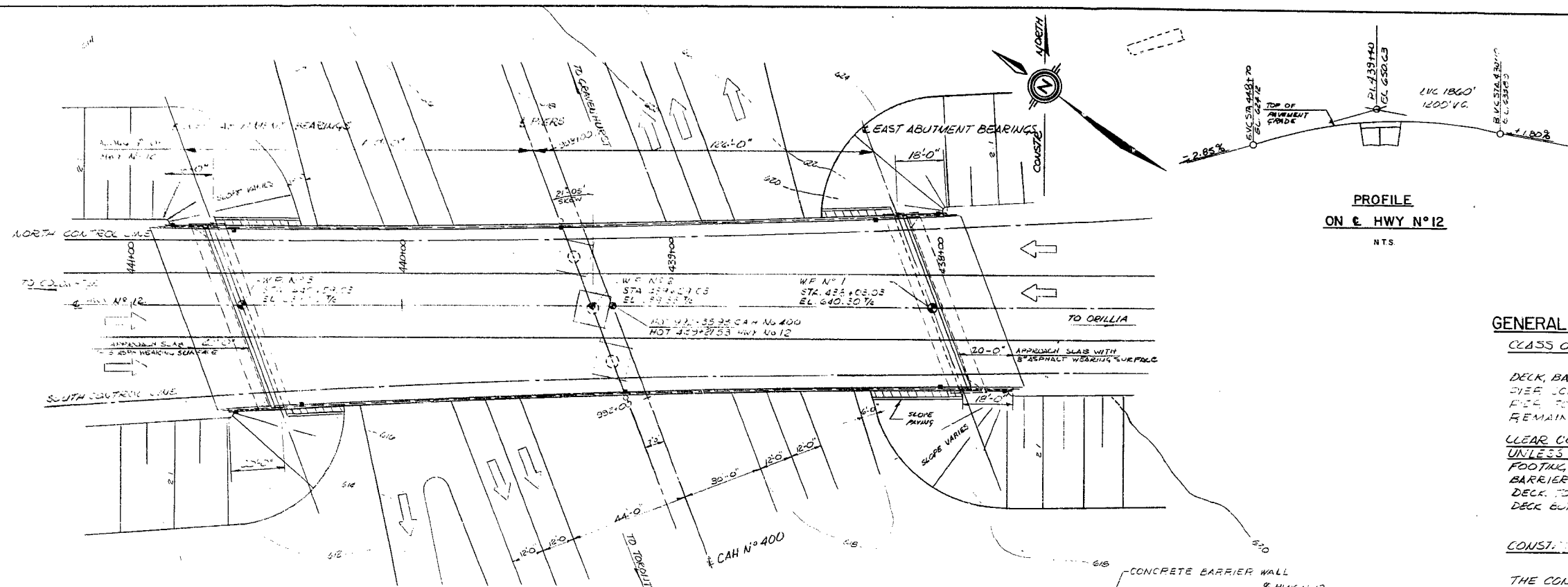


#69-F-79

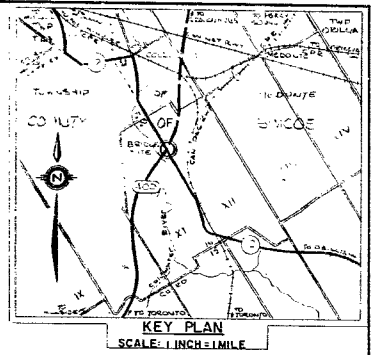
W.P. 906-66-02

H.W.Y. #400

HWY #12 INTERCHANGE  
UNDERPASS



**PROFILE**  
**ON E HWY N°12**  
NTS



**GENERAL NOTES**  
CLASS OF CONCRETE

- DECK, BARRIER WALLS AND PIER COLUMNS - 5000 PSI
- PIER FOOTINGS - 4000 PSI
- REMAINDER - 3000 PSI

- CLEAR COVER ON REINFORCING STEEL UNLESS NOTED OTHERWISE
- FOOTINGS, ABUTMENTS & COLUMNS - 3"
  - BARRIER WALLS - 1 1/2"
  - DECK TOP APPROACH SLABS - 2"
  - DECK BOTTOM - 1 1/2"

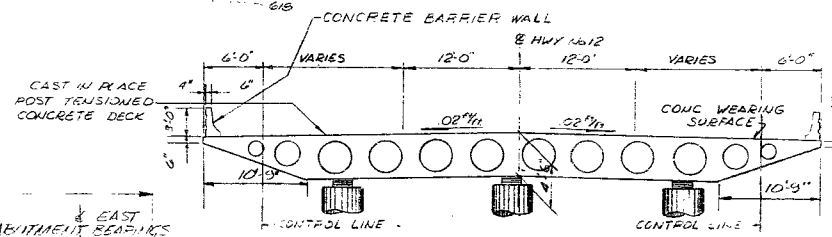
CONSTRUCTION NOTES

THE CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS TO THE SPECIFIED ELEVATIONS, WITH A TOLERANCE OF ± 1/8 IN. NO CONCRETE SHALL BE PLACED ABOVE THE ABUTMENT BEARING SEATS UNTIL THE CONCRETE DECK HAS BEEN PLACED, STRESSED AND GROUTED.

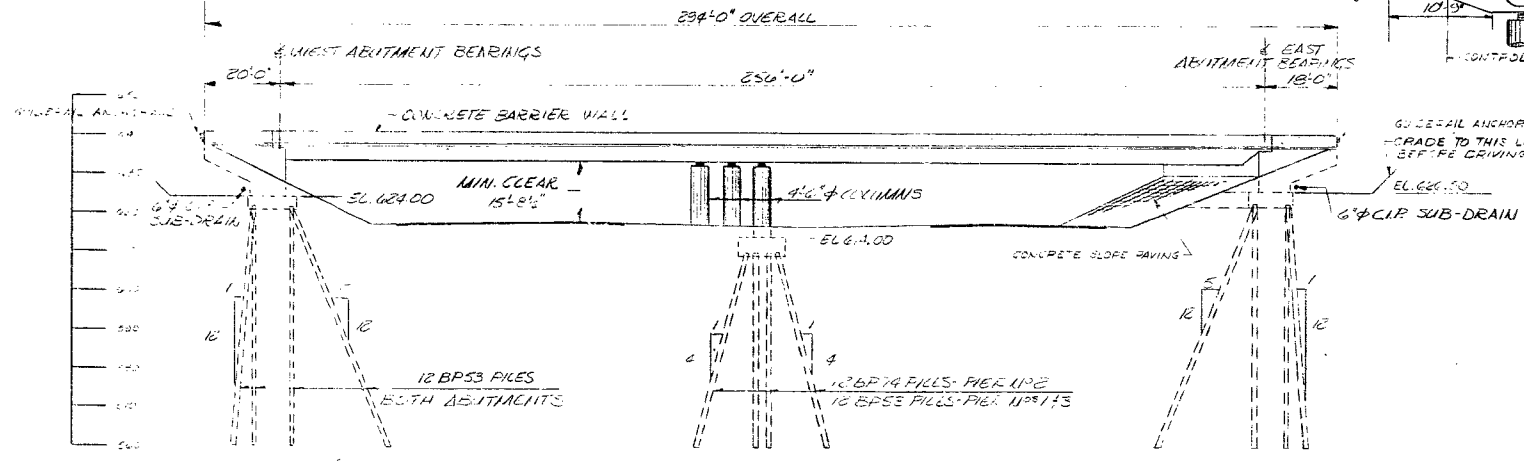
BM 612.46 - GEODETIC  
DRAIN CUT 4' ON SE.  
COR OF BRIDGE SW. 1/4 R.  
364+90 E. N.B.C.

