

G1-30 SEPT 1976

GEOCRES No. 40J14-92
DIST 2 REGION Southwestern
W.P. No. 41-66-14
CONT. No. 18-66
W. O No. _____
STR. SITE No. 19-539
HWY. No. 402
LOCATION Middlesex County Rd
15 Underpass

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

4

REMARKS: documents to be unfolded
before microfilming

FOUNDATION INVESTIGATION REPORT

for

Middlesex County Rd. 15 Underpass, Hwy. 402
Twp. of Delaware, Dist. 2, London
W.P. 41-66-14 Site 19-539

1. INTRODUCTION

A request for a foundation investigation at the above site was received from Mr. A.P. Watt, Regional Structural Planning Engineer, Southwestern Region, London.

A field investigation was subsequently carried out by the Soil Mechanics Section to determine the subsoil conditions existing at the site. This report contains the results of our field and laboratory investigations, together with our recommendations relating to the design of the proposed structure foundations.

2. DESCRIPTION OF THE SITE

The proposed underpass is located 5 miles west of Hwy. 4 where Hwy. 402 crosses Middlesex County Rd. 15. The surrounding area is flat farm land on which cash crops are grown.

Physiographically, the site is situated in an area referred to as the Caradoc Sand Plains.

3. FIELD AND LABORATORY INVESTIGATION PROCEDURES

Field work consisted of five sampled boreholes advanced employing hollow stem augers, as well as, five dynamic cone penetration tests.

Disturbed samples were obtained using a 2-inch O.D. split spoon sampler driven according to the specifications for the Standard Penetration Test.

All boreholes were surveyed in the field by personnel from London Region Engineering Surveys Section. The locations and elevations of the boreholes are shown on Drawing No. 416614-A which accompanies this report.

2

All samples were visually examined and classified at the site as well as in the laboratory. Following this inspection, laboratory tests were carried out on selected representative samples to determine the following physical properties:

Atterberg Limits
Natural Moisture Content
Grain-size Distribution

The test results are summarized on the Record of Borehole sheets contained in the appendix of this report.

4. SUBSOIL CONDITIONS

4.1) General

Subsoil at the site consists of a granular deposit approximately 15 feet in depth. This is underlain by about 25 feet consisting of layers of sand, silt and clayey silt. Beneath this is a deep deposit of over 100 feet of clayey silt.

4.2) Sand

The upper 15 feet consists of a compact to dense deposit of sand. Near the surface it is well graded and contains a trace of gravel. The sand however becomes finer and more uniform with depth until between 10 and 15 feet it is very fine and contains up to 40 per cent silt.

4.3) Layers of Sand, Silt and Clayey Silt

Underlying the sand is 25 to 30 feet of material consisting of layers of sand, silt, silt to clayey silt, and clayey silt. It has a stiff to hard consistency with 'N' values ranging from 8 to over 40.

4.4) Clayey Silt

This stratum extends from a depth of about 40 feet to greater than 145 feet. It has a hard consistency with Standard Penetration 'N' values between 40 and 60 to a depth of 140 feet. Below this depth there is an increase in gravel content and an increase in strength with an 'N' value well in excess of 100.

5. RECOMMENDATIONS

5.1) General

It is proposed to construct a two span structure to carry Middlesex County Rd. 15 over Hwy. 402. This will involve the construction of embankments approximately 24 feet in height and a bridge of two spans each of which will be 112' in length.

5.2) Spread Footings

Center Pier

It is recommended that the center pier be supported on spread footings at approximate elev. 760. A net safe bearing pressure of 2 tons per sq. ft. may be used for design purposes. Resistance to sliding may be determined using a friction coefficient of .45.

Perched Abutments on Compacted Fill

The abutments may be supported on spread footings placed on well compacted G.B.C. Class 'A'. A net safe design load of 2.5 t.s.f. may be assumed. For calculations of sliding resistances, a friction coefficient of 0.6 may be assumed to apply between the footing and G.B.C. Class 'A'. A detailed construction scheme is outlined on Fig. 1 of the appendix.

Settlement

Total short and long term settlement of 1-1/2 inches at the center pier and 3 inches at the abutments is anticipated.

5.3) Pile Footing Alternative

Any or all footings may be placed on piled foundations.

A design value of 30 tons per pile could be used for #14 'treated' timber piles driven to elevation 730. Alternatively steel tube piles driven to elevation 720 may be loaded to 35 tons per pile. It is anticipated that these values will be confirmed by pile loading tests to be carried out in the summer of 1975.

Settlements of approximately 1 inch may be expected for foundations of this type.

Steel H piles will reach their allowable structural loading capacity if driven to approximately elevation 620 some 140 feet below the ground surface, however we consider these long piles to be economically unfeasible.

5.4) Dewatering

The center pier footing will be constructed several feet below the maximum high water level in a highly permeable granular soil. If construction takes place during this period of high water a dewatering scheme such as sumps beyond the limits of the footing will be required.

5.5) Approach Embankments

No stability problems are anticipated with 24 ft. embankment fills if 2:1 slopes are employed. Care, however, should be taken that no material exceeding 3" grain size is placed in the fills at locations through which piles have to be driven.

5.6) Frost Protection

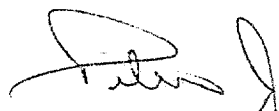
All pile caps or spread footings should be protected against frost action by a minimum 4 ft. of cover.

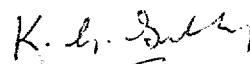
6. MISCELLANEOUS

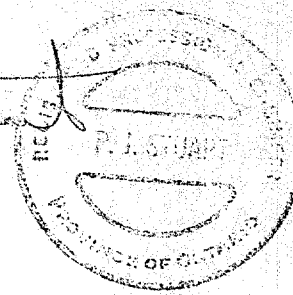
The field work on the project was carried out April 9 to 11, and May 8 to 14, 1975 under the supervision of Mr. P.J. Stuart, Project Foundation Engineer, who also prepared this report.

The equipment was owned and operated by PVK Drilling and Master Soils.

This report was reviewed by Mr. K.G. Selby, Supervising Foundation Engineer.


P.J. STUART
Project Engineer


K.G. SELBY
Supervising Engineer



ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 1

W.P. 41-66-14

LOCATION Co-ords. 15,588,295 N., 1,297,913E.

ORIGINATED BY PJS

DIST. 2 HWY. 402

BORING DATE April 10, 1975

COMPILED BY PJS

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY *CP*

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
762.5	Ground Level															
0.0	Well graded sand, some gravel Compact		1	SS	13	760										15 81 (4)
756.5			2	SS	22											
6.0	Fine sand some silt Compact		3	SS	15	750										
750.5			4	SS	18											
12.0	Layers of sand, silt, silt to clayey silt, and clayey silt, Very stiff to hard.		5	SS	23	740										0 12 65 23
			6	SS	26	730										
724.5			7	SS	58	720										3 19 49 29
38.0	Clayey silt some sand trace of gravel Hard		8	SS	43	710										
			9	SS	54	700										
						690										
						680										3 11 47 39
						670										
						660										

20
15 5 % STRAIN AT FAILURE
10

Continued

RECORD OF BOREHOLE No 1 Continued

W.P. 41-66-14

LOCATION Co-ords. 15, 588,295N., 1,297,913 E.

