DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 31C-120

DIST. 8 REGION

W.P. No.

CONT. No.

W. O. No. 73-11006

STR. SITE No. 28-13

HWY. No. 33

LOCATION GLENORA & ADOLPHUSTOWN

FERRY DOCK'S - PROPOSED RAMP ADDITOWN

No of PAGES -

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

REMARKS:

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

31C-120

TO: Mr. R. J. Sim,
District Maintenance Eng.,
District #8,
Kingston, Ontario.

FROM: Foundations Office,
Design Services Branch,
West Bldg., Downsview.

ATTENTION:

DATE: July 25, 1973.

OUR FILE REF.

IN REPLY TO AUG - 8 1973

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For
Proposed Ramp Addition at Glenora
and Adolphustown Ferry Docks
Hwy. #33, District #8 (Kingston)
W.O. 73-11006(X) - W.P. Nil

Attached we are forwarding to you our detailed foundation investigation report on the subsoil conditions existing at the above-mentioned site.

We believe that the factual data and recommendations contained therein will prove adequate for your design requirements. Should additional information be required, please do not hesitate to contact our Office.

A. G. Stermac,
PRINCIPAL FOUNDATIONS ENGINEER.

AGS/ao
Attch.
c.c. A. E. Argue
A. Rutka
A. J. Percy
V. A. Snell
W. D. Birch
B. J. Giroux
J. M. Crannie
E. R. Saint

Foundations Files ✓
Documents

TABLE OF CONTENTS

1. INTRODUCTION:

2. SOIL TYPES AND SOIL CONDITIONS:
Fill Material:
Silty Sand with Gravel, Trace of Clay:
Limestone - Bedrock:

3. WATER LEVELS:

4. RECOMMENDATIONS:

5. MISCELLANEOUS:

- - - - - - - - - - - -

FOUNDATIONS INVESTIGATION REPORT
For
Proposed Ramp Addition at Glenora
and Adolphustown Ferry Docks
Hwy. #33, District #8 (Kingston)
W.O. 73-11006(X) - W.P. Nil

1. INTRODUCTION:

The Foundations Office was requested by Mr. R.J. Sim, District Maintenance Engineer, to carry out a field investigation for the proposed ramp addition at Glenora and Adolphustown Ferry Docks. The site is located on Prince Edward Peninsula, which projects into Lake Ontario. The shore line is irregular because of a number of deep valleys dissecting into the ground and thus forming long bays or inlets. One of these inlets is crossed by Hwy. #33 and made it necessary to provide ferry services for the traffic.

The existing docking facilities at both sides of the channel or inlet consist of a ferry slip confined between stone filled timber cribs and an approximate 25 ft. long ramp. The function of the existing ramp is to provide an aceess for the vehicles between the shore (dock) and the ferry. However, the level of the ferry's deck varies due to the loading of the ferry and the fluctuating lake water levels. The ramp is supported on hinges at the abutment location and is suspended on the opposite (ferry slip) side. The height of the suspended side is adjustable to accommodate the elevation difference between the shore (dock) and the ferry deck. Due to the existing exceptionally high water level the ramp had to be raised to such an elevation where the vehicles experienced some difficulties to ride over the hump created by the sloping ramp and the adjoining level (horizontal) ferry deck.

....2

To resolve this problem it has been decided to extend the ramp by at least 18'. The new ramp addition will be constructed in the same manner as the existing one, which is proposed to be suspended at both ends, thus reducing the overall gradient of the approach ramps. The top portion of the existing abutment wall will be removed in order to provide sufficient clearance for the vertical movements of the ramps.

2. SOIL TYPES AND SOIL CONDITIONS:

Two sampled boreholes were put down at each new abutment location. The locations and elevations are shown on drawing No. 73-11006(X)A, which accompanies this report. The field and test results, together with the boundaries of the different deposits are shown on the accompanying record of borehole sheets. From ground level downwards the various soil types described in some detail are as follows:

Fill Material:

This deposit was encountered at each boring location and extends to a maximum depth of 16 ft. (EL. 233±). The material in the stratum consists of sand and gravel, some silt and clay and also frequent boulders. Diamond drilling techniques were used to advance the borehole. Up to 24" diameter boulders were recovered. Based on the limited number of standard penetration tests carried out within this zone, the denseness is estimated to vary from compact to very dense.

Silty Sand with Gravel, Trace of Clay:

This deposit was found to underlie the fill material in borehole No. 1 and 2. The thickness is about 8 ft. The material consists of gravel (3 - 24%), sand (36 - 57%), silt (35%) and clay (5%).

The obtained 'N' (SPT) values ranged from 11 to 21 blows per foot, indicating a compact relative density.

Limestone - Bedrock:

Thin to medium bedded limestone with frequent shale

.....3

seams was encountered at the following elevations:

B.H. #1 - El. 227± (sound) B.H. #4 - El. 240± (weathered), El. 235± (sound)	Glenora side
B.H. #2 - El. 234± (weathered), El. 230± (sound) B.H. #3 - El. 234± (weathered), El. 232± (sound)	Adolphustown side

3. WATER LEVELS:

The following groundwater levels were observed during the field work:

B.H. #1 - El. 248.5
B.H. #2 - El. 249.8
B.H. #3 - El. 248.6
B.H. #4 - El. 249.0

The lake water level was found to be at El. 248.44 (April 9, 1973.).

4. RECOMMENDATIONS:

It is proposed to build additional ramps at the Glenora-Adolphustown Ferry Docks.

The subsoil at the site in general was found to consist of granular type deposits (gravels, sands, silts) followed by limestone bedrock.

The natural subsoil is overlain by fill material containing frequent boulders (up to 24" in diameter) and pieces of wood. This type of deposit is considered to be undesirable from foundation point of view. In order to construct the footings within the natural subsoil positive dewatering schemes are required.

In view of these above mentioned facts, piled foundations are considered to be the most suitable means of support. In order to achieve the desired pile penetration the following construction procedures are recommended:

1. Excavate the bouldery fill material to its full vertical and horizontal extent at the abutment locations.

.....4

2. Backfill the excavated area with suitable granular material. The backfill should not contain sizes larger than 3 in.
3. Drive steel 'H' piles to bedrock. The bedrock was found to be at approximate elevation 234± at the Adolphustown side and between El. 240± and El. 227± on the Glenora side. It is assumed that the piles may penetrate into the weathered portion of the limestone for a short distance.

The maximum allowable load for the particular steel section may be used.

5. MISCELLANEOUS:

The field work was carried out during the period April 15 - 21, 1973, under the supervision of Mr. J. Bangs, Project foundations Engineer.

Equipment used was owned and operated by Canadian Longyear Limited.

This report was written by Mr. P. Payer, Senior Foundations Engineer and reviewed by Mr. M. Devata, Supervising Foundations Engineer.

P. Payer

P. Payer, P. Eng.

M. Devata

M. Devata, P. Eng.

PP/ks
June 6, 1973.

