

sheet size: Super A1 24" x 36" plot scale: 1:1 (metric) File name: U:\FMS\23-0109-004\Ar_Canada Park_CALL = TabC1.1 Plotted By: Aley 24/02/09 [Fri 2:59pm]

LAND DRAINAGE CALCULATIONS

CALCULATIONS WERE DONE USING RATIONAL METHOD $Q = C i A$ WHERE:

- Q = RUNOFF IN cfs (L/s, m³/s)
- C = RUNOFF COEFFICIENT
- i = RAINFALL INTENSITY IN in/hr
- A = AREA IN acres (m², ha)

PRE-DEVELOPMENT (ALLOWABLE) DISCHARGE RATE WAS CALCULATED FOR 5-YEAR STORM USING TIME OF CONCENTRATION OF 10 MIN AND ACCORDING TO THE RAINFALL INTENSITY EQUATION OUTLINED IN MACLAREN 1974 DRAINAGE CRITERIA MANUAL FOR THE CITY OF WINNIPEG.

- C = 0.4 (SUPPLIED BY CITY OF WINNIPEG)
- i = 4.311 in/hr
- A ENTIRE CATCHMENT = 0.492 acres (1,991,053 m², 0.199 ha)
- Q PRE-DEVELOPMENT (ALLOWABLE) = (0.4) * (4.311 in/hr) * (0.492 acres) = 0.848 cfs (24.013 L/s, 0.02401 m³/s)

POST-DEVELOPMENT DISCHARGE RATE WAS CALCULATED FOR 25-YEAR STORM USING TIME OF CONCENTRATION OF 10 MIN AND ACCORDING TO THE RAINFALL INTENSITY EQUATION OUTLINED IN MACLAREN 1974 DRAINAGE CRITERIA MANUAL FOR THE CITY OF WINNIPEG.

- C PERVIOUS = 0.2
- C IMPERVIOUS = 0.9
- A IMPERVIOUS = 0.133 acres (538,232 m², 0.054 ha)
- A IMPERVIOUS = 0.359 acres (1,452,822 m², 0.145 ha)
- C WEIGHTED = [(0.2 * 0.133 acres) + (0.9 * 0.359 acres)] / (0.492 acres) = 0.711
- i = 6.076 in/hr
- Q POST-DEVELOPMENT = (0.711) * (6.076 in/hr) * (0.492 acres) = 2.122 cfs (60.088 L/s, 0.06009 m³/s)

POST-DEVELOPMENT DISCHARGE RATE IS HIGHER THAN PRE-DEVELOPMENT (ALLOWABLE) DISCHARGE RATE, THEREFORE FLOW RESTRICTION AND STORAGE ARE REQUIRED.

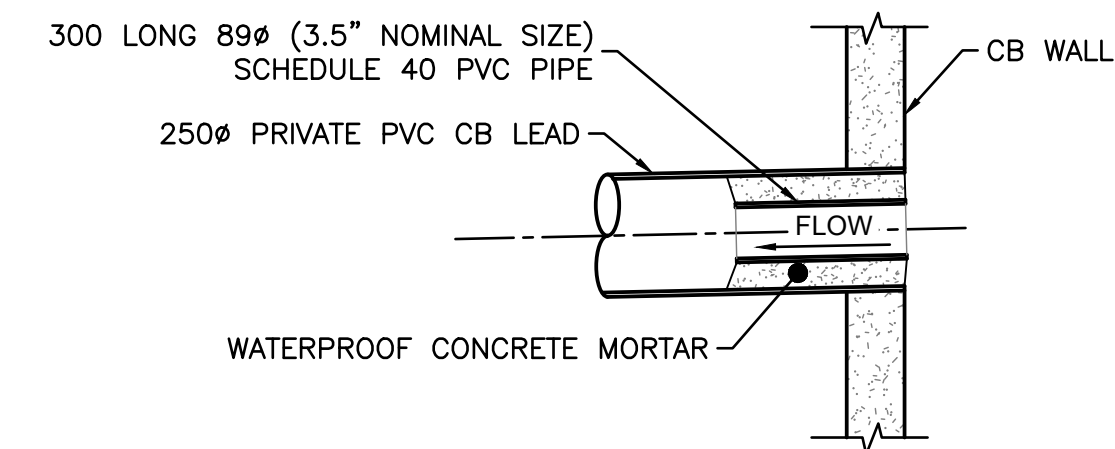
ORIFICE DISCHARGE RATE WAS CALCULATED USING BERNOULLI'S EQUATION AND THE CONTINUITY EQUATION.

