

DOCUMENT MICROFILMING CERTIFICATION

GEOCRES No. 30 MIS-67

DIST. 6 REGION CENTRAL

W.P. No. 44-71-24

CONT. No. 77-133

W. O. No. _____

STR. SITE No. _____

HWY. No. 401

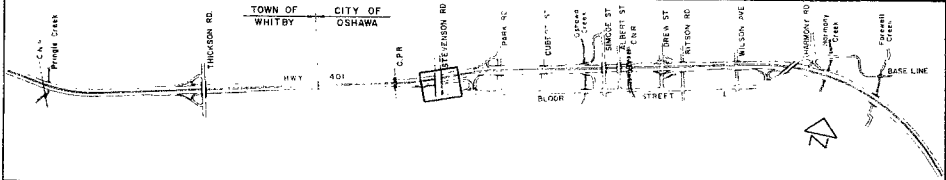
LOCATION HWY 401 AND STEVENSON RD.

RETAINING WALL, SOUTH SIDE,

STA. 130 TO 145

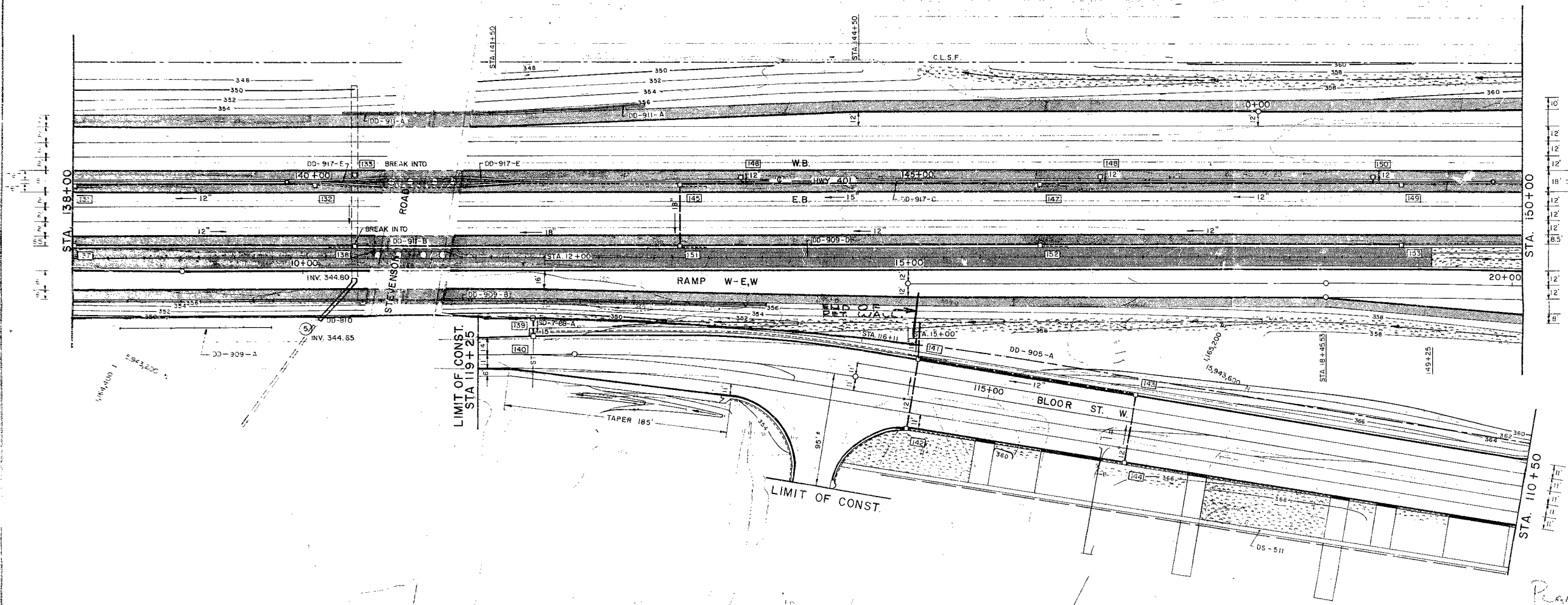
OVERSAY DRAWINGS TO BE INCLUDED WITH THIS REPORT 3

REMARKS: _____



CONT. No. 77-133
W. P. No. 44-71-05
30M15-67
GRADING, PAVING AND DRAINAGE

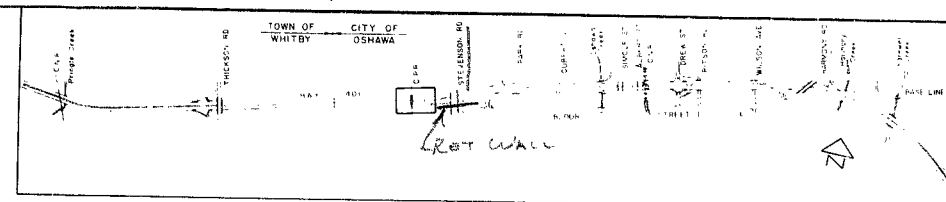
SHEET
40



Plan 2

SCALE
20' 0 40'



