

150 mm WM	WATERMAIN	300 mm LDS	LAND DRAINAGE SEWER	HYDRO	100	AQUEDUCT JOINT	AQUEDUCT PIPE
⊕	HYDRANT	250 mm WWS	WASTE WATER SEWER	COMMUNICATION	⊕	UNDERDRAIN MANHOLE	UNDERDRAIN
⊗	VALVE	○	MANHOLE	TRAFFIC SIGNALS	⊕	UNDERDRAIN RISER	GROUNDLINE
⊖	REDUCER	□	CATCH BASIN	PEDESTAL	⊕	UNDERDRAIN WELL	CENTERLINE
⊕	COUPLING	△	CURB INLET	SIGNAL CONTROLLER	⊕	TESTHOLE	N/W GUTTER
⊕	WM FITTINGS	⊕	CULVERT	GAS	⊕	PEIZOMETER	S/E GUTTER
⊕	CURB STOP	---	DITCH	STEAM HEAT	⊕		N/W DITCH
⊕	EDGE OF PAVEMENT	→	LAMP STANDARD	FENCE	⊕		S/E DITCH
⊕	RAILWAY TRACK	→	TRAFFIC SIGNAL	TREE	⊕		N/W PROPERTY LINE
⊕	GEODETIC BENCHMARK	→	WOOD POLE	BUILDING	⊕		S/E PROPERTY LINE
⊕	SURVEY BAR	→	POLE ANCHOR	SUBSURFACE STRUCTURE	⊕		
---	EXISTING	---	EXISTING	---	---	---	---
---	LEGEND - PLAN	---	LEGEND - PLAN	---	---	---	---

NO.	REVISIONS	DATE	BY

DATA SOURCES
 Aqueduct Joints: Interpreted From Manholes Located in 1994
 UMA Total Station Survey and 1995 Internal Inspections
 Unless Otherwise Noted
 Surface Features: UMA Total Station Survey (1994)
 Legal Right of Way M11 to M12: City of Wpg LBS (1994)
 Legal Right of Way M12 to M17: Pollock & Wright (1995)
 Utilities: Compiled from Information Obtained From
 City of Winnipeg Underground Structures (1994)

METRIC
 WHOLE NUMBERS INDICATE MILLIMETRES
 DECIMALIZED NUMBERS INDICATE METRES

UMA Engineering Ltd.
 Engineers and Planners

CASS
 CHAM GORE & STOREY LIMITED

DESIGNED BY	BC	CHECKED BY	CCM
DRAWN BY	BC/MAG	APPROVED BY	CCM
HOR. SCALE:	1:500	RELEASED FOR CONSTRUCTION	
VERTICAL:	1:50	DATE	

