

Lamoille Valley Rail Trail Project – VTrans Project STP
LVRT(11): Cambridge to Sheldon; LVRT(12): Hardwick to Morrisville; LVRT(13): Danville to Hardwick

Vermont Agency of Transportation

USACE Section 404/10 Permit Application - Impact Summary

Prepared by VHB

3/17/2021; REVISED March 26, 2021

Feature ID ^{1,2}	Feature Type	Trail Section	Proposed Work	EPSC Corresponding Sheet	Proposed WOTUS Impacts		TOTAL IMPACTS (Sq. Ft.)
					Permanent Impacts ³ (Sq. Ft.)	Temporary Impacts ⁴ (Sq. Ft.)	
2008-421	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):47	252	407	659
2008-422	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):47	83	37	120
2008-423	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):47	69	389	458
2008-424	Wetland	LVRT(11)	REPAIR INLET AND OUTLET	LVRT(11):48	0	1,161	1,161
2008-425	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):48	133	2,057	2,190
2008-426	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):48,49	367	1,417	1,784
2008-430	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):49	54	563	617
2008-431	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):49	0	372	372
2008-432	Wetland	LVRT(11)	CLEAN AND REGRADE INLET, INSTALL BEAVER FENCE	LVRT(11):49	340	1,014	1,354
2008-435	Wetland	LVRT(11)	REPAIR AND REGRADE INLET, INSTALL BEAVER FENCE	LVRT(11):50	122	749	871
2008-438	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):51	133	582	715
2008-439	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):51,53,54	961	3,413	4,374
2008-440	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):35,53,54	375	2,011	2,386
2008-441	Wetland	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS, REPOINT ABUTMENTS AND WINGWALLS	LVRT(11):35,54	0	266	266
2008-442	Wetland	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS, REPLACE BRIDGE SEATS AND BACKWALLS, REPOINT ABUTMENTS	LVRT(11):36,55	0	146	146
2008-443	Wetland	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS, REPLACE BRIDGE SEATS AND BACKWALLS, REPOINT ABUTMENTS	LVRT(11):36,55	0	86	86
2008-444	Wetland	LVRT(11)	CLEAN INLET/OUTLET, REPAIR BANKING, INSTALL BEAVER FENCE	LVRT(11):55	178	579	757
2008-445	Wetland	LVRT(11)	CLEAN INLET/OUTLET, REPAIR BANKING, INSTALL BEAVER FENCE	LVRT(11):37,55	204	787	991
2008-446	Wetland	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS	LVRT(11):37,55	0	374	374
2008-447	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):56	330	1,083	1,413
2008-449	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):56	297	1,000	1,297
2008-450	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):56	190	873	1,063
2008-451	Wetland	LVRT(11)	CLEAN INLET, EXCAVATE AND REPAIR	LVRT(11):57	0	788	788
2008-452	Wetland	LVRT(11)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(11):57,58	233	2,500	2,733
2008-453	Wetland	LVRT(11)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(11):58	161	541	702
2008-456	Wetland	LVRT(11)	CLEAN AND REPAIR INLET, INSTALL BEAVER FENCE	LVRT(11):58	0	514	514
2008-457	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):59	276	637	913
2008-458	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):59	235	941	1,176
2008-459	Wetland	LVRT(11)	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET	LVRT(11):59	0	1,554	1,554
2008-460	Wetland	LVRT(11)	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET	LVRT(11):59	0	1,143	1,143
2008-464	Wetland	LVRT(11)	CLEAN INLET AND OUTLET, REPAIR OUTLET, REPAIR BANKING	LVRT(11):60,61	206	513	719
2008-467	Wetland	LVRT(11)	REPLACE CULVERT, REPAIR BANKING, REGRADE AROUND OUTLET	LVRT(11):61	46	53	99
2008-468	Wetland	LVRT(11)	EXCAVATE AND REPAIR	LVRT(11):61	0	666	666
2008-469	Wetland	LVRT(11)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(11):62	304	790	1,094
2008-476	Wetland	LVRT(11)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(11):62	94	543	637
2008-477	Wetland	LVRT(11)	EXCAVATE AND REPAIR	LVRT(11):63	0	363	363
2008-480	Wetland	LVRT(11)	EXCAVATE AND REPLACE, INSTALL BEAVER FENCE	LVRT(11):64	296	427	723
2008-481	Wetland	LVRT(11)	EXCAVATE AND REPLACE, INSTALL BEAVER FENCE	LVRT(11):64	676	1,554	2,230
2008-485	Wetland	LVRT(11)	CLEAN INLET, REGRADE INLET AND OUTLET, REPAIR BANKING	LVRT(11):66	0	194	194
2008-486	Wetland	LVRT(11)	CLEAN OUTLET, REGRADE AROUND INLET, REPAIR BANKING	LVRT(11):66	13	354	367
2008-488	Wetland	LVRT(11)	EXCAVATE AND REPLACE, REGRADE INLET AND OUTLET	LVRT(11):66	174	560	734
2008-489	Wetland	LVRT(11)	REPLACE CULVERT, REPAIR BANKING	LVRT(11):67	338	229	567
2008-491	Wetland	LVRT(11)	CLEAN AND REPAIR INLET, INSTALL BEAVER FENCE	LVRT(11):68	0	459	459
2008-492	Wetland	LVRT(11)	REGRADE AROUND OUTLET, REPAIR BANKING	LVRT(11):68	0	89	89
2008-493	Wetland	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS, REPLACE BRIDGE SEATS AND BACKWALLS, RESET STONE MASONRY WINGWALLS, REPOINT ABUTMENTS AND WINGWALLS	LVRT(11):42,68	0	71	71
2008-497	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):70	276	554	830
2008-503	Wetland	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS	LVRT(11):43,73	0	194	194
2008-506	Wetland	LVRT(11)	REPLACE CULVERT	LVRT(11):75	73	695	768
2008-507	Wetland	LVRT(11)	REPLACE CULVERT	LVRT(11):75	0	5	5
2008-508	Wetland	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS	LVRT(11):44,75	0	0	0
2008-510	Wetland	LVRT(11)	INSTALL NEW CULVERT, RESTORE EMBANKMENT OVER CULVERT	LVRT(11):76	391	676	1,067
2008-511	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):76	82	719	801
2008-512	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):76	0	341	341
2008-513	Wetland	LVRT(11)	REPLACE CULVERT, REPAIR BANKING, REGRADE AROUND INLET	LVRT(11):77	333	1,041	1,374
2008-515	Wetland	LVRT(11)	CLEAN INLET AND OUTLET, REGRADE AROUND INLET AND OUTLET	LVRT(11):77,78	120	697	817
2008-516	Wetland	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):78	0	355	355
2008-518	Wetland	LVRT(11)	CLEAN INLET, REPAIR OUTLET AND BANKING	LVRT(11):79	160	144	304
2008-520	Wetland	LVRT(11)	INSTALL GUARDRAILS, RESET STONE MASONRY HEADWALLS, RESET COLLAPSED STONE MASONRY WINGWALL, REPOINT STONE ARCH AND WINGWALLS	LVRT(11):45,80	0	430	430
2008-523	Wetland	LVRT(11)	CLEAN INLET, REPAIR INLET AND OUTLET, REPAIR BANKING	LVRT(11):81	64	588	652
2008-524	Wetland	LVRT(11)	CLEAN INLET, REPAIR INLET AND OUTLET, REPAIR BANKING	LVRT(11):82	253	339	592
2008-526	Wetland	LVRT(11)	REPLACE CULVERT	LVRT(11):82,83	282	430	712
2008-527	Wetland	LVRT(11)	EXCAVATE AND REPAIR	LVRT(11):83	0	774	774
2008-528	Wetland	LVRT(11)	EXCAVATE AND REPAIR	LVRT(11):83	0	169	169
2020-10	Wetland	LVRT(11)	REPLACE CULVERT	LVRT(11):81,82	0	47	47
2020-12	Wetland	LVRT(11)	REPAIR INLET, REPAIR BANKING	LVRT(11):77,78	61	182	243
2020-14	Wetland	LVRT(11)	REPLACE CULVERT, REPAIR BANKING, REGRADE AROUND INLET	LVRT(11):77	9	513	522

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2020-4	Wetland	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS, REPLACE BRIDGE SEATS AND BACKWALLS, RESET STONE MASONRY WINGWALLS, REPOINT ABUTMENTS AND WINGWALLS	LVRT(11):42,68	0	4,432	4,432
2020-6	Wetland	LVRT(11)	INSTALL NEW CULVERT, RESTORE EMBANKMENT OVER CULVERT	LVRT(11):76	527	1,110	1,637
2008-SC263	Water	LVRT(11)	EXCAVATE AND REPLACE	LVRT(11):47	92	45	137
2008-SC267	Water	LVRT(11)	CLEAN INLET AND OUTLET, REPAIR INLET	LVRT(11):50	0	37	37
2008-SC278	Water	LVRT(11)	EXCAVATE AND REPAIR	LVRT(11):63	0	149	149
2008-SC280	Water	LVRT(11)	CLEAN INLET, REGRADE INLET AND OUTLET, REPAIR BANKING	LVRT(11):66	79	32	111
2008-SC281	Water	LVRT(11)	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET	LVRT(11):66	0	63	63
2008-SC282	Water	LVRT(11)	CLEAN OUTLET, REGRADE AROUND INLET, REPAIR BANKING	LVRT(11):66	25	0	25
2008-SC284	Water	LVRT(11)	EXCAVATE AND REPLACE, REGRADE INLET AND OUTLET	LVRT(11):66	48	9	57
2008-SC288	Water	LVRT(11)	STABILIZE OUTLET	LVRT(11):68	142	44	186
2008-SC290	Water	LVRT(11)	CLEAN INLET, REPAIR INLET AND OUTLET, REPAIR BANKING	LVRT(11):69	131	14	145
2008-SC298	Water	LVRT(11)	CLEAN INLET AND OUTLET, REGRADE AROUND INLET AND OUTLET	LVRT(11):78	8	15	23
2008-SC299	Water	LVRT(11)	CLEAN INLET AND OUTLET, REGRADE AROUND INLET AND OUTLET	LVRT(11):78	131	22	153
2008-SC300	Water	LVRT(11)	CLEAN INLET, REPAIR OUTLET AND BANKING	LVRT(11):79	182	0	182
2008-SC302	Water	LVRT(11)	CLEAN INLET AND OUTLET, REPAIR OUTLET	LVRT(11):79	0	108	108
2008-TB269	Water	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS, REPOINT ABUTMENTS AND WINGWALLS	LVRT(11):54,35	0	1,461	1,461
2008-TB270	Water	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS, REPLACE BRIDGE SEATS AND BACKWALLS, REPOINT ABUTMENTS	LVRT(11):55,36	0	1,509	1,509
2008-TB271	Water	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS	LVRT(11):55,37	0	2,060	2,060
2008-TB273	Water	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS	LVRT(11):60,38	0	775	775
2008-TB275	Water	LVRT(11)	REPLACE CULVERT, REPAIR BANKING, REGRADE AROUND OUTLET	LVRT(11):61	92	96	188
2008-TB279	Water	LVRT(11)	INSTALL GUARDRAILS, STABILIZE SIDE SLOPES WITH STONE FILL, TYPE I	LVRT(11):65,40	0	1,329	1,329
2008-TB285	Water	LVRT(11)	INSTALL GUARDRAILS, RESET STONE MASONRY HEADWALLS, REPOINT STONE ARCH AND WINGWALLS	LVRT(11):66,41	0	1,913	1,913
2008-TB289	Water	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS, REPLACE BRIDGE SEATS AND BACKWALLS, RESET STONE MASONRY WINGWALLS, REPOINT ABUTMENTS AND WINGWALLS	LVRT(11):68,42	0	1,075	1,075
2008-TB295	Water	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS	LVRT(11):73,43	0	2,072	2,072
2008-TB297	Water	LVRT(11)	REPLACE DECK, INSTALL CURB, INSTALL BRIDGE AND APPROACH RAILS	LVRT(11):75,44,76	0	4,425	4,425
2008-TB303	Water	LVRT(11)	INSTALL GUARDRAILS, RESET STONE MASONRY HEADWALLS, RESET COLLAPSED STONE MASONRY WINGWALL, REPOINT STONE ARCH AND WINGWALLS	LVRT(11):80,45	0	1,859	1,859
2020-SC-3	Water	LVRT(11)	CLEAN INLET/OUTLET, REPAIR BANKING, INSTALL BEAVER FENCE	LVRT(11):55	12	0	12
LVRT(11) Wetland Impact Subtotals (sq. ft.):					9,771	49,284	59,055
LVRT(11) Wetland Impact Subtotals (acres):					0.224	1.131	1.356
LVRT(11) Water Impact Subtotals (sq. ft.):					942	19,112	20,054
LVRT(11) Water Impact Subtotals (acres):					0.022	0.439	0.460
LVRT(11) Impact Type Subtotals (sq. ft.):					10,713	68,396	79,109
LVRT(11) Impact Type Subtotals (acres):					0.246	1.570	1.816
2008-219	Wetland	LVRT(12)	REMOVE EXISTING CULVERT, CONSTRUCT WASTE BLOCK ABUTMENTS, CONSTRUCT BRIDGE USING RECYCLED H-PILES PROVIDED BY VAST	LVRT(12):63,78	0	280	280
2008-220	Wetland	LVRT(12)	RESTORE GRADE AT INLET & OUTLET, RESET EXIST. CULVERT	LVRT(12):78	107	290	397
2008-221	Wetland	LVRT(12)	REPAIR EAST ABUTMENT, REPLACE/RAISE DECK, INSTALL GUARDRAILS	LVRT(12):64,78	0	115	115
2008-226	Wetland	LVRT(12)	EXCAVATE AND REPLACE	LVRT(12):79	92	565	657
2008-227	Wetland	LVRT(12)	EXCAVATE AND REPLACE	LVRT(12):79	72	47	119
2008-228	Wetland	LVRT(12)	STABILIZATION	LVRT(12):79	1,271	0	1,271
2008-229	Wetland	LVRT(12)	STABILIZATION	LVRT(12):79	885	0	885
2008-234	Wetland	LVRT(12)	INSTALL NEW CULVERT, DITCH FROM 1919+50 LEFT TO CULVERT	LVRT(12):80	3	223	226
2008-235	Wetland	LVRT(12)	INSTALL NEW CULVERT, DITCH FROM 1919+50 LEFT TO CULVERT	LVRT(12):80	568	427	995
2008-237	Wetland	LVRT(12)	EXCAVATE AND REPLACE	LVRT(12):81	168	428	596
2008-238	Wetland	LVRT(12)	EXCAVATE AND REPLACE	LVRT(12):81	155	826	981
2008-240	Wetland	LVRT(12)	INSTALL GUARDRAILS, REPAIR FASCIA	LVRT(12):65,82	0	5	5
2008-241	Wetland	LVRT(12)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(12):82	148	262	410
2008-242	Wetland	LVRT(12)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(12):82	73	624	697
2008-244	Wetland	LVRT(12)	INSTALL NEW CULVERT	LVRT(12):82	12	557	569
2008-246	Wetland	LVRT(12)	REPLACE DECK, REMOVE AND RESET ABUTMENT STONES, INSTALL GUARDRAILS	LVRT(12):66,83	0	309	309
2008-247	Wetland	LVRT(12)	REPLACE DECK, CONSTRUCT NEW CONCRETE ABUTMENTS, INSTALL GUARDRAILS	LVRT(12):67,84	0	403	403
2008-248	Wetland	LVRT(12)	REPAIR INLET, REPAIR BANKING	LVRT(12):84	289	881	1,170
2008-249a	Wetland	LVRT(12)	REPAIR INLET, REPAIR BANKING	LVRT(12):84	152	423	575
2008-251	Wetland	LVRT(12)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(12):84,85	276	829	1,105
2008-252	Wetland	LVRT(12)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(12):84,85	314	455	769
2008-255	Wetland	LVRT(12)	REPAIR SIDING, REPLACE DECK, REPAIR ABUTMENTS, WIDEN APPROACH	LVRT(12):68,85,86	0	140	140
2008-257	Wetland	LVRT(12)	EXCAVATE AND REPLACE, INSTALL BEAVER FENCE AT INLET	LVRT(12):87	236	629	865
2008-258	Wetland	LVRT(12)	REGRADE AROUND INLET	LVRT(12):87	31	234	265
2008-262	Wetland	LVRT(12)	CLEAN OUTLET, EXCAVATE AND REPLACE	LVRT(12):89	203	686	889
2008-263	Wetland	LVRT(12)	CLEAN OUTLET, EXCAVATE AND REPLACE	LVRT(12):89	0	1	1
2008-264	Wetland	LVRT(12)	CLEAN INLET AND OUTLET, EXCAVATE AND REPLACE	LVRT(12):90	53	234	287
2008-265	Wetland	LVRT(12)	CLEAN INLET AND OUTLET, EXCAVATE AND REPLACE	LVRT(12):90	5	106	111
2008-273	Wetland	LVRT(12)	EXCAVATE AND REPAIR CULVERT	LVRT(12):91	0	915	915
2008-274	Wetland	LVRT(12)	EXCAVATE AND REPAIR CULVERT	LVRT(12):91	0	977	977
2008-282	Wetland	LVRT(12)	REMOVE STRUCTURE, INSTALL 4x4 BOX CULVERT	LVRT(12):72,94,95	0	0	0
2008-285	Wetland	LVRT(12)	EXCAVATE AND REPLACE	LVRT(12):95,96	386	984	1,370
2008-289	Wetland	LVRT(12)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(12):96	101	233	334

