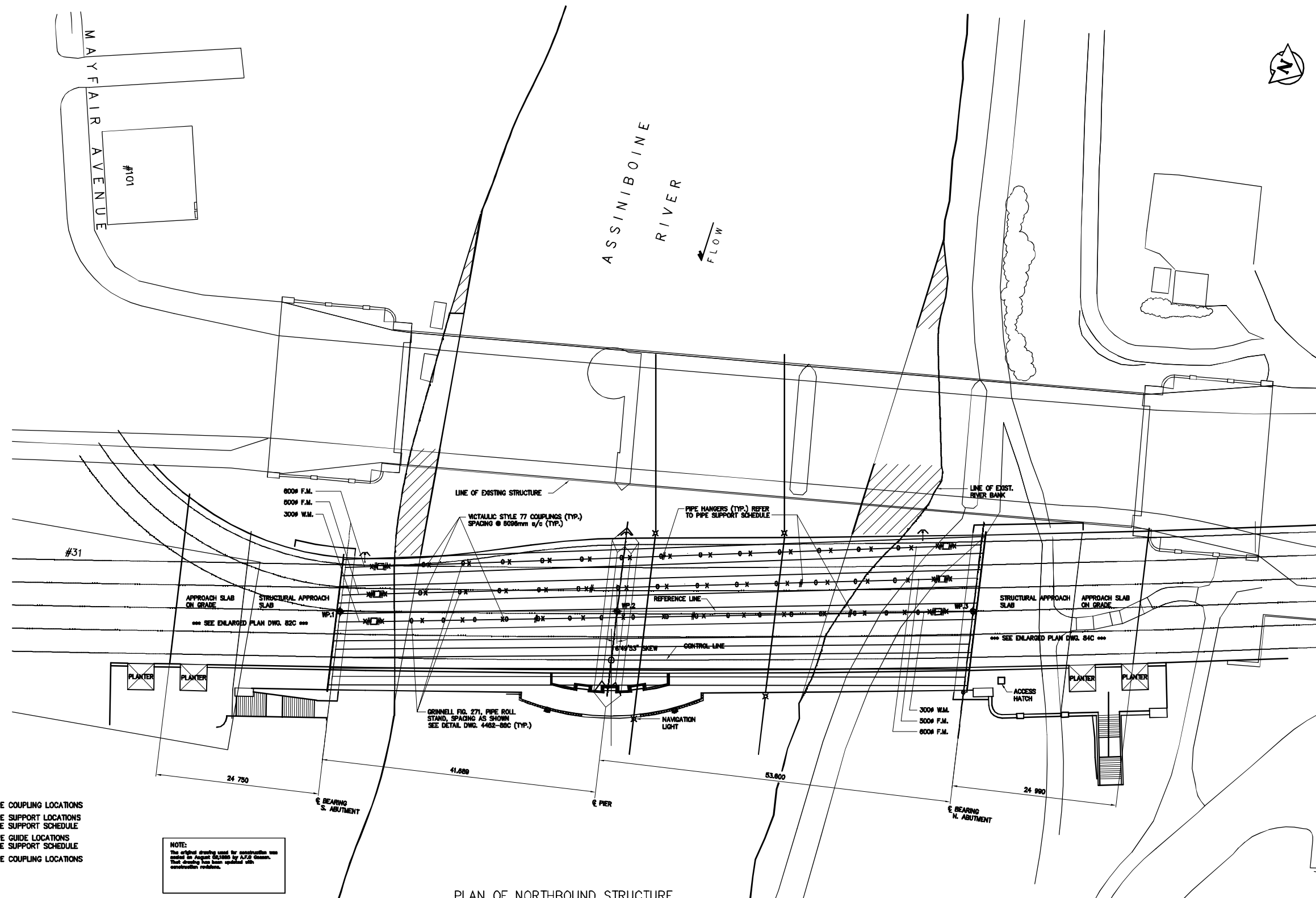


PLOT SCALE: 1:300

KGS FILE NO. G:\94-183-03\AS-CONSTRUCTED\418303-1M.dwg



- LEGEND**
- X INDICATES PIPE COUPLING LOCATIONS
 - O INDICATES PIPE SUPPORT LOCATIONS REFER TO PIPE SUPPORT SCHEDULE
 - # INDICATES PIPE GUIDE LOCATIONS REFER TO PIPE SUPPORT SCHEDULE
 - INDICATES PIPE COUPLING LOCATIONS

NOTE:
This original drawing used for construction was created as a project file by A.F.G. Gossen. That drawing has been updated with construction revisions.

PIPE SUPPORT SCHEDULE

PIPE SIZE	PIPE HANGERS AND ROLLERS	PIPE GUIDES	PIPE COUPLINGS
300mm	4.8M SPACING 1 PER SPOOL MIN.	WITHIN 4 PIPE DIA. OF EXPANSION JOINT 30M SPACING ON PIPE LINE MAX.	VICTAULIC STYLE 07 ON ELBOWS, STYLE 77 ELSEWHERE
500mm	6.0M SPACING 1 PER SPOOL MIN.	WITHIN 4 PIPE DIA. OF EXPANSION JOINT 45M SPACING ON PIPE LINE MAX.	VICTAULIC STYLE 07 ON ELBOWS, STYLE 77 ELSEWHERE
600mm	6.0M SPACING 1 PER SPOOL MIN.	WITHIN 4 PIPE DIA. OF EXPANSION JOINT 54M SPACING ON PIPE LINE MAX.	VICTAULIC STYLE 07 ON ELBOWS, STYLE 77 ELSEWHERE

AS-CONSTRUCTED

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

KGS GROUP CONSULTING ENGINEERS & PROJECT MANAGERS
WINNIPEG THUNDER BAY

LOCATIONS APPROVED UNDERGROUND STRUCTURES

SUPV U/O STRUCTURES COMMITTEE DATE

NOTE:
LOCATION 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 COORDINATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION

NO.	REVISIONS	DATE	BY

DS-Lea Consultants Ltd.
Consulting Engineers - Planners - Transportation Consultants
Suite 111-83 Lombard Avenue Winnipeg, Manitoba R2S 3B1
Phone (204) 943-5770 Fax (204) 943-4648

DESIGNED BY: RBB CHECKED BY: AFG
DRAWN BY: VJH APPROVED BY: [Signature]
AUTHORIZED BY: [Signature] DATE: [Date]
HOR. SCALE: 1:300
VERTICAL SCALE: [Blank]
DATE: JUNE 1995

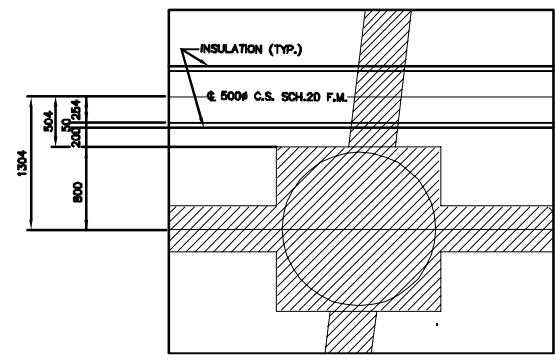
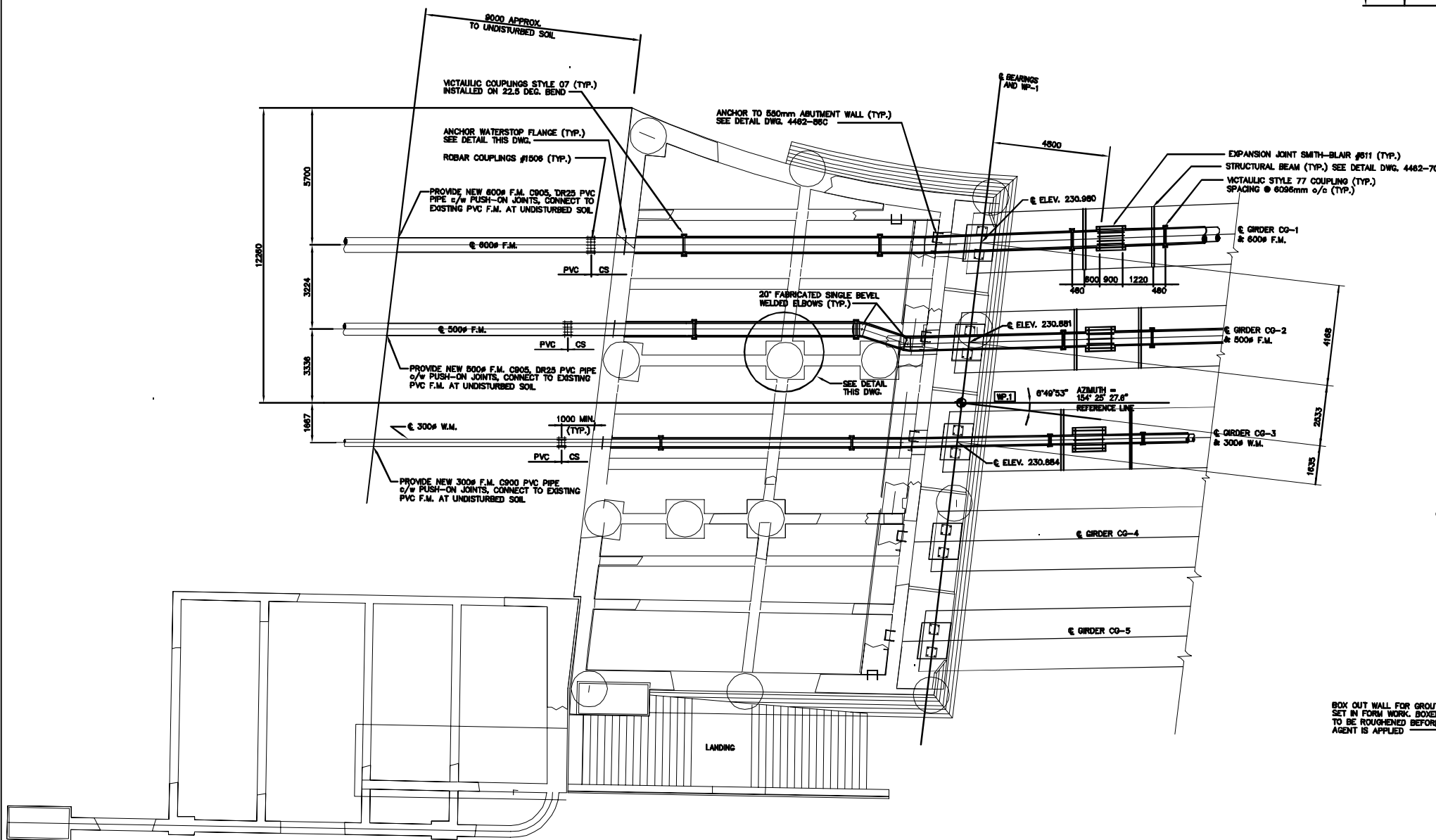
ENGINEER'S SEAL
PROVINCE OF MANITOBA
A.F.G. GOSSEN
REGISTERED PROFESSIONAL ENGINEER

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

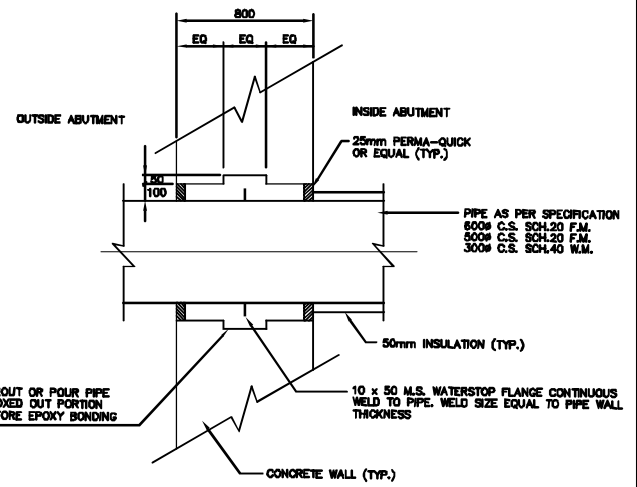
MAIN STREET AND NORWOOD BRIDGES PROJECT
MAIN STREET BRIDGE
NORTHBOUND STRUCTURE

CITY DRAWING NUMBER: B104-95-81C
SHEET 81 OF 121
CONSULTANT DRAWING NO. 4462-81C
CONCRETE GIRDER GENERAL ARRANGEMENT PLAN OF FORCEMAINS AND WATERMAINS
05788

HALF SIZE REDUCTION



DETAIL OF 500Ø PIPE (TYP.)
N.T.S.



ANCHOR WATERSTOP FLANGE DETAIL
N.T.S.

PLAN OF SOUTH ABUTMENT BELOW SLAB
1:100

NOTE:
The original drawing used for construction was issued on August 02, 1995 by A.F.G. Gossen. That drawing has been updated with construction revisions.

AS-CONSTRUCTED

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

KGS GROUP CONSULTING ENGINEERS & PROJECT MANAGERS
WINNIPEG THUNDER BAY

LOCATIONS APPROVED UNDERGROUND STRUCTURES

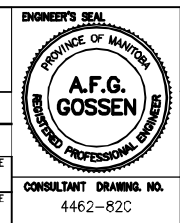
SUPPLY U/G STRUCTURES COMMITTEE	DATE

NOTE:
LOCATION 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 DISTANCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION

NO.	REVISIONS	DATE	BY

DS-Lea Consultants Ltd.
Consulting Engineers - Planners - Transportation Consultants
Suite 111-93 Lombard Avenue Winnipeg, Manitoba R3B 3B1
Phone (204) 943-3178 Facsimile (204) 943-4848

DESIGNED BY	RBB	CHECKED BY	AFG
DRAWN BY	VJH	APPROVED BY	
HOR. SCALE	1:100	AUTHORIZED BY	DATE
VERTICAL	1:100	G.R. SMITH / SENIOR BRIDGE ENGINEER	DATE
DATE	JUNE 1995	ACCEPTED BY	DATE
		B. DEBENPUNGER / BRIDGE ENGINEER	



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

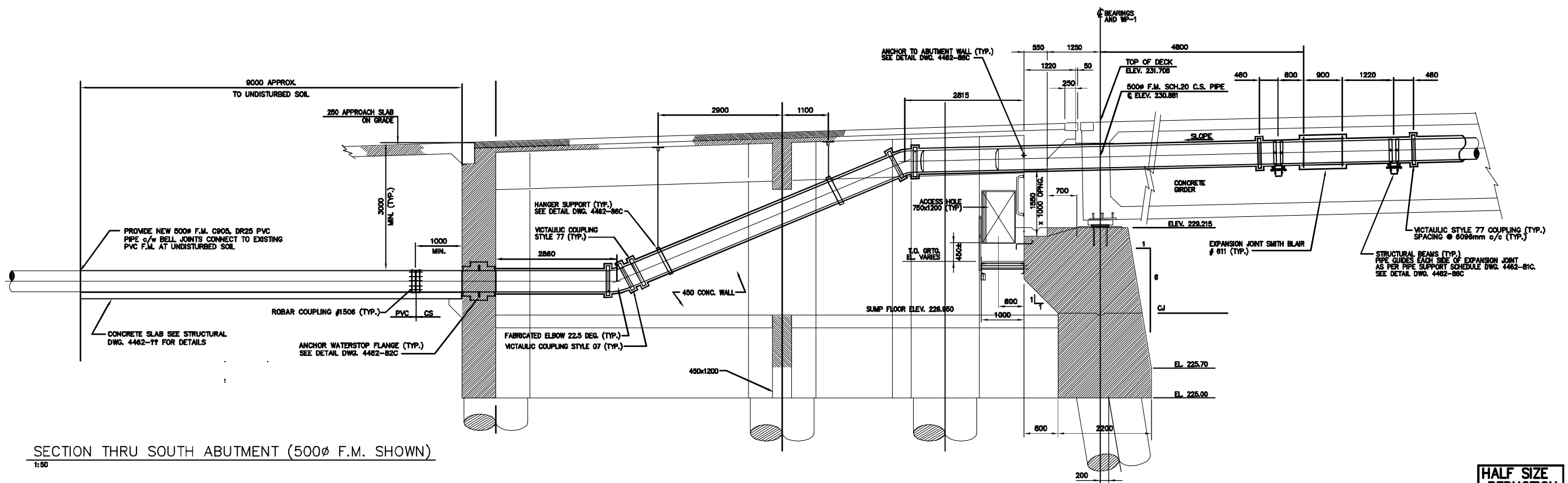
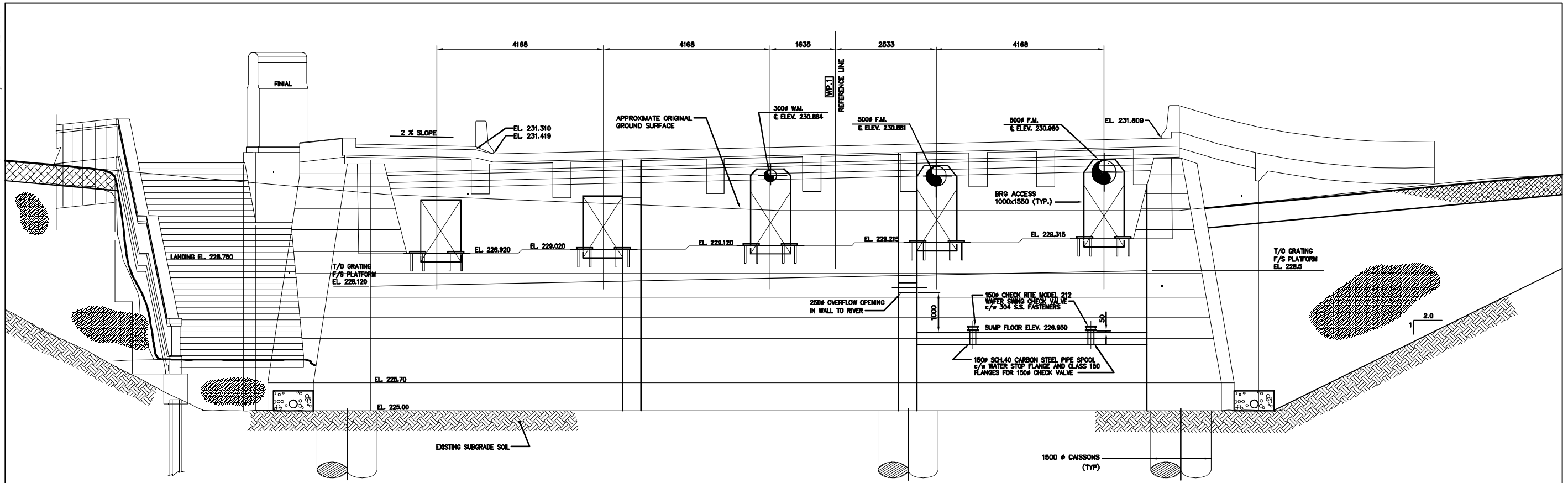
MAIN STREET AND NORWOOD BRIDGES PROJECT
MAIN STREET BRIDGE
NORTHBOUND STRUCTURE

CONCRETE GIRDER SOUTH ABUTMENT PLAN

CITY DRAWING NUMBER
B104-95-82C
SHEET 82 OF 121

05789

HALF SIZE REDUCTION



NOTE:
The original drawing used for construction was issued on August 02, 1995 by A.F.G. Gossen. That drawing has been updated with construction revisions.

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

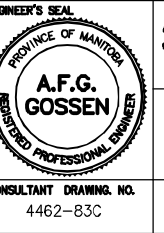
KGS CONSULTING ENGINEERS & PROJECT MANAGERS
WINNIPEG THUNDER BAY

AS-CONSTRUCTED

LOCATIONS APPROVED UNDERGROUND STRUCTURES		B.M. - ELEV. -
NO.	REVISIONS	DATE BY
D	AS-CONSTRUCTED - FROM INFORMATION	
C	ISSUED FOR CONSTRUCTION	08/95 JWB
B	ISSUED FOR TENDER	06/95 JWB
A	ISSUED FOR CONSTRUCTION	08/95 JWB

DS-Lea Consultants Ltd.
Consulting Engineers - Planners - Transportation Consultants
Suite 111-93 Lombard Avenue Winnipeg, Manitoba R3B 3P1
Phone [204] 943-3178 Facsimile [204] 943-4948

DESIGNED BY: RBB
CHECKED BY: AFG
DRAWN BY: VJH
APPROVED BY: [Signature]
HOR. SCALE: 1:50
VERTICAL: [Signature]
DATE: JUNE 1995



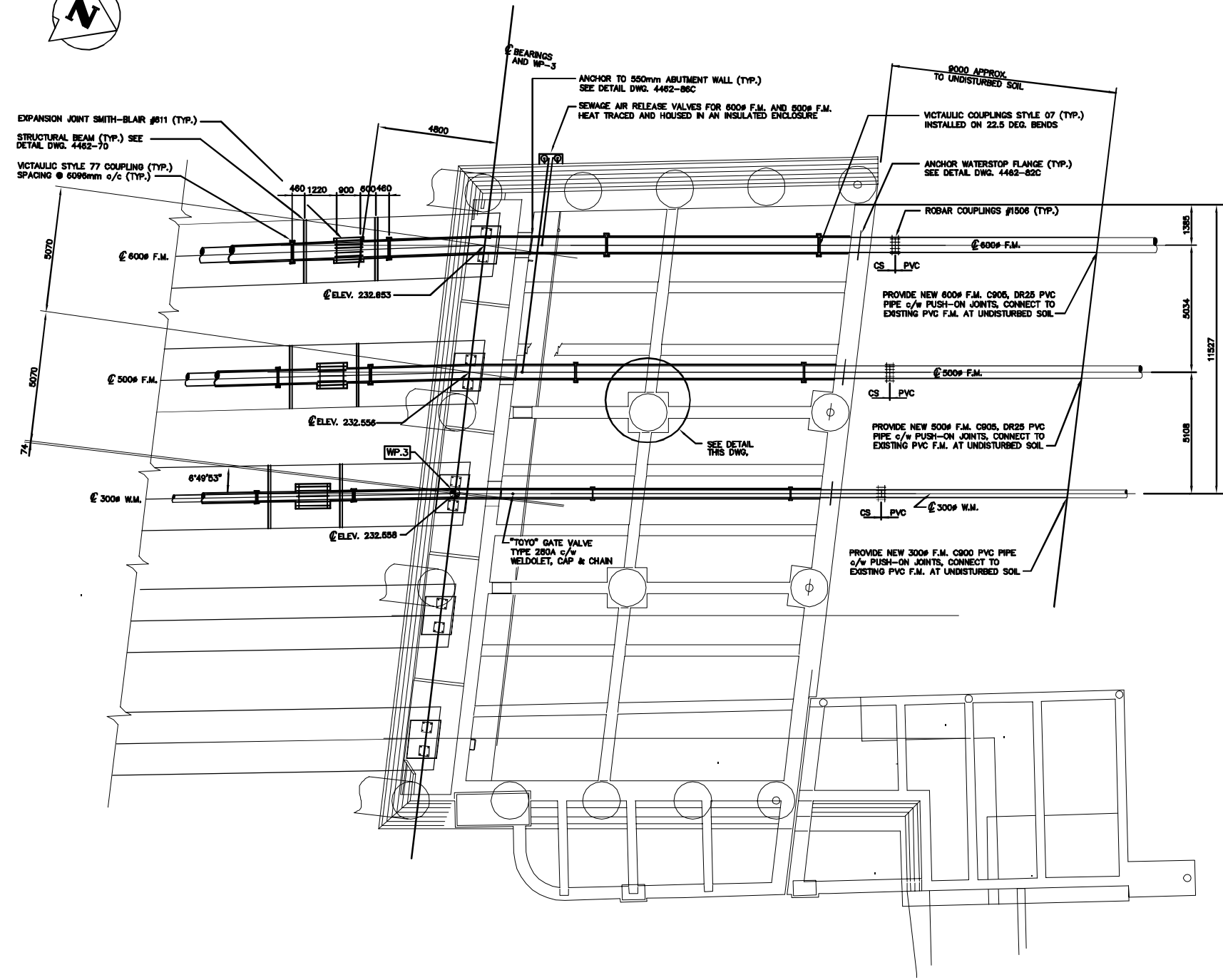
THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
STREETS AND TRANSPORTATION DEPARTMENT

MAIN STREET AND NORWOOD BRIDGES PROJECT
MAIN STREET BRIDGE
NORTHBOUND STRUCTURE

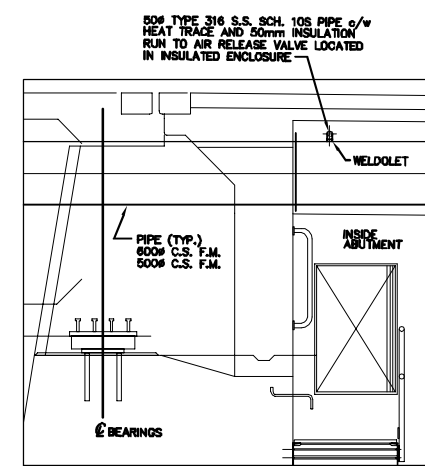
CONCRETE GIRDER SOUTH ABUTMENT
ELEVATION AND SECTION

CITY DRAWING NUMBER: B104-95-83C
SHEET 83 OF 121
05790

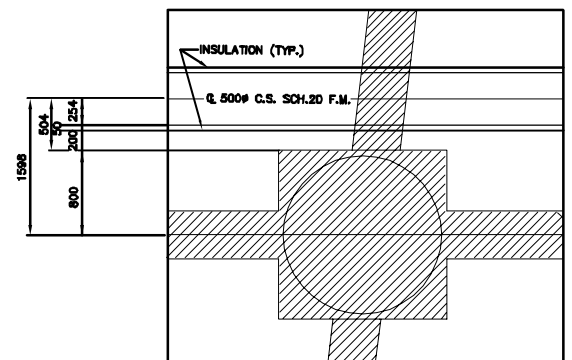
HALF SIZE REDUCTION



PLAN OF NORTH ABUTMENT BELOW SLAB
1:100



DETAIL OF AIR RELEASE PIPING
N.T.S.



DETAIL OF 500# PIPE (TYP.)
N.T.S.

NOTE:
The original drawing used for construction was sealed on August 02, 1995 by A.F.G. Gossen. That drawing has been updated with construction revisions.

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

KGS CONSULTING ENGINEERS & PROJECT MANAGERS
WINNIPEG THUNDER BAY

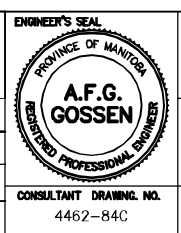
AS-CONSTRUCTED

LOCATIONS APPROVED UNDERGROUND STRUCTURES		SUPPLY U/G STRUCTURES COMMITTEE	DATE
D	AS-CONSTRUCTED - FROM INFORMATION		
C	REVISED PIPING LAYOUT	12/97	JWB
B	ISSUED FOR CONSTRUCTION	08/96	AS
A	ISSUED FOR TENDER	08/96	JWB
NO.	REVISIONS	DATE	BY

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

DS-Lea Consultants Ltd.
Consulting Engineers - Planners - Transportation Consultants
Suite 111-93 Lombard Avenue Winnipeg, Manitoba R3B 3B1
Phone [204] 943-3178 Facsimile [204] 943-4948

DESIGNED BY	RBB	CHECKED BY	AFG
DRAWN BY	VJH	APPROVED BY	
AUTHORIZED BY		DATE	
HOR. SCALE	1:100	DATE	
VERTICAL		DATE	
DATE	JUNE 1995	DATE	



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

MAIN STREET AND NORWOOD BRIDGES PROJECT
MAIN STREET BRIDGE
NORTHBOUND STRUCTURE

CONCRETE GIRDER NORTH ABUTMENT PLAN

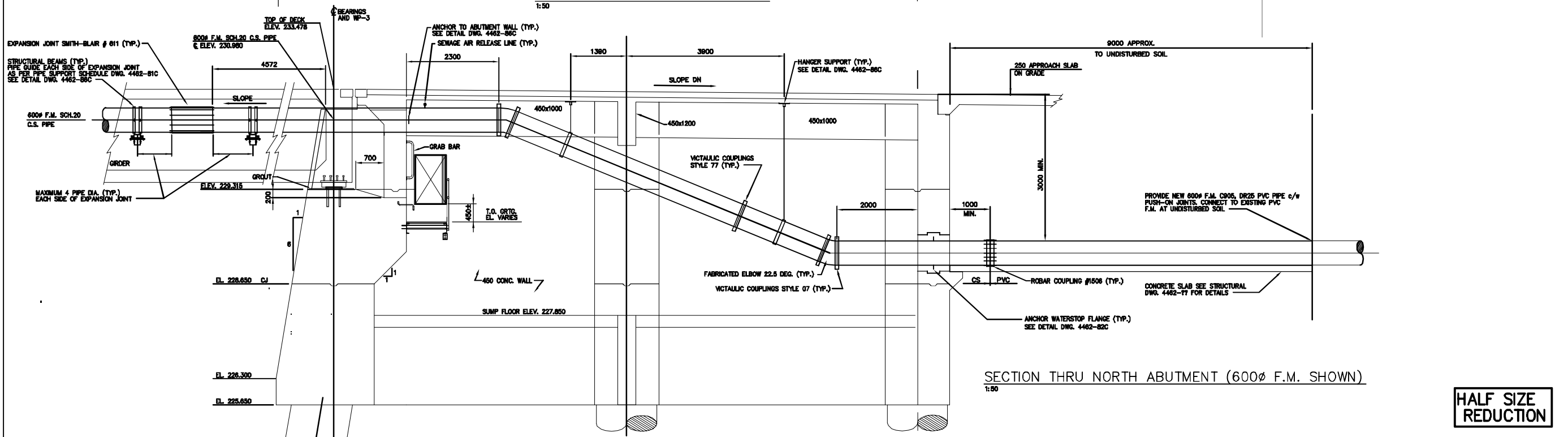
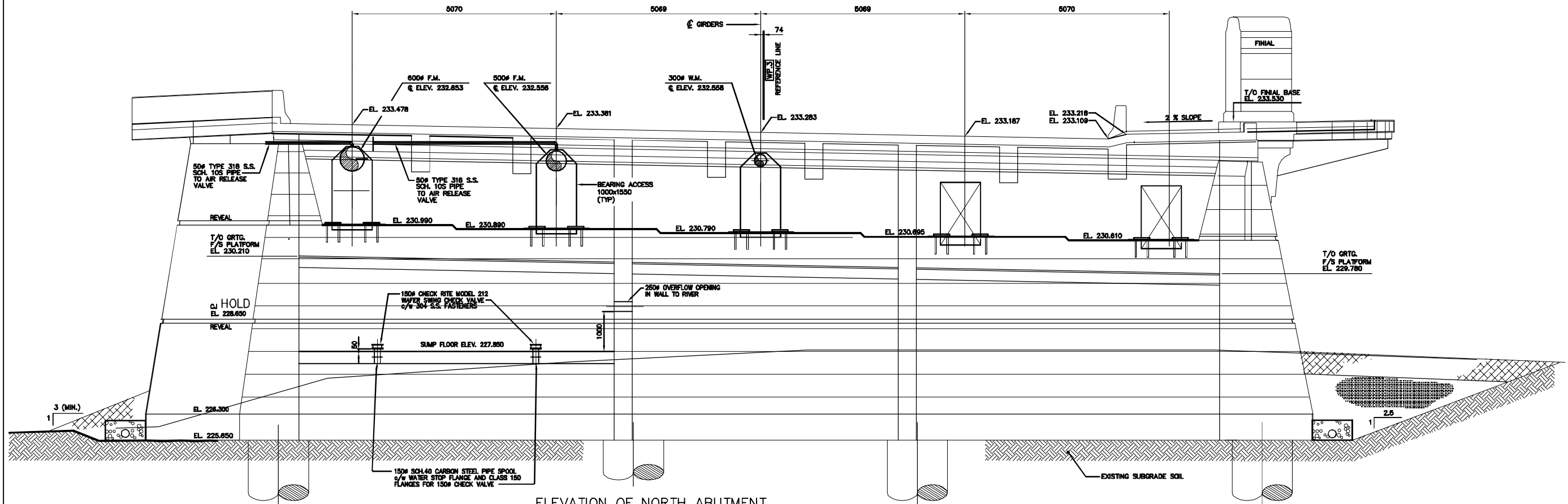
CITY DRAWING NUMBER B104-95-84C
SHEET 84 OF 121

05791

HALF SIZE REDUCTION

84 mm X 594mm/ PLT SCALE: 1:50

KGS FILE NO. G:\94-183-03\AS-CONSTRUCTED\418303-5M.dwg



NOTE:
The original drawing used for construction was issued on August 02, 1995 by A.F.G. Gossen. That drawing has been updated with construction revisions.

AS-CONSTRUCTED

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

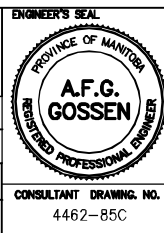
KGS GROUP CONSULTING ENGINEERS & PROJECT MANAGERS
WINNIPEG THUNDER BAY

LOCATIONS APPROVED UNDERGROUND STRUCTURES		B.M. ELEV.
SUPV U/G STRUCTURES COMMITTEE	DATE	
NOTE: LOCATION 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. COORDINATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.		
B	AS-CONSTRUCTED - FROM INFORMATION	
	SUPPLIED	12/97 JWB
A	ISSUED FOR TENDER	06/96 JWB
NO.	REVISIONS	DATE BY

DS-Lea Consultants Ltd.
Consulting Engineers - Planners - Transportation Consultants
Suite 111-93 Lombard Avenue Winnipeg, Manitoba R3B 3B1
Phone [204] 943-3178 Facsimile [204] 943-4948

DESIGNED BY: RBB
CHECKED BY: AFG
DRAWN BY: VJH
APPROVED BY:
AUTHORIZED BY: DATE:
G.R. SMITH / SENIOR BRIDGE ENGINEER
ACCEPTED BY: DATE:
B. BRONSPANGLER / BRIDGE ENGINEER

HOR. SCALE: 1:50
VERTICAL SCALE: 1:50
DATE: JUNE 1995



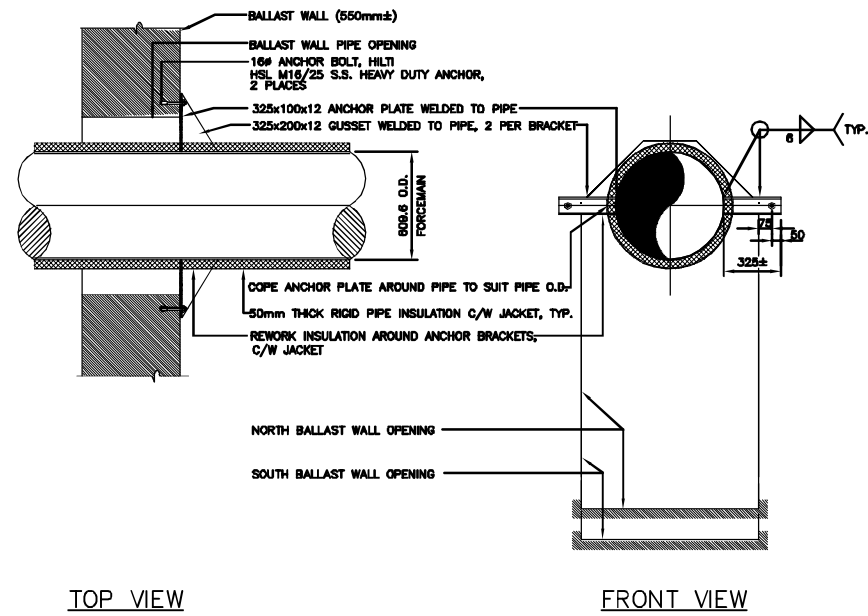
THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
STREETS AND TRANSPORTATION DEPARTMENT

MAIN STREET AND NORWOOD BRIDGES PROJECT
MAIN STREET BRIDGE
NORTHBOUND STRUCTURE

CONCRETE GIRDER NORTH ABUTMENT
ELEVATION AND SECTION

CITY DRAWING NUMBER: B104-95-85C
SHEET 85 OF 121

05792

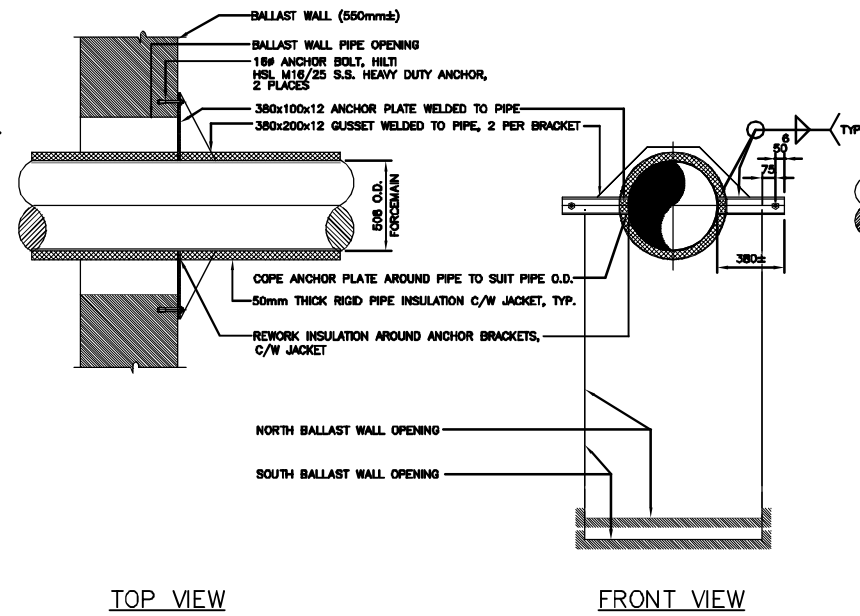


TOP VIEW

FRONT VIEW

600Ø PIPE THRUST RESTRAINT BRACKET DETAIL, (x2)

1:20

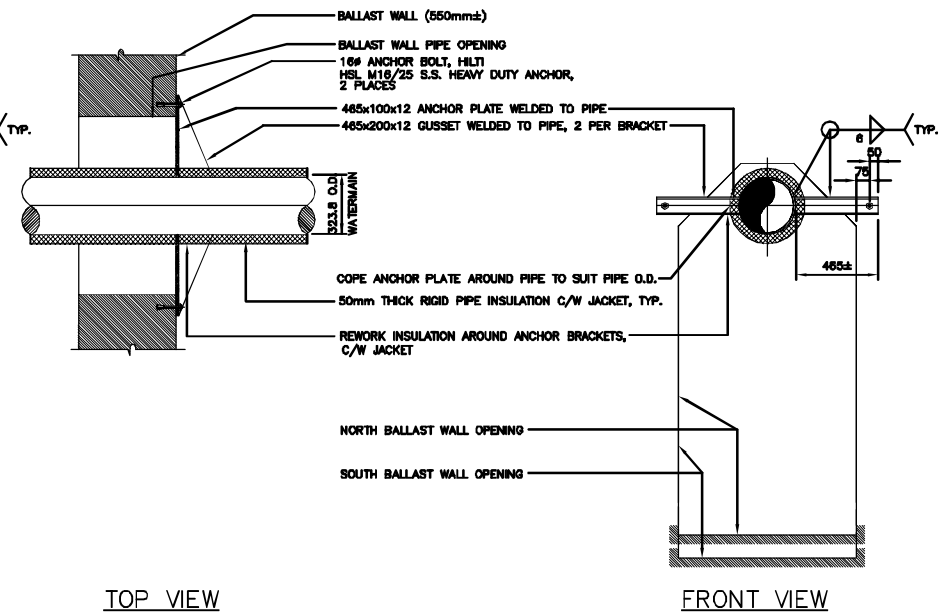


TOP VIEW

FRONT VIEW

500Ø PIPE THRUST RESTRAINT BRACKET DETAIL, (x2)

1:20

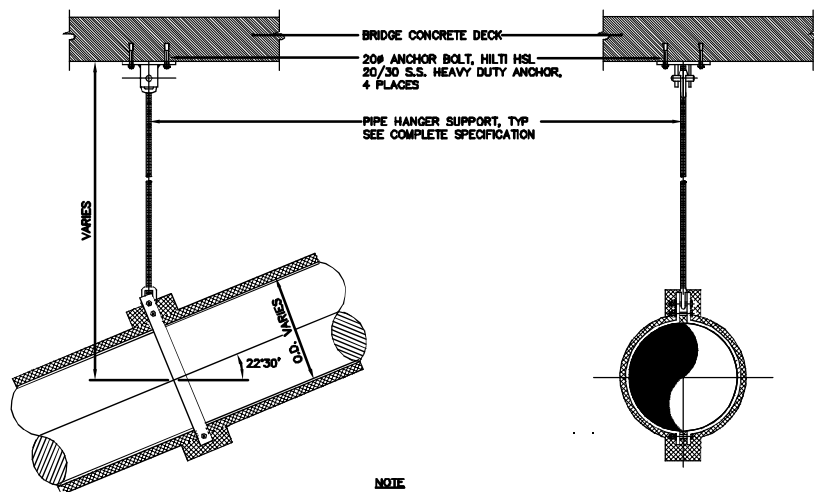


TOP VIEW

FRONT VIEW

300Ø PIPE THRUST RESTRAINT BRACKET DETAIL, (x2)

1:20



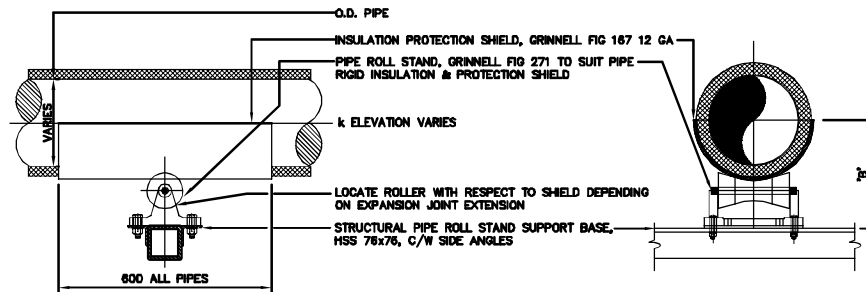
NOTE
CONTRACTOR TO LOCATE REBAR PRIOR TO DRILLING FOR ANCHOR BOLTS INSTALLATION.

- PIPE HANGER SUPPORT
- CONCRETE CLEVIS PLATE, GRINNELL FIG. 49 SIZE TO SUIT ROD Ø
 - WELDLESS EYE NUT, GRINNELL FIG. 290 TO SUIT ROD Ø (2 REQ'D. EACH SUPPORT)
 - A# HANGER ROD, GRINNELL FIG. 148 304 S.S.
 - DOUBLE BOLT PIPE CLAMP, GRINNELL FIG. 295 TO SUIT PIPE O.D.

PIPE O.D.	A#
323.8	22
508	32
609.6	32

PIPE HANGER SUPPORT (TYP.)

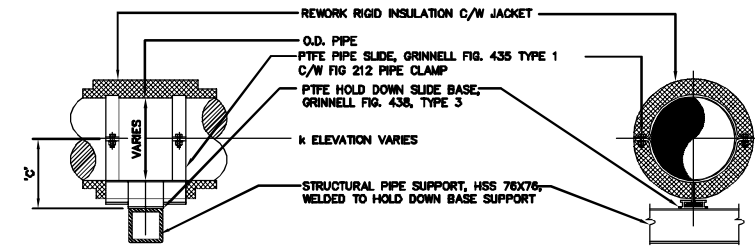
1:20



PIPE O.D.	INSULATION SHIELD	PIPE ROLL STAND	"B"
323.8	GRINNELL FIG. 167-18C	GRINNELL FIG. 271 FOR 425 O.D. PIPE	349
508	GRINNELL FIG. 167-25C	GRINNELL FIG. 271 FOR 610 O.D. PIPE	453
609.6	GRINNELL FIG. 167-28C	GRINNELL FIG. 271 FOR 710 O.D. PIPE	582

PIPE ROLL STAND SUPPORT (TYP.)

N.T.S.



PIPE O.D.	PIPE SLIDE	HOLD DOWN BASE	"C"
323.8	GRINNELL FIG. 435 TYPE 1, FOR PIPE SIZE 250#-350#	GRINNELL FIG. 438, TYPE 3 SIZE B	129
508	GRINNELL FIG. 435 TYPE 1, FOR PIPE SIZE 400#-750#	GRINNELL FIG. 438, TYPE 3 SIZE B	131
609.6	GRINNELL FIG. 435 TYPE 1, FOR PIPE SIZE 400#-750#	GRINNELL FIG. 438, TYPE 3 SIZE B	131

PIPE GUIDE SUPPORT (TYP.)

1:20

NOTE:
The original drawing used for construction was revised on August 02, 1999 by A.F.G. Gosse. That drawing has been updated with construction revisions.

HALF SIZE REDUCTION

AS-CONSTRUCTED

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

KGS CONSULTING ENGINEERS & PROJECT MANAGERS
WINNIPEG THUNDER BAY

LOCATIONS APPROVED UNDERGROUND STRUCTURES		B.M. ELEV.	DATE
SUPV U/G STRUCTURES COMMITTEE			
NOTE:			
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN 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			
B AS-CONSTRUCTED - FROM INFORMATION	12/97	JWB	
A SUPPLIED	06/95	JWB	
A ISSUED FOR TENDER			
NO. REVISIONS	DATE	BY	

DESIGNED BY	CHECKED BY	DATE
RBB	AFG	
DRAWN BY	APPROVED BY	DATE
AS		
HOR. SCALE	AUTHORIZED BY	DATE
1:20	C.R. SMITH / SENIOR BRIDGE ENGINEER	
VERTICAL	ACCEPTED BY	DATE
	B. ERDISPANCER / BRIDGE ENGINEER	

DS-Lea Consultants Ltd.
Consulting Engineers - Planners - Transportation Consultants
Suite 111-93 Lombard Avenue Winnipeg, Manitoba R3B 3B1
Phone (204) 943-3178 Facsimile (204) 943-4948

ENGINEER'S SEAL
PROVINCE OF MANITOBA
A.F.G. GOSSEN
REGISTERED PROFESSIONAL ENGINEER

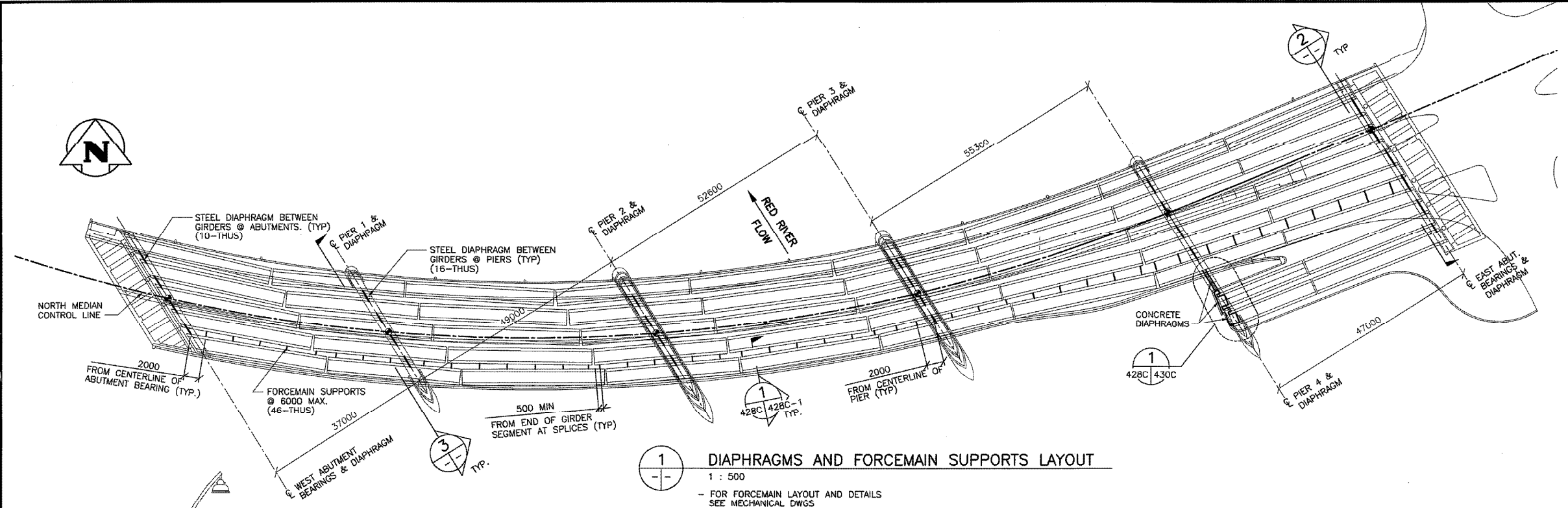
THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
STREETS AND TRANSPORTATION DEPARTMENT

MAIN STREET AND NORWOOD BRIDGES PROJECT
MAIN STREET BRIDGE
NORTH-BOUND STRUCTURE

CITY DRAWING NUMBER
B104-95-86C
SHEET 86 OF 121

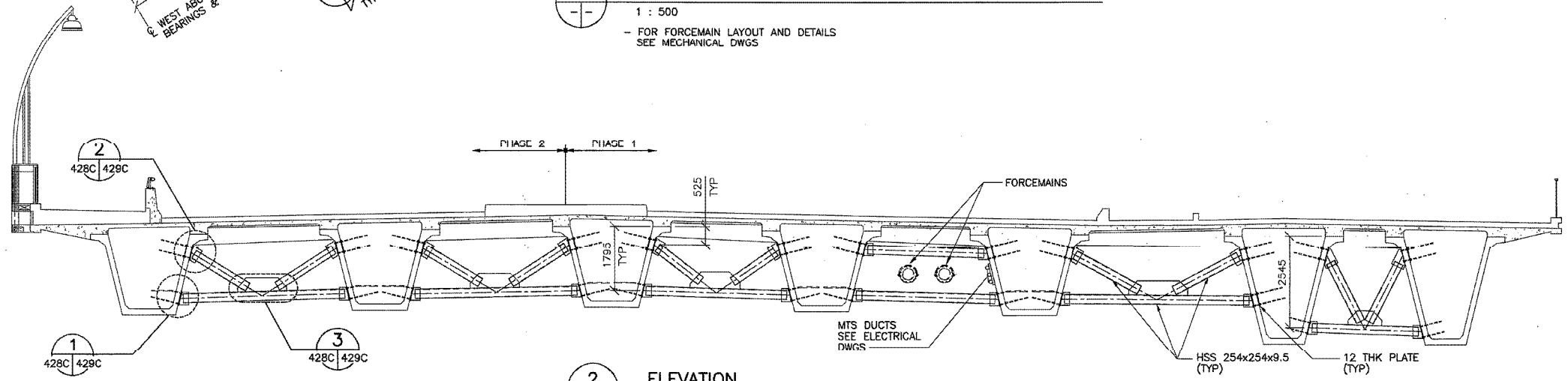
CONCRETE GIRDER
PIPE DETAILS

05793



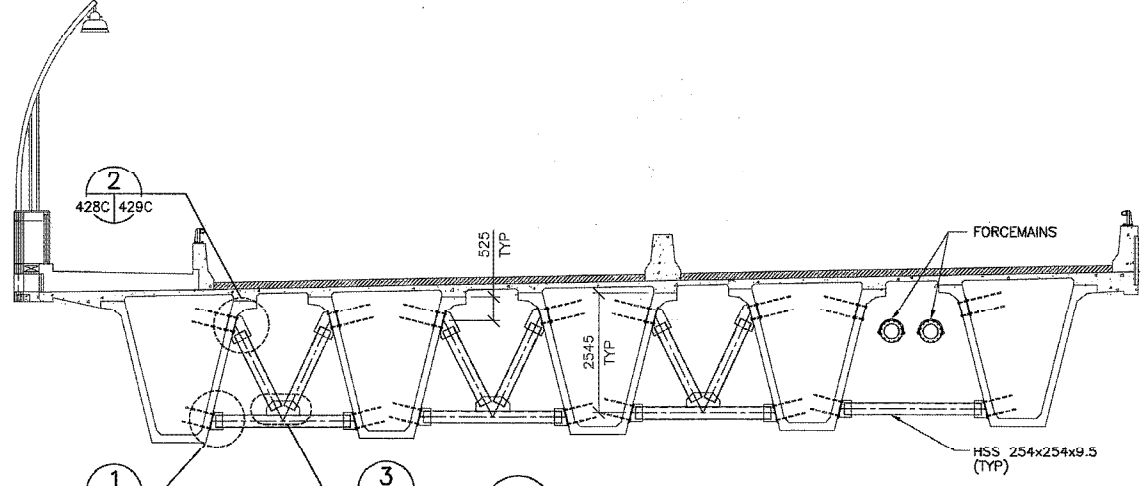
1
DIAPHRAGMS AND FORCEMAIN SUPPORTS LAYOUT
1 : 500

- FOR FORCEMAIN LAYOUT AND DETAILS
SEE MECHANICAL DWGS



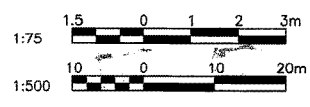
2
ELEVATION
1 : 75

- SHOWING TYPICAL DIAPHRAGMS AT ABUTMENTS



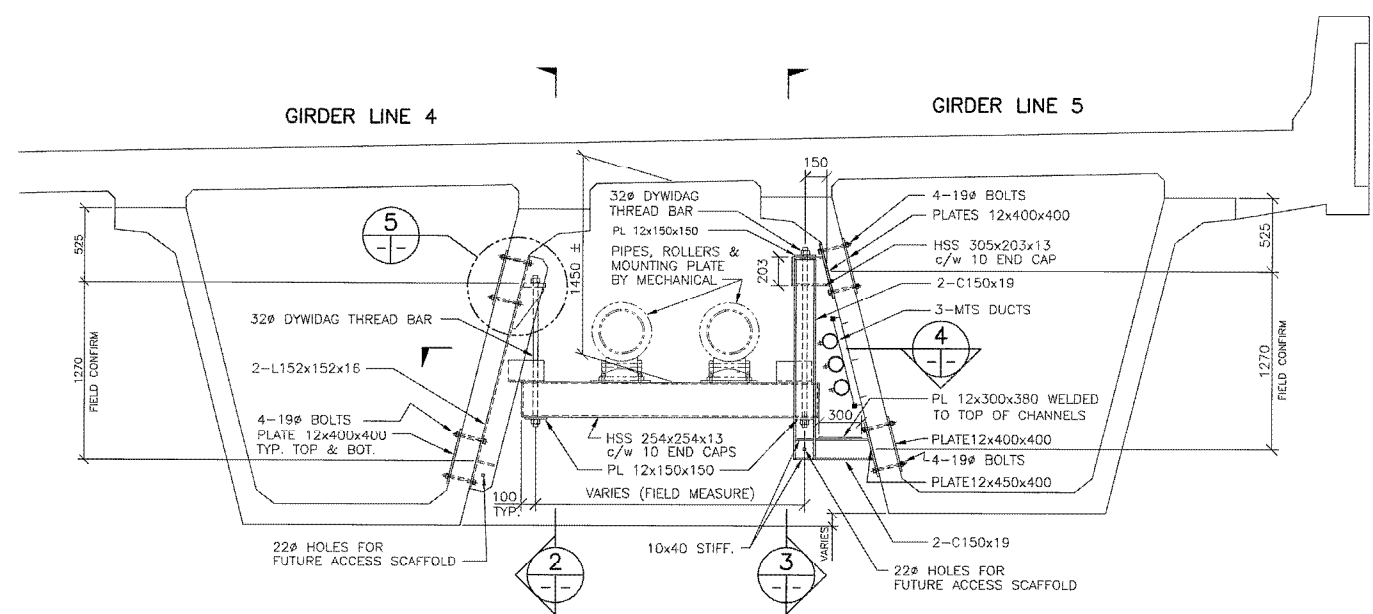
3
ELEVATION
1 : 75

- SHOWING TYPICAL DIAPHRAGMS AT PIERS

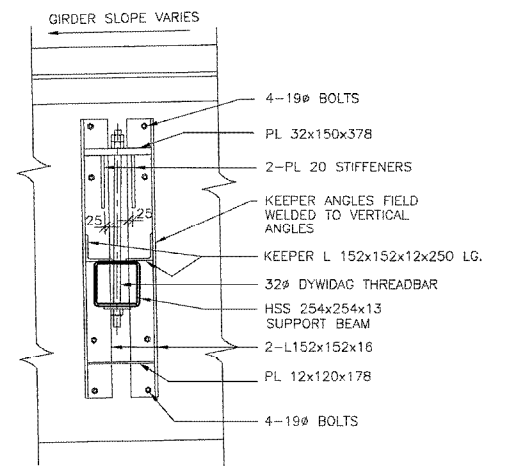


RECORD DRAWING
DATE 05.01.20 BY W.P.S.
REVIEWED BY P.S.

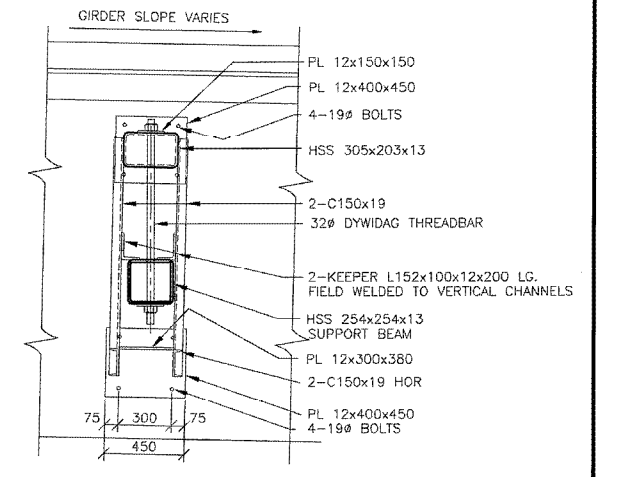
B.M. ELEV.	F.B.	WARDROP Engineering Inc.	ORIGINAL DRAWING REVISION "0" SEALED BY D.N. BURMEY 01.04.24	THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	CITY DRAWING NUMBER B110-01-077C SHEET OF
DESIGNED BY D.N.B./B.C.	CHECKED BY D.N.B.	DRAWN BY A.K.	APPROVED BY R.V.G.	PROVENCHER PAIRED BRIDGES PROJECT VEHICULAR BRIDGE CONCRETE GIRDER ALTERNATIVE	GIRDER DIAPHRAGMS AND FORCEMAIN SUPPORTS - PLAN AND SECTIONS
2 RECORD DRAWING 1 ISSUED FOR CONSTRUCTION 0 ISSUED FOR TENDER	05.01.20 P.S. 01.07.05 R.V.G. 01.04.30 D.N.B.	NO. REVISIONS	DATE	BY	DATE
			01.04.30		01.04.30
		SCALE: AS NOTED	VERTICAL:	ACCEPTED BY ORIGINAL DRAWING SIGNED BY B. EBENSPIGGER (01.04.24)	CONSULTANT DRAWING NO. 990007-08-00
				Winnipeg	428C



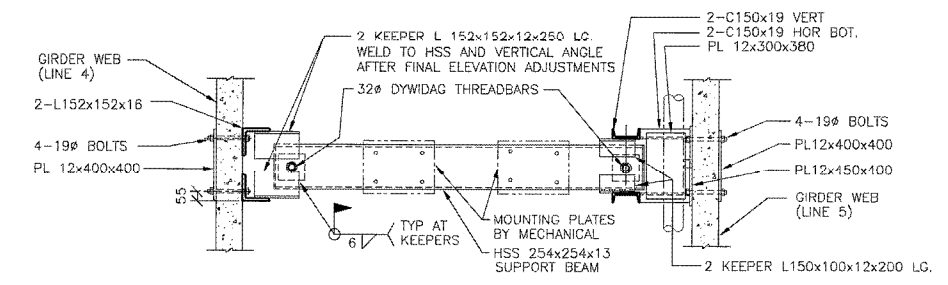
1 ELEVATION - TYPICAL FORCEMAIN SUPPORT
248C 248C-1 1 : 25



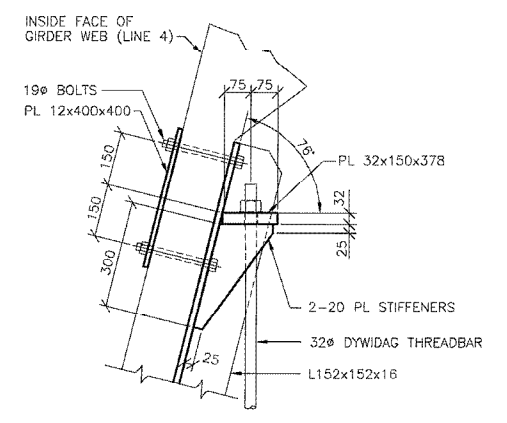
2 SECTION
1 : 20



3 SECTION
1 : 20



4 PLAN/SECTION
1 : 20



5 DETAIL
1 : 10

GENERAL NOTES

1. DISTANCE AND RELATIVE ELEVATION BETWEEN GIRDER LINES 4 AND 5 VARIES OVER THE LENGTH OF THE BRIDGE. CONTRACTOR SHALL FIELD CONFIRM ALL DIMENSIONS AND ELEVATIONS.
2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
3. MINIMUM WELD SHALL BE 8mm FILLET.

RECORD DRAWING
DATE 05.01.20 BY W.P.S.
REVIEWED BY P.S.