- LEGEND**
- 3"x3"x7" JUNCTION BOX (P.V.C.)
  - 5' LIGHTING POLE
  - 3" ELECTRICAL CONDUIT
  - W.R. DENOTES WORKING POINT
  - 7% DENOTES TOP OF CONCRETE

**PLAN**  
SCALE: 1" = 20'-0"



**TYPICAL DECK SECTION**  
SCALE: 1/8" = 1 FT.



**SOUTH ELEVATION**  
SCALE: 1" = 20'-0"

**LIST OF DRAWINGS**

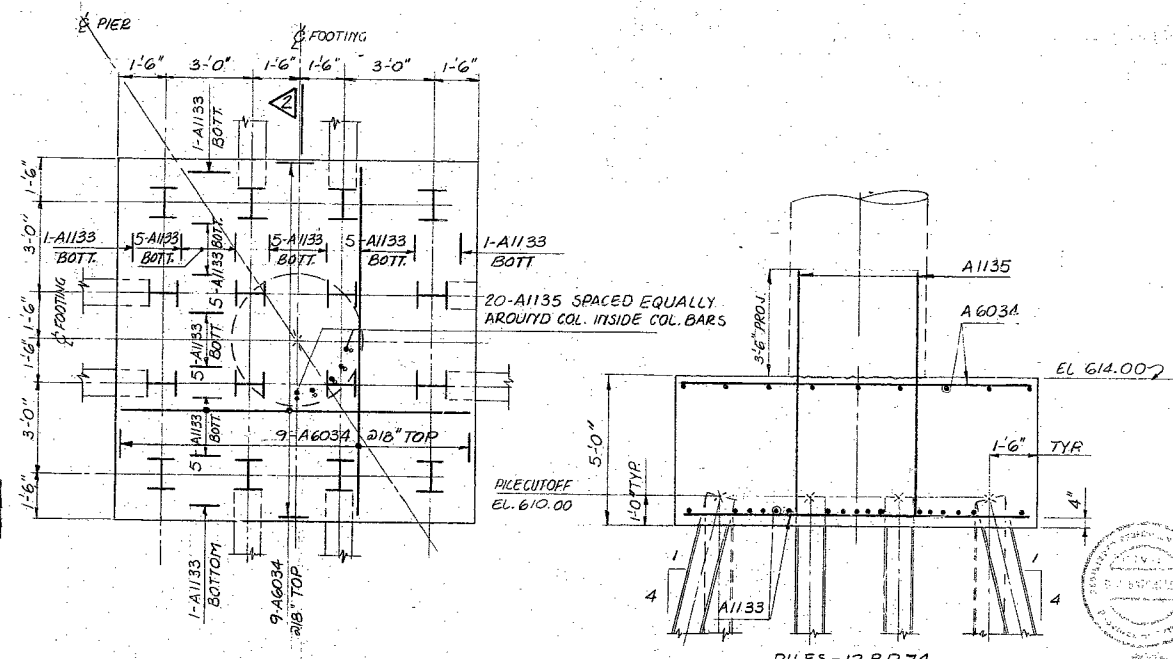
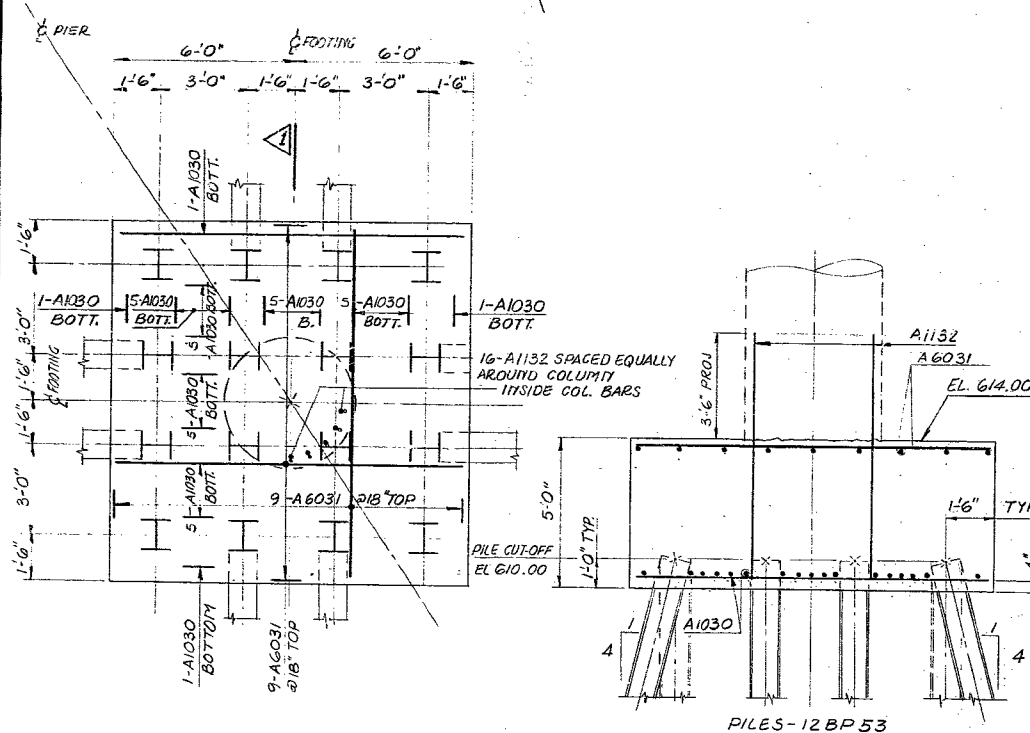
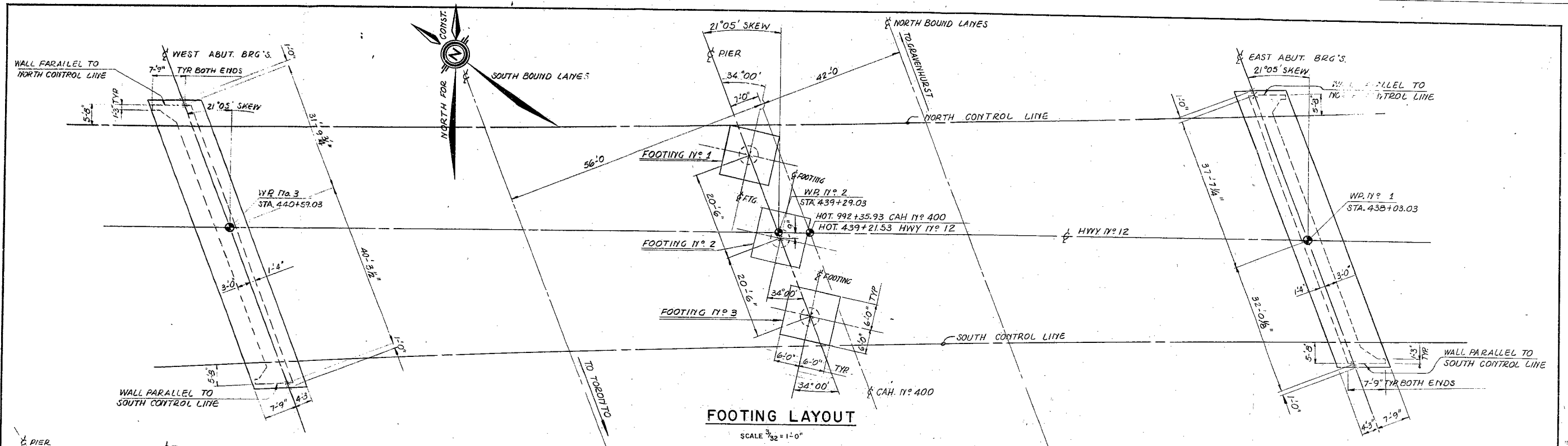
- GENERAL PLAN D-6729-1
- FOUNDATION LAYOUT & PIER DETAILS D-6729-2
- ABUTMENT FOOTING DETAILS D-6729-3
- EAST ABUTMENT AND WINGWALLS D-6729-4
- WEST ABUTMENT AND WINGWALLS D-6729-5
- PIER DETAILS D-6729-6
- DECK DETAILS D-6729-7
- DECK REINFORCING D-6729-8
- CABLE DETAILS D-6729-9
- CONCRETE BUILT-UP JOINT DETAIL D-6729-10
- APPROACH SLABS D-6729-11
- DETAILS OF CONC. SLOPE PAVING D-6729-12
- STANDARD DETAILS D-6729-13
- STANDARD DETAILS D-6729-14
- BRIDGE ELECTRICAL DETAILS TYPE D-6729-15
- CORE HOLE LOCATIONS & SOIL STRATA D-6729-16

