage Area (A _{lc}) LAKE CONTROL (sq.mi.)	-	-	-	-	-	0.6
Relief (feet)	-	-	-	-	-	550
(100 - L)	-	-	-	-	-	.22
Rainfall (inches in 24 hours)	-	-	-	-	-	3.5
Q _{lc} (c.f.s.)	-	-	-	-	-	12
Drainage Area (A _m) MUSKEG (sq. miles)	-	-	-	-	-	-
Q _m (c.f.s.)	-	-	-	-	-	-
Q rational (c.f.s.) (Q _e + Q _{lc} + Q _m)	430	177	460	117	400	66
Q design (c.f.s.)	430	210	460	120	430	175

TABLE 2
HYDROLOGY SUMMARY

MILE 495 to MILE 545

Part 3

MILE	519.3	524.8	529.1	534.2		
Drainage Area (A) Total (sq. miles)	5.2	1.0	12.0	0.2		
Qhwm (c.f.s.)	630	*	750	-		
Drainage Area (Ae) EFFECTIVE (sq. miles)	5.2	1.0	12.0	0.2		
Relief (feet)	1600	950	900	200		
(100 - L) Water Retained for Runoff	.26	.23	.23	.20		
Rainfall (inches in 24 hours)	3.5	3.5	3.5	3.5		
M Ratio	3.87	4.2	3.47	5.0		
Qe (c.f.s.)	489	90	895	19		
Drainage Area (A1c) LAKE CONTROL (sq.mi.)	-	-	-	-		
Relief (feet)	-	-	-	-		
(100 - L)	-	-	-	-		
Rainfall (inches in 24 hours)	-	-	-	-		
Q1c (c.f.s.)	-	-	-	-		
Drainage Area (Am) MUSKEG (sq. miles)	-	-	-	-		
Qm (c.f.s.)	-	-	-	-		
Q rational (c.f.s.) (Qe + Q1c + Qm)	489	90	895	19		
Q design (c.f.s.)	630	90	895	19 **		

* HWM Due to Icing - QHWM Invalid

** Q Design will be affected by head differential across grade on Little Smith Creek floodplain.

November 19, 1974

TABLE 3
CREEK MILE 504.9

ESTIMATED CULVERT COST VS. BRIDGE COST

CULVERT COSTS

3 - 96" Diameter X 98' - 10 Gauge C.S.P.P. Culverts

Supply and Delivery - \$90.55/lin.ft.	\$26,622	
Assembly - \$150.00/lin.ft.	<u>44,100</u>	\$70,722

Excavation - 934 cu.yd. @ \$10.00/cu.yd.		9,340
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Bed Material - 1053 cu.yd. (5265 cu.yd. miles)		
Haul - 5 miles @ \$0.40/cu.yd.mi.	\$ 2,106	
Load - 1053 cu.yd. @ \$2.50/cu.yd.	<u>2,633</u>	4,739

Fill Material - 1043 cu.yd. (extra compared to bridge) (3129 cu.yd. miles)		
Haul - 3 miles @ \$0.65/cu.yd.mi.	\$2,034	
Load - 1043 cu.yd. @ \$2.25/cu.yd.	<u>2,347</u>	4,381

Rip-Rap - 220 cu. yd. @ \$40.00/cu.yd.		8,800
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TOTAL		<u>\$97,982</u>
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BRIDGE COST

32' Wide X 76' Span

2,432 sq. ft. @ \$125.00/sq. ft.	<u>\$304,000</u>
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SUMMARY

Estimated Culvert Cost \$ 98,000

Estimated Bridge Cost\$304,000

**PLANNING ONLY
NOT FOR CONSTRUCTION**

APPENDIX "C"

DRAFT SPECIFICATIONS

1.1.1 Description

Description of the contract limits will be inserted.

1.1.2 Location

Location of the contract limits will be inserted.

1.1.3 Project Access
and Services

- .1 See Construction Schedule Specification, (Division 1, Section 2) for time restrictions on various methods of access.
- .2 Fort Simpson, Mile 300 on the Mackenzie Highway, has access by public road and by commercial aircraft. The road is open year round except for a period in the fall when the ice forms on the Liard River and in the spring when the Liard River ice breaks up.
- .3 Wrigley, Mile 436 of the proposed Mackenzie Highway, has access by an all-weather air strip and by barge landing.
- .4 There is no public road access to the site of the work.
- .5 The Contractor's attention is drawn to the following access restrictions to the project.
 - (a) Depending on the contract limits possible, barge access landing sites from the following list will be inserted.

1.1.3 Project Access
and Services
cont'd

- Mile 511 (Steep Creek) Barge access is possible both north and south of the confluence of Steep Creek and the MacKenzie. Access roads present no difficulty, can be constructed from either landing site to the right of way a distance of only a few hundred feet. The water in Steep Creek is of very good quality and this should be an attractive site for a contractor's camp.
- Mile 521 (Saline Creek) A barge landing is possible on the southern side of the Saline Creek at its confluence with the MacKenzie. An access road of approximately one-half mile could be constructed along the south side of the Saline Creek. This access road would require detailed investigation for layout but would be on a relatively flat granular area. The only possible access at the north side of the Saline Creek would be obtained at the right-of-way after having taken the initial access along the southern side of the river.

1.1.3 Project Access
and Services
cont'd

- (b) Final loading date for equipment and material for shipment by barge is governed by the barge company and is generally in early September.
- (c) Access may be possible via winter road to the project. However, there is no guarantee that this winter road will be open during the life of the contract.

.6 The above information on access is for guidance only and it will be the responsibility of the Contractor to familiarize himself with access to the site and with the availability of transportation and other services.

.7 The Contractor will be permitted to construct a maximum of two airstrips on sections of the roadway. For the airstrips the roadway surface will be widened to a maximum of 50 feet for a maximum length of 2,000 feet. The clearing will be widened to a maximum width of 200 feet for a total length of 4,000 feet, i.e. for the length of the runway plus 1,000 foot approaches to the runway. The locations of the airstrips will be subject to the approval of the Engineer in writing. Measurement for payment for the construction of the airstrips will be in accordance with the appropriate Unit Price Table items. Maintenance will be performed at no cost to the Department.

1.1.4 Schedule of
Work

See Construction Schedule Specification, (Division 1, Section 2) for details.

1.1.5 Land Use
Regulations

Land Use Permit No. issued to this Department, grants it the authority to carry out the work described in the Specifications and Plans subject to the Territorial Land Use Regulations of the Territorial Land Use Act and the operating Terms and Conditions of the Permit. A copy of the Permit is included in and forms part of, these specifications. The Contractor will be required to operate within the terms of the Permit.

1.1.6 Control of
Materials

The source of rock, gravel, sand and/or loam material will be located and designated by the Engineer, and will be made available to the Contractor. Royalties payable to the Crown under the Territorial Quarrying Regulation for rock gravel, sand and/or loam are hereby cancelled for the purpose of carrying out work under this contract.

1.1.7 Terms and
Definitions

Right of way: The area designated by the Engineer necessary for the construction of the roadway.

Roadway: The area of the right of way within the construction limits of the grading and drainage.

Culvert: A structure not classified as a bridge, which provides an opening under the roadway.

1.1.8 Plan Profile
Drawings .1

The profile elevations differ from the elevations shown on the 1" to 200 foot orthophoto mapping.

The profile elevations are elevations established in the field from departmental Bench Mark Elevations. The orthophoto mapping elevations are based on a separate map datum and indicate the difference in elevations of the general terrain, with the accuracy obtainable from aerial photogrammetry being approximately within one-half ($\frac{1}{2}$) the elevation difference between contours in open areas and within one quarter ($\frac{1}{4}$) the height of the trees in wooded areas. Where there is a discrepancy between the mapping and profile elevations, the profile elevations will govern.

- .2 Where there is a discrepancy between plan and the profile relative to the horizontal location, the profile will govern subject to final layout for the culvert in the field by the Engineer.

1.1.9 Measurement of
Quantities .1

Linear: All linear measurements shall be based on horizontal distances, except as noted in Division 9, Section 6 (C.M.P. culverts).

1.1.9 Measurement of .2
Quantities
cont'd

Volume

- .1 In computing volumes of excavation, borrow and embankment, the average end area method will be used except as otherwise decided by the Engineer.
- .2 When materials are to be measured in the haulage vehicle, the vehicle shall be of a size and type acceptable to the Engineer. Unless approved vehicles are of uniform capacity, each must bear a plainly legible identification mark indicating its specific approved capacity. Loads shall be levelled and measured at the point of delivery and no allowance will be made for settlement of the material while in transit.
- .3 Material specified to be measured by the cubic yard may be weighed and such weights shall be converted to cubic yards for payment purposes. Factors of conversion from weight measurement to volume measurement will be determined by the Engineer and shall be agreed to by the Contractor before such method of measurement of pay quantities will be approved by the Engineer.

.3 Weight

- .1 The term ton shall mean 2,000 pounds avoirdupois.
- .2 All materials which are specified for measurement by weight shall be weighed on scales approved by and at locations designated by the Engineer. Trucks used to haul material being paid for by weight shall be weighed empty at such times as the Engineer directs, and each truck shall bear a plainly legible identification mark.
- .3 Weight measurements shall be made by a weightmaster provided by the Department using scales and a scale house provided by the Contractor. The scales shall be of suitable design and of sufficient capacity to accommodate any vehicles used on the work and shall be inspected and tested for accuracy as often as may be

1.1.9 Measurement of
Quantities cont

required by the Engineer. The scale house shall be weatherproof and constructed to afford protection for the recording device of the scales. It shall be of suitable size, having one sliding window facing the scale platform, one end window and a shelf desk at least 2 feet wide and 6 feet long. Doors shall not open onto the scale platform. The Contractor shall provide adequate lighting and heating.

- .4 If material is shipped by rail, the car weight will be accepted.

1.1.10 Construction
Interruptions
Resulting from
Environmental
Protection
Requirements

The Contractor will be required to temporarily cease operation on sections of the project for reasons of protecting the Environment. The Contractor shall cease work upon written instruction from the Engineer and will not recommence his operation before permission in writing is obtained from the Engineer.

The Contractor shall schedule his operations so that productive work can continue on sections of the road outside the areas listed for environmental protection during the periods of constraint as outlined in the Construction Schedule Specification, Division 1, Section 2.

When unscheduled shutdown of the Contractor's operation has been ordered for reasons of protecting the environment other than those specified in Division 1, Section 2 and when, in the opinion of the Engineer, productive work can not be performed on other sections of the project, the Department will make compensation for machinery and labour standby costs will be as follows:

- .1 Production Equipment Standby: Production Equipment is only those units listed in the following group: scrapers, dozers/rippers, front end loaders, trucks larger than 8 cubic yards, rock drills, compressors, back-hoes, shovels over 1/2 cubic yard. The formula to be applied in determining standby costs for a piece of equipment shall be 50% of the current "Alberta Roadbuilders

1.1.10 Construction
Interruptions
Resulting from
Environmental
Protection
Requirements
cont'd

Association Rental Rate," less the cost quoted in those rates of operator, which will apply only up to 10 hours per day, 5 days per week and to a maximum monthly of 200 hours.

The following example illustrates the method of determining such a standby rate based on the 1974 schedule of rates:

D-9 Cat complete with Dozer and Ripper (\$49.00+\$8.50)	= \$57.50
Less operator (Schedule A, Group 2)	= 6.15
Bare rental	= 51.35
Standby rate @ 50% bare rental	= 25.68

- .2 Labour Standby: Labour standby costs will be paid only for those operators assigned to production equipment. The costs of labour standby shall be according to General Conditions "C", Clause 45. The Contractor will be required to present copies of his payroll records to support any labour costs claimed under this section.

1.1.11 Barricades and
Warning Signs

The Contractor shall at no expense to the Department, provide, erect, and maintain all necessary barricades, suitable and sufficient lights, danger signals and other signs and take all necessary precautions for the protection of the work and the safety of the public.

1.1.12 Project Signs

The Contractor shall erect and maintain the standard Department of Public Works sign(s) supplied by the Department. Measurement for payment for the erection and maintenance of the sign(s) will be made on a Change Order in accordance with Clause 45 in the General Condition "C". The signs will be supplied by the Department.

1.1.13 Layout of Work

- .1 The Engineer will set stakes and establish bench marks to indicate the location, alignment and reference elevations for the work. This will include the setting out of one set of clearing flagging, grubbing stakes, offset baseline, bench marks, work or slope stakes, culvert plugs and two sets of second grade stakes.
- .2 Any re-staking resulting from the careless operations of the Contractor will be at the Contractor's expense.

1.1.14 Maintenance of Work During Construction

- .1 General
- The Contractor shall maintain all work during construction. The maintenance shall constitute continuous and effective work, prosecuted day by day, with adequate equipment and forces to the end that the roadway or structures, are kept in a condition at all times satisfactory to the Engineer.
- .2 Roadway
- (a) Ruts and ridges caused by machinery or vehicles shall be removed on the completed or partially completed roadway.
- (b) Any portion of the road opened to traffic shall be kept free of snow.
- (c) Prior to spring thaw, snow shall be removed from the top of the road for the full length of completed or partially completed construction as directed by the Engineer.
- (d) On completion of the project and before the project is accepted by the Engineer, the Contractor will grade the surface of the entire route in one continuous operation.

1.1.14 Maintenance
of Work During
Construction
cont'd

(e) Maintenance except as provided in 1.1.15.3 will not be measured separately for payment, but will be considered incidental to and included in, the various Unit Price Table items.

.3 Icing of Culverts:

The Contractor will be required to thaw iced culverts so as to ensure that culverts are functioning during the period of spring breakup. The Department will provide a mobile steamer for this purpose and the Contractor will be responsible for operating and maintaining this unit and will return it to the Engineer in good condition upon completing this work. This work will be measured for payment as a Change Order in accordance with Clause 45 of the General Condition "C".

1.1.15 Use of Road-
way During
Construction

Vehicles of the Government of Canada and the Northwest Territories will be allowed access within the limits of the contract at all times; however, the Contractor may close the road to the general public during construction. Should others request permission to use any section of the constructed roadway prior to completion, authorization can be granted upon consultation with, and written approval from the Engineer.

1.1.16 Forest Protec-
tion and Fire
Fighting Equip
ment

The Contractor shall comply with the requirements for forest protection and fire fighting equipment regulations as outlined in the Land Use Permit and the Forest Protection Ordinance, Chapter 38 of the Revised Ordinances of the Northwest Territories.

The supply of fire fighting equipment shall be incidental to the contract and no separate measurement for payment will be made therefor.

1.1.17 Construction
Camp

The Contractor's camp and service area locations are subject to the approval of the Engineer and shall be set up and operated in accordance with the Government of the Northwest Territories Regulations governing operation of temporary field camps.

1.1.17 Construction
Camp cont'd

The Contractor shall make application to the Controller of Water Rights, D.I.N.A. Box 1500, YELLOWKNIFE, N.W.T., for authorization for the use of water and disposal of domestic sewage wastes at the camp in accordance with the Northern Inland Waters Act. The Contractor shall obtain this authorization prior to camp start-up.

Untreated sewage shall not be discharged directly or indirectly into any natural waters. Depending on camp population, soil condition, climatic conditions and time duration of camp at one site, the following generally are acceptable methods of waste disposal.

.1 Total underground containment or lagooning by means of:

- (a) Discharge directly to a suitably cribbed and covered cesspool.
- (b) Discharge to suitably cribbed leach pit through a septic tank or through a leach cesspool compartment. The septic tank or leach cesspool compartment is for settlement and digestion and for sludge removal as necessary.
- (c) Discharge to an underground holding pit (which could be a cesspool, leach pit or tank) of at least one week retention capacity and discharge weekly from there to a lagoon via a portable pump and flexhose or other suitable arrangement. The lagoon shall be suitably located and at least 300 feet away from the camp being served.

The lagoon shall have a minimum retention period of one year with a liquid depth of 6 feet to 8 feet with a free board minimum of 18 inches and impervious berms sloped at a minimum of 3:1 with a 10 foot top width. Suitable precaution shall be taken for erosion control.

1.1.17 Construction
Camp cont'd

- .2 Package treatment plants such as rotating Bio Disc, Physical Chemical Plant, etc.

The plants to be sized and operated to produce an effluent of secondary treatment quality.

The Contractor shall make every effort to use water-saving fixtures in the camps such as low water-use toilets and urinals, wash basin taps, shower heads, and washing machines.

- .3 Prior to the installation of the camp and services, a plan of the layout shall be submitted to the Engineer for approval.

The construction camp and service areas shall upon vacation, be left in a condition acceptable to the Engineer.

All costs relating to the Contractor's camp shall be incidental to construction and no separate payment will be made therefor.

1.1.18 Employment of
Native People

- .1 The Contractor's attention is drawn to the following guidelines on the Employment of Native People and Section 27 (2) of General Conditions "C". Notwithstanding all the terms of Section 27 (2), special arrangements are desired for this contract in line with these Guidelines. The Contractor, prior to recruiting his work force, shall meet with the:

Manager, Canada Manpower Centre,
FORT SIMPSON, N.W.T.

and acquaint him of all his labour force requirements.

1.1.18 Employment of Native People
cont'd

- .1 The Canada Manpower Centre will identify for the Contractor, local residents in the area of the contract who are qualified to perform the duties as outlined by the Contractor and the Contractor must show just cause, in event these qualified local people are not offered employment.

During the progress of the work, the Employment Section, Department of Local Government, Government of the Northwest Territories, will make a Liaison Officer available on site to assist the Contractor with any employment arrangements with the local people.

.2 Project Employment Guidelines

- .1 The prime Contractor and sub-contractors will be required to notify the Canada Manpower Centre of all jobs prior to recruiting his work force and the Contractor agrees to recruit his workers outside the Northwest Territories only to the extent that qualified residents are not available. The Canada Manpower Centre will act as the employment referral agency.
- .2 The prime Contractor will maintain contact with Liaison Officers provided by the Territorial Government. The Liaison Officers will provide counselling services as required for employees and their families.
- .3 The prime Contractor will provide for training-on-the-job contracts to be arranged by the Territorial Government for those indigenous Territorial residents who require special assistance in order to fill available jobs.

1.1.19 Climatic
Conditions

The Contractor's attention is drawn to the severe climatic conditions on the location of the project. Information regarding the climatic conditions can be obtained from the Ministry of Transport.

1.1.20 Environmental Briefings

The successful bidder shall arrange to have all his field staff available for environmental briefings for a maximum of three (3) hours when he has commenced operation of all equipment necessary to perform the work identified as clearing, grubbing, common excavation, channel excavation and overhaul and thereafter approximately every six (6) months.

The Contractor shall provide the facilities for the briefings at his camp. The Department will arrange to have environmental experts available for the briefings and will bear the cost of bringing in these people.

The briefings will be scheduled to fit in with the Contractor's operation (double shift), so as to cause no shutdown of the construction work. The Contractor will choose the time convenient for him within a period of ten (10) days.

No payment will be made to the Contractor for the time that his staff attend the environmental briefing(s).

1.1.21 Winter Road

The winter road previously used from Fort Simpson is shown on the Plans. This road has been operated and maintained by a private company, which has been charging a toll for the usage of the road.

It is the Contractor's responsibility to make any arrangements concerning the usage of the road. The Contractor will be responsible for any toll charges at his own expense.

1.1.22 Additional Information Package

An additional information package consisting of:

- .1 Final Design Package.
- .2 Consultant reports (Environmental and Geotechnical).
- .3 Mass haul diagram.
- .4 Bar Chart of departmental scheduling opinion.

1.1.22 Additional
Information
Package contd

will be available for viewing in Edmonton office and Fort Simpson Area office. The additional information package is intended to provide the Contractor with background information used by the Department in preparing contract documents. This information package will not be part of nor will it be considered as part of the Contract Documents.

1.1.23 Engineer's
Camp & Board

.1

Description: This item will consist of the set up, operating, maintaining, dismantling and moving the Engineer's trailer camp, the supplying of meals, bedding and cleaning services for all equipment and staff as may be required therefor. The Engineer's camp may be located within the Contractor's camp facility subject to approval of the Engineer.

.2

Accommodation: The Department will supply and the Contractor will service in accordance with 1.1.25.1, the following equipment for the exclusive use of the Engineer and his staff for the duration of the work and for as long thereafter as required by the Engineer to complete final measurements.

- .1 One office trailer (10 feet by 50 feet), three (3) eight-man sleeper trailers (10 feet by 50 feet), one (1) ablution trailer (10 feet by 30 feet), one (1) recreation trailer (10 feet by 50 feet).

These trailers will be supplied to the Contractor at the barge landing site on the Mackenzie River at its confluence with the Willowlake River.

- .2 The trailers specified in 1.1.25.2.1 will be placed in a self-contained unit, joined by a minimum 8 foot wide walkway having the same floor elevation as the trailers. The walkway will be weather-proof, insulated and adequately heated and the layout will be subject to the Engineer's approval. If the Contractor has a camp with enclosed weatherproof walkways the Engineer's Camp is to be joined to it, and the Department's ablution trailer will be eliminated and the Engineer's staff will use the Contractor's ablution facilities.

All the trailers specified above will be adequately blocked and weather skirted.

1.1.23 Engineer's
Camp & Board
cont'd

- .3 One only cold storage shed a minimum of 8 foot by 12 foot, weatherproof and equipped with one locking door and one interior lite, will be supplied by the Contractor and placed near the Engineer's Camp.
- .4 There shall be provided near the office trailer five (5) parking places for vehicles complete with five (5) exterior electrical outlets for the exclusive use of the Engineer.
- .5 The trailers supplied by the Department to the Contractor are the Contractor's responsibility from the time he originally moves them from the barge landing site for the duration of the contract. At the completion of contract work, the Contractor will return these trailers to the Department at the barge landing site in the same shape as he received them, normal wear and tear excepted. The Contractor will be responsible for the operation of the trailers at his own expense. The supplying and installing of any replacement parts to these trailers will be carried out by the Contractor and the work will be measured for payment as a Change Order in accordance with Clause 45 of the General Conditions "C".
- .6 Services:
 - .1 The Contractor shall provide all equipment, supplies and labour required to prepare and serve each man on the Department's staff, registered and staying in the camp, or as otherwise designated by the Engineer, meals and services of the same quantity and quality provided for the Contractor. A man will be considered to have been in camp for a full day unless he is signed out twenty-four hours previous. There may be variations in the number of personnel from two to twenty-four over a season.
 - .2 The Contractor shall clean trailers daily and change the linen weekly or whenever a change in personnel occurs. "Linen" shall consist of three (3) blankets, two (2) sheets, one (1) pillow and one (1) pillow cover for each occupant.