B.M. ELEV.	F.B.	WARDROP Engineering Inc.	
		DESIGNED BY D.N.B.	CHECKED BY
		DRAWN BY P.S.	APPROVED BY
1 RECORD DRAWING	05.01.20	HR. SCALE: AS NOTED	ACCEPTED BY DATE
0 ISSUED WITH P.C.N. 18	02.03.01	VERTICAL:	
NO. REVISIONS	DATE BY	DATE 02.03.01	B. EBENSPANER, P. ENG. BRIDGE DESIGN AND PROJECTS ENGINEER

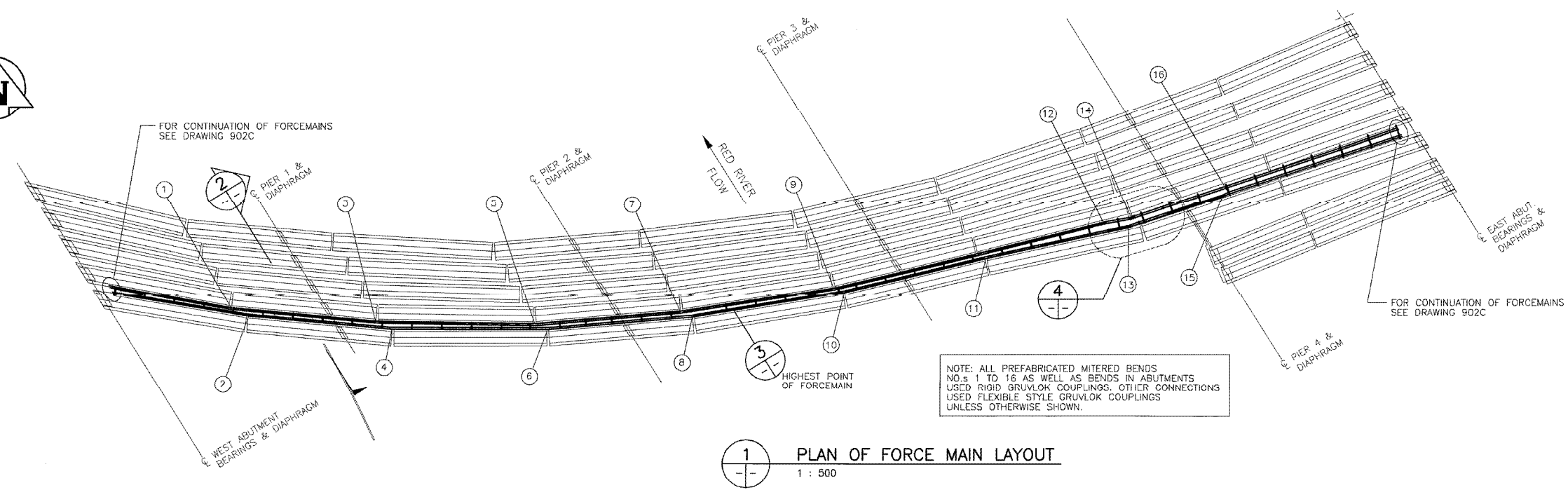
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

PROVENCHER PAIRED BRIDGES PROJECT
VEHICULAR BRIDGE
CONCRETE GIRDER ALTERNATIVE

CITY DRAWING NUMBER
B110-01-144C
SHEET OF

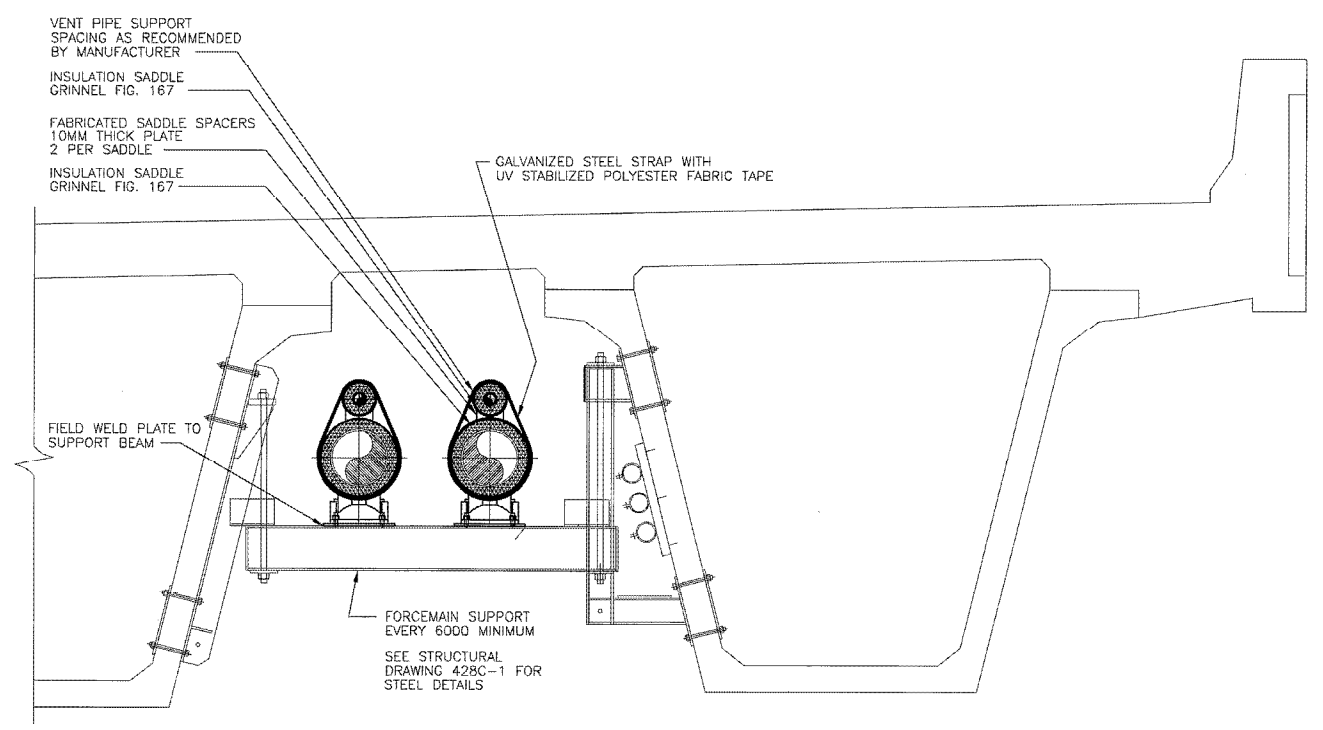
CONSULTANT DRAWING NO.
990007-08-00

REVISIONS
428C-1
TYPICAL ELEVATION, SECTIONS AND DETAILS

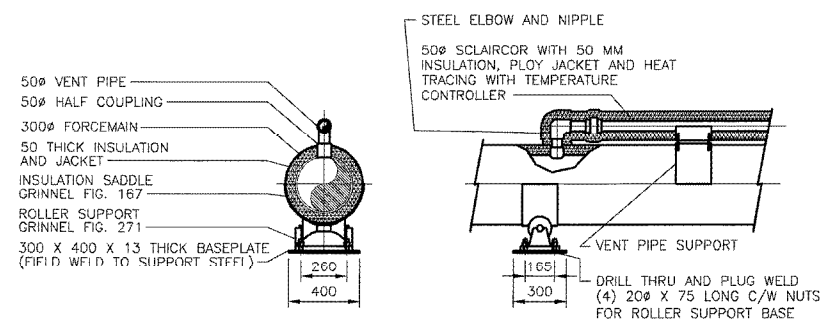


WELDED MITER SCHEDULE STEEL PIPE ELBOWS	
NO.	ANGLE IN DEGREES
1.	5.1°
2.	4.1°
3.	4.5°
4.	4.3°
5.	5.8°
6.	4.9°
7.	4°
8.	4.6°
9.	4.6°
10.	4.6°
11.	1.3°
12.	3.5°
13.	6.3°
14.	8.1°
15.	7.7°
16.	7.9°

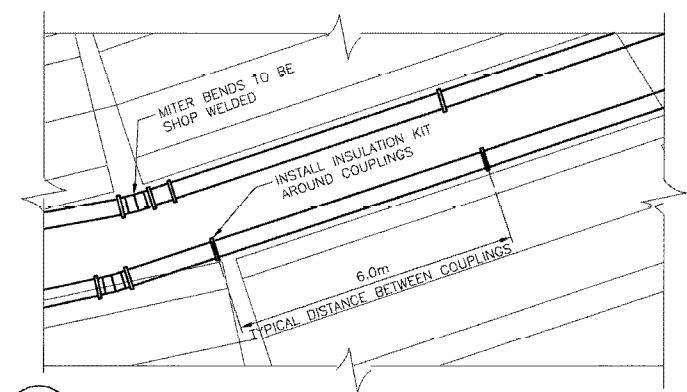
1 PLAN OF FORCE MAIN LAYOUT
1 : 500



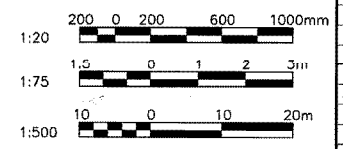
2 FORCEMAINS SUPPORTS AND VENT PIPING SUPPORT LOOKING EAST
1 : 20



3 FORCEMAIN DETAIL - VENT CONNECTION AT HIGHEST ELEVATION OF BRIDGE
1 : 20



4 MITERED BEND AND COUPLING SPACING DETAIL
1 : 75



B.M. ELEV.	F.B.	WARDROP Engineering Inc.	
		DESIGNED BY M.B.	CHECKED BY M.B.
		DRAWN BY M.B.	APPROVED BY R.V.G.
2	RECORD DRAWING	05.01.20	P.S.
1	ISSUED FOR CONSTRUCTION	01.07.05	R.v.g.
0	ISSUED FOR TENDER	01.04.30	M.B.
NO.	REVISIONS	DATE	BY
		DATE 01.04.30	

ORIGINAL DRAWING
REVISION "0" SEALED BY
M. BIMA
01.04.25

ACCEPTED BY DATE
ORIGINAL DRAWING SIGNED BY
R. SOROKOWSKI (01.04.25)

CONSULTANT DRAWING NO.
990007-08-01

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

Winnipeg

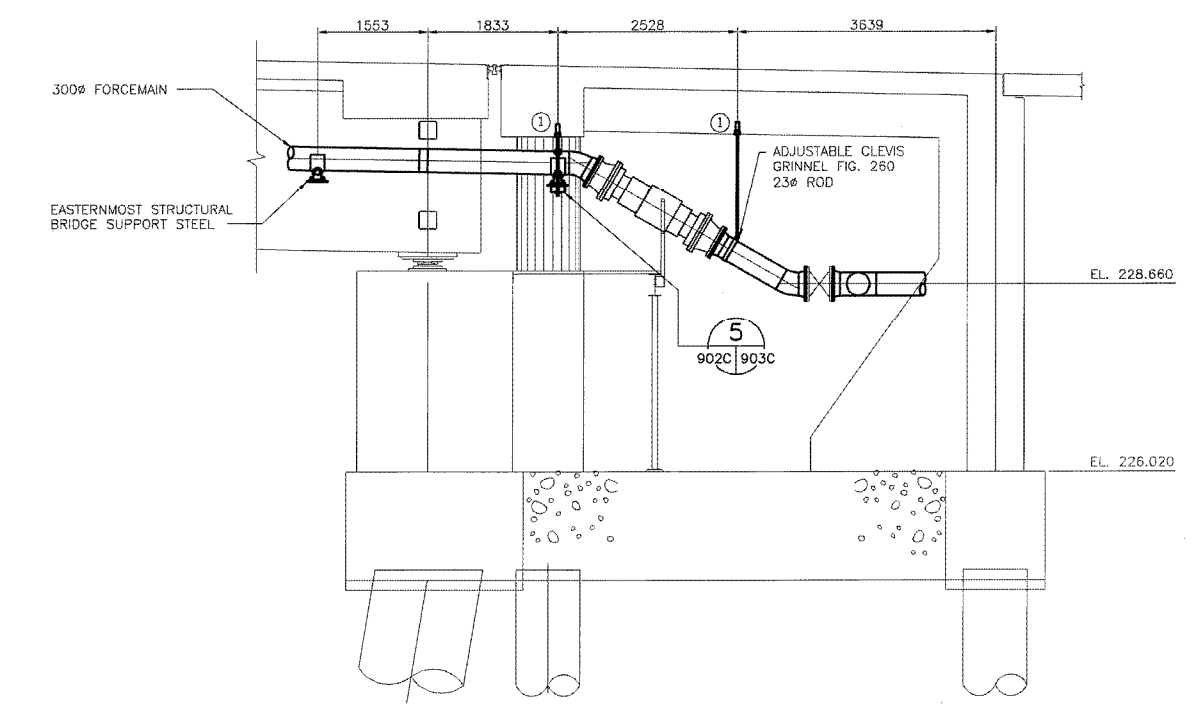
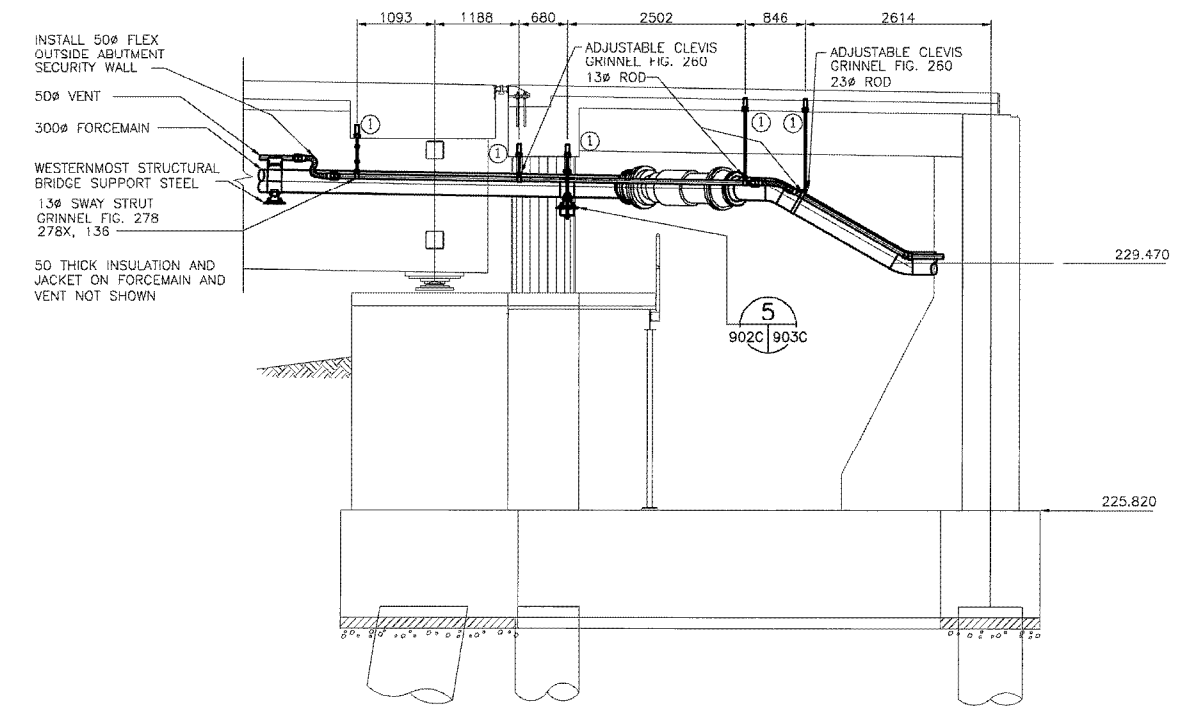
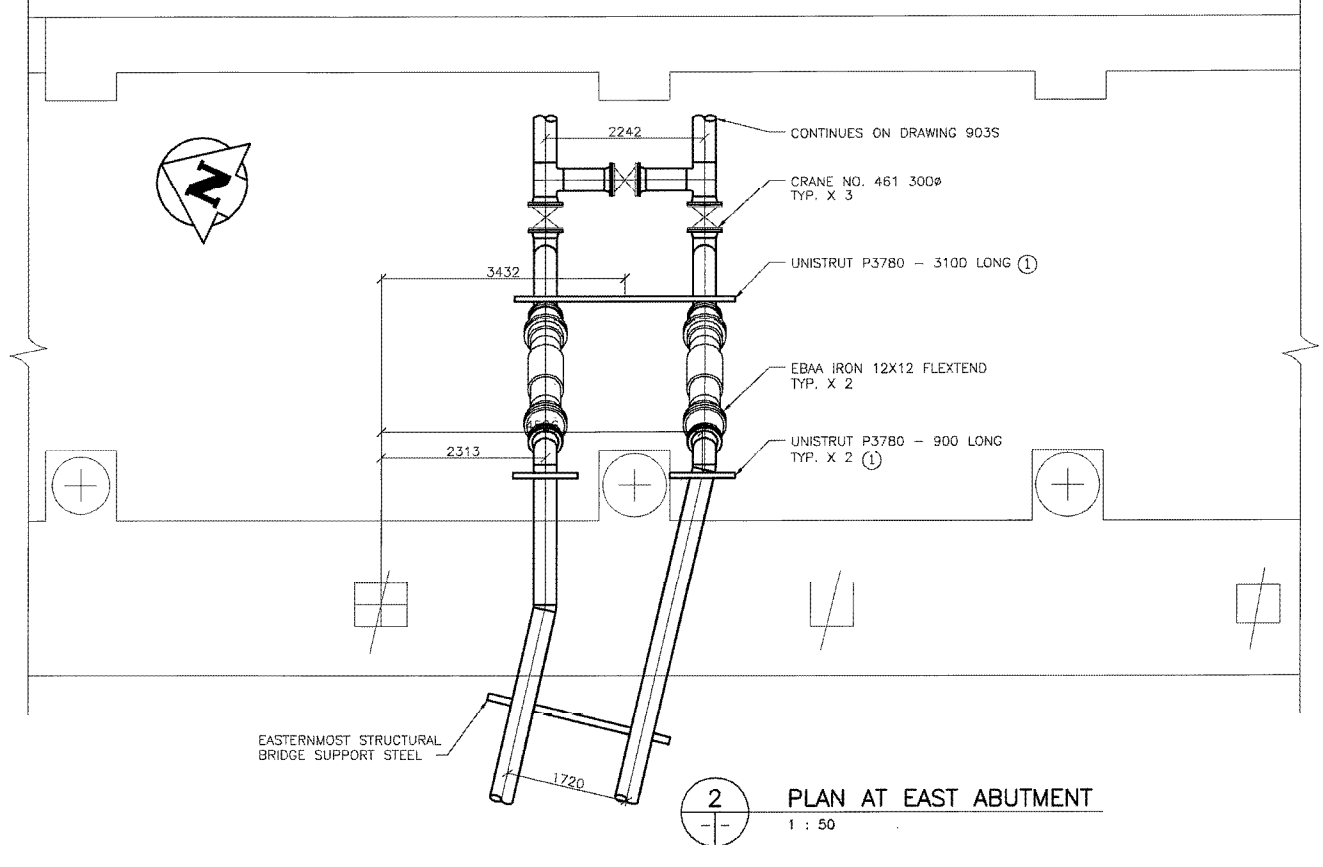
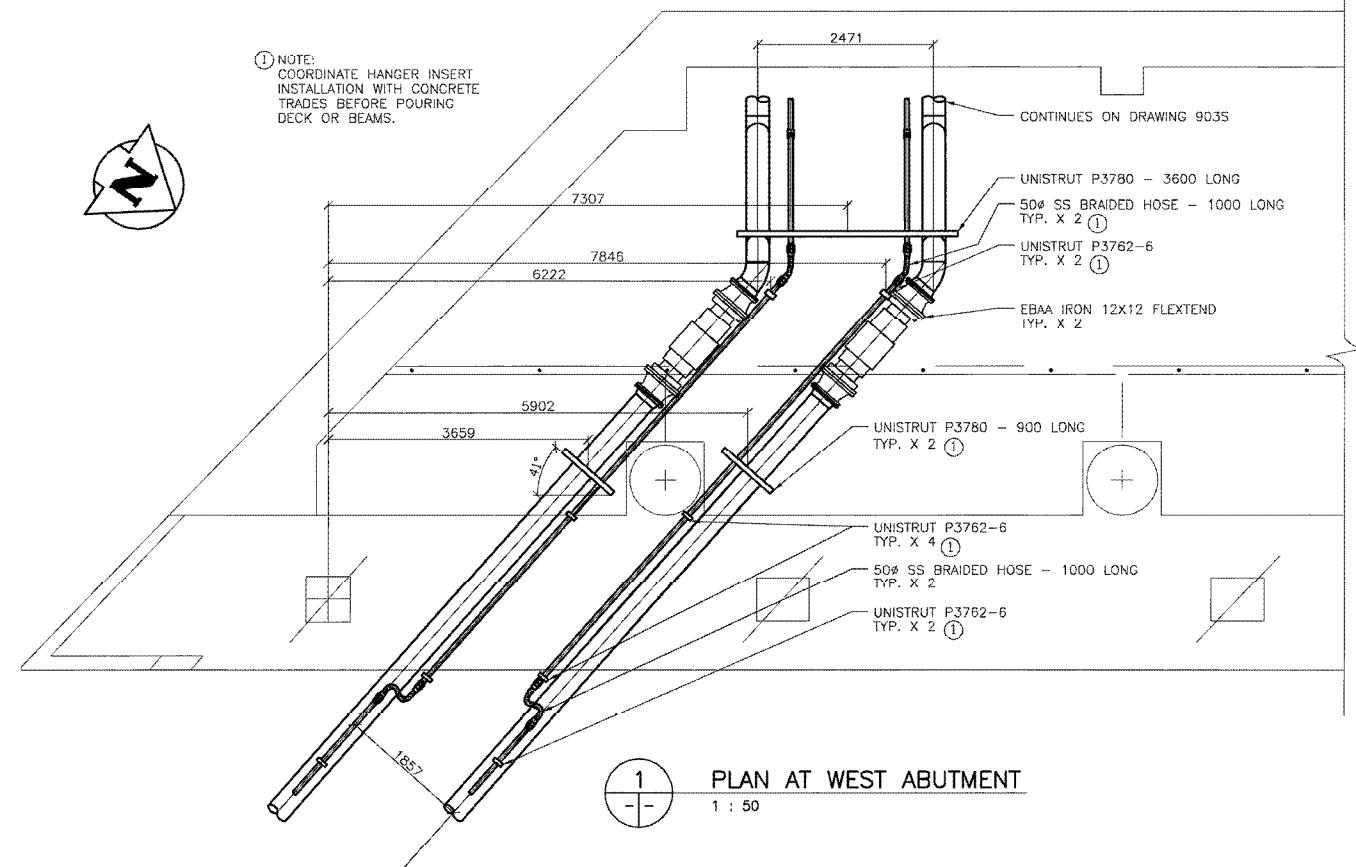
PROVENCER PAIRED BRIDGES PROJECT
VEHICULAR BRIDGE
CONCRETE GIRDER ALTERNATIVE

CITY DRAWING NUMBER
B110-01-124C
SHEET OF

FORCEMAIN AND VENT PIPING
PLAN AND DETAILS

901C

RECORD DRAWING
DATE 05.01.20 BY W.P.S.
REVIEWED BY P.S.



RECORD DRAWING
DATE 05.01.20 BY W.P.S.
REVIEWED BY P.S.

NO.	REVISIONS	DATE	BY
2	RECORD DRAWING	05.01.20	P.S.
1	ISSUED FOR CONSTRUCTION	01.07.05	R.v.g.
0	ISSUED FOR TENDER	01.04.30	M.B.

DESIGNED BY	M.B.	CHECKED BY	M.B.
DRAWN BY	M.B.	APPROVED BY	R.v.g.
HOR. SCALE: AS NOTED		ACCEPTED BY . . . DATE	
VERTICAL: . . .		ORIGINAL DRAWING SIGNED BY R. SOROKOWSKI (01.04.25)	
R. SOROKOWSKI, PE, INC. WATER AND WASTE DEPARTMENT		CONSULTANT DRAWING NO. 990007-08-01	

WARDROP Engineering Inc.

ORIGINAL DRAWING REVISION "0" SEALED BY M. BIMA 01.04.25

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

PROVENCER PAIRED BRIDGES PROJECT
VEHICULAR BRIDGE
CONCRETE GIRDER ALTERNATIVE

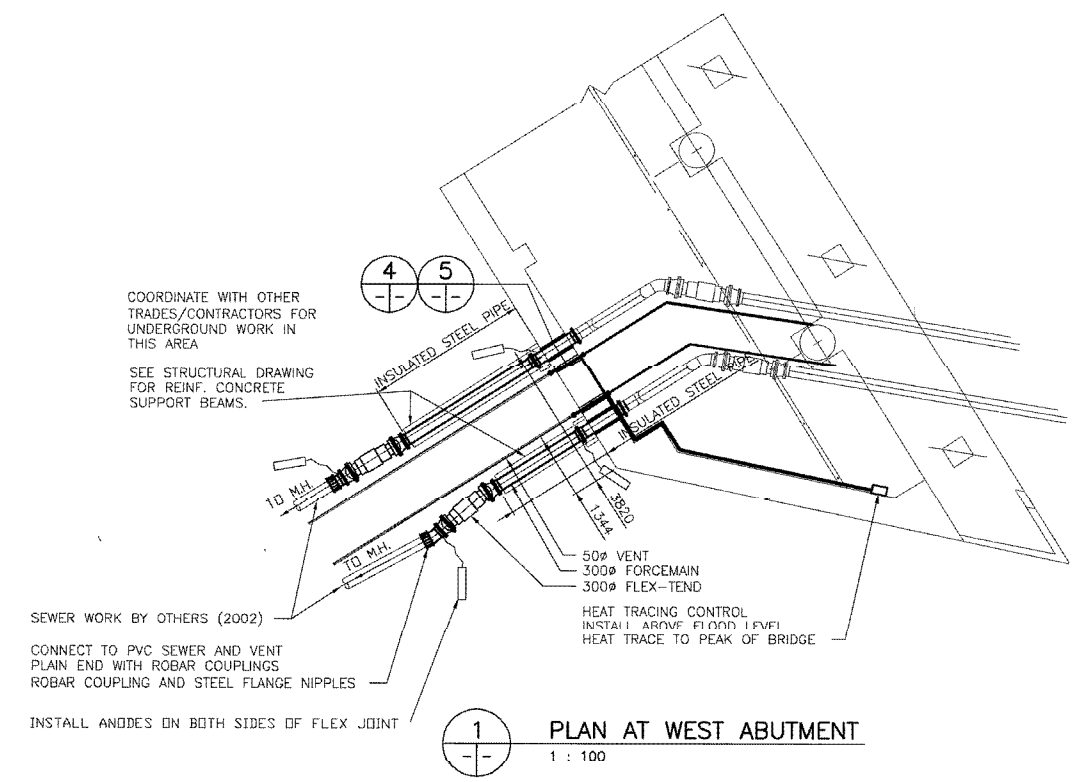
CITY DRAWING NUMBER B110-01-125C
SHEET UP

FORCEMAIN AND VENT PIPING ABUTMENTS PLANS AND ELEVATIONS

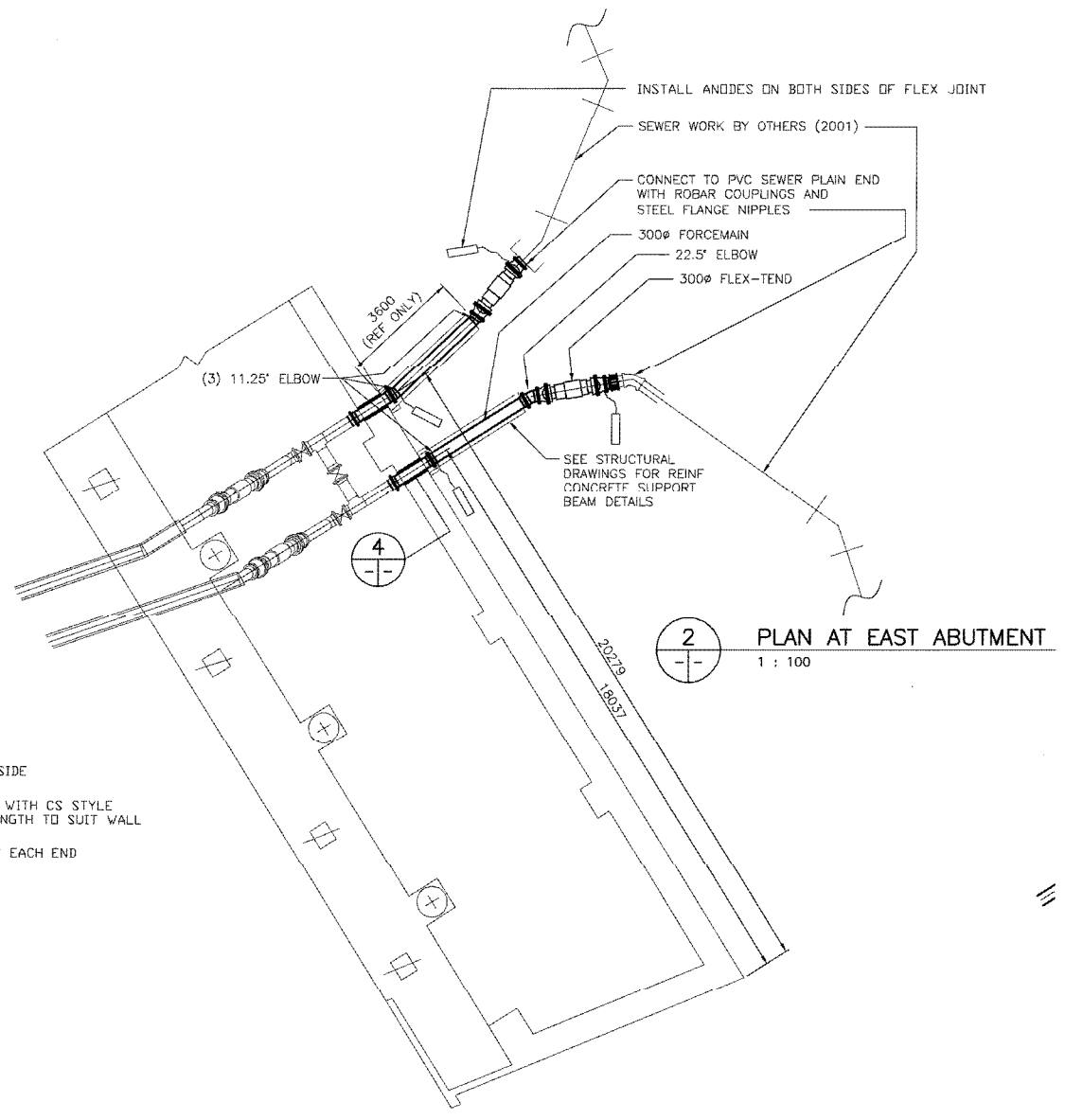
902C



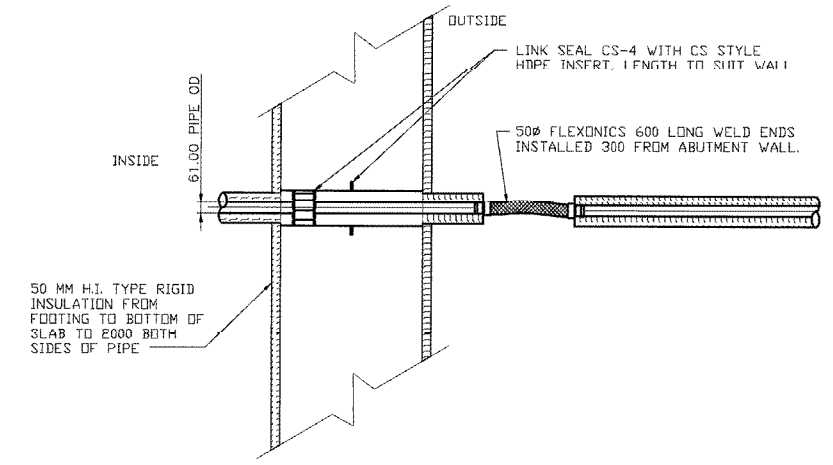
CITY DRAWING NUMBER 5798



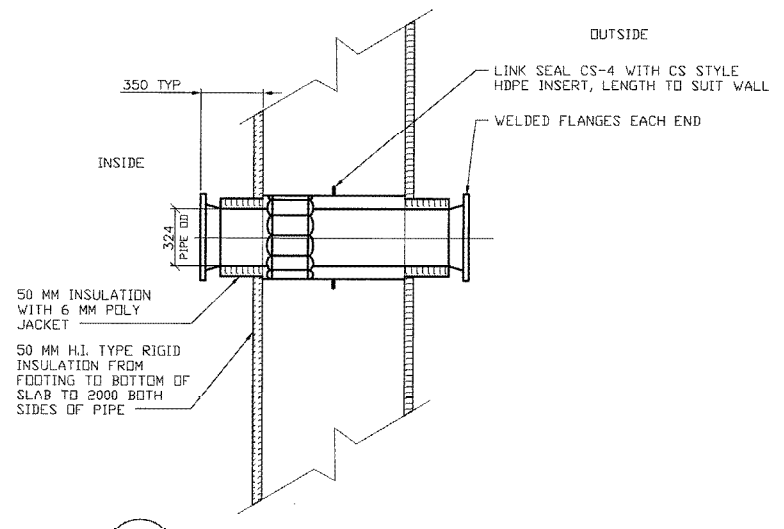
1 PLAN AT WEST ABUTMENT
1 : 100



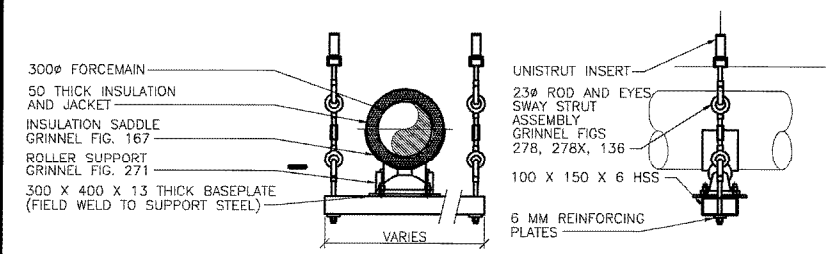
2 PLAN AT EAST ABUTMENT
1 : 100



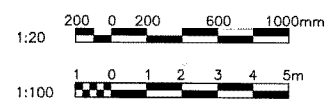
3 WALL PENETRATION DETAIL FORCEMAIN VENT PIPE
1 : 20



4 WALL PENETRATION DETAIL - FORCEMAIN
1 : 20



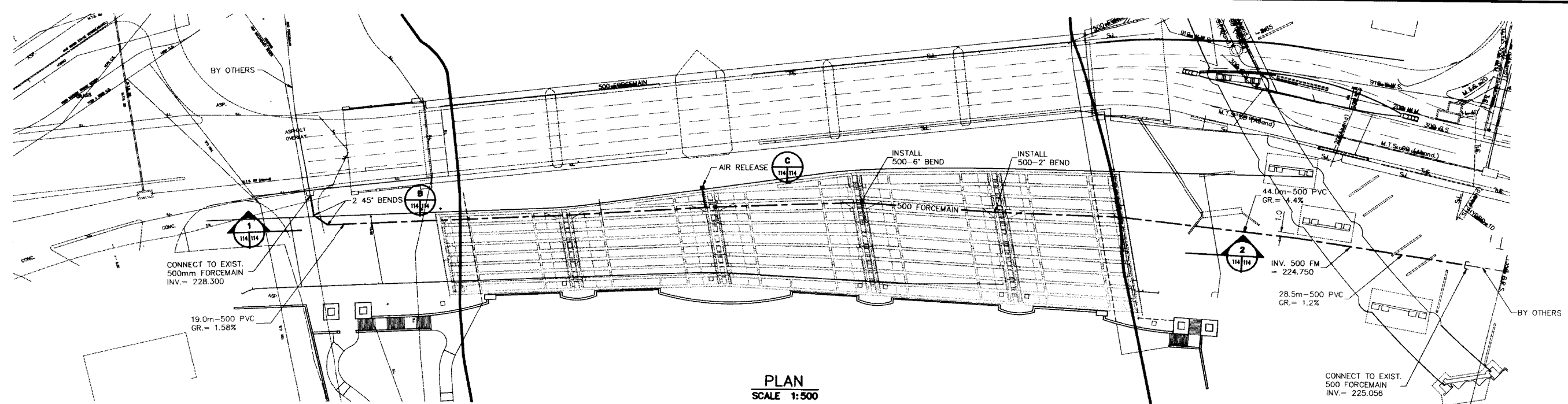
5 HANGER ASSEMBLY DETAIL
1 : 20



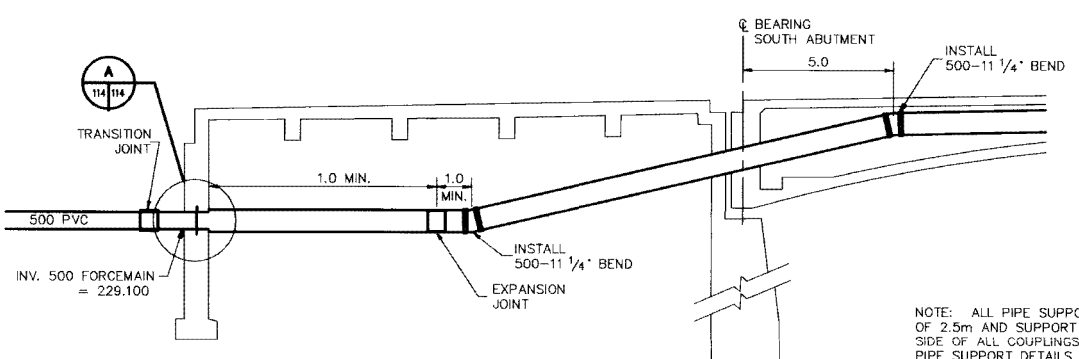
RECORD DRAWING
DATE 05.01.20 BY W.P.S.
REVIEWED BY P.S.

B.M. ELEV.		F.B.		WARDROP Engineering Inc.	ORIGINAL DRAWING REVISION "0" SEALED BY M. BIMA 01.04.25	THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	PROVENCER PAIRED BRIDGES PROJECT VEHICULAR BRIDGE CONCRETE GIRDER ALTERNATIVE	CITY DRAWING NUMBER B110-01-126C
DESIGNED BY M.B.		CHECKED BY M.B.						CITY DRAWING NUMBER 903C
DRAWN BY M.B.		APPROVED BY R.v.G.		HOR. SCALE: AS NOTED VERTICAL: AS NOTED	ACCEPTED BY DATE ORIGINAL DRAWING SIGNED BY R. SOROKOWSKI (01.04.25)	CONSULTANT DRAWING NO. 990007-08-01	FORCEMAIN AND VENT PIPING ABUTMENT PLAN AND DETAILS	SHEET OF
NO. REVISIONS		DATE BY						

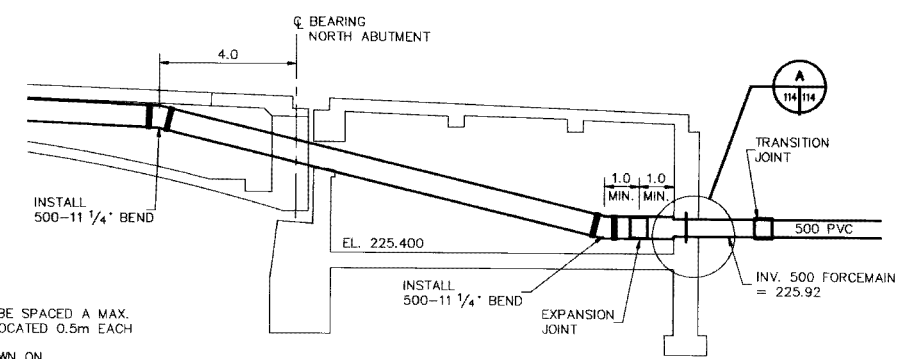
CITY DRAWING NUMBER 5799



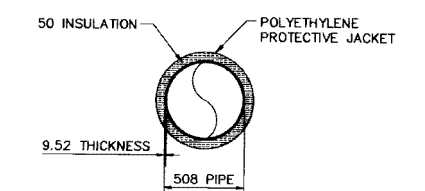
PLAN
SCALE 1:500



1 SECTION
SCALE 1:10

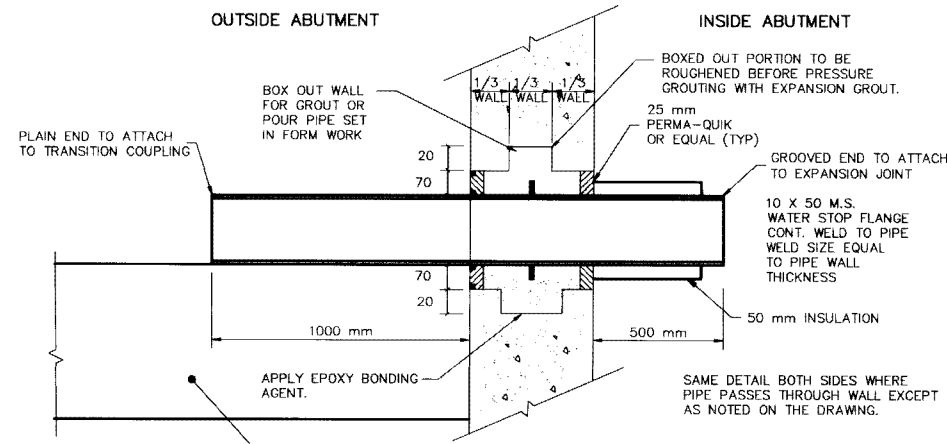


2 SECTION
SCALE 1:10

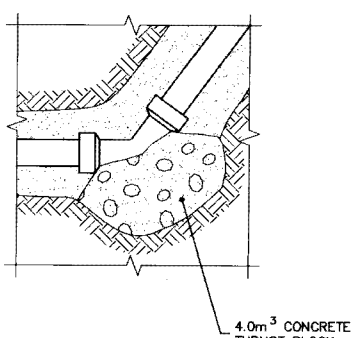


TYPICAL FORCEMAIN DETAIL
SCALE N.T.S.

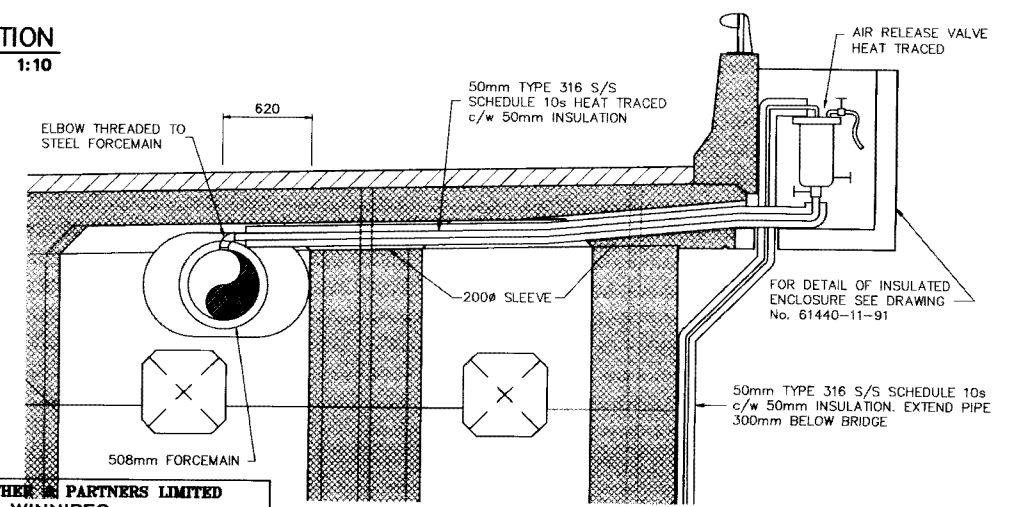
NOTE: ALL PIPE SUPPORTS TO BE SPACED A MAX. OF 2.5m AND SUPPORT TO BE LOCATED 0.5m EACH SIDE OF ALL COUPLINGS. PIPE SUPPORT DETAILS ARE SHOWN ON DRAWING No. 61440-11-115



A DETAIL
SCALE N.T.S.



B DETAIL
SCALE N.T.S.



C DETAIL
SCALE 1:25

REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
SIG: *[Signature]* DATE: *9/16/95*

LOCATION APPROVED UNDERGROUND STRUCTURES
SUPV. U/G STRUCTURES COMMITTEE DATE
NOTE: LOCATION 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.

NO.	REVISIONS	DATE	BY
AS CONSTRUCTED		10/10/97	KAA
ISSUED AS PER ADDENDUM No. 1		04/20/95	DM

Reid Crowther
DESIGNED BY: GDL
DRAWN BY: GAM, GDL
HOR. SCALE: AS NOTED
VERTICAL: AS NOTED
DATE: 03/15/95

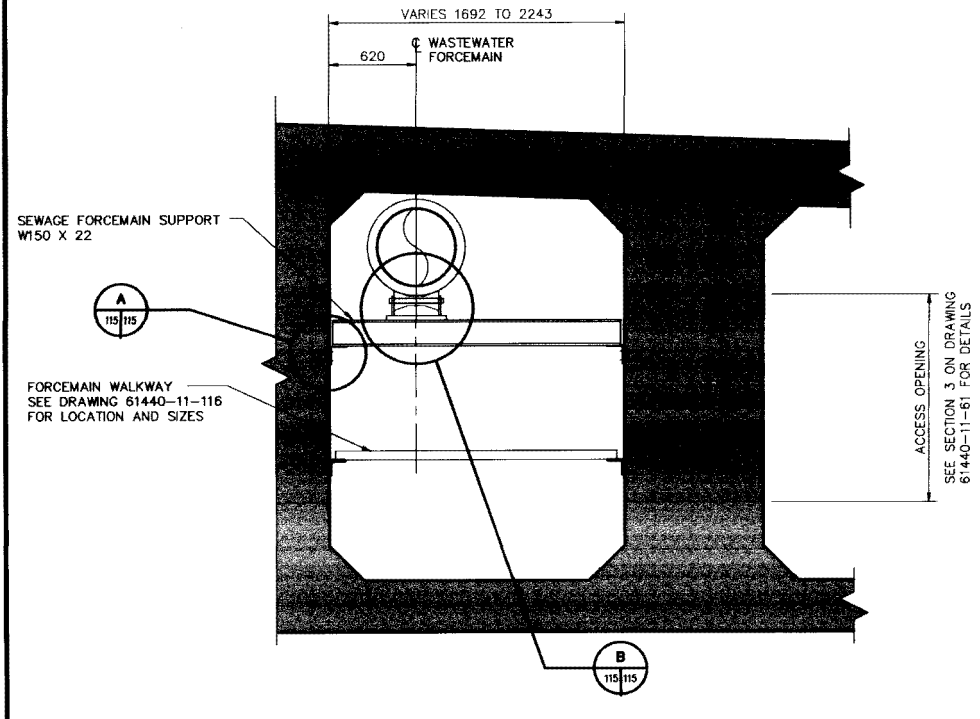
ENGINEER'S SEAL
ORIGINAL SIGNED BY
MILLER
95/03/15
REGISTERED PROFESSIONAL ENGINEER

THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
STREETS AND TRANSPORTATION DEPARTMENT
MAIN STREET AND NORWOOD BRIDGES PROJECT
NORWOOD BRIDGE - NORTHBOUND
FORCEMAIN LAYOUT AND DETAILS

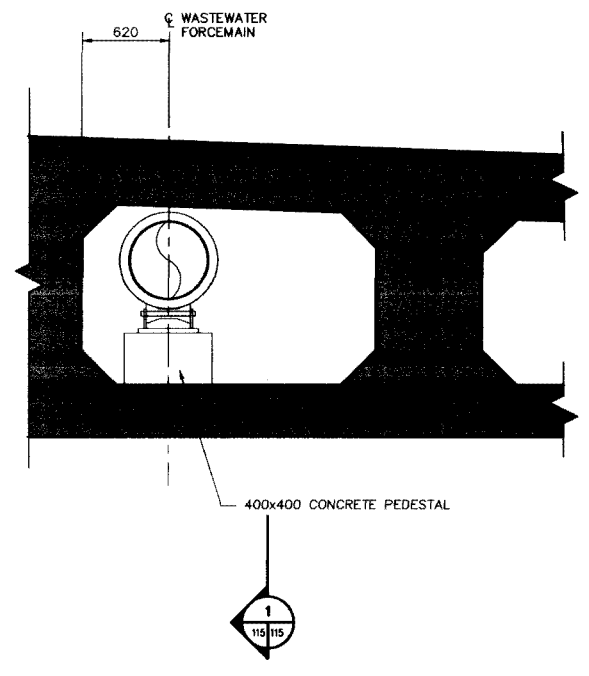
B-5990-114

QTY DRAWING NUMBER B103-95-119
SHEET 114 OF 126
REV. B

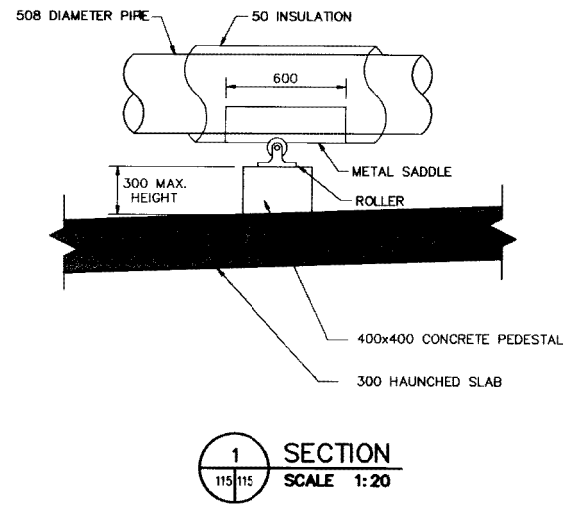
METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES



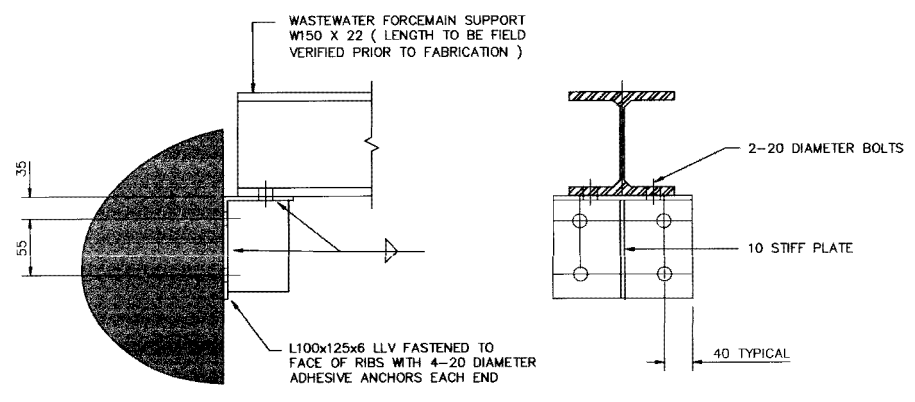
FORCEMAIN SUPPORT AT UNRESTRICTED AREAS
SCALE 1:20



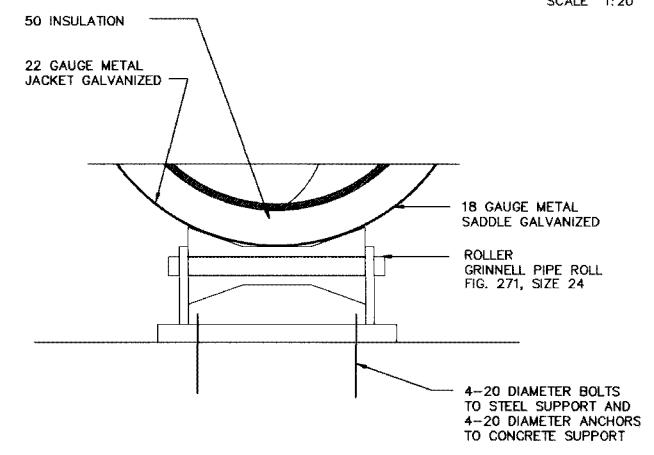
FORCEMAIN SUPPORT AT RESTRICTED AREAS
SCALE 1:20



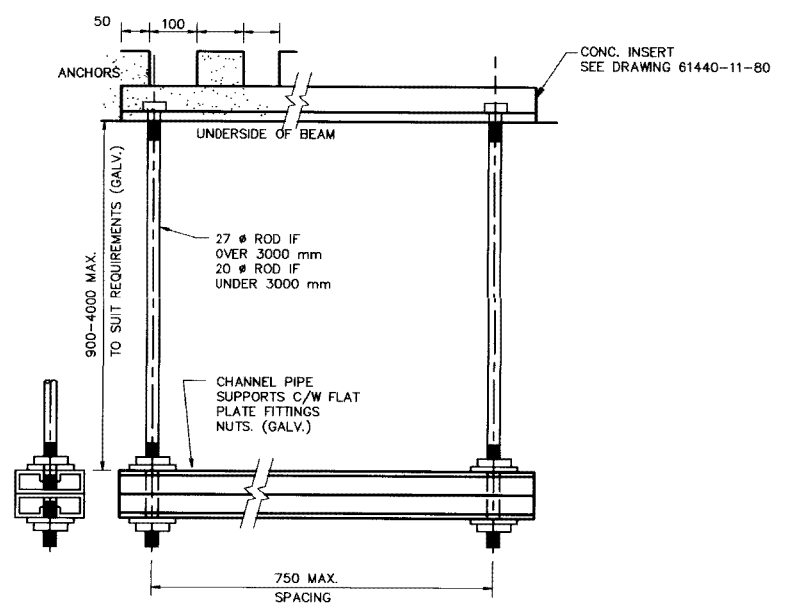
SECTION 1-1
SCALE 1:20



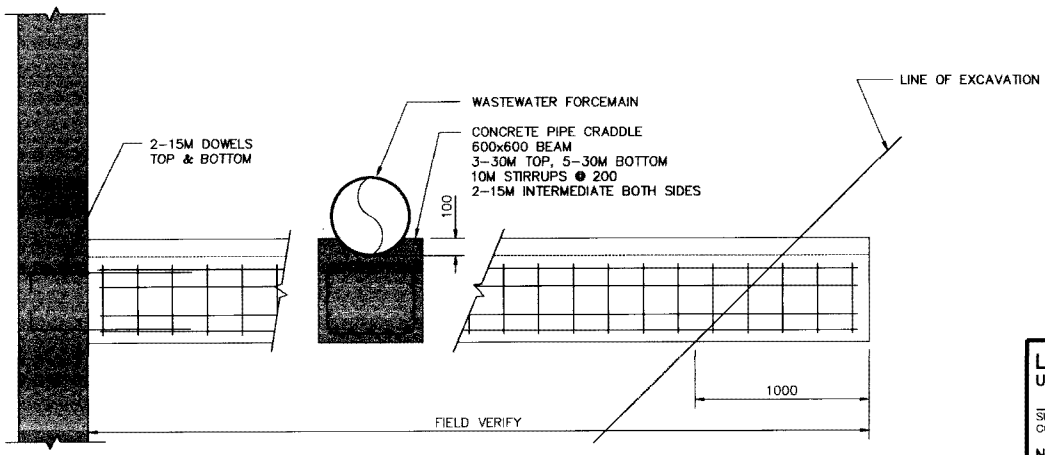
A DETAIL
SCALE 1:5



B DETAIL
SCALE 1:5



FORCEMAIN SUPPORT AT INTERIOR OF ABUTMENTS
SCALE NTS



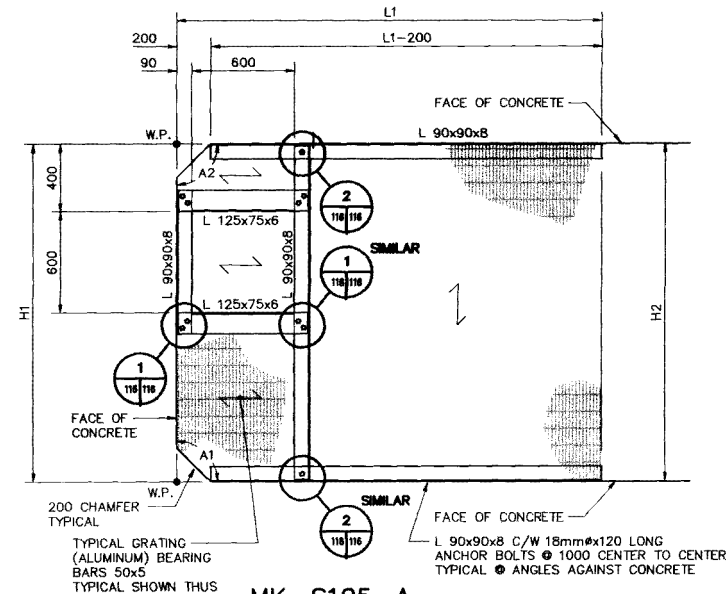
FORCEMAIN SUPPORT AT EXTERIOR OF ABUTMENTS
SCALE NTS

REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
SIG. *[Signature]* DATE 27/09/20

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

LOCATION APPROVED UNDERGROUND STRUCTURES		B.M. ELEV.		Reid Crowther		ENGINEER'S SEAL		THE CITY OF WINNIPEG	
SUPV. U/G STRUCTURES COMMITTEE DATE				DESIGNED BY: GAM		CHECKED BY:		WORKS AND OPERATIONS DIVISION	
NOTE: LOCATION 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.				DRAWN BY: GAM		APPROVED BY:		STREETS AND TRANSPORTATION DEPARTMENT	
				HOR. SCALE: AS NOTED		AUTHORIZED BY: DATE:		MAIN STREET AND NORWOOD BRIDGES PROJECT	
				VERTICAL: AS NOTED		C.R. SMITH / SENIOR BRIDGE ENGINEER		NORWOOD BRIDGE - NORTHBOUND	
NO. REVISIONS		DATE BY		DATE: 03/15/95		ACCEPTED BY: DATE:		CITY DRAWING NUMBER: B103-95-120	
						B. ECKENSPÄNNER / BRIDGE ENGINEER		SHEET 115 OF 126	
						CONSULTANT DRAWING NO. 61440-11-115		FORCEMAIN SUPPORT DETAILS	
								REV. B	

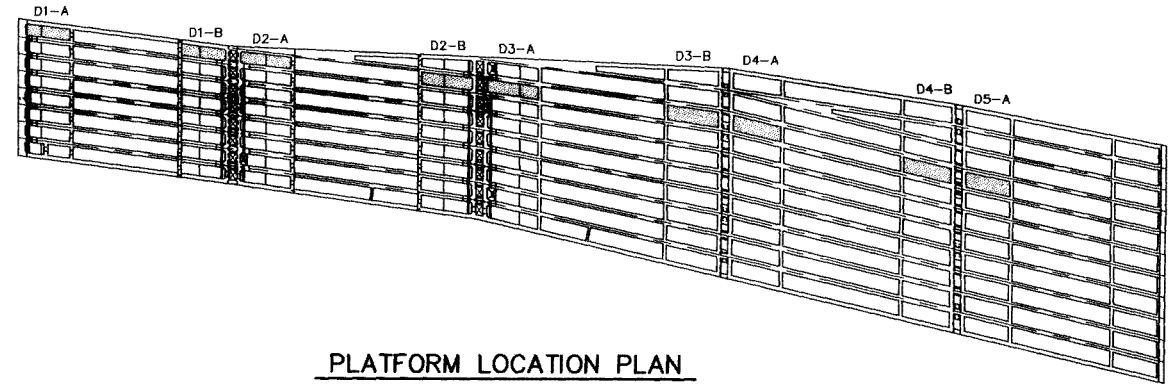
B-5990-115



**MK. S105-A
PLATFORM PLAN**

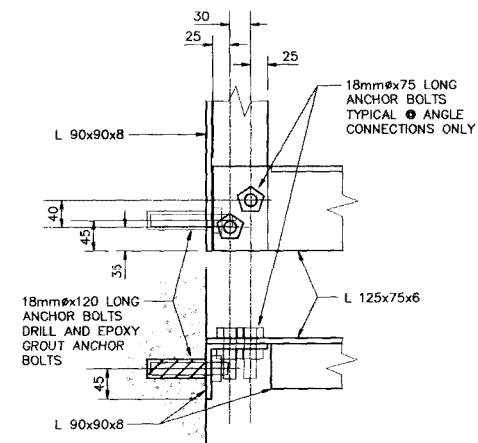
NOTE: - RUN GRATING OVER BOLTS.
- TRIM GRATING BARS TO SUITE BOLTS.

PLATFORM SCHEDULE					
LOCATION	L1	H1	H2	A1	A2
D1-A	1008	1685	1685	97°25'19"	82°35'35"
D1-B	4730	1692	1692	82°34'41"	97°24'25"
D2-A	5173	1699	1715	96°45'0"	83°38'2"
D2-B	5434	1821	1801	83°21'20"	96°27'50"
D3-A	5702	1832	1899	98°37'16"	82°3'30"
D3-B	5620	2175	2241	81°26'59"	97°52'14"
D4-A	6188	2244	2240	103°36'7"	76°21'40"
D4-B	5710	2222	2226	76°23'53"	103°38'20"
D5-A	4384	2228	2246	101°59'9"	78°15'33"

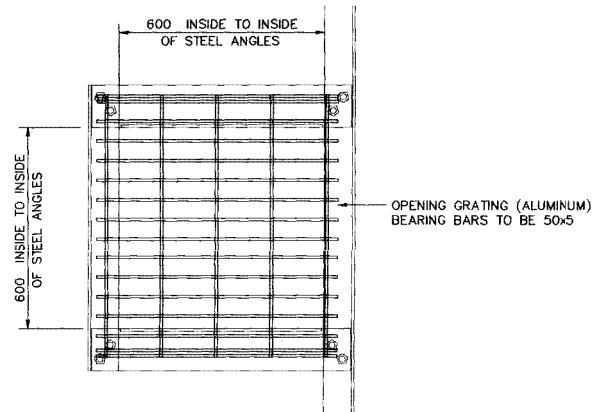


PLATFORM LOCATION PLAN

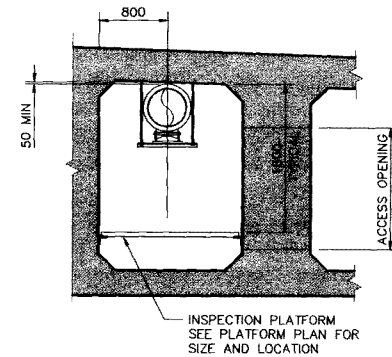
NOTE: FOR SIZE OF MEMBERS
SEE PLATFORM SCHEDULE



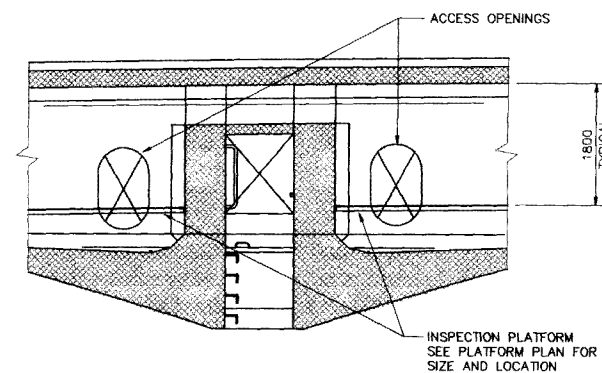
**1 DETAIL
SCALE 1:10**



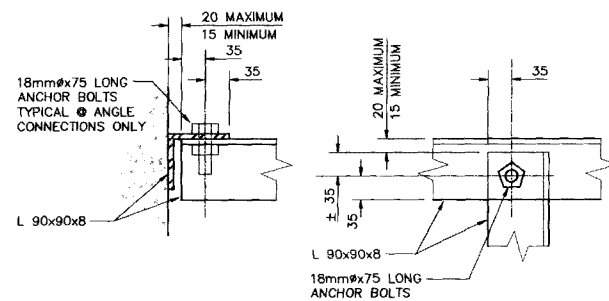
GRATING @ HATCH OPENING



**MK. S105-B
PLATFORM ELEVATION**



**MK. S105-C
PLATFORM ELEVATION**

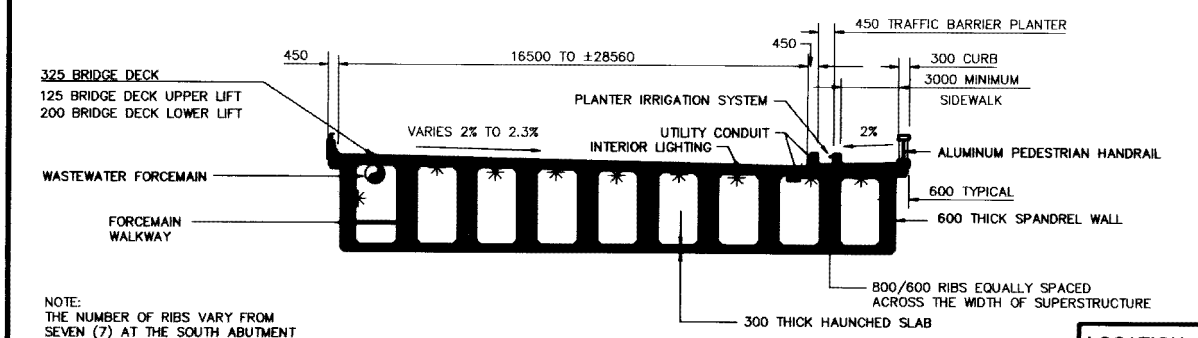
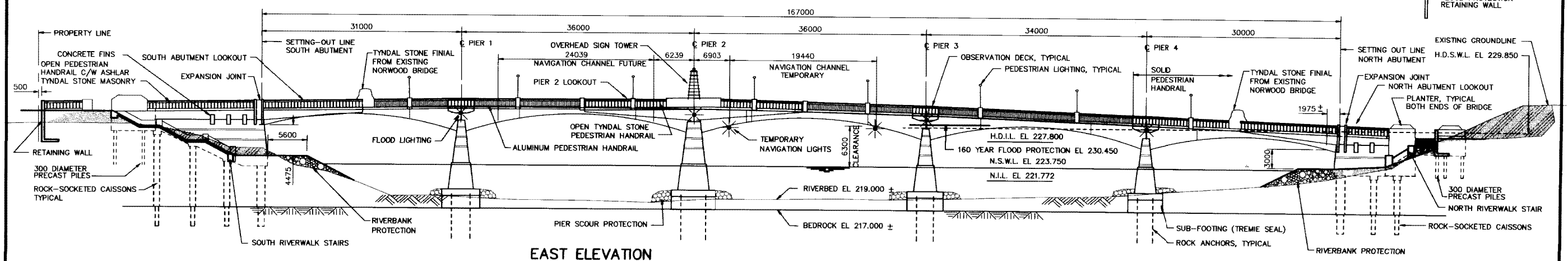
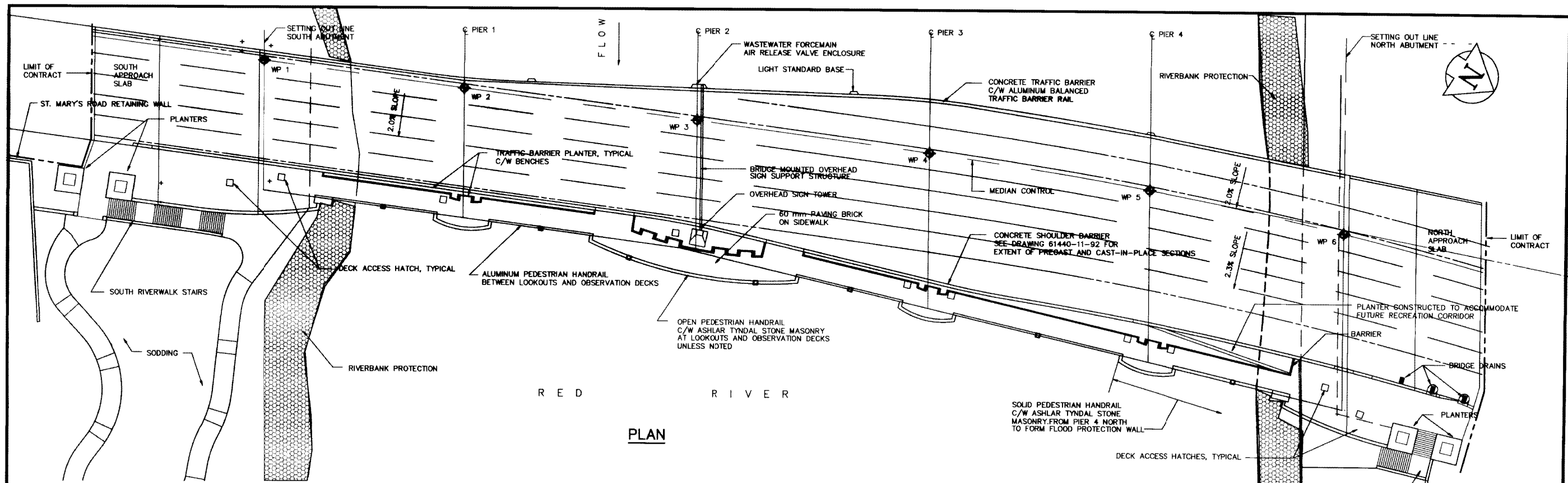


**2 DETAIL
SCALE 1:10**

REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
SIG: *[Signature]* DATE: 07/19/20

B-5990-116

LOCATION APPROVED UNDERGROUND STRUCTURES SUPV. U/G STRUCTURES COMMITTEE DATE NOTE: LOCATION 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.		B.M. ELEV. <table border="1"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>																		Reid Crowther Reid Crowther & Partners Ltd. Engineers Planners Scientists DESIGNED BY: TLK DRAWN BY: TLK HOR. SCALE: AS NOTED VERTICAL: AS NOTED DATE: 03/15/95		ENGINEER'S SEAL PROVINCE OF MANITOBA ORIGINAL SIGNED BY G.A. WEBSTER REGISTERED PROFESSIONAL ENGINEER CONSULTANT DRAWING NO. 61440-11-116		THE CITY OF WINNIPEG WORKS AND OPERATIONS DIVISION STREETS AND TRANSPORTATION DEPARTMENT MAIN STREET AND NORWOOD BRIDGES PROJECT NORWOOD BRIDGE - NORTHBOUND QUANTITY DRAWING NUMBER B103-95-121 SHEET 116 OF 126 REV. B	
METRIC WHOLE NUMBERS INDICATE MILLIMETRES DECIMALIZED NUMBERS INDICATE METRES		AS CONSTRUCTED 10/10/97 KAA A REVISED PLATFORM LAYOUT 10/18/95 TLK NO. REVISIONS DATE BY		AUTHORIZED BY: DATE S.R. SMITH / SENIOR BRIDGE ENGINEER ACCEPTED BY: DATE B. ERDMAN / BRIDGE ENGINEER		FORCEMAIN WALKWAY DETAILS																			



REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
SIG. [Signature] DATE 01/15/95

ABBREVIATIONS

N.S.W.L.	NORMAL SUMMER WATER LEVEL
N.I.L.	NORMAL ICE LEVEL
H.D.I.L.	HIGH DECILE ICE LEVEL
H.D.S.W.L.	HIGH DECILE SUMMER WATER LEVEL (160 YEAR FLOOD EVENT)

NOTES

CONTRACTOR TO MAINTAIN FLOOD PROTECTION TO EL 230.450 AT ALL TIMES TO ALL AREAS OUTSIDE WORK LIMITS AS SHOWN ON DRAWING 61440-11-06

SPAN LENGTHS AS SHOWN ARE MEASURED PERPENDICULAR TO CENTERLINE OF PIERS AND ABUTMENT BEARING. THE SUBSTRUCTURE IS SET OUT BY WORKING POINTS AND BEARING ANGLES AS INDICATED ON DRAWING 61440-11-18. THE SUPERSTRUCTURE IS SET OUT FROM HORIZONTAL AND VERTICAL GEOMETRIC CONTROL DATA AS SHOWN ON DRAWINGS 61440-11-09, 10 AND 11.

THIS PROJECT IS SET OUT BY CO-ORDINATE GEOMETRY BASED ON CONTROL MONUMENTS AS SHOWN ON DRAWING 61440-11-09.

B-5990-04

NOTE: THE NUMBER OF RIBS VARY FROM SEVEN (7) AT THE SOUTH ABUTMENT TO TEN (10) AT THE NORTH ABUTMENT

LOCATION APPROVED UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES COMMITTEE	DATE
DESIGNED BY	
CHECKED BY	
DRAWN BY	GAM
APPROVED BY	
AUTHORIZED BY	DATE
S.R. SMITH / SENIOR BRIDGE ENGINEER	
ACCEPTED BY	DATE
B. ERNSPÄHNER / BRIDGE ENGINEER	

NOTE: LOCATION 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.

B.M. ELEV.	
DESIGNED BY	
CHECKED BY	
DRAWN BY	GAM
APPROVED BY	
AUTHORIZED BY	DATE
S.R. SMITH / SENIOR BRIDGE ENGINEER	
ACCEPTED BY	DATE
B. ERNSPÄHNER / BRIDGE ENGINEER	

Reid Crowther
Professional Engineer
10/10/97
10/12/98
03/15/95

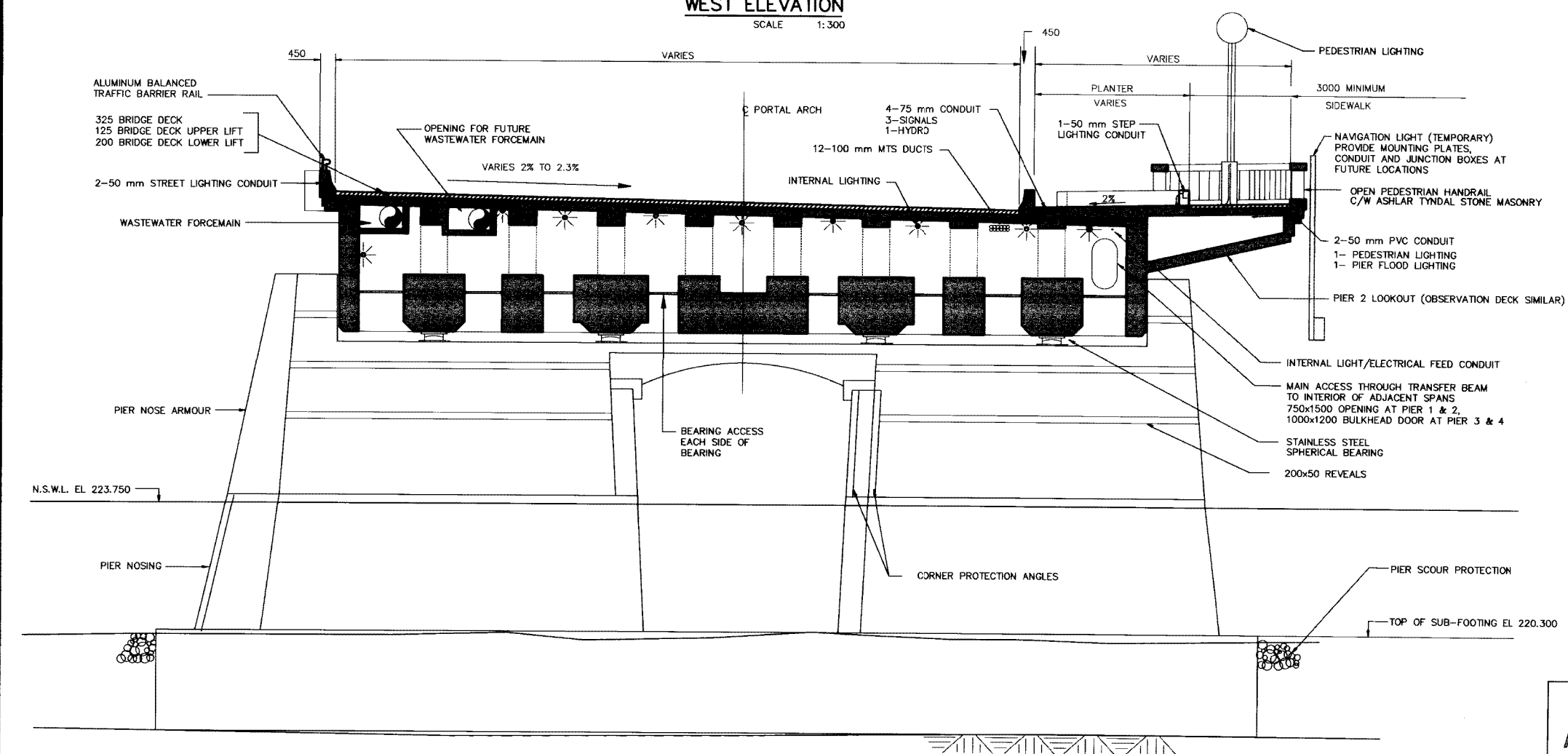
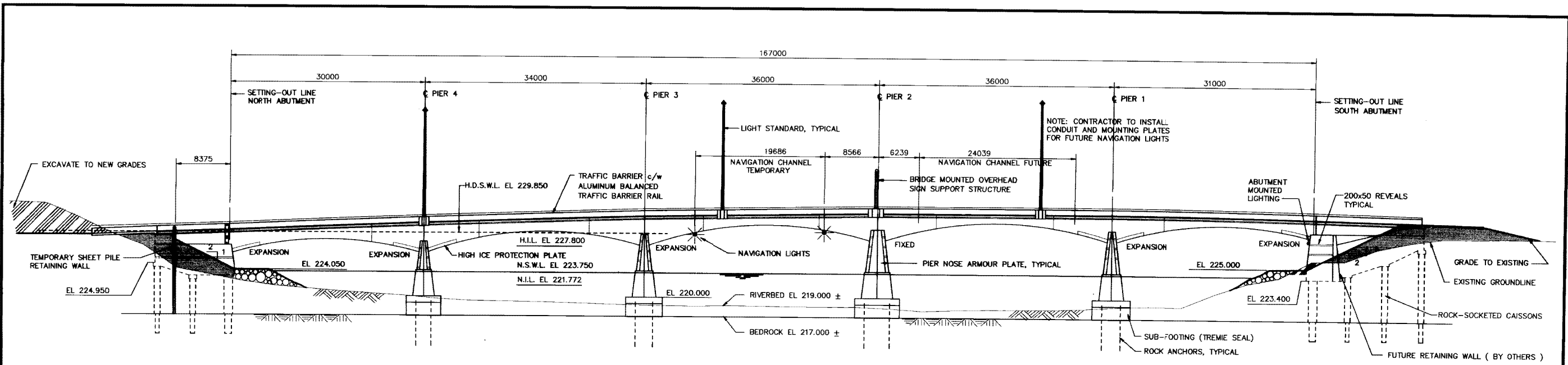
ENGINEER'S SEAL
PROFESSIONAL ENGINEER
WEBSTER
95/03/15

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

MAIN STREET AND NORWOOD BRIDGES PROJECT
NORWOOD BRIDGE - NORTHBOUND

GENERAL ARRANGEMENT OF PROPOSED WORKS
PLAN, EAST ELEVATION AND
TYPICAL SECTION

CITY DRAWING NUMBER
B103-95-09
SHEET 4 OF 126
REV. B



REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
SIG. DATE

B-5990-05

TYPICAL PIER ELEVATION AND CROSS-SECTION OF SUPERSTRUCTURE
SCALE 1:150

LOCATION APPROVED UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES COMMITTEE DATE

NOTE:
LOCATION 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.

