

GEN FILES

Mr. J. McCombie,
Bridge Plans & Engr.
Materials & Research Section,
(Foundations Office).

Attention: Mr. E. De Vries.

July 21, 1961.

D.H.C. FOUNDATION INVESTIGATION
No. 61-7-0 -- W.P. 193-58.

Re: Avenue Road Underpass,
Way, 2401, District 26.

In response to your request contained in your letter of May 3, 1960, we have carried out a subsail investigation at the above mentioned site. Two boroholes were put down at the locations shown on the attached sketch. Borohole logs are also attached to this memo.

The investigation has shown the subsail stratification to be quite regular. Below a 4 to 5 ft. thick loose granular fill layer, is a 20-ft. layer of very dense brown-gray silty sand with gravel. The Standard Penetration Test values are in excess of 100, very often even in excess of 200, indicating the extremely dense state of the layer. This material is underlain by a layer of very hard clay and then again, by an undetermined depth of sand. The boroholes were stopped at 21 and 22 ft. below ground level, respectively.

The described layers and their properties indicate that no foundation problems should be encountered. Self load of

6.6 F.S.F. can be used for spread footings placed at or below elevation 979.0'.

The investigation was carried out for the two additional rigid frame structures which are proposed to be constructed on each side of the existing underpass. It was first thought that the possible kicking out of the legs of the existing structure upon removal of the backfill material, could be prevented by sheet piling driven adjacent to the back side of the existing footings and down to sufficient depth. However, the investigation has revealed the very dense till material and it is reasonable to assume that an economical sheet pile driving could not be achieved. Therefore, this solution should be abandoned and the excavation adjacent to the existing footings be carried out in stages - i.e., the material should not be excavated along the full width of the footing at once. When a portion is excavated, concrete should be poured and then another section started. In this way, a lateral support on the existing footing is continuously maintained.

During the investigation, the ground water level was found in B.H. 1 at 8'-8", and in B.H. 2 at 19' below ground level. It is believed that no ground dewatering problems will be encountered during footing excavations and subsequent construction.

We believe that the above information should prove to be adequate for you to proceed with the design work. However, should there be any additional information or comments that you require, please do not hesitate to contact our office.

Yours truly,

Attach.

Respectfully,
A. S. Tremblay
S. S. McWilliam
J. C. Campbell
J. P. Vincent
H. A. Devich
J. Ray

J. P. Vincent
J. A. Grunpeter
J. Sorman
Foundations Office

Gen. Files.

DEFECTS IN NEGATIVE DUE TO
CONDITION OF ORIGINAL DOCUMENT

MEMORANDUM

R. Selby.
A. Devota

Mr. A. G. Stermac
Materials & Research Section
Principal Foundations Engr.
Lab. Bldg.

FROM:

A. Urbanowicz
for C. Grebski
Sr. Bridge Project Engineer
Bridge Division
September 27, 1962.

DATE:

Our File Ref.

IN REPLY TO

SUBJECT:

Retaining Walls A, B, D.
Ave. Rd. Underpass - Hwy. 401
Twp. of North York, Cty. of York.
District No. 6 - W.P. 193-58

FILMED ON
35 mm

We are forwarding to you drawings D 5034-21, 22, 24, 25 and 26 of retaining walls to be included under Ave. Rd. bridge contract.

As there has been no soil data available to us, particularly for wall D, could you review your soil information along the length of Hwy. 401 within following limits.

Leg A from Hwy. 401 Sta. 317+00 to Sta. 323+50 on the South side of Hwy. 401

Ramp B from Hwy. 401 Sta. 314+50 to Sta. 321+35 on the North side of Hwy. 401

Ramp D from Hwy. 401 Sta. 330+50 to Sta. 358+50 on the South side of Hwy. 401

The above walls vary in height from 4'-0" to 14'-6". The maximum toe pressure does not exceed 1.6 Ton/sq. ft. and pressure diagram is almost triangular. Over a considerable length of these walls there is surcharge on top of wall from Hwy. 401 or Metro Rd. traffic.

Factor of safety against forward movement relies on passive resistance of soil in front of wall footing and in all cases is approximately 2. This is assuming friction coefficient 0.40.

Could you review our proposal in view of existing soil data for this location and carry out some additional investigation as you consider necessary.