ENGINEER'S SEAL
 PROVINCE OF MANITOBA
 1106 97
C. C. MACEY
 REGISTERED ENGINEER

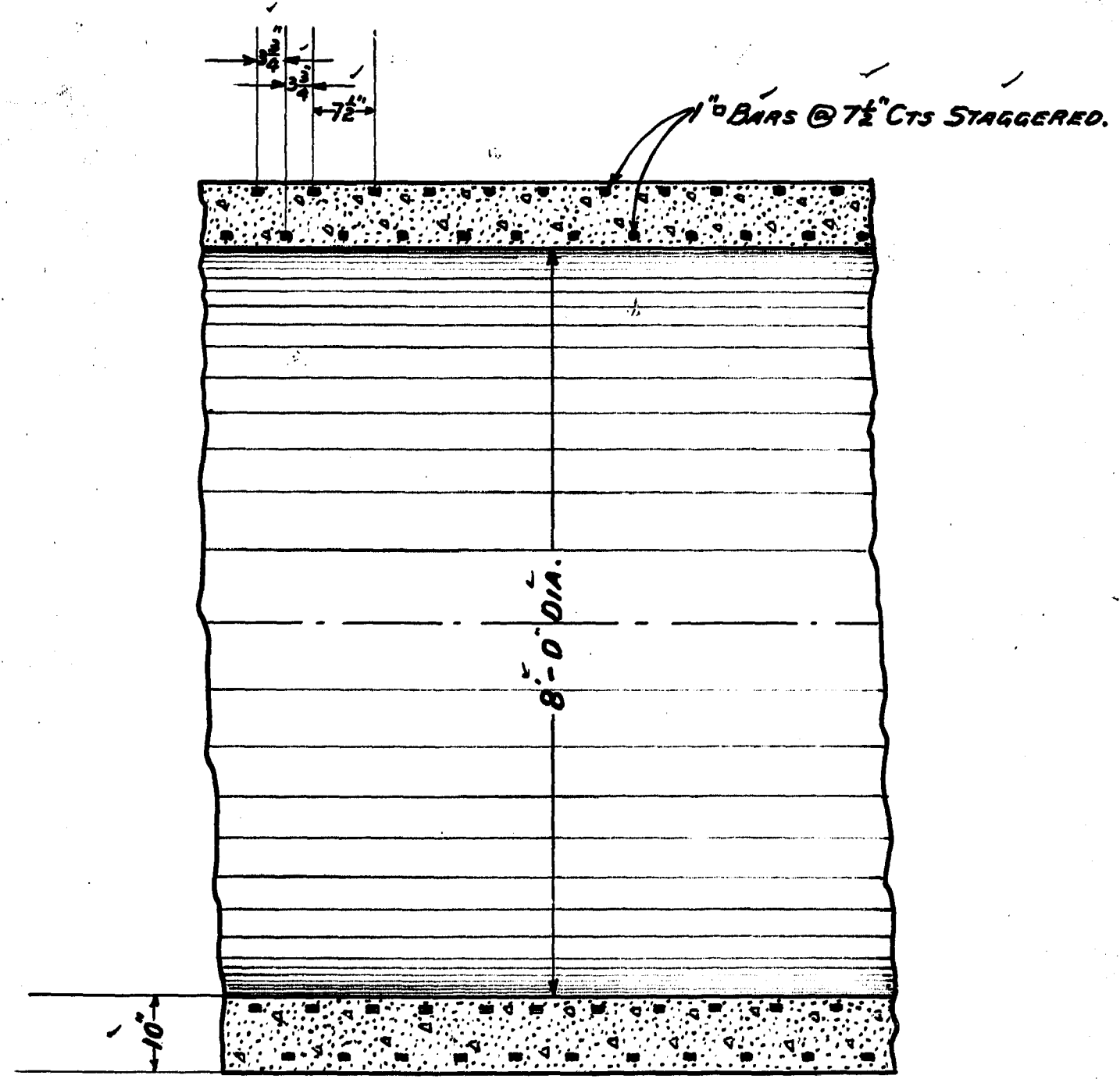
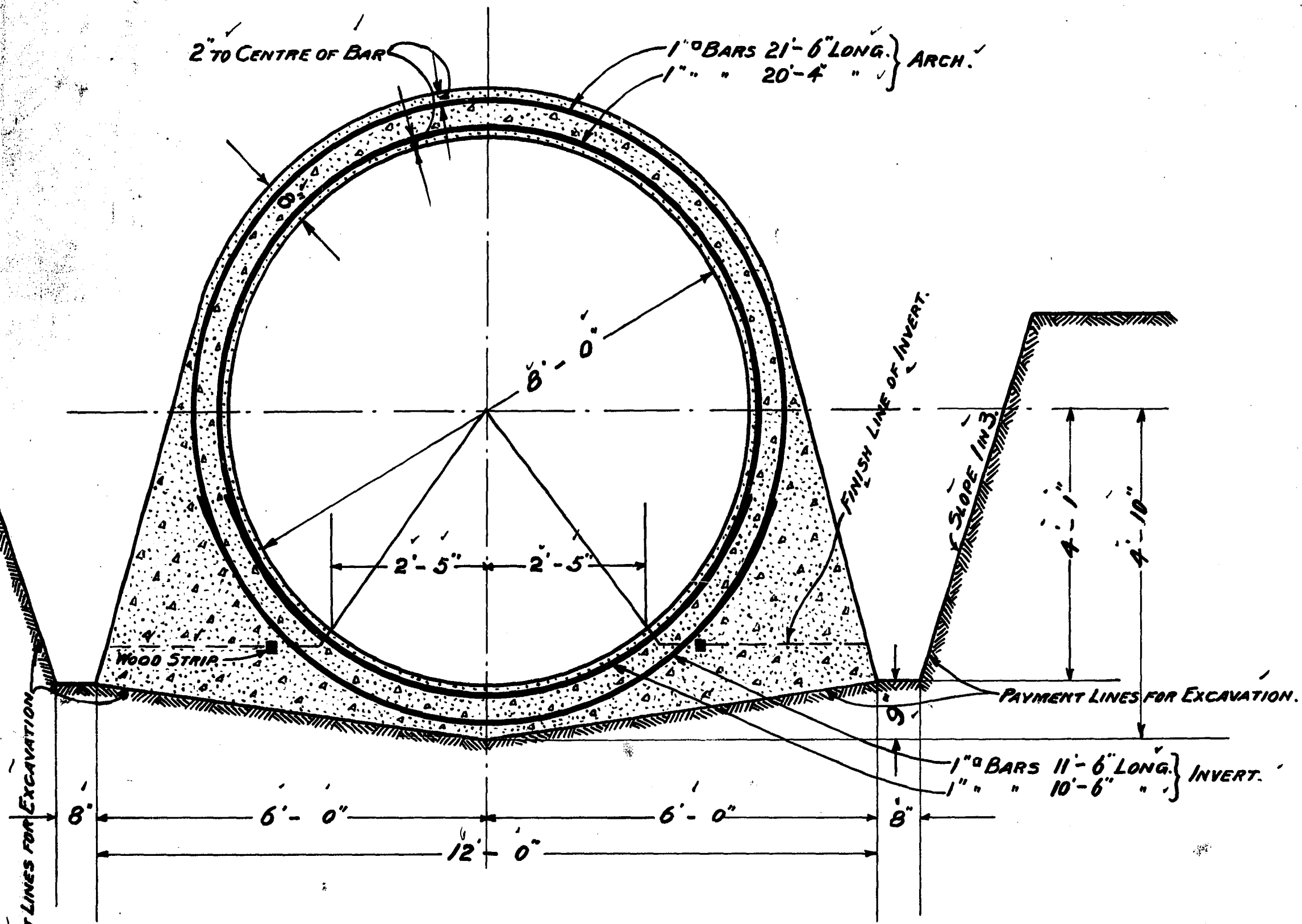
CONSULTANT DRAWING NO. 108
 41-02-D265-136-01

