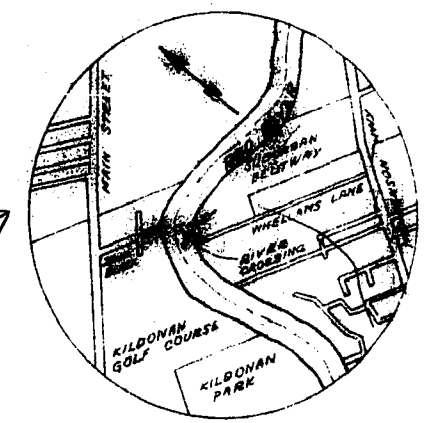
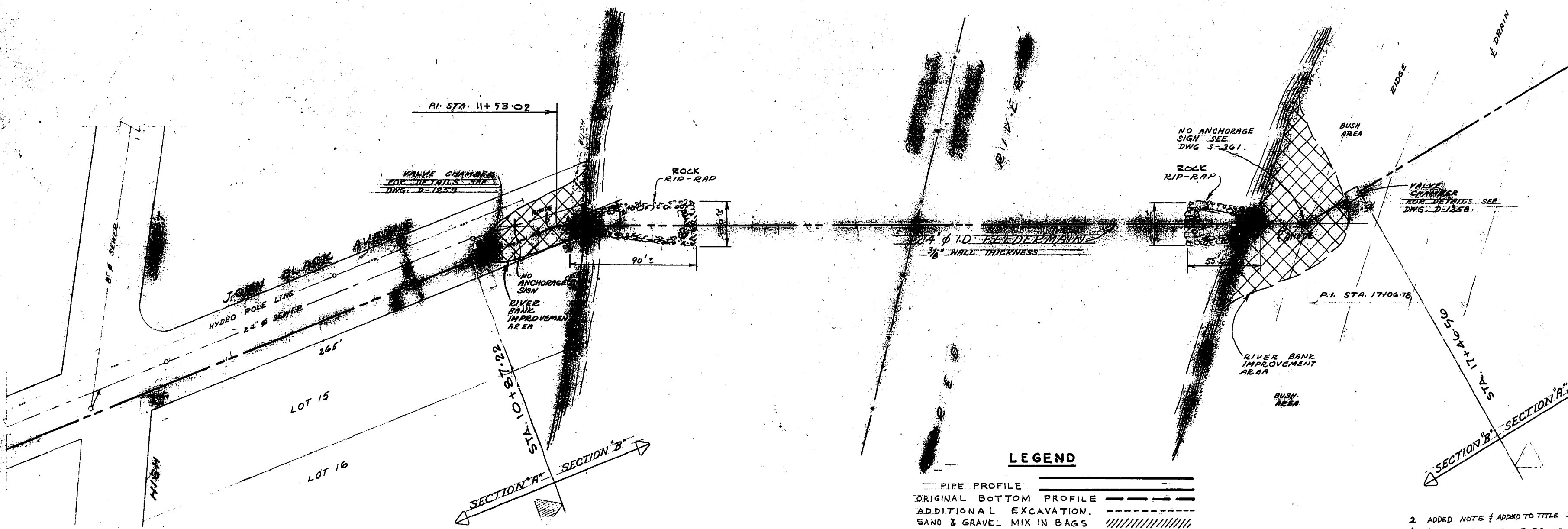


APPENDIX A – ADDITIONAL INFORMATION

1. **NK FM DRAWING D1251**
2. **NK FEEDERMAIN RIVER BED PROFILE NOVEMBER 2012**
3. **TEST HOLE LOCATIONS**
4. **NK FM TEST HOLE LOGS**

