

# **APPENDIX 'D'**

## **REFERENCE DRAWINGS**



# CITY OF WINNIPEG

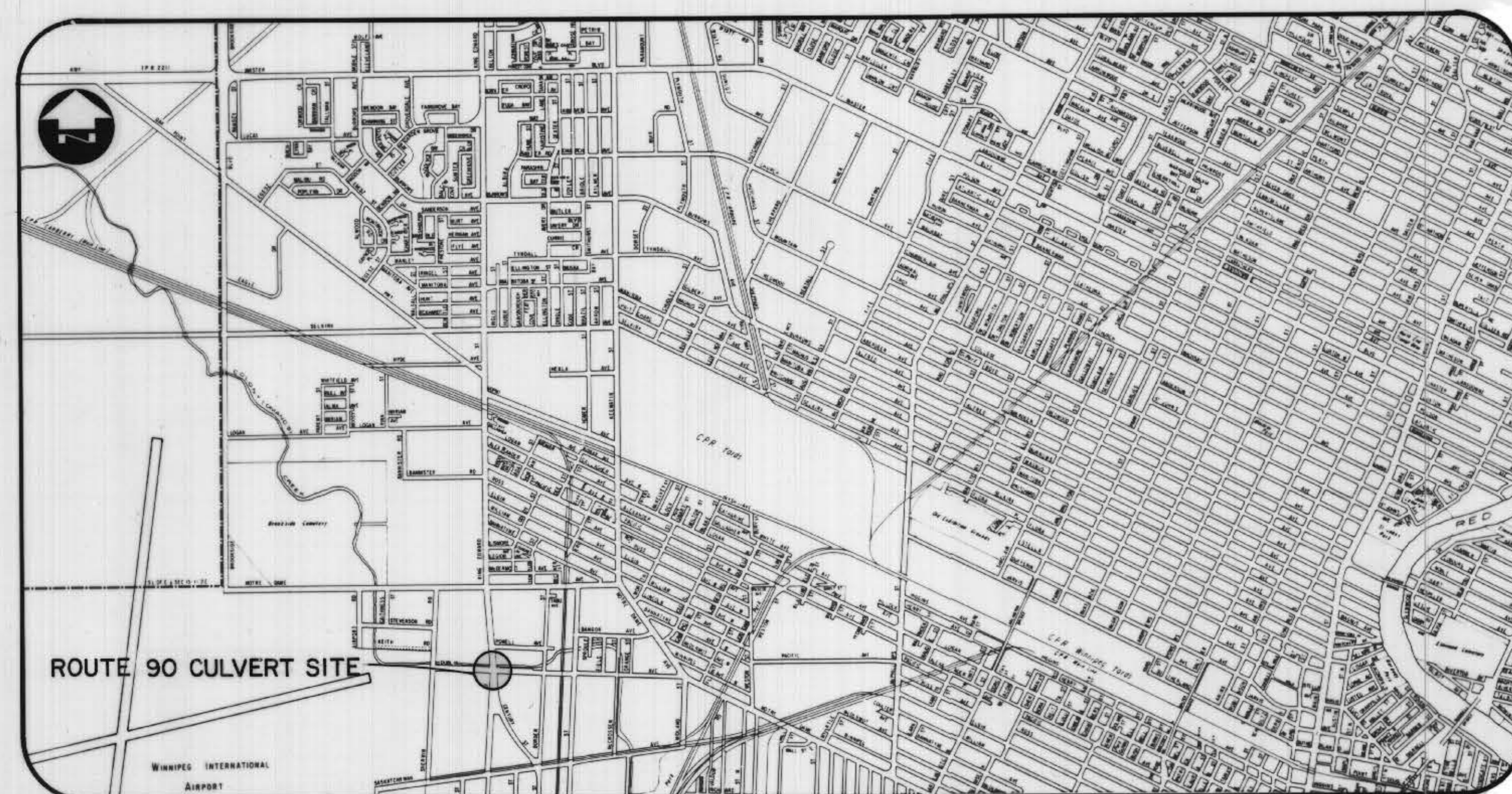
WORKS AND OPERATIONS DIVISION

STREETS AND TRANSPORTATION DEPARTMENT

ROUTE 90 CULVERT AT OMAND'S CREEK  
TOP SLAB REHABILITATION, STRUCTURAL  
STRENGTHENING AND RELATED WORKS

TOP SLAB

P.D. NO. 85-104



LOCATION PLAN

### DESIGN DATA

DESIGN SPECIFICATIONS	-	AASHTO 1983
LIVE LOADING	-	HSS 25-44 TRUCK LOADING HS 25-44 LANE LOADING
STRUCTURAL CONCRETE	-	$f'_c = 30$ MPa
REINFORCING STEEL	-	CSA G30.12-M77 GRADE 400
STRUCTURAL STEEL	-	CSA CAN 3 - G40.21-M81 GRADE 300W
ALUMINUM	-	ASTM B221
HIGH DENSITY CONCRETE	-	100mm CONCRETE TOPING ON CULVERT TOP SLAB
CLEAR COVER TO REINFORCING STEEL	-	60mm ± 10mm

### DRAWING LIST

C315-85-01	COVER SHEET
C315-85-02	GENERAL ARRANGEMENT & LOCATION OF PROPOSED WORKS
C315-85-03	TRAFFIC ROUTING & CONSTRUCTION SEQUENCE
C315-85-04	DETAILS OF TOP SLAB MODIFICATIONS AND APPROACH SLABS
C315-85-05	ASPHALT OVERLAY - LAYOUT & GRADES
C315-85-06	LAYOUT & DETAILS OF ALUMINUM PEDESTRIAN HANDRAIL
C315-85-07	LAYOUT OF BALANCED ALUMINUM SHOULDER BARRIER, HEADWALL CHAINLINK FENCE & RIPRAP
C315-85-08	BALANCED ALUMINUM SHOULDER BARRIER STANDARD DETAILS
C315-85-09	DETAILS OF ALUMINUM BRIDGE RAIL POSTS

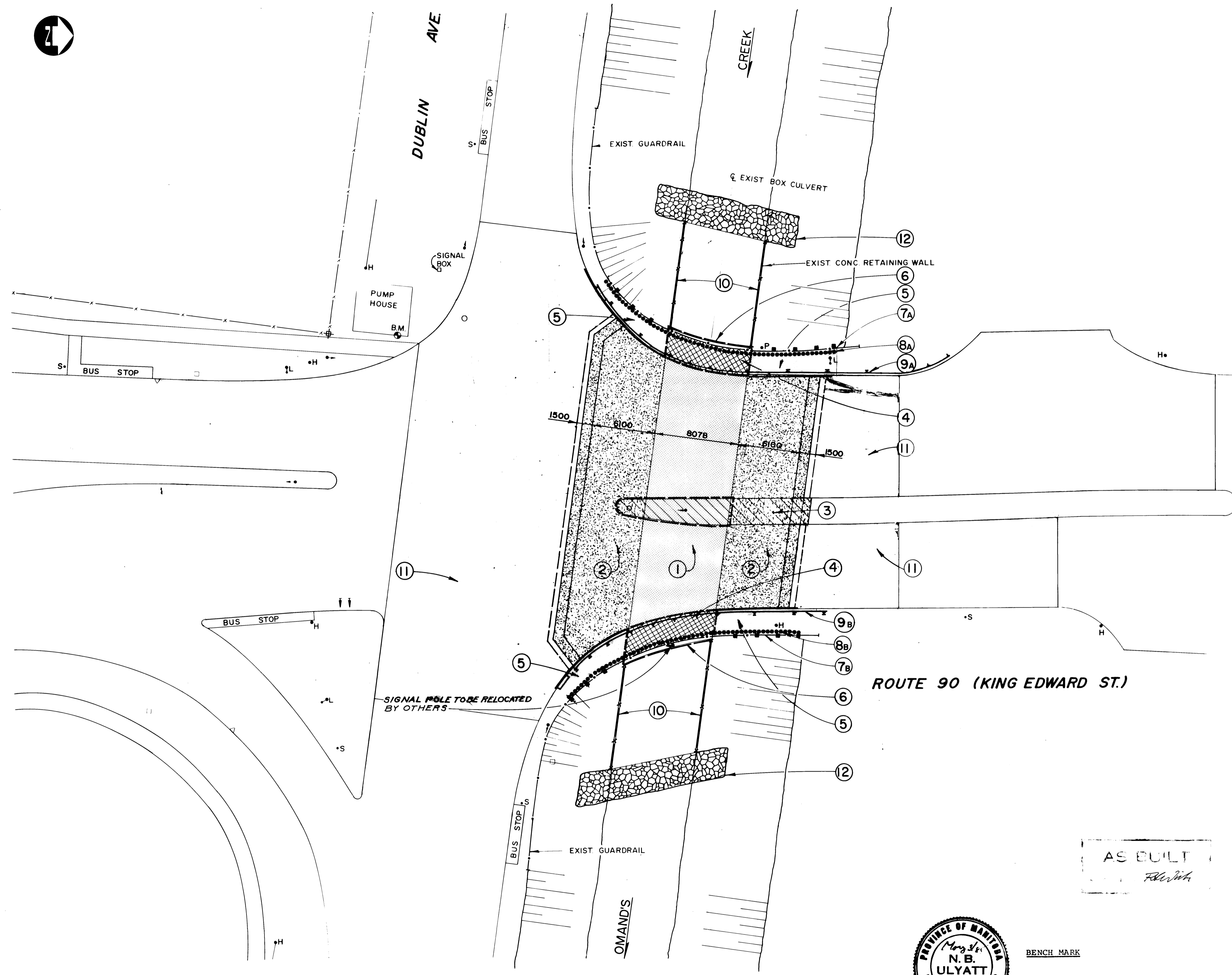
**DILLON**  
Consulting Engineers & Planners

RELEASED FOR CONSTRUCTION  
*Small R. Ogilby* 85 of 03  
MANAGER OF STREETS AND TRAFFIC

AS BUILT  
APPROVED BY: *R. [Signature]*

DWG. NO. C315-85-01

B-5530-1



**PLAN**

PROPOSED WORKS	REFERENCE DRAWING NUMBER
1 REMOVE EXISTING CONCRETE FROM MEDIAN SLAB, CULVERT WALLS, 25 - 50mm FROM CULVERT TOP SLAB. CONSTRUCT NEW APPROACH SLAB SEATS. PLACE ADDITIONAL REINFORCING STEEL, SAND BLAST EXISTING REINFORCING STEEL AND PLACE MIN. 100mm THICK HIGH DENSITY CONCRETE TOPPING	C315-85-04
2 REMOVE EXISTING APPROACH SLABS, CURBS, AND APPROACH SIDEWALK SLABS. CONSTRUCT NEW APPROACH SLABS	C315-85-04
3 CONSTRUCT NEW MONOLITHIC CONCRETE APPROACH MEDIAN SLAB	C315-85-04
4 CONSTRUCT CULVERT SIDEWALK MODIFICATIONS C/W MONOLITHIC PARAPET	C315-85-04
5 CONSTRUCTION OF NEW APPROACH STRUCTURAL SIDEWALK SLABS C/W MONOLITHIC PARAPET AND CAISSONS	C315-85-02,04
6 APPLY SURFACE MEMBRANE ON CULVERT SIDEWALKS	C315-85-04
7 REMOVE EXISTING FLEX-BEAM TRAFFIC/ PEDESTRIAN BARRIER	C315-85-02
A - LENGTH = 54M B - LENGTH = 54M	
8 INSTALL NEW ALUMINUM PEDESTRIAN HANDRAIL	C315-05-06
A - LENGTH = 23.5M B - LENGTH = 23.5M	
9 INSTALL NEW BALANCED ALUMINUM SHOULDER BARRIER	C315-85-07,08,09
A - LENGTH = 37M B - LENGTH = 27M	
10 INSTALL NEW GALVANIZED CHAINLINK FENCING ON HEADWALLS	C315-85-07
11 ASPHALT OVERLAY AND RELATED WORK	C315-85-05
12 INSTALL GROUTED FIELDSTONE RIPRAP	C315-85-07

NOTE: THE EXECUTION OF PROPOSED WORKS ABOVE SHALL BE IN ACCORDANCE WITH THE TRAFFIC ROUTING AND CONSTRUCTION SEQUENCE SHOWN ON DRAWING C315-85-03.

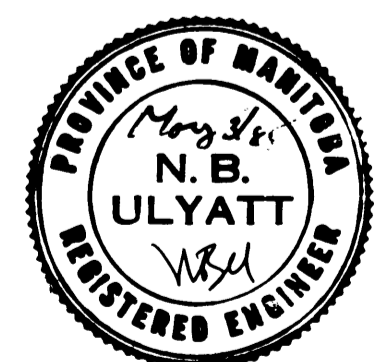
**GENERAL NOTES**

- STRUCTURAL CONCRETE:
 

	28-Day STRENGTH (MPa)	AGGR. (mm)	SLUMP (mm)	CEMENT TYPE	ENTRAINED AIR %
A) APPROACH SLABS	30	40	60	10	4 - 7
B) APPROACH SLAB SEATS AND ALL OTHER CONCRETE	30	20	80±25	50	5 - 8
C) SIDEWALKS	30	20	80±25	10	5 - 8
D) CAISSONS	30	40	100±25	50	3 - 6

REFER TO SPECS FOR ADDITIONAL PROPERTIES OF STRUCTURAL CONCRETE.
- REINFORCING STEEL SHALL BE NEW DEFORMED BILLET BARS TO CSA G30.12-M77 STIRRUPS AND TIES GRADE 300 ALL OTHER BARS GRADE 400
- ALL NEW TOP BARS AND ALL BARS MARKED THUS \* SHALL BE FACTORY EPOXY COATED.
- ALL EXPOSED EXISTING REINFORCING STEEL SHALL BE SANDBLASTED UNLESS OTHERWISE SPECIFIED FOR REPLACEMENT WITH NEW EPOXY COATED BARS.
- MINIMUM LAP SPLICE LENGTHS SHALL BE 40 BAR DIAMETERS UNLESS OTHERWISE NOTED.
- CONCRETE CLEAR COVER TO REINFORCING STEEL SHALL BE 60mm UNLESS OTHERWISE NOTED.
- ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 13mm UNLESS OTHERWISE SHOWN.
- CONSTRUCTION JOINTS THAT ARE REQUIRED BUT NOT SHOWN ARE TO HAVE FORMED KEY AND MUST BE APPROVED BY THE ENGINEER.