FD-9b (Rev. Jan. 73)

ABBREVIATIONS & SYMBOLS USED IN THIS REPORT

SOIL PROPERTIES

γ	UNIT WEIGHT OF SOIL (BULK DENSITY)
γ_s	UNIT WEIGHT OF SOLID PARTICLES
γ_w	UNIT WEIGHT OF WATER
γ_d	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
γ'	UNIT WEIGHT OF SUBMERGED SOIL
G	SPECIFIC GRAVITY OF SOLID PARTICLES $G = \frac{\gamma_s}{\gamma_w}$
e	VOID RATIO
n	POROSITY
w	WATER CONTENT
S_r	DEGREE OF SATURATION
w_L	LIQUID LIMIT
w_P	PLASTIC LIMIT
I_P	PLASTICITY INDEX
w_S	SHRINKAGE LIMIT
I_L	LIQUIDITY INDEX $= \frac{w - w_P}{I_P}$
I_C	CONSISTENCY INDEX $= \frac{w_L - w}{I_P}$
e_{max}	VOID RATIO IN LOOSEST STATE
e_{min}	VOID RATIO IN DENSEST STATE
I_D	DENSITY INDEX $= \frac{e_{max} - e}{e_{max} - e_{min}}$
	RELATIVE DENSITY D_r IS ALSO USED
h	HYDRAULIC HEAD OR POTENTIAL
q	RATE OF DISCHARGE
v	VELOCITY OF FLOW
i	HYDRAULIC GRADIENT
k	COEFFICIENT OF PERMEABILITY
j	SEEPAGE FORCE PER UNIT VOLUME
m_v	COEFFICIENT OF VOLUME CHANGE $= \frac{-\Delta e}{(1+e)\Delta \sigma'}$
c_v	COEFFICIENT OF CONSOLIDATION
C_c	COMPRESSION INDEX $= \frac{\Delta e}{\Delta \log_{10} \sigma'}$
T_v	TIME FACTOR $= \frac{c_v t}{d^2}$ (d, DRAINAGE PATH)
U	DEGREE OF CONSOLIDATION
τ_f	SHEAR STRENGTH
c'	EFFECTIVE COHESION INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF EFFECTIVE STRESS $\tau_f = c' + \sigma' \tan \phi'$
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF TOTAL STRESS $\tau_f = c_u + \sigma \tan \phi$
μ	COEFFICIENT OF FRICTION
S_t	SENSITIVITY

GENERAL

π	= 3·1416
e	BASE OF NATURAL LOGARITHMS 2·7183
$\log_e a$ OR $\ln a$	NATURAL LOGARITHM OF a
$\log_{10} a$ OR $\log a$	LOGARITHM OF a TO BASE 10
t	TIME
g	ACCELERATION DUE TO GRAVITY
V	VOLUME
W	WEIGHT
M	MOMENT
F	FACTOR OF SAFETY

STRESS AND STRAIN

u	PORE PRESSURE
σ	NORMAL STRESS
σ'	NORMAL EFFECTIVE STRESS ($\bar{\sigma}$ IS ALSO USED)
τ	SHEAR STRESS
ε	LINEAR STRAIN
γ	SHEAR STRAIN
ν	POISSON'S RATIO (μ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNGS MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
η	COEFFICIENT OF VISCOSITY

EARTH PRESSURE

d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_o	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY. DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
β	ANGLE OF SLOPE TO HORIZONTAL

FD-9 (Rev. Jan. 73)

ABBREVIATIONS & SYMBOLS USED IN THIS REPORT

PENETRATION RESISTANCE

'N'=STANDARD PENETRATION RESISTANCE : - THE NUMBER OF BLOWS REQUIRED TO ADVANCE A STANDARD SPLIT SPOON SAMPLER 12 INCHES INTO THE SUBSOIL, DRIVEN BY MEANS OF A 140 POUND HAMMER FALLING FREELY A DISTANCE OF 30 INCHES.

DYNAMIC PENETRATION RESISTANCE : - THE NUMBER OF BLOWS REQUIRED TO ADVANCE A 2 INCH, 60 DEGREE CONE, FITTED TO THE END OF DRILL RODS, 12 INCHES INTO THE SUBSOIL, THE DRIVING ENERGY BEING 350 FOOT POUNDS PER BLOW.

DESCRIPTION OF SOIL

THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE DENSITY OR DENSENESS OF COHESIONLESS SOILS ARE DESCRIBED IN THE FOLLOWING TERMS :-

CONSISTENCY	c LB./SQ.FT.
VERY SOFT	0 - 250
SOFT	250 - 500
FIRM	500 - 1000
STIFF	1000 - 2000
VERY STIFF	2000 - 4000
HARD	> 4000

DENSENESS	'N' BLOWS / FT.
VERY LOOSE	0 - 4
LOOSE	4 - 10
COMPACT	10 - 30
DENSE	30 - 50
VERY DENSE	> 50

TERMS TO BE USED IN DESCRIBING SOILS:-

TRACE < 10% , SOME 10-25% , WITH 25-40% , > 40% SILTY, SANDY, GRAVELLY, CLAYEY ETC.

TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.T.	SLOTTED TUBE SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE

P.H. SAMPLE ADVANCED HYDRAULICALLY

P.M. SAMPLE ADVANCED MANUALLY

SOIL TESTS

U	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
UU	UNCONSOLIDATED UNDRAINED TRIAXIAL	F.V.	FIELD VANE
CIU	CONSOLIDATED ISOTROPIC UNDRAINED TRIAXIAL	C	CONSOLIDATION
CID	" " DRAINED "	S	SENSITIVITY
CAU	" ANISOTROPIC UNDRAINED "		
CAD	" " DRAINED "		

APPENDIX

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS – ONTARIO

DESIGN SERVICES BRANCH — FOUNDATIONS OFFICE

RECORD OF BOREHOLE Nº 1

JOB 73-11006 (x) LOCATION Glenora Side-West Corner ORIGINATED BY J.B.

W.P. Nil BORING DATE April 5, 1973 COMPILED BY J.B.

DATUM Geodetic BOREHOLE TYPE Washbore - BX Casing - AXT Rock Coring CHECKED BY

SOIL PROFILE ELEV./DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE
249.5	Ground level					
0.0	Sand and gravel, some silt and clay, boulders and wood, compact to dense, fill material		1	SS	27	
			2	RC AXT	Rec 63%	240
			3	SS	47	
236.0						
13.5	Silty sand, traces of gravel and clay, compact		4	SS	18	
			5	SS	11	230
227.0			6	RC	86%	
22.5	Limestone (Sound) Bedrock		7	RC AXT	Rec 96%	
222.1						
27.4	End of borehole					220

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE

LIQUID LIMIT w_L
PLASTIC LIMIT w_P
WATER CONTENT w
w_P — w — w_L
WATER CONTENT % 10 20 30

BULK DENSITY γ P.C.F.

REMARKS

WL 249.5

GR SA SI CL

3 57 35 5

OFFICE REPORT - SOIL EXPLORATION

20
15 ◇ 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS – ONTARIO

DESIGN SERVICES BRANCH — FOUNDATIONS OFFICE

RECORD OF BOREHOLE No 2

JOB 73-11006(x) LOCATION Adolphustown Side - West Corner ORIGINATED BY J.B.

W.P. Nil BORING DATE April 5 & 9, 1973 COMPILED BY J.B.

