

MEMORANDUM

To: Mr. B. R. Davis,
Bridge Engineer,
Bridge Division.

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

Attention: Mr. S. McCorbie

Date: August 19, 1965

Our File Ref.

IN REPLY TO

SUBJECT:

FOUNDATION INVESTIGATION REPORT

For

Proposed Crossing of Gravel Road and
Hwy. #401, County of Essex, Twp. of
Sandwich South, Lot 12, Con. 9 & 10.
District #1 (Chatham)

W.J. 65-F-69 -- W.P. 669-64

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

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

KYL/MdeF

Attach.

cc: Messrs. B. R. Davis (2)
H. A. Tregaskes
D. W. Farren
A. Gater
F. C. Brown
J. Roy
A. Watt

Foundations Office
Gen. Files

K. Y. Lo,
SUPERVISING FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

D.H.O.
TORONTO
RECEIVED
OCT 15 1965
BRIDGE
OFFICE

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FOUNDATION INVESTIGATION REPORT

For

Proposed Crossing of Gravel Road and
Hwy. #401, County of Essex, Twp. of
Sandwich South, Lot 12, Con. 9 and 10.
District #1 (Chatham)

W.J. 65-F-69 -- W.P. 669-64

1. INTRODUCTION:

A request to carry out a foundation investigation at a proposed gravel road and Hwy. #401 crossing, was received from Regional Bridge Location Engineer, Mr. N. Zoltay, dated May 7, 1965. It is proposed to erect a new bridge at this location to carry the gravel road over Hwy. #401. The site is located in the County of Essex, Twp. of Sandwich South, Lot 12, Con. 9 and 10, approximately 2.3 miles east of the intersection of Hwy's. #98 and #401. At this location the chainage of the gravel road is from 13+94 to 16+06.

In order to determine the soil properties and decide on the type of foundation, an investigation was carried out by this Section. Results and discussion of the field and laboratory investigations, as well as conclusions and recommendations for the future design work, are contained in the following paragraphs of this report.

2. DESCRIPTION OF SITE:

The site of the future bridge is located in the County of Essex, Twp. of Sandwich South, Lot 12, Con. 9 and 10, approximately

cont'd. /2 ...

2. DESCRIPTION OF SITE: (cont'd.) ...

2.3 miles east of the intersection of Hwy's. #98 and #401. The surrounding area is generally flat terrain.

Physiographically, the site is located in the so-called St. Clair Clay Plains.

3. FIELD AND LABORATORY WORK:

In order to obtain sufficient information on the type and properties of the subsoil, five sampled boreholes and five dynamic cone penetration tests were carried out at this site. Split-spoon and thin-walled samples were taken at various depth intervals. In-situ vane tests were performed in B.H. #3, 18" below the bottom of the thin-walled sampler, immediately after the samples were removed.

Samples recovered in the split-spoon and thin-walled samplers were used to determine the following physical properties:

1. Natural Moisture Contents
2. Bulk Densities
3. Grain Size Distribution
4. Atterberg Limits
5. Undrained Shear Strength
6. Consolidation Curves

Results of these laboratory tests are summarized in Appendix I of this report.

cont'd. /3 ...

4. SUBSOIL CONDITIONS:

4.1) General:

The stratigraphy of the soil at the site was found to be generally uniform. A detailed description of various soil types encountered during the investigation, is shown in Appendix I of this report, and is also given in subsequent paragraphs. The estimated stratigraphical profile shown on Dwg. No. 65-F-69A, is based upon this information.

4.2) Sandy Clayey Silt with Traces of Gravel - Stiff to Hard:

This layer starts at the surface and extends down to approx. El. 529.0 for a depth of about 83'-0" to 85'-0". It may be classified as stiff to hard with an average 'N' value of 26 blows/foot. 'N' values varied from 11 blows/foot to 67 blows/foot.

Liquid limits for this material varied from 20.0% to 44.5%, while plastic limits range from 11.6% to 23.3%. The average moisture content was found to be 18.5%, ranging from 9.2% to 32.4%. A typical Plasticity Chart is given in Appendix #1 of this report.

Grain size distribution curves indicated that this stratum is composed of 47% silt, 25% sand, 24% clay, and the rest of 4%, is gravel. In-situ vane and unconfined shear tests carried out in this material showed some disagreement. From the vane results, it is estimated that the shear strength of this stratum varies from 1,360 lbs./sq.ft. to over 2,000 lbs./sq.ft.

Consolidation tests carried out on the material, show that this stratum is overconsolidated.

cont'd. /4 ...