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2008-291	Wetland	LVRT(12)	REPLACE CULVERT	LVRT(12):96,97	88	701	789
2008-294	Wetland	LVRT(12)	EXCAVATE AND REPLACE, INSTALL BEAVER FENCE AT INLET	LVRT(12):97,98	759	1,474	2,233
2008-296	Wetland	LVRT(12)	CLEAN AND REPAIR INLET AND OUTLET	LVRT(12):98	0	658	658
2008-297	Wetland	LVRT(12)	CLEAN AND REPAIR INLET AND OUTLET	LVRT(12):98	0	967	967
2008-299	Wetland	LVRT(12)	REPAIR OUTLET AND BANKING	LVRT(12):98	321	621	942
2008-300	Wetland	LVRT(12)	REPAIR OUTLET AND BANKING	LVRT(12):98	192	746	938
2008-302	Wetland	LVRT(12)	CLEAN INLET AND OUTLET, REPAIR OUTLET	LVRT(12):99	0	865	865
2008-303	Wetland	LVRT(12)	REGRADE AND STABILIZE INLET AND OUTLET, REPLACE CULVERT	LVRT(12):99,100	349	1,147	1,496
2008-304	Wetland	LVRT(12)	REGRADE AND STABILIZE INLET AND OUTLET, REPLACE CULVERT	LVRT(12):100	103	701	804
2008-306	Wetland	LVRT(12)	EXCAVATE AND REPAIR CULVERT, REPAIR BANKING	LVRT(12):101	25	48	73
2008-308	Wetland	LVRT(12)	REPLACE CULVERT	LVRT(12):101	81	33	114
2008-310	Wetland	LVRT(12)	CLEAN INLET AND OUTLET, REPAIR BANKING	LVRT(12):102	168	838	1,006
2020/2008-295	Wetland	LVRT(12)	INSTALL NEW CULVERT	LVRT(12):97	558	1,731	2,289
2020-15	Wetland	LVRT(12)	STABILIZATION	LVRT(12):80	152	0	152
2020-16	Wetland	LVRT(12)	STABILIZATION	LVRT(12):80	164	0	164
2008/2019-SC141	Water	LVRT(12)	RESTORE GRADE AT INLET & OUTLET, RESET EXIST. CULVERT	LVRT(12):78	3	0	3
2008/2019-TB140	Water	LVRT(12)	RESTORE GRADE AT INLET & OUTLET, RESET EXIST. CULVERT	LVRT(12):78,63	22	647	669
2008/2019-TB141	Water	LVRT(12)	RESTORE GRADE AT INLET & OUTLET, RESET EXIST. CULVERT	LVRT(12):78	174	6	180
2008-SC142	Water	LVRT(12)	EXCAVATE AND REPLACE	LVRT(12):79	15	0	15
2008-SC143	Water	LVRT(12)	INSTALL NEW CULVERT, DITCH FROM 1919+50 LEFT TO CULVERT	LVRT(12):80	11	0	11
2008-SC147	Water	LVRT(12)	EXCAVATE AND REPLACE, CLEAN INLET AND OUTLET	LVRT(12):80,81	65	45	110
2008-SC155	Water	LVRT(12)	CLEAN OUTLET, REPAIR BANKING	LVRT(12):85	48	33	81
2008-SC156	Water	LVRT(12)	CLEAN INLET, REPAIR OUTLET	LVRT(12):86	0	21	21
2008-SC159	Water	LVRT(12)	REGRADE AROUND INLET	LVRT(12):87	16	0	16
2008-SC164	Water	LVRT(12)	REGRADE AROUND INLET	LVRT(12):88	118	18	136
2008-SC167	Water	LVRT(12)	EXCAVATE AND REPAIR CULVERT	LVRT(12):91	0	2	2
2008-SC175	Water	LVRT(12)	CLEAN OUTLET, REPAIR INLET AND BANKING	LVRT(12):97	22	0	22
2008-SC180	Water	LVRT(12)	CLEAN INLET AND OUTLET, REGRADE AROUND OUTLET	LVRT(12):100	50	0	50
2008-SC181	Water	LVRT(12)	CLEAN INLET AND OUTLET, REPAIR OUTLET	LVRT(12):100	0	53	53
2008-SC182	Water	LVRT(12)	EXCAVATE AND REPAIR INLET AND OUTLET, REPAIR BANKING	LVRT(12):100	89	31	120
2008-SC183	Water	LVRT(12)	REPLACE CULVERT, REGRADE AROUND INLET AND OUTLET	LVRT(12):100,101	129	65	194
2008-SC184	Water	LVRT(12)	EXCAVATE AND REPAIR CULVERT, REPAIR BANKING	LVRT(12):101	168	32	200
2008-SC186	Water	LVRT(12)	REPLACE CULVERT AND REPAIR BANKING	LVRT(12):101	96	35	131
2008-SC191	Water	LVRT(12)	CLEAN INLET AND OUTLET, REPAIR BANKING	LVRT(12):102	67	28	95
2008-TB145	Water	LVRT(12)	RESET HEADWALL, REPAIR BANKING	LVRT(12):80	163	225	388
2008-TB148	Water	LVRT(12)	EXCAVATE AND REPLACE, REPAIR BANKING	LVRT(12):81	158	72	230
2008-TB149	Water	LVRT(12)	INSTALL GUARDRAILS, REPAIR FASCIA	LVRT(12):82,65	0	968	968
2008-TB151	Water	LVRT(12)	REPLACE DECK, REMOVE AND RESET ABUTMENT STONES, INSTALL GUARDRAILS	LVRT(12):83,66	0	453	453
2008-TB153	Water	LVRT(12)	REPLACE DECK, CONSTRUCT NEW CONCRETE ABUTMENTS, INSTALL GUARDRAILS	LVRT(12):84,67	0	1,496	1,496
2008-TB156	Water	LVRT(12)	CLEAN INLET, REPAIR OUTLET	LVRT(12):86	0	82	82
2008-TB157	Water	LVRT(12)	REPLACE DECK, REMOVE AND RESET GIRDERS, REPAIR ABUTMENTS, INSTALL GUARDRAILS	LVRT(12):87,69	0	1,373	1,373
2008-TB168	Water	LVRT(12)	REPLACE CULVERT	LVRT(12):91,92	181	95	276
2008-TB169	Water	LVRT(12)	ERECT PREFABRICATED MULTI-MODAL BRIDGE, CONSTRUCT NEW CONCRETE ABUTMENTS	LVRT(12):93,71	0	5,531	5,531
2008-TB176	Water	LVRT(12)	REPLACE DECK, REPOINT ABUTMENTS	LVRT(12):98,74	0	1,822	1,822
2008-TB179	Water	LVRT(12)	REPLACE CULVERT	LVRT(12):99,75	360	105	465
2008-TB184	Water	LVRT(12)	EXCAVATE AND REPAIR CULVERT, REPAIR BANKING	LVRT(12):101	29	30	59
2008-TB187	Water	LVRT(12)	REPAIR OUTLET	LVRT(12):101	0	66	66
2008-TB192	Water	LVRT(12)	INSTALL GUARDRAILS, REPOINT ABUTMENTS	LVRT(12):102,76	0	524	524
2008-TBLM	Water	LVRT(12)	REPLACE DECK, CONSTRUCT NEW CONCRETE ABUTMENTS, INSTALL GUARDRAILS	LVRT(12):80,87,92,89,70,86,68,96,73,78,64,97,85,LVRT(13):60	462	24,063	24,525
2019-SC140	Water	LVRT(12)	CONST. BRIDGE	LVRT(12):78,63	0	0	0
2020-SC-104	Water	LVRT(12)	REPLACE CULVERT	LVRT(12):94,72	81	78	159
LVRT(12) Wetland Impact Subtotals (sq. ft.):					8,560	23,618	32,178
LVRT(12) Wetland Impact Subtotals (acres):					0.197	0.542	0.739
LVRT(12) Water Impact Subtotals (sq. ft.):					2,527	37,999	40,526
LVRT(12) Water Impact Subtotals (acres):					0.058	0.872	0.930
LVRT(12) Impact Type Subtotals (sq. ft.):					11,087	61,617	72,704
LVRT(12) Impact Type Subtotals (acres):					0.255	1.415	1.669
2008-111	Wetland	LVRT(13)	REPLACE DECK, INSTALL BRIDGE AND APPROACH RAILS	LVRT(13):31,33	0	19	19
2008-111a	Wetland	LVRT(13)	REPLACE DECK, INSTALL BRIDGE AND APPROACH RAILS	LVRT(13):31,33	0	25	25
2008-116	Wetland	LVRT(13)	CLEAN INLET AND OUTLET, EXCAVATE AND REPLACE	LVRT(13):34	25	49	74
2008-127	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):35,36	28	569	597
2008-128	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):36	224	558	782
2008-129	Wetland	LVRT(13)	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET	LVRT(13):36	0	78	78
2008-131	Wetland	LVRT(13)	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET	LVRT(13):36	0	436	436
2008-148	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):42	75	502	577
2008-151	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):44	48	24	72
2008-152	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):44	0	2	2
2008-156	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):47	0	19	19
2008-161	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):48	134	171	305
2008-162	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):48	126	777	903
2008-170	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):50	94	273	367
2008-182	Wetland	LVRT(13)	REPAIR BANKING AT OUTLET	LVRT(13):56	368	698	1,066
2008-192	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):59,60	155	181	336
2008-197	Wetland	LVRT(13)	REPLACE CULVERT	LVRT(13):60	206	264	470
2008-199	Wetland	LVRT(13)	REPLACE CULVERT	LVRT(13):60	192	634	826
2008-208	Wetland	LVRT(13)	EXCAVATE AND REPLACE, REPAIR BANKING AT OUTLET	LVRT(13):66	717	2,746	3,463
2008-209	Wetland	LVRT(13)	EXCAVATE AND REPLACE, REPAIR BANKING AT OUTLET	LVRT(13):66	206	902	1,108
2008-215	Wetland	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):69	377	591	968
2020/2008-212	Wetland	LVRT(13)	CLEAN OUTLET, REGRADE AROUND INLET	LVRT(13):68	64	627	691
2008/2020-SC120	Water	LVRT(13)	REPLACE CULVERT	LVRT(13):60	110	0	110
2008-SC071	Water	LVRT(13)	CLEAN INLET AND OUTLET, EXCAVATE AND REPLACE	LVRT(13):35,36	57	29	86

Feature ID ^{1,2}	Feature Type	Trail Section	Proposed Work	EPSC Corresponding Sheet	Proposed WOTUS Impacts		TOTAL IMPACTS (Sq. Ft.)
					Permanent Impacts ³ (Sq. Ft.)	Temporary Impacts ⁴ (Sq. Ft.)	
2008-SC072	Water	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):36	4	0	4
2008-SC073	Water	LVRT(13)	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET	LVRT(13):36	0	136	136
2008-SC081	Water	LVRT(13)	REPAIR OUTLET	LVRT(13):41	0	74	74
2008-SC084	Water	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):42	59	24	83
2008-SC085	Water	LVRT(13)	CLEAN INLET AND OUTLET, REPAIR OUTLET	LVRT(13):42	0	32	32
2008-SC087	Water	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):44	85	19	104
2008-SC089	Water	LVRT(13)	REPAIR INLET AND OUTLET, REPAIR BANKING	LVRT(13):45	152	30	182
2008-SC092	Water	LVRT(13)	CLEAN INLET, REPAIR OUTLET AND BANKING	LVRT(13):45,46	81	58	139
2008-SC100	Water	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):50	38	13	51
2008-SC105	Water	LVRT(13)	CONSTRUCT STONE ARMOR AT OUTLET	LVRT(13):52	3	0	3
2008-SC119	Water	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):60	58	30	88
2008-SC122	Water	LVRT(13)	EXCAVATE AND REPAIR	LVRT(13):63	0	67	67
2008-SC129	Water	LVRT(13)	EXCAVATE AND REPLACE, REPAIR BANKING AT OUTLET	LVRT(13):66	42	0	42
2008-SC131	Water	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):66	118	32	150
2008-SC132	Water	LVRT(13)	REPAIR BANKING, CLEAN CULVERT	LVRT(13):67	110	18	128
2008-SC134	Water	LVRT(13)	INSTALL CULVERT	LVRT(13):67	7	27	34
2008-SC135	Water	LVRT(13)	CLEAN INLET, REGRADE AROUND OUTLET	LVRT(13):67	57	14	71
2008-TB068	Water	LVRT(13)	REPLACE DECK, INSTALL BRIDGE AND APPROACH RAILS	LVRT(13):33,31	0	975	975
2008-TB076	Water	LVRT(13)	REPAIR AND REGRADE OUTLET	LVRT(13):39	112	65	177
2008-TB082	Water	LVRT(13)	CLEAN INLET, REPAIR OUTLET	LVRT(13):41,42	0	94	94
2008-TB092	Water	LVRT(13)	CLEAN INLET, REPAIR OUTLET AND BANKING	LVRT(13):45,46	23	57	80
2008-TB100	Water	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):50	67	30	97
2008-TB101	Water	LVRT(13)	CLEAN INLET, REGRADE OUTLET	LVRT(13):50	120	0	120
2008-TB102	Water	LVRT(13)	CLEAN AND REGRADE AROUND INLET	LVRT(13):51	546	271	817
2008-TB104	Water	LVRT(13)	CLEAN INLET, REPAIR OUTLET AND BANKING	LVRT(13):52	150	0	150
2008-TB110	Water	LVRT(13)	REPAIR OUTLET	LVRT(13):54	0	339	339
2008-TB116	Water	LVRT(13)	REPLACE DECK, INSTALL BRIDGE AND APPROACH RAILS, FILL VOIDS AND RE-POINT SUBSTRUCTURE	LVRT(13):59,32	0	2,569	2,569
2008-TB117	Water	LVRT(13)	EXCAVATE AND REPLACE	LVRT(13):59,60	207	731	938
2008-TB123	Water	LVRT(13)	EXCAVATE AND REPAIR	LVRT(13):63	0	341	341
2008-TB124	Water	LVRT(13)	CONSTRUCT STONE ARMOR AT OUTLET	LVRT(13):63	92	0	92
2008-TBLM	Water	LVRT(13)	REPLACE DECK, CONSTRUCT NEW CONCRETE ABUTMENTS, INSTALL GUARDRAILS	LVRT(12):80,87,92,89,70,86,68,96,73,78,64,97,85,LVRT(13):60	0	165	165
LVRT(13) Wetland Impact Subtotals (sq. ft.):					3,039	10,145	13,184
LVRT(13) Wetland Impact Subtotals (acres):					0.070	0.233	0.303
LVRT(13) Stream Impact Subtotals (sq. ft.):					2,298	6,240	8,538
LVRT(13) Stream Impact Subtotals (acres):					0.053	0.143	0.196
LVRT(13) Impact Type Subtotals (sq. ft.):					5,337	16,385	21,722
LVRT(13) Impact Type Subtotals (acres):					0.123	0.376	0.499
Total Wetland Impact Subtotals (sq. ft.):					21,370	83,047	13,184
Total Wetland Impact Subtotals (acres):					0.491	1.906	0.303
Total Stream Impact Subtotals (sq. ft.):					5,767	63,351	8,538
Total Stream Impact Subtotals (acres):					0.132	1.454	0.196
TOTAL PROPOSED IMPACTS (SQUARE FEET):					27,137	146,398	173,535
TOTAL PROPOSED IMPACTS (ACRES):					0.623	3.361	3.984

¹ Wetlands delineated per the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northeast and North Central Region. U.S. Army Corps of Engineers. 2011.