DATUM Geodetic BOREHOLE TYPE Washbore - BX Casing CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT W_L / PLASTIC LIMIT W_P / WATER CONTENT W	BULK DENSITY γ P.C.F.	REMARKS
ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	WATER CONTENT % 10 20 30		GR. SA. SI. CL.
249.9	Ground (Pav't.) Level									249.8
0.0	Sand and gravel with boulders, traces of silt and clay.		1	SS	100/1"					
241.4	Compact (Fill)		2	SS	23			○		42 41 (17)
8.5	Silty sand with gravel, trace of clay.		3	SS	21	240		○		
233.9	Compact		4	SS	87/8"			○		24 36 35 5
16.0	Weathered		5	RC	71%					
			6	RC	55%					
	Limestone Bedrock		7	RC	95%	230				
227.4	Sound		8	RC	92%					
22.5	End of Borehole									
						220				

OFFICE REPORT – SOIL EXPLORATION

20
15 ◇ 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS – ONTARIO

DESIGN SERVICES BRANCH — FOUNDATIONS OFFICE

RECORD OF BOREHOLE Nº 3

JOB 73-11006(X) LOCATION Adolphustown Side - East Corner ORIGINATED BY JB

W.P. Nil BORING DATE April 9, 1973 COMPILED BY JB

DATUM Geodetic BOREHOLE TYPE Washbore-BX Casing, AXT Rock Coring CHECKED BY

SOIL PROFILE ELEV./DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT / SHEAR STRENGTH P.S.F. ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	LIQUID LIMIT W_L / PLASTIC LIMIT W_P / WATER CONTENT W — WATER CONTENT % 10 20 30	BULK DENSITY γ P.C.F.	REMARKS GR. SA. SI. CL.
249.6	Ground Level									248.6 ▽
0.0	boulders wood Sand & gravel traces of clay and silt. Compact to Very Dense		1	SS	21			○		
			2	SS	18	240		○		47 49 (4)
			3	SS	56					
233.8	Fill Material									
15.8	weathered Limestone Bedrock		4	RC	63%					
			5	RC	93%	230				
225.2	sound		6	RC	98%					
24.4	End of Borehole					220				

OFFICE REPORT ON SOIL EXPLORATION

20
15 ◇ 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS – ONTARIO

DESIGN SERVICES BRANCH — FOUNDATIONS OFFICE

RECORD OF BOREHOLE No 4

JOB 73-11006 (X) LOCATION Glenora Side - East Corner ORIGINATED BY JB

W.P. Nil BORING DATE April 11, 1973 COMPILED BY JB

DATUM Geodetic BOREHOLE TYPE Washbore-EX Casing-AXT Rock Core CHECKED BY

ELEV. / DEPTH	SOIL PROFILE: DESCRIPTION	STRAT. PLOT	SAMPLES: NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	REMARKS
250.3	Ground Level						
0.0	Sand and gravel, some silt & clay, boulders and wood. Fill Material					250	249.0 ▽
240.2			1	RC	63%	240	
10.1	weathered Limestone		2	RC	43%		
			3	RC	83%		
			4	RC	50%		
231.4	sound Bedrock		5	RC	97%		
18.9	End of Borehole					230	

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE

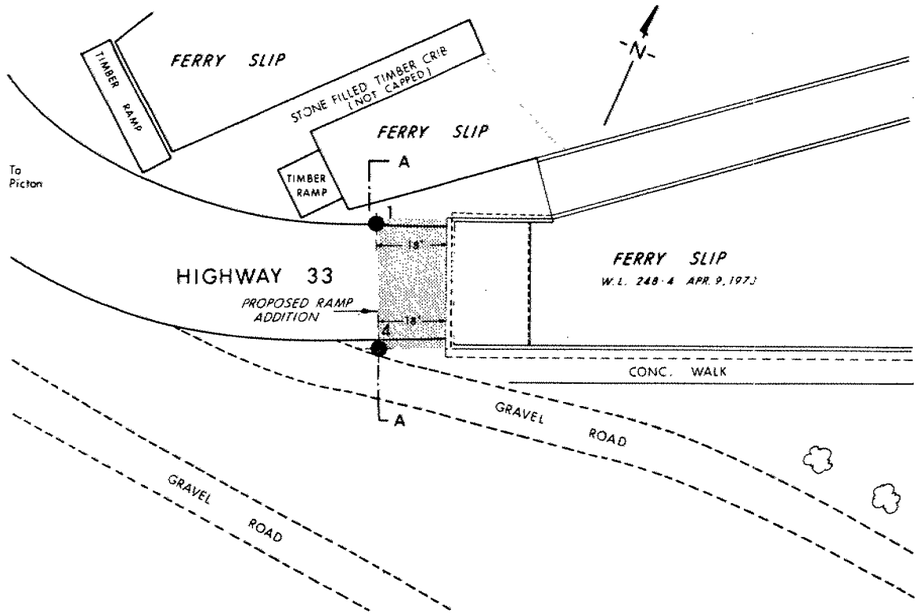
LIQUID LIMIT W_L
PLASTIC LIMIT W_P
WATER CONTENT W
W_P — W — W_L
WATER CONTENT %

BULK DENSITY γ P.C.F.

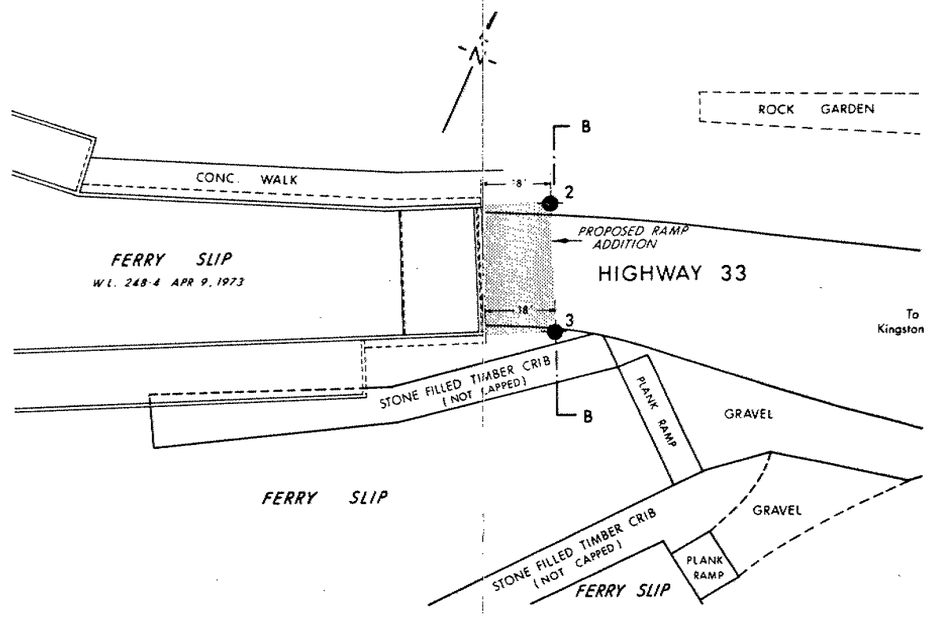
REMARKS: GR. SA. SI. CL.

