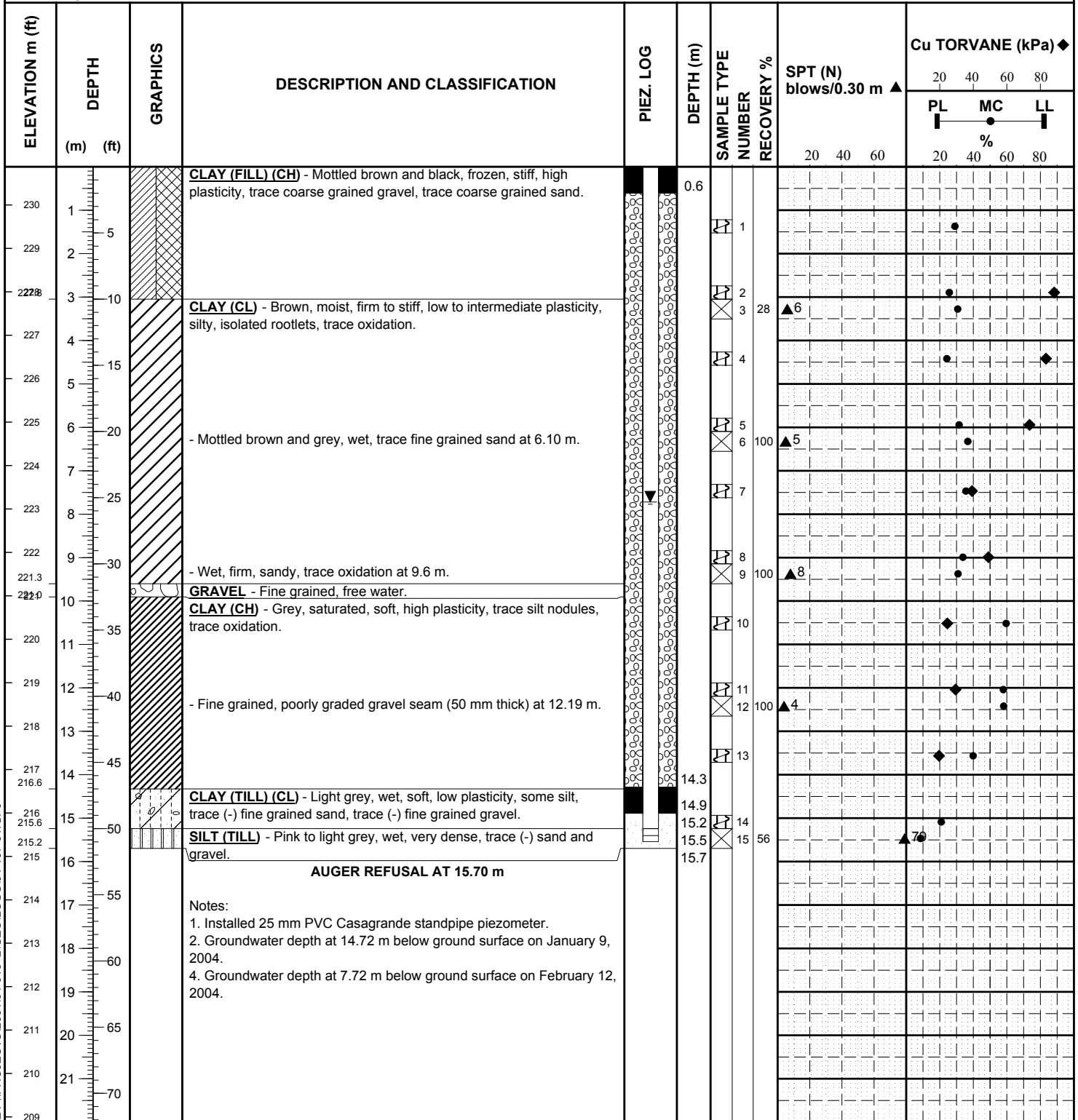


**CLIENT** CITY OF WINNIPEG  
**PROJECT** SEWER OUTFALL UPGRADING  
**SITE** LA VERENDRYE  
**LOCATION**  
**DRILLING METHOD** 125 mm ø Solid Stem Auger, Track Mounted

**JOB NO.** 04-107-01  
**GROUND ELEV.** 230.88 m  
**WATER ELEV.** 223.16 m (12 Feb 04)  
**DATE DRILLED** 09 Jan 04  
**UTM** N 5528505.8  
 E 634507.9



SAMPLE TYPE  Auger Grab  Split Spoon

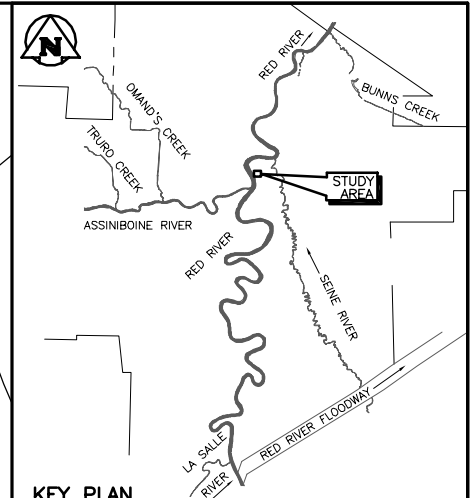
**CONTRACTOR** Paddock Drilling Ltd. **INSPECTOR** D. ANDERSON

**APPROVED** \_\_\_\_\_ **DATE** 24-06-04



RED RIVER

RUE LA VERENDRYE  
TACHE AVE



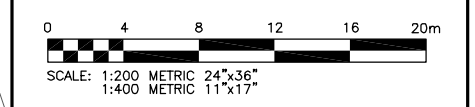
**KEY PLAN**

**LEGEND**

- 224 GROUND CONTOUR (GEODETIC, m)
- MANHOLE
- TH04-02 TESTHOLE (KGS GROUP, JAN. 9, 2004)
- 221.4 x SPOT ELEVATION (GEODETIC, m) (SEE NOTE 3)
- STRATIGRAPHIC BOUNDARY
- GROUND WATER ELEVATION (FEB. 12, 2004)
- MONITORING ZONE

**REFERENCES**

1. 2004 GATE CHAMBER UPGRADES DRAWING, LA VERENDRYE, CITY OF WINNIPEG, 2004.
2. ORTHO-DIGITAL BASE MAPPING, CITY OF WINNIPEG, 1999.
3. RIVER BANK SURVEY, CITY OF WINNIPEG, MARCH 2004.
4. TESTHOLE SUMMARY LOG NO. TH-04-02, KGS GROUP, JAN. 9, 2004.
5. WWW.WINNIPEG.CA/PUBLICWORKS/PWDDATA/RIVERLEVELS



A 18/03/04 ISSUED WITH FINAL REPORT		
NO.	D / M / Y	DESCRIPTION

REVISIONS / ISSUE		
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	OR	
	DRAWING WHERE SECTION OR DETAIL WAS INDICATED	
	SECTION OR DETAIL SHOWN ON SAME DRAWING	