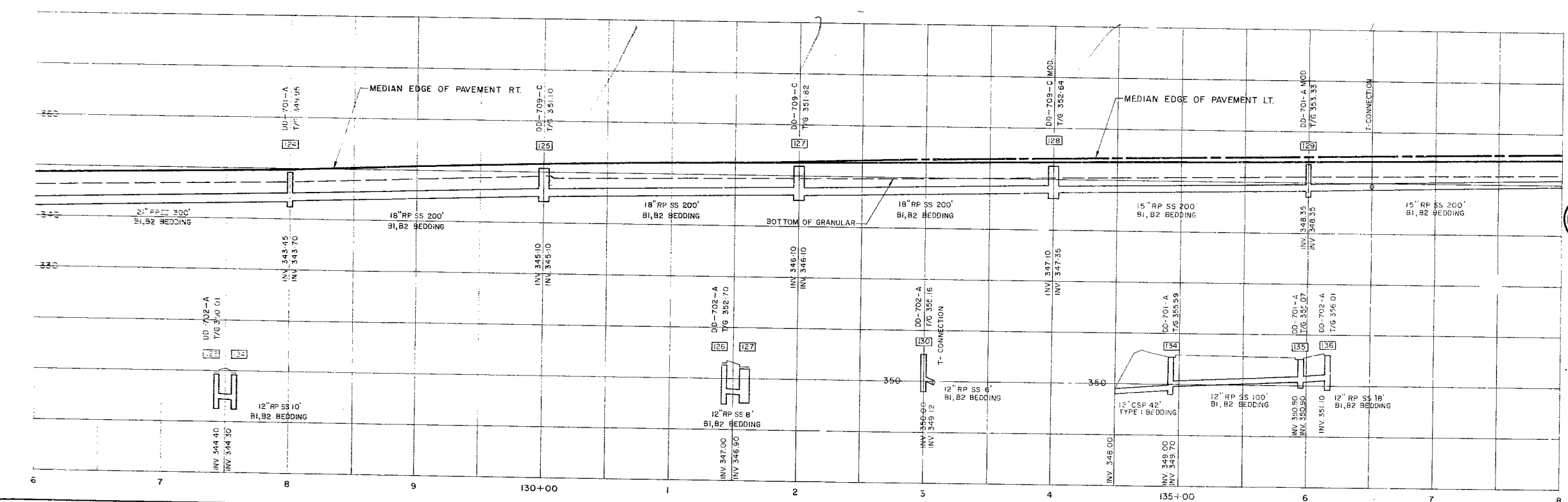
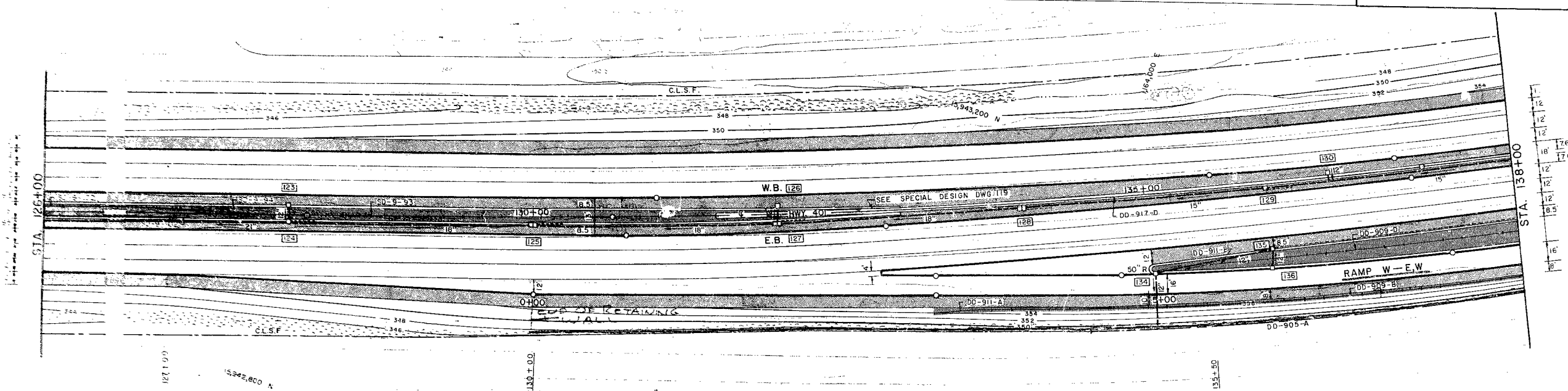


