

Drawing Index	
19022 A1-1	Title Page
19022 A1-2	Notes
19022 A1-3	Plan Overview - 1:2000
19022 A1-4	Plan Overview - 1:1000
19022 A1-5	Road Profile
19022 A1-6	Plan 1:500 (1)
19022 A1-7	Plan 1:500 (2)
19022 A1-8	Cross Sections (1)
19022 A1-9	Cross Sections (2)
19022 A1-10	Estimated Volumes
19022 A1-11	Vehicle Tracking Analysis
19022 A1-12	Photos

Mt. Ozzard Bypass Road (0+000m - 0+435m)

EOR Seal	Prepared for:		
		Fisheries & Oceans Canada Canadian Coast Guard Ucluelet Mt. Ozzard	
Surveyed _____ D. Cybak, T. Scuffi _____ Apr. 2-4, 2019 Design _____ L. Deslauriers, T. Scuffi _____ Aug 14, 2019 Checked _____ L. Deslauriers _____ Aug 14, 2019 Drawn _____ T. Scuffi _____ Aug 14, 2019	StoneCraft PROJECT ENGINEERING		
Engineer of Record (EOR) _____ Lee Deslauriers, P. Eng, RPF _____	Drawing No. 19022 A1	Sheet 1 of 12	

Caution:
 Drawing scale may distort
 with printing. Intended to
 be printed on 11"x17"
 paper in colour.

1.0 General Notes:

1.1 Design Criteria:

- 1.1.1 This structure is part of the permanent infrastructure of the Mt. Ozzard Operation.
- 1.1.2 The design of this road limits the use to heavy single-unit (HSU) trucks only and it is unlikely to accommodate tractor-trailer trucks or lowbeds.
- 1.1.3 StoneCroft Project Engineering Ltd. deems this structure to be a low risk design.
- 1.1.4 Slopes:
- Fill slopes no steeper than:
- 1.5H:1V in compact granular fill
 - 1.25H:1V in stacked riprap
- Cut slopes no steeper than:
- 1H:1V in organics/overburden
 - 0.5H:1V in compact till
 - 0.25H:1V in competent bedrock

1.2 Geotechnical:

- 1.2.1 A formal geotechnical assessment was completed by Westcoast Geotechnical. See "Mt. Ozzard Debris Flow Site Evaluation and Bypass Road Evaluation", Sealed by D.M. Hazenboom, P. Eng., on August 13, 2014. The site appears to be composed of a blanket of colluvium and till over bedrock.
- 1.2.2 If excavation of foundations reveals any deviation, the Engineer of Record is to be advised prior to continuation of work.

1.3 General Requirements:

- 1.3.1 Engineer of Record field reviews are required for slope staking, horizontal / vertical grade control during construction, placement of rock fill foundation, and completion of installation.
- 1.3.2 A danger tree assessment should be completed by a WorkSafeBC approved person prior to works.
- 1.3.3 Final cut and fill slopes to be reviewed at site by Engineer of Record prior to approval.
- 1.3.4 All organics and overburden must be stripped from road prism prior to placing granular subgrade material (with no more than 10% fines).

1.4 Material Specifications:

Refer to project specifications.

2.0 Safety:

A preconstruction meeting will be held prior to any work outlining the environmental and safety concerns of the project. All work will comply with the British Columbia Occupational Health and Safety Regulations.

All cut slopes to be assessed by the Engineer of Record during construction.

3.0 Environmental:

3.1 Stream Classification:

No classified streams within the work area.

3.2 Environmental Management Plan (EMP):

Refer to project specifications.

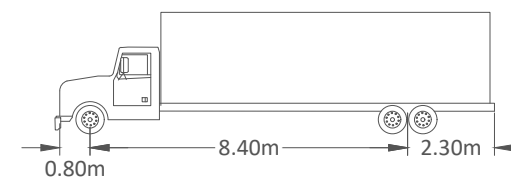
3.3 Timing:

Follow all wet weather shutdown measures, or as specified in the EMP.

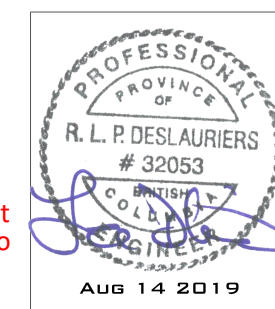
*Vertical datum based on geoid CGVD2013

Benchmark Location Table (UTM NAD83 Zone 10)				
Benchmark #	Description	Northing (Y)	Easting (X)	Elevation (Z)
BM300	BM300 Road	5425800.252	316878.917	430.015
BM301	BM301 Road	5425768.334	316942.428	417.993
BM302	BM302 Road	5425575.793	316972.325	344.880
BM303	BM303 Road	5425628.814	317016.429	348.653
BM304	BM304 Hemlock	5425796.415	316867.683	426.316
BM305	BM305 Balsam	5425784.614	316836.784	417.610
BM306	BM306 Root Path	5425780.319	316780.325	410.761
BM307	BM307 Stump Path	5425785.816	316789.228	411.911
BM308	BM308 Stump Path	5425769.214	316762.530	405.404
BM309	BM309 Stump	5425776.897	316742.725	399.924
BM310	BM310 Hemlock	5425752.894	316745.488	394.770
BM311	BM311 Hemlock	5425755.032	316770.593	400.952
BM312	BM312 Hemlock	5425738.942	316811.658	393.850
BM313	BM313 Hemlock	5425736.602	316818.039	393.664
BM314	BM314 Stump	5425692.480	316844.507	376.129
BM315	BM315 Hemlock	5425712.910	316854.064	388.778
BM316	BM316 Cedar Root	5425683.122	316880.696	378.867
BM317	BM317 Stump	5425665.590	316867.991	367.844
BM318	BM318 Hemlock	5425655.159	316913.188	367.932
BM319	BM319 Hemlock Root	5425658.589	316918.218	366.601

Design Vehicle Used for Tracking Analysis
Heavy Single-Unit (HSU) Truck



Caution:
Drawing scale may distort
with printing. Intended to
be printed on 11"x17"
paper in colour.