THE CITY OF WINNIPEG
 WATER AND WASTE DEPARTMENT

Plan and Profile of Shoal Lake Aqueduct

From Joint CJ-A1371 To Joint CJ-A1284
 From Mile 13.16 To Mile 13.41

SHEET 108 OF 214
 CITY DRAWING NUMBER
D-6386 REV



LONGITUDINAL SECTION OF PIPE.

CONCRETE IN ARCH = 0.829 CU YDS PER LINEAR FOOT.	STEEL IN ARCH = 982.5 = 3340.5 Lbs.
" " INVERT = 0.397 " " " " " "	" " INVERT = 516.5 = 1756.1 " "
TOTAL = 1.226 " " " " " "	TOTAL 1499.0 = 5096.6 " PER 15'-0" SECTION.

CONTRACT. 30.

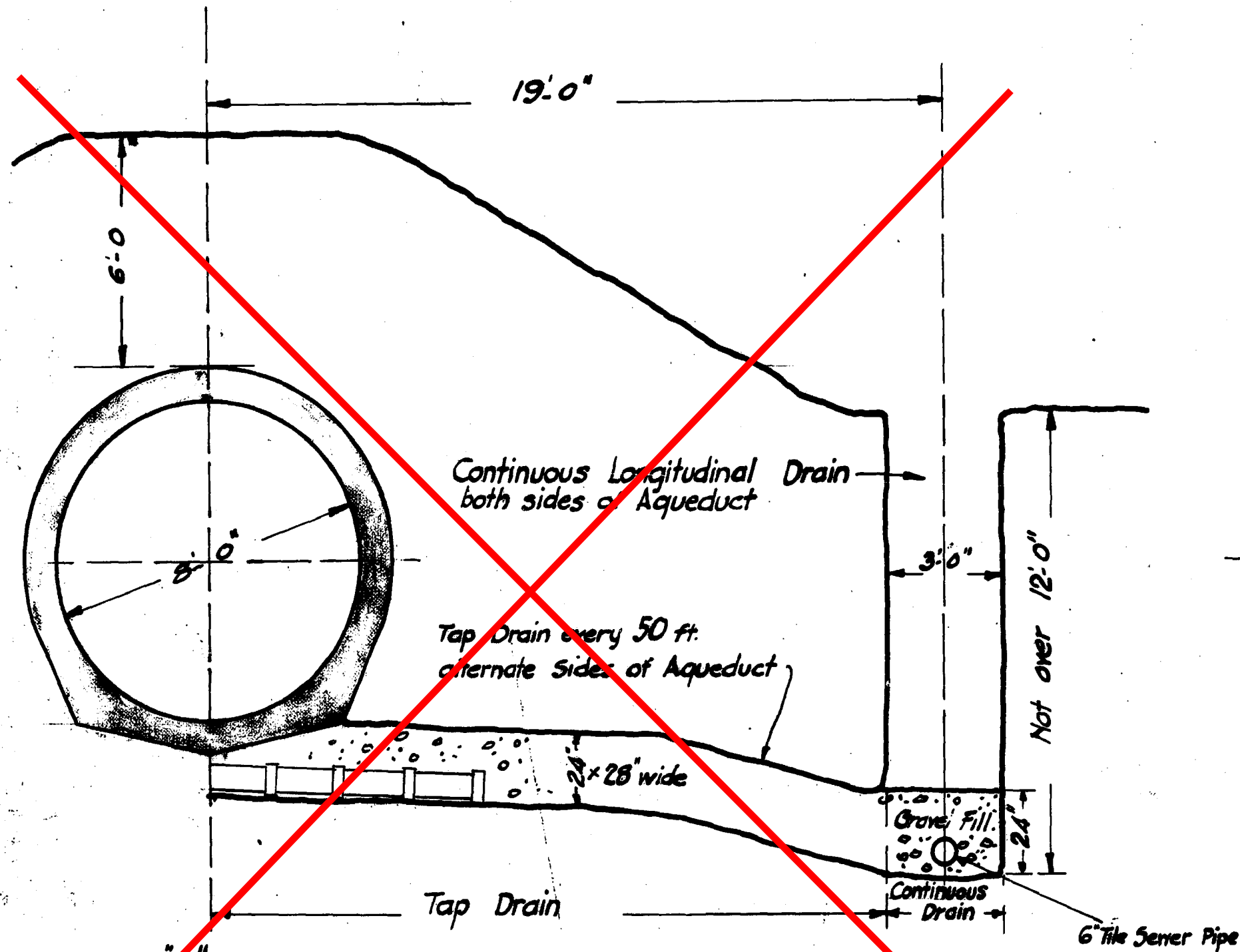
B346.