**KGS GROUP** CONSULTING ENGINEERS & PROJECT MANAGERS  
 WINNIPEG (204) 896-1209  
 THUNDER BAY (807) 345-2233

CLIENT: **CITY OF WINNIPEG**  
 WATER AND WASTE DEPARTMENT  
 Winnipeg

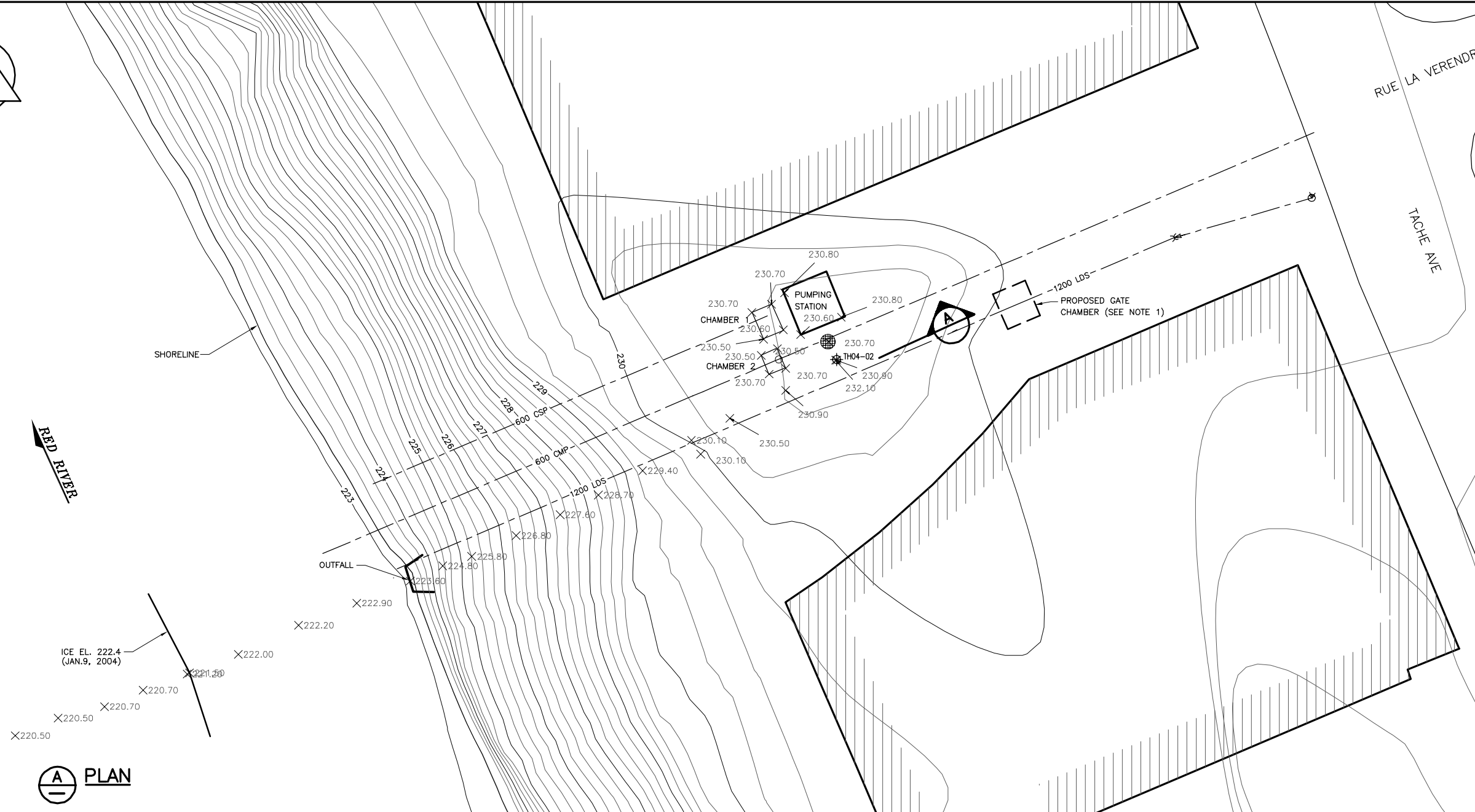
PROJECT: **SEWER OUTFALL UPGRADE  
 RUE LA VERENDRYE  
 WINNIPEG, MB**

DWG. DESCRIPTION:

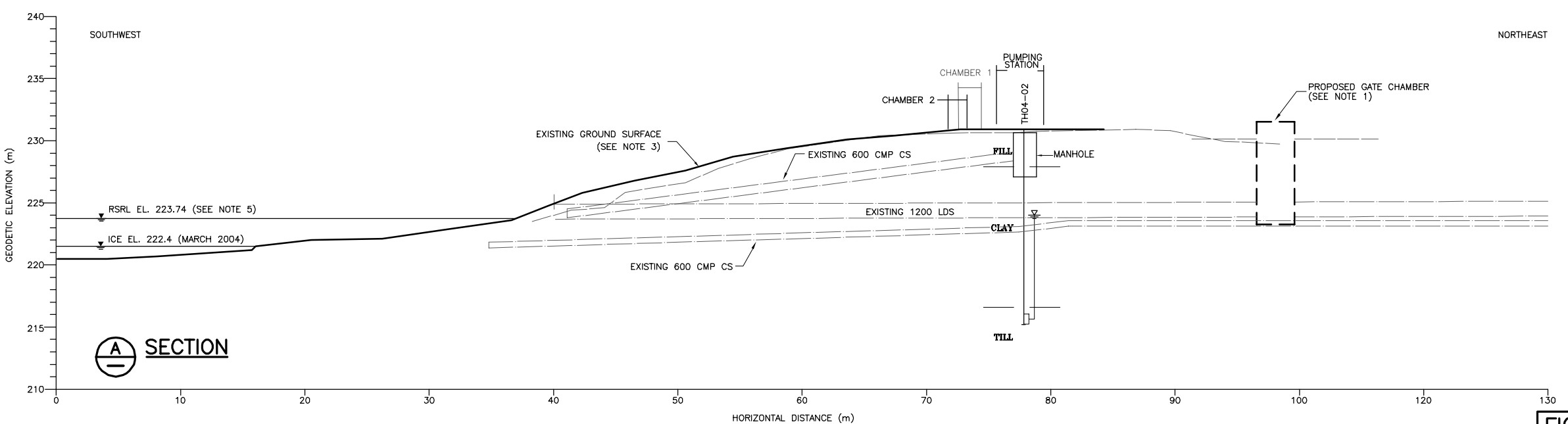
**PLAN AND SECTION**

ENG. STAMP	DESIGNED BY: JMC	DRAWN BY: TE
	CHECKED: JMC	CHECKED:
APPROVED:		
SCALE: AS NOTED	DATE: MARCH 2004	
KGS DWG. NO. 04-107-01(2)	01	