B.M. ELEV.	NO.	REVISIONS	DATE	BY

Reid Crowther
Bridges & Structures Ltd.
Engineers Planners Scientists

DESIGNED BY	CHECKED BY
DRAWN BY	APPROVED BY
HOR. SCALE:	AUTHORIZED BY
VERTICAL:	DATE
	DATE

ENGINEER'S SEAL
PROVINCE OF MANITOBA
ORIGINAL SIGNED BY
GA
WEBSTER
95/03/15
REGISTERED PROFESSIONAL ENGINEER

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

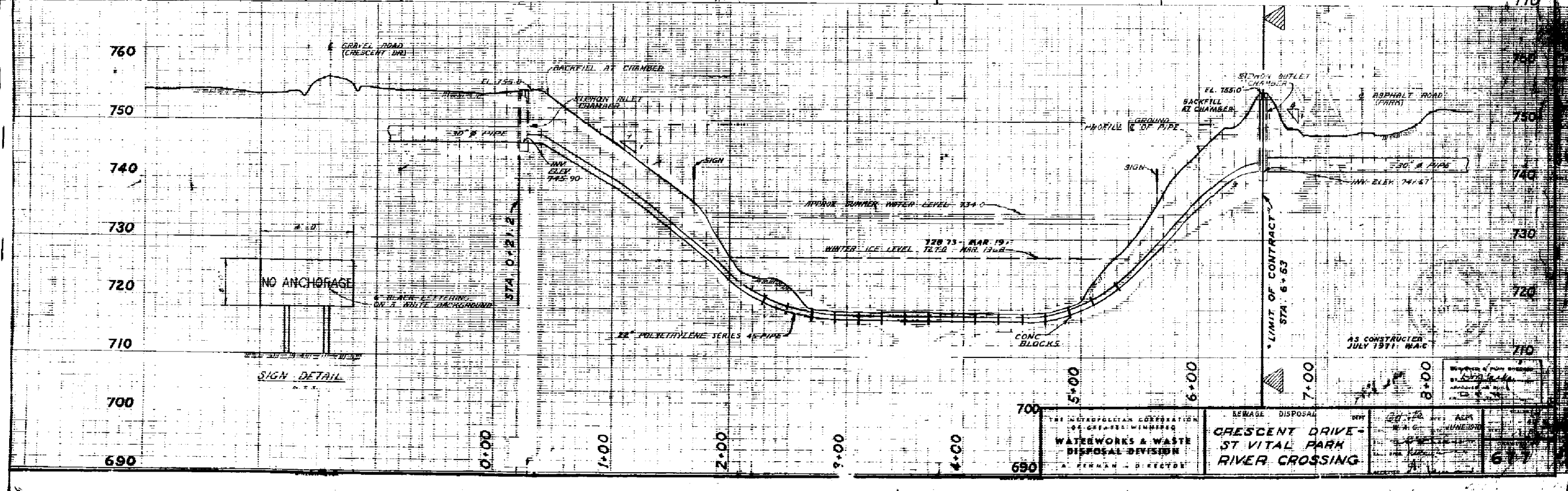
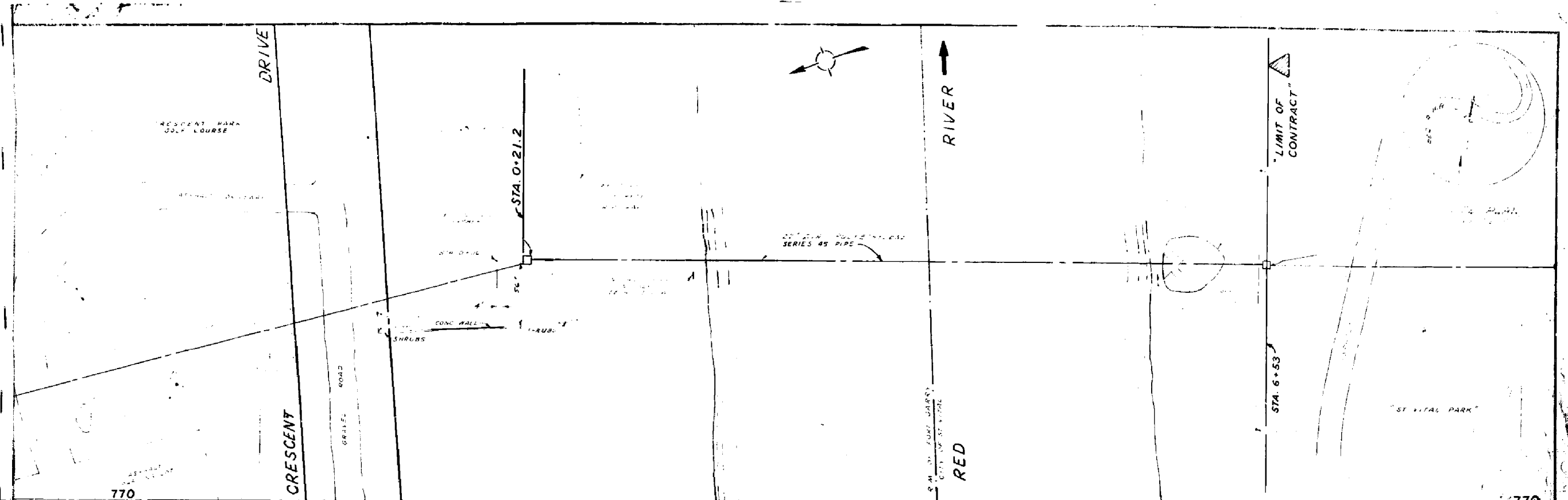
MAIN STREET AND NORWOOD BRIDGES PROJECT
NORWOOD BRIDGE - NORTHBOUND

CITY DRAWING NUMBER B103-95-10
SHEET 5 OF 126

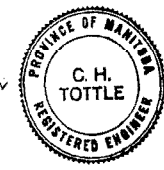
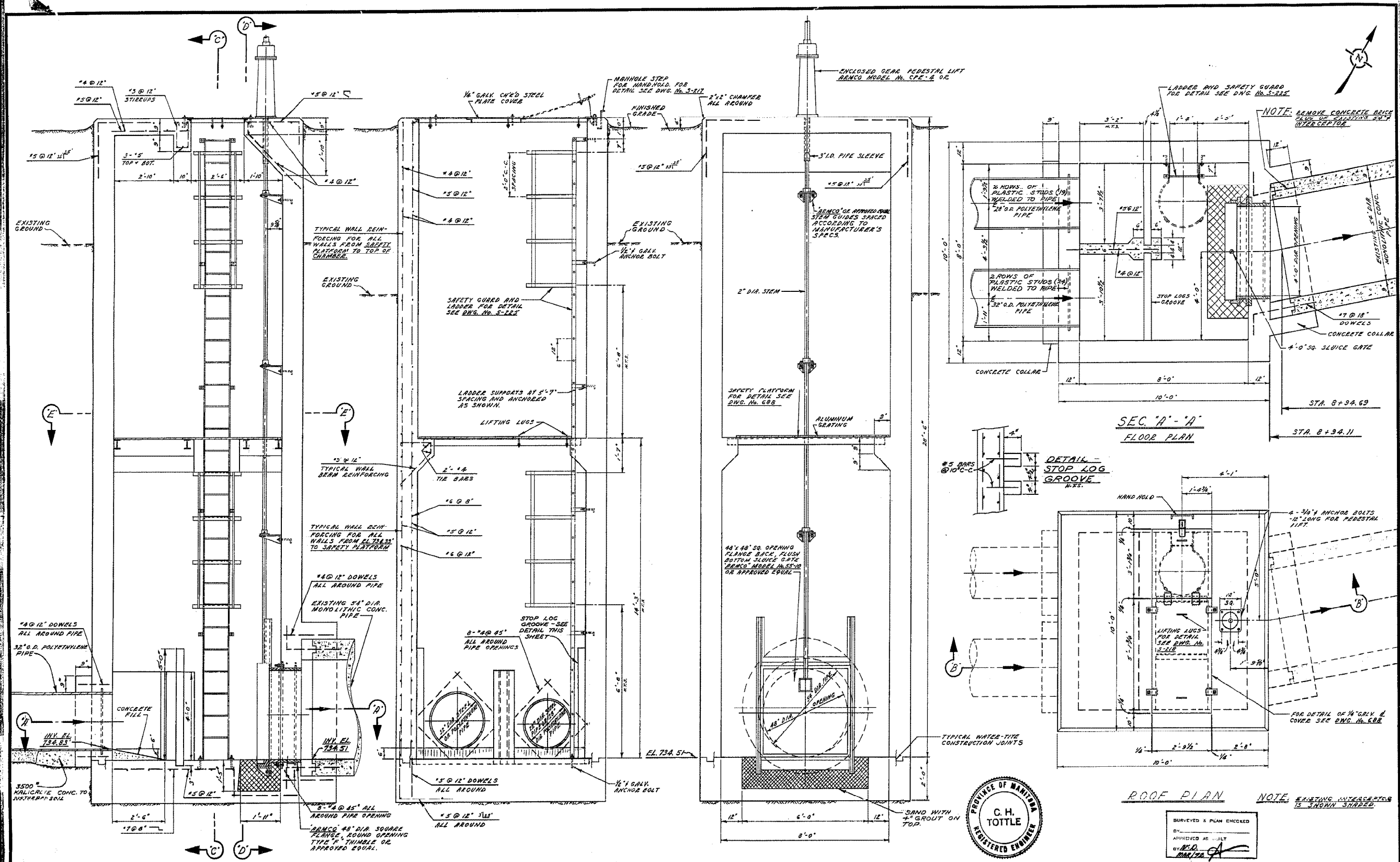
GENERAL ARRANGEMENT OF PROPOSED WORKS
WEST ELEVATION AND TYPICAL SECTION AT PIER

REV. A

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES



THE METROPOLITAN CORPORATION OF GREATER MINNEAPOLIS WATERWORKS & WASTE DISPOSAL DIVISION A. FERMAN, DIRECTOR	SEWAGE DISPOSAL CRESCENT DRIVE - ST VITAL PARK RIVER CROSSING	DWG. NO. 24-72 DATE: JUN 1970 ALP	677
--	---	---	-----

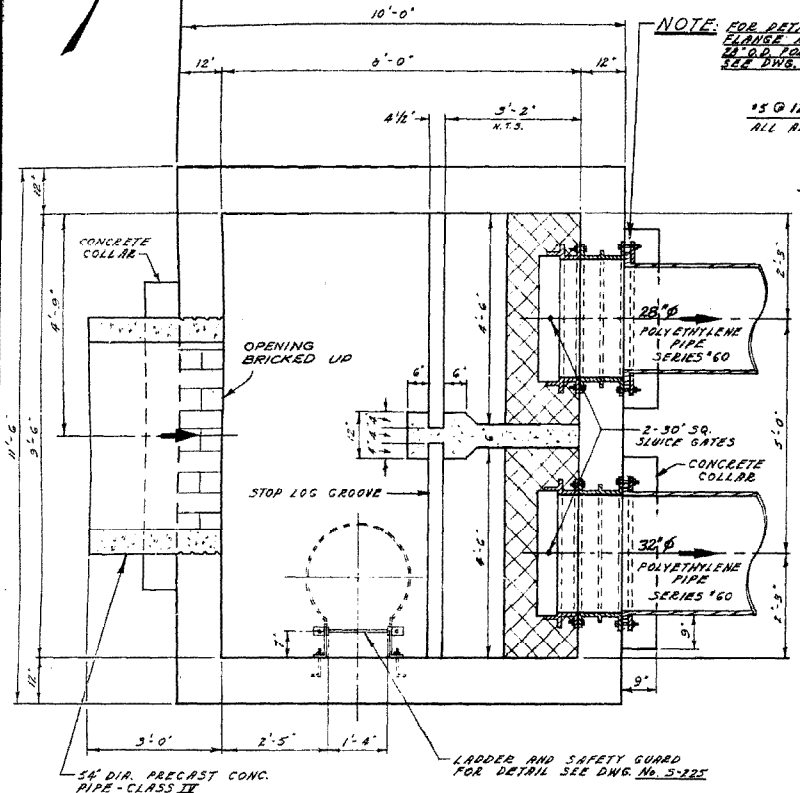


BURVEYED & PLAN CHECKED
 BY: _____
 APPROVED AS SHOWN
 BY: C.H. TOITTE
 DATE: MAR/78

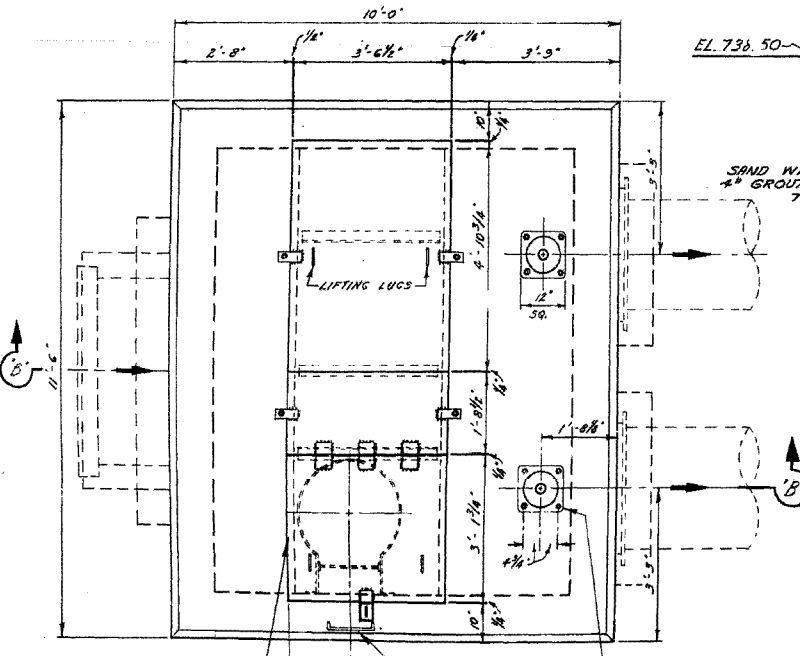
THE METROPOLITAN CORPORATION OF GREATER WINNIPEG WATERWORKS & WASTE DISPOSAL DIVISION A. PENMAN - DIRECTOR	SEWAGE DISPOSAL DEPT. FT. GARRY-ST. VITAL INTERCEPTOR RIVER CROSSING	DRN. S.S. DATE 23 SEPT 70 ENGR. DES. _____ ENGR. OPER. _____ APPROVED _____	SHEETS 1/2" x 1'-0" DRAWING NO. 686
	SIPHON OUTLET CHAMBER		MICROFILMED 1978



STA. 0+49



SEC. 'A' - 'A'
FLOOR PLAN



ROOF PLAN

NOTE: FOR DETAIL OF SPECIAL FLANGE ASSEMBLY OF 24\"/>

1/2\"/>

ENCLOSED GEAR PEDESTAL LIFT 'RAMCO' MODEL NO. C1E-2 OR APPROVED EQUIV.

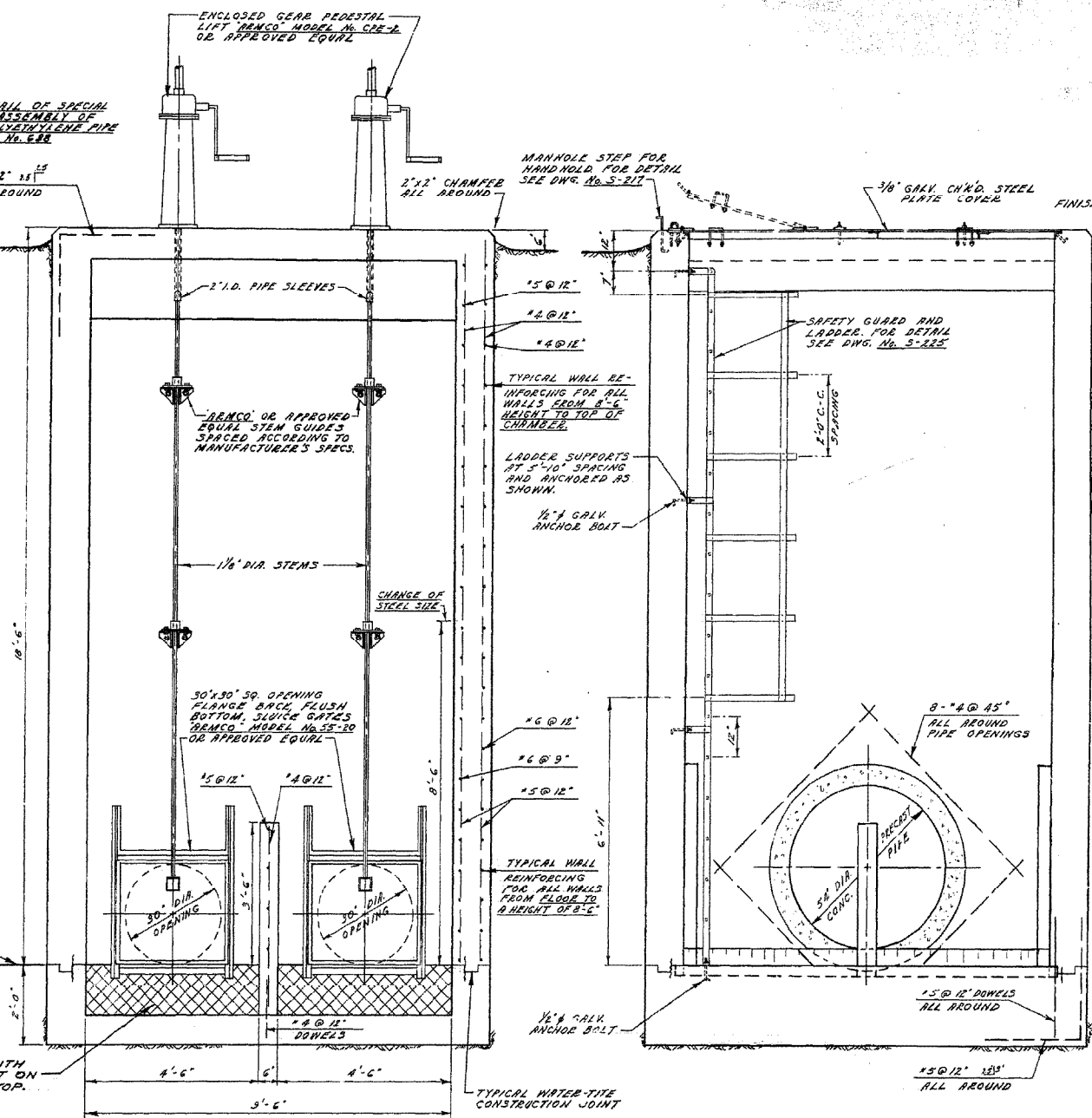
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MANHOLE STEP FOR HANDHOLD FOR DETAIL SEE DWG. NO. S-217

3/8\"/>

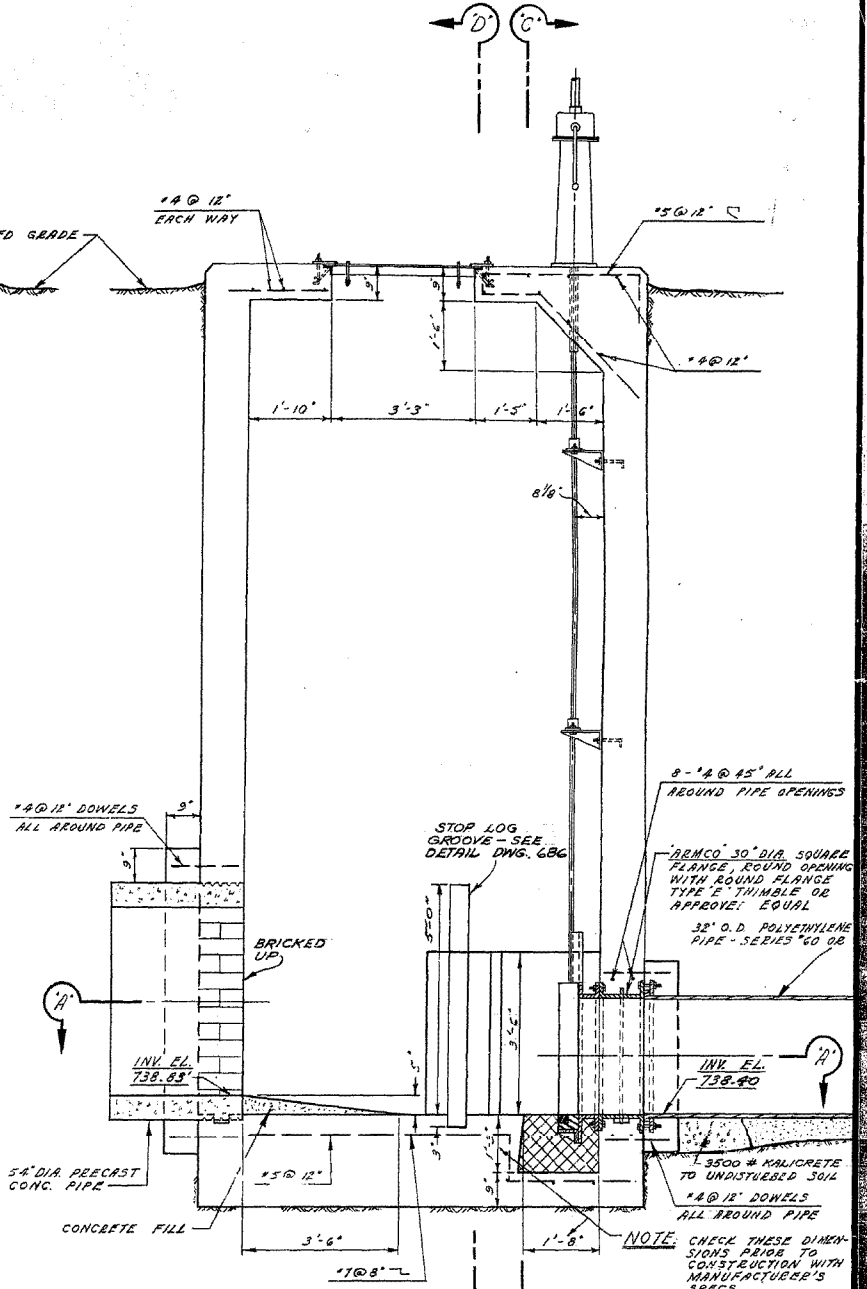
1/2\"/>

1/2\"/>



SEC. 'C' - 'C'

SEC. 'D' - 'D'



SEC. 'B' - 'B'

NOTE: CHECK THESE DIMENSIONS PRIOR TO CONSTRUCTION WITH MANUFACTURER'S SPECS.

SURVEYED & PLAN CHECKED
BY: [Signature]
APPROVED AS BUILT
BY: [Signature]
DATE: 24 SEPT 70

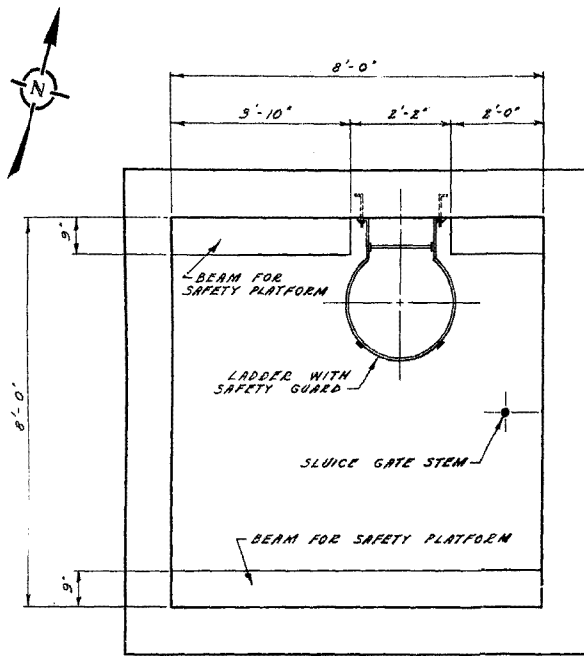


THE METROPOLITAN CORPORATION OF GREATER WINNIPEG
WATERWORKS & WASTE DISPOSAL DIVISION
A. PENMAN - DIRECTOR

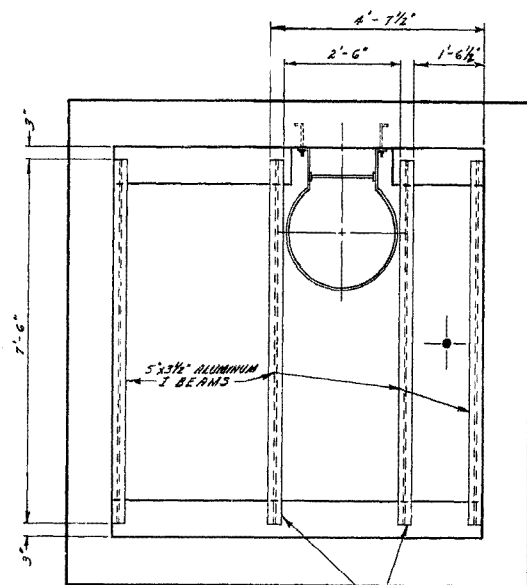
SEWAGE DISPOSAL DEPT.
FT. GARRY - ST. VITAL INTERCEPTOR RIVER CROSSING
SIPHON INLET CHAMBER

SCALE: 1/2\"/>

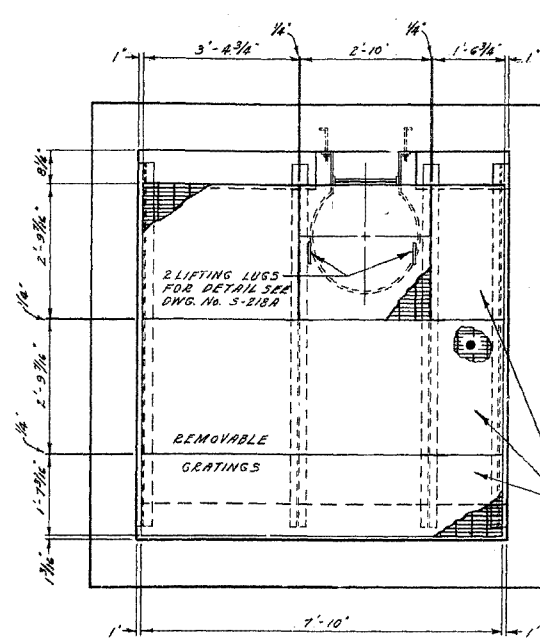
DRAWING NO. 687



CONCRETE PLATFORM BEAMS

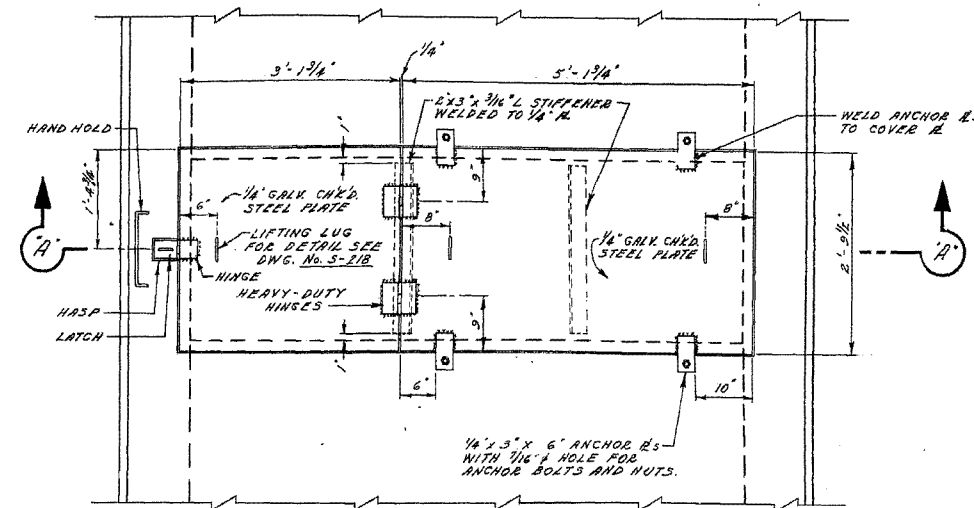


ALUMINUM I BEAM SUPPORTS FOR GRATING

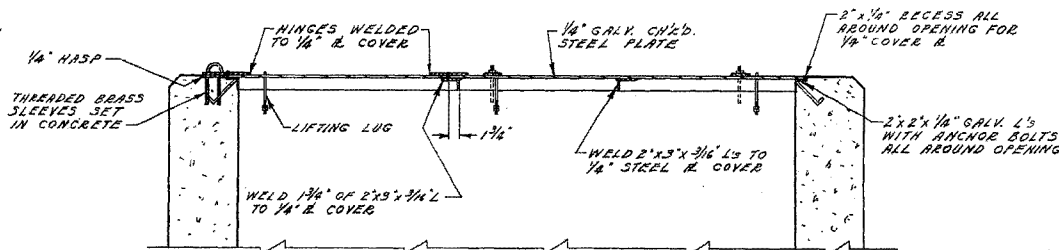


NOTE: GRATING TO BE INSTALLED BEFORE 2" GATE STEM INSTALLATION. CUT OPENING IN GRATING FOR STEM AT TIME OF STEM INSTALLATION.

SEC. "E" - "E" COMPLETE PLATFORM

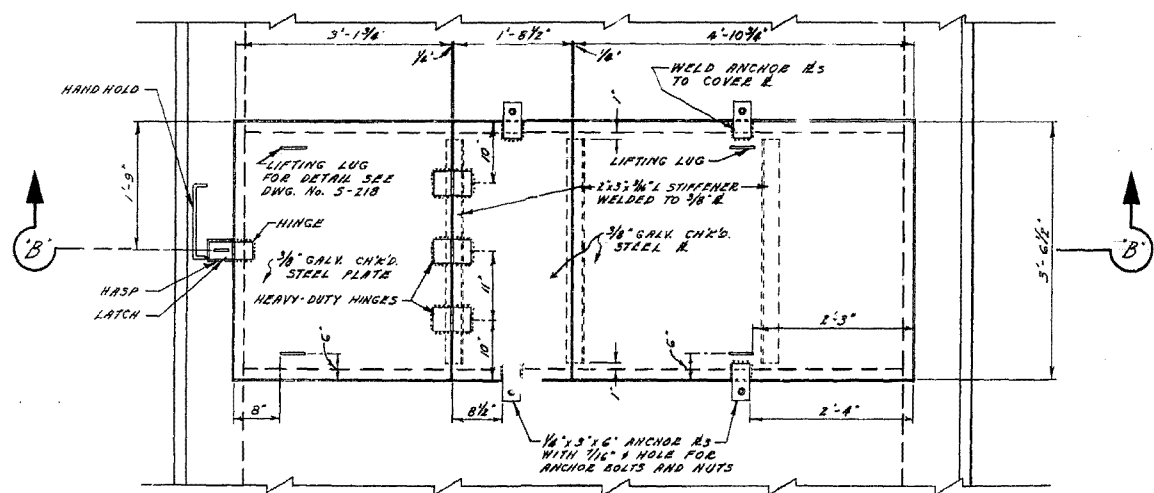


PLAN



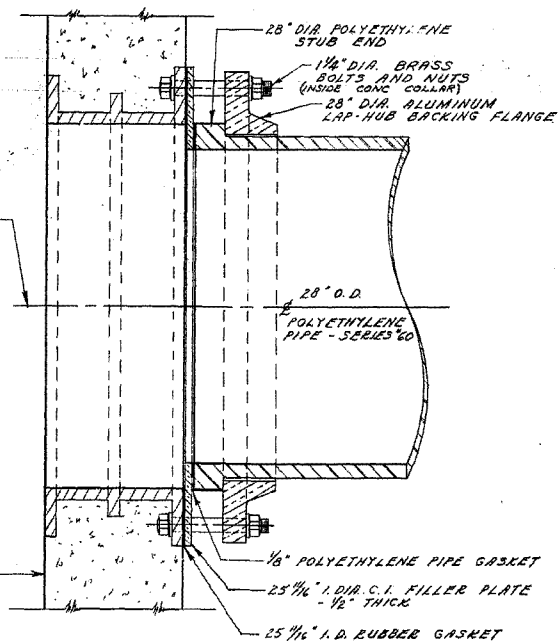
SEC. "A" - "A" DETAIL OF HINGES, PADLOCK AND ANGLE IRON STIFFENER OF 1/4" PLATE COVER FOR SIPHON OUTLET CHAMBER AT STA. 8+94.11

SCALE - 3/4" = 1'-0"



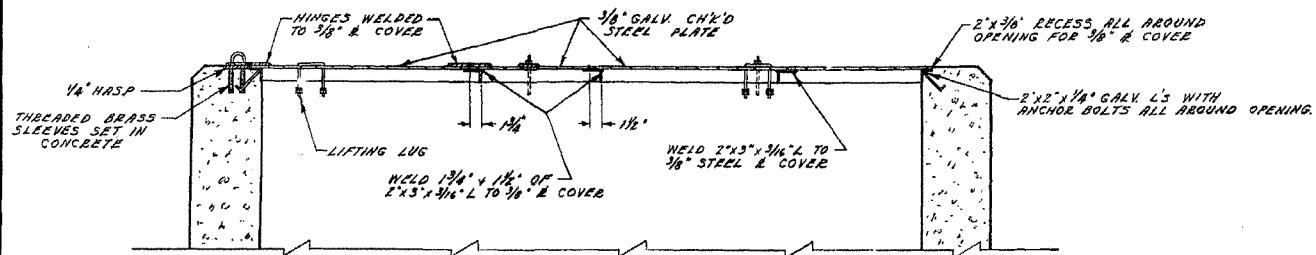
PLAN

Ø OF 30" DIA. C.I. WALL THIMBLE (SQ. TO ROUND FLGE)



DETAIL OF SPECIAL FLANGE ASSEMBLY FOR 28" DIA. POLYETHYLENE PIPE CONNECTION

SCALE - 1 1/2" = 1'-0"



SEC. "B" - "B"

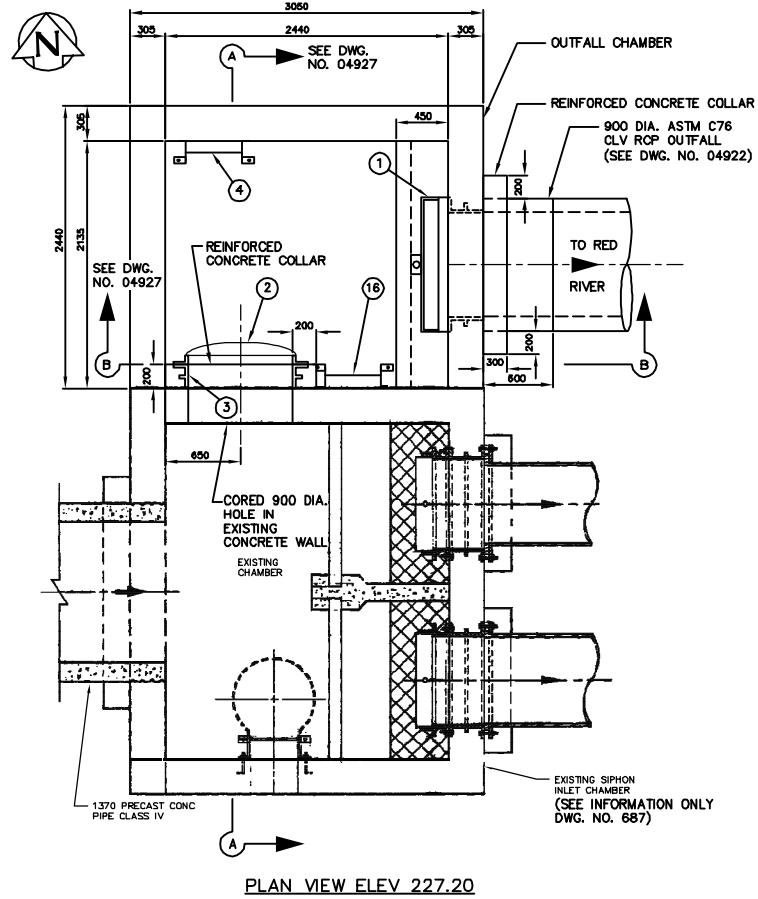
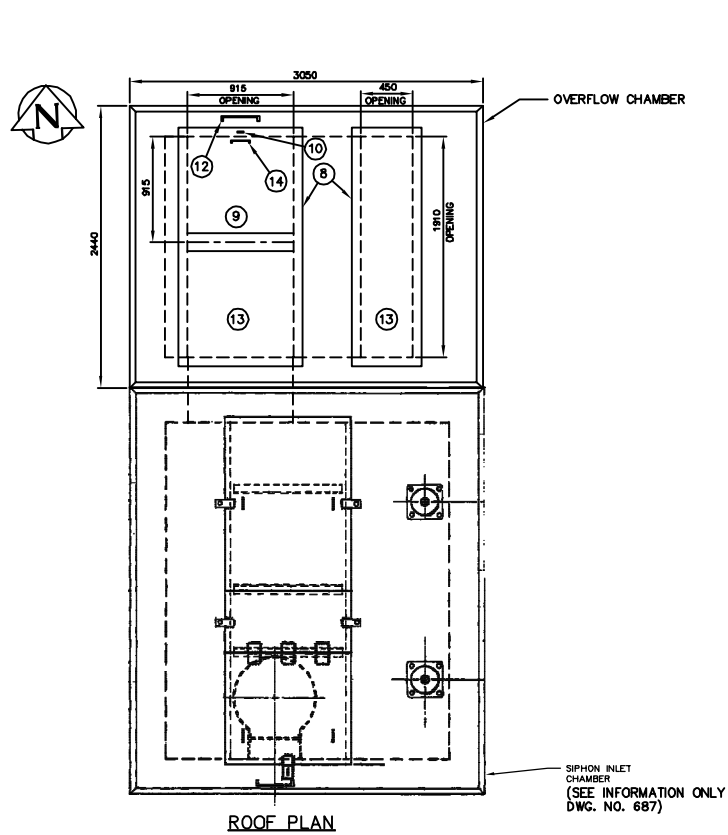
DETAIL OF HINGES, PADLOCK AND ANGLE IRON STIFFENER OF 3/8" PLATE COVER FOR SIPHON INLET CHAMBER AT STA. 0+49

SCALE - 3/4" = 1'-0"

SURVEYED & PLAN CHECKED BY: APPROVED AS BUILT BY: 8/22/72



THE METROPOLITAN CORPORATION OF GREATER WINNIPEG WATERWORKS & WASTE DISPOSAL DIVISION A. PENMAN - DIRECTOR	SEWAGE DISPOSAL DEPT. FT. GARRY-ST. VITAL INTERCEPTOR RIVER CROSSING	DES. <i>C.H.T.</i> DRN. S.C. ENG. DES. <i>[Signature]</i> APPROV. <i>[Signature]</i>	DATE 23 SEPT. 70 SCALE - AS NOTED DRAWING NO. 688
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LIST OF MATERIALS			
NO.	DESCRIPTION	LENGTH	QUANTITY
1.	900X900 STAINLESS STEEL SLUICE GATE FONTAINE SERIES 20 MODEL 204 C/W MODEL F-2 STAINLESS STEEL WALL THIMBLE		1
2.	900# ARMTEC MODEL 20C CI FLAP GATE WITH BRONZE SEATING FACES		1
3.	900# CI ROUND FLANGE ROUND OPENING ARMTEC TYPE "F" WALL THIMBLE		1
4.	FABRICATED GALVANIZED STEEL LADDER (RUNGS @ 300 O.C.)	7785	1
5.	STAINLESS STEEL STEM GUIDE C/W UHMWPE BUSHING		AS REQ'D
6.	SOLID ROUND STAINLESS STEEL VALVE STEM		AS REQ'D 1
7.	PEDESTAL MOUNTED GATE OPERATOR C/W STEM COVER AND POSITION INDICATOR (FONTAINE TYPE MNEP)		1
8.	ALUMINUM ANGLE EXTRUSION (DIE #670826) FRAME C/W CONC. ANCHORS @ 300 O.C.		AS REQ'D 2
9.	10 THICK ALUMINUM TREAD PLATE COVER C/W 3 THICK X 32 WIDE NEOPRENE GASKET BONDED TO ANGLE FRAME		AS REQ'D 1
10.	50 X 38 X 10 ALUMINUM BAR C/W 15# HOLE FOR PADLOCK		1
11.	100 X 64 X 6 ALUMINUM SUPPORT CHANNEL	915	1
12.	19# CONTINUOUS ALUMINUM HINGE C/W 10# REMOVABLE STAINLESS STEEL PIN	1005	1
13.	10 THICK ALUMINUM TREAD PLATE COVER C/W 3 THICK X 32 WIDE NEOPRENE GASKET BONDED TO ANGLE FRAME AND 8# X 20 LONG FLAT HEAD SCREWS @ 450 O.C. MAX.		AS REQ'D 2
	12# ALUMINUM ROD LIFTING HANDLE		1
	FABRICATED ALUMINUM HANDHOLD C/W 12# X 140 LONG ANCHOR BOLTS	300	1
	FABRICATED STEEL LADDER		1

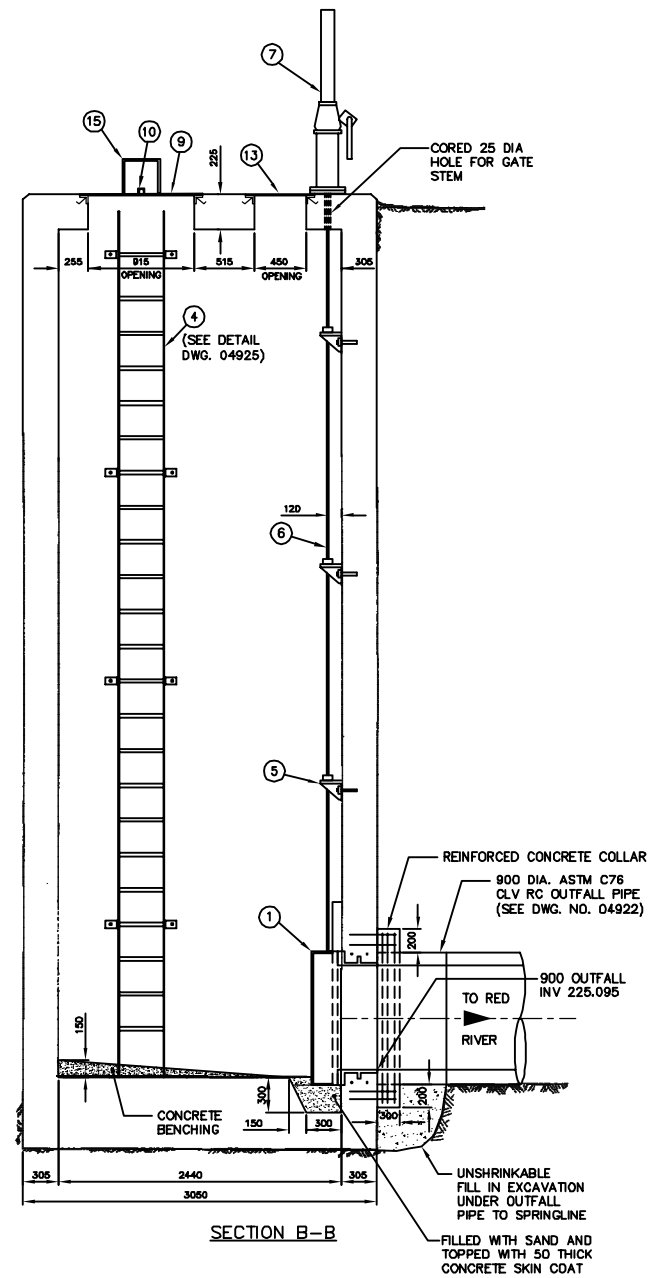
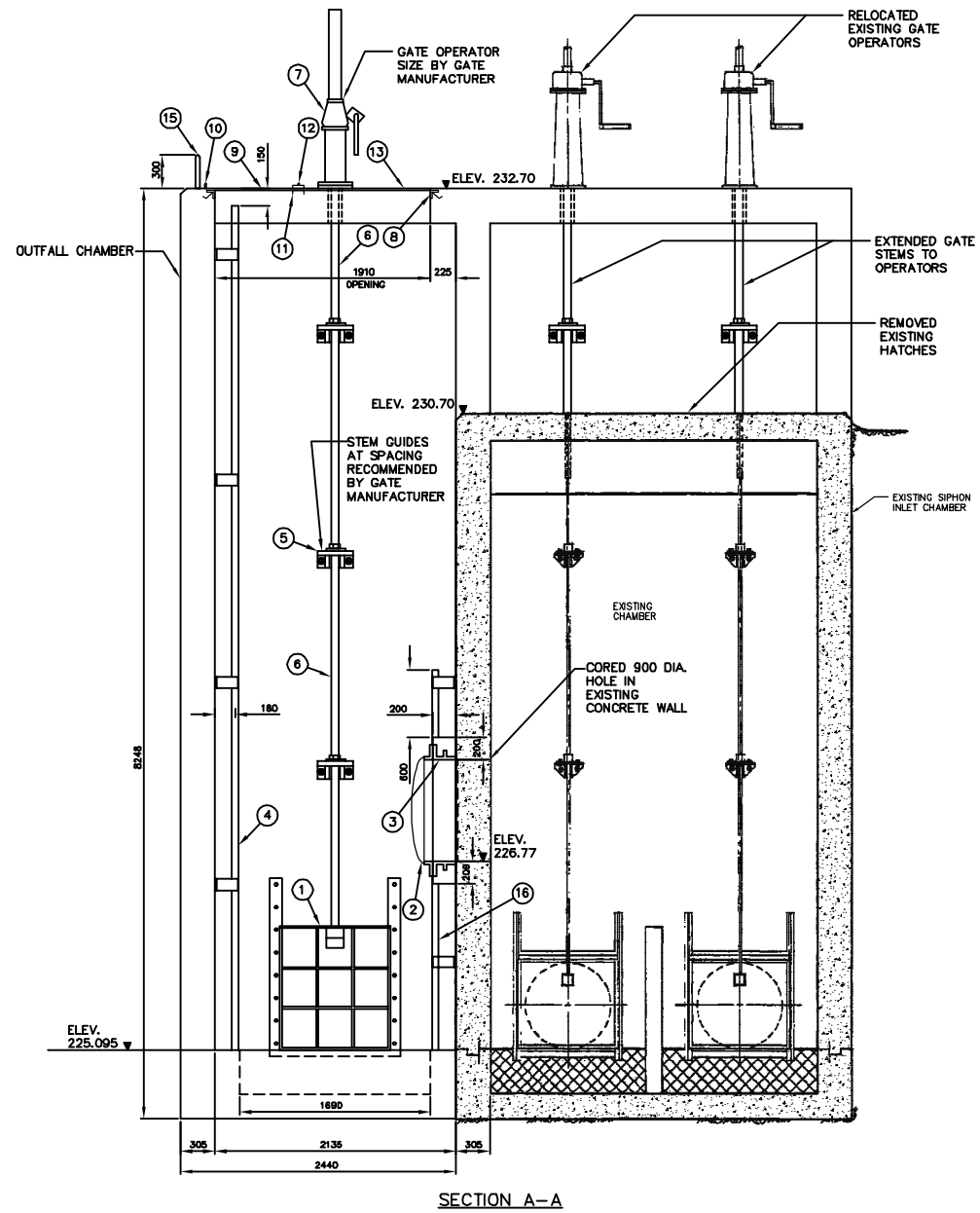
- NOTES:
- SEE DRAWING 04920 FOR CHAMBER LOCATION
 - ALL ALUMINUM MATERIAL 6351-T6
 - ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE TREATED WITH TWO COATS OF ALKALI RESISTANT BITUMINOUS PAINT
 - ALL UNIDENTIFIED NUTS, BOLTS AND ANCHORS TYPE 316 STAINLESS STEEL

THIS DRAWING CONTAINS A RASTER IMAGE
FILENAME:
04926_687SEC.tif

CONTRACTOR: NELSON RIVER CONSTRUCTION
PROJECT COMPLETION DATE: 2004 01 01

RECORD DRAWING
WATER AND WASTE DEPARTMENT

B.M. ELEV.	FIELD BOOK #	CITY OF WINNIPEG WATER AND WASTE ENGINEERING DIVISION		ENGINEER'S SEAL	THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT	SHEET 7 of 11 CITY DRAWING NUMBER 04926
POSTED TO LBIS		DESIGNED BY TW	CHECKED BY TW	ORIGINAL SIGNED BY W.D. WATTERS 01/08/16		
		DRAWN BY WKT	APPROVED BY	RELEASED FOR CONSTRUCTION	D'ARCY WASTEWATER PUMPING STATION BUILDING, GATE CHAMBER MODIFICATIONS, OUTFALL, AND SITE GRADING OUTFALL CHAMBER PLAN VIEWS	
		HOR. SCALE 1:30	VERTICAL	DATE 2001 08 16		
1	REVISED TO RECORD DWG.	08.04.14	CJM		TENDER NO. 0695-2001	
NO.	REVISIONS	DATE	BY	DATE	AUTOCADR2000: 04926.dwg PLOT DATE: 2008 06 03	



LIST OF MATERIALS			
NO.	DESCRIPTION	LENGTH	QUANTITY
1.	900X900 STAINLESS STEEL SLUICE GATE FONTAINE SERIES 20 MODEL 204 C/W MODEL F-2 STAINLESS STEEL WALL THIMBLE		1
2.	900# ARMTEC MODEL 20C CI FLAP GATE WITH BRONZE SEATING FACES		1
3.	900# CI ROUND FLANGE ROUND OPENING ARMTEC TYPE 7" WALL THIMBLE		1
4.	FABRICATED GALVANIZED STEEL LADDER (RUNGS @ 300 O.C.)	7785	1
5.	STAINLESS STEEL STEM GUIDE C/W UHMWPE BUSHING		AS REQ'D
6.	SOLID ROUND STAINLESS STEEL VALVE STEM		AS REQ'D
7.	PEDESTAL MOUNTED GATE OPERATOR C/W STEM COVER AND POSITION INDICATOR (FONTAINE TYPE MNEP)		1
8.	ALUMINUM ANGLE EXTRUSION (DIE #670826) FRAME C/W CONC. ANCHORS @ 300 O.C.		AS REQ'D
9.	10 THICK ALUMINUM TREAD PLATE COVER C/W 3 THICK X 32 WIDE NEOPRENE GASKET BONDED TO ANGLE FRAME		AS REQ'D
10.	50 X 38 X 10 ALUMINUM BAR C/W 15# HOLE FOR PADLOCK		1
11.	100 X 64 X 6 ALUMINUM SUPPORT CHANNEL	915	1
12.	19# CONTINUOUS ALUMINUM HINGE C/W 10# REMOVABLE STAINLESS STEEL PIN	1005	1
13.	10 THICK ALUMINUM TREAD PLATE COVER C/W 3 THICK X 32 WIDE NEOPRENE GASKET BONDED TO ANGLE FRAME AND 8# X 20 LONG FLAT HEAD SCREWS @ 450 O.C. MAX.		AS REQ'D
14.	12# ALUMINUM ROD LIFTING HANDLE		1
15.	FABRICATED ALUMINUM HANDHOLD C/W 12# X 140 LONG ANCHOR BOLTS	300	1
16.	FABRICATED STEEL LADDER		1

- NOTES:
- SEE DRAWING 04920 FOR CHAMBER LOCATION
 - ALL ALUMINUM MATERIAL 6351-T6
 - ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE TREATED WITH TWO COATS OF ALKALI RESISTANT BITUMINOUS PAINT
 - ALL UNIDENTIFIED NUTS, BOLTS AND ANCHORS TYPE 316 STAINLESS STEEL
 - SEE DRAWING NO. 04928 AND 04929 FOR REINFORCING

THIS DRAWING CONTAINS
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04927_687SEC.tif

CONTRACTOR: NELSON RIVER CONSTRUCTION
PROJECT COMPLETION DATE: 2004 01 01

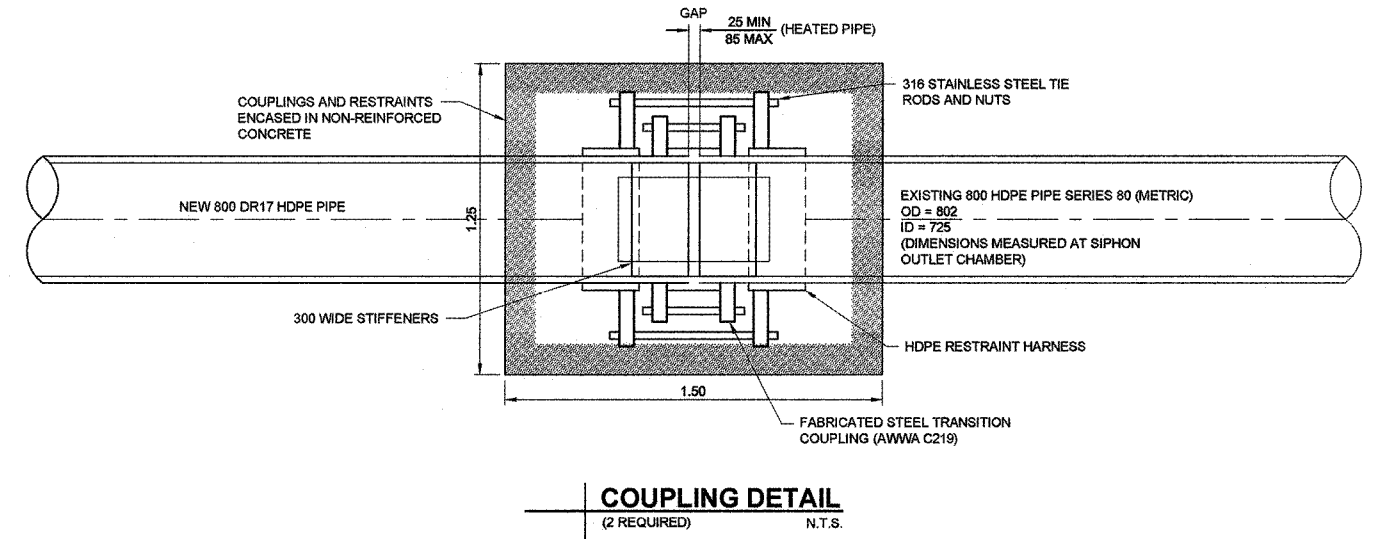
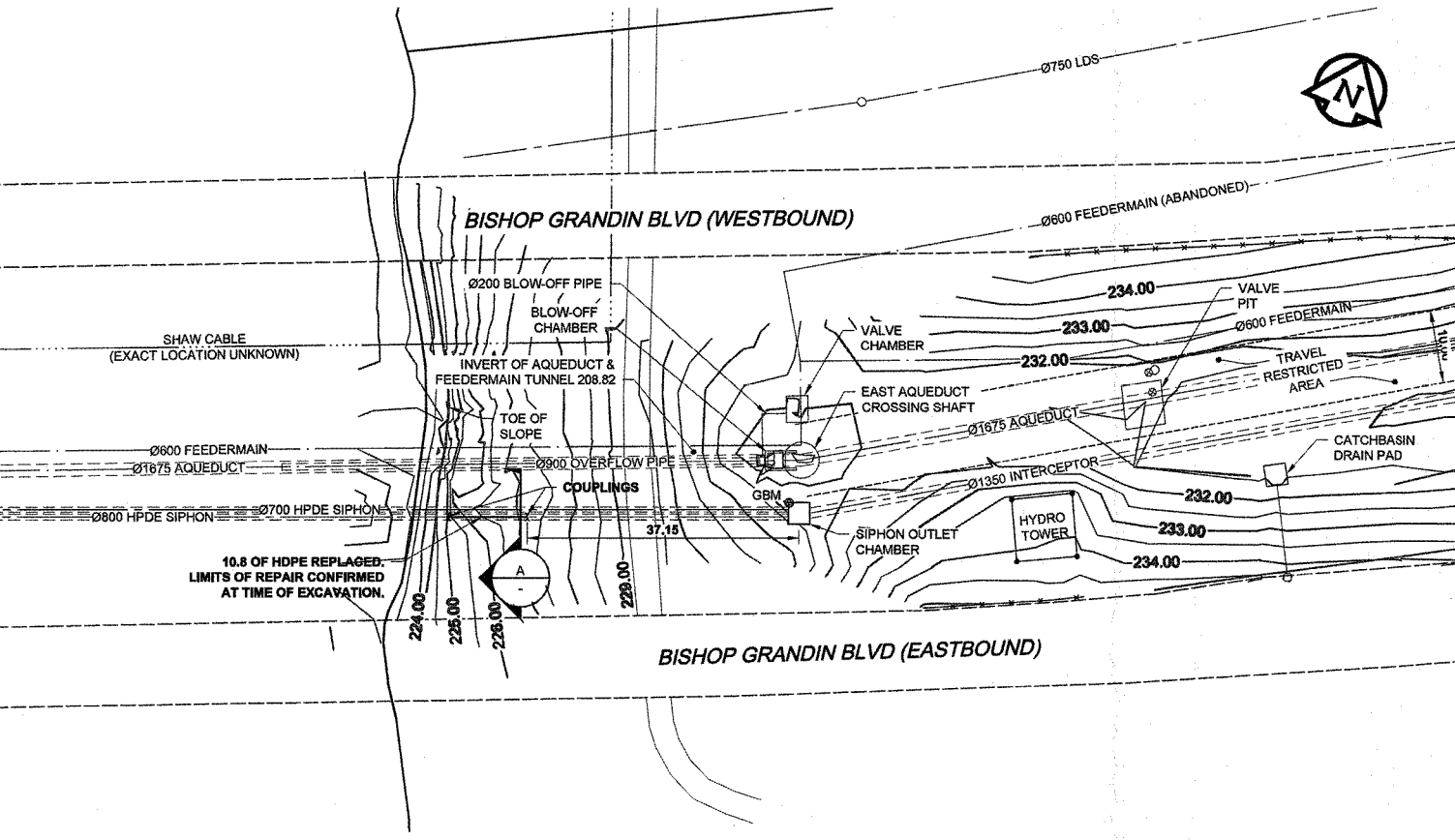
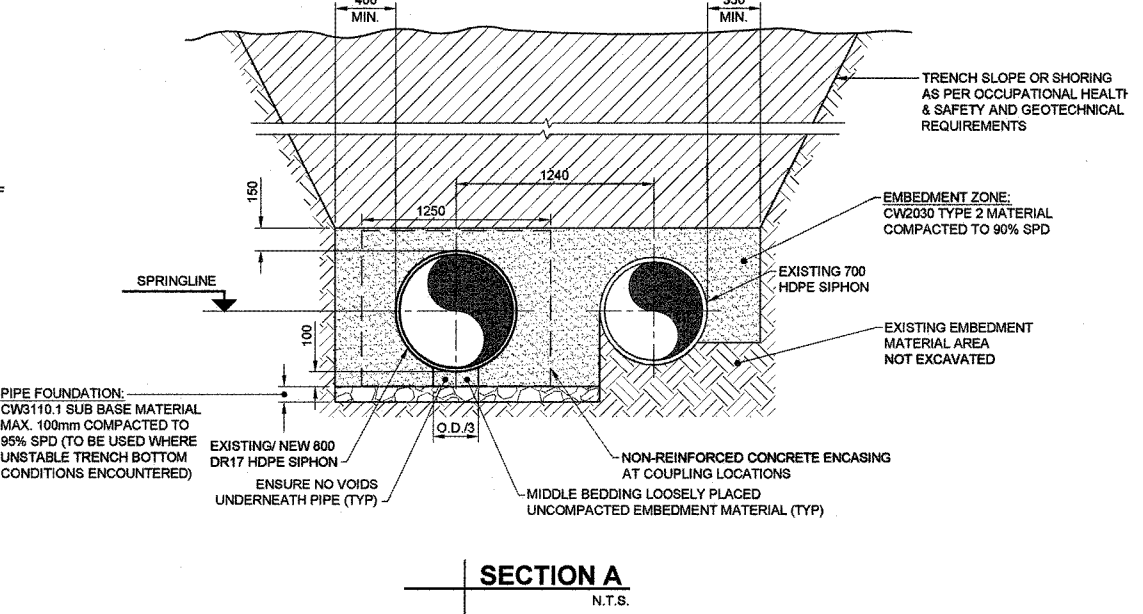
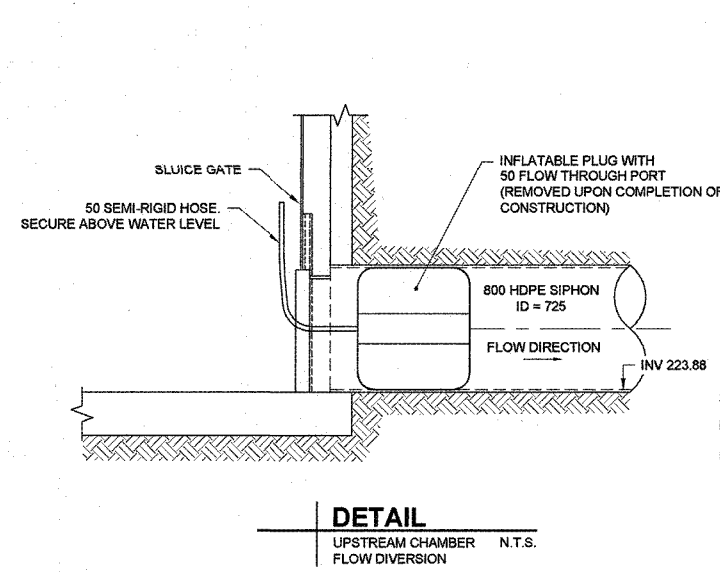
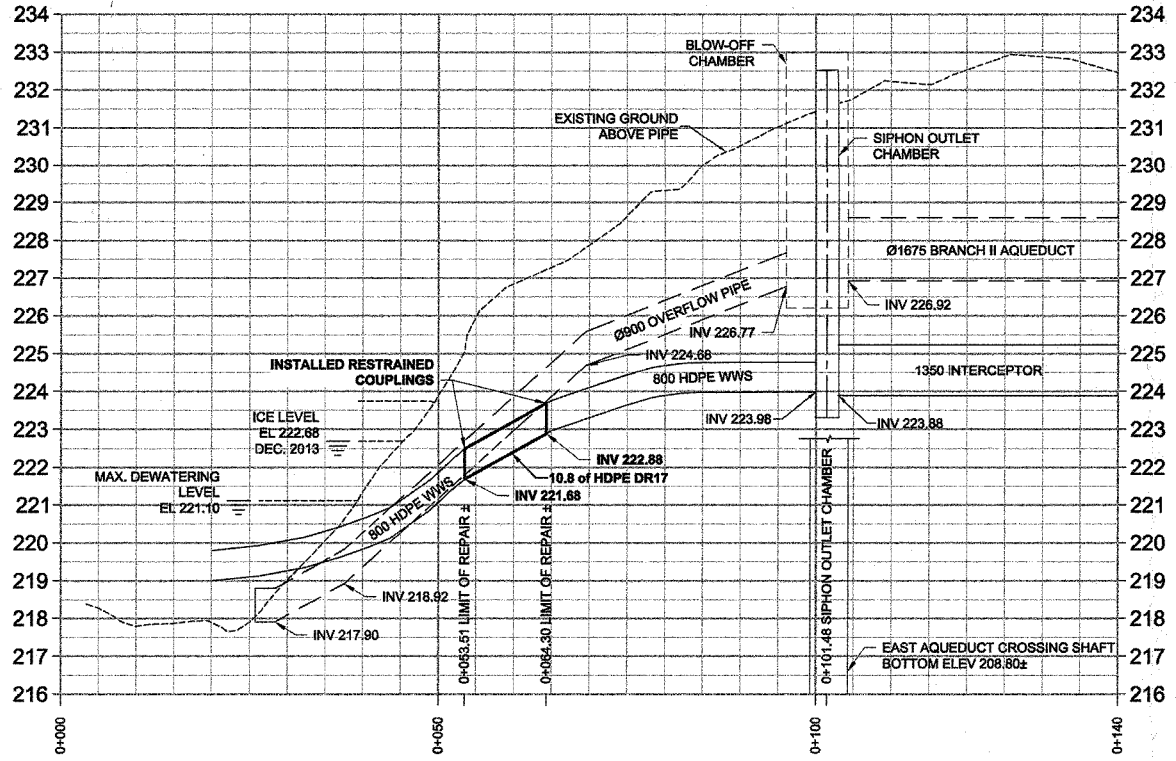
RECORD DRAWING
WATER AND WASTE DEPARTMENT

B.M. ELEV.	FIELD BOOK #	CITY OF WINNIPEG WATER AND WASTE ENGINEERING DIVISION		ENGINEER'S SEAL	THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT D'ARCY WASTEWATER PUMPING STATION BUILDING, GATE CHAMBER MODIFICATIONS, OUTFALL, AND SITE GRADING OUTFALL CHAMBER SECTION VIEWS	SHEET 8 OF 11 CITY DRAWING NUMBER 04927
POSTED TO LBS		DESIGNED BY TW	CHECKED BY TW	ORIGINAL SIGNED BY W.D. WATTERS 01/08/16		
		DRAWN BY WKT	APPROVED BY	RELEASED FOR CONSTRUCTION	TENDER NO. 0695-2001 AUTOCADR2000: 04927.dwg PLOT DATE: 2008 06 03	
		HOR. SCALE VERTICAL 1:30	DATE 2001 08 16	DATE		
NO.	REVISIONS	DATE	BY	DATE		

D SIZE 22" x 34" (56mm x 864mm)

PLOT: 05/2016 9:23:43 AM

AECOM REVIEW DRFT CHK
AECOM FILE NAME: 00274906-01-C-1001-RUX.dwg Saved By: [Name]



MATERIAL LIST	MANUFACTURER	MATERIAL SPECIFICATION	SPECIAL FEATURES
ITEM			
WATER WORKS			
800 HDPE PIPE	WL Plastics Corporation	AWWA C908 ASTM F714	DR 17 IRON PIPE SIZE (IPS) PE4710
750 STEEL SLEEVE TRANSITION COUPLING	ROBAR INDUSTRIES LTD.	AWWA C219 MODEL "1846/1946"	STEEL SLEEVE & END RINGS. 12.7 X 254 MM CENTER RING 316 STAINLESS STEEL BOLTS, NUTS & WASHERS FUSION BONDED EPOXY COATING 304 STAINLESS STEEL 12 GAUGE X 305 MM LONG STEEL RINGS 316 STAINLESS STEEL BOLTS, NUTS & WASHERS FUSION BONDED EPOXY COATING 6 SERRATIONS PER INCH
750 PIPE STIFFENER	ROBAR INDUSTRIES LTD.	MODEL "9626"	
750 HDPE RESTRAINT HARNESS	JMC INDUSTRIES INC.	MODEL "SUR-GRIP RESTRAINER"	
CLASS 350 RIPRAP	MULDER CONSTRUCTION & MATERIALS LTD.		
DRAINAGE FABRIC	BROCK WHITE CANADA	PROPEX GEOTEX 801	NON-WOVEN GEOTEXTILE
CONTRACT INFORMATION			
CONTRACTOR:	JC PAVING LTD.		
CONSTRUCTION PERIOD:	FEB. 28 - APR. 15, 2014		
FIELD BOOK NO.:			



METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES
BID OPPORTUNITY NO. 1040-2013

RECORD DRAWING

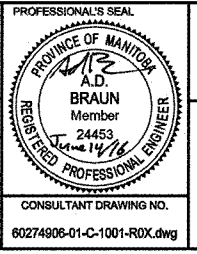
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○	HYDRANT	○	○	REDUCER	○	HYDRANT	○
○	VALVE	○	○	COUPLING	○	VALVE	○
○	LAND DRAINAGE SEWER	○	○	ANODE	○	LAND DRAINAGE SEWER	○
○	WASTE WATER SEWER	○	○	HYDRO	○	WASTE WATER SEWER	○
○	MANHOLE	○	○	MTS	○	PAVEMENT CROWN	○
○	CATCH BASIN	○	○	GAS	○	N/W PROPERTY LINE	○
○	CURB INLET	○	○	TESTHOLE	○	S/E PROPERTY LINE	○
○	CULVERT	○	○	LAMP STANDARD	○	N/W GUTTER	○
○	PIPE ABANDONMENTS	○	○	TREE	○	S/E GUTTER	○
○	SURVEY BAR	○	○		○		○
○	EXISTING	○	○	LEGEND - PLAN	○	LEGEND - PROFILE	○
○	NEW	○	○		○		○

LOCATION APPROVED
UNDERGROUND STRUCTURES
DATE: [Date]
NOTE: LOCATION 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.