ORIGINATED BY PJS

DIST. 2 HWY. 402

BORING DATE April 10, 1975

COMPILED BY PJS

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY *JP*

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
658.5	Continued															
104.0	Clayey Silt Some Sand, Trace of Gravel Hard		10	SS	46	650										
638.7						640										
123.8	End of Borehole		11	SS	137											4 15 55 26

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 2

W.P. 41-66-14

LOCATION Co-ords. 15,588,400 N., 1,297,855 E.

ORIGINATED BY PJS

DIST. 2 HWY. 402

BORING DATE April 9, 1975

COMPILED BY PJS

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY 

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w w_p — w — w_L WATER CONTENT % 10 20 30	UNIT WEIGHT γ	REMARKS % GR. SA. SI. CL.
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES					
766.0	Ground Level									
0.0	Well graded sand some gravel, Compact		1	SS	29	760				
757.0			2	SS	24					8 89 (3)
9.0	Fine sand, some silt, Dense		3	SS	41					
750.0			4	SS	35	750				1 54 40 5
16.0	Layers of sand, silt, silt to clayey silt, and clayey silt Very Stiff to Hard		5	SS	18					
			6	SS	18	740				
737.0			7	SS	33					
29.0	End of Borehole									

ENGINEERING SERVICES BRANCH - GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 3

W.P. 41-66-14

LOCATION Co-ords. 15,588,508N., 1,297,819E.

ORIGINATED BY PJS


DIST. 2 HWY. 402

BORING DATE April 11, 1975

COMPILED BY PJS

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY 

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		2'0	4'0	6'0	8'0	10'0	w_p	w	w_L		
766.1	Ground Level															
0.0	Well graded sand some gravel Compact		1	SS	29	760										14 78 (8)
757.1			2	SS	28											
9.0	Fine sand some silt, Compact to dense			SS	26											
751.1				SS	38											0 62 (38)
				SS	15	750										
15.0	Layers of sand, silt, silt to clayey silt and clayey silt Stiff to Hard		6	SS	11											
			7	SS	11	740										0 0 79 21
			8	SS	41											
						730										
			9	SS	39											
720.1						720										
45.0	Clayey silt Trace of sand Hard		10	SS	68											
						710										
702.1			11	SS	53											1 4 50 45
64.0	End of Borehole Note: Water level not established															

RECORD OF BOREHOLE NO 4

W.P. 42-66-14

LOCATION Co-ords. 15,588,411 N., 1,297,905 E.

ORIGINATED BY PJS

DIST. 2 HWY. 402

BORING DATE May 14, 1975

COMPILED BY PJS

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L	
764.0	Ground Level														
0.0	Well graded sand some gravel Compact		1	SS	26	760									
757.0			2	SS	22										
7.0	Fine sand some silt loose to compact		3	SS	10										
752.0			4	SS	11										
12.0	Layers of sand, silt, silt to clayey silt and clayey silt Stiff to Hard		5	SS	6	750									
			6	SS	9										
			7	SS	10	740									
			8	SS	25										
			9	SS	47	730									
727.5			10	SS	28										
36.5	End of Borehole														

ENGINEERING SERVICES BRANCH - GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 5

W.P. 41-66-14

LOCATION Co-ords. 15,588,502 N., 1,297,876 E.

ORIGINATED BY PJS

DIST. 2 HWY. 402

BORING DATE May 8th, 9th, and 13th, 1975

COMPILED BY PJS

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY *CP*

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
764.5	Ground Level															
0.0	Well graded sand some gravel Dense to Very Dense		1	SS	43	760										
757.0			2	SS	30											
7.0	Fine sand some silt Compact		3	SS	19											
752.0			4	SS	23											
12.0	Layers of sand, silt silt to clayey silt, and clayey silt Stiff to Very Stiff		5	SS	7	750										
			6	SS	11											
			7	SS	8											
			8	SS	20	740										
			9	SS	19											
						730										
			10	SS	28											
719.5						720										
45.0	Clayey silt Hard		11	SS	36	710										
			12	SS	41	700										
						690										
			13	SS	41	680										
						670										
660.5																
104.0																

20
15 ϕ 5 % STRAIN AT FAILURE
10

Continued

ENGINEERING SERVICES BRANCH - GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 5 Continued

W.P. 41-66-14

LOCATION Co-ords. 15,588,502 N., 1,297,876 E.

ORIGINATED BY PJS

DIST. 2 HWY. 402

BORING DATE May 8th, 9th, and 13th, 1975

COMPILED BY PJS

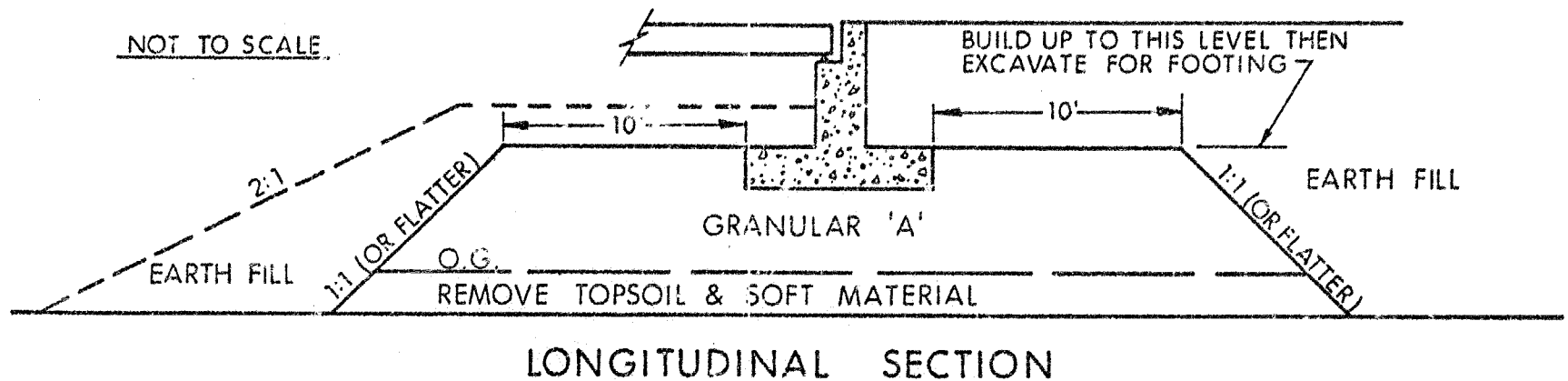
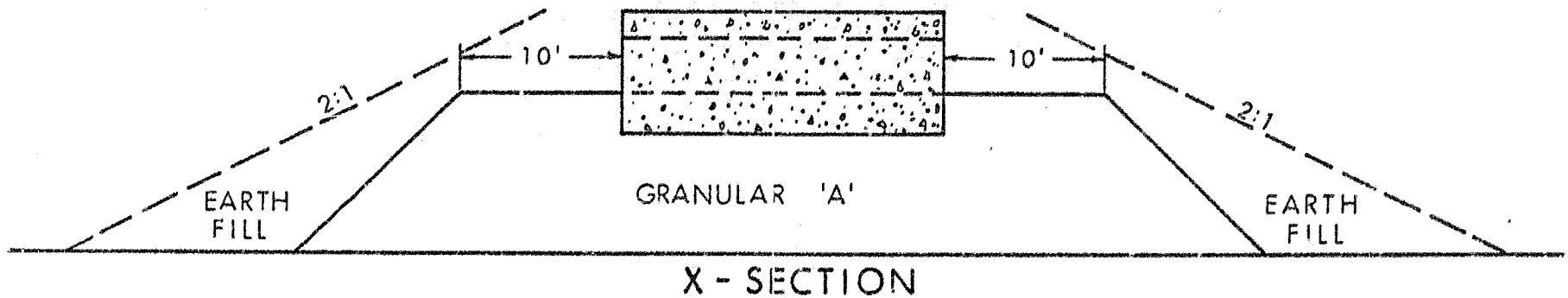
DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
660.5	Continued															
104.0	Clayey		14	SS	50	660										
	Silt					650										
	Hard					640										
			15	SS	88	630										
619.2			15	SS	200	620										
145.3	End of Borehole															
	Note - Water level not established.															