A. Urbanowicz

AU:gc

A. Urbanowicz
for C. Grebski
Sr. Bridge Project Engineer.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS AND RESEARCH SECTION

W.P. 193-58

BORE HOLE NO. 2

JOB 61-P-63

STATION 326+72 (47' 1" L)

DATUM 584.0

COMPILED BY H.S.

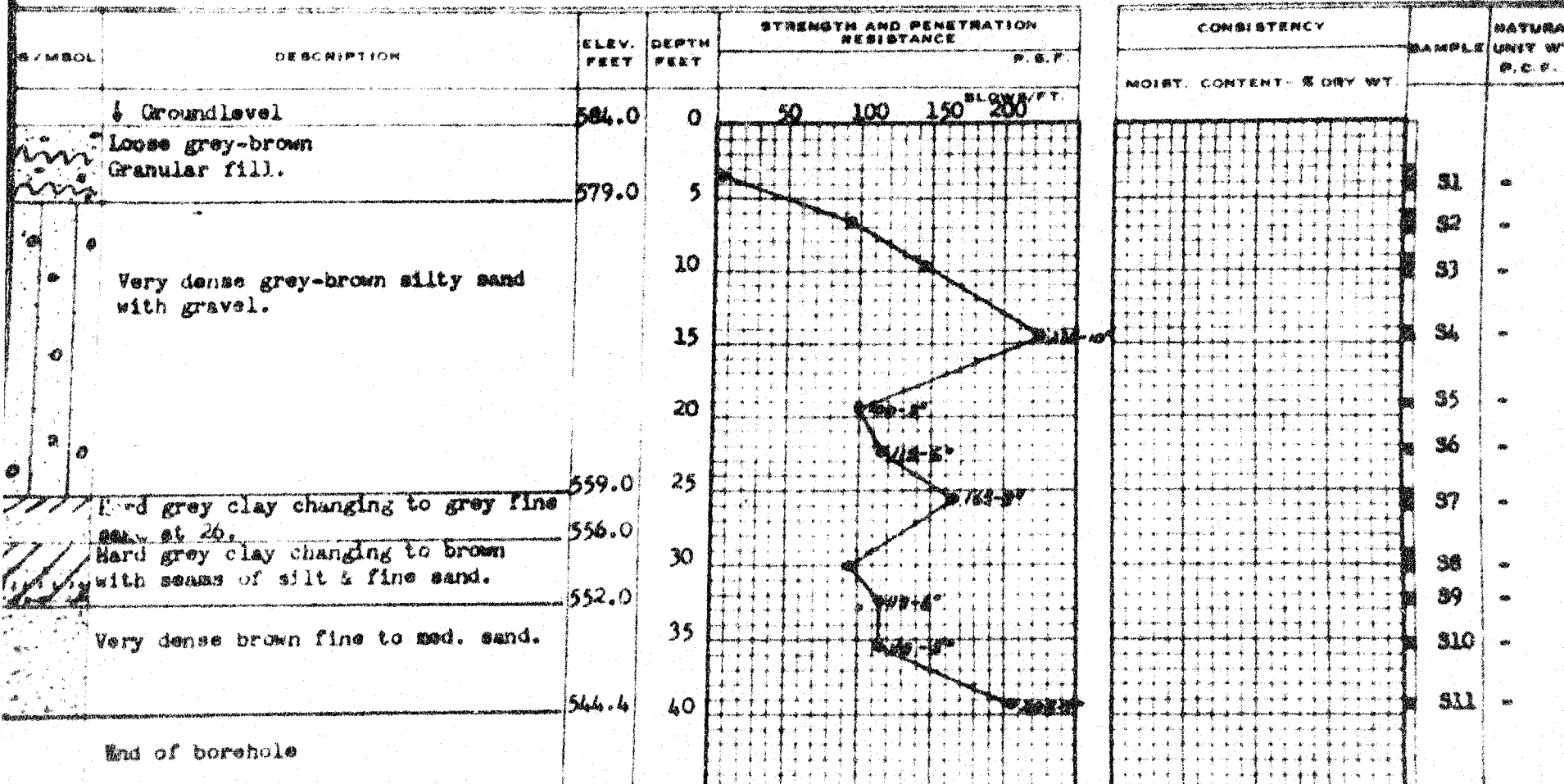
BORING DATE June 26/61