4. SUBSOIL CONDITIONS: (cont'd.) ...

4.3) Silty Clayey Sand (Glacial Till) - Very Dense:

Immediately below the sandy clayey silt is a layer of silty clayey sand (glacial till). It may be classified as very dense with an average 'N' value in excess of 150 blows/foot.

5. GROUND WATER CONDITIONS:

The ground water level, at the time of the investigation, was found to be between the elevation 597.0 and 599.0. It may be assumed that the ground water level will vary with the seasons of the year.

No artesian water conditions were encountered.

6. DISCUSSION AND RECOMMENDATIONS:

As was described in the previous paragraphs, the subsoil basically consists of sandy clayey silt with traces of gravel with a relative density ranging from stiff to hard, followed by very dense clayey silty sand (glacial till). The investigation has revealed that within the upper 20 feet of the deposit, the properties are such that adequate support for spread footings could be obtained. It is recommended to place the footings approximately 5'-0" below existing original ground levels at the approximate El. 608.0. Net allowable pressure of 2.5 t.s.f. may be assumed for design purposes.

If perched abutments are used, they may be founded within the approach fills on 12 $\frac{3}{4}$ " x $\frac{1}{4}$ " steel tube piles driven to approx.

cont'd. /5 ...

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

El. 600.0. A design load of 40 tons per pile may be used in this event.

see letter 207/0

Since the subsoil consists of relatively impervious material and the water level is low, dewatering should not present problems. No stability problems are anticipated with the approach fills.

7. SUMMARY:

1) The stratification of the soil, which consists of sandy clayey silt with traces of gravel, followed by clayey silty sand (glacial till), is quite uniform. The density of the material encountered, varies from stiff to hard.

2) Because of the stiffness of the upper layers, spread footings may be used for the proposed piers with a design load of 2.5 t.s.f.

3) If perched abutments are used, they may be founded within the approach fills on $12\frac{3}{4}" \times \frac{1}{4}"$ steel tube piles driven to approx. El. 600.0. A design load of 40 tons per pile may be used in this event.

4) Dewatering of the excavations should not present major problems.

5) No stability problems are anticipated for the approach fills.

cont'd. /6 ...

8. MISCELLANEOUS:

The field work, performed during the period from June 23 to June 28, 1965, together with the preparation of this report, was undertaken by Mr. W. W. Kulmatickas, Project Foundation Engineer. The investigation was carried out under the general supervision of Mr. K. G. Selby, Senior Foundation Engineer, who also reviewed this report.

August 1965

APPENDIX I.

DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 65-F-69

LOCATION Hwy #401 & Gravel Rd Ch 16/06 17'-0" Lt.

ORIGINATED BY W.W.K.