AS BUILT  
*File with*



BENCH MARK

B.M. #23022 S.W. CORNER KING EDWARD STREET @ DUBLIN AVE. TBLT. IN EAST FOUNDATION OF PUMPING STATION 4 m. NORTH EAST. 1 m. BELOW TOP OF PLATFORM ELEVATION 234.879

**B-5530-2  
METRIC**

WHOLE NUMBERS INDICATE MILLIMETRES  
DECIMALIZED NUMBERS INDICATE METRES

ITEM	EXISTING	PROPOSED
POLES - HYDRO(H) MTS.(T)	—	—
SIGNAL POLE	—	—
LIGHT STANDARD	—	—
SURVEY BAR	—	—
FIRE HYDRANT	—	—
WATER VALVE	—	—
EDGE OF PAVT NO CURB	—	—
EDGE OF PAVT CURBED	—	—
EDGE PAVT CURB & GUTTER	—	—
PARAPLEGIC RAMP	—	—
ELEVATIONS	40265	(40265)
ASPHALT OVERLAY	—	—
PROPERTY LINE	—	—
MANHOLE	○	●
CATCH BASIN	□	■
CATCH BASIN INLET	▽	▼

**WARNING**

IF POWER EQUIPMENT OR EXPLOSIVES ARE TO BE USED FOR EXCAVATION ON THIS PROJECT THE CONTRACTOR MUST:

1. NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION.
2. TAKE PRECAUTION TO AVOID DAMAGE TO GAS COMPANY INSTALLATIONS.

SEE PROVINCIAL REGULATION 270-72 FOR DETAILS

LOCATION APPROVED	DATE	SUPERVISOR
UNDERGROUND STRUCTURES		

LOCATIONS OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION



**DILLON**  
Consulting Engineers & Planners

S.S.R. C.R.B.  
N.B.U. MAY/85

APPROVED BY: *W.B. Ulyatt* DATE: *1985-05-03*

**THE CITY OF WINNIPEG**

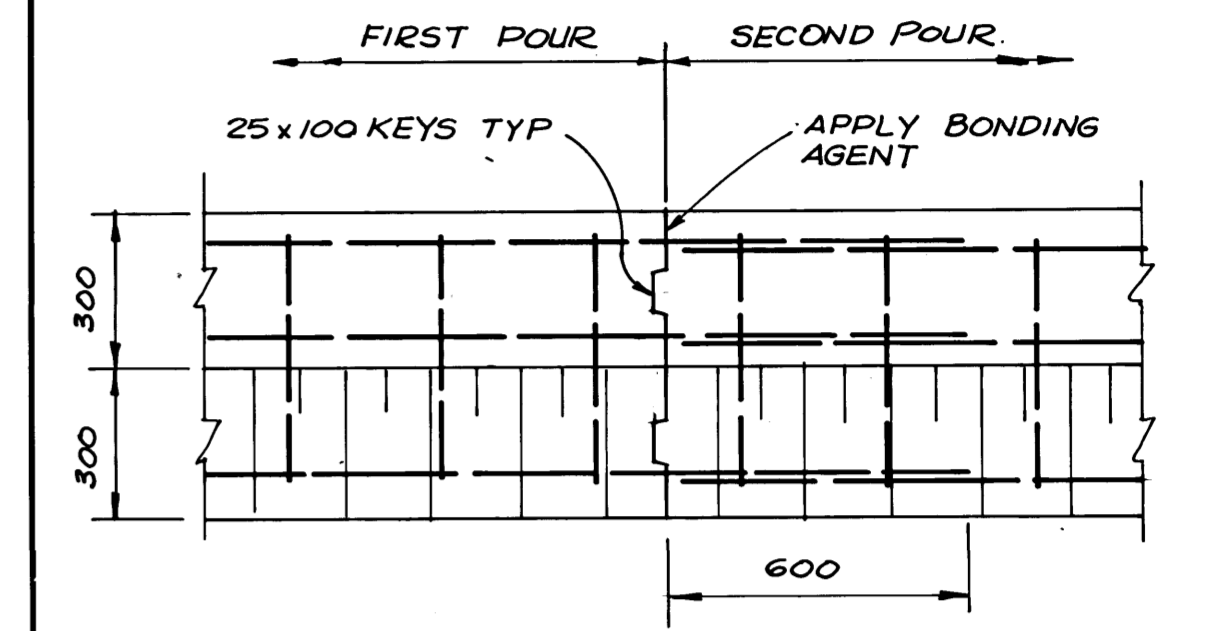
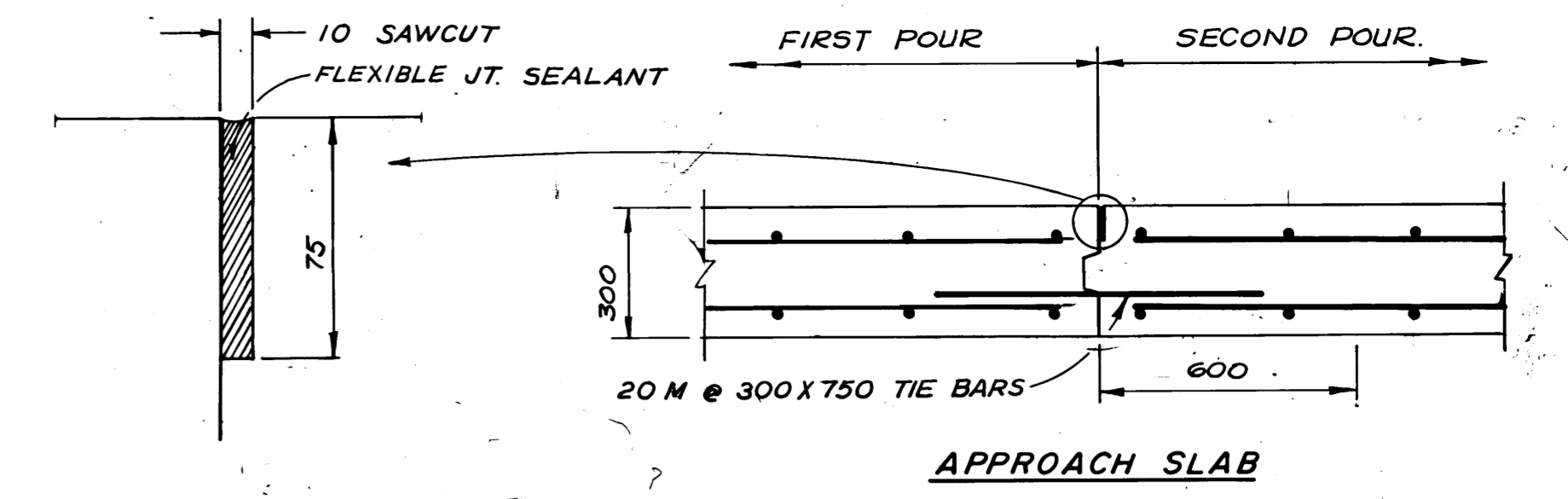
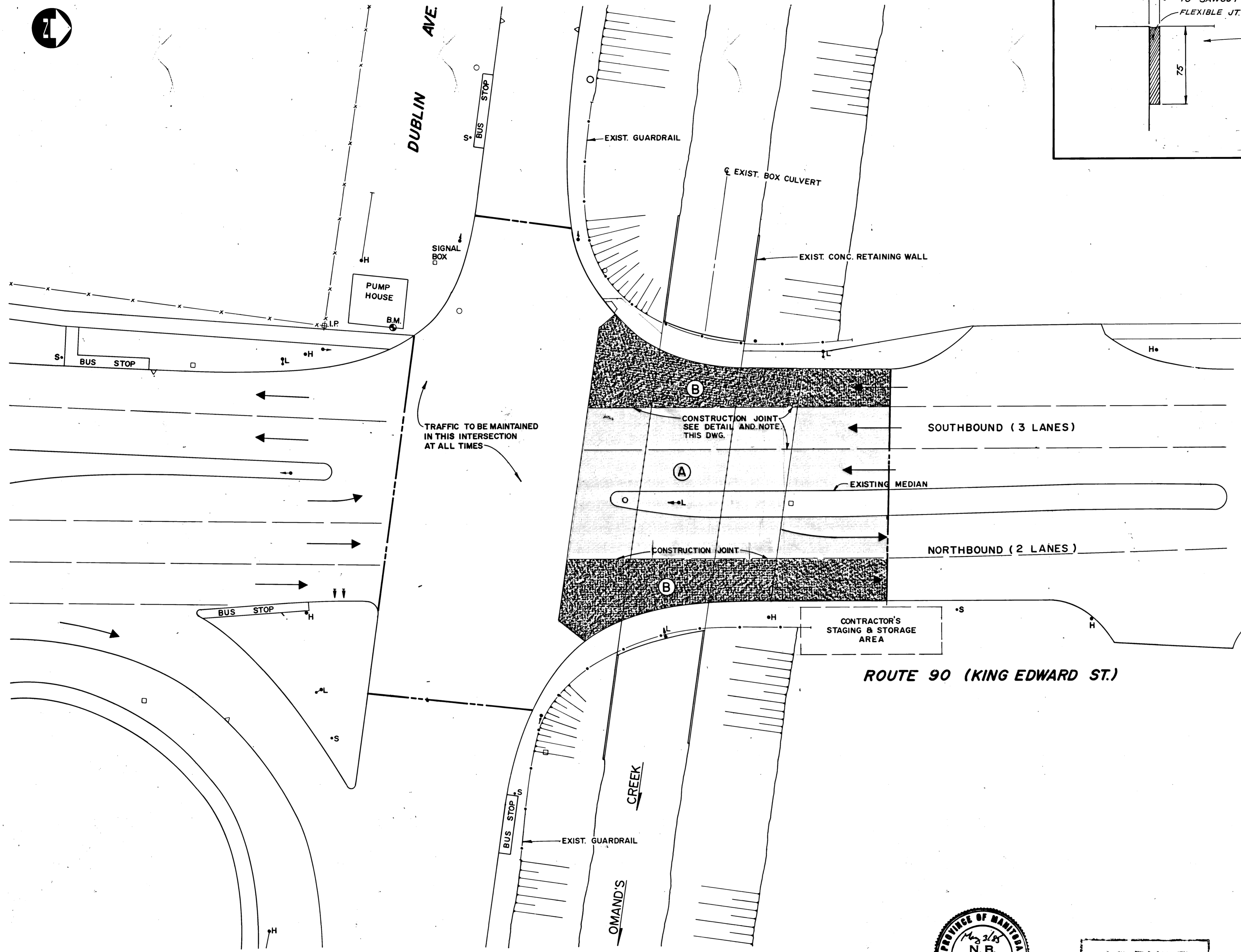
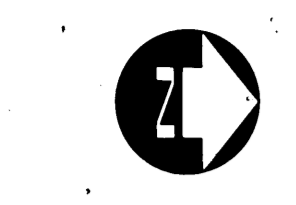
WORKS & OPERATIONS DIVISION  
STREETS & TRANSPORTATION DEPARTMENT

**ROUTE 90 CULVERT AT OMAND'S CREEK**  
TOP SLAB REHABILITATION, STRUCTURAL STRENGTHENING AND RELATED WORKS

GENERAL ARRANGEMENT AND LOCATION OF PROPOSED WORKS

APPROVED BY: *W.B. Ulyatt* DATE: *1985-05-03*

SCALE 1:200 DRAWING NO. C315-85-02



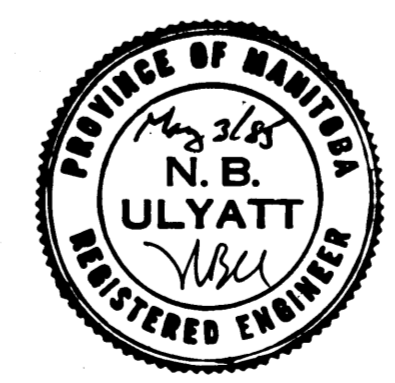
**CONSTRUCTION JOINTS**  
1:15

- NOTES**
1. CONCRETE SHEAR KEY IS NOT REQ'D. FOR CONST. JT. @ R/W KING EDWARD.
  2. BOTTOM LAYER OF REINFORCING STL. SHALL BE CONTINUOUS @ CONST. JT. @ R/W KING EDWARD.