CONT. No. 77-133
W. P. No. 44-71-05
30415-67

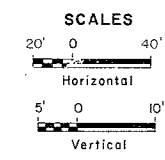


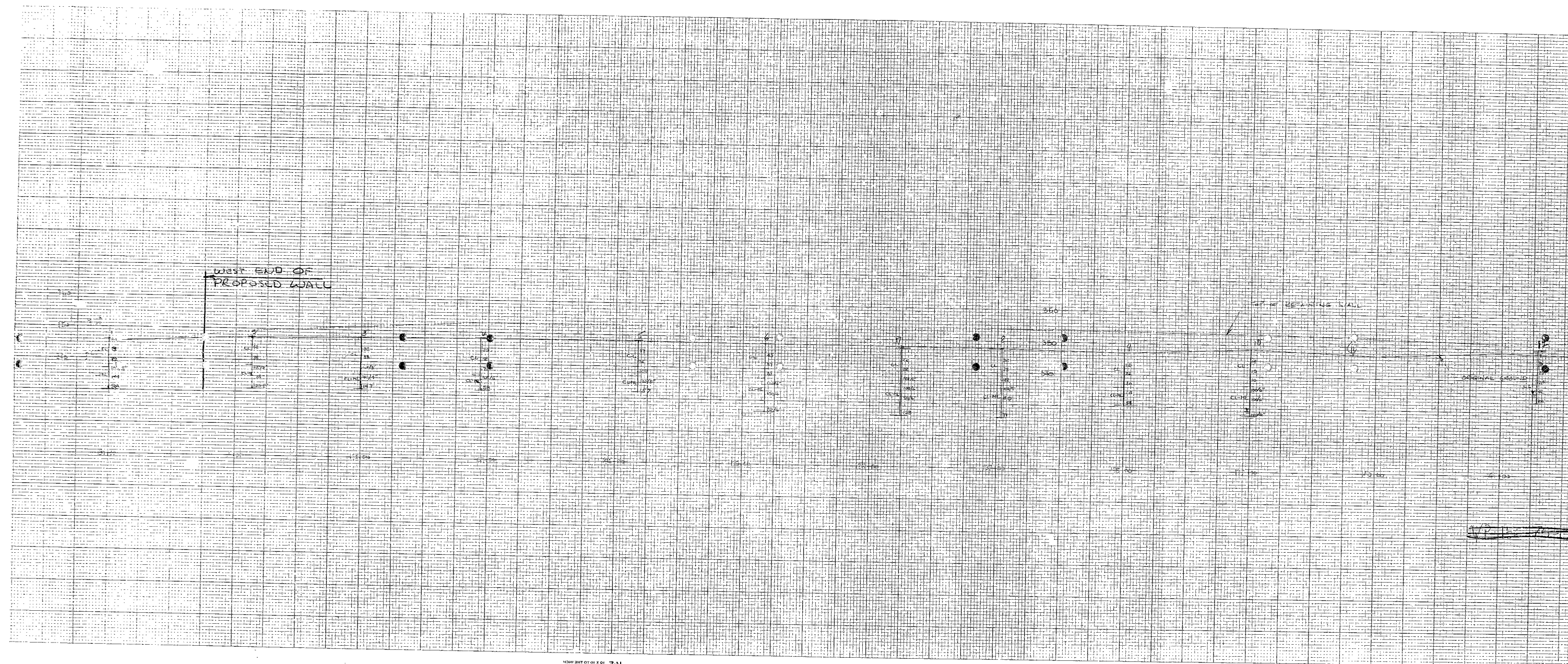
GRADING, PAVING AND DRAINAGE

SHEET
39



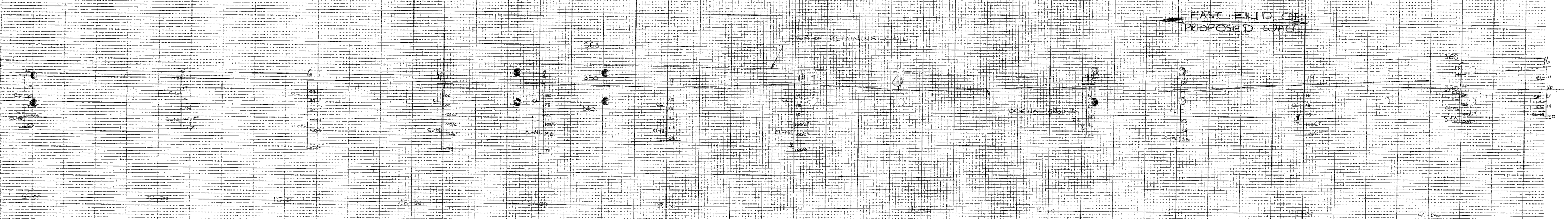
PLAN 1





3-K
10 X 10 TO THE INCH
OF 17523 0 22472X

BY ORDER OF THE BOARD OF DIRECTORS
JAMES A. HARRIS, JR.



PROFILE OF
PROPOSED WALL
WP 44-71-24
30M15-67

1/4" = 10' HORIZ.
1/4" = 10' VERT.

1/4" = 10' HORIZ.
1/4" = 10' VERT.

DOCUMENT MICROFILMING IDENTIFICATION

G.I-30 SEPT 1976

GEOCRES No. 30M15-67

DIST. 6 REGION Central

W.P. No. 44-71-24

CONT. No. 77-133

W. O. No. _____

STR. SITE No. _____

HWY. No. 401

LOCATION Hwy. 401 & Stevenson Rd.
Retaining Wall, South Side,
Sta. 130 to 145

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 3

REMARKS: documents to be unfolded
before microfilming

Mr. G.C.E. Burkhardt
Head, Structural Section
Central Region
3501 Dufferin St., Downsview

Soil Mechanics Section
Engineering Materials Office
Room 315, Central Building

Mr. D.H. Bye

79 02 02

Re: Contract 77-133, Reconstruction of Hwy. 401
in Oshawa Area, Proposed Retaining Wall in
Vicinity of Stevenson Road on South Side
W.P. 44-71-24, Site 22, Hwy. 401
District 6, Toronto

With due regard to the urgent nature of this project, the fieldwork was undertaken in late November, 1978. Subsequently our preliminary recommendations were submitted in a memorandum to your office on 79 01 03.

In view of your memorandum of 79 01 25 stating that the above retaining wall will not be required and similarly, a complete Foundation Investigation Report is not necessary, we have stopped work on this project. The data already obtained from sampled borings and laboratory testing will be retained in our files.

M. MacLean
Project Engineer

For: M. Devata
Supervising Engineer

MM/MD/gs

cc: W. Lankinen
R. Fitzgibbon
Files



Memorandum

To: G. Norman,
Head,
Resources Planning & Scheduling
Office, Central Region.

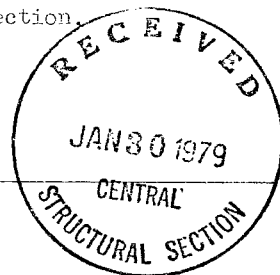
From: W. Jankinen,
Planning & Design Section,
Central Region.

Attention:

Date: 1979-01-29

Our File Ref.

In Reply to



Subject: Contract 77-133, W.P. 44-71-24, Highway 401
Proposed Retaining Wall Southside at
Stevenson Road Underpass and Bloor Street,
Oshawa, District 6, Toronto

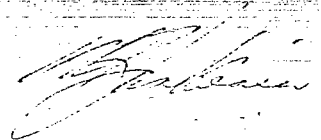
It is my understanding that due to construction problems encountered on the above noted contract, Mr. W. Greskow requested that a work project be assigned to facilitate the construction of a retaining wall along the W-EW entrance ramp to Bloor Street, to alleviate the encroachment of a fill slope onto Bloor Street, west of Stevenson Road. The estimated cost for this work was approximately \$150,000.00.

