

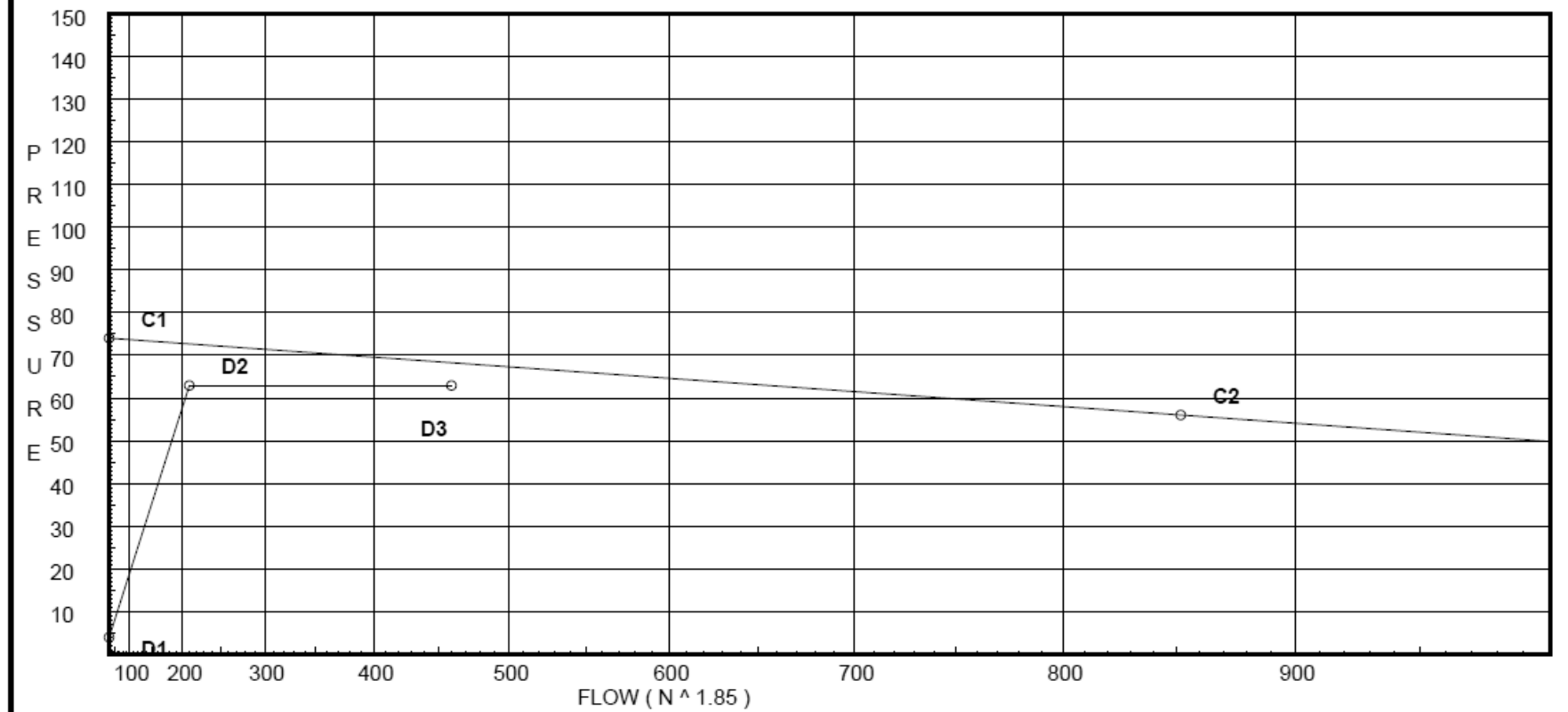
AutoCAD 2015/01/28 Q:\IVERS\140216-1 SCC, CONFORMITE SYSTEMES GICLEURS AUTOM, SAPLAINES\15-01-23 ÉMIS POUR APPEL D'OFFRES\140216-1-M7-R1-CALCULS.DWG

Water Supply Curve (C)