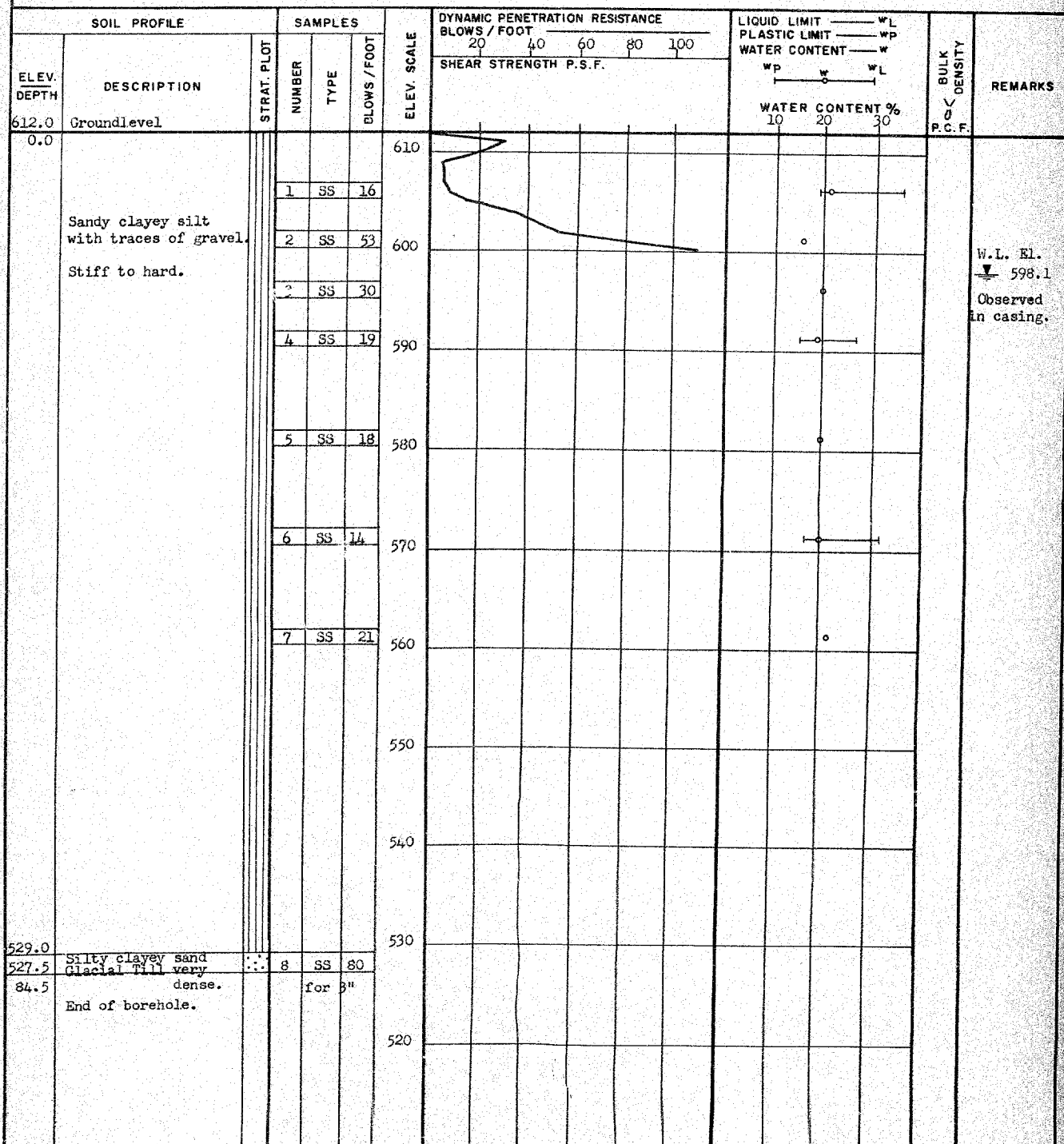
W.P. 669-64

BORING DATE June 23 & 24, 1965

COMPILED BY W.W.K.

DATUM 612.0

BOREHOLE TYPE Washboring NX Casing.

CHECKED BY *W.W.K.*

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 65-F-69LOCATION Hwy. #401 & Gravel Rd Ch 15/71 17'-0" Rt.ORIGINATED BY W.W.K.W.P. 669-64BORING DATE June 24 & 25, 1965.COMPILED BY W.W.K.DATUM 614.0BOREHOLE TYPE Washboring NX Casing.CHECKED BY W.W.K.

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	WP	WL		
614.0	Groundlevel										
0.0											
	Sandy clayey silt with traces of gravel. Stiff to hard.		1	SS	11						
			2	SS	67						
			3	SS	24						
			4	SS	18						
			5	SS	14						
567.5			6	SS	16						
46.5	End of borehole.										

W.L. El. 598.0
Observed in casing.

DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 3

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 65-F-69

LOCATION Hwy. #401 & Gravel Rd Ch 15/00 17'-0" Lt.

ORIGINATED BY W.W.K.