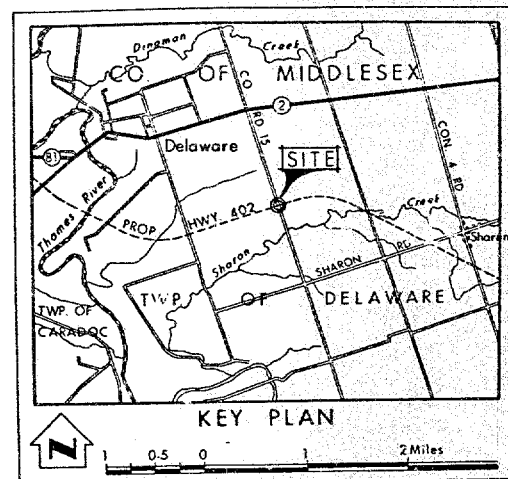
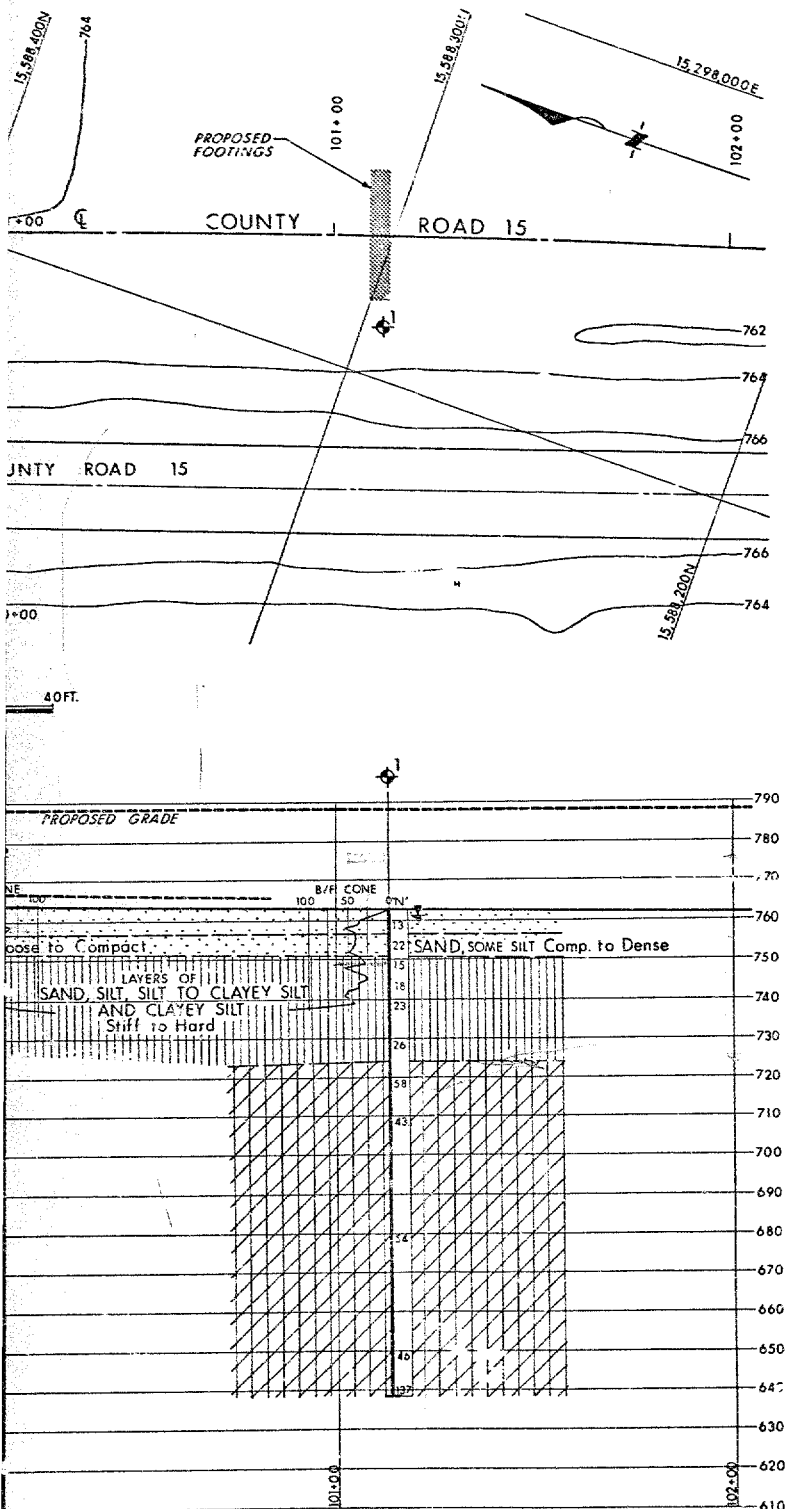
ABUTMENT ON COMPACTED FILL SHOWING GRANULAR 'A' CORE



NOTES

- 1 - REMOVE TOPSOIL &/OR SOFT SUBSOIL UNDER AREA OF COMPACTED GRANULAR 'A'.
- 2 - PLACE GRANULAR 'A' TO TOP OF FOOTING LEVEL, COMPACTED ACCORDING TO CURRENT M.T.C. STANDARDS.
- 3 - EXCAVATE COMPACTED GRANULAR 'A' MATERIAL FOR FOOTING.

FIG. 1



LEGEND			
	Bore Hole		
	Dynamic Cone Penetration Resistance Test		
	Bore Hole & Cone Test		
	Water Levels established at time of field investigation. April 1975 W.L. for B.H. #4, May 14, 1975 Water Level in B.H. #3 & 5 not established.		
NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	762.5	15,588,295	1,297,913
2	766.0	15,588,400	1,297,855
3	766.1	15,588,508	1,297,819
4	764.0	15,588,411	1,297,905
5	764.5	15,588,502	1,297,876

NOTE: FOR CONTRACT DOCUMENT

The complete foundation investigation report for this structure may be examined at the Structural Office and Foundations Office, Downsview, and at the LONDON District Office.

