

APPENDIX C - DATA COLLECTION

GEOCRES No. FD-136

DIST. 8 REGION Eastern

W.P. No. 35-73-03

CONT. No. 79-42

W. O. No. _____

STR. SITE No. 17-79

HWY. No. 2

LOCATION Millhaven Creek

Bridge, Adessa

OVERALL PROJECT NO. 5

REMARKS: _____

E-2585-1

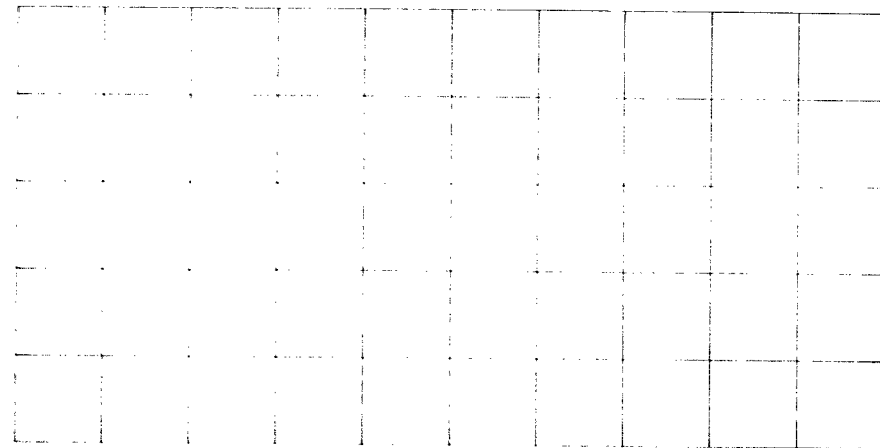
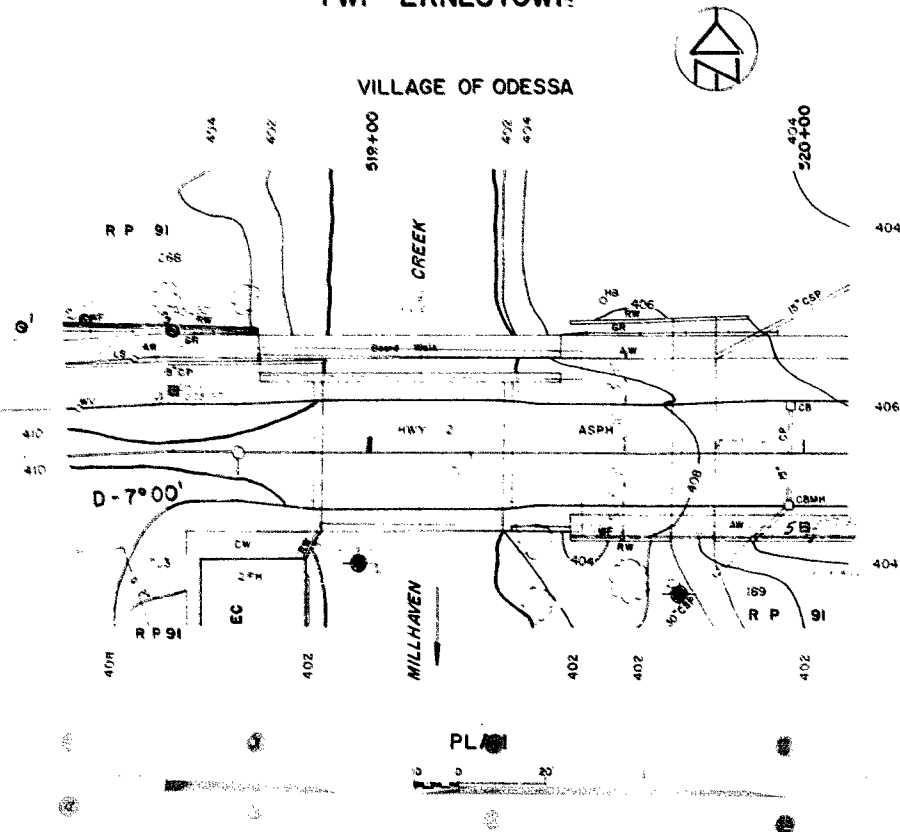
E-2585-1

CO LENNOX & ADDINGTON
TWP ERNESTOWN

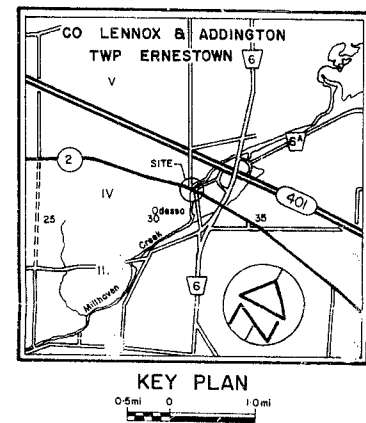
31C-136

E-2585-1

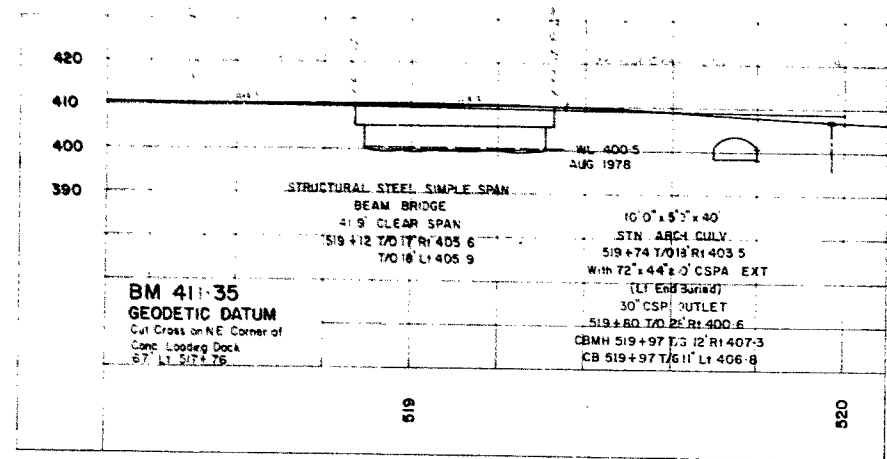
E-2585-1



DHO BM 612-68 EL 420.710
Concrete bridge carrying Odessa Road over Hwy. 401, being 0.55 miles west of interchange No. 99 (jct. Hwy. 401 and Wilton Road) at Odessa and 0.5 miles east of Mile Post 367. Tablet is set horizontally in south-west face of middle concrete pillar on north side of bridge, being 2.3 feet above ground level and 60 feet north of centreline of Hwy. 401.



WP 35-73-01
STR WP 35-73-03



PROFILE



420
390
130

DATE	REVISIONS & ADDITIONS
10/18/18	500' TOTAL PROJECT LOCATION OF MAIN STRUCTURE AS SUBMITTED TO SOIL MECHANICS SECTION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
HIGHWAY ENGINEERING DIVISION - ENGINEERING AND RIGHT-OF-WAY OFFICE
SURVEYS AND PLANS SECTION

BRIDGE SITE

PROPOSED CROSSING
AT
MILLHAVEN CREEK
AND
KING'S HIGHWAY 2

LOTS 189, 268 & 293
TWP ERNESTOWN
CO LENNOX & ADDINGTON

R.P. 91

SCALE	DISTRICT	REGION
AS SHOWN	8 KINGSTON	EASTERN

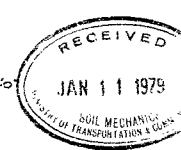
STUDY PLAN	PROFILE	PLAN
	C-18-2-1	B-18-2-1

Date of Survey	Date of Plan	SITE
APRIL 1973	AUG 1978	17-79

WO
WP 35-73-01

PLAN E-5282-1





FOR REDUCED PLAN

USE SCALE BELOW

10 11 12 13

3 INCHES ON ORIGINAL PLAN

REVISION	DATE	BY	DESCRIPTION
DESIGN	✓	CHECK	LOADING = 2 P.C. = CATERPILLAR
DRAWING	✓	CHECK	PILE CAP = 10 C.F.