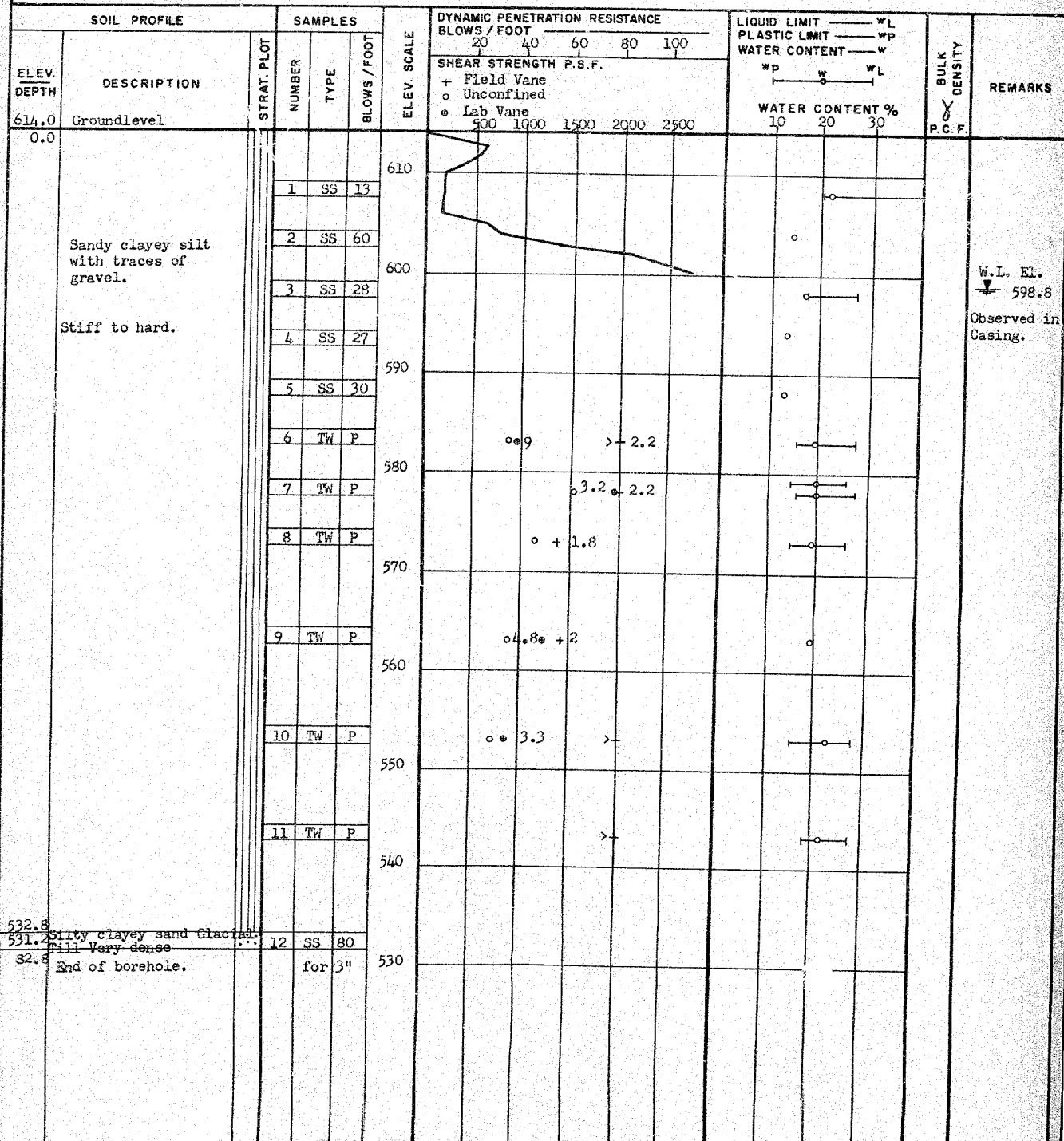
W.P. 669-64

BORING DATE June 29 & 30, 1965.

COMPILED BY W.W.K.

DATUM 614.0

BOREHOLE TYPE Washboring NX Casing.

CHECKED BY *W.W.K.*

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

JOB 65-F-69 LOCATION Hwy. #401 & Gravel Rd Ch 1A/29 17'-0" Rt. ORIGINATED BY W.W.K.
W.P. 669-64 BORING DATE June 25, 1965. COMPILED BY W.W.K.
DATUM 614.0 BOREHOLE TYPE Washboring NX Casing. CHECKED BY dl

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 SHEAR STRENGTH P.S.F.	LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W Wp — W — WL WATER CONTENT % 10 20 30	BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE					
614.0	Groundlevel								
0.0	Sandy clayey silt with traces of gravel. Stiff to hard.		1	SS	18				
			2	SS	59				
			3	SS	23				
			4	SS	17				
			5	SS	17				
567.5			6	SS	15				
46.5	End of borehole.								

W.L. El. 598.3
Observed in Casing.

DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 65-F-69

LOCATION Hwy. #401 & Gravel Rd Ch 14/29 17'-0" Rt.

ORIGINATED BY W.W.K.

W.P. 669-64

BORING DATE June 25, 1965.

COMPILED BY W.W.K.

DATUM 614.0

BOREHOLE TYPE Washboring NX Casing.

CHECKED BY *dl*

SOIL PROFILE

SAMPLES

DYNAMIC PENETRATION RESISTANCE

BLOWS / FOOT

20 40 60 80 100

SHEAR STRENGTH P.S.F.

LIQUID LIMIT — WL

PLASTIC LIMIT — WP

WATER CONTENT — W

wp — w — WL

WATER CONTENT %

10 20 30

BULK
DENSITY
P.C.F.

REMARKS

ELEV.
DEPTH

DESCRIPTION

STRAT. PLOT

NUMBER

TYPE

BLOWS / FOOT

ELEV. SCALE

614.0
0.0

Groundlevel

Sandy clayey silt
with traces of
gravel.