— 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
ENGINEERING SERVICES BRANCH—GEOTECHNICAL OFFICE—SOIL MECHANICS SECTION

COUNTY ROAD 15

HIGHWAY NO Prop. 402 LINE 'A' DIST. NO 2
CO MIDDLESEX
TWP DELAWARE LOT 8 CON II

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D P.I.S. CHECKED <input checked="" type="checkbox"/>	WP NO 41-66-14	DRAWING NO
DRAWN <input checked="" type="checkbox"/> CHECKED <input checked="" type="checkbox"/>	W.C. NO	416614-A
DATE June 5, 1975	SITE NO 19-539	BRIDGE DRAWING NO
APPROVED	CONT NO	

12483

Mr. A. Wittenberg,
Regional Manager,
Regional Planning & Design,
Southwestern Region, London.

Structural Office,
West Building, Downsview.

77 09 13

County Road 15 Underpass,
W.P. 41-66-14, Site 19-539,
Highway 402, District 2.

Please be advised of the following changes to the Bridge D4 and Material Supplied by M.T.C. to Contractor, recommended by Soils Mechanics Section.

Revise D4

1. Item #3 Driving Timber Piles
Change quantity 5315 to read 2256
2. Item #4 Cutting Off Tops of Timber Piles
Change quantity 121 to read 90

Materials Supplied by M.T.C. To Contractor

Revise Treated Timber Piles #14
72 pieces each 50'-0" long
49 pieces each 35'-0" long

To Read Treated Timber Piles #14
28 pieces each 24'-0" long
28 pieces each 25'-0" long
34 pieces each 26'-0" long

JS/KGB/cf

J. Szekeres,

for: K. G. Bassi,
Head, Eastern Region.

c.c. J. Keen
J. Wear
E. Willis
G. French
A. Watt
B. Giroux
A. McKim
E. Van Beilen
N. Zoltay
J. Meyer
Giffels Davis & Jorgensen

Mr. A. Wittenberg,
Regional Manager,
Regional Planning & Design,
Southwestern Region, London.

Structural Office,
West Building, Downsview.

77 09 13

Concession 1 Road Underpass,
W.P. 41-66-15, Site 19-538,
Highway 402, District 2.

Please be advised of the following changes to the Bridge D4
and Material Supplied by M.T.C. to Contractor, recommended by
Soil Mechanics Section.

Revise D4

1. Item #4, Driving Timber Piles
Change quantity 3150 to read 1610
2. Item #5, Cutting off Tops of Timber Piles
Change quantity 105 to read 65
3. Item #6 Reinforcing Steel (Bridge)
Change quantity 41 to read 42

Materials Supplied by M.T.C. to Contractor

Revise: #14 Treated Timber Piles
105 pieces, each 30 feet long

To Read: #14 Treated Timber Piles
29 pieces, each 22 feet long
36 pieces, each 27 feet long.

JS/KGB/cf

J. Szekeres,

for: K. G. Bassi,
Head, Eastern Section.

c.c. J. Keen
J. Wear
E. Willis
G. French
A. Watt
B. Giroux
A. McKim
E. Van Beilen
N. Zoltay
J. Meyer
R. Kan

Mr. A. Wittenberg,
Regional Manager,
Regional Planning & Design,
Southwestern Region, London.

Structural Office,
West Building, Downsview.

77 09 13

Broken Front Road Underpass,
W.P. 41-66-16, Site 19-537,
Highway 402, District 2.

Please be advised of the following changes to Bridge D4 and
Material Supplied by M.T.C. to Contractor, recommended by
Soil Mechanics Section.

Revise D4

1. Item No. 3 Driving Timber Piles
Change quantity 5015 to read 1914
2. Item No. 4 Cutting off Tops of Timber Piles
Change quantity 115 to read 66

Materials Supplied by M.T.C. to Contractor

Revise Treated Timber Piles #14
 66 pieces each 50'-0" long
 49 pieces each 35'-0" long

To Read Treated Timber Piles #14
 66 pieces each 29'-0" long

JS/XGB/cf

J. Szekeres,

for: K. G. Bassi,
 Head, Eastern Section.

c.c. J. Keen
 J. Wear
 E. Willis
 G. French
 A. Watt
 B. Giroux
 A. McKim
 E. Van Beilen
 N. Zoltay
 J. Meyer
 Giffels Davis & Jorgensen

Mr. A. Wittenberg,
Regional Manager,
Regional Planning & Design,
Southwestern Region, London.

Structural Office,
West Building, Downsview.

77 09 13

Highway 2 Interchange Overpass, EBL & WBL.,
W.P. 41-66-19 & -20; Site 19-535,
Highway 402, District 2.

Please be advised of the following changes to the Bridge D4
and Material Supplied by M.T.C. to Contractor, recommended by
Soil Mechanics Section.

Revise D4

1. Eastbound Lane Bridge W.P. 41-66-19

Item No. 3 Driving Timber Piles
change quantity 8407 to read 7040

2. Westbound Lane Bridge W.P. 41-66-20

Item No.17 Driving Timber Piles
change quantity 8212 to read 6906

Material Supplied by M.T.C. to Contractor.

1. Eastbound Lane Bridge W.P. 41-66-19

Revise: #14 Timber Piles
126 pieces each 50 ft. long
43 pieces each 49 ft. long

To Read: #14 Timber Piles
9 pieces each 37 ft. long
19 pieces each 38 ft. long
23 pieces each 39 ft. long
30 pieces each 40 ft. long
8 pieces each 42 ft. long
8 pieces each 43 ft. long
32 pieces each 44 ft. long
40 pieces each 45 ft. long

2. Westbound Lane Bridge W.P. 41-66-20

Revise #14 Timber Piles
 127 Pieces each 50 ft. long
 38 Pieces each 49 ft. long

To Read #14 Timber Piles
 10 pieces each 38 ft. long
 22 pieces each 39 ft. long
 49 pieces each 40 ft. long
 8 pieces each 42 ft. long
 8 pieces each 43 ft. long
 32 pieces each 44 ft. long
 36 pieces each 45 ft. long

JS/KGB/cf

J. Szekeres,

for: K. G. Bassi,
Head, Eastern Section.

c.c. J. Keen
 J. Wear
 E. Willis
 G. French
 A. Watt
 B. Giroux
 A. McKim
 E. Van Beilen
 N. Zoltay
 J. Meyer
 K. Pilgrim

Mr. K.C. Bassi
Structural Engineer
Structural Office
West Building, Downsview

Soil Mechanics Section
Engineering Materials Office
West Building, Downsview

77 08 29

Re: Pile Capacities - Hwy. 402 Structures
W.P. 41-66-14/15/16/19/20
District 2, London

A pile testing program in which 6 No. 14 treated timber piles were load tested to failure at sites located in Westminster and Delaware Townships has recently been completed by this Section. As a result of these tests we are revising recommendations contained in the foundation reports for the above mentioned projects which relate to pile lengths and pile capacities of No. 14 treated timber piles. Our new recommendations are as follows:

W.P. 41-66-14 - County Road 15

Safe Capacity Abuts. - 30 tons/pile
Pier - 40 tons/pile

Lengths Required N. Abut. - 25 ft.
Pier - 26 ft.
S. Abut. - 24 ft.