A S BUILT
 D.S. SURVEY ENGINEERING
 1978 U.T. 13
 DAE

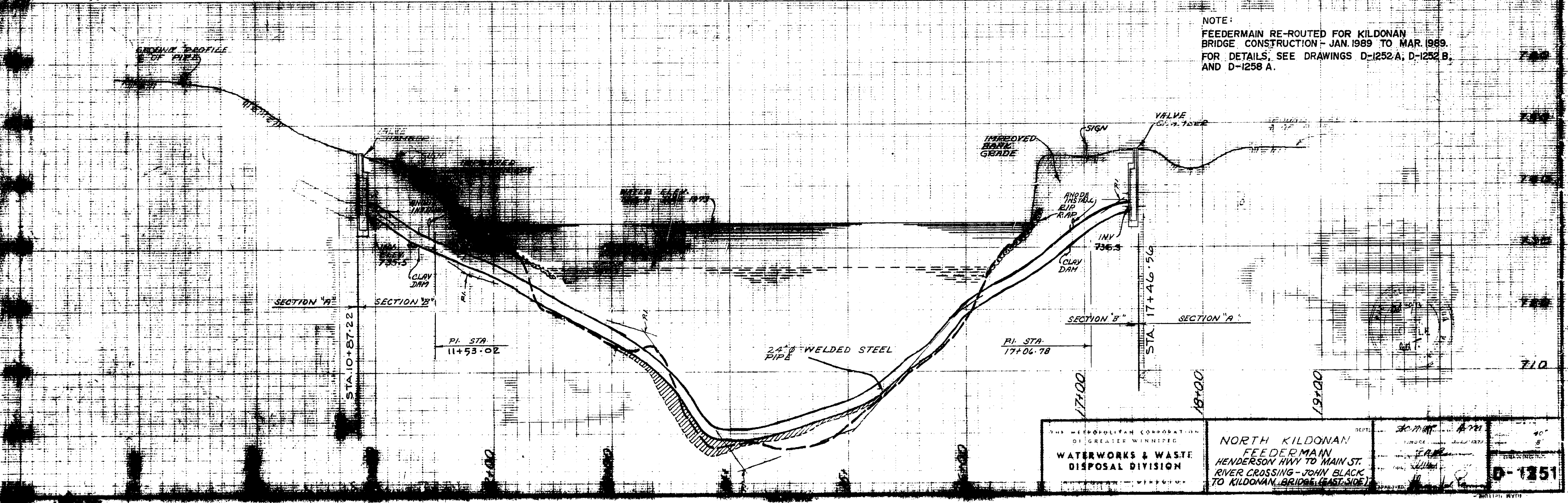


LEGEND

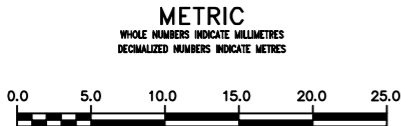
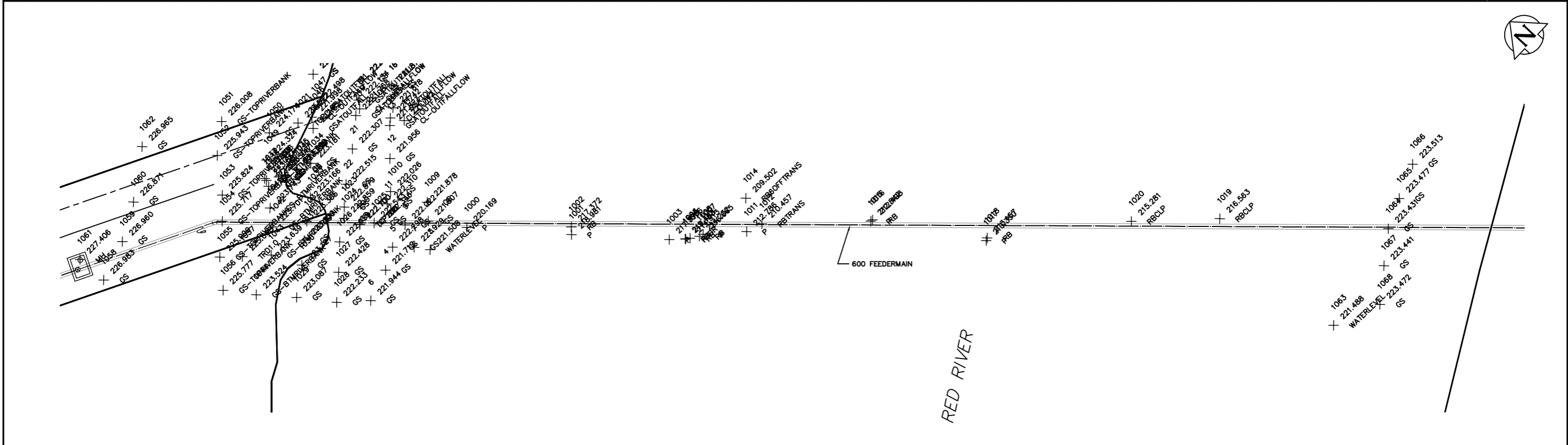
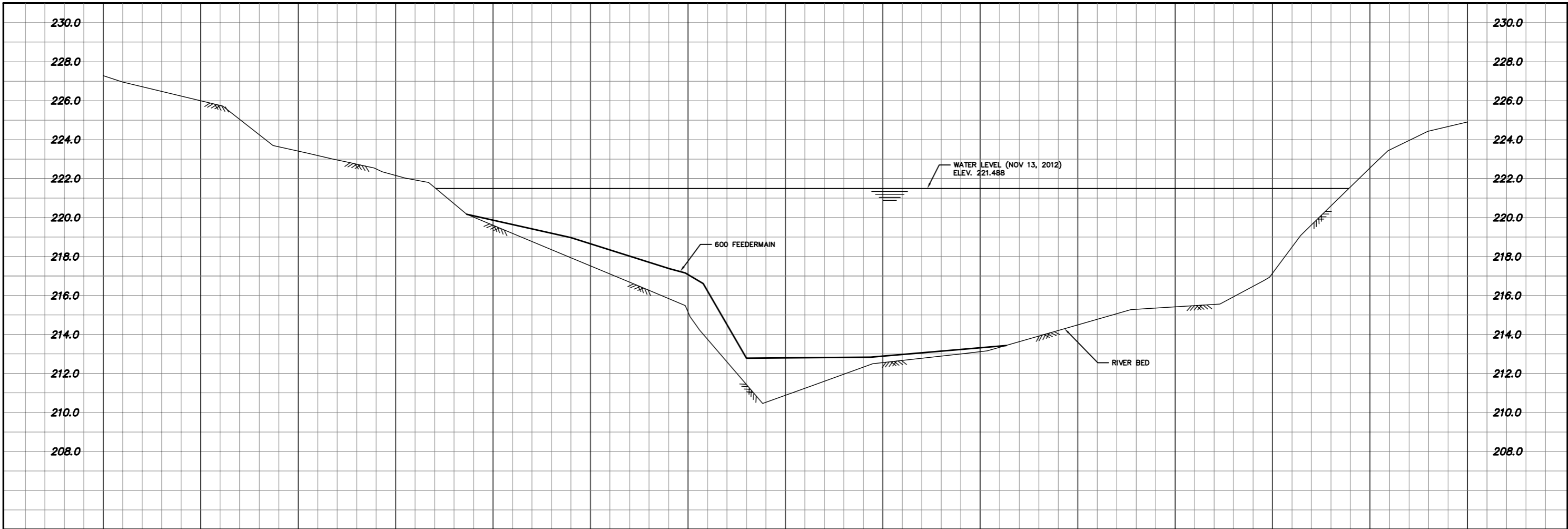
- PIPE PROFILE
- ORIGINAL BOTTOM PROFILE
- - - ADDITIONAL EXCAVATION
- /// SAND & GRAVEL MIX IN BAGS