² Areas of delineated wetlands within the project boundary from survey of wetlands and located by VHB GPS data collections.

³ Proposed Permanent Impacts would result from fill- structure and riprap placement

⁴ Proposed Temporary Impacts would occur from temporary construction and the installation of erosion prevention and sediment control measures during construction.



Lamoille Valley Rail Trail Project – VTrans Project STP
LVRT(11): Cambridge to Sheldon; LVRT(12): Hardwick to Morrisville; LVRT(13): Danville to Hardwick
Vermont Agency of Transportation
Vermont Wetland Program
Prepared by VHB
2/22/2021; Revised 3/2/2021, 3/9/2021, 3/25/2021

Feature ID ^{1,2}	Proposed Work	EPSC Corresponding Sheet	Proposed Class II Wetland and Buffer Impacts				TOTAL IMPACTS (Sq. Ft.)
			Permanent Wetland Impacts ³ (Sq. Ft.)	Temporary Wetland Impacts ⁴ (Sq. Ft.)	Permanent Buffer Impacts ³ (Sq. Ft.)	Temporary Buffer Impacts ⁴ (Sq. Ft.)	
2008-423	Culvert	LVRT(11):47	69	388	247	671	1,375
2008-424	Culvert,Ditch	LVRT(11):48	394	866	217	142	1,619
2008-425	Culvert,Ditch	LVRT(11):48	456	1,733	244	164	2,597
2008-426	Culvert,Ditch	LVRT(11):48,49	366	1,412	170	529	2,477
2008-430	Culvert	LVRT(11):49	53	562	279	431	1,325
2008-431	Culvert	LVRT(11):49	0	370	115	708	1,193
2008-432	Culvert	LVRT(11):49	339	1,012	63	95	1,509
2008-434	Culvert,Ditch	LVRT(11):49	240	532	335	592	1,699
2008-435	Culvert	LVRT(11):50	121	746	58	66	991
2008-438	Culvert	LVRT(11):51	133	581	55	87	856
2008-439	Culvert	LVRT(11):51,53,54	959	3,405	0	0	4,364
2008-440	Bridge,Culvert	LVRT(11):53,54,35	374	2,003	28	593	2,998
2008-441	Bridge	LVRT(11):54,35	0	266	0	0	266
2008-442	Bridge	LVRT(11):55,36	0	146	0	151	297
2008-443	Bridge	LVRT(11):55,36	0	86	0	15	101
2008-444	Culvert,Ditch	LVRT(11):55	177	579	148	103	1,007
2008-445	Bridge,Culvert,Ditch	LVRT(11):55,37	203	787	296	310	1,596
2008-446	Bridge	LVRT(11):55,37	0	374	0	0	374
2008-447	Culvert,Ditch	LVRT(11):56	330	1,081	981	0	2,392
2008-448	Ditch	LVRT(11):56	0	0	99	0	99
2008-449	Culvert,Ditch	LVRT(11):56	898	952	384	514	2,748
2008-450	Culvert,Ditch	LVRT(11):56	916	810	728	31	2,485
2008-451	Culvert,Ditch	LVRT(11):57	264	524	158	109	1,055
2008-452	Culvert	LVRT(11):58,57	621	2,106	10	14	2,751
2008-453	Culvert,Ditch	LVRT(11):58	543	540	456	139	1,678
2008-455	Culvert,Ditch	LVRT(11):58	35	619	192	196	1,042
2008-456	Culvert,Ditch	LVRT(11):58	0	509	96	184	789
2008-457	Culvert,Ditch	LVRT(11):59	278	636	207	93	1,214
2008-458	Culvert,Ditch	LVRT(11):59	235	938	124	0	1,297
2008-459	Culvert,Ditch	LVRT(11):59,60	386	1,158	186	0	1,730
2008-460	Culvert,Ditch	LVRT(11):59,60	267	918	259	0	1,444
2008-461	Bridge,Ditch	LVRT(11):60,38	0	0	23	124	147
2008-462	Bridge	LVRT(11):60,38	0	0	0	319	319
2008-465	Culvert	LVRT(11):61	303	1,041	9	16	1,369
2008-466	Culvert	LVRT(11):61	0	0	230	333	563
2008-467	Culvert	LVRT(11):61	46	53	188	249	536
2008-468	Culvert	LVRT(11):61	25	638	353	514	1,530
2008-469	Culvert	LVRT(11):62	303	790	0	0	1,093
2008-476	Culvert	LVRT(11):62	93	542	172	353	1,160
2008-477	Culvert,Ditch	LVRT(11):63	0	362	129	253	744
2008-479	Ditch	LVRT(11):64	0	0	399	0	399
2008-480	Culvert	LVRT(11):64	296	427	124	205	1,052
2008-481	Culvert	LVRT(11):64	676	1,551	273	457	2,957
2008-484	Bridge	LVRT(11):65,40	0	0	0	704	704
2008-485	Culvert	LVRT(11):66	0	193	336	781	1,310
2008-486	Culvert,Ditch	LVRT(11):66	13	352	270	400	1,035
2008-488	Culvert	LVRT(11):66	173	560	288	647	1,668
2008-489	Culvert,Ditch	LVRT(11):67	338	229	193	1,019	1,779
2008-490	Culvert	LVRT(11):68	71	687	342	520	1,620
2008-491	Culvert	LVRT(11):68	87	370	180	616	1,253
2008-492	Culvert	LVRT(11):68	3	604	155	640	1,402
2008-493	Bridge	LVRT(11):68,42	0	71	0	271	342
2020-4	Bridge	LVRT(11):68,42	0	4,432	0	765	5,197
2008-494	Ditch	LVRT(11):68,69	0	0	157	0	157
2020/2008-495	Ditch	LVRT(11):69	1,347	0	219	0	1,566
2008-497	Culvert	LVRT(11):70	275	554	203	304	1,336
2008-503	Bridge,Culvert	LVRT(11):73,43	191	1,056	0	168	1,415
2008-504	Culvert	LVRT(11):73	136	790	126	113	1,165
2008-505	Ditch	LVRT(11):75	0	0	220	0	220
2008-506	Culvert	LVRT(11):75	73	692	96	153	1,014
2008-507	Culvert	LVRT(11):75	0	5	269	674	948
2008-508	Bridge	LVRT(11):75,44	0	0	0	57	57
2008-510	Culvert	LVRT(11):76	575	1,516	546	815	3,452
2008-511	Culvert	LVRT(11):76	81	716	226	333	1,356
2008-512	Culvert	LVRT(11):76	0	340	168	497	1,005
2020-6	Culvert	LVRT(11):76	526	1,109	160	231	2,026
2008-513	Culvert	LVRT(11):77	333	1,039	0	0	1,372
2020-14	Culvert	LVRT(11):77	9	510	302	542	1,363
2020-12	Culvert	LVRT(11):77,78	61	181	654	844	1,740

Feature ID ^{1,2}	Proposed Work	EPSC Corresponding Sheet	Proposed Class II Wetland and Buffer Impacts				TOTAL IMPACTS (Sq. Ft.)
			Permanent Wetland Impacts ³ (Sq. Ft.)	Temporary Wetland Impacts ⁴ (Sq. Ft.)	Permanent Buffer Impacts ³ (Sq. Ft.)	Temporary Buffer Impacts ⁴ (Sq. Ft.)	
2008-516	Culvert	LVRT(11):78	0	353	343	501	1,197
2008-517	Culvert	LVRT(11):78	0	0	0	339	339
2008-515	Culvert	LVRT(11):78,77	120	696	611	1,418	2,845
2008-518	Culvert	LVRT(11):79	160	144	358	626	1,288
2020-11	Culvert	LVRT(11):79	4	23	487	776	1,290
2008-520	Bridge	LVRT(11):80,45	0	430	0	3,208	3,638
2008-522	Culvert,Ditch	LVRT(11):80	0	0	7	91	98
2008-523	Culvert	LVRT(11):81	63	586	274	419	1,342
2020-10	Culvert,Ditch	LVRT(11):81,82	0	47	285	793	1,125
2008-524	Culvert	LVRT(11):82	253	339	365	699	1,656
2008-526	Culvert	LVRT(11):82,83	281	430	462	974	2,147
2008-527	Culvert,Ditch	LVRT(11):83	92	679	406	461	1,638
2008-528	Culvert,Ditch	LVRT(11):83,84	0	168	835	545	1,548
LVRT(11) Impact Type Subtotals (sq ft):			15,664	51,944	17,578	30,704	115,890
LVRT(11) Impact Type Subtotals (acres):			0.360	1.192	0.404	0.705	2.660
LVRT(11) Impact Subtotals (sq ft):			67,608		48,282		--
LVRT(11) Impact Subtotals (acres):			1.552		1.108		--
2008-218	Culvert,Stabilization	LVRT(12):99	0	0	265	528	793
2008-221	Bridge	LVRT(12):99,85	0	115	0	517	632
2019/2008-217	Culvert	LVRT(12):99,84	0	0	346	455	801
2008-226	Culvert	LVRT(12):100	91	563	60	251	965
2008-227	Culvert	LVRT(12):100	72	47	277	488	884
2008-228	Ditch	LVRT(12):100	0	0	56	0	56
2008-230	Ditch	LVRT(12):100	0	0	20	0	20
2008-234	Culvert	LVRT(12):101	3	223	627	898	1,751
2008-235	Culvert	LVRT(12):101	75	426	75	377	953
2008-236	Culvert,Ditch	LVRT(12):101	0	0	147	302	449
2020-16	Cattlepass	LVRT(12):101	115	532	133	405	1,185
2008-237	Culvert	LVRT(12):102	167	427	188	277	1,059
2008-238	Culvert	LVRT(12):102	154	823	0	0	977
2008-240	Bridge	LVRT(12):103,86	0	0	0	345	345
2008-241	Culvert	LVRT(12):103	148	262	264	797	1,471
2008-242	Culvert	LVRT(12):103	73	621	53	155	902
2008-244	Culvert,Ditch,Stabilization	LVRT(12):103	11	554	838	261	1,664
2008-246	Bridge,Ditch	LVRT(12):104,87	0	309	41	746	1,096
2008-247	Bridge	LVRT(12):105,88	0	403	0	396	799
2008-248	Culvert,Ditch	LVRT(12):105	289	879	255	0	1,423
2008-249a	Culvert	LVRT(12):105	152	423	137	206	918
2008-251	Culvert,Ditch	LVRT(12):105,106	275	828	102	0	1,205
2008-252	Culvert	LVRT(12):105,106	314	455	75	133	977
2008-255	Bridge	LVRT(12):106,107,89	0	140	0	1,283	1,423
2008-257	Culvert	LVRT(12):108	236	629	83	263	1,211
2008-258	Culvert,Ditch	LVRT(12):108	31	234	731	489	1,485
2008-262	Crossing,Culvert	LVRT(12):110,91	202	684	280	1,513	2,679
2008-263	Culvert	LVRT(12):110	0	1	153	281	435
2008-264	Culvert	LVRT(12):111	53	234	103	523	913
2008-265	Culvert	LVRT(12):111	5	106	304	266	681
2008-266	Stabilization	LVRT(12):111	0	0	1,089	0	1,089
2008-267	Ditch	LVRT(12):111	0	0	4	0	4
2008-273	Culvert	LVRT(12):112	197	716	0	0	913
2008-274	Culvert	LVRT(12):112	258	688	13	0	959
2008-280	Ditch	LVRT(12):115	0	0	41	0	41
2008-282	Bridge,Ditch	LVRT(12):115,116,93	0	0	80	1,430	1,510
2008-284	Culvert	LVRT(12):116	0	0	0	95	95
2008-285	Culvert	LVRT(12):116,117	385	983	31	59	1,458
2008-289	Culvert	LVRT(12):117	101	233	263	432	1,029
2008-291	Culvert	LVRT(12):118,117	88	700	192	150	1,130
2020/2008-295	Culvert,Ditch	LVRT(12):118,117	2,340	1,622	672	240	4,874
2008-294	Culvert,Ditch	LVRT(12):118,119	758	1,464	726	1,365	4,313
2008-296	Culvert	LVRT(12):119	230	428	214	244	1,116
2008-297	Culvert	LVRT(12):119	295	672	0	0	967
2008-299	Culvert	LVRT(12):119	320	566	27	0	913
2008-300	Culvert	LVRT(12):119	192	745	0	0	937
2008-302	Culvert	LVRT(12):120	242	621	199	281	1,343
2008-304	Culvert,Ditch	LVRT(12):121	235	1,454	220	9	1,918
2008-303	Culvert	LVRT(12):120,121	348	1,138	657	1,155	3,298
2008-306	Culvert	LVRT(12):122	25	48	403	613	1,089
2008-308	Culvert	LVRT(12):122	81	33	270	498	882
2008-309	Bridge,Culvert	LVRT(12):123,97	0	0	522	1,062	1,584
2008-310	Culvert	LVRT(12):123	168	835	33	52	1,088
LVRT(12) Impact Type Subtotals (sq. ft.):			8,729	22,864	11,269	19,840	62,702
LVRT(12) Impact Type Subtotals (sq. ft.):			0.200	0.525	0.259	0.455	1.439
LVRT(12) Impact Subtotals (sq. ft.):			31,593		31,109		--
LVRT(12) Impact Subtotals (sq. ft.):			0.725		0.714		--