- MAXIMUM WATER ELEVATION = 230.970 m (TOP OF MC-7200 CHAMBER WITHIN ADS STORAGE TANK)
- OUTLET PIPE INVERT ELEVATION = 229.093 m (EAST 250Ø PIPE OF STANDARD MH 1)
- CENTER LINE OF HEAD, H = 230.650 - (228.773 + 0.250m / 2) = 1.752 m
- DIAMETER OF ORIFICE, D = 0.0889 m (3.5")
- AREA OF ORIFICE, A_{ORIFICE} = 0.006207 m²
- COEFFICIENT OF DISCHARGE, Cd = 0.6
- Q RESTRICTED = Cd * A_{ORIFICE} * (2 * 9.81 m/s² * H)^{1/2} = 0.771 cfs (21.832 L/s, 0.02183 m³/s)

AN 89 mm (3.5") DIAMETER ORIFICE SHALL BE INSERTED INTO THE EAST 250Ø PIPE OF STANDARD MH 1 PER DETAIL ON THIS SHEET.

REQUIRED STORAGE WAS CALCULATED USING A 25 YEAR DISCRETIZED STORM OUTLINED IN MACLAREN 1974 DRAINAGE CRITERIA MANUAL FOR THE CITY OF WINNIPEG.

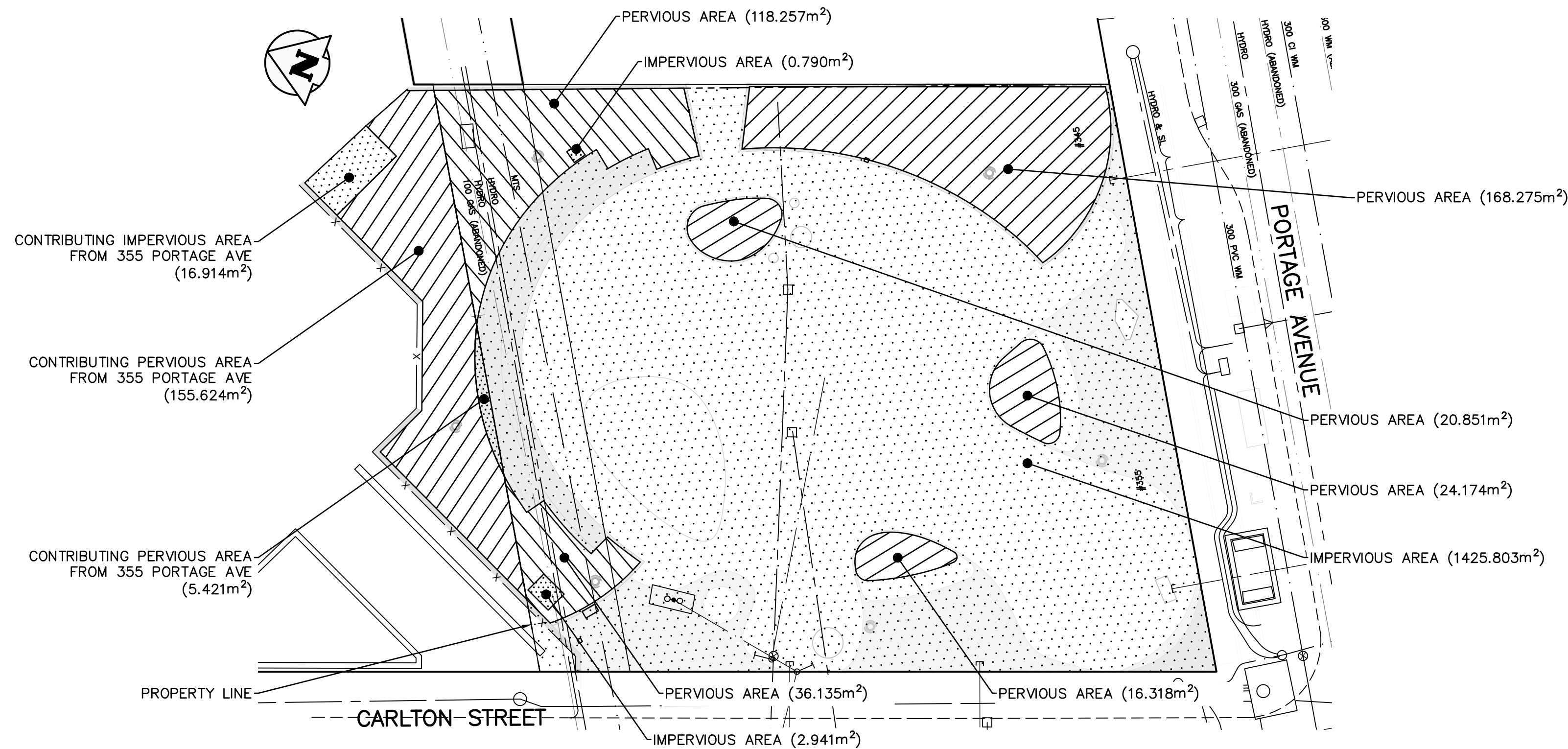
- A PERVIOUS = 0.133 acres (538,232 m², 0.054 ha)
- A IMPERVIOUS = 0.359 acres (1,452,822 m², 0.145 ha)
- Q RESTRICTED = 0.771 cfs (21.832 L/s, 0.02183 m³/s)
- REQUIRED STORAGE = 1,569.67 ft³ (44.45 m³)
- AVAILABLE STORAGE = 1,741.013 ft³ (49.3 m³) (FROM ADS STORAGE TANK)



