

STORMWATER NOTES:

PEAK PIPE FLOW ESTIMATES WHEN MAJORITY OF FLOW IS TOWARD POND

CB	RATIONAL COEFFICIENT 'C'	AREA (AC)	INTENSITY (5 YR) IN/HR	INTENSITY (25 YR) IN/HR	Q (5 YR) CFS	Q (25 YR) CFS	PIPE CO-	Q (5 YR) CFS	Q (25 YR) CFS
1	0.43	0.686	4.2	6.1	1.24	1.80	1	-2.12	-1.02
2	0.95	0.331	4.2	6.1	1.32	1.92	2	-0.80	0.90
3	0.95	0.342	4.2	6.1	1.36	1.98	3	6.79	11.93
4	0.89	0.487	4.2	6.1	1.82	2.64	4	3.96	5.76
5	0.95	0.277	4.2	6.1	1.11	1.61	5	2.14	3.11
6	0.95	0.260	4.2	6.1	1.04	1.51	6	1.03	1.50
7	0.95	0.308	4.2	6.1	1.23	1.78	7	8.02	13.72
8	0.2	0.988	4.2	6.1	0.83	1.21	8	8.85	14.92
9	0.95	0.203	4.2	6.1	0.81	1.18	9	1.80	2.61
10	0.95	0.158	4.2	6.1	0.63	0.92	10	0.99	1.44
11	0.2	0.428	4.2	6.1	0.36	0.52	11	0.36	0.52
12	N/A	0	4.2	6.1	N/A	N/A	12	0.00	0.00
13	0.2	0.74	4.2	6.1	N/A	N/A	13	0.00	0.00
14	0.95	0.30	4.2	6.1	1.20	1.74	14	1.20	1.74
TOTAL AREA		5.512							

200MM COMBINED SEWER CONNECTION		250MM COMBINED SEWER CONNECTION	
44.5M	GRAVITY FLOW @ 2.2%	44.5M	GRAVITY FLOW @ 2.2%
	2.15 CFS		3.11 CFS
	SURCHARGE WITH 1 M OF HEAD		SURCHARGE WITH 1 M OF HEAD
	2.05 CFS		3.72 CFS
	SURCHARGE WITH 1.5 M OF HEAD		SURCHARGE WITH 1.5 M OF HEAD
	2.51 CFS		4.56 CFS
	SURCHARGE WITH 1.8 M OF HEAD		SURCHARGE WITH 1.8 M OF HEAD
	2.75 CFS		4.99 CFS

SINCE THE ROADWAY DRAINAGE IS TYPICALLY DESIGNED FOR 0.3 BELOW GRADE DURING THE 5 YEAR STORM. CB'S IN THIS AREA AROUND 232.2, EVEN ASSUMING A HYDRAULIC GRADIENT 1.5 M BELOW GRADE (5 TIMES THE ALLOWABLE DESIGN CRITERIA), THAT WOULD PUT THE GRADIENT AT 230.7. AT DESIGN POND VOLUME (ELEV. 232.15) HEAD ON PIPE WILL BE APPROXIMATELY 232.15-230.7 = 1.45M OF HEAD. USE 250MM PIPE.

POND VOLUME CALCULATION

ELEVATION (M)	AREA (M ²)	INCREMENTAL VOL. (M ³)	TOTAL VOLUME (M ³)
232.15	1391		735
232.0	1095	186	549
231.5	432	369	180
231.0	175	147	33
230.7	55	33	0

25 YEAR PONDING LEVEL (689M³) IS JUST BELOW ELEVATION 232.15.

EXISTING C&S MANHOLE
RIM = 232.40±
INV = 228.95±
S INV = 227.000

CONSTRUCTION NOTES:

- EXPOSE EXISTING WATERMAIN & CONFIRM INVERTS PRIOR TO CONSTRUCTION.
- CONFIRM LOCATION OF ALL EXISTING UTILITIES. LOCATIONS OF EXISTING UTILITIES AT CROSSINGS ARE TO BE VERIFIED VERTICALLY AND HORIZONTALLY (VH) USING SOFT-DIG METHODS PRIOR TO CONSTRUCTION.
- CARE SHOULD BE TAKEN AS THERE MAY BE CATHODIC PROTECTION ON WATERMANS ON PACIFIC AVE.
- WATERMAIN INSTALLED IN CITY RIGHT-OF-WAYS TO BE INSTALLED BY TRENCHLESS METHODS.
- TRENCHES AND EXCAVATIONS WITHIN 1 METRE OF A PAVED AREA INCLUDING SIDEWALKS SHALL BE CLASS 3 BACKFILL. ALL MATERIALS SHALL CONFORM TO THE CITY OF WINNIPEG STANDARD CONSTRUCTION SPECIFICATIONS.
- NOTIFY ALL RESIDENTS AND BUSINESSES 24 HOURS IN ADVANCE OF ANY WATER SHUTDOWNS OR DISRUPTION OF SERVICE.
- CONTACT CUSTOMER TECHNICAL SERVICES BRANCH AT (204)986-3322 48 HOURS PRIOR TO CONSTRUCTION FOR CLEARANCE OF EXISTING WATER AND WASTEWATER UTILITIES.
- MANHOLES ARE 1200 DIAMETER UNLESS OTHERWISE NOTED.