1.1.23 Engineer's
Camp & Board
cont'd

.6 Services cont'd

- .3 If the Contractor shows movies, the Engineer's staff shall be allowed to attend these showings.
- .4 A water and sewage system shall be provided by the Contractor and installed, operated and maintained to service the camp. The Contractor shall connect the departmental ablution trailer to this system. The Contractor must include these units in his application under the Northern Inland Waters Act.
- .5 A steady and dependable source of electric power will be supplied by the Contractor. The Contractor shall connect all required trailers and buildings to this source.
- .6 The Contractor shall supply all the fuel requirements for the camp and shall see that each heating unit is kept supplied with fuel and is in good operating condition.
- .7 The Contractor shall dismantle, move and re-establish the camp when the Contractor moves his own camp.

.7 Measurement for Payment:

- .1 Measurement for payment for the camp shall be on a lump sum price for the delivery, set up, moving re-installation and return of the complete camp as specified.
- .2 The quantity of board which will be measured for payment will be the number of mandays that the Engineer's staff is registered in camp and shall include the supply, preparation and serving of meals, cleaning, bedding, fuel, electric power, garbage and sewage disposal and all other labour, materials and equipment required for the operation and maintenance of the camp.

1.1.24 Clearing and
Grubbing

Clearing and/or grubbing shall be in accordance with Division 9, Section 1 of these specifications and will include:

- a) Areas of right of way adjacent to stream crossings.
- b) Right of way widening as directed by the Engineer.
- c) Borrow pits and access roads as directed by the Engineer.

The Contractor is advised that a major portion of the right of way has been cleared by others.

Additional right of way clearing will provide a minimum of fifteen feet from toe of embankment or from top of excavation back-slope.

The Contractor shall advise the Engineer no later than October 1 of each year of the section of anticipated embankment construction between October 1 and April 15. This is to allow time for the Engineer to arrange for necessary flushcutting of stumps within the limits of the embankment, by others.

1.1.25 Excavation

All excavation shall be carried out in accordance with the requirements for Roadway and Borrow Excavation and Channel Excavation, Division 9, Sections 2 and 3.

Excavation Rock or Channel Excavation Rock is not expected to be encountered on this Project and these items are not shown on the Unit Price Table. If, however, during the construction, material is encountered that meets the definition of the above items, measurement for payment for the excavation of these materials will be made on a Change Order in accordance with Clause 45 of the General Conditions "C".

1.1.26 Embankments

The embankment construction shall be in accordance with the requirement for Embankment, Specification Division 9, Section 4.

1.1.2.6 Embankments
cont'd

- .1 As this project lies within the zone of permafrost, it will be permissible to construct embankment using soils in a frozen state, in a manner designated by the Engineer.
- .2 When constructing embankment with frozen material, the Engineer may direct that the embankment be constructed to a specified height above Grade to allow for settlement that will occur when frozen embankment thaws and consolidates.
- .3 The Contractor is to provide a minimum of:

Required compaction equipment will be inserted.

The Engineer may instruct that additional compaction units be placed on the work if necessary to meet the requirements of the Contractor's schedule.

The above units shall conform with the type of units described in Division 9, Section 4.

- .4 The Contractor is to provide a drying unit of the hinge type offset disk plowing harrow described in Division 9, Section 4.
- .5 Upon callup, a minimum of one (1) full shift of work will be specified by the Engineer for (the drying unit and required compaction equipment to be inserted). Upon callup, a minimum of one (1) hour of work will be specified by the Engineer for the self-powered hand operated tamping units and vibratory roller, type "B".

Notwithstanding minimum callup defined above No Payment will be made for interruptions or downtime of any kind, for any compactors specified in this contract.

1.1.2.7 Culverts

- .1 The locations of all culverts and the lengths of Corrugated Metal Pipe Culverts as shown on the plans are approximate only. The exact location of all culverts and the exact lengths of Corrugated Metal Pipe Culverts will be determined in the field by the Engineer.

1.1.27 Culverts
cont'd

- .2 The assembly and installation of all culverts shall be in accordance with Division 9, Sections 6 and 7 of the Specifications. All materials required for Corrugated Metal Pipe Culverts and Corrugated Structural Plate Culverts will be supplied to the Contractor by the Department as follows:

Approximate delivery dates and delivery points for contractor pickup will be inserted.

Upon delivery of culvert materials as outlined above, the Contractor shall supply the Engineer with a certificate acknowledging receipt and from then to completion of the project, the Contractor shall assume full responsibility for the materials and shall replace any lost or damaged items at no cost to the Department. The materials will be delivered in bundles, pallets or containers having maximum dimensions of 10 feet wide by 9 feet high by 22 feet long.

- .3 The Engineer may designate that certain of the Structural Plate Culverts be equipped with antibouyant devices and/or end treatments. For such cases, the payment for materials and work required will be negotiated in accordance with Article 45 of General Conditions "C".

1.1.28 Gravel

The source of gravel is not designated on the Plans. Possible sources of gravel will be available at approximately Miles 498.2, 500.3 and 545.9 (s). Sources discovered during the construction shall be used as directed by the Engineer.

The gravel shall comply with the specifications for Pit Run Gravel, Division 9, Section 8, and will be applied on the road in lifts varying from 2 inches to 4 inches in thickness.

1.1.29 Rip-Rap

The rip-rap placed on this project will consist of STONE RIP-RAP. The stone rip-rap will be hand-placed rip-rap or heavy rip-rap placed in the random manner as outlined in Division 9, Section 11. The type of stone rip-rap to be used at the various sites shall be as designated by the Engineer.

1.2.1 Tender
Schedule

The bidder will submit with his tender a schedule in bar chart form covering excavation, gravel and structural plate culverts and showing the calendar dates on which activities on each of those items will take place for each five-mile section of the contract. This schedule will have to clearly demonstrate that the bidder has examined all of the requirements of this specification, has examined the site conditions, has made himself aware of access problems to the site and is aware of schedule limitations which may be brought about by climatic conditions or Environmental Requirements.

1.2.2 Construction
Schedule

After notification of award of contract the Contractor must prepare a detailed Construction Schedule showing the calendar time planned for clearing, common excavation, traffic gravel, installation of corrugated metal pipe and installation of corrugated structural plate pipe and corrugated structural plate pipe arch on the basis of a mile by mile identification for the total length of the contract.

1.2.3 Scheduling
Details

.1

Milestone Dates

The Contractor's construction schedule must show milestone dates as follows:

Milestone Date 1

The Contractor must have completed all grading work with the exclusion of the placing of traffic gravel by a date to be inserted after contract limits have been decided.

Milestone Date 2

The Contractor must have completed all work including the placing of traffic gravel by a date to be inserted after contract limits have been decided.

.2

Commencement Restrictions

The Contractor's attention is drawn to the following restrictions to the project.

- a) The camp establishment shall be in a location approved by the Engineer.

1.2.3. Scheduling
Details cont'd

.2 Commencement Restrictions cont'd

- (b) The commencement of construction will be controlled by the conditions outlined in the Land Use Permit which forms a portion of this contract.
- (c) The access road from the barge landings to the right-of-way should be constructed during the late summer or fall.

.3 Environmental Protection Schedule Restrictions

The following constraints have been imposed for protection of the Environment during the construction period. During any shutdown listed in 1.2.3.3 (a), the Contractor will be responsible for any resulting costs as the Contractor shall so schedule his operations that alternative work can be carried out during the shutdown period on other sections of the Highway.

- (a) No construction activity or alteration or diversion of a stream channel will be permitted in the construction of bridges and culverts in excess of 60" diameter in the period from May 15 to July 15 each year.

.4 Terrain & Material Restrictions

The responsibility for the detailed examination and planning of all activities in the construction schedule will rest with the Contractor. Other than the restrictions and milestone dates indicated above the Contractor will have full freedom to plan and schedule his operations. However, in determining the schedule of operations, the Contractor should consider the terrain and material conditions outlined below:

- (a) The material to be used from borrow pits and Right-of-way excavation. From Mile 495.0 to Mile 497.5 can be expected to be clay with moisture content near the Plastic limit. This material can be placed during winter months. Planning and scheduling should be such that heavy equipments will not have to travel on this material during the summer immediately following its placing.

1.2.3. Scheduling
Details cont'd

.4

- (b) The material used between approximately Mile 497.5 to Mile 512.0 can be expected to be granular material. The construction of this section can take place in summer months.
- (c) Clay with moisture content near plastic limit is expected to be used from approximately Mile 512.0 to Mile 519.9. This material can be placed during winter months planning and scheduling should be arranged to avoid movements of heavy equipments over this material during summer immediately following its placing.
- (d) The embankment on the section of road from approximately Mile 519.9 to Mile 531.0 will be constructed mainly using granular materials. The construction can take place in summer months.
- (e) The embankment from Mile 531.0 to Mile 546.3 (s) will be constructed with mainly granular material. Placing of this material can take place in summer months.

1.3.1 Description

This item consists of the provision to the Contractor of a fixed sum to cover costs of mobilization of plant, personnel and material, the establishment of temporary buildings, shops, offices and facilities and licenses, fees and premiums necessary to commence the work and which are not specifically measured under any other item contained in the Unit Price Table.

1.3.2 Measurement

Measurement for payment for mobilization will be on the basis of the LUMP SUM amount pre-established by the Department and shown on the Unit Price Table. This amount is to be included in the total amount of the tender and will be paid on the following schedule.

- .1 Fifty (50) percent of the lump sum amount when the Contractor has established his camp, has placed his fuel storage and has delivered to the camp site all the equipment necessary to perform work identified as clearing, grubbing and common and channel excavation.
- .2 Twenty-five (25) percent of the lump sum amount when the Contractor has commenced operation of all the equipment indicated in 1.3.2.1 above in the performance of that work identified on the project right of way as clearing, grubbing, common and channel excavation and overhaul.
- .3 Twenty-five (25) percent of the lump sum amount when the Contractor has completed construction of the equivalent of fifteen (15) percent of the mileage of the contract.

9.1.1 Description

This item consists of the removal and disposal of trees, stumps, brush, roots, surface logs, embedded logs, all other surface debris and other work as herein described. The areas to be cleared and/or grubbed shall be those areas indicated on the Plans or designated by the Engineer.

9.1.2 Materials

Not applicable

9.1.3 Construction

- .1 Clearing - Clearing shall consist of removal and disposal of all trees, brush, fallen trees and all other surface debris, except such trees and shrubs as may be designated for preservation. Trees and shrubs designated for preservation shall be protected from scarring, barking or other injury during the construction operations. Dangerous trees and snags overhanging the right-of-way and leaners along the edge of any cleared area are to be removed.
 - (a) Where clearing only is required, trees, brush, rubbish and stumps shall be hand cut to within eight (8) inches of the ground surface. This clearing operation must be carried out in such a manner that will prevent damage to the existing insulating value of the organic material.
 - (b) Where grubbing is designated by the Engineer, clearing and grubbing may be carried out in one operation if approved by the Engineer.
 - (c) Generally all right-of-way widenings, right-of-way adjacent to stream crossings and off-take ditches will be cleared by hand, and the use of machinery to pile and dispose of the clearing debris will only be allowed in the winter months. Borrow pit areas and haul roads will generally be machine cleared.
- .2 Grubbing - Grubbing shall consist of the removal and disposal of roots, stumps, imbedded logs and other objectionable debris on the surface and imbedded in the surface. Areas where grubbing is required will be designated by the Engineer. Grubbing will be required on all areas where excavation or subexcavation is to take place but generally will not be required on the right-of-way where height of embankment exceeds three (3) feet.

9.1.3 Construction
(Cont'd)

- .3 Brush Piles - Brush piles consisting of trees, rubbish and/or organic materials existing from previous operations shall be removed and disposed of by the contractor. Such work will not be measured separately for payment but will be considered incidental to those areas staked or designated for clearing and/or grubbing by the Engineer.
- .4 Disposal - All clearing and/or grubbing debris shall be disposed of as directed by the Engineer. Generally the disposal will consist of burning and placing of the burned debris in disposal pits or disposal areas. For the clearing and grubbing of borrow pits, the contractor will generally be permitted to push clearing and grubbing debris into a section of the pit where excavation is completed and to flatten and trim such debris to a condition acceptable to the Engineer. Any earth material pushed in with the clearing and grubbing debris will not be separately measured for payment, but will be considered incidental to the clearing and grubbing operation.
- In specific areas, the Engineer may permit trees from the hand-cut clearing operation to be laid into uniform mat transverse to the right-of-way centreline within the limits of future embankment. This work shall take place just in advance of the embankment construction.
- .5 Progress of Work - Except as may otherwise be provided or directed by the Engineer, borrow pit areas shall not be cleared and grubbed in advance of excavation by more than one (1) week. The clearing and/or grubbing within the right-of-way shall be completed at least one (1) mile in advance of the grading operation.

9.1.4 Measurement

The quantity of CLEARING to be measured for payment will be the number of acres acceptably cleared in accordance with these specifications.

The quantity of GRUBBING to be measured for payment will be the number of acres acceptably grubbed in accordance with these specifications.

9.2.1 Description

This item consists of the excavation, loading, hauling within the freehaul distance, placing or disposal and trimming of all materials classified as Excavation Rock or Excavation Common. The work is to be carried out in conformity with the lines, grades and dimensions shown on the plans or as staked by the Engineer.

9.2.2 Materials
Classification

.1 Excavation Rock - Excavation Rock is defined as:

- (a) Material excavated from solid masses of igneous, sedimentary or metamorphic rock which prior to removal was integral with its parent mass.
- (b) Boulder or rock fragments measuring in volume two (2) cubic yards or more.

.2 Excavation Common - Excavation Common shall consist of all other materials of whatever nature, including dense tills, hardpan and frozen materials that do not come under the classification of Excavation Rock or Channel Excavation.

9.2.3 Construction

.1 Roadway Excavation

- (a) Roadway Excavation will include the construction of roadway ditches, embankments, permanent access and connecting roads, berms, haul roads, excavation for culverts and the removal and disposal of unsuitable materials.
- (b) All suitable materials shall be placed in roadway embankments except as otherwise directed by the Engineer.
- (c) All unsuitable and/or excess material excavated from the roadway will be disposed of as directed by the Engineer.
- (d) All roadway excavation shall be carried out in a manner as not to damage the natural ground cover on adjacent areas.
- (e) Where the subgrade is in transition from excavation to embankment, sub-excavation will be carried out in that portion under the embankment to lines and grades established in the field by the Engineer.

9.2.3 Construction
(Cont'd)

- (f) All roadway excavation shall be to the lines and grades established on the Plans or set in the field by the Engineer to a tolerance maximum of two-tenths (2/10) of a foot.

In addition, variation in grade tolerances between any two successive 100 foot stations shall not exceed one-tenth (1/10) of a foot.

- (g) Where unsuitable material is encountered at the grade level of a cut, the sub-grade shall be sub-excavated to the depth staked by the Engineer.

- (h) Where suitable material is encountered at the grade level of a cut, scarifying to a minimum depth of one (1) foot below sub-grade will be performed prior to re-laying and shaping.

- (i) If during excavation, material appearing to conform to the classification of Excavation Rock is encountered, the Contractor shall notify the Engineer and shall provide ample opportunity for the Engineer to investigate and to make such measurements as are necessary to determine the volume of material in question.

- (j) Rock which can not be ripped, shall be drilled and blasted in such a manner as to allow usage of all material excavated.

- (k) Rock slopes shall be scaled down to remove boulders and rock fragments which may slide or roll down the slope.

.2 Borrow Excavation

- (a) The Engineer will designate and approve all borrow areas and access to borrow areas. Haul roads from borrow areas may consist of one two-way road having a maximum surface width of forty (40) feet or two one-way haul roads each having a maximum surface width of twenty-five (25) feet. The haul roads will generally be doglegged so that only a short section of the haul road is visible from the Highway.

9.2.3. Construction .2 cont'd
(Cont'd)

- (b) The location of potential borrow areas has been indicated generally on the photo mosaic plans. The indicated areas have been provided to give the Contractor an appreciation of the general type of material to be encountered in borrow areas and the general spacing of such borrow areas. The actual location, which need not be the same as indicated on the plans, dimensions and depths for excavation of all borrow areas will be designated in the field by the Engineer.
- (c) Slopes of the excavated borrow areas shall not be steeper than two to one (2:1) for excavation common and one quarter to one (1/4:1) for excavation rock, unless otherwise directed by the Engineer.
- (d) Unsuitable materials excavated from borrow areas will be disposed of by placing it immediately adjacent to the borrow areas as designated by the Engineer in such a location as not to interfere with the natural ground drainage or drainage from or into the proposed borrow area. The disposed of material will be trimmed as directed by the Engineer.

Where the unsuitable material from borrow areas is to be placed back into the excavated area after completion of the borrow excavation, this material will not be classified as roadway or borrow excavation but will be measured for payment as a Change Order in accordance with Clause 45 of the General Conditions "C".

- (e) If during excavation, material appearing to conform to the classification of Excavation Rock is encountered, the Contractor shall notify the Engineer and shall provide ample opportunity for the Engineer to investigate and to make such measurements as are necessary to determine the volume of material in question.

9.2.3 Construction
(Cont'd)

.2 cont'd

- (f) Rock which can not be ripped, shall be drilled and blasted in such a manner as to allow usage of all material excavated.

9.2.4 Measurement

.1

Excavation Common - The volume of EXCAVATION COMMON which will be measured for payment, will be the number of cubic yards excavated in its original position, loaded, hauled within the free-haul distance, placed, trimmed and accepted in the work or disposed of in accordance with these specifications.

Original cross sections for measurements will be taken after the clearing and grubbing is completed.

Scarifying and relaying as specified in Article 9.2.3.1 (h) is incidental to construction and will not be measured separately for payment.

.2

Excavation Rock - The volume of EXCAVATION ROCK which will be measured for payment in cubic yards in its original position for those materials excavated, loaded, hauled within the free-haul distance, placed, trimmed and accepted in the work or disposed of in accordance with these specifications.

Original cross sections for measurements will be taken on top of the exposed rock surface.

Where, in the opinion of the Engineer, unavoidable overbreak occurs, measurement will be made for the actual quantity involved provided the overbreak does not exceed ten (10) percent of the actual quantity within the lines as staked by the Engineer between the established 100-foot station intervals where the overbreak occurs. All materials exceeding ten (10) percent by this definition, when placed in the embankment, will be measured for payment as Excavation Common.

9.3.1 Description

This item consists of the excavation required for deepening, widening and relocating water channels, the construction of ditches other than contiguous roadway ditches, loading, hauling material within the free haul distance, disposal and trimming of material in accordance with the Plans or as staked by the Engineer.

9.3.2 Materials

.1 Channel Excavation Rock

Channel excavation rock is defined as:

(a) Channel material excavated from solid masses of igneous, sedimentary or metamorphic rock which prior to removal was integral with its parent mass.

(b) boulder or rock fragments measuring in volume two (2) cubic yards or more.

.2 Channel Excavation Common

Channel Excavation Common shall consist of the excavation of all other materials of whatever nature, including dense tills, hardpan and frozen materials that do not come under the classification of Channel Excavation Rock.

9.3.3 Construction

All material excavated will be disposed of as shown on the Plans or as directed by the Engineer; suitable material will be used in the embankment. When excavated material is placed near the banks of a channel or a ditch, provision shall be made to ensure proper flow of water from adjacent land to this waterway. The excavation shall be neatly finished and the disposed of material shall be shaped and trimmed to a condition satisfactory to the Engineer. The Engineer must approve the use of excavation equipment other than draglines and/or backhoes.

9.3.4 Measurement

The quantity of CHANNEL EXCAVATION COMMON or CHANNEL EXCAVATION ROCK to be measured for payment, will be the number of cubic yards of material acceptably excavated and disposed of in accordance with the Plans or as directed by the Engineer, measured in its original position.

There will be no measurement for payment for material excavated beyond the lines shown on the Plans or as staked by the Engineer, except that for Channel Excavation Rock where in the

9.3.4 Measurement
(cont'd)

opinion of the Engineer, unavoidable overbreak occurs, measurement for payment will be made for the actual quantities involved, provided the overbreak quantity does not exceed ten (10) percent of the actual quantity of rock within the lines as staked by the Engineer between the established 100-foot station intervals where overbreak occurs.

Rock excavated beyond the lines staked by the Engineer in excess of the overbreak allowed, will not be measured for payment.

9.4.1 Description

This item consists of the construction of subgrade, approach road, ditch block embankments; and backfilling culvert and roadway sub-excavations with excavated material, all to the lines, grades, cross-sections and dimensions shown on the Plans or as staked or designated by the Engineer.

9.4.2 Materials

The materials shall consist of acceptable earth and rock material free from wood, brush, roots and organic matter. The Engineer will approve all materials prior to incorporation into embankments.

9.4.3 Construction .1

Placing Roadway Embankment

- (a) The embankment shall be constructed to the lines, grades and cross-section as indicated on the Plans and/or staked by the Engineer. If an embankment is constructed beyond the staked grades and cross-section, without the written approval of the Engineer, the excess material will be removed by the Contractor at his own expense and placed on the grade where the embankment is not completed. If the excess material has not been removed at the time of the completion of the work, this material will not be measured for payment. The excavation quantity of excess material will be based on the excess embankment volumes times the embankment adjustment factor for the section where the embankment was constructed beyond the staked lines.
- (b) Sufficient crown and/or superelevation shall be maintained at all times during construction to ensure ready runoff of surface water. The top surface shall be free of ruts and ridges, and windrows will not be permitted to remain along the edges of the embankment.