Stiff to hard.

1 SS 18

2 SS 59

3 SS 23

4 SS 17

5 SS 17

6 SS 15

610

600

590

580

570

560

W.L. EL.

598.3

Observed in
Casing.567.5
46.5

End of borehole.

DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 65-F-69

LOCATION Hwy. #401 & Gravel Rd Ch 13494 17'-0" Lt.

ORIGINATED BY W.W.K.

W.P. 669-64

BORING DATE June 28, 1965.

COMPILED BY W.W.K.

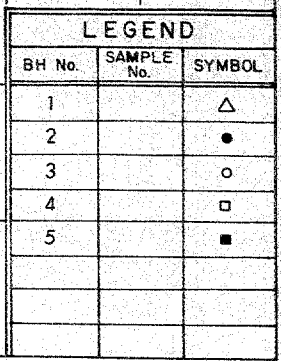
DATUM 612.0

BOREHOLE TYPE Washboring NX Casing.

CHECKED BY *HL*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	Wp	WL		
612.0	Groundlevel											
0.0												
			1	SS	23							
			2	SS	62							
			3	SS	20							
			4	SS	26							
			5	SS	19							
			6	SS	17							
			7	SS	16							
			8	SS	14							
			9	SS	14							
529.3			10	SS	71							
527.8	Glacial Till											
84.2	End of borehole.											

W.L. El. 597.0
Observed in Casing.



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

PLASTICITY CHART

W.P. No. 669 - 64

JOB No. 65 - F - 69

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

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
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
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
μ	COEFFICIENT OF FRICTION
S_t	SENSITIVITY

GENERAL

π	= 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e \sigma$ OR $\ln \sigma$	NATURAL LOGARITHM OF σ
$\log_{10} \sigma$ OR $\log \sigma$	LOGARITHM OF σ 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
$\bar{\sigma}$	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 (YOUNG'S 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_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
β	ANGLE OF SLOPE TO HORIZONTAL

MEMORANDUM

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

FROM: Bridge Division,
Downsview, Ontario.

DATE: May 7, 1965. 65-F-69

OUR FILE REF.

IN REPLY TO

SUBJECT:

W.P. 669-64, Site #6-239,
Sandwich South Twp. Rd.,
Underpass, Hwy. 401, District 1.

We are sending to you herewith two prints of Bridge Site Plan E-4350-1 on which we have marked in red the proposed location of the above structure.

The bridge site is readily accessible. It is 2.3 miles east of Hwy. 98. No problems are anticipated regarding the accommodation.

Please make the necessary arrangement for foundation investigation. We will be pleased to have your report in due course.

NZ/ag
c.c. S. McCombie
G. Scott
N. D. Smith
W. Kinnear

N. Zoltay
N. Zoltay,
for G. Scott,
Regional Bridge Location Engineer.

Rec May 11

Sept 1/65

MEMORANDUM:

Nov 1/65

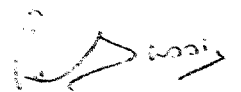
To File

RE: Proposed structures on Hwy. 401,
located 0.6 miles to 8.9 miles
East of Hwy. 98.
District No. 1, Chatham.
W.P. 127-64, 128-64, 129-64,
131-64, 132-64, 309-64, 310-64,
669-64 and 670-64.

At a meeting between Mr. M. Devata of Foundations Branch and K. Bassi of Bridge Division, concerning the above structures held on October 28, 1965 at the Bridge Office, it was agreed that:

1. The spread footings for all the piers can be designed for a bearing capacity of $2\frac{1}{2}$ tons/ft.².
2. The abutment piles for all the structures if driven in accordance with the recommendations given in the individual Foundation Reports, can be designed to carry 30 Tons/pile.
3. The structures should be designed to tolerate a maximum differential settlement between the abutments and shoulder piers in the order of 1 to $1\frac{1}{2}$ inches.

KGB/ag
c.c. A. G. Stermac
G. Scott


K. G. Bassi,
Bridge Project Engineer.

MEMORANDUM

To: Mr. S. McCombie,
Bridge Planning Engineer,
Bridge Division.

FROM: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Attn: Mr. G. Scott

DATE: December 14, 1965

OUR FILE REF.

IN REPLY TO

SUBJECT:

Preliminary Review of the Bridge Plans for the
Proposed Structures on Hwy. 401, located 0.6 miles
to 8.9 miles East of Hwy. 98, Hwy. 401, District
No. 1 (Chatham) - W.P. 127-64, 128-64, 129-64, 237
309-64, 310-64, 669-64, and 670-64.
6-242 6-238 6-239 6-240

BA 2145
2173
2153
2158
2154
2171
2102

We have reviewed the preliminary bridge drawings for
the above-mentioned structures. The foundation design for each
structure appears to comply with recommendations contained in
our foundation reports.