SITE PLAN
 SCALE: 1" = 200'
 2. ADDED NOTE & ADDED TO TITLE 93.04.20 KT.
 REV. A AS BUILT 1978 07 20 RH 770

NOTE:
 FEEDERMAIN RE-ROUTED FOR KILDONAN
 BRIDGE CONSTRUCTION - JAN. 1989 TO MAR. 1989.
 FOR DETAILS, SEE DRAWINGS D-1252 A, D-1252 B,
 AND D-1258 A.



THE METROPOLITAN CORPORATION OF GREATER WINNIPEG WATERWORKS & WASTE DISPOSAL DIVISION	NORTH KILDONAN FEEDERMAIN HENDERSON HWY TO MAIN ST. RIVER CROSSING - JOHN BLACK TO KILDONAN BRIDGE (EAST SIDE)		DEPT. DATE BY CHECKED APPROVED	90' 8" D-1251
	SURVEYED & PLAN CHECKED BY APPROVED AS BUILT			1989



WARNING

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

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

SEE PROVINCIAL REGULATION 210/72 FOR DETAILS

LOCATION APPROVED UNDERGROUND STRUCTURES

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.	

CONSTRUCTION COMPLETION DATE: YYYY MM DD	

NO.	REVISIONS	DATE	BY

DESIGNED BY	XX	CHECKED BY	XX
DRAWN BY	XX	APPROVED BY	XX
SCALE:		RELEASED FOR CONSTRUCTION	
HORIZONTAL	1:250	DATE	
VERTICAL	1:100	DATE	