- CONSTRUCTION SEQUENCE**
1. AT LEAST ONE LANE OF TRAFFIC IS TO BE MAINTAINED IN THE NORTHBOUND AND SOUTHBOUND DIRECTIONS AT ALL TIMES.
  2. THE WORKS SHALL BE UNDERTAKEN IN STAGES. CLOSURES BY THE CONTRACTOR WILL BE PERMITTED SEPARATELY IN AREAS "A" AND "B" IN THE SEQUENCE INDICATED BELOW. PARTIAL CLOSURES BY THE CONTRACTOR WILL BE ALLOWED FOR ASPHALT RESURFACING AND ALL OTHER RELATED WORKS WHILE MAINTAINING TRAFFIC IN THE INTERSECTION.
    - A) STAGE I: CONSTRUCT APPLICABLE PORTIONS OF CONCRETE WORKS (1), (2), (4), (5), (6), AND (11) (SEE DRAWING C315-85-02) BY CLOSING AREA "A" BUT KEEPING AREA "B" OPEN TO TRAFFIC.
    - B) STAGE II: CONSTRUCT APPLICABLE PORTIONS OF CONCRETE WORKS (1), (2), (3), AND (6) IN AREA "B" WHILE KEEPING AREA "A" OPEN TO TRAFFIC.
    - C) STAGE III: CARRY OUT ASPHALT RESURFACING IN ONE LANE AT A TIME AFTER COMPLETION OF STAGE I AND II.
  3. ANY REQUEST FOR DEVIATION FROM THE ABOVE IDENTIFIED CONSTRUCTION SEQUENCE MUST BE SUBMITTED TO THE ENGINEER IN WRITING WITH AT LEAST SEVEN (7) DAYS NOTICE.
  4. AT LEAST ONE OF THE TWO EXISTING TRAFFIC SIGNAL LIGHTS FOR NORTHBOUND TRAFFIC LOCATED ON THE STRUCTURE IS TO REMAIN IN SERVICE AT ALL TIMES DURING STAGE I AND STAGE II WORKS.
  5. INSTALLATION OF TEMPORARY OVERHEAD POWER LINES AS WELL AS REMOVAL AND REINSTALLATION OF THE SIGNAL POLES WILL BE CARRIED OUT BY OTHERS.

**ROUTE 90 (KING EDWARD ST.)**

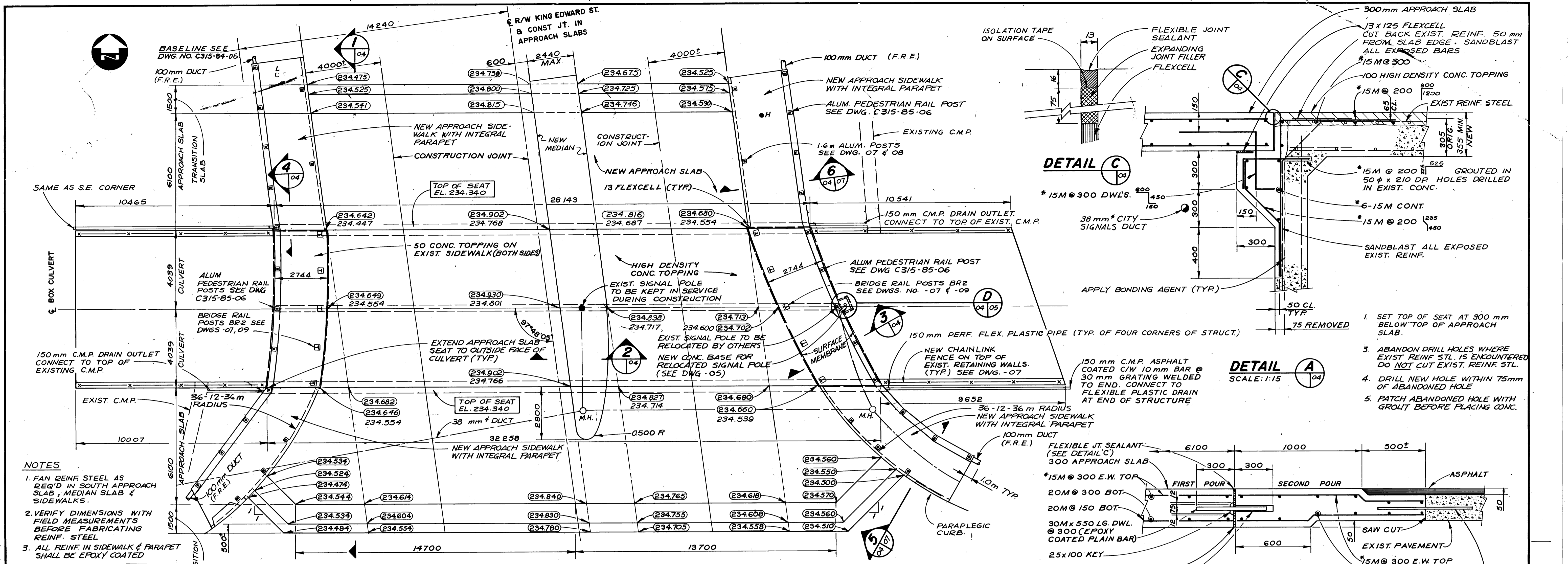
**PLAN**



**AS BUILT**  
APPROVED BY: *R. H. Wick*

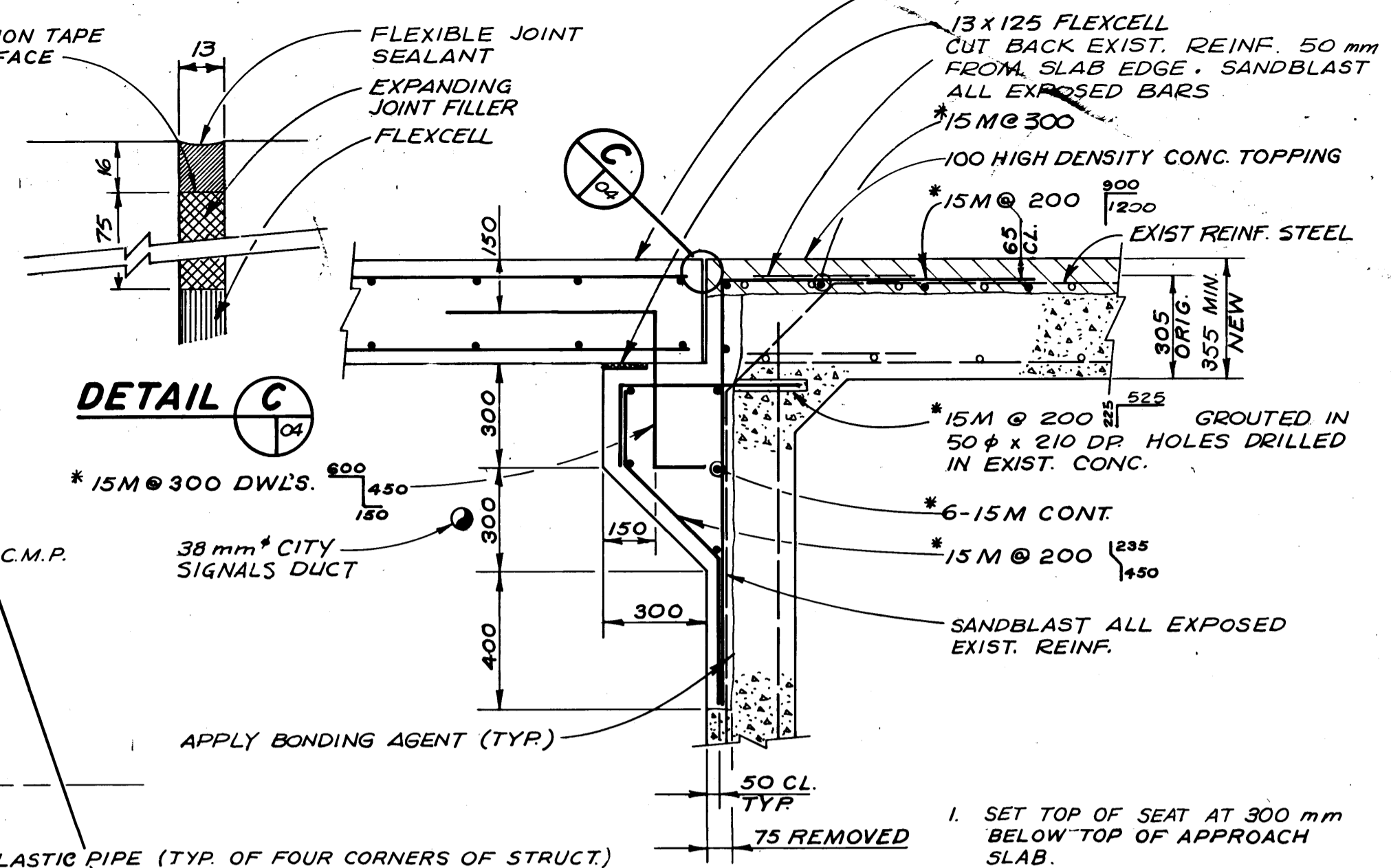
**B-5530-3**

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">ITEM</th> <th style="text-align: left;">EXISTING</th> <th style="text-align: left;">PROPOSED</th> </tr> <tr> <td>POLES - HYDRO(H) MTS (T)</td> <td>—</td> <td>—</td> </tr> <tr> <td>SIGNAL POLE</td> <td>—</td> <td>—</td> </tr> <tr> <td>LIGHT STANDARD</td> <td>—</td> <td>—</td> </tr> <tr> <td>SURVEY BAR</td> <td>—</td> <td>—</td> </tr> <tr> <td>FIRE HYDRANT</td> <td>—</td> <td>—</td> </tr> <tr> <td>WATER VALVE</td> <td>—</td> <td>—</td> </tr> </table>	ITEM	EXISTING	PROPOSED	POLES - HYDRO(H) MTS (T)	—	—	SIGNAL POLE	—	—	LIGHT STANDARD	—	—	SURVEY BAR	—	—	FIRE HYDRANT	—	—	WATER VALVE	—	—	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">ITEM</th> <th style="text-align: left;">EXISTING</th> <th style="text-align: left;">PROPOSED</th> </tr> <tr> <td>EDGE OF PAV'T NO CURB</td> <td>—</td> <td>—</td> </tr> <tr> <td>EDGE PAV'T CURBED</td> <td>—</td> <td>—</td> </tr> <tr> <td>EDGE PAV'T CURB &amp; GUTTER</td> <td>—</td> <td>—</td> </tr> <tr> <td>PARAPLEGIC RAMP</td> <td>—</td> <td>—</td> </tr> <tr> <td>ELEVATIONS</td> <td>40.265</td> <td>40.265</td> </tr> <tr> <td>ASPHALT OVERLAY</td> <td>—</td> <td>—</td> </tr> <tr> <td>PROPERTY LINE</td> <td>—</td> <td>—</td> </tr> <tr> <td>MANHOLE</td> <td>—</td> <td>—</td> </tr> <tr> <td>CATCH BASIN</td> <td>—</td> <td>—</td> </tr> <tr> <td>CATCH BASIN INLET</td> <td>—</td> <td>—</td> </tr> </table>	ITEM	EXISTING	PROPOSED	EDGE OF PAV'T NO CURB	—	—	EDGE PAV'T CURBED	—	—	EDGE PAV'T CURB & GUTTER	—	—	PARAPLEGIC RAMP	—	—	ELEVATIONS	40.265	40.265	ASPHALT OVERLAY	—	—	PROPERTY LINE	—	—	MANHOLE	—	—	CATCH BASIN	—	—	CATCH BASIN INLET	—	—	<p style="text-align: center;"><b>WARNING</b></p> <p>IF POWER EQUIPMENT OR EXPLOSIVES ARE TO BE USED FOR EXCAVATION ON THIS PROJECT THE CONTRACTOR MUST:</p> <ol style="list-style-type: none"> <li>1) NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION.</li> <li>2) TAKE PRECAUTION TO AVOID DAMAGE TO GAS COMPANY INSTALLATIONS.</li> </ol> <p>SEE PROVINCIAL REGULATION 210/72 FOR DETAILS</p>	<p style="text-align: center;"><b>LOCATION APPROVED UNDERGROUND STRUCTURES</b></p> <p>DATE _____ SUPERVISOR _____</p> <p>LOCATIONS OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE. BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NO.</th> <th>REVISIONS</th> <th>DATE</th> <th>APP.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	REVISIONS	DATE	APP.									<p style="text-align: center;"><b>PROVINCE OF MANITOBA</b> REGISTERED ENGINEER May 3/85 N. B. ULYATT R. H. Wick</p>	<p style="text-align: center;"><b>DILLON</b> Consulting Engineers &amp; Planners</p> <p>DESIGNED BY: S.S.R.      DRAWN BY: C.R.B. CHECKED BY: N.B.U.      DATE: MAY/85 APPROVED BY: <i>W.B. Ulyatt</i>      DATE: <i>May 1985</i></p>	<p style="text-align: center;"><b>THE CITY OF WINNIPEG</b> WORKS &amp; OPERATIONS DIVISION STREETS &amp; TRANSPORTATION DEPARTMENT</p>	<p style="text-align: center;"><b>ROUTE 90 CULVERT AT OMAND'S CREEK</b> TOP SLAB REHABILITATION, STRUCTURAL STRENGTHENING AND RELATED WORKS</p> <p style="text-align: center;"><b>TRAFFIC ROUTING AND CONSTRUCTION SEQUENCE</b></p> <p>AUTHORIZED BY: <i>Winnipeg P. Eng</i> 1985-05-03 ACCEPTED BY: <i>Winnipeg P. Eng</i> 1985-05-03 SCALE: 1:200      DRAWING NO: C315-85-03</p>
ITEM	EXISTING	PROPOSED																																																																								
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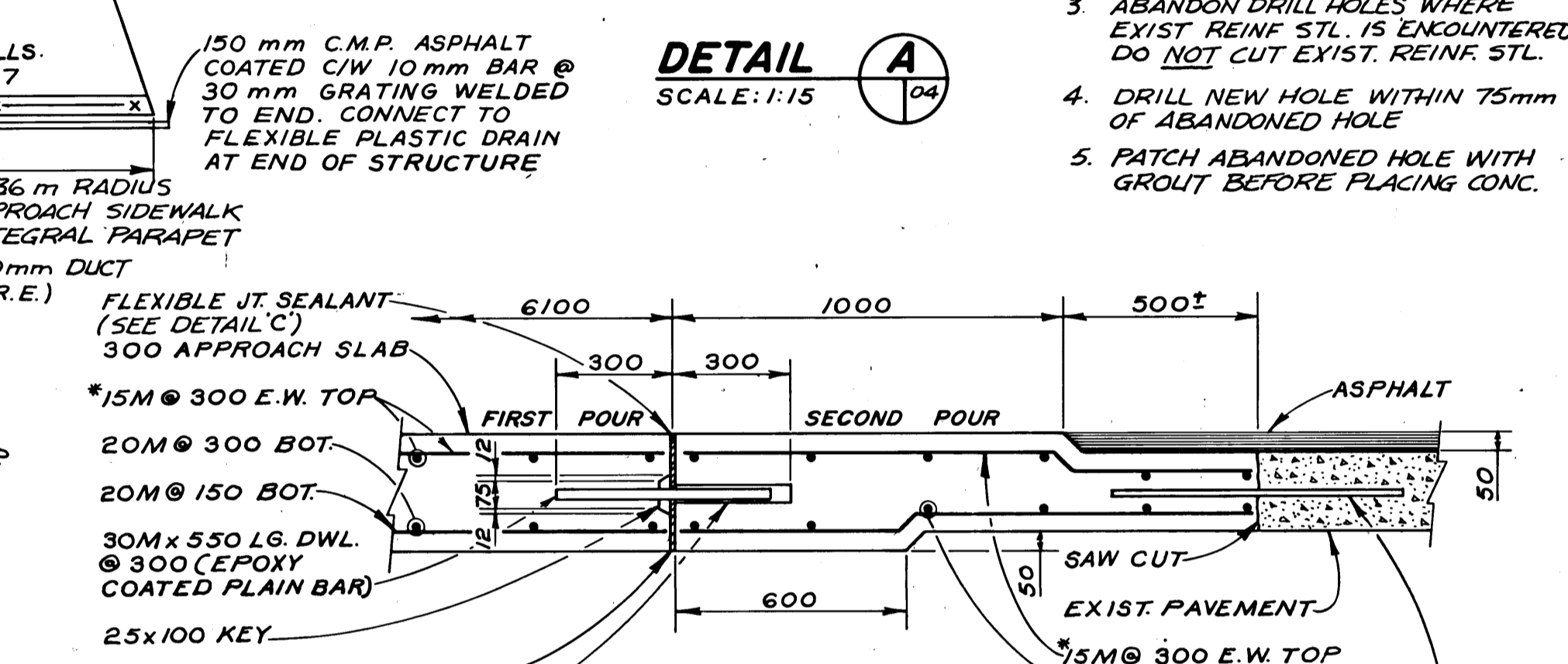