9.4.3 Construction
(Cont'd)

- (c) The initial lift of embankment material on unstable foundations shall have a minimum compacted thickness of three (3) feet for support of the equipment. The Engineer may permit the initial lift to be placed in a narrow fill along the uphill side of the embankment area to provide access to various work along the right-of-way. After the initial lift has been constructed to the full design width, embankment material shall be placed in successive uniform layers across the entire width of the embankment. Where considered possible by the Engineer, this shall consist of placing successive layers of eight (8) inch maximum compacted thickness. In embankments composed principally of material obtained from rock cuts, the larger stones shall be carefully distributed and the interstices filled with smaller stones and other available material to form as compact a mass as practicable.
- (d) Preliminary shaping of side slopes shall be done as close behind embankment placement as possible.
- (e) Trimming of the top surface, side slopes and toe of the embankments shall be done in a neat and workmanlike manner. All embankments shall be constructed to the lines and grades shown in the Plans, or as staked by the Engineer, to tolerance maximum of two-tenths (2/10) of a foot. In addition, variation in grade tolerance between any two successive 100 feet stations shall not exceed one-tenth (1/10) of a foot.

.2 Compaction of Embankment

- (a) The embankment shall be placed as described in .1(c) above. Each layer of material shall be spread evenly and to the satisfaction of the Engineer. The hauling equipment shall be directed over the full width of each layer of material placed.
- (b) The Engineer will determine if and when additional compaction effort is required other than what is obtained by the hauling units and will decide the type and number of compaction units to be used.

9.4.3 Construction
(Cont'd)

- (c) Water may be added to the embankment material during the compaction operation. The Engineer will decide when this is required and the quantities to be applied. The water shall be distributed in accordance with the requirements for water (Specification Division 9, Section 10).
- (d) During embankment construction, if in the opinion of the Engineer, the material is too wet for placing and/or compacting, he will direct drying of the embankment material. The type and number of drying equipment and the drying procedure used will be as directed by the Engineer. If the weather is not suitable for drying, the Engineer will direct work to cease temporarily until such time as drying conditions have improved.

.3 Embankment Adjacent to Structures

- (a) Embankment on Bridge Approaches - The permission of the Engineer must be obtained before any fill is placed against concrete arches, abutments or wing walls.

Approach fills to structures within the lines shown on the Plans or as directed by the Engineer shall be constructed of approved material placed in layers of maximum compacted thickness of six (6) inches. The amount of compaction and the type of equipment to be used will be determined by the Engineer. For structures requiring embankments on both sides, the embankment shall be placed simultaneously at uniform elevations on both sides of the structure.

- (b) Embankment at Culverts - Embankment around culverts shall consist of approved material placed to the limits shown on the typical plans for installation of Corrugated Metal Pipe Culverts and Corrugated Structural plate Culverts or as directed by the Engineer. Material shall be placed and compacted in six (6) inch layers alternately on each side of the culvert so as not to displace it during installation. Special attention shall be given to compaction under the haunches.

9.4.3 Construction
(Continued)

- (c) Fill - Retaining Walls - The fill behind the walls shall be approved material placed in layers not exceeding six (6) inches in thickness and compacted as directed by the Engineer. In the case of cell type retaining walls, the fill behind the wall shall be tamped and kept near but not above the level of the compacted material within the cells. Where fill is to be placed on a sloping surface, the surface must be benched to reduce the load on the retaining structure.

.4 Compaction Equipment

All compactors specified herein for compaction of materials shall comply with the following minimum requirements:

- (a) Sheepsfoot compactors shall consist of one or more drum units, having a total minimum width of 8 feet. The length of the tamping feet shall not be less than 7 inches. Under working conditions, the compactor shall be of such weight that the minimum load upon each tamper foot will not be less than 400 pounds per square inch of cross-sectional area. The sheepsfoot compactor shall be of the self-cleaning type and the ends of the tamping feet shall at all times be kept in a flat condition acceptable to the Engineer.
- (b) Pneumatic-tired rollers shall have a width of not less than 6 feet. They shall be equipped with pneumatic tires of equal size and diameter. The space between the side walls of adjacent tires shall be not greater than the tire width, and the rear tires shall be staggered in relation to the front tires. The roller shall be equipped with mechanical means of distributing the contact pressure uniformly among all the tires and the tires shall be uniformly inflated so that the air pressure in several tires shall not vary more than 5 pounds per square inch. Pneumatic-tired rollers shall be so constructed that the total weight of the roller shall be not less than 17 tons and that the roller shall develop a minimum of 400 pounds pressure per

9.4.3 Construction
(Cont'd)

- (b) inch width of tire. During rolling, the operating weight of the roller and the tire pressure shall be varied to fit the soil conditions.
- (c) Grid Rollers shall not weigh less than 15 tons, and shall be of such weight that the load on each square inch of surface in contact with the road at any time shall not be less than 250 pounds.
- (d) Type (A) steel drum vibratory compactors shall have a drum width of not less than 6 feet. The weight on the drum end shall not be less than 5 tons with minimum total applied force of 500 lbs. (combined vertical components of dynamic and static forces) per linear inch of drum.
- (e) Type (B) steel drum vibratory compactors shall consist of a double drum (vibrations on both drums), self propelled compaction unit meeting the following minimum requirements:
 - Total weight: 1 ton
 - Width of drums: 30 inches
 - Drum diameter: 18 inches
 - Total applied force 150 lbs per
(combined vertical linear inch
components of dy- of drum
namic and static
forces)
- (f) A compaction unit shall consist of a self-propelled or a power-drawn compactor. Compaction units shall be capable of moving at a speed up to 5 m.p.h, with exception of the compaction units described in (e) above which shall be capable of moving at a speed up to 1.5 m.p.h.
- (g) Self-powered, hand-operated vibrating or tamping units for compaction of backfill and/or embankments immediately adjacent to structures and culverts shall be of the vibratory or ramming type of approved design and weighing not less than 100 pounds.

9.4.3 Construction
(Cont'd)

.5 Drying Equipment

- (a) Disc plowing harrows shall be of the heavy duty hinge offset type meeting the following minimum requirements:

Weight 8000 lbs. with provisions for additional weight as required

Width 8 feet

No. of discs 12

Disc diameter 36 inches

- (b) A drying unit shall consist of power-drawn drying equipment. Drying units shall be capable of moving at a speed up to 4 m.p.h.

- .6 (a) All drying units and compaction units with the exception of the self-powered hand operated tamper as described in 9.4.3.5(g) shall be equipped with an approved time recording device which accurately records the number of hours each machine is in operation.
- (b) It will be the contractor's responsibility to ensure that the time recording devices are properly mounted and maintained, that the cards are accurately identified, as to the machine, date, and shift, and to daily deliver said cards to the Engineer.
- (c) The Engineer will record the number of operating hours for each machine and both the Engineer and the Contractor will certify daily that such records are correct.

9.4.4 Measurement

Construction of an embankment in accordance with these specifications will not be measured for payment directly but will be considered as a subsidiary obligation of the Contractor under other Unit Price Table items.

9.4.4 Measurement
(Cont'd)

The quantity of COMPACTION AND DRYING to be measured for payment, will be the actual number of hours each compaction and drying unit is operated as directed by the Engineer.

Any other equipment used in the drying and compaction operation which is not shown in the Unit Price Table, will not be measured separately for payment but will be considered incidental to the drying and compaction operation.

9.5.1 Description

This item consists of authorized hauling of excavated material classified under the various excavation items for a distance beyond a free haul distance of one-half ($\frac{1}{2}$) mile (2,640 feet).

9.5.2 Materials

Not applicable.

9.5.3 Construction

Not applicable.

9.5.4 Measurement

The quantity of OVERHAUL to be measured for payment will be the number of cubic yard miles of authorized material hauled beyond the 2,640 feet free haul distance as calculated by the Mass Diagram Method.

(a) The overhaul distance shall be the distance between the centres of volume of the overhauled material in its original position and its position after placing, less the free haul distance. The haul distance shall be measured along the shortest route determined by the Engineer as feasible and satisfactory. If the Contractor chooses to haul the material over some other route, this route must be approved by the Engineer. The measurement shall be based on the haul distance of the route designated by the Engineer or if the alternate route is shorter, the haul distance will be measured along this route.

(b) When material is obtained by extra widening of a right-of-way cut, any area laying more than one hundred and fifty (150) feet from the centreline of the roadway will, for the purpose of centre of mass and overhaul calculations, be considered as a separate area off the right-of-way.

9.6.1 Description

This item consists of the transportation from barge landing and the installation of corrugated metal pipe and pipe arch culverts in accordance with these specifications, and to the lines and grades shown on the Plans or as directed by the Engineer.

This work shall include all types of corrugated metal pipe culverts except structural plate culverts and sub-surface drainage pipes.

9.6.2 Materials

Except as otherwise herein provided, corrugated metal pipes and couplers shall conform with the requirements of the latest A.A.S.H.O. Specification M36.

.1 Pipe

- (a) Culvert corrugations shall have a maximum pitch of 2 3/4 inches and a minimum depth of 1/2 inch. Annular corrugated culvert shall have a minimum width of longitudinal lap of 2 inches. Helically corrugated culvert shall have a minimum width of longitudinal lap of 3/8 inch (See Plan No. 1 for definition of longitudinal lap for helical culvert). Outside dimensions of the culverts shall meet the following requirements:

Nominal Diameter	Minimum Outside Circumference Along the Crest
30 inches	96.9 inches
36 inches	115.6 inches
42 inches	134.4 inches
48 inches	153.1 inches
54 inches	171.7 inches

- (b) For annular riveted culverts the longitudinal seam shall contain two rows of rivets. Rivets shall be not less than 3/8 inch in diameter.
- (c) For helically corrugated culverts, the metal sheets forming the pipe shall be joined with a continuous lockseam paralleling the corrugation. The lockseam shall be formed by folding over the edges of adjacent sheets so that they interlock with each other to form a tight joint. The joint shall not be an element of weakness in the pipe and shall be so fabricated as to not affect the shape or nominal diameter requirements specified. The two laps shall be of equal dimensions and not less than 3/8 of an inch. The lockseam shall be retained by an adjacent shoulder or retaining offset. The retaining offset shall be equal to at

9.6.2 Materials
(Cont'd)

- (c) least 1/2 of the sheet thickness in contact with the 180-degree fold, and in no case shall the total retaining offset for the two ends be less than 1 1/2 times the sheet thickness. The 180-degree fold of metal at the lockseam shall have a smooth curvature with no angularity of the interior of the fold. There shall be no roller indentations on the 180-degree fold.

Prior to shipment, the manufacturer shall be prepared to saw into the lockseam of any pipe section supplied. If the lockseam does not meet the specified requirements, the pipe section(s) with unacceptable lockseam, will be rejected, and shall be replaced with a satisfactory pipe section at no additional cost to the Department. The contractor may also be required to perform such saw cuts after delivery of materials to the site if such is considered necessary by the Engineer because of indicated weaknesses in the seam. All saw cuts shall be welded after inspection and the welded areas protected as specified in Paragraph .1(g) below.

- (d) The helical angle is here defined as the angle between the corrugations and the pipe axis and shall not be less than shown in the following table:

Minimum helical angle for Helical C.M.P.

Pipe Diameter 2 2/3" x 1/2" corrugation

24 inches	71 degrees
30 inches	75 degrees
36 inches	78 degrees
48 inches	80 degrees
60 inches	82 degrees
72 inches	83 degrees
84 inches	84 degrees
96 inches	85 degrees

- (e) The A.A.S.H.O. Specification for copper base metal, Designation M36, is hereby waived and the base metal shall conform to the current specifications of the American Iron and Steel Institute.

Butt welds joining coils of base metal in the manufacture of helically corrugated pipe shall be of the same strength as the base metal, watertight and protected as outlined in Paragraph .1(g) below.

- (f) The saw-cut ends of each continuously formed corrugated metal pipe section

9.6.2 Materials
(Cont'd)

- (f) shall be completely deburred and the allowable mismatch of the saw-cut end will not exceed 1/8 inch.
- (g) Damage to the spelter coating during the manufacturing process shall be protected by the application of two coats of weather-resistant, high zinc dust content outside paint. The areas damaged shall be thoroughly cleaned and rough edges ground smooth prior to the paint application.

.2 Couplers

- (a) Coupling bands shall be manufactured using the same base metal as used in the culvert. Coupling bands for 30-inch diameter culverts shall be no lighter than 16 gauge and for 36 inch to 48 inch diameter culverts inclusive, shall be no lighter than 14 gauge.
- (b) For annular corrugated culverts the coupling bands shall be corrugated type, at least 18 inches wide for 30 inch diameter culverts and at least 24 inches wide for 36 inch to 48 inch diameter culverts inclusive.
- (c) For helically corrugated culverts, 30 inches in diameter, coupling bands shall be either (a) the corrugated type not less than 18 inches wide, or (b) the universal dimpled type not less than 24 inches wide with a minimum of 6 rows of 8 dimples each, spaced equally circumferentially.
- (d) For helically corrugated culverts, 36 inch to 48 inch diameter inclusive, coupling bands shall be either (a) the corrugated type not less than 24 inches wide, or (b) the universal dimpled type not less than 27 inches wide with a minimum of 6 rows of 8 dimples each, spaced equally circumferentially.
- (e) The coupling bands shall be so manufactured as to lap on an equal portion of each of the culvert sections to be connected, and shall be connected at the ends by galvanized angles having section dimensions of not less than two (2) inches by two (2) inches by 3/16 inches.
- (f) The annular and helical corrugated coupling band shall be a two-piece coupler manufactured so that each half of the band will overlap the other. The

9.6.2 Materials
(Cont'd)

- .5 Material used for the bed and fill around the culverts will be selected by the Engineer from one of the contract Unit Price Table items.

9.6.3 Construction

.1 Excavation

- (a) The location, elevation and excavation for culverts will be staked by the Engineer.
- (b) Excavation shall be carried out in accordance with the requirement for Excavation Common and/or Excavation Rock (Specification Division 9, Section 2).

During construction the contractor may be required to provide for the temporary flow of water outside of the limits of the culvert. The method used in diverting the water shall be approved by the Engineer.

.2 Bedding

The culvert bed shall provide a firm foundation of uniform density throughout its entire area. When a firm foundation is not encountered at the grade established the bottom of the bed shall be sub-excavated to the dimensions staked by the Engineer. The sub-excavated area shall be backfilled with material approved by the Engineer.

.3 Installation

- (a) Pipes shall be placed with the inside circumferential laps pointing downstream and with longitudinal laps at the side or quarter points.
- (b) The sections of the culvert shall be firmly jointed with coupling bands.
- (c) If a watertight joint is specified, the method used will be as directed by the Engineer.
- (d) If insulation is specified, installation of insulation material will be as shown on the plans or as directed by the Engineer.
- (e) The backfillfilling around the culvert will be in accordance with the Plans and shall conform with the requirements for Embankment Construction. (Specification Division 9, Section 4).

The Engineer will determine the amount of compactive effort required.

9.6.3 Construction
(Cont'd)

(f) No strutting of culverts will be allowed without written approval from the Engineer.

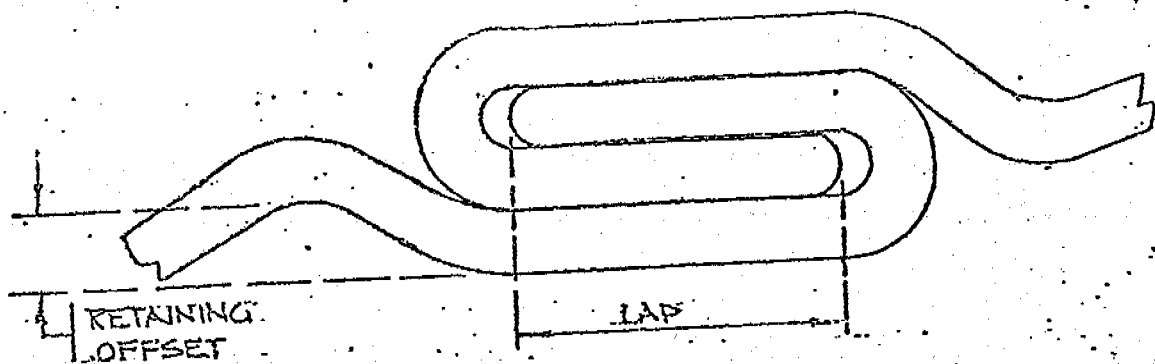
9.6.4 Measurement

.1 Delivery and Installation

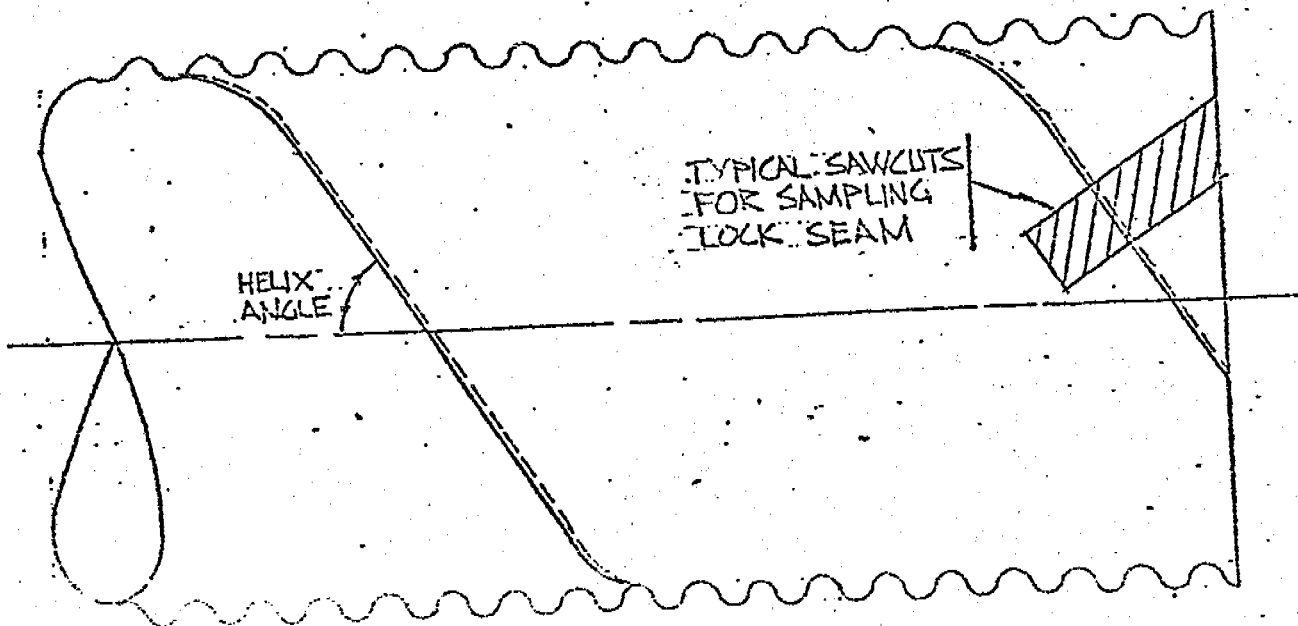
The quantity of CORRUGATED METAL PIPE to be measured for payment, will be the number of lineal feet of pipe complete in place and accepted by the Engineer. The measurement will be based on nominal length of pipe sections.

Loading of the pipes at designated stockpile sites, hauling and unloading the pipes at the culvert site, preparing the bed, assembling the culvert and placement of backfill material around the pipe, will be considered incidental to the culvert installation.

Quantities for culvert excavation, backfill material and compaction will be measured for payment in accordance with the appropriate Unit Price Table Items.



CROSS-SECTION OF LOCK SEAM



DEPARTMENT OF PUBLIC WORKS
MINISTÈRE DES TRAVAUX PUBLICS

Drawing title: LOCK SEAM ON
Titre du dessin: HELICALLY FABRICATED
CORRUGATED METAL PIPE

scale:
échelle:

date:

revisions:

Designed by:
conçu par:

drawn by:
dessiné par: R SANDL

reviewed by:
examiné par: J TWACH

approved by:
approuvé par: F KIMBLE

project no.:
no. du projet:

dwg. no.:
dessin no.

4 of 4

9.7.1 Description

This item consists of:

- .1 The transportation from barge landing and the installation of Corrugated Structural Plate Pipe (C.S.P.P.) and Pipe Arch (C.S.P.P.A.) Culverts in accordance with these specifications and to the lines and grades shown on the plans or as directed by the Engineer.
- .2 The design, supply, delivery and installation of Corrugated Structural Plate Horizontal Ellipse (C.S.P.H.E.) culverts in accordance with these specifications and to the lines and grades shown on the plans or as directed by the Engineer.

9.7.2 Materials

- .1 Corrugated Structural Plate Pipe Culverts (C.S.P.P.), Corrugated Structural Plate Pipe Arch Culverts (C.S.P.P.A) and Corrugated Structural Plate Horizontal Ellipse Culverts, (C.S.P.H.E.) shall conform to the requirements of the current Specification of AASHTO M167.
- .2 Fabrication of the culvert material shall conform to the requirements of Section 23, Division 11 of the Standard Specification for Highway Bridges of the AASHTO, 1969, or latest revision thereof with the following exceptions and additions.
- .3 All Corrugated Structural Plate Pipe (C.S.P.P.) shall be fabricated approximately five (5) per cent vertically elongated. The diameter dimension stipulated on the Plans and in the Specifications is nominal and is the clear inside diameter of a round pipe having equal circumference. The plates for the pipe shall be factory-formed so that the finished pipe is an ellipse in cross-section and is symmetrical about the vertical axis.
- .4 The Supplier shall submit five (5) sets of shop drawings, assembly plans and instructions for approval by the Engineer prior to shipment. These plans and instructions shall show all details of the ends, the shape, radii, circumference, inside clear horizontal and vertical dimensions of the assembled pipe, the position of bolts of different lengths, and the codes used to identify all plates and bolts.
- .5 All plates shall be marked with weather resistant paint so as to readily identify the mileage of the pipe they belong to and their position in the pipe. In addition, the mileage

9.7.2 Materials
(Cont'd)

for the structure, the radius of the plate, and the gauge shall be stamped into each plate on the inside of the structure.