MD/MdeF

M. Devata

M. Devata,
SENIOR FOUNDATION ENGINEER

For:

A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Foundations Office

Gen. Files

copy handed to Designer. Dec 21/65

Bridge Division,
Downsview, Ontario,
November 1, 1965.

MEMORANDUM:

To File

RE: Proposed structures on Hwy. 401,
located 0.6 miles to 0.9 miles
East of Hwy. 93.
District No. 1, Chatham.
W.P. 127-04, 128-04, 129-04,
131-04, 132-04, 309-04, 310-04,
609-04 and 670-04.

At a meeting between Mr. N. Devata of Foundations Branch
and E. Bassi of Bridge Division, concerning the above structures
held on October 28, 1965 at the Bridge Office, it was
agreed that:

1. The spread footings for all the piers can be designed for
a bearing capacity of $2\frac{1}{2}$ tons/ft.².
2. The abutment piles for all the structures if driven in
accordance with the recommendations given in the indi-
vidual Foundation Reports, can be designed to carry
30 Tons/pile.
3. The structures should be designed to tolerate a maximum
differential settlement between the abutments and shoulder
piers in the order of 1 to $1\frac{1}{2}$ inches.

WCB/ug
c.c. E. G. Sternac /
G. Scott.

E. G. Bassi,
Bridge Project Engineer.

MEMORANDUM

TO: M. A. Stermac,
Principal Foundation Engineer,
Room 107, Lab. Bldg.

FROM: Bridge Division,
Downsview, Ontario.

DATE: December 3, 1965.

OUR FILE REF.

IN REPLY TO

SUBJECT:

W.P. 669-64, Site 6-239,
Sandwich South Twp. Road,
Concession X Underpass,
2.3 miles east of Hwy. 98,
Hwy. 401, District 1.

We are sending to you herewith one print of
Preliminary Plan D 5822-P1 of the above structure.

Would you please let us have your written
comments.



NZ/ag
c.c. S. McCombie
G. Scott

N. Zoltay,
for G. Scott,
Regional Bridge Location Engineer.

cc: Foundations Office (RM. 410)

Mr. S. McCombie,
Bridge Planning Engineer,
Bridge Division.

Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Attn: Mr. G. Scott

December 14, 1965

Preliminary Review of the Bridge Plans for the
Proposed Structures on Hwy. 401, located 0.6 miles
to 8.9 miles East of Hwy. 98, Hwy. 401, District
No. 1 (Chatham) - h.P. 127-64, 128-64, 129-64,
309-64, 310-64, 669-64, and 670-64.

We have reviewed the preliminary bridge drawings for
the above-mentioned structures. The foundation design for each
structure appears to comply with recommendations contained in
our foundation reports.

MD:MSF

M. Devata,
SENIOR FOUNDATION ENGINEER
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Foundations Office

Gen. Files

Foundations
Office

Mr. P. C. Brown,
District Engineer,
Chatham, Ontario.

Materials & Testing Division.

Attn: Mr. P. Peacock.

April 5, 1966.

Installation of Settlement Plates at the
Approach Fill Locations on Hwy. 401, Dist. #1.

Further to our telephone conversation, we are enclosing the list of various structure which are scheduled to be built in your district. We may wish to instrument some of these projects and request you to advise us at least two weeks prior to the commencement of approach fill construction of each project.

- WP127-64 County Rd. to Puce Interchange No. 4 3.9 Miles East of Hwy. 98.
- WP131-64 Sandwich S. Twp. Rd., Concession XI, Underpass 3.2 Miles East of Hwy. 98.
- WP132-64 Essex County Rd. 27 Underpass 1.5 Miles East of Hwy. 98.
- WP309-64 Maidstone Twp. Rd. Concession VII Underpass 7.1 Miles East of Hwy. 98.
- WP310-64 Maidstone Twp. Rd. Concession IX Underpass 5.4 Miles East of Hwy. 98.
- WP123-64 Maidstone Twp. Rd. Concession VI Underpass 3.0 Miles East of Hwy. 98.
- WP129-64 Maidstone Twp. Rd. Concession XII Underpass 6.3 Miles East of Hwy. 98.
- WP569-64 Sandwich S. Twp. Rd. Concession X Underpass 2.3 Miles East of Hwy. 98. 65-6-69
- WP670-64 Sandwich S. Twp. Rd. Concession XII Underpass 0.6 Miles East of Hwy. 98.