NO.	REVISIONS	DATE	BY
1	ISSUED FOR RECORD	16/05/12	CLC/KLC
0	ISSUED FOR CONSTRUCTION	13/12/13	KLC

AECOM

DESIGNED BY: ADB
CHECKED BY: [Signature]
DRAWN BY: JP
APPROVED BY: [Signature]
HOR. SCALE: 1:500
VERT. SCALE: 1:100
DATE: [Date]

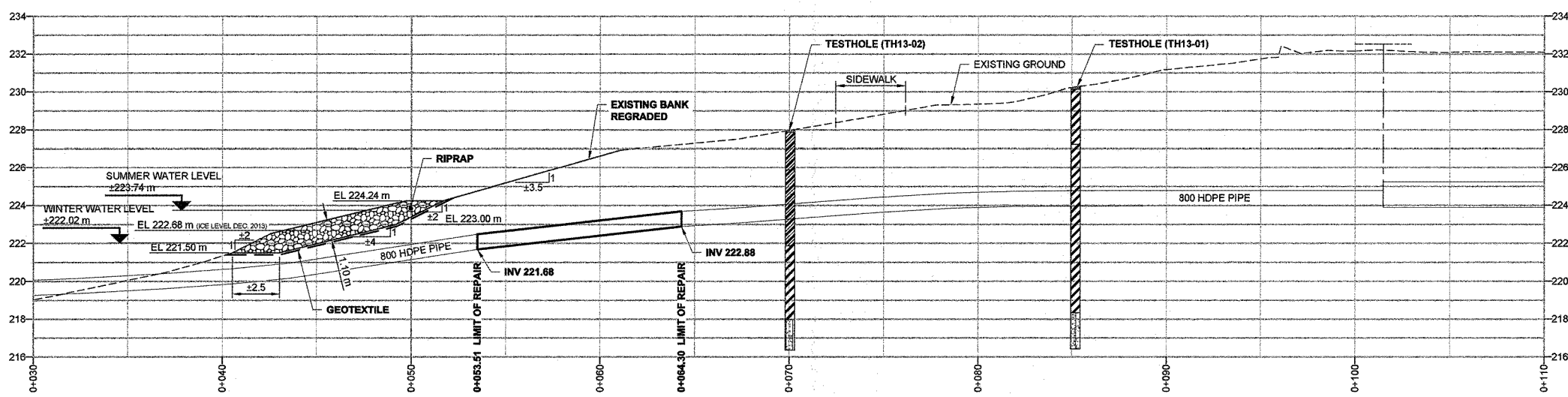
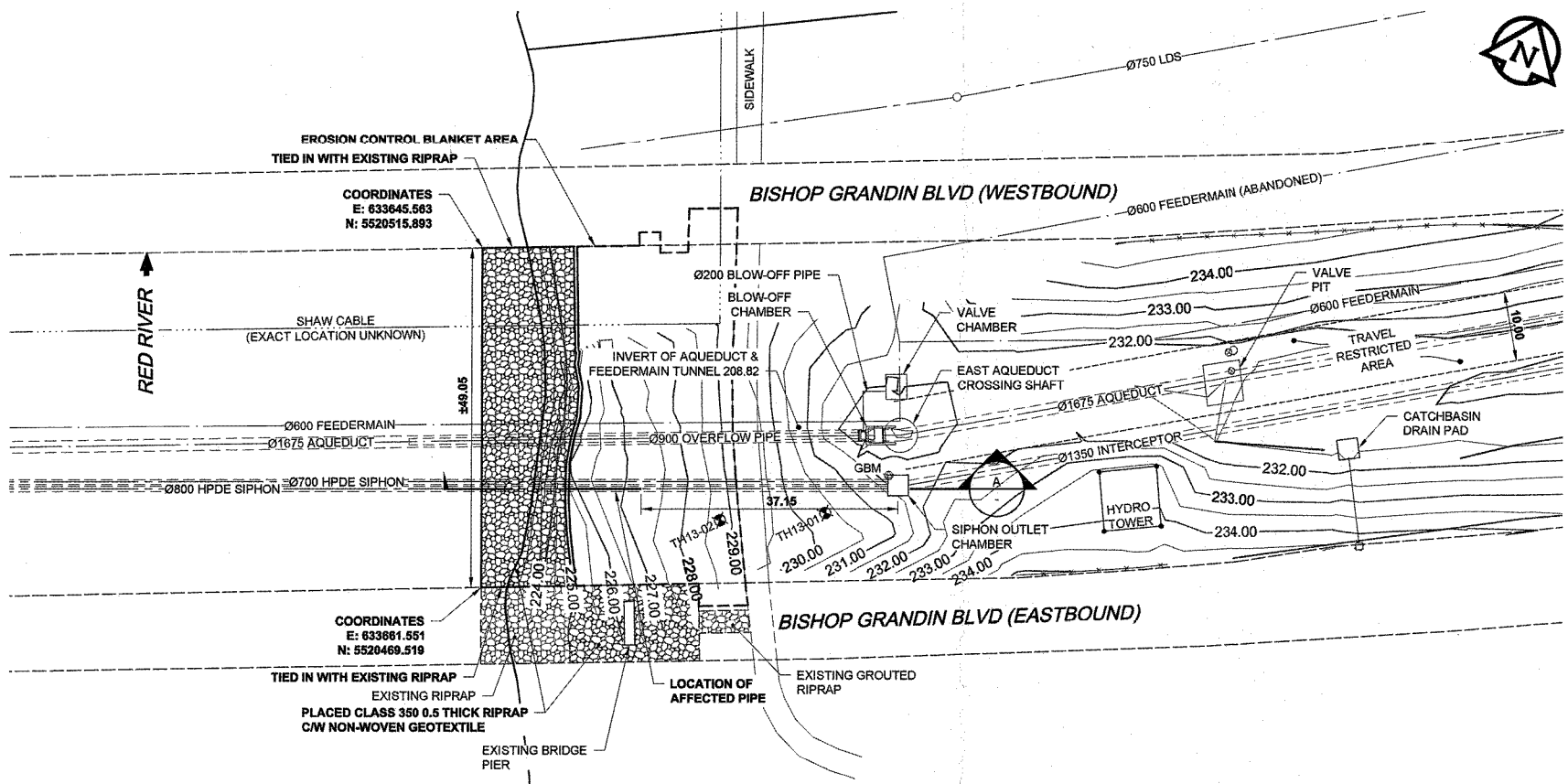


THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

FORT GARRY INTERCEPTOR SIPHON REPAIR CIVIL

PLANNING & DESIGN DIVISION

SHEET 1 OF 2
CITY DRAWING NUMBER: 10723
REV 1



LEGEND

---	EXISTING GROUND PROFILE	[Hatched]	EXISTING GROUND TO BE EXCAVATED	[Dotted]	TOPSOIL / ORGANICS	[Diagonal Lines]	CLAY
---	GEOTEXTILE	[Stippled]	RIP RAP CLASS 350	[Diagonal Lines]	CLAY AND SILT	[Cross-hatched]	TILL
---	NEW GROUND PROFILE						

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

AECOM
Certificate of Authorization
AECOM Canada Ltd.
No. 4671 Date: June 14/16

RECORD DRAWING

BID OPPORTUNITY NO. 1040-2013

150 WM	WATERMAIN	150 WM	150 WM	CURB STOP	150 WM	WATERMAIN	150 WM
300 LDS	LAND DRAINAGE SEWER	300 LDS	300 LDS	REDUCER	300 LDS	LAND DRAINAGE SEWER	300 LDS
250 WWS	WASTE WATER SEWER	250 WWS	250 WWS	COUPLING	250 WWS	WASTE WATER SEWER	250 WWS
○	MANHOLE	○	○	ANODE	○	PAVEMENT CROWN	○
□	CATCH BASIN	□	□	HYDRO	□	N/W PROPERTY LINE	□
△	CURB INLET	△	△	MTS	△	S/E PROPERTY LINE	△
○	PIPE ABANDONMENTS	○	○	GAS	○	N/W GUTTER	○
+	SURVEY BAR	+	+	TESTHOLE	+	S/E GUTTER	+
---	EXISTING	---	---	LAMP STANDARD	---		---
---	LEGEND - PLAN	---	---	TREE	---		---
---	NEW	---	---		---		---
---	EXISTING	---	---		---		---

LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPR. U/G STRUCTURES DATE COMMITTEE

NOTE:
LOCATION 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.

1	ISSUED FOR RECORD	16/05/12	KMB/KLC
0	ISSUED FOR CONSTRUCTION	13/12/13	CM
NO.	REVISIONS	YYMMDD	BY

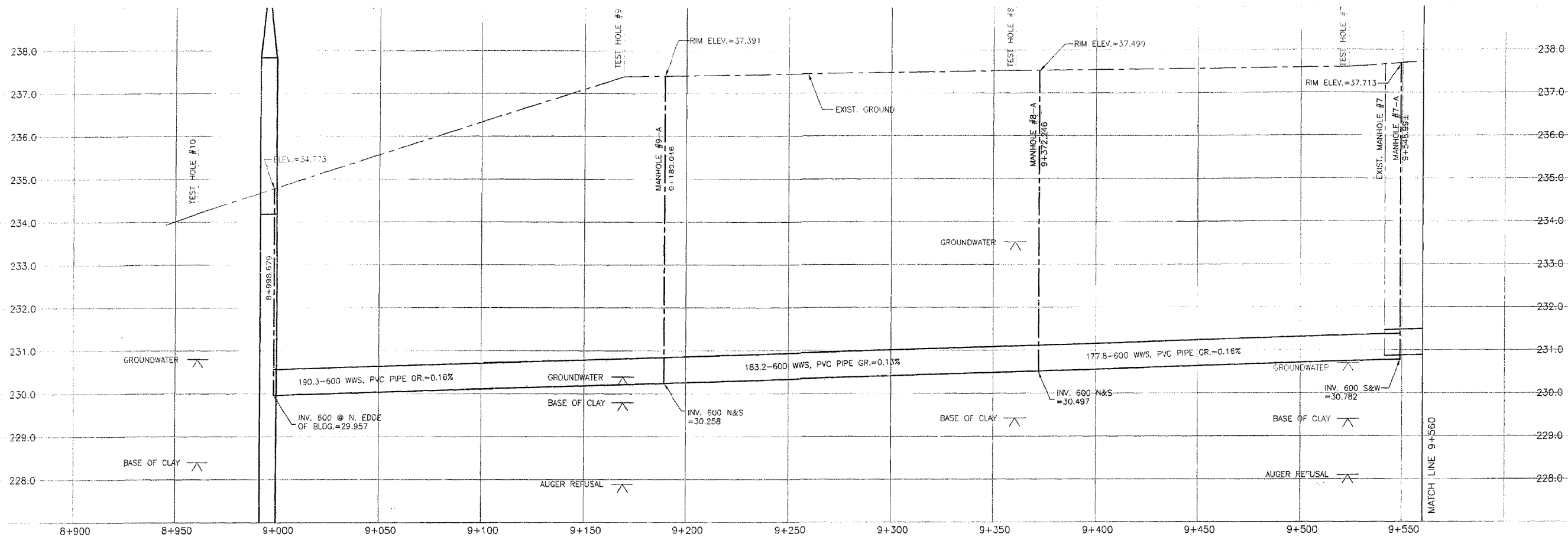
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VERT. SCALE	AS NOTED	DATE	

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Z.T. AL-HAYAZI
Member
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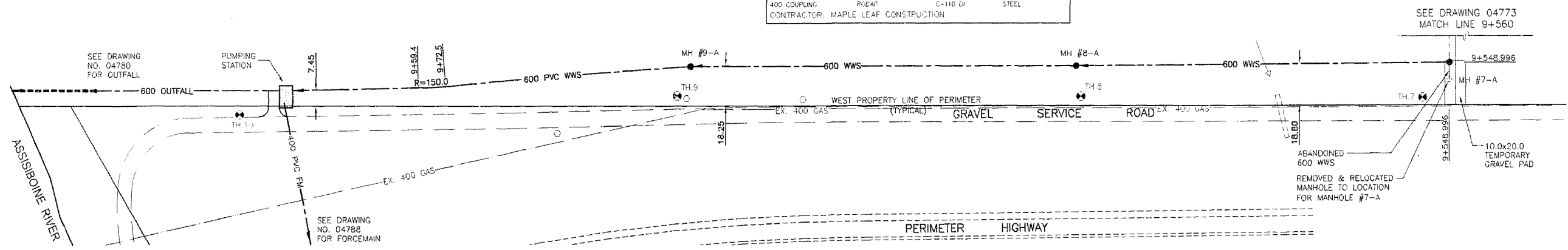
THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

FORT GARRY INTERCEPTOR SIPHON REPAIR GEOTECHNICAL PLAN/PROFILE

SHEET 2 OF 2
CITY DRAWING NUMBER
LD-7277
REV 1



MATERIAL LIST			
WASTE WATER SEWER	MANUFACTURER	SPECIFICATION	SPECIAL FEATURES
MANHOLE BASES	LAFARGE	ASTM C76	REINF. CONC.
MANHOLE RISERS	LAFARGE	ASTM C76	REINF. CONC.
FRAMES AND COVERS	TITAN FOUNDRY	CW 2131/CW 3205	C.I.
600 SEWER	IPEX	ASTM F769	PVC
600 OUTFALL SEWER	LAFARGE	ASTM C76	REINF. CONC.
400 FORCEMAIN PIPE	IPEX CENTURION	ASTM C-900	PVC
550 ENCASEMENT PIPE	OCIF (OAKVILLE, ONT.)	8.7mm THICK	STEEL
400 ENCASEMENT PIPE (RIVER CROSSING)	OCIF	9.53mm THICK	STEEL (DEV-TAR COATING)
600 CSP	ARMCO	2mm THICK	CALVANIZED METAL
600 SLIP JOINT	ARMCO		CALVANIZED METAL
400-45' BEND	GRINNELL	AWWA C-110	C.I.
400-22.5' BEND	IPEX	ASTM-C900	PVC
400 GATE VALVE	CLOW	AWWA C-509	PVC
400-300 REDUCER	STAR	C-110	PVC
400-11.25' BEND	STAR	C-110	PVC
COUPLING	FORD		STEEL
400 COUPLING	ROEAP	C-110 Di	STEEL
CONTRACTOR: MAPLE LEAF CONSTRUCTION			



METRIC
 WHOLE NUMBERS INDICATE MILLIMETRES
 DECIMALIZED NUMBERS INDICATE METRES

NOTE:
 CHAINAGE IS CALCULATED ALONG
 CENTERLINE OF 600 WASTEWATER SEWER

82r471-S.E. Cor. Portage Ave. & Camp
 Manitou Rd., Tblt. on top of 0.05 m dia
 x 2.4 m iron pipe, 6.9 m N. of S.L.
 Portage Ave. & 3 m W. of E.L. Camp
 Manitou Rd.

REVISED AS CONSTRUCTED
 BY: V.M. DATE: 2001/04/04
 CHECKED BY: R.M.

CONSTRUCTION COMPLETION DATE - AUGUST 2001

EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PROFILE	PROPOSED
150 WWS	WATERMAIN	150 WWS	HYDRANT	HYDRO	150 WWS	WATERMAIN	LOCATION APPROVED	B.M. 42-007
300-100	HYDRANT	300-100	M.T.S.	CONCRETE	300-100	LAND DRAINAGE SEWER	UNDERGROUND STRUCTURES	ELEV. 237.945 m
300-100	VALVE	300-100	CONCRETE	ASPHALT	300-100	LAND DRAINAGE SEWER		
250 WWS	LAND DRAINAGE SEWER	250 WWS	CONCRETE	SIDEWALK	250 WWS	WASTE WATER SEWER		
250 WWS	WASTE WATER SEWER	250 WWS	PROPERTY LINE		250 WWS	WASTE WATER SEWER		
MANHOLE	MANHOLE	MANHOLE	SUPVEY BAR	DITCH	MANHOLE	WASTE WATER SEWER		
CATCH BASIN	CATCH BASIN	CATCH BASIN	DITCH	ELEVATION	CATCH BASIN	WASTE WATER SEWER		
CURB INLET	CURB INLET	CURB INLET	TEST HOLE	TEST HOLE	CURB INLET	WASTE WATER SEWER		
JUNCTION	JUNCTION	JUNCTION			JUNCTION	WASTE WATER SEWER		
TULVERT	TULVERT	TULVERT			TULVERT	WASTE WATER SEWER		

NO.	REVISIONS	DATE	BY
5	REVISED AS CONSTRUCTED	2001/04/04	V.M.
4	ADDED WATER & WASTE COMMENTS	2001/04/18	T.G.
3	REVISED WWS GRADES PH. 2		K.R.
2	REV PHASE 1 TO AS BUILT	2000/05/16	V.M.
1	REV. ALIGNMENT MH7-MH10	1999/12/8	V.A.M.

Stantec Consulting Ltd.
 905 Waverley Street, Winnipeg, Manitoba
 Tel. 204-489-5900 Fax: 204-453-9012

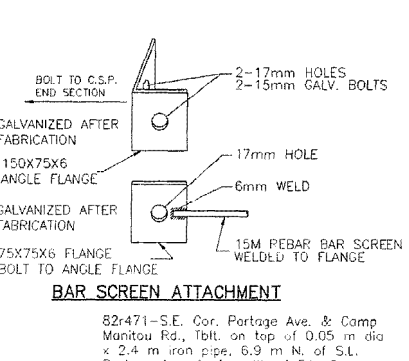
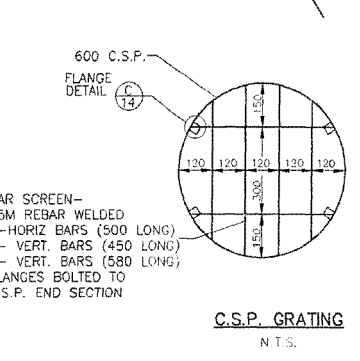
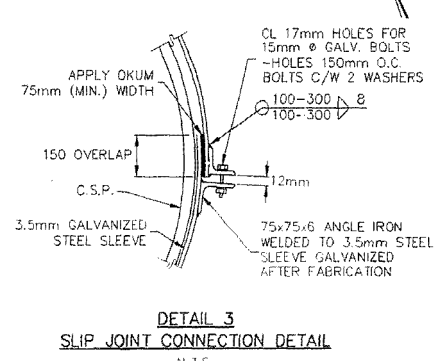
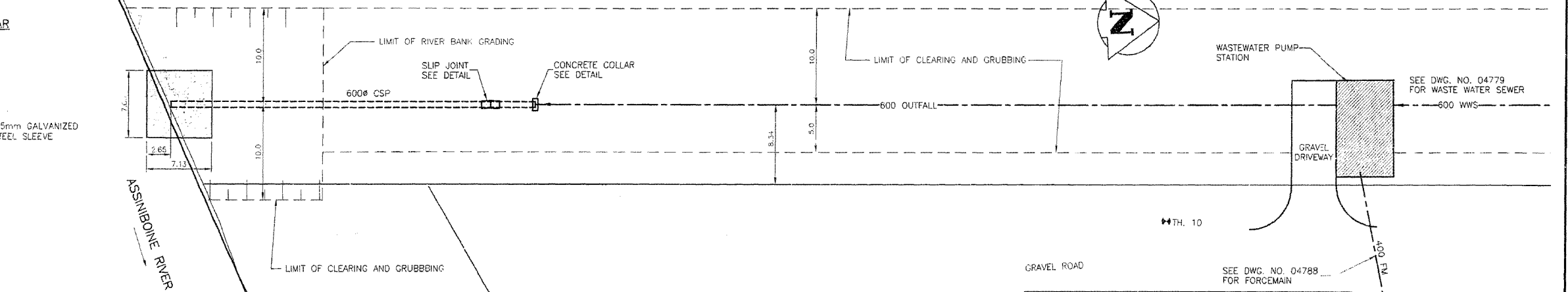
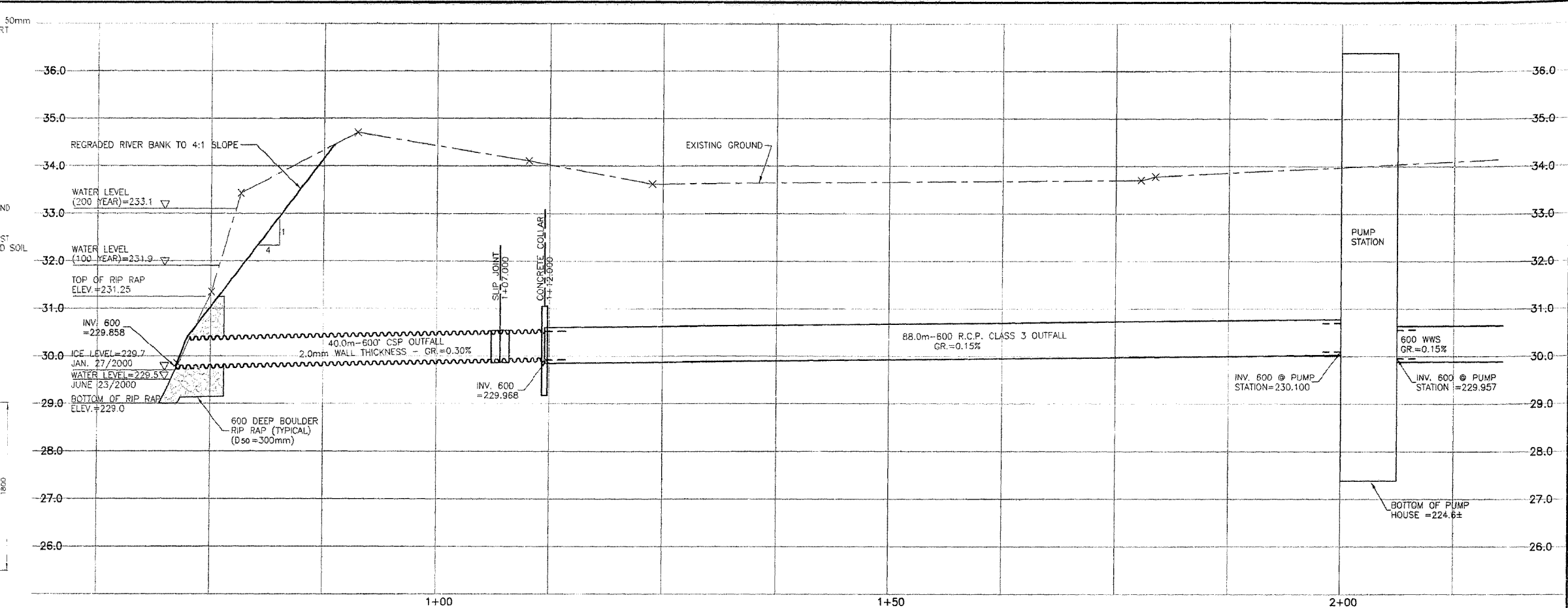
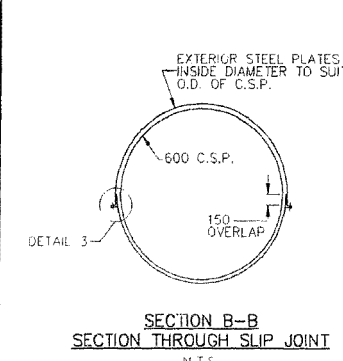
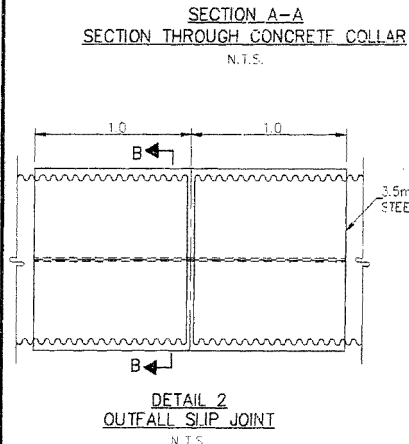
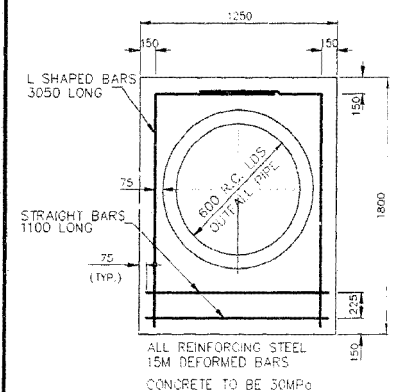
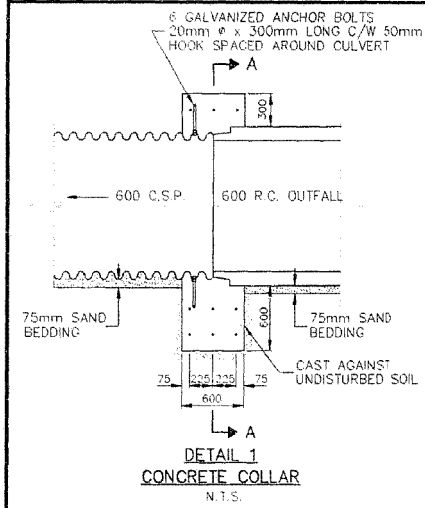
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 VERTICAL SCALE: 1:50
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 CONSULTANT DRAWING NO.: PW-83-549
 DATE: 1999.06.08

THE CITY OF WINNIPEG
 WATER AND WASTE DEPARTMENT

PERIMETER WEST FORCEMAIN AND
 WASTE WATER PUMP STATION
 600 WASTEWATER SEWER INSTALLATION
 PHASE 2
 PUMPING STATION TO STA. 9+560 NORTH

CITY DRAWING NUMBER: 04779
 SHEET: 1 OF 24

4/18/01/100220 - Perimeter w/s 600 WWS/Temp/04779-04
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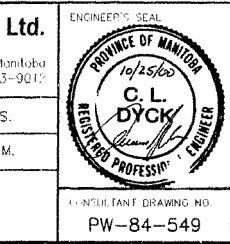


MATERIAL LIST			
WASTE WATER SEWER	MANUFACTURER	SPECIFICATION	SPECIAL FEATURES
MANHOLE BASES	LAFARGE	ASTM C76	REINF. CONC.
MANHOLE RISERS	LAFARGE	ASTM C76	REINF. CONC.
FRAMES AND COVERS	TITAN FOUNDRY	GW 2131/CW 3205	C.I.
600 SEWER	IPEX	ASTM F769	PVC
600 OUTFALL SEWER	LAFARGE	ASTM C76	REINF. CONC.
400 FORCEMAIN PIPE	IPEX CENTURION	ASTM C-900	PVC
550 ENCASUREMENT PIPE	CCTF (DARVILLE, ONT.)	3.74mm THICK	STEEL (BEV-TAR COATING)
400 ENCASUREMENT PIPE (RIVER CROSSING)	CCTF	9.53mm THICK	STEEL (BEV-TAR COATING)
600 CSP	ARMCO	2mm THICK	GALVANIZED METAL
600 SLIP JOINT	ARMCO		GALVANIZED METAL
400-45° BEND	GRINNELL	AWWA C-110	C.I.
400-22.5° BEND	IPEX	ASTM-C990	PVC
400 GATE VALVE	AWWA	AWWA C-509	PVC
400-300 REDUCER	STAR	C-110	PVC
400-11.25° BEND	STAR	C-110	PVC
COUPLING	FORC		
400 COUPLING	ROBAR	C-110 DI	STEEL

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

REVISED AS CONSTRUCTED
BY V.M. DATE 2001/04/04
CHECKED BY R.M.

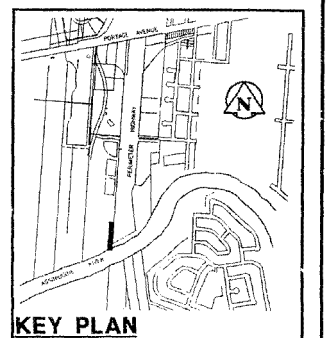
CONSTRUCTION COMPLETION DATE - AUGUST 2001



THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

PERIMETER WEST FORCEMAIN AND WASTE WATER PUMP STATION
600 DIA. OUTFALL SEWER
PHASE 2
PUMP STATION TO ASSINIBOINE RIVER

CITY DRAWING NUMBER 04780
SHEET 2 OF 24



EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PROFILE	PROPOSED
150 W.M.	WATERMAIN	150 W.M.	HYDRANT	HYDRANT	150 W.M.	WATERMAIN	HYDRANT, VALVE	150 W.M.
300 L.D.S.	LAND DRAINAGE SEWER	300 L.D.S.	M.T.S.	CONCRETE	300 L.D.S.	WATERMAIN	LAND DRAINAGE SEWER	300 L.D.S.
250 W.W.S.	WASTE WATER SEWER	250 W.W.S.	ASPHALT	PROPERTY LINE	250 W.W.S.	WASTE WATER SEWER	WASTE WATER SEWER	250 W.W.S.
○	MANHOLE	●	SIDEWALK	SURVEY BAR	○	WASTE WATER SEWER	WASTE WATER SEWER	○
□	CATCH BASIN	■	DITCH	DITCH	○	WASTE WATER SEWER	WASTE WATER SEWER	○
▽	CURB INLET	▽	ELEVATION	ELEVATION	○	WASTE WATER SEWER	WASTE WATER SEWER	○
○	JUNCTION'S	○			○	WASTE WATER SEWER	WASTE WATER SEWER	○
○	CULVERT	○			○	WASTE WATER SEWER	WASTE WATER SEWER	○
○	GAS	○			○	WASTE WATER SEWER	WASTE WATER SEWER	○

NO.	REVISIONS	DATE	BY
3	REVISED AS CONSTRUCTED	00/04/04	VM
2	ADDED RIVERS & STREAMS COMMENTS	10/11/06	T.G.
1	ADDED WATER & WASTE COMMENTS	00/10/16	T.G.

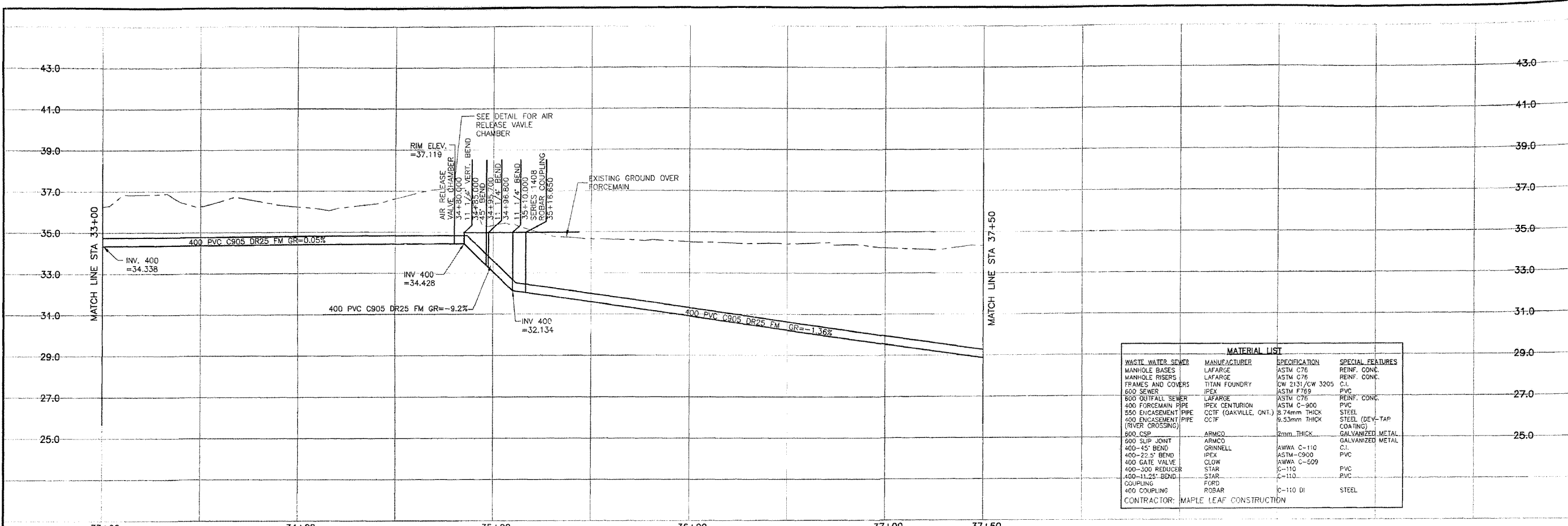
Stantec Consulting Ltd.
905 Waverley Street, Winnipeg, Manitoba
Tel: 204-489-5900 Fax: 204-453-9017

DESIGNED BY C.D. CHECKED BY P.J.S.
DRAWN BY R.M. APPROVED BY D.G.M.

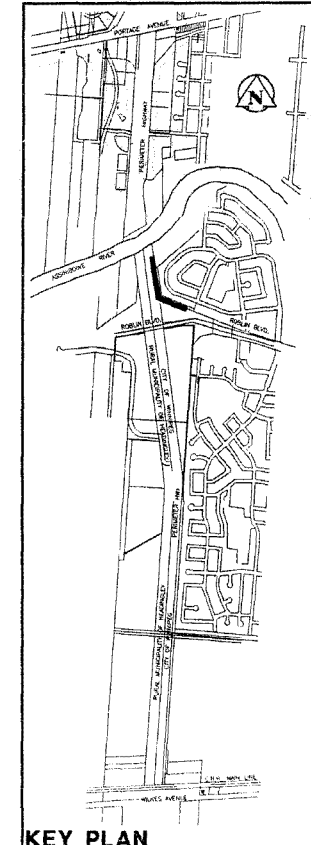
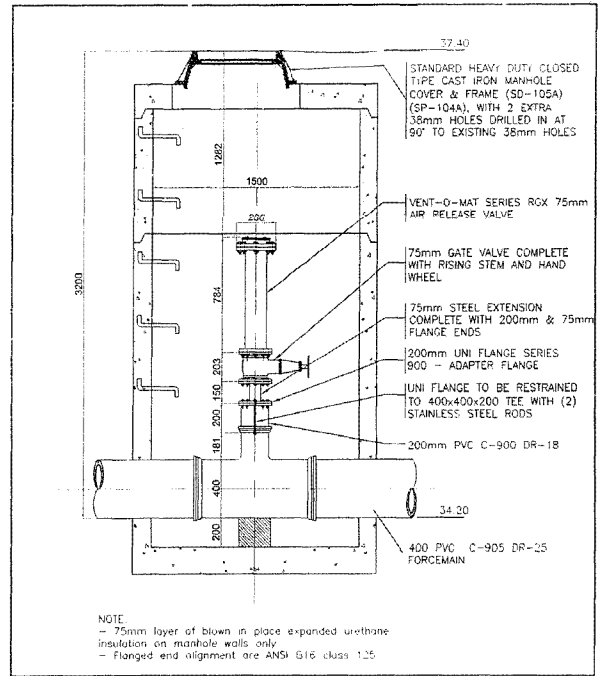
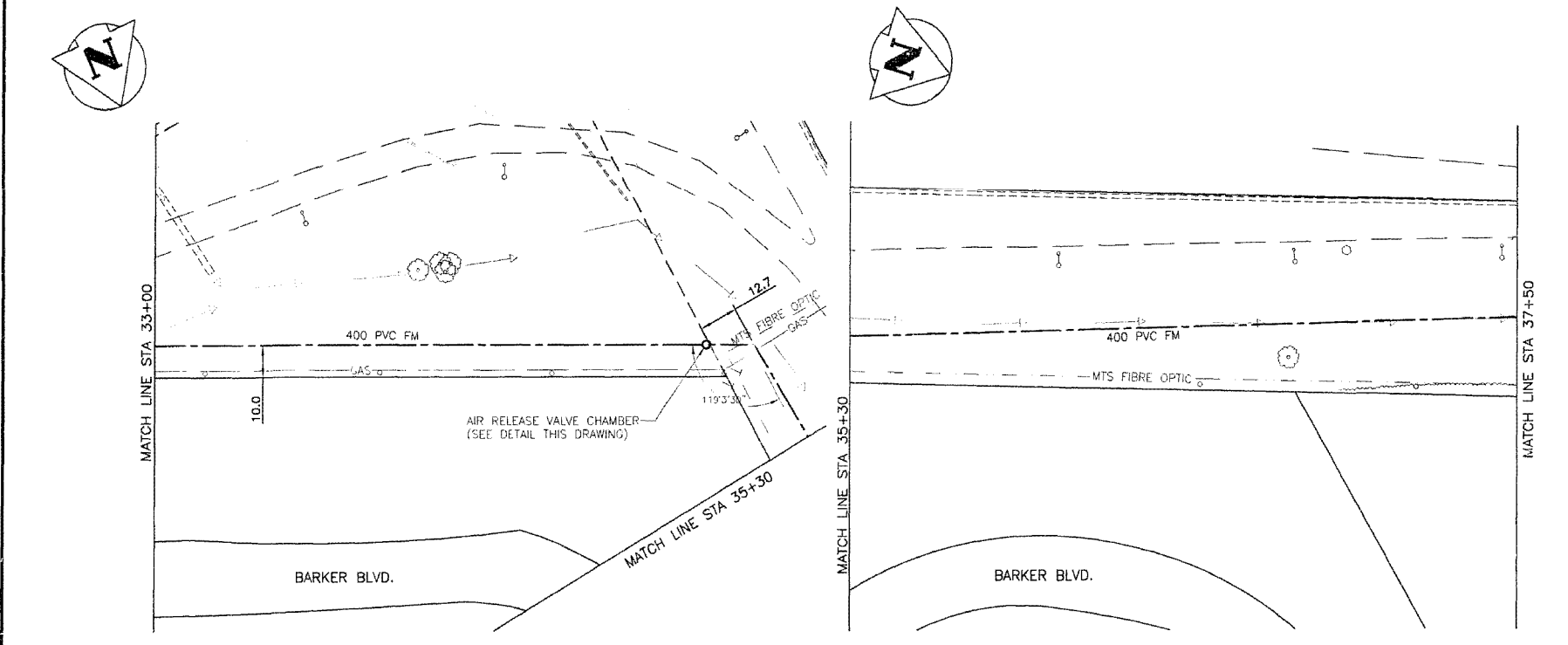
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DATE: 00.03.05

1:12/2001/08/20/01 - Winnipeg, Manitoba, 489-5900 FAX: 204-453-9017
 2001-08-08 09:58 AM By: r.m.v.



MATERIAL LIST			
WASTE WATER SEWER	MANUFACTURER	SPECIFICATION	SPECIAL FEATURES
MANHOLE BASES	LAFARGE	ASTM C76	REINF. CONC.
MANHOLE RISERS	LAFARGE	ASTM C76	REINF. CONC.
FRAMES AND COVERS	TITAN FOUNDRY	QW 2131/CW 3205	C.I.
600 SEWER	IPEX	ASTM F769	PVC
600 OUTFALL SEWER	LAFARGE	ASTM C76	REINF. CONC.
400 FORCEMAIN PIPE	IPEX CENTURION	ASTM C-900	PVC
350 ENCASEMENT PIPE	CTCF (GAKVILLE, ONT.)	8.74mm THICK	STEEL
400 ENCASEMENT PIPE (RIVER CROSSING)	CTCF	9.53mm THICK	STEEL (DEV-TAP COATING)
500 CSP	ARMCO	2mm THICK	GALVANIZED METAL
500 SLIP JOINT	ARMCO		GALVANIZED METAL
400-45\"/>			



REVISED AS CONSTRUCTED
 BY V.M. DATE 2001/04/04
 CHECKED BY R.M.

METRIC
 WHOLE NUMBERS INDICATE MILLIMETRES
 DECIMALIZED NUMBERS INDICATE METRES

NOTE:
 ALL 400 FM BENDS RESTRAINED USING A SERIES 1300 UNI-FLANGE BLOCK BUSTER RESTRAINT DEVICE AND A THRUST BLOCK (SD-004,SD-005)

Bench Mark
 81RG28 - Perimeter Hwy. (P.T.H. 100) & Roblin Blvd. Interchange; Tblt. on top of N. span (sidewalk) of overpass at interchange, 6.3m W. & 0.9m Nly. of N.E. Conc. edge of sidewalk on overpass.

CONSTRUCTION COMPLETION DATE - AUGUST 2001

EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PROFILE	PROPOSED
150 WM	WATERMAIN	150 WM	HYDRO	HYDRO	150 WM	WATERMAIN	WATERMAIN	150 WM
+	HYDRANT	+	M.T.S.	M.T.S.	+	HYDRANT, VALVE	HYDRANT, VALVE	+
○	VALVE	○	CONCRETE	CONCRETE	○	LAND DRAINAGE SEWER	LAND DRAINAGE SEWER	○
300 LGS	LAND DRAINAGE SEWER	300 LGS	ASPHALT	ASPHALT	300 LGS	WASTE WATER SEWER	WASTE WATER SEWER	300 LGS
250 WWS	WASTE WATER SEWER	250 WWS	SIDEWALK	SIDEWALK	250 WWS	C PROFILE	C PROFILE	250 WWS
○	MANHOLE	○	PROPERTY LINE	PROPERTY LINE	○	NORTH OR WEST GUTTER	NORTH OR WEST GUTTER	○
□	CATCH BASIN	□	SURVEY BAR	SURVEY BAR	□	SOUTH OR EAST GUTTER	SOUTH OR EAST GUTTER	□
▽	CURB INLET	▽	DITCH	DITCH	▽	NORTH OR WEST R	NORTH OR WEST R	▽
+	JUNCTIONS	+	ELEVATION	ELEVATION	+	SOUTH OR EAST R	SOUTH OR EAST R	+
+	CULVERT	+			+	NORTH OR WEST DITCH	NORTH OR WEST DITCH	+
+	GAS	+			+	SOUTH OR EAST DITCH	SOUTH OR EAST DITCH	+

NO.	REVISIONS	DATE	BY
2	REVISED AS CONSTRUCTED	2001/04/04	V.M.
1	ADDED WATER & WASTE COMMENTS	00/10/18	T.G.

Stantec Consulting Ltd.
 905 Waverley Street, Winnipeg, Manitoba
 Tel 204-489-5900 F 204-453-9012

DESIGNED BY: C.D. CHECKED BY: P.J.S.
 DRAWN BY: T.G. APPROVED BY: D.M.

RELEAS'D FOR CONSTRUCTION: _____ DATE: _____

CONSTRUCTION DRAWING NO. PW-91-549

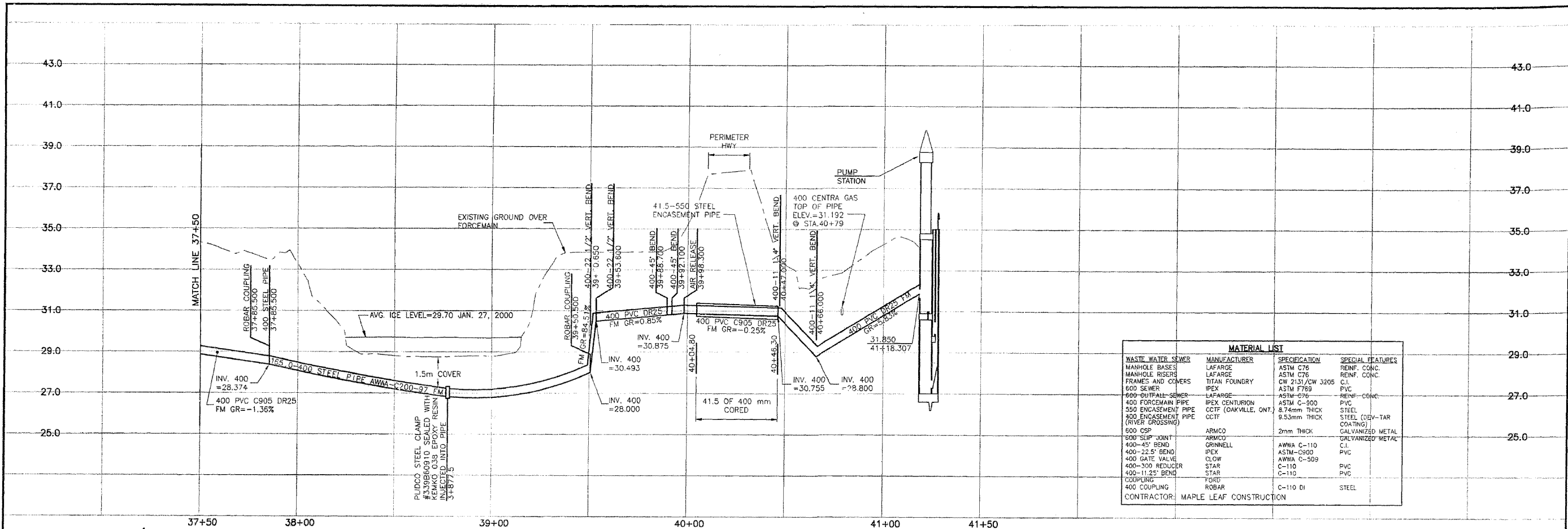
THE CITY OF WINNIPEG
 WATER AND WASTE DEPARTMENT

PERIMETER WEST FORCEMAIN
 WASTE WATER SEWER AND PUMP STATION

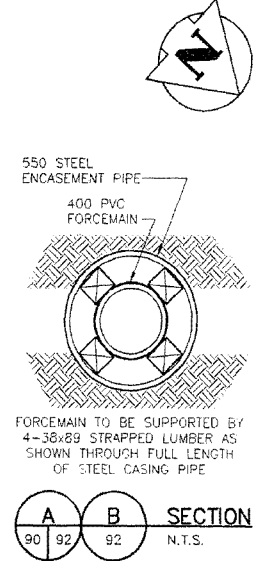
400 FORCEMAIN
 PHASE 2
 STA 33+00 TO STA 37+50

DRAWING NUMBER 04787
 SHEET 9 OF 24

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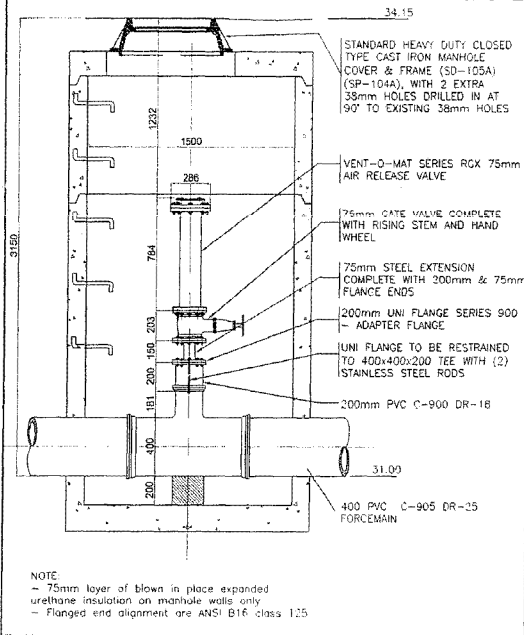
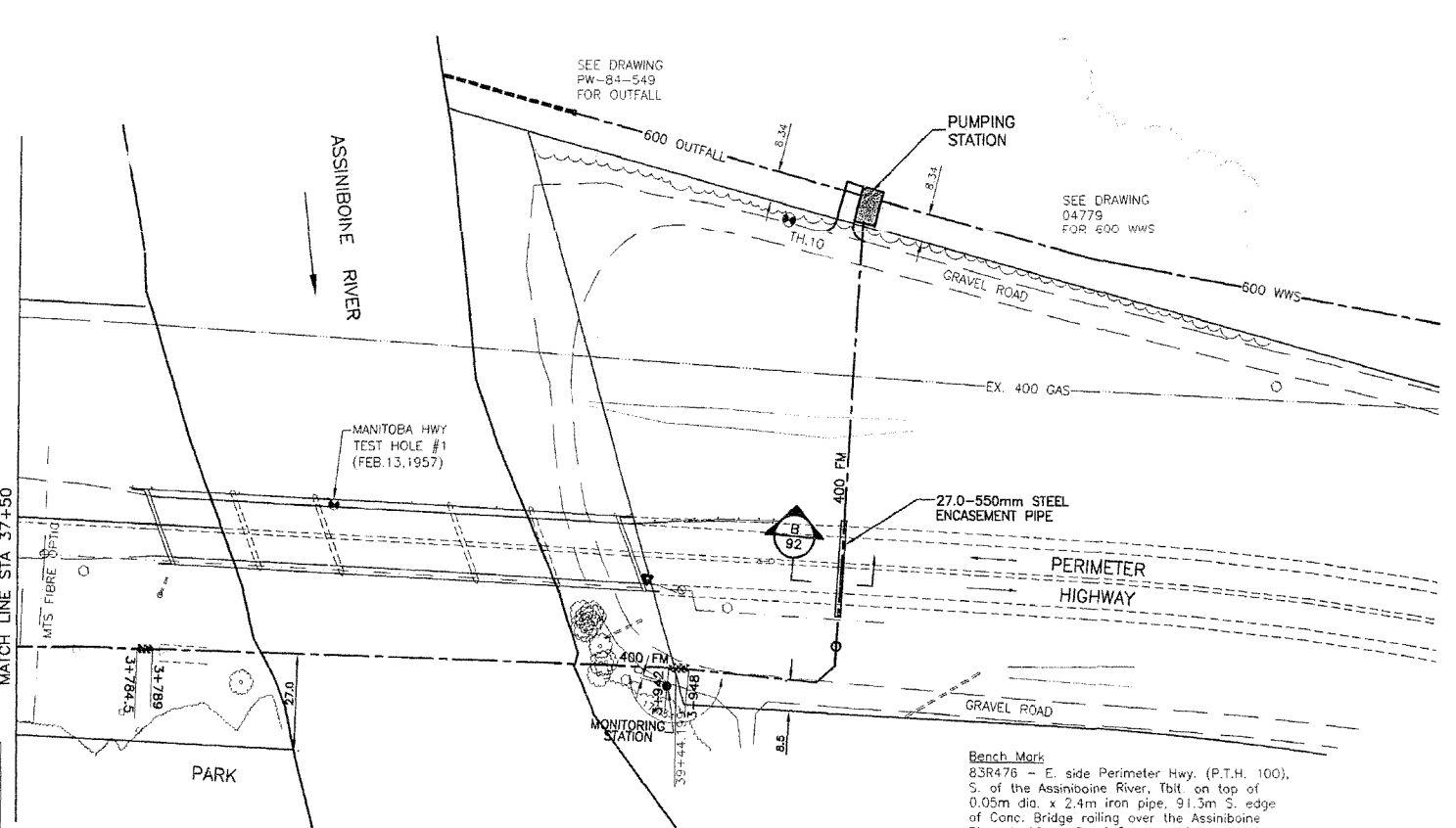


MATERIAL LIST			
WASTE WATER SEWER	MANUFACTURER	SPECIFICATION	SPECIAL FEATURES
MANHOLE BASES	LAFARGE	ASTM C76	REINF. CONC.
MANHOLE RISERS	LAFARGE	ASTM C76	REINF. CONC.
FRAMES AND COVERS	TITAN FOUNDRY	CW 2151/CW 3205	C.I.
600 SEWER	IPEX	ASTM F769	PVC
600 OUTFALL SEWER	LAFARGE	ASTM C76	REINF. CONC.
400 FORCEMAIN PIPE	IPEX CENTURION	ASTM C-900	PVC
550 ENCASUREMENT PIPE	CCTF (OAKVILLE, ONT.)	8.74mm THICK	STEEL (DEV-TAR COATING)
400 ENCASUREMENT PIPE (RIVER CROSSING)	CCTF	9.53mm THICK	STEEL (DEV-TAR COATING)
500 CSP	ARMCO	2mm THICK	GALVANIZED METAL
500 SLIP JOINT	ARMCO		GALVANIZED METAL
400-45° BEND	GRINNELL	AWWA C-110	C.I.
400-22.5° BEND	IPEX	ASTM-C900	PVC
400 GATE VALVE	CLOW	AWWA C-509	PVC
400-300 REDUCER	STAR	C-110	PVC
400-11.25° BEND	STAR	C-110	PVC
COUPLING	FORD		
400 COUPLING	ROBAR	C-110 DI	STEEL
CONTRACTOR: MAPLE LEAF CONSTRUCTION			



METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

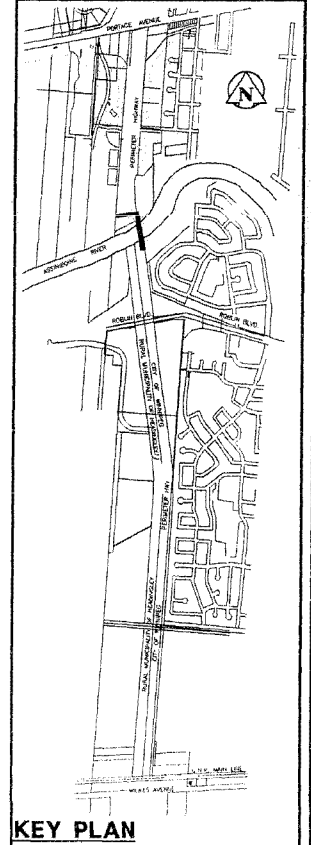
REVISED AS CONSTRUCTED
By V.M. DATE 2001/04/04
CHECKED BY P.M.



AIR RELEASE VALVE CHAMBER AT STATION 39+98.300

NOTE:
ALL 400 FM BENDS RESTRAINED USING A SERIES 1300 UNI-FLANGE BLOCK BUSTER RESTRAINT DEVICE AND A THRUST BLOCK (SD-004,SD-005)

NOTE:
CHAINAGES CALCULATED ALONG CENTERLINE OF 400 PVC FM



KEY PLAN

150 MM	WATERMAIN	150 MM	HYDRO	150 MM	WATERMAIN	150 MM
+	HYDRANT	+	M.T.S.	+	HYDRANT, VALVE	+
+	VALVE	+	CONCRETE	+	LAND DRAINAGE SEWER	+
+	LAND DRAINAGE SEWER	+	ASPHALT	+	WASTE WATER SEWER	+
+	WASTE WATER SEWER	+	SIDEWALK	+	Q PROFILE	+
+	MANHOLE	+	PROPERTY LINE	+	NORTH OR WEST GUTTER	+
+	CATCH BASIN	+	SURVEY BAR	+	SOUTH OR EAST GUTTER	+
+	CURB INLET	+	DITCH	+	NORTH OR WEST R	+
+	JUNCTIONS	+	ELEVATION	+	SOUTH OR EAST R	+
+	CULVERT	+		+	NORTH OR WEST DITCH	+
+	GAS	+		+	SOUTH OR EAST DITCH	+
+	EXISTING	+	LEGEND-PLAN	+	PROPOSED	+
+	LEGEND-PLAN	+	PROPOSED	+	EXISTING	+
+	LEGEND-PROFILE	+	PROPOSED	+	LEGEND-PROFILE	+
+	PROPOSED	+	EXISTING	+	PROPOSED	+

LOCATION APPROVED UNDERGROUND STRUCTURES		B.M. 48-025 ELEV. 237.037m	
DESIGNED BY	C.D.	DATE	
CHECKED BY	F.J.S.	DATE	
DRAWN BY	T.G.	DATE	
APPROVED BY	D.M.	DATE	
REVISIONS	DATE	BY	
2	REVISED AS CONSTRUCTED	00/01/04	V.M.
1	ADDED WATER & WASTE COMMENTS	00/10/18	T.G.
NO.	REVISIONS	DATE	BY
		00/03/06	

Stantec Consulting Ltd.
905 Waverley Street, Winnipeg, Manitoba
Tel 204-489-5900 Fax 204-453-9012

ENGINEER'S SEAL
C.L. DYCK
REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY: C.D.
CHECKED BY: F.J.S.
DRAWN BY: T.G.
APPROVED BY: D.M.

HOR. SCALE: 1:1000
VERTICAL: 1:100

RELEASED FOR CONSTRUCTION
DATE

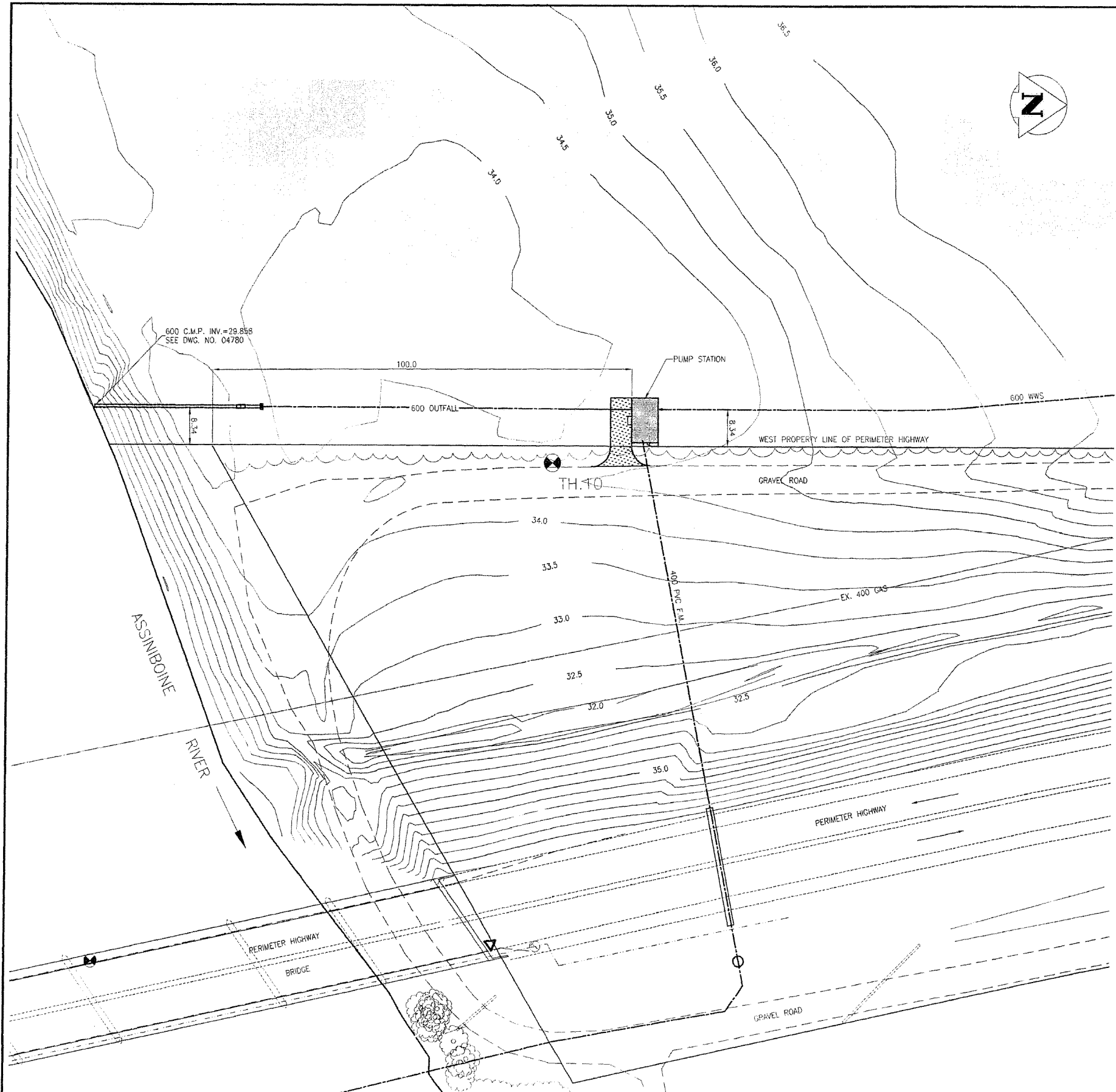
CONSULTANT DRAWING NO.
PW-92-549

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

PERIMETER WEST FORCEMAIN
WASTE WATER SEWER AND PUMP STATION
400 FORCEMAIN AND PUMP STATION
PHASE 2
STA 37+50 TO STA 41+50

CITY DRAWING NUMBER: 04788
SHEET: 10 OF 24

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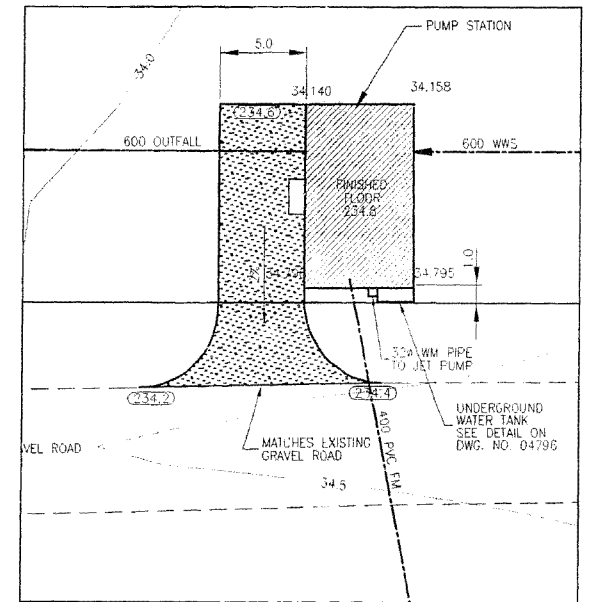
Testhole No. TH10

Depth (m)	Symbol	Testhole Log	Elevation (m)	Other Tests
0		Ground Surface	234.2	
0		FILL - grass covered clay	233.743	
1		CLAY		Water Level 99/05/13 -UFVS=123kPa -DFVS=29kPa
2		-very stiff to stiff, black, some roots		
2		-brown below 1.2m, trace silt and gypsum		
2		-sand layers below 2.4m, slight seepage		
2		-grey at 4.9m		
2		-firm to soft below 5m		
6		GLACIAL TILL	228.409	
7		-very soft, clayey, grey, wet		
7		-medium dense at 6.1m, silty, sandy, gravelly		
7		-abundant gravel, some cobbles below 7.6m		
8		-red, medium dense to dense below 10.1m, some gravel		
8		-seepage		
10			223.532	
11				

End testhole at 10.7m from grade.

NOTES

- 1) Testhole open to 7.9m from grade upon completion of drilling.
- 2) Ground water level at 3.4m from grade upon completion of drilling.



SITE PLAN
SCALE: 1:500

CONSTRUCTION COMPLETION DATE - AUGUST 2001

REVISED AS CONSTRUCTED
 BY: K.R. DATE: 24/08/2001
 CHECKED BY: R.M.

METRIC
 WHOLE NUMBERS INDICATE MILLIMETRES
 DECIMALIZED NUMBERS INDICATE METRES

LOCATION APPROVED UNDERGROUND STRUCTURES		B.M. ELEV.
SUPV. U/G STRUCTURES COMMITTEE	DATE	
NOTE: LOCATION 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.		
NO. REVISIONS	DATE	BY
1	24.08.01	K.R.

Stantec Consulting Ltd.
 905 Waverley Street, Winnipeg, Manitoba
 Tel: 204-489-5900 Fax: 204-455-9012

DESIGNED BY: T.T.	CHECKED BY: T.T.
DRAWN BY: R.M.	APPROVED BY: D.G.M.
HOR. SCALE: AS SHOWN	RELEASED FOR CONSTRUCTION:
VERTICAL:	DATE: MAY 8, 2000

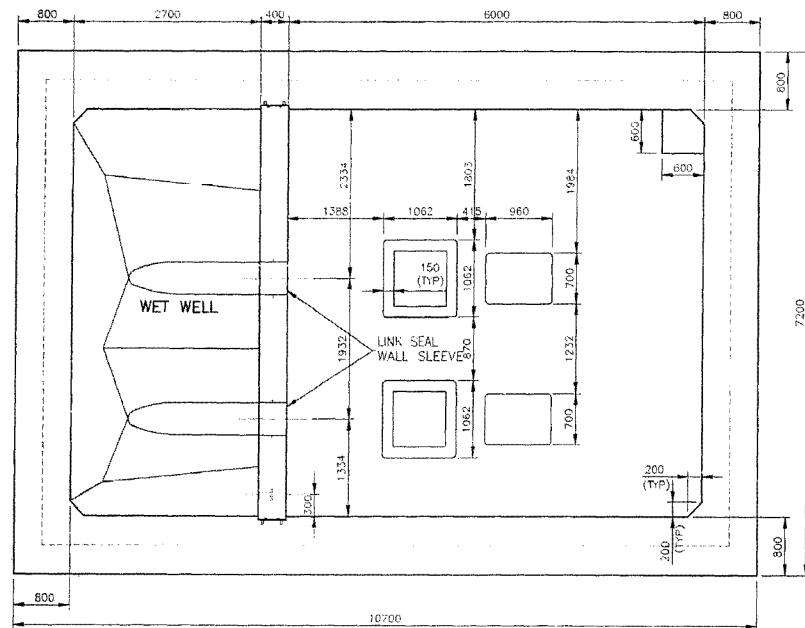
ENGINEER'S SEAL
D. G. MULDER
 REGISTERED ENGINEER
 CONSULTANT DRAWING NO. PW-93-549

THE CITY OF WINNIPEG
 WATER AND WASTE DEPARTMENT

PERIMETER WEST FORCEMAIN
 WASTEWATER SEWER AND PUMP STATION
 WASTE WATER PUMP STATION
 PHASE 2
 SITE PLAN

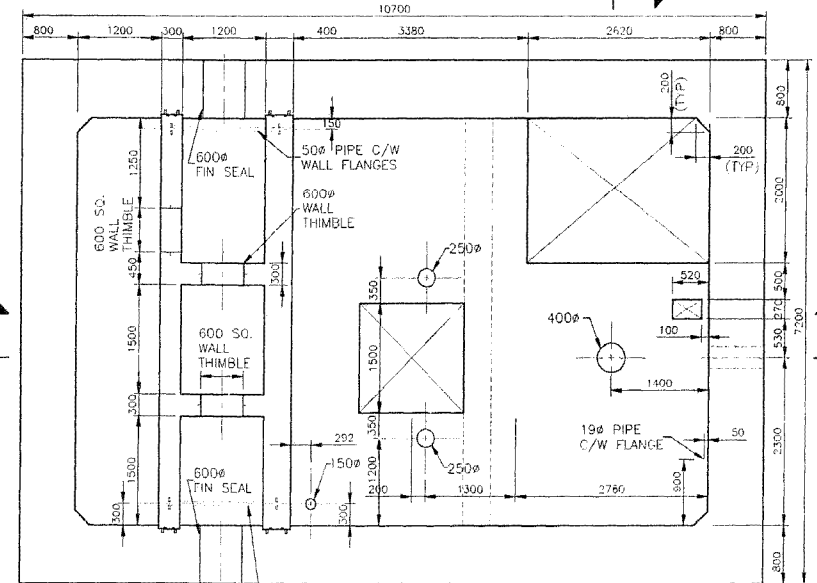
CITY DRAWING NUMBER: 04789
 SHEET 11 OF 24

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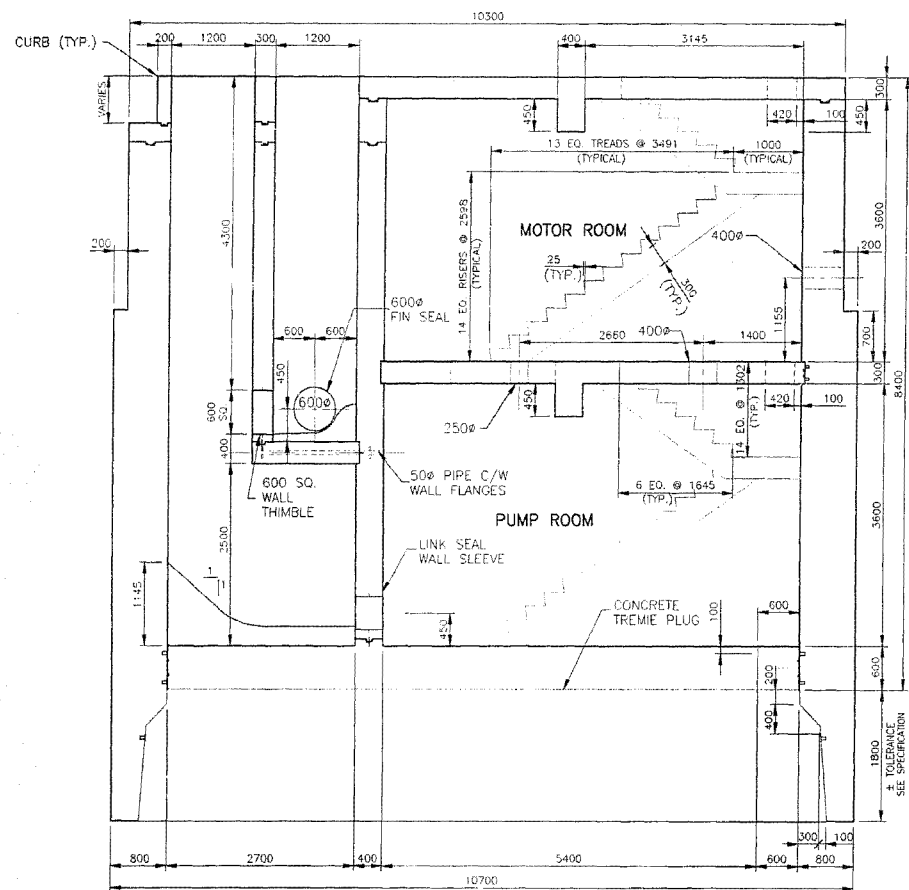


WET WELL/DRY WELL FLOOR PLAN
SCALE: 1:50

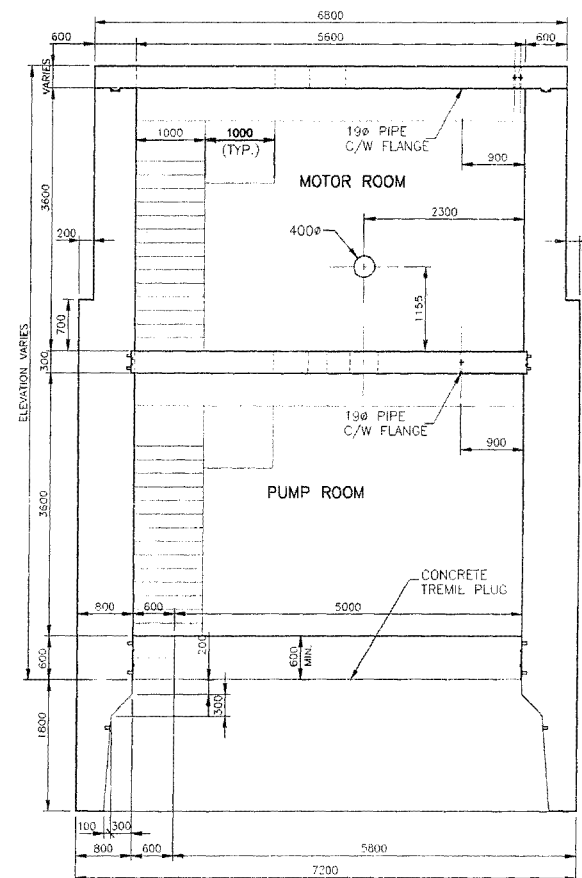
NOTE:
CONCRETE STAIRS AND
LANDING NOT SHOWN ON
PLANS FOR CLARITY.
REFER TO SECTIONS



MOTOR ROOM FLOOR PLAN
SCALE: 1:50



SECTION A
SCALE 1:50



SECTION B
SCALE 1:50

CONSTRUCTION COMPLETION DATE - AUGUST 2001

REVISED AS CONSTRUCTED
BY: P.P. DATE: 24/08/2001
CHECKED BY: P.M.