Kelvin EMtech

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City Water Supply:	Demand:
C1 - Static Pressure : 74	D1 - Elevation : 3.898
C2 - Residual Pressure: 56	D2 - System Flow : 209.817
C2 - Residual Flow : 852	D2 - System Pressure : 62.880
	Hose (Demand) : 250
	D3 - System Demand : 459.817
	Safety Margin : 5.369



Fittings Used Summary

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Fitting Legend	Abbrev.	Name	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
Avk	Alarm Viking J1																					
E	NFPA 13 90° Standard Elbow		1	2	2	3	4	5	6	7	8	10	12	14	16	18	20	22	27	35	40	45
S	NFPA 13 Swing Check		0	0	5	7	9	11	14	16	19	22	27	32	45	55	65	71	81	91	101	121
T	NFPA 13 90° Flow thru Tee		3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	9.0	5.6	17.57	na	23.47	0.15	130	7.0
5	9.0	5.6	19.14	na	24.5	0.15	130	7.0
4	9.0	5.6	18.38	na	24.01	0.15	130	7.0
9	9.0	5.6	12.13	na	19.5	0.15	130	7.0
8	9.0	5.6	13.19	na	20.34	0.15	130	7.0
2	9.0	5.6	19.35	na	24.63	0.15	130	7.0
3	9.0	5.6	19.86	na	24.95	0.15	130	7.0
7	9.0	5.6	16.87	na	23.0	0.15	130	7.0
6	9.0	5.6	20.58	na	25.41	0.15	130	7.0
10	9.0		24.63	na				
11	9.0		25.53	na				
12	9.0		34.3	na				
13	9.0		40.96	na				
14	9.0		52.43	na				
15	9.0		55.77	na				
16	9.0		57.04	na				
17	9.0		57.73	na				
18	9.0		58.01	na				
19	9.0		58.32	na				
20	1.0		62.0	na				
21	1.0		62.18	na				
22	1.0		62.22	na	250.0			
CITY	0.0		62.88	na				

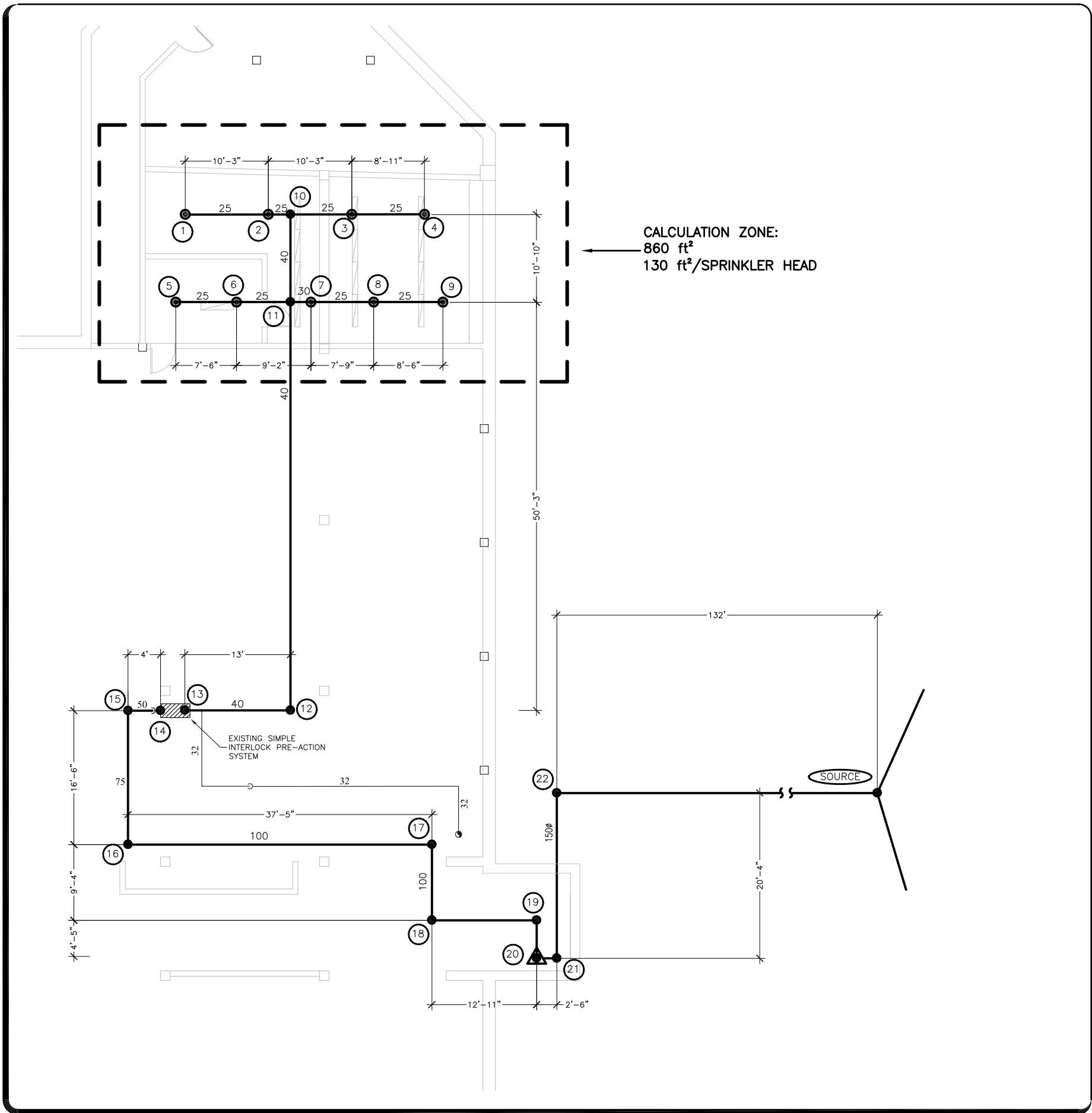
The maximum velocity is 23.33 and it occurs in the pipe between nodes 7 and 11