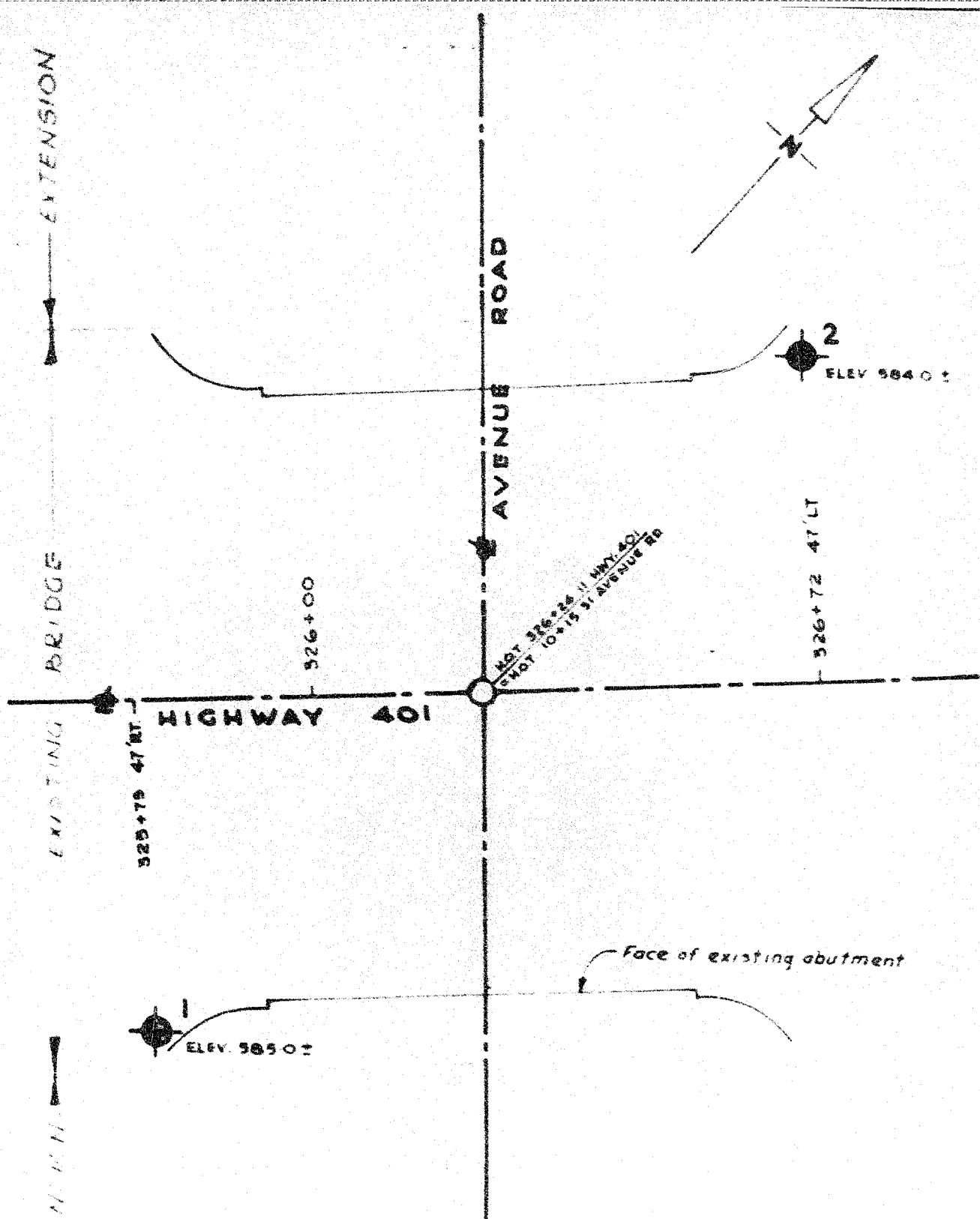
CHECKED BY

2" DIA. SPLIT TUBE
 2" SHELBY TUBE
 2" SPLIT TUBE
 2" DIA. CONE
 2" SHELBY
 CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Q_u) — 0
 VANE TEST (C) AND SENSITIVITY (S) — +
 NATURAL MOISTURE AND LIQUIDITY INDEX — LI
 LIQUID LIMIT — X
 PLASTIC LIMIT —