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

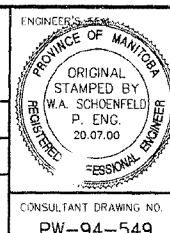
LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES DATE COMMITTEE

NOTE:
LOCATION 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.

B.M. ELEV.	
1	REVISED AS CONSTRUCTED 24.08.01 K.R.
NO.	REVISIONS DATE BY

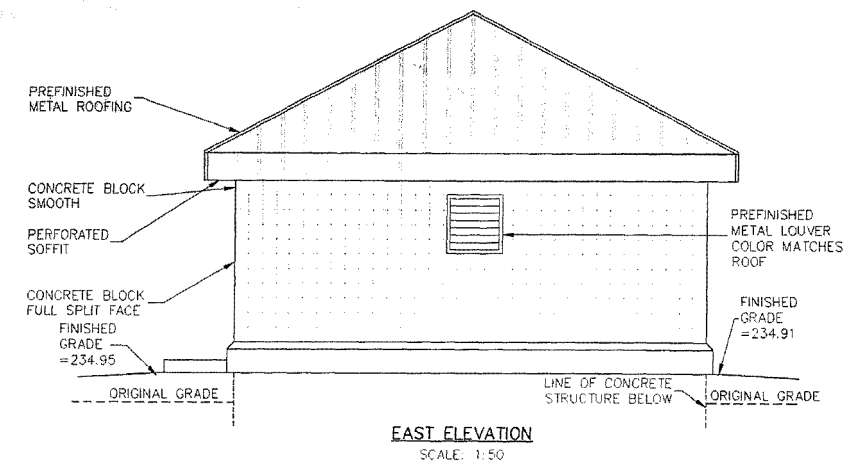
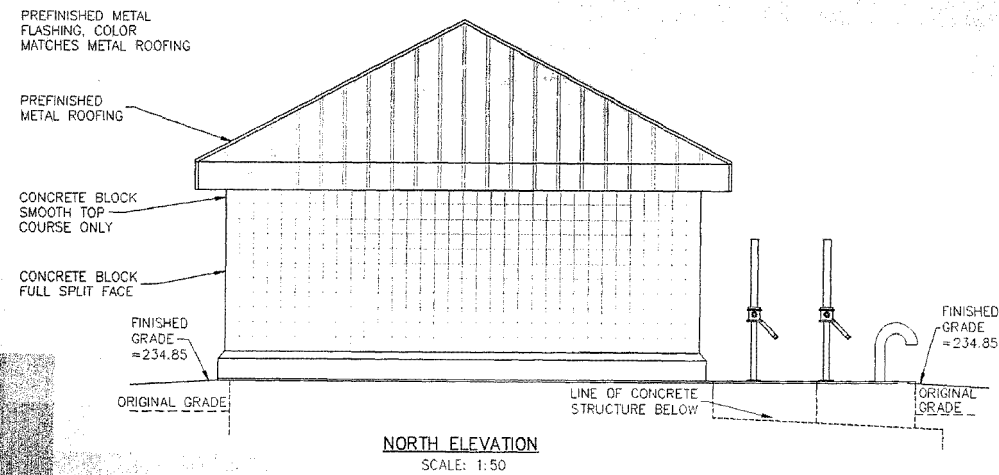
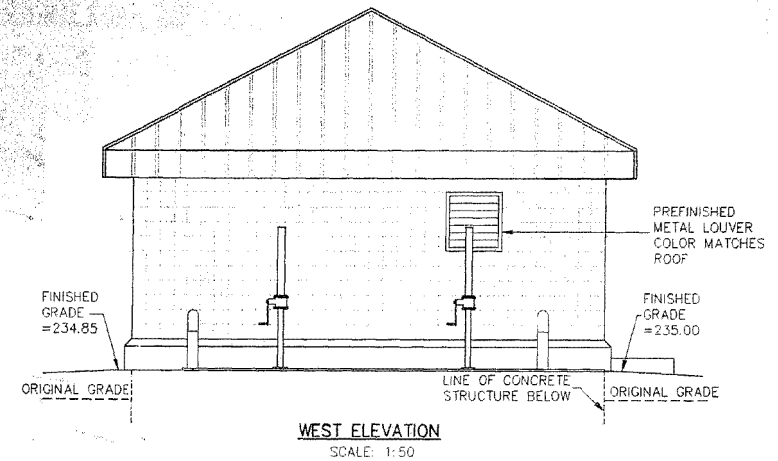
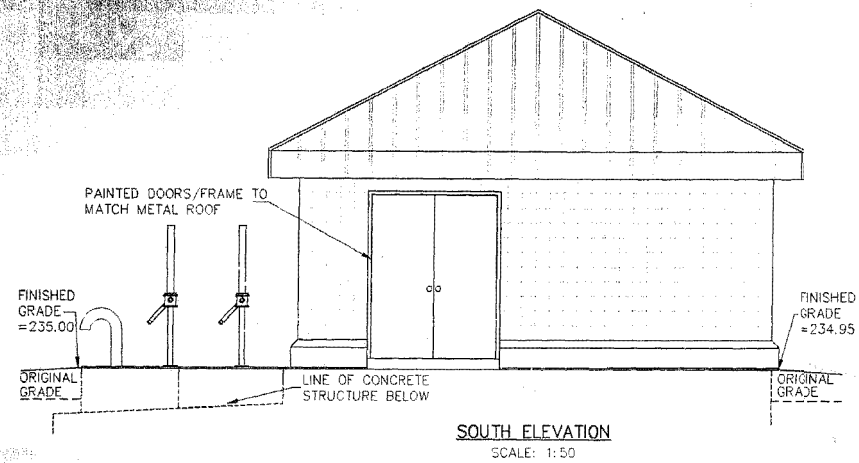
Stantec Consulting Ltd.	
905 Waverley Street, Winnipeg, Manitoba Tel 204-489-5900 Fax 204-453-9011	
DESIGNED BY: W.S.	CHECKED BY: W.S.
DRAWN BY: R.M.	APPROVED BY: D.G.M.
HOR. SCALE: 1:50	RELEASED FOR CONSTRUCTION
VERTICAL:	DATE: JULY 24, 2000



THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

PERIMETER WEST FORCEMAIN
WASTE WATER SEWER AND PUMP STATION
PHASE 2
WASTE WATER PUMP STATION
CONCRETE PLANS AND SECTIONS
SHEET #1

CITY DRAWING NUMBER: 04790
SHEET 12 OF 24
CONSULTANT DRAWING NO.: PW-94-549



METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

REVISED AS CONSTRUCTED
BY K.R. DATE 24/08/2001
CHECKED BY R.M.

LOCATION APPROVED UNDERGROUND STRUCTURES		B.M. ELEV.
SUPV. U/G STRUCTURES COMMITTEE	DATE	
NOTE: LOCATION 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.		
NO. REVISIONS	DATE	BY
1	24.08.01	K.R.

Stantec Consulting Ltd.
905 Waverley Street, Winnipeg, Manitoba
Tel 204-489-5900 | 204-453-9012

DESIGNED BY: W.S.	CHECKED BY: W.S.
DRAWN BY: R.M.	APPROVED BY: D.G.A.
HOR. SCALE: AS SHOWN	RELEASED FOR CONSTRUCTION: DATE
VERTICAL:	

ENGINEER'S SEAL
PROVINCE OF MANITOBA
ORIGINAL STAMPED BY
W.A. SCHOENFELD
P. ENG. 20.07.00
REGISTERED PROFESSIONAL ENGINEER
CONSULTANT DRAWING NO.
PW-98-549

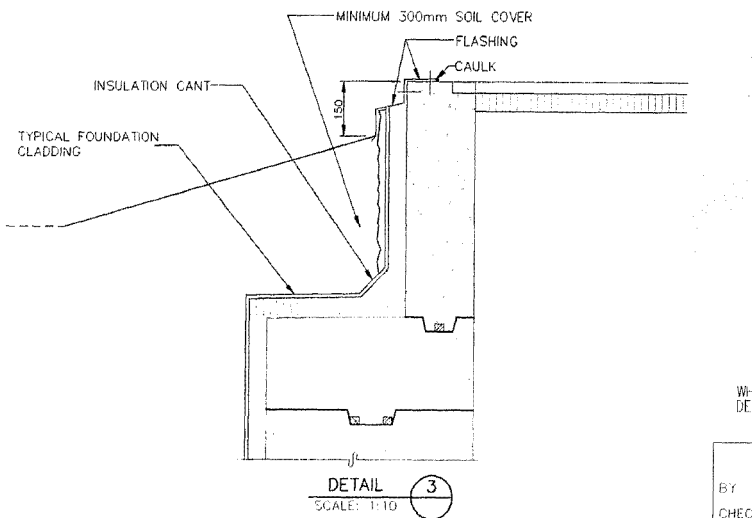
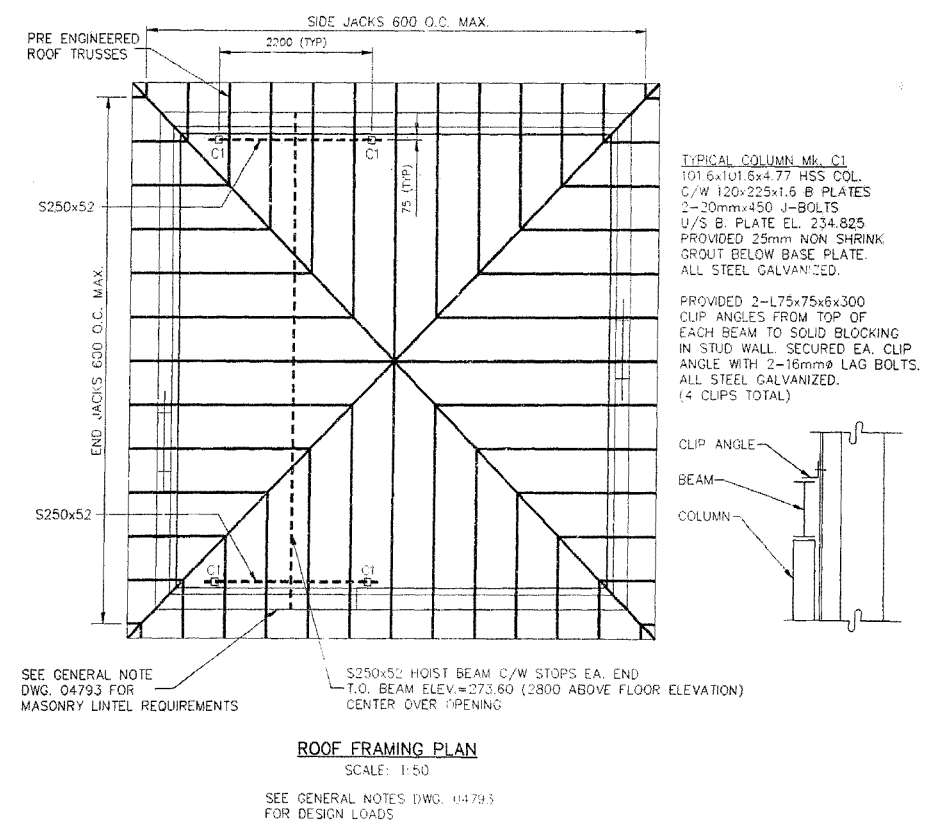
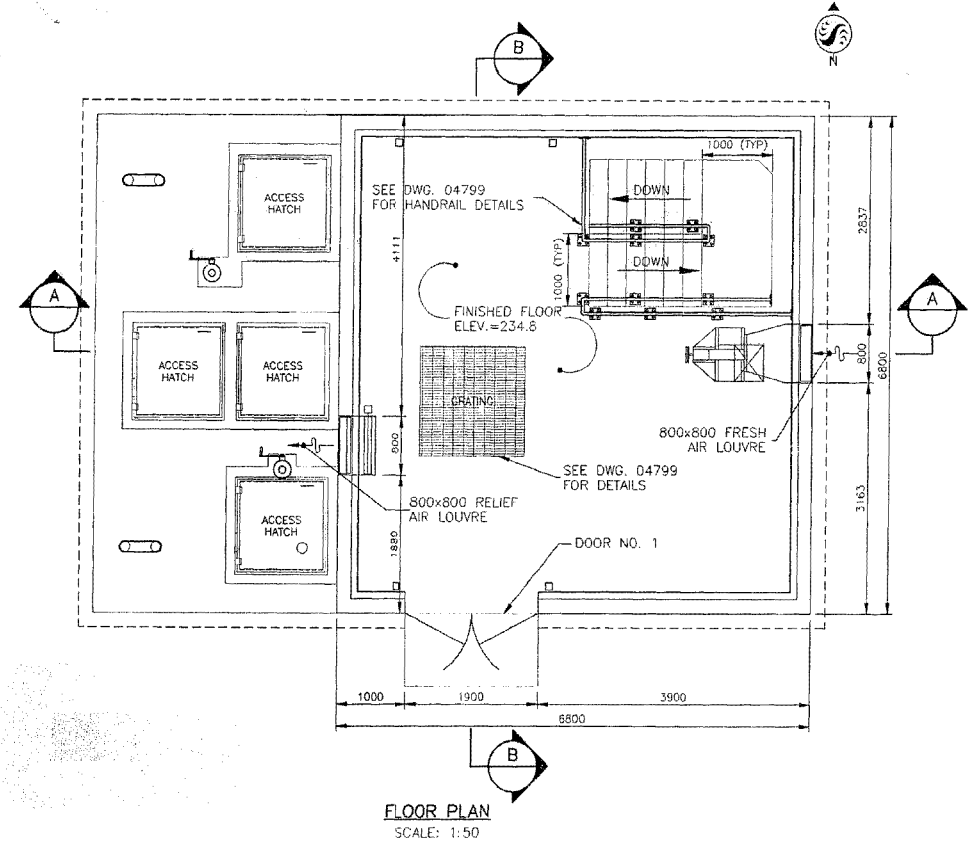
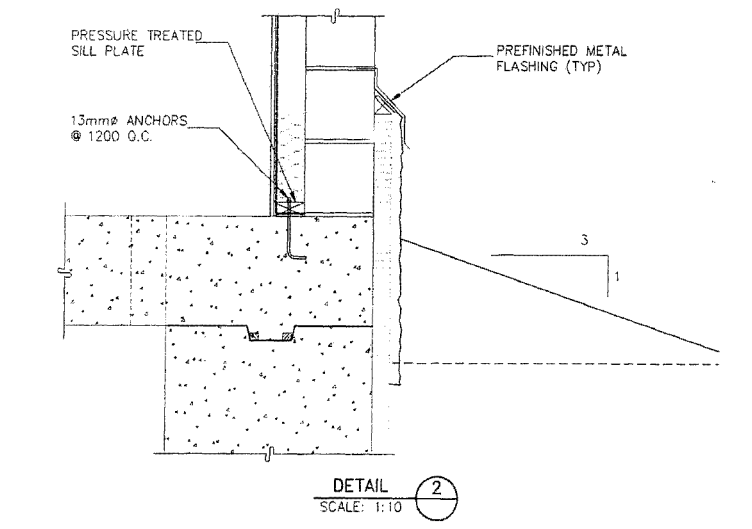
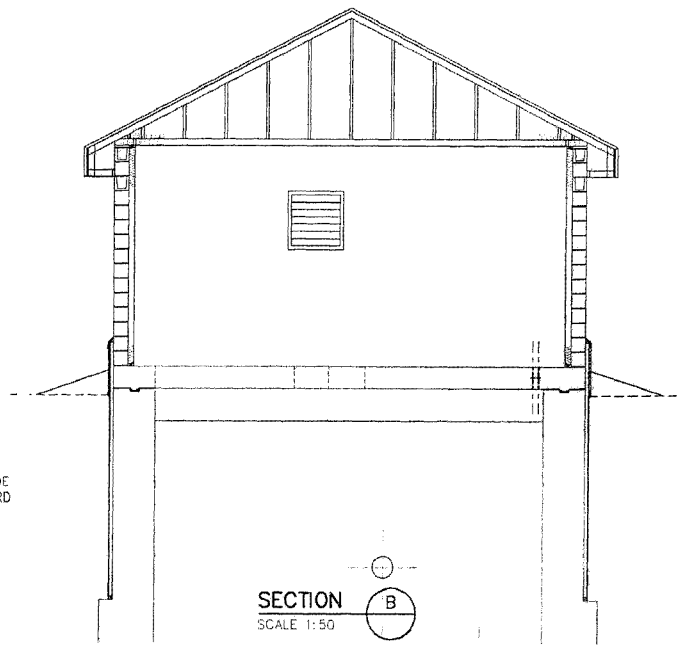
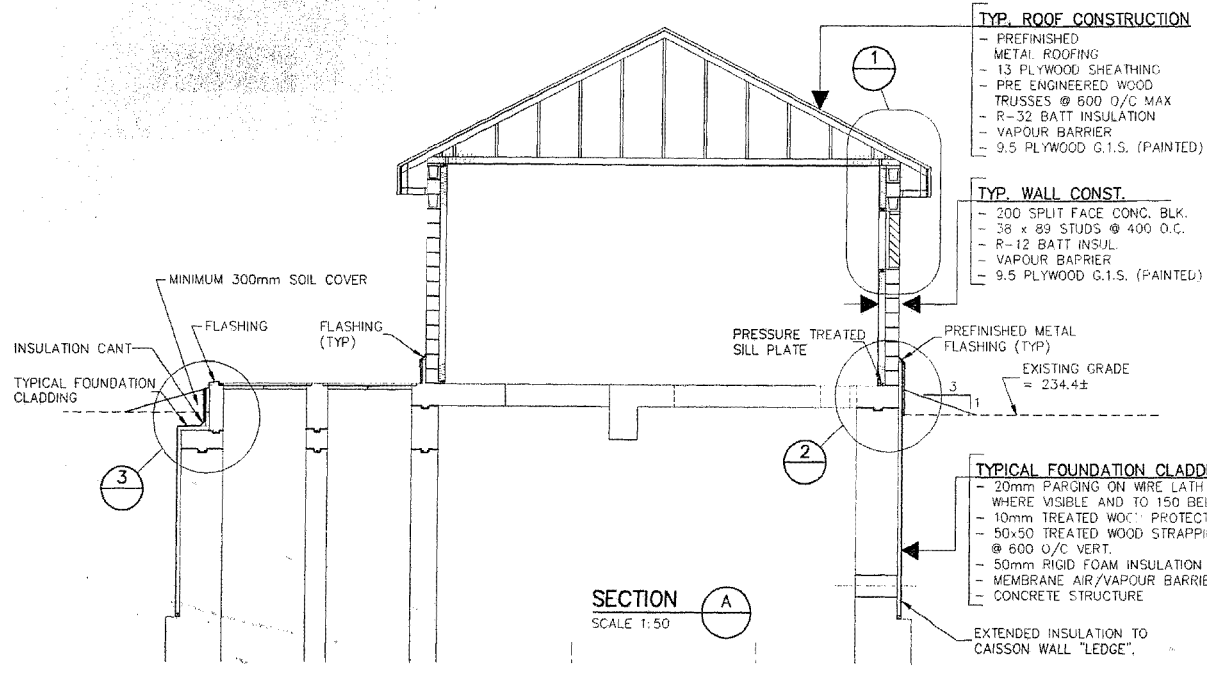
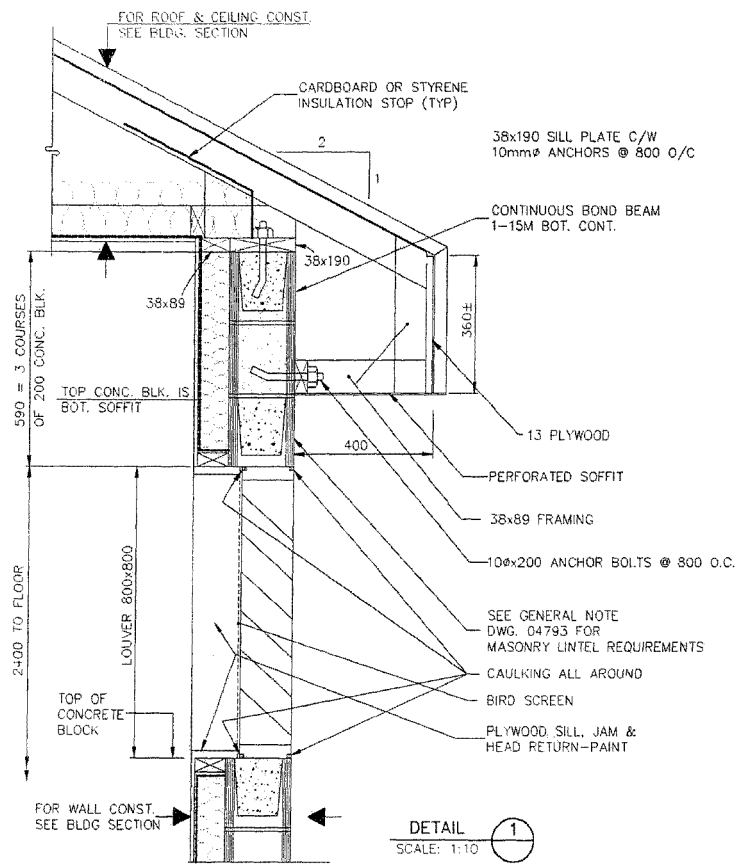
CONSTRUCTION COMPLETION DATE - AUGUST 2001

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

PERIMETER WEST FORCEMAIN
WASTE WATER SEWER AND PUMP STATION
PHASE 2

PUMP HOUSE
BUILDING ELEVATIONS
AND DETAILS

CITY DRAWING NUMBER 04794
SHEET 16 OF 24



METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

REVISED AS CONSTRUCTED
BY K.R. DATE 24/08/2001
CHECKED BY P.M.

LOCATION APPROVED UNDERGROUND STRUCTURES		B.M. ELEV.
SUPV. U/G STRUCTURES COMMITTEE	DATE	
NOTE: LOCATION 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.		
NO. REVISIONS	DATE	BY
1	REVISED AS CONSTRUCTED 24.08.01	K.R.

Stantec Consulting Ltd.
905 Waverley Street, Winnipeg, Manitoba
Tel 204-489-5900 Fax 204-453-9012

DESIGNED BY W.S. CHECKED BY W.S.
DRAWN BY R.M. APPROVED BY D.C.

HOR. SCALE: AS SHOWN VERTICAL: RELEASED FOR CONSTRUCTION

DATE MAY 8, 2000

CONSULTANT DRAWING NO. PW-99-549

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

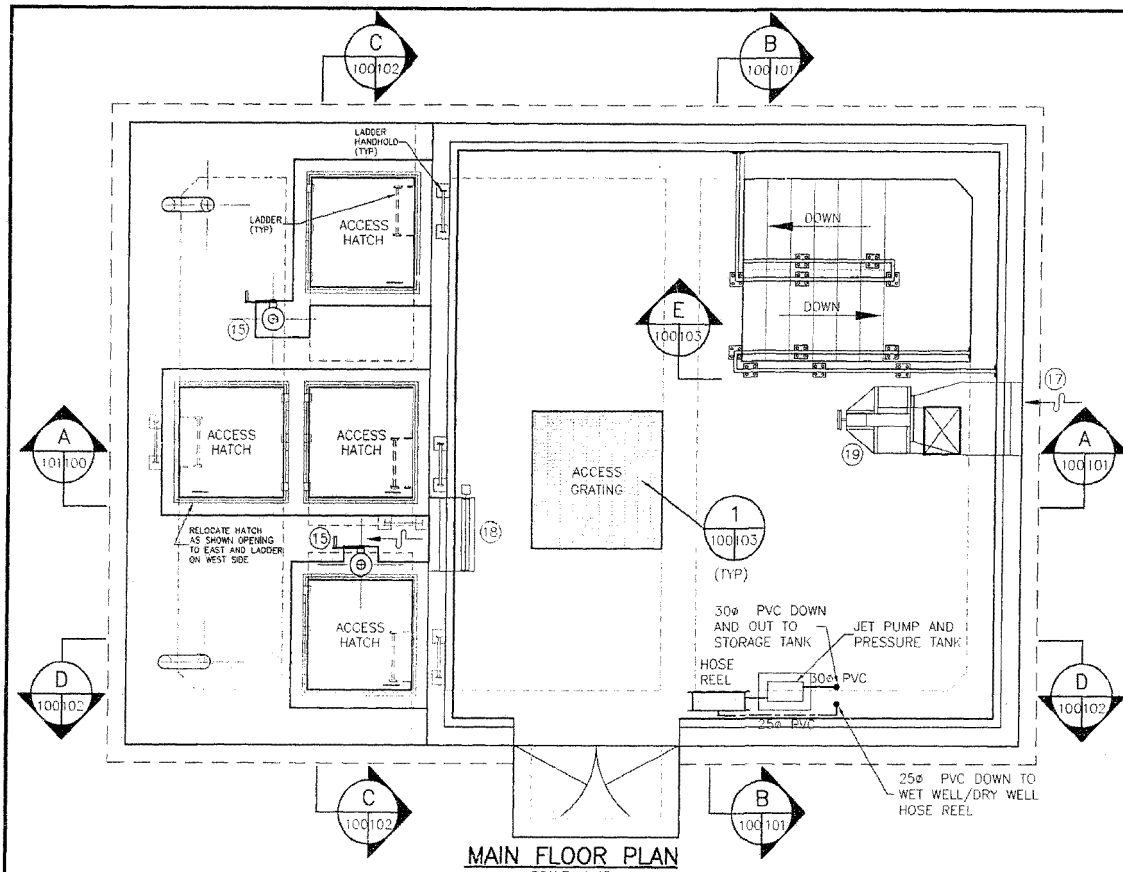
PERIMETER WEST FORCEMAIN
WASTE WATER SEWER AND PUMP STATION
PHASE 2

PUMP STATION
BUILDING ELEVATIONS
AND DETAILS

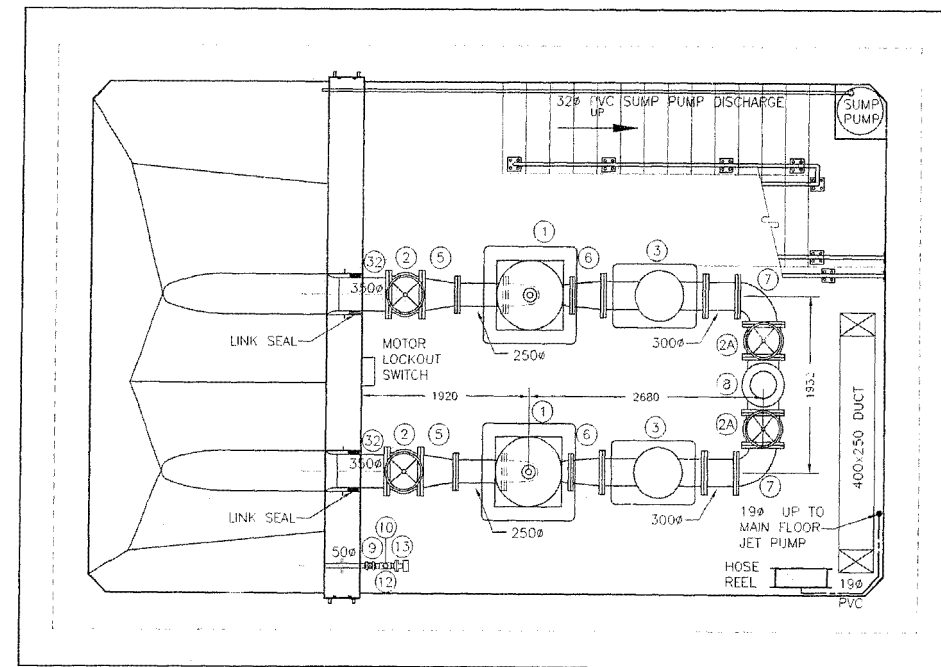
CITY DRAWING NUMBER 04795
SHEET 17 OF 24

CONSTRUCTION COMPLETION DATE - AUGUST 2001

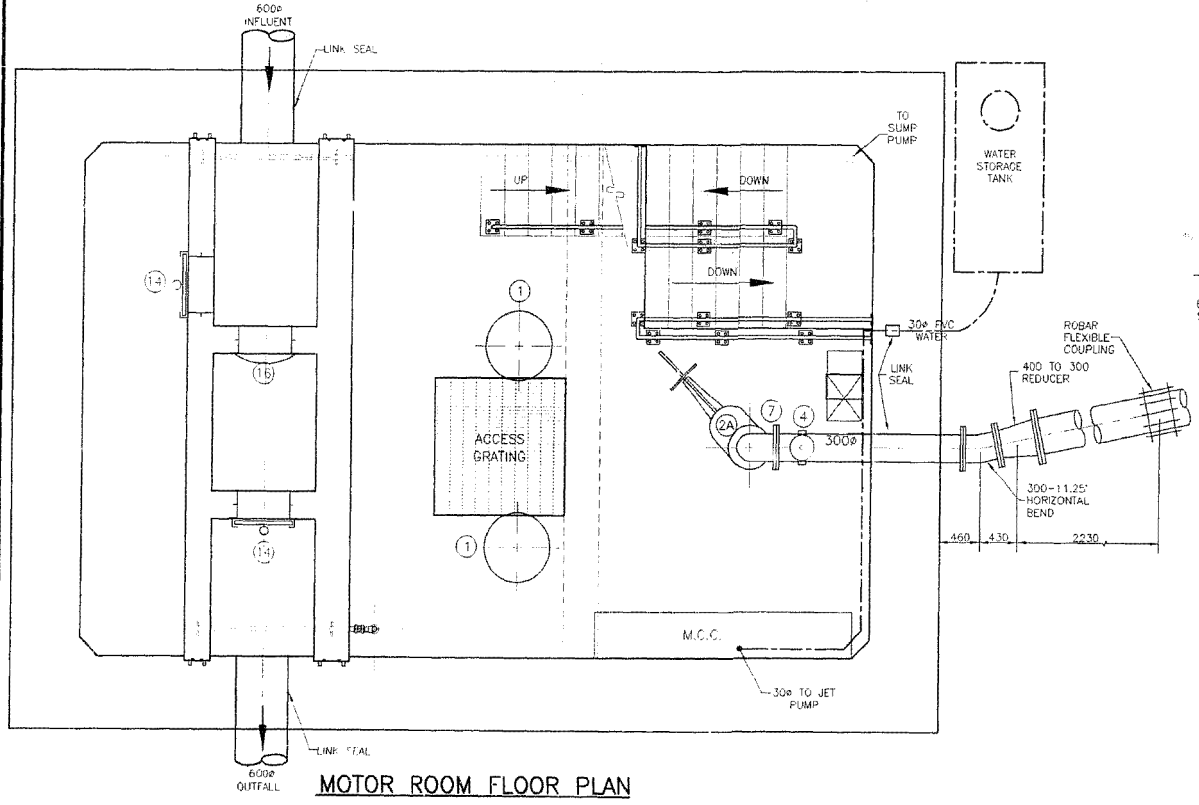
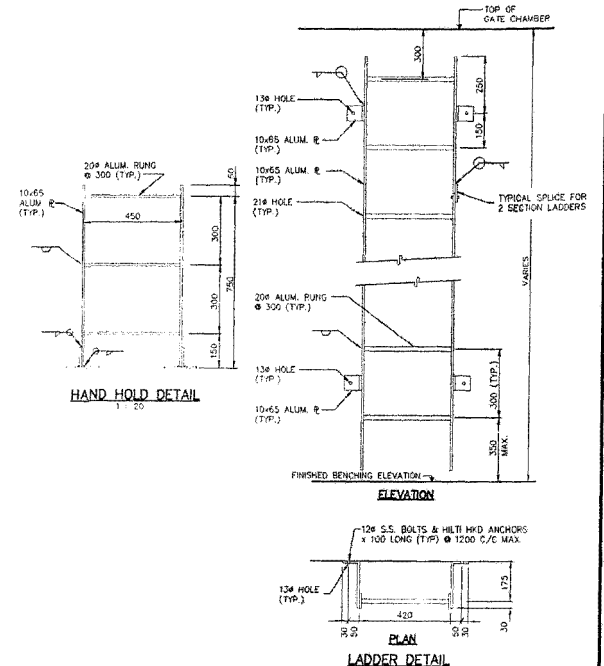
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2001-08-11 12:58:04 By: mcm



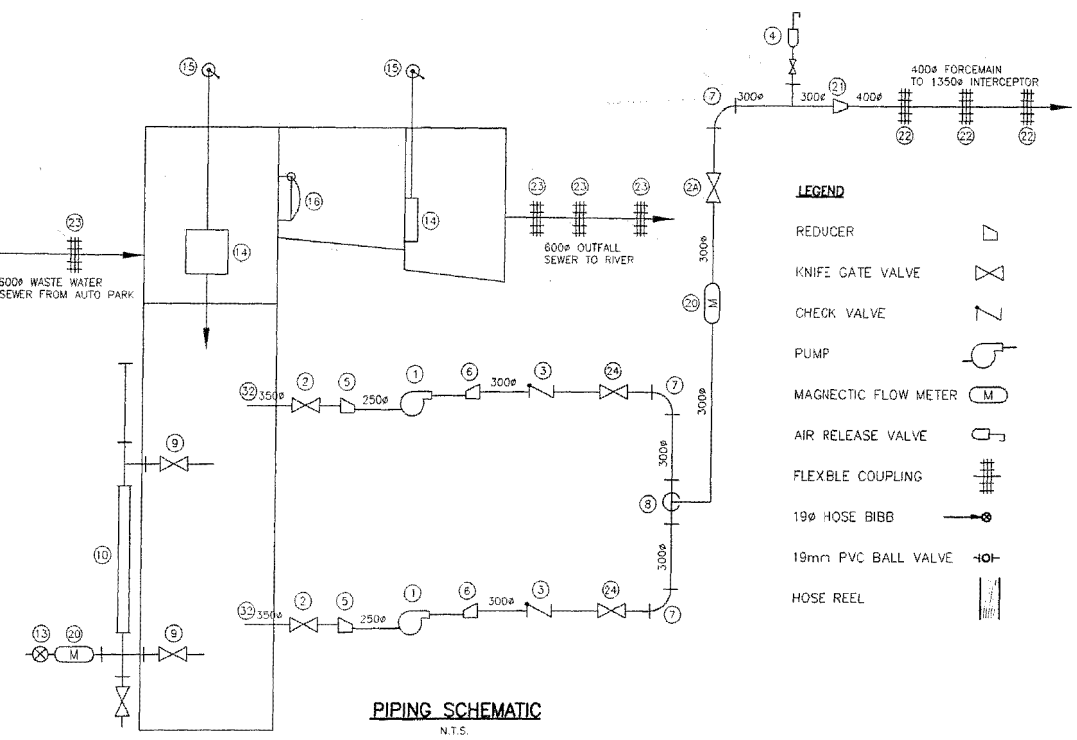
MAIN FLOOR PLAN
SCALE: 1:40



WET WELL/DRY WELL FLOOR PLAN
SCALE: 1:40



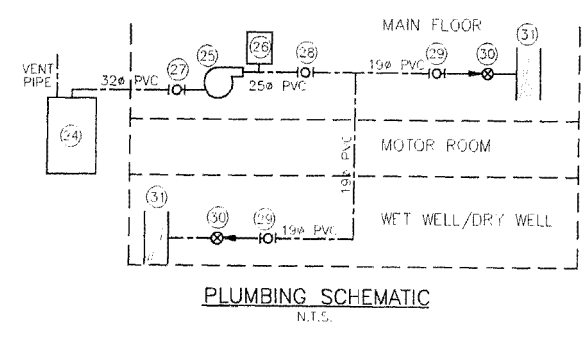
MOTOR ROOM FLOOR PLAN
SCALE: 1:40



PIPING SCHEMATIC
N.T.S.

LIST OF ITEMS		
ITEM NO.	NO.	DESCRIPTION
1.	2	125 H.P. SEWAGE PUMP
2.	2	350Ø GATE VALVE (RISING STEM)
2A.	3	300Ø GATE VALVE (RISING STEM)
3.	2	300Ø BALL CHECK VALVE
4.	1	AIR RELIEF VALVE
5.	2	350Ø TO 250Ø ECCENTRIC REDUCER
6.	2	300Ø TO 250Ø OR 200Ø ECCENTRIC REDUCER
7.	3	300Ø-90° BEND
8.	1	300Øx300Øx300 TEE
9.	2	50Ø GATE VALVE
10.	1	50Ø SITE GLASS
11.	1	50x50x50 CROSS
12.	1	50x50x50 TEE
13.	1	DP CELL
14.	2	610x610 HEAVY DUTY C.I. SLUICE GATE GEARED LIFT AND PEDESTAL
15.	2	610Ø FLAP GATE
16.	1	800x800 VENTILATION AIR LOUVRE
17.	1	800x800 EXHAUST AIR LOUVRE
18.	1	VENTILATION FAN
19.	1	300Ø FLOW METER
20.	1	400Ø TO 320Ø CONCENTRIC REDUCER
21.	1	400Ø FLEXEND FLEXIBLE COUPLING
22.	1	600Ø FLEXEND FLEXIBLE COUPLING
23.	5	600Ø FLEXEND FLEXIBLE COUPLING
24.	1	UNDERGROUND WATER STORAGE TANK
25.	1	WATER PUMP - MONARCH MUS-50
26.	1	PRESSURE TANK - MONARCH JR-255
27.	1	32mm PVC BALL VALVE
28.	1	25mm PVC BALL VALVE
29.	2	19mm PVC BALL VALVE
30.	2	19mm HOSE BIBB
31.	2	HOSE REEL
32.	2	350Ø CL. 52 DUCTILE IRON INLET PIPE 1 END FLANGED & 1 END PLAIN

NOTE: USE UNIFLANGE WITH DI PIPE BETWEEN FITTINGS.



PLUMBING SCHEMATIC
N.T.S.

METRIC

REVISED AS CONSTRUCTED

BY: K.R. DATE: 24/08/2001

CHECKED BY: R.M.

LOCATION APPROVED UNDERGROUND STRUCTURES		B.M. ELEV.
SUPV. U/G STRUCTURES COMMITTEE	DATE	
NOTE: LOCATION 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 RELEVANT UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.		
NO. REVISIONS	DATE	BY
2	24.08.01	K.R.
1	00.09.21	R.M.

Stantec Consulting Ltd.
905 Waverley Street, Winnipeg, Manitoba
Tel: 204-489-9000 Fax: 204-453-9012

DESIGNED BY: T.T. CHECKED BY: T.T.
DRAWN BY: R.M. APPROVED BY: G.M.

HOR. SCALE: AS SHOWN
VERTICAL: 1:10

RELEASED FOR CONSTRUCTION DATE: MAY 8, 2000

INSULATION DRAWING NO. PW-100-549

CONSTRUCTION COMPLETION DATE - AUGUST 2001

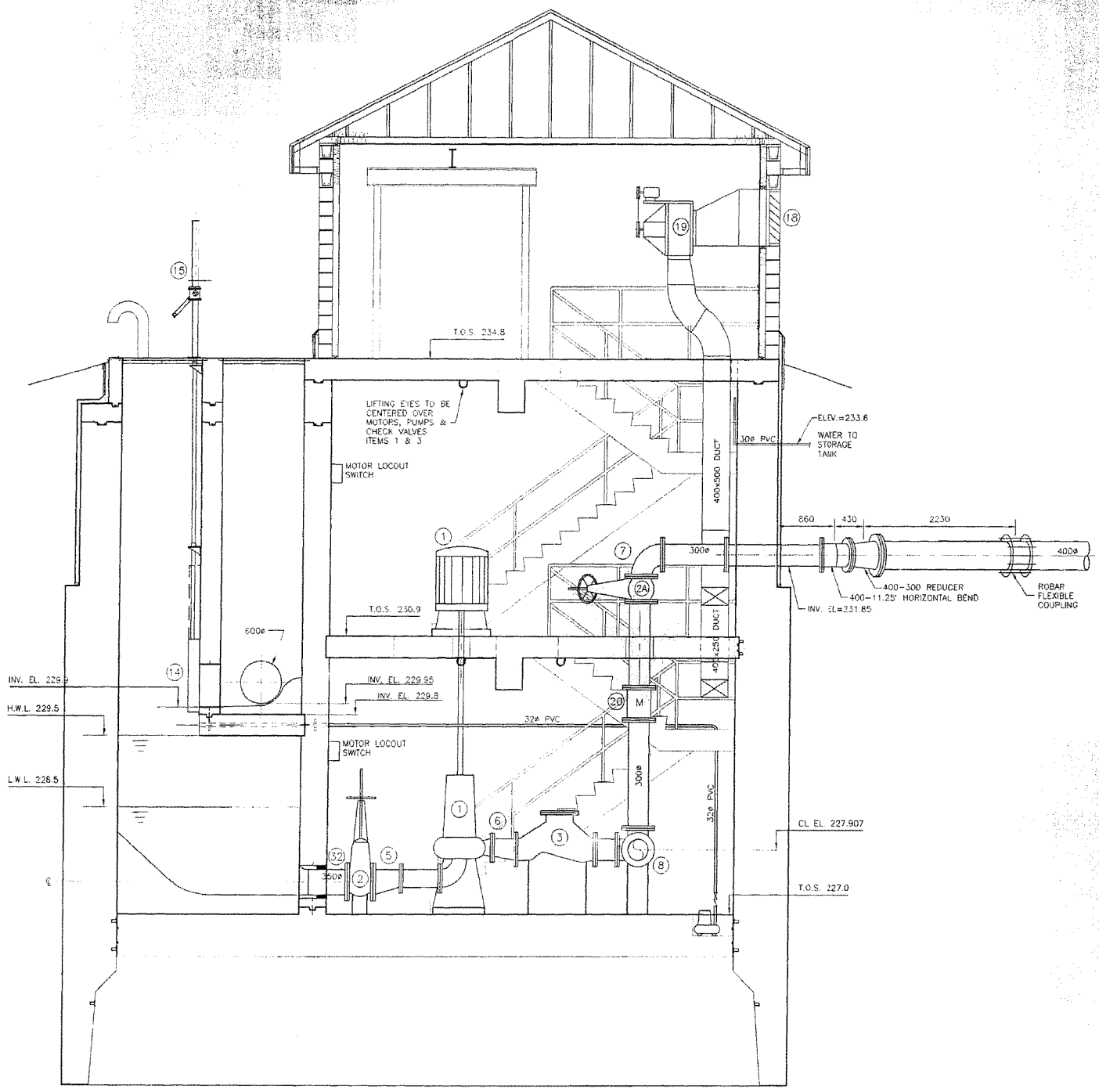
THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

PERIMETER WEST FORCEMAIN
WASTE WATER SEWER AND PUMP STATION
PHASE 2
WASTE WATER PUMP STATION
MECHANICAL PLANS

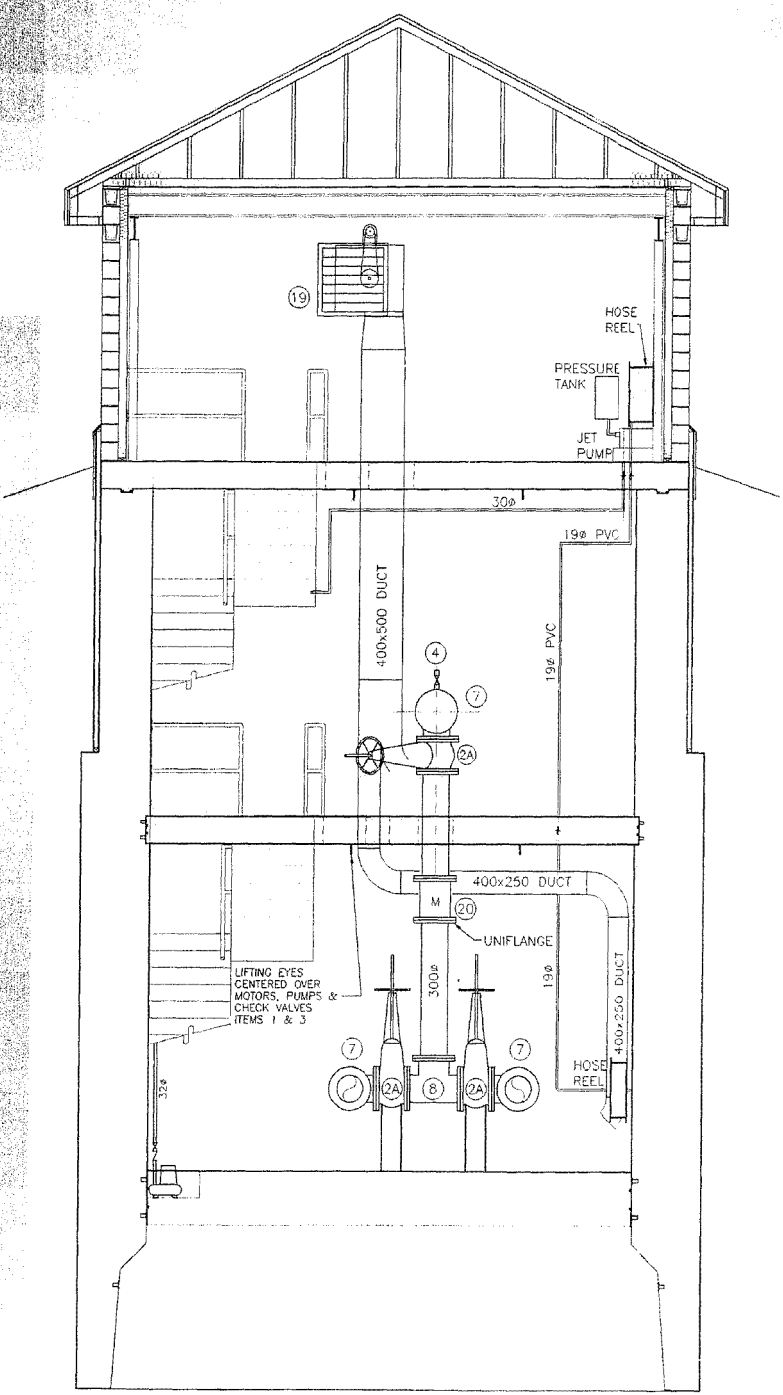
DRAWING NUMBER: 04796
SHEET 18 OF 24

ENGINEER'S SEAL:
D.G. MULDER
REGISTERED PROFESSIONAL ENGINEER
PW-100-549

#118184118182030 - Perimeter w/w 400 (Wastewater) 04796.dwg
 2001-08-09 10:54AM B. mason



SECTION A
SCALE 1:40



SECTION B
SCALE 1:40

K:\168\dwg\1680223 - Perimeter West 450 PA\asv\mexon\04797.dwg
 2007-08-12 01:27PM By: mrona
 SHEET 19 OF 24

METRIC

REVISED AS CONSTRUCTED
 BY: K.R. DATE 24/08/2001
 CHECKED BY: R.M.

LOCATION APPROVED UNDERGROUND STRUCTURES
 SUPPLY U/G STRUCTURES DATE COMMITTEE
 NOTE:
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NO.	REVISIONS	DATE	BY
2	REVISED AS CONSTRUCTED	24.08.01	K.R.
1	REV. WET WELL SLOPES, INLET PIPE & TYPE OF COUPLINGS	30.09.21	R.M.

Stantec Consulting Ltd.
 905 Waverley Street, Winnipeg, Manitoba
 Tel 204-489-5900 Fax 204-453-1112

DESIGNED BY: T.T.	CHECKED BY: T.T.
DRAWN BY: R.M.	APPROVED BY: D.G.M.
HOR. SCALE: AS SHOWN	RELEASED FOR CONSTRUCTION:
VERTICAL:	DATE: MAY 8, 2000

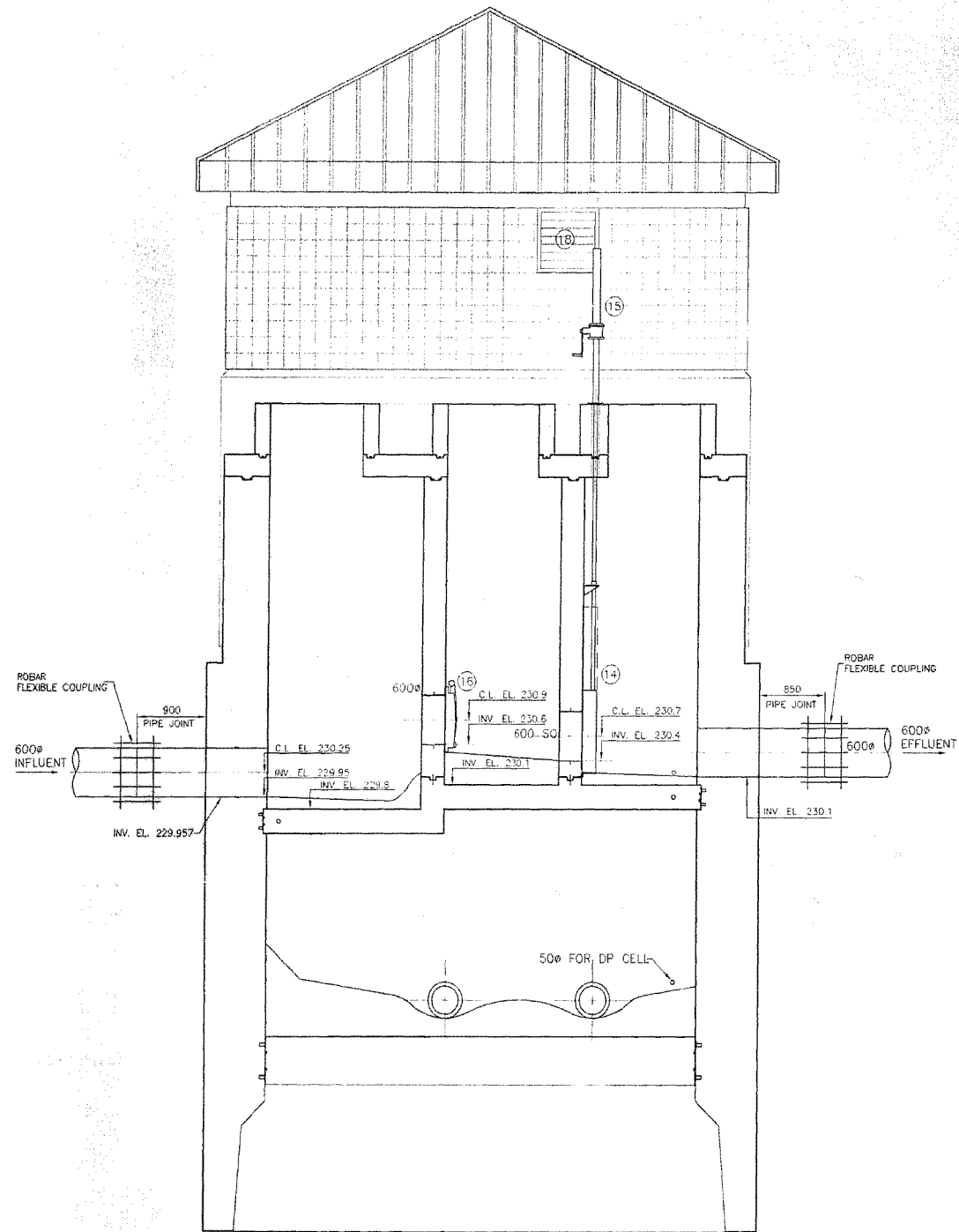
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D. G. MULDER
 14-7-00
 CONSULTANT DRAWING NO. PW-101-549

THE CITY OF WINNIPEG
 WATER AND WASTE DEPARTMENT

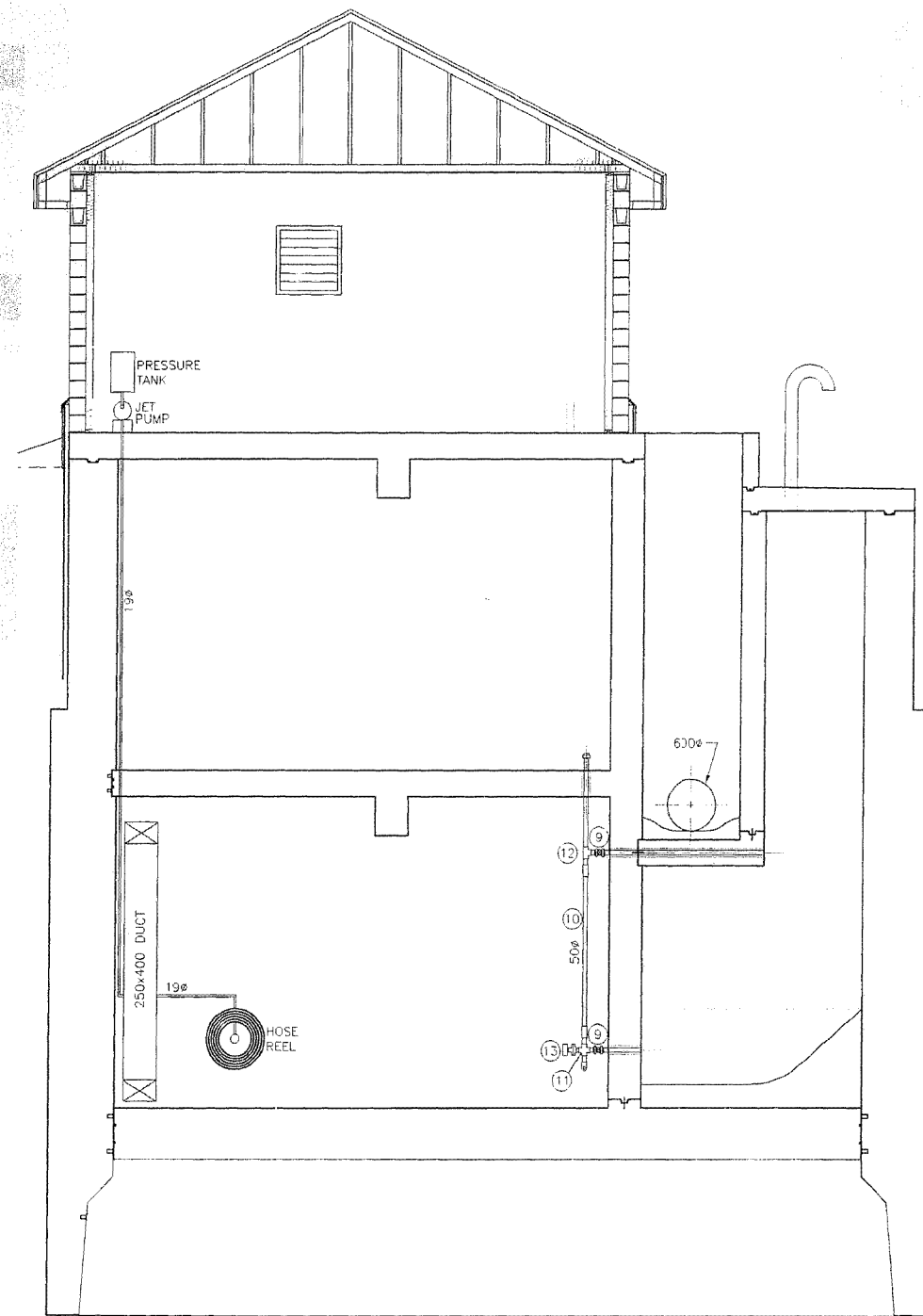
PERIMETER WEST FORCEMAIN
 WASTE WATER SEWER AND PUMP STATION
 PHASE 2
 WASTE WATER PUMP STATION
 MECHANICAL SECTIONS-1

CITY DRAWING NUMBER: 04797
 SHEET: 19 OF 24

CONSTRUCTION COMPLETION DATE - AUGUST 2001



SECTION C
SCALE 1:40



SECTION D
SCALE 1:40

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

REVISED AS CONSTRUCTED
BY: K.R. DATE 24/08/2001
CHECKED BY: R.M.

LOCATION APPROVED UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES DATE COMMITTEE

NOTE:
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NO.	REVISIONS	DATE	BY
2	REVISED AS CONSTRUCTED	24.08.01	K.R.
1	REV. WET WELL SLOPES & TYPE OF COUPLINGS	00.09.21	R.M.

Stantec Consulting Ltd.
905 Waverley Street, Winnipeg, Manitoba
Tel 204-489-5900 Fax 204-453-9012

DESIGNED BY: T.T.	CHECKED BY: T.
DRAWN BY: R.M.	APPROVED BY: D.G.M.

HOR. SCALE: AS SHOWN
VERTICAL: RELEASED FOR CONSTRUCTION

DATE: MAY 8, 20000

ENGINEER'S SEAL
D. G. MULDER
24-7-00
REGISTERED ENGINEER
CONSULTANT DRAWING NO. PW-102-549

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

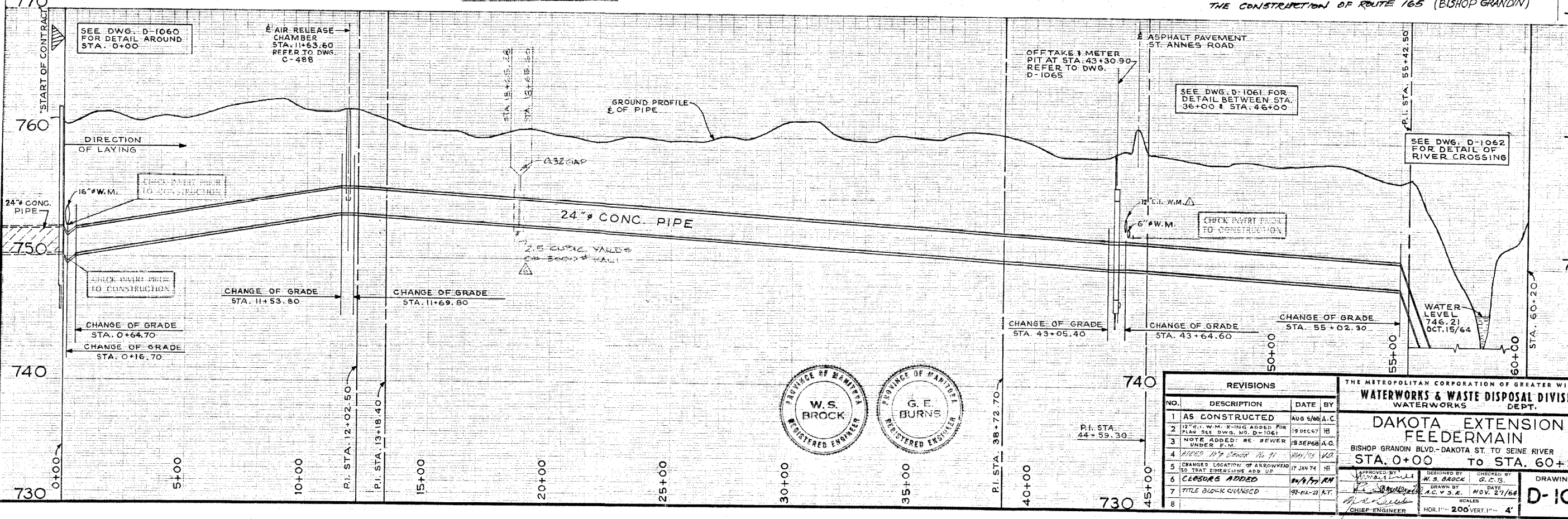
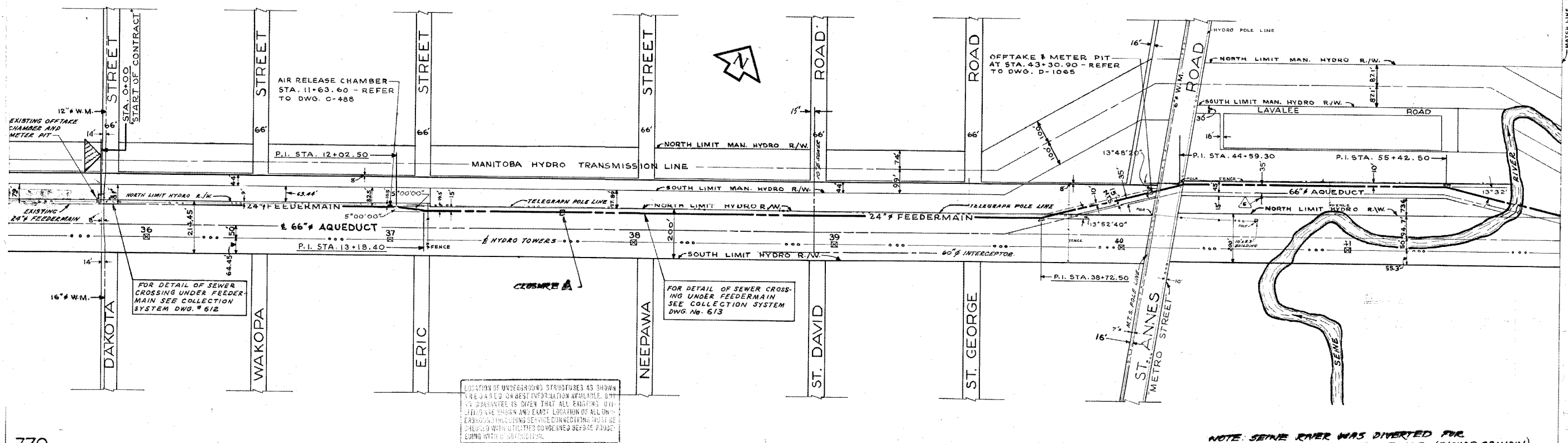
PERIMETER WEST FORCEMAIN
WASTE WATER SEWER AND PUMP STATION
PHASE 2
WASTE WATER PUMP STATION
MECHANICAL SECTIONS-2

CITY DRAWING NUMBER: 04798
SHEET 1 OF 20

CONSTRUCTION COMPLETION DATE - AUGUST 2001

CITY OF ST. VITAL

COMPILED FROM REG'D. PLANS No. 3460, 2040, 3364, 6914, 1774
COMPILED FROM FIELD BOOKS No. 81, 91, AND



REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	AS CONSTRUCTED	AUG 5/64	A.C.
2	12" C.I. W.M. X-ING ADDED FOR PLAN SEE DWS. NO. D-1061	19 DEC 67	HB
3	NOTE ADDED RE SEWER UNDER F.M.	18 SEP 68	A.C.
4	ADDED 12" Sewer No. 91	NOV 15 1968	VD
5	CHANGED LOCATION OF ARROWHEAD SO THAT DIMENSIONS ADD UP	17 JAN 74	HB
6	CLOSURE ADDED	04/17/77	RN
7	TITLE BLOCK CHANGED	03-02-77	AT
8			

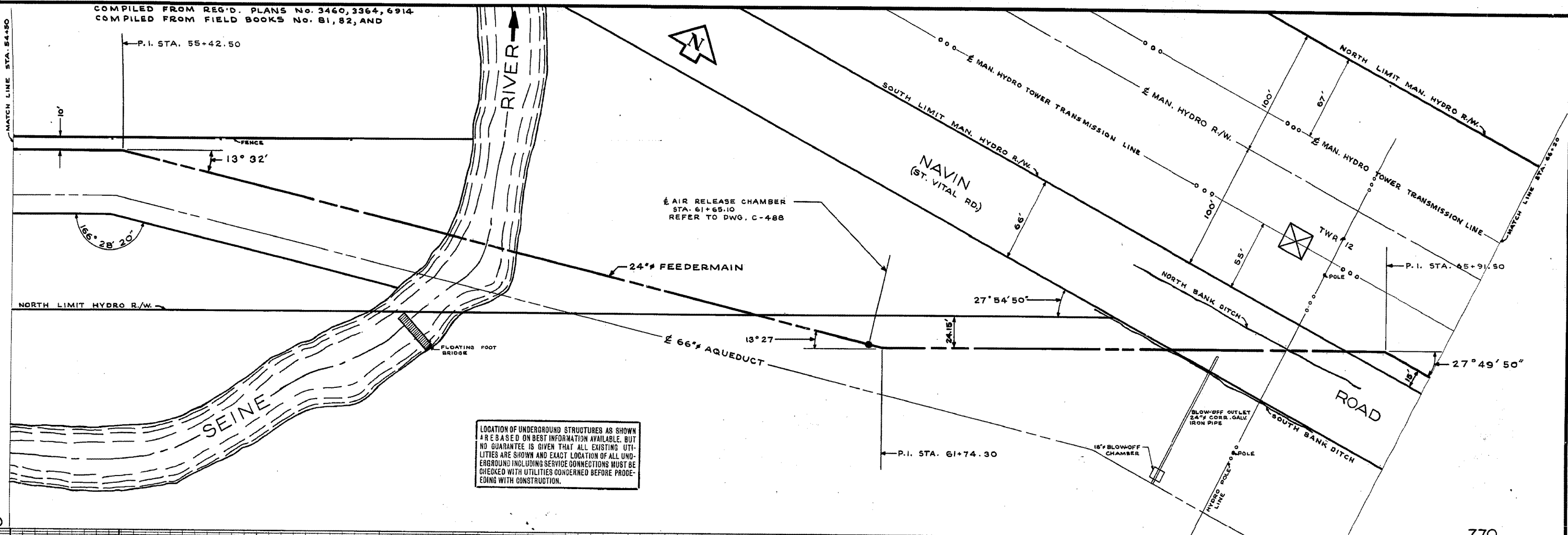
THE METROPOLITAN CORPORATION OF GREATER WINNIPEG
WATERWORKS & WASTE DISPOSAL DIVISION
 WATERWORKS DEPT.

DAKOTA EXTENSION FEEDER MAIN
 BISHOP GRANDIN BLVD.-DAKOTA ST. TO SEINE RIVER
 STA. 0+00 TO STA. 60+20

DESIGNED BY: W.S. BROCK
 CHECKED BY: G.C.B.
 DRAWN BY: A.C.V.S.E.
 DATE: NOV. 27/68
 SCALE: HOR. 1"=200' VERT. 1"=4'

DRAWING NO. **D-1051**

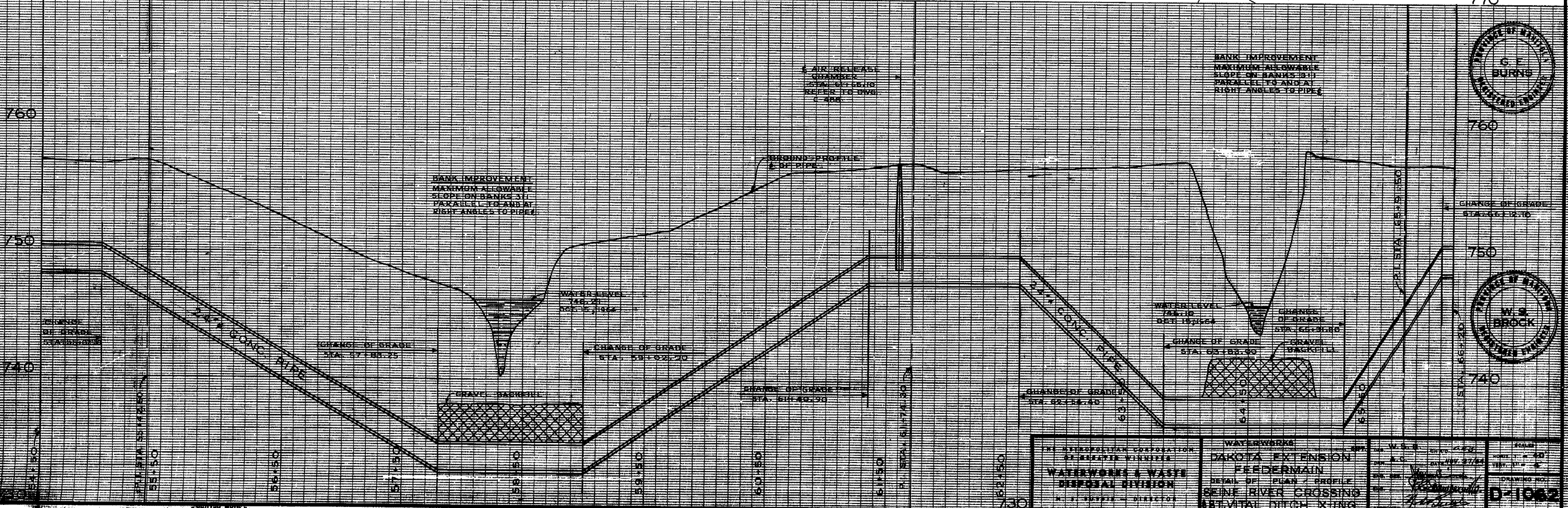
COMPILED FROM REG'D. PLANS No. 3460, 3364, 6914
COMPILED FROM FIELD BOOKS No. 81, 82, AND



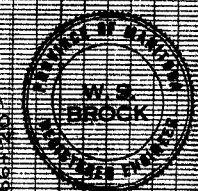
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON BEST INFORMATION AVAILABLE, BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN AND EXACT LOCATION OF ALL UNDERGROUND INCLUDING SERVICE CONNECTIONS MUST BE CHECKED WITH UTILITIES CONCERNED BEFORE PROCEEDING WITH CONSTRUCTION.