Feature ID ^{1,2}	Proposed Work	EPSC Corresponding Sheet	Proposed Class II Wetland and Buffer Impacts				TOTAL IMPACTS (Sq. Ft.)
			Permanent Wetland Impacts ³ (Sq. Ft.)	Temporary Wetland Impacts ⁴ (Sq. Ft.)	Permanent Buffer Impacts ³ (Sq. Ft.)	Temporary Buffer Impacts ⁴ (Sq. Ft.)	
2008-110	Bridge	LVRT(13):33,31	0	0	0	194	194
2008-111	Bridge	LVRT(13):33,31	0	18	0	1	19
2008-111a	Bridge	LVRT(13):33,31	0	24	0	976	1,000
2008-116	Culvert	LVRT(13):34	25	49	485	609	1,168
2008-117	Culvert	LVRT(13):34	0	0	198	266	464
2008-128	Culvert	LVRT(13):36	224	558	0	0	782
2008-129	Culvert,Ditch	LVRT(13):36	47	31	445	516	1,039
2008-131	Culvert	LVRT(13):36	221	214	298	561	1,294
2008-127	Culvert,Ditch	LVRT(13):36,35	28	566	92	741	1,427
2008-133	Ditch	LVRT(13):37	21	0	176	0	197
2008-141	Bridge	LVRT(13):40	0	0	0	922	922
2008-142	Bridge	LVRT(13):40	0	0	0	464	464
2008-143	Bridge	LVRT(13):40	0	0	0	675	675
2008-146	Culvert	LVRT(13):41	0	0	303	266	569
2008-147	Culvert	LVRT(13):41,42	77	244	611	1,174	2,106
2008-148	Culvert	LVRT(13):42	74	502	271	570	1,417
2008-151	Culvert	LVRT(13):44	48	24	328	541	941
2008-152	Culvert	LVRT(13):44	0	2	299	740	1,041
2008-155	Culvert	LVRT(13):45	0	0	173	127	300
2008-156	Culvert	LVRT(13):47	0	19	155	690	864
2020-100	Bridge	LVRT(13):47	0	0	0	21	21
2008-161	Culvert,Ditch	LVRT(13):48	178	171	928	192	1,469
2008-162	Culvert,Ditch	LVRT(13):48	186	774	103	0	1,063
2008-163	Culvert	LVRT(13):49	112	622	188	398	1,320
2008-170	Culvert	LVRT(13):50	93	272	250	360	975
2008-172	Ditch	LVRT(13):52	0	0	6	0	6
2008-178	Culvert	LVRT(13):54	0	0	210	336	546
2008-182	Culvert	LVRT(13):56	368	698	83	126	1,275
2008-185	Bridge	LVRT(13):59,32	0	0	0	255	255
2008-186	Bridge	LVRT(13):59,32	0	0	0	686	686
2008-187	Bridge	LVRT(13):59,32	0	0	0	150	150
2008-192	Culvert	LVRT(13):59,60	155	180	215	384	934
2008-196	Culvert	LVRT(13):60	0	0	0	131	131
2008-197	Culvert	LVRT(13):60	206	263	518	500	1,487
2008-199	Culvert	LVRT(13):60	192	633	314	387	1,526
2008-201	Culvert,Ditch	LVRT(13):62	522	826	485	168	2,001
2008-209	Culvert	LVRT(13):66	206	899	199	289	1,593
2008-208	Culvert, Ditch, Stabilization	LVRT(13):66,65	2,909	2,681	1,215	856	7,661
2020/2008-212	Culvert	LVRT(13):68	63	625	72	147	907
2008-215	Culvert	LVRT(13):69	377	591	376	563	1,907
2008-216	Ditch	LVRT(13):69	155	0	110	0	265
2020-400	Culvert	LVRT(13):69	0	0	123	159	282
LVRT(13) Impact Type Subtotals (sq. ft.):			6,487	11,486	9,229	16,141	43,343
LVRT(13) Impact Type Subtotals (acres):			0.149	0.264	0.212	0.371	
LVRT(13) Impact Subtotals (sq. ft.):			17,973		25,370		--
LVRT(13) Impact Subtotals (acres):			0.413		0.582		--
SUB-TOTAL PROPOSED IMPACTS (SQUARE FEET):			30,880	86,294	38,076	66,685	221,935
			117,174		104,761		--
TOTAL PROPOSED IMPACTS (ACRES):			0.709	1.981	0.874	1.531	5.095
			2.690		2.405		--

¹ Wetlands delineated per the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northeast and North Central Region. U.S. Army Corps of Engineers. 2011.

² Areas of delineated wetlands within the project boundary from survey of wetlands and located by VHB GPS data collections.

³ Proposed Permanent Impacts would result from structure placement, banking repair, ditching and riprap placement within wetlands/buffers.

⁴ Proposed Temporary Impacts would occur from temporary construction and the installation of erosion prevention and sediment control measures during construction.



Lamoille Valley Rail Trail – 401 Water Quality Certification Application

Appendix IB. Project Coordinates

March 31, 2021

Feature	Latitude	Longitude
LVRT (11)		
Trail Segment (Centroid)	44.77161	-72.87369
LVRT (12)		
Trail Segment (Centroid)	44.54304	-72.46123
LVRT (13)		
Trail Segment (Centroid)	44.49586	-72.28356



Lamoille Valley Rail Trail – 401 Water Quality Certification Application

Appendix IC. Location Maps

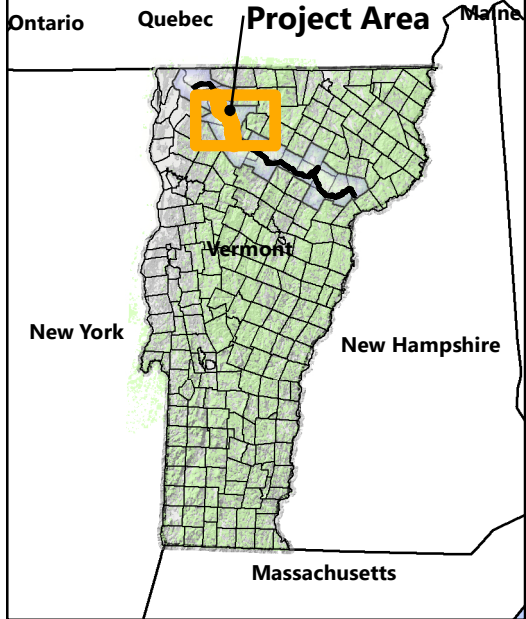
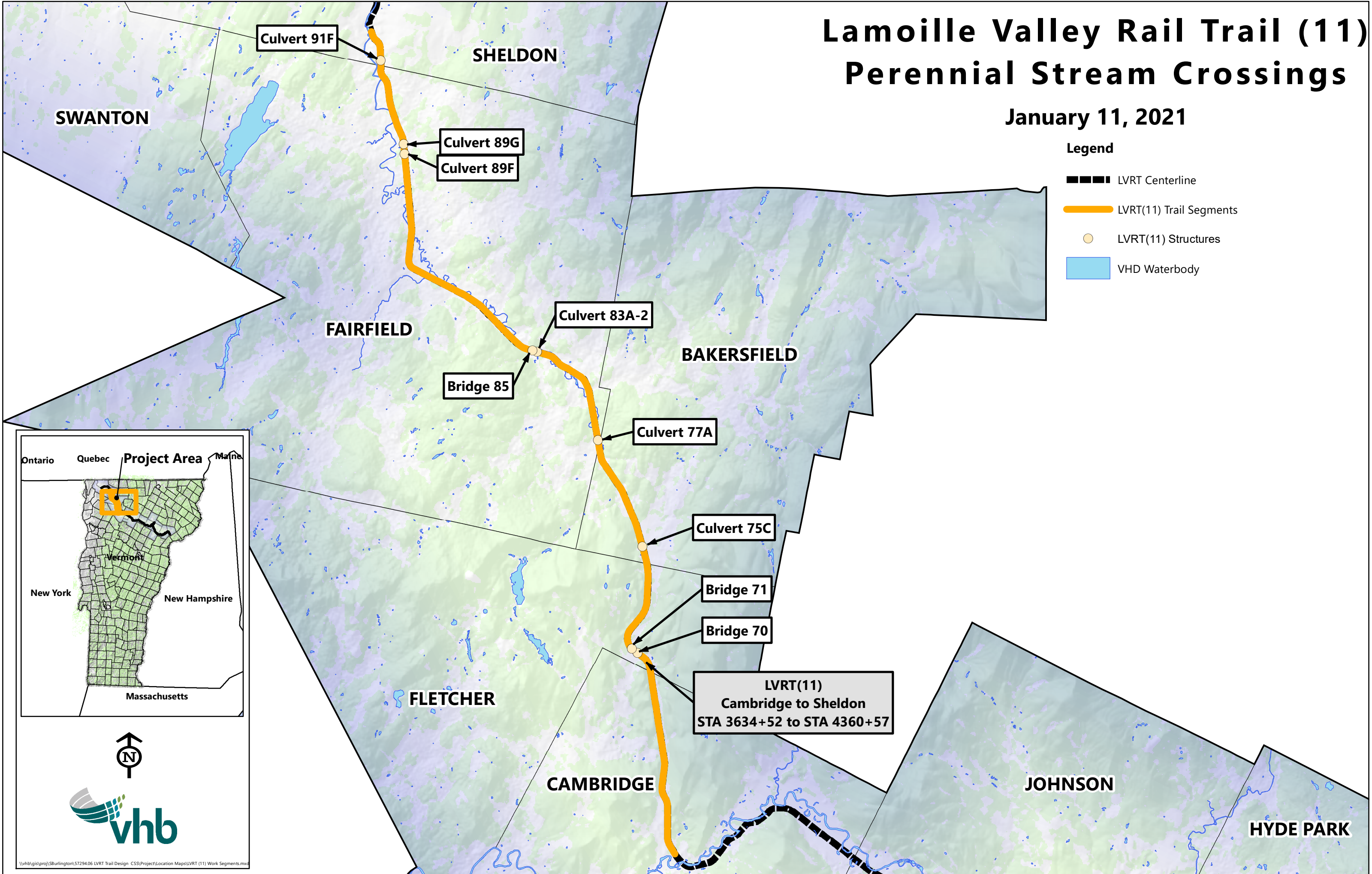
February 12, 2021

Lamoille Valley Rail Trail (11) Perennial Stream Crossings

January 11, 2021

Legend

- LVRT Centerline
- LVRT(11) Trail Segments
- LVRT(11) Structures
- VHD Waterbody

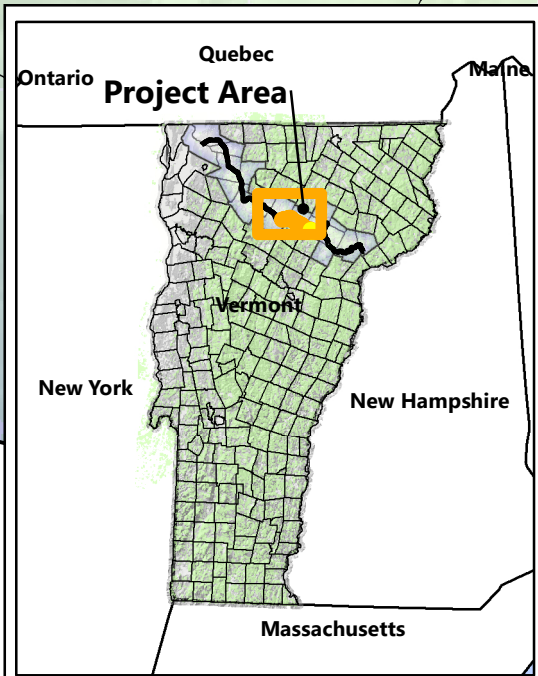
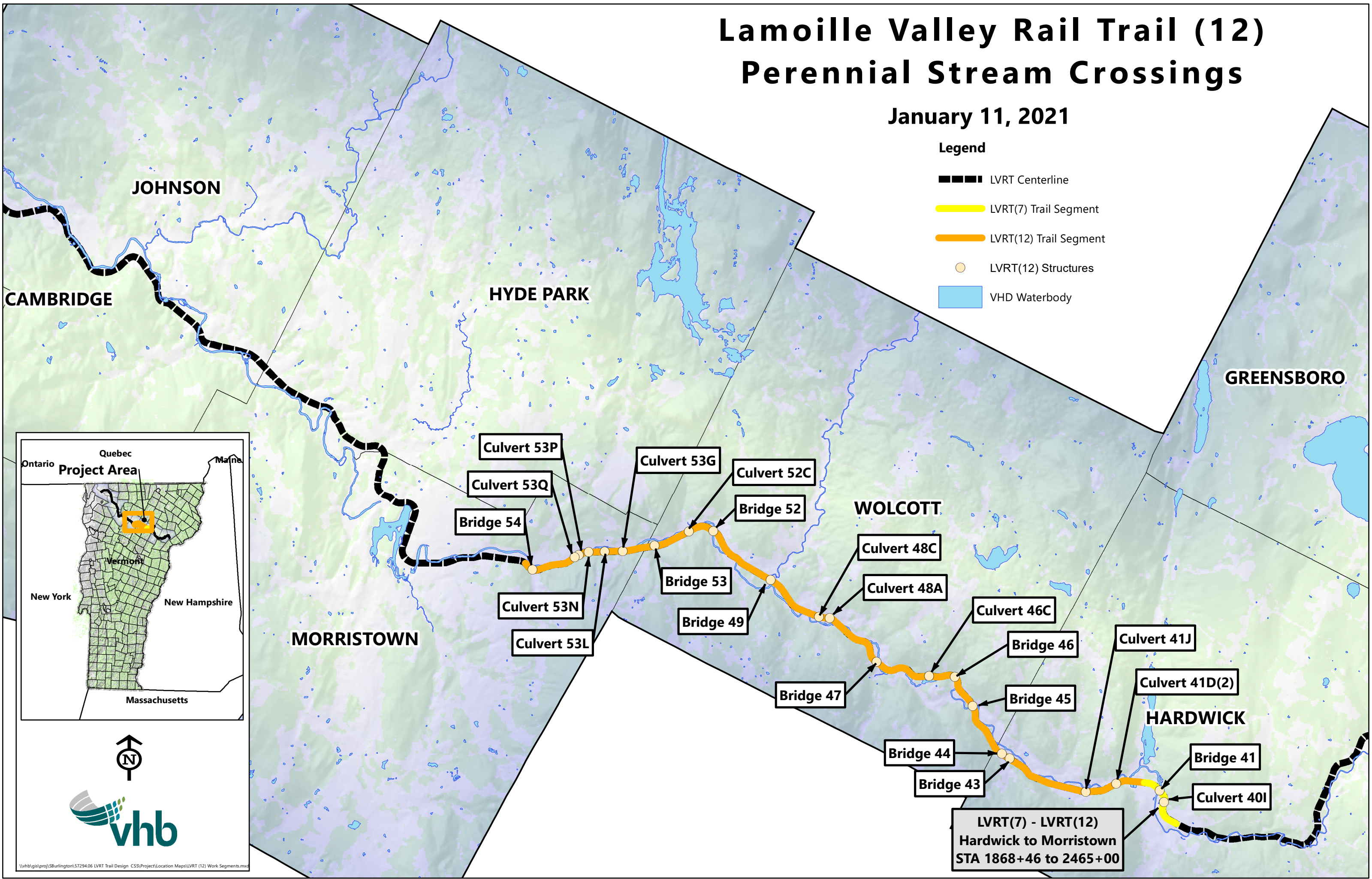


Lamoille Valley Rail Trail (12) Perennial Stream Crossings

January 11, 2021

Legend

- ■ ■ ■ ■ LVRT Centerline
- LVRT(7) Trail Segment
- LVRT(12) Trail Segment
- LVRT(12) Structures
- VHD Waterbody