Note on Drawing Abuts. - drive to elev. 753
Pier - drive to elev. 735

W.P. 41-66-15 - Con. 1 Rd.

Safe Capacity 35 tons/pile

Lengths Required N. Abut. - 26 ft.
Pier - 22 ft.
S. Abut. - 26 ft.

Note on Drawing Abuts. - drive to elev. 740
Pier - drive to elev. 730

W.P. 41-66-16 - Broken Front Road

Safe Capacity 40 tons/pile

Lengths Required N. Abut. - 29 ft.
Pier - 29 ft.
S. Abut. - 29 ft.

Note on Drawing Abuts. - drive to elev. 720
Pier - drive to elev. 703

cont'd.....

W.P. 41-66-19/20 - Hwy. 2 (EBL and WBL Structures)

Safe Capacity - 35 tons/pile

Lengths Required - 38 ft. (all footings)

Note on Drawing - drive to elev. 658 (all piles)

The lengths as shown are for vertical piles and include about 2 feet extra to allow for cut-off of damaged tops. For piles which are battered, lengths should be increased accordingly.

If the foregoing recommendations are implemented the savings should be as follows:

W.P. 41-66-14	-	\$16,000
41-66-15	-	10,000
41-66-16	-	15,000
41-66-19	-	14,000
41-66-20	-	14,000
TOTAL	-	\$69,000

K.G. Selby
Supervising Engineer

KGS/gs

cc: B. Giroux
J. Keen
Files

MEMORANDUM

TO: Soil Mechanics Section
Southwestern Region
335 Saskatoon St., P.O. Box 6338
Postal Stn. D, LONDON, Ont.

FROM: Insurance & Claims Section
Downsview, Ontario M3M 1J8

ATTENTION: Mr. Peter Stuart ✓

DATE: June 11th, 1975

OUR FILE REF. No. 28-75-GL

IN REPLY TO

SUBJECT: Property Damage Report - May 16th, 1975 - involving property in District # 2, London, Highway # 402, Township of Delaware, Concession 2, Lot 8 & 9. Owner: M. Van de Male (A & M Sod)

We would request that a more comprehensive report be submitted than the one which was received on May 21st, 1975, regarding the above-mentioned incident. We enclose a photocopy of this report for your information.

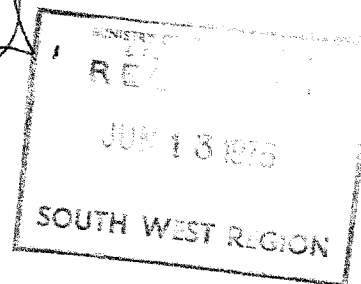
Please advise this Department of the name and address of the owner of the property that was damaged. We would also like to know if your section will be paying for the damage, and if there was an invoice submitted for the cost of replacing the damaged sod.

Please advise at your earliest possible convenience.

Encl.
GK/bg

G. Kleban
G. Kleban
Claims Assistant

Called Kleban and he will take care of claims



PROPERTY DAMAGE REPORT

REGION: SOUTHWESTERN

DATE: May 16, 1975

IDENTIFICATION OF:



OWNER



TENANT

NAME: M. Van de Male (company name - A & M Sod)

POST OFFICE ADDRESS:

RR 1 Delaware

LOCATION:

DISTRICT 2, London

HIGHWAY 402

TOWNSHIP, LOT AND CONCESSION ETC.

Twp. of Delaware, Concession 2 - Lot 8 & 9

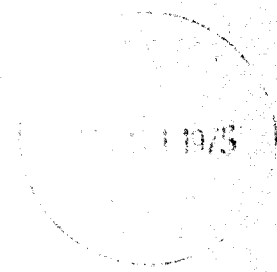
DETAIL OF DAMAGE:

DATE DAMAGE DONE: May 9 - 14, 1975

TYPE(S) OF DAMAGE: (CROP, TREES, FENCES, LAWNS, FLOWER BEDS, ORNAMENTAL PLANTINGS ETC.)

A bombardier mounted drill was used to advance 2 boreholes in a field of commercial sod. As a result, 2 patches of sod were damaged. One was 15 feet by 25 feet, the second was 10 feet by 20 feet.

DETAILED DESCRIPTION OF EACH TYPE OF DAMAGE: (USE ADDED SHEETS IF REQUIRED)