DRAWN BY. R.S.
 TRACED BY. R.S.
 CHECKED BY. *[Signature]*
 APPROVED. *[Signature]*

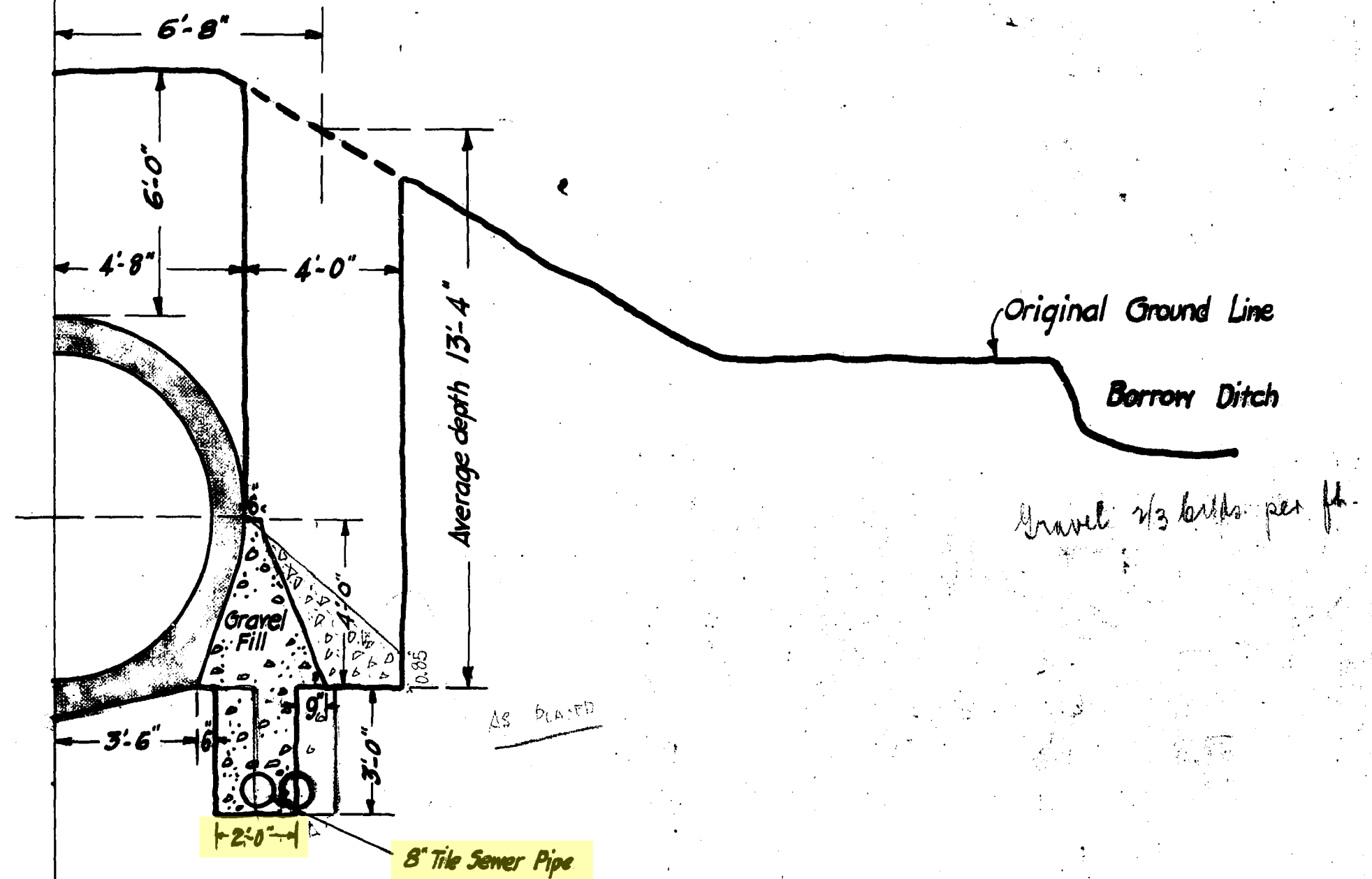
[Signature]
 CHIEF ENGINEER.