Canadian Coast Guard
Mt. Ozzard

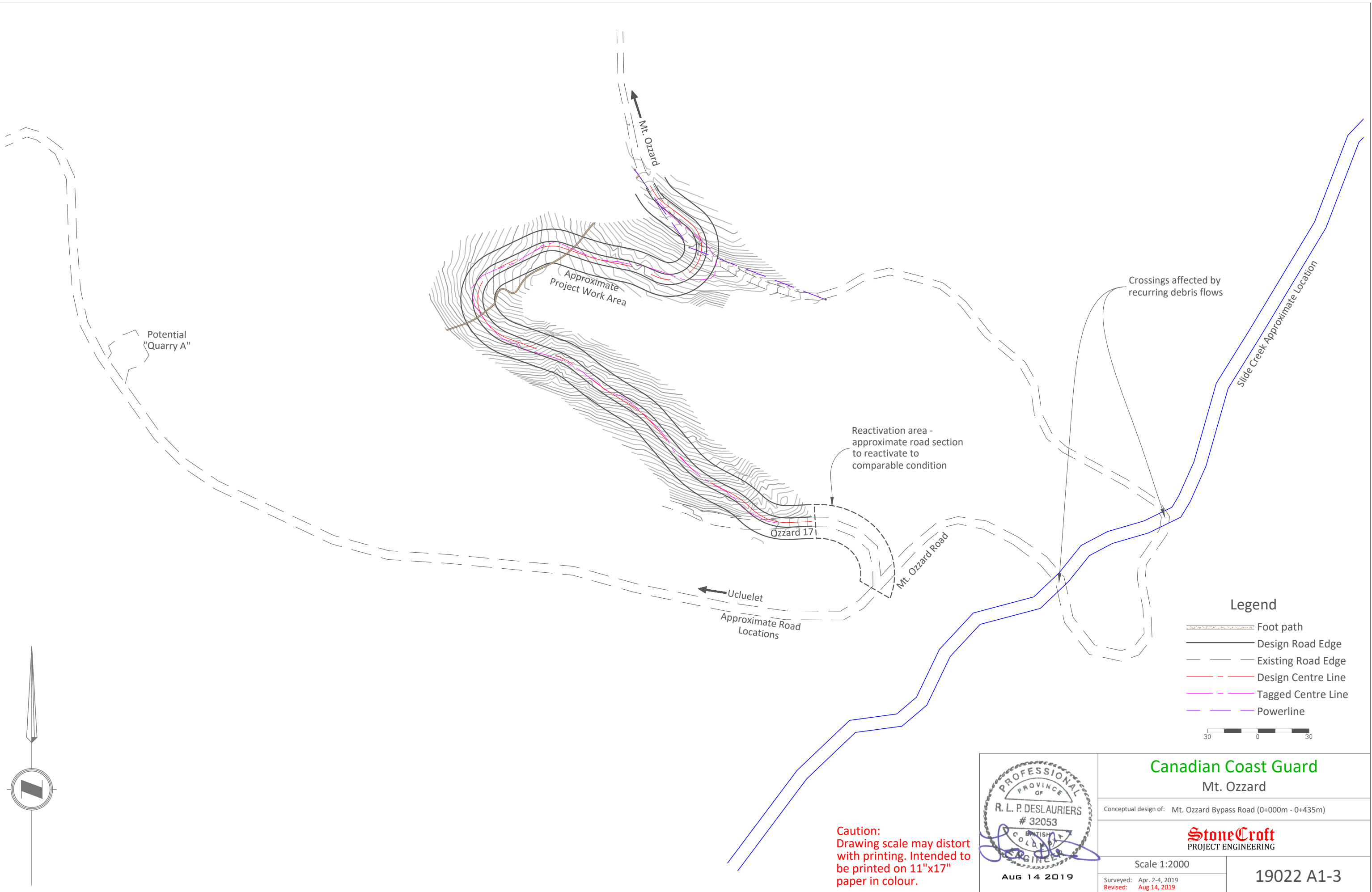
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)

StoneCroft
PROJECT ENGINEERING

Not to Scale

Surveyed: Apr. 2-4, 2019
Revised: Aug 14, 2019

19022 A1-2



Legend

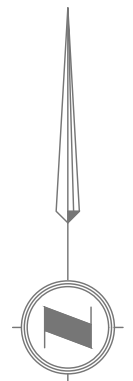
- Foot path
- Design Road Edge
- Existing Road Edge
- Design Centre Line
- Tagged Centre Line
- Powerline



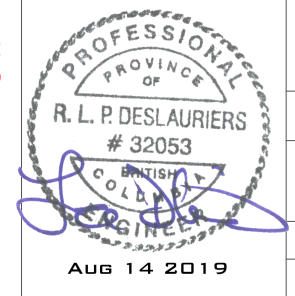
Caution:
Drawing scale may distort
with printing. Intended to
be printed on 11"x17"
paper in colour.

PROFESSIONAL
PROVINCE OF
R. L. P. DESLAURIERS
32053
BRITISH COLUMBIA
ENGINEER
AUG 14 2019

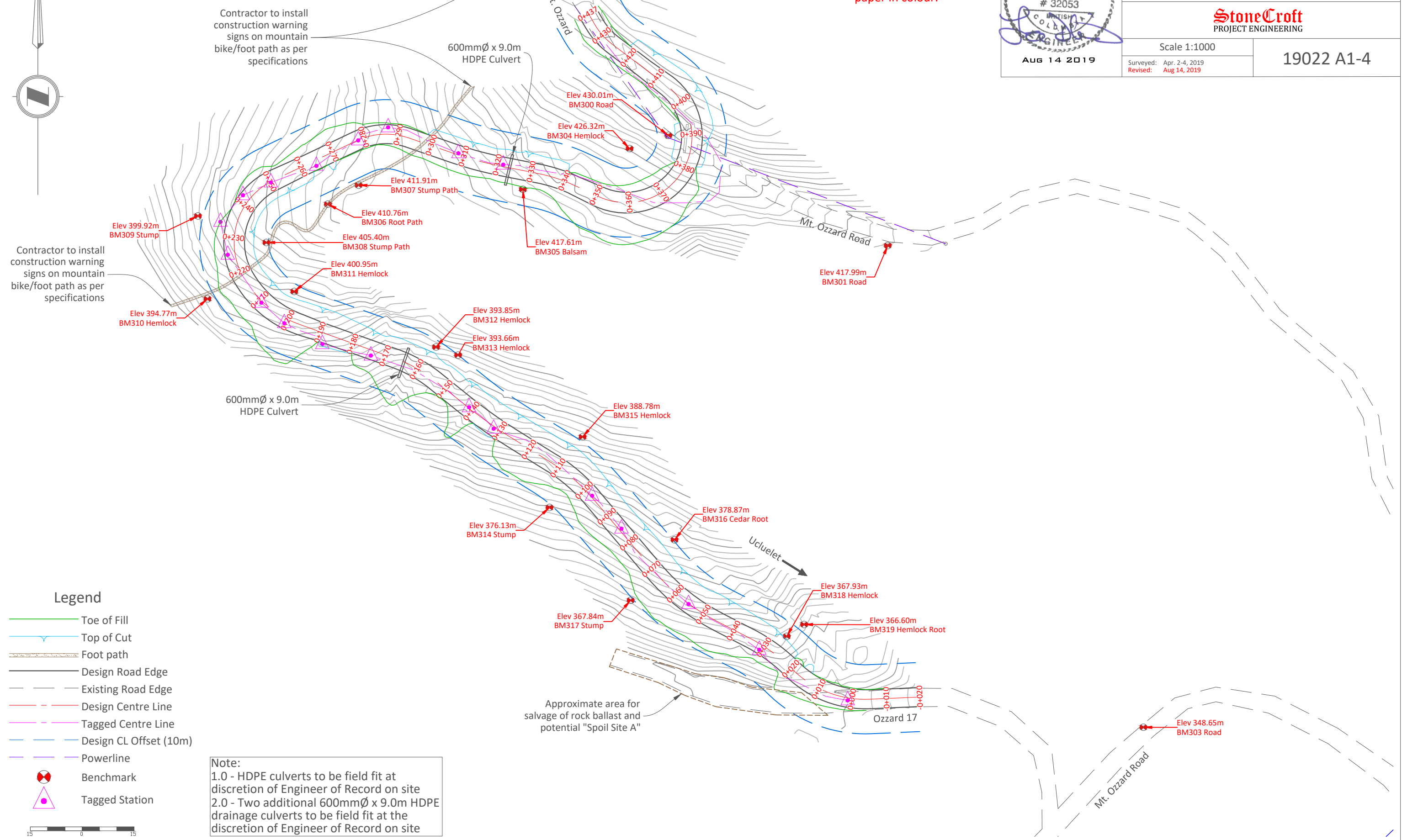
Canadian Coast Guard Mt. Ozzard	
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)	
StoneCroft PROJECT ENGINEERING	
Scale 1:2000	19022 A1-3
Surveyed: Apr. 2-4, 2019 Revised: Aug 14, 2019	