ORIGINATED H SZYMANSKI

DEPARTMENT OF HIGHWAYS - ONTARIO

DRAWN H D REED

MATERIALS & RESEARCH SECTION

CHECKED

LOCATION OF BOREHOLES FOR

APPROVED

PROPOSED BRIDGE EXTENSION

DATE 24 JULY 1961

AVENUE ROAD & HIGHWAY NO 401

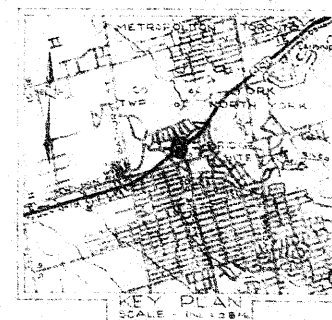
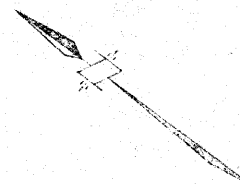
SCALE 1 inch = 20 feet

W P NO 193-58

JOB NO 61-F-63

DWG NO 61-F-63A

IN METROPOLITAN & TORONTO



W.P. 193-58

CONFIDENTIAL

№ 6

1. M. ROSEN, *ANAL. CHEM.* **36**, 1251 (1964).

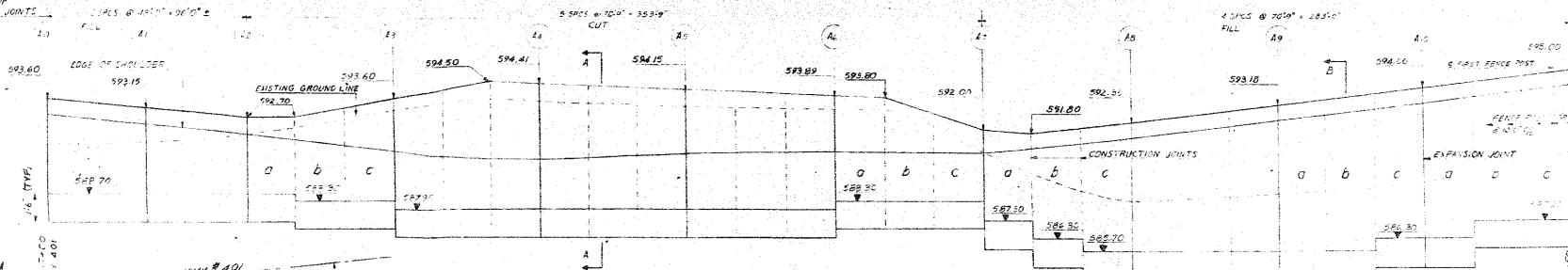
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UNOFFICIAL COPY

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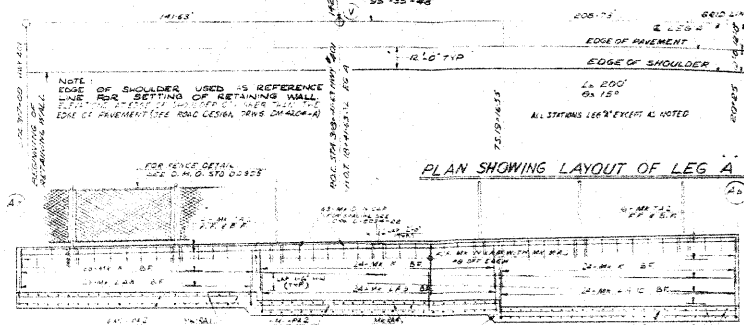
SPACING OF
EXPANSION JOINTS

770'2" DEVELOPED LENGTH



NORTH ELEVATION OF LEG A RETAINING WALL

VERTICAL SCALE: 1" = 1'-0"
HORIZONTAL SCALE: 1" = 25'-0"



PLAN SHOWING LAYOUT OF LEG A RETAINING WALL

SCALE: 1" = 25'-0"



ELEVATION (TYP)

SCALE: 1" = 1'-0"

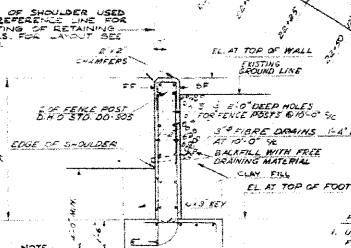
WALL MAY BE MADE STRAIGHT BETWEEN
CONSTRUCTION JOINTS WHERE CURVATURE IS SHARP
EXPANSION JOINTS WHERE CURVATURE IS FLAT
MOVING IN 1" SET BETWEEN CURVE AND CURVE AT THE
1" SET OF SHOULDER SHALL NOT EXCEED 1"

FOR REINFORCING STEEL SEE DRS D-5034-23.
FOR BAR M-60 SEE DRS D-5034-23.