- .6 The plates shall be shipped in bundles and strapped with metal bands to prevent the plates from separating.
- .7 The number of bolts and nuts for each pipe shall be 5% greater than actually required for assembly. The bolts and nuts shall be shipped in weather resistant containers which will be marked with the mileage of the pipe they belong to.
- .8 Furnishing of containers and strapping bands will be incidental to the culvert supply and no separate measurement for payment will be made therefor.
- .9 The metal culvert material shall be handled so as not to bruise or damage the spelter coating. It shall not be dragged on the ground or manipulated with heavy equipment without proper precautions to protect the surface. Any damage to the spelter coating shall be protected by the application of two (2) coats of weather-resistant, high zinc dust content paint. The areas damaged shall be thoroughly cleaned and rough edges ground smooth prior to the paint application.
- .10 Culverts shall be supplied to the size, length and gauge shown on the Plans. Materials for the standard bevelled end treatment, steel cut off walls and hold downs shall be fabricated and supplied, all in accordance with the details shown on the Plans.
- .11 The Structural Plate Horizontal Ellipses shall be the size shown on the drawings or approved equivalent to provide the same end areas.

The Contractor shall design the structures for a live load of HS20-44 and an embankment dead load of 125 lbs. per cu. ft. He shall submit with the tender, drawings and calculation sheets for consideration by the Engineer. This information shall include all steel thickness calculations and joint detail designs to allow a check to be made on the adequacy of the proposed design.

The Contractor shall submit to the Engineer:

- (a) Two (2) sets of shop and assembly draw-

9.7.2 Materials
(Cont'd)

ings for approval prior to fabrication.

(b) Five (5) sets of shop and assembly drawings as approved.

(c) Five (5) sets of assembly and installation drawings and instructions.

Steel end stiffeners, cut-off walls, retaining walls and wingwall bins shall be supplied and fabricated in accordance with the general details shown on the drawings and to the Contractor's approved drawings.

9.7.3 Construction

.1 Excavation

(a) The location, elevation and excavation for the culvert will be staked by the Engineer.

(b) Excavation shall be carried out in accordance with the requirement for Excavation Common and/or Excavation Rock, (Specification Division 9, Section 2).

(c) Where applicable, the Contractor shall provide a temporary diversion for the flow of water outside the limits of the culvert. The method used in diverting the water shall be approved by the Engineer.

.2 Foundation

The culvert bed shall provide a firm foundation throughout its entire area. The bed shall be sub-excavated to the dimensions staked by the Engineer and backfilled with approved material which will be compacted as directed by the Engineer.

.3 Assembly

(a) Placing and assembly of the pipe may only proceed after the excavation, foundation and bottom bedding layer for the pipe has been approved by the Engineer, except that for smaller diameter pipes the Engineer may give permission for assembly of the pipe prior to completion of culvert bed. The assembly shall be in accordance with the shop drawings. All holes shall be filled with bolts which will be tightened to a torque of not less than 150 foot pounds and not more than 200 foot pounds.

(b) The Contractor shall when specified in the General Requirements, arrange at his own cost to have in the field a fully qualified representative of the culvert

9.7.3 Construction
(Cont'd)

Supplier during the period of installation to ensure that the culvert assembly, erection and general construction are in accordance with the Supplier's recommendations.

.4 Backfilling

Assembly and tightening of all bolts shall be completed and approved by the Engineer before backfilling may commence. Backfill material will be located and approved by the Engineer.

During the course of backfilling around and above the pipe the deflections will be measured. Plumb bobs and line shall be installed within the pipe by the contractor at locations under each embankment shoulder, at the midpoint of the pipe and under each slope at locations designated by the Engineer. Plumb bobs shall be suspended and maintained by the contractor throughout the course of construction at the 10, 12 and 2 o'clock positions.

Backfill material shall be placed in successive layers and compacted in accordance with the Plans and Specifications or as directed by the Engineer. Equipment used for the backfilling operation up to three (3) feet above the top of the pipe shall run parallel and as close to the pipe as possible with simultaneous hand spreading and compaction by mechanical impact tampers along the face of the pipe. Special attention shall be given to compaction under the haunches.

Lateral movement shall be prevented by controlling the rate of filling on each side. The contractor will be responsible for the proper placing of the bedding and backfill as evidenced by the deformation of the pipe from its original shape. No strutting of the pipe will be allowed without written approval from the Engineer. Unless otherwise directed, the following criteria on deflection will be followed. Vertical deflections that tend to increase the original vertical dimension only will be allowed. Vertical deflections shall not be permitted to exceed three (3) percent of the original vertical diameter. Horizontal deflections shall not be permitted to exceed five (5) percent of the original horizontal diameter.

If during the placement of backfill or embankment around and above the pipe, the deformations should exceed the above limits, the work shall cease, and the Engineer shall

9.7.3 Construction
(Cont'd)

be notified. The Engineer may then order the removal and replacement of the backfill in its entirety or in part and may require, as a corrective measure, that the pipe be strutted, either horizontally or vertically, as directed by the Engineer. The contractor shall undertake the corrective work so ordered entirely at his own expense.

Vehicular traffic and construction equipment will not be allowed to cross over the structure until the backfill has been constructed and compacted to a minimum depth of three (3) feet over the highest point on the pipe, or to a height specified by the pipe supplier for the loadings anticipated.

9.7.4 Measurement

- .1 The quantity of Corrugated Structural Plate Pipe (C.S.P.P.) and Pipe Arch (C.S.P.P.A.) Culverts to be measured for payment will be as a lump sum for transportation and installation of each individual pipe acceptably completed in accordance with the Plans and Specifications.
- .2 The quantity of Corrugated Structural Plate Horizontal Ellipse (C.S.P.H.E.) to be measured for payment will be as a lump sum for the design, supply, delivery and installation of each individual pipe acceptably completed in accordance with the Plans and Specifications.

9.8.1 Description

This item consists of excavating; crushing and/or screening gravel or stone or removing oversize material, loading; and placing the material in stockpile(s) or on the road as shown on the Plans or as directed by the Engineer.

9.8.2 Materials

The material will be obtained from sources shown on the Plans, except the Engineer may designate other sources if during the construction other sources are located.

.1 Crushed Gravel - 3/4" Minus

The material shall consist of crushed stone or crushed gravel of clean, hard, angular particles, free from clay lumps, cementation and organic or other deleterious material, and shall meet the following gradation requirements:

<u>Sieve No.</u>	<u>Percent Passing (By Weight)</u>
3/4"	100%
No. 4	40 - 65
No. 10	25 - 55
No. 40	10 - 30
No. 200	3 - 8

A minimum of 50% of the material retained on No. 4 Sieve shall have at least one fractured face.

.2 Screened Gravel - 3" Minus

The material shall consist of screened gravel of clean, hard particles, free from clay lumps, cementation and organic or other deleterious material, and shall meet the following gradation requirement.

<u>Sieve No.</u>	<u>Percent Passing (By Weight)</u>
3"	100%
No. 4	30 - 70
No. 200	3 - 10

.3 Pit Run Gravel

The material shall consist of pit run gravel of clean hard particles free from cementation and organic or other deleterious material. All oversize material shall be removed at the pit or on the road. Stones of dimensions exceeding the thickness of the lift in which the gravel is spread by more than one (1)

9.8.2 Materials
(Cont'd)

inch is defined as oversize material; except that material passing the 3 inch sieve will not be classified as oversized.

9.8.3 Construction

- .1 Clearing and Grubbing of gravel deposit(s) and quarry area(s) access roads and stockpile site(s), shall conform to the requirements for Clearing and Grubbing (Division 9 Section 1).
- .2 Excavating and disposal of material overlaying the gravel deposit(s) and quarry area(s) and the construction of access roads, shall be in accordance with the requirements for Excavation Common and Embankments (Division 9 Sections 2 and 4).
- .3 Before gravel can be placed either on the road or in stockpile(s), approval must be received from the Engineer.
 - (a) For placement of gravel on the road, the roadbed surface shall be smooth-riding and free from potholes and ruts. Scarifying and blading shall be performed as directed by the Engineer.
 - (b) The hauling shall be uniformly spread over the width of the traffic lanes to produce uniform compaction. The Contractor will maintain the haulroads at his own expense.
 - (c) The gravel shall be dumped and spread uniformly on the roadbed surface at the rate specified by the Engineer.
 - (d) When gravel is used to backfill sub-excavated areas, and for backfill material around culverts, the backfill operation will be in accordance with the requirements for Embankment (Division 9 Section 4).
 - (e) Stockpile site(s) shall be firm and level and be clean of all deleterious material. The stockpile(s) shall be shaped as directed by the Engineer and constructed in layers not exceeding three (3) feet in depth over the entire stockpile area. Stockpiles shall be kept free from snow and ice during the construction.

9.8.4 Measurement

The quantity of CRUSHED, SCREENED and/or PIT RUN GRAVEL to be measured for payment, will be the number of tons of material produced, loaded and placed in accordance with this specification and accepted by the Engineer.

Measurement for Gravel Haul will be in accordance with the requirements for Gravel Haul (Division 9 Section 9).

The clearing, grubbing and/or stripping of gravel deposits and stockpile sites and the construction of access roads will be measured for payment under the appropriate unit price table items.

The removal of snow and ice as specified in Article 9.8.3.3 (e) is considered incidental to the construction and no separate measurement for payment will be made therefor.

9.9.1 Description

This item consists of the authorized hauling of material measured for payment under the classification of gravel.

9.9.2 Materials

Not applicable.

9.9.3 Construction

Not applicable.

9.9.4 Measurement

The quantity of HAUL to be measured for payment will be the number of ton miles of gravel acceptably delivered.

The quantity will be computed by multiplying the weight of the material in tons by the haul distance in miles along the designated route between the point of loading and the designated delivery point.

For the purpose of this Specification, the designated delivery point shall be considered as the center of the project mile, except:

- (a) If a section is shorter than one mile, the designated delivery point will be the center of that section.
- (b) If sections within a project mile are to be constructed at varying rates of application, the designated delivery point will be the center of each such section within the mile.

9.10.1 Description

This item consists of loading, transporting and distributing water required for the construction of the highway.

9.10.2 Materials

The Engineer will approve the source of water.

The water shall be free from undesirable quantities of organic matter and mineral salts.

9.10.3 Construction

Watering equipment shall consist of water-tight tanks mounted on adequately powered trucks. The water shall be applied through a spray bar of such design as to provide a uniform unbroken spread of water the full width of the spray bar. A suitable device for positive shutoff of the spray bar shall be so located as to permit control from the cab.

The Engineer will determine the quantity of water to be applied and the rate of application.

9.10.4 Measurement

The quantity of WATER to be measured for payment, will be the number of 1,000 gallon units of water acceptable loaded, transported and distributed.

Measurement will be made at the point of delivery. The volume of water will be computed from the volumetric capacity of the tank.

9.11.1 Description

This item consists of constructing a protective covering of sacked soil-cement or approved stone, with or without mortar on an earth bed or granular filter blanket in accordance with these specifications. Rip-rap shall be constructed at the locations and in conformity with the lines, grades and dimensions shown on the Plans or as designated by the Engineer.

9.11.2 Materials

The Contractor shall supply all materials.

- .1 Stone Rip-Rap: Rip-rap materials shall be of approved quality and shall consist of sound, hard and dense stones, boulders or quarry rocks resistant to the action of air and water and free from seams, cracks or other structural defects.

a) Hand-placed rip-rap material for Corrugated Metal Pipe Culverts, ditch blocks and ditch checks shall consist of stones, boulders or quarry rocks having dimensions of not less than six (6) inches in any one direction.

b) Rip-rap materials for Structural Plate Culverts, bridges, and channel bank protection shall consist of stones, boulders or quarry rocks meeting the requirements for "Heavy Rip-Rap."

HEAVY RIP-RAP

Weight of Stones (lbs.)	Percentage
800 - 1,200	40 - 60
400 - 800	20 - 40
50 - 400	10 - 30
Under 50	0

9.11.2 Materials
cont'd

or meeting the requirements for "Armour
Rip-Rap":

ARMOUR RIP-RAP

Weight of Stones (lbs)	Percentage
1,200 - 2,000	60 - 70
400 - 1,200	20 - 30
200 - 400	10 - 20
Under 200	0

Spalls shall be supplied to fill open joints.
Filter blanket material shall be approved by
the Engineer.

Sand for mortar shall conform to the latest
C.S.A. Specifications for Aggregate for
Masonry Mortar A 82.56 unless otherwise
instructed by the Engineer.

Cement for mortar shall be Portland Cement
conforming to the latest C.S.A. Specification
A 5, (Type 1) unless otherwise instructed by
the Engineer.

.2 Sacked Soil-Cement Rip-Rap

- a) The soil material will consist of a
sand and/or gravel from a source selected
by the Engineer.
- b) Sacks shall be manufactured from
minimum 10 ounce burlap and shall be
approximately 20 inches by 36 inches
measured inside the seams when the
sack is laid flat. The capacity of each
sack shall be approximately 1.25 cubic
feet.
- c) The cement shall be Portland Cement
conforming to the latest C.S.A.
Specification A5, Type 1.

9.11.3 Construction .1

Preparation of Foundation

- a) Hand-Placed Rip-Rap: Aprons and slopes
to be rip-rapped shall be excavated as
shown on the plans or as specified by

9.11.3 Construction
cont'd

the Engineer to provide adequate foundation upon which the rip-rap shall rest. The foundation bed shall be fine graded to form a uniform and even surface. Depressions shall be filled and thoroughly compacted.

- b) Hand-Placed Grouted Rip-Rap: Preparation of foundation shall be performed as .1 (a) above.
- c) Random Rip-Rap: If required, a shelf or ledge shall be excavated to permit dumping of the stones.
- d) Sacked Soil-Cement Rip-Rap: Preparation of foundation shall be performed as .1 (a) above.
- e) Filter Blanket: Filter blankets shall be constructed at locations shown on the Plans or where directed by the Engineer, and to the lines and grades as staked by the Engineer.

.2 Placing

- a) Hand-Placed Rip-Rap: Stones shall be placed by hand to cover the required length, width and thickness. Stones shall be firmly bedded into the slope and against adjoining stones with spalls used to fill the voids. The larger stones shall be placed in the bottom rows. The largest dimension of the stones shall be perpendicular to the slope, unless such dimension is greater than the specified thickness of the rip-rap.
- b) Hand-Placed Grouted Rip-Rap: The stones shall be placed as specified in .2(a) above. The surface of the stones shall be thoroughly wetted before applying the mortar. The spaces between the stones shall be filled with cement mortar with the outer faces of the stones left exposed. The mortar shall be composed of one (1) part Portland Cement and three (3) parts of sand, of such consistency that it can be placed with a mason's trowel. After completing the grouting,

9.11.3 Construction
cont'd

the exposed surfaces of the stones shall be thoroughly brushed to remove the cement mortar. The outer stones shall project two (2) to four (4) inches above the grouted surface.

Grouted rip-rap shall be cured using curing compounds, burlap, a blanket of earth kept wet for seventy-two (72) hours, or by sprinkling with a fine spray every two (2) hours during the daytime for a period of three (3) days.

- c) Random Rip-Rap: Random rip-rap shall be dumped onto the surface to be rip-rapped; sufficient hand and/or machine work shall be performed to produce a uniform depth and surface of the finished rip-rap.
- d) Sacked Soil-Cement Rip-Rap: The Engineer will designate the amount of cement to be used in the preparation of the soil-cement mixture. The soil and cement shall be dry mixed in a manner which, in the opinion of the Engineer, is acceptable for uniformly distributing the cement throughout the soil. Each burlap sack shall be filled with approximately one (1) cubic foot of soil-cement mixture and securely tied at the top in a manner meeting with the acceptance of the Engineer. If the sacks are not to be immediately placed into their final position, they shall be kept dry. Upon placing into the work, each sack shall be packed into conformance with the prepared base and adjacent sacks already in place. Additional courses of sacks shall be placed to obtain the required depth within the area staked or designated by the Engineer. If being placed in the summer, the sacks shall then be thoroughly soaked with a gentle spray of water and kept moist for twenty-four (24) hours by sprinkling, covering with moist earth or other approved means.

9.11.3 Construction
cont'd

When placing sacked soil-cement rip-rap during the summer months the Contractor may wet mix the soil-cement mixture providing the filled sacks are immediately placed into the work and kept moist for a period of twenty-four (24) hours.

9.11.4 Measurement

The quantity of rip-rap which will be measured for payment will be the number of cubic yards of rip-rap of the types specified in Division 1, Section 1 and provided for in the Unit Price Table, accepted in the completed work by the Engineer. The measurement will be based on the volume of rip-rap in its final position.

In addition the following related work items will be measured for payment:

- .1 The supply and transportation of soil material for the sacked soil-cement will, for the purpose of payment, be measured as PIT RUN GRAVEL and HAUL OF PIT RUN GRAVEL.
- .2 The supply and transportation of filter blanket material will, for the purpose of payment, be measured as PIT RUN GRAVEL and HAUL OF PIT RUN GRAVEL.
- .3 The transportation of stone rip-rap material will, for the purpose of payment, be measured as HAUL OF PIT RUN GRAVEL.
- .4 Portland Cement for sacked soil-cement rip-rap will be measured as the number of 80 pound bags of cement acceptably supplied, delivered and incorporated into the soil-cement mixture.

All other work and materials required for acceptably completing the rip-rap installations, with filter blankets where directed, will not be measured separately for payment but will be considered incidental to the work measurements outlined above.

9.12.1 Description

This item consists of the removal and disposal of snow and ice from the right of way, borrow areas and embankments, in accordance with these specifications.

9.12.2 Materials

Not applicable.

9.12.3 Construction

.1 Removal of Snow and Ice

- a) Snow shall be removed from areas being excavated.
- b) Solid ice encountered during the excavation of earth material, shall be removed as directed by the Engineer.
- c) Prior to placing the embankment, snow and ice shall be removed from the area within the limits of the embankment unless otherwise directed by the Engineer. The removal of snow and ice shall be carried out so as to cause minimum disturbance to the natural ground cover.
- d) During the placing of material, the embankment shall be kept free of snow and ice.

.2 Snow and Ice Removal Equipment

The Snow and Ice Removal Equipment shall consist of a crawler tractor of minimum net flywheel horse power of 101, equipped with a dozer blade. The blade shall be equipped with two height adjustable mushroom type shoes of a design approved by the Engineer.

The Snow and Ice Removal Equipment shall be equipped with an approved time recording device which accurately records the number of hours the machine is in operation.

9.12.3 Construction
cont'd

- .2 It will be the Contractor's responsibility to ensure that the device is properly mounted and maintained, that the cards are accurately identified, as to date, and shift, and to daily deliver said cards to the Engineer.

The Engineer will record the number of operating hours for the machine and both the Engineer and the Contractor will certify daily that such records are correct.

9.12.4 Measurement

- .1 The quantity of SNOW AND ICE REMOVAL as specified in paragraph (c) to be measured for payment, will be the number of approved hours the Snow and Ice Removal Equipment is operated removing snow and ice.

Removal of snow as specified in paragraphs 9.12.3.1 (a) and (d) will not be measured separately for payment but will be considered incidental to the construction under other Unit Price Table items.

Removal of ice as specified in 9.12.3.1 (b) will be measured for payment in Excavation Common or Channel Excavation Common (Specification 9.2 and 9.3).

9.13.1 Description

This item consists of supplying vehicles for the use of the Engineer and his representatives.

.1 Type and Equipment

- a) Vehicles shall be of the types and number specified in Division 1, Section 1.
- b) Vehicles shall be maintained in good running order, equipped with heater, defroster, right and left hand mirrors, windshield washers, permanent type anti-freeze, spare wheel, heavy duty bumper jack, wheel wrench, all-weather mud and snow tires on rear and spare wheels, directional signals with two-way flasher, full width front seat, first aid kits, and licensed in accordance with Territorial regulations.

.2 Delivery and Return of Vehicles

- a) The vehicles shall be delivered to a location designated by the Engineer. From the time of delivery, they shall be deemed to be in the possession of the Crown until returned to the Contractor.
- b) The Engineer may, at any time or times, return any or all of the vehicles to the Contractor by advising the Contractor's representative in writing. From the date of such advice to the Contractor's representative the specified vehicles shall be deemed to be in the possession of the Contractor.
- c) The Contractor shall, upon written request from the Engineer, redeliver to him any vehicles returned to the Contractor.
- d) The Engineer may require the Contractor to furnish vehicles until final measurements have been completed.

9.13.3 Rental
Conditions

.1 Damage and Repairs

- a) All vehicles supplied pursuant to this contract are at the risk of the Contractor whether in the possession of

9.13.3 Rental
Conditions
cont'd

the Contractor or the Crown, and the Contractor shall not make any claim or demand, or bring any action or other legal proceedings against the Crown in respect of damage to any such vehicle, including damage caused by the negligence of an officer or servant of the Crown while acting within the scope of his duties.

- b) All repairs to vehicles supplied under this contract will be performed expeditiously by the Contractor.

- .2 Protection: The Contractor, for himself, his heirs, executors and administrators, hereby undertakes to indemnify and save harmless, the Crown, and officers, servants and agents of the Crown from and against all manner of actions, causes of action, suits, debts, duties, agreements, claims and demands whatsoever which may hereafter exist or be made for or by reason of any cause, matter or thing whatsoever arising out of these terms of rental and the transportation or operation of equipment herein referred to.