FOR REDUCED PLAN



PRINT RECORD	FOR	DATE

DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION	
<b>WYLLIE &amp; UFNAL LIMITED</b> CONSULTING ENGINEERS TORONTO	
<b>HWY. N° 12 INTERCHANGE UNDERPASS</b>	
KING'S HIGHWAY No. CAH. 400 CO. SIMCOE TWP. MEDONTE	DIST. No. 5 LOT 19 CON. XI & XII
<b>GENERAL PLAN</b>	
APPROVED _____ DESIGN DCB DRAWING WYABJRC DATE DEC. 1969	SITE No. 30-362 W.P. No. 906-66-02 CONTRACT No. _____ CHECK KNS CHECK DCB LOADING HS20-44
D-6729-1	



NOTE:  
PILES TO BE DRIVEN IN ACCORDANCE WITH PILE DRIVING STD. DD-1218 OR DD-1219 ON DWG NO. 6729-14

PILE DATA (DESIGN LOAD - 12 BP 53 - 70 TONS - 12 BP 74 - 95 TONS)			
LOCATION	SIZE	N°	LENGTH
FTG. N° 1	12 BP 53	16	54'-0"
FTG. N° 2	12 BP 74	16	54'-0"
FTG. N° 3	12 BP 53	16	54'-0"