**TYPICAL DETAIL OF STEP IN FOOTINGS
AT CONSTR. JOINT**

SCALE: 1" = 1'-0"

FOR DETAIL OF SPID
SEE ROAD DESIGN
DRAWING DR-1004-A



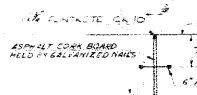
NOTE
FOR REINFORCING
DETAILS SEE
SEC. B-B

TYPICAL SECTION A-A IN CUT

SCALE: 1" = 1'-0"

FOOTING NOTES

1. INSIDE OF CONCRETE FOOTING TO BE 4" MIN FROM LOWEST GROUND LEVEL.
2. FOOTINGS TO BE POURED AGAINST FIRM UNDISTURBED SOIL.
3. IN CASE OF SOFT MATERIAL BEING ENCOUNTERED AT INSIDE OF FOOTING USE MASS CONCRETE TO A FIRM STRATA.
4. FOOTINGS TO BE INSPECTED BY THE BRIDGE OFFICE BEFORE POURING.



DETAIL OF EXPANSION JOINT

SCALE: 1" = 1'-0"



DETAIL OF CONSTR JOINT

SCALE: 1" = 1'-0"

TYPICAL SECTION B-B IN FILL

SHOWING REINFORCEMENT

SCALE: 1" = 1'-0"

REINFORCEMENT NOTES

1. CONCRETE MIX: MIN. STRENGTH 3000 PSI (21 MPa) (NO. 4) (GRADE 60)
2. CONSTRUCTION JOINTS SHALL BE MADE AT THE RETAINING WALLS AND SHALL NOT BE MADE AT THE EXPANSION JOINTS AND SHALL NOT BE MADE AT THE SHOULDER JOINTS
3. REINFORCEMENT SHALL BE AS NOTED
4. SEE DRS D-5034-23

PRINT RECORD

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DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE DIVISION

AVENUE RD UNDERPASS HWY 101

KING'S HIGHWAY No. 101

CD 101A

TWP. NORTH HURON LOT 101

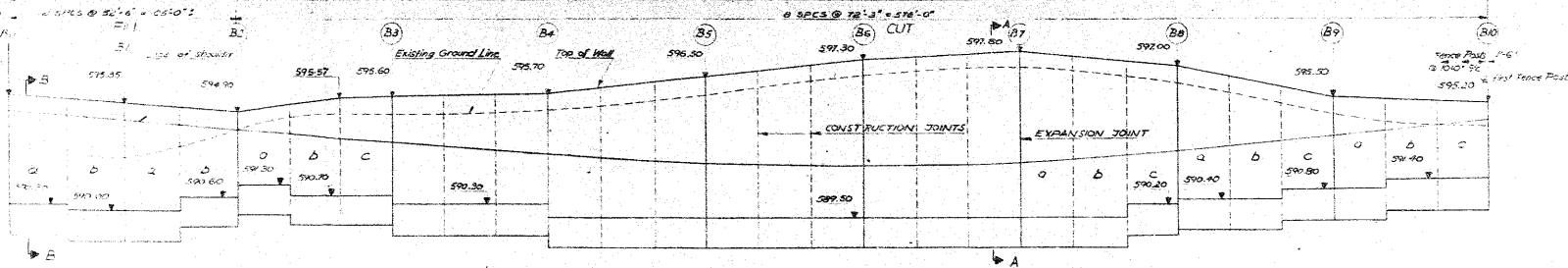
LEG A RETAINING WALL

APPROVED: [Signature] DATE: 10/1/80

DESIGN: J. A. [Signature] CHECK: [Signature]