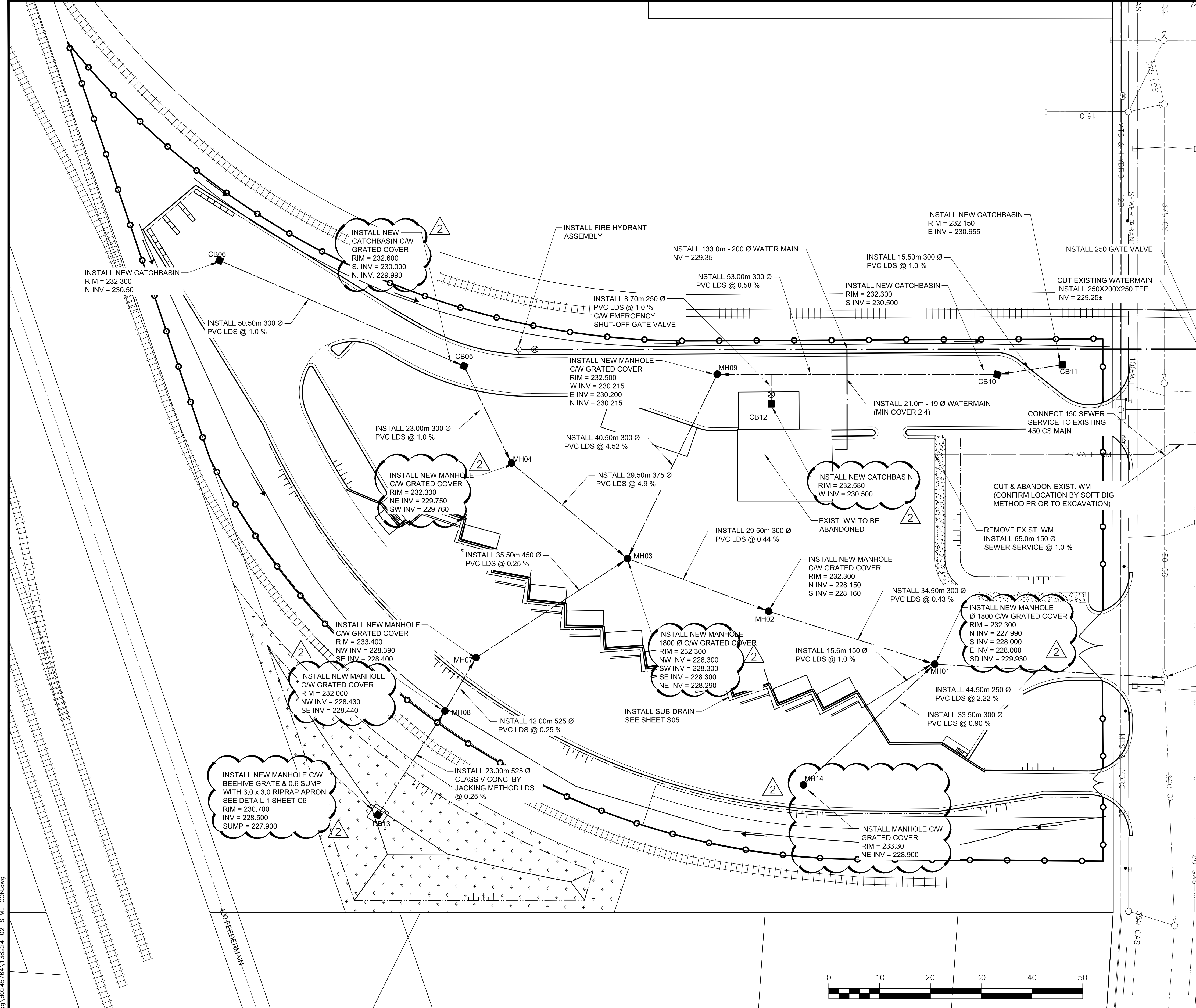
WARNING

- IF POWER EQUIPMENT OR EXPLOSIVES ARE TO BE USED FOR EXCAVATION ON THIS PROJECT THE CONTRACTOR MUST:
- NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION.
 - TAKE PRECAUTION TO AVOID DAMAGE TO GAS COMPANY INSTALLATIONS SEE PROVINCIAL REGULATIONS 210/72 FOR DETAILS.
 - OBTAIN EXCAVATION PERMITS PRIOR TO CONSTRUCTION.

APEGM
Certificate of Authorization
Dillon Consulting Limited (MB)
No. 1789 Date: MAR. 4, 2016

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES



150 WM	150 WM	M.T.S.	M.T.S.	150 mm W.M.	150 mm W.M.
WATERMAIN	HYDRANT VALVE	CONCRETE ASPHALT PLANING	CONCRETE ASPHALT PLANING	WATERMAIN	HYDRANT VALVE
300 LDS	LAND DRAINAGE SEWER	PAVING STONES	PAVING STONES	300 mm L.D.S.	LAND DRAINAGE SEWER
250 WWS	WASTE WATER SEWER	PROPERTY LINE	PROPERTY LINE	250 mm W.W.S.	WASTE WATER SEWER
MANHOLE	MANHOLE	SURVEY BAR	SURVEY BAR	Q PROFILE	PVMT FLOW DIRECTION
CATCH BASIN	CATCH BASIN	CURB RAMP	CURB RAMP		
TEST HOLES	TEST HOLES	DITCH	DITCH		
JUNCTIONS	JUNCTIONS	SWALE	SWALE		
CULVERT	CULVERT				
100 GAS	GAS				
EXISTING	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PROFILE	PROPOSED

UNDERGROUND STRUCTURES

SUPPLY, 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.

NO.	REVISIONS	DATE	BY
2	ISSUED FOR ADDENDUM #1	16/03/14	ARR
1	ISSUED FOR TENDER	16/03/04	ARR

DESIGNED BY	WPN
DRAWN BY	GLG
CHECKED BY	WPN
APPROVED BY	ARR
HOR. SCALE	1:400
VERTICAL	
RELEASED FOR CONSTRUCTION	
DATE	

ENGINEER'S SEAL
PROVINCE OF MANITOBA
W.P. NAIRN
MAR 2, 2016
Member 34277
REGISTERED PROFESSIONAL ENGINEER

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

4R WINNIPEG DEPOT
PACIFIC AVENUE

UNDERGROUND UTILITIES AND STORM SEWER

CITY DRAWING NUMBER: 1-0851A-C004-001
SHEET 5 OF 43
CONSULTANT DRAWING NUMBER: C-4

CONSULTANT PROJECT NUMBER: 13-8224

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