DEPARTMENT OF HIGHWAYS ONTARIO  
BRIDGE DIVISION

**WYLLIE & UFAL LIMITED**  
CONSULTING ENGINEERS TORONTO

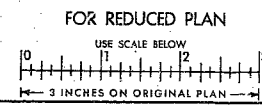
**HWY. N° 12 INTERCHANGE UNDERPASS**

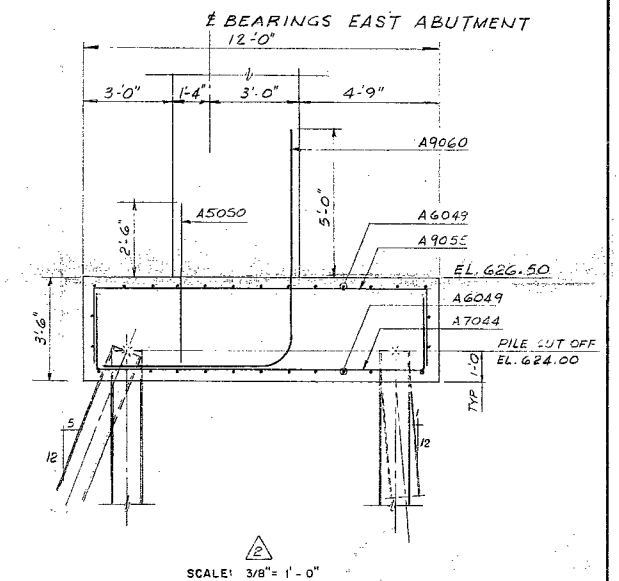
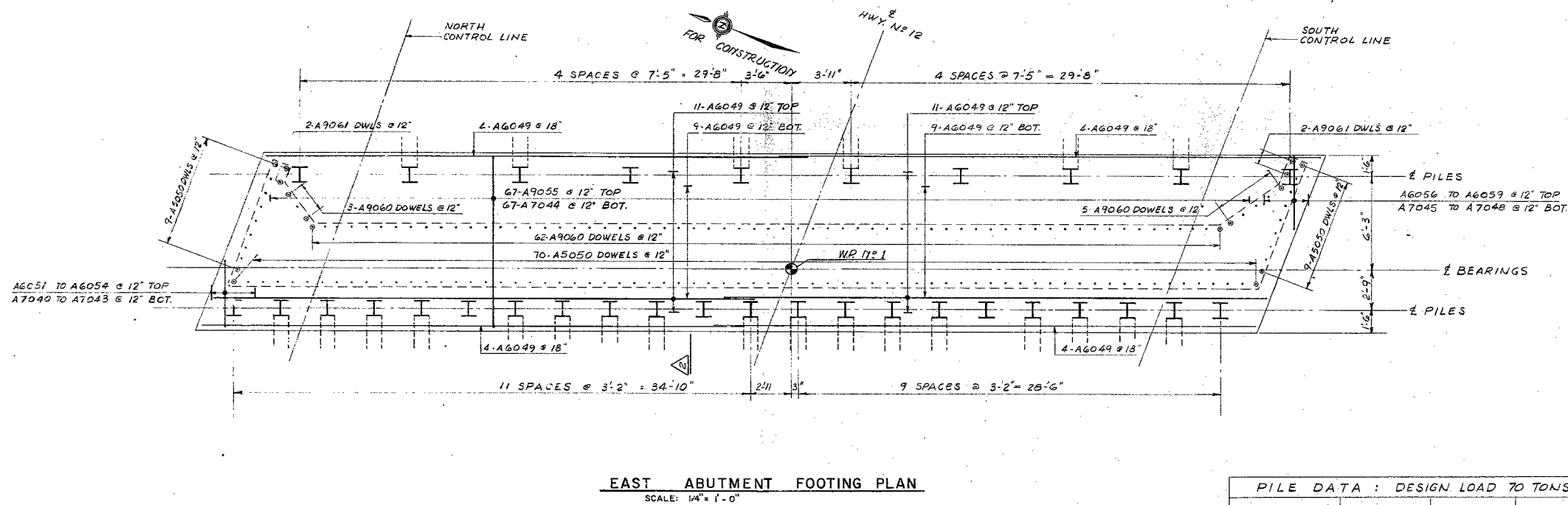
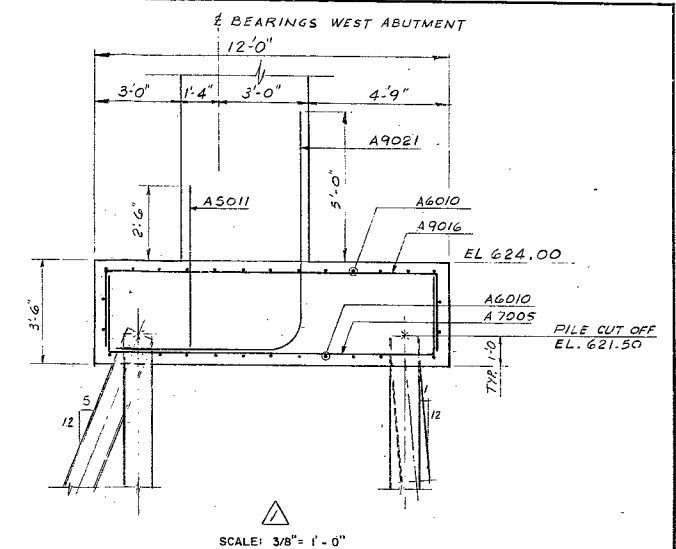
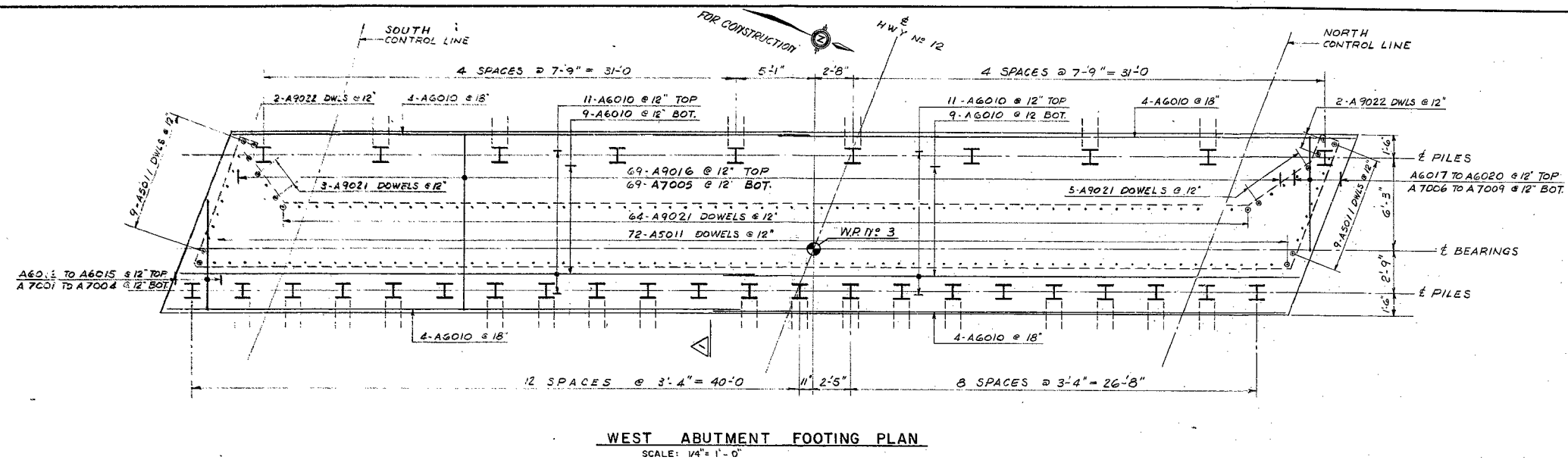
KING'S HIGHWAY No. CAH. 400 Dist. No. 5  
CO. SIMCOE  
TWP. MEDONTE LOT 19 CON. XI & XII

**FOUNDATION LAYOUT & PIER DETAILS**

APPROVED \_\_\_\_\_  
DESIGN R. B. W. CHECK D. C. B.  
DRAWING R. J. CHECK D. C. B.  
DATE DEC. 1969 LOADING HS20-44

CONTRACT No. 30-362 W.P. No. 906-66-02  
DRAWING No. **D-6729-2**

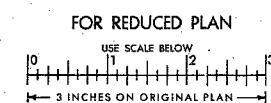




PILE DATA : DESIGN LOAD 70 TONS			
LOCATION	SIZE	Nº	LENGTH
WEST. ABUT.	12 BP 53	15	65'-0"
WEST ABUT.	12 BP 53	17	70'-0"
EAST ABUT.	12 BP 53	15	67'-0"
EAST ABUT.	12 BP 53	17	72'-0"

NOTE:

- PILES TO BE DRIVEN IN ACCORDANCE WITH PILE DRIVING STD. DD-1218 OR DD-1219 ON DWG. 6729-14.
- THIS DWG. TO BE READ IN CONJUNCTION WITH DWG. D-6729-2.