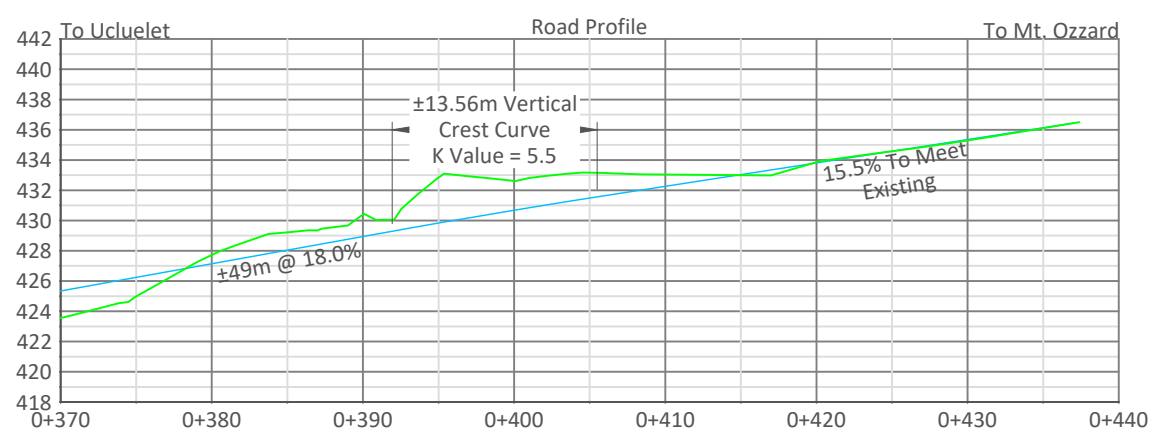
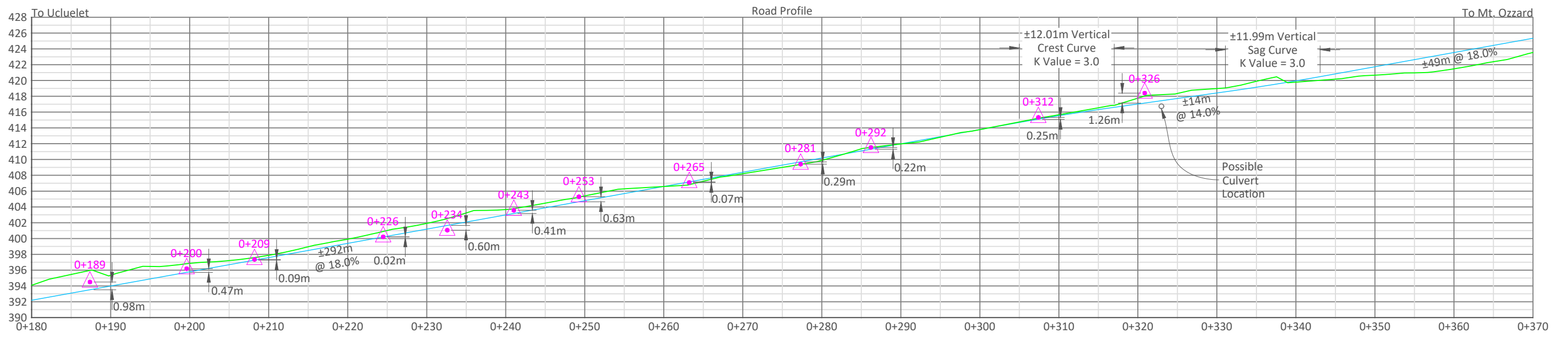


Caution:
Drawing scale may distort
with printing. Intended to
be printed on 11"x17"
paper in colour.



Canadian Coast Guard Mt. Ozzard	
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)	
StoneCroft PROJECT ENGINEERING	
Scale 1:1000	19022 A1-4
Surveyed: Apr. 2-4, 2019 Revised: Aug 14, 2019	

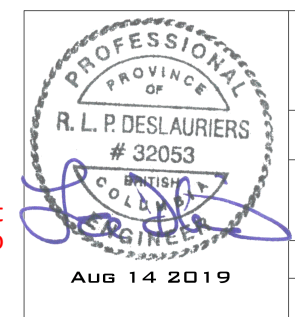




Legend

- Existing Grade
- Design Grade
- ▲ Tagged Station

Caution:
Drawing scale may distort
with printing. Intended to
be printed on 11"x17"
paper in colour.



Canadian Coast Guard
Mt. Ozzard

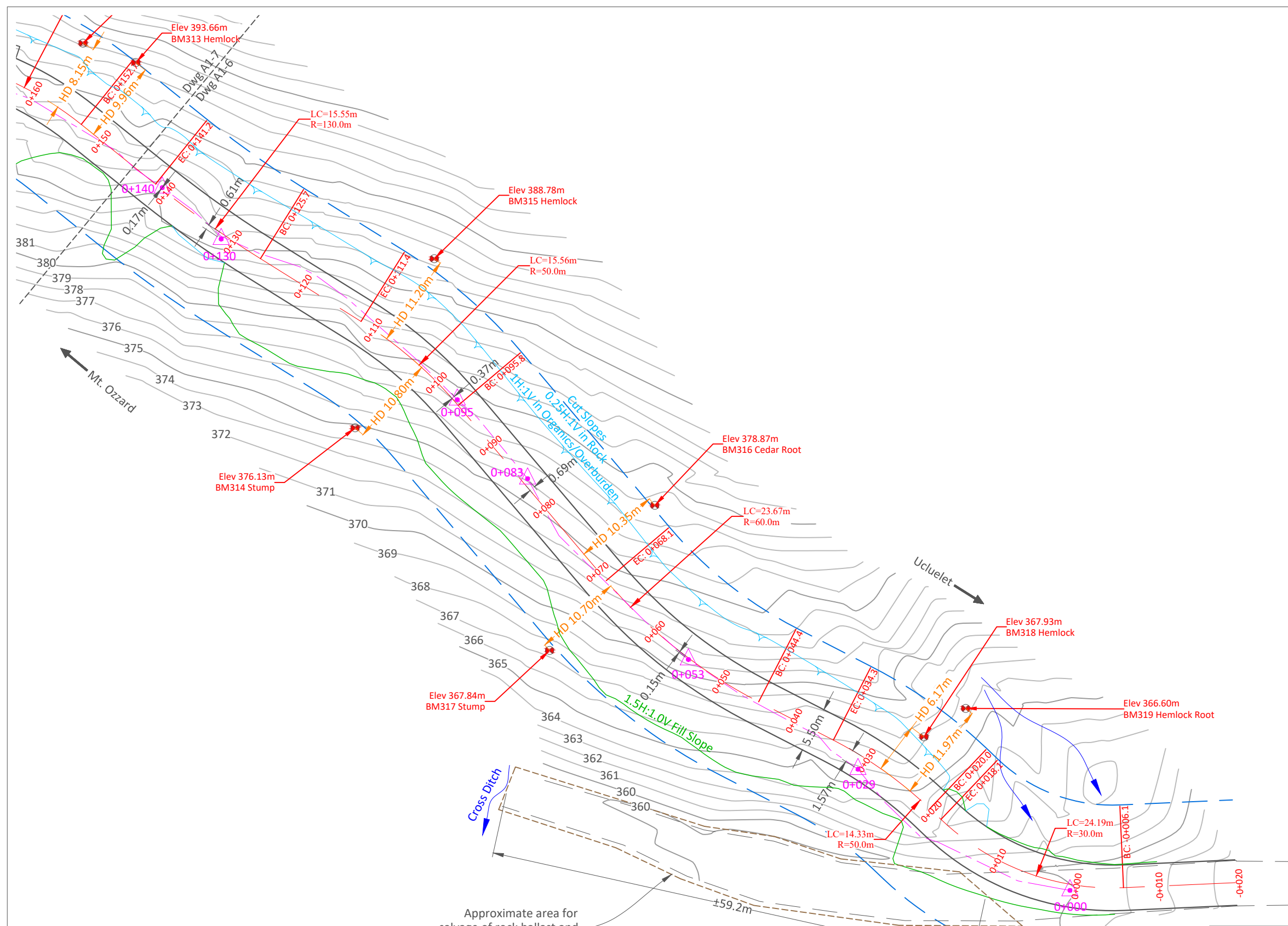
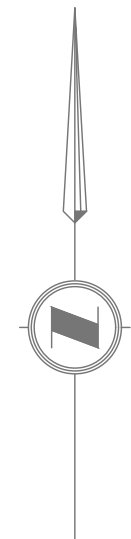
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)