770

770



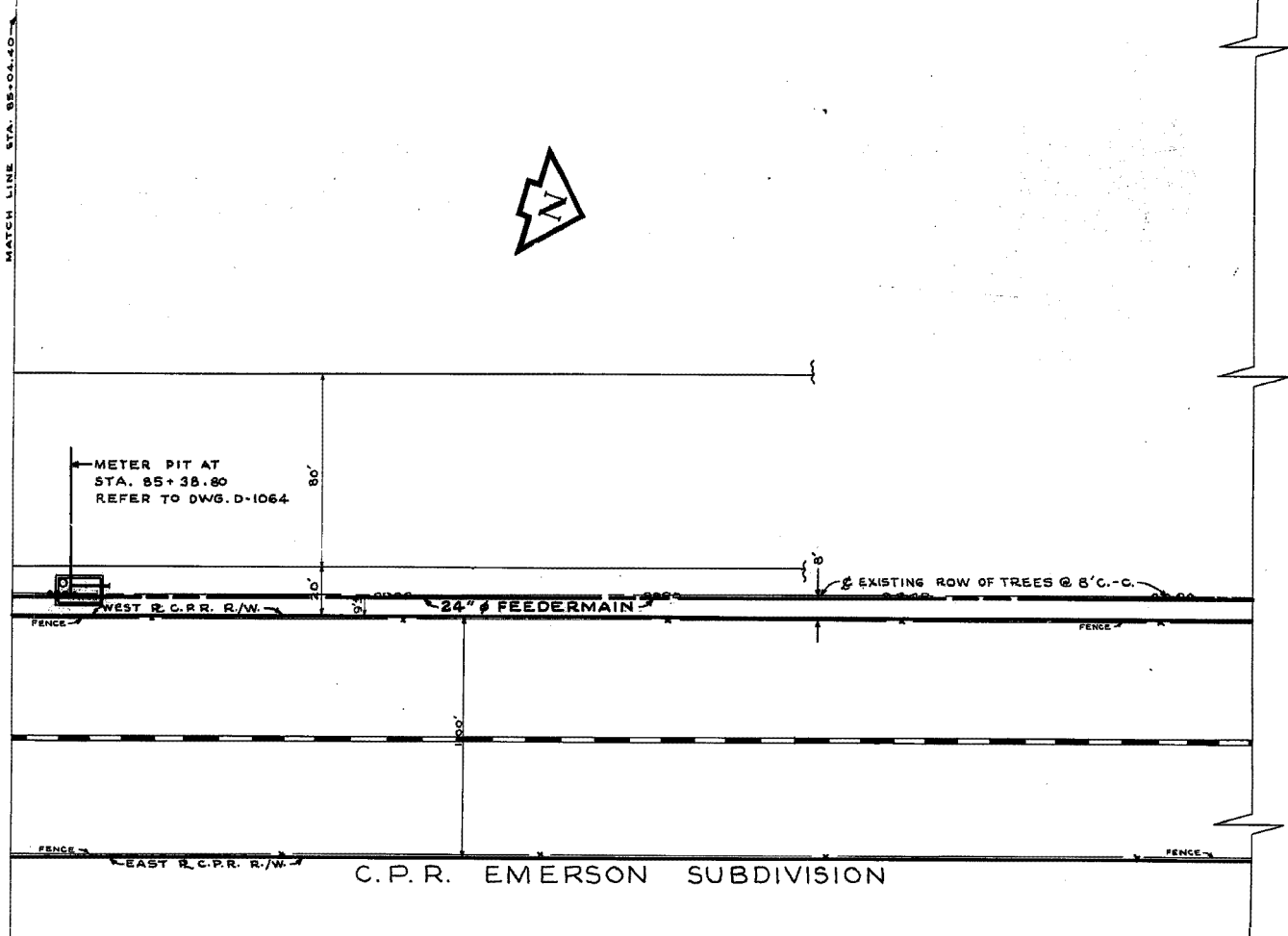
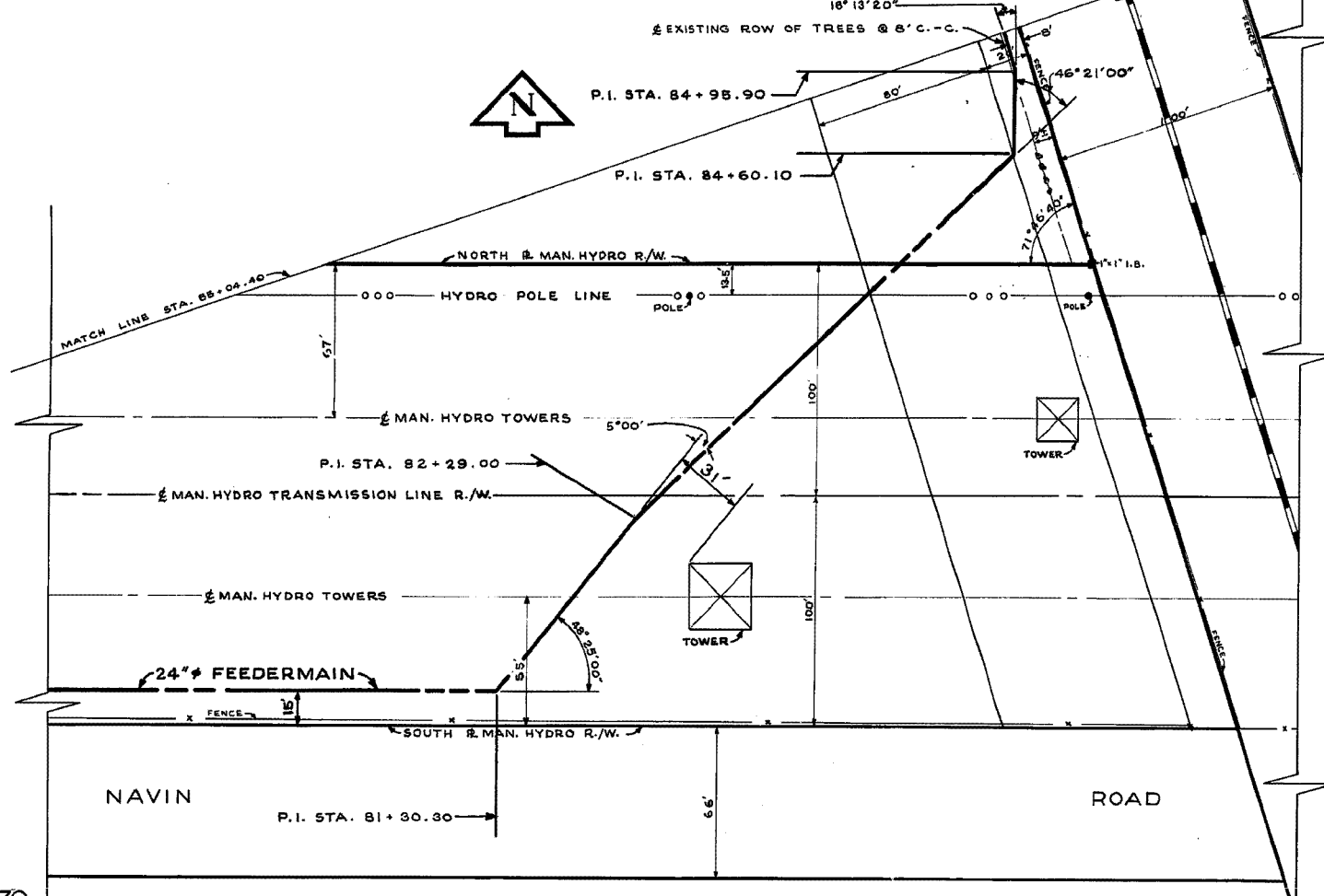
760



740

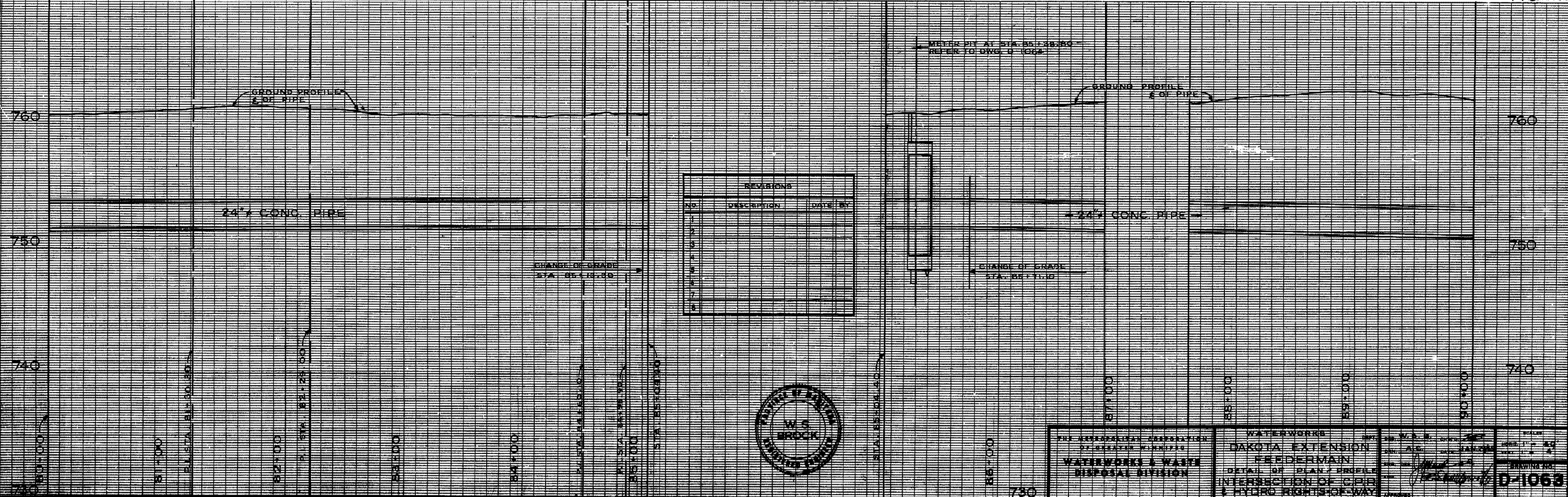
THE METROPOLITAN CORPORATION OF BISMARCK, NORTH DAKOTA WATERWORKS & WASTE DISPOSAL DIVISION N. J. TUPPES - DIRECTOR	WATERWORKS DAKOTA EXTENSION FEEDERMAIN DETAIL OF PLAN & PROFILE SEINE RIVER CROSSING AT VITAL DITCH CROSSING	DATE: 12/24/64 DRAWN BY: [Signature] CHECKED BY: [Signature]	SHEET NO. 2 TOTAL SHEETS 2
		PROJECT NO. 1258 DRAWING NO. D-1062	AS CONSTRUCTED AUG. 17, 65 A.C.

C.P.R. EMERSON SUBDIVISION



770

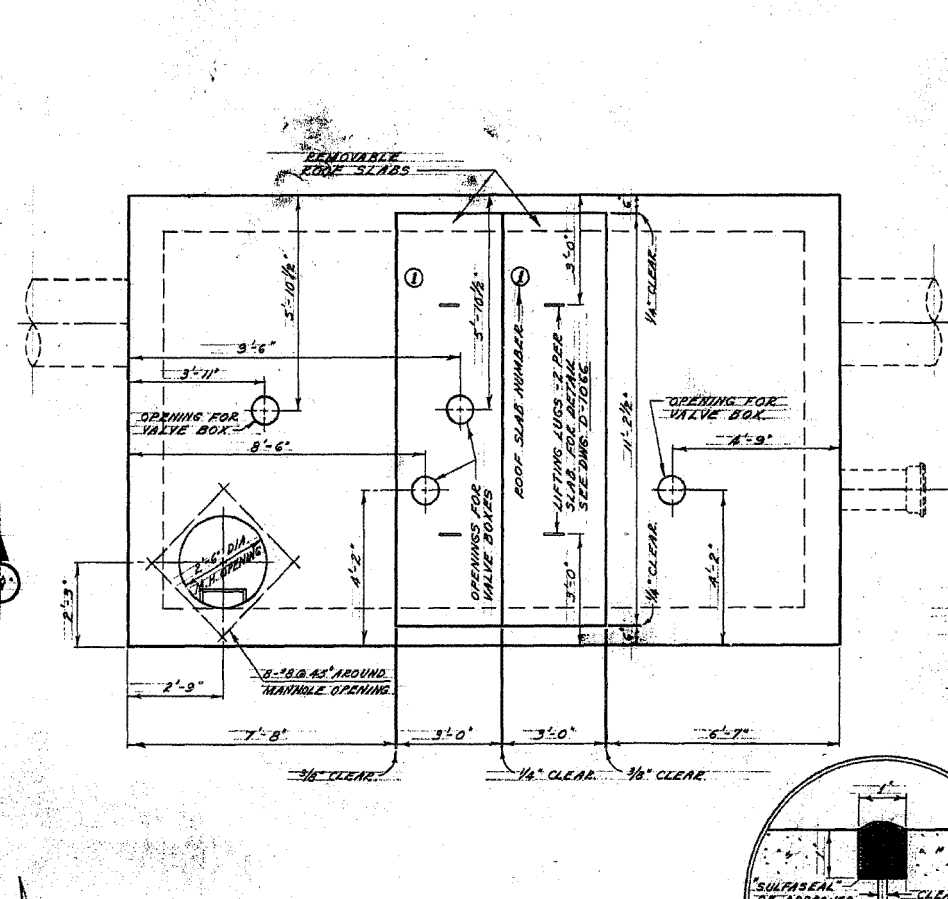
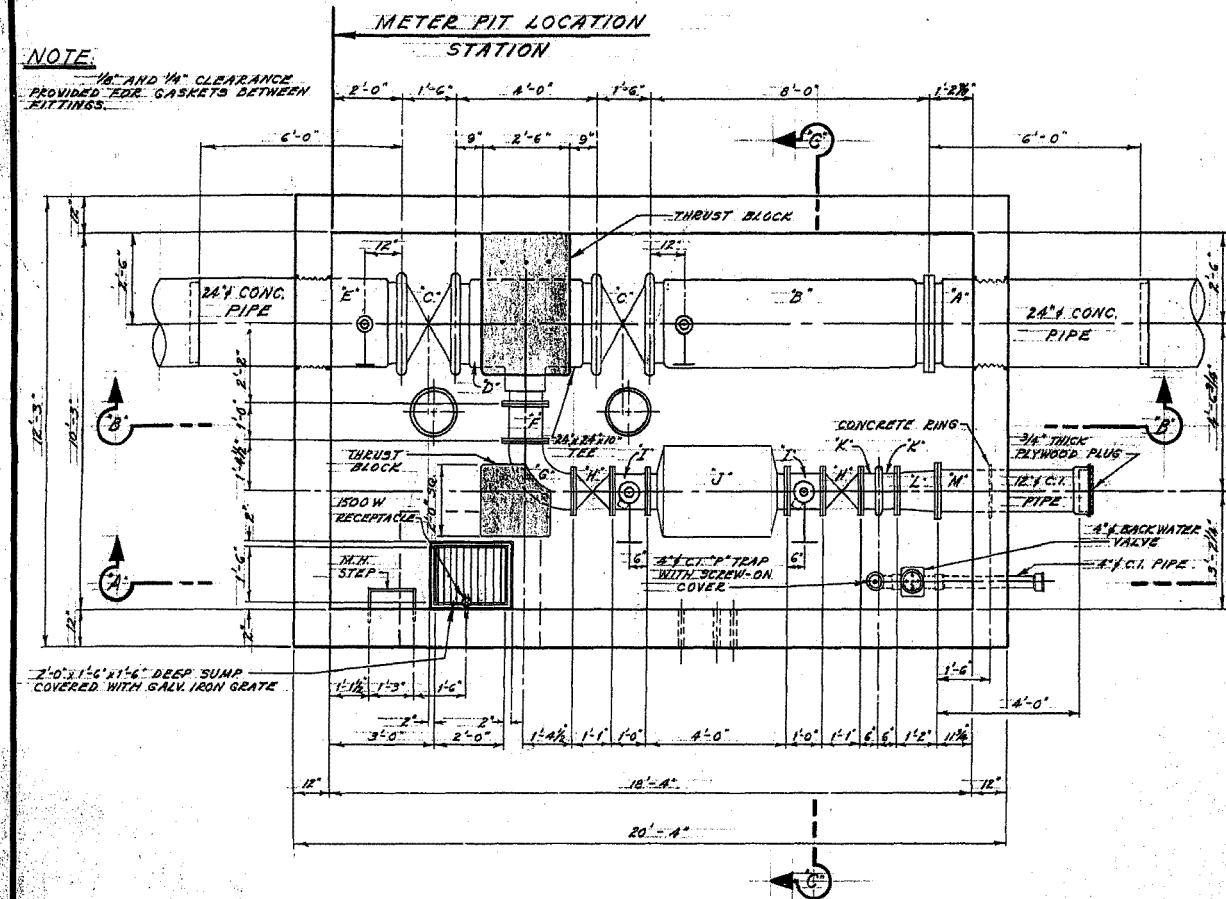
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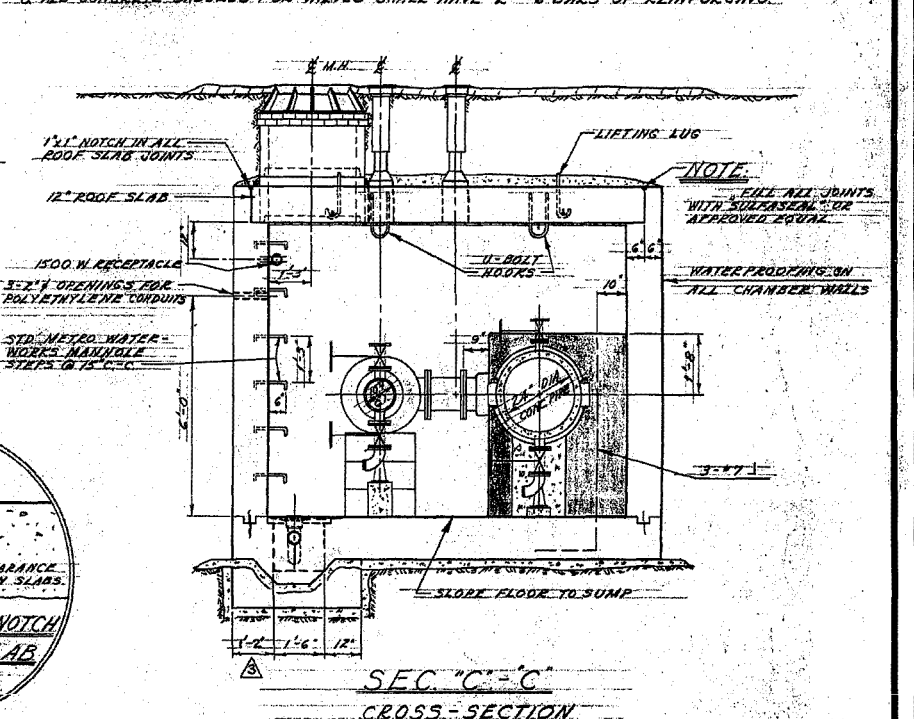
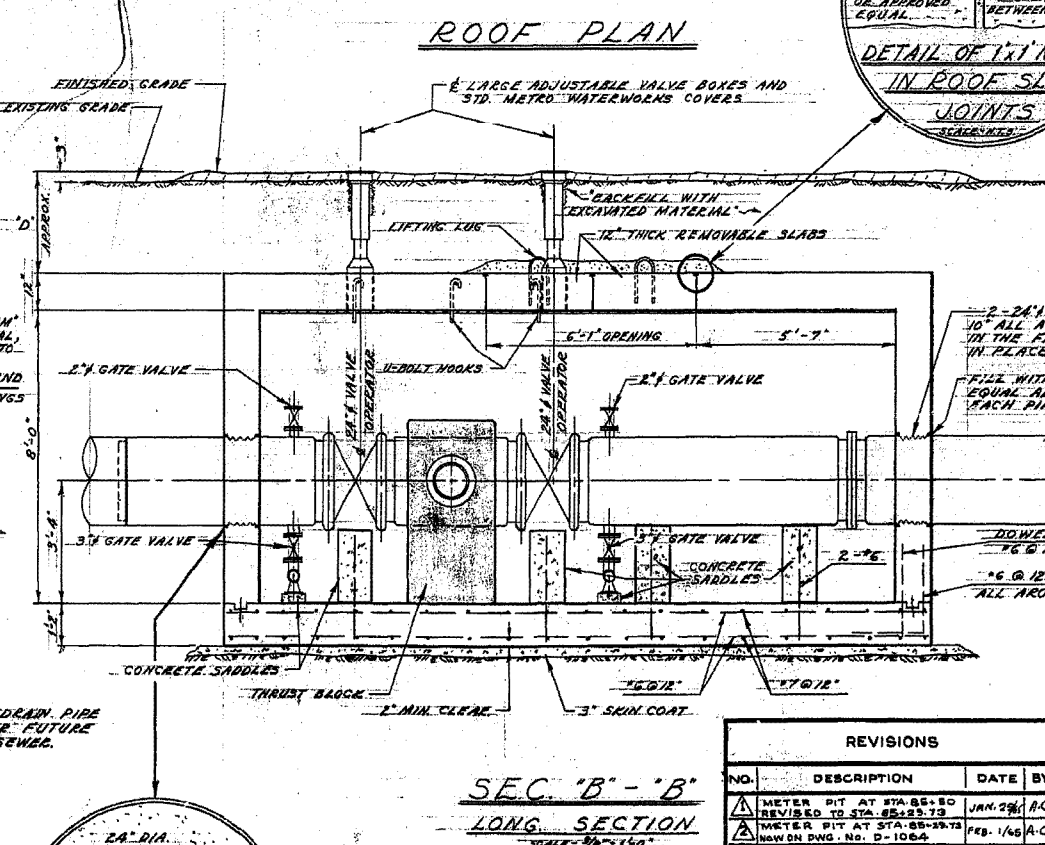
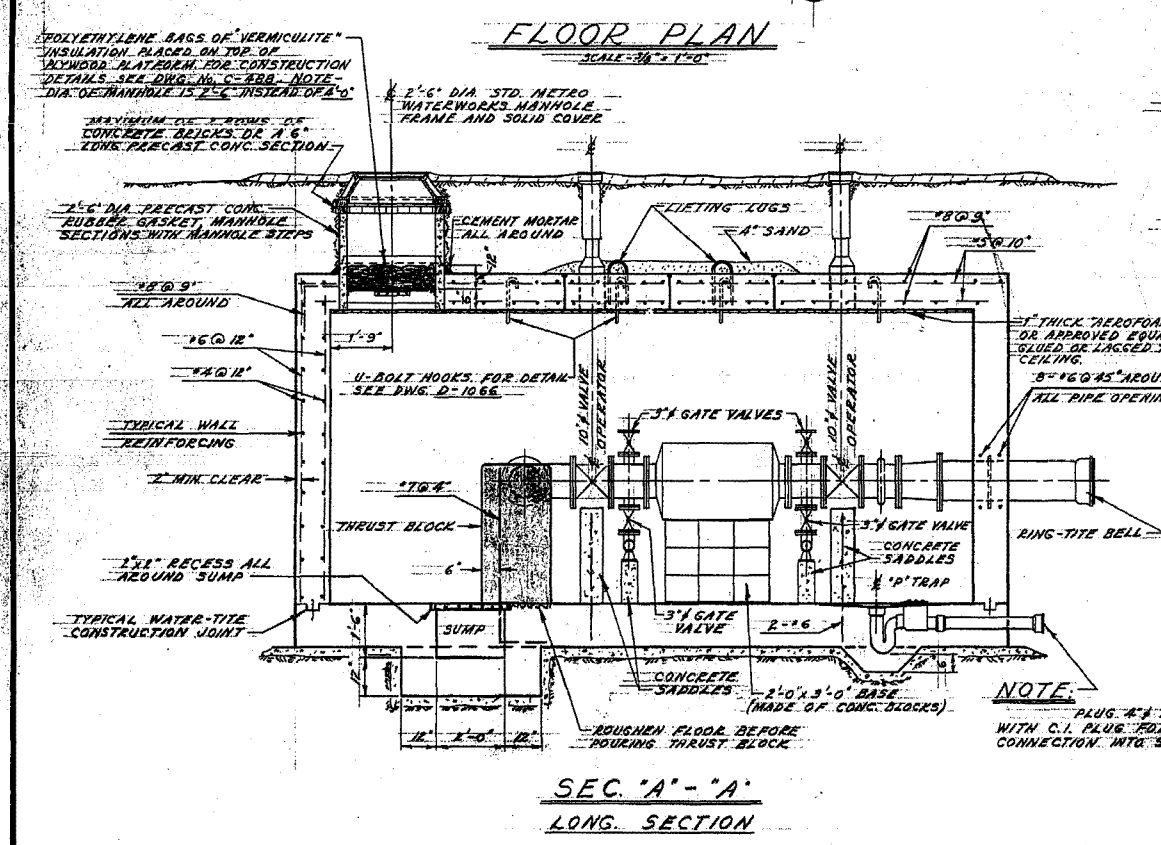
REVISIONS		
NO.	DESCRIPTION	DATE BY
1		
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THE MINNESOTA ASSOCIATION OF PROFESSIONAL ENGINEERS WATERWORKS & WASTE DISPOSAL DIVISION	WATERWORKS DAKOTA EXTENSION FEEDER MAIN	DATE: AUG 19 1965 DRAWING NO.: D-1063
	DETAIL OF PLAN & PROFILE INTERSECTION OF C.P.R. & HYDRO RIGHTS-OF-WAY	



- NOTES**
- ALL PRECAST CHAMBER SLABS ARE TO BE NUMBERED ON THE UNDERSIDE IN THE ORDER BY WHICH THEY CAN BE REMOVED. CAST IN TYPICAL HOUSE NUMBERS.
 - PLACE BUILDING PAPER BETWEEN VALVES AND CONCRETE SADDLES, BETWEEN ELBOWS AND CONCRETE SADDLES, BETWEEN CONCRETE BASE AND METER AND BETWEEN CONCRETE SADDLE AND PIPE.
 - ALL EXTERIOR AND INTERIOR CORNERS, INCLUDING PRECAST SLABS TO BE CHAMFERED AS SPECIFIED IN THE SPECIFICATIONS.
 - VICTAULIC COUPLINGS TO BE STYLE #4A.
 - FITTINGS REQUIRED FOR EACH 10" C.I. SHORT WITH 3" OUTLETS (ITEMS 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z'):
 - ON TOP OF SHORT: 3" NIPPLE (SCREEN TO SCREEN-ON-FLANGE)
 - ON THE BOTTOM OF 3" OUTLET: 3" NIPPLE (SCREEN TO SCREEN-ON-FLANGE)
 - 3" C.I. GATE VALVE FLANGED WITH BRONZE TRIM
 - 3" x 90° GALV. OR C.I. BASE ELBOW (FLANGE TO SCREEN)
 - JOIN ELBOW TO VALVE WITH SCREEN END DIRECTED TOWARDS MANHOLE OPENING. - ALL FITTINGS TO BE MADE OF BRONZE UNLESS SPECIFIED OTHERWISE.
 - SEE DWG. C-480 FOR ELECTRICAL REQUIREMENTS.
 - ALL CONCRETE SADDLES FOR VALVES SHALL HAVE 2-#6 BARS OF REINFORCING.



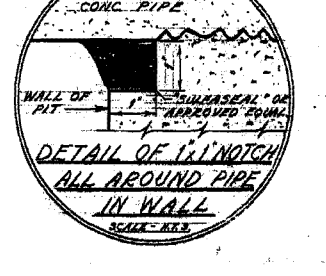
- NOTES (CONT'D)**
- FITTINGS REQUIRED FOR EACH 24" CONC. SHORT (ITEMS 'B', 'E', 'H', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z'):
 - ON TOP OF SHORT: 3" NIPPLE (SCREEN TO SCREEN-ON-FLANGE) - SUPPLIED WITH PIPE.
 - FOR METER FIT TO STA. 43+22.00: 3" C.I. GATE VALVE FLANGED WITH BRONZE TRIM.
 - 3" x 90° GALV. OR C.I. BASE ELBOW (FLANGE TO SCREEN)
 - JOIN ELBOW TO VALVE WITH SCREEN END DIRECTED TOWARDS MANHOLE OPENING.
 - ON BOTTOM OF SHORT: 3" NIPPLE (SCREEN TO SCREEN-ON-FLANGE) - SUPPLIED WITH PIPE.
 - 3" C.I. GATE VALVE FLANGED WITH BRONZE TRIM.
 - 3" x 90° GALV. OR C.I. BASE ELBOW (FLANGE TO SCREEN)
 - JOIN ELBOW TO VALVE WITH SCREEN END DIRECTED TOWARDS MANHOLE OPENING.

LIST OF MATERIALS FOR METER PIT

NO.	ITEM	DESCRIPTION	LENGTH
1	A	24" CONC. SHORT (BELL TO FLANGE)	6'-0"
2	B	24" CONC. SHORT (FLANGE TO VICTAULIC)	8'-0"
3	C	2-24" VICTAULIC BUTTERFLY VALVES	1'-6"
4	D	24" x 24" x 10" CONC. TEE (VIC TO VIC TO FLANGE BR.)	4'-0"
5	E	24" CONC. SHORT (VICTAULIC TO SPIGOT END)	6'-0"
6	F	10" C.I. FILLER PIECE FLANGED	1'-0"
7	G	10" x 90° C.I. ELBOW (LONG RADIUS) FLANGED	1'-4"
8	H	2-10" GATE VALVES FLANGED	1'-1"
9	I	2-10" FILLER PIECES FLANGED WITH 3" OUTLETS	1'-0"
10	J	10" MAGNETIC FLOW METER FLANGED	4'-0"
11	K	2-10" C.I. FILLER PIECES (FLANGE TO VICTAULIC)	0'-6"
12	L	10" x 12" C.I. INCREASER FLANGED	1'-2"
13	M	12" C.I. SHORT (FLANGE TO RING-TITE BELL)	4'-0"

TABLE OF ELEVATIONS FOR METER PITS

LOCATION	TOP OF FLOOR SLAB	TOP OF PIPE	TOP OF ROOF SLAB	EXISTING GRADE	FINISHED GRADE	'D'
STA. 43+22.00	EL. 147.27	EL. 150.60	EL. 156.27	EL. 158.77	EL. 159.02	2'-9"



REVISIONS

NO.	DESCRIPTION	DATE	BY
1	METER PIT AT STA. 43+22.00	JAN. 29/65	A.C.
2	REVISION TO STA. 43+22.00	FEB. 1/65	A.C.
3	REVISION TO STA. 43+22.00	FEB. 1/65	A.C.
4	REVISION TO STA. 43+22.00	FEB. 1/65	A.C.
5	REVISION TO STA. 43+22.00	FEB. 1/65	A.C.
6	REVISION TO STA. 43+22.00	FEB. 1/65	A.C.

NOTE:

- ITEMS 'I' TO 'V' TO HAVE 3/4" TAPPED HOLES ON OPPOSITE SIDES. ITEMS 'B' AND 'E' TO HAVE A 1/4" I.P.T. HOLE ON TOP AND A 3/4" I.P.T. HOLE ON BOTTOM.
- ITEM 'M' TO HAVE A CONCRETE RING 1'-6" FROM FLANGED END.
- METRO CORPORATION WILL SUPPLY ITEMS 'A', 'B', 'C', 'D', 'E', 'N' AND 'J'. ALSO 4-24" VICTAULIC COUPLINGS AND A 10" VICTAULIC COUPLING.

THE METROPOLITAN CORPORATION OF GREATER WINNIPEG

WATERWORKS & WASTE DISPOSAL DIVISION

N. S. BUBBIS - DIRECTOR

WATERWORKS DEPT. DAKOTA EXTENSION FEEDERMAIN

METER PIT AT STA. 43+22

DES. H. J. BROCK CH'ED. S.E. DATE 20 NOV 64

ENGR. H. J. BROCK

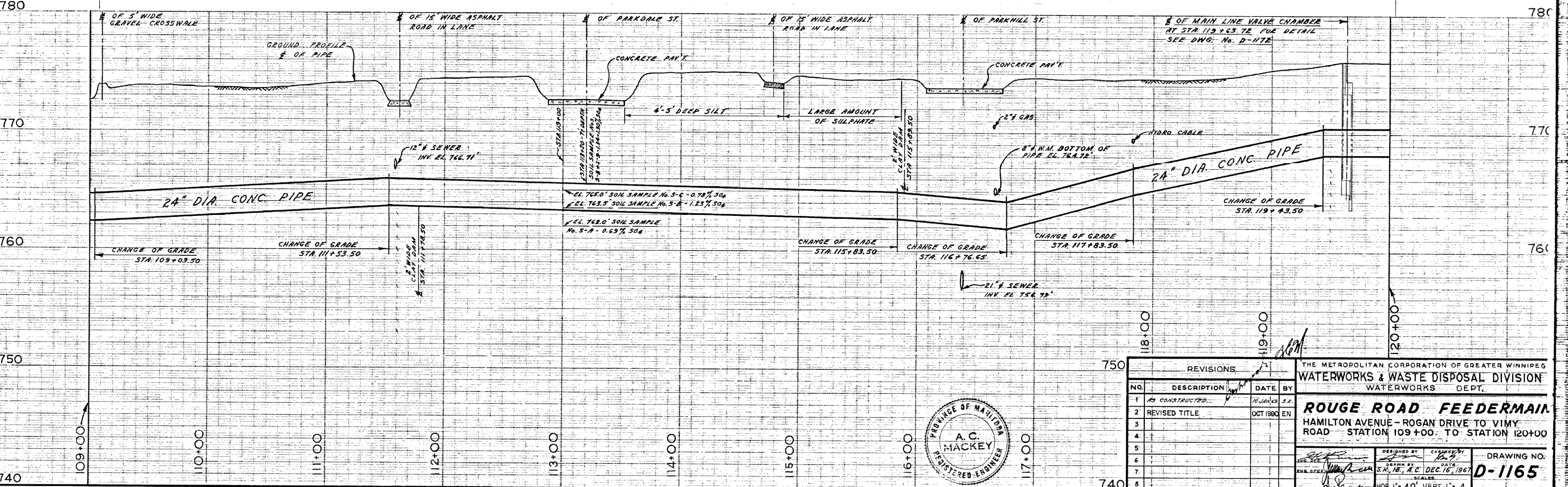
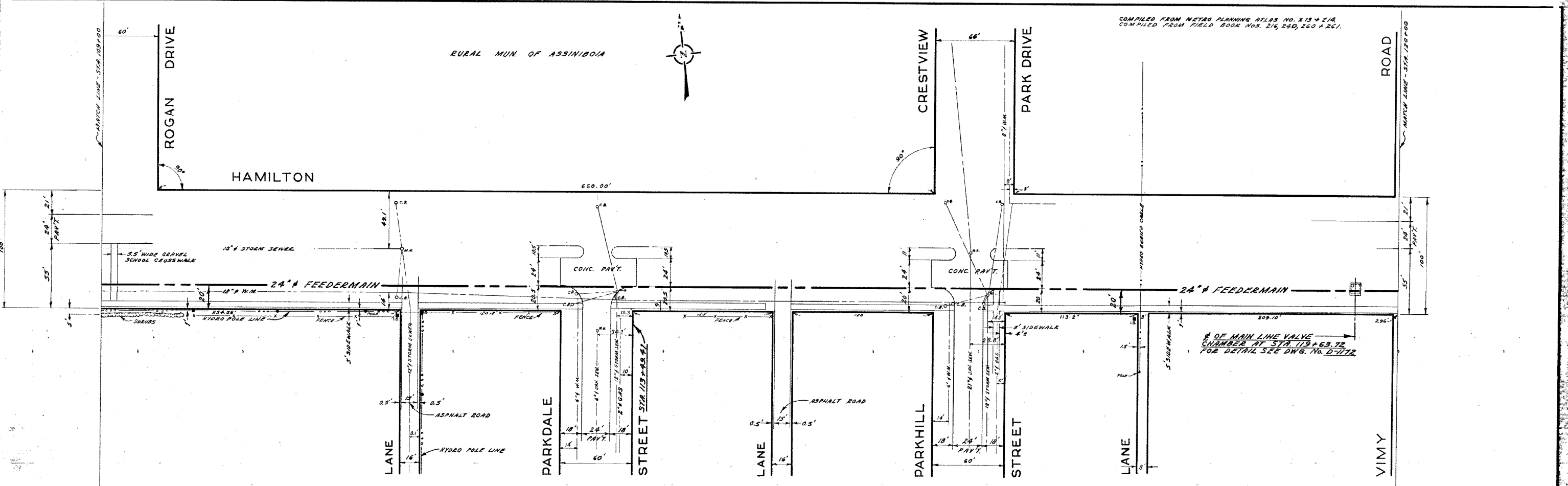
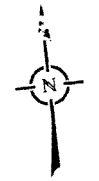
APPROVED

SCALE: 3/8" = 1'-0" AND AS NOTED.

DRAWING NO. D-1065

COMPILED FROM METRO PLANNING ATLAS No. 213 + 21A
COMPILED FROM FIELD BOOK Nos. 216, 240, 260 + 261.

RURAL MUN. OF ASSINIBOIA



REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	AS CONSTRUCTED	10/20/69	S.E.
2	REVISED TITLE	OCT 1960	EN
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THE METROPOLITAN CORPORATION OF GREATER WINNIPEG
WATERWORKS & WASTE DISPOSAL DIVISION
WATERWORKS DEPT.

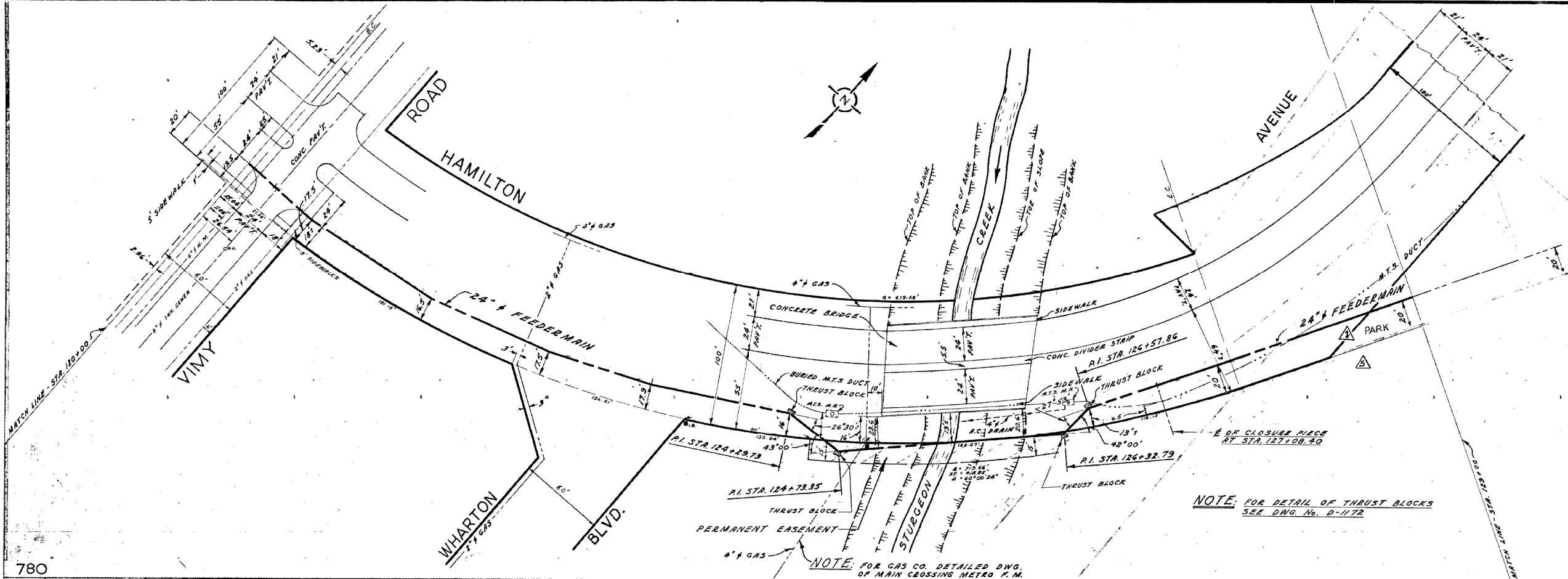
ROUGE ROAD FEEDERMAIN
HAMILTON AVENUE - ROGAN DRIVE TO VIMY ROAD
STATION 109+00 TO STATION 120+00

DESIGNED BY: [Signature] CHECKED BY: [Signature]
DRAWN BY: [Signature] DATE: DEC. 16, 1967
SCALE: [Blank] DRAWING NO.: **D-1165**

HOR. 1" = 40' VERT. 1" = 4'

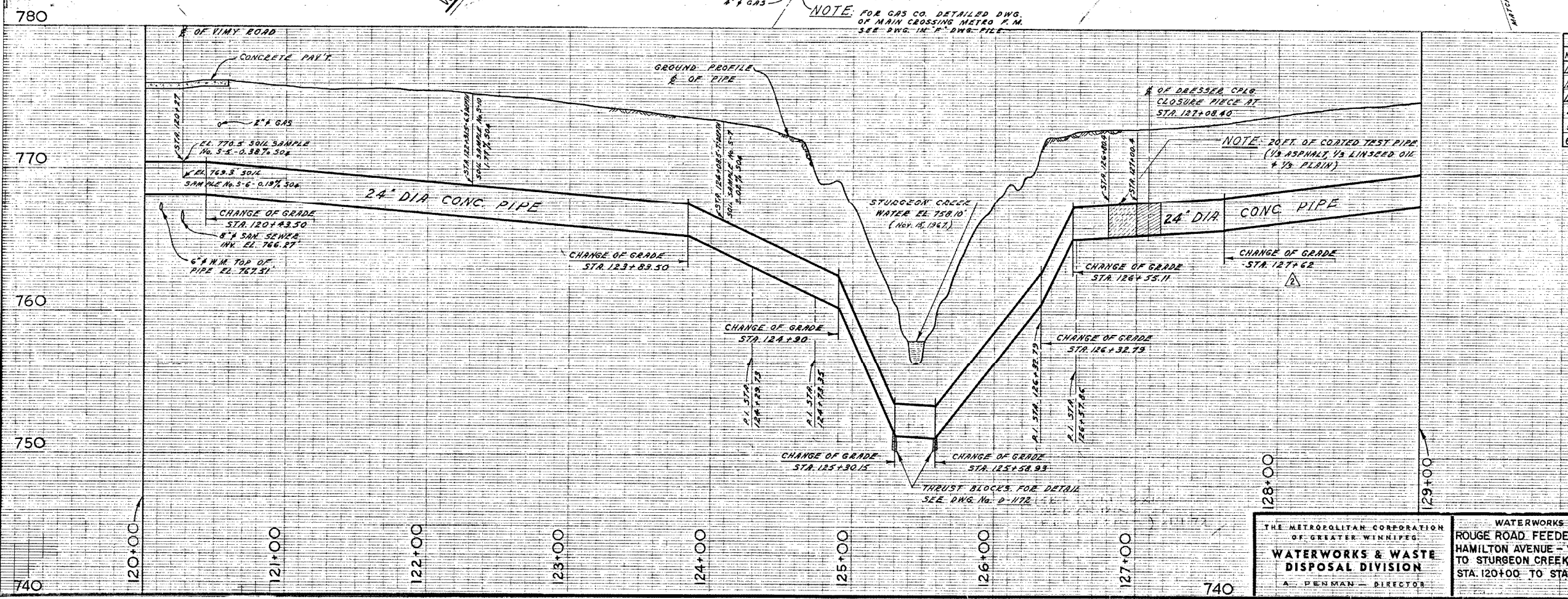
D-1165

City of Winnipeg
W002300



NOTE: FOR DETAIL OF THRUST BLOCKS
SEE DWG. No. D-1172

NOTE: FOR GAS CO. DETAILED DWG.
OF MAIN CROSSING METRO P.M.
SEE DWG. IN "A" DWG. FILE



REVISIONS		
No.	DESCRIPTION	BY DATE
1	ALIGNMENT OF 24" FM CHANGED	A.C. APRIL 30/68
2	PIPE PROFILE REVISED	A.C. APRIL 30/68
3	MATCH LINE & TITLE BLOCK REVISED	A.C. APRIL 30/68
4	AS CONSTRUCTED (W.M.A.N.)	S.K. 15 MAY 69
5	TITLE & PROPERTY LINE REVISED	M.D. JAN 91
6		

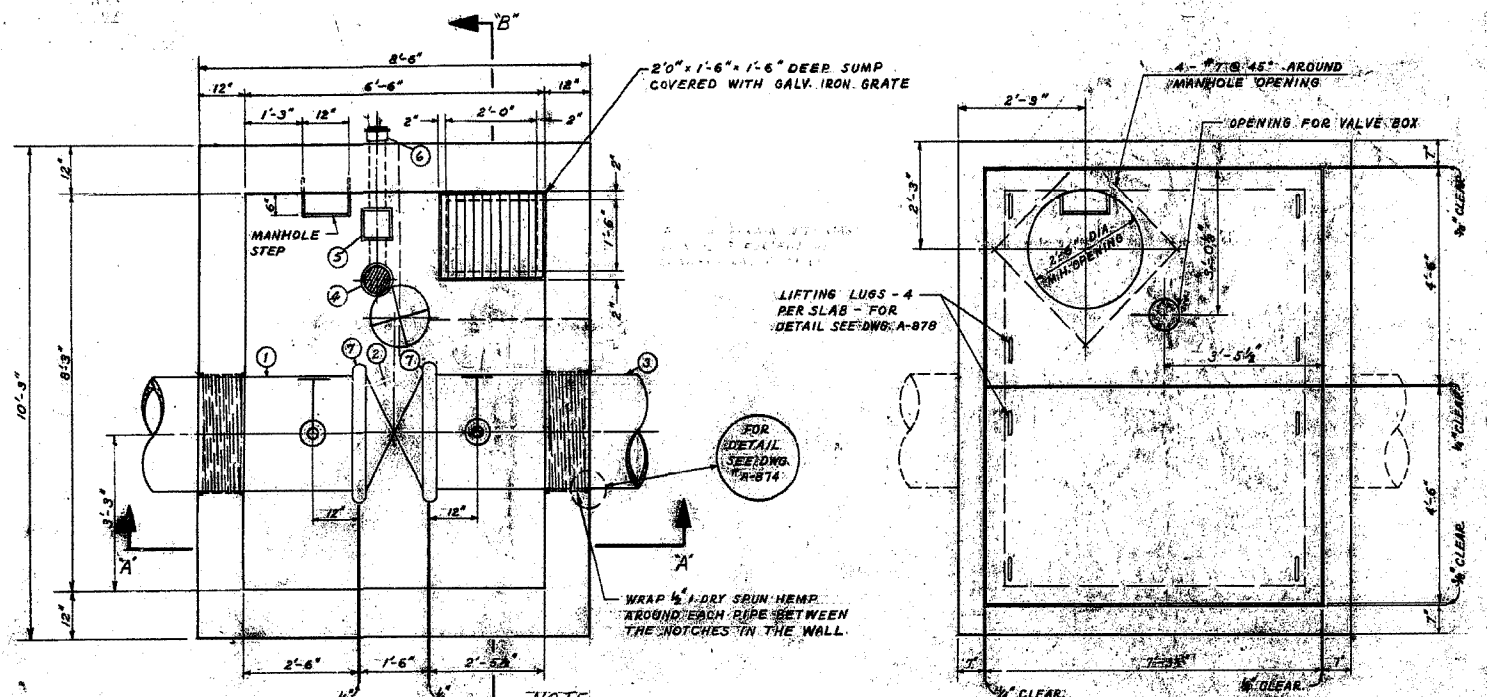


THE METROPOLITAN CORPORATION
OF GREATER WINNIPEG
**WATERWORKS & WASTE
DISPOSAL DIVISION**
A. PENMAN - DIRECTOR

WATERWORKS
ROUGE ROAD FEEDERMAIN
HAMILTON AVENUE - VIMY ROAD
TO STURGEON CREEK
STA. 120+00 TO STA. 129+00

DEPT. ENGR. SK, A.C. CHECKED: [Signature] DATE: DEC 18/67
ENGR. DES. [Signature]
ENGR. SUPER. [Signature]
APPROVED: [Signature]

SCALE: HORIZ. 1" = 40' VERT. 1" = 4'
DRAWING NO. **D-1166**



FLOOR PLAN

ROOF PLAN

NOTE:
 VALVE CHAMBER AT STA. 61+68.52 HAS 4" PIT DRAIN CONNECTED TO SEWER ON PORTLAND M.H. WITH SECTIONS INSTALLED 1'-4" O.D. AND 1'-1" O.D. WITH 2 ROWS OF BRICKS TO M.H. FRAME 1'-0" DEPTH FROM TOP OF ROOF SLAB TO M.H. COVER.
 VALVE CHAMBER AT STA. 112+63.72 HAS 4" PIT DRAIN WITH PLUG. THEREFORE NOT CONNECTED TO SEWER AND CONTAINS 2' SUMP. M.H. SECTION INSTALLED 1'-1" O.D. WITH NO BRICKS TO M.H. FRAME. 1'-0" DEPTH FROM TOP OF SLAB TO M.H. COVER.

24" DIA. MAIN LINE VALVE CHAMBER	
STATION	ELEV. $\frac{1}{2}$ OF PIPE
STATION 61+68.52	ELEV. 764.89'
STATION 112+63.72	ELEV. 759.16'

LIST OF MATERIALS		
NO.	DESCRIPTION	QUANTITY
1	24" CONC. PIPE 6' LONG	1
2	24" V. BUTTERFLY VALVE (WORM VALVE)	1
3	14' LONG PIPE VICTAULIC TO BALL	1
4	4" 1/2" TRAP DRAIN WITH SCREW-ON COVER	1
5	4" BRASS WATER VALVE	1
6	4" C.I. PIPE	1
7	24" A-STYLE 4" VICTAULIC COUPLING	2
8	2" BRONZE GATE VALVE - SCREWED ENDS	2
9	2" BRONZE NIPPLE - SCREWED ENDS	2
10	3" BRONZE NIPPLE - SCREWED ENDS	2
11	3" BRONZE GATE VALVE - SCREWED ENDS	2
12	3/4-90° 2" WELDBOWL - SCREWED ENDS	2

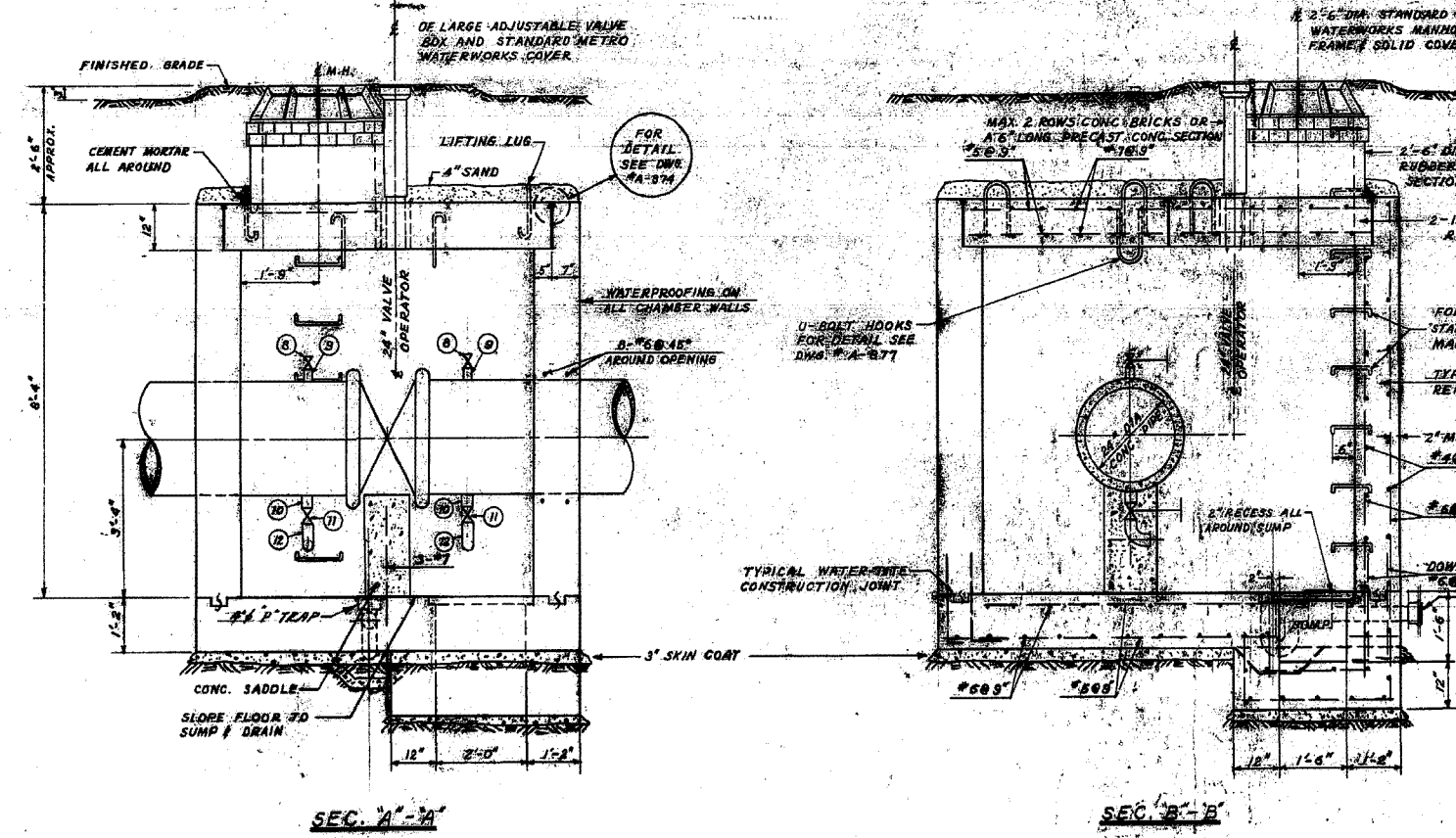
LIST OF THRUST BLOCKS			
No.	LOCATION	ANGLE	BEARING AREA
1	P.I. STA. 33+03.60	5°00'00"	3'0" x 2'6"
2	P.I. STA. 34+28.86	5°00'00"	3'0" x 2'6"
3	P.I. STA. 61+28.51	75°07'00"	8'0" x 7'0"
4	P.I. STA. 64+28.08	35°00'00"	5'0" x 4'9"
5	P.I. STA. 68+38.54	45°00'00"	6'0" x 5'6"
6	P.I. STA. 88+00.59	74°58'50"	8'0" x 7'0"
7	P.I. STA. 103+15.38	7°30'00"	3'0" x 2'6"
8	P.I. STA. 105+36.16	7°30'00"	3'0" x 2'6"
9	P.I. STA. 124+28.73	26°30'00"	3'0" x 4'3"
10	P.I. STA. 124+28.73	26°30'00"	3'0" x 4'3"
11	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"
12	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"
13	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"
14	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"
15	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"
16	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"
17	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"
18	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"
19	P.I. STA. 125+30.15 (CHAMBER OF GRADE)	15°00'00"	2'0" x 2'6"

NOTE:
 BUILDING PAPER PLACED BETWEEN CONCRETE PIPE AND THRUST BLOCK FOR T.B. NO. 13 AND NO. 14.

NOTE:
 BUILDING PAPER PLACED BETWEEN VALVES AND CONCRETE SADDLES.

NOTE:
 PLACE BUILDING PAPER BETWEEN ALL UNDESIRED WALLS AND CONCRETE WALLS.

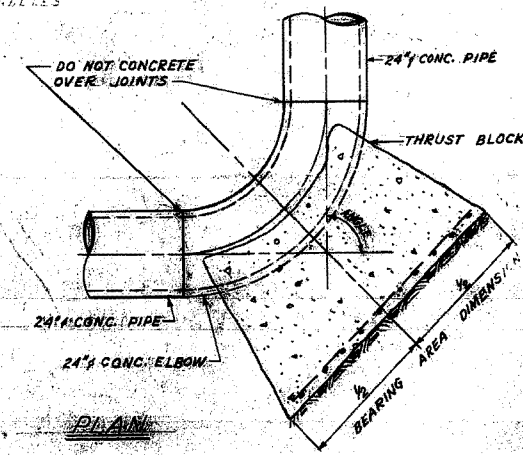
TYPICAL THRUST BLOCK DETAIL FOR 24" 70° TO 90° CONC. ELBOWS
 SCALE: 3/8"=1'-0"



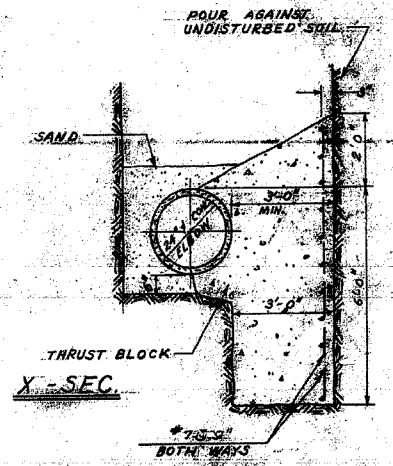
SEC. A-A

SEC. B-B

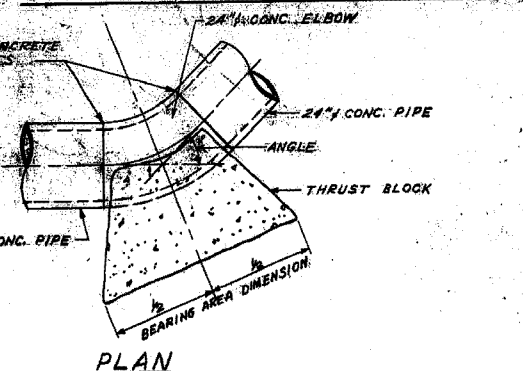
TYPICAL 24" DIA. MAIN LINE VALVE CHAMBER
 SCALE: 1/8"=1'-0"



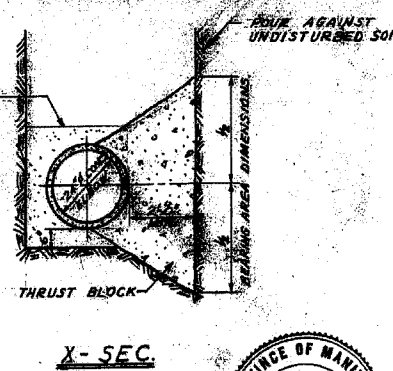
PLAN



X-SEC.



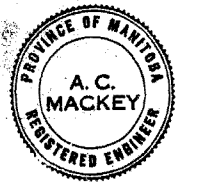
PLAN



X-SEC.

TYPICAL THRUST BLOCK DETAILS FOR 24" 45° OR LESS - CONC. ELBOWS
 SCALE: 3/8"=1'-0"

REVISIONS		
No.	DESCRIPTION	BY DATE
1	THRUST BLOCKS No. 13 & 14 DELETED	A.C. APRIL 1968
2	THRUST BLOCK No. 15 RELOCATED	A.C. APRIL 1968
3	AS CONSTRUCTED.	S.E. 15 MAY 68
4		
5		

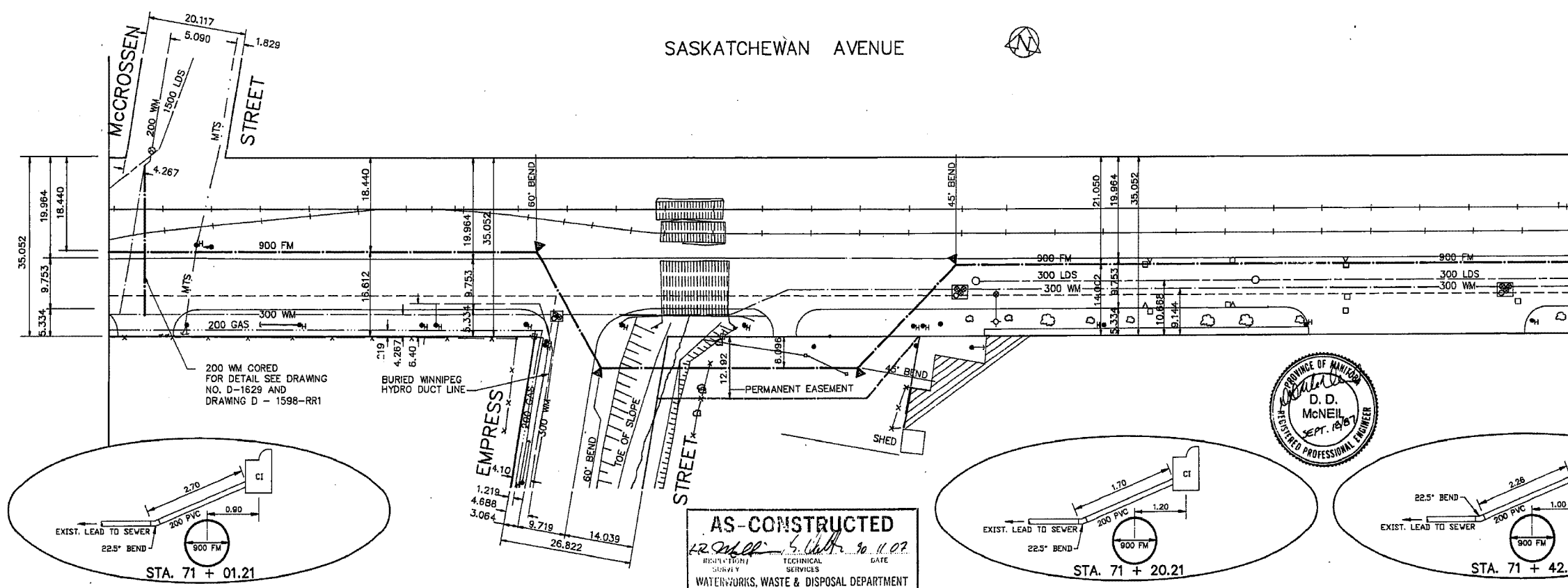
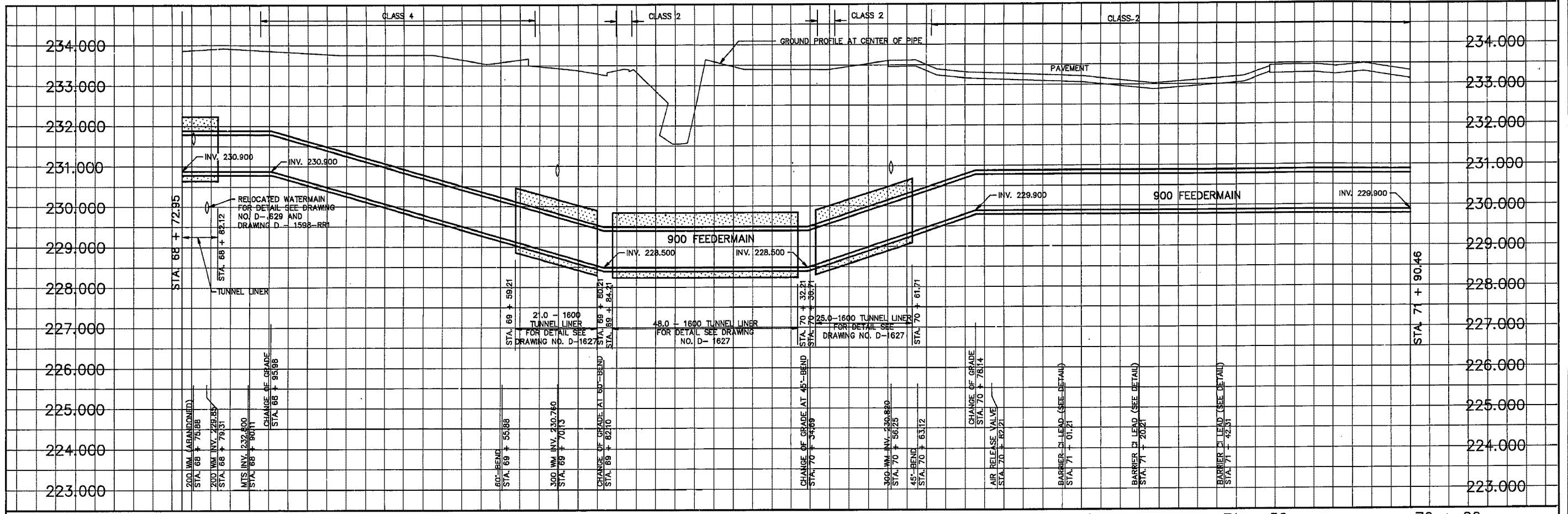


THE METROPOLITAN CORPORATION OF GREATER WINNIPEG
WATERWORKS & WASTE DISPOSAL DIVISION
 A. PENMAN - DIRECTOR

WATERWORKS DEPT.
ROUGE ROAD FEEDERMAIN
 MAIN LINE VALVE CHAMBERS & THRUST BLOCK DETAILS

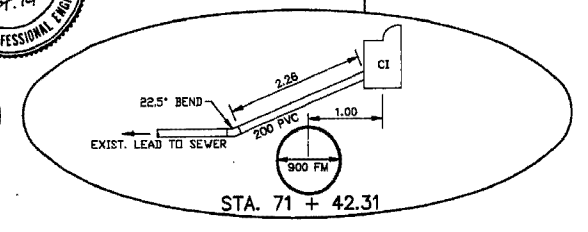
DESIGNED BY: [Signature]
 DATE: JAN 10/68
 DRAWN BY: [Signature]
 DATE: [Signature]
 APPROVED BY: [Signature]

SCALE: AS SHOWN
 DRAWING NO. **D-1172**



1W-404

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES



AS-CONSTRUCTED
12/2/88
REVISION SURVEY
WATERWORKS, WASTE & DISPOSAL DEPARTMENT

200 WM	WATERMAIN	200 WM	SL - HYDRO	150 WM	WATERMAIN	150 WM
HYDRANT	HYDRANT	MTS	CONCRETE	HYDRANT	HYDRANT	VALVE
VALVE	VALVE	PROPERTY LINE	PROPERTY LINE	LAND DRAINAGE SEWER	LAND DRAINAGE SEWER	LAND DRAINAGE SEWER
525 LDS	LAND DRAINAGE SEWER	525 LDS	WASTEWATER SEWER	300 LDS	WASTEWATER SEWER	300 LDS
375 WWS	WASTEWATER SEWER	375 WWS	SURVEY BAR	250 WWS	WASTEWATER SEWER	250 WWS
MANHOLE	MANHOLE	FENCE	FENCE	PROFILE	PROFILE	PROFILE
CATCH BASIN	CATCH BASIN	POLE - HYDRO, MTS	POLE - HYDRO, MTS			
CURB INLET	CURB INLET	RAILWAY SIGN	RAILWAY SIGN			
JUNCTIONS	JUNCTIONS	GUY ANCHOR	GUY ANCHOR			
CULVERT	CULVERT	LIGHT STANDARD	LIGHT STANDARD			
50 GAS	GAS	TREE	TREE			
EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PLAN	PROPOSED	EXISTING
				LEGEND-PROFILE		PROPOSED

LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPPLY U/O STRUCTURES COMMITTEE DATE

NOTE:
LOCATION 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.