DATE: 10/1/80 DRAWN: [Signature] NO. D-5034-23

Location of Expansion Joints



NORTH ELEVATION OF RAMP B RETAINING WALL

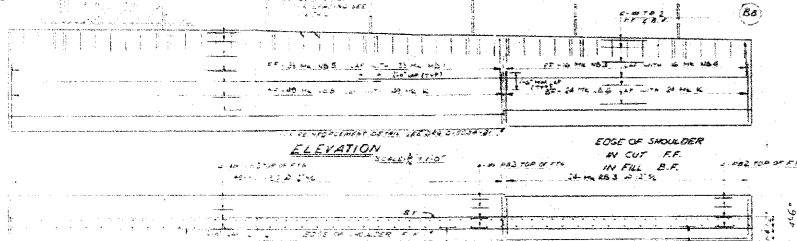
VERTICAL SCALE: 1" = 1'-0"
HORIZONTAL SCALE: 1" = 25'-0"

FOR SETTING OF GRID LINE AND ELEVATION OF EDGE OF PAVEMENT SEE ROAD DESIGN DRG DM-1204-B. EDGE OF SHOULDER 12'-0" FROM THE EDGE OF PAVEMENT.

NOTE: EDGE OF SHOULDER USED AS REFERENCE LINE FOR SETTING OF RETAINING WALL. FOR DETAILS SEE DRG D-5034-B. SECTIONS A-A' AND B-B' ELEVATIONS AT EDGE OF SHOULDER 6" HIGHER THAN THE EDGE OF PAVEMENT (SEE ROAD DESIGN DRG DM-1204-B).

PLAN SHOWING LAYOUT OF RAMP B RETAINING WALL

SCALE: 1" = 25'-0"



ELEVATION

PLAN

TYPICAL DETAIL OF REINFORCEMENT

SCALE: 1" = 1'-0"