StoneCrest
PROJECT ENGINEERING

Scale 1:500

Surveyed: Apr. 2-4, 2019
Revised: Aug 14, 2019

19022 A1-5



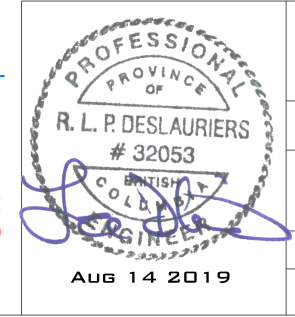
Legend

- Toe of Fill
- Top of Cut
- Design Road Edge
- Existing Road Edge
- Design Centre Line
- Tagged Centre Line
- Design CL Offset (10m)
- Benchmark
- Tagged Station

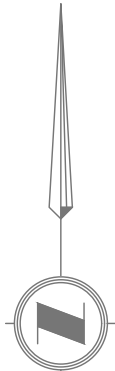


Approximate area for salvage of rock ballast and potential "Spoil Site A"

Caution:
Drawing scale may distort with printing. Intended to be printed on 11"x17" paper in colour.

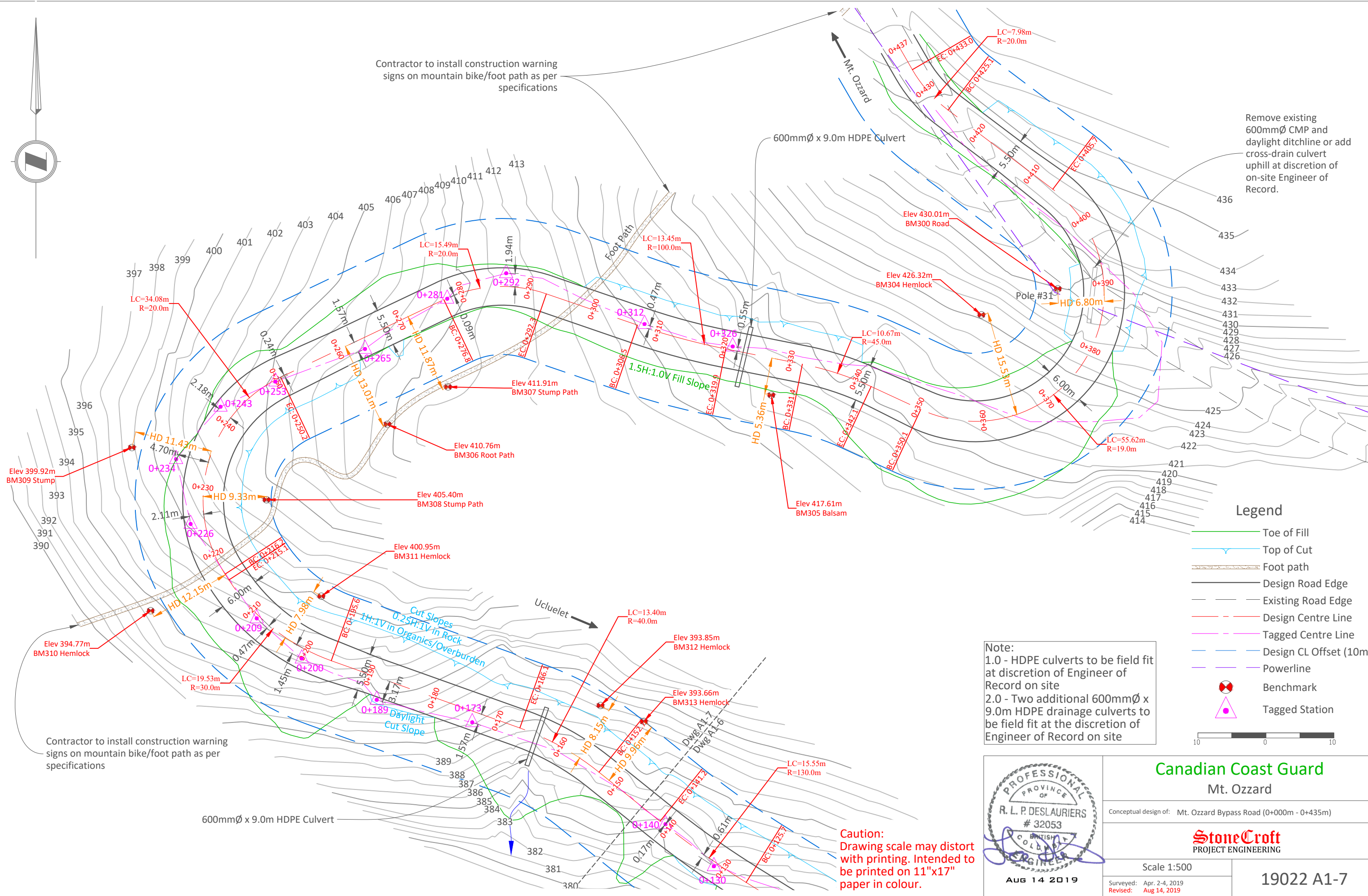


Canadian Coast Guard Mt. Ozzard	
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)	
StoneCroft PROJECT ENGINEERING	
Scale 1:500	19022 A1-6
Surveyed: Apr. 2-4, 2019 Revised: Aug 14, 2019	



Contractor to install construction warning signs on mountain bike/foot path as per specifications

Remove existing 600mmØ CMP and daylight ditchline or add cross-drain culvert uphill at discretion of on-site Engineer of Record.



Legend

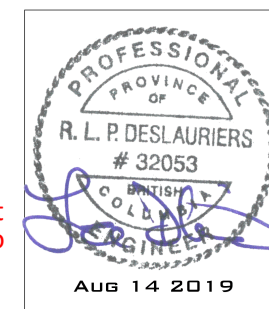
- Toe of Fill
- Top of Cut
- Foot path
- Design Road Edge
- Existing Road Edge
- Design Centre Line
- Tagged Centre Line
- Design CL Offset (10m)
- Powerline
- Benchmark
- Tagged Station