Upon further investigation, the retaining wall scheme was abandoned in favour of extending the 4 lane urban section on Bloor Street to the Carousel Motel entrance some 900 feet west of the Stevenson Road underpass, at a considerable cost saving. The estimated cost for widening approximately 1100 feet of existing Bloor Street is \$70,000.00. (tender, materials, sundry and engineering).

Attached we are forwarding a copy of a letter received from Mr. R.G. Dupuis, Road Design Engineer, Regional Municipality of Durham, dated 79-01-11 indicating the Region's agreement with our proposals, which are to be constructed entirely at the Ministry's expense.

Would you please advise the Program Office of the necessary change in the description of this project and of the revised estimate of cost for the additional work.

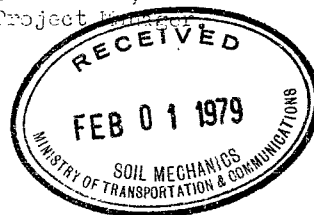
Revised construction drawings are to be issued to the Construction Office as an addendum to Contract 77-133 by 79-02-02.


W. R. Jankinen,
Sr. Project Engineer

WRL/ama

Attachment

cc D.E. Thrasher
D.P. Collins
R.E. Dawson
J.A. McKillop
J.E. Hafferman
V.R. Berkis





THE REGIONAL MUNICIPALITY OF DURHAM

WORKS DEPARTMENT W.A. TWELVETREES, P.Eng. / Commissioner of Works
105 CONSUMERS DRIVE, P.O. BOX 623, WHITBY, ONTARIO L1N 1C4 TELEPHONE: (416) 668-7721

January 11, 1979

Mr. W. Lankinen, P.Eng.
Senior Project Manager
Planning & Design Office
Ministry of Transportation & Communications
3501 Dufferin Street
Downsview, Ontario
M3K 1N6

Dear Sir:

Re: M.T.C. Contract 77-133, Hwy 401
Reconstruction through Whitby and Oshawa
Modifications to Bloor Street at Stevenson Rd.

Further to our recent review of your preliminary design for the above, this will advise that the Region of Durham concurs with the reconstruction proposed. It is our understanding that detailed plans will be forwarded to us, upon their completion, and that construction will be performed in 1979 as part of the Hwy 401 project. If I can be of further assistance to you, please feel free to contact me.

Yours very truly,

R.G. Dupuis, P.Eng.
Road Design Engineer

RGD/wg

memorandum



To: Mr. M. Devata,
Supervising Engineer,
Soil Mechanics Section,
Central Building, Downsview.

Date: 1979-01-25

RE: Contract 77-133 Reconstruction of Hwy. 401 in
Oshawa Area, Proposed Retaining Wall in Vicinity
of Stevenson Road on South Side,
W.P. 44-71-24, Site 22,
Highway 401, District 6

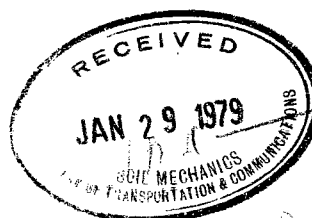
The Regional Planning and Design Office recently informed this office verbally, that the above mentioned retaining wall will not be required. For this reason it will not be necessary for your office to complete the detailed Foundation Investigation Report for this project. We have already received your preliminary recommendations.

As soon as we receive a memo from the Regional Planning and Design Office regarding this decision, a copy will be sent to your office.

DHB:gj

D.H. Bye
D.H. Bye,
Structural Supervisor,
for:
G.C.E. Burkhardt,
Head, Structural Section.

c.c. W. Lankinen
R. Fitzgibbon





Memorandum

To: Mr. G.C.E. Burkhardt
Head, Structural Section
Central Region
3501 Dufferin St., Downsview

From: Soil Mechanics Section
Engineering Materials Office
Room 315, Central Building

Attention:

Date: 79 01 03

Our File Ref.

In Reply to

Subject: Re: Proposed Retaining Wall in Vicinity
of Stevenson Road on South Side
Contract 77-133, Hwy. 401
District 6, Toronto
W.P. 44-71-24, Site 22

Reconstruction of Hwy. 401 is in progress at the above mentioned area. The design calls for standard slopes for the highway embankment construction for this project. During construction it was discovered that adequate property was not available to incorporate embankment slopes as designed. As a result of this, it was concluded that south slopes for the embankment should be retained by a retaining structure. In order to facilitate the design of the retaining structure in this area, we have been requested by your Mr. D. Bye that a subsurface investigation should be undertaken in order to provide necessary recommendations for the design and construction of the above mentioned retaining structure.

We have now completed the foundation investigation fieldwork for the above project. The due date for this project is 79 01 30, however, because of the urgency of this job we are hereby submitting our recommendations for the design and construction of the retaining walls. A detailed report will be submitted before the end of this month.

The fieldwork was carried out during the period of November 23 to November 28, 1978. The subsurface investigation consisted of 15 sampled borings, each accompanied by a dynamic cone penetration test advanced to depths of 17 to 22 feet below the ground surface by means of hollow stem augers. The borings revealed the dominant surficial deposit is a heterogeneous mixture of clayey silt, sand and gravel, a glacial till. The deposit was not penetrated fully but proven to a depth of 22 feet. The till is stiff to hard ('N' value range 8 to 100 blows/foot being generally 20 to 40 blows/foot) in the upper 6-18 feet and thereafter becomes hard ('N' values greater than 100 blows/foot). Up to 5 feet of fill material was encountered on the east end of the retaining location Sta. 140+00 to Sta. 145+00. Groundwater was encountered in three borings only at a depth of 12 to 19 feet below the ground surface which corresponds to elevation 329 to 339.

cont'd.....

