

**CLIENT** CITY OF WINNIPEG  
**PROJECT** MONTCALM FORCE MAIN REPLACEMENT  
**SITE** MONTCALM FORCE MAIN  
**LOCATION** RUE ARCHIBALD, EAST TOP OF BANK, 5529380.2 N 635928.9 E  
**DRILLING METHOD** 150 mm ø Solid Stem Auger, Nodwell and HQ Coring

**JOB NO.** 03-107-17  
**GROUND ELEV.** 230.40 m  
**WATER ELEV.** 222.48 m (9-Jan-04)  
**DATE DRILLED** 6-Jan-04, 8-9-Jan-04

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
230.3				<b>GRAVEL (FILL)</b> - Crushed limestone.								
230				<b>CLAY (FILL)</b> - Brown, frozen to moist, stiff, high plasticity, trace fine grained sand. - Frozen to 0.6 m.								
229	1	5					1					
228.1				<b>CLAY (LACUSTRINE) (CH)</b> Brown, moist, stiff, high plasticity, silty.								
228								2				
227	3	10			- Silt layer from 3.35 to 3.66 m. - Increased silt content, trace 2-3 mm ø silt nodules, trace oxidation below 3.35 m.			4				
226	4	15						3				
225	5	20						5				
224	6	25						6				
223	7	30			- Increased moisture content, soft, high plasticity between 7.32 to 7.62 m.			7				
222	8											
221	9			- Increased moisture content, decreased silt nodules between 8.84 to 9.14 m. - Grey, saturated at 9.14 m.								

SAMPLE TYPE Auger Grab Split Spoon Select Core Barrel

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **J. CHING / G.E. HARRISON**

APPROVED \_\_\_\_\_ DATE 19/01/04

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ELEVATION m (ft)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.30 m ▲	Cu TORVANE (kPa) ◆		
									PL	MC	LL
								20 40 60	20 40 60 80	20 40 60 80	20 40 60 80
220	35		- Firm at 10.67 m.			8					
219											
218	40					9					
217											
216	45					10					
215			- Trace 1-2 mm ø silt nodules, trace fine grained angular gravel, between 14.94 and 15.24 m.			11					
214											
213.6	55		- Soft at 16.5 m.			12					
213			<b>SILT (TILL) (ML)</b> - Brown, soft, low plasticity, with fine to coarse grained angular gravel.								
212	60		- End of solid stem auger hole at 18.35 m on Jan 6/04. - Set casing to 18.59 m. - Begin HQ Coring from 18.35 m on Jan 8/04. - Limestone cobble at 18.35 m. - Tan, damp, very dense, low plasticity, trace gravel (to 25 mm ø), trace cobbles (-) at 18.48 m. - Poor recovery, good circulation. - Limestone cobble at 19.51 m.			13					
211											
210	65		- Granitic cobble at 20.57 m. - Limestone cobble at 20.65 m.			1					
209	70		- Granitic cobble at 21.34 m. - Limestone cobble at 21.54 m.			2					

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ELEVATION m (ft)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.30 m ▲	Cu TORVANE (kPa) ◆			
									PL	MC	LL	
22					22.0							
208			- Limestone boulder at 22.40 m.			3						
23	75		- Coarse grained, numerous granitic (10%) and limestone pebbles to 0.08 mm ø, minimal recovery, fine grained sand visible in drill fluid.		23.0							
207					23.3							
24			- Loss of circulation. Advance casing to 24.8 m.									
206.1												
206	80		<b>LIMESTONE (BEDROCK)</b> - Solid buff limestone core, very strong.			4						
25						5						
205			- Distinct sedimentation planes with vug holes at 25.15 m.			6						
26	85											
204												
27			- White, massive at 27.0 m.			7						
203	90				27.6							
202.8			<b>END OF HOLE AT 27.56 m</b>									
28			Notes: 1. Installed Casagrande standpipe at 23.32 m depth. Pipe consists of 25 mm diameter PVC with response zone from 22.05 to 27.56 m depth. 2. Lockable protective steel casing installed at ground surface. 3. Groundwater depth at 7.92 m below ground surface on January 11, 2004.									
202												
29	95											
201												
30												
200	100											
31												
199												
32	105											
198												
33												
197	110											

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