OFFICE REPORT — SOIL EXPLORATION

20
15 ◇ 5 % STRAIN AT FAILURE
10



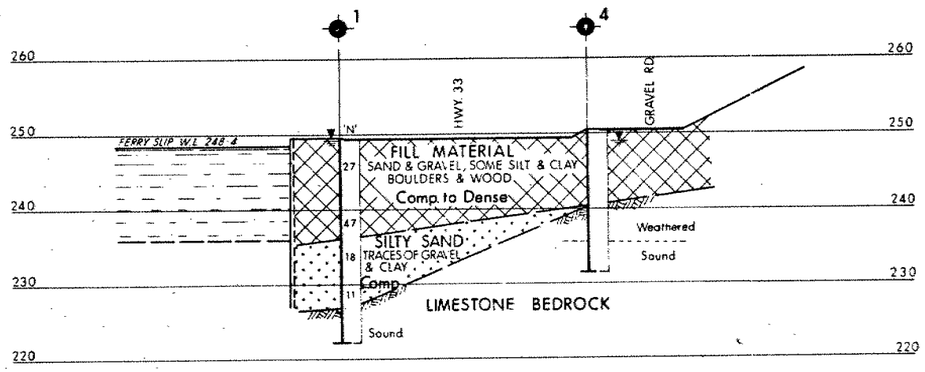
GLENORA SIDE



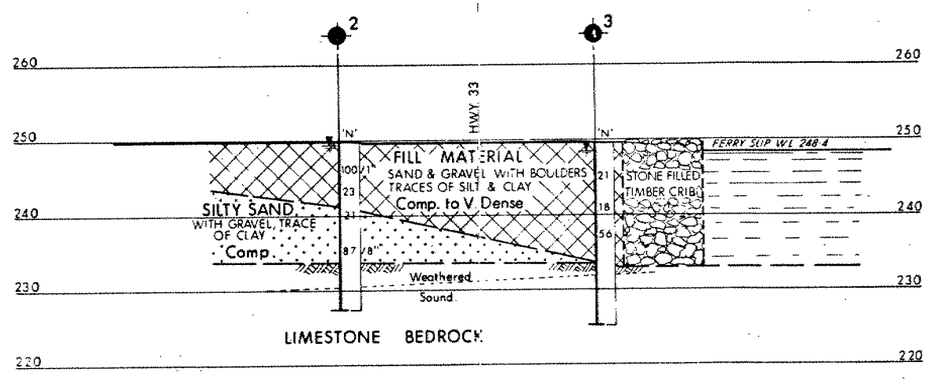
ADOLPHUSTOWN SIDE

PLANS

SCALE 20 10 0 20 40 FT



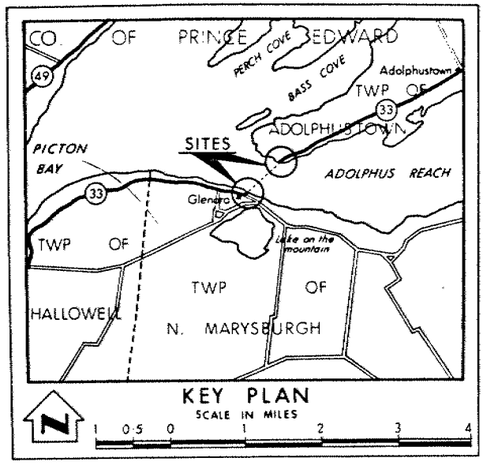
A-A



B-3

SECTIONS

SCALE 0 5 0 10 20 FT



LEGEND

- Bore Hole
- Cone Penetration Test
- Bore Hole & Cone Test
- Water Levels established at time of field investigation. APRIL 1973

NO.	ELEVATION	
1	249·5	AS SHOWN ON PLAN
2	249·9	
3	249·6	
4	250·3	

— NOTE —

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

REVISIONS

DATE	BY	DESCRIPTION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO
DESIGN SERVICES BRANCH — FOUNDATIONS OFFICE

PROPOSED RAMP ADDITION AT
GLENORA & ADOLPHUSTOWN FERRY DOCKS

HIGHWAY NO 33 DIST NO. 8
CO PRINCE EDWARD
TWP N. MARYSBURGH & ADOLPHUSTOWN

BORE HOLE LOCATIONS & SOIL STRATA

SUBMD P.P.	CHECKED	W.P. NO	DRAWING NO 73-11006 A
DRAWN S.D.	CHECKED	W.O. NO 73-11006(X)	
DATE 24 JULY 1973		SITE NO	BRIDGE DRAWING NO
APPROVED PRINCIPAL FOUNDATION ENGINEER		CONT NO	

BMO-TRACE 505-8-72

Mr. R. J. Sim,
District Maintenance Engineer,
District #8,
Kingston, Ontario.

Foundations Office,
Design Services Branch,
West Bldg., Downsview.

April 12, 1973.

Proposed Ramp Addition at Glenora and Adolphustown Ferry Docks, Hwy. #33, Site No. 28-13, District #8, Kingston
W.O. 73-11006 (X)

We have recently completed a field investigation for the above project. The present proposal calls for construction of additional ramps at the ferry slips.

The borings have revealed that the subsoil at the proposed new abutment locations, in general, consists of an approximately 4 to 15 ft. thick bouldery fill material followed by granular type (gravels, sands and silts) deposits followed by limestone bedrock. The boundaries of the different soil types are shown on the accompanying drawing.

In view of the encountered subsoil conditions the following construction procedures are recommended:

1) Excavate the bouldery fill material to its full extent (horizontal and vertical) at the abutment locations.

2) Backfill the excavated area with suitable granular material. The backfill should not contain grain sizes larger than 3 in.

3) Drive steel 'H' piles to bedrock (refusal). The bedrock was found to be at approximate elevation 234+ at the Adolphustown side and between elevation 240± and elevation 227± at the Glenora side.

   The maximum allowable load for the particular steel section chosen may be used for design purposes.

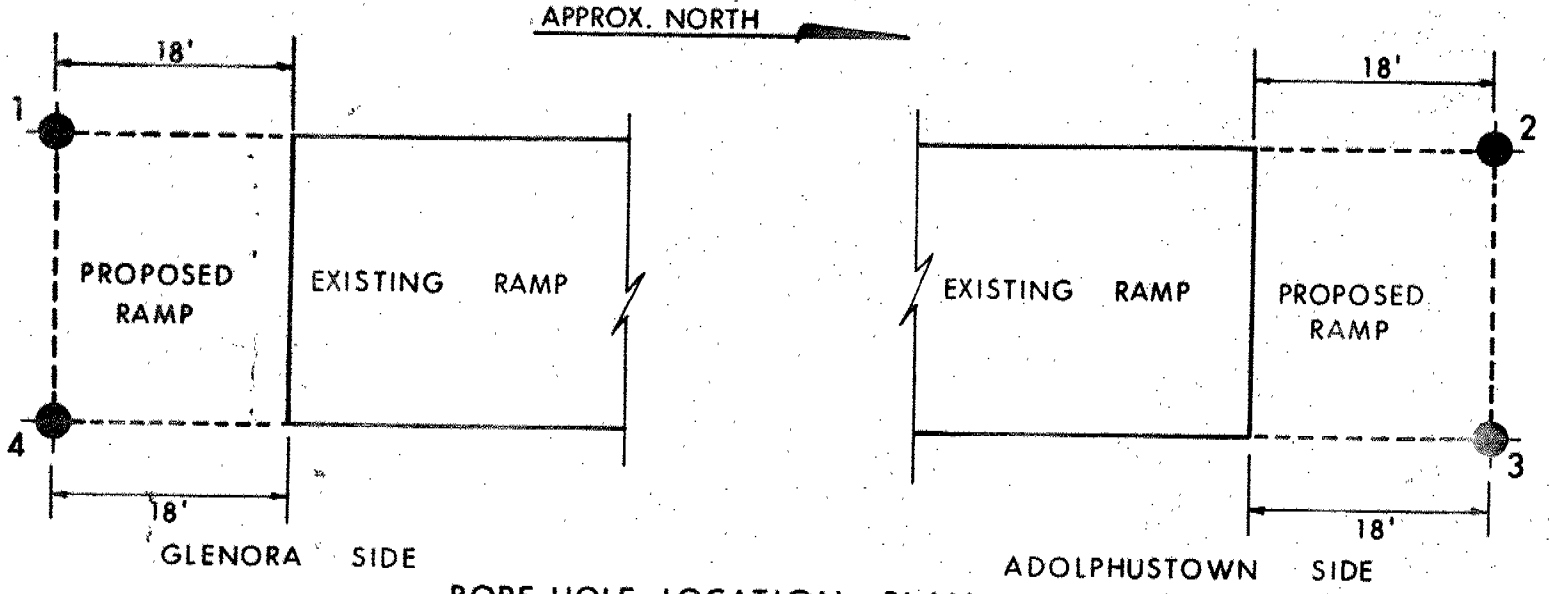
We hope that the foregoing will enable you to proceed with the design of the additional ramps and their foundations.