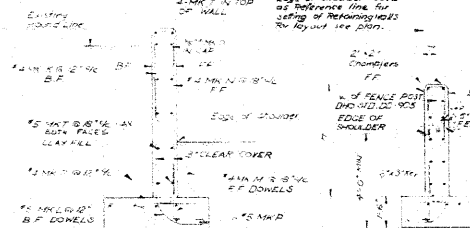
REINFORCING STEEL	BAR	SIZE	LENGTH	QUANTITY	TOTAL LENGTH	REMARKS
REINFORCING STEEL	1	1/2"	10'-10"	1	10'-10"	1
	2	1/2"	10'-10"	1	10'-10"	2
	3	1/2"	10'-10"	1	10'-10"	3
	4	1/2"	10'-10"	1	10'-10"	4
REINFORCING STEEL	5	1/2"	10'-10"	1	10'-10"	5
	6	1/2"	10'-10"	1	10'-10"	6
	7	1/2"	10'-10"	1	10'-10"	7
	8	1/2"	10'-10"	1	10'-10"	8
REINFORCING STEEL	9	1/2"	10'-10"	1	10'-10"	9
	10	1/2"	10'-10"	1	10'-10"	10
	11	1/2"	10'-10"	1	10'-10"	11
	12	1/2"	10'-10"	1	10'-10"	12
REINFORCING STEEL	13	1/2"	10'-10"	1	10'-10"	13
	14	1/2"	10'-10"	1	10'-10"	14
	15	1/2"	10'-10"	1	10'-10"	15
	16	1/2"	10'-10"	1	10'-10"	16
REINFORCING STEEL	17	1/2"	10'-10"	1	10'-10"	17
	18	1/2"	10'-10"	1	10'-10"	18
	19	1/2"	10'-10"	1	10'-10"	19
	20	1/2"	10'-10"	1	10'-10"	20
REINFORCING STEEL	21	1/2"	10'-10"	1	10'-10"	21
	22	1/2"	10'-10"	1	10'-10"	22
	23	1/2"	10'-10"	1	10'-10"	23
	24	1/2"	10'-10"	1	10'-10"	24
REINFORCING STEEL	25	1/2"	10'-10"	1	10'-10"	25
	26	1/2"	10'-10"	1	10'-10"	26
	27	1/2"	10'-10"	1	10'-10"	27
	28	1/2"	10'-10"	1	10'-10"	28
REINFORCING STEEL	29	1/2"	10'-10"	1	10'-10"	29
	30	1/2"	10'-10"	1	10'-10"	30
	31	1/2"	10'-10"	1	10'-10"	31
	32	1/2"	10'-10"	1	10'-10"	32
REINFORCING STEEL	33	1/2"	10'-10"	1	10'-10"	33
	34	1/2"	10'-10"	1	10'-10"	34
	35	1/2"	10'-10"	1	10'-10"	35
	36	1/2"	10'-10"	1	10'-10"	36
REINFORCING STEEL	37	1/2"	10'-10"	1	10'-10"	37
	38	1/2"	10'-10"	1	10'-10"	38
	39	1/2"	10'-10"	1	10'-10"	39
	40	1/2"	10'-10"	1	10'-10"	40
REINFORCING STEEL	41	1/2"	10'-10"	1	10'-10"	41
	42	1/2"	10'-10"	1	10'-10"	42
	43	1/2"	10'-10"	1	10'-10"	43
	44	1/2"	10'-10"	1	10'-10"	44
REINFORCING STEEL	45	1/2"	10'-10"	1	10'-10"	45
	46	1/2"	10'-10"	1	10'-10"	46
	47	1/2"	10'-10"	1	10'-10"	47
	48	1/2"	10'-10"	1	10'-10"	48
REINFORCING STEEL	49	1/2"	10'-10"	1	10'-10"	49
	50	1/2"	10'-10"	1	10'-10"	50
	51	1/2"	10'-10"	1	10'-10"	51
	52	1/2"	10'-10"	1	10'-10"	52
REINFORCING STEEL	53	1/2"	10'-10"	1	10'-10"	53
	54	1/2"	10'-10"	1	10'-10"	54
	55	1/2"	10'-10"	1	10'-10"	55
	56	1/2"	10'-10"	1	10'-10"	56
REINFORCING STEEL	57	1/2"	10'-10"	1	10'-10"	57
	58	1/2"	10'-10"	1	10'-10"	58
	59	1/2"	10'-10"	1	10'-10"	59
	60	1/2"	10'-10"	1	10'-10"	60
REINFORCING STEEL	61	1/2"	10'-10"	1	10'-10"	61
	62	1/2"	10'-10"	1	10'-10"	62
	63	1/2"	10'-10"	1	10'-10"	63
	64	1/2"	10'-10"	1	10'-10"	64
REINFORCING STEEL	65	1/2"	10'-10"	1	10'-10"	65
	66	1/2"	10'-10"	1	10'-10"	66
	67	1/2"	10'-10"	1	10'-10"	67
	68	1/2"	10'-10"	1	10'-10"	68
REINFORCING STEEL	69	1/2"	10'-10"	1	10'-10"	69
	70	1/2"	10'-10"	1	10'-10"	70
	71	1/2"	10'-10"	1	10'-10"	71
	72	1/2"	10'-10"	1	10'-10"	72
REINFORCING STEEL	73	1/2"	10'-10"	1	10'-10"	73
	74	1/2"	10'-10"	1	10'-10"	74
	75	1/2"	10'-10"	1	10'-10"	75
	76	1/2"	10'-10"	1	10'-10"	76
REINFORCING STEEL	77	1/2"	10'-10"	1	10'-10"	77
	78	1/2"	10'-10"	1	10'-10"	78
	79	1/2"	10'-10"	1	10'-10"	79
	80	1/2"	10'-10"	1	10'-10"	80
REINFORCING STEEL	81	1/2"	10'-10"	1	10'-10"	81
	82	1/2"	10'-10"	1	10'-10"	82
	83	1/2"	10'-10"	1	10'-10"	83
	84	1/2"	10'-10"	1	10'-10"	84
REINFORCING STEEL	85	1/2"	10'-10"	1	10'-10"	85
	86	1/2"	10'-10"	1	10'-10"	86
	87	1/2"	10'-10"	1	10'-10"	87
	88	1/2"	10'-10"	1	10'-10"	88
REINFORCING STEEL	89	1/2"	10'-10"	1	10'-10"	89
	90	1/2"	10'-10"	1	10'-10"	90
	91	1/2"	10'-10"	1	10'-10"	91
	92	1/2"	10'-10"	1	10'-10"	92
REINFORCING STEEL	93	1/2"	10'-10"	1	10'-10"	93
	94	1/2"	10'-10"	1	10'-10"	94
	95	1/2"	10'-10"	1	10'-10"	95
	96	1/2"	10'-10"	1	10'-10"	96
REINFORCING STEEL	97	1/2"	10'-10"	1	10'-10"	97
	98	1/2"	10'-10"	1	10'-10"	98
	99	1/2"	10'-10"	1	10'-10"	99
	100	1/2"	10'-10"	1	10'-10"	100

NOTE:

For general notes, footing notes and joint details see DRG D-5034-B. All details for LEG A and Ramp B retaining walls similar.