ENGINEER'S SEAL

CONSULTANT DRAWING NUMBER

THE CITY OF WINNIPEG
Winnipeg
WATER AND WASTE DEPARTMENT
ENGINEERING DIVISION

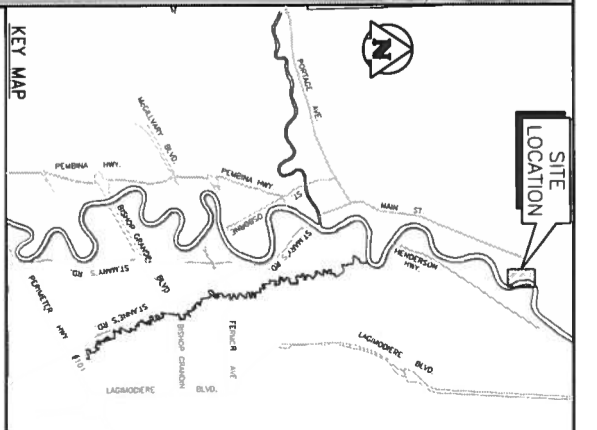
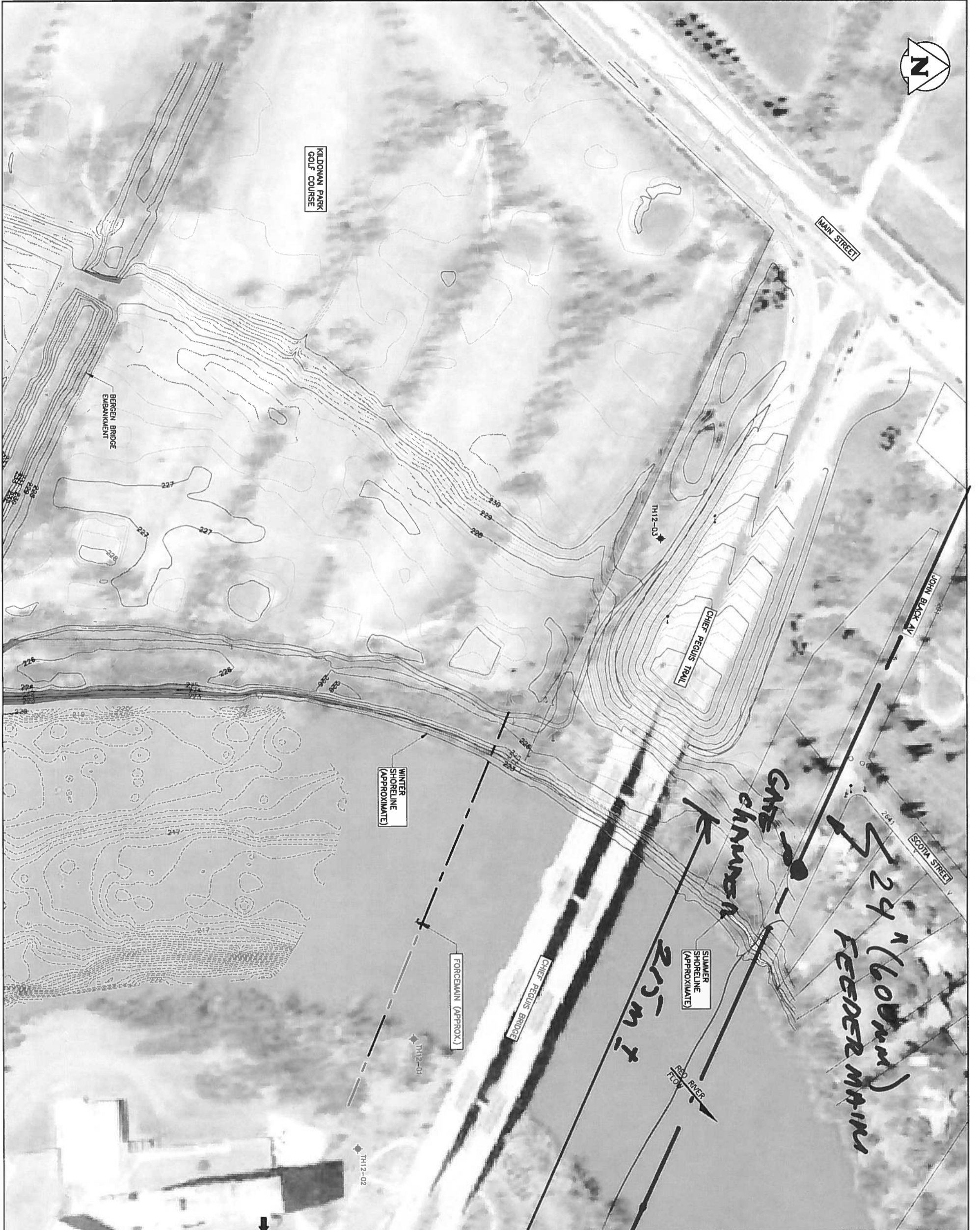
JOHN BLACK RIVER CROSSING
RIVER BED PROFILE

SHEET X OF X
CITY DRAWING NUMBER

BID OPPORTUNITY: XXX-20XX
CONTRACT NUMBER: X

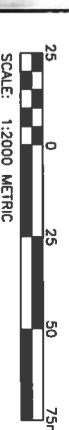
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FILE NAME: SHOTS.dwg

PLOT DATE: 2012 11 14



LEGEND:
 ◆ TH12-01 TEST HOLE (KGS 2012)

NOTES:
 1. LOCATION OF P.H. FROM DILLON CONSULTING LTD. CITY DRAWING NUMBER W-502-02 (SEE APPENDIX A
 2. SURVEY CONTROLS FROM DILLON CONSULTING LTD. (2010) AND KGS GROUP (BATHYMETRY, JULY 2010).



NO.	DATE	DESCRIPTION	BY
1	12/12/20	ISSUED FOR INFORMATION	DE
2	12/12/20	REVISIONS / ISSUE	DE

CLIENT:
THE CITY OF WINNIPEG
 WATER AND WASTE DEPARTMENT

PROJECT:
FORCEMAIN CROSSING AT CHIEF PEGUIS TRAIL BRIDGE

DATE REVISION:

DESIGNER	DATE	REVISION
CF	12/12/20	CF
DEA	12/12/20	DEA
RPM	12/12/20	RPM
DEA	12/12/20	DEA

DWG NO: 12-0107-018 G01
 SHEET: A

KGS GROUP
 CONSULTING ENGINEERS

SITE PLAN SHOWING TEST HOLE LOCATIONS

CLIENT CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT
PROJECT Chief Peguis Bridge Sewer Replacement
SITE East of Red River and South of Chief Peguis Trail
LOCATION South of Existing Sewermain on the Upper Bank
DRILLING METHOD Acker Track Drill Rig, 125 mm ø Solid Stem and HQ Core Barrel

JOB NO. 12-0107-018
GROUND ELEV. 228.37
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 11/8/2012
UTM (m) N 5,534,757
 E 636,604

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆				
									20	40	60	80	
			SILTY CLAY FILL - Brown, moist, stiff, intermediate to high plasticity, some medium to coarse grained sand, some fine grained gravel, trace coarse grained gravel, trace rootlets.			S1							
	1		SILTY CLAY - Brown, moist, stiff, high plasticity, trace fine to medium grained sand.										
	5		- Increased sand content below 1.83 m.										
	2		SAND - Brown, moist, compact, fine to medium grained, trace coarse grained sand, trace silt, trace clay.			S2							
	3		SILTY SAND - Brown, moist, loose, fine to medium grained, with silt, trace clay.			S3							
	4		SAND - Brown, moist, compact, fine to medium grained, trace silt.			S4							
	15		- Water noticed on sample at ~ 5.49 m.										
	5		SANDY SILT - Brown, moist, firm, intermediate to high plasticity, trace oxidation.			S5							
	6		SILTY SAND - Brown, moist, soft, fine to medium grained, trace oxidation.										
	7		- Grey, no oxidation below 6.71 m.										
	25		SAND - Grey, moist, compact, medium grained, some fine and coarse grained sand.										
	8		SILTY CLAY - Grey, moist, firm, high plasticity. - Medium grained sand layer between 7.39 and 7.47 m.			S6							
	9		SILTY SAND - Grey, moist, soft, fine to medium grained sand, with silt. - Organic layer between 8.53 and 8.64 m.										
	30		SILTY CLAY - Grey, moist, firm, high plasticity, trace fine grained sand. - Increased sand between 9.75 and 9.96 m.			S7							

GEOTECHNICAL-SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE Auger Grab Split Spoon Core Barrel

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **C. FRIESEN**

APPROVED **DRAFT** DATE **11/26/12**

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★	Cu TORVANE (kPa) ◆
								20 40 60	20 40 60	20 40 60 80	20 40 60 80
										PL MC LL	
	35		- Increased sand between 10.36 and 10.52 m.								
	11		SILTY SAND - Grey, moist, compact, medium grained, trace fine grained sand, trace clay. - Test hole squeezing at 10.67 m.			S8					
	12		- 25 mm thick organic layer at 12.50 m.								
	13		- Decreased sand between 12.95 and 13.26 m.			S9					
	14		SILTY CLAY - Grey, moist, firm, high plasticity, trace coarse grained sand, trace fine grained gravel, trace silt nodules.								
	15		- Grain Size Distribution: Gravel (1.0%), Sand (8.8%), Silt (21.9%), Clay (57.0%) at 14.63 m.			S10					
	16		SILT TILL - Tan, moist, compact, with medium to coarse grained sand, some fine grained gravel, trace coarse grained gravel.								
	17		- Loose, decreased gravel below 16.46 m.			S11					
	18		- Auger refusal at 18.34 m on bedrock. Switched over to core below 18.34 m.			S12	100				
	19		LIMESTONE BEDROCK - White, competent, vertical and horizontal fractures.			S13					
	20					R1	98				
	21					R2	98				

GEOTECHNICAL-SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE Auger Grab Split Spoon Core Barrel

CONTRACTOR Paddock Drilling Ltd.	INSPECTOR C. FRIESEN	APPROVED DRAFT	DATE 11/26/12
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ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	Cu POCKET PEN (kPa) ★
								DYNAMIC CONE (N) blows/ft △	Cu TORVANE (kPa) ◆
								20 40 60 80	PL MC LL %
22			- Increased fractures below 22.94 m. - Vertical fracture between 23.01 and 23.67 m.		22.2	R3	98		
23	75				R4	100			
24	80								
25	85				R5	100			
26	85						25.8		
			END OF TEST HOLE AT 26.06 m		26.1				
27			Notes: 1. Installed casagrande standpipe at a depth of 26.06 m with a stick-up of 0.84 m. 2. Backfilled test hole with silica sand between 26.06 and 22.17 m and bentonite chips from 22.17 m to grade.						
28	90								
29	95								
30	100								
31	105								
32	110								

GEOTECHNICAL-SOIL LOG P:\PROJECTS\2012\12-01\07-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL-SEWERMAIN.GPJ

SAMPLE TYPE Auger Grab Split Spoon Core Barrel

CONTRACTOR Paddock Drilling Ltd.	INSPECTOR C. FRIESEN	APPROVED DRAFT	DATE 11/26/12
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CLIENT CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT
PROJECT Chief Peguis Bridge Sewer Replacement
SITE East of Red River and South of Chief Peguis Trail
LOCATION North of Existing Sewermain on the Lower Bank
DRILLING METHOD Acker Track Drill Rig, 125 mm ø Solid Stem and HQ Core Barrel