The wall will be located to retain the Hwy. 401 W.B. - Park Road ramp from encroaching on Bloor Street. It is understood that the retaining wall will extend from Hwy. 401 Sta. 130+50 to Hwy. 401 Sta. 143+00 and will be in the order of 5 to 6 feet high. Here the existing ground surface is generally flat and varying from elevation 347 to 350.

Subsoil conditions are such that the retaining wall can be founded on spread footings located within the deposit of stiff to very stiff glacial till. It will be necessary to provide the base of the footing with a minimum of 4 feet of earth cover for frost protection purposes. Taking into account the frost requirements, the footing will be located at elevation 343 to 346. Footings located at or below this elevation can be designed for a maximum allowable load of 2 t.s.f. For estimating the earth pressure on the retaining wall a coefficient of active earth pressure of $K_a=0.33$ may be used if some movement at the top of the wall is permitted. The backfill to the retaining wall should consist of free draining granular material constructed in accordance with current M.T.C. Specifications. To estimate the horizontal resistance to sliding between the rough concrete and the cohesive till a cohesion of 2000 p.s.f. can be used. Because of the relatively impermeable subsurface conditions and the generally low water table, no dewatering scheme will be required and any surface runoff into the excavation can be removed by pumping from sumps.

A 3 inch concrete working pad should be provided to the base of the footing excavation if the founding level is exposed for more than 24 hours prior to pouring the footing since the founding subsoil is subject to softening upon exposure.

Depending on the proximity of the required retaining wall excavations to Hwy. 401, it may be necessary to provide a temporary roadway protection scheme. This could be accomplished by soldier piles and timber lagging.

Finally, it may be necessary to relocate some of the underground utilities (i.e. watermain and gas lines) in the vicinity of the retaining wall. Any required excavations for relocation beneath the base of the retaining wall should be backfilled with well compacted granular 'A'.



M. MacLean
Project Engineer

For: M. Devata
Supervising Engineer

MM/MD/gs

cc: W. Lin	P.D. Billings
D. MacDonald	Files ✓
R.D. Gunter	



Memorandum

To: Mr. M. Devata,
Supervising Engineer,
Soil Mechanics Section,
Central Building, Downsview.

From: G.C.E. Burkhardt,
Structural Section,
Central Region.

Attention:

Date: 1978-11-15

Our File Ref.

In Reply to

Subject: RE: Contract 77-133,
Reconstruction of Hwy. 401 in Oshawa Area,
Proposed Retaining Wall in Vicinity of
Stevenson Road on South Side,
W.P. 44-71-24, Site 22,
Highway 401, District 6

This is in reply to your memo of 1978-11-09. My apologies for not including the required data with my original request.

There appears to be two underground utilities in the vicinity of the proposed wall, a gas main and a water main. I have enclosed a plan from contract 77-133 showing the approximate location of these utilities. Also enclosed are, the completed Reconnaissance Report and some other drawings showing the proposed design of Highway 401 in the area. The Regional Planning and Design Section have not as yet prepared a profile for the proposed wall, but you can assume that the cross-section I sent you previously would represent the worst case.

I hope this data will allow you to proceed with the field investigation. Please do not hesitate to contact me if further data is required.

DHB:gj
Encl.

DH Bye
D.H. Bye,
Structural Supervisor,
for:
G.C.E. Burkhardt,
Head, Structural Section.

c.c. W. Greskow



Please note.
00:00
↓
Film.

Mr. G.C.E. Burkhardt
Head, Structural Section
Central Region
3501 Dufferin St., Downsview

Soil Mechanics Section
Engineering Materials Office
Room 315, Central Building

78 11 09

Re: Contract 77-133, Reconstruction of Hwy. 401 in
Oshawa Area, Proposed Retaining Wall in Vicinity
of Stevenson Road on South Side, W.P. 44-71-24
Site 22, Hwy. 401, District 6, Toronto

We have received the memorandum dated 78 11 07 containing an urgent request for a foundation investigation for the above mentioned project from Mr. D. Bye of your office.

As you are aware from our Bi-Weekly Progress Report, we are fully committed on a number of projects for the next several weeks. In our assessment, taking into account our present work load, the field investigation could be initiated within the third or fourth week of November, 1978. The duration of the fieldwork would be in the order of one to two weeks. After the completion we would be glad to provide you with the necessary recommendations and followed with a completed report by the end of January, 1979.

In order to expedite this project as soon as possible, we would like to obtain the following information.

1. A complete reconnaissance report with all the pertinent information in order to proceed with the fieldwork.
2. A copy of the detailed drawing showing existing underground utilities in this area.
3. A longitudinal profile showing existing ground, proposed ground and the proposed retaining structure locations and grades.

As an alternative to concrete cantilever type retaining walls, other types should be considered such as bin type retaining walls or reinforced earth as retaining walls. This aspect should be based on cost analysis of the various schemes as suggested.

We believe that we will be able to complete the urgent request upon receipt of the above information.

M. Devata
Supervising Engineer
MD/gs

cc: C. Grebski D. MacDonald R. Fitzgibbon
W. Lin M.R. Ernesaks Files ✓



Memorandum

To: Mr. C. Mirza,
Head,
Soil Mechanics Section,
Central Building, Downsview.

From: G.C.E. Burkhardt,
Structural Section,
Central Region.

Attention:

Date: 1978-11-07

Our File Ref.