- NOTES**
1. FAN REINF. STEEL AS REQ'D IN SOUTH APPROACH SLAB, MEDIAN SLAB & SIDEWALKS.
  2. VERIFY DIMENSIONS WITH FIELD MEASUREMENTS BEFORE FABRICATING REINF. STEEL
  3. ALL REINF. IN SIDEWALK & PARAPET SHALL BE EPOXY COATED
  4. PROPOSED ELEV. (234.440)
  5. AS BUILT ELEV. OF BOTTOM OF HIGH DENSITY CONCRETE 234.806

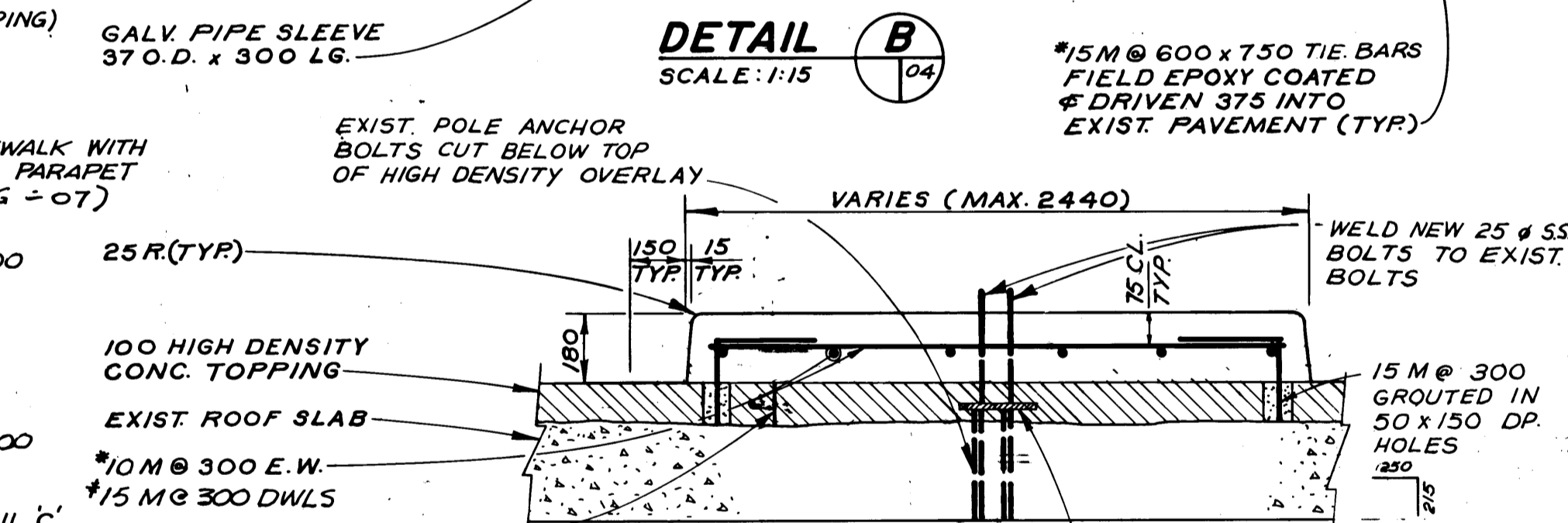
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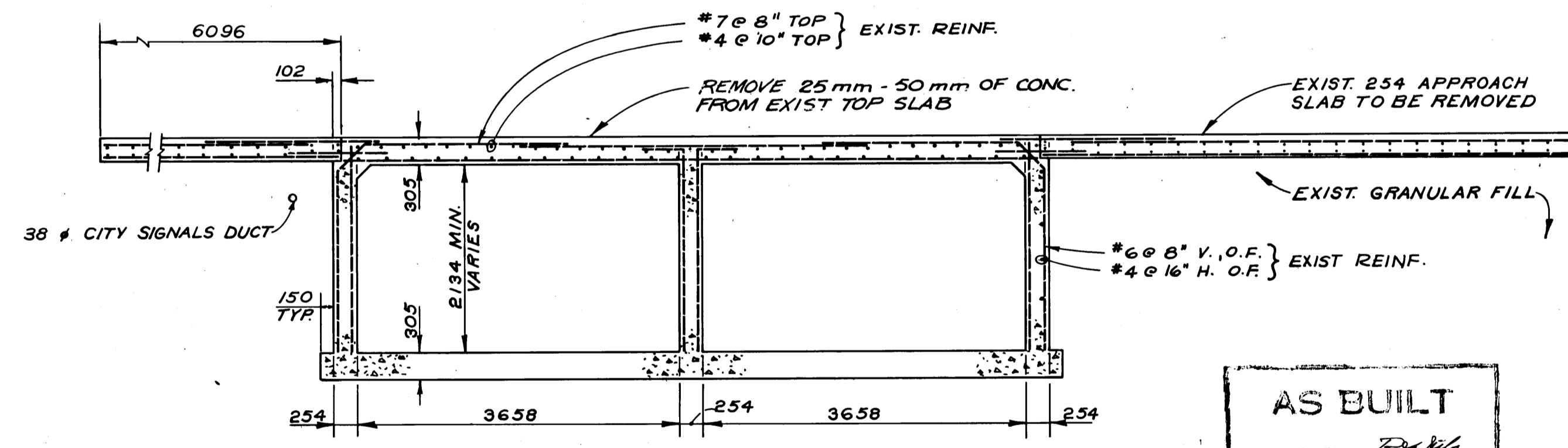
**DETAIL C**  
SCALE: 1:15