PROPERTY REQUEST

PARTY CHIEF

Peter Stuart

WORK ~~Added~~ Project 41-66-14

SECTION

Soil Mechanics Section

DOCUMENT VERIFICATION

GEOCRES No. 4014-92

DIST. 2 REGION Southwestern

W.P. No. 41-66-14

CONT. No. 78-66

W. O. No. _____

STR. SITE No. 19-539

HWY. No. 402

LOCATION Middlesex County Rd 15
Underpass

OVERLAY DRAWING TO BE USED FOR THIS REPORT 4

REMARKS: _____

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS ONTARIO DB-BE-15 4-72

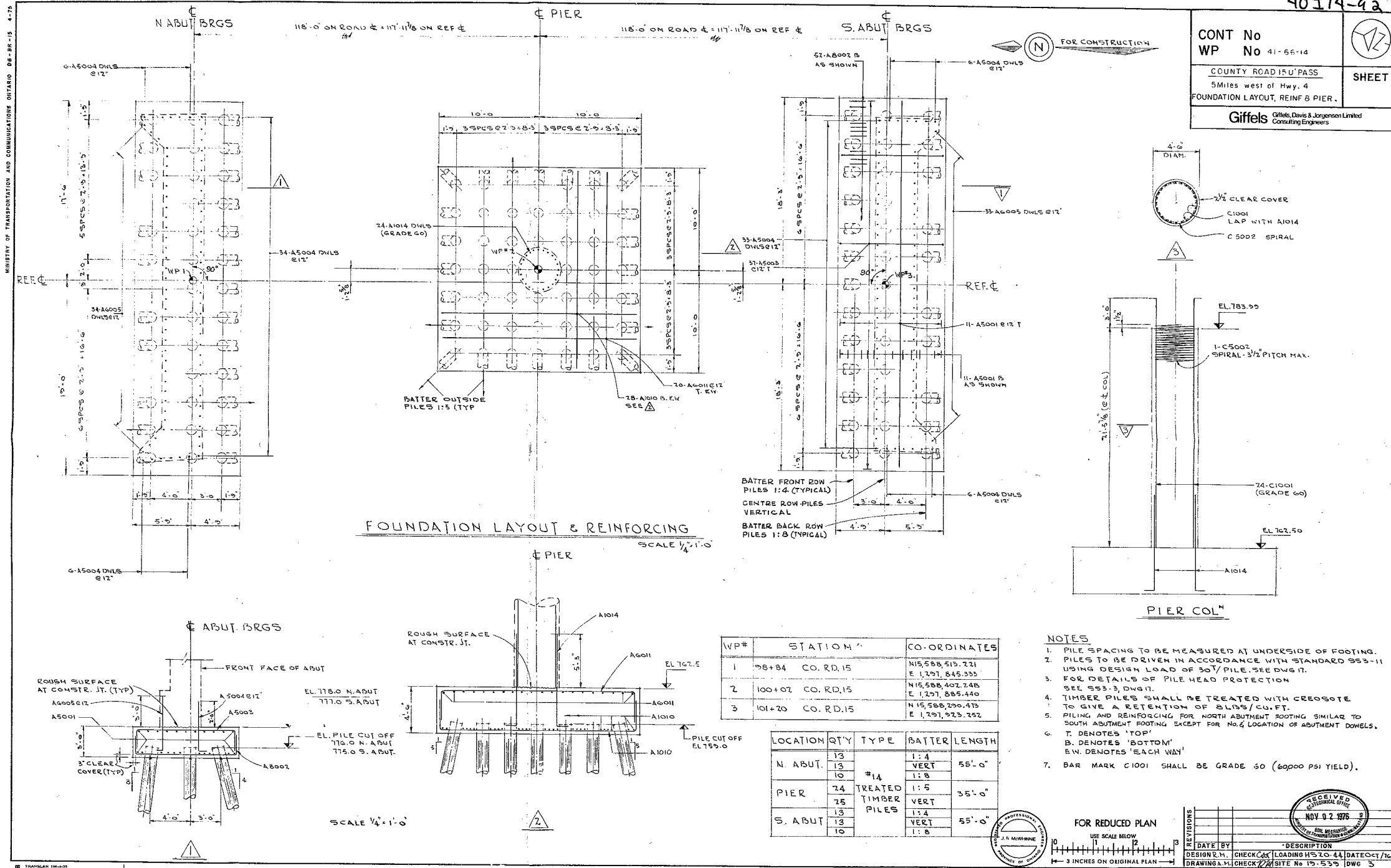
40114-92

CONT No
WP No 41-55-14

COUNTY ROAD 15 U/PASS
5 Miles west of Hwy. 4
FOUNDATION LAYOUT, REINF & PIER.

Giffels Giffels, Davis & Jorgensen Limited
Consulting Engineers

SHEET



18 TRANS-LINK 104-100



FOR REDUCED PLAN
USE SCALE BELOW
1" = 3' ON ORIGINAL PLAN

REVISIONS

DATE BY DESCRIPTION

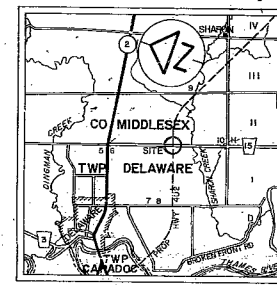
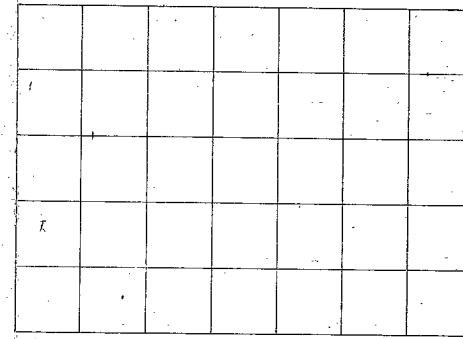
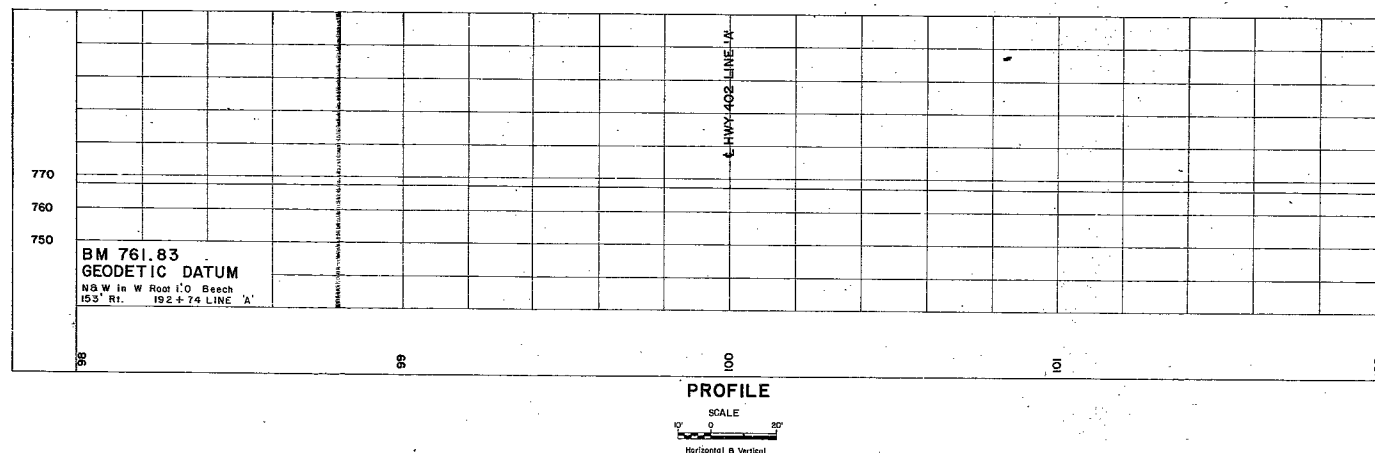
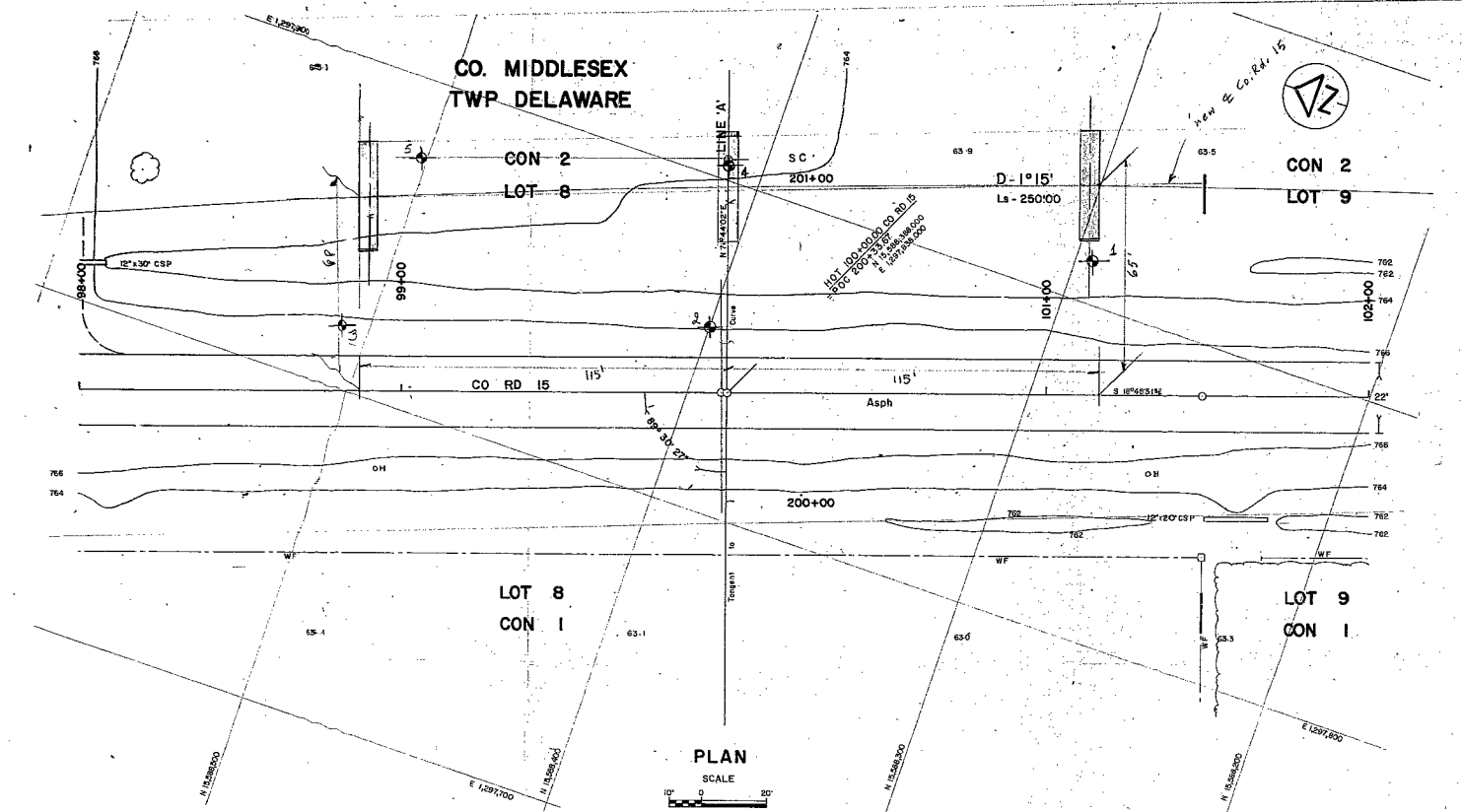
DESIGNER M. CHECKER A. CHECKER J. DATE OCT/16