In Reply to

Roy Dickson 825-668-0450

Subject: RE: Contract 77-133 - Reconstruction of Hwy. 401 In
Oshawa Area, Proposed Retaining Wall In Vicinity
of Stevenson Road on South Side,
W.P. 44-71-24, Site 22,
Highway 401, District 6

During construction of Contract 77-133 it was found that there was not enough property between Highway 401 - Ramp W-E,W and Bloor Street to place the fills for Ramp W-E,W. For this reason it will be necessary to construct a retaining wall approximately 8' high parallel to Ramp W-E,W for 1000' west of Stevenson Road and 500' east. The retaining wall will be placed approximately 2' inside the M.T.C. right-of-way and will be approximately 22' away from Ramp W-E,W edge of pavement.

I have enclosed a plan showing the approximate location of the retaining wall. Also enclosed is a typical cross-section showing the location of the wall.

Would you please prepare a Foundation Investigation Report of sufficient scope to enable the Structural Design Office to design the wall.

At this time, it is anticipated that the wall will be constructed in the Spring of 1979. For this reason we would appreciate having a preliminary report as soon as possible, when the field work is completed. The formal report could follow in two or three weeks.

If any further information is required, please do not hesitate to contact the undersigned.

DHB:gj
Encl.



D.H. Bye,
Structural Supervisor,
for:
G.C.E. Burkhardt,
Head, Structural Section.

c.c. W. Greskow
R. Fitzgibbon
Z. Byblow
R.D. Gunter



RECORD OF BOREHOLE No 1

W P 44-71-215 LOCATION Rot. Wall - DePawa ORIGINATED BY UK
DIST 6 HWY 601 BOREHOLE TYPE 3 1/2" H.S.M.V. Auger COMPILED BY UK
DATUM Canadian DATE Nov. 22 1988 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	PLASTIC LIMIT W _p NATURAL MOISTURE CONTENT W LIQUID LIMIT W _L WATER CONTENT (%)	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES						
34.6	Ground level										
34.2	Topsoil										
	Het. Mix. of clayey silt,		1	SS	8						
	sand & gravel		2	SS	79						
	glacial till		3	SS	100/30						
9.0			4	SS	144						
			5	SS	38						
16.5	End of Borehole										

RECORD OF BOREHOLE No 2

W P 44-76-24 LOCATION Pal. Mall. Ontario ORIGINATED BY UK
 DIST 6 HWY 401 BOREHOLE TYPE 24" H.D. N.V. Auger COMPILED BY UK
 DATUM Sea Level DATE Nov. 24 1977 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	PLASTIC LIMIT W _p NATURAL MOISTURE CONTENT W LIQUID LIMIT W _L WATER CONTENT (%)	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES						
347.5	Ground Level		1	2	44						
8.0			2	2	38						
9.0			3	2	120						
			4	2	115						
16.5	End of Borehole		5	2	150						

+³, x⁵: Numbers refer to Sensitivity

20
15
10
5 (%) STRAIN AT FAILURE



SOIL MECHANICS SECTION

SHEET OF

DRILLING CO. Eastern Soil DATUM ELEV. _____ B.H. No. 1
DRILLER A. Moreau GROUND ELEV. 346.5 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 23/78
SITE LOCATION Dehanna - Ret. Wall @ 401 + Stinsons Rd.
HOLE LOCATION 130 + 00
REMARKS _____

DEPTH FEET		DESCRIPTION	SAMPLE TYPE, No. & RECOVERY	METHOD OR BLOWS & DISTANCE
FROM	TO			
0'	6.5'	12.15, 8.12, 20.45, 100/2'		
0'	3'	Began the hole (12' gravel to soil)		
3'	4.5'	Brown clayey silt + some sand + fragments	38.1	2-3-5
3'	6'	Began the hole		(8)
6'	7.5'	Clayey silt + some sand + gravel fragments	38.2	36-38-41
6'	9'	Began the hole		(79)
9'	10.5'	Hit stone - no recovery	38.3	100/3'
9'	12'	Began the hole		
12'	12.5'	Silt to clayey silt + some sand + gravel	38.4	59-85
12'	15'	Began the hole		(148)
15'	16.5'	The same as above	38.5	18-18-20
				(39)



FIELD BORING LOG

SOIL MECHANICS SECTION

DRILLING CO. Eastern S. P. DATUM ELEV. _____ B.H. No. 2
DRILLER A. Moore GROUND ELEV. 347.5 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 24/78
SITE LOCATION Galena - Red Wall
HOLE LOCATION _____
REMARKS _____

QB-MT-231 8-74

**SOIL MECHANICS SECTION**

DRILLING CO. Eastern Soil DATUM ELEV. _____ B.H. No. 3
DRILLER A. Moreau GROUND ELEV. 347.8 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 24/78
SITE LOCATION Dakota - Rt. 100
HOLE LOCATION _____
REMARKS _____

OB-MT-231 8-74



FIELD BORING LOG

SOIL MECHANICS SECTION

DRILLING CO. Eastern Socl DATUM ELEV. _____ B.H. No. 4
DRILLER A. Moran GROUND ELEV. 348.2 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 24/78
SITE LOCATION Columbia - Ret. Wall
HOLE LOCATION _____
REMARKS _____

DEPTH FEET		DESCRIPTION	SAMPLE TYPE, No. & RECOVERY	METHOD OR BLOWS & DISTANCE
FROM	TO			
0	7.5'	4, 7, 18, 34, 50, 57, 80, 100/6"		
0	3'	Reger the hole (12" to soil)		
3	4.8	Brown clayey silt, some sand & gravel	SS. 1	7-12-17
3	6	Reger the hole		(2)
6	7.5	The same as above	SS. 2	14-24-34
6	9	Reger the hole		(3)
9	12.5	The same as above	SS. 3	25-30-41
9	12	Reger the hole		(2)
12	12.5	Silt to clayey silt, sand & fine gravel	SS. 4	100/6"
12	15	Reger the hole		
15	16.5	The same as above (wet)	SS. 5	20-25-35
				(5)