If further information is required, please contact this Office. Our more detailed report will follow in the near future.

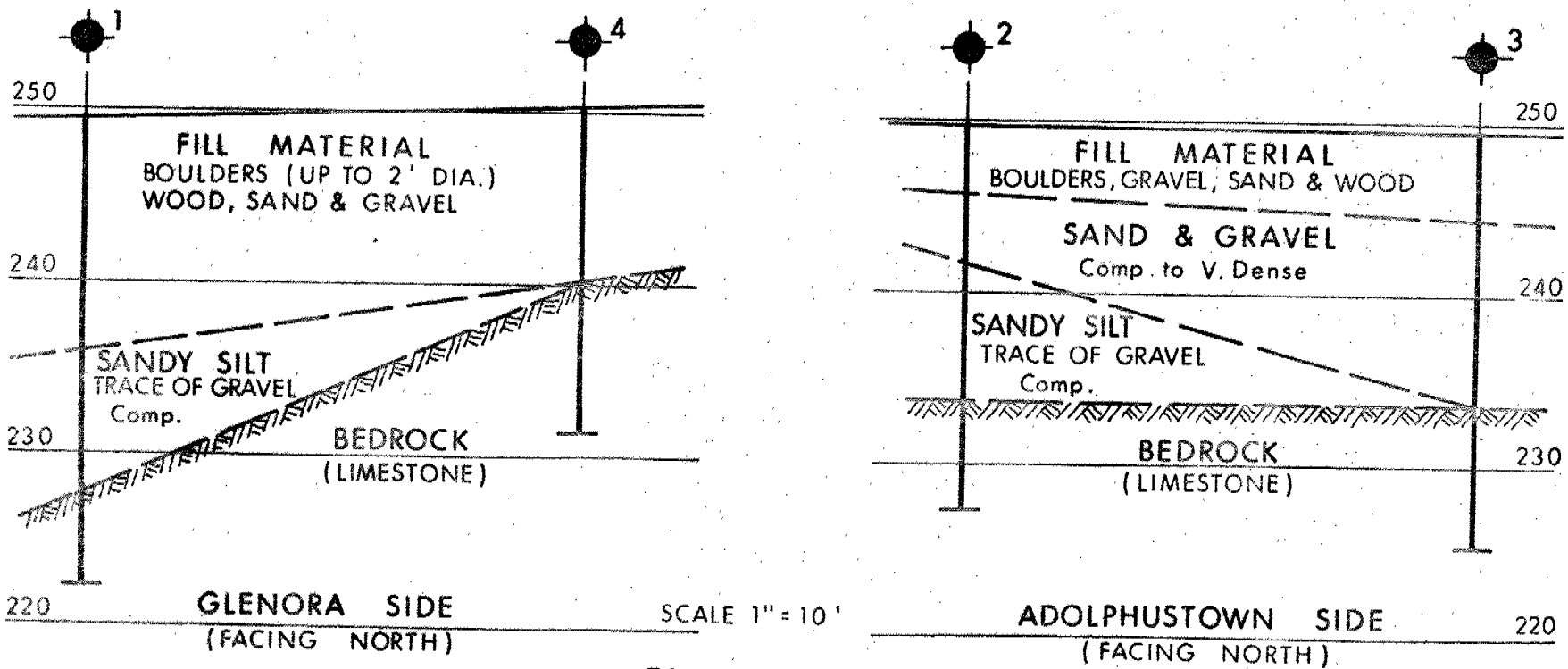
P. Payer

P. Payer,
Senior Foundations Engineer,
For: M. Devata,
Supervising Foundations Engineer.

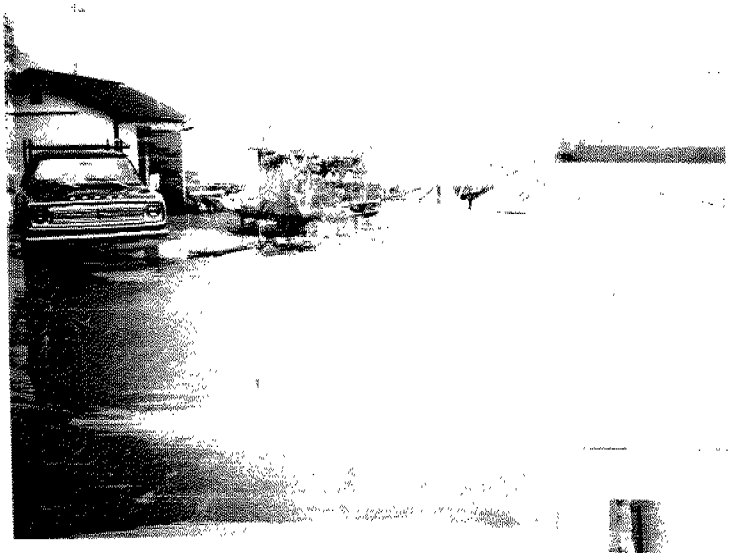
PP/ao
Attch.
cc: W. Birch
T. C. Kingsland
C. S. Grebski

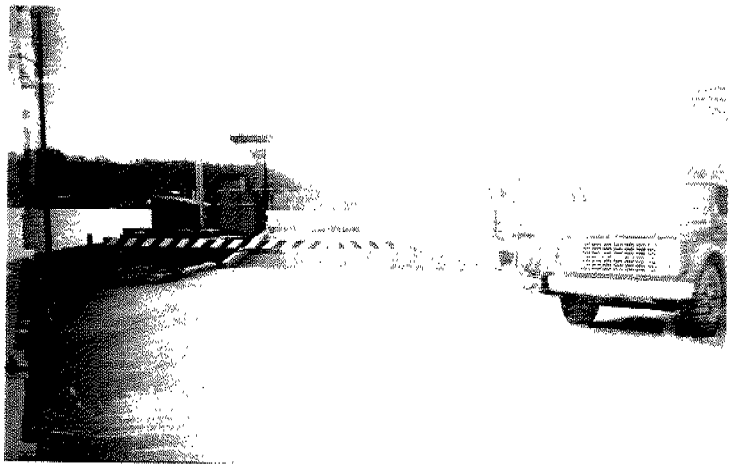


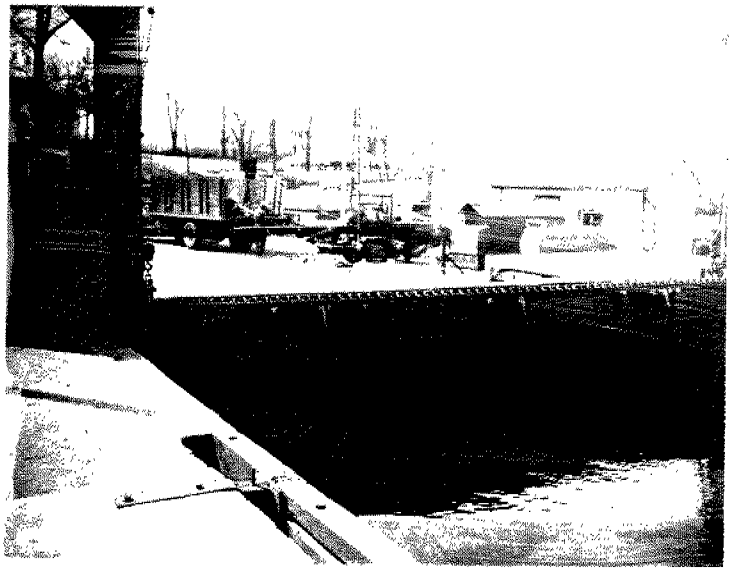
BORE HOLE LOCATION PLAN
N.T.S.