9.13.4 Measurement

The quantity of vehicles for use by the Engineer which will be measured for payment, will be the actual number of months and fractions thereof that the vehicles are in possession of the Engineer and are in acceptable operating condition. All costs of supply, operation and maintenance of the vehicles and ancilliary equipment will be incidental to the Unit Prices bid for the vehicles.



These Articles of Agreement made in duplicate this _____ day
of _____ 19____

Between

Her Majesty the Queen, in right of Canada (referred to in the documents forming the contract as "Her Majesty") represented by the Minister of Public Works (referred to in the documents forming the contract as "the Minister")

**PLANNING ONLY
NOT FOR CONSTRUCTION**

(referred to in the documents forming the contract as the "Contractor")

Witness that Her Majesty and the Contractor covenant and agree as follows:

Article I

The Contractor will between the date of these Articles of Agreement and

in a careful and workmanlike manner execute the following work;

which work is more particularly described in the documents that are attached hereto, entitled "Plans and Specifications" and marked "A" (referred to in the documents forming the contract as the "Plans and Specifications") at the place and in the manner therein set out.

Article II

- (1) Her Majesty will pay to the Contractor as consideration for the execution of the portion of the work to which the fixed price arrangement is applicable the sum of \$ (subject to any additions or deductions provided for in these Articles, the General Conditions, the Terms of Payment, or the Labour Conditions except any addition or deduction which is expressly stated to be applicable only to a unit price arrangement), at the times and in the manner set out or referred to in the document that is attached hereto entitled "Terms of Payment" and marked "B" (referred to in the documents forming the contract as the "Terms of Payment").
- (2) (a) Her Majesty will pay to the Contractor as consideration for the execution of the portion of the work to which the unit price arrangement is applicable a sum equal to the number of units of measurement of each class of labour, plant or material actually performed, used or supplied by the Contractor in the execution of the work as measured by the Engineer and set out in the Engineer's Final Certificate of Measurement multiplied by the price for each such unit of measurement as set out in the Unit Price Table as added to or amended in accordance with paragraphs (b), (c) and (d) of this Article or as, in a proper case, determined in accordance with paragraphs (e) of this Article (such sum being subject to any additions or deductions provided for in the General Conditions, Terms of Payment, Labour Conditions, except any addition or deduction which is expressly stated to be applicable only to a fixed price arrangement) at the times and in the manner set out or referred to in the document that is attached hereto entitled "Terms of payment" and marked "B" (referred to in the documents forming the contract as the "Terms of Payment").
- (b) The Engineer and the Contractor may by agreement in writing add to the Unit Price Table classes of labour, plant or material together with units of measurement, prices per unit and estimated quantities therefor where any labour, plant or material which will be included in the Engineer's Final Certificate of Measurement is not included in any class of labour, plant or material set out in the Unit Price Table.
- (c) The Engineer and the Contractor may by agreement in writing amend the price per unit set out in the Unit Price Table for any class of labour, plant or material included therein where an estimated quantity is set out therein for that class of labour, plant or material, if the Engineer's Final Certificate of Measurement shows or will show that the total quantity of that class of labour, plant or material performed, used or supplied by the Contractor in executing the work is less than 85% of that estimated quantity.
- (d) The Engineer and the Contractor may by agreement in writing amend the price per unit set out in the Unit Price Table for any class of labour plant or material included therein where an estimated quantity is set out therein for that class of labour, plant or material, by establishing a price per unit for units of that class of labour, plant or material performed, used or supplied by the Contractor in executing the work which are in excess of 115% of that estimated quantity.

Article II (Cont'd)

- (e) Where the Engineer and the Contractor do not agree as contemplated in paragraphs (b), (c) and (d) of this Article the Engineer shall determine the class of and the unit of measurement of the labour, plant or material involved and the price per unit therefor shall be determined in accordance with section 46 of the General Conditions.
 - (f) For the information and guidance of the Contractor and the persons administering the contract on behalf of Her Majesty, but not so as to constitute a warranty, representation or undertaking of any nature, either by Her Majesty to the Contractor or by the Contractor to Her Majesty, it is estimated that the total amount payable by Her Majesty to the Contractor for the portion of the work to which the unit price arrangement is applicable will not exceed \$
- (3) Subsection (1) of this Article is not applicable where the unit price arrangement applies to the whole of the work.
- (4) Subsection (2) of this Article is not applicable where the fixed price arrangement applies to the whole of the work.

Article III

- (1) Subject to subsections (2) and (3) of this Article, the document attached hereto, entitled "General Conditions" and marked "C" (referred to in the documents forming the contract as the "General Conditions"), the document attached hereto entitled "Labour Conditions" and marked "D" (referred to in the documents forming the contract as the "Labour Conditions"), the document attached hereto and entitled "Insurance Schedule" and marked "E" (referred to in the documents forming the contract as the "Insurance Schedule"), the "Plans and Specifications", the "Terms of Payment" and these Articles of Agreement all form part of the contract between Her Majesty and the Contractor.
- (2) Any of the provision of these Articles, the Terms of Payment and the General Conditions which are expressly stated to be applicable only to a unit price arrangement are not applicable to the whole or to the portion of the work to which the fixed price arrangement is applicable.
- (3) Any of the provisions of these Articles, the Terms of Payment and the General Conditions which are expressly stated to be applicable only to a fixed price arrangement are not applicable to the whole or to the portion of the work to which the unit price arrangement is applicable.

Article IV

The amount of \$ _____, that has been deposited with the Minister by the Contractor as a security deposit for the due fulfilment of the contract will be dealt with in accordance with the provisions concerning security deposit in the General Conditions.

The Contractor has furnished and Her Majesty accepts a Performance Bond, (insert details — name of Company, amount, date, etc.)

and a Labour and Material Payment Bond, (insert details — name of Company, amount, date, etc.)

with respect to the execution of the work by the Contractor, which bond or bonds shall operate according to their tenor. The Contractor shall post on the site of the work a notice that a Labour and Material Payment Bond is in force together with the name and address of the surety thereunder, definition of those persons protected thereunder and an outline of the procedure for submitting a claim thereunder.

Article V

For all purposes of or incidental to the contract, the Contractor's address shall be deemed to be:

Article VI

- (1) Her Majesty and the Contractor agree that the following table is the Unit Price Table for the purposes of the contract:

Column 1	Column 2	Column 3	Column 4
Class of labour plant or material	Unit of Measurement	Price per Unit	Estimated quantity

- (2) The Unit Price Table set out in subsection (1) designates the portion of the work to which the unit price arrangement is applicable.
- (3) The portion of the work which does not fall within subsection (2) of this Article is the portion of the work to which the fixed price arrangement is applicable.

EXECUTED ON BEHALF OF HER MAJESTY on the _____ day of _____ 19____ by _____

DEPUTY MINISTER
(Name to be printed or stamped)

DEPUTY MINISTER

in the presence of _____
WITNESS

and countersigned by

SECRETARY
(Name to be printed or stamped)

SECRETARY

in the presence of _____
Witness

SEALED, ATTESTED TO AND DELIVERED on the _____ day of _____ 19____
on behalf of _____ by _____
(Name of Contractor)

(Name and Status of Authorized Signing Officer in block letters)

SIGNATURE OF AUTHORIZED SIGNING OFFICER

(Name and Status of Authorized Signing Officer in block letters)

SIGNATURE OF AUTHORIZED SIGNING OFFICER

Seal of
Company

SEALED, ATTESTED TO AND DELIVERED on the _____ day of _____ 19____
on behalf of _____ by _____
(Name of Contractor)

in the presence of _____
WITNESS TO SIGNATURE OF

SIGNATURE OF PARTNER OR SOLE OWNER

Seal

(Name of Person signing in right hand column)

in the presence of _____
WITNESS TO SIGNATURE OF

SIGNATURE OF PARTNER

Seal

(Name of Person signing in right hand column)

N.B. The attention of the Contractor is drawn to the following Statutory provision:

"It is a term of every contract providing for the payment of any money by Her Majesty that payment thereunder is subject to there being an appropriation for the particular service for the fiscal year in which any commitment thereunder would come in course of payment." (Section 38, Financial Administration Act, R.S.C. 1952, c.116)



This document is the document referred to as "Terms of Payment" and marked "B" in the Articles of Agreement entered into on the _____ day of _____ 19_____, between Her Majesty the Queen and

Signatures

Minister _____

Contractor _____

Amount Payable – General

1. Her Majesty will pay to the Contractor at the times and in the manner hereinafter set out the amount by which

(a) the aggregate of the amounts described in section 2 of the Terms of payment exceeds

(b) the aggregate of the amounts described in section 3 of the Terms of Payment

and the Contractor will accept the payment as full consideration for everything furnished and done by him in respect of the work.

Amounts Payable to the Contractor

2. (1) the amounts referred to in paragraph (a) of section 1 of the Terms of Payment are:

(a) the amount set out in Article II of the Articles of Agreement;

(b) the amount, if any, payable to the Contractor pursuant to section 12 of the General Conditions relating to unexpected soil conditions, neglect or delay;

(c) the amount, if any, payable to the Contractor on account of a suspension of work pursuant to section 18 of the General Conditions;

(d) the amount, if any, payable to the Contractor pursuant to section 37 of the General Conditions relating to work not required to be done under the contract but done by the Contractor under order of the Engineer;

(e) the amount, if any, payable to the Contractor by reason of an order or change pursuant to section 38 of the General Conditions; and

(f) the amount, if any, payable to the Contractor pursuant to section 39 of the General Conditions relating to cooperation with other contracting persons and workmen.

(2) Paragraph (e) of subsection (1) is applicable only to a fixed price arrangement.

Time of Payment (Cont'd)

(5) Upon the expiration of 60 days from the date of issuance of an Interim Certificate of Completion under subsection (2) of section 40 of the General Conditions and if the Contractor has made and delivered to the Engineer his Statutory Declaration deposing to the fact that all his lawful obligations to subcontractors, workmen and suppliers of material in respect of the work are fully discharged, the amount described in section 1 of the Terms of Payment less the aggregate of

(a) all payments made pursuant to subsection (4);

(b) an amount equal to double the cost to Her Majesty of completing the items and doing the things described in the Interim Certificate of Completion which, in the opinion of the Engineer, are brought about by defects and faults in the work; and

(c) an amount equal to the cost to Her Majesty of completing the items and doing the things described in the Interim Certificate of Completion other than items or things to which paragraph (b) applies;

shall become due and be payable by Her Majesty to the Contractor.

(6) Upon the expiration of 60 days from the date of issuance of a Final Certificate of Completion under subsection (1) of section 40 of the General Conditions and if the Contractor has made and delivered to the Engineer his Statutory Declaration deposing to the fact that all his lawful obligations and lawful claims against him, arising out of the execution of the work, have been discharged and satisfied, the amount described in section 1 of the Terms of Payment less the aggregate of

(a) all payments made pursuant to subsection (4); and

(b) all payments made pursuant to subsection (5);

shall become due and be payable by Her Majesty to the Contractor.

Progress Report and Payment
thereunder not binding on
Her Majesty

5. Neither a Progress Report nor a payment by Her Majesty pursuant to the Terms of Payment shall be construed as evidence that the work, material or any part thereof is complete, is satisfactory or is in accordance with the contract.

Delay in Making Payment

6. Delay by Her Majesty in making payment when it becomes due and is payable pursuant to the Terms of Payment shall be deemed not to be a breach of the contract by Her Majesty but such delay shall, if the payment involved is payable pursuant to subsection (4) of section 4 of the Terms of Payment and if the delay continues for more than 15 days, entitle the Contractor to interest on the amount overdue and Her Majesty will, when making payment of the amount overdue, pay to the Contractor interest on the amount overdue calculated for the period of the said delay at 1½% plus the average accepted tender rate of Government of Canada three-month treasury bills, as announced each week by the Bank of Canada on behalf of the Minister of Finance, which rate shall be that which is announced immediately preceding the date on which payment was originally due the Contractor.

Right of Set-off

7. (1) Without restricting any right of set-off given or implied by law, Her Majesty may set-off against any amount payable to the Contractor under the contract, any amount payable to Her Majesty by the Contractor under this contract or under any current contract and without restricting the generality of the foregoing Her Majesty may when making payment pursuant to section 4 of the Terms of Payment deduct from the amount payable any amount which is then payable to Her Majesty by the Contractor under the contract or which, by virtue of the right of set-off, may be retained by Her Majesty.
- (2) For the purposes of this section "current contract" means;
- (a) a contract between Her Majesty and the Contractor under which the Contractor has an undischarged obligation to perform or supply work, labour or materials, or
- (b) a contract between Her Majesty and the Contractor in respect of which Her Majesty has since the date on which these Articles of Agreement were made exercised the right to take the work, the subject of that contract, out of the Contractor's hands.

Payment in Event of
Termination

8. In the event that the contract is terminated pursuant to section 19 of the General Conditions Her Majesty will as soon as is practicable under the circumstances pay to the Contractor the amount, if any, payable to the Contractor pursuant to that section.

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This document is the document referred to as "General Conditions" and marked "C" in the Articles of Agreement entered into on the _____ day of _____ 19____, between Her Majesty the Queen and

Signatures _____

Minister _____

Contractor _____

Interpretation _____

1. (1) In the contract

(a) "Engineer" means the _____ REGIONAL MANAGER
DESIGN AND CONSTRUCTION
WESTERN REGION
DEPARTMENT OF PUBLIC WORKS, CANADA

of _____
of the Government of Canada, and includes a person specially authorized by him to perform on his behalf any function under the contract;

- (b) "herein", "hereby", "hereof", "hereunder" and similar expressions refer to the contract as a whole and not to any particular subdivision or part thereof;
- (c) "material" includes all materials, commodities, articles and things required to be furnished under the contract for incorporation in the work;
- (d) "Minister" includes a person acting for, or if the office is vacant, in the place of such Minister, under the authority of an order of the Governor General of Canada in Council, and also his successors in the office, and his or their lawful deputy;
- (e) "plant" includes all animals, tools, implements, machinery, vehicles, buildings, structures, equipment, articles and things required for the execution of the work;
- (f) "security deposit" means the security given by the Contractor to Her Majesty in accordance with the contract;
- (g) "subcontractor" means a person, firm or corporation to whom or to which the Contractor has, pursuant to section 4 of the General Conditions and with the consent of the Engineer, subcontracted the whole or any portion of the work;
- (h) "superintendent" means the employee of the Contractor who is designated by the Contractor as being in full charge of the field operations of the Contractor for the purposes of the contract; and
- (i) "work" includes the whole of the works, materials, matters and things required to be done, furnished and performed by the Contractor under the contract.

Interpretation (Continued)

(2) The marginal notes in the contract form no part of the contract but shall be deemed to be inserted for the convenience of reference only.

(3) Unless the context otherwise requires, where in the contract reference is made to a subsection or paragraph, the reference shall be deemed to be a reference to a subsection or paragraph of the section or subsection, as the case may be, in which the reference is made.

(4) In interpreting the contract in the event of discrepancies or conflicts between anything in the Plans and Specifications and the General Conditions, the General Conditions shall govern.

(5) In interpreting the Plans and Specifications –

(a) in the event of discrepancies or conflicts between the Plans and Specifications, the Specifications shall govern;

(b) in the event of discrepancies or conflicts between the Plans, the Plans drawn with the largest scale shall govern; and

(c) in the event of discrepancies or conflicts between figured dimensions and scaled dimensions, the figured dimensions shall govern.

Successors and Assigns

2. The contract shall inure to the benefit of and be binding upon the parties hereto and their executors, administrators, successors and assigns.

Assignment of Contract

3. The contract may not be assigned without the written consent of the Minister.

Subcontracting by Contractor

4. (1) Neither the whole nor any part of the work may be subcontracted by the Contractor without the consent of the Engineer.

(2) Every subcontracting by the Contractor shall provide that the subcontractor shall comply with all terms and conditions of this contract which can reasonably be applied to his undertaking.

Description of Work
All-Inclusive

5. The description of the work and material set out in the contract includes not only the particular kind of work and material mentioned but also all labour, plant and material necessary for the full execution, completion and delivery ready for use of the work and material.

No Implied Obligations

6. No implied obligation of any kind by or on behalf of Her Majesty shall arise from anything in the contract, and the express covenants and agreements herein contained and made by Her Majesty are and shall be the only covenants and agreements upon which any rights against Her Majesty are to be founded; and, without limiting the generality of the foregoing, the contract supersedes all communications, negotiations and agreements, either written or oral, relating to the work and made prior to the date of the contract.

Time of Essence

7. Time is of the essence of the contract.

Indemnification by Contractor

8. (1) Except as provided in Section 9 of the General Conditions, the Contractor shall indemnify and save harmless Her Majesty from and against all claims, demands, losses, costs, damage, actions, suits or proceedings by whomsoever made, brought or prosecuted in any manner based upon, arising out of, related to, occasioned by or attributable to the activities of the Contractor in executing the work under the contract or to an infringement or an alleged infringement by the Contractor of a patent of invention.
- (2) For the purposes of subsection (1), "activities" includes an act improperly carried out, an omission to carry out an act and a delay in carrying out an act.

Indemnification by
Her Majesty

9. Her Majesty shall indemnify and save harmless the Contractor from and against all claims, demands, losses, costs, damage, actions, suits or proceedings arising out of his activities under the contract which are directly attributable to
- (a) lack of or a defect in, title or an alleged lack of or defect in, title to the site of the work; or
 - (b) an infringement or an alleged infringement of any patent of invention in executing anything for the purposes of the contract, the model, plan or design of which was supplied by Her Majesty to the Contractor.

Members of House of
Commons not to Benefit

10. No Member of the House of Commons shall be admitted to any share or part of the contract or to any benefit arising therefrom.

Notices, Orders, etc.,
to Contractor

11. (1) Notices for the purposes of paragraph (a) of subsection (1) of section 16, section 18 and section 19 of the General Conditions shall be in writing and shall
- (a) be delivered to the Contractor in person or, if the Contractor is a corporation or partnership, be delivered to a senior administrative or executive officer of the corporation or partnership, or
 - (b) sent by mail to the Contractor or his superintendent addressed to the address mentioned in the contract,
- and if any question arises as to whether any such notice was communicated to the Contractor it shall be deemed to have been sufficiently communicated to him
- (c) if it was delivered pursuant to paragraph (a), on the day it was delivered, and
 - (d) if it was sent by mail pursuant to paragraph (b), on the day it was received by the Contractor or on the sixth day after it was mailed, whichever is earlier.
- (2) Any notice, order, direction, decision or communication other than a notice to which subsection (1) refers, which may be given to the Contractor pursuant to the contract may be given in any manner, but it shall be deemed to have been sufficiently communicated to the Contractor if it was put in writing and the writing was
- (a) delivered to the Contractor in person or, if the Contractor is a corporation or partnership was delivered to a senior administrative or executive officer of the corporation or partnership,

Notices, Orders, etc.,
to Contractor (Continued)

- (b) delivered to the Contractor's superintendent,
- (c) left at the Contractor's office or, if he has more than one office, at one of them, or
- (d) sent by mail to the Contractor or his superintendent addressed to the address mentioned in the contract or to the Contractor's last known place of business or residence.

Changes in Soil Conditions
and Neglect or Delay by
Her Majesty

12. (1) No payment will be made by Her Majesty to the Contractor in addition to the payment expressly promised by the contract on account of any extra expense, loss or damage incurred or sustained by the Contractor for any reason including a misunderstanding on the part of the Contractor as to any fact, whether or not such misunderstanding is attributable directly or indirectly to Her Majesty or any of Her Majesty's agents or servants (whether or not any negligence or fraud on the part of Her Majesty's agents or servants is involved) unless, in the opinion of the Engineer, the extra expense, loss or damage is directly attributable to

- (a) a substantial difference between information relating to soil conditions at the site of the work, or a reasonable assumption of fact based thereon, in the Plans and Specifications or other documents or material communicated by Her Majesty to the Contractor for his use in preparing his tender and the real soil conditions encountered at the site of the work by the Contractor when executing the work, or
- (b) neglect or delay occurring after the date of the contract on the part of Her Majesty in providing any information or in doing any act which the contract either expressly requires Her Majesty to do or which would be done by an owner, in accordance with the usage of the trade, to enable his Contractor to carry out an undertaking similar to the work being executed under the contract for Her Majesty,

in which case, if the Contractor has given to the Engineer written notice of his claim before the expiration of thirty days from the encountering of the soil conditions giving rise to the claim or from the day on which the neglect occurs or the delay commences, as the case may be, Her Majesty will pay to the Contractor in respect of the additional expense, loss or damage incurred or sustained by reason of that difference, neglect or delay, an amount equal to the cost, calculated in accordance with sections 44 to 47 of the General Conditions of the additional plant, labour and materials necessarily involved.

(2) If, in the opinion of the Engineer, the Contractor has effected a saving of expenditure by reason of the execution of the work by the Contractor being rendered less difficult and less costly because the soil conditions actually encountered by the Contractor at the site of the work when executing the work are substantially different from soil conditions indicated in information or a reasonable assumption of fact based thereon in the Plans and Specifications or other documents or material communicated by Her Majesty to the Contractor for his use in preparing his tender, the amount set out in Article II of the Articles of Agreement shall be reduced by an amount equal to the saving effected by the Contractor.

(3) Paragraph (a) of subsection (1) and subsection (2) are applicable only to a Fixed Price Arrangement.

**Changes in Soil Conditions
and Neglect or Delay by
Her Majesty (Continued)**

(4) If information relating to soil conditions at the site of the work appeared in the Plans and Specifications or in other documents or material communicated by Her Majesty to the Contractor for his use in preparing his tender and if the real soil conditions encountered at the site of the work by the Contractor when executing the work are substantially different from such information, or a reasonable assumption of fact based thereon, so that the cost to the Contractor of executing the work is directly and substantially increased or decreased by reason of such difference then the Engineer and the Contractor shall exercise their powers under subsection (2) of Article II of the Articles of Agreement relating to amendment of the Unit Price Table so that the benefit of a substantial decrease in cost shall accrue to Her Majesty and the burden of a substantial increase in cost will not be borne by the Contractor.