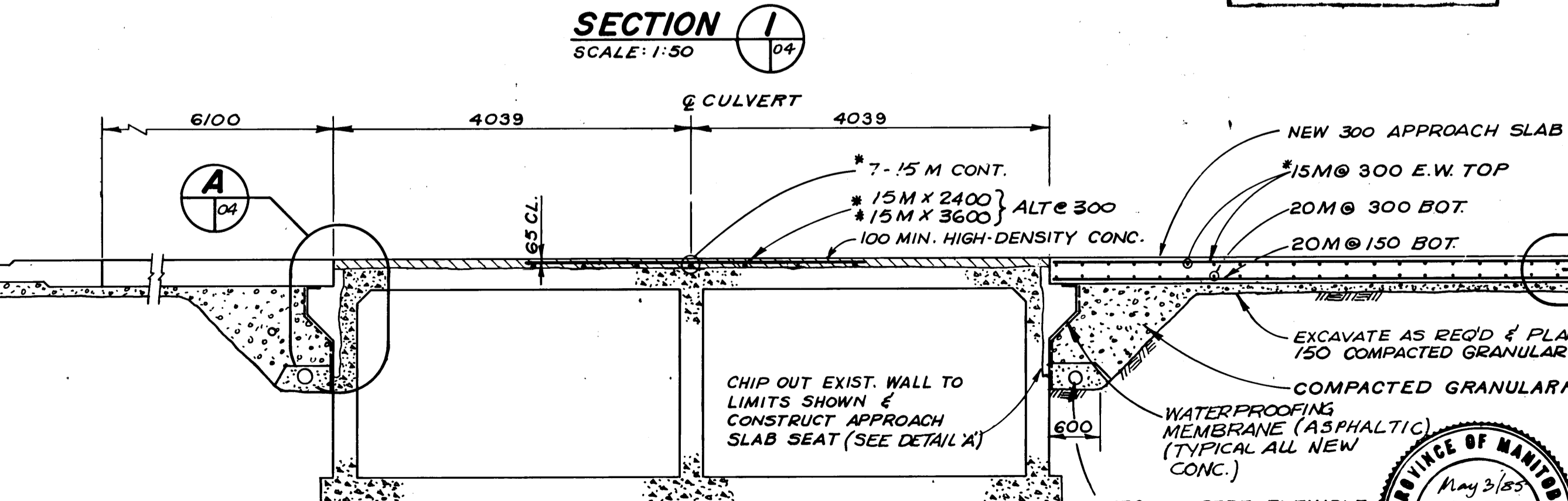
**DETAIL A**  
SCALE: 1:15



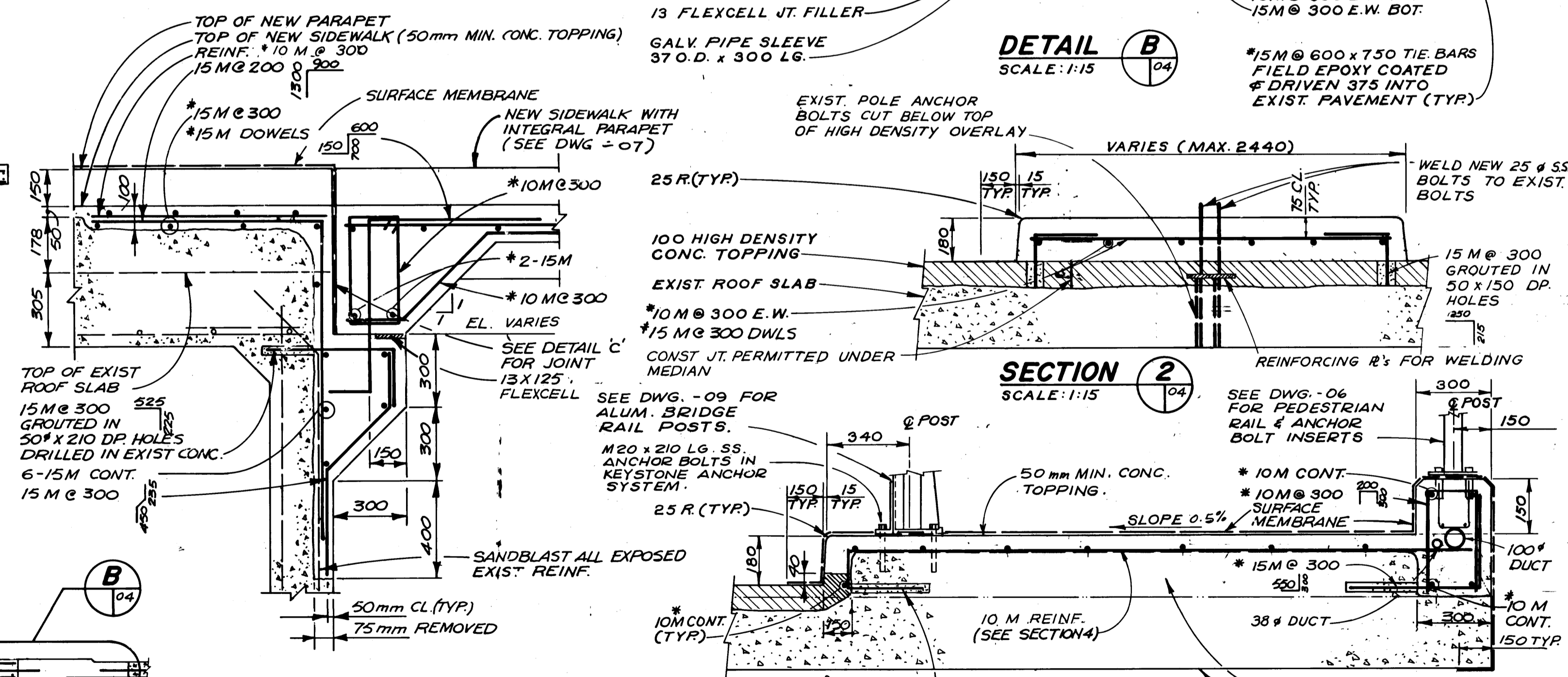
**DETAIL B**  
SCALE: 1:15



**SECTION 1**  
SCALE: 1:50



**SECTION 2**  
SCALE: 1:50



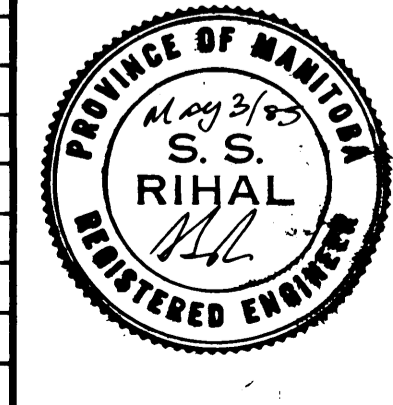
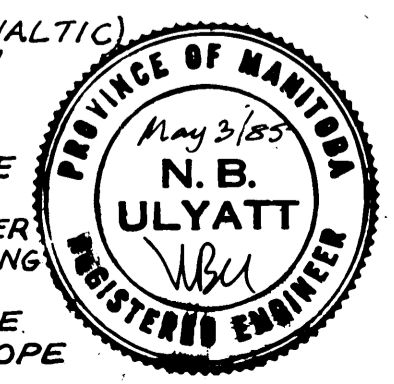
**SECTION 3**  
SCALE: 1:15



**SECTION 4**  
SCALE: 1:15

**AS BUILT**  
APPROVED BY: *[Signature]*

SHOWING NEW WORK



**DILLON**  
Consulting Engineers & Planners

DESIGNED BY: S.S.R. DRAWN BY: C.R.B.  
CHECKED BY: N.B.U. DATE: MAY 85  
APPROVED BY: *[Signature]* DATE: May 2/85

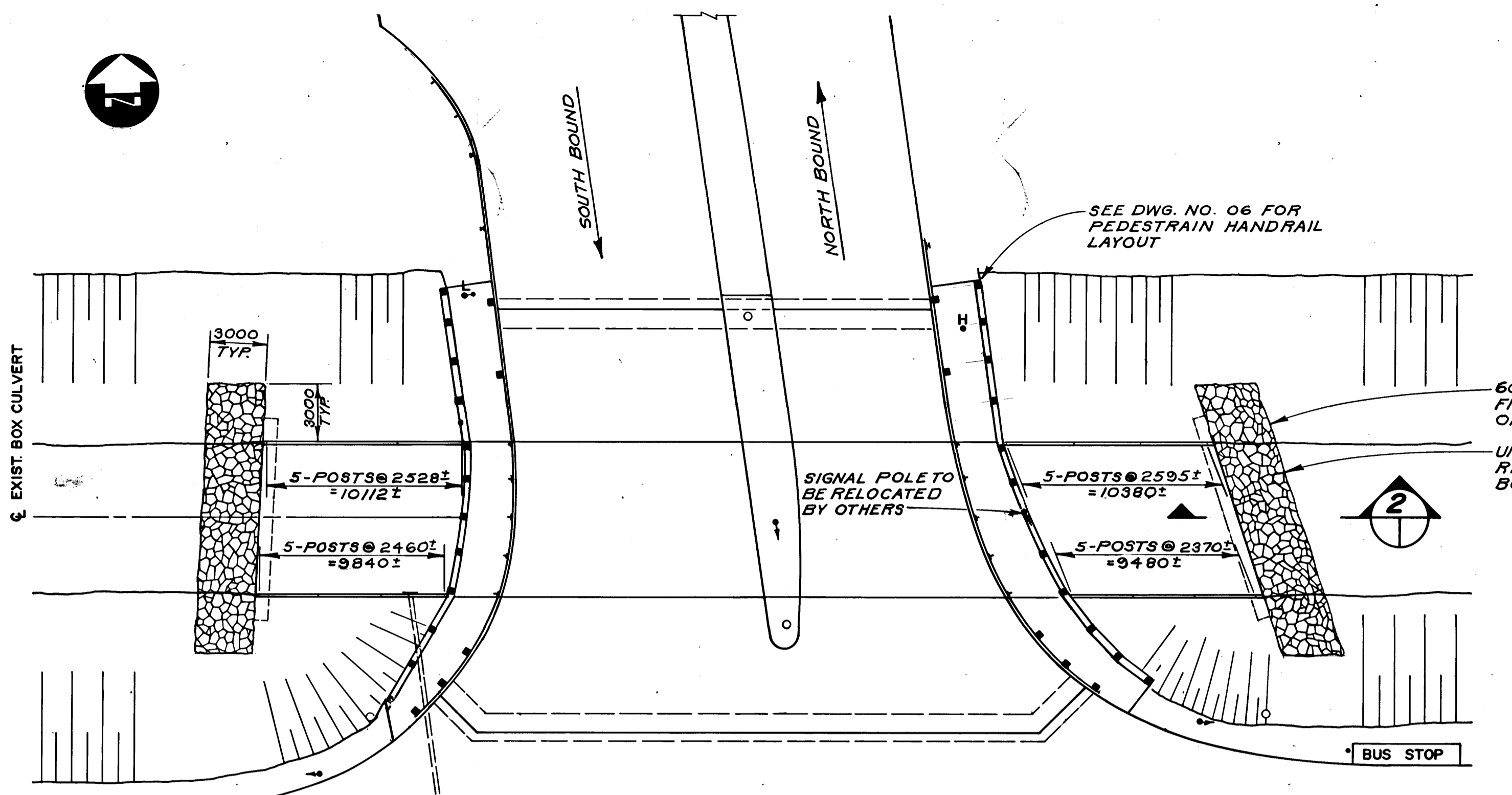


THE CITY OF WINNIPEG  
WORKS & OPERATIONS DIVISION  
STREETS & TRANSPORTATION DEPARTMENT

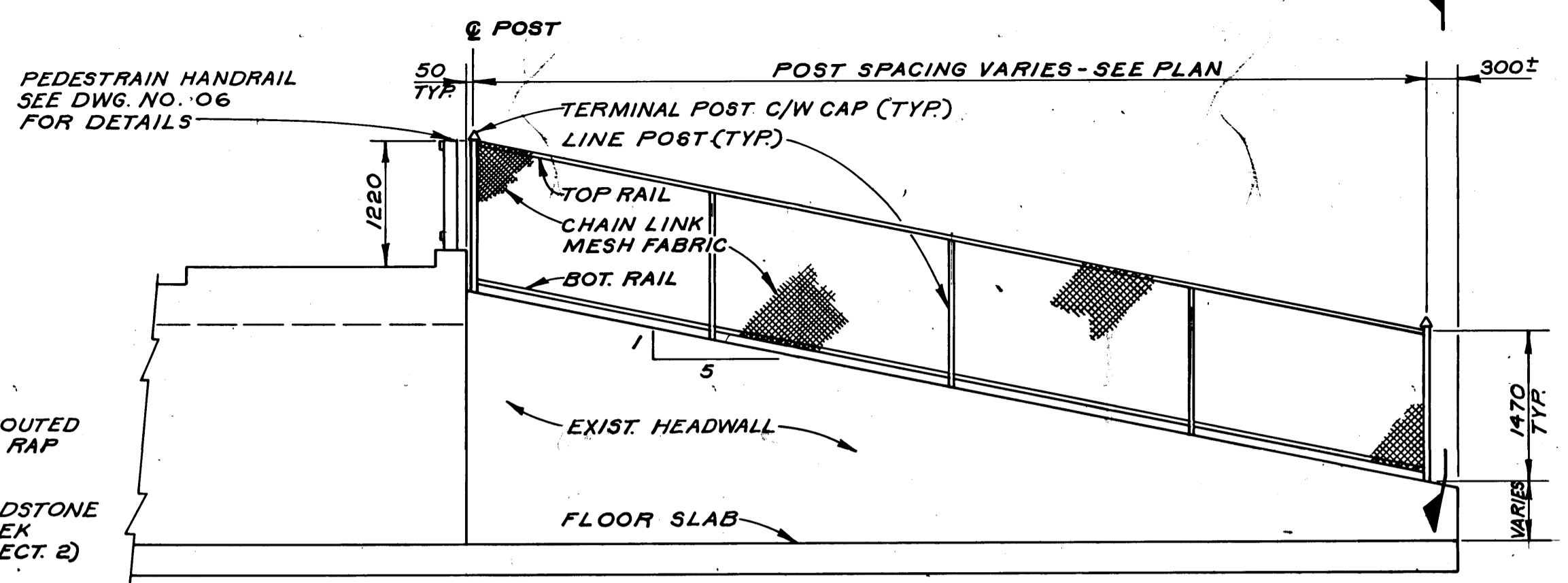
ROUTE 90 CULVERT AT OMAND'S CREEK  
TOP SLAB REHABILITATION, STRUCTURAL STRENGTHENING AND RELATED WORKS  
**DETAILS OF TOP SLAB MODIFICATIONS AND APPROACH SLABS**  
AUTHORIZED BY: *[Signature]* DATE: 8/85-05-83  
ACCEPTED BY: *[Signature]* DATE: 8/85-05-83  
SCALE: AS NOTED DRAWING NO: C315-85-04



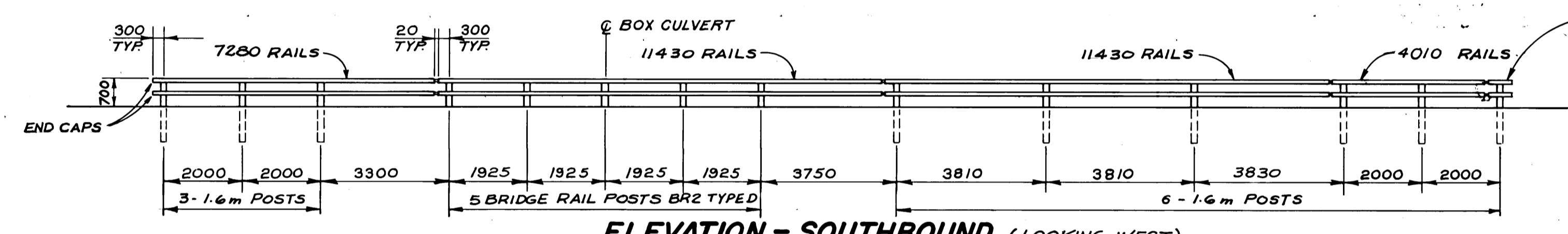




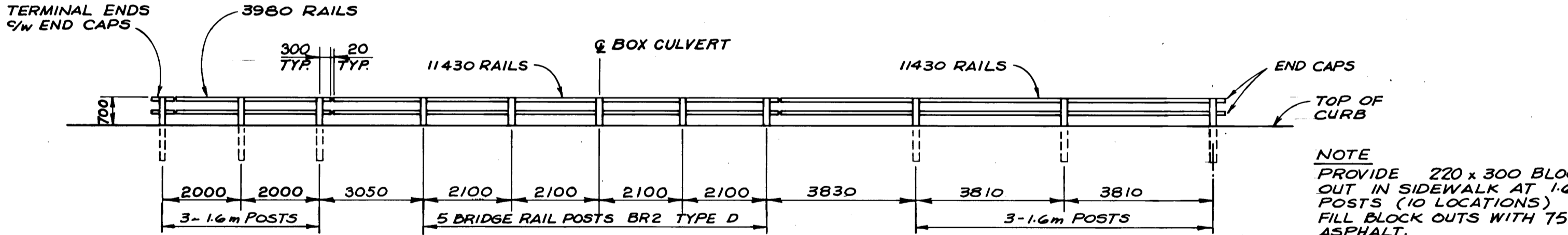
**PLAN**  
SCALE: 1:200



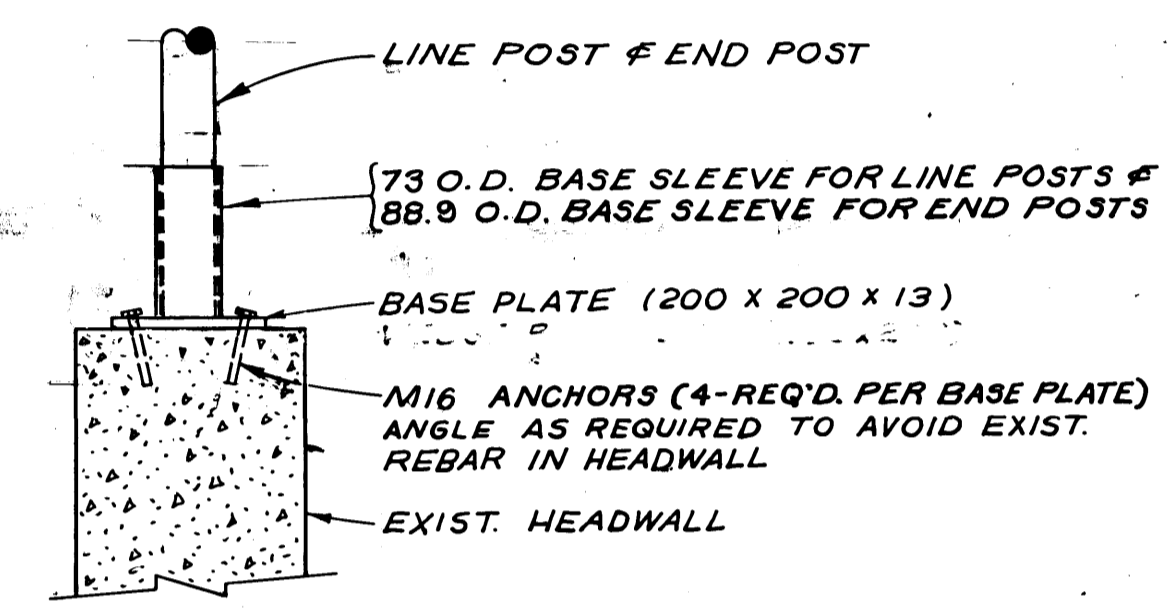
**ELEVATION - SHOWING CHAIN LINK FENCE**  
SCALE: 1:50