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Fing's Total	Pt Pf	Pt Pv Pn	*****	Notes	*****
1	23.47	1.049	0.0	10.200	17.566			K Factor = 5.60	
to		120.0	0.0	0.0	0.0				
2	23.47	0.1750	0.0	10.200	1.785			Vel = 8.71	
0.0									
23.47					19.351			K Factor = 5.34	
5	24.50	1.049	0.0	7.600	19.143			K Factor = 5.60	
to		120.0	0.0	0.0	0.0				
6	24.5	0.1895	0.0	7.600	1.440			Vel = 9.10	
0.0									
24.50					20.583			K Factor = 5.40	
4	24.01	1.049	0.0	8.110	18.378			K Factor = 5.60	
to		120.0	0.0	0.0	0.0				
3	24.01	0.1824	0.0	8.110	1.479			Vel = 8.91	
0.0									
24.01					19.857			K Factor = 5.39	
9	19.50	1.049	0.0	8.600	12.125			K Factor = 5.60	
to		120.0	0.0	0.0	0.0				
8	19.5	0.1242	0.0	8.600	1.068			Vel = 7.24	
8	20.34	1.049	0.0	7.900	13.193			K Factor = 5.60	
to		120.0	0.0	0.0	0.0				
7	39.84	0.4657	0.0	7.900	3.679			Vel = 14.79	
0.0									
39.84					16.872			K Factor = 9.70	
2	48.10	1.049	1T	5.0	19.351			K Factor = 5.60	
to		120.0	0.0	5.000	0.0				
10	48.1	0.6599	0.0	8.000	5.279			Vel = 17.86	
0.0									
48.10					24.630			K Factor = 9.69	
3	48.96	1.049	0.0	7.000	19.857			K Factor = 5.60	
to		120.0	0.0	0.0	0.0				
10	48.96	0.6819	0.0	7.000	4.773			Vel = 18.18	
0.0									
48.96					24.630			K Factor = 9.87	
7	62.84	1.049	1T	5.0	3.000			K Factor = 5.60	
to		120.0	0.0	5.000	0.0				
11	62.84	1.0820	0.0	8.000	8.656			Vel = 23.33	
0.0									
62.84					25.528			K Factor = 12.44	
6	49.91	1.049	0.0	7.000	20.583			K Factor = 5.60	
to		120.0	0.0	0.0	0.0				
11	49.91	0.7064	0.0	7.000	4.945			Vel = 18.53	
0.0									
49.91					25.528			K Factor = 9.88	
10	97.07	2.067	0.0	10.100	24.630				
to		120.0	0.0	0.0	0.0				
11	97.07	0.0889	0.0	10.100	0.898			Vel = 9.28	
11	112.75	2.469	1E	6.0	50.300			25.528	
to		120.0	0.0	6.000	0.0				
12	209.82	0.1558	0.0	56.300	8.770			Vel = 14.06	