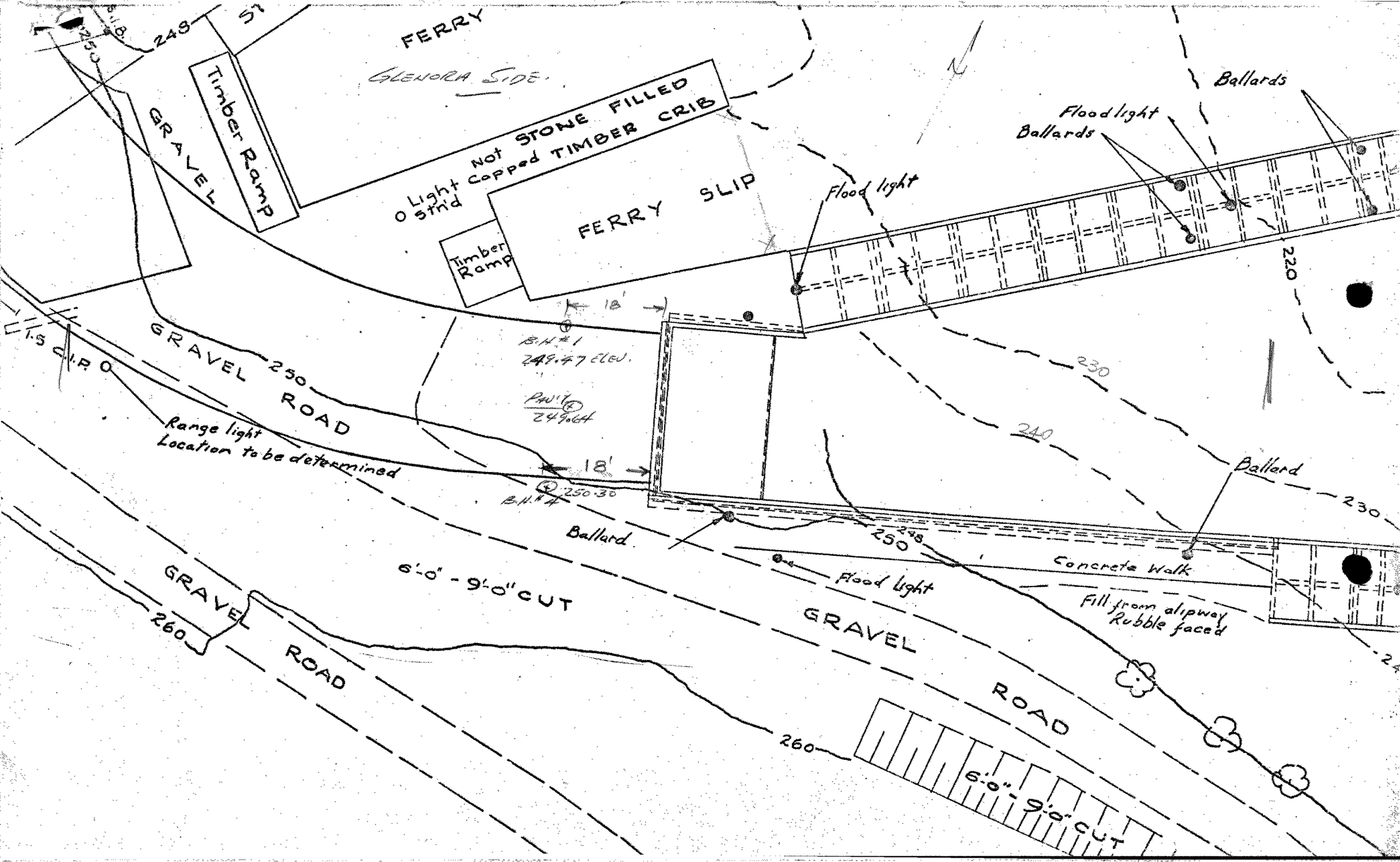


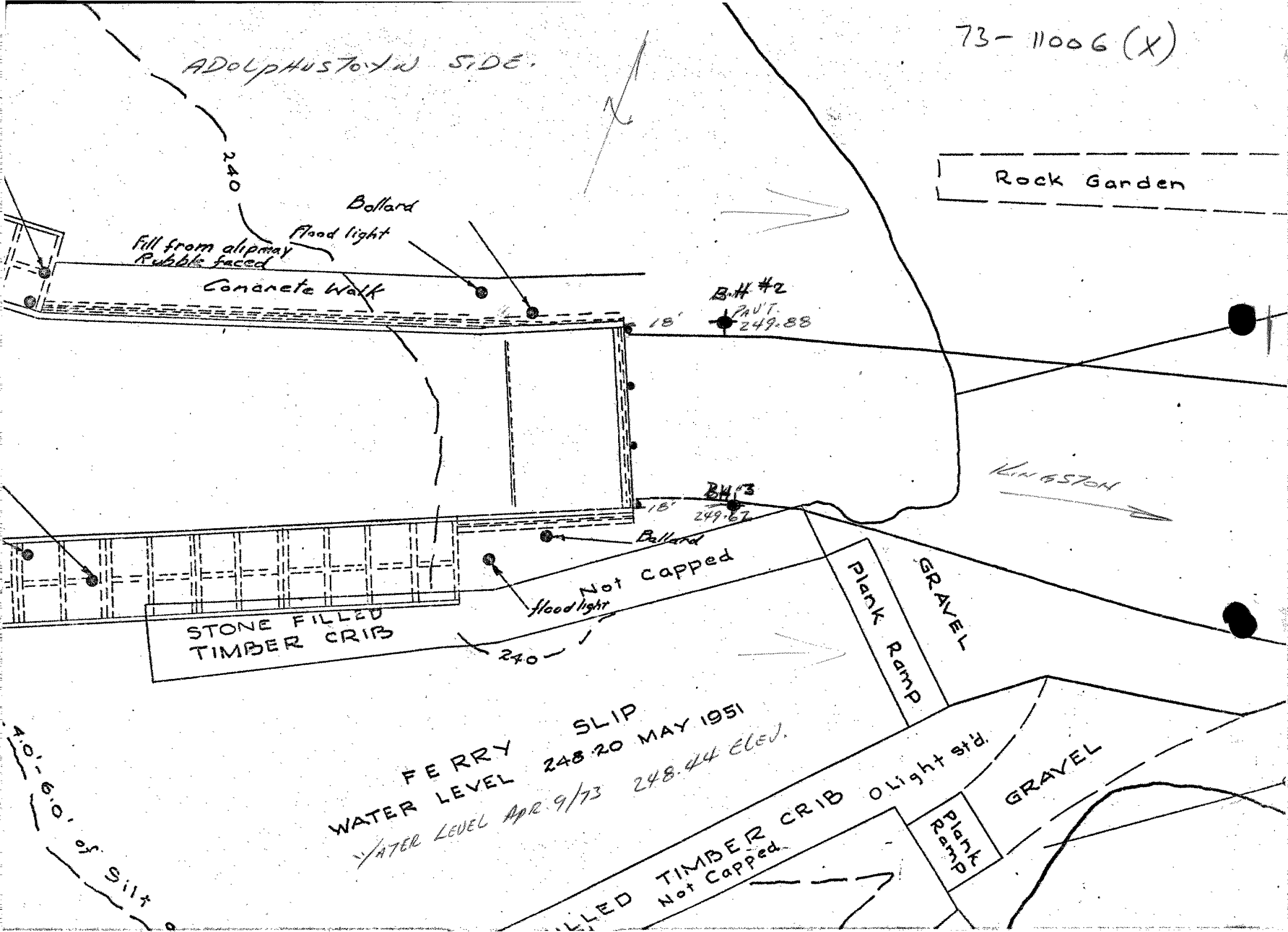
73 - 11006 X

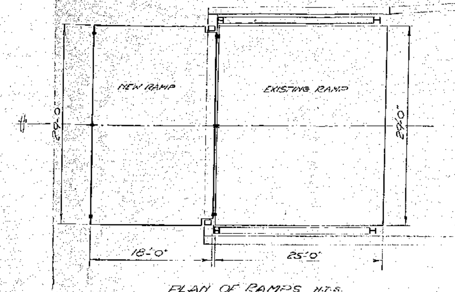




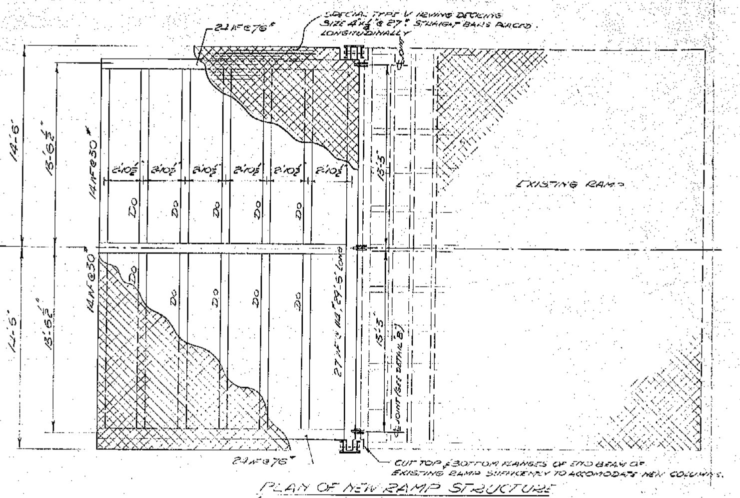



FERRY
GLENORA SIDE
Timber Ramp
GRAVEL
Light Not STONE FILLED
Stnd Capped TIMBER CRIB
FERRY SLIP
Timber Ramp
Flood light
Ballards
Flood light
Ballards
220
18'
B.M. #1
249.47 elev.
Pin
249.64
GRAVEL ROAD
230
240
Range light
Location to be determined
18'
B.M. #2
250.30
Ballard
Ballard
230
250
248
Flood light
Concrete Walk
Fill from slipway
Rubble faced
6'-0" - 9'-0" CUT
GRAVEL ROAD
260
260
GRAVEL ROAD
6'-0" - 9'-0" CUT

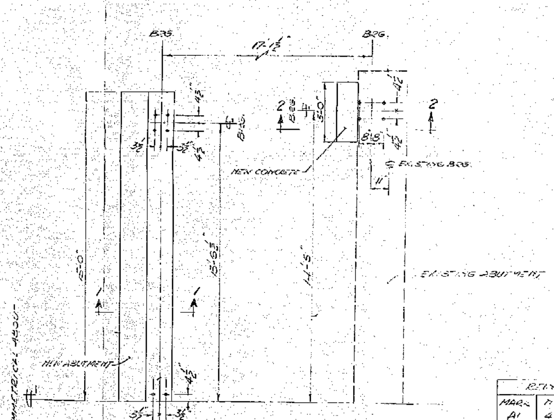

73-11006 (X)
ADOLPHUS TOWN SIDE.
240
Bollard
Flood light
Fill from slipway
Rubble faced
Concrete Walk
B.M #2
PAV'T.
249.88
18'
Rock Garden
KINGSTON
BM #3
249.67
18'
Bollard
Not capped
Flood light