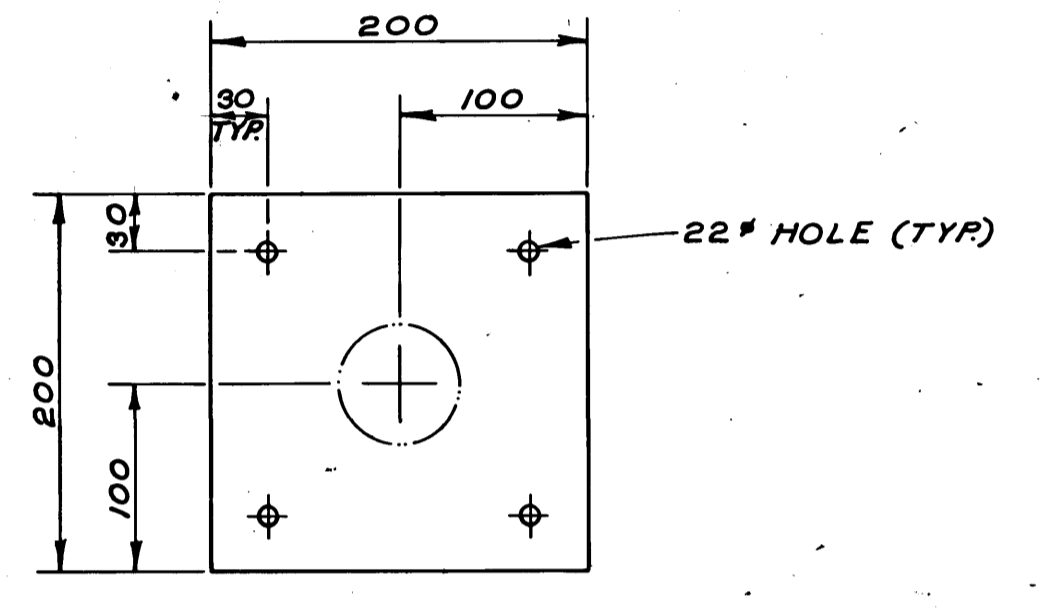
**ELEVATION - SOUTHBOUND (LOOKING WEST)**  
SCALE: 1:100



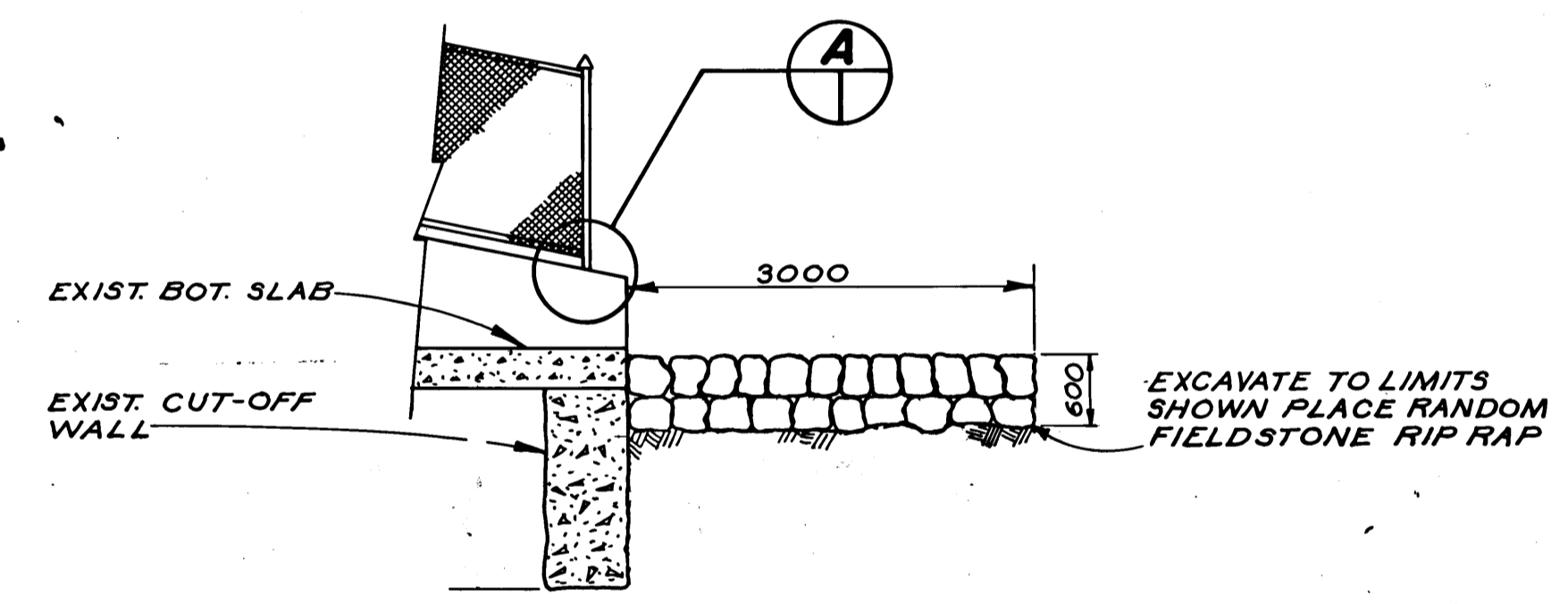
**ELEVATION - NORTHBOUND (LOOKING WEST)**  
SCALE: 1:100



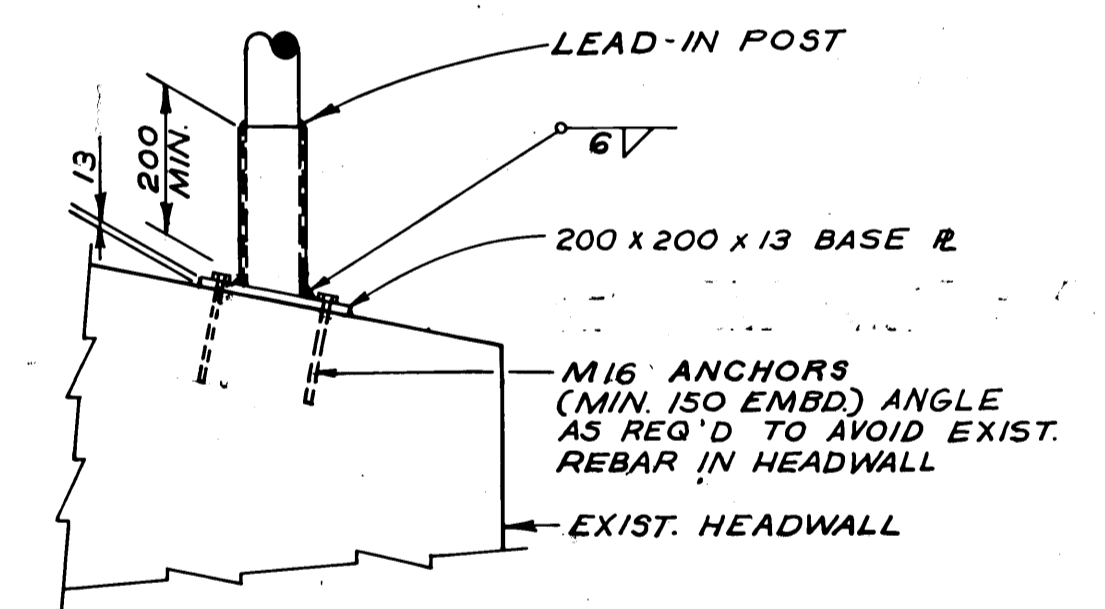
**SECTION 1**  
SCALE: 1:10



**BASE PLATE DETAIL**  
SCALE: 1:40

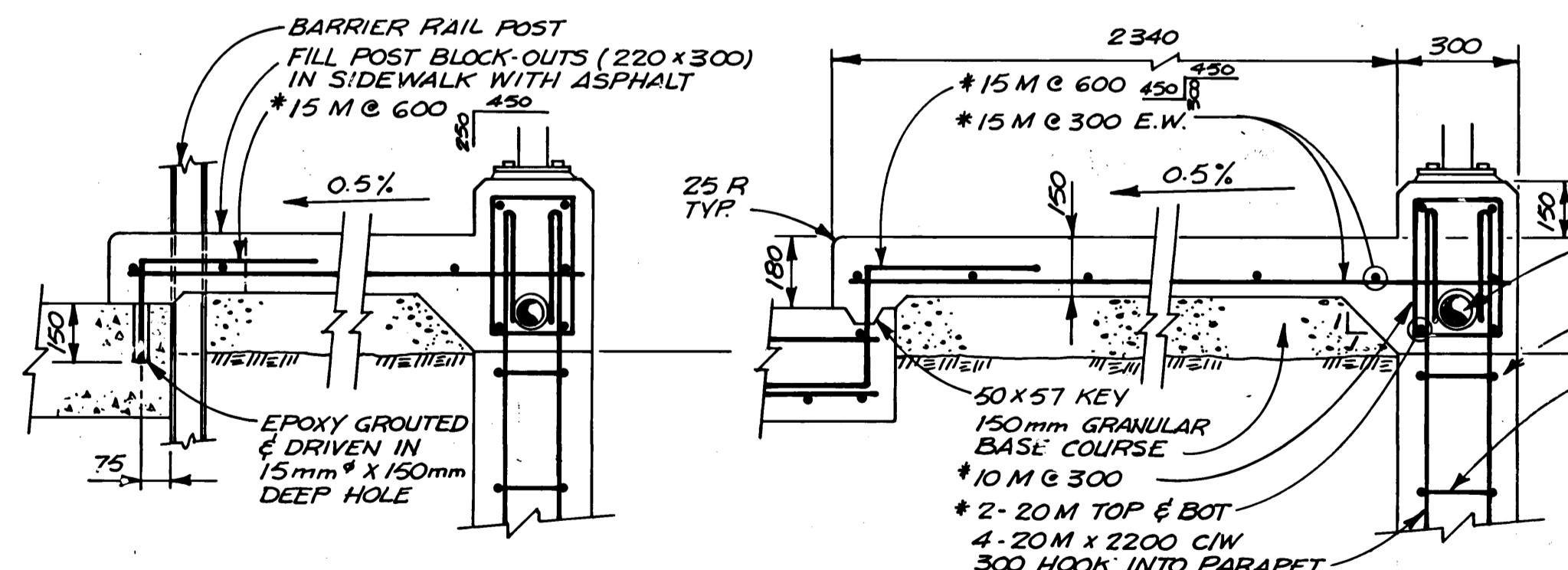


**SECTION 2**  
SCALE: 1:50



**DETAIL A**  
SCALE: 1:50

NOTE: PROVIDE 220 x 300 BLOCK OUT IN SIDEWALK AT 1.6m POSTS (10 LOCATIONS) FILL BLOCK OUTS WITH 75mm ASPHALT.



**SECTION 5**  
SCALE: 1:15

**SECTION 6**  
SCALE: 1:15

**CHAINLINK FENCE NOTES**

1. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENTS PRIOR TO FABRICATION.
2. ALL FENCING MATERIALS TO BE GALVANIZED, AS SPECIFIED, AND TOUCHED UP USING "GALVALLOY".
3. CHAIN LINK MESH FABRIC TO BE CONNECTED TO POSTS AND RAILS WITH A "SLINKY" COIL.
4. NO SHARP POINTS SHALL REMAIN ON ENDS OF WIRE MESH FABRIC.
5. POSTS SHALL BE LEADED INTO GALVANIZED STEEL BASE SLEEVES.
6. POSTS AND RAILS TO BE SCH.40 PIPE.
7. ALL TERMINAL AND CORNER POSTS TO BE 73.0 mm O.D.
8. ALL LINE POSTS TO BE 60.3 mm O.D.
9. TOP AND BOTTOM RAILS TO BE 42.9 mm O.D.
10. FABRIC MESH TO BE 3.77 mm (9 GAUGE) WIRE.
11. ANCHOR BOLTS - TO BE S/S 20 mm Ø "KEYSTON ANCHOR SYSTEMS" EACH C/W S/S NUT AND S/S WASHER.