REVISIONS									
DATE	BY	DESCRIPTION							
<div style="text-align: right; font-size: 1.5em; margin-right: 50px;">69-F-79</div>									
<div style="text-align: center;"> <b>DEPARTMENT OF HIGHWAYS ONTARIO</b>  <b>BRIDGE DIVISION</b> </div>									
<div style="text-align: center;"> <b>WYLLIE &amp; UNFAL LIMITED</b>  CONSULTING ENGINEERS <span style="float: right;">TORONTO</span> </div>									
<div style="text-align: center; font-size: 1.5em;"> <b>HWY. N° 12 INTERCHANGE UNDERPASS</b> </div>									
KING'S HIGHWAY No. <u>CAH. 400</u> <span style="float: right;">DIST. No. <u>5</u></span>									
CO. <u>SIMCOE</u>									
TWP. <u>MEBDONTE</u> <u>LOT 19</u> <u>CON. XI &amp; XII</u>									
<div style="text-align: center; font-size: 1.2em;"> <b>ABUTMENT FOOTING &amp; DETAILS</b> </div>									
<div style="text-align: center;"> <b>APPROVAL</b> </div>					<div style="text-align: center;"> <b>SITE No.</b> <u>30-362</u> <b>W.P. No.</b> <u>906-66-02</u> </div>				
<div style="text-align: center;"> <b>BRIDGE ENGINEER</b> </div>					<div style="text-align: center;"> <b>CONTRACT</b>  <b>No.</b> </div>				
DESIGN	W. V. A.	CHECK	D. C. B.						
DRAWING	C. A. L.	CHECK	D. C. B.						
DATE	DEC. 1969	LOADING	HS20-44	<div style="text-align: center;"> <b>DRAWING</b>  <b>No.</b> </div>		<div style="text-align: center; font-size: 1.5em;"> <b>D-6729-3</b> </div>			

## MEMORANDUM

To: Mr. B. R. Davis,  
Bridge Engineer,  
Bridge Office,  
Admin. Bldg.

From: Foundation Section,  
Materials & Testing Office,  
Room 107, Lab. Bldg.

ATTENTION: Mr. S. McCombie

DATE: October 6, 1969

OUR FILE REF.

IN REPLY TO OCT - 8 1969

SUBJECT:

FOUNDATION INVESTIGATION REPORT  
For  
Hwy. #12 Interchange Underpass  
Hwy. #400 at Coldwater  
District No. 5 (Owen Sound)  
W.J. 69-F-79 -- W.P. 906-66-02

Attached, we are forwarding to you a new foundation investigation report for the above mentioned project. The original report was issued on June 22, 1960. The new report contains a new Drawing #69-F-79A, which supersedes Drawing #60-F-48A, and new recommendations which supersede those contained on pages 5 and 6 of the old report. The old report may be referred to for a description of subsoil conditions.

Should additional information be required, please do not hesitate to contact our Office.

AGS/MdeF  
Attach.

cc: Messrs. B. R. Davis (2)  
H. A. Tregaskes  
D. W. Farren  
W. Zonnenberg  
G. M. Sinclair  
A. P. Watt  
J. Roy  
B. A. Singh

Foundations Files  
Gen. Files

*A. G. Stermac*  
A. G. Stermac  
PRINCIPAL FOUNDATION ENGINEER

## TABLE OF CONTENTS

1. INTRODUCTION.
  2. DESCRIPTION OF THE SITE AND GEOLOGY.
  3. DISCUSSION AND RECOMMENDATIONS.
  4. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION REPORT  
For  
Hwy. #12 Interchange Underpass  
Hwy. #400 at Coldwater  
District No. 5 (Owen Sound)  
W.J. 69-F-79 -- W.P. 906-66-02

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1. INTRODUCTION:

A foundation investigation for the proposed Hwy. #12 Interchange Underpass on Hwy. #400 at Coldwater, Ontario, was carried out by this Section in May 1960, and a report was subsequently issued, numbered 60-F-48. Since a number of years have elapsed since this report was issued, and since it is the present intention to commence construction in 1970, it was felt that some modification of some parts of the original report would be advantageous. Specifically, the stratigraphical profile has been revised, and the parts of the report dealing with foundation recommendations, have been enlarged. Thus it should be noted that Drawing #60-F-48A has been superseded by Drawing #69-F-79A, and those parts of Report #60-F-48 on pages 5 and 6, under the headings: 'Foundation Support' and 'Conclusions and Recommendations' are now superseded by this present report. This report, therefore, contains our revised recommendations with regard to the foundations for the new structure, which are based entirely on the subsoil conditions as described in Report #60-F-48. For a description of subsoil conditions, Report #60-F-48 should be studied.

2. DISCUSSION AND RECOMMENDATIONS:

It is proposed to construct a new interchange at the junction of Hwys. #12 and #400 at Coldwater, Ontario. The part of the new interchange dealt with by this report, is the underpass structure which will carry Hwy. #12 over the future Northbound and Southbound lanes of Hwy. #400. The new bridge is at present proposed to be a 4-span structure of total length about 290 ft.

2. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

The present centre-line of Hwy. #400 will be the future centre-line of the Northbound lane, and the centre-line of Hwy. #12 will remain essentially as is. The new grade of Hwy. #12 will necessitate approach fills in the order of 22 ft. high at the abutments. Hwy. #400 grade remains unchanged.

Subsoil at this site consists of about 25 ft. of compact to very dense silty sand with some gravel overlying about 30 ft. of very dense sand, gravel and boulders, followed by very dense glacial till. The groundwater level, at the time of the field investigation (May 1960), was found to be within 3 ft. of the ground surface.

Structure Foundations -

The proposed structure may be supported on spread footings placed at or below el. 610.00, assuming a net safe pressure of 2.0 t.s.f. Footings must be placed deep enough to ensure a depth of cover below finished ground level sufficient for frost protection (i.e., 6 ft.). It is estimated that the maximum settlement under the structure load, will not exceed 1 inch and will occur immediately the load is applied.

As an alternative, the structure may be supported on piled foundations. Two types of piles appear to be feasible:

(1) Steel H-piles should achieve the maximum allowable load for the particular steel section adopted if driven to approximate elevation 560.0. Due to the presence of boulders, it would be advisable to reinforce the pile tips with standard flange plates. These boulders may cause the piles to reach practical refusal at a higher elevation than 560.0 in some cases. Driving should be controlled in the field by means of the Hiley Formula.



2. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

Structure Foundations - (cont'd.) ...

(2) Franki type displacement caissons should achieve a design capacity of 150 tons/pile in the case of 22-inch  $\emptyset$  shafts. It is estimated that the expanded bases may be formed at or about el. 595.0. Piles may be reinforced according to structural requirements.

Pile caps should be provided with a minimum cover of 6 ft. for frost protection.

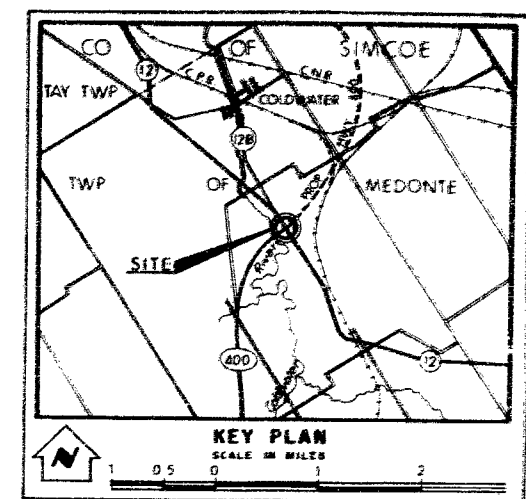
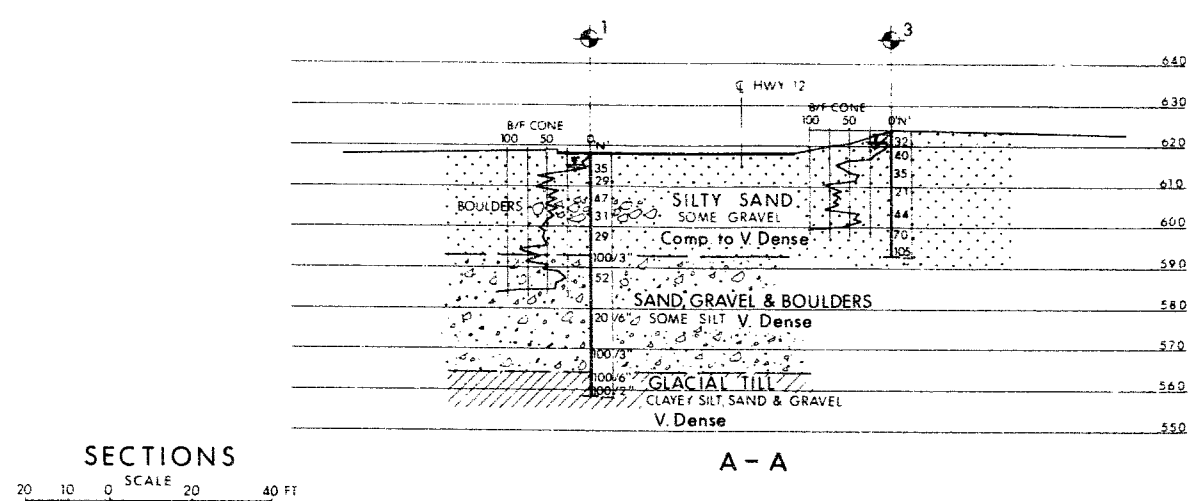
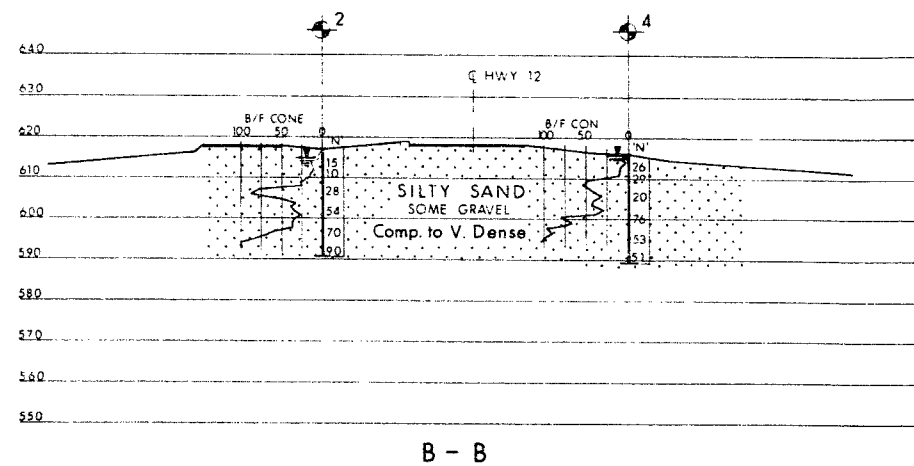
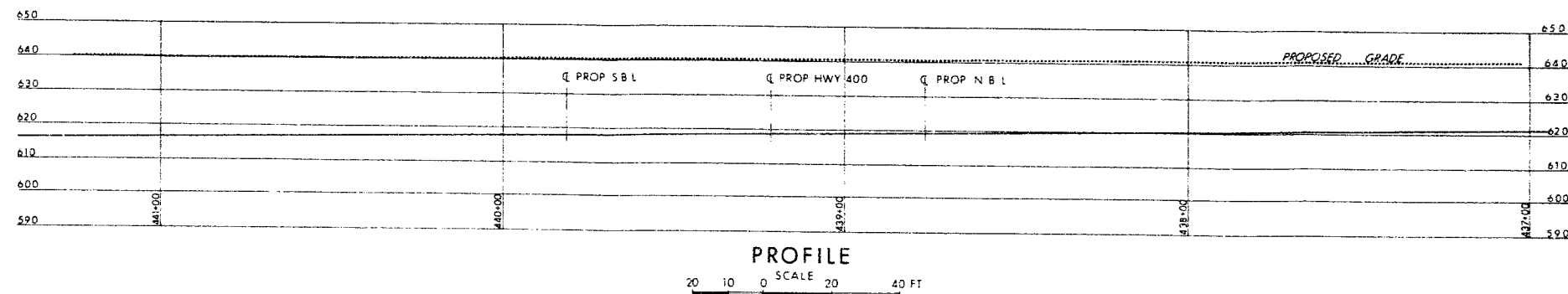
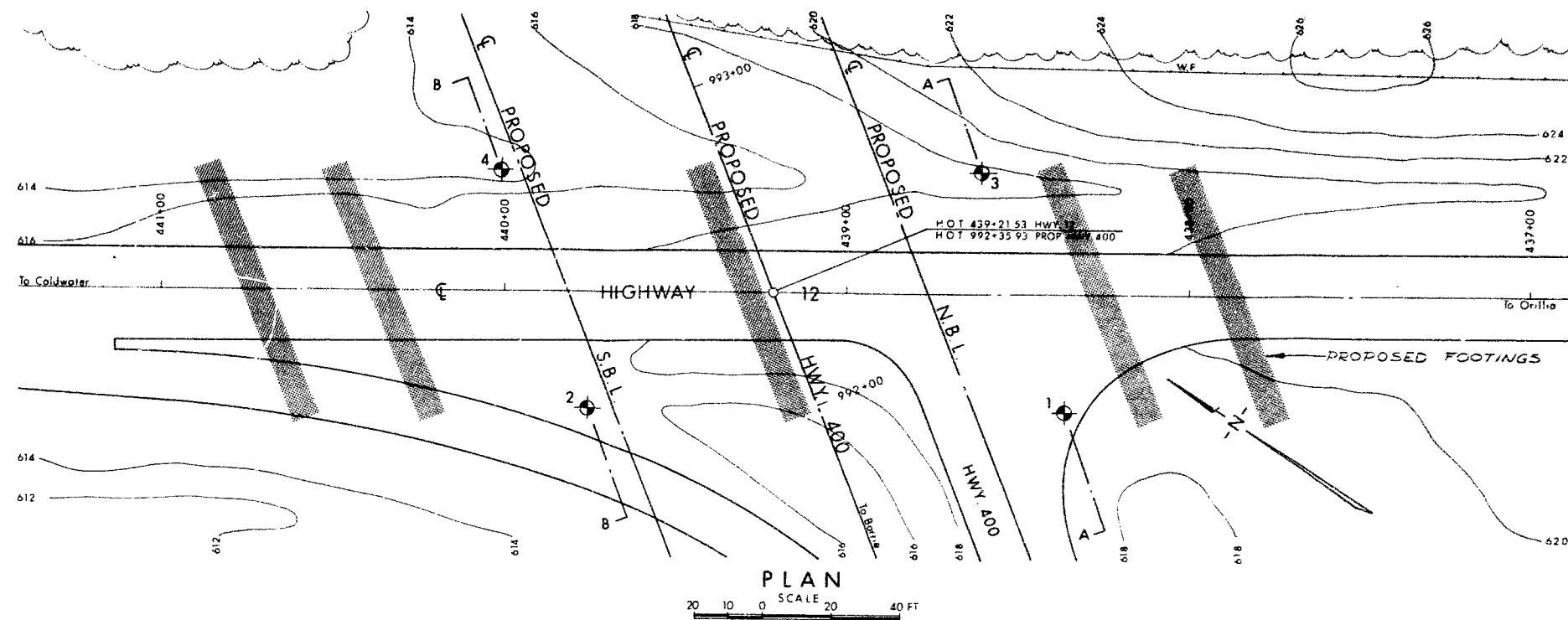
Excavations carried out below the groundwater level, will require a dewatering scheme in order to maintain a stable and safe excavation. Subsoil consists of granular type material and is highly susceptible to conditions of unbalanced hydrostatic head. Under such conditions, the excavation bases will be likely to 'boil'. This must be prevented by means of a suitable dewatering scheme involving wellpoints, or by other means, such as excavating within a steel sheet cofferdam. If the latter method is used, sheeting should be pre-driven to a depth below the excavation base equal to the height of the prevailing groundwater level above it.