STONE FILLED
TIMBER CRIB
240
Plank Ramp
GRAVEL
FERRY SLIP
WATER LEVEL 248.20 MAY 1951
WATER LEVEL Apr 9/73 248.44 ELEV.
4.0'-6.0' of Silt
TIMBER CRIB
Not Capped
Light std.
Plank Ramp
GRAVEL



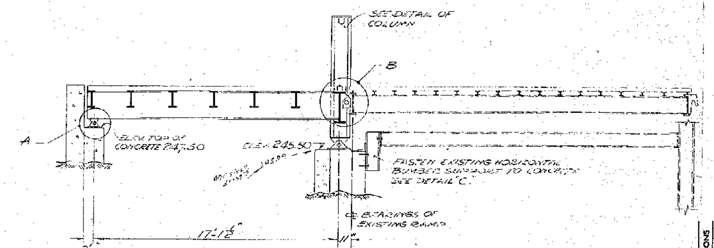
PLAN OF RAMPS N.T.S.



PLAN OF NEW RAMP STRUCTURE
(ABUTMENTS NOT SHOWN)



LAYOUT OF BRG'S AND PLAN OF CONCRETE



LONGITUDINAL SECTION OF RAMPS

NOTES:

STRUCTURAL STEEL:

ALL STEEL TO BE C.S.A.G. 40.4 AND GALVANIZED OR METALLIZED WITH ZINC IN ACCORDANCE WITH C.S.A.G. 164.
ZINC TO BE APPLIED FOR MARINE ATMOSPHERE. COATING THICKNESS IS TO BE .010"-.012"
WELDING TO BE IN ACCORDANCE WITH M.T.C. FORM 9.
WELDING ELECTRODES TO BE LOW HYDROGEN CLASSIFICATION.

CLASS OF CONCRETE:

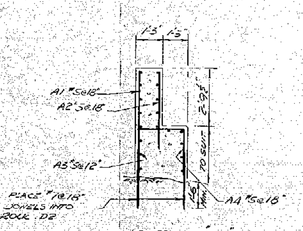
5000 P.S.I. @ 28 DAYS.

REINFORCING STEEL:

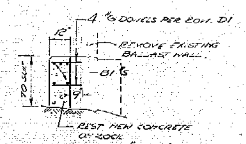
2" CLEAR COVER.