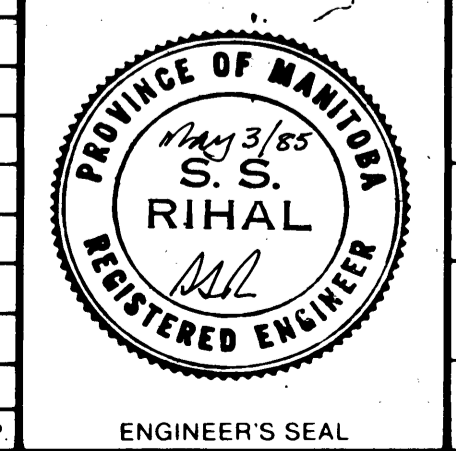
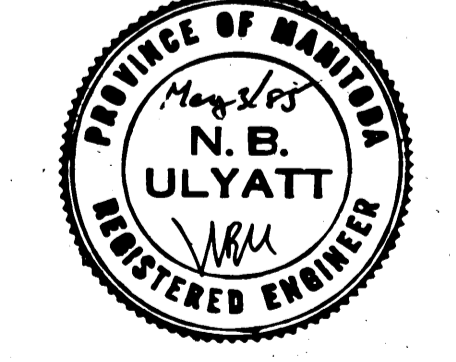
ALUMINUM TRAFFIC BARRIER RAIL COMPONENTS BILL OF MATERIALS		
ITEM	FOR INSTALLATION	FOR STANDBY
BARRIER RAIL 11430 (STRAIGHT)	4	-
BARRIER RAIL 11430 (PREBENT)	4	1
BARRIER RAIL 7280 (PREBENT)	2	1
BARRIER RAIL 4010 (PREBENT)	2	1
BARRIER RAIL 3980 (PREBENT)	2	1
TERMINAL ENDS	4	-
BRIDGE RAIL POSTS (BR 2 TYPE D)	10	-
BARRIER POST (1600)	15	1
STANDARD SPICE BAR	14	-
RAIL CLAMP BAR	104	-
CAP SCREWS	264	-
WASHERS	264	-
SHIMS FOR RAIL POSTS	AS REQUIRED	-
SHIMS FOR RAIL END SECTION	AS REQUIRED	-
RAIL END CAPS	8	-
RAIL POST ANCHOR BOLTS	50	-

NOTE: RADIUS OF ALL PREBENT RAILS SHALL BE CHECKED WITH FIELD MEASUREMENTS TO SUIT FIELD CONDITIONS PRIOR TO FABRICATION

ITEM	EXISTING	PROPOSED
POLES - HYDRO(H) MTS (T)	---	---
SIGNAL POLE LIGHT STANDARD	---	---
SURVEY BAR	---	---
FIRE HYDRANT	---	---
WATER VALVE	---	---
EDGE OF PAV'T NO CURB	---	---
EDGE OF PAV'T CURBED	---	---
EDGE PAV'T CURB & GUTTER	---	---
PARAPLEGIC RAMP	---	---
ELEVATIONS	40265	40265
ASPHALT OVERLAY	---	---
PROPERTY LINE	---	---
MANHOLE	○	●
CATCH BASIN	□	■
CATCH BASIN INLET	▽	▼

**WARNING**  
IF POWER EQUIPMENT OR EXPLOSIVES ARE TO BE USED FOR EXCAVATION ON THIS PROJECT THE CONTRACTOR MUST:  
1) NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION.  
2) TAKE PRECAUTION TO AVOID DAMAGE TO GAS COMPANY INSTALLATIONS.  
SEE PROVINCIAL REGULATION 210/72 FOR DETAILS

**LOCATION APPROVED UNDERGROUND STRUCTURES**  
DATE: \_\_\_\_\_ SUPERVISOR: \_\_\_\_\_  
LOCATIONS OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE, BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.



**DILLON**  
Consulting Engineers & Planners  
DESIGNED BY: S.S.R. DRAWN BY: C.R.B.  
CHECKED BY: N.B.U. DATE: MAY 85  
APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

**THE CITY OF WINNIPEG**  
WORKS & OPERATIONS DIVISION  
STREETS & TRANSPORTATION DEPARTMENT

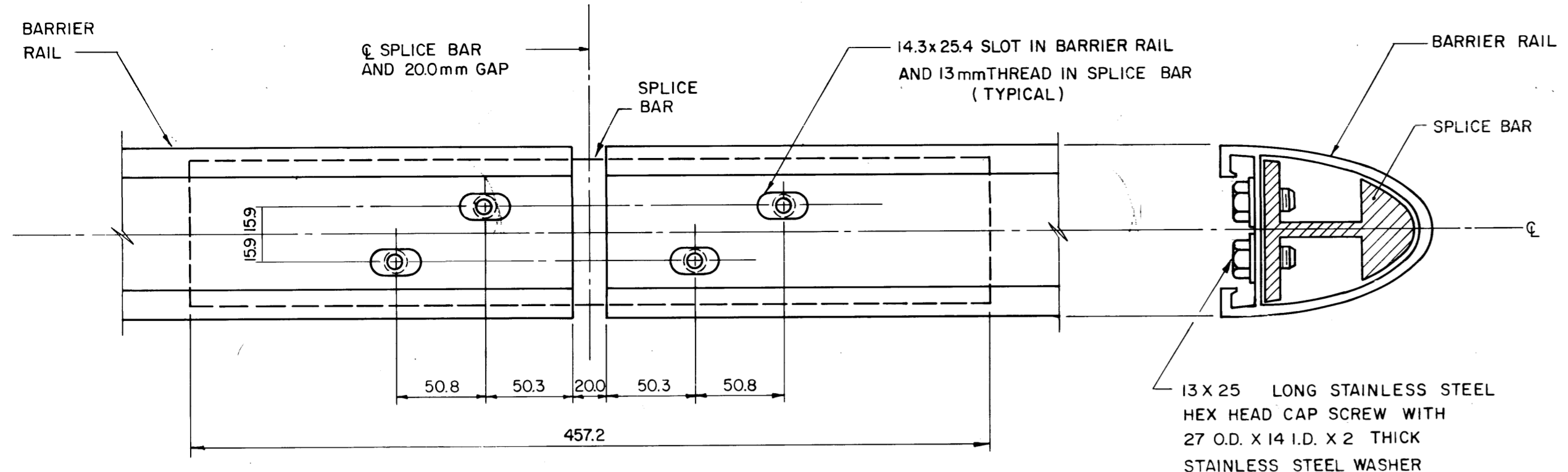
**ROUTE 90 CULVERT AT OMAND'S CREEK**  
TOP SLAB REHABILITATION, STRUCTURAL STRENGTHENING AND RELATED WORKS  
LAYOUT OF BALANCED ALUMINUM SHOULDER BARRIER, HEADWALL CHAINLINK FENCE AND RIP RAP  
AUTHORIZED BY: \_\_\_\_\_ DATE: 1985-05-03  
ACCEPTED BY: \_\_\_\_\_ DATE: 1985-05-03  
SCALE: 1:100 OR AS NOTED DRAWING NO: C315-85-07