(5) Subsection (4) is applicable only to a Unit Price Arrangement.

**Materials, Plant and Real
Property Become Property
of Her Majesty**

13. (1) All materials and plant and the interest of the Contractor in all real property, licences, powers and privileges acquired, used or provided by the Contractor for the work shall from the time of being so acquired, used or provided, become and they are the property of Her Majesty for the purposes of the work and they shall continue to be the property of Her Majesty

(a) in the case of materials, until incorporated in the work or until the Engineer indicates that he is satisfied that they will not be required for the work, and

(b) in the case of plant, real property, licences, powers and privileges, until the Engineer indicates that he is satisfied that the interest vested in Her Majesty therein is no longer required for the purposes of the work.

(2) Material or plant that is the property of Her Majesty by virtue of this section shall not be taken away from the site of the work, or used or disposed of, except for the purposes of the work, without the consent in writing of the Engineer.

(3) Her Majesty is not liable for loss or damage to material or plant that is the property of Her Majesty by virtue of this section and the Contractor is liable for such loss or damage notwithstanding that the material or plant is the property of Her Majesty.

**Materials, Plant and Real
Property Supplied by
Her Majesty**

14. (1) The Contractor is liable to Her Majesty for loss of or damage to material, plant or real property, whether attributable to causes beyond his control or not, supplied or made available by Her Majesty to the Contractor for use in connection with the work other than loss or damage resulting from and directly attributable to reasonable wear and tear.

(2) The Contractor will not use material, plant or real property to which this section applies except for the purpose of carrying out this contract.

(3) When the Contractor has failed within a reasonable time after being required by the Engineer to do so, to make good any loss or damage for which he is liable under this section, the Engineer may cause the loss or damage to be made good, and the Contractor shall thereupon be liable to Her Majesty for the cost thereof and shall on demand pay to Her Majesty an amount equal to such cost.

**Materials, Plant and Real
Property Supplied by
Her Majesty (Continued)**

(4) The Contractor shall keep records of material, plant and real property to which this section applies that the Engineer from time to time requires and shall, from time to time as the Engineer requires, satisfy the Engineer that such material, plant and real property are at the place and in the condition that they ought to be.

(5) This section applies to material, plant and real property supplied or made available by Her Majesty to the Contractor for use in connection with the work.

Extension of Time

15. (1) The Minister may, on the application of the Contractor made before the day fixed by Article I of the Articles of Agreement for completion of the work or before any new date for completion fixed under this subsection, if in his opinion it is in the public interest, extend the time for completion of the work by fixing a new day for completion of the work.
- (2) Where the Contractor does not complete the work by the day fixed by Article I of the Articles of Agreement for completion of the work but does complete the work thereafter, the Contractor shall pay to Her Majesty
- (a) an amount equal to all salaries, wages and travelling expenses paid by Her Majesty to persons superintending the work during the period of delay,
 - (b) an amount equal to the value to Her Majesty of the use of the completed work for the period of delay, and
 - (c) an amount equal to all other expenses and damages incurred or sustained by Her Majesty as a result of the work not being completed during the period of delay.
- (3) For the purposes of this section,
- (a) the work shall be deemed to be completed on the day the Engineer issues his Interim Certificate of Completion, and
 - (b) "period of delay" means the period commencing on the day fixed by Article I of the Articles of Agreement for completion of the work and ending on the day immediately preceding the day on which the work is completed, but excluding therefrom any day within a period of extension granted under subsection (1), if on such day, in the opinion of the Minister, causes beyond the control of the Contractor delayed completion of the work.
- (4) The Minister may, if in his opinion, it is in the public interest, waive the right of Her Majesty to the whole or any part of a payment payable pursuant to subsection (2).

**Taking the Work out of
the Contractor's hands**

16. (1) In any of the following cases, namely,
- (a) where the Contractor has made default or delayed in commencing or in diligently executing the work or any portion thereof to the satisfaction of the Engineer and the Minister or the Engineer has given notice thereof to the Contractor and has by such notice required the Contractor to put an end to such default or delay, and such default or delay continues for six days after such notice was communicated;

**Taking the Work out of
the Contractor's hands
(Continued)**

- (b) where the Contractor has made default in the completion of the work, or any portion thereof, within the time limited for such completion by the contract;
- (c) where the Contractor has become insolvent;
- (d) where the Contractor has committed an act of bankruptcy;
- (e) where the Contractor has abandoned the work;
- (f) where the Contractor has made an assignment of the contract without the required consent; or
- (g) where the Contractor has otherwise failed to observe or perform any of the provisions of the contract;

the Minister may, without any other authorization, take all or any part of the work out of the Contractor's hands and may employ such means as he may see fit to complete the work.

(2) Where the work or any portion thereof has been taken out of the Contractor's hands under subsection (1) the Contractor shall not except as provided in subsection (3), be entitled to any further payment including payments then due and payable but not paid and the obligation of Her Majesty to make payments as provided for in the Terms of Payment shall be at an end and the Contractor shall be liable to and upon demand therefor pay to Her Majesty an amount equal to all loss and damage suffered by Her Majesty by reason of the non-completion of the work by the Contractor.

(3) Where the work or any portion thereof has been taken out of the Contractor's hands under subsection (1) and that portion is subsequently completed by Her Majesty, the Engineer shall determine the amount, if any, of hold-back and progress claims of the Contractor unpaid at the time of taking the work out of his hands that in his opinion are not required by Her Majesty for the purposes of the contract and the Minister shall, if he is of opinion that no financial prejudice to Her Majesty will result, authorize payment of that amount to the Contractor.

**Effect of Taking the
Work from Contractor**

17. (1) The taking of the work, or any portion thereof, out of the Contractor's hands pursuant to section 16 of the General Conditions does not operate so as to relieve or discharge the Contractor from any obligation under the contract or imposed upon him by law except the obligation to complete the physical execution of that portion of the work so taken out of his hands.
- (2) If the work or any part thereof is taken out of the Contractor's hands pursuant to section 16, all materials and plant and the interest of the Contractor in all real property, licences, powers and privileges acquired, used or provided by the Contractor for the purposes of the work shall, notwithstanding subsection (1) of section 13 of the General Conditions, be the property of Her Majesty without compensation to the Contractor.
- (3) If the Engineer certifies that any interest in the property of Her Majesty by virtue of subsection (2) is no longer required for the purposes of the work and that it is not in the interests of Her Majesty to retain the interest it shall become the property of the Contractor.

**Suspension of Work
by Minister**

18. (1) The Minister may, when in his opinion it is in the public interest, require the Contractor to suspend execution of the work either for a specified or unspecified period by communicating notice to that effect to the Contractor.
- (2) The Contractor upon receiving notice of the Minister's requirement pursuant to subsection (1) shall suspend all operations except those which in the Engineer's opinion, are necessary for the care and preservation of the work, the materials and plant.
- (3) During the period of suspension the Contractor shall not remove from the site any part of the work, any materials or any plant without the consent of the Engineer.
- (4) If the period of suspension is 30 days or less, the Contractor, upon the expiration of the period of suspension, shall resume the execution of the work and he is entitled to be paid the cost, calculated in accordance with sections 44 to 47 of the General Conditions, of any plant, labour and material necessarily involved in complying with the suspension.
- (5) If the period of suspension is more than 30 days and if, upon the expiration of the period of suspension, the Minister and the Contractor agree that the execution of the work be completed by the Contractor, the Contractor shall resume operations and complete the execution of the work in accordance with any terms and conditions agreed upon by the Minister and the Contractor.
- (6) If upon the expiration of a period of suspension of more than 30 days, the Minister and the Contractor do not agree that the work will be completed by the Contractor or they are unable to agree upon the terms and conditions under which the Contractor will complete the work, the notice of suspension shall be deemed to be a notice of termination pursuant to section 19.

Termination of Contract

19. (1) The Minister may at any time by giving notice to that effect terminate the contract.
- (2) The Contractor will upon receipt of a notice pursuant to subsection (1) cease all operations forthwith.
- (3) If the contract is terminated pursuant to subsection (1) Her Majesty will pay to the Contractor an amount equal to the lesser of
- (a) the cost as agreed upon by the Contractor and the Engineer of all labour, material and plant supplied by the Contractor as at the date of termination or, if the Contractor and the Engineer cannot agree, as calculated in accordance with the formula set out in section 46 of the General Conditions less all amounts already paid to the Contractor by Her Majesty and less all amounts which the Contractor is liable to pay to Her Majesty, and
- (b) the amount calculated in accordance with the Terms of Payment which would have been payable to the Contractor had he completed the work.

**Termination of Contract
(Continued)**

(4) If the contract is terminated pursuant to subsection (1) Her Majesty will pay to the Contractor an amount equal to the cost as agreed upon by the Contractor and the Engineer of all labour, material and plant supplied by the Contractor as of the date of termination or, if the Contractor and the Engineer cannot agree, as calculated in accordance with the formula set out in section 46 of the General Conditions, less all amounts already paid to the Contractor by Her Majesty and less all amounts which the Contractor is liable to pay to Her Majesty.

(5) Subsection (3) is applicable only to a Fixed Price Arrangement and subsection (4) is applicable only to a Unit Price Arrangement.

**Provision for Execution
of Work**

20. The Contractor will provide everything necessary for the execution of the work except things in respect of which the contract expressly provides otherwise and except the site of the work if the work when completed is to remain permanently affixed thereon.

**Claims Against and
Obligations of the
Contractor or Subcontractor**

21. (1) Her Majesty may, in order to discharge lawful obligations of and satisfy lawful claims against the Contractor or a subcontractor arising out of the execution of the work, pay any amount which is due and payable to the Contractor pursuant to the Terms of Payment or is payable pursuant to section 41 of the General Conditions following a conversion or a negotiation of the security deposit directly to the obligees of and the claimants against the Contractor or the subcontractor.

(2) A payment made pursuant to subsection (1) is to the extent of the payment a discharge of Her Majesty's liability under the contract to the Contractor.

(3) To the extent that the circumstance of the work being executed for Her Majesty permits it, the Contractor will comply with all laws in force in the Province where the work is being executed relating to payment periods, mandatory holdbacks, and creation and enforcement of mechanics' liens or, if such Province is the Province of Quebec, the law relating to privileges.

(4) The Contractor will discharge all lawful obligations of his and will satisfy all lawful claims against him arising out of the execution of the work at least as often as the Terms of Payment require Her Majesty to discharge Her obligations to the Contractor.

(5) The Contractor will, whenever so requested by the Engineer, make a Statutory Declaration despositing to the existence and condition of the obligations and claims referred to in subsection (4).

**Execution of Work under
Direction of Engineer**

22. The Contractor will permit the Engineer to have access to the work at all times during the execution of the work, will provide the Engineer with full information concerning what is being done to execute the work and will give the Engineer every possible assistance in respect of the performance of his duty to see that the work is executed in accordance with the contract and also in respect of the performance and exercise of the duties and powers specially imposed or conferred on him by the contract.

Clearing of Site

23. The Contractor will upon completion of the work clear and clean the work and its site to the satisfaction of and in accordance with any directions of the Engineer.

Contractor's Superintendent

24. (1) The Contractor will, during working hours, until the work has been completed, keep on the site of the work a competent superintendent who has authority to receive on behalf of the Contractor any order, direction or other communication that may be given under the contract.
- (2) The Contractor will, upon the request of the Engineer, remove any Superintendent who, in the opinion of the Engineer, is incompetent or has been conducting himself improperly and shall replace a Superintendent so removed with another Superintendent as described in subsection (1).

Unsuitable Workmen

25. The Contractor will, at the request of the Engineer, remove from the work any person employed on the work who, in the opinion of the Engineer, is incompetent or has been conducting himself improperly and the Contractor shall not permit a person so removed to remain on the site of the work.

No Additional Payment
for Increased Costs

26. (1) The amount payable to the Contractor under the contract will not be increased or decreased by reason of any increase or decrease in the cost of the work brought about by an increase or decrease in the cost of plant, labour, material or the wage rates set out in or prescribed pursuant to the Labour Conditions.
- (2) Notwithstanding section 12 and subsection (1) of this section the amount set out in Article II of the Articles of Agreement shall be adjusted, in the manner provided in subsection (3), in the event of any change in any tax imposed under the *Excise Act*, the *Excise Tax Act*, the *Old Age Security Act*, the *Customs Act* or the *Customs Tariff*.
- (a) after the date of the submission by the Contractor of the tender for the contract, and
- (b) that applies to the materials incorporated or to be incorporated in the work and that affects the cost to the Contractor of such materials.
- (3) In the event of any change after the date of submission of the tender for the contract by the Contractor in any tax described in subsection (2) that applies to the materials incorporated or to be incorporated in the work and that affects the cost to the Contractor of such materials the amount set out in Article II of the Articles of Agreement shall
- (a) be increased where the cost to the Contractor of any of the materials has been increased by virtue of the change, or
- (b) be decreased where the cost to the Contractor of any of the materials has been decreased by virtue of the change,
- by an amount equal to such amount as it is established upon examination of the relevant records of the Contractor referred to in section 48, represents the increase or decrease, as the case may be, in the cost to the Contractor of the materials involved that is directly attributable to the change in the tax levied on such materials.
- (4) For the purpose of determining the adjustment in the amount set out in Article II of the Articles of Agreement by virtue of any change in any tax described in subsection (2), where such tax is changed after the date of submission of the tender by the Contractor but public notice of such change has been given by the Minister of Finance before the date of submission of the tender, the change of such tax shall, for the purposes of this section, be deemed to have occurred before the date of submission of the tender.

Canadian Labour and Materials

27. (1) The Contractor will use Canadian labour and material in carrying out the work, to the full extent to which they are procurable, consistent with proper economy and the expeditious carrying out of the work.

(2) Subject to subsection (1) the Contractor will employ labour from the locality where the work is being executed to the extent to which it is available and shall use the Canada Manpower Centres in the recruitment of workers wherever practicable.

(3) Subject to subsections (1) and (2) the Contractor will employ a reasonable proportion of men who have served on active service with the armed forces of Canada and have been honourably discharged therefrom.

Security

28. (1) If the Minister is of opinion that national security is involved he may order the Contractor to provide information concerning persons employed or to be employed on the work and may order the removal of any person from the work.

(2) The Contractor will comply with an order of the Minister pursuant to subsection (1).

Protection of Work
and Documents

29. (1) The Contractor will guard or otherwise protect the work and shall protect the contract, specifications, plans, drawings, information, material, plant and real property provided by Her Majesty to the Contractor against loss or damage from any cause, and without limiting the generality of the foregoing, from espionage and sabotage and will not use, issue or disclose them except as may be essential for the execution of the work without the written consent of the Minister.

(2) If any document or information given or disclosed to the Contractor is given a security rating the Contractor will take all measures directed by the Engineer to ensure the maintenance of the security rating.

(3) The Contractor will provide facilities for and will assist any person authorized by the Minister to inspect or to take security measures in respect of the work.

(4) The Engineer may direct the Contractor to such things and to construct such works which the Engineer considers reasonable and necessary to ensure compliance with or to remedy a breach of this section.

Public Ceremonies

30. (1) The Contractor will not allow or permit any public ceremony in connection with the work without the permission of the Minister.

(2) The Contractor will not erect or permit the erection of any sign or advertising on the work without the approval of the Engineer.

Insurance

31. (1) The Contractor will at his expense maintain insurance contracts in a form and with companies approved by the Minister of the nature, in the amounts, for the periods and containing the terms and conditions, if any, set out in the Insurance Schedule.

(2) All fire insurance contracts maintained by the Contractor pursuant to subsection (1) shall provide that the proceeds thereof are payable to Her Majesty.

Insurance (Continued)

(3) The Contractor will deposit with the Engineer the originals of all contracts of insurance maintained by the Contractor pursuant to subsection (1) and the Contractor will, when required by the Engineer, submit to him proof that such policies are in force.

(4) Upon application by the Contractor the Engineer may waive compliance with subsections (2) and (3).

Insurance - Proceeds

32. (1) If the work or any portion thereof is lost or destroyed and monies are paid to Her Majesty in respect of the loss or damage under a contract of fire insurance maintained by the Contractor pursuant to section 31 of the General Conditions the monies will be held by Her Majesty for the purposes of the contract.

(2) The Minister may, on behalf of Her Majesty, elect to retain absolutely the monies held under subsection (1) and, in such event, the monies belong absolutely to Her Majesty and

(a) the Contractor is liable to Her Majesty in an amount equal to the amount by which the insurance monies payable is less than the loss and damages suffered and sustained by Her Majesty, including costs associated with clearing and cleaning the site of the work, and

(b) there shall be a financial accounting between Her Majesty and the Contractor in respect of the portion of the work which was lost or damaged and in respect of which monies have been retained absolutely by Her Majesty and there shall be included in the financial accounting all amounts paid or payable by Her Majesty under the contract together with all amounts paid or payable by the Contractor under the contract to Her Majesty and Her Majesty will pay to the Contractor any amount which the financial accounting shows to be payable by her Majesty to the Contractor under the contract and similarly the Contractor will pay to Her Majesty any amount which the financial accounting shows to be payable by the Contractor to Her Majesty under the contract.

(3) Upon payment as required by subsection (2) by Her Majesty or the Contractor, as the case may be, Her Majesty and the Contractor are discharged from all rights and obligations under the contract in respect of the portion of the work which was lost or damaged and in respect of which monies have been retained absolutely by Her Majesty, as though such portion of the work had been fully completed and executed by the Contractor in accordance with the contract.

(4) If an election is not made under subsection (2) the Contractor shall restore and replace the portion of the work lost or damaged and the monies shall be disbursed by Her Majesty to the Contractor in the manner and subject to the terms and conditions governing monies payable under the contract to the Contractor by Her Majesty, except that for the purpose of monies "100%" shall be substituted in subsection (4) of section 4 of the Terms of Payment for "95%" and "90%".

Precautions against Damage,
Infringements of Rights, Fire,
etc.

33. (1) The Contractor shall at his own expense do whatever is necessary to ensure that

(a) no person, property, right, easement or privilege is injured, damaged or infringed by reason of the Contractor's activities under this contract;

**Precautions against Damage,
Infringements of Rights,
Fire, etc. (Continued)**

- (b) pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted or endangered by the execution or existence of the work and plant;
 - (c) fire hazards are eliminated and in the case of a fire in or about the works that it is promptly extinguished;
 - (d) the health of all persons employed on the work is not endangered;
 - (e) adequate medical supervision of all persons employed on the work is maintained;
 - (f) adequate sanitation measures in respect of the work are taken; and
 - (g) all stakes, buoys, and marks placed on or about the works by or under the authority of the Engineer are protected and are not removed, defaced or altered.
- (2) The Engineer may direct the Contractor to do such things and to construct such works which the Engineer considers reasonable and necessary to ensure compliance with or to remedy a breach of subsection (1).
- (3) The Contractor will at his own expense comply with a direction of the Engineer made pursuant to subsection (2).

**Interpretation of Contract
by Engineer**

34. (1) If at any time before the work has been completed and the Engineer has issued his Final Certificate of Completion, any question arises as to whether anything has been done as required by the contract or as to what the Contractor is required by the contract to do, and, in particular, and without limiting the generality of the foregoing, as to
- (a) the meaning of anything in the Plans and Specifications;
 - (b) the meaning to be given to the Plans and Specifications in case of any error therein, an omission therefrom, or an obscurity or discrepancy in their wording or intention;
 - (c) whether the quality or quantity of any material or workmanship meets the requirements of the contract;
 - (d) whether the plant, materials or workmen provided by the Contractor for executing the work and carrying out the contract are adequate to ensure that the work will be executed in accordance with the contract and that the contract will be carried out in accordance with its terms;
 - (e) what quantity of any kind of work has been completed by the Contractor; or
 - (f) the timing and scheduling of the various phases of the execution of the work,
- the question shall be decided by the Engineer.
- (2) The Contractor will construct the work in accordance with the decisions and directions of the Engineer given under this section and in accordance with any consequential decisions and directions given by the Engineer.

**Rectification of
Defects in Work**

35. (1) Without restricting any warranty or guarantee implied or stipulated by law the Contractor will at his own expense rectify and make good any defect or fault however caused, that within twelve months from the date of the Engineer's Final Certificate of Completion appears in the work.

(2) If any defect or fault appears in the work and the Engineer is of the opinion that it is one which the Contractor, either under subsection (1) or under a warranty or guarantee implied or stipulated by law, is obligated to remedy and make good the Engineer may direct the Contractor to remedy and make good the defect or fault by giving notice to the Contractor of the existence of the defect or fault and the notice may specify the time within which the defect or fault is to be rectified and made good.

(3) The Contractor will rectify and make good the defect or fault described in a notice given pursuant to subsection (1) within the time specified in the notice.

Non-compliance by Contractor

36. (1) Where the Contractor has failed to comply with any decision or direction given by the Engineer under sections 23, 29, 33, 34 or 35 of the General Conditions, the Engineer may employ such methods, as he deems advisable, to do that which the Contractor failed to do.

(2) The Contractor shall on demand pay to Her Majesty all costs, expenses and damage incurred or sustained by Her Majesty by reason of the Contractor's non-compliance with any decision or direction given by the Engineer under sections 23, 29, 33, 34 or 35 of the General Conditions and by the action taken by the Engineer pursuant to subsection (1).

**Protesting Engineer's
Decisions**

37. If the Contractor has, within ten days of communication to him by the Engineer of any decision or direction of the Engineer under sections 23, 29, 33, 34, or 35 of the General Conditions given notice to the Engineer in writing that the decision or direction is accepted under protest, Her Majesty will pay to the Contractor for anything the Contractor was required by the Engineer's decision or direction to do beyond what the contract correctly understood and interpreted would have required the Contractor to do, the cost, calculated in accordance with sections 44 to 47 of the General Conditions, of the labour, materials and plant necessarily involved in carrying out the decision or direction.

