

**STORMWATER MANAGEMENT**

T<sub>c</sub> = 10 min.  
 C<sub>allowable</sub> = 0.30 (ASSIGNED BY CITY OF WINNIPEG)  
 TOTAL SITE AREA = 2.47 acres  
 TOTAL IMPERVIOUS AREA = 1.27 acres  
 TOTAL PERVIOUS AREA = 1.2 acres

**PRE-DEVELOPMENT:**

ALLOWABLE STORM DISCHARGE (RATIONAL METHOD)  
 C = 0.35  
 i = 4.3 in/hr (109.22 mm/hr), 5yr storm event  
 A = 2.47 acres  
 Q = 0.0913 m<sup>3</sup>/s (91.3 L/s)

**POST-DEVELOPMENT:**

	TOTAL
TOTAL SITE AREA, (m <sup>2</sup> )	1583
ALLOWABLE RUNOFF COEFFICIENT (C)	0.30
Q - ALLOWABLE RUNOFF (m <sup>3</sup> /s)	0.0913
Q <sub>restricted</sub> - TOTAL RESTRICTED RUNOFF (m <sup>3</sup> /s)	0.057*
Q <sub>unrestricted</sub> - (C = 0.90, i = 154.3 mm/hr)	
Q <sub>unrestricted</sub> - TOTAL UNRESTRICTED RUNOFF (m <sup>3</sup> /s)	0.2043
Q - WWS FLOWS (m <sup>3</sup> /s)	0.00146
Q <sub>unrestricted</sub> - TOTAL RUNOFF (m <sup>3</sup> /s)	0.0813
ON-SITE STORAGE REQUIRED (m <sup>3</sup> )	248.0
ON-SITE STORAGE AVAILABLE (m <sup>3</sup> )	285.3

\*BASED ON RESTRICTOR SIZE OF: 110mm (CB01) & 100mm (CB02)

**COMBINED SEWER FLOW SUMMARY:**

**PRE-DEVELOPMENT FLOW SUMMARY (A+B)**

A. - EX. WASTEWATER FLOWS (BASED ON C.O.W. FLOW EST. GUIDELINES):  
 PDWF (28,000 L/ha/day) = 0.33 L/s  
 PWWF = 0.56 L/s

B. - EX. STORM RUNOFF FLOWS (BASED ON RATIONAL METHOD):  
 AREA = 2.47 acres  
 C<sub>existing</sub> = 0.30  
 i<sub>5yr</sub> = 109.5 mm/hr, T<sub>c</sub> = 10 min.  
 Q<sub>5yr</sub> = 0.0913 m<sup>3</sup>/s = 91.3 L/s

TOTAL PRE-DEVELOPMENT FLOWS (COMBINED SEWER):  
 Q = 0.56 L/s + 91.3 L/s = 91.86 L/s (A+B)

**POST-DEVELOPMENT FLOW SUMMARY**

D. - WASTEWATER FLOWS (BASED ON C.O.W. FLOW EST. GUIDELINES):  
 PWWF = 0.56 L/s (REFER TO WWS FLOW ESTIMATION LETTER, DATED JUNE 17, 2019)

STORM RUNOFF FLOWS (BASED ON RATIONAL METHOD):  
 AREA = 2.47 acres  
 C<sub>allowable</sub> = 0.30  
 i<sub>5yr</sub> = 109.5 mm/hr, T<sub>c</sub> = 10 min.  
 Q<sub>5yr</sub> = 0.0913 m<sup>3</sup>/s = 91.3 L/s

E. - STORM DISCHARGE (25-YR STORM EVENT):  
 RESTRICTED = 37.5 L/s (Using ICD = 110mm DIA. CB01)  
 UNRESTRICTED = 19.5 L/s (Using ICD = 100mm DIA. CB02)  
 UNRESTRICTED Q<sub>25yr</sub> = 24.3 L/s