JOB NO. 12-0107-018
GROUND ELEV. 226.37
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 11/7/2012
UTM (m) N 5,534,788
 E 636,543

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★		Cu TORVANE (kPa) ◆	
									20	40	60	80
1	5		SILTY CLAY - Brown, damp, firm, intermediate plasticity, trace rootlets, trace fine grained sand, trace fine grained gravel.	Auger Grab	S1							
2	10		SAND & GRAVEL - Light grey, moist, dense, medium to coarse grained sand, fine to coarse grained gravel, some clay. - Hole squeezing at 1.83 m.	Auger Grab	S2							
3	15		SAND - Brown, moist to wet, loose, fine to medium grained, trace oxidation. - Water noticed on sample below 4.57 m. - Grey, no oxidation below 5.33 m.	Auger Grab	S3							
4	20		SILTY CLAY - Grey, moist, firm, high plasticity.	Auger Grab	S4							
5	25		SAND - Grey, moist, loose, medium grained, trace coarse grained sand.	Auger Grab	S5							
6	30		SILTY CLAY - Grey, moist, firm, high plasticity, trace silt nodules, trace medium grained sand, trace fine grained gravel. - Some to with silt, reduced sand below 7.92 m.	Auger Grab	S6							

GEO-TECHNICAL SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE Auger Grab Core Barrel

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED
DRAFT

DATE
11/26/12

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★	Cu TORVANE (kPa) ◆
						20 40 60	20 40 60	20 40 60 80	20 40 60 80
	35		- Stiff below 10.06 m.	S7					
	35		- Reduced fine grained gravel below 10.67 m.						
	40		- Grain Size Distribution: Gravel (1.2%), Sand (11.7%), Silt (30.5%), Clay (56.6%) at 11.58 m.	S8					
	40		- Reduced silt nodules below 12.50 m.						
	45		- Firm below 12.95 m.	S9					
	45		- Grain Size Distribution: Gravel (0.8%), Sand (10.2%), Silt (23.7%), Clay (65.3%) at 13.11 m.						
	50		SILTY TILL - Tan, moist, compact, with medium to coarse grained sand, some fine grained gravel, trace coarse grained gravel.						
	50		- Loose, reduced coarse grained sand, reduced fine to coarse grained gravel below 14.63 m.	S10					
	55		- Auger refusal at 16.76 m on bedrock. Switched over to core below 16.76 m.	S11					
	60		LIMESTONE BEDROCK - White, fractured with vertical and horizontal fractures.	R1	85				
	65		- Clay seam at 19.69 m.	R2	98				
	65		- Clay between 20.12 and 20.19 m.	R3	100				
	70		- Yellow fractured limestone between 21.41 and 22.25 m.	R4	100				

GEO-TECHNICAL SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ


SAMPLE TYPE  Auger Grab  Core Barrel

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED
DRAFT

DATE
11/26/12

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	Cu POCKET PEN (kPa) ★						
							DYNAMIC CONE (N) blows/ft △	Cu TORVANE (kPa) ◆						
							20 40 60 80	20 40 60 80						
							PL MC LL	PL MC LL						
							%	%						
22			- Reduced fractures below 22.25 m.	R5	100									
23	75													
24								R6	100					
25	80						- Increased fractures below 24.69 m.							
26	85													
26	85						END OF TEST HOLE AT 25.91 m	R7	100					
27							Notes: 1. Water level measured at 15.70 m below grade after drilling. 2. Backfilled test hole with a thick bentonite grout mixture and bentonite chips.							
28	90													
29	95													
30														
31	100													
32	105													
33														
	110													

GEO-TECHNICAL-SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUJIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE  Auger Grab  Core Barrel

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED
DRAFT

DATE
11/26/12

CLIENT CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT
PROJECT Chief Peguis Bridge Sewer Replacement
SITE East of Red River and South of Chief Peguis Trail
LOCATION ~3 m West of TH12-02
DRILLING METHOD Acker Track Drill Rig, 125 mm ø Solid Stem

JOB NO. 12-0107-018
GROUND ELEV.
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 11/9/2012
UTM (m) N
 E