DRAWING A. M. CHECKER J. SITE No 15-535 DWG 3

RECEIVED
NOV 02 1976
Giffels, Davis & Jorgensen Limited
Consulting Engineers

E-5369-1

E-5369-1



KEY PLAN
SCALE
1" = 100'

STR WP 41-66-14 4014-92			
DATE	REVISIONS & ADDITIONS	BY	CHKD
28/4/75 new & Co. Rd. 15			
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS ONTARIO DESIGN DIVISION DESIGN SERVICES BRANCH ENGINEERING SURVEYS OFFICE SOUTHWESTERN REGION			
BRIDGE SITE			
PROPOSED CROSSING AT COUNTY ROAD 15 AND PROPOSED KING'S HWY. 402 LINE 'A'			
LOT 8 TWP. DELAWARE		CON. 2 CO. MIDDLESEX	
SCALE AS SHOWN	DISTRICT 2 LONDON	REGION SOUTHWESTERN	
WP 41-66-03	Date of Survey Plan Nov. 1974	SITE 19-539'	
SURVEY BY Chief of Party W. FISCHER Supervisor R. AGNEW		DRAWN BY Draftsman J. BAXTER-DONNEN Supervisor O. SCHUR	
CHECKED BY Draftsman J. JANUJ Supervisor O. SCHUR		PLAN E-5369-1	

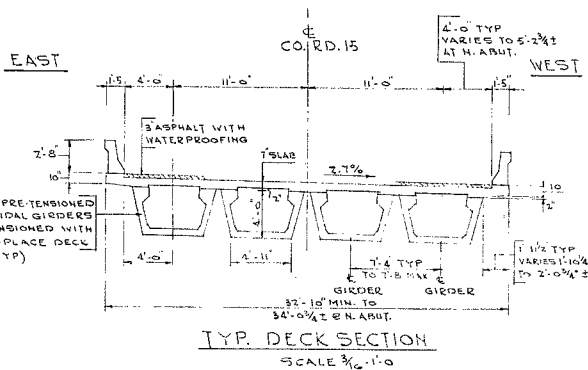
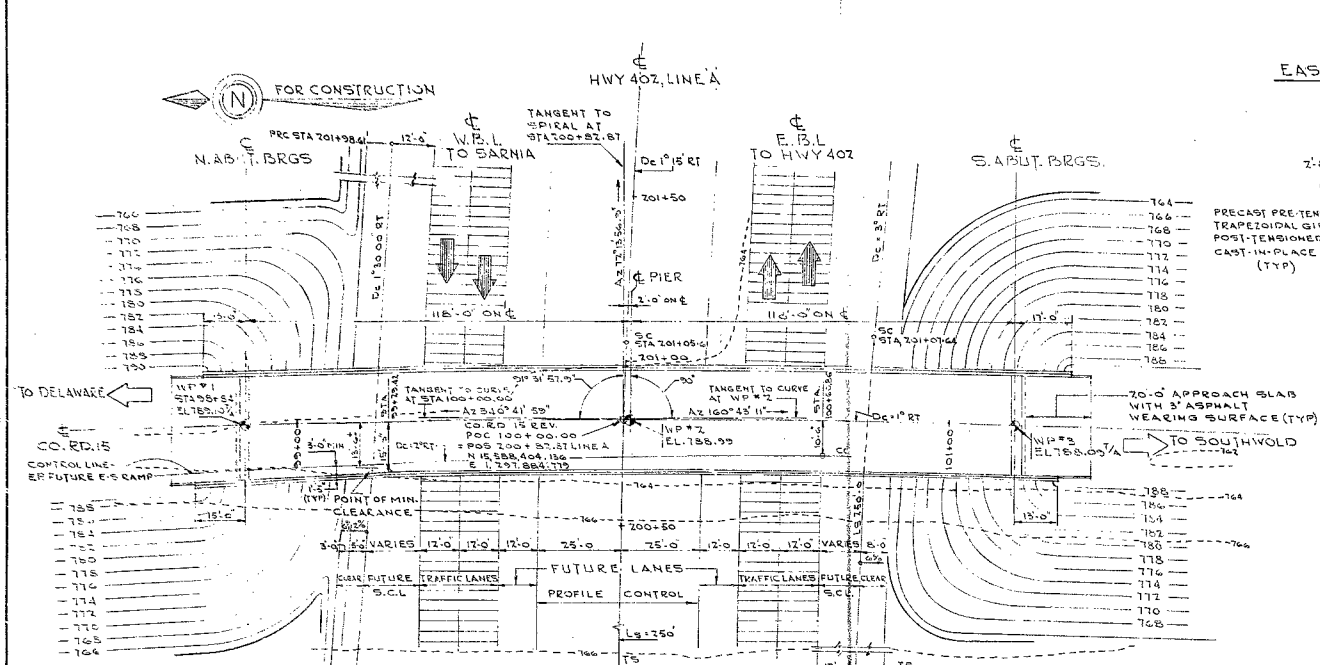