CLIENT DWG. NO. REV: A

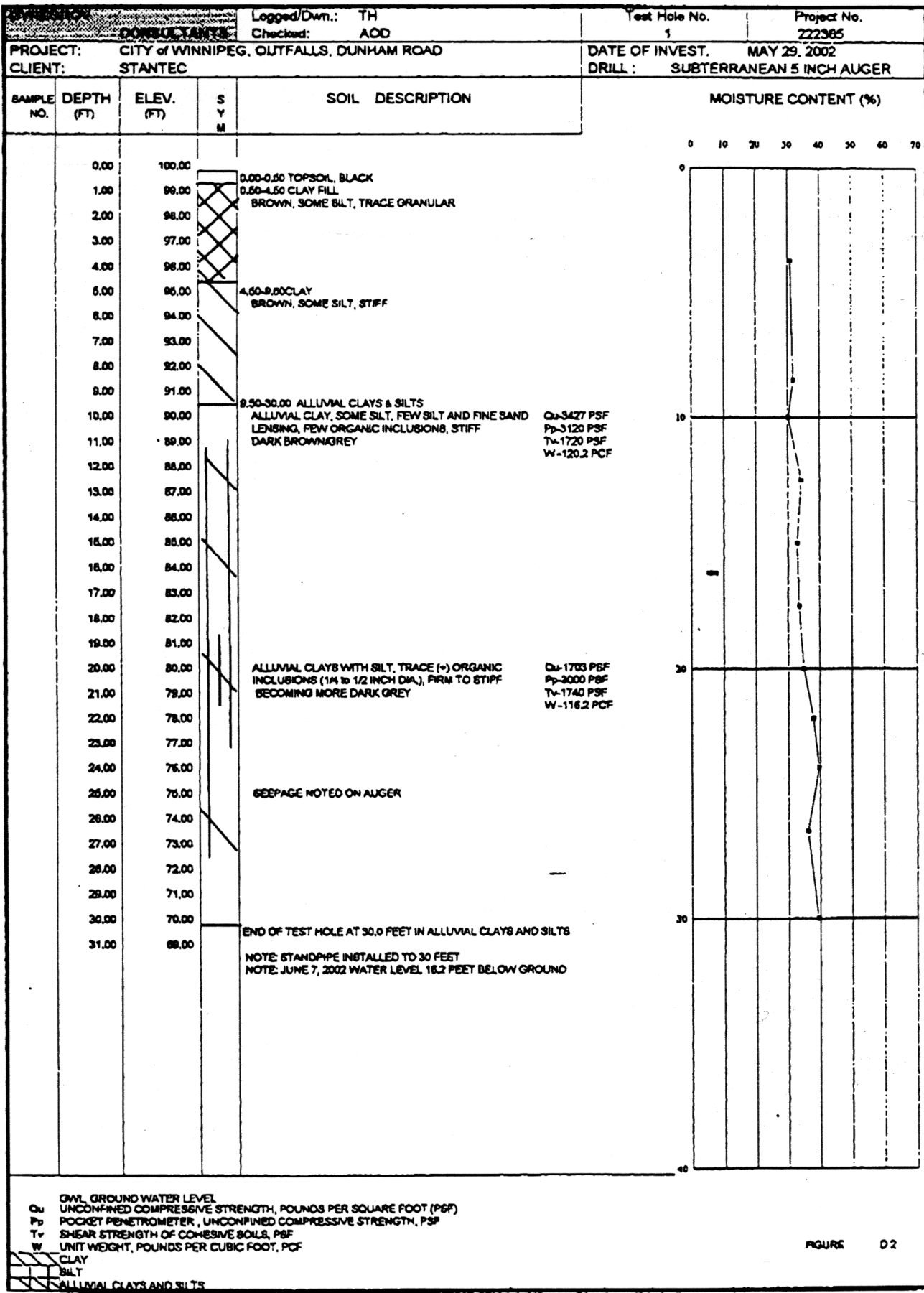


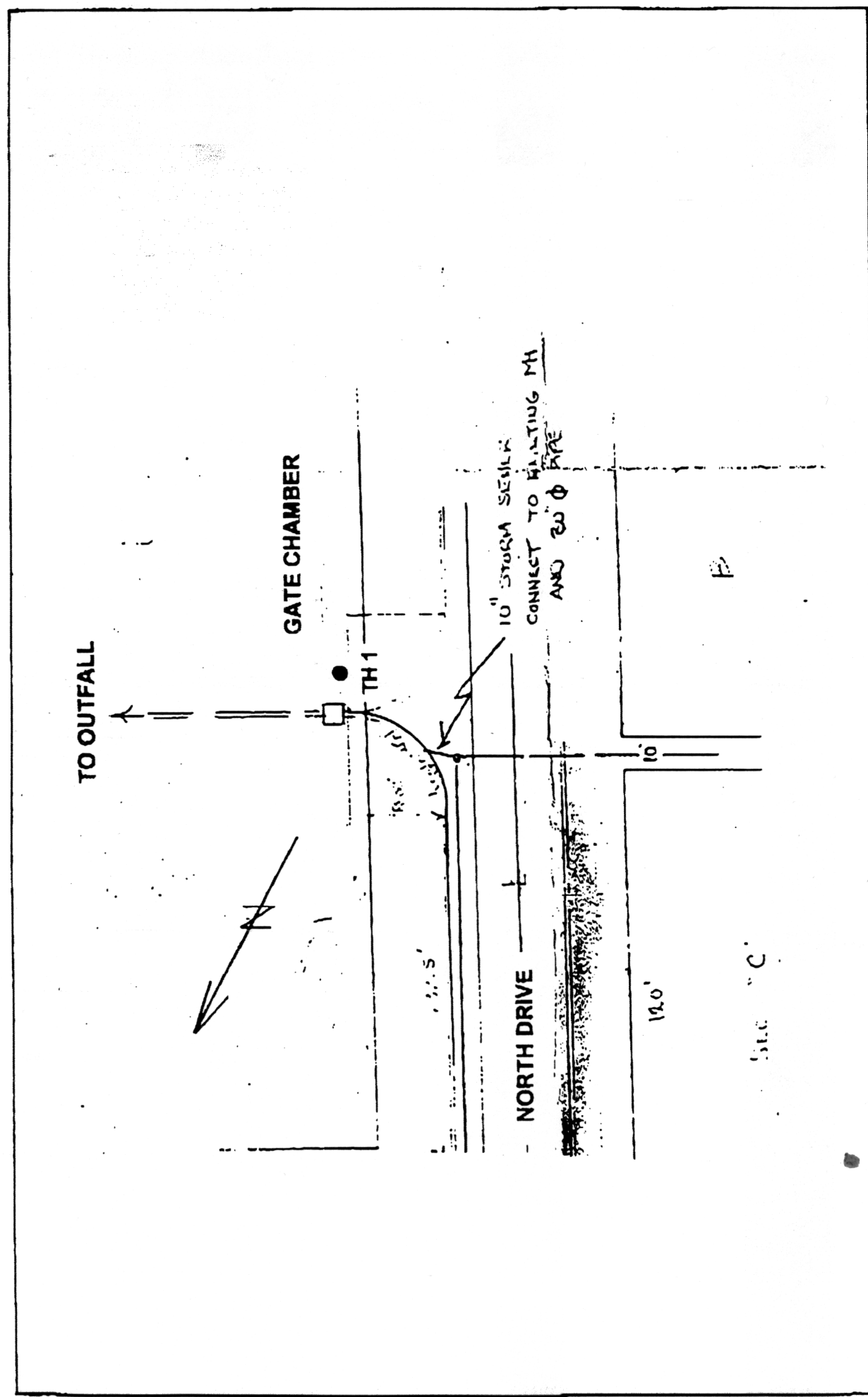
**PLAN**



**SECTION**

**FIGURE 1**





<b>DYREGROV CONSULTANTS</b> CONSULTING GEOTECHNICAL ENGINEERS		CITY OF WINNIPEG OUTFALLS DUNHAM ROAD TEST HOLE LOCATION PLAN	
SCALE: NTS	DATE: 16/8/02	MADE: TJH	CHKD: AOD
		JOB: 222365	FIGURE: D1

**CLIENT** CITY OF WINNIPEG  
**PROJECT** SEWER OUTFALL UPGRADING  
**SITE** COMANCHE ROAD  
**LOCATION**  
**DRILLING METHOD** 125 mm ø Solid Stem Auger, Track Mounted

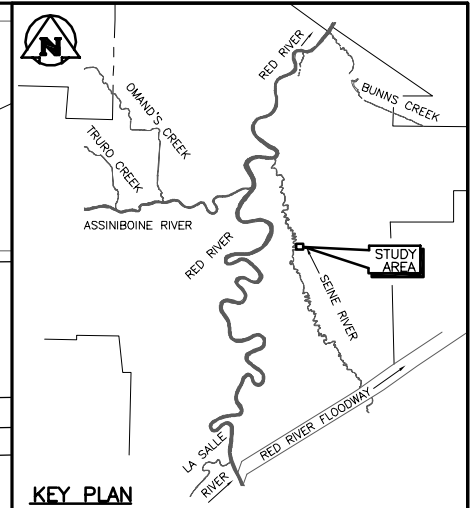
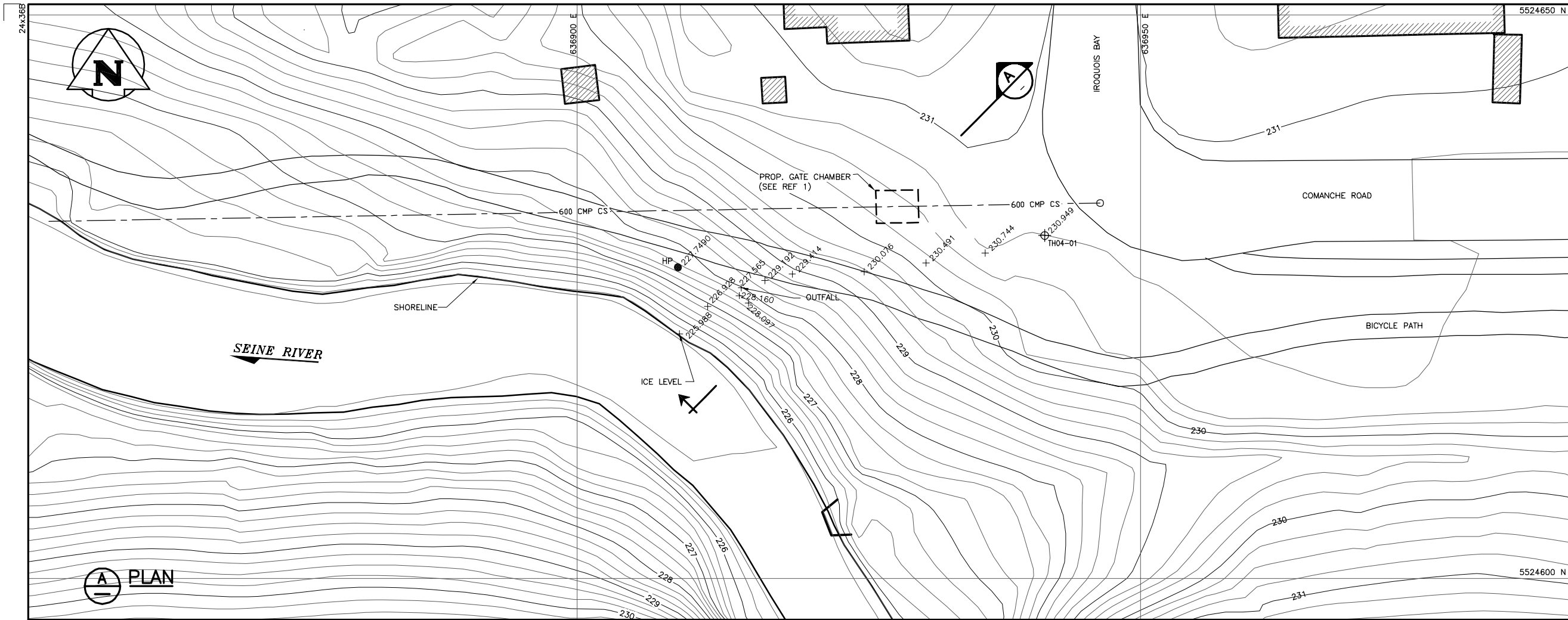
**JOB NO.** 04-107-01  
**GROUND ELEV.** 230.95 m  
**WATER ELEV.** 220.69 m (12-Feb-04)  
**DATE DRILLED** 09 Jan 04  
**UTM** N 5524630.0  
 E 636941.0