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	DYNAMIC CONE (N) blows/ft ▲	Cu POCKET PEN (kPa) ★	Cu TORVANE (kPa) ◆
								20 40 60	20 40 60	20 40 60 80	20 40 60 80
			SILTY CLAY FILL - Brown, moist, stiff, intermediate to high plasticity, some medium to coarse grained sand, some fine grained gravel, trace coarse grained gravel, trace rootlets.								
	1		SILTY CLAY - Brown, moist, stiff, high plasticity, trace fine to medium grained sand.								
	5		- Increased sand content below 1.83 m.								
	2		SAND - Brown, moist, compact, fine to medium grained, trace coarse grained sand, trace silt, trace clay.								
	3		SILTY SAND - Brown, moist, loose, fine to medium grained, with silt, trace clay.								
	4		SAND - Brown, moist, compact, fine to medium grained, trace silt.								
	15		- Water noticed on sample at ~ 5.49 m.								
	5		SANDY SILT - Brown, moist, firm, intermediate to high plasticity, trace oxidation.								
	6		SILTY SAND - Brown, moist, soft, fine to medium grained, trace oxidation.								
	7		- Grey, no oxidation below 6.71 m.								
	25		SAND - Grey, moist, compact, medium grained, some fine and coarse grained sand.								
	8		SILTY CLAY - Grey, moist, firm, high plasticity. - Medium grained sand layer between 7.39 and 7.47 m.								
	9		SILTY SAND - Grey, moist, soft, fine to medium grained sand, with silt. - Organic layer between 8.53 and 8.64 m.								
	30		SILTY CLAY - Grey, moist, firm, high plasticity, trace fine grained sand. - Increased sand between 9.75 and 9.96 m.								

GEO-TECHNICAL-SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED
DRAFT

DATE
11/26/12

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	Cu POCKET PEN (kPa) ★
									DYNAMIC CONE (N) blows/ft △	Cu TORVANE (kPa) ◆
									20 40 60	20 40 60 80
									20 40 60	PL MC LL % 20 40 60 80
	35		- Increased sand between 10.36 and 10.52 m.							
11			SILTY SAND - Grey, moist, compact, medium grained, trace fine grained sand, trace clay. - Test hole squeezing at 10.67 m.		11.4					
					11.6					
12	40		- 25 mm thick organic layer at 12.50 m.							
13			- Decreased sand between 12.95 and 13.26 m.							
14	45		SILTY CLAY - Grey, moist, firm, high plasticity, trace coarse grained sand, trace fine grained gravel, trace silt nodules.							
15	50									
16	55		SILT TILL - Tan, moist, compact, with medium to coarse grained sand, some fine grained gravel, trace coarse grained gravel. - Loose, decreased gravel below 16.46 m.		16.8					
17					17.4					
18	60		AUGER REFUSAL AT 18.34 m		17.7					
					18.3					
19	65		Notes: 1. Stratigraphy assumed from TH12-02 drilled ~3 m away. 2. Installed casagrande standpipe at a depth of 17.68 m with a stick-up of 0.91 m. 3. Installed PN 034983 at a depth of 11.58 m. below grade. 4. Backfilled test hole with silica sand between 17.68 and 16.76 m and bentonite chips from 16.76 m to grade.							
20	70									
21										

GEO TECHNICAL - SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED
DRAFT

DATE
11/26/12

CLIENT CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT
PROJECT Chief Peguis Bridge Sewer Replacement
SITE West of Red River and South of Chief Peguis Trail
LOCATION North of Existing Sewermain on the Upper Bank
DRILLING METHOD CME Track Drill Rig, 125 mm ø Solid Stem and HQ Core Barrel

JOB NO. 12-0107-018
GROUND ELEV. 230.84
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 11/13/2012
UTM (m) N 5,534,926
 E 636,265

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆	
									20 40 60 80	PL MC LL %
			SILTY CLAY FILL - Black, moist, stiff, high plasticity, trace rootlets. - Trace medium to coarse grained sand, trace fine to coarse grained gravel below 0.23 m.							
	1		SILTY CLAY - Brown, moist, stiff, high plasticity, trace coarse grained sand. - No sand below 1.22 m.			S1				
	2		SILTY SAND TO SANDY SILT - Light brown, moist, soft/loose, fine grained sand.			S2				
	3									
	4		SILTY CLAY - Brown, moist, stiff, high plasticity, trace silt nodules (~1-3 mm diameter). - 10 mm diameter gravel piece at 3.73 m.			S3				
	5									
	6		- Grey below 5.49 m. - Firm below 6.10 m.			S4				
	7					S5				
	8									
	9		- Slightly increased silt nodules (up to 5 mm diameter) below 9.14 m.			S6				

GEO TECHNICAL - SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE Auger Grab Split Spoon Core Barrel

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED
DRAFT

DATE
11/26/12

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆	
									PL	MC
35	11					S7				
40	12		- Trace silt pockets below 12.19 m. - Trace fine grained gravel below 12.50 m.			S8				
45	13					S9				
50	14					S10				
55	15		- Reduced silt, trace coarse grained sand, no fine grained gravel below 15.24 m.			S11				
60	16					S12				
65	17		- Occasional silt pockets/nodules below 16.92 m.			S13				
66	18		- Grain Size Distribution: Gravel (0.7%), Sand (7.5%), Silt (19.4%), Clay (72.4%) at 17.68 m. - Trace fine grained gravel below 18.29 m.			S14	61			
67	19					S15				
70	20		SILT TILL - Tan with grey, moist, compact, fine to coarse grained sand, fine grained gravel, trace clay.			R1	88			
70	21		- Auger refusal at 21.03 m on bedrock. Switched over to core below 21.03 m. LIMESTONE BEDROCK - White, competent, horizontal fractures.		21.0					