310-136

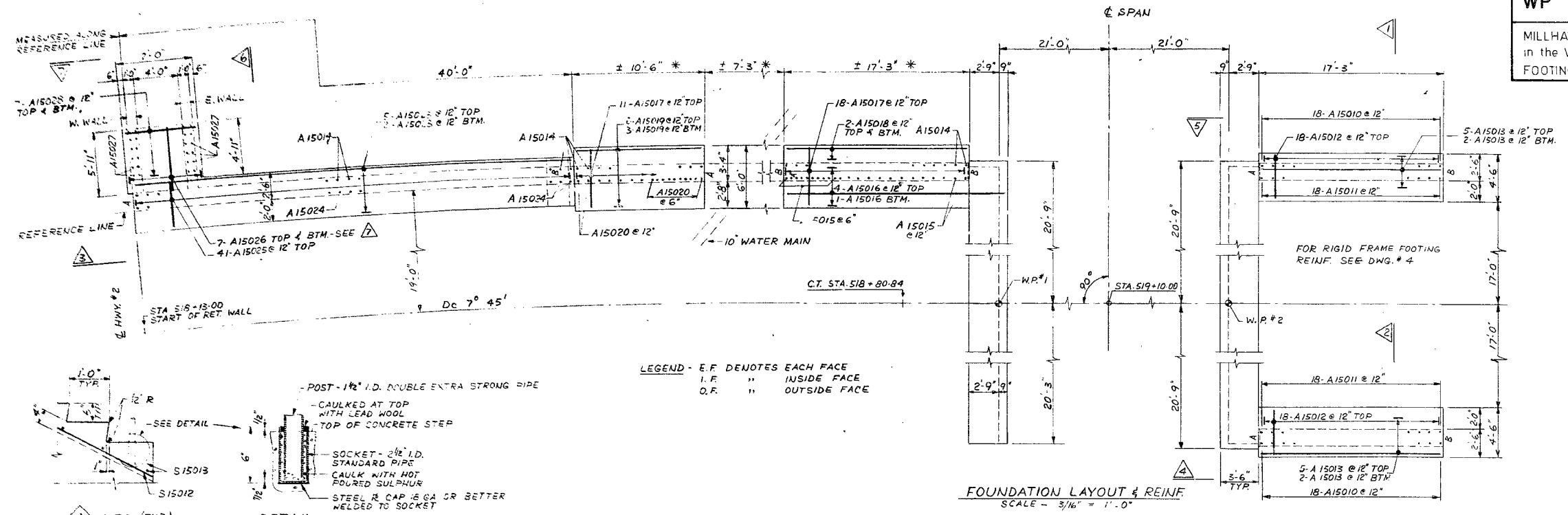
CONT No
WP No 35-73-03



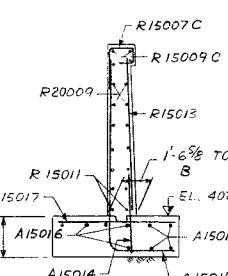
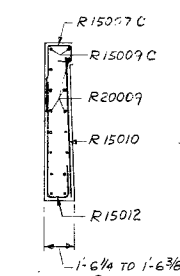
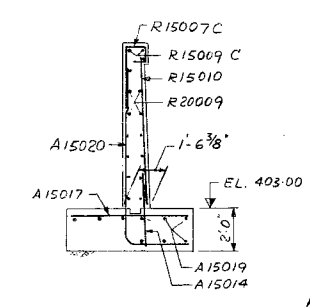
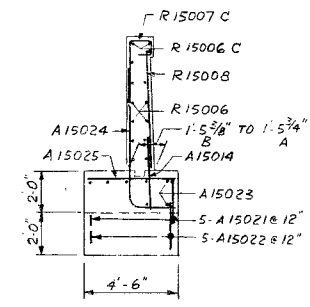
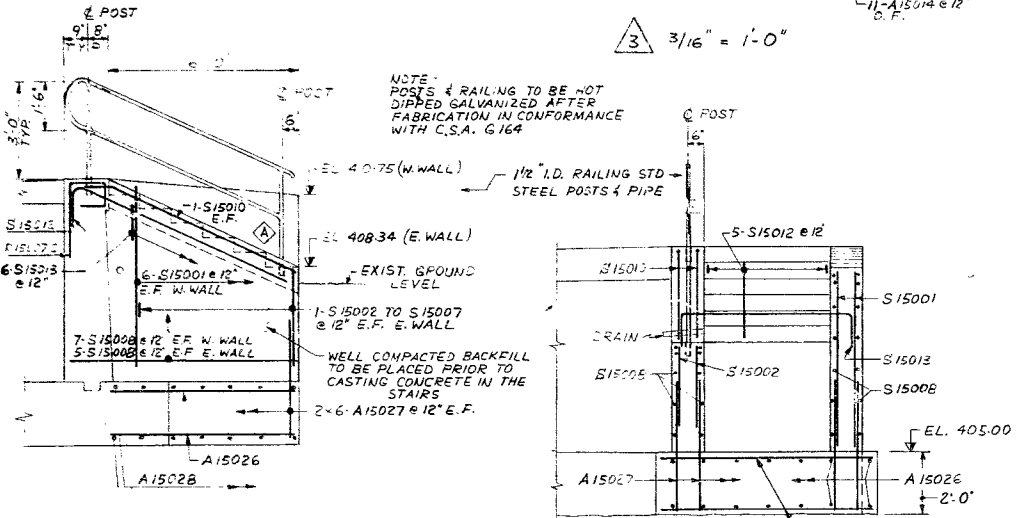
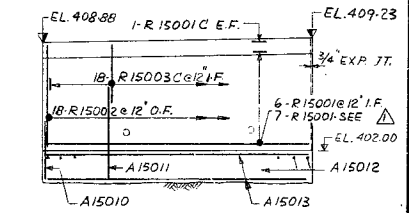
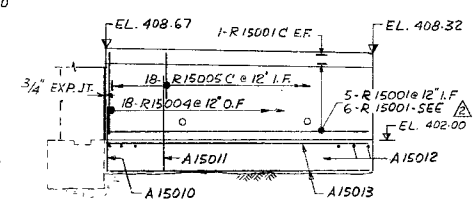
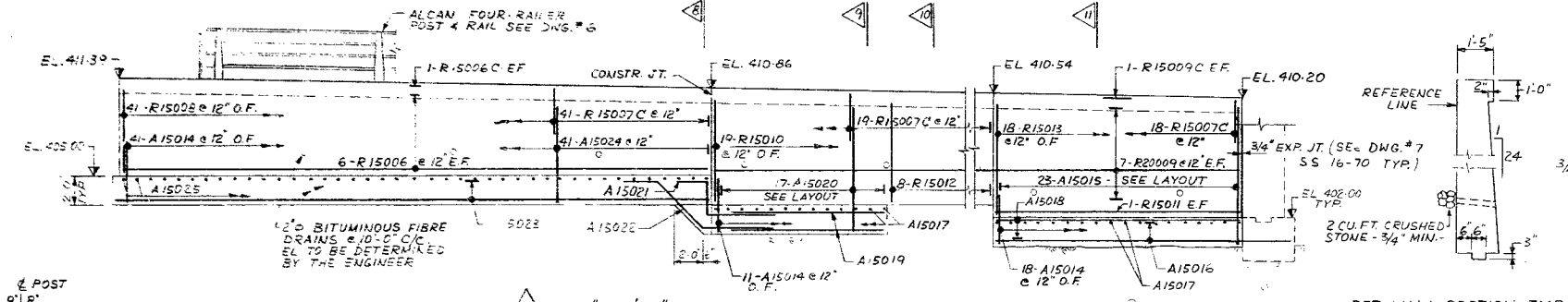
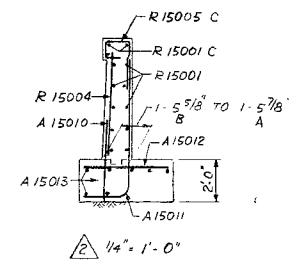
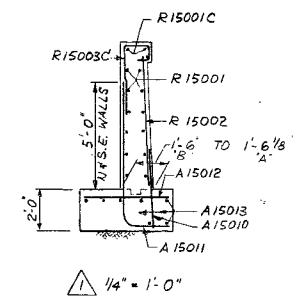
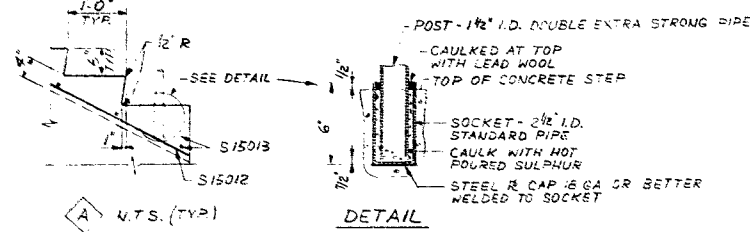
MILLHAVEN CREEK BRIDGE
in the Village of Odessa
FOOTINGS & RET. WALLS

SHEET

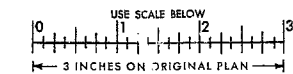
NOTE - DIMENSIONS MARKED * ARE TO BE ADJUSTED IN THE FIELD TO AVOID THE 10" WATERMAIN.