3. MISCELLANEOUS:

The field work for this project was carried out in May 1960, under the supervision of Project Foundation Engineer Mr. F. Norman. This report was written by Mr. K. G. Selby, Supervising Foundation Engineer.

October 1969

APPENDIX I.



LEGEND			
	Bore Hole		
	Cone Penetration Hole		
	Bore & Cone Penetration Hole		
	Water Levels established at time of field investigation, MAY 1960		
NO.	ELEVATION	STATION	OFFSET
1	618.0	436+36	35' LT
2	617.0	439+76	35' LT
3	623.5	438+61	35' RT
4	616.0	440+01	35' RT

**- NOTE -**

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

REVISIONS	DATE	BY	DESCRIPTION

SUPERCEDES DRAWING NO. 60-F-484

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING OFFICE - FOUNDATION SECTION

**HIGHWAY No 12**

KING'S HIGHWAY NO. 400 DIST. NO. 5

CO. SIMCOE

TWP. MEDONTE LOT 19 CON. 11 & 12

**BORE HOLE LOCATIONS & SOIL STRATA**

SUSAN D. K. S. CHECKED: [Signature] W.P. NO. 906-66-02 M.B.T. DRAWING NO.

DRAWN S.C. CHECKED: [Signature] JOB NO. 69-F-79 69-F-79A

DATE 22 SEPT 1969 SITE NO. BRIDGE DRAWING NO.

APPROVED: [Signature] CONT. NO.

## ABBREVIATIONS USED IN THIS REPORT

### PENETRATION RESISTANCE

STANDARD PENETRATION RESISTANCE 'N' - 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 :-

<u>CONSISTENCY</u>	<u>'N' BLOWS / FT.</u>	<u>c LB. / SQ. FT.</u>	<u>DENSENESS</u>	<u>'N' BLOWS / FT.</u>
VERY SOFT	0 - 2	0 - 250	VERY LOOSE	0 - 4
SOFT	2 - 4	250 - 500	LOOSE	4 - 10
FIRM	4 - 8	500 - 1000	COMPACT	10 - 30
STIFF	8 - 15	1000 - 2000	DENSE	30 - 50
VERY STIFF	15 - 30	2000 - 4000	VERY DENSE	> 50
HARD	> 30	> 4000		

### TYPE OF SAMPLE

S.S	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.B.	SCRAPER BUCKET SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE
S.T.	SLOTTED TUBE SAMPLE		
	P.H. SAMPLE ADVANCED HYDRAULICALLY		
	P.M. SAMPLE ADVANCED MANUALLY		

### SOIL TESTS

Qu	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Qcu	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Qd	DRAINED TRIAXIAL	S	SENSITIVITY

## ABBREVIATIONS USED IN THIS REPORT

### SOIL PROPERTIES

$\gamma$	UNIT WEIGHT OF SOIL (BULK DENSITY)
$\gamma_s$	UNIT WEIGHT OF SOLID PARTICLES
$\gamma_w$	UNIT WEIGHT OF WATER
$\gamma_d$	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
$\gamma'$	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
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
$\tau_f$	SHEAR STRENGTH
$c'$	EFFECTIVE COHESION INTERCEPT
$\phi'$	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
$c_u$	APPARENT COHESION
$\phi_u$	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
$\mu$	COEFFICIENT OF FRICTION
$S_t$	SENSITIVITY

### GENERAL

$\pi$	= 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
$\sigma$	NORMAL STRESS
$\sigma'$	NORMAL EFFECTIVE STRESS ( $\bar{\sigma}$ IS ALSO USED)
$\tau$	SHEAR STRESS
$\epsilon$	LINEAR STRAIN
$\gamma$	SHEAR STRAIN
$\nu$	POISSON'S RATIO ( $\mu$ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
$\eta$	COEFFICIENT OF VISCOSITY

### EARTH PRESSURE

d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
$\delta$	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
$K_0$	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
$\beta$	ANGLE OF SLOPE TO HORIZONTAL

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. Stermac,  
Principal Foundation Engineer,  
Room 107, Lab. Building

FROM: C.S. Grebski,  
Bridge Office

ATTENTION:

DATE: December 19, 1969

OUR FILE REF.