**AS BUILT**  
APPROVED BY: \_\_\_\_\_

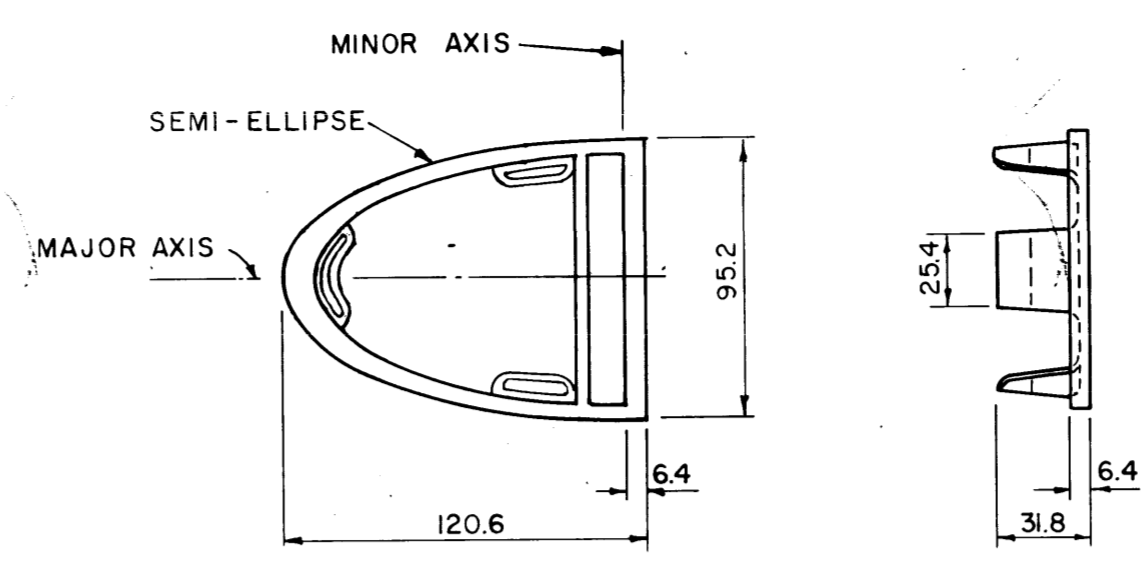
**B-5530-7 METRIC**

WHOLE NUMBERS INDICATE MILLIMETRES DECIMALIZED NUMBERS INDICATE METRES

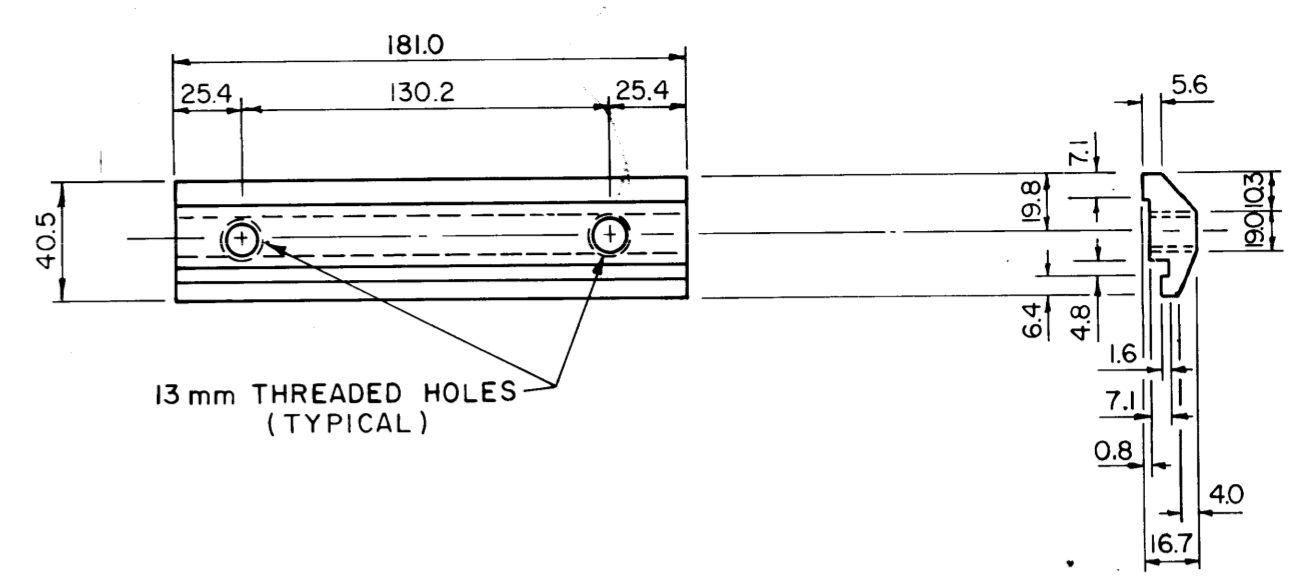




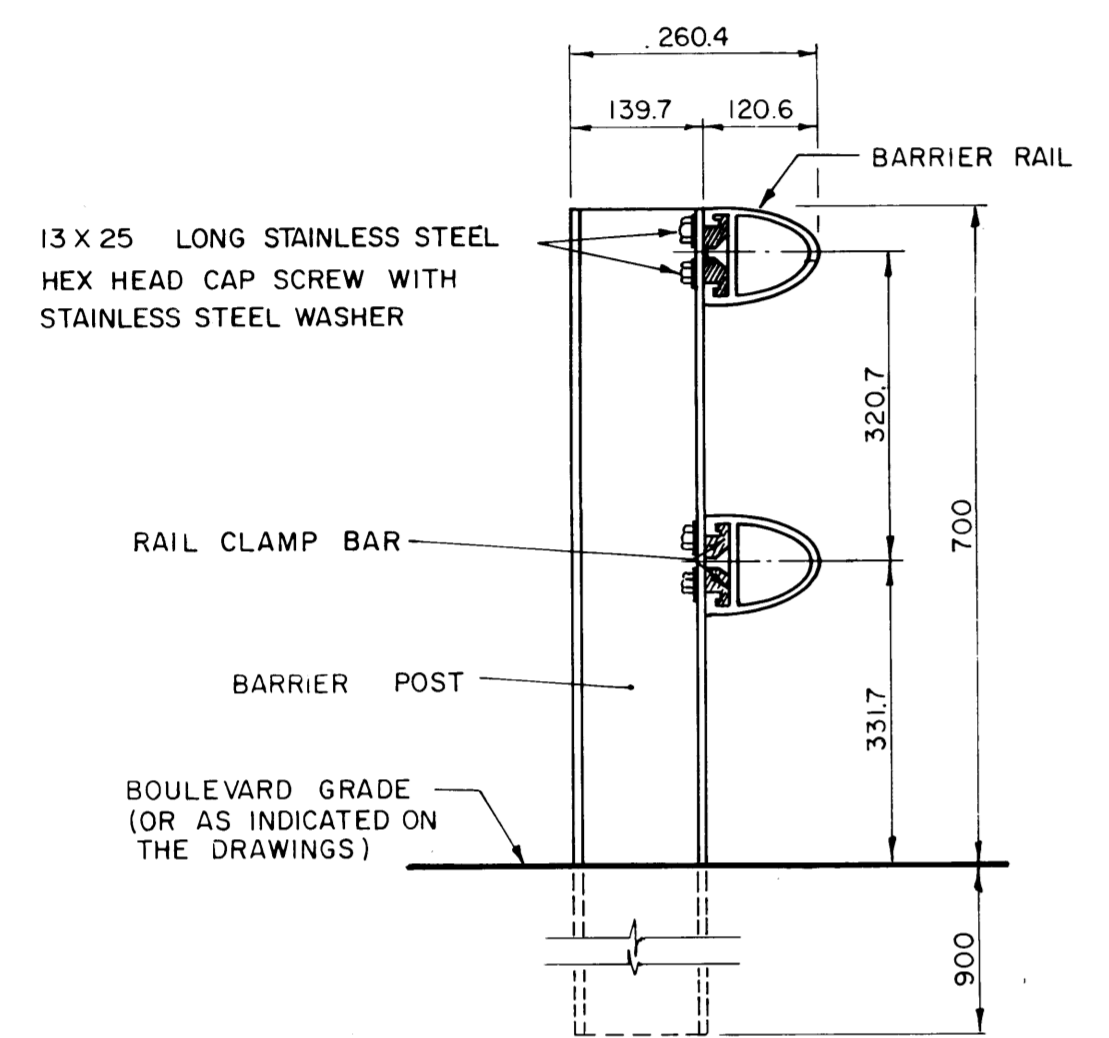
**SPlice bar to rail assembly detail**



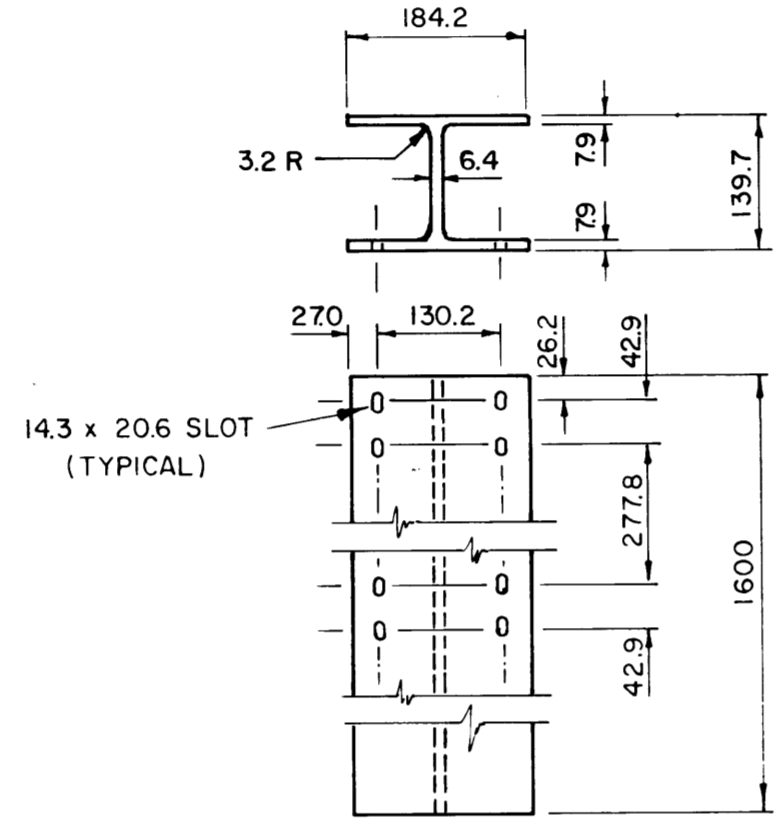
**RAIL END CAP**



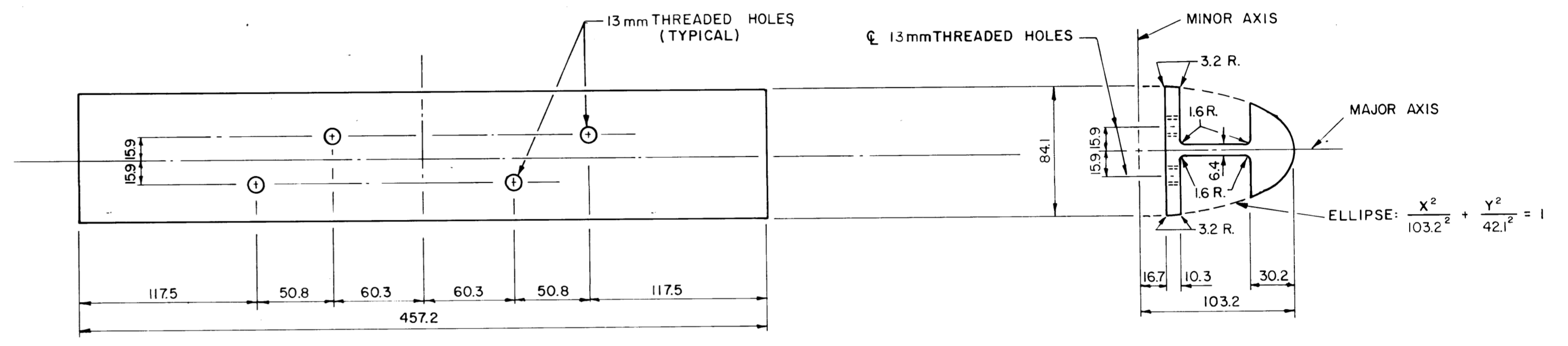
**RAIL CLAMP BAR**



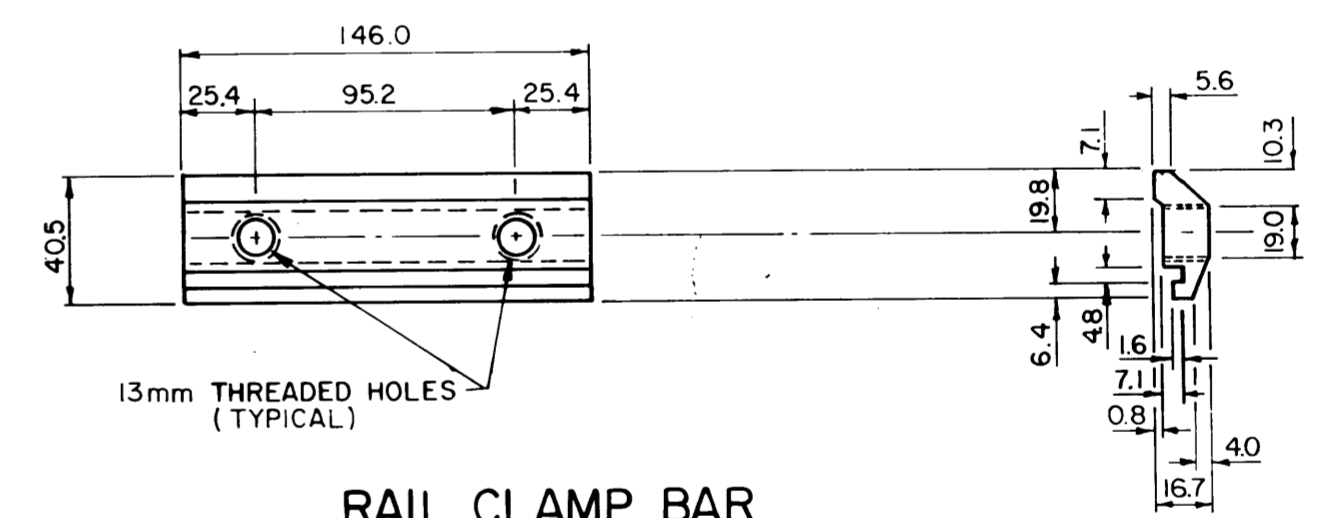
**RAIL TO POST ASSEMBLY DETAIL**



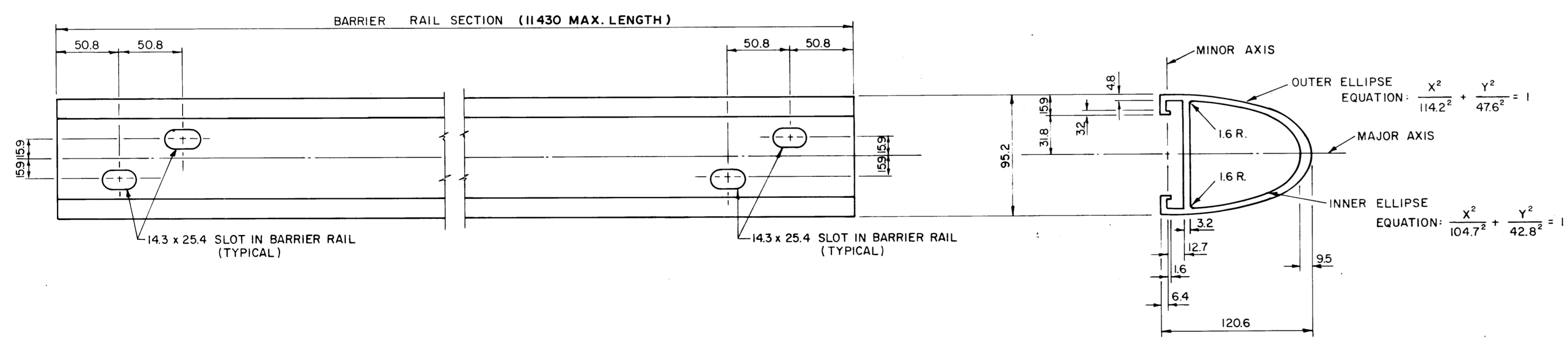
**1600 m POST**  
(0800 m POST SIMILAR EXCEPT WITH ONLY FOUR SLOTS AT TOP OF POST)



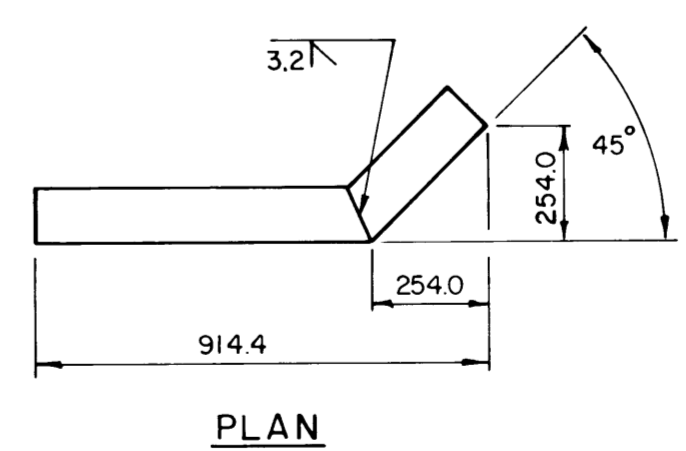
**SPlice bar**



**RAIL CLAMP BAR**  
(FOR BR1C BRIDGE RAIL POST)



**BARRIER RAIL**



**PLAN**

**FRONT ELEVATION**

**TERMINAL END**  
(FABRICATED FROM BARRIER RAIL)

**MATERIAL SPECIFICATIONS**

1. ALUMINUM RAILS, POSTS, SPlice BARS, CLAMP-BARS, AND END CAPS SHALL CONFORM TO ASTM B 221, ALLOY 6061-T6, OR ALLOY 6351-T6.
2. STAINLESS STEEL WASHERS SHALL CONFORM TO ASTM A296.
3. CAP SCREWS SHALL CONFORM TO ASTM A276, TYPE 430 STAINLESS STEEL.
4. NOTE THAT ALL FASTENERS ARE SPECIFIED IN IMPERIAL UNITS.

**METRIC**  
ALL DIMENSIONS SHOWN ON THIS PLAN ARE IN MILLIMETRES EXCEPT AS OTHERWISE INDICATED

NO.	REVISIONS	DATE	APP.
R2	RE-DRAWN	83-12-21	
R1	BRIDGE RAIL CLAMP BAR ADDED	83-6-16	

N.A.

ENGINEER'S SEAL

**DIRECON**  
Consulting Engineers & Planners

DESIGNED BY: N.A. DRAWN BY: GFN  
CHECKED BY: ZVK DATE: 80-03-18  
APPROVED BY: *John J. Parkin* DATE: 83-12-22

**THE CITY OF WINNIPEG**  
WORKS & OPERATIONS DIVISION  
STREETS & TRANSPORTATION DEPARTMENT

**ROUTE 90 CULVERT AT OMAND'S CREEK**  
TOP SLAB REHABILITATION, STRUCTURAL STRENGTHENING AND RELATED WORKS

**BALANCED SHOULDER BARRIER STANDARD DETAIL**

DESIGNED BY: *Winnipeg, P. Eng.* 1983-12-23  
APPROVED BY: *John J. Parkin* 1983-12-22  
SCALE: N.T.S. DRAWING NO: C315-85-08

**B-5530-8**