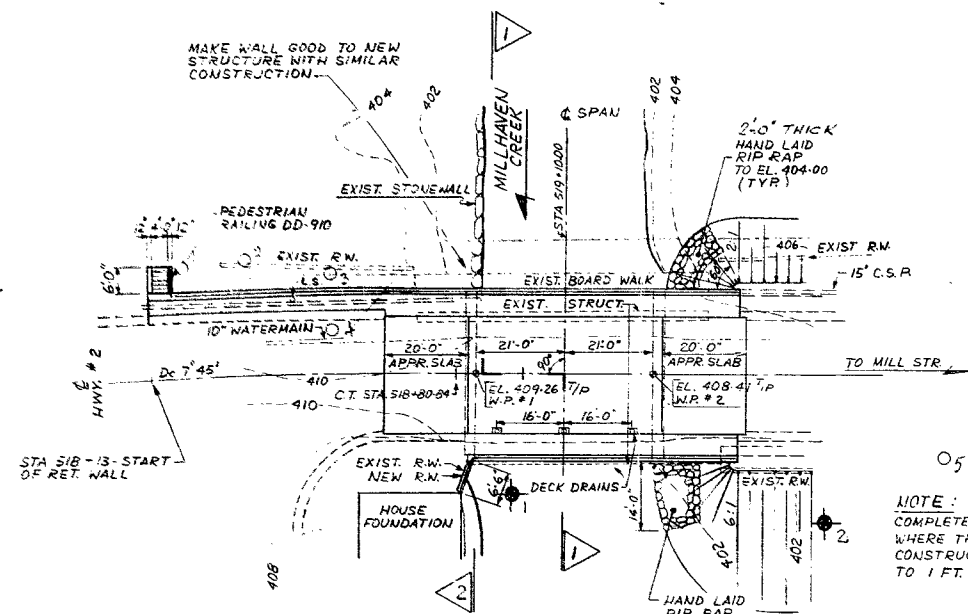
LEGEND - E.F. DENOTES EACH FACE
I.F. " INSIDE FACE
O.F. " OUTSIDE FACE



FOR REDUCED PLAN

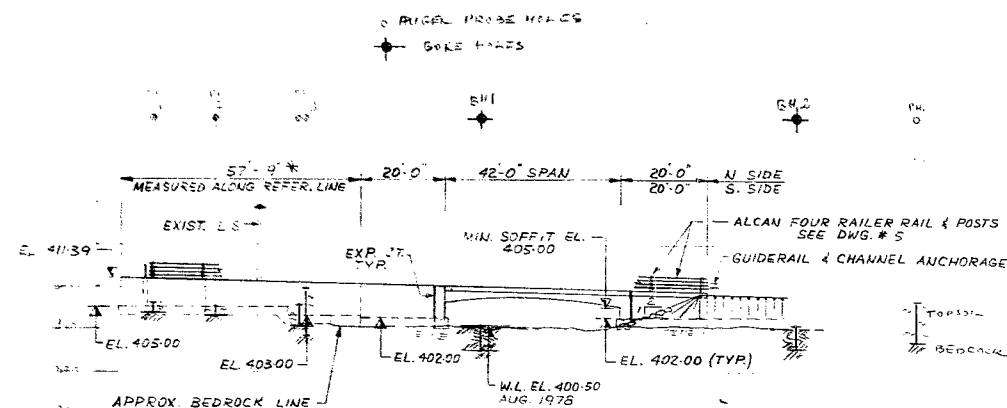


REVISIONS	DATE	BY	DESCRIPTION
DESIGN	12/1/73	R.K.	LOADING HS 20-44
DRAWING	12/1/73	M.H.	SITE No 17-79
			DATE DEC 78
			DWG 3



NOTE:
EXISTING STRUCTURE, BOARD
WALK, IS C.S.F. & LIGHT STANDARD
TO BE REMOVED.

PLAN
SCALE: 1" = 20'-0"



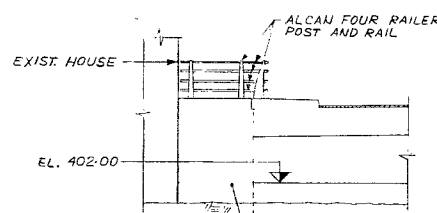
ELEVATION
SCALE: 1"=20'-0"

LEGEND

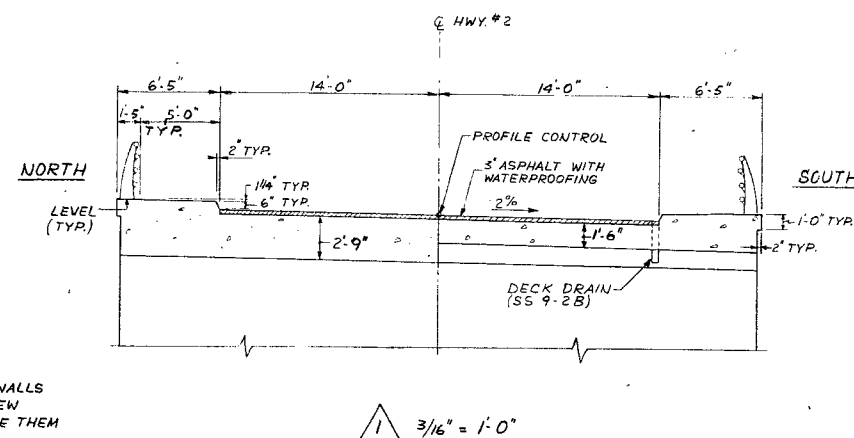
N.P.	WORKING POINT
T/P	TOP OF FINISHED PAVEMENT
RW	RETAINING WALL

REFERENCE BENCH MARK

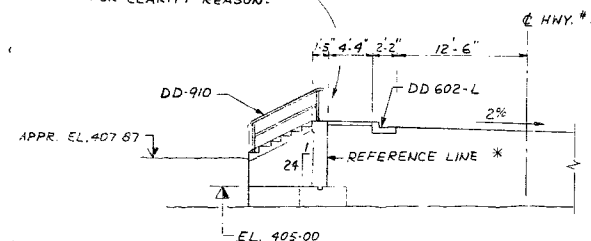
BM 411-35
GEODETIC DATUM
CUT CROSS ON N.E. CORNER OF
CONC. LOADING DOCK
67' L x 517' W



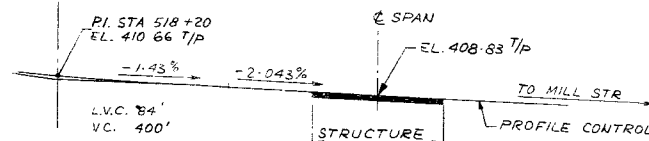
EXISTING MORTAR FACED RUBBLE-
RETAINING WALL TO BE REPLACED
BY NEW REINF. CONCR. RET. WALL



NOTE - POST & RAIL NOT SHOWN
FOR CLARITY REASON.



SECTION THROUGH STAIR
SCALE: $\frac{1}{8}" = 1'-0"$



PROFILE OF HWY. # 2
N.T.S.

NOTES

CLASS OF CONCRETE

DECK & ABUTMENTS ----- 4000 P.S.I.
REMAINDER ----- 3000 P.S.I.

GRADE OF REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400

REINFORCING BARS WITH THE DESIGNATION "C" AT THE END OF BAR MARKS SHALL BE COATED BARS.

CLEAR COVER TO REINFORCING STEEL

FOOTINGS, ABUTMENTS & RETAINING WALLS 3",
DECK TOP 2", DECK BTM. 1 1/2", STAIRS &
APPROACH SLABS 2", UNLESS STATED OTHERWISE
ON THE DRAWINGS.