The City of Winnipeg
Works & Operations Division
Waterworks, Waste & Disposal Department

DESIGNED BY RAS,DDM
CHECKED BY RAS,DDM

DRAWN BY REF, TM
APPROVED BY

HOR. SCALE 1:500
VERTICAL 1:50

RELEASED FOR CONSTRUCTION
DATE

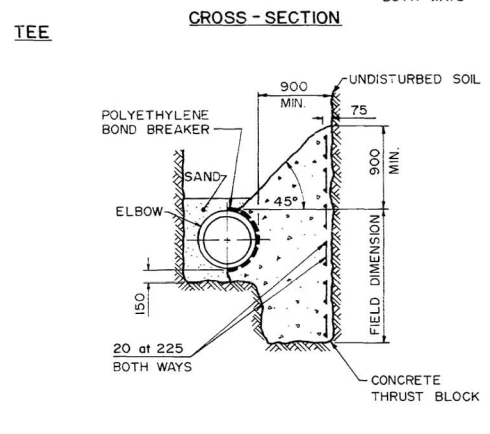
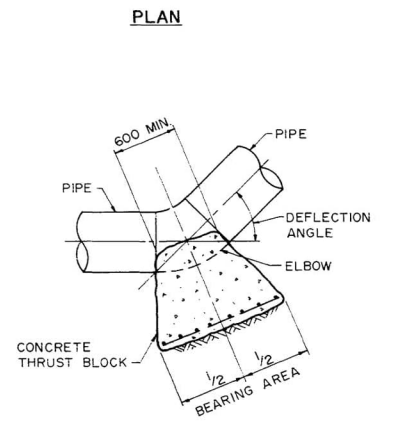
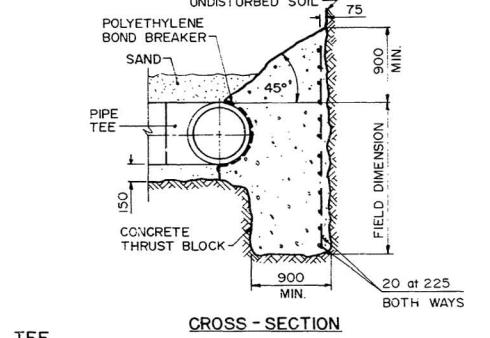
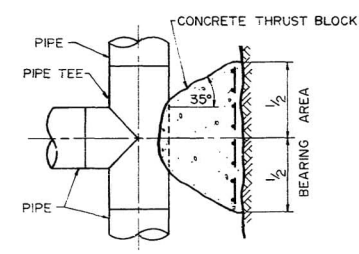
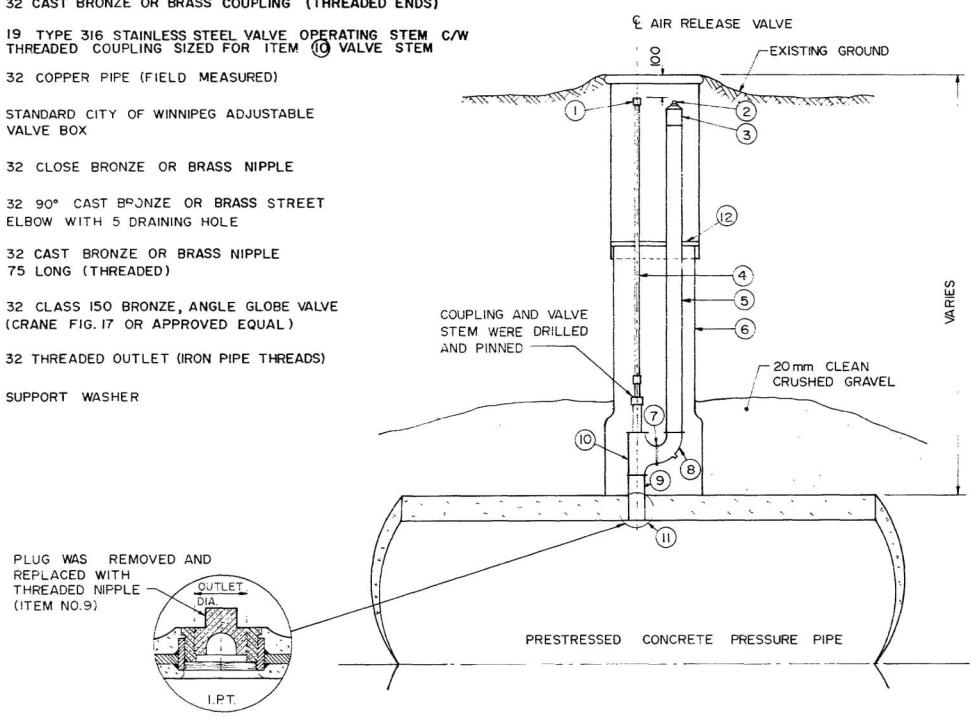


THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
WATERWORKS WASTE AND DISPOSAL DEPARTMENT

WEST END FEEDERMAIN
SASKATCHEWAN AVE. - McCROSSEN ST.
TO 270 METERS EAST
STA. 68 + 72.95 TO STA. 71 + 90.46

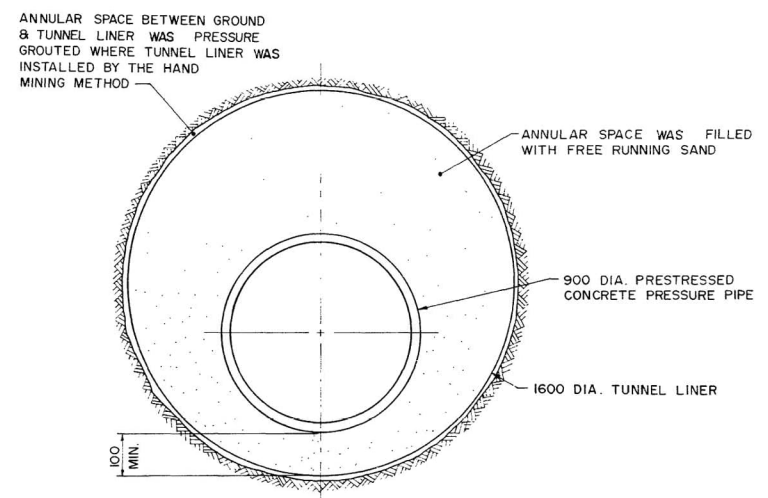
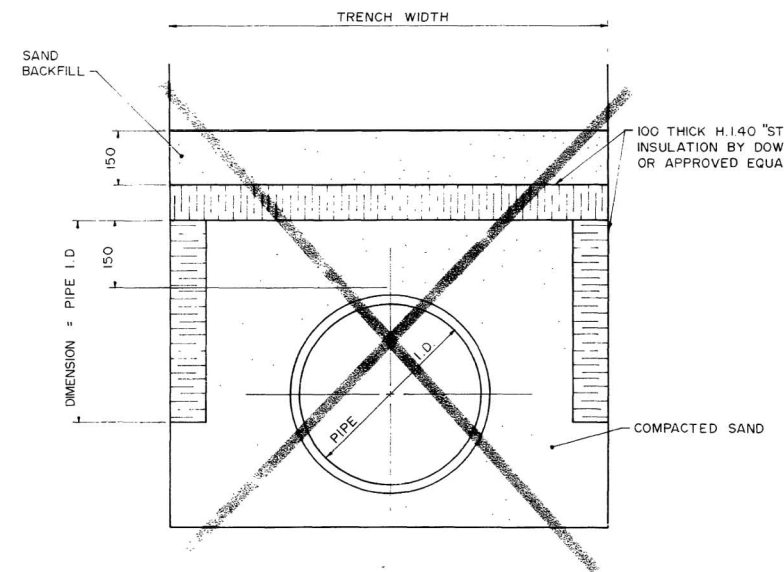
CITY DRAWING NUMBER
SHEET OF
D-1599

- ① 25 OPERATING NUT
- ② 32 CAST BRONZE OR BRASS PLUG (FINGER TIGHT)
- ③ 32 CAST BRONZE OR BRASS COUPLING (THREADED ENDS)
- ④ 19 TYPE 316 STAINLESS STEEL VALVE OPERATING STEM C/W THREADED COUPLING SIZED FOR ITEM ⑩ VALVE STEM
- ⑤ 32 COPPER PIPE (FIELD MEASURED)
- ⑥ STANDARD CITY OF WINNIPEG ADJUSTABLE VALVE BOX
- ⑦ 32 CLOSE BRONZE OR BRASS NIPPLE
- ⑧ 32 90° CAST BRONZE OR BRASS STREET ELBOW WITH 5 DRAINING HOLES
- ⑨ 32 CAST BRONZE OR BRASS NIPPLE 75 LONG (THREADED)
- ⑩ 32 CLASS 150 BRONZE, ANGLE GLOBE VALVE (CRANE FIG. 17 OR APPROVED EQUAL)
- ⑪ 32 THREADED OUTLET (IRON PIPE THREADS)
- ⑫ SUPPORT WASHER



TYPICAL THRUST BLOCK DETAILS
FOR ELBOWS AND TEES - N.T.S.

LIST OF THRUST BLOCKS			
LOCATION (APPROX.)	PIPE DIA.	ANGLE	BEARING AREA
STA. 0+39.20	900	45°	7.25 sq. metres
STA. 0+55.37	900	45°	7.25 sq. metres
STA. 3+79.22	900	45°	7.25 sq. metres
STA. 4+69.24	900	45°	7.25 sq. metres
STA. 18+67.14	900	45°	7.25 sq. metres
STA. 18+75.76	900	45°	7.25 sq. metres
STA. 34+67.35	900	45°	7.25 sq. metres
STA. 34+80.28	900	45°	7.25 sq. metres
STA. 37+96.77	900	45°	7.25 sq. metres
STA. 38+10.96	900	45°	7.25 sq. metres
STA. 38+76.12	900	45°	7.25 sq. metres
STA. 38+89.16	900	45°	7.25 sq. metres
STA. 48+57.58	900	60°	9.46 sq. metres
STA. 49+00.73	900	30°	4.90 sq. metres
STA. 54+69.49	900	45°	7.25 sq. metres
STA. 55+04.01	900	35°	5.70 sq. metres
STA. 66+37.58	900	22°30'	3.69 sq. metres
STA. 66+60.28	900	22°30'	3.69 sq. metres
STA. 69+66.67	900	60°	9.46 sq. metres
STA. 69+92.89	900	60°	9.46 sq. metres
STA. 70+45.48	900	45°	7.25 sq. metres
STA. 70+73.91	900	45°	7.25 sq. metres
STA. 75+26.35	900	45°	7.25 sq. metres
STA. 75+37.79	900	35°	5.70 sq. metres
STA. 76+86.06	900	23°30'	3.86 sq. metres
STA. 79+21.87	900	45°	7.25 sq. metres
STA. 79+28.94	900	45°	7.25 sq. metres
STA. 80+67.36	900	58°	9.18 sq. metres
STA. 80+86.91	900	58°	9.18 sq. metres
STA. 83+99.99	900	26°23'35"	4.30 sq. metres
STA. 87+18.16	900	11°56'	1.97 sq. metres
STA. 87+48.89	900	33°05'	5.39 sq. metres
STA. 87+57.48	900	45°	7.25 sq. metres
STA. 93+49.31	900	45°	7.25 sq. metres
STA. 93+56.38	900	45°	7.25 sq. metres
STA. 95+53.72	900	45°	7.25 sq. metres
STA. 95+60.79	900	45°	7.25 sq. metres
STA. 96+76.05	900	46°51'	7.53 sq. metres
STA. 96+82.88	900	46°51'	7.53 sq. metres
STA. 96+92.26	900	DEAD END	9.46 sq. metres

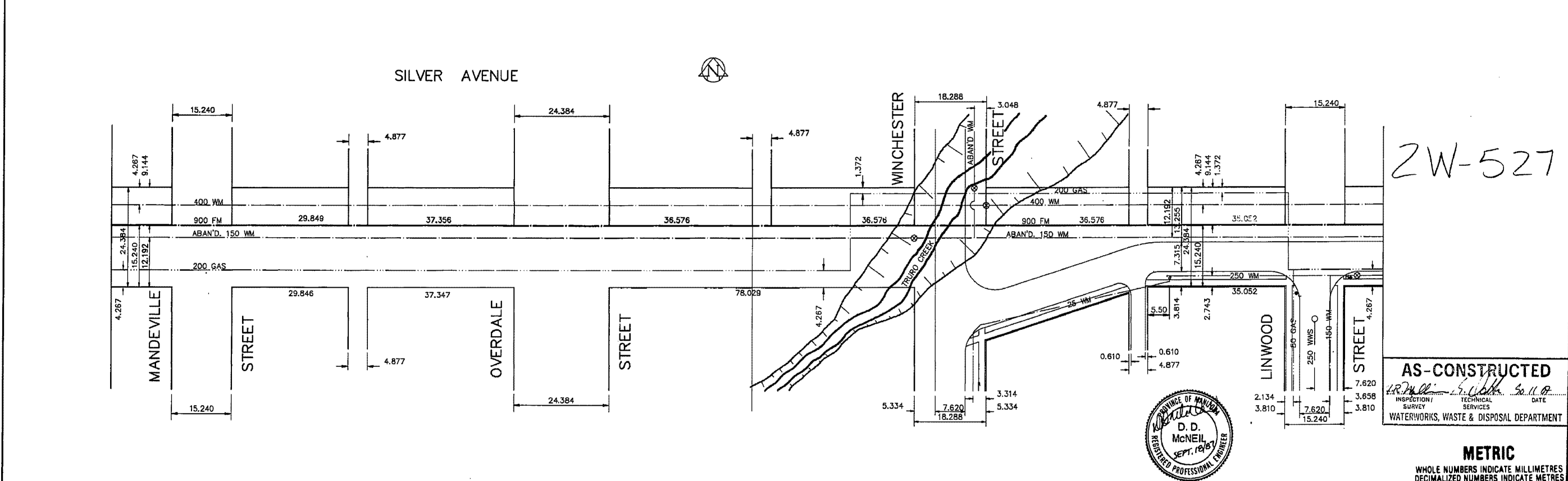
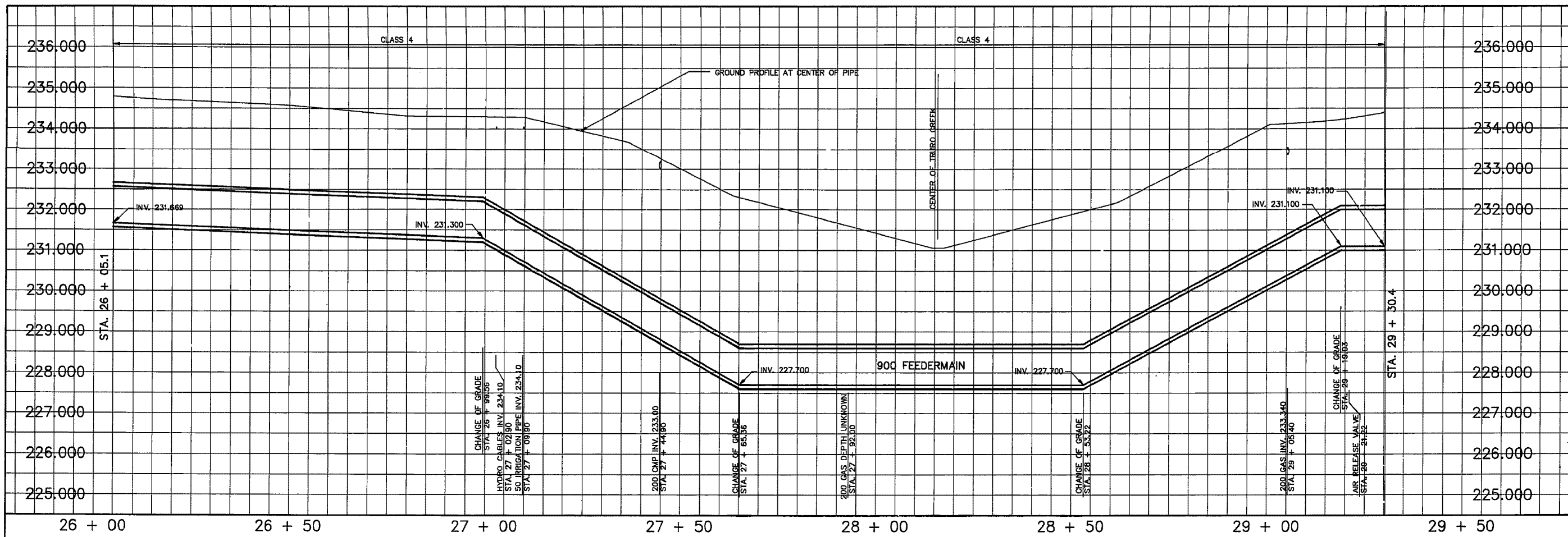


AS-CONSTRUCTED
 720-111-1111
 INSPECTION SURVILY TECHNICAL SERVICES
 WATERWORKS, WASTE & DISPOSAL DEPARTMENT
 90 11 07



METRIC
 WHOLE NUMBERS INDICATE MILLIMETRES
 DECIMALIZED NUMBERS INDICATE METRES

B.M. ELEV. 01 REVISI NO REVISIONS	DESIGNED D.D.M., R.A.S. BY DRAWN BY J.D.P. HOR SCALE AS SHOWN VERTICAL DATE 99.09.13 TM	CHECKED D.D.M., R.A.S. BY APPROVED BY RELEASED FOR CONSTRUCTION DATE 1987 09 15	ENGINEER'S SEAL PROVINCE OF MANITOBA REGISTERED PROFESSIONAL ENGINEER D.D. McNEIL	THE CITY OF WINNIPEG WORKS AND OPERATIONS DIVISION WEST END FEEDERMAIN MISCELLANEOUS DETAILS	CITY DRAWING NUMBER
					SHEET OF
					D-1627



2W-527

AS-CONSTRUCTED
 I.R. McNeil
 INSPECTOR
 SURVEY SERVICES
 DATE
 WATERWORKS, WASTE & DISPOSAL DEPARTMENT



METRIC
 WHOLE NUMBERS INDICATE MILLIMETRES
 DECIMALIZED NUMBERS INDICATE METRES

200 WM	WATERMAIN	200 WM	SL, HYDRO	150 WM	WATERMAIN	150 WM
HYDRANT	HYDRANT	MTS	CONCRETE	HYDRANT	HYDRANT	VALVE
VALVE	VALVE	CONCRETE	PROPERTY LINE	VALVE	VALVE	VALVE
575 LDS	LAND DRAINAGE SEWER	575 LDS	SURVEY BAR	300 LDS	LAND DRAINAGE SEWER	300 LDS
375 WWS	WASTEWATER SEWER	375 WWS	FENCE	250 WWS	WASTEWATER SEWER	250 WWS
MANHOLE	MANHOLE	POLE - HYDRO, MTS	RAILWAY SIGN	PROFILE	PROFILE	PROFILE
CATCH BASIN	CATCH BASIN	RAILWAY SIGN	GUY ANCHOR			
CURB INLET	CURB INLET	LIGHT STANDARD	TREE			
JUNCTIONS	JUNCTIONS					
CULVERT	CULVERT					
50 GAS	GAS					
EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PLAN	PROPOSED	EXISTING
				LEGEND-PROFILE	PROPOSED	

LOCATION APPROVED
 UNDERGROUND STRUCTURES

SURV. U/C STRUCTURES COMMITTEE DATE

NOTE:
 LOCATION 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. CONTRIBUTION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

The City of Winnipeg
 Works & Operations Division
 Waterworks, Waste & Disposal Department

DESIGNED BY RAS,DDM
 CHECKED BY RAS,DDM

DRAWN BY REF, TM
 APPROVED BY

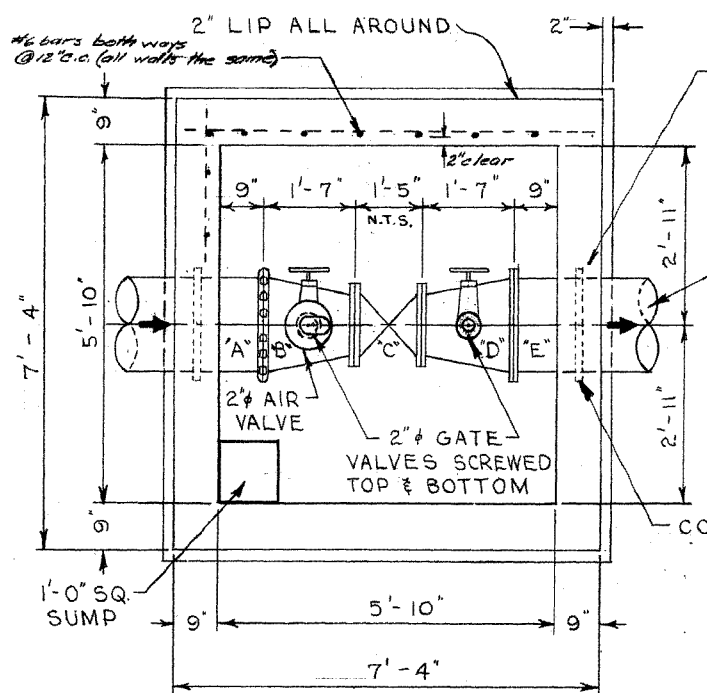
HOR. SCALE 1:500
 VERTICAL 1:50

DATE OCTOBER, 1986

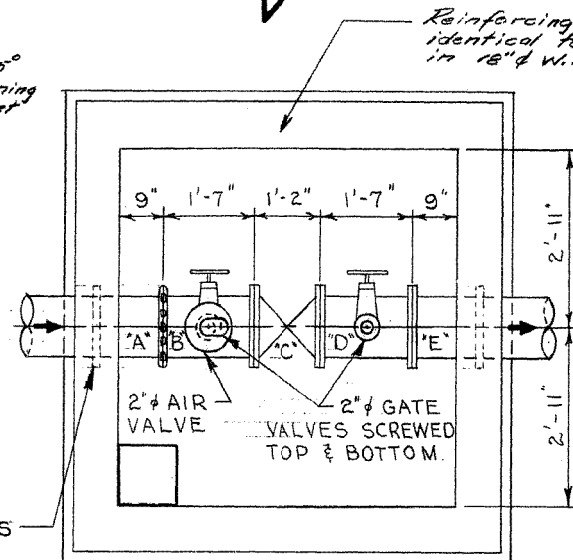
THE CITY OF WINNIPEG
 WORKS AND OPERATIONS DIVISION
 WATERWORKS WASTE AND DISPOSAL DEPARTMENT

WEST END FEEDERMAIN
 SILVER AVE. - BELVIDERE ST. TO
 LINWOOD ST.
 STA. 26 + 05.1 TO STA. 29 + 30.4

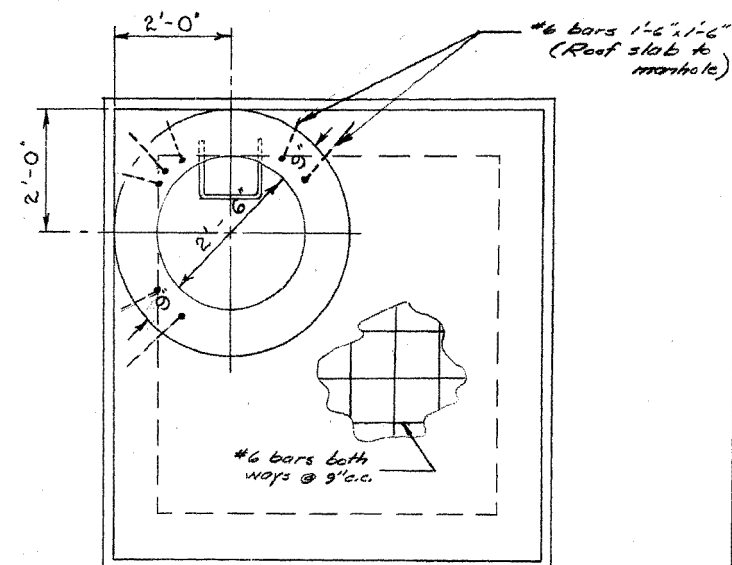
CITY DRAWING NUMBER
 SHEET OF
D-1584



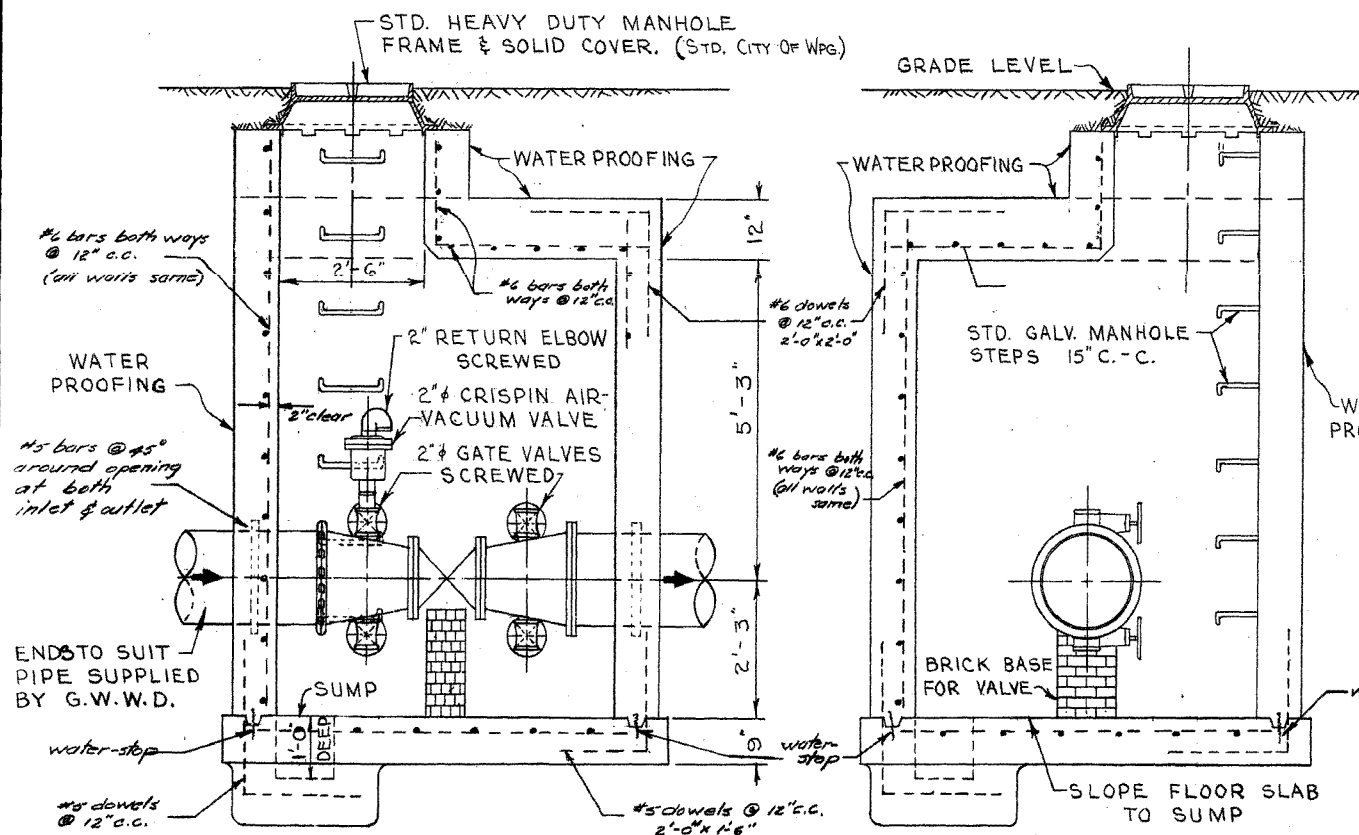
FLOOR PLAN
FOR 18" DIA. WATERMAIN



FLOOR PLAN
FOR 12" DIA. WATERMAIN
(SAME CHAMBER DIMENSIONS AS)
(FOR 18" WATERMAIN)



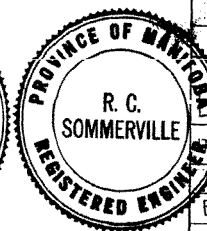
ROOF PLAN
FOR 18" OR 12" DIA. WATERMAIN



LONGITUDINAL SECTION
FOR 18" OR 12" DIA. WATERMAIN

X-SECTION
FOR 18" OR 12" DIA. WATERMAIN

Note:
Reinforcing steel to be 2" clear



NOTE:
PIPE THROUGH
CHAMBER WALLS SHALL BE
C. I. OR STEEL. A. C. PIPE
WILL NOT BE ALLOWED.

LIST OF MATERIALS FOR 18" WATERMAIN

ITEM	DESCRIPTION	NO. REQ'D
A	18" C.I. PIPE - ENDS TO SUIT	1
B	18" x 16" REDUCER - VICT. CPLG. TO FLGE.	1
C	16" GEARED GATE VALVE FLGED. (N.R.S.)	1
D	18" x 12" REDUCER FLGED.	1
E	18" C.I. PIPE - ENDS TO SUIT.	1
	2" CRISPIN AIR-VACUUM VALVE SCREWED.	1
	2" RETURN ELBOW SCREWED.	1
	2" BRASS GATE VALVE SCREWED WITH NIPPLES	4

LIST OF MATERIALS FOR 12" WATERMAIN

ITEM	DESCRIPTION	NO. REQ'D
A	12" C.I. PIPE - ENDS TO SUIT.	1
B	12" C.I. PIPE - VICT. CPLG. TO FLGE.	1
C	12" GATE VALVE FLGED. (N.R.S.)	1
D	12" C.I. PIPE FLGED.	1
E	12" C.I. PIPE - ENDS TO SUIT.	1
	2" CRISPIN AIR-VACUUM VALVE SCREWED	1
	2" RETURN ELBOW SCREWED.	1
	2" BRASS GATE VALVE SCREWED WITH NIPPLES	4
	1-18" OR 12" VICTAULIC COUPLING REQUIRED.	

REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	5.6 FEET ADDED TO STA. CHAINAGE.	30 June 60	S.K.

GREATER WINNIPEG WATER DISTRICT
MUNICIPAL WATERMANS

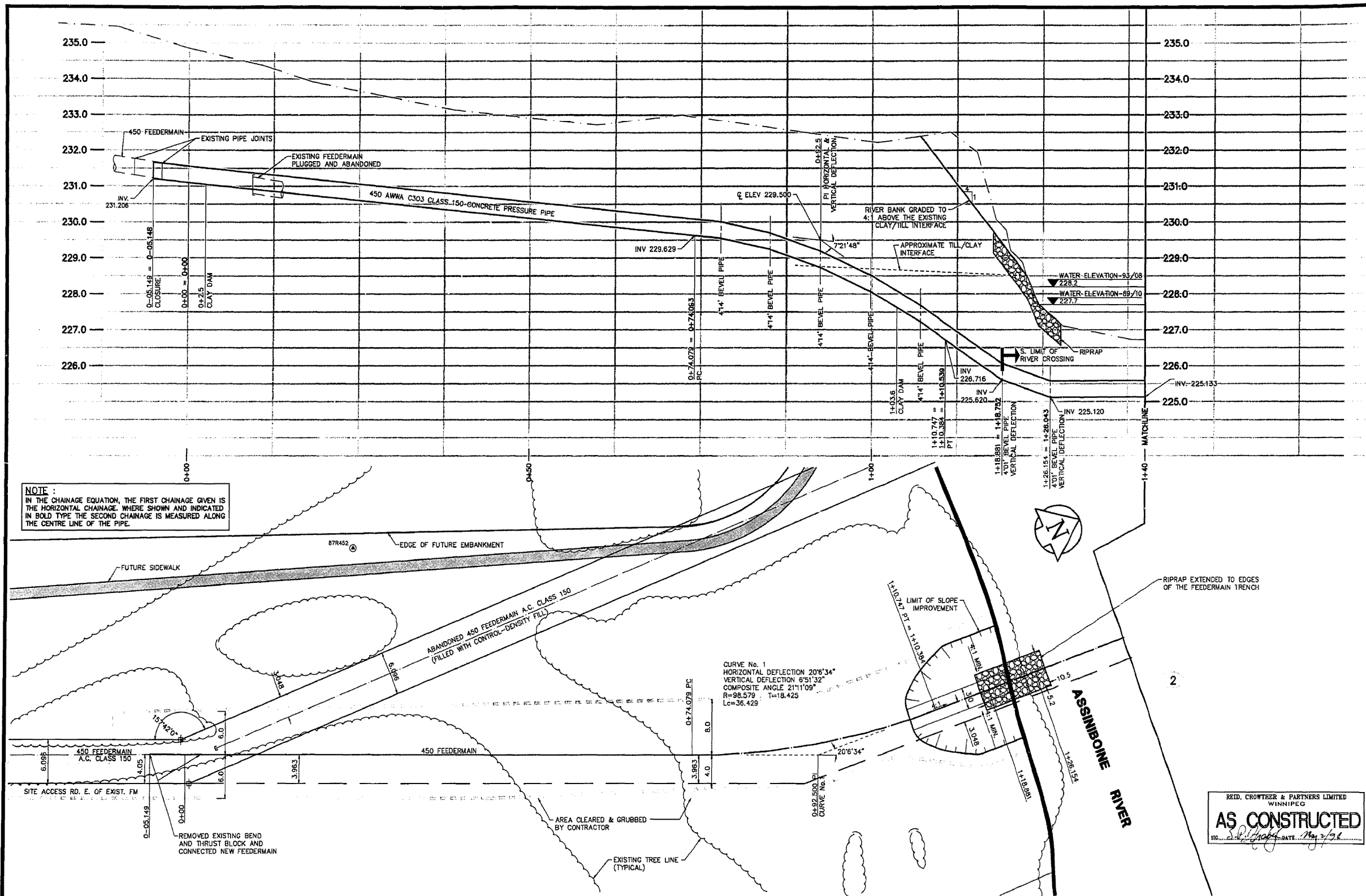
TITLE:
HANEY - MORAY WATERMAIN
GATE VALVE CHAMBER
@ STA. 62 + 55.6

APPROVED BY: *[Signature]* CHIEF ENGINEER
DESIGNED BY: NWS.
CHECKED BY: ECS.
DRAWN BY: S.K.
DATE: 16 JUNE 60.

SCALES:
1/2" INCH = 1'-0" FT.
OTHERWISE AS NOTED.

DRAWING NO. **C-451**

File #
FE10862



NOTE:
IN THE CHAINAGE EQUATION, THE FIRST CHAINAGE GIVEN IS THE HORIZONTAL CHAINAGE. WHERE SHOWN AND INDICATED IN BOLD TYPE THE SECOND CHAINAGE IS MEASURED ALONG THE CENTRE LINE OF THE PIPE.

CURVE No. 1
HORIZONTAL DEFLECTION 20°3'34"
VERTICAL DEFLECTION 6°51'32"
COMPOSITE ANGLE 21°11'09"
R=98.579 T=18.425
Lc=36.429

REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
DATE: May 2/98

EXISTING	LEGEND - PLAN	PROPOSED	EXISTING	LEGEND - PLAN	PROPOSED	EXISTING	LEGEND - PROFILE	PROPOSED
150mm W.W.	WATERMAIN	150mm W.W.	HYDRO	M.T.S.		300mm W.W.	WATERMAIN	HYDRANT
300mm L.O.S.	LAND DRAINAGE SEWER	300mm L.O.S.	CONCRETE	ASPHALT		300mm L.O.S.	LAND DRAINAGE SEWER	VALVE
250mm W.W.S.	WASTEWATER SEWER	250mm W.W.S.	PROPERTY LINE	SURVEY BAR		250mm W.W.S.	WASTE WATER SEWER	Q PROFILE
	MANHOLE		ELEVATION	(32.750)			FEEDERMAIN	
	CATCH BASIN		TREE					
	CURB INLET		SIDEWALK RAMP					
	JUNCTIONS		CONCRETE SIDEWALK					
	CULVERT		FENCE					
	GAS							

LOCATION APPROVED UNDERGROUND STRUCTURES
SUPV. U/G STRUCTURES DATE COMMITTEE

NOTE:
LOCATION 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.

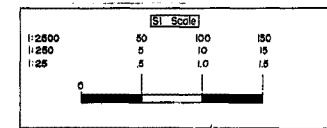
NO.	REVISIONS	DATE	BY
D	AS CONSTRUCTED	04.05.02	GSK
C	ISSUED FOR TENDER	03.09.15	DED
B	ISSUED FOR CITY REVIEW	03.08.24	GSK
A	ISSUED FOR APPROVAL	03.08.13	GSK

REID Crowther
BAM/GSK
DESIGNED BY
DRAWN BY
DATE 93-06-28

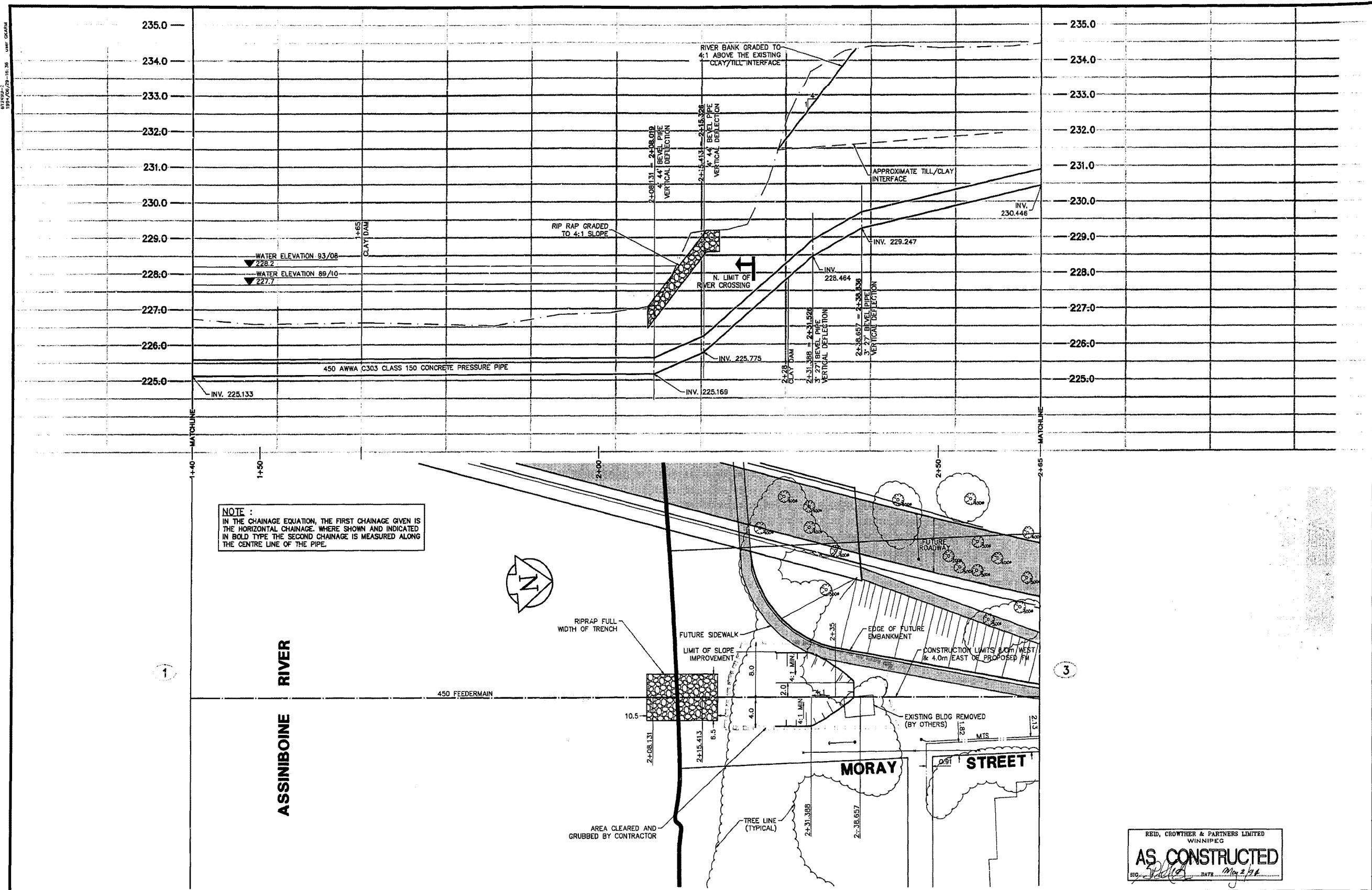
THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
WATER WORKS, WASTE AND DISPOSAL DEPT.

HANEY-MORAY FEEDERMAIN RELOCATION
298m NORTH OF ROBLIN BLVD. TO PINWOOD DRIVE
FEEDERMAIN RELOCATION
0+00 TO 1+40

CITY DRAWING NUMBER
SHEET 1 OF 5
D-1955



File # FE10862



NOTE:
IN THE CHAINAGE EQUATION, THE FIRST CHAINAGE GIVEN IS THE HORIZONTAL CHAINAGE. WHERE SHOWN AND INDICATED IN BOLD TYPE THE SECOND CHAINAGE IS MEASURED ALONG THE CENTRE LINE OF THE PIPE.

REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
DATE: May 2, 1994

EXISTING	LEGEND - PLAN	PROPOSED	EXISTING	LEGEND - PLAN	PROPOSED	EXISTING	LEGEND - PROFILE	PROPOSED
150 mm W.M.	WATERMAIN	150 mm W.M.	HYDRO	M.T.S.		150 mm W.M.	WATERMAIN	150 mm W.M.
300 mm L.D.S.	LAND DRAINAGE SEWER	300 mm L.D.S.	CONCRETE	ASPHALT		300 mm L.D.S.	LAND DRAINAGE SEWER	300 mm L.D.S.
250 mm W.W.S.	WASTEWATER SEWER	250 mm W.W.S.	PROPERTY LINE	SURVEY BAR	(32.750)	250 mm W.W.S.	WASTE WATER SEWER	250 mm W.W.S.
	MANHOLE		ELEVATION	TREE			FEEDERMAIN	
	CATCH BASIN		SIDEWALK RAMP	CONCRETE SIDEWALK				
	JUNCTIONS		FENCE					
	CULVERT							
	GAS							

LOCATION APPROVED UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES	DATE
AS CONSTRUCTED	04.05.02 GSK
ISSUED FOR TENDER	03.09.15 DED
ISSUED FOR CITY REVIEW	03.08.24 GSK
ISSUED FOR APPROVAL	03.08.13 GSK

NOTE:
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B.M. 38-048
ELEV. 237.184

1/2" SIDE PORTAGE IN MEDIUM OF MORAY ST.
18" TL. ON TOP OF 6.05m x 2.4m IRON PIPE.
0.5m W.M.L. PORTAGE @ 12.5m W/E.L. USWAY.

Reid Crowther
Bald Crowther & Partners Ltd.
Consulting Engineers

DESIGNED BY	BAM/GSK	CHECKED BY	BAM
DRAWN BY	GSK	APPROVED BY	
HOR. SCALE:	250	RELEASED FOR CONSTRUCTION:	
VERTICAL:	50	DATE	93-08-28

ENGINEER'S SEAL
PROFESSIONAL ENGINEER
DESIGN ORIGINAL
STAMPED BY
B.A. MORTON
AUG. 16 / 93
REGISTERED PROFESSIONAL ENGINEER

THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
WATER WORKS, WASTE AND DISPOSAL DEPT.

HANEY-MORAY FEEDERMAIN RELOCATION
298m NORTH OF ROBLIN BLVD. TO PINEWOOD DRIVE
FEEDERMAIN RELOCATION
1+40 TO 2+65

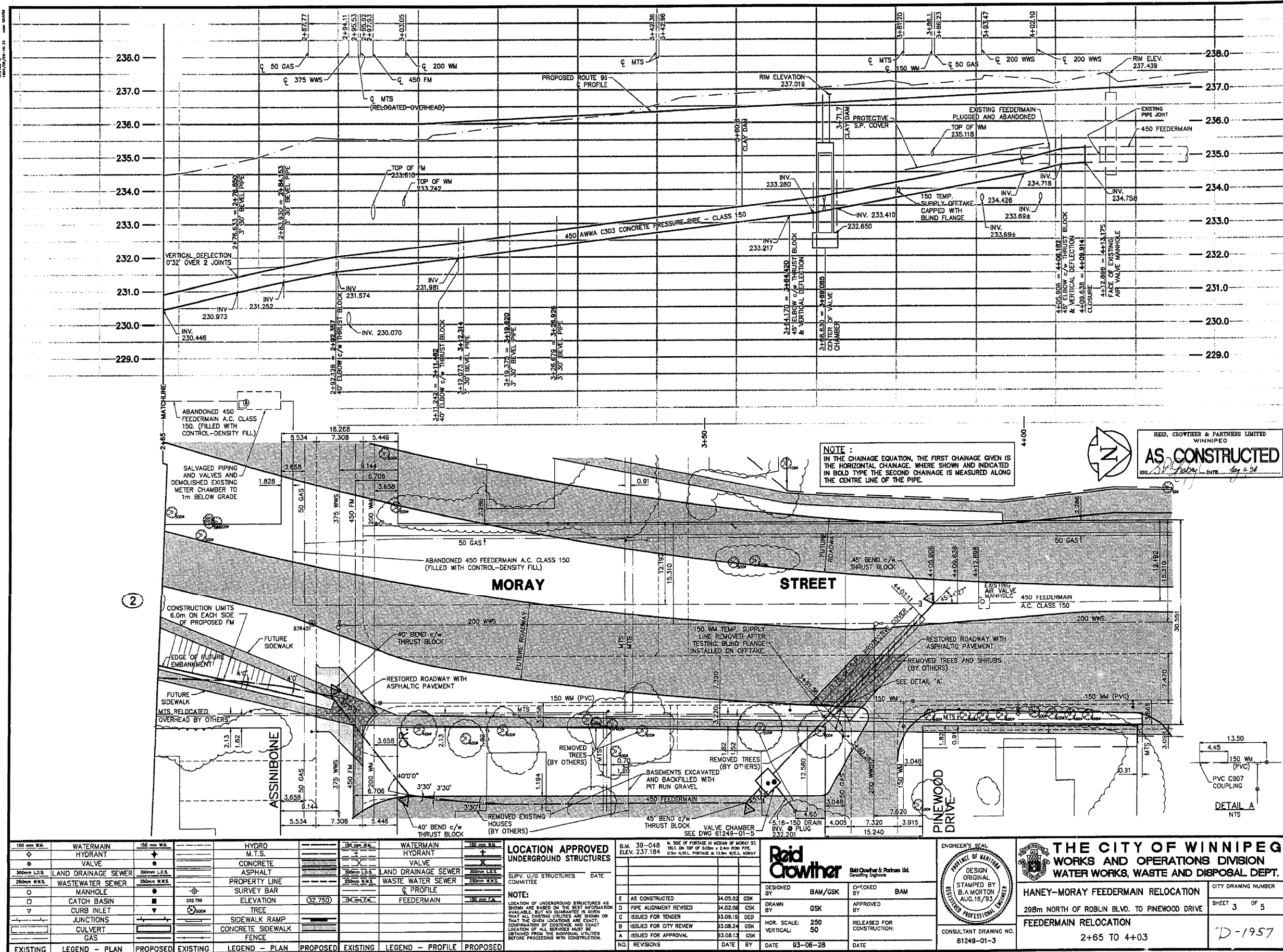
CITY DRAWING NUMBER
SHEET 2 OF 5
D-1956

D-1957

REF. or DRAWING No.

DETAILS

File # FE10864



NOTE:
IN THE CHAINAGE EQUATION, THE FIRST CHAINAGE GIVEN IS THE HORIZONTAL CHAINAGE, WHERE SHOWN AND INDICATED IN BOLD TYPE THE SECOND CHAINAGE IS MEASURED ALONG THE CENTRE LINE OF THE PIPE.

REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
DATE: Aug 2, 98

EXISTING	LEGEND - PLAN	PROPOSED	EXISTING	LEGEND - PLAN	PROPOSED	EXISTING	LEGEND - PROFILE	PROPOSED
150mm W.M.	WATERMAIN	150mm W.S.	HYDRO	M.T.S.	150mm W.M.	WATERMAIN	HYDRANT	
300mm L.D.S.	LAND DRAINAGE SEWER	300mm L.D.S.	CONCRETE	ASPHALT	300mm L.D.S.	LAND DRAINAGE SEWER	VALVE	
250mm W.W.S.	WASTEWATER SEWER	250mm W.W.S.	PROPERTY LINE	SURVEY BAR	250mm W.W.S.	WASTE WATER SEWER	Q PROFILE	
○	MANHOLE	●	ELEVATION	(32,750)	150mm W.M.	FEEDERMAIN		
□	CATCH BASIN	▽	SIDEWALK RAMP					
▽	CURB INLET	▽	CONCRETE SIDEWALK					
○	JUNCTIONS	▽	FENCE					
○	CULVERT							
	GAS							

LOCATION APPROVED UNDERGROUND STRUCTURES	DATE
SUPV. U/G STRUCTURES COMMITTEE	

NOTE:
LOCATION 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. COORDINATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

Reid Crowther
Reid Crowther & Partners Ltd.
Consulting Engineers

ENGINEER'S SEAL
DESIGN ORIGINAL
STAMPED BY
B.A. MORTON
AUG. 16/93
REGISTERED PROFESSIONAL ENGINEER

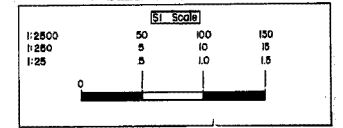
THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
WATER WORKS, WASTE AND DISPOSAL DEPT.

HANEY-MORAY FEEDERMAIN RELOCATION
298m NORTH OF ROBLIN BLVD. TO PINEWOOD DRIVE
FEEDERMAIN RELOCATION
2+65 TO 4+03

CITY DRAWING NUMBER
SHEET 3 OF 5
D-1957

File # FE10864

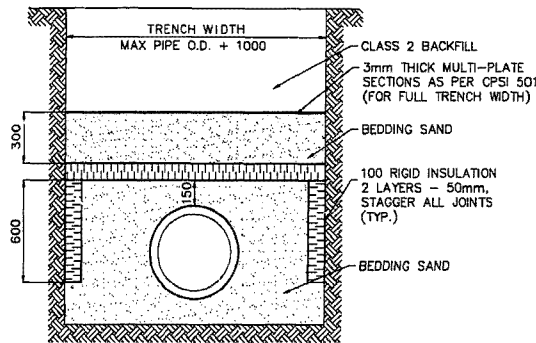
29x



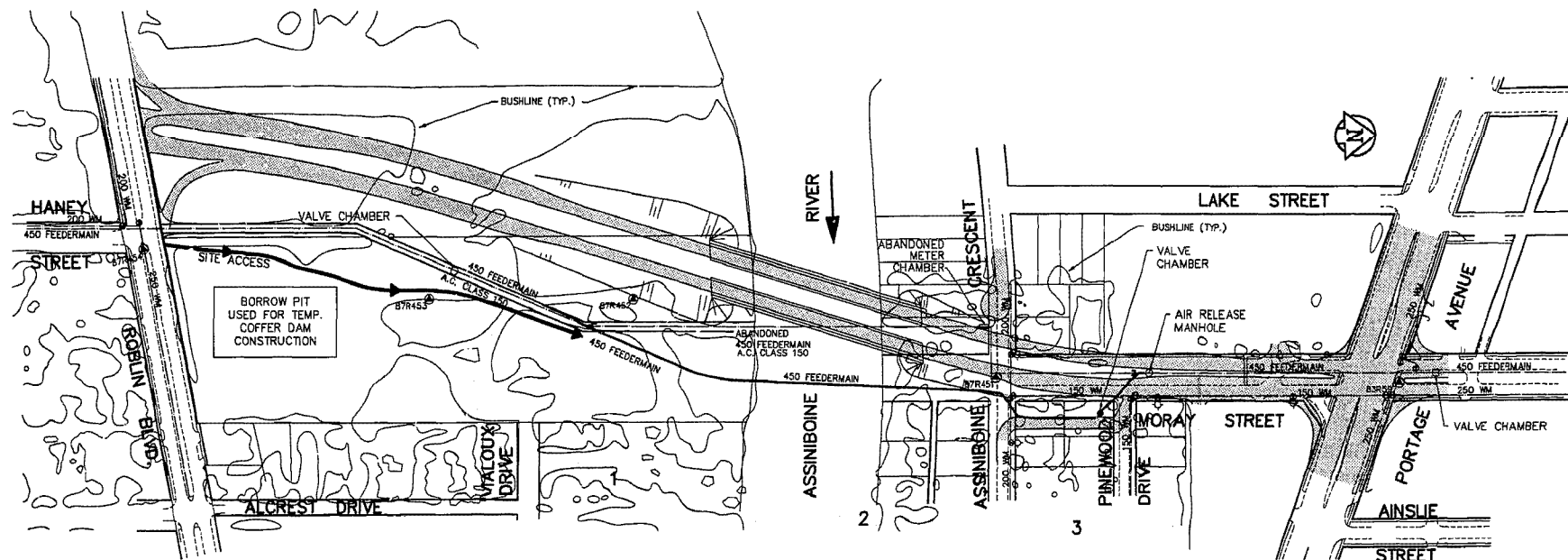
file # FE10865

3130110300
1891/09/25-16-42
1891/09/25-16-42
1891/09/25-16-42

MATERIALS :
450mm FEEDERMAIN - MANUFACTURED BY HYPRESCON INC.
TO AWWA C303 CLASS 150
CLOSURES - MANUFACTURED BY ROBAR INDUSTRIES LTD.
STYLE 140B c/w 10kg ZINC ANODE CAD WELDED
TO COUPLING.

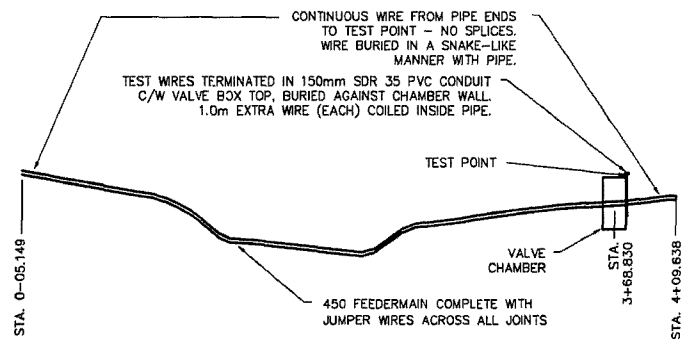


PIPE INSULATION/PROTECTION DETAIL
STATION 3+81.36 TO 4+03.11
NTS

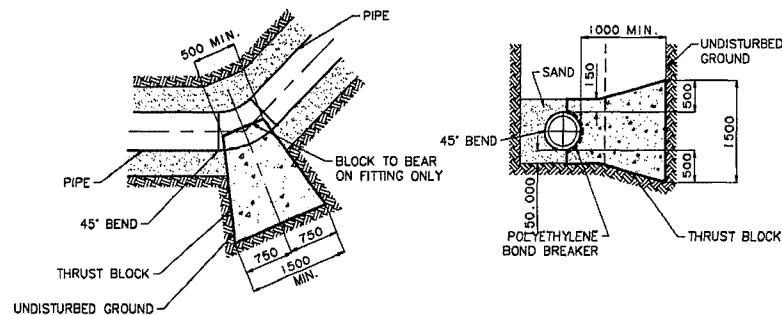


PLAN OF EXISTING AND PROPOSED MAINS

SCALE 1:2000



ELECTRICAL CONTINUITY AND TEST POINT SCHEMATIC
NTS



THRUST BLOCK DETAILS
NTS

SURVEY DETAILS

Table with columns: PROJECT COORDINATES (NORTHING, EASTING, ELEVATION), CHAINAGE (HORIZONTAL, PIPE), HORIZONTAL ANGLE, VERTICAL ANGLE, COMPOSITE ANGLE, DESCRIPTION.

PROJECT CONTROL MONUMENTS

Table with columns: NORTHING, EASTING, MONUMENT No.

REFERENCE NOTES:

- A. RCPL FIELD BOOKS No. 3623, 3649, 3674, 8 3918.
B. LEGAL PLANS No. 6564 & 7368.
C. BASELINE CHAINAGE IS HORIZONTAL THROUGH PI POINTS AND IS ADJUSTED AT THE END OF THE CURVE. CHAINAGES SHOWN IN BOLD ARE MEASURED ALONG THE PIPE CENTER LINE.

REID, CROWTHER & PARTNERS LIMITED
WINNIPEG
AS CONSTRUCTED
DATE: Mar 2/91

Legend table with columns: EXISTING, LEGEND - PLAN, PROPOSED, EXISTING, LEGEND - PROFILE, PROPOSED. Includes symbols for watermain, sewer, manhole, etc.

LOCATION APPROVED UNDERGROUND STRUCTURES

NOTE: LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE...

Table with columns: NO., REVISIONS, DATE, BY. Includes dates like 94.05.02 and 93.09.15.



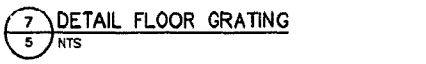
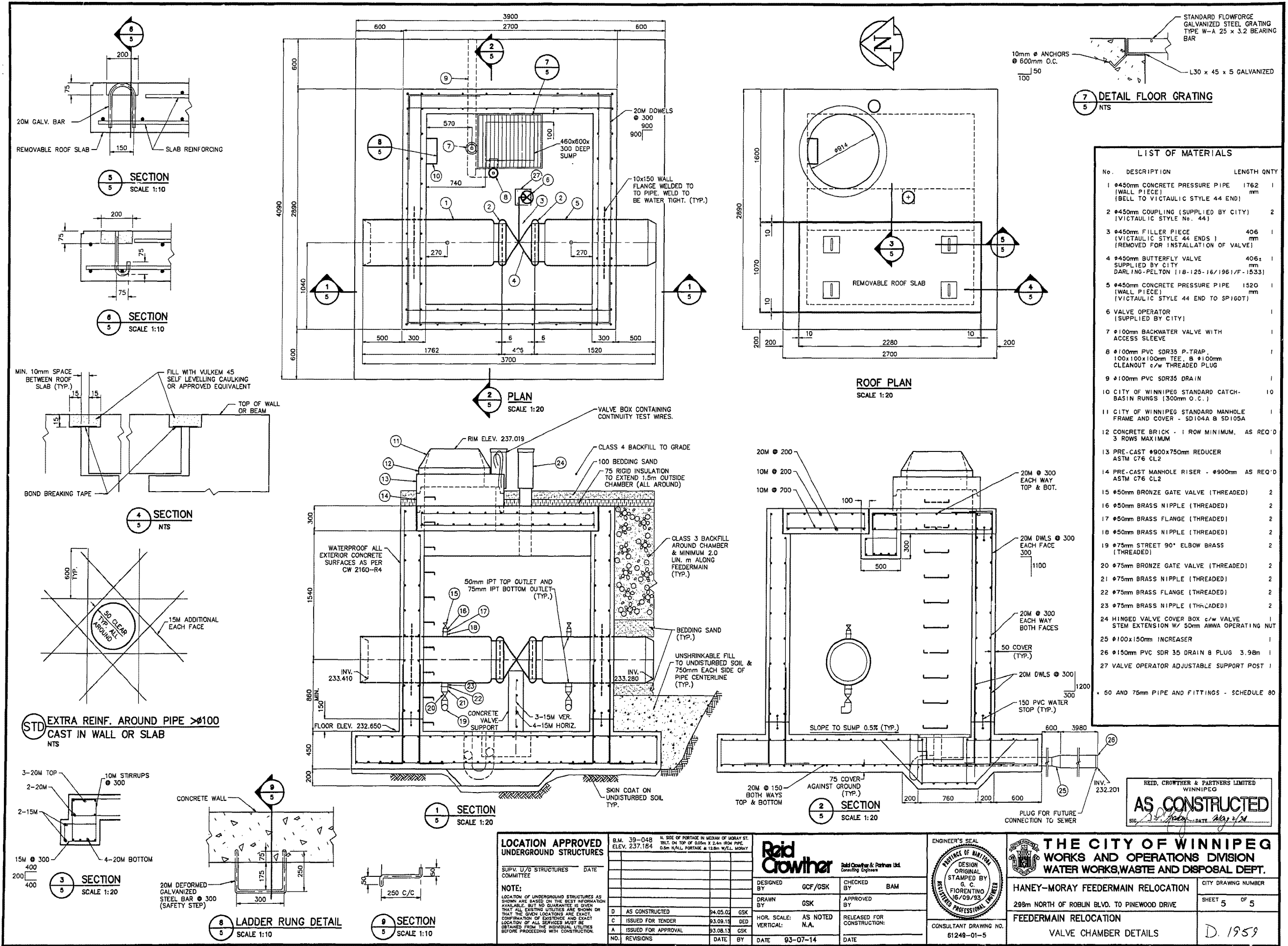
Table with columns: DESIGNED BY (BAM), CHECKED BY (BAM), DRAWN BY (GSK), APPROVED BY.



THE CITY OF WINNIPEG WORKS AND OPERATIONS DIVISION WATER WORKS, WASTE AND DISPOSAL DEPT. HANEY-MORAY FEEDERMAIN RELOCATION... SHEET 4 OF 5

file # FE10865

File # **FE-10866**



LIST OF MATERIALS

No.	DESCRIPTION	LENGTH	QTY
1	Ø450mm CONCRETE PRESSURE PIPE (WALL PIECE) (BELL TO VICTAULIC STYLE 44 END)	1762 mm	1
2	Ø450mm COUPLING (SUPPLIED BY CITY) (VICTAULIC STYLE No. 44)		2
3	Ø450mm FILLER PIECE (VICTAULIC STYLE 44 ENDS) (REMOVED FOR INSTALLATION OF VALVE)	406 mm	1
4	Ø450mm BUTTERFLY VALVE SUPPLIED BY CITY DARLING-PELTON 11B-125-16/1961/F-15331	406 mm	1
5	Ø450mm CONCRETE PRESSURE PIPE (WALL PIECE) (VICTAULIC STYLE 44 END TO SP160T)	1520 mm	1
6	VALVE OPERATOR (SUPPLIED BY CITY)		1
7	Ø100mm BACKWATER VALVE WITH ACCESS SLEEVE		1
8	Ø100mm PVC SDR35 P-TRAP, 100x100x100mm TEE, Ø100mm CLEANOUT c/w THREADED PLUG		1
9	Ø100mm PVC SDR35 DRAIN		1
10	CITY OF WINNIPEG STANDARD CATCH-BASIN RUNGS (300mm O.C.)		10
11	CITY OF WINNIPEG STANDARD MANHOLE FRAME AND COVER - SD104A B SD105A		1
12	CONCRETE BRICK - 1 ROW MINIMUM, AS REQ'D 3 ROWS MAXIMUM		
13	PRE-CAST Ø900x750mm REDUCER ASTM C76 CL2		1
14	PRE-CAST MANHOLE RISER - Ø900mm AS REQ'D ASTM C76 CL2		
15	Ø50mm BRONZE GATE VALVE (THREADED)		2
16	Ø50mm BRASS NIPPLE (THREADED)		2
17	Ø50mm BRASS FLANGE (THREADED)		2
18	Ø50mm BRASS NIPPLE (THREADED)		2
19	Ø75mm STREET 90° ELBOW BRASS (THREADED)		2
20	Ø75mm BRONZE GATE VALVE (THREADED)		2
21	Ø75mm BRASS NIPPLE (THREADED)		2
22	Ø75mm BRASS FLANGE (THREADED)		2
23	Ø75mm BRASS NIPPLE (THREADED)		2
24	HINGED VALVE COVER BOX c/w VALVE STEM EXTENSION w/ 50mm AWWA OPERATING NUT		1
25	Ø100x150mm INCREASER		1
26	Ø150mm PVC SDR 35 DRAIN & PLUG 3.98m		1
27	VALVE OPERATOR ADJUSTABLE SUPPORT POST		1

Ø 50 AND 75mm PIPE AND FITTINGS - SCHEDULE 80

LOCATION APPROVED UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES COMMITTEE DATE

NOTE:
LOCATION 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.

B.M. 39-048 ELEV. 237.184	N. SIDE OF PORTAGE IN MEDIUM OF MORGAN ST. TIE: ON TOP OF 600mm Ø 2.4m HIGH PIPE. 0.5m WALL PORTAGE & 12.5m W/LL MORGAN
DESIGNED BY GCF/GSK	CHECKED BY BAM
DRAWN BY GSK	APPROVED BY
HOR. SCALE: AS NOTED	RELEASED FOR CONSTRUCTION:
VERTICAL: N.A.	DATE 93-07-14

Reid Crowther
Reid Crowther & Partners Ltd.
Consulting Engineers

ENGINEER'S SEAL
DESIGN ORIGINAL STAMPED BY S. C. FIORENTINO 06/09/93
CONSULTANT DRAWING NO. 61248-01-5

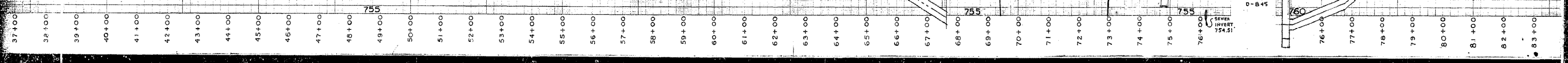
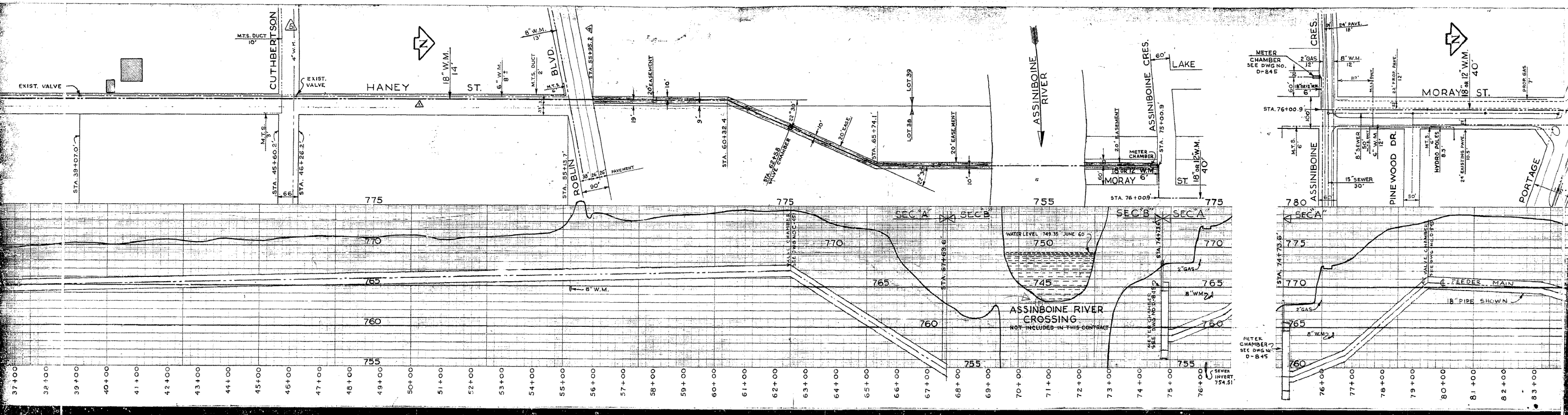
THE CITY OF WINNIPEG
WORKS AND OPERATIONS DIVISION
WATER WORKS, WASTE AND DISPOSAL DEPT.