GREATER WINNIPEG WATER DISTRICT.
 8'-0" CIRCULAR REINFORCED AQUEDUCT.
 DOUBLE REINFORCED FOR RAILWAY CROSSING.
 JUNE 5TH 1918. SCALE 1/2" = 1 FT.

Feb 4. 210000
Sewer Pipe 19000
229000



Method "A" of underdrainage which is the basis of payment to Fowler & Young and estimated to cost \$26,000.00 per Mile



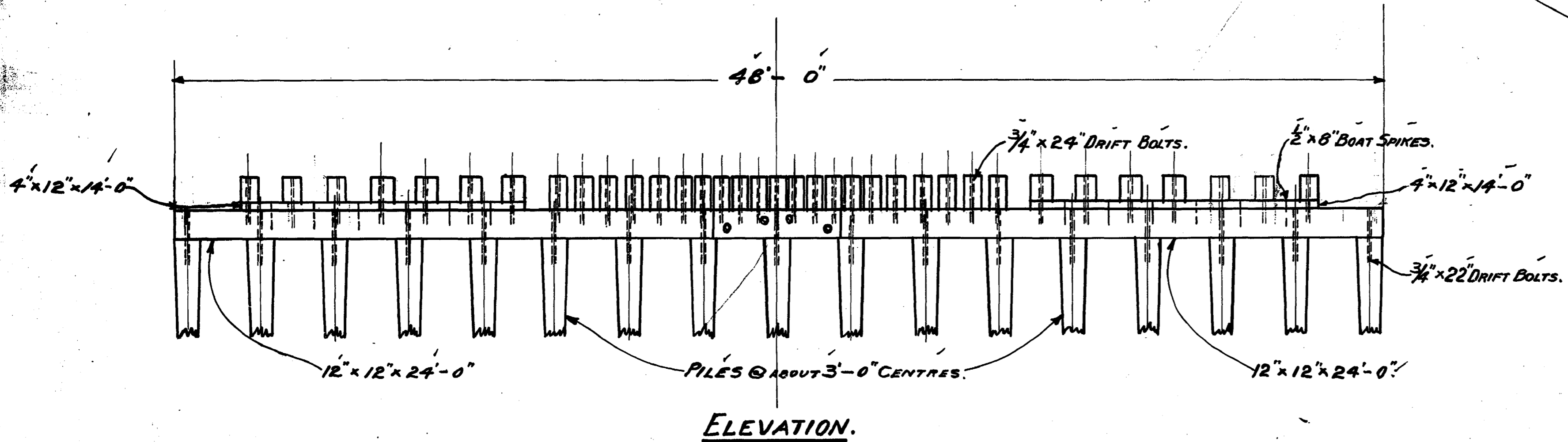
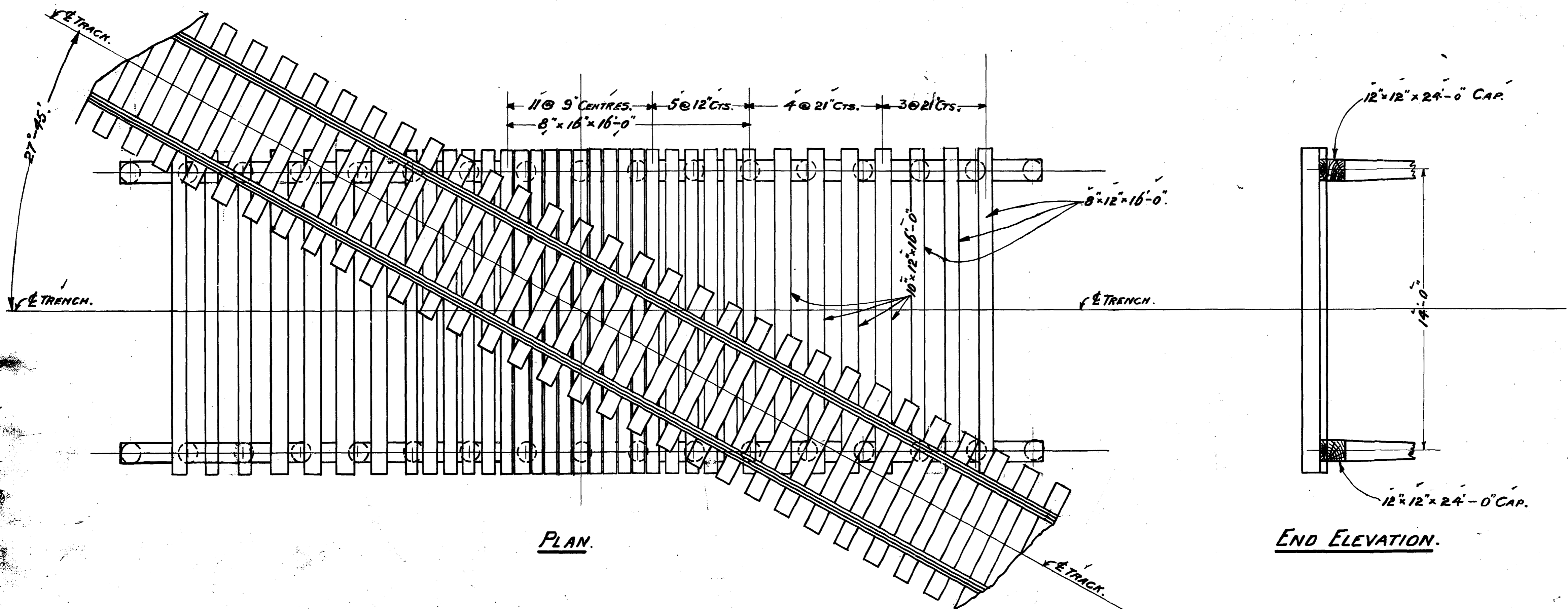
Proposed Method "C" of Underdraining South side of Aqueduct Section "A" between sta. 795+07 & 846+94 and both sides of Aqueduct between sta. 677+50 & 795+07 Estimated to cost \$60,000.00 per Mile.