CONSTRUCTION NOTES

- BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL ALMOST EXACTLY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATIONS BE GREATER THAN 2 FT.
- TO ACHIEVE THE MIN. CLEAR COVER OF 2" SPECIFIED AT TOP OF DECK, THE TOP LAYER OF REINFORCEMENT SHALL BE PLACED, PRIOR TO CONCRETING, WITH A CLEAR COVER OF $2\frac{1}{2}'' \pm \frac{1}{2}''$ TOLERANCE.

LIST OF DRAWINGS

- 17-79 - 1- GENERAL LAYOUT.
2- BOREHOLE LOCATIONS & SOIL STRATA.
3- FOOTINGS & RET. WALLS.
4- RIGID FRAME
5- RAILING
6- 20 FT. APPROACH SLAB
7- STANDARD DETAILS I
17-79 - 8- AS CONSTRUCTED ELEVATION & DIMENSIONS

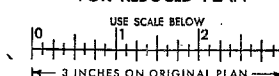
CONCRETE QUANTITIES

CONCRETE QUANTITIES ARE LISTED BELOW FOR THE APPROPRIATE CONCRETE LUMP SUM TENDER ITEM.

CONCRETE IN BRIDGE ——— CU. YDS. 178
CONCRETE IN RET. WALLS & STAIRS - CU. YDS. 45
CONCRETE IN SIDEWALKS ——— CU. YDS. 19
CONCRETE IN APPROACH SLABS - CU. YDS. 36



FOR REDUCED PLAN



3	REVISIONS				
	DATE	BY	DESCRIPTION		
4	DESIGN R.K.	CHECK F.C.	LOADING HS 20-44	DATE DEC.	
	DRAWING M.M.	CHECK R.L.	SITE No. 17-72	DWG.	

31C-136

PLATE No 18-2/34-0

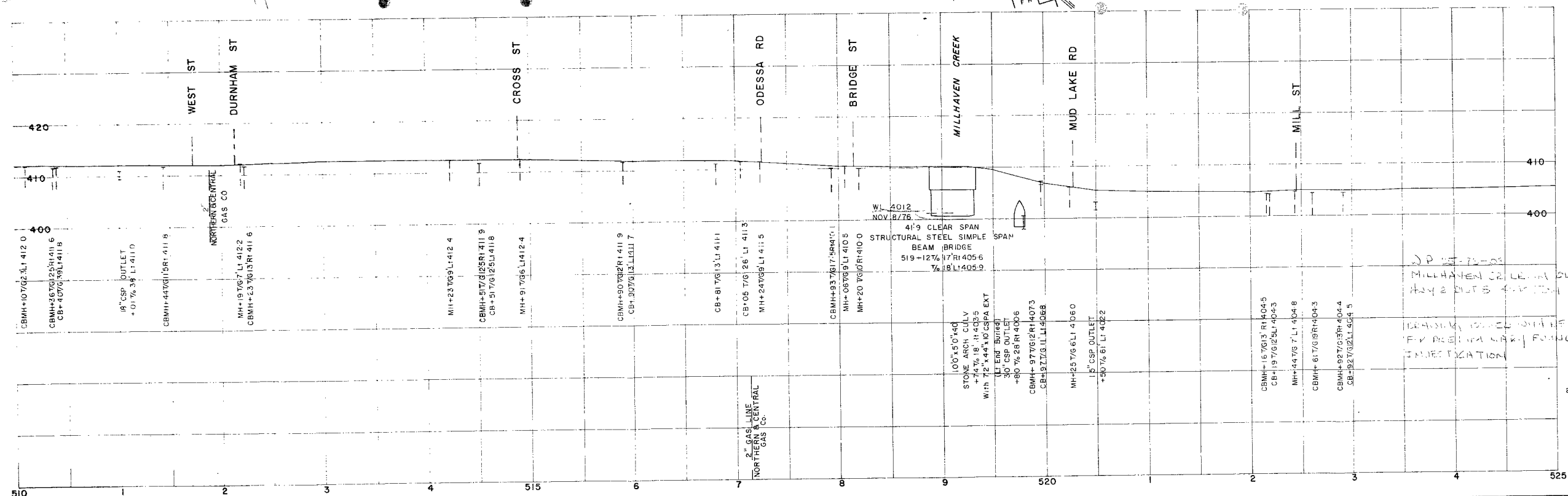
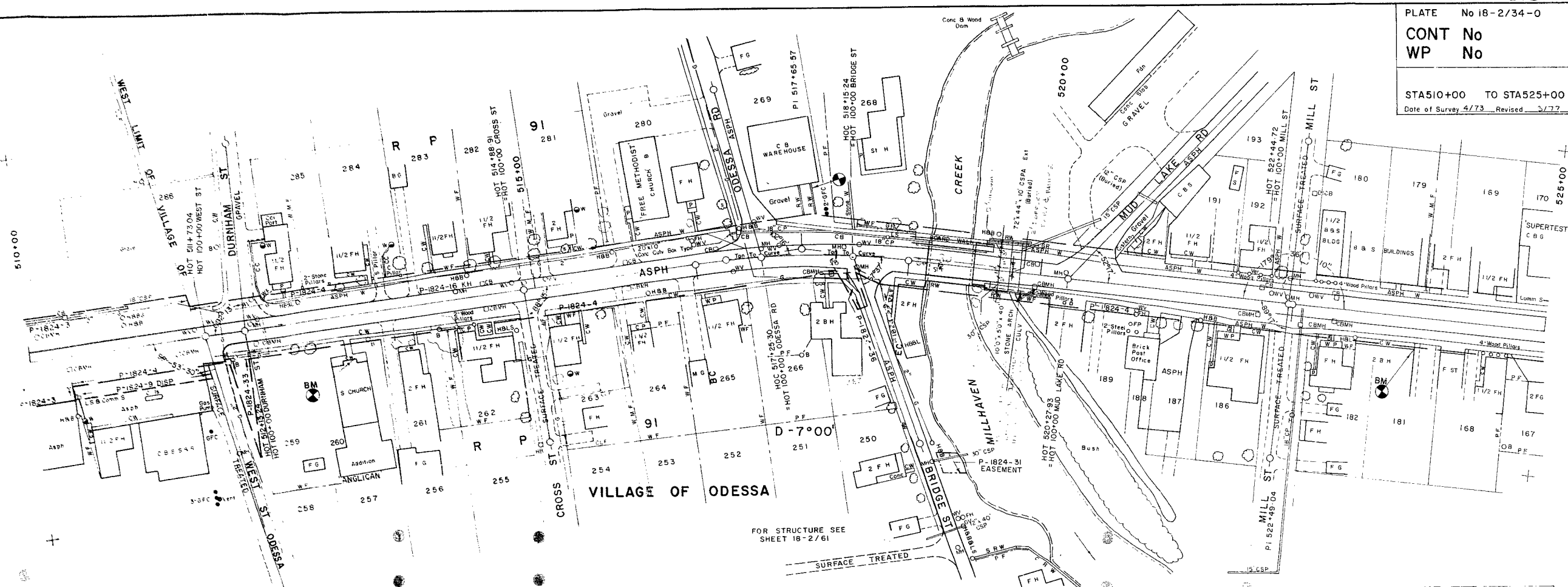
CONT No
WP No

STA510+00 TO STA525+00

Date of Survey 4/73 Revised 3/77



SHEET



SCALES

Horizontal

Vertical



DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 31C-136

DIST 8 REGION Eastern

W.P. No. 35-73-03

CONT. No. 79-42

W. O. No. _____

STR. SITE No. 17-79

HWY. No. 2

LOCATION Millhaven Creek Bridge,
Odessa

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 5

REMARKS: documents to be unfolded
before microfilming

FOUNDATION INVESTIGATION REPORT

For

Millhaven Creek Bridge, Odessa

W.P. 35-73-03, Site 17-79

Hwy. 2, District 8, Kingston

INTRODUCTION

This report contains the results of a foundation investigation carried out at the site of the above mentioned project. The fieldwork was carried out on August 17, 1978 and consisted of two sampled boreholes. The borings were advanced through a thin veneer of overburden by solid stem augers and bedrock was proven by obtaining up to 5.3 feet of BX size rock core.

SITE DESCRIPTION AND GEOLOGY

The site is located at the crossing of Hwy. 2 and Millhaven Creek in the Village of Odessa.

Land use in the vicinity is residential and the topography is flat.