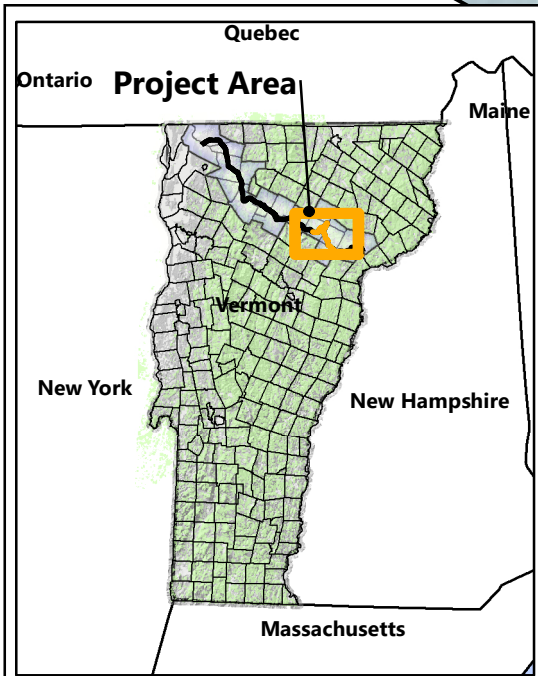
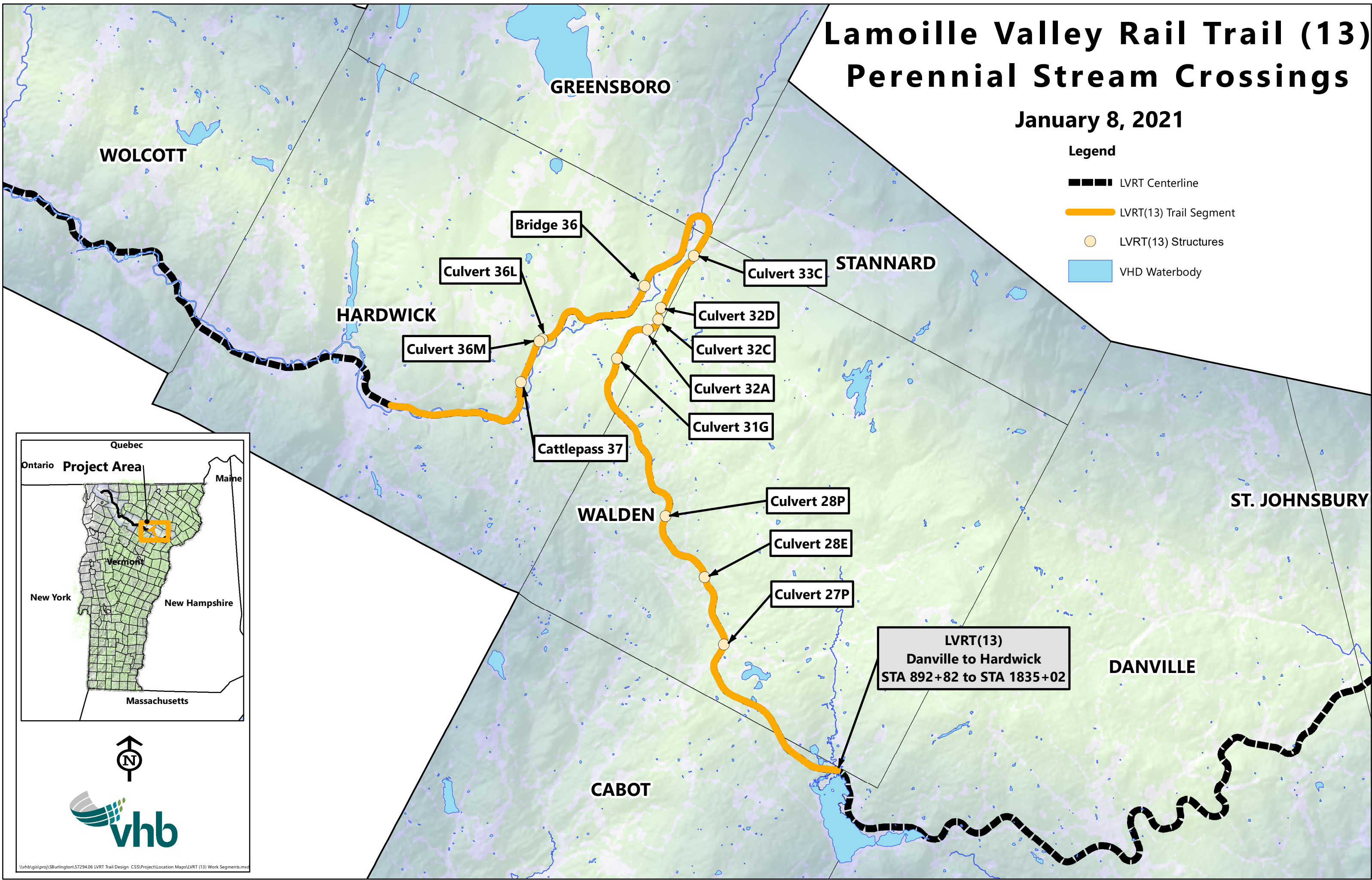
LVRT(7) - LVRT(12)
Hardwick to Morrystown
STA 1868+46 to 2465+00

Lamoille Valley Rail Trail (13) Perennial Stream Crossings

January 8, 2021

Legend

- LVRT Centerline
- LVRT(13) Trail Segment
- LVRT(13) Structures
- VHD Waterbody



Lamoille Valley Rail Trail

St. Johnsbury to Swanton, VT

Location Map

February 12, 2021

Legend

- STP LVRT(13)
- STP LVRT(12)
- STP LVRT(11)
- Trail Completed
- STP LVRT(10) Bridge Location

End of Trail -
Swanton, VT

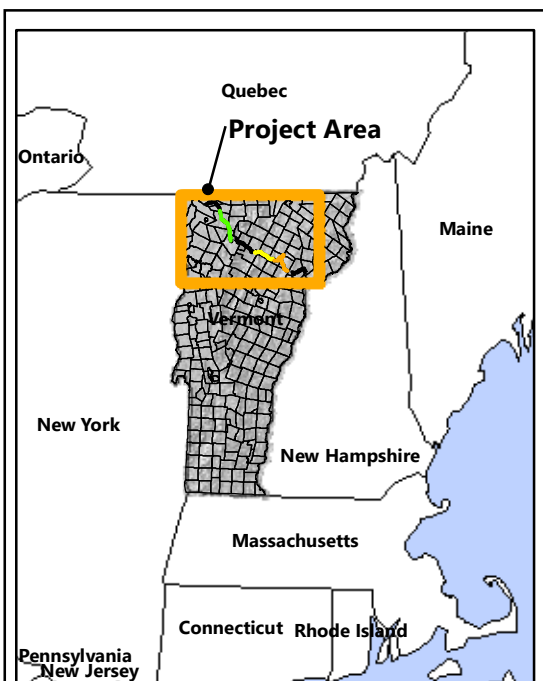
STP LVRT(11)
Cambridge to Sheldon
STA 3422+32 to STA 4392+52

STP LVRT(13)
Danville to Hardwick
STA 892+82 to STA 1835+02

STP LVRT(12)
Hardwick to Morristown
STA 1893+62 to STA 2502+52

STP LVRT(7) - to be combined with STP LVRT(12)
Hardwick
STA 1845+57 to 1893+62

Start of Trail -
St. Johnsbury, VT



Lamoille Valley Rail Trail – 401 Water Quality Certification Application

Appendix ID. Project Narrative

March 31, 2021

The Vermont Agency of Transportation (“VTrans”), in collaboration with the Vermont Association for Snow Travelers (“VAST”) is currently working to convert the former Lamoille Valley Railroad (“LVRR”) railbed to the Lamoille Valley Rail Trail (“LVRT”), which is a year-round alternative transportation / recreation trail (“Project”). The Project was originally proposed to be implemented in three phases over time (Phases I, II, and III) as funding and opportunity have allowed, with the ultimate goal of a completed trail along the overall 93-mile corridor, beginning in northeastern Vermont in St. Johnsbury and ending along the shores of Lake Champlain in Swanton. To date the following Phases have been completed and/or permitted:

- Phase IA: a 15.35-mile section between St. Johnsbury and Danville (completed in 2014);
- Phase IB: a 17.42-mile segment between Morristown and Cambridge (completed in 2014, except for Bridge 68, which was completed in 2017);
- Phase IC: a 11.63-mile corridor between Sheldon to Swanton that was begun in 2018 and 2019, with the remainder scheduled to be completed in 2020/2021; and
- Priority Bridges LVRT(10): Repairs to six bridges - Bridge 35 and 48 over the Lamoille River, Bridge 77, 80, and 83 over Black Creek, and Bridge 34 over Stannard Brook (authorized in 2021).

The remaining portions of the LVRT that require authorization are located in the towns of Cambridge to Sheldon (LVRT 11), Hardwick to Morrisville (LVRT 12), and Danville to Hardwick (LVRT 13). Roughly half of the rail corridor is already functioning as a shared-used recreational trail. Establishing an unbroken trail along the entire length of the proposed LVRT would require that maintenance issues, such as trail resurfacing, ditching, installation/repairs of culverts, signing, and miscellaneous structure repairs and bridge modifications including decking and railing replacements, be addressed along the remaining portions of the trail in the towns listed above. This is necessary to provide a safe environment for the public and to enhance the viewshed from the trail surface, both of the surrounding landscape and of the original LVRR structures.

Trail infrastructure that require specific individual actions to bring the LVRT to a durable and functional state range from simple vegetation removal and debris clearing (*i.e.*, routine maintenance) to the installation/replacement of culverts or bridges. Proposed work activities are as follows:

Culverts

Minimal permanent impacts to resources are associated with the placement of Type II stone fill to stabilize the trail corridor embankments and/or culvert abutments and grading. Identified culvert locations where improvements are needed are due to drainage problems or structure failure. These will be repaired if possible or otherwise replaced.

Bridges

In some cases, existing culverts or bridges will be replaced with new bridges. Bridges are proposed for replacement due to the poor condition of the existing structures, because the existing culverts are undersized hydraulically, to address erosion in the stream channels associated with undersized hydraulic openings, or a combination of these factors.

Ditching

The vast majority of proposed ditching is to be carried out where the trail is in a "cut" condition. Without ditching, these areas are most susceptible to stormwater and groundwater inundation that will lead to flooding of the trail and/or saturation of the subbase. These conditions will result in the failure of the trail structure, rendering the trail unusable. It is important to note that this work is proposed only for unmaintained, existing ditches and work will strive to reestablish the original ditch cross section.

Cattlepasses

In most instances the former cattlepasses are no longer used as such and have been abandoned. If the existing cattlepasses are structurally sound, they are to remain and will be repaired to the extent needed. For the existing cattlepasses that are in poor condition, they will either be repaired or completely abandoned and removed or backfilled as appropriate.

Washouts

Several former culvert locations have been destroyed by flooding and there now exists washouts of the former rail embankment. In these locations, a new, appropriately-sized culvert will be installed and the embankment will be restored to its original extent.

Pause Places

In select locations, the trail will be over-widened to provide places that trail users can take a break off of the side of the trail without blocking it. These "pause places" will be constructed using excess material excavated from ditches and located in areas away from wetlands, waterbodies and other known resources.

Access and Staging

VTrans proposes to use existing public, private, and farm road crossings as the main routes for Project access. These crossings allow access to the entire trail and permit construction to the proposed trail right-of-way ("ROW") without impacting adjacent lands or resources. Areas of construction ingress and egress are limited as Project construction is confined to the VTrans ROW or public roads. Staging areas will be located in areas that are not environmentally or historically sensitive and located within the LVRT ROW (typically sites used by VTrans during the VTrans Rail and Tie Removal Project).

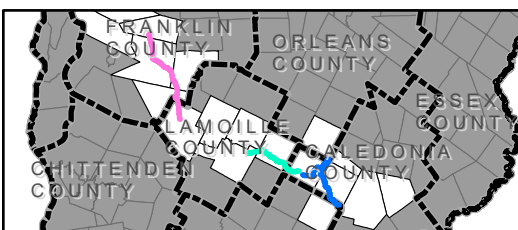
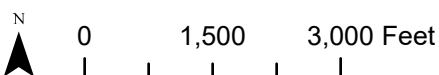
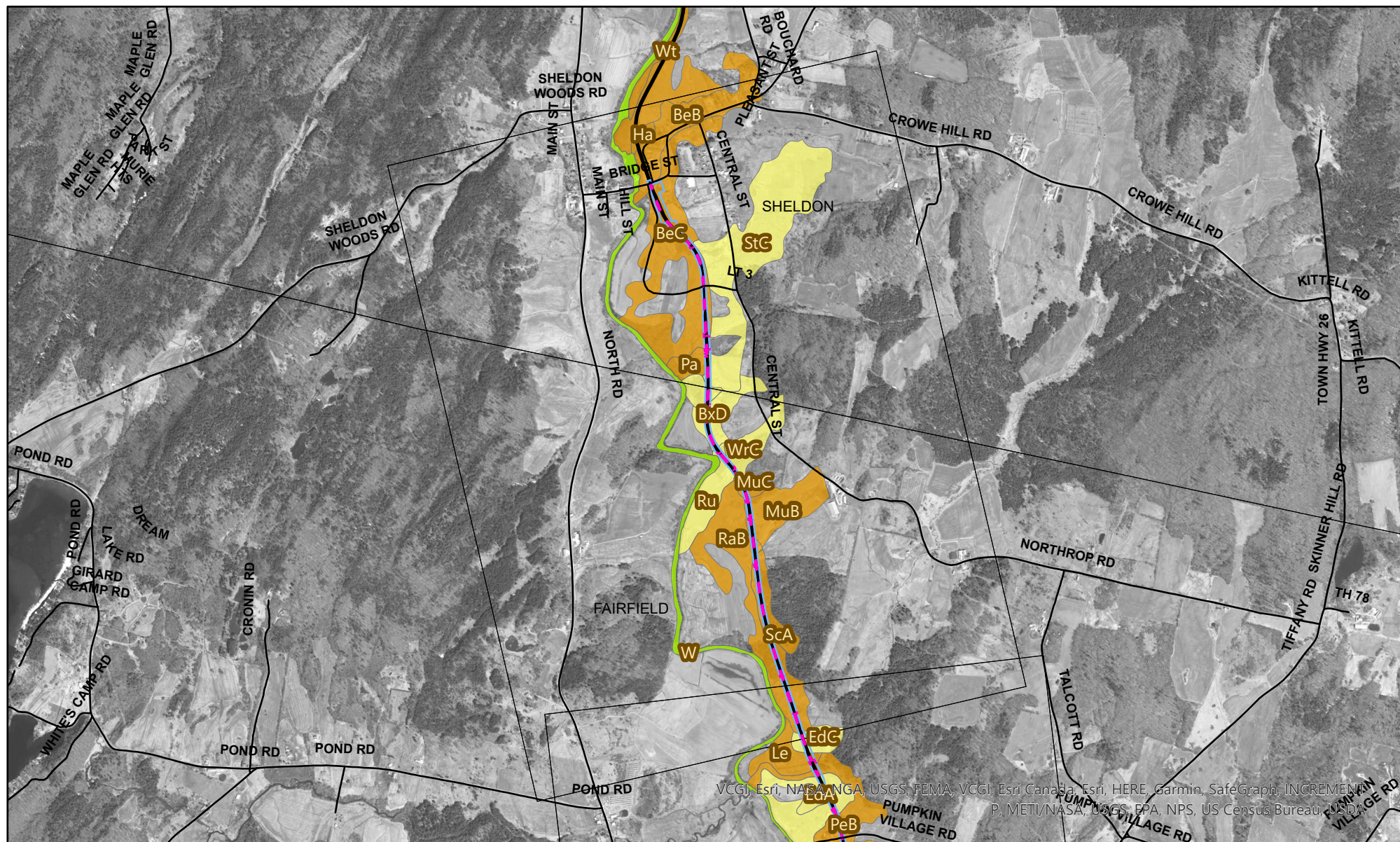
VTrans intends to begin construction during summer 2021 but is intending to put plans out to bid in early 2021. Per VTrans guidelines, all necessary permits and approvals are to be in place before the bid process can be initiated.