MILE 12.83 MILE 15.05

Drawn by H.S.
Traced by H.S.
Checked by M.S.
Approved M.S.

M. R. Davis
Engineer.

GREATER WINNIPEG WATER DISTRICT
Comparison of Methods of Underdrainage
of Aqueduct Section "A"
Jan. 5. 1921
Scale 1/4" = 1 foot



BILL OF MATERIAL.

LUMBER					IRON.			
DESCRIPTION					DESCRIPTION.			
	KIND.	SIZE.	LENGTH.	NO OF Pcs.		SIZE.	NO OF Pcs.	
✓	CAPS.	DOUGLAS FIR	12' x 12'	24'-0"	4	DRIFT BOLTS	3/4" x 22"	38.
✓	TIES.	"	8' x 16'	16'-0"	21	"	3/4" x 24"	70.
✓	"	"	10' x 12'	16'-0"	8	BOAT SPIRES	2" x 8"	24.
✓	"	"	8' x 18'	16'-0"	6			
✓	FACING STRIPS	"	4' x 12'	12'-0"	4	BOLTS	3/4" x 22"	8
✓	SPLICES	"	4' x 12'	5'-0"	4	CAST WASHERS	3/4" x 3 1/2" P.P.	10.

CONTRACT 30.

C274.

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 TRACED BY. R.S.
 CHECKED BY. *[Signature]*
 APPROVED. *[Signature]*

[Signature]
 CHIEF ENGINEER.

GREATER WINNIPEG WATER DISTRICT.
 BRIDGE OVER AQUEDUCT AT DEACON.

JUNE 12TH 1910.

SCALE 1/4" = 1 FT.



Stantec Consulting Ltd.
905 Waverley Street
Winnipeg MB R3T 5P4
Tel: (204) 489-5900
Fax: (204) 453-9012

Stantec

October 23, 2008
Stantec File: 113731470

The City of Winnipeg
Water and Waste Department
552 Plinquet Street
Winnipeg MB R2J 0G1

Attention: Mr. David E. Carr, P.Eng.

Dear Sir :

**Reference: City of Winnipeg GWWD Bridge Inspections
Deacon Railway Bridge (buried) – Initial Inspection Results**

Stantec Consulting Ltd. was retained to complete a visual inspection of the Deacon Railway Bridge, a buried timber structure which spans the Shoal Lake Aqueduct supporting the GWWD Railway. The bridge is located between PR 207 and the east entrance to the Deacon Reservoir water treatment plant currently under construction. Stantec understands the bridge was constructed circa 1918 and has not been visually inspected since its construction. The bridge is buried below the railway ballast and surrounding terrain and generally consists of 8"x16", 10"x12" and 8"x12" timber ties supported by timber caps which are in turn supported by timber piles.

Stantec proposed to expose two areas of the bridge, through soft-digging operations, away from the track and ballast for an initial visual inspection and to obtain timber cores, if possible. The holes were then to be backfilled with granular material.