At the location Millhaven Creek flows southerly and the flow is controlled by a concrete and wood dam located some 200 feet upstream of the crossing. The creek water level has been established at elevation 401.2 during November, 1976. At the time of the foundation investigation the depth of water was generally in the order of 1 inch which indicates a water level at elevation 400.5. The creek bed is flat, about 40 to 50 feet wide and exposed limestone bedrock is observed at the creek bed. The creek banks are in the order of 2 to 3 feet high with slopes of 1:1.

The existing structure is a 41.9 foot clear span structural steel beam bridge. A separate bailey bridge sidewalk is located to the north of the existing structure. Stone and concrete retaining walls up to 70 feet long and 10 feet high are used to retain the approach fills.

Physiographically the site is located in the region known as the Napanee Plains which is characterized by a flat to undulating limestone plain.

SUBSOIL CONDITIONS

Subsoil conditions across the site were found to be uniform. Beyond the limits of the creek, subsoil consists of a surficial deposit of topsoil overlying bedrock. Immediately below the topsoil the upper 1 foot of the bedrock consists of limestone slabs up to 5 inches thick separated by weathered zones in the order of 1 inch thick. Exposed in the creek bed and elsewhere beneath the upper 1 foot zone of weathered limestone slabs is sound limestone bedrock at elevation 400.0 to 400.3. The limestone bedrock is described as very hard to hard medium grey colour with numerous irregular shale partings and small calcite crystals present. Based on the RQD values, being in the order of 100%, the rock is estimated to have an excellent quality.

Variations in subsoil conditions can be anticipated where public works have required rock excavation. The watermain to the immediate north of the existing structure was constructed by rock excavation and subsequent backfilling by mass concrete. It is suspected that the stone arch culvert and CSP located about 50 feet east of the existing east abutment were constructed by rock excavation utilizing the broken rock for the required backfilling.

The boundaries between the various subsoil and bedrock types are shown on the Record of Borehole Sheets. The location of boreholes are shown on the sketch, Figure 1.

DISCUSSION AND RECOMMENDATIONS

The proposed structure will replace the existing and is to be located at the crossing of Hwy. 2 and Millhaven Creek in the Town of Odessa.

The existing structure is a 42 foot clear span structural steel beam bridge; a bailey bridge sidewalk is located to the immediate north of this structure. Stone and concrete retaining walls are currently retaining portions of the east and west approaches and in conjunction with replacing the existing structure all or portions of the retaining wall may require replacement.

The approach embankments are in the order of 10 feet high. No major alignment or grade revisions are anticipated.

Subsoil conditions across the site consist of generally flat sound limestone exposed in the creek bed; whereas outside the creek limits the limestone is overlain by up to 1 foot of weathered limestone slabs beneath a thin veneer of topsoil.

Structure/Retaining Wall Foundation

The proposed structure and retaining walls can be supported on spread footings placed within the sound bedrock. To ensure that the footing is located on sound bedrock, the footing should be located 2 to 3 inches below the bedrock surface or in areas of the existing abutment the new footing level should be located 2 to 3 inches below the previous founding level. If loose rock or granular backfill is encountered at the footing founding level this deleterious material shall be completely removed and brought up to the founding level by mass concrete. In view of this, provisions should be made in the contract to allow for the adjustment during construction. Spread footings constructed in such a manner can be designed using an allowable load of 15 t.s.f.

In order to construct the footings in the dry a temporary dewatering scheme will be required. This could be accomplished by the construction of temporary earth dykes.

To compute horizontal resistance to sliding between rough concrete and the bedrock surface, a coefficient of friction of 0.8 may be used. If additional horizontal resistance is required the footing should be keyed into the bedrock or alternatively the footing may be dowelled to bedrock.

Furthermore, to prevent the build-up of hydrostatic pressures behind the retaining wall or abutment wall, free draining granular material should be used for backfill behind the wall placed to the dimensions as shown in current M.T.C. Standards. In addition, no heavy vibratory compaction equipment or other heavy machinery should be allowed within a distance of twice the height of the fill at any given time.

It is understood that the roadway will be detoured at this location to allow for reconstruction. In this manner roadway protection will not be required since portions of the approach fill may be removed to allow for construction. However, it should be noted that excavations of the approach fill or roadway adjacent to existing buildings may be detrimental to the foundations of such buildings. Depending on the proximity of the required excavation to the building foundation, underpinning or a temporary sheeted wall may be required. The limits where underpinning is required is shown on Figure 2.

Approach Embankments

The existing approach embankment height is in the order of 10 feet above the creek bed, and it is understood that there will be no significant grade changes. No stability problems are anticipated provided the following is carried out:

1. Fill material is placed in accordance with current M.T.C. Standards.
2. Widening to be carried out in accordance with M.T.C. Standard Benching of Earth Slopes (DD-414).

MISCELLANEOUS

The fieldwork for this investigation was carried out under the supervision of Mr. M. MacLean, Project Engineer using equipment rented from Atcost Soil Drilling Inc.

This report was written by Mr. M. MacLean and reviewed by
Mr. M. Devata, Supervising Engineer

M Maclean

M. MacLean, P. Eng.
Project Engineer



M. Devata

M. Devata, P. Eng.
Supervising Engineer

September, 1978

SKETCH SHOWING BOREHOLE LOCATIONS MILLHAVEN CREEK BRIDGE

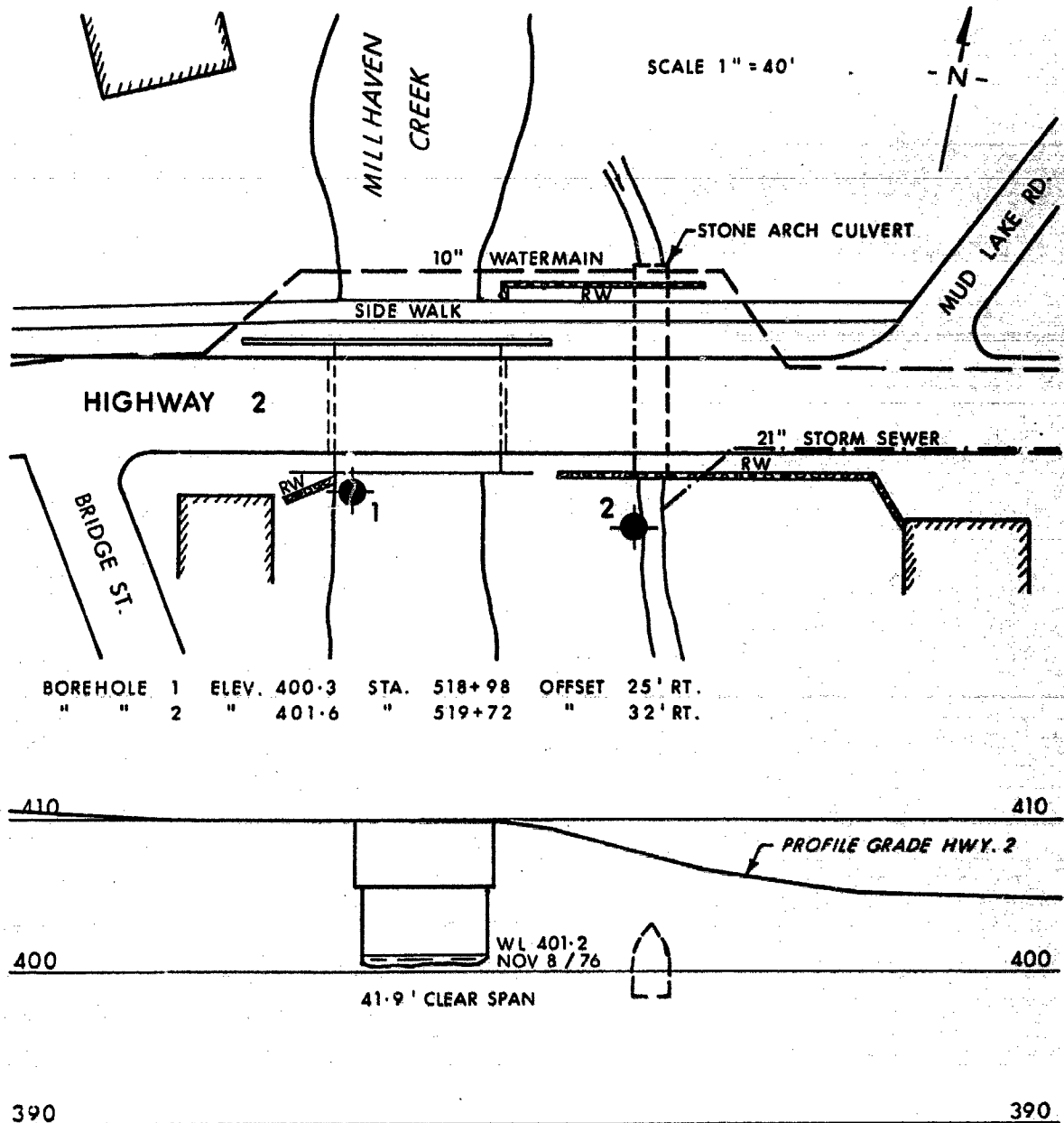
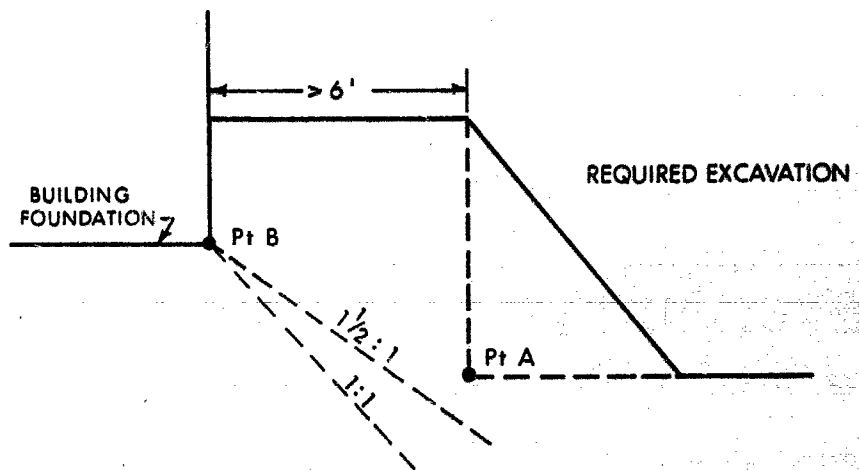