HYDRAULIC CALCULATIONS RESULTS

12	0.0	2.067	1E	5.0	13.000	34.298		
to		120.0	0.0	5.000	0.0			
13	209.82	0.3702	0.0	18.000	6.663			Vel = 20.06
13	0.0	2.067	1Eq	28.0	3.000	40.961		
to		120.0	0.0	28.000	0.0			
14	209.82	0.3701	0.0	31.000	11.473			Vel = 20.06
14	0.0	2.067	1E	5.0	4.000	52.434		
to		120.0	0.0	5.000	0.0			
15	209.82	0.3702	0.0	9.000	3.332			Vel = 20.06
15	0.0	3.068	1E	7.0	16.600	55.766		
to		120.0	0.0	7.000	0.0			
16	209.82	0.0541	0.0	23.600	1.276			Vel = 9.11
16	0.0	4.026	1E	10.0	37.500	57.042		
to		120.0	0.0	10.000	0.0			
17	209.82	0.0144	0.0	47.500	0.684			Vel = 5.29
17	0.0	4.026	1E	10.0	9.400	57.726		
to		120.0	0.0	10.000	0.0			
18	209.82	0.0144	0.0	19.400	0.279			Vel = 5.29
18	0.0	4.026	1E	10.0	12.110	58.005		
to		120.0	0.0	10.000	0.0			
19	209.82	0.0144	0.0	22.110	0.319			Vel = 5.29
19	0.0	4.026	1E	10.0	4.500	58.324		
to		120.0	0.0	10.000	3.465			
20	209.82	0.0143	0.0	14.500	0.208			Vel = 5.29
20	0.0	4.026	1E	10.0	2.600	61.997		
to		120.0	0.0	10.000	0.0			
21	209.82	0.0144	0.0	12.600	0.182			Vel = 5.29
21	0.0	7.981	1Avk	23.0	20.400	62.179		
to		120.0	1S	45.0	68.000	0.0		
22	209.82	0.0005	0.0	88.400	0.045			Vel = 1.35
22	250.00	8.27	1E	28.468	132.000	62.224		
to		140.0	0.0	28.468	0.433			
CITY	459.82	0.0014	0.0	160.468	0.223			Vel = 2.75
0.0								
459.82					62.880			K Factor = 57.99

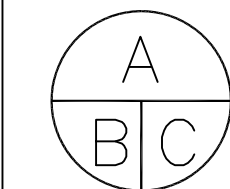


Service Correctionnel
Canada
Administration régionale du
Québec

Correctional Service
Canada
Quebec Regional
Headquarters

Canada

DO NOT USE FOR CONSTRUCTION



A no. du détail
detail no.
B no. de la feuille—où détail
exigé
sheet no. — where detail
required
C no. de la feuille—où détaillé
sheet no. — where detailed

Projet
SERVICE CORRECTIONNEL CANADA
CORRECTIONAL SERVICE CANADA

246 Montée Gagnon, SADP

CONFORMITÉ DES SYSTÈMES
GICLEURS AUTOMATIQUES
AUTOMATIC SPRINKLERS
SYSTEMS UPGRADE

Dessin
MÉCANIQUE
MECHANICAL

CALCULS
HYDRAULIQUES

HYDRAULIC
CALCULATION

Conçu par
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Designed by
28 janvier 2014

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Drawn by
28 janvier 2014

Approuvé par
Marc Bachkongi, Ing.

Approved by
28 janvier 2014

Soumission
Émis pour appel d'offres
Tender
PWGSC Project Manager

No de projet
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TPSC
Nom du fichier
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No de plan ou dessin
M7

File no
M7/7