E-5369-1

E-5369-1

40714-92

DIST. 2	CONT No	SHEET
WP	No 41-66-14	
COUNTY ROAD 15 U-PASS		
5 Miles west of Hwy 4		
GENERAL PLAN		
Giffels Giffels, Davis & Jorgensen Limited Consulting Engineers		



REFERENCE BENCH MARK
B.M. 761.83
GEODETIC DATUM
N.G.V. IN V. ROOT 11.0 BECH
153 RT 132+74

LIST OF DRAWINGS

1. GENERAL PLAN
2. BORE HOLE LOCATIONS & SOIL STRATA
3. FOUNDATION LAYOUT, REINFORCING PIER
4. NORTH ABUTMENT & BEARINGS
5. SOUTH ABUTMENT & BEARINGS
6. GIRDER LAYOUT
7. GIRDER REINFORCEMENT
8. DECK REINFORCEMENT
9. TYPICAL VERTICAL PRESTRESS
10. DECK & PIER CAP REINFORCING
11. DECK & PIER CAP REINFORCING DETAILS
12. CONCRETE BARRIER WALL (2.5' HIGH)
13. STEEL PAVEMENT RAILING (SINGLE TUBE)
14. 20' FOOT APPROACH SLAB (BARRIER WALL)
15. DETAILS OF CONCRETE SLOPE PAVING
16. AS NOTED ELEVATIONS & DIMENSIONS
17. STANDARD DETAILS I
18. STANDARD DETAILS II
19. STANDARD DETAILS III

NOTES

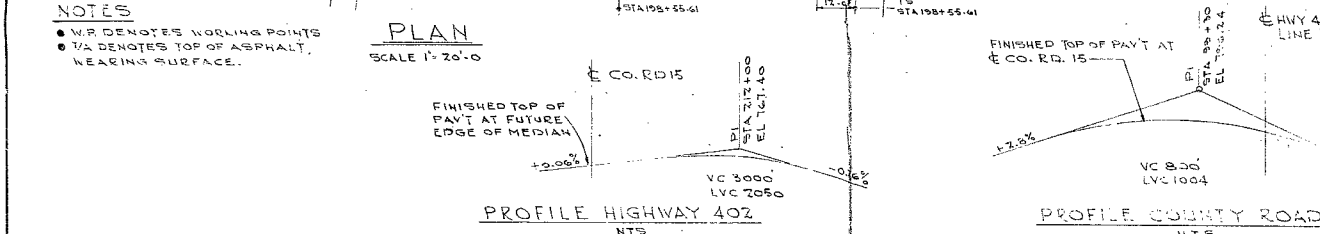
CLASS OF CONCRETE
DECK, BARRIER WALLS, & PIER COLUMN... 4000 PSI
PRECAST GIRDERS... 6000 PSI
REMAINDER... 3000 PSI

REINFORCING STEEL GRADE
DECK SLAB TRANSVERSE BARS & PIER COLUMN VERTICAL BARS... 60
PRECAST GIRDERS... 40
REMAINDER... 50

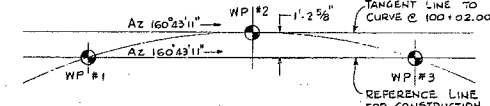
CLEAR COVER TO REINFORCING
FOOTINGS, ABUTMENTS, WINGWALLS... 3"
PIER COLUMN... 2"
PRECAST GIRDERS... 1"
DECK... TOP 2", BOT... 1 1/2"
BARRIER WALLS... 1 1/2"
AND/OR AS NOTED ON DWG'S.

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

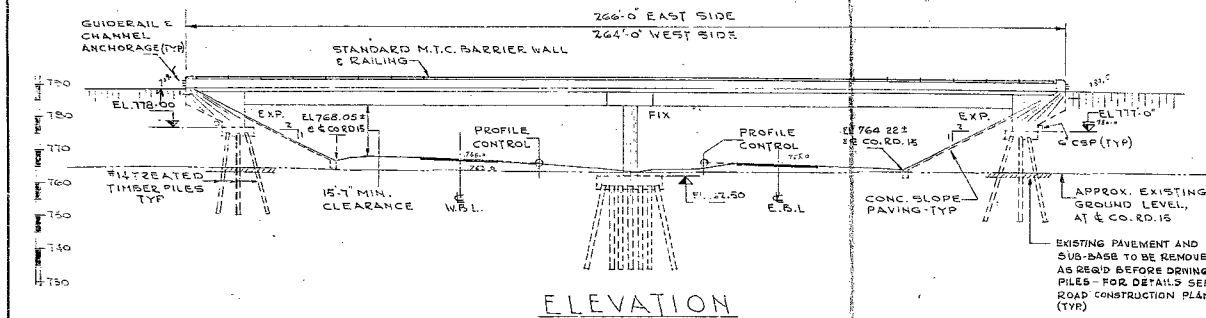
CONCRETE QUANTITIES
CONCRETE QUANTITIES ARE LISTED BELOW FOR THE APPROPRIATE CONCRETE LUMP SUM TENDER ITEMS:
CONCRETE IN PIERS, ABUTMENTS & WINGWALLS... 4000 PSI... 13 CU.YDS
3000 PSI... 93 CU.YDS
PRESTRESSED CONCRETE BRIDGE DECK... 312 CU.YDS
CONCRETE IN BARRIER WALLS... 40 CU.YDS
CONCRETE IN APPROACH SLABS... 40 CU.YDS
CONCRETE IN SLOPE PAVING... 38 CU.YDS



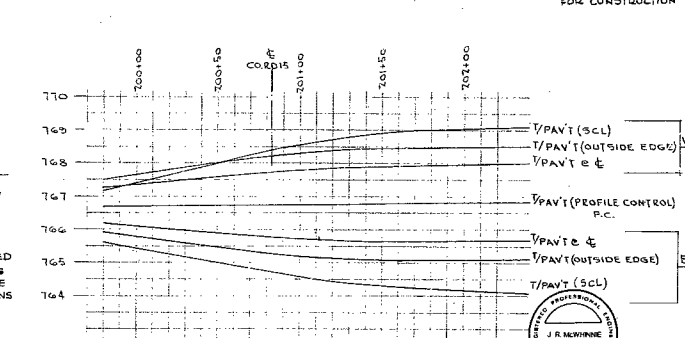
PROFILE HIGHWAY 402
NTS



PROFILE COUNTY ROAD 15
NTS



ELEVATION
SCALE 1" = 20'-0"



HWY 402 - PROFILE CONTROL
SCALE: HORIZ 1" = 40'
VERT 1" = 10'



REVISIONS	DATE	BY	DESCRIPTION
1	10/1/76	J.R. McPherson	DESIGN & CHECK
2	10/1/76	J.R. McPherson	CHECK & LOAD
3	10/1/76	J.R. McPherson	CHECK & SITE
4	10/1/76	J.R. McPherson	CHECK & DWG