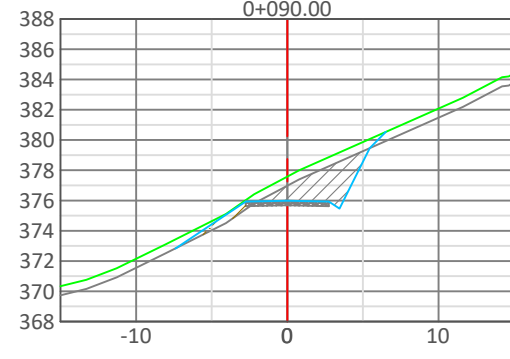
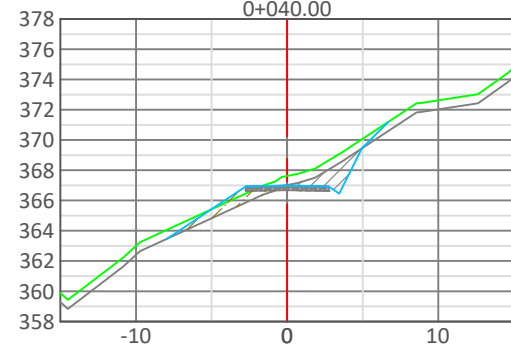
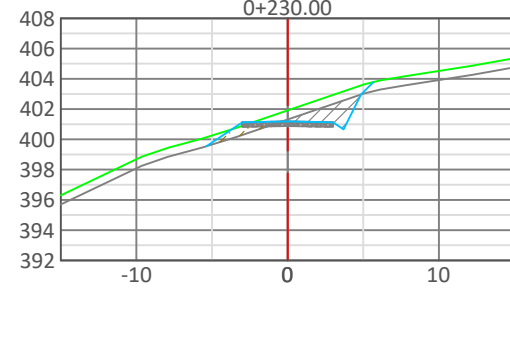
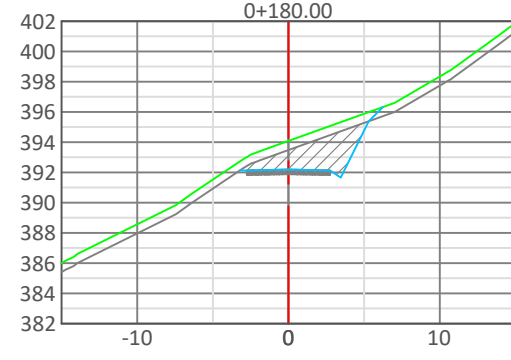
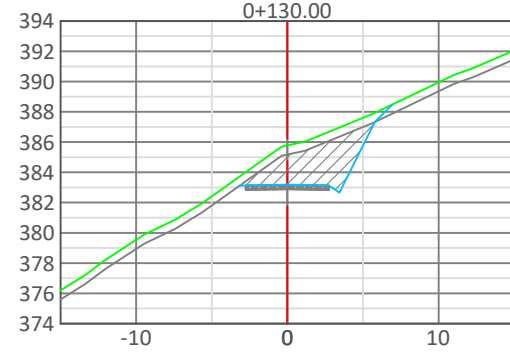
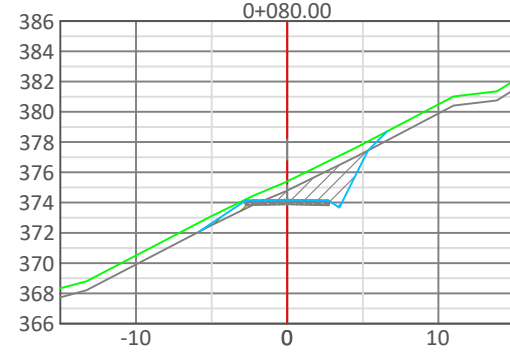
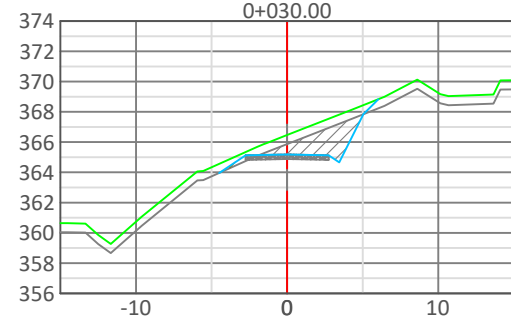
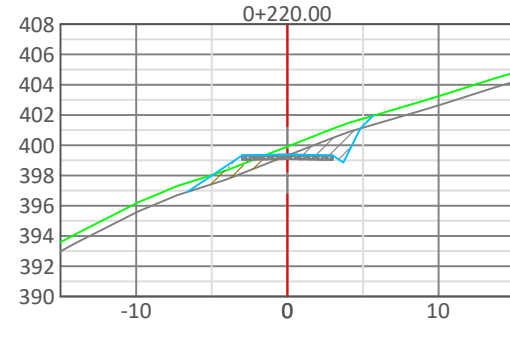
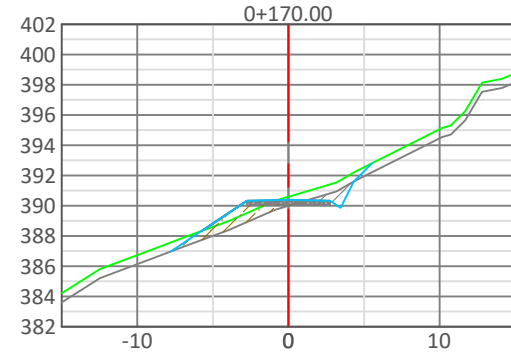
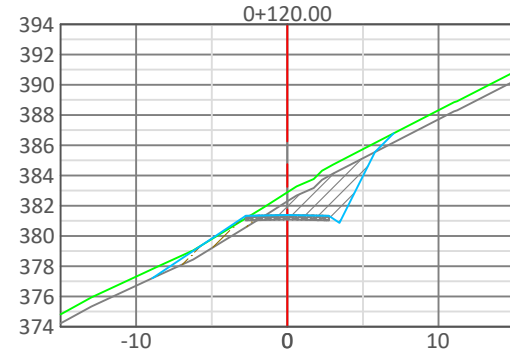
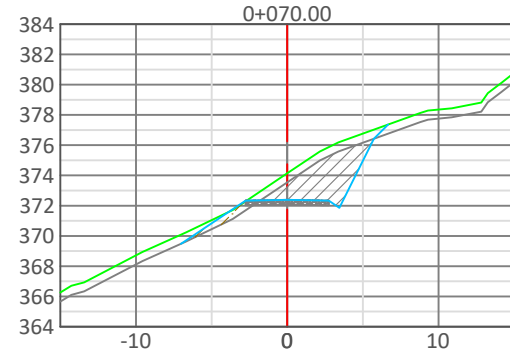
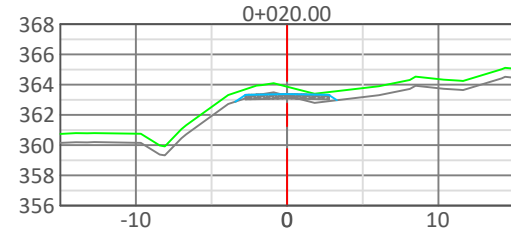
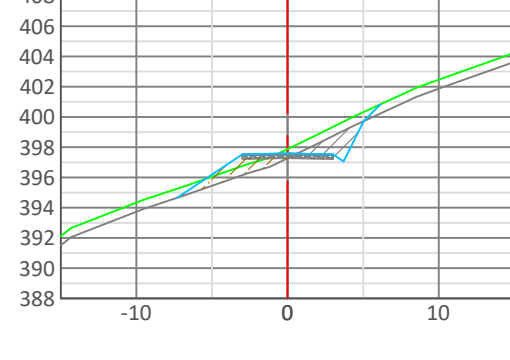
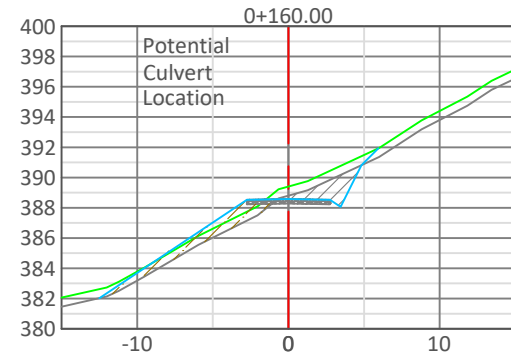
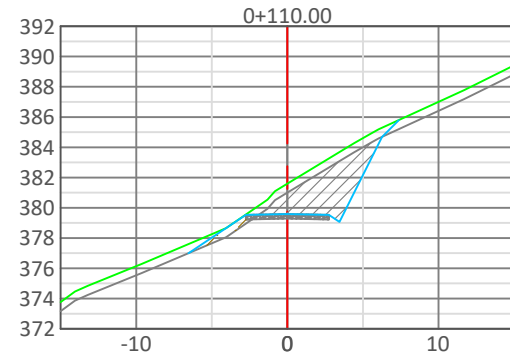
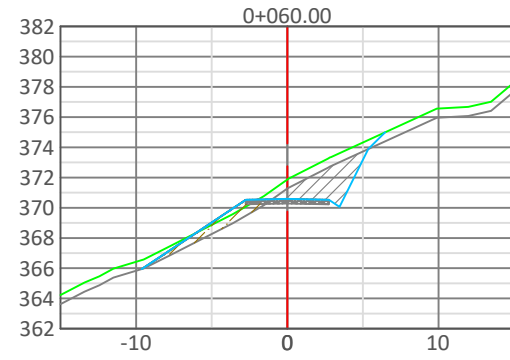
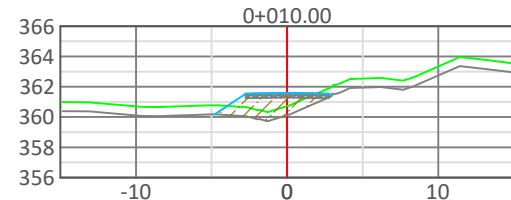
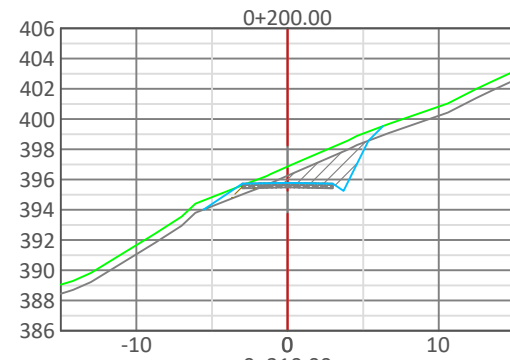
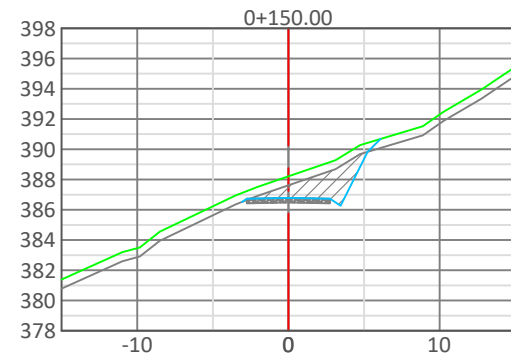
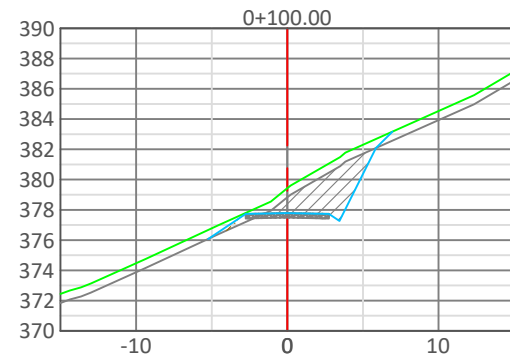
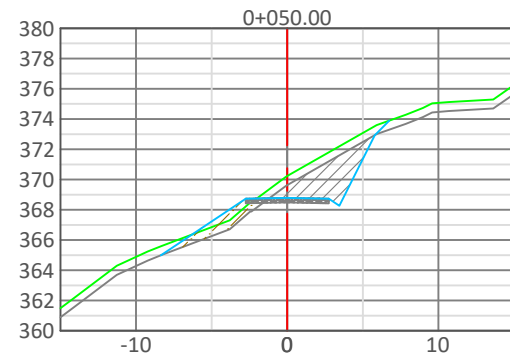
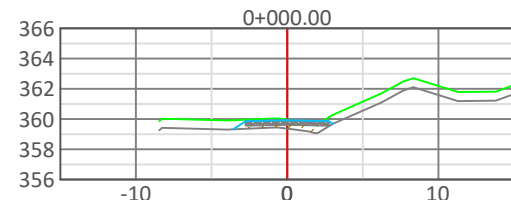
Note:
 1.0 - HDPE culverts to be field fit at discretion of Engineer of Record on site
 2.0 - Two additional 600mmØ x 9.0m HDPE drainage culverts to be field fit at the discretion of Engineer of Record on site