ELEVATION m (ft)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.30 m ▲	Cu TORVANE (kPa) ◆		
	(m)	(ft)								PL	MC	LL
230.8				TOPSOIL - Black, clayey.		0.6						
230	1	5		CLAY (LACUSTRINE) (CH) - Mottled light and dark brown, moist, stiff, high plasticity, trace coarse grained gravel, trace fine grained sand, trace silt nodules.			1					
229	2	10					2					
228	3	15					3	89	▲10			
227	4	20					4					
226	5	25		- Wet, firm.			5					
225	6	30					6	100	▲7			
224	7	35					7					
223	8	40		- Trace till inclusions at 10.67 m.			8					
222	9	45					9	100	▲6			
221	10	50					10					
220	11	55		- Soft, saturated.			11					
219	12	60					12	100	▲5			
218	13	65					13					
217.9	14	70		SILT (TILL) (ML) - Pink to light grey, saturated, compact, low plasticity, trace clay, trace coarse grained gravel.			14					
216	15			- Very dense.		15.5	15					
215	16					16.2						
214	17					16.8						
213.4	17			AUGER REFUSAL AT 17.07 m		17.1						
213	18			Notes:								
212	19			1. Installed Casagrande standpipe piezometer at 17.07 m depth. Pipe consists of 25 mm diameter PVC with 0.3 m long screen zone.								
211	20			2. Stick up height = 0.88 m.								
210	21			3. Groundwater depth at 17.37 m below ground surface on January 9, 2004.								
209	21			4. Groundwater depth at 10.26 m below ground surface on February 12, 2004.								

SAMPLE TYPE  Auger Grab  Split Spoon

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. ANDERSON**

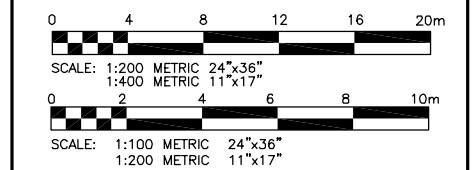
APPROVED \_\_\_\_\_ DATE 24-06-04



**LEGEND**

- 5524600 N UTM GRID LINE (NAD 83)
- 600 CMP CS SEWER OUTFALL (SEE REF 1)
- 226 GROUND CONTOUR (GEODETIC, m)
- HP HYDROPOLE
- TH04-01 TESTHOLE (KGS GROUP, JAN. 9, 2004)
- +230.491 SPOT ELEVATION (GEODETIC, m) (SEE REF 3)
- STRATIGRAPHIC BOUNDARY
- GROUNDWATER LEVEL (FEBRUARY 12, 2004)
- MONITORING ZONE

- REFERENCES**
- 2004 GATE CHAMBER UPGRADES DRAWING, COMANCHE RD, CITY OF WINNIPEG, 2004.
  - ORTHO-DIGITAL BASE MAPPING, CITY OF WINNIPEG, 1999.
  - RIVER BANK SURVEY, CITY OF WINNIPEG, MARCH, 2004.



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 DRAWING WHERE SECTION OR DETAIL WAS INDICATED  
 — SECTION OR DETAIL SHOWN ON SAME DRAWING

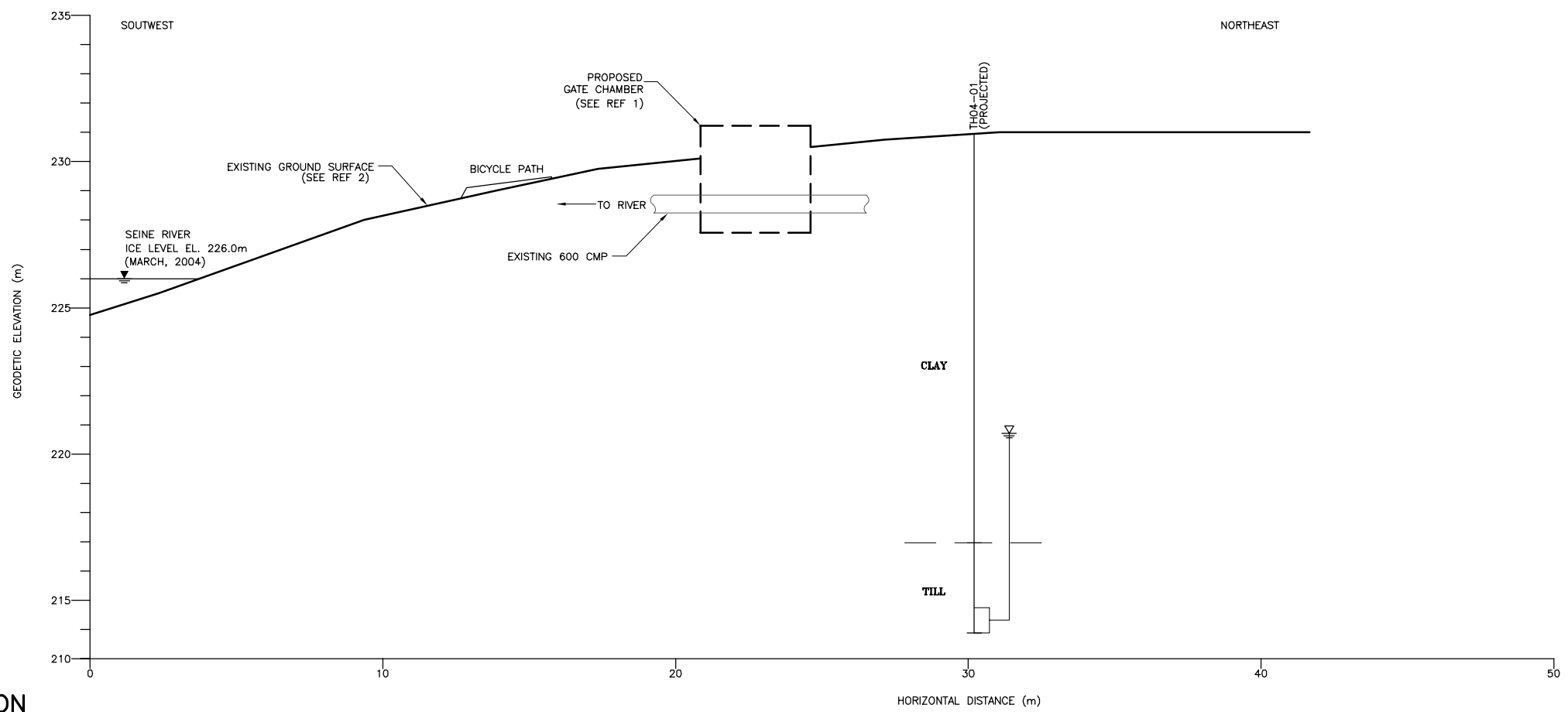
**KGS GROUP CONSULTING ENGINEERS & PROJECT MANAGERS**  
 WINNIPEG (204) 896-1209  
 THUNDER BAY (807) 345-2233

CLIENT: **CITY OF WINNIPEG**  
 WATER AND WASTE DEPARTMENT

PROJECT: **SEWER OUTFALL UPGRADE  
 COMANCHE RD  
 WINNIPEG, MB**

DWG. DESCRIPTION:  
**PLAN AND SECTION**

DESIGNED BY: JMC	DRAWN BY: TE
CHECKED: RKe	CHECKED:
APPROVED:	DATE: MARCH 2004
SCALE: AS NOTED	KGS DWG. NO. 04-107-01(1) 01



KGS FILE NO.: P:\Projects\2004\04-107-01\Geo\Draws\04-107-01(1)-01.dwg  
 24"x36"/PLOT SCALE: 1:2

**A SECTION**

**FIGURE 1** CLIENT DWG. NO. REV: A

**APPENDIX B**

**G05OH006 BEDROCK WELL DATA**

G050H006

Line

LOCATION - RIVER LOT 319 IN PARISH OF R.C. Mission  
Owner - WRB  
Driller - PRUDEN DRILLING CO. LTD.  
Well Name - G050H006 #67  
Well Use - OBSERVATION  
Date Completed - 18 Jul 1963 Aquifer - Limestone or dolomite  
Top of Casing - 1.0 ft. above ground