Edge of shoulder used as reference line for setting of retaining wall. For layout see plan.

Edge of shoulder used as reference line for setting of retaining wall. For layout see plan.



NOTE:

For fence post reinforcement see section B-B.

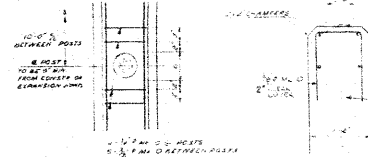
TYPICAL SECTION A-A IN CUT SHOWING REINFORCEMENT

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

TYPICAL SECTION B-B IN FILL SHOWING GENERAL DETAILS

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

REINFORCEMENT DETAIL AT FENCE POST



PRINT RECORD

NAME, TITLE, DATE

APPROVED BY, DATE

DATE	BY	ELEVATION

DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION			
AVENUE RD. UNDERPASS - HWY No. 401			
KING'S HIGHWAY No. 401		DIST. No. 4	
CO. YORK		CON. No. 4	
TWP. NORTH YORK		LOT	
RAMP B RETAINING WALL			
APPROVED	BY	DATE	BY
DESIGN	BY	CHECK	BY
CONTRACT	BY	CHECK	BY
DATE	BY	DATE	BY

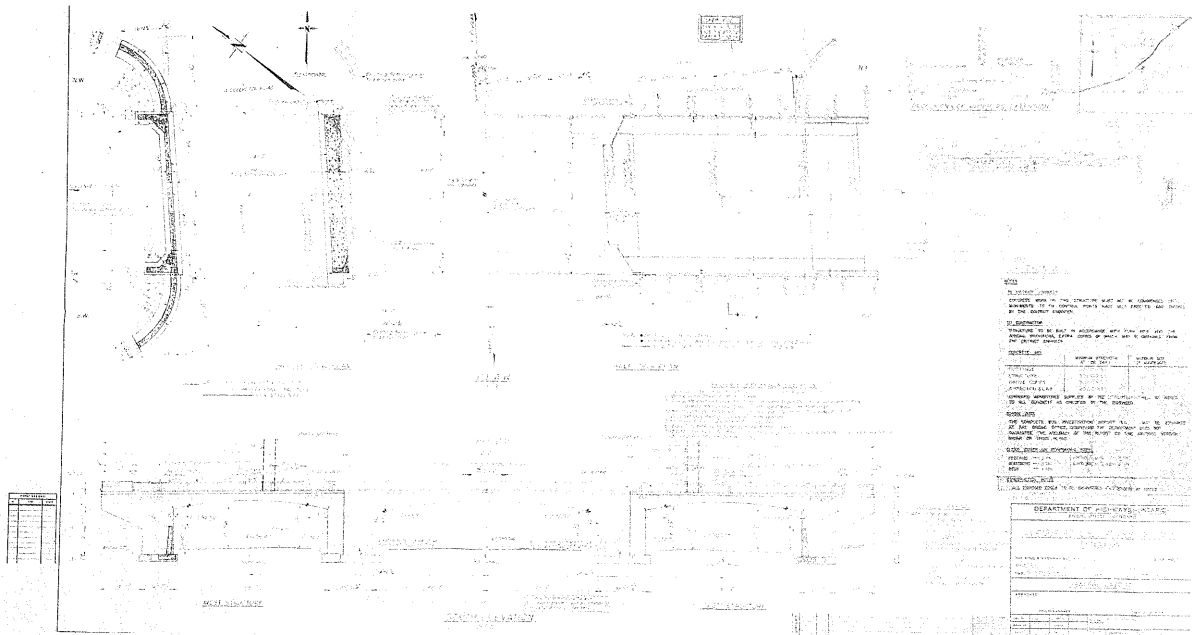
61-F-63

W.P. 193-58

HWY 401

AVENUE ROAD

UNDERPASS



1. **GENERAL**
 2. **DESCRIPTION**
 3. **CONSTRUCTION**
 4. **DETAILS**
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 6. **REFERENCES**
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SOME DEFECTS IN NEGATIVE DUE

TO CONDITION OF ORIGINAL DOCUMENTS