**Engineer may Order
Additional Work,
Changes, etc.**

38. (1) The Engineer may at any time before he issues his Final Certificate of Completion, in writing,

(a) order work or material in addition to that provided for in the Plans and Specifications; and

(b) dispense with or change the dimensions, character, quantity, quality, description, location or position of the whole or any part of the work or material provided for in the Plans and Specifications or as ordered pursuant to paragraph (a),

and the Contractor will execute the work in accordance with such orders, dispensations and changes as if the same had appeared in and been part of the Plans and Specifications.

(2) The Engineer shall determine whether anything done or not done by the Contractor pursuant to an order, dispensation or change made by the Engineer pursuant to subsection (1) increased or decreased the cost of the work to the Contractor.

**Engineer may Order
Additional Work, Changes,
etc. (Continued)**

(3) If the Engineer determines under subsection (2), that the cost has been increased Her Majesty will pay to the Contractor the cost, calculated in accordance with sections 44 to 47 of the General Conditions, of the additional labour, materials and plant necessarily involved.

(4) If the Engineer determines under subsection (2), that the cost has been decreased, Her Majesty may reduce the amount payable to the Contractor under the contract by an amount equal to the cost, calculated in accordance with sections 44 to 47 of the General Conditions, of the labour, material and plant necessarily involved.

(5) Subsections (2), (3) and (4) are applicable only to a Fixed Price Arrangement.

**Cooperation with
other Contractors**

39. (1) Where, in the opinion of the Engineer, it is necessary that contracting persons or workmen, with or without plant and materials, be sent on to the site of the work the Contractor shall, to the satisfaction of the Engineer, allow them access to the work and shall cooperate with them in the carrying out of their duties and obligations.

(2) If the sending onto the work of a contracting firm or workmen under subsection (1) could not have been reasonably foreseen or anticipated by the Contractor when entering into the contract and if, in the opinion of the Engineer, the Contractor has incurred expense in complying with subsection (1) in respect of that contracting firm or those workmen Her Majesty, if the Contractor has given to the Engineer written notice of his claim before the expiration of thirty days from the sending onto the work of the contracting firm or workmen involved, shall pay to the Contractor the cost, calculated in accordance with sections 44 to 47 of the General Conditions, of the material, labour and plant necessarily involved.

Engineer's Certificates

40. (1) On the day that

(a) the work has been completed, and

(b) the Contractor has complied with the contract and all orders and directions made pursuant thereto,

to the satisfaction of the Engineer, he shall issue to the Contractor a Final Certificate of Completion.

(2) If the Engineer is satisfied that the work is substantially completed and is acceptable for use by Her Majesty, he may at any time before issuance of a Final Certificate of Completion issue to the Contractor an Interim Certificate of Completion, and shall describe therein the portions of the work not completed to his satisfaction and all things which must be done by the Contractor before a Final Certificate of Completion can be issued.

(3) The Engineer, before issuing a Final Certificate of Completion, may, in addition to the matter described in the Interim Certificate of Completion, require the Contractor to rectify any other portions of the work not completed to the satisfaction of the Engineer and to do any other things necessary for the completion of the work.

(4) The Engineer shall measure and keep records of his measurements of the quantities of labour, material and plant performed, used and supplied by the Contractor in executing the work and shall, at the request of the Contractor, inform him of his measurements and the Contractor will assist and cooperate with the Engineer in such measuring and is entitled to inspect the records of measurement kept by the Engineer.

Engineer's Certificates
(Continued)

(5) On the day that the Engineer issues his Final Certificate of Completion under subsection (1) he shall issue a Final Certificate of Measurement showing the quantity of labour, plant and material performed, used and supplied by the Contractor in executing the work and all measurements included therein shall be binding upon Her Majesty and the Contractor and are conclusive between them as to the quantity of any labour, plant or material performed, used or supplied by the Contractor in executing the work.

(6) Subsections (4) and (5) are applicable only to a Unit Price Arrangement.

**Security Deposit –
Forfeiture or Return**

41. If the work is taken out of the Contractor's hands pursuant to section 16 of the General Conditions or if the contract is terminated pursuant to section 19 of the General Conditions or if the Contractor is in breach of or in default under the contract Her Majesty may negotiate the security deposit, in the case of bonds, or convert the security deposit to Her own use, in the case of money, and the amount realized by Her Majesty shall be deemed to be a debt payable by Her Majesty to the Contractor and Her Majesty shall have the right of set-off and may set-off against the debt any sum or amount which the Contractor may be liable to pay to Her Majesty and the balance of the debt, if any, after the right of set-off has been exercised, and if such balance, in the opinion of the Engineer, is not required for the purposes of the contract shall be paid by Her Majesty to the Contractor.

**Security Deposit –
Return all or any
Part thereof**

42. (1) Upon the Engineer's Interim Certificate of Completion being issued, Her Majesty will, if the Contractor is not in breach of or in default under the contract, return to the Contractor that part of the security deposit which, in the opinion of the Engineer, is not required for the purposes of the contract.

(2) If the security deposit was deposited in the Consolidated Revenue Fund of Canada Her Majesty will pay to the Contractor interest thereon in accordance with the *Government Contracts Regulations*.

Municipal Permits

43. (1) The Contractor will within one month from the date of the contract tender to the municipal authority an amount equal to all fees and charges which would be payable to the municipal authority in respect of building permits if the work were being constructed for a person other than Her Majesty.

(2) The Contractor will notify the Minister within ten days of the tender the amount of and whether or not the municipal authority accepted the tender.

(3) If the municipal authority did not accept the tender the Contractor will deliver to the Minister within the time limited by subsection (2) the amount of the tender.

(4) For the purposes of this section "municipal authority" means an authority which would have jurisdiction respecting permission to construct the work if the owner of the work were not Her Majesty.

**Determination of Cost –
Unit Price Table**

44. Whenever it is necessary for the purposes of sections 12, 18, 37, 38 and 39 of the General Conditions to determine the cost of labour, plant or material the Unit Price Table shall be used, that is the cost shall be equal to the product of the quantity of such labour, plant or material expressed in the unit set out in column 2 of the Unit Price Table in respect of the labour, plant or material involved, multiplied by the price in respect of the unit set out in column 3 of the Unit Price Table.

**Determination of Cost –
Negotiation**

45. If the method of determination in section 44 of the General Conditions cannot be used because the labour, plant or material involved is not included in the Unit Price Table, the cost of the labour, plant or material for the purposes of sections 12, 18, 37, 38 and 39 of the General Conditions shall be the amount agreed upon from time to time by the Contractor and the Engineer.

**Determination of Cost –
Failing Negotiation**

46. (1) If the method of determination in section 44 of the General Conditions cannot be used and if the Contractor and the Engineer cannot agree as contemplated by section 45 of the General Conditions, the cost of labour, plant or material for the purposes of sections 12, 18, 37, 38 and 39 of the General Conditions shall be equal to the aggregate of

(a) all reasonable and proper amounts actually expended by or legally payable by the Contractor in respect of the labour, plant or material which fall within one of the classes of expenditure described in subsection (2) (being costs which are directly attributable to the execution of the work and are not costs in respect of which the allowance in paragraph (b) is made); and

(b) 10% of the total of the expenditures of the Contractor that meet the test in paragraph (a) being an allowance for all other expenditures by the Contractor and for profit and without limiting the generality of the foregoing, being also an allowance for payments and charges relating to overhead, head office expenses and general administration costs of the Contractor, including finance and interest charges.

(2) Classes of expenditure that are allowable are:

(a) payments to subcontractors;

(b) wages, salaries and travelling expenses of employees of the Contractor while they are actually and properly engaged on the work other than wages, salaries, bonuses, living and travelling expenses of personnel of the Contractor generally employed at the head office, or at a general office, of the Contractor unless such personnel is engaged at the site of the work with the approval of the Engineer;

(c) payments for materials necessary for and incorporated in the work, or necessary for and consumed in the execution of the work;

(d) payments for tools, other than tools customarily provided by tradesmen, necessary for and used in the execution of the work;

(e) payments for preparation, inspection, delivery, installation and removal of plant and materials necessary for the execution of the work;

(f) payments for renting, erecting, maintaining and removing temporary offices, sheds and similar structures necessary for and used by the Contractor in executing the work;

(g) assessments payable under any statutory scheme relating to workmen's compensation, unemployment insurance or holidays with pay;

(h) payments for renting plant and allowances for plant owned by the Contractor necessary for the execution of the work providing that such payments or allowances are reasonable or have been agreed to by the Contractor and the Engineer; and

(i) payments made with the approval of the Engineer that are necessary for the execution of the work.

**Determination of Cost –
Clarification of Terms**

47. (1) For the purposes of sections 45 and 46 of the General Conditions "plant" does not include tools.

(2) For the purposes of sections 44, 45 and 46 of the General Conditions "Unit Price Table" means the table set out in Article VI of the Articles of Agreement.

**Records to be Kept
by Contractor**

48. (1) The Contractor shall maintain full records of his estimates of and actual cost to him of the work together with all proper tender calls, quotations, contracts, correspondence, invoices, receipts and vouchers relating thereto, shall make them available to audit and inspection by the Minister, the Comptroller of the Treasury of the Government of Canada or by persons acting on their behalf, shall allow them to make copies thereof and to take extracts therefrom, and shall furnish them with any information which they may require from time to time in connection with such records.

(2) The records maintained by the Contractor pursuant to this section shall be kept intact until the expiration of two years from the date of issuance of the Final Certificate of Completion under subsection (1) of section 40 of the General Conditions or until the expiration of such other period as the Minister may direct.

(3) The Contractor shall require all subcontractors and all firms, corporations and persons directly or indirectly controlled by or affiliated with the Contractor and all firms, corporations and persons directly or indirectly having control of the Contractor to comply with subsections (1) and (2) as if they were the Contractor.



LABOUR CONDITIONS CONDITIONS DE TRAVAIL

This document is the document referred to as
"Labour Conditions" in the contract entered
into on the _____ day of _____ 19____
between Her Majesty the Queen and:

Contractor (Name)

Contracting Authority (Signature)

Contractor (Signature)

Interpretation

1. In these conditions

- (a) "Act" means the *Fair Wages and Hours of Labour Act*;
- (b) "Regulations" means the Fair Wages and Hours of Labour Regulations made pursuant to the Act;
- (c) "contract" means the contract to which these Labour Conditions are attached;
- (d) "contracting authority" means the department of Government or Corporation that is an agent of Her Majesty with whom the contract is made;
- (e) "contractor" means the person who has entered into the contract with the contracting authority;
- (f) "Director" means the Director of Labour Standards, Canada Department of Labour;
- (g) "fair wage officer" means the officer of the Canada Department of Labour designated by the Minister of Labour;
- (h) "Minister" means the Canada Minister of Labour;
- (i) "persons" means those workers employed by the contractor, subcontractor or any other person doing or contracting to do the whole or any part of the work contemplated by the contract.

Wage Rates and Working Hours

- 2. (a) All persons in the employ of the contractor, subcontractor, or any other person doing or contracting to do the whole or any part of the work contemplated by the contract shall during the continuance of the work be paid fair wages; that is, such wages as are generally accepted as current for competent workers in the district in which the work is being performed for the character or class of work in which such workers are respectively engaged; such wages shall in no case be less than the wage rates as set out in Appendix A to these Labour Conditions, or the minimum hourly rate of pay prescribed by or pursuant to the Part III of the Canada Labour Code (Labour Standards).
- (b) Except as provided in paragraph (g) the working hours of persons employed in the execution of the contract shall not exceed 8 hours in a day or 48 hours in a week except where longer daily or weekly hours are authorized by the Minister in cases of exceptional circumstances.
- (c) All persons shall be paid for hours worked in excess of 8 hours in a day or 40 hours in a week at an overtime rate at least one and one-half times the wage rates required to be paid under these Labour Conditions, as set out in paragraph (a).

Le présent document est le document appelé
"Conditions de Travail" dans le marché intervenu
le _____ jour de _____ 19____
entre Sa Majesté La Reine et:

Entrepreneur (Nom)

Adjudicateur (Signature)

Entrepreneur (Signature)

Interprétation

1. Dans ces conditions

- a) "Loi" désigne la *Loi sur les justes salaires et les heures de travail*;
- b) "Règlement" désigne le Règlement sur les justes salaires et les heures de travail établi en application de la Loi;
- c) "contrat" désigne le contrat auquel sont annexées les présentes conditions de travail;
- d) "adjudicateur" désigne le ministère du gouvernement ou la société qui est un agent de Sa Majesté avec lequel le contrat a été passé;
- e) "entrepreneur" désigne la personne qui a passé le contrat avec l'adjudicateur;
- f) "Directeur" désigne le directeur des Normes du travail, ministère du Travail du Canada;
- g) "agent des justes salaires" désigne l'agent du ministère du Travail du Canada désigné par le ministre du Travail;
- h) "Ministre" désigne le ministre du Travail du Canada;
- i) "personnes" désigne les travailleurs employés par l'entrepreneur, le sous-traitant ou toute autre personne exécutant ou s'engageant par contrat à exécuter la totalité ou une partie quelconque des travaux prévus dans le contrat.

Taux de salaire et durée du travail

- 2. a) A toutes les personnes employées par l'entrepreneur, le sous-traitant ou toute autre personne exécutant ou s'engageant par contrat à exécuter la totalité ou une partie quelconque des travaux prévus dans le contrat, il sera payé, tant que dureront les travaux, des justes salaires, c'est-à-dire les salaires généralement reconnus comme salaires courants pour les travailleurs qualifiés dans la région où les travaux sont exécutés, selon la nature ou la catégorie du travail auquel ces travailleurs sont respectivement affectés; dans aucun cas, ces salaires ne devront être inférieurs aux taux indiqués dans l'Annexe A aux présentes conditions de travail, ou au taux horaire minimum prescrit par la Partie III du Code canadien du travail (Normes du travail) ou en conformité de ce Code.
- b) Sauf dispositions contraires à l'alinéa g), la durée du travail des personnes employées à l'exécution du contrat ne devra pas dépasser 8 heures par jour ni 48 heures par semaine, sauf lorsqu'une journée ou une semaine de travail plus longue a été autorisée par le Ministre en raison de circonstances exceptionnelles.
- c) Toutes les personnes seront rémunérées, pour les heures de travail effectuées en sus de 8 par jour ou de 40 par semaine, à des taux majorés au moins égaux à une fois et demie les taux de salaire exigés dans les présentes conditions de travail; tel que défini à l'alinéa a).

- (d) All applications for permission to exceed 8 hours in a day or 48 hours in a week shall be made to the contracting authority for reference to the Minister.
- (e) The Director may determine at any time and from time to time what are the current or fair and reasonable rates of wages for the purpose of the contract, and may revise the wage rates in Appendix A attached to these Labour Conditions during the term of the contract.

The contractor agrees that where during the term of the contract he receives from the contracting authority a copy of any change in the wage rates referred to in the above paragraph, the contractor will pay not less than the wage rates as changed commencing with the first day following the receipt by him of the copy of the changed wage rates.

- (f) The contractor agrees that where during the term of the contract any question arises as to the proper classification of employment of work for the purpose of the payment of fair wages, the classification shall be determined by the Director. Immediately upon receipt of notice of any decision of the Director hereunder the contractor agrees to adjust the wages and classification of work of the persons affected commencing with the first day following the receipt by him of the copy of the changed wage rates.
- (g) The daily or weekly hours of work set out in paragraph (b) or authorized by the Minister under paragraph (b) may be exceeded where there is serious interference with the ordinary carrying out of the work contemplated by the contract by reason of;
 - (i) an accident involving injury to a worker,
 - (ii) a breakdown of or damage to machinery or equipment, or
 - (iii) other unforeseen, unpreventable or emergent circumstances,
 but only to the extent necessary to prevent such serious interference.
- (h) Where because of serious interference referred to in paragraph (g) the working hours of any worker exceeded the weekly hours of work set out in paragraph (b) or authorized by the Minister under paragraph (b), the contractor shall report in writing to the Director, within fifteen days after the end of the week in which such hours of work were exceeded, setting forth;
 - (i) the nature of the serious interference,
 - (ii) the names of all workers who worked in excess of the weekly hours of work set out in paragraph (b) or authorized by the Minister under paragraph (b), and
 - (iii) the number of hours each worker worked in excess of the weekly hours of work referred to in sub-paragraph (ii).

Labour Conditions to be Posted

- 3. For the protection of all persons the contractor agrees to post and keep posted, in a conspicuous place on the premises where work contemplated by the contract is being carried out or on premises occupied or used by persons engaged in carrying out such work, a copy of these Labour Conditions, and any authorization by the Minister for the working hours of persons employed under the contract to exceed 8 hours in a day or 48 hours in a week.

The Contractor to keep Records which are to be Kept open for Inspection

- 4. The contractor agrees to keep proper books and records showing the names, addresses and classifications of em-

- d) Toutes les demandes d'autorisation de travail au delà de 8 heures par jour ou de 48 heures par semaine devront être adressées à l'adjudicateur pour être transmises au Ministre.
- e) Le Directeur pourra en tout temps et à l'occasion déterminer quels sont les taux de salaire courants ou justes et raisonnables, pour les fins du contrat, et pourra revoir les taux de salaire indiqués dans l'Annexe A jointe aux présentes conditions de travail pendant la durée du contrat.

L'entrepreneur convient que s'il reçoit de l'adjudicateur, pendant la durée du contrat, un exemplaire de toute modification aux taux de salaire mentionnés dans l'alinéa ci-dessus, il ne paiera pas moins que les taux de salaire modifiés, à compter du premier jour qui suit la réception, par lui, d'un exemplaire des taux de salaire modifiés.

- f) L'entrepreneur convient que s'il surgit quelque doute, pendant la durée du contrat, quant à la catégorie appropriée d'emploi ou de travail aux fins du paiement des justes salaires, il appartiendra au Directeur de déterminer la catégorie. Dès réception de l'avis de toute décision du Directeur, en vertu des présentes, l'entrepreneur s'engage à rajuster le salaire et la catégorie de travail des personnes touchées, à compter du premier jour qui suit la réception, par lui, d'un exemplaire des taux de salaire modifiés.
- g) La durée journalière ou hebdomadaire du travail énoncée dans l'alinéa b) ou autorisée par le Ministre, en vertu de l'alinéa b), peut être dépassée en cas de danger d'entrave grave à la marche ordinaire des travaux prévus aux termes du contrat par suite
 - (i) d'un accident ayant causé une lésion à un employé,
 - (ii) d'une panne ou de l'endommagement de l'outillage ou des appareils, ou
 - (iii) d'autres circonstances imprévues, inévitables ou fortuites,
 mais uniquement dans la mesure nécessaire pour prévenir une telle entrave grave à la marche des travaux.
- h) Lorsque, par suite du danger d'entrave grave à la marche des travaux mentionné dans l'alinéa g), la durée du travail d'un employé a dépassé la durée hebdomadaire du travail énoncée dans l'alinéa b) ou autorisée par le Ministre, en vertu de l'alinéa b), l'entrepreneur doit adresser par écrit au Directeur, dans les quinze jours qui suivent la fin de la semaine au cours de laquelle la durée du travail a été dépassée, un rapport indiquant
 - (i) la nature de l'entrave grave à la marche des travaux,
 - (ii) les noms de tous les employés qui ont fourni des heures supplémentaires en excédent de la durée hebdomadaire du travail énoncée dans l'alinéa b) ou autorisée par le Ministre en vertu de l'alinéa b) et
 - (iii) le nombre d'heures supplémentaires fournies par chacun d'entre eux en excédent de la durée hebdomadaire du travail mentionnée dans le sous-alinéa (ii).

Affichage des conditions de travail

- 3. Pour la protection de toutes les personnes, l'entrepreneur s'engage à afficher et à tenir affichés, bien à la vue, à l'endroit où les travaux prévus dans le contrat sont exécutés, ou dans les locaux occupés ou fréquentés par les personnes employées à l'exécution desdits travaux, un exemplaire des présentes conditions de travail, de même qu'un exemplaire de toute autorisation de prolongation de la durée du travail des personnes employées en vertu du contrat, au delà de 8 heures par jour ou de 48 heures par semaine, accordée par le Ministre.

L'entrepreneur s'engage à tenir des dossiers pour fins d'inspection

- 4. L'entrepreneur s'engage à tenir les registres et dossiers appropriés indiquant le nom, l'adresse et la catégorie

ployment and work of all workers employed in work under the contract and the rate of wages, the wages paid and the daily hours worked by such workers.

The contractor also agrees to undertake that his books, records and premises will be open at all reasonable times for inspection by the Minister, a fair wage officer or any other person designated by the Minister.

The contractor also agrees to furnish the Minister, the contracting authority, the fair wage officer or other person designated by the Minister, on request, with such further information as is required to ascertain that the requirements of the Act, the Regulations and the contract with respect to wages, hours of work and other labour conditions have been complied with.

Departmental Requirements before Payments made to Contractor

5. The contractor agrees that he will not be entitled to payment of any money otherwise payable under the contract until he has filed with the contracting authority in support of his claim for payment a sworn statement;
 - (i) that he has kept the books and records required by these Regulations;
 - (ii) as to whether any wages in respect of work performed under the contract remain in arrears, and
 - (iii) that to his knowledge, all the conditions in the contract required by the Act and the Regulations have been complied with.

The contractor also agrees that, where the Minister informs the contracting authority and the contractor that fair wages and overtime rates have not been paid by the contractor to persons employed under the contract, the contracting authority will be entitled to withhold from any monies otherwise payable under the contract the amount the Minister indicates should be withheld until such time as the matter has been dealt with to the satisfaction of the Minister.

Authority to Pay Wages in the Event of Default by the Contractor

6. The contractor agrees that where he is in default of payment of wages to an employee the contractor will send to the Minister a cheque payable to the Receiver General of Canada for the amount determined by the Minister as being the amount the contractor is in default.