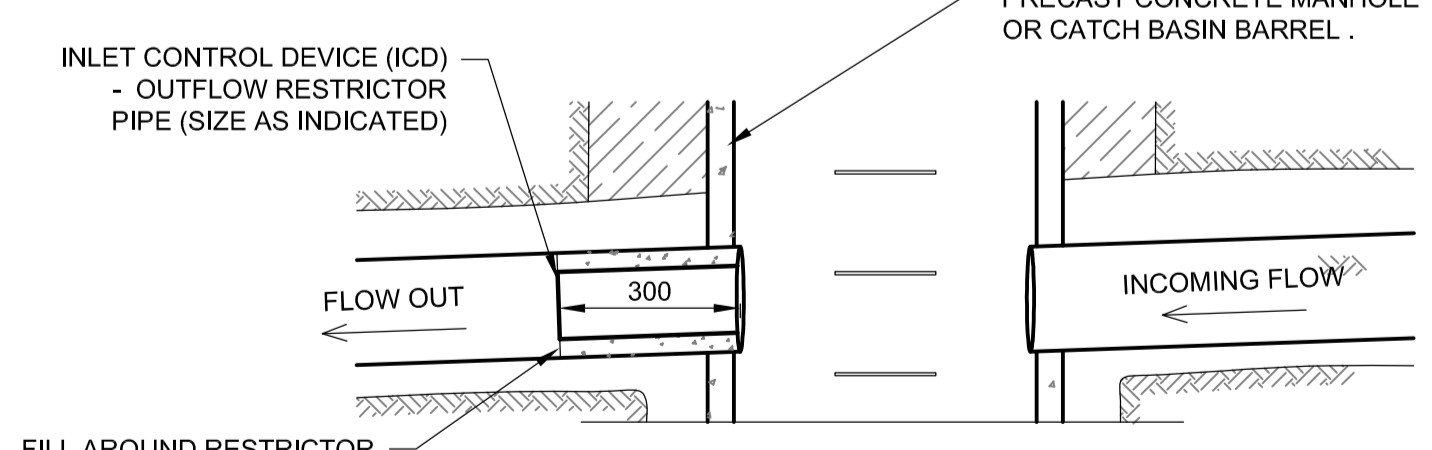
TOTAL STORMWATER DISCHARGE = 81.3 L/s  
 TOTAL POST-DEVELOPMENT FLOWS 174 PROVENCHER (COMBINED SEWER):  
 Q<sub>POST</sub> = 0.56 L/s + 81.3 L/s = 81.86 L/s (D+E) < Q<sub>ALLOWABLE</sub> = 91.9 L/s  
 (D+E) = 81.86 L/s < (A+B) = 91.86 L/s

REQUIRED ON-SITE STORAGE = 248.0 m<sup>3</sup> (USING ISOCHRONE METHOD)  
 AVAILABLE ON-SITE STORAGE = 285.3 m<sup>3</sup>

(MAXIMUM DEPTH OF PONDING SHALL NOT EXCEED 0.3m OF DEPTH ON PAVED SURFACES FOR A 1 IN 25-YR CITY OF WINNIPEG DESIGN STORM)

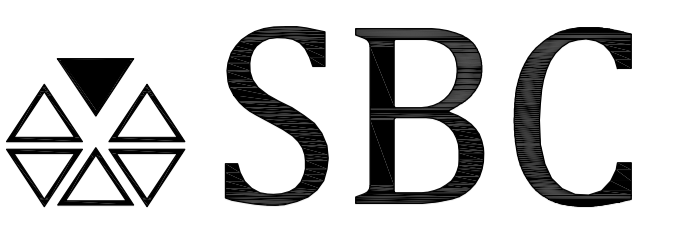
**GENERAL CONSTRUCTION NOTES:**

- ALL CONSTRUCTION AND MATERIALS INCORPORATED IN THE WORK SHALL CONFORM TO THE LATEST EDITION OF THE CITY OF WINNIPEG "STANDARD CONSTRUCTION SPECIFICATIONS", UNLESS NOTED OTHERWISE.
- LOCATIONS 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, EXACT LOCATION AND DEPTH OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.
- LOCATIONS OF PROPERTY LIMITS AND EXISTING AND/OR PROPOSED FEATURES RELATIVE TO THESE LIMITS AS SHOWN DO NOT REPRESENT A LEGAL SURVEY. SBC INC. MAKES NO REPRESENTATION OR GUARANTEE THAT THE PROPERTY LIMIT INFORMATION SHOWN IS ACCURATE, AND ACCEPTS NO RESPONSIBILITY FOR ANY DAMAGES SUFFERED BY ANY THIRD PARTY AS A RESULT OF DECISIONS OR ACTIONS BASED ON THIS DRAWING.
- ALL SURFACES AND ANY EXISTING UTILITIES DAMAGED OR DISTURBED BY CONSTRUCTION SHALL BE RESTORED TO ITS ORIGINAL CONDITION OR BETTER, OR REPLACED, AT THE CONTRACTOR'S EXPENSE.



FILL AROUND RESTRICTOR W/ NON-SHRINKABLE GROUT AS PER COW SD-025B

ICD FLOW RESTRICTOR DETAIL (MHL01)  
 N.T.S.