Contractor to install construction warning signs on mountain bike/foot path as per specifications

Caution: Drawing scale may distort with printing. Intended to be printed on 11"x17" paper in colour.



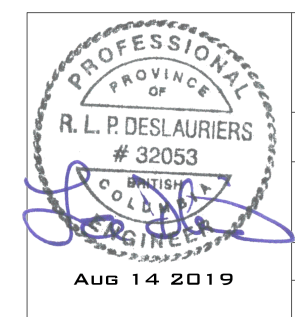
Canadian Coast Guard Mt. Ozzard	
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)	
StoneCroft PROJECT ENGINEERING	
Scale 1:500	19022 A1-7
Surveyed: Apr. 2-4, 2019 Revised: Aug 14, 2019	



Caution:
Drawing scale may distort
with printing. Intended to
be printed on 11"x17"
paper in colour.

Legend

- Existing Surface
- Design Surface
- Estimated Rock Surface
- Tagged Station
- Fill
- Rock/Till Cut
- Road Capping



Canadian Coast Guard
Mt. Ozzard

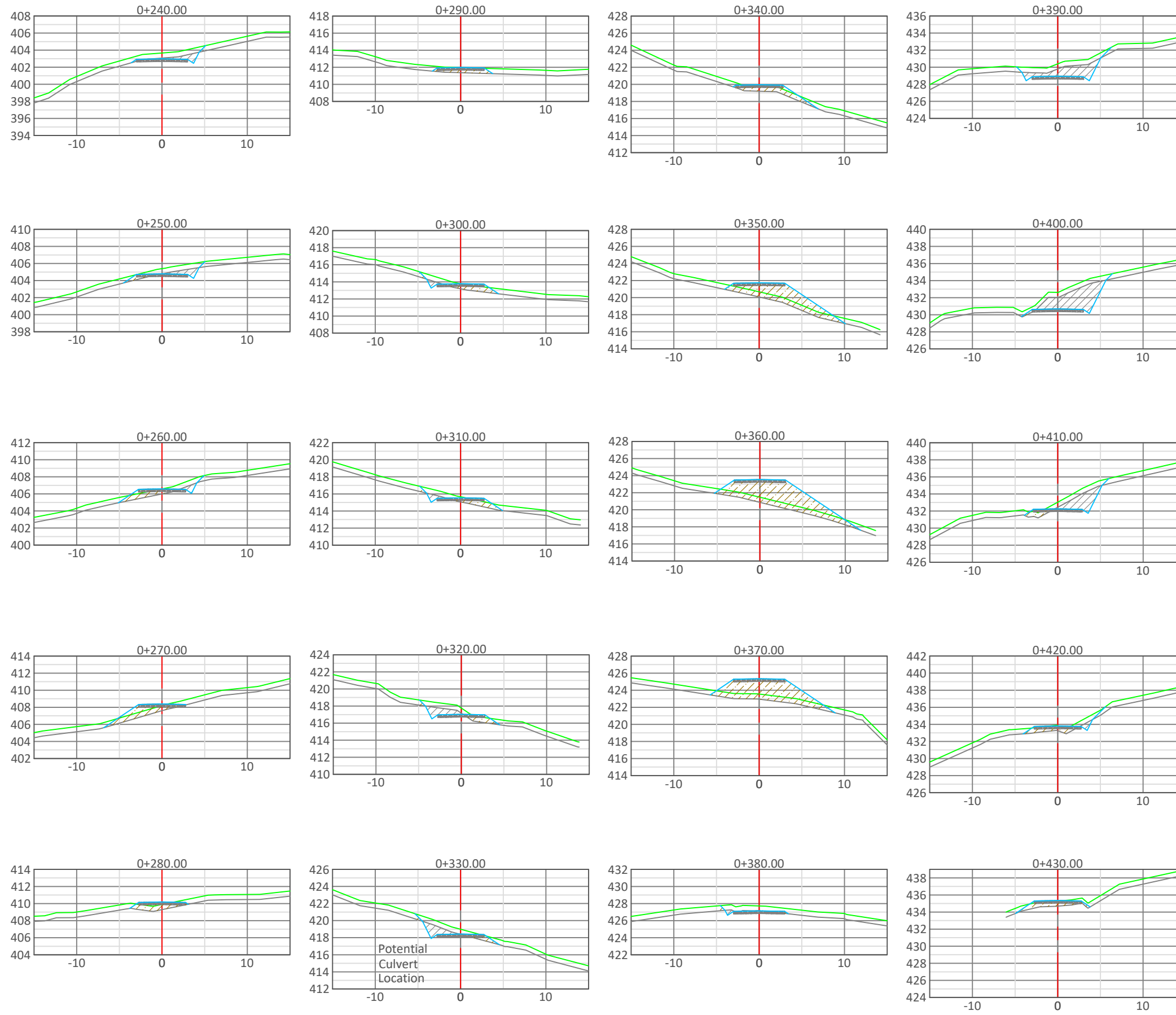
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)