Remarks:

ORIGINAL OWNER METRO CORPORATION, WINDSOR PARK GOLF COURSE, N OF SEINE RIVER AND N OF STORAGE BUILDING, WELL NOT PUT INTO USE, ACQUIRED BY WRB AS PERMANENT OBSERVATION WELL, FILE WATER CONTROL BRANCH, FILE 10.1.6, WATER RIGHTS, CHEMICAL ANALYSIS, GROUND LEVEL ELEV MEASURED 230.365 M

WELL LOG (Imperial units)

From	To(ft.)	Log	
0.0	1	TOPSOIL	
1.0	25	STIFF BROWN CLAY	CLAY
25.0	50	STIFF GREY CLAY	
50.0	57	LIGHT GREY HARDPAN	TILL 1
57.0	61	GRAVEL	GRAVEL
61.0	69	UNCONSOLIDATED LIMESTONE	BEDROCK
69.0	424.7	BEDROCK	
424.7	444.7	SHALE CONTAINING SALT WATER	

WELL CONSTRUCTION

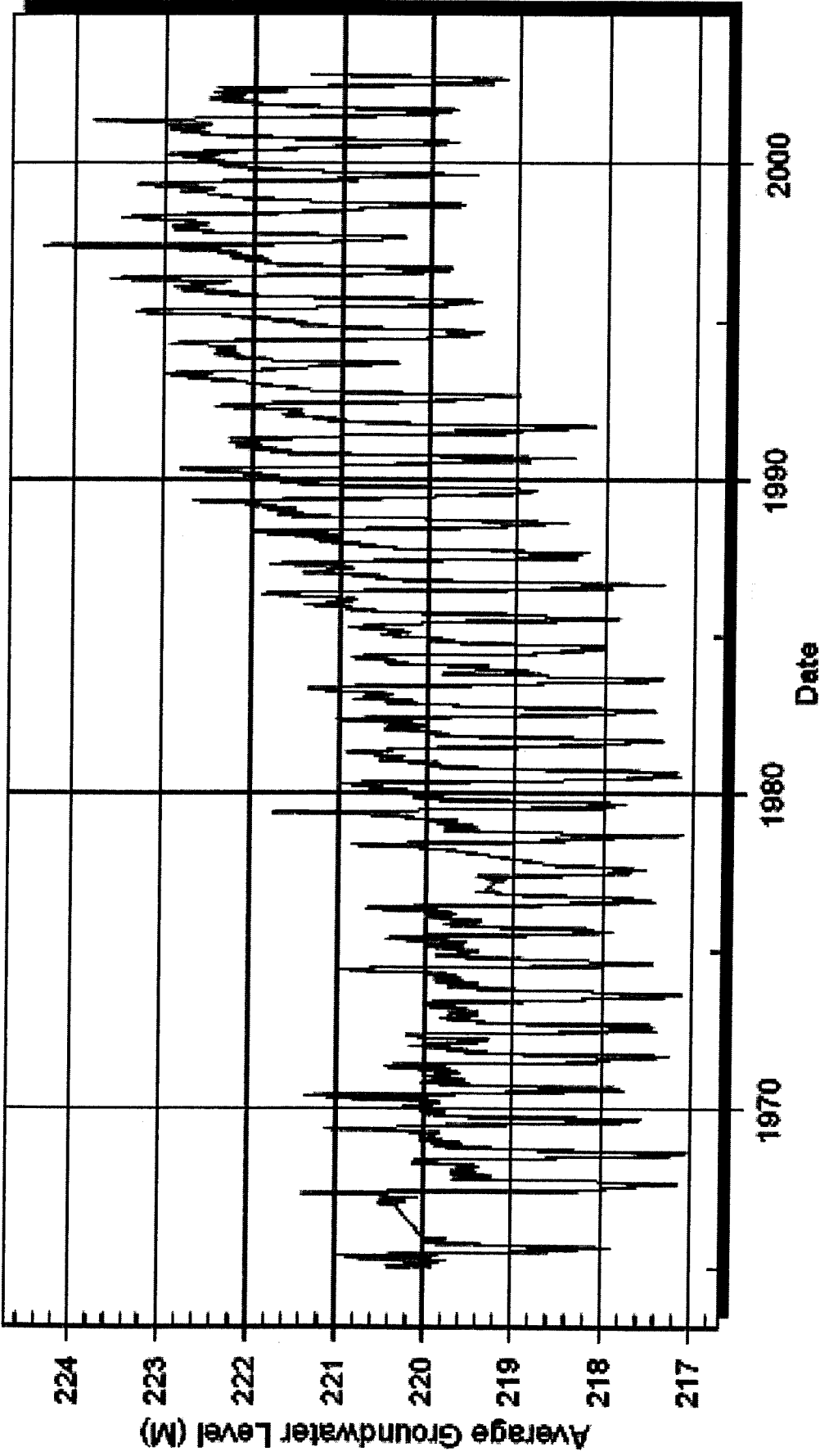
From	To(ft)	Casing	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0.0	61.0	casing	12.0				IRON
61.0	444.7	open hole					

PUMPING TEST

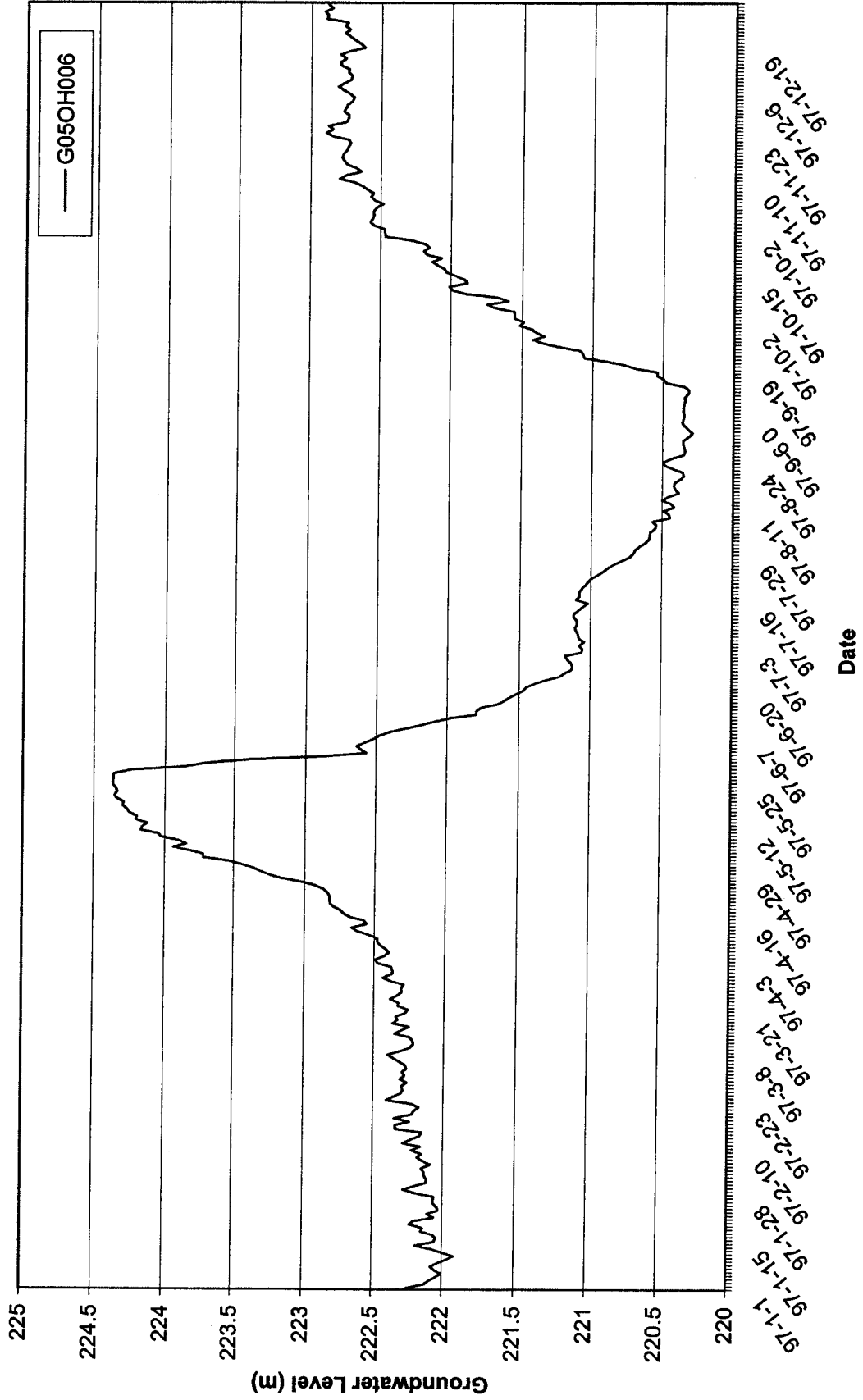
Date : Jul/18/1963 Pumping 50.0 Imp. gallons/minute  
Water level before test : 41.0 ft below ground  
Water level at end of test : 140.9 ft below ground  
Test duration: 6:00:00 water temperature: degree(s) F