RESTRICTION PIPE DETAIL (AS PER SD-025B)

SCALE: NTS

- NOTES:**
- GENERAL NOTES:**
1. ALL WORK & MATERIALS TO BE IN ACCORDANCE WITH THE LATEST REVISION OF THE CITY OF WINNIPEG STANDARD CONSTRUCTION SPECIFICATIONS AS OF THREE DAYS BEFORE TENDER CLOSES. SPECIFICATIONS AS OF THREE DAYS BEFORE TENDER CLOSES.
 2. CONTRACTOR TO CONFIRM THE LOCATION OF ALL UTILITIES & SERVICES IN THE FIELD PRIOR TO CONSTRUCTION.
 3. ALL UTILITY DIMENSIONS ARE SHOWN TO PROPERTY LINE.
 4. CONTRACTOR TO PROTECT EXISTING TREES REMAINING ON SITE WITHIN LIMITS OF CONSTRUCTION.
 5. LAMP STANDARDS, HYDRO POLES, AND ANCHORS THAT REQUIRE TEMPORARY SUPPORT, REMOVAL OR REPLACEMENT, TO BE DONE AT CONTRACTORS EXPENSE.
 6. INSTALL CONCRETE ISOLATIONS IN ACCORDANCE WITH CITY OF WINNIPEG STANDARDS.
 7. REPLACE FRAMES & COVERS WHERE DIRECTED.
 8. ADJUST ALL WATER VALVES, HYDRANTS, MANHOLES, WATER SERVICE SHUT-OFF VALVES (CURB STOPS), & CATCH BASINS IN AREA OF WORK TO MATCH NEW GRADES.
 9. CONTRACTOR TO RESTORE EXISTING SIDEWALK, CURB, AND ROAD PAVEMENT TO MATCH EXISTING CONDITION UNLESS OTHERWISE NOTED IN DRAWINGS.