StoneCroft
PROJECT ENGINEERING

Scale 1:500

Surveyed: Apr. 2-4, 2019
Revised: Aug 14, 2019

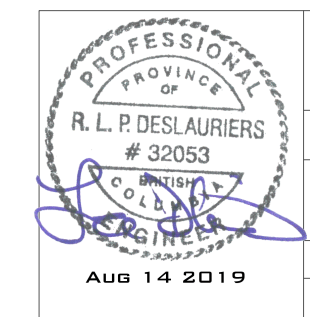
19022 A1-8



Caution:
Drawing scale may distort
with printing. Intended to
be printed on 11"x17"
paper in colour.

Legend

- Existing Surface
- Design Surface
- Estimated Rock Surface
- Tagged Station
- Fill
- Rock/Till Cut
- Road Capping



Canadian Coast Guard Mt. Ozzard	
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)	
StoneCroft PROJECT ENGINEERING	
Scale 1:500	19022 A1-9
Surveyed: Apr. 2-4, 2019 Revised: Aug 14, 2019	

Estimated Total Volume Table (no expansion factor)				
Station (m)	In-Bank Cut (±m³)	In-Place Fill (±m³)	Cumulative In-Bank Cut (±m³)	Cumulative In-Place Fill (±m³)
-0+005	0	0	0	0
0+000	19	13	19	13
0+005	21	24	40	37
0+010	23	36	63	73
0+015	29	42	92	115
0+020	29	25	121	140
0+025	47	11	168	151
0+030	75	13	243	164
0+035	75	20	318	184
0+040	70	28	388	212
0+045	79	33	467	245
0+050	99	35	566	280
0+055	109	33	675	313
0+060	105	33	780	346
0+065	102	27	882	373
0+070	111	20	992	393
0+075	107	16	1100	409
0+080	93	14	1193	423
0+085	84	17	1277	440
0+090	92	18	1369	458
0+095	105	19	1474	477
0+100	107	16	1581	493
0+105	105	12	1686	505
0+110	116	14	1803	520
0+115	117	26	1919	546
0+120	109	31	2028	576
0+125	118	21	2146	597
0+130	122	13	2268	610
0+135	111	10	2379	620
0+140	90	20	2469	641

Estimated Total Volume Table (no expansion factor)				
Station (m)	In-Bank Cut (±m³)	In-Place Fill (±m³)	Cumulative In-Bank Cut (±m³)	Cumulative In-Place Fill (±m³)
0+145	86	20	2555	661
0+150	85	10	2639	671
0+155	73	15	2712	685
0+160	75	36	2787	721
0+165	74	67	2862	788
0+170	57	59	2919	847
0+175	58	26	2977	873
0+180	82	13	3059	886
0+185	111	10	3170	895
0+190	114	12	3284	907
0+195	113	15	3397	922
0+200	102	16	3499	938
0+205	76	23	3575	961
0+210	68	32	3643	993
0+215	64	34	3707	1027
0+220	63	30	3770	1057
0+225	60	23	3830	1080
0+230	60	18	3890	1098
0+235	61	14	3951	1112
0+240	53	10	4004	1122
0+245	43	13	4048	1135
0+250	44	15	4091	1150
0+255	44	13	4135	1163
0+260	40	18	4176	1181
0+265	31	28	4207	1209
0+270	28	35	4235	1244
0+275	28	38	4263	1281
0+280	24	31	4287	1312
0+285	20	17	4307	1329
0+290	20	14	4328	1343

Estimated Total Volume Table (no expansion factor)				
Station (m)	In-Bank Cut (±m³)	In-Place Fill (±m³)	Cumulative In-Bank Cut (±m³)	Cumulative In-Place Fill (±m³)
0+295	22	20	4350	1363
0+300	28	21	4377	1385
0+305	34	22	4412	1407
0+310	36	22	4447	1428
0+315	36	19	4483	1448
0+320	42	18	4526	1465
0+325	48	17	4573	1483
0+330	49	16	4622	1499
0+335	52	14	4674	1513
0+340	42	23	4717	1536
0+345	34	51	4751	1586
0+350	41	85	4791	1671
0+355	46	116	4837	1787
0+360	51	146	4888	1933
0+365	50	158	4938	2090
0+370	47	141	4985	2232
0+375	41	109	5026	2341
0+380	35	51	5061	2391
0+385	47	10	5108	2402
0+390	72	11	5180	2413
0+395	98	12	5278	2425
0+400	111	12	5390	2437
0+405	105	12	5495	2449
0+410	83	15	5578	2464
0+415	57	18	5635	2482
0+420	39	20	5674	2502
0+425	28	21	5702	2523
0+430	25	22	5727	2545
0+435	26	20	5753	2565

1.0 Estimated Volumes Notes:

- 1.1 Cut volume estimates are "in bank" volumes (unexpanded).
- 1.2 "In place" fill volume estimates are final, compacted volumes.
- 1.3 Cut volume in table includes both organics/overburden (to be spoiled) and rock/till cut (to be used with approval from on-site Engineer of Record).
- 1.4 Fill volume in table includes both road subgrade and road capping.
- 1.5 Volumetrics assume 0.6m layer of organics/overburden over bedrock/till.

