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## Control Survey Report

Submission of Horizontal and Vertical Control Surveys -  
 Contract 5013-E-0018 – Rehabilitation/Replacement of 12 Structures on Highway 11,  
 101, 577, 579, 634 & 668 in New Liskeard Area

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## GWP 5159-12-00

### Site 47-273C – Highway 11 Calamity Creek Culvert, replacement

HCPs 100-105 were established by RTK measurements from HCM 00819740140 with check measurements to HCMs 00819740138, 00819740139, 01019801501 and 01019801502. HCPs 100-105 were leveled and balanced from VCM 0011993U755 to BM 501 from MTO H&V WP147-98-00 July 2003.

SITE 47-273C NAD83 MTM 12 CGVD 1928:1978				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	5268953.702	404559.400	217.337	HCP
101	5269139.977	404537.228	216.993	HCP
102	5269310.887	404532.667	213.982	HCP
103	5269452.007	404541.603	214.165	HCP
104	5269662.444	404520.879	220.333	HCP
105	5269800.432	404535.251	221.966	HCP
00819740138	5267402.244	404355.062		HCM_00819740138_SIB & BRONZE CAP
00819740139	5268615.437	404543.168		HCM_00819740139_SIB & BRONZE CAP
00819740140	5269728.319	404544.715	220.921	HCM_00819740140_SIB & BRONZE CAP
01019801501	5268921.964	404542.470		HCM_01019801501_SIB & BRASS CAP
01019801502	5268905.258	403610.050		HCM_01019801502_SIB & BRASS CAP
134	5268938.680	404535.934		CM_MTO H&V WP147-98-00 July 2003
135	5268919.063	404537.068		CM_MTO H&V WP147-98-00 July 2003
501	5269480.874	404555.470	215.391	BM_RIB_MTO H&V WP147-98-00 July 2003
0011993U755	5268911.114	404529.514	216.487	VCM 0011993U755 HELIX PIPE WITH BRASS CAP

## GWP 5368-11-00

### Site 39E-006 – Highway 579 Gilles Creek Bridge, replacement

Local horizontal coordinates were established at this site. There were no existing Horizontal Control Monuments in the vicinity of this site. HCPs 100-103 were leveled and balanced from VCMs 00819798160 and 00819798161.

SITE 39E-006 LOCAL HORIZONTAL CGVD1928:1978				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	59283.131	9412.746	241.022	HCP
101	59482.168	9410.528	241.429	HCP
102	59728.792	9410.092	241.912	HCP
103	60031.854	9409.998	238.87	HCP
819798160			240.999	VCM 00819798160_STEEL ROD & BRASS CAP
819798161			254.862	VCM 00819798161_STEEL ROD & BRASS CAP

## GWP 5165-12-00

### Site 39E-213 – Highway 101 Anderson Lake Culvert, replacement

HCPs 100-102 were established by averaged RTK measurements from HCMs 00819760283 and 00819760284 with checks to 00819760285. HCPs 100-102 were leveled and balanced from VCMs 00819718250 and 00819718251.

SITE 39E-213 NAD83 MTM 12 CGVD 1928:1978				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	5377775.113	334829.729	276.894	HCP
101	5377777.194	335051.811	272.770	HCP
102	5377777.431	335284.228	274.290	HCP
00819760283	5377793.843	336203.137		HCM 00819760283_SIB & BRASS CAP
00819760284	5377752.637	334499.056		HCM 00819760284_SIB & BRASS CAP
00819760285	5377785.549	332911.988		HCM 00819760285_SIB & BRASS CAP
00819718250			279.529	VCM 00819718250_STEEL ROD & BRASS CAP
00819718251			270.553	VCM 00819718251_STEEL ROD & BRASS CAP

### Site 39E-214 – Highway 101 Shillington Creek Culvert, replacement

HCPs 100-102 were established by averaged RTK measurements from HCMs 00819760286 and 00819760287. HCPs 100-102 were leveled and balanced from VCMs 00819718246 and 0011984U013.

SITE 39E-214 NAD83 MTM 12 CGVD 1928:1978				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	5377731.741	329090.883	269.102	HCP
101	5377745.247	328886.275	266.967	HCP
102	5377744.256	328665.202	266.849	HCP
00819760286	5377723.709	329613.776		HCM 00819760286_SIB & BRASS CAP
00819760287	5377718.585	326344.739		HCM 00819760287_SIB & BRASS CAP
00819718246			268.527	VCM 00819718246_TABLET IN CONC FOUNDATION
0011984U013			267.838	VCM 0011984U013_DEEP BM IN MANHOLE

GWP 5379-11-00

#### Site 39E-242 – Highway 634 Hogg Creek Culvert, rehabilitation

Local control only was established at this site. VCMs in the vicinity of the project were found disturbed/destroyed. Closed-loop levels were completed to establish elevations on the project control. Horizontal control was established by traversing.

SITE 39E-242 LOCAL				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	9795.688	4999.993	101.350	HCP 100
101	9999.995	4999.997	100.000	HCP 101
102	10144.743	5023.950	99.950	HCP 102
103	10276.017	5031.287	101.040	HCP 103
104	10404.915	5040.424	101.570	HCP 104

#### Site 39E-243 – Highway 634 Unknown Creek Culvert, rehabilitation

Local control only was established at this site. VCMs in the vicinity of the project were found disturbed/destroyed. Closed-loop levels were completed to establish elevations on the project control. Horizontal control was established by traversing.