SHEET _____ OF _____

DEPTH FEET		DESCRIPTION	SAMPLE TYPE, No. & RECOVERY	METHOD OR BLOWS & DISTANCE
FROM	TO			
0'	6.5'	14, 24, 42, 60, 78, 89. 100/6"		
0'	3'	Auger the hole (10" gauge against)		
3	4.5	Brown clay with gray sand & gravel SS. 1		5-17-20
3	6	Auger the hole		(5)
6	7.5	The same as above	SS. 2	28-32-40
6	9	Auger the hole		(12)
9	10.5	The same as above	SS. 3	20-80
9	12	Auger the hole		(100)
12	12.5	12.5' till & clay with sand & gravel SS. 4		100/5"
12	15	Auger the hole		
15	16.5	The same as above (smell of gas) SS. 5		50-68-89
				(157)



FIELD BORING LOG

DRILLING CO. *Eastern Soc'l* DATUM ELEV. _____ B.H. No. *6*
DRILLER *A. Moreau* GROUND ELEV. *348.1* JOB No. *44-71-24*
ENGINEER *V.S.* CASING SIZE _____ DATE *Nov. 24/78*
SITE LOCATION *Oskana - Rot. Well*
HOLE LOCATION _____
REMARKS _____

OB-MT-231 8-74

**SOIL MECHANICS SECTION**

DRILLING CO. Eastern Soil DATUM ELEV. _____ B.H. No. 7
DRILLER A. Moreau GROUND ELEV. 347.4 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 24/78
SITE LOCATION Debrau, Ret. Wall
HOLE LOCATION _____
REMARKS _____

DEPTH FEET		DESCRIPTION	SAMPLE TYPE, No. & RECOVERY	METHOD OR BLOWS & DISTANCE
FROM	TO			
0	9.5	7, 35, 31, 36, 34, 32, 30, 41, 42. 100/6"		
0	3	Auger the hole (12" to soil)		
3	4.5	Brown clayey silt, some sand & gravel	SS. 1	5-10-12
3	6	Auger the hole		(22)
6	7.5	The same as above	SS. 2	9-10-12
6	9	Auger the hole		(22)
9	10.5	The same as above (wet)	SS. 3	25-100/6"
9	12	Auger the hole		
12	13.5	Fine silt to clayey silt, sand & gravel	SS. 4	55-100/6"
12	15	Auger the hole		
15	16.5	The same as above	SS. 5	90/6"
15	20	Auger the hole		
20	21.5	Silt, clayey silt, sand & gravel	SS. 6	48-80
				(132)



FIELD BORING LOG

SOIL MECHANICS SECTION

DRILLING CO. Eastern Salt DATUM ELEV. _____ B.H. No. 8
DRILLER A. Moorey GROUND ELEV. 347.4 JOB No. 44-71-24
ENGINEER V. K. CASING SIZE _____ DATE Nov 27/78
SITE LOCATION Oshaw - Ret. Well
HOLE LOCATION _____
REMARKS _____

OB-MT-231 8-74



FIELD BORING LOG

SOIL MECHANICS SECTION

DRILLING CO. Eastern Soil DATUM ELEV. _____ B.H. No. 9
DRILLER A. Morcan GROUND ELEV. 347.0 JOB No. 44-71-24
ENGINEER V.B. CASING SIZE _____ DATE Nov. 27/78
SITE LOCATION Ocala - Ret. 140 ft.
HOLE LOCATION _____
REMARKS _____

DEPTH FEET		DESCRIPTION	SAMPLE TYPE, No. & RECOVERY	METHOD OR BLOWS & DISTANCE
FROM	TO			
0	12'	5, 7, 10, 21, 23, 27, 40, 42, 43, 45, 75, 110/8 ft.		
0'	3'	Reger the hole (12" top soil)		
3	4.5	Brown clayey silt some sand & gravel	ss. 1	4-10-12
3'	6'	Reger the hole		(22)
6	7.5	Too small as a blow	ss. 2	5-10-12
6	9	Reger the hole		(22)
9	10.5	@ 8.5 clayey silt some sand & gravel	ss. 3	7-8-12
9	12	Reger the hole		(20)
12	13.5	silt clayey with sand & gravel	ss. 4	35-80
12	15	Reger the hole		(15)
15	16.5	Too small as a blow	ss. 8	17-26-30
				(33)

**SOIL MECHANICS SECTION**

DRILLING CO. Eastern Drill DATUM ELEV. _____ B.H. No. 10
DRILLER A. Mearns GROUND ELEV. 348.5 JOB No. 44-71-84
ENGINEER V.K. CASING SIZE _____ DATE Nov. 27/78
SITE LOCATION Osbama - Ret. wall
HOLE LOCATION _____
REMARKS 42.19.5

OB-MJ-231 8-74



FIELD BORING LOG

SOIL MECHANICS SECTION

DRILLING CO. Easton S. I DATUM ELEV. _____ B.H. No. 12
DRILLER A. Moreau GROUND ELEV. 349.5 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 27/78
SITE LOCATION Debra - Rest. Wall
HOLE LOCATION _____
REMARKS W.B. 13.5

[illegible]

**SOIL MECHANICS SECTION**

DRILLING CO. Eastern Soil DATUM ELEV. _____ B.H. No. 13
DRILLER A. Moreau GROUND ELEV. 348.7 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 27/78
SITE LOCATION Delaware Ret. well
HOLE LOCATION _____
REMARKS _____