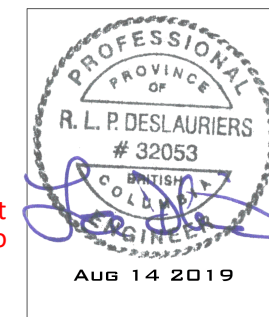
2.0 Estimated Volumes Required:

1820m³ of subgrade material (in place)
750m³ of road capping material (in place)

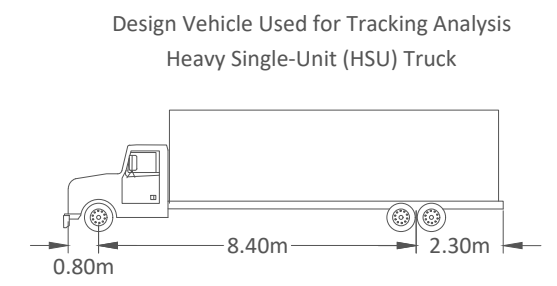
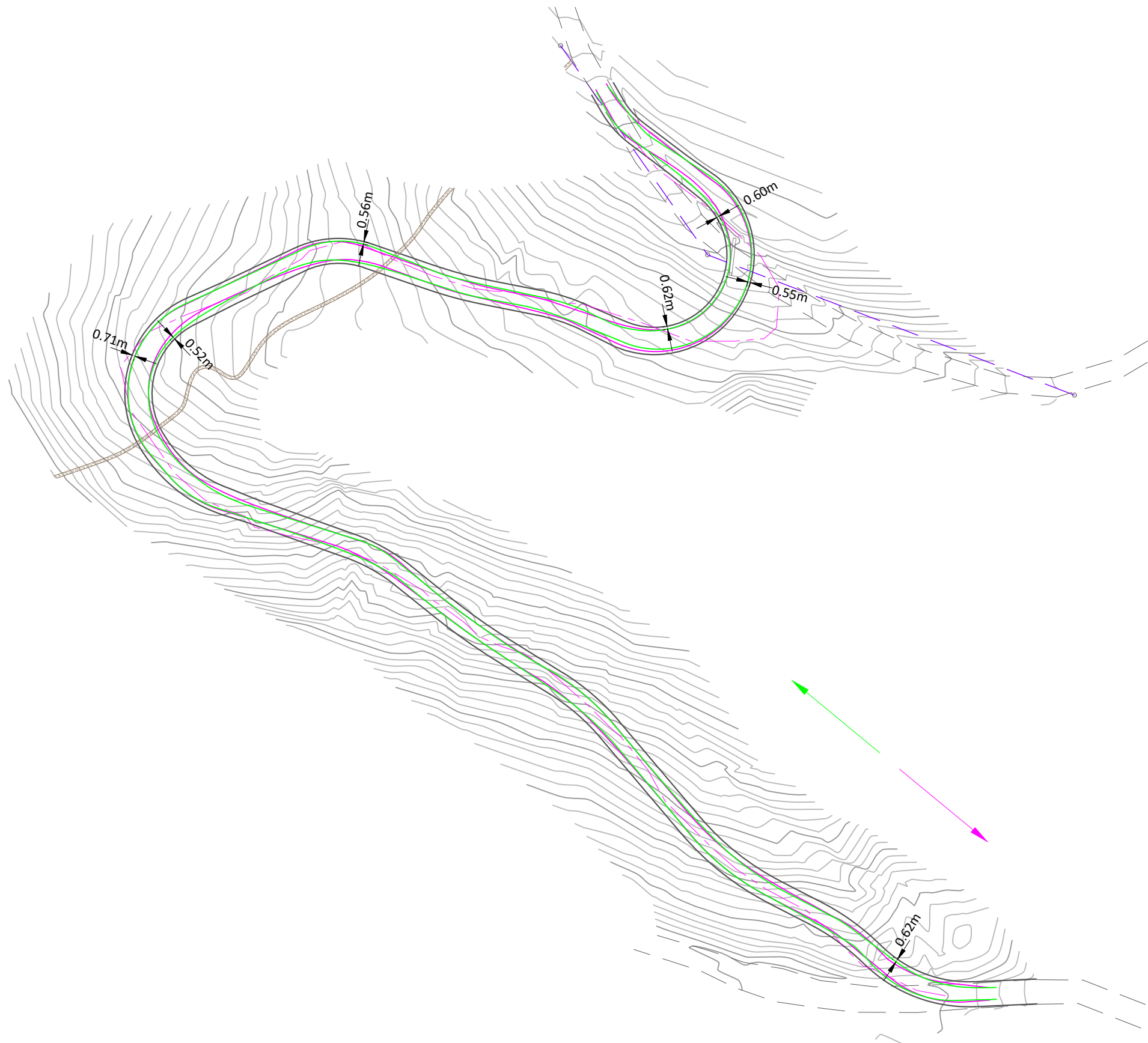
3.0 Estimated Volumes Produced:

3000m³ of rock or till cut (10% net expansion factor applied)
3020m³ of organics/overburden (in bank)

Caution:
Drawing scale may distort
with printing. Intended to
be printed on 11"x17"
paper in colour.



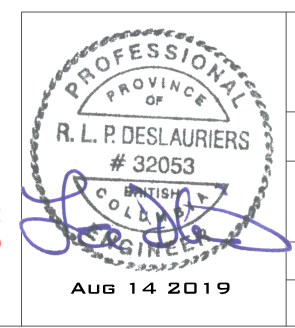
Canadian Coast Guard Mt. Ozzard	
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)	
StoneCroft PROJECT ENGINEERING	
Scale 1:200	19022 A1-10
Surveyed: Apr. 2-4, 2019 Revised: Aug 14, 2019	



- Legend**
- Tracking extents - towards Mt. Ozzard summit
 - Tracking extents - towards Ucluelet



Caution:
Drawing scale may distort
with printing. Intended to
be printed on 11"x17"
paper in colour.



Canadian Coast Guard Mt. Ozzard	
Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)	
StoneCroft PROJECT ENGINEERING	
Scale 1:1000	19022 A1-11
Surveyed: Apr. 2-4, 2019 Revised: Aug 14, 2019	



Start of Ozzard-17 from Ozzard Road



Facing Towards Ozzard Road from Ozzard-17



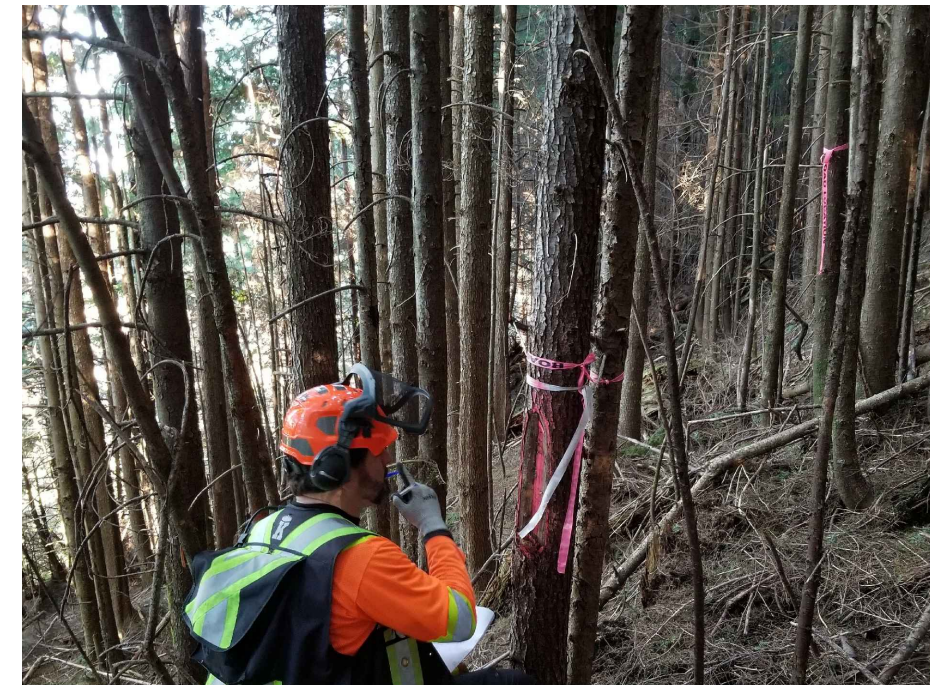
Facing Up Ozzard Road at Design CL



Facing Down Ozzard Road at Design CL



Facing Down Design CL at 0+053



Facing Up Design CL at 0+053

Canadian Coast Guard
Mt. Ozzard

Conceptual design of: Mt. Ozzard Bypass Road (0+000m - 0+435m)

StoneCroft
PROJECT ENGINEERING

Not to Scale

Surveyed: Apr. 2-4, 2019
Revised: Aug 14, 2019

19022 A1-12