The visual inspection of the Deacon Railway Bridge was conducted on October 21, 2008. As the condition of the timber was unknown, exposure was facilitated via soft-digging operations conducted by Uni-Jet to mitigate any damage to the structure. The first hole was located approximately 14.5m east of two manholes located approximately 40.0m east of the entrance to the water treatment plant, and 2.9m south of the south rail of the track. The hole was dug until the top of the timber ties were located at a depth of approximately 0.9m below the top of the adjacent rail. The hole was then carefully enlarged, to 1.5x1.5m, to expose portions of three ties and a portion of the cap and one pile, as shown in the attached photographs. All of the exposed timber had very severe rot such that the wood could be crumbled and disintegrated with ease by hand. Due to the state of deterioration of the exposed timber Stantec did not proceed with a second hole as it was determined by interpolation that the remaining timber was more than likely in a similar condition. The hole was then backfilled with granular material. Mr. Jerry Legal, Section Foreman, of the City of Winnipeg Water and Waste Department was present onsite during the inspection.

Stantec

October 23, 2008

Mr. David E. Carr, P.Eng.

Page 2 of 2

**Reference: City of Winnipeg GWWD Bridge Inspections
Initial Results of the Inspection of the Deacon Bridge**

Based on the exposed portion of the bridge it can be concluded that the timber is currently not providing any structural resistance to live loads induced by the railway, or any other loading. The rot has likely been in existence for a considerable period of time. However, there are no noticeable effects to the railway such as subsidence of the ballast and rail. Mr. Jerry Legal indicated that they have not performed any maintenance operations such as re-leveling of the railway at this location in recent memory. Therefore, at least for the immediate short term, we believe that emergency repairs to provide additional support to the railway are not required. Mr. Ed Clarkson, Engine Driver, of the City of Winnipeg Water and Waste Department was contacted by telephone on October 21, 2008 and informed of the findings of the inspection. Mr. Clarkson was noted to be the contact person by Mr. Dave Carr during periods of his absence from the office.

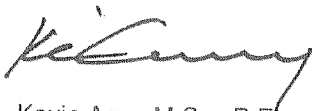
Stantec recommends that the City of Winnipeg conduct an immediate review of the loading on the aqueduct due to the railway, neglecting the load carrying capacity of the bridge, to identify any structural concerns. Based on the fact that a bridge was constructed at this location, we assume that the aqueduct was not originally designed to support the railway loading and that replacement of the existing bridge with a new structure will be required to support the railway and to ensure the long term structural integrity of the aqueduct. At this point in time we recommend that a new structure be constructed no later than early spring of 2009, but this timeframe should be re-assessed based on the results of the load analysis, and any associated risks.

Stantec would like to meet with the City to further discuss the findings of the inspections and possible risks associated with the current condition of the Deacon Railway Bridge at the earliest time convenient.

If you have any questions or comments please contact the undersigned.

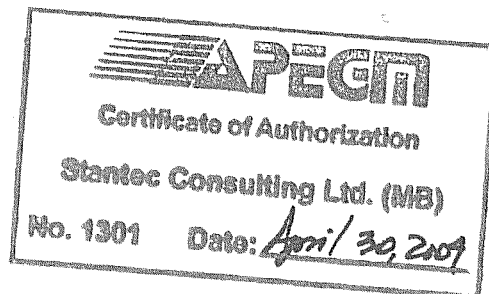
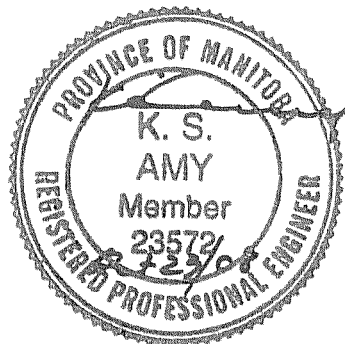
Sincerely,

STANTEC CONSULTING LTD.



Kevin Amy, M.Sc., P.Eng.
Structural Engineer
Tel: (204) 488-5742
Fax: (204) 799-7474
kevin.amy@stantec.com