REINFORCING STEEL TABLE

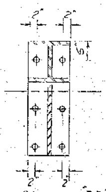
MARK	No	SIZE	LENGTH	DETAIL	REMARK
A1	42	#5	TO SUIT	STRAIGHT	
A2	42	#5	4'-0"	DO	
A3	TO SUIT	#5	15'-6	DO	1'-6" LAP
A4	42	5		2'-2" / TO SUIT	
B1	20	#5	2'-6"	STRAIGHT	
D1	24	#5	1'-9	DO	
D2	81	#6	3'-0"	DO	



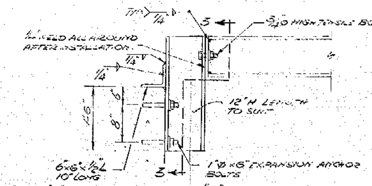
SECTION 1-1



SCALE: 3/8"=1'-0" SECTION 2-2



SECTION 3-3



SCALE 3/4"=1'-0" DETAIL "C"

FOR REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

REVISIONS		
DATE	BY	DESCRIPTION

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO

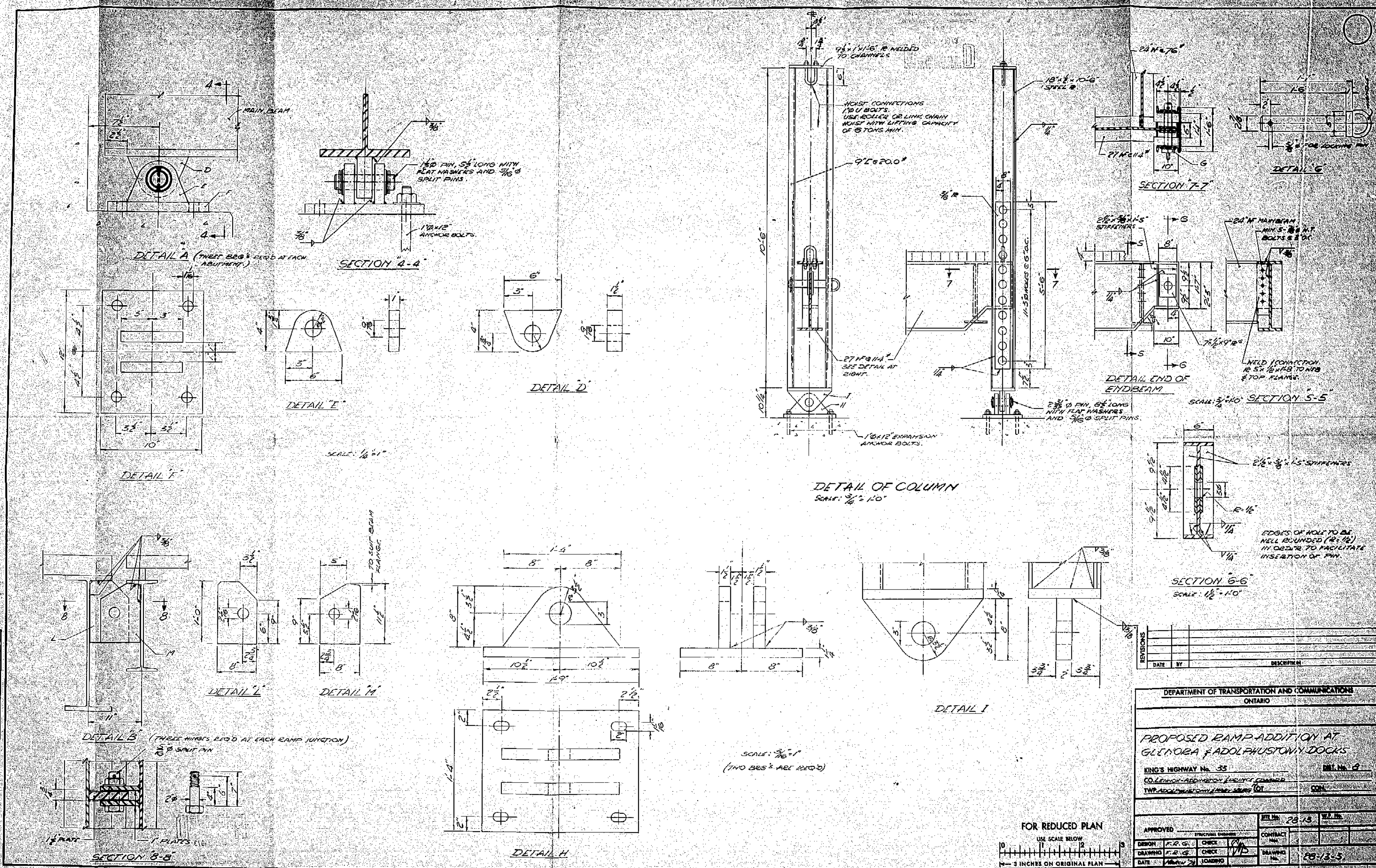
PROPOSED RAMP ADDITION AT
GLENORA & ADOLPHUSTOWN DOCKS

KING'S HIGHWAY No. 33 DIST. No. 8
CO. LENNOX-ADDINGTON & PRINCE EDWARD
TWP. ADOLPHUSTOWN - MARYSBURGH N. LOT CON.

APPROVED	STRUCTURAL ENGINEER			SITE No.	28-13
				W.P. No.	
DESIGN	F.R.G.	CHECK		CONTRACT Nos.	
DRAWING	F.R.G.	CHECK		DRAWING No.	28-13-2
DATE	MARCH 73	LOADING			

PRINT RECORD

No.	FOR	DATE


DETAIL "A" (THREE BRG'S REQ'D AT EACH ABUTMENT)
MAIN BEAM
SECTION "4-4"
1½"Ø PIN, 5½" LONG WITH FLAT WASHERS AND 5/16"Ø SPLIT PINS.
1"Ø x 12" ANCHOR BOLTS.
DETAIL "F"
DETAIL "E"
DETAIL "D"
SCALE: 1/4" = 1'
9½ x 1½ x 1'-6" ℞ WELDED TO CHANNELS
HOIST CONNECTIONS 1"Ø U BOLTS. USE ROLLER OR LINK CHAIN HOIST WITH LIFTING CAPACITY OF 6 TONS MIN.
9"[@ 20.0#
27 N.F. @ 114# SEE DETAIL AT RIGHT.
1"Ø x 12" EXPANSION ANCHOR BOLTS.
18" x ½" x 10'-6" SPECL ℞
2¾"Ø PIN, 8½" LONG WITH FLAT WASHERS AND 5/16"Ø SPLIT PINS.
11-3 SPACES @ 6" C.C.
DETAIL OF COLUMN
SCALE: 3/4" = 1'-0"
24 N.F. @ 76#
27 N.F. @ 114#
SECTION "7-7"
DETAIL "G"
2½ x 3/8 x 1'-5" STIFFENERS
DETAIL END OF ENDBEAM
24" N.F. MAIN BEAM
WELD CONNECTION ℞ 5 x ½ x 1'-8" TO WEB & TOP FLANGE.
SCALE: 3/4" = 1'-0"
SECTION "5-5"
2½ x 3/8 x 1'-5" STIFFENERS
EDGES OF HOLE TO BE WELL ROUNDED (R = ½") IN ORDER TO FACILITATE INSERTION OF PIN.
SECTION "6-6"
SCALE: 1½" = 1'-0"
TO SUIT BEAM FLANGE
DETAIL "L"
DETAIL "M"
DETAIL "B" (THREE HINGES REQ'D AT EACH RAMP JUNCTION)
SECTION "8-8"
DETAIL "H"
SCALE: 3/16" = 1'
(TWO BRG'S ARE REQ'D)
DETAIL "I"
PRINT RECORD
No. | FOR | DATE
REVISIONS
DATE | BY | DESCRIPTION
FOR REDUCED PLAN
USE SCALE BELOW
3 INCHES ON ORIGINAL PLAN
DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO
PROPOSED RAMP ADDITION AT GLENORA & ADOLPHUSTOWN DOCKS
KING'S HIGHWAY No. 33
DIST. No. 8
CO. LENNOX-ADDINGTON & PRINCE EDWARD
TWP. ADOLPHUSTOWN & MARYSBURG LOT
CON.
APPROVED
STRUCTURAL ENGINEER
SITE No. 28-13
W.P. No.
CONTRACT No.
DESIGN F.R.G.
CHECK
DRAWING F.R.G.
CHECK
DATE March '72
LOADING
DRAWING No. 28-13-3