FIG. 1

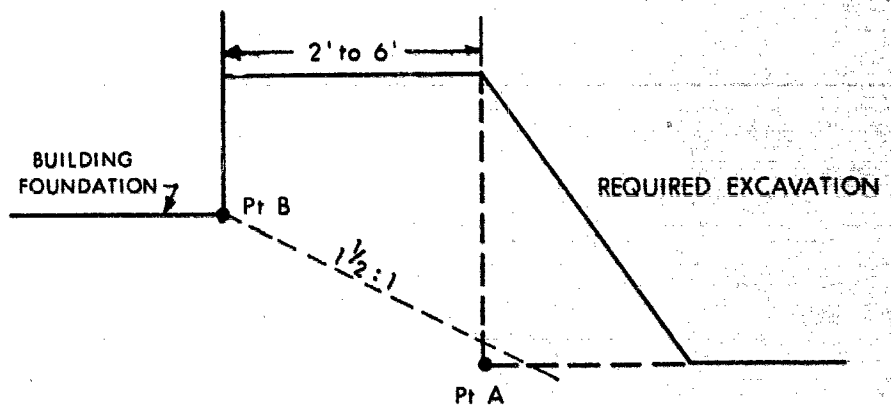
FIG. 2

UNDERPINNING REQUIREMENTS



CASE A

- Groundwater Above Point A
Underpinning is required if a 1 vertical to 1.5 horizontal influence line from the foundation (Pt. B) is above Point A.
- Groundwater Below Point A
Underpinning is required if a 1:1 projection from the foundation (Pt. B) is above Point A.



CASE B

- Underpinning is required if a 1 vertical to 1.5 horizontal influence line from the building foundation is above Pt. A.

CASE C

- Underpinning is required if the crest of the excavated slope is closer to the building foundation than 2 feet.

RECORD OF BOREHOLE No 1

W P 35-71-03 LOCATION Sta. 518+28.0 o/s 25 Feet Right ORIGINATED BY N.M.
 DIST 8 HWY 2 BOREHOLE TYPE BX Rock Coring COMPILED BY N.M.
 DATUM Geodetic DATE August 17, 1978 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
400.3	Ground Surface																
0.0	Limestone Bedrock Sound		1	BX RC	Rec 100%		400										RQD = 100%
395.0	End of Borehole						395										

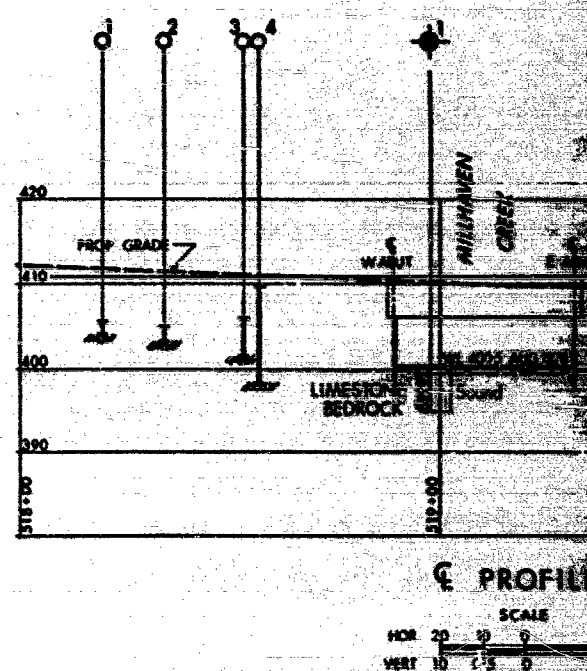
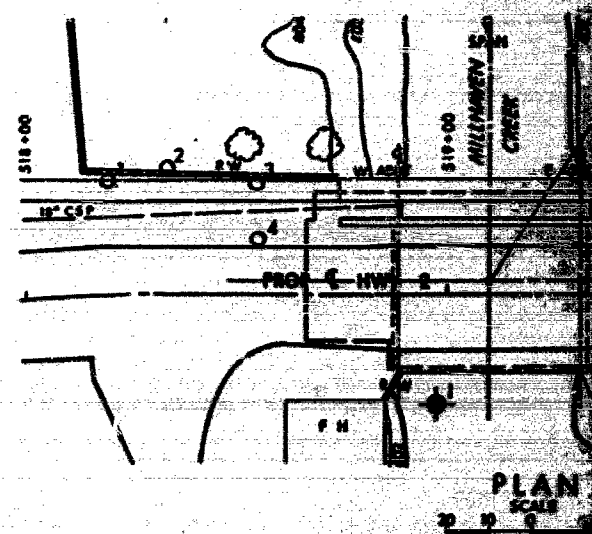
RECORD OF BOREHOLE No 2

W P 35-73-03 LOCATION Sta. 519+72 o/s 32 Feet Right ORIGINATED BY N.M.
 DIST 8 HWY 2 BOREHOLE TYPE Solid Stem Augers & BX Rock Coring COMPILED BY N.M.
 DATUM Geodetic DATE August 17, 1978 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
401.6	Ground Surface																
0.0	Topsoil																
0.6	Limestone Slabs Weathered		1	BX RC	Rec 80%		400										RQD = 0%
1.6	Limestone Bedrock Sound		2	BX RC	Rec 100%												RQD = 100%
395.8							395										

+3, x5: Numbers refer to Sensitivity

20
15
10
+5 (%) STRAIN AT FAILURE



PROFILE

SCALE
HOR 20 10 0
VERT 10 5 0

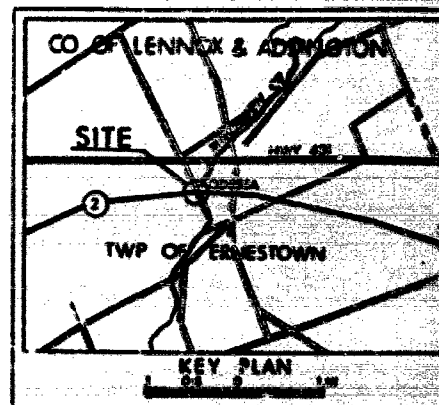
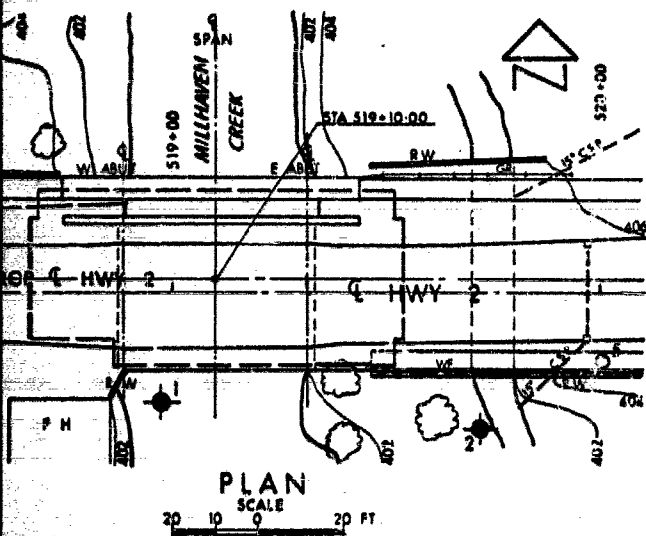
CONT No
WP No 35-73-03