POST-DEVELOPMENT STORMWATER MANAGEMENT AREAS

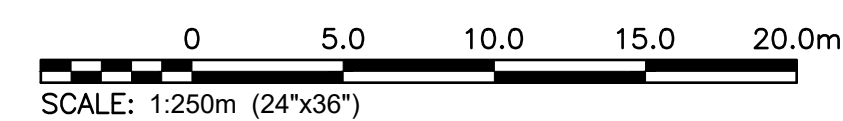
SCALE: 1:250

300 LBS	LAND DRAINAGE SEWER	300 LBS	x	FENCE	o-o	LIGHT STANDARD	o-o
250 WWS	WASTE WATER SEWER	250 WWS	>	DITCH	o-o	TRAFFIC SIGNAL	o-o
---	GAS	---	---	BACK OF CURB	---	LEGEND-PLAN	---
---	HYDRO	---	---	ASPHALT MILL & FILL	---	PROPOSED	---
---	M.T.S.	---	---	ASPHALT	---	PROPOSED SLOPE	---
150 WM	WATER MAIN	150 WM	---	CONCRETE	---	LHS SIDEWALK	---
+	HYDRANT	+	+	LANDSCAPING	---	RHS SIDEWALK	---
o	VALVE	o	o	PROPERTY LINE	---	LHS GUTTER	---
o	MANHOLE	o	o	TEST HOLE	---	RHS GUTTER	---
o	CATCH BASIN	o	o	GEODETIC BENCHMARK	---	Q PROFILE	---
o	CURB INLET	o	o	ELEVATION	---	LHS PROPERTY LINE (P)	---
o	POLES T-W/S	o	o	LEGEND-PLAN	---	RHS PROPERTY LINE (P)	---
o	POLES H-HYDRO	o	o	PROPOSED	---	PROPOSED	---
o	GUY WIRE	o	o	EXISTING	---	EXISTING	---
o	LEGEND-PLAN	o	o	PROPOSED	---	PROPOSED	---

LOCATION APPROVED UNDERGROUND STRUCTURES

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

FOR TENDER ONLY
NOT TO BE USED FOR CONSTRUCTION



ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
KGS Group
No. 245

PROPERTY LIMITS DELINEATION

DELINEATION OF PROPERTY LIMITS AS SHOWN ON THIS DWG DOES NOT REPRESENT A "LEGAL SURVEY". KGS GROUP MAKES NO REPRESENTATION OR WARRANTY AS TO THE ACCURACY OF PROPERTY LIMITS DELINEATED ON THIS DWG, NOR ON THE DIMENSIONAL ACCURACY OF DWG FEATURES RELATIVE TO THOSE PROPERTY LIMITS.

WARNING

NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION. TAKE PRECAUTION TO AVOID DAMAGE TO GAS COMPANY INSTALLATIONS.

SEE PROVINCIAL REGULATION 210/72 FOR DETAILS.

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

BID OPPORTUNITY No. 78-2024

0	24 / 02 / 09	ISSUED FOR TENDER	ALH
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REV	YY / MM / DD	DESCRIPTION	BY
A		SECTION LETTER OR DETAIL NUMBER.	
B		DRAWING WHERE SECTION OR DETAIL IS DRAWN.	
		OR	
		DRAWING WHERE SECTION OR DETAIL IS INDICATED	
		--- SECTION OR DETAIL SHOWN ON SAME DRAWING.	

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CONSULTANT FILE NAME AIR CANADA PARK REDEVELOPMENT

CLIENT **CITY OF WINNIPEG**
PLANNING, PROPERTY & DEVELOPMENT

Winnipeg
AIR CANADA WINDOW PARK REDEVELOPMENT

CITY DRAWING NUMBER SHEET OF
2 2

MUNICIPAL STORMWATER CALCULATIONS

DESIGN	DRAWN	DATE - Y / M / D	SCALE
ALH	ALH	23/07/25	AS NOTED
CHECKED	APPROVED	PROJECT No.	DRAWING No.
MAT	MAT	23-0109-004	C1.1