Attachment: Pictures



Deacon Bridge



Deacon Bridge

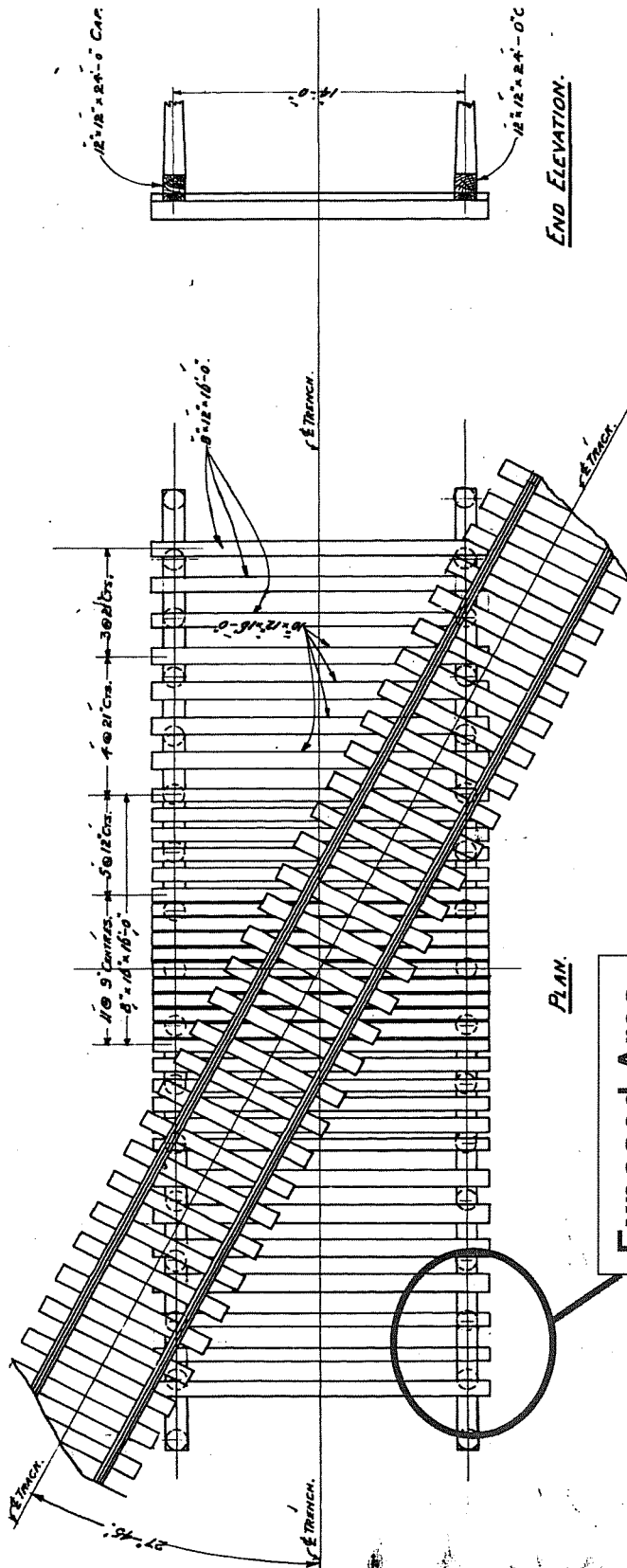


Deacon Bridge



Deacon Bridge



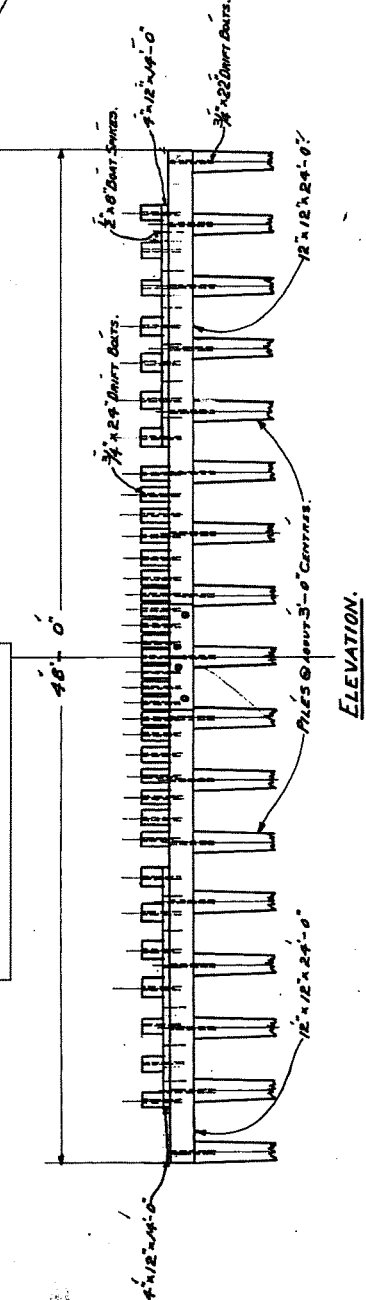


END ELEVATION.

PLAN.

Exposed Area

BILL OF MATERIAL			
LUMBER			
DESCRIPTION	SIZE	LENGTH	QUANTITY
CANS.	4" x 4" x 16'-0"	84'-0"	4
TIES.	1/2" x 12" x 16'-0"	21'	21
	1/2" x 12" x 16'-0"	8	8
	1/2" x 12" x 16'-0"	6	6
RAILING	1/2" x 12" x 16'-0"	4	4
SHOULDER	1/2" x 12" x 16'-0"	4	4



ELEVATION.

Figure 1

CONTRACT 30.

DRAWN BY: R.S.
 TRACED BY: R.S.
 CHECKED BY: *[Signature]*
 APPROVED: *[Signature]*

W. Geisler
 CHIEF ENGINEER.

GREATER WINNIPEG WATER
 BRIDGE OVER AQUEDUCT AT D.

JUNE 12 1918.