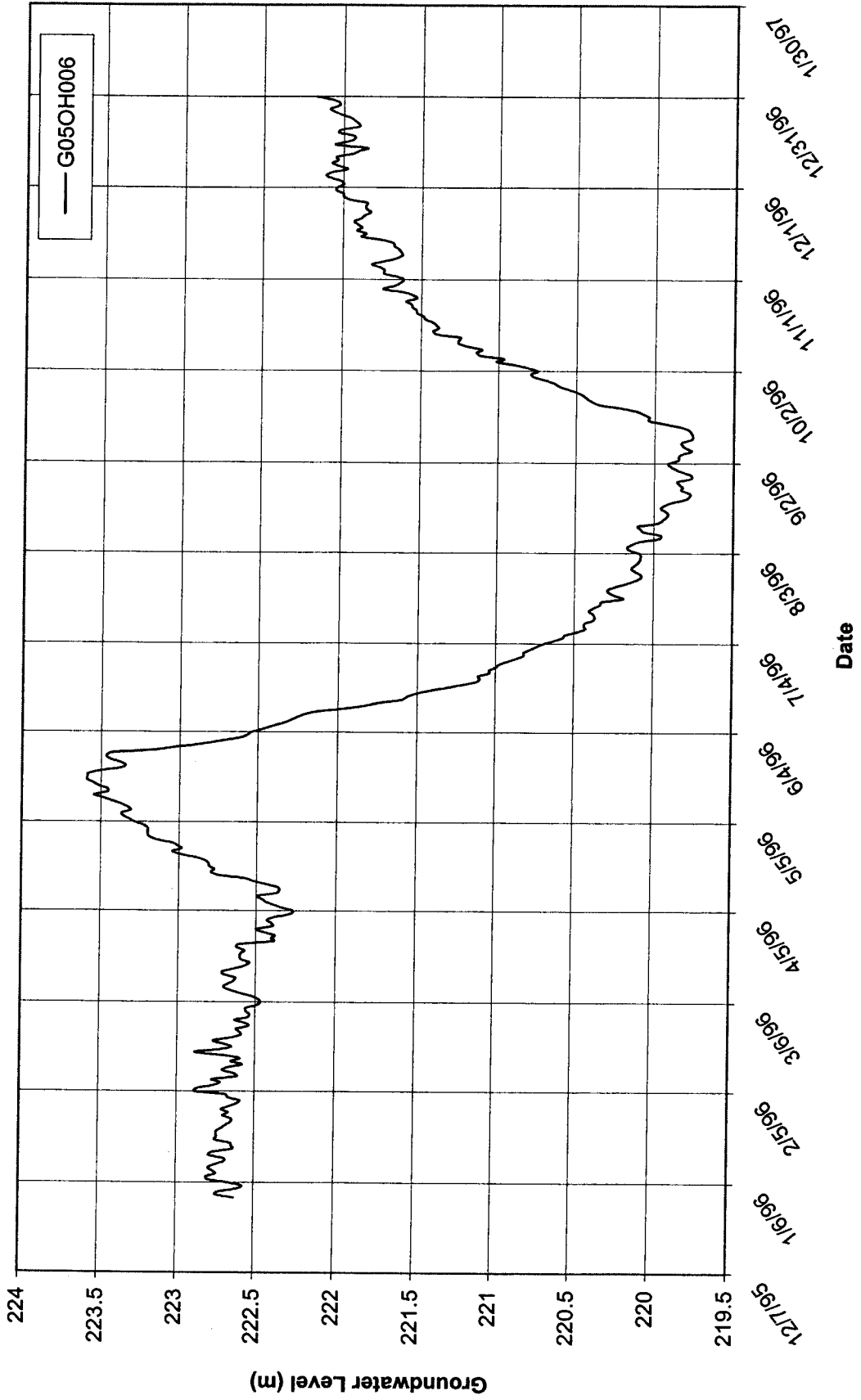
**G050H006 WINNIPEG #67 319 R C MISSION**  
**GROUND LEVEL ELEVATION 230.365 METRES (755.79 FEET)**



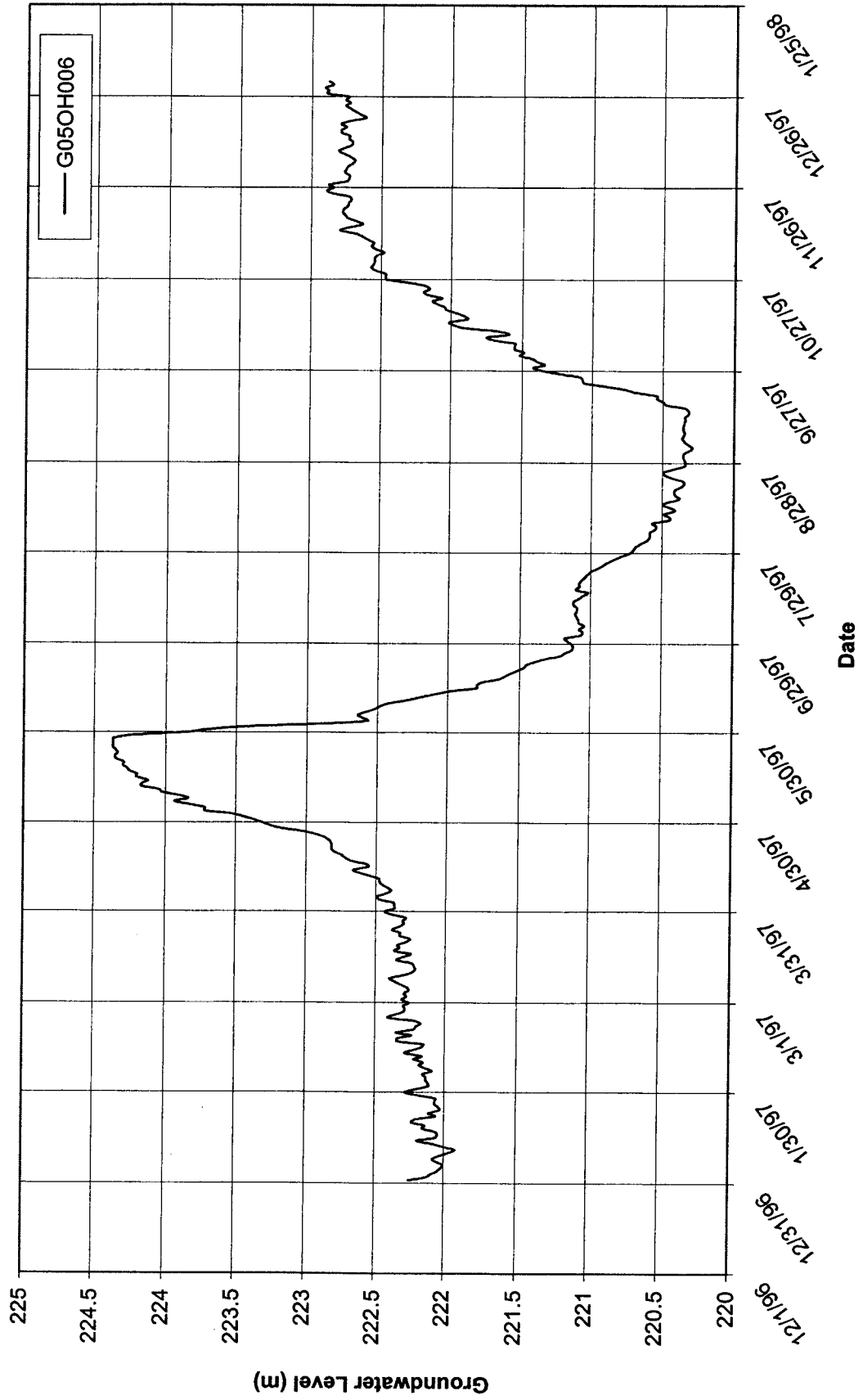
G05OH006 WINNIPEG #67 319 R C MISSION



G05OH006 WINNIPEG #67 319 R C MISSION




G05OH006 WINNIPEG #67 319 R C MISSION



**CLIENT** CITY OF WINNIPEG  
**PROJECT** BREDIN DRIVE OUTFALL  
**SITE** ELMWOOD PARK  
**LOCATION** Winnipeg, Manitoba  
**DRILLING METHOD** 125 mm ø Solid Stem Auger, ACKER MP5 Drill Rig