MD/tt
cc: Foundations Office
Gen. Files

M. Devata
SENIOR FOUNDATION ENGINEER

For: A. G. Sterzac
PRINCIPAL FOUNDATION ENGINEER

65-F-69

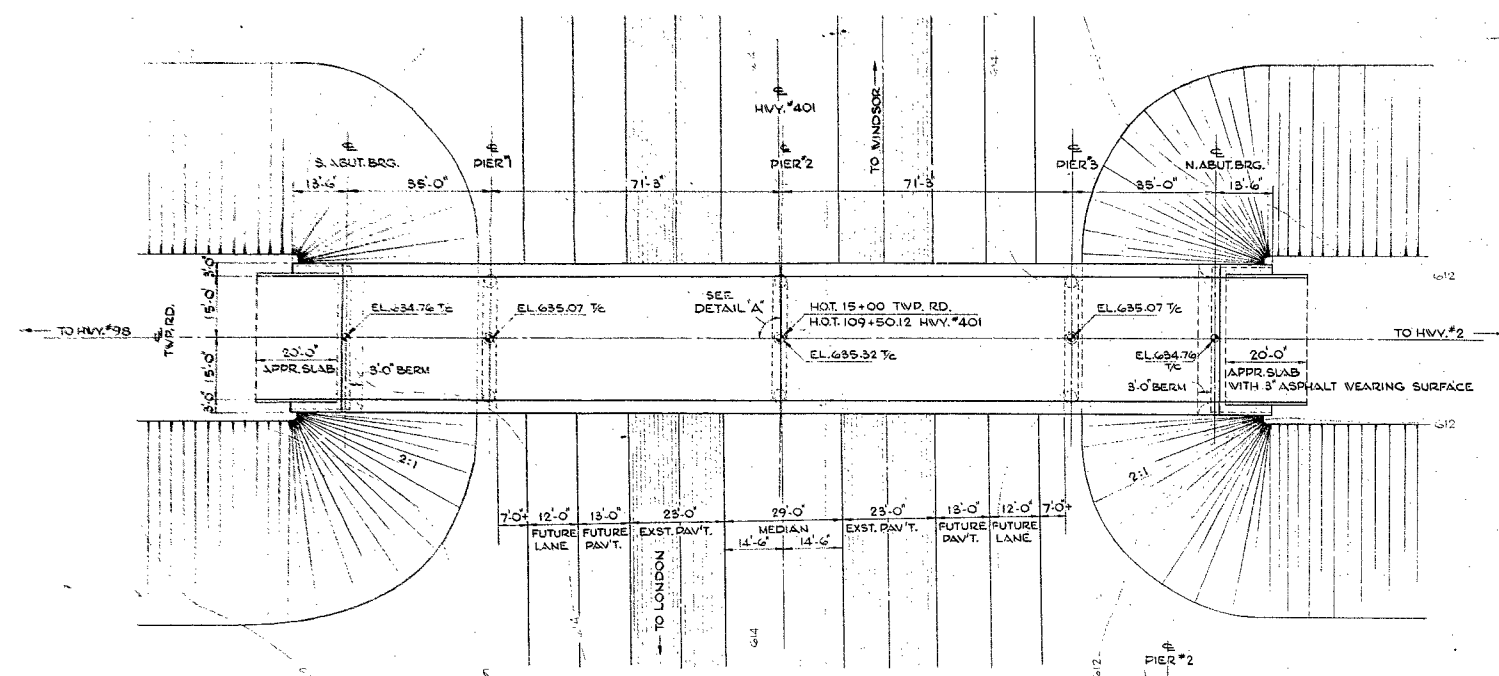
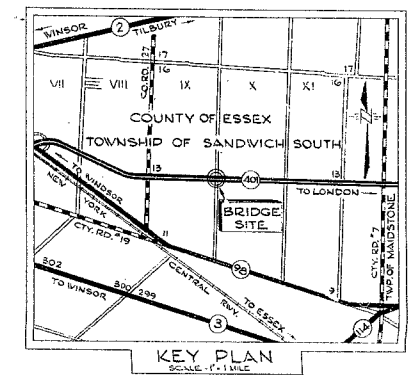
W.P. # 669-64

HWY. # 401 &

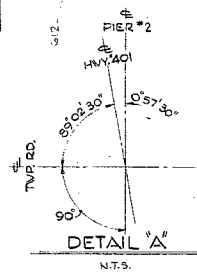
GRAVEL RD.

SANDWICH SOUTH

TWP.