HANEY-MORAY FEEDERMAIN RELOCATION
298m NORTH OF ROBLIN BLVD. TO PINWOOD DRIVE

FEEDERMAIN RELOCATION
VALVE CHAMBER DETAILS

CITY DRAWING NUMBER
SHEET 5 OF 5
D. 1959

File # FE 10866

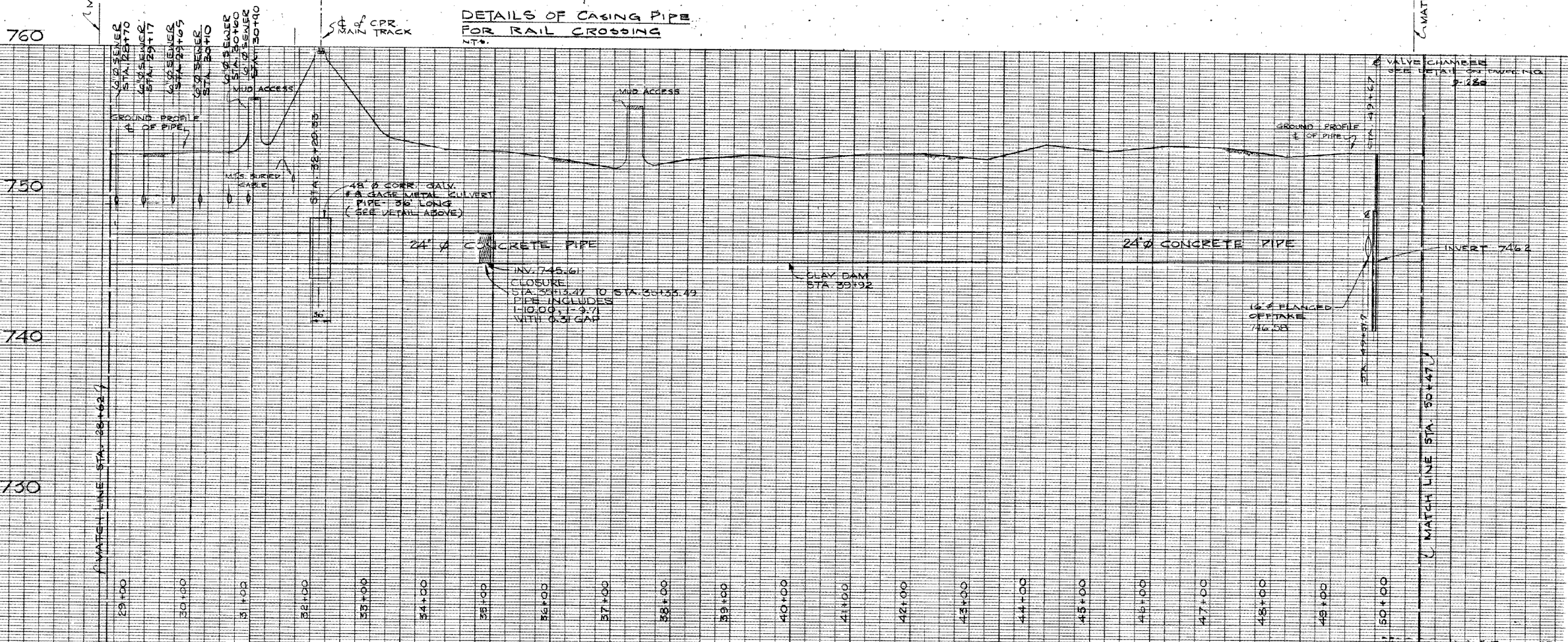
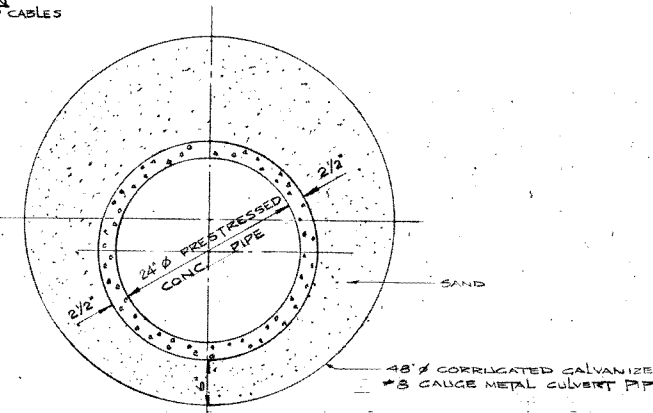
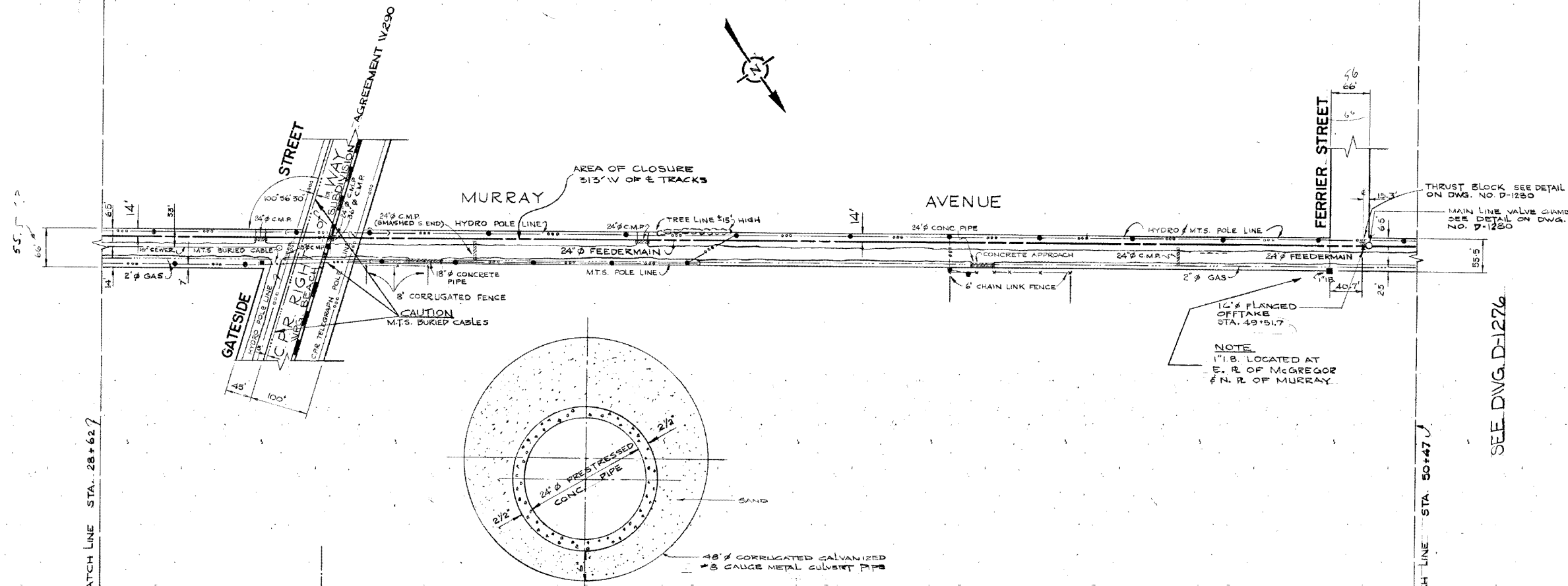


STA. 39+07.0
 STA. 45+60.2
 STA. 46+26.2
 STA. 58+13.7
 STA. 60+32.4
 STA. 62+45.8
 STA. 63+00.0
 STA. 64+00.0
 STA. 65+74.1
 STA. 67+00.0
 STA. 68+00.0
 STA. 69+00.0
 STA. 70+00.0
 STA. 71+00.0
 STA. 72+00.0
 STA. 73+00.0
 STA. 74+00.0
 STA. 75+00.0
 STA. 76+00.9
 STA. 77+00.0
 STA. 78+00.0
 STA. 79+00.0
 STA. 80+00.0
 STA. 81+00.0
 STA. 82+00.0
 STA. 83+00.0

775
 770
 765
 760
 755

EXIST. VALVE
 M.T.S. DUCT 10"
 CUTHBERTSON
 HANEY ST.
 18" W.M.
 14"
 6" W.M.
 8"
 M.T.S. DUCT 10"
 BLVD.
 20' EASEMENT
 10'
 19'
 9'
 STA. 58+13.7
 30' x 30' PAVEMENT
 90'
 STA. 60+32.4
 STA. 62+45.8
 VALVE CHAMBER
 SEE DWG. NO. D-845
 20' LEASE
 STA. 65+74.1
 LOT 28
 LOT 29
 20' EASEMENT
 10'
 ASSINBOINE RIVER
 ASSINBOINE CRES.
 LAKE
 STA. 75+00.9
 METER CHAMBER
 10' x 12' W.M.
 MORAY ST.
 18" W.M.
 40'
 ASSINBOINE
 PINE WOOD DR.
 15" SEWER
 30'
 8" W.M.
 12'
 5" W.M.
 12'
 HYDRO PILES
 8' x 8'
 24' EXISTING PAVEMENT
 18"
 PORTAGE
 PROP. GAS
 7'
 METER CHAMBER
 SEE DWG. NO. D-845
 STA. 76+00.9
 M.T.S. 6"
 2" GAS
 12'
 8" W.M.
 12'
 17'
 24' PAVE
 18"
 STA. 74+73.6
 M.T.S. 6"
 2" GAS
 12'
 8" W.M.
 12'
 17'
 24' PAVE
 18"
 FEEDER MAIN
 18" PIPE SHOWN
 VALVE CHAMBER
 SEE DWG. NO. D-845
 METER CHAMBER
 SEE DWG. NO. D-845
 STA. 75+51
 SEWER INVERT

SEE DWG. D-1274



LEGEND

WATERWORKS, WASTE AND DISPOSAL / UNDERGROUND UTILITIES

PROPOSED FORCEMAIN, INTERCEPTOR OR SECONDARY SEWER _____

EXISTING FORCEMAIN, INTERCEPTOR OR SECONDARY SEWER _____ W.W.D. 24" SEWER

PROPOSED FEEDERMAIN _____

EXISTING FEEDERMAIN _____ W.W.D. 24" F.W.M.

W.W.D. — WATERWORKS, WASTE AND DISPOSAL

OTHER UNDERGROUND UTILITIES

COMMUNITY SEWER _____

COMMUNITY WATERMAIN _____

GAS _____

HYDRO DUCT _____

M.T.S. DUCT OR CABLE _____

STREET LIGHTING, RAILWAY SIGNAL OR TRAFFIC SIGNAL CABLE _____

SURFACE UTILITIES

COMMUNITY BOUNDARY LINE _____

FENCE LINE _____ X _____ X

POLE LINE _____

RAILWAY LINE _____

MISCELLANEOUS SYMBOLS

CATCH BASIN _____ ○

CULVERT _____ □

HYDRANT _____ ⊕

MANHOLE _____ ⊙

HYDRO OR M.T.S. POLE _____ ●

LAMP STANDARD _____ ⊛

RAILWAY OR TRAFFIC SIGNAL STANDARD _____ ⊛

SURVEY BAR _____ ⊠

TREE _____ ⊙

VALVE _____ ⊙

NOTES

AS BUILT

D. S. G. SURVEY *W. Alexopoulos* Nov 25/76
ENGINEERING DATE

3	REVISED TITLE & STREET NAMES	91-01-22 M.T.S.	
4	6-6" SEWER CROSSINGS ADDED	781005 RH	
	AS BUILT	1-11-76 M.S.	
NO.	DESCRIPTION	DATE	BY

REVISIONS

FIELD BOOK(S) NO. F-387, F-394, F-408, F-426 SURVEYED BY D.M. GALKA

LAND SURVEY PLAN(S) NO. DATE MAY 14, 1974

B. M.

The City of Winnipeg

Waterworks, Waste and Disposal Division

Branch Operations (Waterworks)

MURRAY AVENUE FEEDERMAIN

FROM A POINT 220FT EAST OF GATESIDE STREET TO FERRIER STREET STA. 28+62 TO STA 50+47

DESIGNED BY *Rub* DRAWN BY F. Kolbert

CHECKED BY *[Signature]* DATE SEPT. 10-74

APPROVED BY *[Signature]*

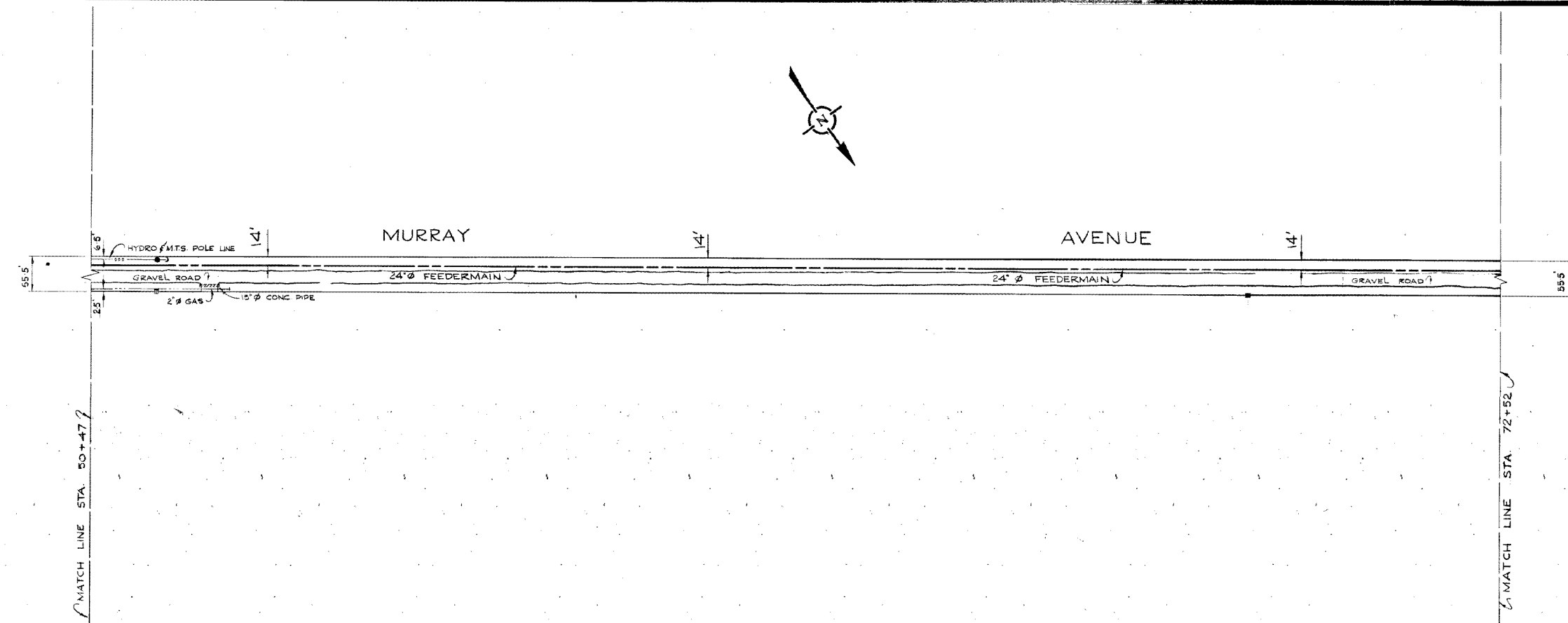
SCALE HOR. - 1" = 100' VERT. - 1" = 4'-0"

DRAWING NO. **D-1275**

D-1275

CITY OF WINNIPEG
15030035

SEE DWG. D-1275



760

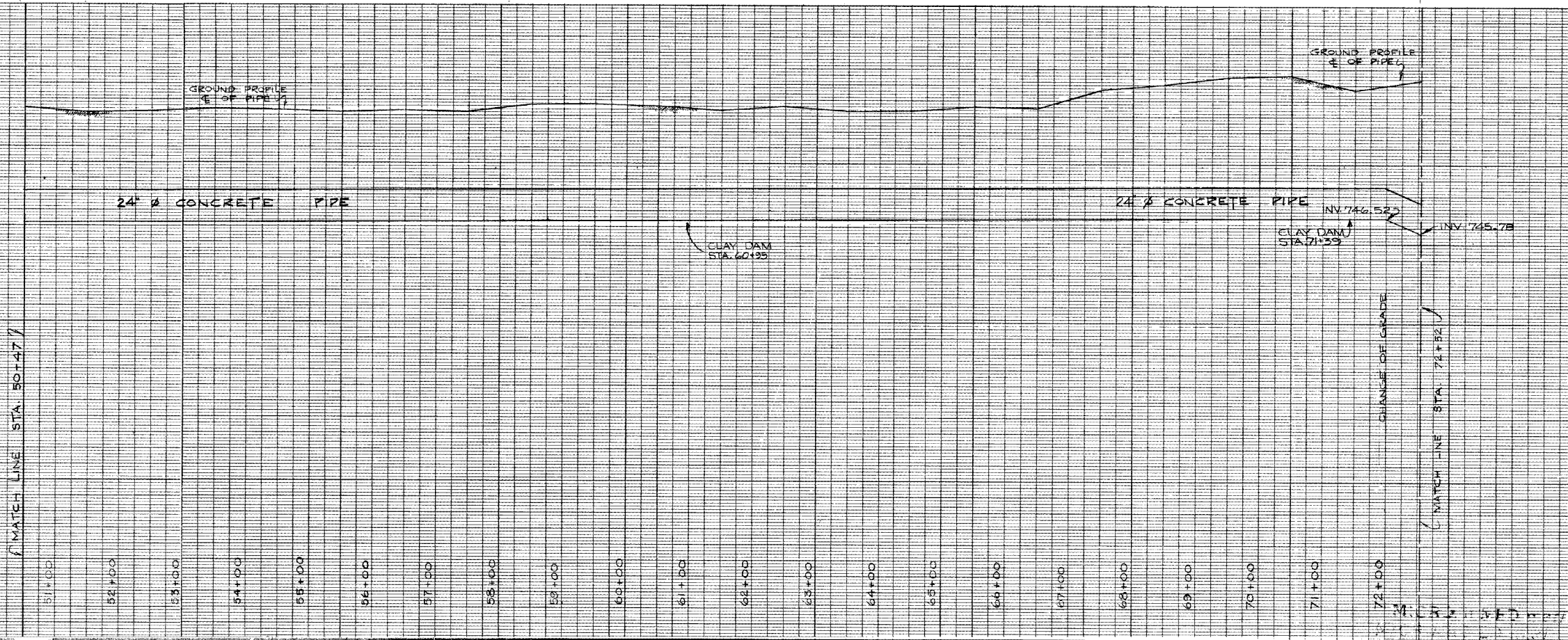
740

730

MATCH LINE STA. 50+47

MATCH LINE STA. 72+52

SEE DWG. D-1277



LEGEND

WATERWORKS, WASTE AND DISPOSAL - UNDERGROUND UTILITIES	
PROPOSED FORCEMAIN, INTERCEPTOR OR SECONDARY SEWER	_____
EXISTING FORCEMAIN, INTERCEPTOR OR SECONDARY SEWER	_____ W.W.D. 24" SEWER
PROPOSED FEEDERMAIN	_____
EXISTING FEEDERMAIN	_____ W.W.D. 24" F.W.M.
W.W.D.	_____ WATERWORKS, WASTE AND DISPOSAL
OTHER UNDERGROUND UTILITIES	
COMMUNITY SEWER	_____
COMMUNITY WATERMAIN	_____
GAS	_____
HYDRO DUCT	_____
M.T.S. DUCT OR CABLE	_____
STREET LIGHTING, RAILWAY SIGNAL OR TRAFFIC SIGNAL CABLE	_____
SURFACE UTILITIES	
COMMUNITY BOUNDARY LINE	_____
FENCE LINE	_____ X _____ X
POLE LINE	_____
RAILWAY LINE	_____
MISCELLANEOUS SYMBOLS	
CATCH BASIN	○
CULVERT	□
HYDRANT	⊕
MANHOLE	⊙
HYDRO OR M.T.S. POLE	●
LAMP STANDARD	⊙
RAILWAY OR TRAFFIC SIGNAL STANDARD	⊙
SURVEY BAR	⊙
TREE	⊙
VALVE	⊙

NOTES

AS BUILT
 Survey Engineering Date
 11/17/76

2	REVISED TITLE	91-01-22 M.T.S
1	AS BUILT	1-11-76 M.S
NO.	DESCRIPTION	DATE BY
REVISIONS		
FIELD BOOKS NO. F-387, F-394, F-408, F-426		SURVEYED BY D.M. GALKA
LAND SURVEY PLANS NO.		DATE MAY 14, 1974
B. M.		

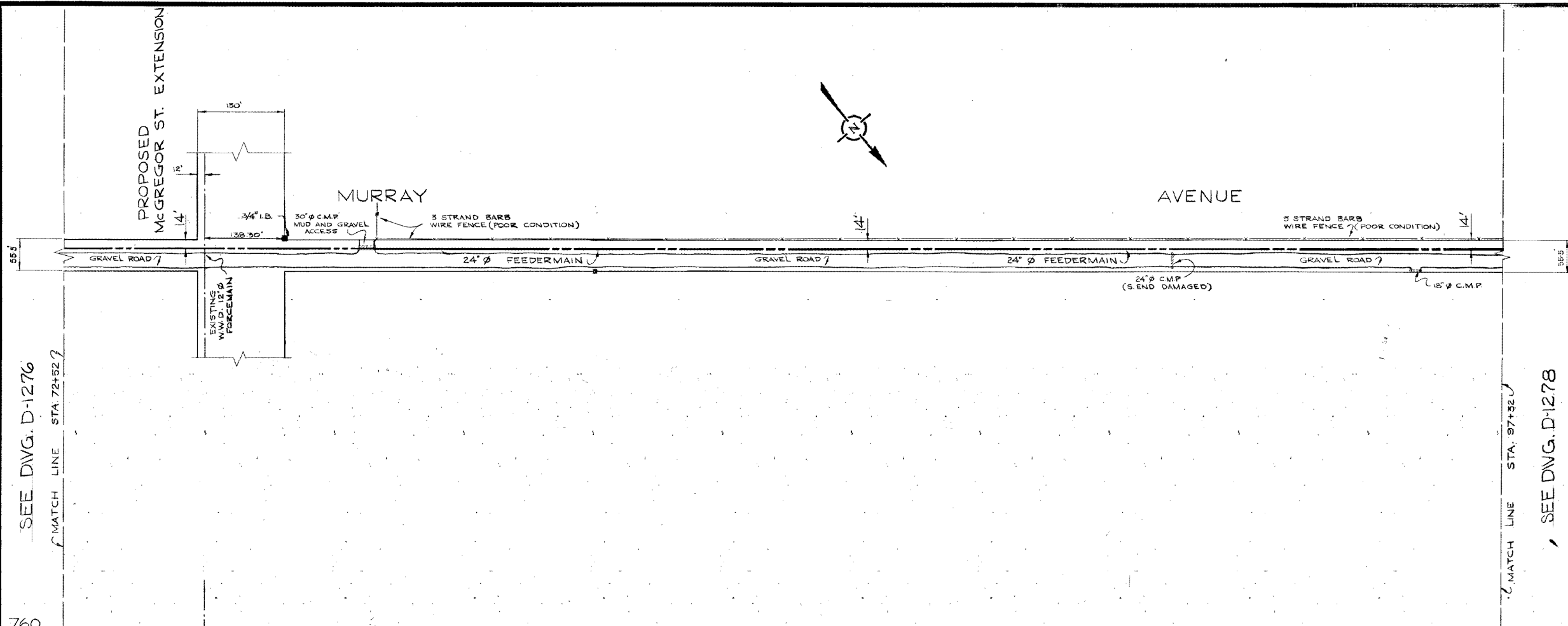
The City of Winnipeg
 Waterworks, Waste and Disposal Division

Branch Operations (Waterworks)
MURRAY AVENUE FEEDERMAIN
 FROM A POINT 80 FT WEST OF FERRIER ST. TO A POINT 230 FT EAST OF MCGREGOR STREET STA. 50+47 TO STA. 72+52

DESIGNED BY	DRAWN BY
CHECKED BY	DATE
APPROVED BY	
SCALE	DRAWING NO.
HOR. - 1" = 100'	VERT. - 1" = 4'-0"
	D-1276

City of Winnipeg
W000018

D-1276



LEGEND

WATERWORKS, WASTE AND DISPOSAL UNDERGROUND UTILITIES

PROPOSED FORCEMAIN, INTERCEPTOR OR SECONDARY SEWER _____

EXISTING FORCEMAIN, INTERCEPTOR OR SECONDARY SEWER _____ W.W.D. 24\"/>

PROPOSED FEEDERMAIN _____

EXISTING FEEDERMAIN _____ W.W.D. 24\"/>

W.W.D. _____ WATERWORKS, WASTE AND DISPOSAL

OTHER UNDERGROUND UTILITIES

COMMUNITY SEWER _____

COMMUNITY WATERMAIN _____

GAS _____

HYDRO DUCT _____

M.T.S. DUCT OR CABLE _____

STREET LIGHTING, RAILWAY SIGNAL OR TRAFFIC SIGNAL CABLE _____

SURFACE UTILITIES

COMMUNITY BOUNDARY LINE _____

FENCE LINE _____ X _____ X _____

POLE LINE _____

RAILWAY LINE _____

MISCELLANEOUS SYMBOLS

CATCH BASIN _____ O

CULVERT _____ []

HYDRANT _____ +

MANHOLE _____ O

HYDRO OR M.T.S. POLE _____ ●

LAMP STANDARD _____ ◆

RAILWAY OR TRAFFIC SIGNAL STANDARD _____ ⊠

SURVEY BAR _____ []

TREE _____ ●

VALVE _____ ⊙

NOTES

AS BUILT
 P. J. WALKER ENGINEERING
 SURVEY ENGINEERING DATE
 Nov 25/76

2	REVISED TITLE	91-01-22 M.T.S.
1	AS BUILT	5-11-76 M.S.
NO.	DESCRIPTION	DATE BY
REVISIONS		
FIELD BOOK(S) NO.	F-387, F-384, F-406, F-424	SURVEYED BY D.M. GALKA
LAND SURVEY PLAN(S) NO.		DATE MAY 14, 1974
B. M.		

The City of Winnipeg
 Waterworks, Waste and Disposal Division

Branch Operations (Waterworks)

MURRAY AVENUE FEEDERMAIN

FROM A POINT 230FT EAST OF MCGREGOR STREET TO A POINT 55FT EAST OF MCPHILLIPS STREET STA. 72+52 TO STA. 97+32

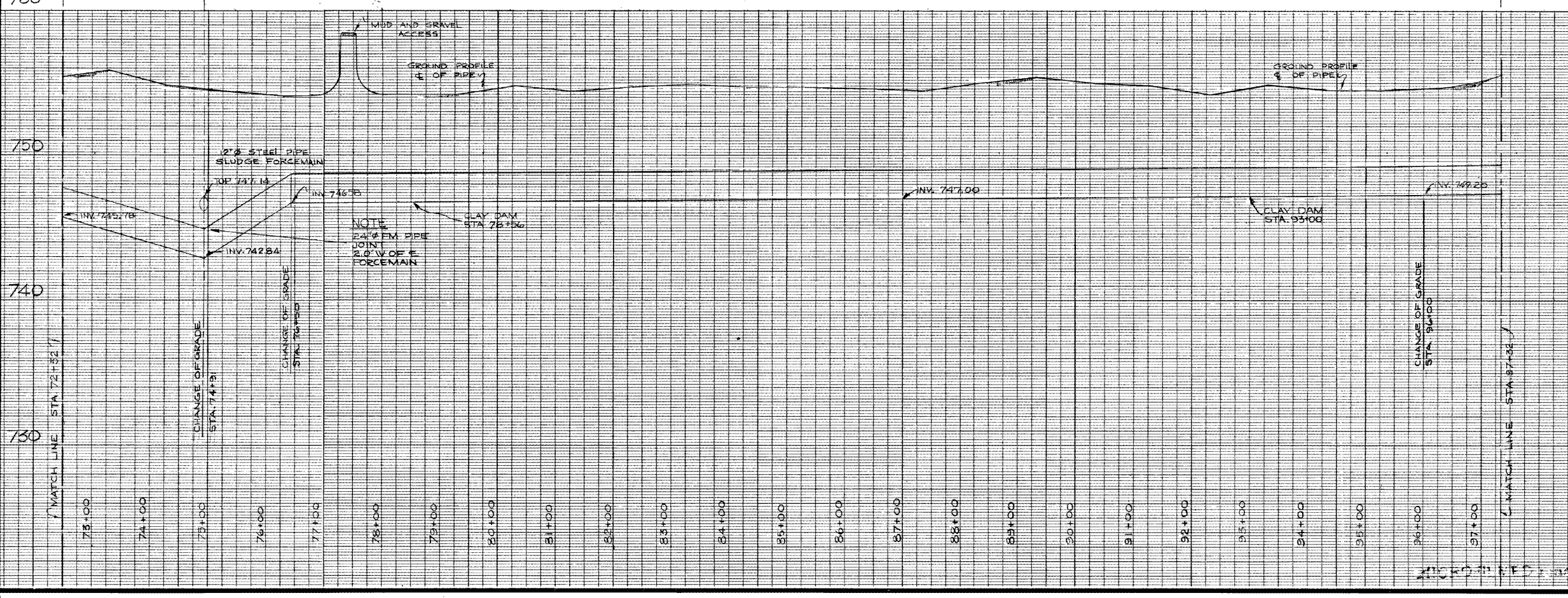
DESIGNED BY: *Big* DRAWN BY: f. kolbert

CHECKED BY: *AS* DATE: SEPT-10-74

APPROVED BY: *St. Pannan*

SCALE: HOR. - 1"=100' VERT. - 1"=4'-0"

DRAWING NO. **D-1277**



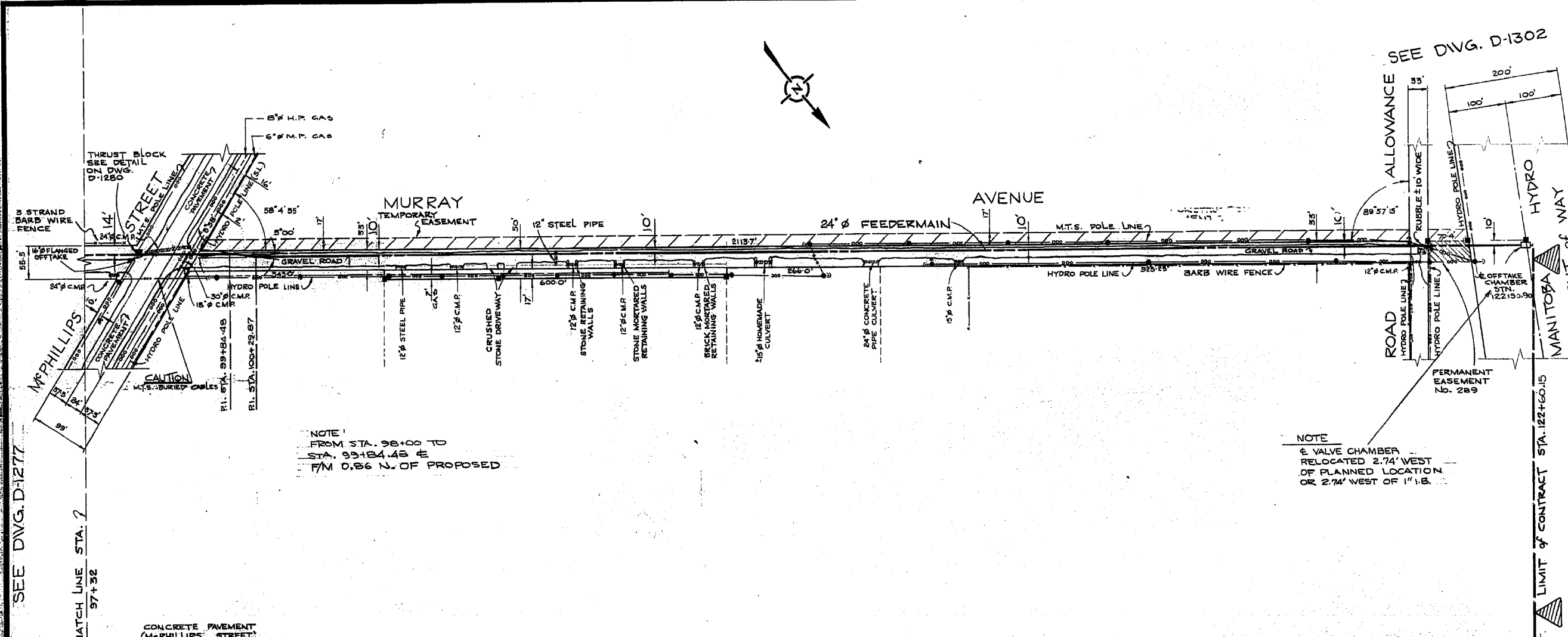
SEE DWG. D-1276
 MATCH LINE STA. 72+52

MATCH LINE STA. 97+32
 SEE DWG. D-1278

City of Winnipeg
 W003017

D-1277

1:1



NOTE
 FROM STA. 98+00 TO
 STA. 99+84.48 E
 1/4 M. C.B. N. OF PROPOSED

NOTE
 E VALVE CHAMBER
 RELOCATED 2.74' WEST
 OF PLANNED LOCATION
 OR 2.74' WEST OF 1" I.B.

LEGEND

WATERWORKS, WASTE AND DISPOSAL; UNDERGROUND UTILITIES

PROPOSED FORCEMAIN, INTERCEPTOR OR SECONDARY SEWER _____

EXISTING FORCEMAIN, INTERCEPTOR OR SECONDARY SEWER _____ W.W.O. 24" SEWER

PROPOSED FEEDERMAIN _____

EXISTING FEEDERMAIN _____ W.W.O. 24" W.M.

W.W.O. WATERWORKS, WASTE AND DISPOSAL

OTHER UNDERGROUND UTILITIES

COMMUNITY SEWER _____

COMMUNITY WATERMAIN _____

GAS _____

HYDRO DUCT _____

M.T.S. DUCT OR CABLE _____

STREET LIGHTING, RAILWAY SIGNAL OR TRAFFIC SIGNAL CABLE _____

SURFACE UTILITIES

COMMUNITY BOUNDARY LINE _____

FENCE LINE _____

POLE LINE _____

RAILWAY LINE _____

MISCELLANEOUS SYMBOLS

CATCH BASIN _____ ○

CULVERT _____ □

HYDRANT _____ ⊕

MANHOLE _____ ○

HYDRO OR M.T.S. POLE _____ ●

LAMP STANDARD _____ ⊙

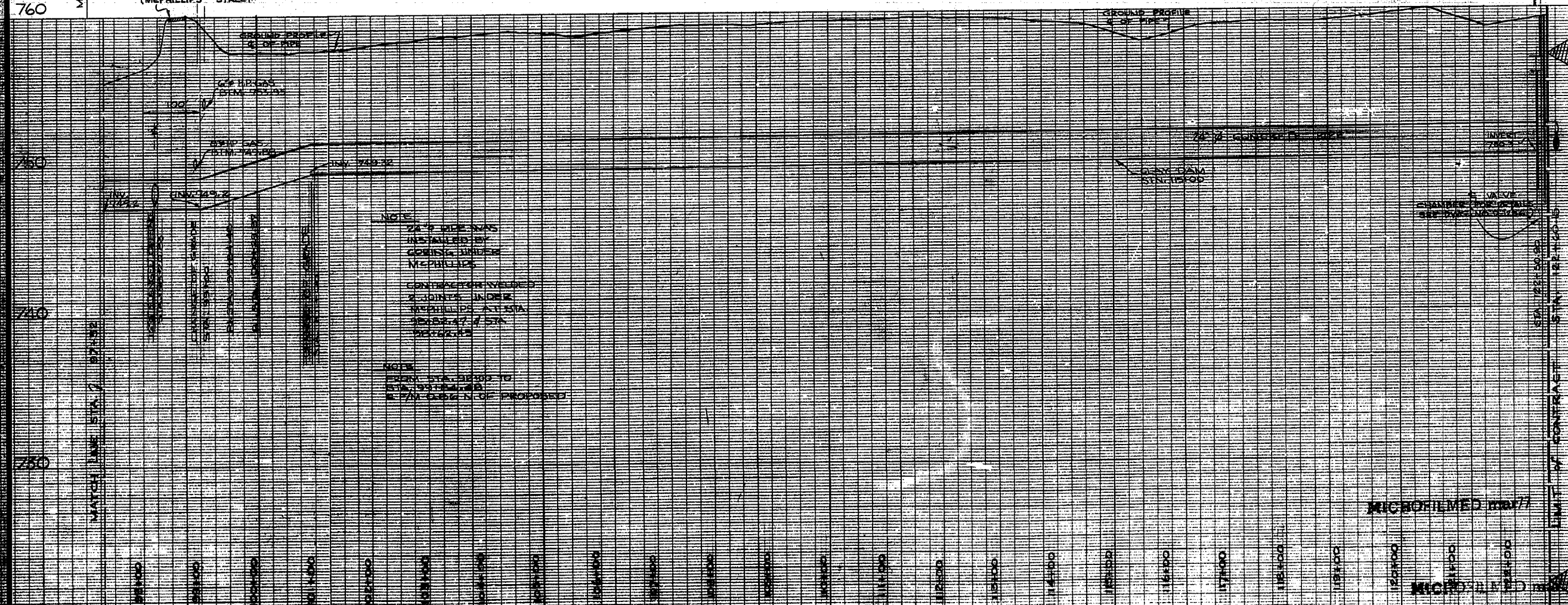
RAILWAY OR TRAFFIC SIGNAL STANDARD _____ ⊕

SURVEY BAR _____ ■

TREE _____ ○*

VALVE _____ ⊗

NOTES



NOTE
 24" PIPE WAS
 INSTALLED BY
 GEORGE J. JONES
 McPHILLIPS ST.

NOTE
 FROM STA. 98+00 TO
 STA. 99+84.48 E
 1/4 M. C.B. N. OF PROPOSED

AS BUILT

D. S. SURVEY W. Alex. Lion ENGINEERING Nov 25/76 DATE

AS BUILT	9-11-74 M.S.
NO.	DESCRIPTION
DATE	BY

REVISIONS

FIELD BOOKS NO. F-587, F-394, F-406, F-426	SURVEYED BY P.M. GALKA
LAND SURVEY PLANS NO.	DATE MAY 14, 1974
R.M.	

The City of Winnipeg
 Waterworks, Waste and Disposal Division

Branch Operations (Waterworks)

-MURRAY AVENUE FEEDERMAIN -
 MAIN ST. TO MANITOBA HYDRO
 RIGHT OF WAY
 PLAN - PROFILE

STA. 97+32 TO STA. 122+60.15

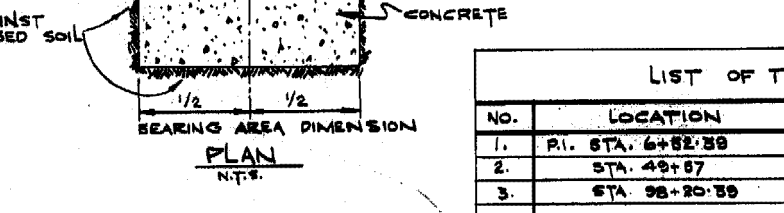
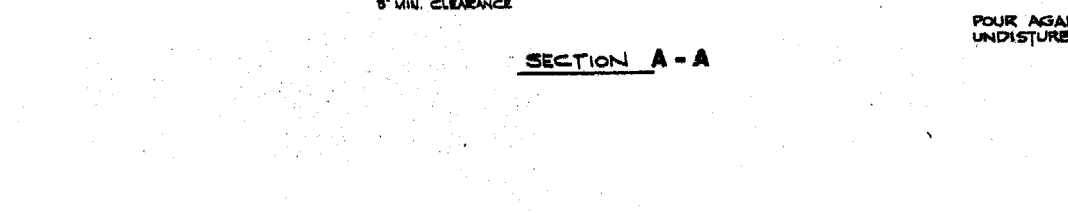
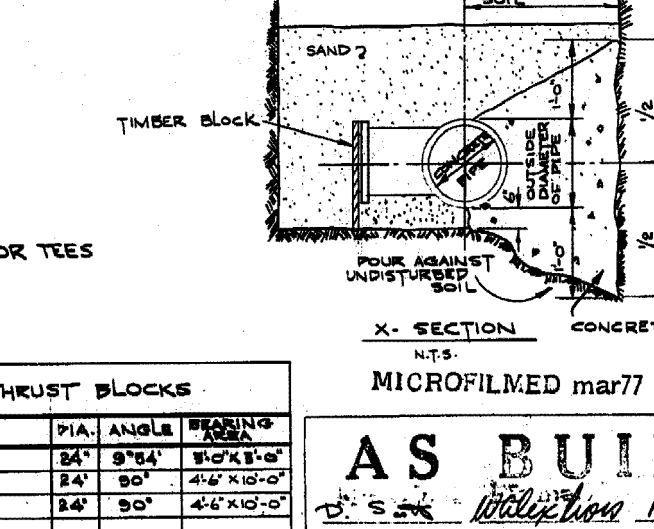
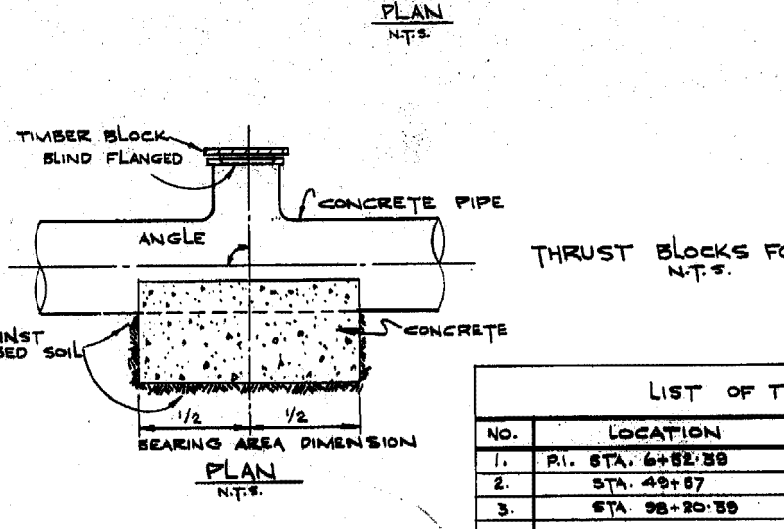
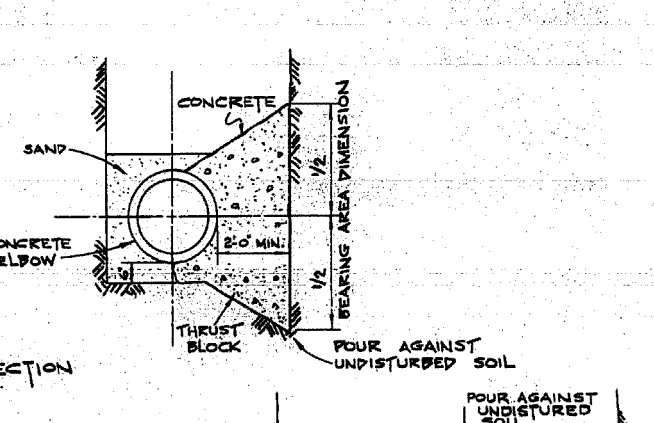
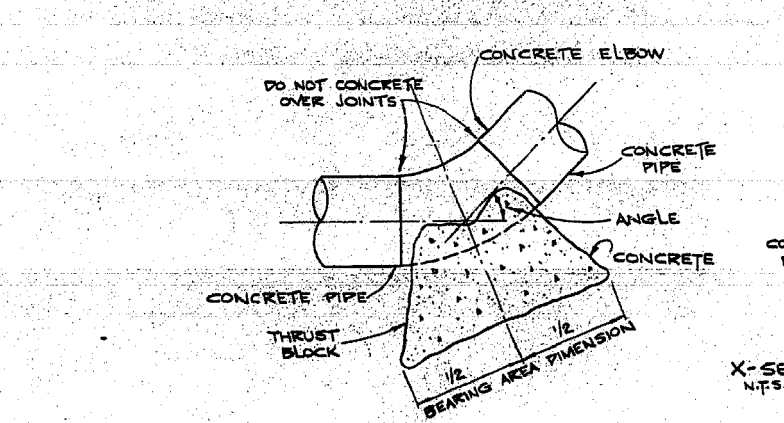
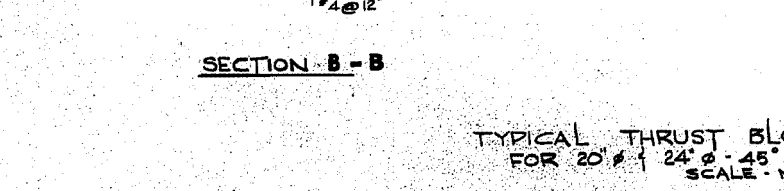
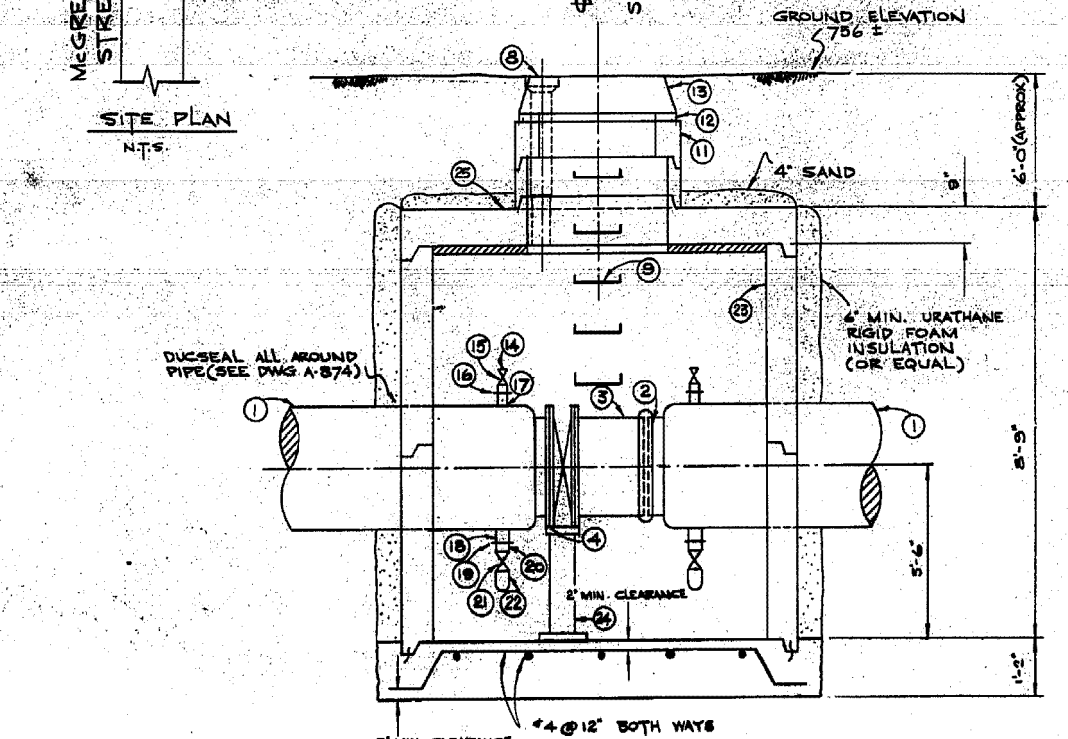
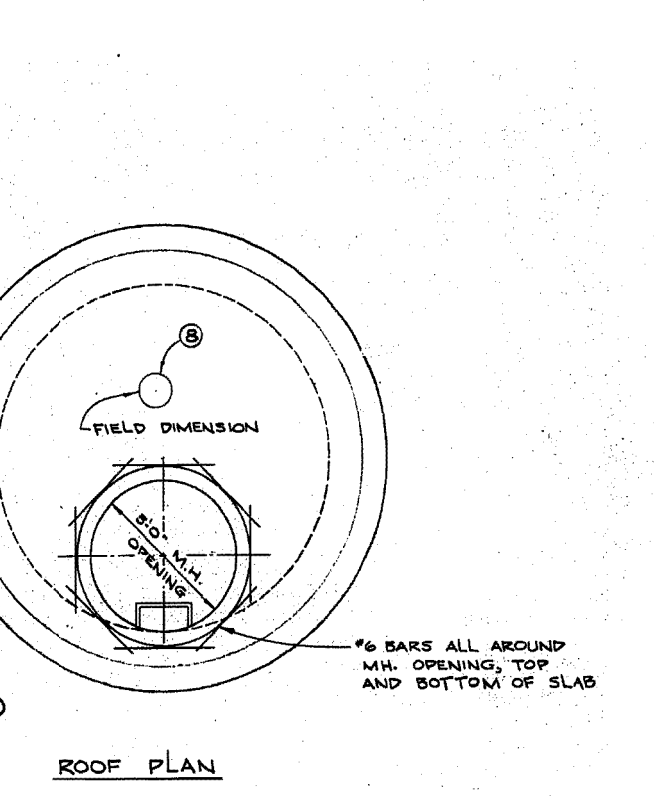
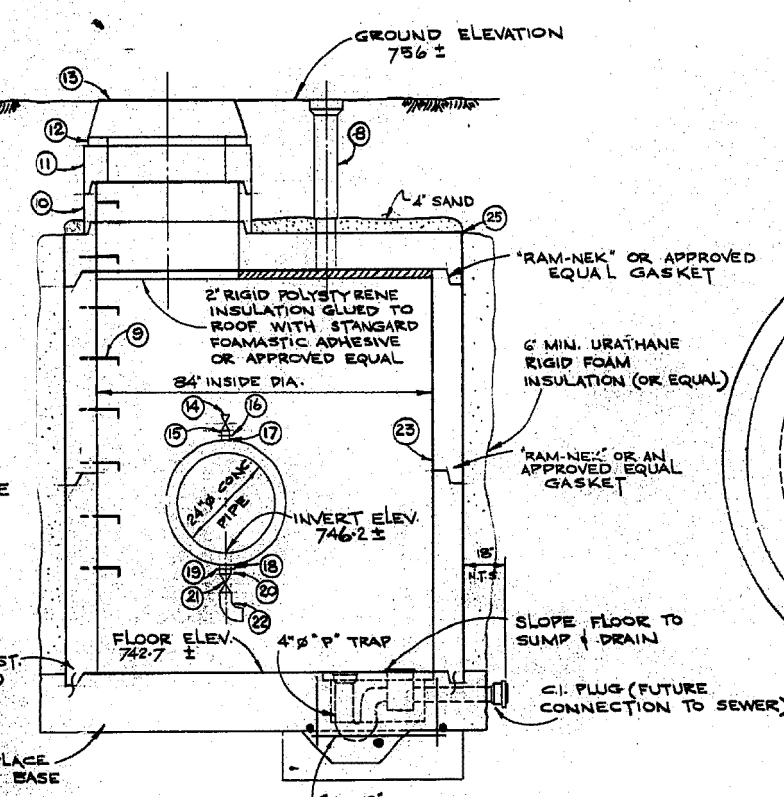
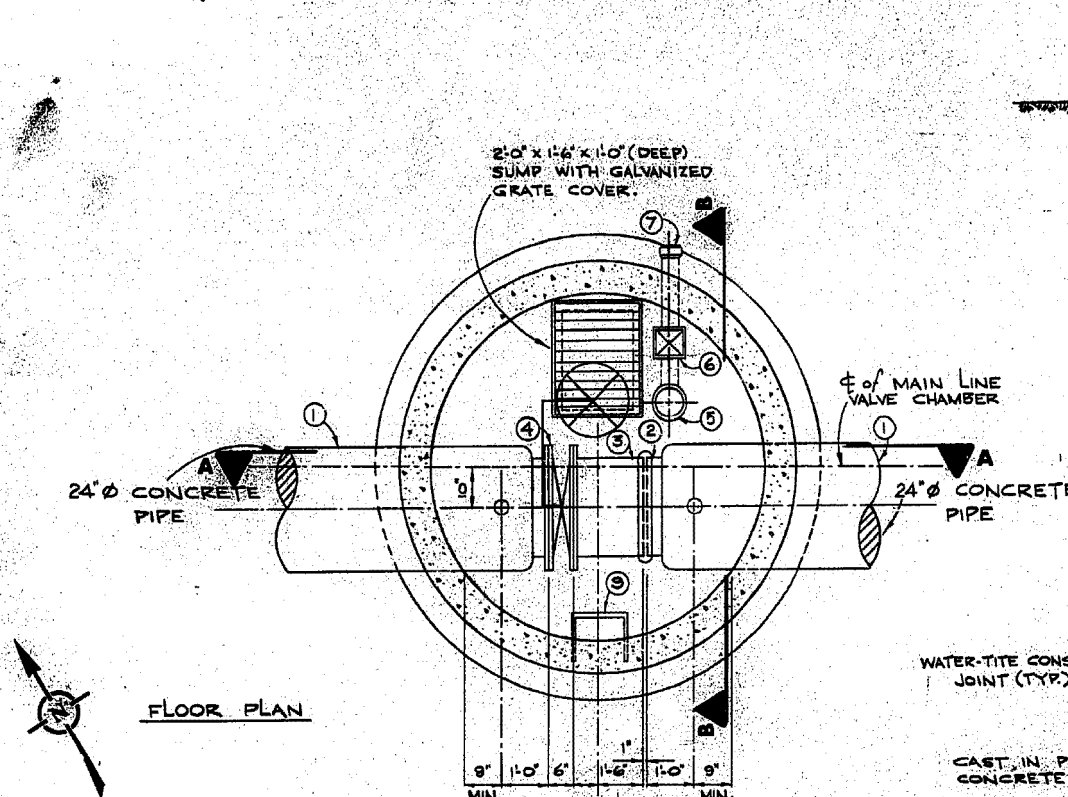
DESIGNED BY *Ruh* DRAWN BY f. kolbert

CHECKED BY *[Signature]* DATE SEPT. 10-74

APPROVED BY *[Signature]*

SCALE
 HOR. 1"=100'
 VERT. 1"=4'-0"

DRAWING NO. **D-1278**



LIST OF THRUST BLOCKS				
NO.	LOCATION	PIA.	ANGLE	BEARING AREA
1.	PI. STA. 6+52.39	24"	90°	3'-0" x 3'-0"
2.	STA. 49+67	24"	90°	4'-6" x 10'-0"
3.	STA. 98+20.39	24"	90°	4'-6" x 10'-0"

List of Materials		Quantity
*1.	4'-0" short prestressed concrete pipe	1
*2.	Victallic coupling style #51	1
*3.	1'-6" prestressed concrete pipe adapter	1
*4.	24" Butterfly valve w/ waffer style	1
5.	4" C.I. "P" trap and drain with screw-on cover.	1
6.	4" Backwater valve	1
7.	4" C.I. pipe spigot to bell	1
8.	Large adjustable valve box and standard City of Winnipeg Waterworks cover.	1
9.	Standard City of Winnipeg manhole steps at 12" centre to centre. For details see Drawing No. 817.	1
10.	36" ASTM C76-70 Class II precast concrete manhole section with "Ram-Nek" or an approved equal gasket.	1
11.	30" x 36" ASTM C76-70 Class II precast concrete eccentric flat top reducer section.	1
12.	Maximum 2 rows concrete brick or 6" long precast section.	1
13.	Standard City of Winnipeg Waterworks manhole frame and solid cover.	1
14.	2" Bronze gate valve - threaded.	2
15.	2" Bronze nipple-threaded	2
16.	2" Threaded Flange	2
17.	2" Steel outlet-Flanged	2
18.	3" Steel outlet - Flanged	2
19.	3" Threaded Flange	2
20.	3" Bronze nipple Threaded	2
21.	3" Bronze Gate Valve - Threaded.	2
22.	3" Elbow - Threaded and Galvanized.	2
23.	36" ASTM C76-70 Class II precast concrete manhole section with "Ram-Nek" or an approved equal gasket	2
24.	Orinell 24" galvanized manhole cover or approved equal gasket	2
25.	84" to 36" eccentric reducer	1

* To be supplied by The City

NOTE: Waterproofing to be applied to all exterior walls.

NO.	AS BUILT	DESCRIPTION	DATE	BY
1	AS BUILT		9-11-74	m.s.

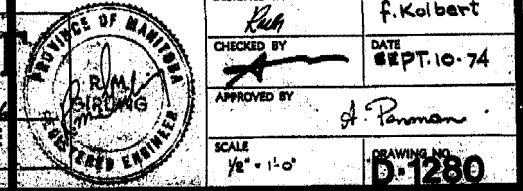
REVISIONS	
FIELD BOOK(S) NO.	SURVEYED BY
LAND SURVEY PLAN(S) NO.	DATE
B. M.	

The City of Winnipeg
Waterworks, Waste and Disposal Division

-MURRAY AVENUE FEEDERMAIN-
MAINLINE VALVE CHAMBER- STA. 49+67
THRUST BLOCK - STA. 6+52.39,
STA. 49+57 + STA. 98+20.39

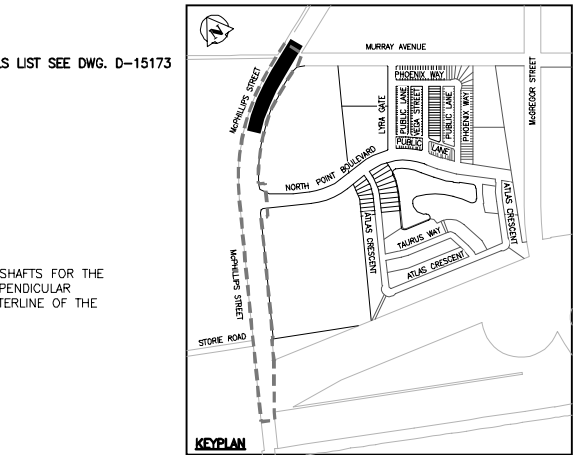
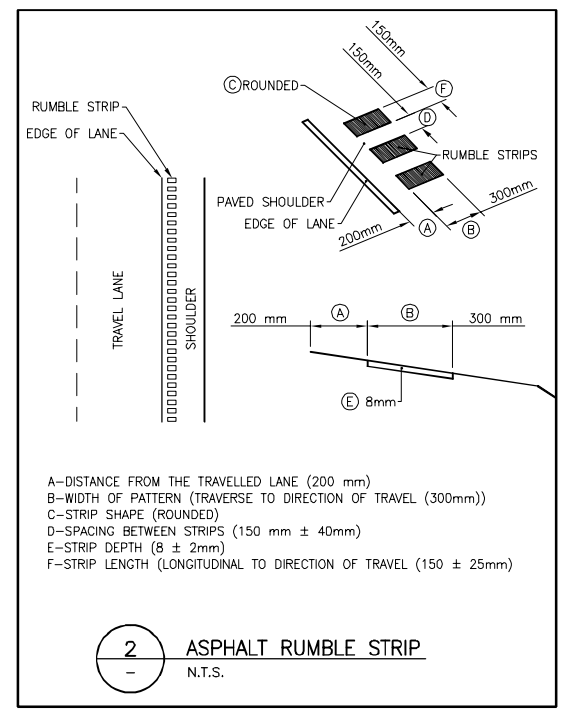
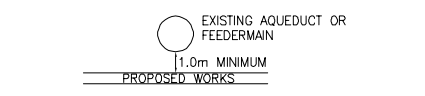
DESIGNED BY <i>R. K.</i>	DRAWN BY F. Kolbert
CHECKED BY <i>[Signature]</i>	DATE SEPT. 10-74
APPROVED BY <i>[Signature]</i>	
SCALE 1/2" = 1'-0"	DRAWING NO. D-1280

AS BUILT
SURVEY ENGINEERING DATE

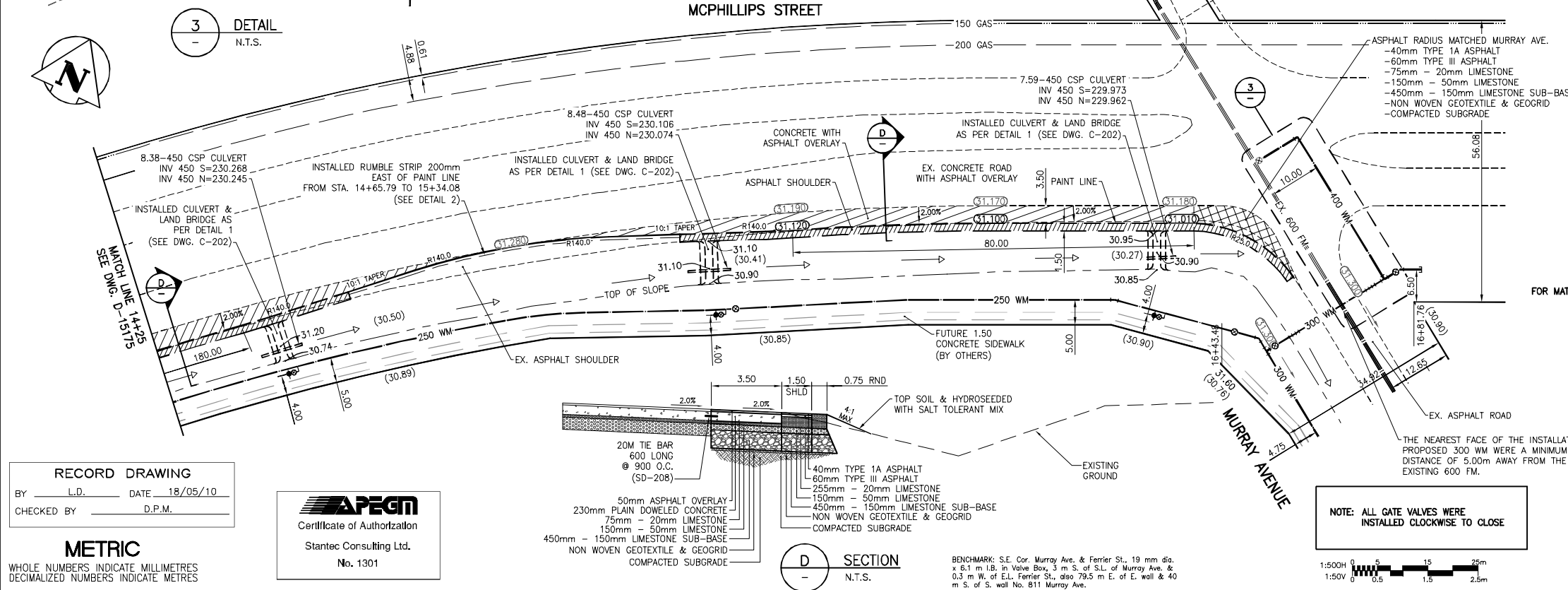
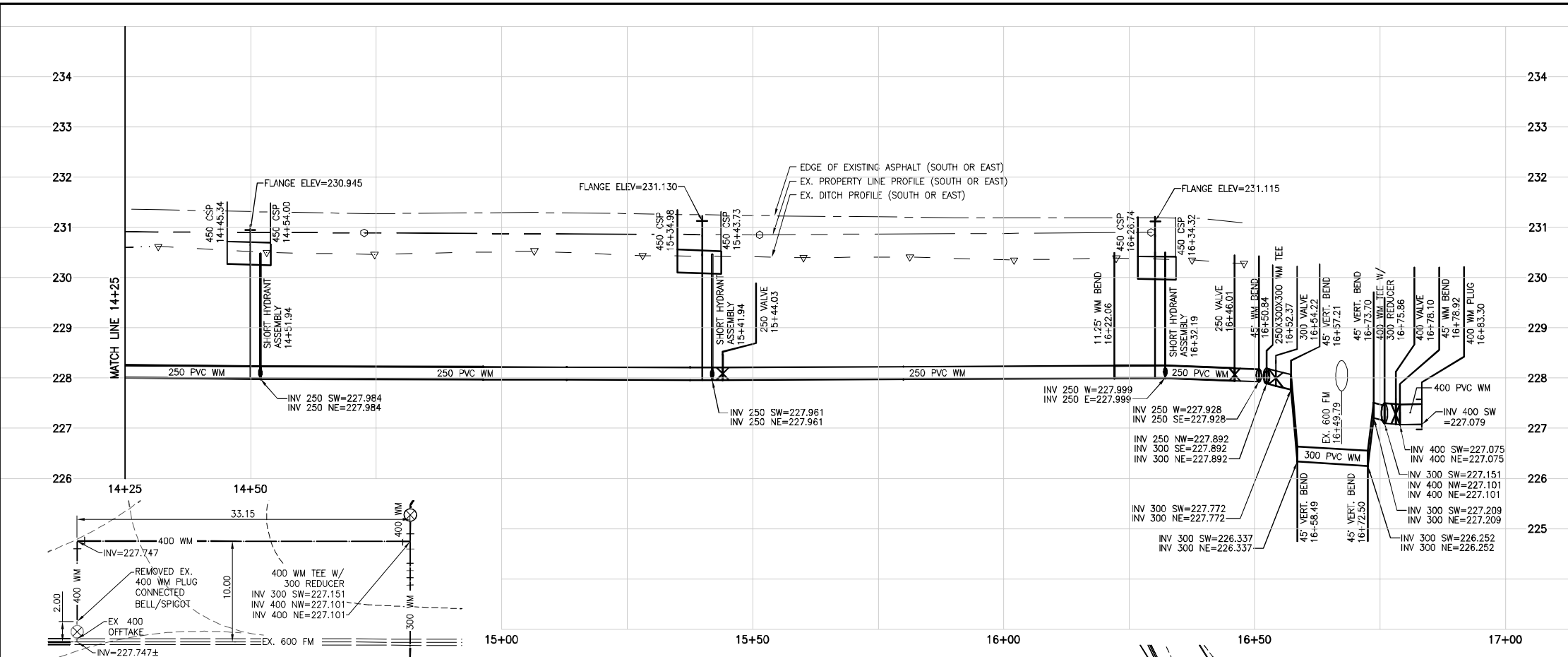


- NOTES:**
- CHAINAGES SHOWN ARE ALONG CENTERLINE OF R.O.W.
 - ALL LONG ASSEMBLY HYDRANTS (SD-006) ALL SHORT ASSEMBLY HYDRANTS (SD-007).
 - PRIOR TO ANY CONSTRUCTION, THE FEEDERMAIN WAS EXPOSED BY A SOFT DIG METHOD SO AS TO CONFIRM DEPTH AND LOCATION.
 - A MINIMUM CLEARANCE OF 1.0m WAS PROVIDED BETWEEN THE UNDERSIDE OF THE FEEDERMAIN AND THE TOP OF THE PROPOSED WORKS.

- A SHAFT WAS EXCAVATED BY SOFT DIG METHODS 4.0m FROM THE CENTERLINE OF THE FEEDERMAIN TO CONFIRM THE ALIGNMENT AND ELEVATION OF THE DRILLING ROD BEFORE IT CROSSED UNDER THE FEEDERMAIN. THIS CONFIRMATION WAS WITNESSED BY A CITY REPRESENTATIVE.
- VIBRATORY EQUIPMENT WAS NOT OPERATED OVER OR WITHIN 3.0m OF THE FEEDERMAIN CENTERLINE. INSTALLATION EQUIPMENT DID NOT CROSS OR TRAVEL ALONG EITHER SIDE OF THE FEEDERMAIN WITHIN A LATERAL DISTANCE OF 5.0m FROM THE CENTERLINE OF THE AQUEDUCT AND/OR FEEDERMAIN.
- CONSTRUCTED VERTICAL WM BENDS IN ACCORDANCE WITH SD-005.



CONSTRUCTION COMPLETION DATE - SEPTEMBER 2017



RECORD DRAWING
BY L.D. DATE 18/05/10
CHECKED BY D.P.M.



METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

LOCATION APPROVED UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES COMMITTEE	DATE

NOTE:
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN 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

Stantec
500 - 311 Portage Avenue, Winnipeg MB Canada R3B 2B9
Tel. 204.489.5900 Fax. 204.453.9012 www.stantec.com

NO.	REVISIONS	YY.MM.DD.	BY	DATE
5	RECORD DRAWING	18.05.10	D.P.M.	
4	ISSUED FOR CONSTRUCTION	16.09.28	D.P.M.	
3	RESUBMITTED FOR REVIEW	16.08.28	D.P.M.	
2	ISSUED FOR BIDDING	16.04.28	D.P.M.	
1	SUBMITTED FOR CITY REVIEW	16.04.25	D.P.M.	

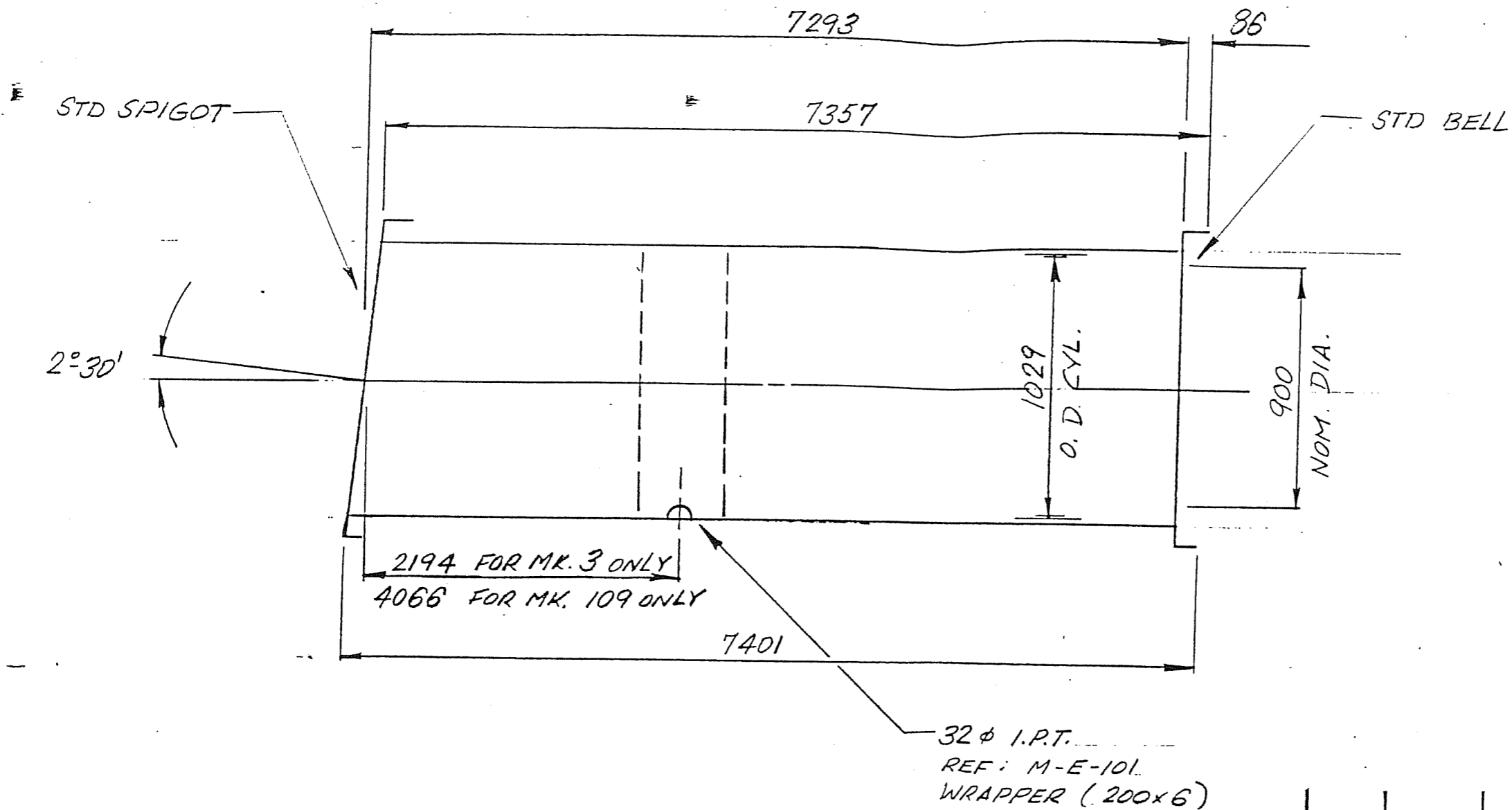
ENGINEER'S SEAL
ORIGINAL SEALED BY
D.P. MAGES
P. ENG.
16/09/28

THE CITY OF WINNIPEG
DASZ 40/2016
1910588 ALBERTA LTD. (AG 40/16)

Winnipeg

AURORA AT NORTH POINT - MCPHILLIPS STREET
MCPHILLIPS STREET
200m NE OF NORTH POINT BOULEVARD TO
MURRAY AVENUE

SHEET 5 OF 5
CAD FILE DRAWING NUMBER 0940IC-201-880DWG
CITY DRAWING NUMBER D-15176



SUBJECT TO REVISIONS IN REF.
APPROVED
 SUBJECT TO SATISFACTORY
 INSTALLATION AND PERFORMANCE
 IN PLACE

CITY OF WINNIPEG
 Waterworks and Waste Disposal Department

DATE 1988 01 20
 SIGNATURE [Signature]

TYPE V CEMENT COATING & LINING

SPECIFICATION : AWWA C301(L)
 TYPE : 'A'
 CLASS/PRESSURE : 14
 PLATE THICKNESS :
 WIRE MESH—INSIDE :
 OUTSIDE :
 WALL THICKNESS : REF: 873152-0-1

REV.	DATE:	RECORD OF CHANGE	BY:
B	JAN. 13	MK. 109 ADDED	S.G.
A	DEC. 17	OUTLET LOCATION REVISED	S.G.

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CANRON INC. PIPE DIVISION

WINNIPEG - WEST END FM.
 DETAIL OF MK: 3 & 109

Scale: N.T.S. Date: NOV. 25/87
 Drawn by: Checked by: Approved by: Drawing No. Rev:

RECEIVED
 WATERWORKS W.D.
 JUN 15 9 08 AM '88