SITE 39E-243 LOCAL				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	10000.000	5000.000	100.000	HCP 100
101	10177.570	5000.001	100.056	HCP 101
102	10349.756	4978.519	100.801	HCP 102
103	10434.874	4984.911	101.736	HCP 103
104	10531.377	4970.222	102.247	HCP 104

#### Site 39E-244 – Highway 634 Unknown Creek Culvert, replacement

Local control only was established at this site. VCMs in the vicinity of the project were found disturbed/destroyed. Closed-loop levels were completed to establish elevations on the project control. Horizontal control was established by RTK.

SITE 39E-244 LOCAL				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	91552.218	7860.365	99.930	HCP 100
101	91782.491	7852.394	100.000	HCP 101
102	92045.121	7856.018	99.910	HCP 102
103	92312.949	7896.589	99.693	HCP 103

#### Site 39E-313 – Highway 634 Unknown Creek Culvert, rehabilitation

Local control only was established at this site. VCMs in the vicinity of the project were found disturbed/destroyed. Closed-loop levels were completed to establish elevations on the project control. Horizontal control was established by RTK.

SITE 39E-313 LOCAL				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	90543.406	7901.246	100.000	HCP 100
101	90774.685	7882.671	99.973	HCP 101
102	90996.681	7888.098	100.331	HCP 102
103	91110.056	7884.854	100.364	HCP 103
104	91352.045	7878.006	101.198	HCP 104

#### GWP 5267-11-00

#### Site 39E-169– Highway 668 Deception Creek Bridge, rehabilitation

#### Site 39E-014 – Highway 668 Smith Creek Bridge, rehabilitation

HCPs 100-102 were established by averaged RTK measurements from HCMs 00819980167 and 00819980169. HCPs 103-105 were established by RTK measurements from HCM 00819980167. HCM 00819980168 was found to be disturbed by 10 centimeters. HCM 00819980166 was destroyed and HCM 00819980169 was located too far away to get measurements to HCPs 103-105. HCPs 100-102 were leveled and balanced VCMs 0011922U1214 and 00819728361. HCPs 103-105 were leveled and balanced from HCPs 101 and 102 from Site 39E-169.

SITE 39E-169 NAD83 MTM 12 CGVD 1928:1978				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	5441495.596	284933.590	269.521	HCP
101	5441706.825	284911.504	267.057	HCP
102	5441903.627	284928.961	271.293	HCP
00819980167	5436019.499	284034.094		HCM 00819980167_SIB & BRASS CAP
00819980169	5435614.705	287730.457		HCM 00819980169_SIB & BRASS CAP
0011922U1214			265.930	VCM 0011922U1214_BOLT IN CONC ABUTMENT
00819728361			281.958	VCM 00819728361_DEEP BM IN MANHOLE

SITE 39E-014 NAD83 MTM 12 CGVD 1928:1978				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
103	5446420.493	284950.476	266.264	HCP
104	5446607.415	284941.484	260.506	HCP
105	5446775.730	284952.578	269.483	HCP
00819980167	5436019.499	284034.094		HCM 00819980167_SIB & BRASS CAP

## GWP 417-91-00

### Site 39E-096 – Highway 577 Driftwood River Bridge, replacement

HCPs 100-102 were established by averaged RTK measurements from HCMs 00819760286 and 00819760287. HCPs 100-102 were leveled and balanced from VCMs 00819808041 and 00819718246.

SITE 39E-096 NAD83 MTM 12 CGVD 1928:1978				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	5379549.702	328349.080	264.255	HCP
101	5379306.468	328358.075	263.959	HCP
102	5379061.049	328345.775	264.795	HCP
00819760286	5377723.709	329613.776		HCM 00819760286_SIB & BRASS CAP
00819760287	5377718.585	326344.739		HCM 00819760287_SIB & BRASS CAP
00819808041			266.210	VCM 00819808041_STEEL ROD WITH BRASS CAP
00819718246			268.527	VCM 00819718246_TABLET IN CONC FOUNDATION

### Site 39E-097 – Highway 577 Driftwood River Bridge, rehabilitation

HCPs 100-102 were established by averaged RTK measurements from HCMs 01019780442 and 01019780443. HCPs 100-102 were leveled and balanced from VCMs 00819808044 and 0011993U791.

SITE 39E-097 NAD83 MTM 12 CGVD 1928:1978				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	5385566.408	328357.715	272.059	HCP
101	5385372.548	328343.459	267.913	HCP
102	5385221.934	328335.584	270.140	HCP
01019780442	5385959.404	330531.866		HCM 01019780442_SIB
01019780443	5384642.070	331709.851		HCM 01019780443_SIB
00819808044			273.850	VCM 00819808044_STEEL ROD & BRASS CAP
0011993U791			288.529	VCM 0011993U791

### Table of COSINE monuments found disturbed or destroyed

Monument #	Comments
00819980166	Destroyed
00819980168	Disturbed, not destroyed, was found to be approximately 10 cms out in northing when measured from adjacent monuments 00819980167 and 00819980169
00819808244	Disturbed
00819808245	Disturbed
00819808246	Disturbed