OB-MT-231 8-74



FIELD BORING LOG

SOIL MECHANICS SECTION

DEPTH FEET		DESCRIPTION	SAMPLE TYPE, No. & RECOVERY	METHOD OR BLOWS & DISTANCE
FROM	TO			
0	12.5	18.7, 11, 17, 12, 17, 26, 37, 38, 40, 42, 84, 100/60		
0	3	Begin the hole		
3	4.5	Clayey with sand - fine gravel & organic f. 11/20.1		5-7-9
3	6	Begin the hole		(16)
6	7.5	5' Brown clayey with some sand & gravel ss. 2		5-8-10
6	9	Begin the hole		(18)
9	10.5	The same as above	ss. 3	4-6-9
9	12	Begin the hole		(19)
12	13.5	The same as above	ss. 4	30-100/6
12	15	Begin the hole		
15	16.0	13' Gray clayey with sand & gravel	ss. 8	100/6



SHEET OF

DRILLING CO. Eastern Soil DATUM ELEV. _____ B.H. No. 15
DRILLER A. Morcaw GROUND ELEV. 354.6 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 28/78
SITE LOCATION Dakota - Ret. No. 11
HOLE LOCATION _____
REMARKS _____

OB-MT-231 8-74

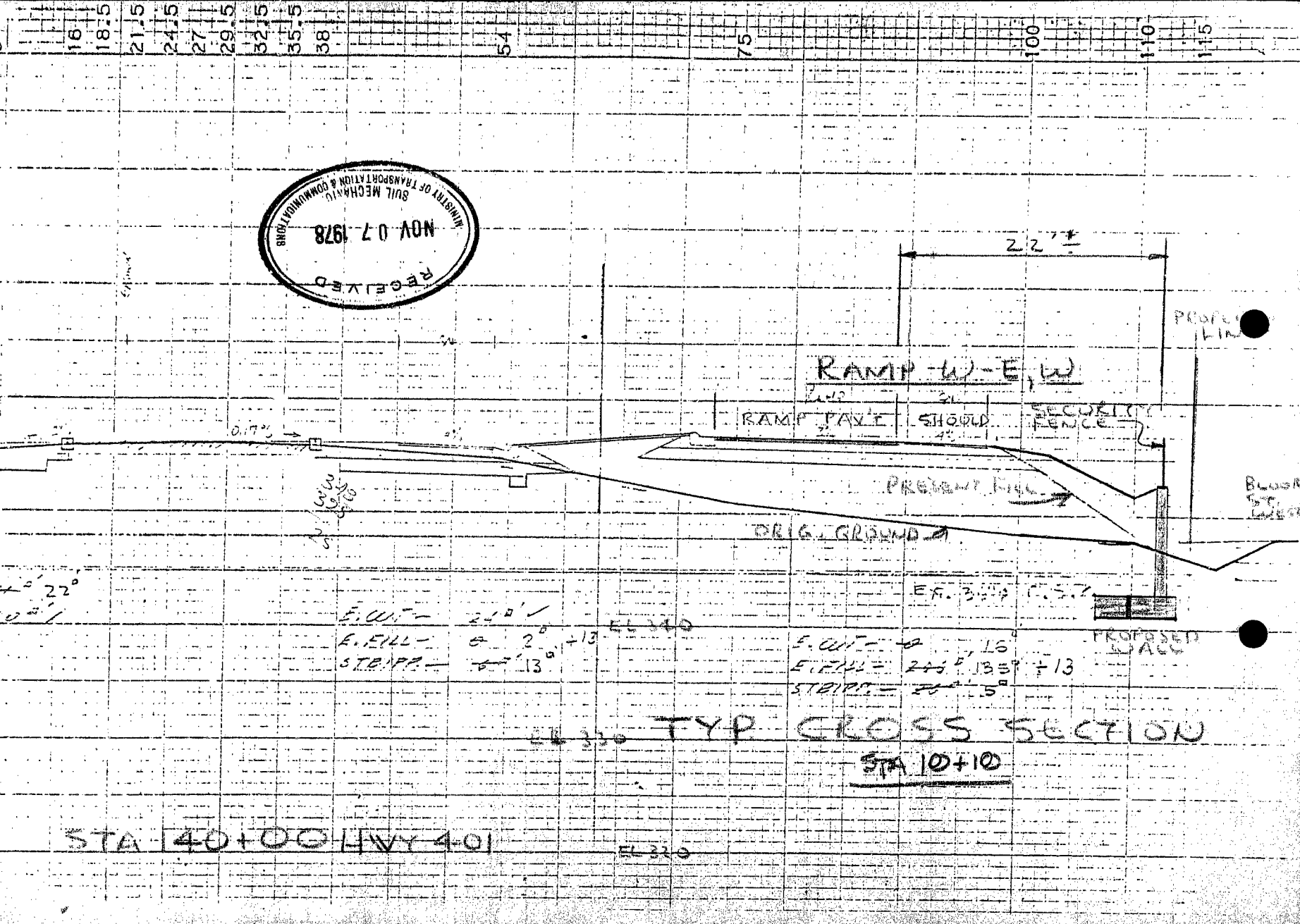
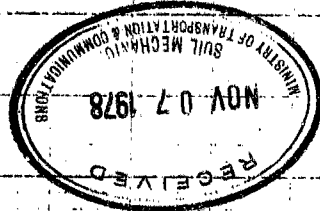


FIELD BORING LOG

SOIL MECHANICS SECTION

DRILLING CO. Eastern Ind. DATUM ELEV. _____ B.H. No. 16
DRILLER A. Moreau GROUND ELEV. 357.5 JOB No. 44-71-24
ENGINEER V.K. CASING SIZE _____ DATE Nov. 28/78
SITE LOCATION Delaware Ret. Well
HOLE LOCATION _____
REMARKS _____

OR-MT-231 8-74



F. CUT - 24' ✓
 F. FILL - 2' + 13' = 15'
 STRIP - 13'

F. CUT - 15'
 F. FILL - 24' + 13' = 37'
 STRIP - 5'

TYP CROSS SECTION
 STA 10+10

STA 40+00 HWY 4-01

EL 32.0