**JOB NO.** 04-107-14  
**GROUND ELEV.**  
**WATER ELEV.**  
**DATE DRILLED** 28-Jun-04

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.30 m▲	CONE blows/0.15 m△	Cu from Uncon. Comp. Test (kPa) ◇				
	(m)	(ft)								20	40	60	80	PL
				<b>CLAY FILL</b> - Black, moist, very stiff, crumbly, some organics.										
				<b>ORGANIC CLAY</b> - Black, moist, very stiff, trace to some silt inclusions, trace fine grained sand, trace rootlets.		1								>100
				<b>CLAY</b> - Brown, moist, very stiff, high plasticity, increasing silt inclusions with depth, trace fine grained sand, trace rootlets.										
				- Intermediate to high plasticity, trace oxidation between 3.05 to 4.57 m.		2								>100
				- Stiff below 4.27 m.		3								
				- Trace light grey silt inclusions, trace fine grained sand, trace coarse grained sand, trace fine grained subangular gravel from 5.79 to 6.10 m.		4								
				<b>LACUSTRINE CLAY</b> - Grey, moist, soft, high plasticity, trace silt nodules (1-2 mm ø).										
				- Trace fine grained subangular gravel, trace to some fine grained sand, trace silt inclusions below 7.62 m.		5								
						6								

SAMPLE TYPE  Auger Grab

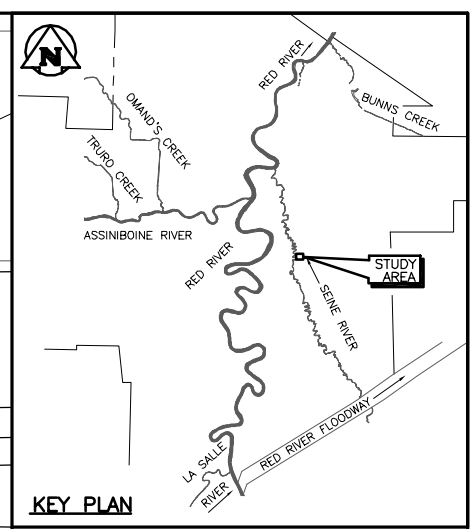
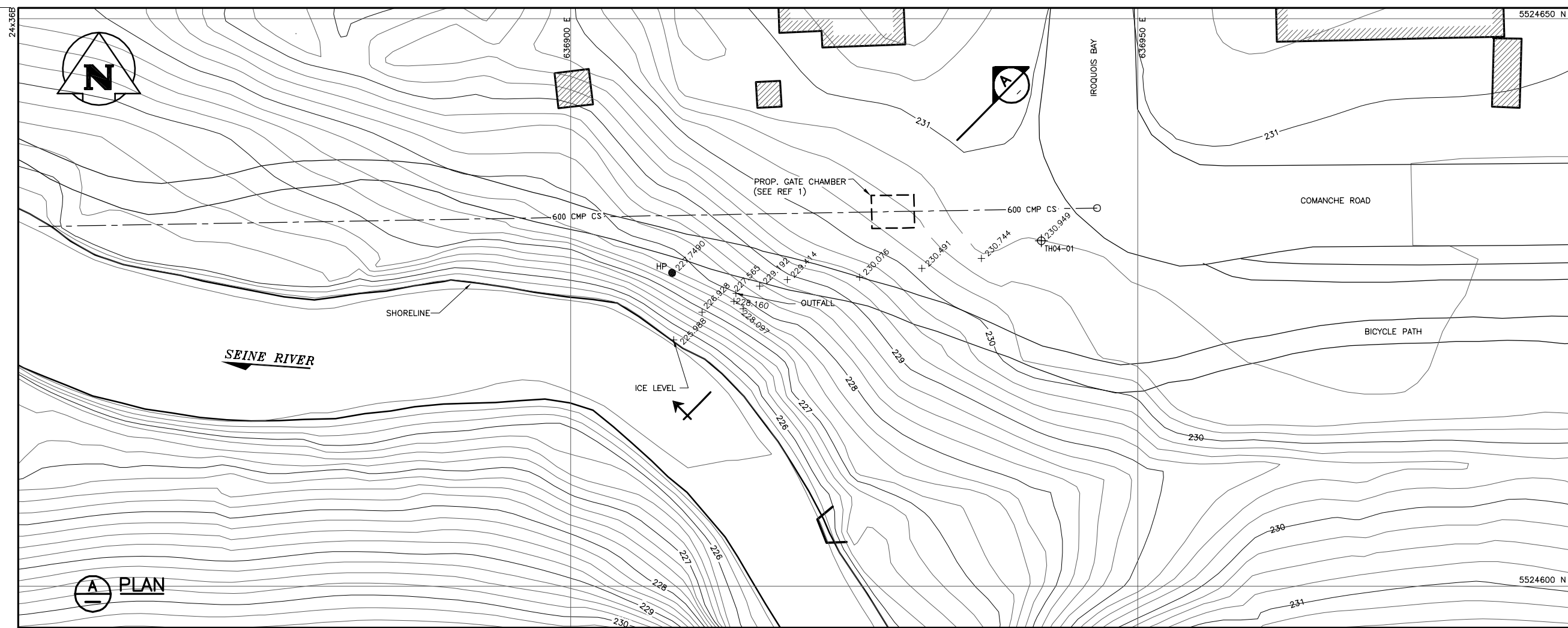
CONTRACTOR **Paddock Drilling Ltd.**

INSPECTOR **J. CHING**

APPROVED \_\_\_\_\_

DATE **30-06-04**

SPT\_FT\_M\_CALC.P:\PROJECTS\2004\04\CBED-2\GEOLOGS\04-107-14.LOG.GPJ

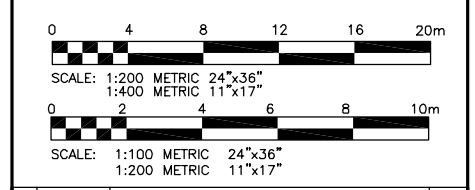


**KEY PLAN**

**LEGEND**

- 5524600 N UTM GRID LINE (NAD 83)
- 600 CMP CS SEWER OUTFALL (SEE REF 1)
- 226 GROUND CONTOUR (GEODETIC, m)
- HP HYDROPOLE
- TH04-01 TESTHOLE (KGS GROUP, JAN. 9, 2004)
- +230.491 SPOT ELEVATION (GEODETIC, m) (SEE REF 3)
- STRATIGRAPHIC BOUNDARY
- GROUNDWATER LEVEL (FEBRUARY 12, 2004)
- MONITORING ZONE

- REFERENCES**
- 2004 GATE CHAMBER UPGRADES DRAWING, COMANCHE RD, CITY OF WINNIPEG, 2004.
  - ORTHO-DIGITAL BASE MAPPING, CITY OF WINNIPEG, 1999.
  - RIVER BANK SURVEY, CITY OF WINNIPEG, MARCH, 2004.