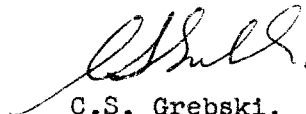
IN REPLY TO

SUBJECT: Hwy. No. 12 Interchange Underpass  
W.P. 906-66-02, Site 30-362  
Highway 400, District No. 5

69-F-79

Attached herewith we are submitting the final bridge drawings which show the foundation design for this structure.

Kindly give us your comments at your earliest convenience.



C.S. Grebski,  
Bridge Design Engineer

CSG:rd

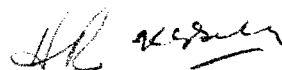
Attach.

c.c. Foundation Section

Steel H-piles used for foundation  
for tie pier  
Pile lengths O.K. Pile cap will be founded  
below G.W.L. and will require a  
dewatering scheme.

AR

5/11/70



69-F-79 ACB  
-1-  
R. M. DEVATA,  
SUPERVISING FOUNDATION ENGINEER  
MATERIALS AND TESTING.  
FOUNDATION SECTION  
KEELE ST. AND HWY. #401  
DOWNSVIEW, ONTARIO

MAY 18, 1971

RE: ACCIDENT ON DARLINGTON BAY.

FROM: SHAHEEN A. AHMAD, (PROJECT FOUNDATION ENGINEER)

The accident occurred approximately at 2:30 PM EDTA <sup>May 17</sup> when I was talking with you on the telephone, which meant that I was not present at the site at the time of the accident. After completing our conversation I returned to the site. Just as I reached there I saw the flagman <sup>top</sup> one of the shooters (Bill Millward) out of the water and the other shooter (Roger Lunt) was walking behind. Both shooters were soaking wet as well as Mr. Esbensen. The shooters had injuries to their legs and were bleeding quite a bit. An ambulance was called but I took them to the hospital in my car. (For complete details of injuries see subsection below).

At the site, at the time of the explosion, the following people were present:

Mr. V. Esbensen	(Norm Paterson & Associates)
Mr. W. Millward	( " " " " )
Mr. R. Lunt	(Dept. of Highways, Ont)
* Flagman #1	" " " "
* Flagman #2	" " " "

\* At the time of writing this report the names of the flagmen were not known to me.

Mr. J. Konantz (Canadian Longyear Ltd)  
Mr. A. Perron ( " " " )

Of the above seven men, the two flagmen and Mr. Joe Konantz claimed that they did not see or heard anything before the explosion. My brief interview with the other four men is as follows:

1. With Mr. W. Millward,

The practice was that the ~~shooters~~ were shooting every 20 feet and ~~a~~ along a line ~~but~~ marked out with a rope. They were lowering dynamite + cap into the water and signalling to the geophysicist, who would then fire. Mr. Lunt's job was to take out the dynamite, place the cap in place and give it to Mr. W. Millward. At this point they were using 2 sticks of dynamite. Mr. Lunt had placed the dynamite with caps. In the meanwhile the boat had drifted away from the line. They were trying to get back on line, when Mr. Esbensen blew the whistle, to alert the flagmen and fired. The two sticks of dynamite were still in the boat. With the explosion the men <sup>blew</sup> jumped off the boat and swam to the bridge pier located some 20 feet from where the explosion occurred.

It should be added that I talked to Mr. W. Millward while he was in the hospital.

Signed W. Millward

2. With Mr. Roger Lunt,

Mr. Lunt's story was identical to Mr. Millward. Again, I talked to Mr. Lunt in the Hospital.



● With Mr. Vic. Esbensen:

Mr. Esbensen told me that he heard Mr. W. Millward say something which he thought meant that he was ready. Exactly what Mr. Millward said could not be recalled by Mr. Esbensen because of the noise of the drilling machine. A few seconds after he thought he heard something the machine (drilling) stopped. (This was the procedure adopted). He blew the whistle to notify the flagnen, then fired. Heard a much louder blast and saw the men swimming, Mr. Esbensen jumped in to help.

4. With Mr. A. Perron:

● Atfit. Mr. Perron was on the raft with drilling. He claimed he heard Mr. Millward say "O.K." He was not sure, whether he was walking to the other shooter or giving a signal for being ready. The drilling machine was shut off, then he heard the blast. Simultaneous with the blast he heard Mr. Millward say "wait". The boat sank almost instantaneously. The men swam toward the bridge.

INJURIES.

Mr. W. Millward was badly cut in his right ~~leg~~ foot. He also had a deep cut in his left arm above the elbow. There were many other ~~injuries~~ cuts and bruises on his arm and right leg. The doctor at Kenora General Hospital informed me that Mr. Millward had many broken bones in his foot and that he was being sent to Winnipeg General Hospital by ambulance to be operated by a specialist.

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Mr. Roger Lunt had a cut to his right leg by a wire that had penetrated in that area. The wire was taken out by the doctor and he was stitched up. Mr. Lunt had a few cuts and bruises on his face and arm. The doctor sent Mr. Lunt home at 4:15 PM E.D.T. the same day.

Mr. V. Esbensen was treated for shock and cold. He was sent back at 5:00 PM on the same day.

#### PROPERTY DAMAGE.

In the course of the explosion the following items were lost:

- 1) A boat (rented from Imperial Marine by Canadian Longyear Ltd).
- 2) A motor for boat ( " )
- 3)  $\frac{1}{2}$  to  $\frac{3}{4}$  case of dynamite
- 4) 1 box of caps.
- 5) Some other & geophysical equipment.

I feel this report is complete in content. Any further information can be obtained from the parties mentioned above.

Shakeen Ahmed.  
(SHAHEEN A. AHMAD)  
PROS. FOUND. ENGR.

Mr. E. Zavitcki, Maintenance  
Engineer, Kenora District.

Mr. J. Coghill, Maintenance Office  
Supervisor, Kenora District.