The contractor agrees that when he fails to comply with the preceding provision, the Minister may instruct the contracting authority to pay to the Receiver General of Canada, out of any monies otherwise payable to the contractor, the amount determined by the Minister as being the amount the contractor is in default.

Conditions of Subcontracting

7. The contractor agrees that in subcontracting any part of the work contemplated by the contract, he will place in the subcontract conditions respecting wages, hours of work and other labour conditions set out in the contract; and also the contractor agrees that he will be responsible for the carrying out of these conditions.

Workers to be Residents of Canada

8. The contractor agrees that all persons employed by him to do any work under the contract will be residents of Canada unless, in the opinion of the contracting authority at the time the work is to commence under the contract;

d'emploi et de travail de tous les travailleurs employés à des travaux exécutés en vertu du contrat, de même que le taux de salaire, le salaire payé et la durée journalière du travail pour chacun de ces travailleurs.

L'entrepreneur s'engage également à faire en sorte que ses registres, ses dossiers et ses locaux soient accessibles en tout temps opportun, pour fins d'inspection par le Ministre, un agent des justes salaires ou toute autre personne désignée par le Ministre.

L'entrepreneur s'engage en outre à fournir, sur demande, au Ministre, à l'adjudicateur, à l'agent des justes salaires ou à toute autre personne désignée par le Ministre tous autres renseignements requis pour permettre de constater qu'on a satisfait aux exigences de la Loi, des règlements et du contrat en ce qui concerne les salaires, la durée du travail et les autres conditions de travail.

Exigences du ministère avant le versement des sommes dues à l'entrepreneur

5. L'entrepreneur convient qu'il n'aura droit au paiement d'aucune somme qui autrement devrait lui être versée en vertu du contrat tant qu'il n'aura pas déposé auprès de l'adjudicateur, à l'appui de sa réclamation de paiement, une déclaration sous serment indiquant;
 - (i) qu'il a tenu les registres et dossiers requis par les présents règlements,
 - (ii) si des salaires à l'égard des travaux exécutés en vertu du contrat demeurent impayés et
 - (iii) qu'à sa connaissance, toutes les conditions du contrat exigées par la Loi et les règlements ont été observées.

L'entrepreneur convient en outre que si le Ministre fait savoir à l'adjudicateur et à l'entrepreneur que des justes salaires et des taux applicables aux heures supplémentaires n'ont pas été payés par l'entrepreneur à des personnes employées en vertu du contrat, l'adjudicateur sera autorisé à retenir de toute somme autrement payable en vertu du contrat le montant indiqué par le Ministre comme devant être retenu jusqu'à ce que la question ait été réglée à la satisfaction du Ministre.

Paiement des salaires par l'adjudicateur, si l'entrepreneur omet de le faire

6. L'entrepreneur convient qu'à défaut de paiement de salaire à un travailleur, de sa part, il devra envoyer au Ministre un chèque établi à l'ordre du Receveur général du Canada, au montant déterminé par le Ministre comme étant le montant que l'entrepreneur a omis de payer.

L'entrepreneur convient que s'il omet de se conformer à la disposition ci-dessus, le Ministre peut ordonner à l'adjudicateur de payer au Receveur général du Canada, à même les sommes autrement payables à l'entrepreneur, le montant déterminé par le Ministre comme étant le montant que l'entrepreneur a omis de payer.

Conditions imposées à un sous-traitant

7. L'entrepreneur convient que dans l'adjudication, à un sous-traitant, de toute partie des travaux prévus par le contrat, il devra insérer dans le sous-contrat les conditions concernant les salaires et la durée du travail et les autres conditions de travail indiquées dans le contrat; l'entrepreneur reconnaît en outre qu'il sera responsable de l'observation desdites conditions.

Les travailleurs doivent résider au Canada

8. L'entrepreneur convient que toutes les personnes employées par lui pour exécuter un travail quelconque en vertu du contrat doivent résider au Canada, à moins que, de l'avis de l'adjudicateur, à la date prévue pour le début des travaux en vertu du contrat,

- (a) persons resident in Canada are not available to do the work, or
- (b) special circumstances exist whereby it would not be in the public interest to require that all such persons be residents of Canada.

- a) il ne se trouve pas de personnes résidant au Canada disponibles pour exécuter les travaux ou,
- b) il existe des circonstances spéciales par suite desquelles il ne serait pas dans l'intérêt public d'exiger que toutes les personnes en question résident au Canada.

Non-discrimination in Hiring and Employment of Labour

9. The contractor agrees that

- (a) in the hiring and employment of workers to perform any work under the contract, the contractor will not refuse to employ and will not discriminate in any manner against any person because
 - (i) of that person's race, national origin, colour, religion, age, sex or marital status,
 - (ii) of the race, national origin, colour, religion, age, sex or marital status of any person having any relationship or association with that person, or
 - (iii) a complaint has been made or information has been given by or in respect of that person relating to an alleged failure by the contractor to comply with subparagraph (i) or (ii);
- (b) if any question arises as to whether the contractor has failed to comply with the provision described in paragraph (a), the Minister or any person designated by the Minister shall decide the question and his decision shall be final for the purposes of the contract; and
- (c) failure to comply with the aforementioned clauses (a) and (b) regarding non-discrimination shall constitute a material breach of the contract.

Non-discrimination dans l'embauchage et l'emploi de main-d'œuvre

9. L'entrepreneur convient que

- a) dans l'embauchage et l'emploi des travailleurs aux fins de l'exécution de tout travail en vertu du contrat, l'entrepreneur ne refusera pas d'employer une personne ou d'exercer de quelque façon que ce soit des distinctions injustes à l'endroit d'une personne à cause
 - (i) de la race, de l'origine nationale, de la couleur, de la religion, de l'âge, du sexe ou de l'état civil de cette personne,
 - (ii) de la race, de l'origine nationale, de la couleur, de la religion, de l'âge, du sexe ou de l'état civil de toute personne ayant un rapport ou une association avec la personne en question, ou parce que
 - (iii) cette dernière a porté plainte ou a fourni des renseignements ou parce qu'une plainte a été portée ou des renseignements ont été fournis en son nom relativement à toute prétendue omission de la part de l'entrepreneur de se conformer aux sous-alinéas (i) ou (ii);
- b) en cas de doute sur la question de savoir si l'entrepreneur a négligé de se conformer aux dispositions de l'alinéa a), le Ministre ou toute personne désignée par le Ministre tranchera la question et sa décision sera sans appel aux fins du contrat;
- c) toute omission de se conformer aux conditions a) et b) ci-dessus concernant la non-discrimination constituera un manquement grave au contrat.

Liquidated Damages

- 10. In the event of any default in carrying out any of the conditions set out in Section 2 of these Labour Conditions in respect of any employee, the contractor shall pay to Her Majesty as liquidated damages a sum of fifty dollars for every such default, and the Minister under whom the work contemplated by the contract is being executed may direct that the amount assessed as liquidated damages under this paragraph be deducted from any moneys payable to the contractor under the contract and be credited to the Consolidated Revenue Fund.

Dommmages-intérêts déterminés à l'avance

- 10. Advenant un manquement dans l'exécution de l'une ou l'autre des conditions énoncées dans l'article 2 des présentes conditions de travail en ce qui concerne un employé quelconque, l'entrepreneur doit payer à Sa Majesté, au titre de dommages-intérêts fixés à l'avance, cinquante dollars pour chaque manquement, et le Ministre sous la juridiction de qui le travail prévu par le contrat est en voie d'exécution peut ordonner que le montant auquel ont été fixés les dommages-intérêts prédéterminés ainsi que le prévoit le présent alinéa soit déduit de toute somme payable à l'entrepreneur aux termes du contrat et soit crédité au Fonds du revenu consolidé.

Schedule of Wage Rates

- 11. A schedule of minimum wage rates, authorized by the Canada Department of Labour, when attached to these Labour Conditions as Appendix A also becomes part of the contract.

Echelle de salaires

- 11. Une échelle de salaires minimums reconnue par le ministère du Travail du Canada, jointe aux présentes conditions de travail en tant qu'Annexe A, devient également partie intégrante du contrat.

The contractor should note that in carrying out any of the work contemplated by the contract, he may also be subject to provincial laws and regulations.

L'entrepreneur doit se rappeler que, dans l'exécution de tout travail prévu par le contrat, il peut aussi être assujéti aux lois et règlements provinciaux.



APPENDIX A — ANNEXE A

WAGE SCHEDULE — BARÈME DE SALAIRE

DEPT. OF LABOUR REF. NO.
N^o DE RÉF. DU MINISTÈRE DU TRAVAIL : 776-P4-34235

DATE: 6/6/74

THIS SCHEDULE IS APPLICABLE TO THE FOLLOWING PROJECT:
LE BARÈME CI-APRÈS S'APPLIQUE AU PROJET SUIVANT

clearing, grubbing, grading, drainage & structures, mile 347.03 to 394.60,

LOCALITY:
ENDROIT: Mackenzie Highway, N.W.T.CONTRACTING AUTHORITY:
ADJUDICATEUR: Public WorksREF. NO.
N^o DE RÉF.: 9305-52-408

CONSTRUCTION CONTRACTS — CONTRATS DE CONSTRUCTION

CLASSIFICATION OF LABOUR CATÉGORIE DE MAIN-D'OEUVRE	RATE OF WAGES PER HOUR NOT LESS THAN TAUX HORAIRE DE SALAIRE NON INFÉRIEUR À		
Air Conditioning Mechanic <i>Mécanicien d'installation de climatisation</i>	\$ 6.75	7.00 EFF. 1/7/74	
Asphalt or Concrete Spreader Operator <i>Conducteur d'épandeur d'asphalte ou de béton</i>	4.05		
Asphalt Raker <i>Ratisseur d'asphalte</i>	3.55		
Batchman <i>Doseur</i>	4.05		
Boilermaker (erection and repair) <i>Chaudronnier (montage et réparation)</i>	7.53	7.74 EFF. 1/7/74	7.91 EFF. 1/1/75
Bricklayer and Stonemason <i>Briqueur et maçon</i>	6.95	7.20 EFF. 1/10/74	
Carpenter <i>Charpentier</i>	7.05		7.40 EFF. 1/10/74
Cement Finisher (on building construction) <i>Cimentier — Applicateur (construction de bâtiments)</i>	6.50	6.85 EFF. 1/10/74	
Cement Finisher (on all other work) <i>Cimentier — Applicateur (tout autre travail)</i>	3.85		
Compressor Operator <i>Conducteur de compresseur</i>	3.80		
Concrete Floatman (puddleman — screedman) <i>Bétonneur (régaleur — dameur)</i>	3.35		
Concrete Mixer Operator <i>Conducteur de bétonnière</i>	4.05		

THE CONTRACTOR SHOULD NOTE INFORMATION ON PAGE 4 OF THIS SCHEDULE.

L'ENTREPRENEUR DOIT PRENDRE CONNAISSANCE DES RENSEIGNEMENTS EN PAGE 4 DE LA PRÉSENTE ANNEXE.

CLASSIFICATION OF LABOUR CATÉGORIE DE MAIN-D'OEUVRE	RATE OF WAGES PER HOUR NOT LESS THAN TAUX HORAIRE DE SALAIRE NON INFÉRIEUR À	
Crane Operator (overhead, climbing, skyway, or equiv.) <i>Grutier (surélevée, montante, gratte-ciel, ou l'équiv.)</i>	\$ 7.50	7.85 EFF. 1/10/74
Driller (air trac, wagon or similar drills) <i>Conducteur de foreuse (air comprimé, chariot ou foreuses du même genre)</i>	3.50	
Drywall Applicator (incl. filling and taping) <i>Poseur de panneaux-mur sec (incl. remplissage et galleon sur joint)</i>	6.70	7.00 EFF. 1/10/74
Electrician <i>Électricien</i>	7.80	8.05 EFF. 1/10/74
Elevator Mechanic <i>Mécanicien d'ascenseur et monte-charge</i>	6.75	
Equipment Operator (backhoe, dragline, gradall, pile driver, shovel, mobile crane) <i>Conducteur de machines (pelle à benne arrière, grue à benne traînante, gradall, sonnette, pelle, grue mobile)</i>	4.75	
Equipment Operator (bulldozer, tractor (D6 or equiv. and over); front end loader (over 1 cu. yd.) <i>Conducteur de machines (bélitier mécanique, tracteur (D6 ou l'équiv. et plus); chargeuse avant (plus de 1 v. cu.)</i>	4.35	
Equipment Operator (bulldozer, tractor (under D6 or equiv.); front end loader (up to 1 cu. yd.) <i>Conducteur de machines (bélitier mécanique, tracteur (moins de D6 ou l'équiv.); chargeuse avant (jusqu'à 1 v. cu.)</i>	4.05	
Flagman <i>Signaleur</i>	2.95	
Float Driver (under 25 tons) <i>Conducteur de fardier (moins de 25 tonnes)</i>	3.65	
Float Driver (25 tons or over) <i>Conducteur de fardier (25 tonnes ou plus)</i>	3.75	
Form Setter <i>Coffreur</i>	3.85	
Glass & Metal Installer <i>Vitrier (poseur de verre)</i>	5.50	
Grader Operator <i>Conducteur de niveleuse</i>	4.35	
Heavy Equipment Mechanic <i>Mécanicien de machines lourdes</i>	4.50	
Hoist Operator <i>Conducteur d'appareils de levage</i>	6.30	6.60 EFF. 1/10/74
Insulation Mechanic (heat and frost) <i>Installateur de matériel (thermique et frigorifique)</i>	5.90	
Jackhammer Operator <i>Conducteur de marteau pneumatique</i>	3.35	
Labourer (building construction) <i>Manoeuvre (construction de bâtiments)</i>	4.60	
Labourer (heavy construction) <i>Manoeuvre (gros travaux de construction)</i>	3.25	
Labourer (roads and paving construction) <i>Manoeuvre (construction de routes et asphaltage)</i>	3.25	
Labourer (demolishing and wrecking) <i>Démolisseur</i>	2.75	
Lather <i>Poseur de lattis</i>	7.00	
Lineman (electric) <i>Monteur de lignes électriques</i>	5.64	
Marble Mason <i>Marbrier de bâtiment</i>	6.80	7.05 EFF. 1/10/74

CLASSIFICATION OF LABOUR CATÉGORIE DE MAIN-D'OEUVRE	RATE OF WAGES PER HOUR NOT LESS THAN TAUX HORAIRE DE SALAIRE NON INFÉRIEUR À		
Millwright <i>Mécanicien - ajusteur</i>	\$ 7.80	8.10 EFF. 1/7/74	
Mortarman <i>Gâcheur de mortier</i>	4.80		
Ornamental and misc. Metal Erector <i>Monteur en métaux d'ornementation et métaux divers</i>	5.75		
Painter (brush and roller) <i>Peintre (pinceau et rouleau)</i>	6.20		
Painter (spray) <i>Peintre au pistolet</i>	6.50		
Pipelayer (caulker and solderer) <i>Poseur de canalisations (mateur et soudeur)</i>	3.80		
Plasterer <i>Plâtrier</i>	7.20		
Plumber, Steamfitter and Welder (pipe) <i>Plombier, appareilleur à vapeur et soudeur en tuyauterie</i>	7.95		
Powdorman <i>Préposé aux explosifs</i>	3.65		
Pump Operator <i>Préposé au pompage</i>	3.80		
Resilient Tile and Carpet Installer <i>Poseur de carreaux (matériaux élastiques) et de tapis</i>	5.20		
Rodman (reinforced concrete) <i>Ferrailleur</i>	6.40	6.70 EFF. 1/7/74	7.00 EFF. 1/1/75
Roller Operator <i>Conducteur de rouleau compresseur</i>	4.05		
Roofer (built-up) <i>Couvreur (toit lamellaire)</i>	6.50	6.80 EFF. 1/10/74	
Roofer's Helper <i>Aide-couvreur</i>	4.90	5.10 EFF. 1/10/74	
Sheet Metal Mechanic <i>Tôlier</i>	7.65	8.00 EFF. 1/10/74	
Sprinkler Installer <i>Installateur d'extincteurs automatiques</i>	6.60		
Structural Steel Erector <i>Monteur d'acier de structure</i>	7.50	7.70 EFF. 1/7/74	7.85 EFF. 1/1/75
Terrazzo Layer <i>Poseur de terrazzo</i>	6.80	7.05 EFF. 1/10/74	
Terrazzo Machine Operator (dry) <i>Conducteur de polisseuse de terrazzo (procédé sec)</i>	5.15		
Terrazzo Machine Operator (wet) <i>Conducteur de polisseuse de terrazzo (procédé humide)</i>	4.90		
Tile Setter (ceramic) <i>Carreleur (céramique)</i>	6.80	7.05 EFF. 1/10/74	
Truck Driver (service, 3 tons or under; dump, single axle) <i>Camionneur (camions, 3 tonnes ou moins; à bascule et à essieu simple)</i>	3.35		
Truck Driver (fuel or lubricant tankers; A-frames under 5 tons (winch equipped) <i>Camionneur (camions-citernes à carburant ou à lubrifiant; châssis entretoisés en A, moins de 5 tonnes (équipés d'un treuil)</i>	3.40		
Truck Driver (dump, double axle) <i>Camionneur (camions à bascule et à double essieu)</i>	3.50		

CLASSIFICATION OF LABOUR CATÉGORIE DE MAIN-D'OEUVRE	RATE OF WAGES PER HOUR NOT LESS THAN TAUX HORAIRE DE SALAIRE NON INFÉRIEUR À
Truck Driver (A-frames, 5 tons or over (winch equipped) <i>Camionneur (camions à châssis entretoisés en A, de 5 tonnes ou plus (équipés d'un treuil))</i>	\$ 3.55
Watchman or Security Guard <i>Gardien ou agent de sécurité</i>	2.50
Welder-General (acetylene or electric) <i>Soudeur-général (acétylène ou électrique)</i>	4.50
Wharf and Dock Builder <i>Constructeur de quais et docks</i>	4.95
DEFINITIONS	DÉFINITIONS
IN THIS APPENDIX:	DANS L'ANNEXE:
(a) "BUILDING CONSTRUCTION" means the construction, remodelling and repair of buildings.	a) "CONSTRUCTION DE BÂTIMENTS" signifie la construction, la rénovation et la réparation de bâtiments.
(b) "HEAVY CONSTRUCTION" means such work as, but not limited to, site preparation, excavations, water and sewer lines, electric transmission lines, marine works, bridges, viaducts, tunnels and dams.	b) "GROS TRAVAUX DE CONSTRUCTION" signifie notamment, mais non exclusivement, l'aménagement de terrain, travaux d'excavation, pose d'égouts et canalisations hydrauliques et électriques, travaux maritimes, construction de ponts, viaducs, tunnels et barrages.
(c) "ROADS AND PAVING CONSTRUCTION" means the construction of roads, parking lots, airport runways, taxi strips and parking aprons, sidewalks, including culverts, drainage and other related work, and all concrete and asphalt paving.	c) "CONSTRUCTION DE ROUTES ET ASPHALTAGE" signifie la construction de routes, terrains de stationnement, pistes d'envol et de déplacement au sol, rampes de stationnement, trottoirs, y compris, les ponceaux, le drainage et les autres travaux connexes, et tous les travaux de bétonnage et d'asphaltage.
(d) "LABOURER (DEMOLISHING & WRECKING)" means a labourer employed by a contractor whose main business activity is the demolition, wrecking or razing of buildings or structures.	d) "DÉMOLISSEUR" signifie un manoeuvre employé par un entrepreneur dont l'activité principale consiste à démolir ou à abattre des édifices ou des constructions.
THE CONTRACTOR SHOULD NOTE:	L'ENTREPRENEUR DOIT NOTER:
(a) THAT DURING THE TERM OF THIS CONTRACT, THE WAGE RATES LISTED HEREIN MAY BE REVISED IN ACCORDANCE WITH SECTION 2(e) OF THE LABOUR CONDITIONS, AND	a) QUE PENDANT LA DURÉE DE CE CONTRAT, LES TAUX DE SALAIRE ÉNUMÉRÉS DANS L'ANNEXE PEUVENT ÊTRE RÉVISÉS EN CONFORMITÉ AVEC LA SECTION 2e) DES CONDITIONS DE TRAVAIL, ET
(b) THAT IN CARRYING OUT ANY OF THE WORK CONTEMPLATED BY THIS CONTRACT, HE MAY ALSO BE SUBJECT TO PROVINCIAL LAWS AND REGULATIONS.	b) QUE, DANS L'EXÉCUTION DE TOUT TRAVAIL PRÉVU PAR LE CONTRAT, IL PEUT AUSSI ÊTRE ASSUJETTI AUX LOIS ET RÈGLEMENTS PROVINCIAUX.

This document is the document referred to as "Insurance
Schedule" and marked "E" in the Articles of Agreement
entered into on the _____ day of

_____ 19____ between Her Majesty the
Queen and

Signed

Minister

Contractor

1 Insurance Contract .1

The Contractor, during the execution of the contract until the day of issue of the Engineer's Interim Certificate of Completion, or, if no such Interim Certificate of Completion is issued, until the day of issue of the Final Certificate of Completion, will maintain an insurance contract of the type known and referred to by the Canadian Underwriters' Association as a bridge builder's all risk policy, insuring the work for its full insurable value until the said day, and insuring, for their full insurable value, all materials for the work delivered to property owned or leased by the Crown.

2 Loss .1

Loss, if any, under the said Policy shall be payable to Her Majesty the Queen in right of Canada.

.2

The total insurance under the said Policy shall not be reduced by the amount of any loss and in the event of a loss the amount payable in respect thereof shall be automatically reinstated.

3 Claim .1

Each claim under the said Policy may be made subject to a deductible amount of not more than.....
.....\$1,000.....

4 Insurable Value .1

For the purposes of this schedule, "Insurable Value" means
.....\$175,000.00.....