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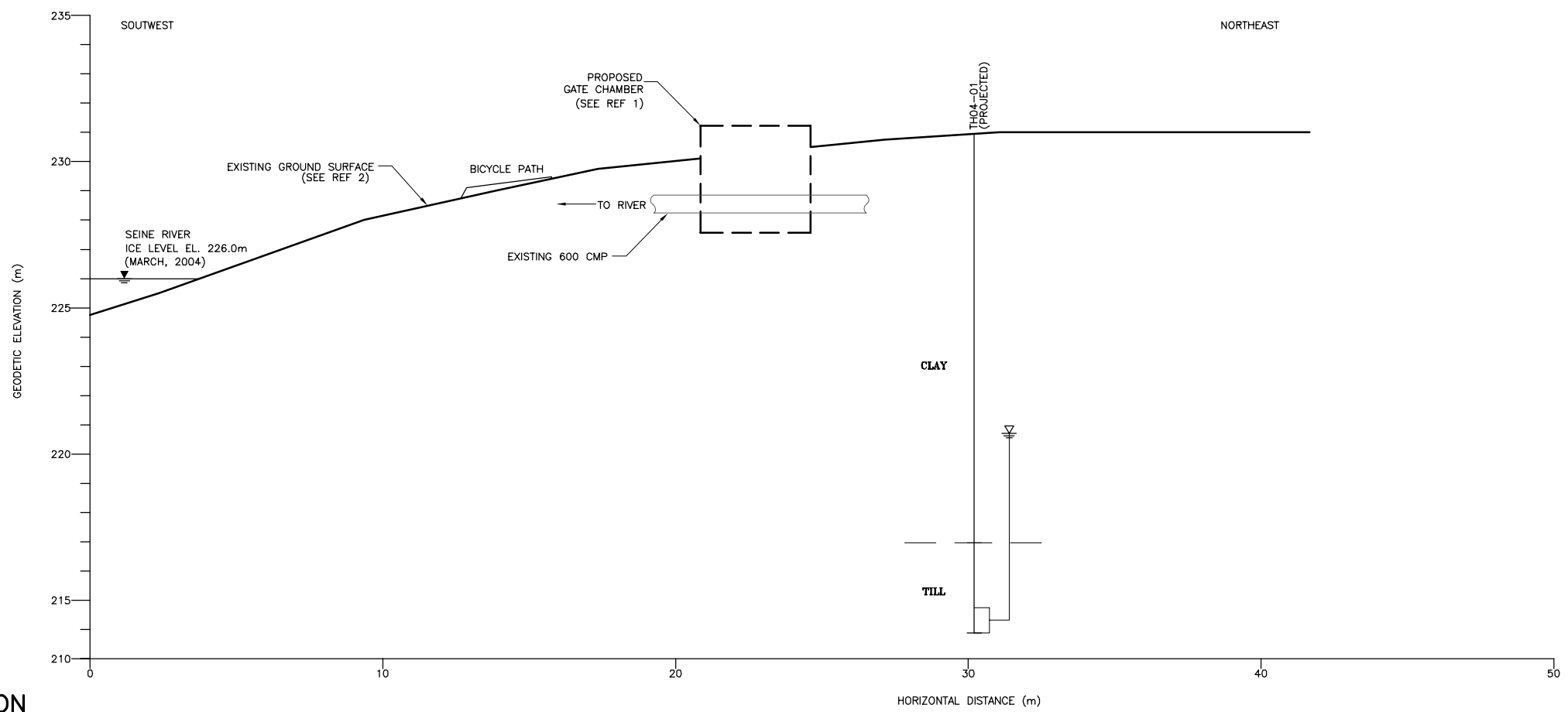
**KGS GROUP** CONSULTING ENGINEERS & PROJECT MANAGERS  
 WINNIPEG (204) 896-1209  
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CLIENT: **CITY OF WINNIPEG**  
 WATER AND WASTE DEPARTMENT  
 Winnipeg

PROJECT: **SEWER OUTFALL UPGRADE  
 COMANCHE RD  
 WINNIPEG, MB**

DWG. DESCRIPTION:  
**PLAN AND SECTION**

ENG. STAMP	DESIGNED BY: JMC CHECKED: RKe	DRAWN BY: TE CHECKED:
APPROVED:	SCALE: AS NOTED	DATE: MARCH 2004
KGS DWG. NO. <b>04-107-01(1)</b>		REV: <b>01</b>



**A PLAN**

**A SECTION**

**FIGURE 1**

KGS FILE NO.: P:\Projects\2004\04-107-01\Geo\Draws\04-107-01(1)-01.dwg  
 24"x36"/PLOT SCALE: 1:2

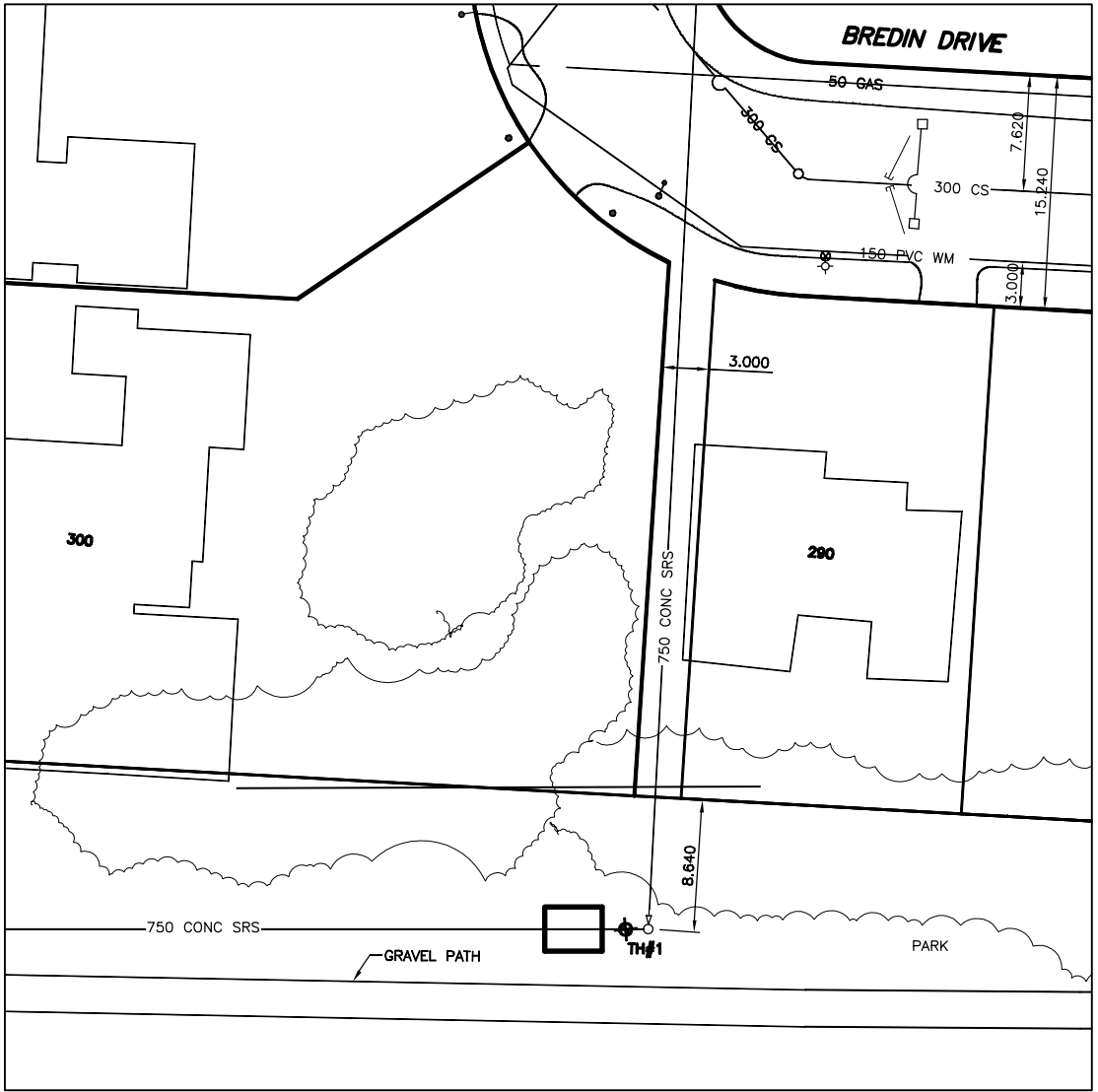
ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.30 m▲	Cu from Uncon. Comp. Test (kPa) ◇
						CONE blows/0.15 m△	Cu TORVANE (kPa) ◆
						20 40 60	20 40 60 80
							PL MC LL % 20 40 60 80
11	35						
12	40		<b>SILT TILL</b> - Beige, moist, soft, intermediate plasticity, trace to some fine to coarse grained angular sand, trace to some fine grained angular gravel.	7			
13				8			
14	45		<b>AUGER REFUSAL IN TILL AT 13.41 m</b>				
15	50		Notes: 1. Test hole remained open and dry upon completion of drilling. 2. Hole backfilled to ground surface with soil cuttings.				
16							
17	55						
18	60						
19							
20	65						
21	70						

SAMPLE TYPE Auger Grab

CONTRACTOR **Paddock Drilling Ltd.**

INSPECTOR **J. CHING**

APPROVED \_\_\_\_\_ DATE **30-06-04**



**METRIC**

WHOLE NUMBERS INDICATE MILLIMETRES  
DECIMALIZED NUMBERS INDICATE METRES



**THE CITY OF WINNIPEG**  
**WATER & WASTE DEPARTMENT**

Reference Spec. No.

2004 OUTFALL GATE  
CHAMBER UPGRADES

Designed By:  
DGS

Drawn By:  
CJH

Scale:

1:10

TEST HOLE LOCATION

Checked By:  
DGS

Date: 04.08.09  
Revision:

Drawing No.

Approved:

—