GEO-TECHNICAL-SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE Auger Grab Split Spoon Core Barrel

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED
DRAFT

DATE
11/26/12

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	Cu POCKET PEN (kPa) ★	
								DYNAMIC CONE (N) blows/ft △	Cu TORVANE (kPa) ◆	
								20 40 60 80	PL MC LL %	
								20 40 60	20 40 60 80	
22			- Thin clay seam at 21.77 m. - Vertical fracture between 21.84 and 22.05 m.							
23	75									
24	80									
25	85									
26	90									
27	95									
28										
29			- Rubble zone between 28.46 and 28.52 m. - Vertical fracture between 28.52 and 28.70 m.							
30										
31										
32										
33										

END OF TEST HOLE AT 30.02 m

Notes:
 1. Installed casagrande standpipe at a depth of 30.02 m with a stick-up of 0.91 m.
 2. Backfilled test hole with silica sand between 30.02 and 27.58 m, bentonite chips from 27.58 to 23.93 m, slough from 23.93 to 21.03 m and bentonite chips from 21.03 m to grade.

GEO TECHNICAL - SOIL LOG P:\PROJECTS\2012\12-0107-018\DESIGN\GEOLOGS\CHIEF PEGUIS TRAIL SEWERMAIN.GPJ

SAMPLE TYPE <input checked="" type="checkbox"/> Auger Grab	<input checked="" type="checkbox"/> Split Spoon	<input type="checkbox"/> Core Barrel
CONTRACTOR Paddock Drilling Ltd.	INSPECTOR C. FRIESEN	APPROVED DRAFT
		DATE 11/26/12

CLIENT CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT
PROJECT Chief Peguis Bridge Sewer Replacement
SITE West of Red River and South of Chief Peguis Trail
LOCATION ~2 m West of TH12-03
DRILLING METHOD CME Track Drill Rig, 125 mm ø Solid Stem

JOB NO. 12-0107-018
GROUND ELEV.
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 11/14/2012
UTM (m) N
 E

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆	
									20 40 60 80	PL MC LL %
			SILTY CLAY FILL - Black, moist, stiff, high plasticity, trace rootlets. - Trace medium to coarse grained sand, trace fine to coarse grained gravel below 0.23 m.							
	1		SILTY CLAY - Brown, moist, stiff, high plasticity, trace coarse grained sand. - No sand below 1.22 m.							
	2		SILTY SAND TO SANDY SILT - Light brown, moist, soft/loose, fine grained sand.							
	3									
	4		SILTY CLAY - Brown, moist, stiff, high plasticity, trace silt nodules (~1-3 mm diameter). - 10 mm diameter gravel piece at 3.73 m.							
	5									
	6		- Grey below 5.49 m. - Firm below 6.10 m.							
	7									
	8									
	9		- Slightly increased silt nodules (up to 5 mm diameter) below 9.14 m.							

SAMPLE TYPE

CONTRACTOR
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INSPECTOR
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DRAFT

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ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	Cu POCKET PEN (kPa) ★
									DYNAMIC CONE (N) blows/ft △	Cu TORVANE (kPa) ◆
									20 40 60	20 40 60 80
11	35									
12	40		- Trace silt pockets below 12.19 m. - Trace fine grained gravel below 12.50 m.		11.6 11.8					
13										
14	45									
15	50		- Reduced silt, trace coarse grained sand, no fine grained gravel below 15.24 m.							
16										
17	55		- Occasional silt pockets/nodules below 16.92 m.							
18										
19	60		- Trace fine grained gravel below 18.29 m.							
20	65		SILT TILL - Tan with grey, moist, compact, fine to coarse grained sand, fine grained gravel, trace clay.		20.1 20.7 21.0					
21	70		AUGER REFUSAL AT 20.98 m							

Notes:
1. Stratigraphy assumed from TH12-03 drilled ~2 m away.

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SAMPLE TYPE

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

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ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲	DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★	Cu TORVANE (kPa) ◆
								20 40 60	20 40 60	20 40 60 80	20 40 60 80
22			2. Installed casagrande standpipe at a depth of 20.98 m with a stick-up of 0.86 m. 3. Installed PN 034985 at a depth of 11.84 m. below grade. 4. Backfilled test hole with silica sand between 20.98 and 20.12 m and bentonite chips from 20.12 m to grade. 5. Test hole squeezing at 8.53 m shortly after drilling.								
23	75										
24											
25											
26	85										
27											
28											
29	95										
30											
31											
32	105										
33											
	110										
SAMPLE TYPE											
CONTRACTOR Paddock Drilling Ltd.				INSPECTOR C. FRIESEN				APPROVED DRAFT			

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