MILLHAVEN CREEK BRIDGE

SHEET

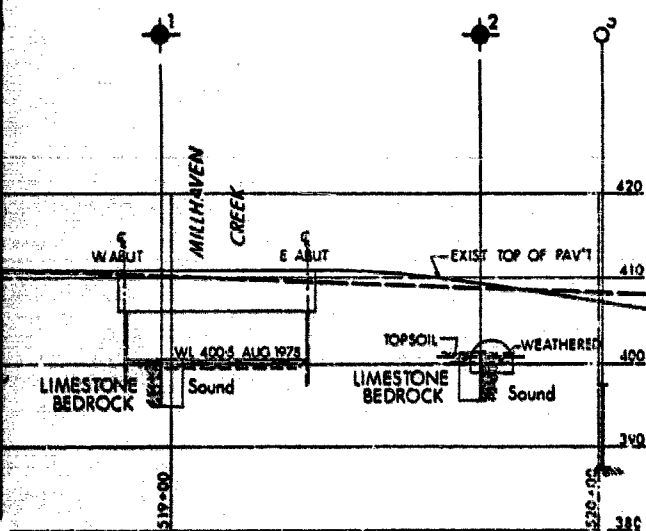
BORE HOLE LOCATIONS & SOIL STRATA



LEGEND

- ◆ Bore Hole
- ◆ Dynamic Cone Penetration Test (Cone)
- ◆ Bore Hole & Cone
- W' Blows/ft (Std Pen Test 350 ft lb energy)
- CONE Blows/ft (60° Cone, 350 ft lb energy)
- ↓ WL at time of investigation
- AUGER PROBE HOLES

No	ELEVATION	STATION	OFFSET
1	400.3	518+98	25' RT
2	401.6	519+72	32' RT
P H			
1	405.55	518+21	30' LT
2	404.25	518+35	31' LT
3	406.00	518+55	28' LT
4	409.85	518+55	14' LT
5	406.98	520+00	17' RT



PROFILE

SCALE
HOR 20 10 0 10 20 FT
VERT 10 0.5 0 10

NOTE

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

REVISED	DATE	BY	DESCRIPTION

HWY No 2
SUBMITTAL CHECKED DATE 10-10-73
DRAWING CHECKED DATE 10-10-73
TWO 1573032A

Mr. K.G. Bassi
Head, Eastern Section
Structural Office
2nd Floor, West Building

Soil Mechanics Section
Engineering Materials Office
Room 315, Central Building

79 02 05

Re: Millhaven Creek Bridge
W.P. 35-33-03, Site 17-79
Hwy. 2, District 8, Kingston

Further to your request of 78 12 27, we have reviewed the final structural design for the above and have the following comments.

As you are aware, it was not possible to carry out soil borings and rock coring for the N-W retaining wall because of the presence of overhead and buried utilities. Rock elevations were obtained by power hand equipment only and we are concerned about the quality of bedrock at this location in the upper 1-2 feet. In view of this we intend to inspect the bedrock foundation for the N-W retaining wall during construction. We would appreciate the assistance of the Regional Construction Office in keeping us informed of the construction progress of this job so we can plan our inspection visit accordingly.

The replacement of the S-W and N-W retaining wall will require excavations and backfilling adjacent to an existing watermain and an existing house. These excavations should be carried out so as not to damage the existing facilities. In backfilling, no heavy vibratory compaction equipment should be permitted in close proximity to the watermain and house foundation or the new structure and associated retaining walls. If the house is supported on spread footings on subsoil, underpinning to sound bedrock will be required. However, if the foundation is carried to bedrock, underpinning may not be required depending on the structural adequacy of the foundation wall. In order to save the Ministry from unwarranted claims on the house foundation arising from construction activities, full documentation including sketches and photographs of cracking or other signs of distresses should be undertaken before and after construction.

As mentioned in the foundation report, a temporary unwatering scheme will be required to construct the footings in the dry. This could be accomplished by a temporary earth dyke.

cont'd.....

These aspects were brought to the attention of the designers at the Technical Review meeting on 79 01 31. Subsequent to this meeting we have submitted to your office our suggested Special Provision limiting the use of heavy vibratory compaction equipment for backfill purposes in close proximity to the watermain and structures.

We have no further comments at this time.

M. MacLean
Project Engineer

For: M. Devata
Supervising Engineer

MM/MD/ga

cc: T.C. Kingsland, Attn: A. Van Dalen
W. Blum
R.W. Franks
Files ✓

Meeting of
Structural Review Committee

Time: 9:00 a.m. January 31, 1979
Place: Boardroom 'B', West Building
Attending: Messrs.

K. Bassi	- Structural Office
W. Hashizumi	- Structural Office
M. Stoyanoff	- Structural Office
C. Farrell	- Structural Office
R. Kam	- Structural Office
C. Sadler	- Structural Office
N. Zoltay	- Structural Office
K. Jorns	- Hydrology Office
<u>M. MacLean</u>	- Soil Mechanics Section
A. Van Dalen	- Regional Structural Section

Project Reviewed

Group W.P. 35-73-01

W.P. 35-73-03 Site 17-79
Millhaven Creek Bridge
Hwy. 2 District 8

Group W.P. 145-78-01

W.P. 145-78-01 Site 11-150
Repairs to St. Hilaire Rd. U'pass
Hwy. 401 District 8

Group W.P. 94-75-01

W.P. 94-75-01 Site 27-51
Hawkesbury Creek Bridge Repairs
Hwy. 17 District 9

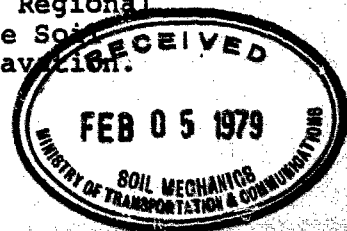
Group W.P. 151-75-01

W.P. 151-75-02 Site 3-151
Widening of Jock River Bridge
Hwy. 16 District 9

Millhaven Creek Bridge (W.P. 35-73-03)

Foundations

- (a) The design complies with the recommendations of the Foundation Report.
- (b) Mr. MacLean expressed the need to review the soil condition at the site of retaining walls prior to placing concrete in footing, because the rock elevation was determined by power hand equipment only. The Regional Construction Office is requested to notify the Soil Mechanics Section, the time of the footing excavation.



Bailey Bridge

The approach slope and the guide rail are to be adjusted according to the latest requirement. The Regional Structural Office will advise the Designer.

Special Provision and D-4

The documents are to comply with the Ministry's policy.

Widening of Jock River Bridge (W.P. 151-75-02)

Foundations

The design complies with the recommendations of the Foundation Office.

Structure

Since the contract advertising is deleted to 1981 the project is not reviewed in this time.

Repairs to St. Hillaire Rd. U'Pass (W.P. 145-78-01)

Structure

Drawing #1

- (a) Section (A) Revise note re: Bell Canada ducts to read: "Existing unused Bell Canada ducts to be replaced".

Special Provisions and D-4

The Regional Planning and Design Office is to add SP No. 182 "Transportation of Structural Components" to the contract.

Hawkesbury Creek Bridge Repairs (W.P. 94-75-01)

Structure

Drawing #1

- (a) The Regional Structural Section is to investigate the existing grading under west approach slab and advise the Designer if any remedial work is required prior to completion of expansion joint.
- (b) Section (F) Delete asphalt

Drawing #2

Detail (c) Correct note to read "Concrete in spalled and delaminated area"

- (c) The Contractor is to be restricted using heavy vibratory equipment in the vicinity of south retaining wall and building. The Designer is to advise the Contractor in a special provision (Operation Constraints) that only hand operated equipment will be permitted inside of the limit of 10 feet from the south retaining wall and the house.
- (d) The Bailey bridge foundations are supported on natural ground. The condition is to be reviewed by Soil Mechanics Office and Structural Office will be advised.