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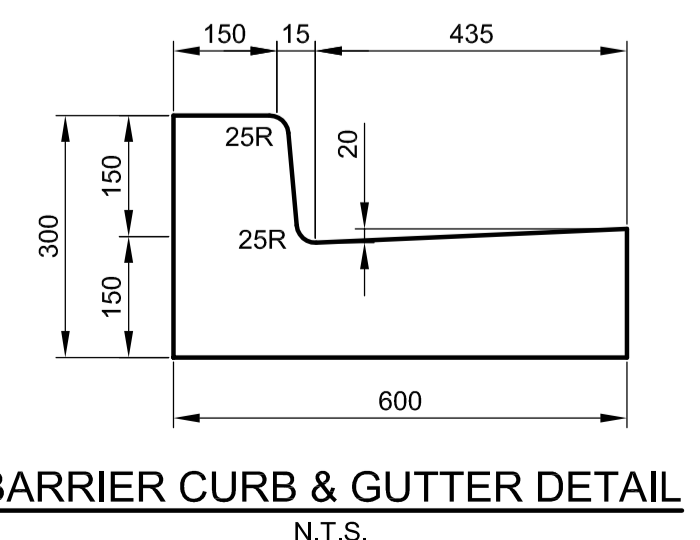
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150 WM	WATERMAIN	150 WM
250 WWS	WASTEWATER	150 WWS
300 LDS	LAND DRAINAGE SEWER	300 LDS
⊗	HYDRANT ASSEMBLY	⊗
⊕	GATE VALVE	⊕
⊖	CURB STOP	⊖
⊗	REDUCER	⊗
⊕	MANHOLE	⊕
⊖	CATCH BASIN	⊖
⊗	CATCH PIT	⊗
⊕	CLEAN OUT	⊕
⊖	TESTHOLE	⊖
⊗	SURVEY BAR	⊗
⊕	SIGN	⊕
⊖	UTILITY POLE	⊖
⊗	UTILITY PEDESTAL	⊗
⊕	HYDRO	⊕
⊖	GAS	⊖
⊗	MTS	⊗
⊕	TREE LINE	⊕
⊖	CULVERT	⊖
⊗	SWALE	⊗
>>>>	DIRECTION OF FLOW	>>>>
⊗ 235.00	BUILDING LOT GRADE	⊗ 235.00
235.38	GROUND ELEVATION	235.38
235.38	DITCH ELEVATION	235.38
235.400	ROAD ELEVATION	235.400
⊕	BARRIER CURB	⊕
⊖	MOUNTABLE CURB	⊖
EXISTING	LEGEND	PROPOSED

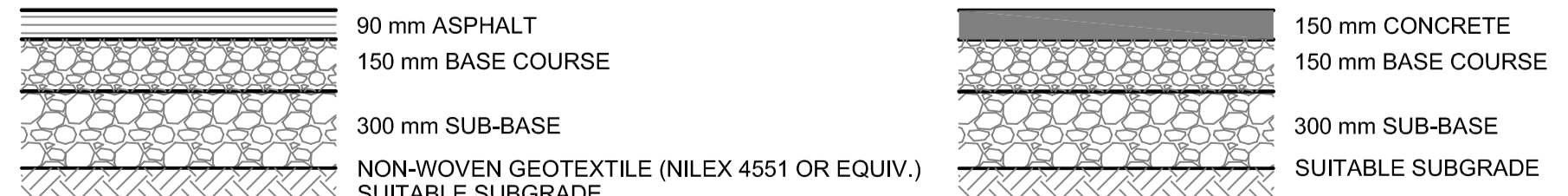
**POST-DEVELOPMENT CATCHMENT AREAS**



**SITE SERVICING PLAN**  
 1:300 (A1)

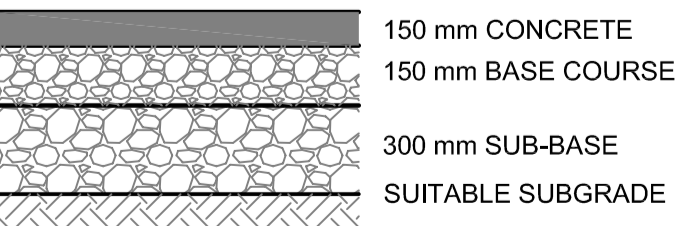


**BARRIER CURB & GUTTER DETAIL**  
 N.T.S.



NOTE: BASE COURSE AND SUB-BASE TO EXTEND MIN. 300 mm FROM EDGE OF ASPHALT OR BACK OF CONCRETE CURB

**ASPHALT PAVEMENT STRUCTURE**  
 N.T.S.



NOTE: BASE COURSE AND SUB-BASE TO EXTEND MIN. 300 mm FROM EDGE OF ASPHALT OR BACK OF CONCRETE CURB

**CONCRETE SIDEWALK PAVEMENT STRUCTURE**  
 N.T.S.

NOTE: REFER TO LANDSCAPE PLANS FOR LOCATION OF PAVEMENT TYPES

No.	Date	Issue / Revision	By
5	July 8, 2019	Issued for Construction	DB
4	June 26, 2019	Issued for 100% Pre-Tender Review	DB
3	Apr. 26, 2019	Issued for Pre-Tender Review	DB
2	Feb. 22, 2019	Design Development Submission	DB
1	Dec. 17, 2018	Schematic Design Review	DB

Drawn By: J.E.  
 Printing Date: July 8, 2019



Sison Blackburn Consulting Inc.  
 No. 5581 Date: July 8, 2019



**Bill and Helen Norrie Library**  
 Project No.: 2017-062  
 Tender No.: 542-2019  
 Address: 15 Poseidon Bay, Winnipeg, MB.

**SITE SERVICING PLAN**

Comm. No.: 1847  
 Sheet: **C1.1**