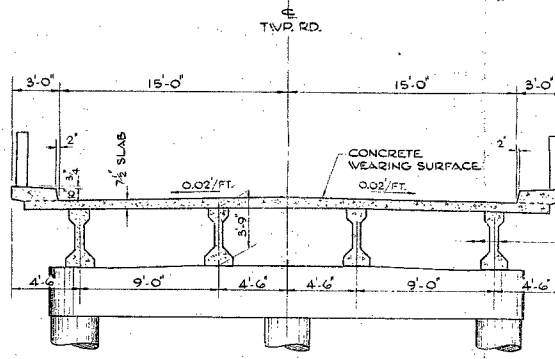


PLAN
SCALE - 1" = 20'-0"



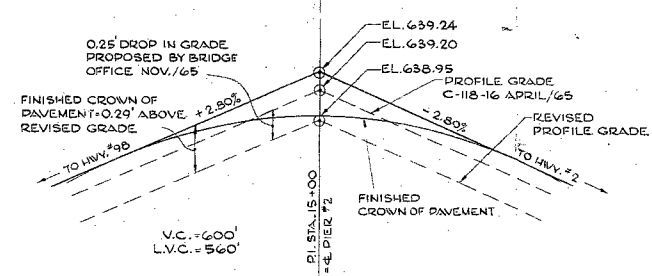
NOTES:
- STRUCTURE TO BE BUILT WITHOUT SKEW AND SQUARE TO TWP RD.
- 1/2" DENOTES ELEVATIONS ARE TO TOP OF CONCRETE WEARING SURFACE ON STRUCTURE

EAST



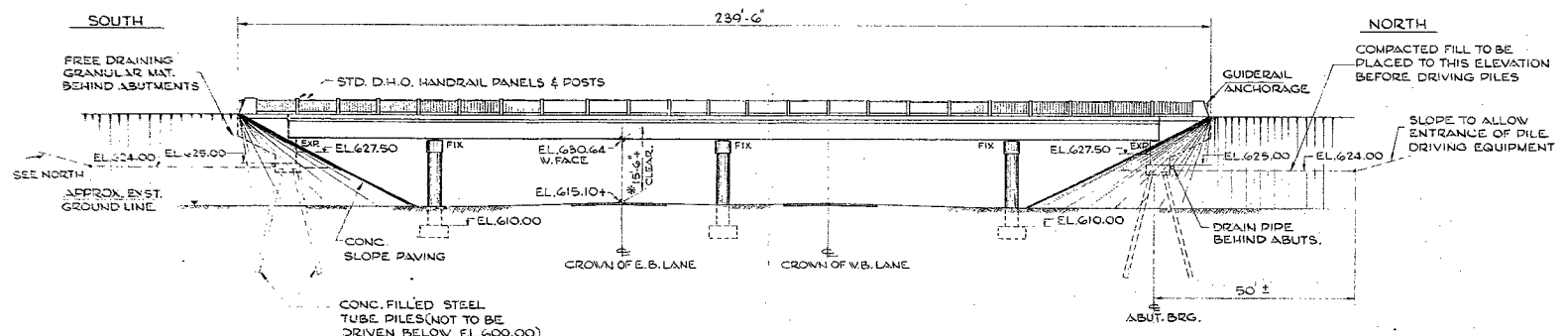
TYPICAL DECK SECTION
SCALE - 3/16" = 1'-0"

WEST



PROFILE OF TOWNSHIP RD.
N.T.S.

REFERENCE BENCH MARK
B.M. ELEVATION 612.27 GEODETIC DATUM
CUT "4" ON E. SIDE OF CONCRETE C.B. @ STA. 105+68 HWY. #401



ELEVATION
SCALE - 1" = 20'-0"

*CLEARANCE INCLUDES 3" ALLOWANCE FOR FUTURE RESURFACING OF HWY. #401

PRINT RECORD		
No.	FOR	DATE

REVISIONS	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION			
SANDWICH SOUTH TWP. RD. CONCESSION X UNDERPASS 2.3 MILES EAST OF HWY. 98 KING'S HIGHWAY No. M.-C. FREEWAY (401) DIST. No. 1 CO. ESSEX TWP. SANDWICH SOUTH LOT 12 CON. IX & X			
PRELIMINARY			
APPROVED	BRIDGE ENGINEER	SITE No.	W.P. No.
DESIGN	CHECK	6-239	669-64
DRAWING	CHECK	CONTRACT No.	
DATE	LOADING	DRAWING No.	
NOV./65	H20-S16		
		D-5822-PI	