Hydrology

Mr. Jorns commented that the hydrology requirements have been prepared by the Regional Structural Section. He recommended to raise the rip-rap elevation at upstream by one foot to the elevation of 405.

Structure

Drawing #1

- (a) The existing watermain may interfere with the backfilling operation. The Regional Structural Section is to advise the Design Section of the correct location of watermain.
- (b) Delete concrete quantity for sidewalk and adjust concrete quantities in Bridge and Approach Slabs accordingly.
- (c) Refer to grading drawing for sidewalk adjacent to wingwall.

Drawing #2

- (a) The 2"Ø wall drain pipe is to be changed to 3".
- (b) The length of bar A15016 is to be reviewed.
- (c) Footing in "Ret. Wall Section-Typ" is to be indicated.

Drawing #7

- (a) The 2"Ø wall drain pipe is to be changed to 3".

Drawing #6

Show sidewalk on plan.

The deck is to be machine finished.

Special Provisions and D-4

The designer is to incorporate the two SP's and D-4's packages for the handrail replacement and for the bridge repairs into one package and re-issue it.

The meeting is adjourned at 12:15 p.m.



N. Zoltay
Sr. Project Engineer
Approvals Section

NZ/jl

Copies to:
All present

c.c. Mr. J. Wilkes
Mr. R. A. Dorton

Mr. T.C. Kingsland
Head, Structural Section
Eastern Region, Kingston

Soil Mechanics Section
Engineering Materials Office
Room 315, Central Building

Mr. A. Van Dalen

78 12 08

Re: Millhaven Creek Bridge
W.P. 35-73-03, Site 17-79
Hwy. 2, District 8, Kingston

The hand auger probings to bedrock performed by Eastern Region is appreciated. However, based on our previous borings in the area, it is our concern that the upper 1 to 2 feet of the bedrock at the retaining wall location may not be sound; indeed it is suspected that the upper portion of the bedrock consists of slabs of limestone 3-6" thick separated by zones of weathered shale 2-4" thick. It is not possible to carry out diamond drilling techniques in this area to determine the quality of the bedrock because of the utilities in the area, overhead as well as buried. Furthermore, the existing retaining wall and roadway make test pits impractical.

In view of the relatively small loading requirements of the retaining wall, the suspected poor quality of the bedrock in the area of concern will not significantly affect the performance of the retaining wall. The footing can be designed assuming the bedrock elevations supplied by the Region.

However, provisions should be made in the contract for the removal of any loose slabs of limestone or other deleterious material and bringing up the footing founding level by means of mass concrete. In addition, a note should be included on the structural drawings to the effect that the Ministry's Soil Mechanics Section will inspect the footing foundations upon completion of the excavation. In view of the foregoing we are of the opinion that no additional borings are warranted prior to construction. We believe that the above comments will be sufficiently adequate to enable you to proceed with design and construction.

Our office will prepare a necessary drawing to be included in the contract package showing the results of our boreholes. The drawing will also incorporate the probings put down by the Region.

cont'd.....

If you have any further questions please do not hesitate to call this office.

M. MacLean
Project Engineer

For: M. Devata
Supervising Engineer

MM/MD/ga

cc: K. Bassi
W. Blum
R.W. Franks
Files /



Memorandum

To: Mr. K.G. Bassi
Head, Eastern Section
Structural Office
2nd Floor, West Building

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

Attention:

Date: 78 11 10

Our File Ref.

In Reply to

Subject: Re: Millhaven Creek Bridge
W.P. 35-73-03, Site 17-79
Hwy. 2, District 8, Kingston

Further to your request of 78 10 25, we have reviewed the preliminary structural design for the above and have the following comments to make.

At the time of the preliminary foundation investigation it was not anticipated that the N-W retaining wall would be reconstructed and accordingly borings were not carried out in this area. From borings carried out for the 10" watermain by the Ministry of the Environment, it appears that the bedrock surface dips slightly down to the west. Furthermore, the surface of the bedrock varies from about elevation 398.0 at the west end of the N-W retaining wall to about elevation 400.3 in the creek bed. It will be necessary to carry out further fieldwork in this area to ascertain bedrock elevations along the N-W retaining wall.

Because of the relative closeness of the Geotechnical Office in Eastern Region, their assistance in this matter has been solicited and they are endeavouring to obtain the required bedrock elevations. The appropriate information will be forwarded to your office when available. The recommendations for the design and construction of this retaining wall would be as discussed in our Foundation Investigation Report.

The proposed N-W retaining wall crosses the existing M.O.E. 10" watermain as shown on your preliminary structural drawing. It will be necessary to ensure the integrity of the 10" watermain. One alternative is to enclose the watermain in a steel liner and encase the steel liner in concrete. Provisions should be made in the contract to allow for field adjustment of the retaining wall reinforcing steel to accommodate the watermain. In addition, it will be necessary to backfill with concrete any bedrock excavations below the retaining wall footing that were carried out during the construction of the watermain.

cont'd.....

The replacement of the S-W retaining wall will require an excavation adjacent to the nearby house. Measures should be taken to ensure that construction activities do not damage the house foundation. Excavation in close proximity to the house foundation should be carried out using hand equipment. No heavy vibratory compaction equipment should be allowed within ten feet of the house foundation; compaction of the backfill for this retaining wall should be carried out by using hand held mechanical equipment. If the house is supported on spread footings on subsoil, underpinning to sound bedrock will be required. However, if the foundation is carried to bedrock, underpinning may not be required depending on the structural adequacy of the foundation wall. In order to save the Ministry from unwarranted claims on the house foundation arising from construction activities, full documentation including sketches and photographs of cracking or other signs of distresses should be undertaken before and after construction.

As mentioned in the foundation report, a temporary unwatering scheme will be required to construct the footings in the dry. This could be accomplished by a temporary earth dyke.

We have no further comments at this time.

M MacLean

M. MacLean
Project Engineer

For: M. Devata
Supervising Engineer

MM/MD/gs

cc: T.C. Kingsland, Attn: A. Van Dalen
W. Blum
R.W. Franks
Files ✓



Memorandum

To: Mr. M. Devata,
Supervising Eng.,
Soils Mechanics Section,
Dowsview,

From: Structural Section,
Kingston, Ontario.

Attention:

Date: 78 08 08

Our File Ref.

In Reply to

Subject:

W.P. 35-73-03, Site 17-79
Millhaven Creek Bridge in Odessa
Highway 2, District 8, Kingston

As discussed with Mr. M. MacLean on August 3, 1978 the above structure is to be replaced as part of the reconstruction work on Highway 2 under W.P. 35-73-01 presently on the 1978 Program of Construction.

The Pre-Engineering Schedule has yet to be established but we are attempting to speed up all phases of the project in order to complete the design of the proposed structure and avoid delay of the Project Award.

Survey work has only just been started and no bridge site plan is available at this time. However, in view of the fact that the proposed structure will be located in the same location as the present structure and because of the bedrock conditions at the site, I would be pleased if you could carry out a preliminary foundation investigation at your earliest opportunity.

The bedrock in the creek bed is exposed and presently there is only 2 to 5 cm water in the creek making access by wheeled vehicles possible. During the late fall and winter up to 60 cm of water can be expected while water depth during the spring run-off is about 1½ metres.

A ten inch diameter watermain is buried in the creek bed approximately 10 metres north of the centreline of the existing bridge. Hydro and Bell Canada cables are suspended from wooden poles just north of the pedestrian crossing.

I enclose two copies of E.T.R. Sheet #18-2/34-0 on which the approximate limits of the proposed structure are shown in red. As you may note also contemplated in the design of the new structure is a retaining wall at the south-east corner. Several underground utilities such as watermains and storm sewers are located in this vicinity. Copies of the bridge site plan will be forwarded as soon as they become available. Enclosed also are two copies of the field reconnaissance report. Should you need further information prior to starting the investigation please call this office.

AVD.TCK.jea

Encl.

c.c. K. G. Bassi
C. E. Pritchard Att: D. Kimmatt

A. Van Dalen,
for: T. C. Kingsland,
Head, Structural Section