Lamoille Valley Rail Trail – 401 Water Quality Certification Application

Appendix IE. Soil K-Factors

April 7, 2021

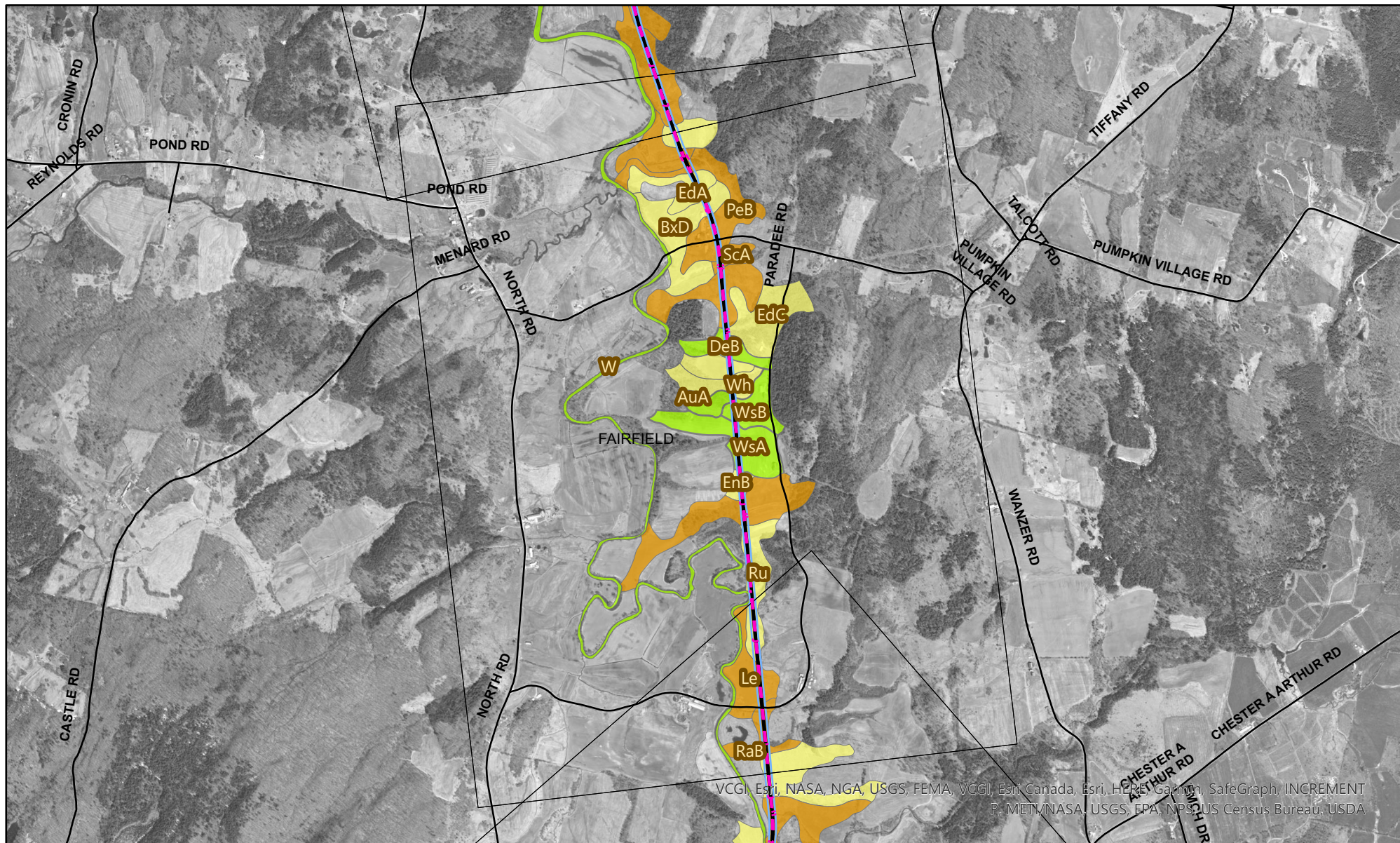


* Unassigned K factors were assigned based on the anticipated depth of construction disturbance of 12 inches. Refer to EPSC Plan Narrative for complete list of soil K factors.

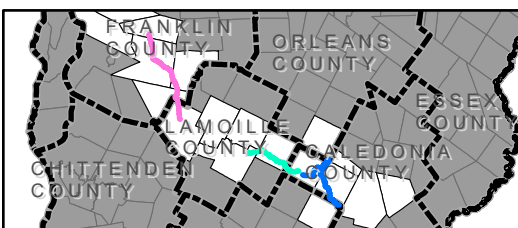
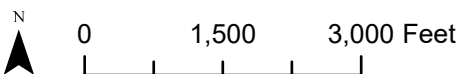
Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)

- LVRT ROW (VHB)
- LVRT Centerline (VTrans)
- Soils (K factor) (VCGI)***
- < 0.18
- 0.18 - 0.36
- > 0.36
- LVRT(11) LOD (VHB)
- LVRT(12) LOD (VHB)
- LVRT(13) LOD (VHB)
- Roads (VTRANS)

Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

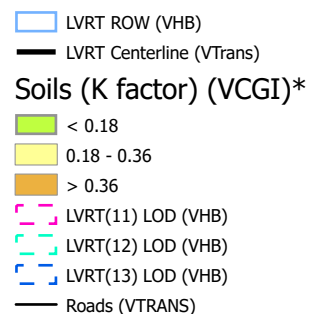


VCGI, Esri, NASA, NGA, USGS, FEMA, VCGI, Esri, Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI, NASA, USGS, EPA, NPS, US Census Bureau, USDA

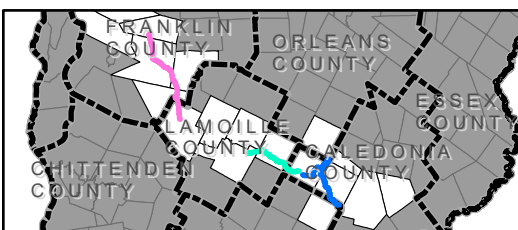
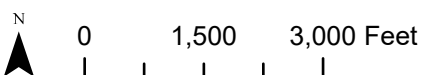
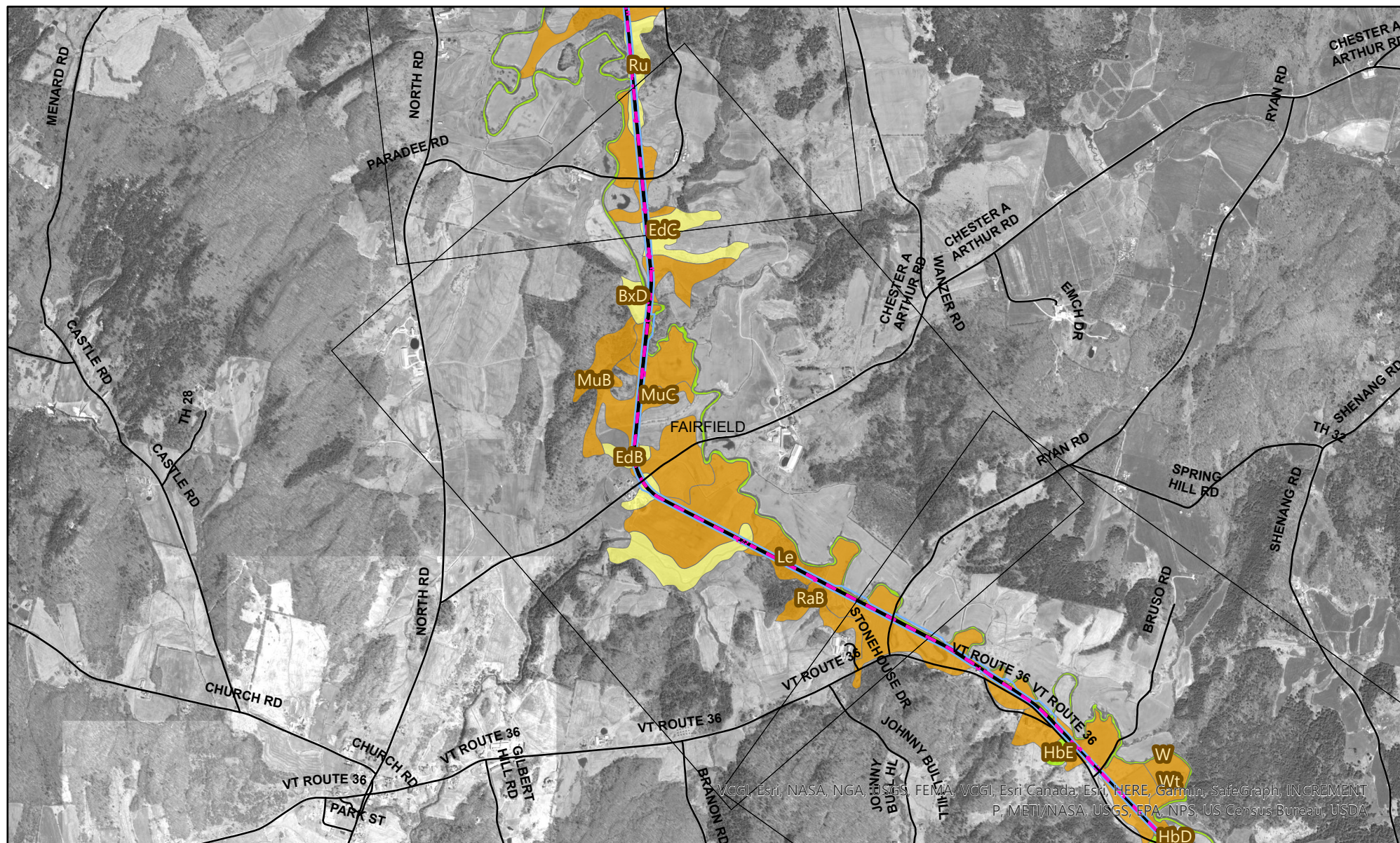


* Unassigned K factors were assigned based on the anticipated depth of construction disturbance of 12 inches. Refer to EPSC Plan Narrative for complete list of soil K factors.

Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)

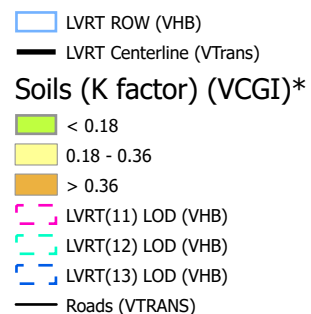


Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series



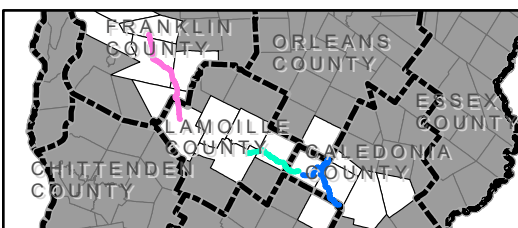
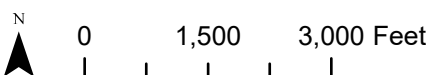
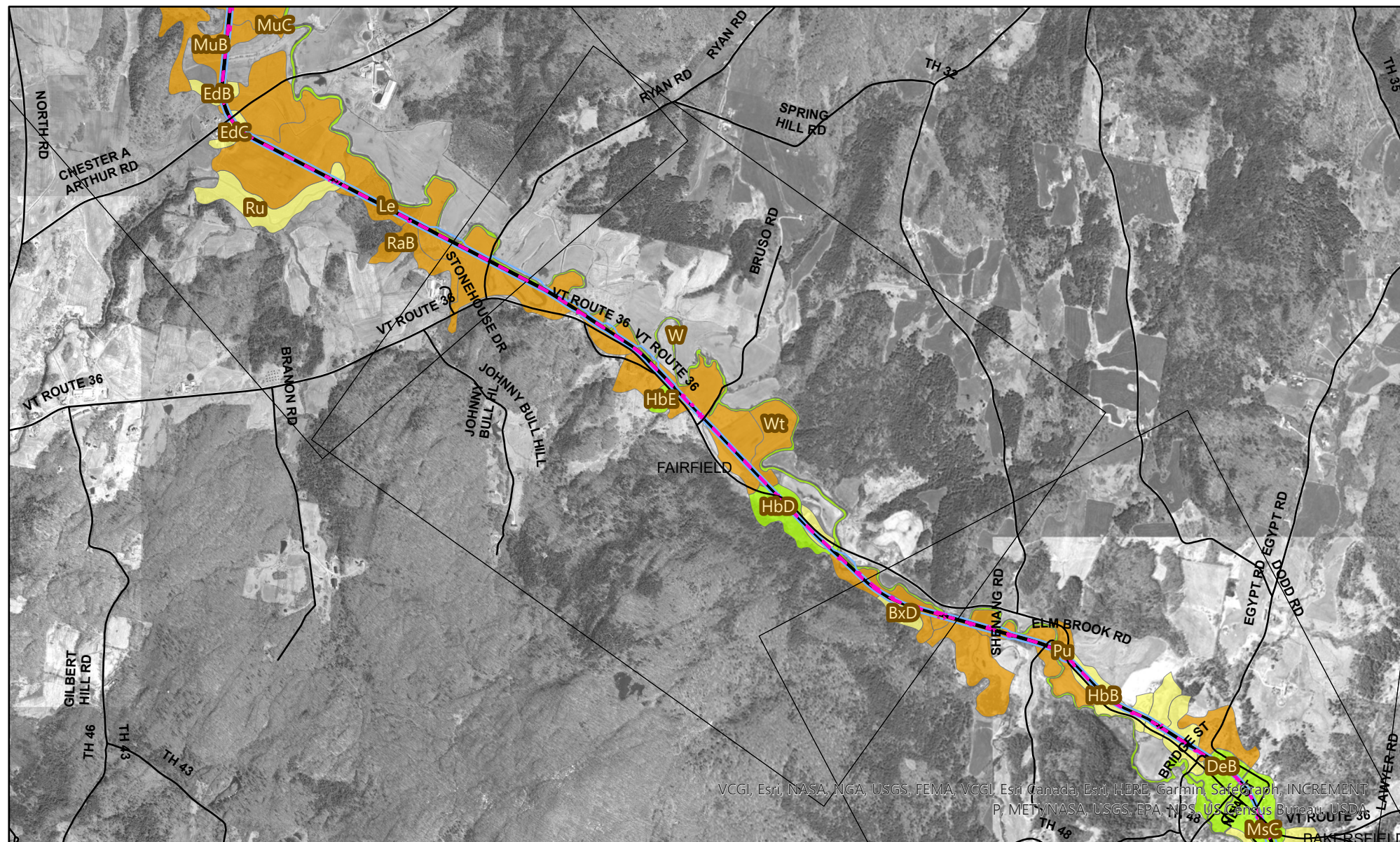
* Unassigned K factors were assigned based on the anticipated depth of construction disturbance of 12 inches.
Refer to EPSC Plan Narrative for complete list of soil K factors.

Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)



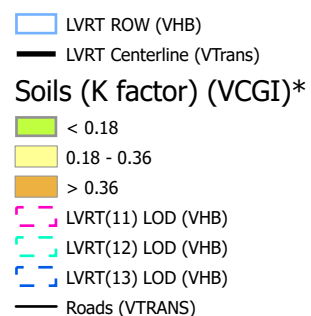
Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

Sheet 3 of 25



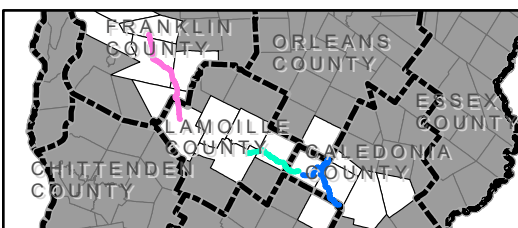
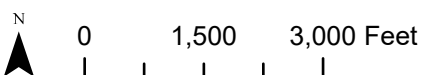
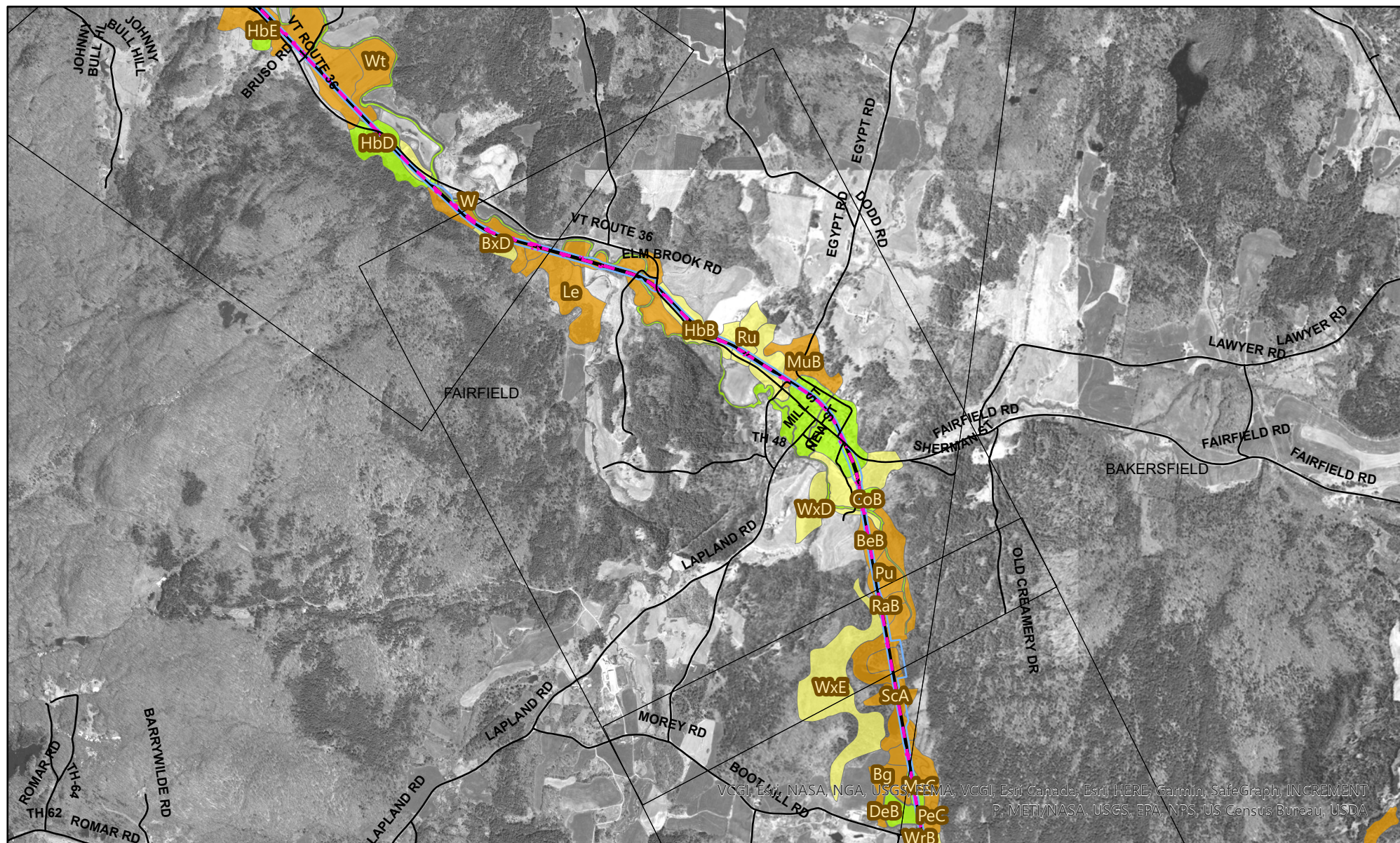
* Unassigned K factors were assigned based on the anticipated depth of construction disturbance of 12 inches.
Refer to EPSC Plan Narrative for complete list of soil K factors.

Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)



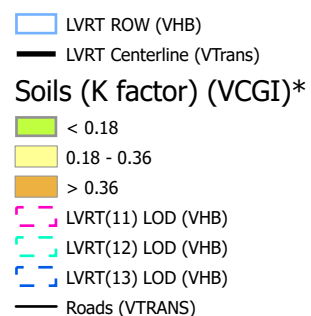
Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

Sheet 4 of 25



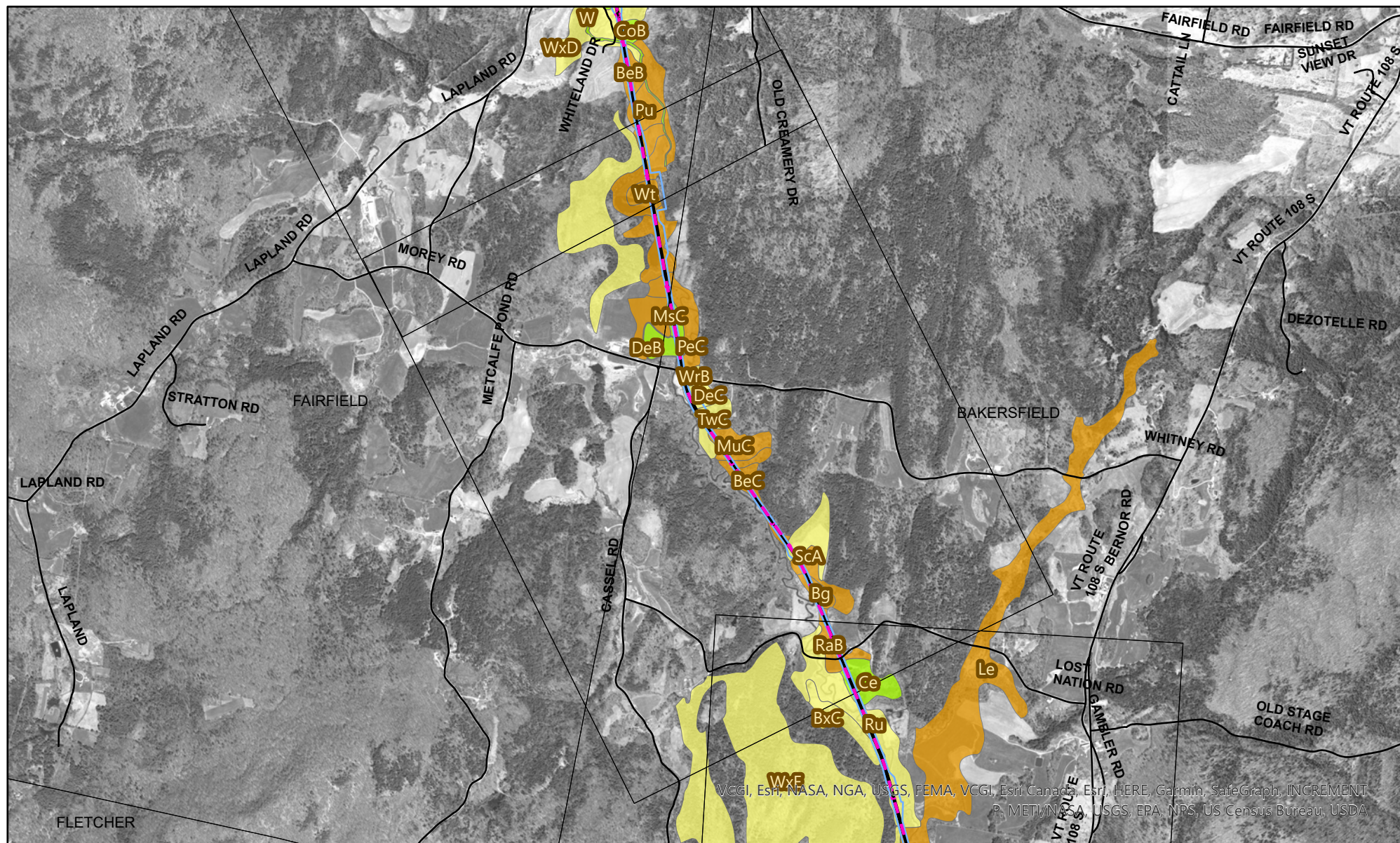
* Unassigned K factors were assigned based on the anticipated depth of construction disturbance of 12 inches.
Refer to EPSC Plan Narrative for complete list of soil K factors.

Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)

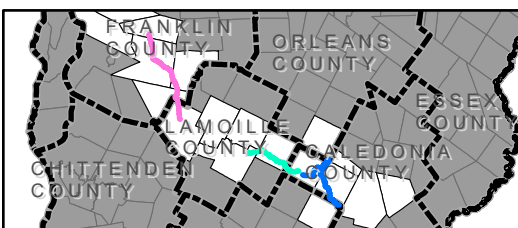
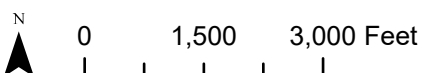


Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

Sheet 5 of 25

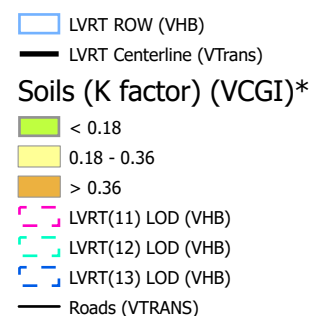


VCGI, Esri, NASA, NGA, USGS, FEMA, VCGI, Esri Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, MET/NASA, USGS, EPA, NPS, US Census Bureau, USDA



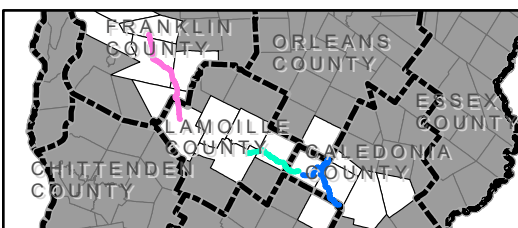
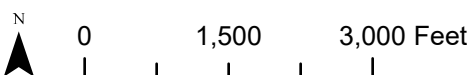
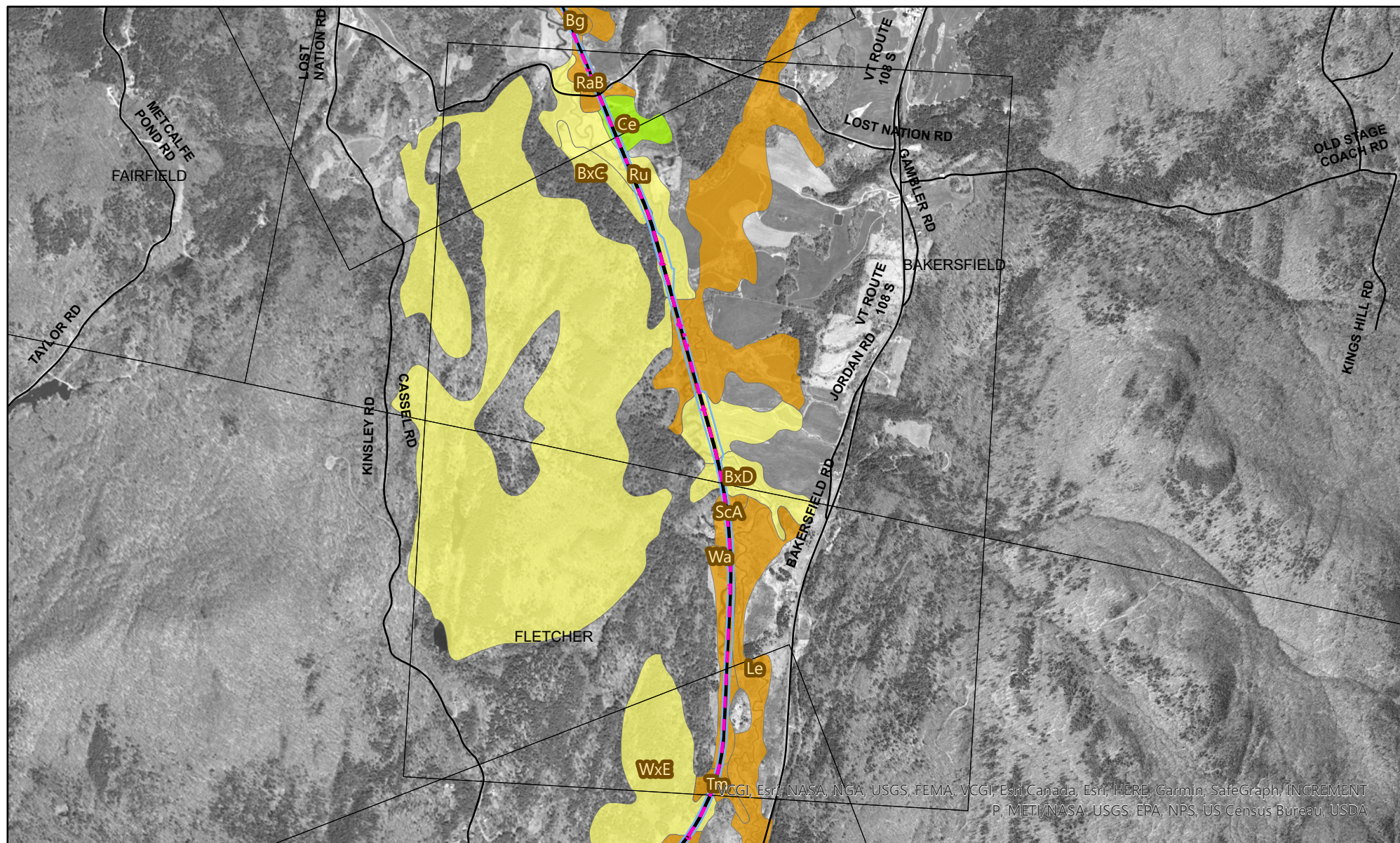
* Unassigned K factors were assigned based on the anticipated depth of construction disturbance of 12 inches. Refer to EPSC Plan Narrative for complete list of soil K factors.

Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)



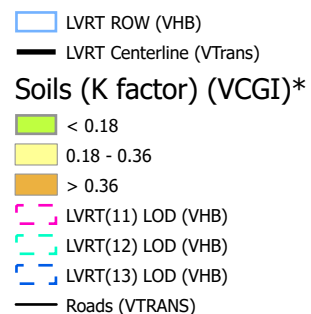
Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

Sheet 6 of 25



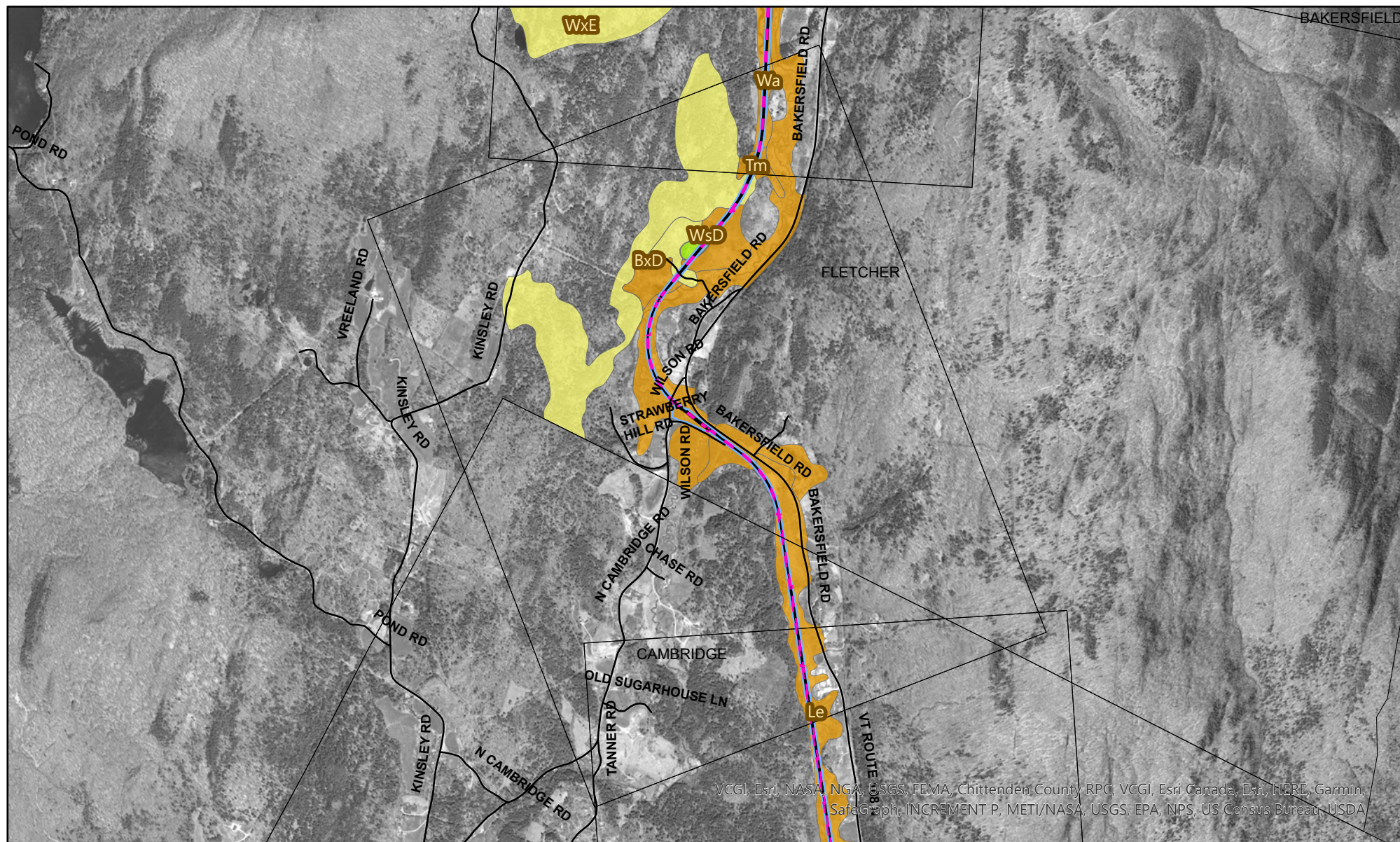
* Unassigned K factors were assigned based on the anticipated depth of construction disturbance of 12 inches.
Refer to EPSC Plan Narrative for complete list of soil K factors.

Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)

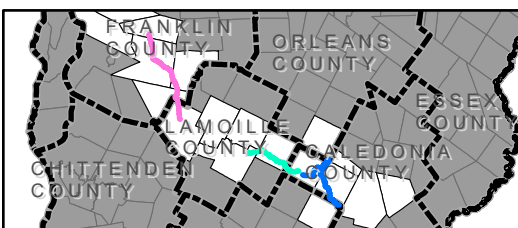
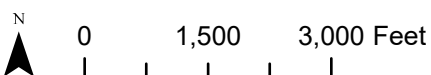


Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

Sheet 7 of 25

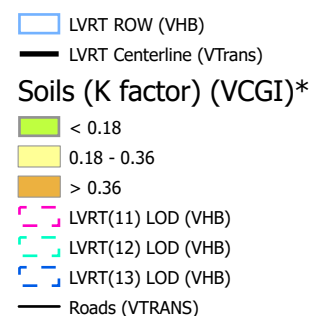


VCGI, Esri, NASA, NGA, USGS, FEMA, Chittenden County RPC, VCGI, Esri Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA



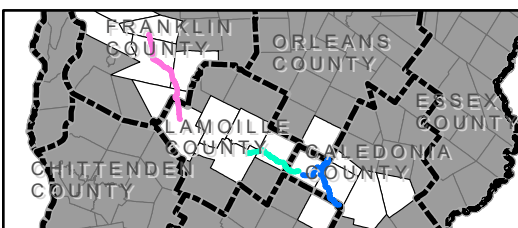
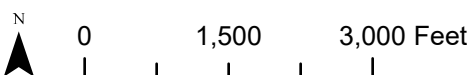
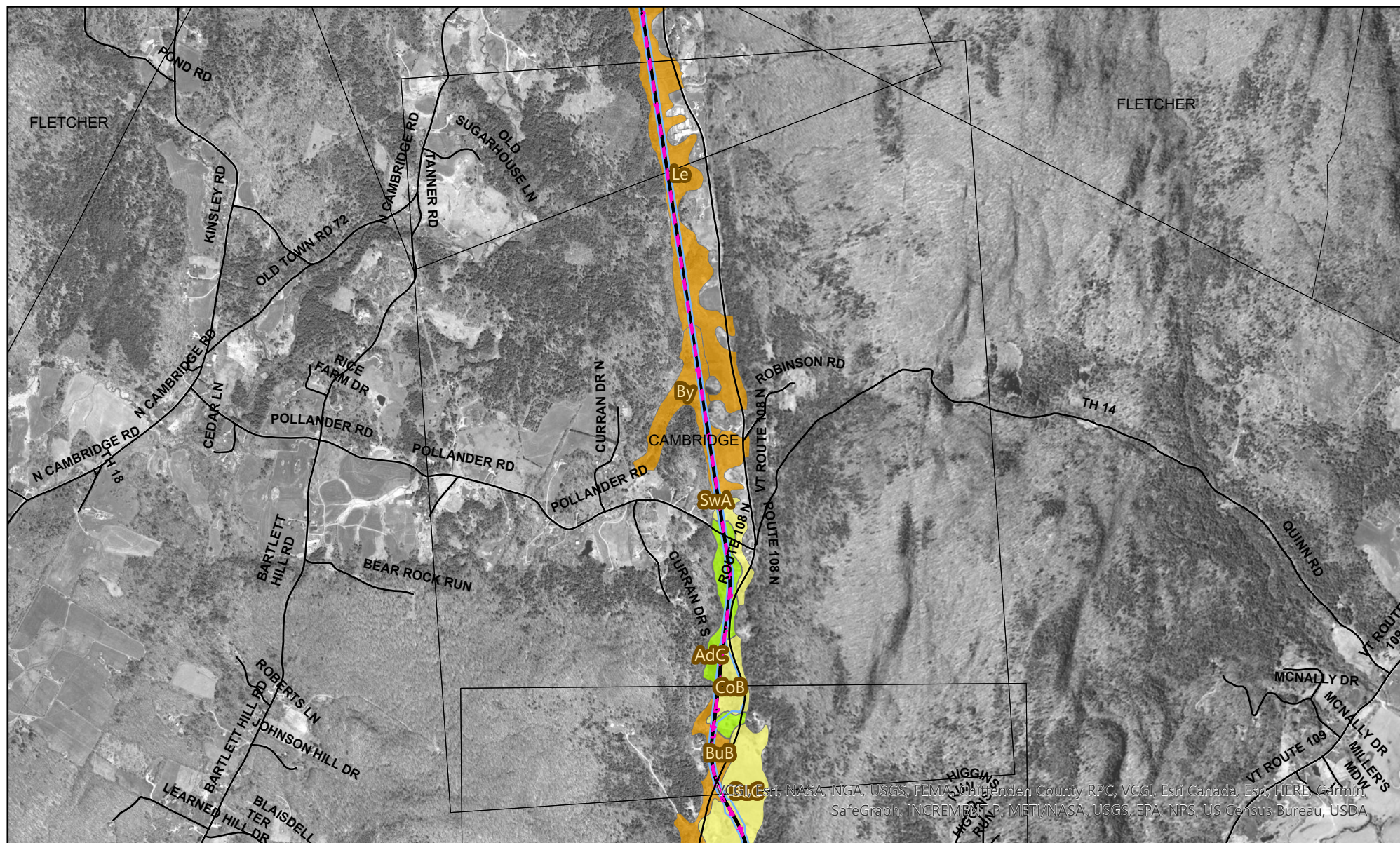
* Unassigned K factors were assigned based on the anticipated depth of construction disturbance of 12 inches.
Refer to EPSC Plan Narrative for complete list of soil K factors.

Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)



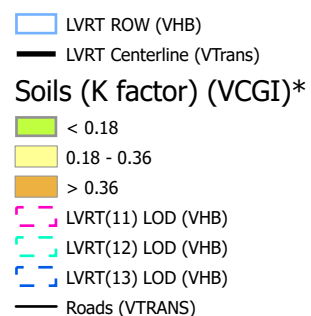
Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

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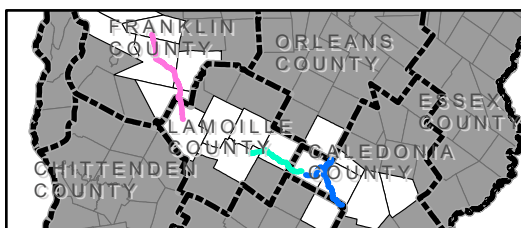
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Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

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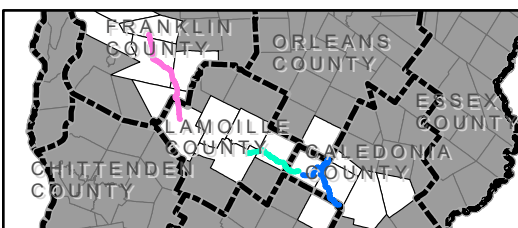
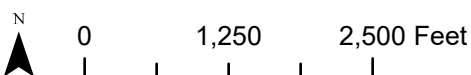
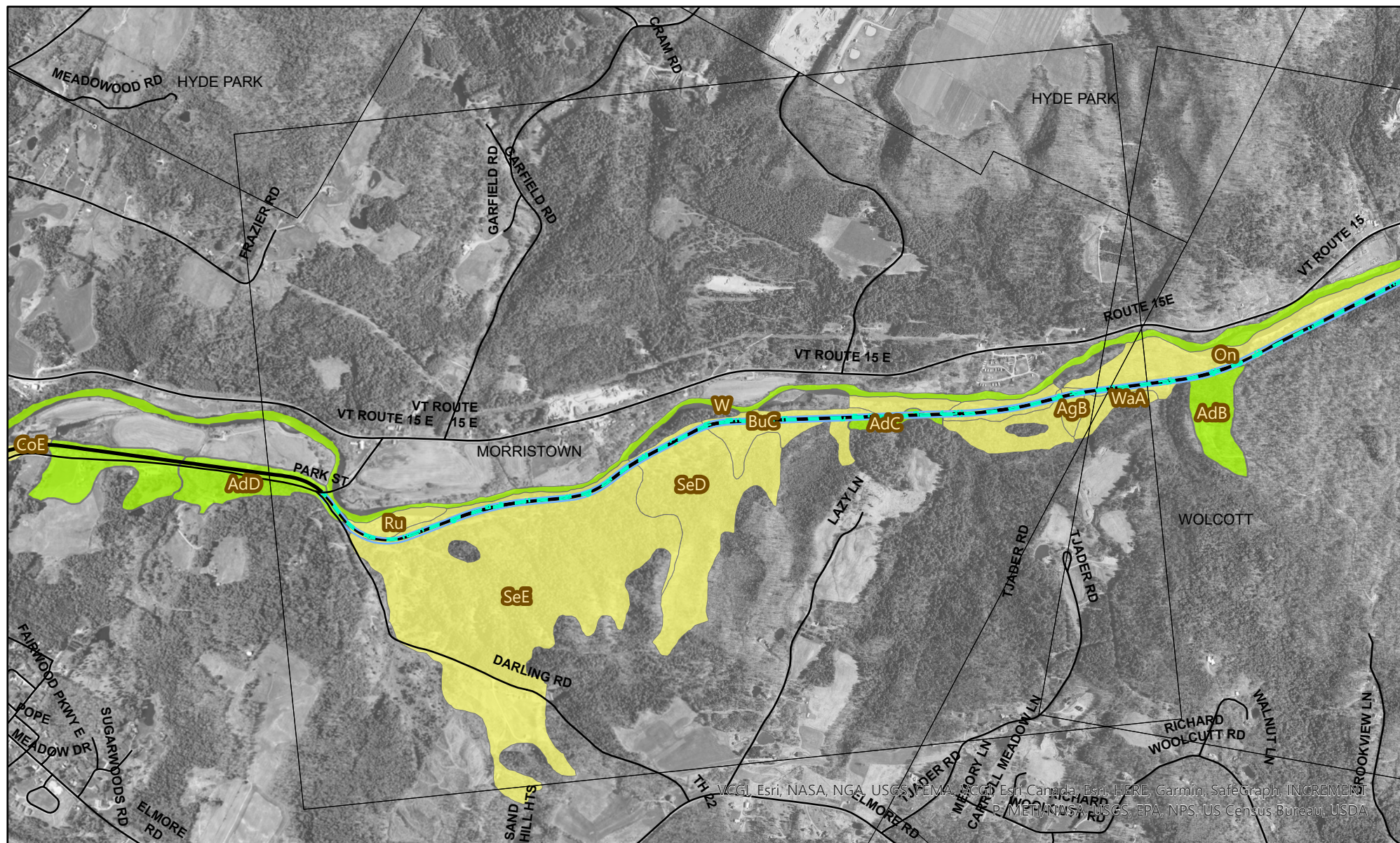
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 VTrans (Vermont Department of Transportation)
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 LVRT ROW (VHB)
 LVRT Centerline (VTrans)
Soils (K factor) (VCGI)*
 < 0.18
 0.18 - 0.36
 > 0.36
 LVRT(11) LOD (VHB)
 LVRT(12) LOD (VHB)
 LVRT(13) LOD (VHB)
 Roads (VTRANS)

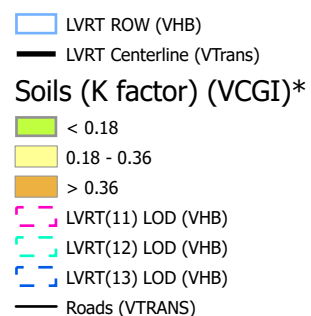
**Lamoille Valley Rail Trail (LVRT)
STP-LVRT(11), (12) & (13)
Danville to Sheldon, Vermont
Soil K- Factor Map Series**

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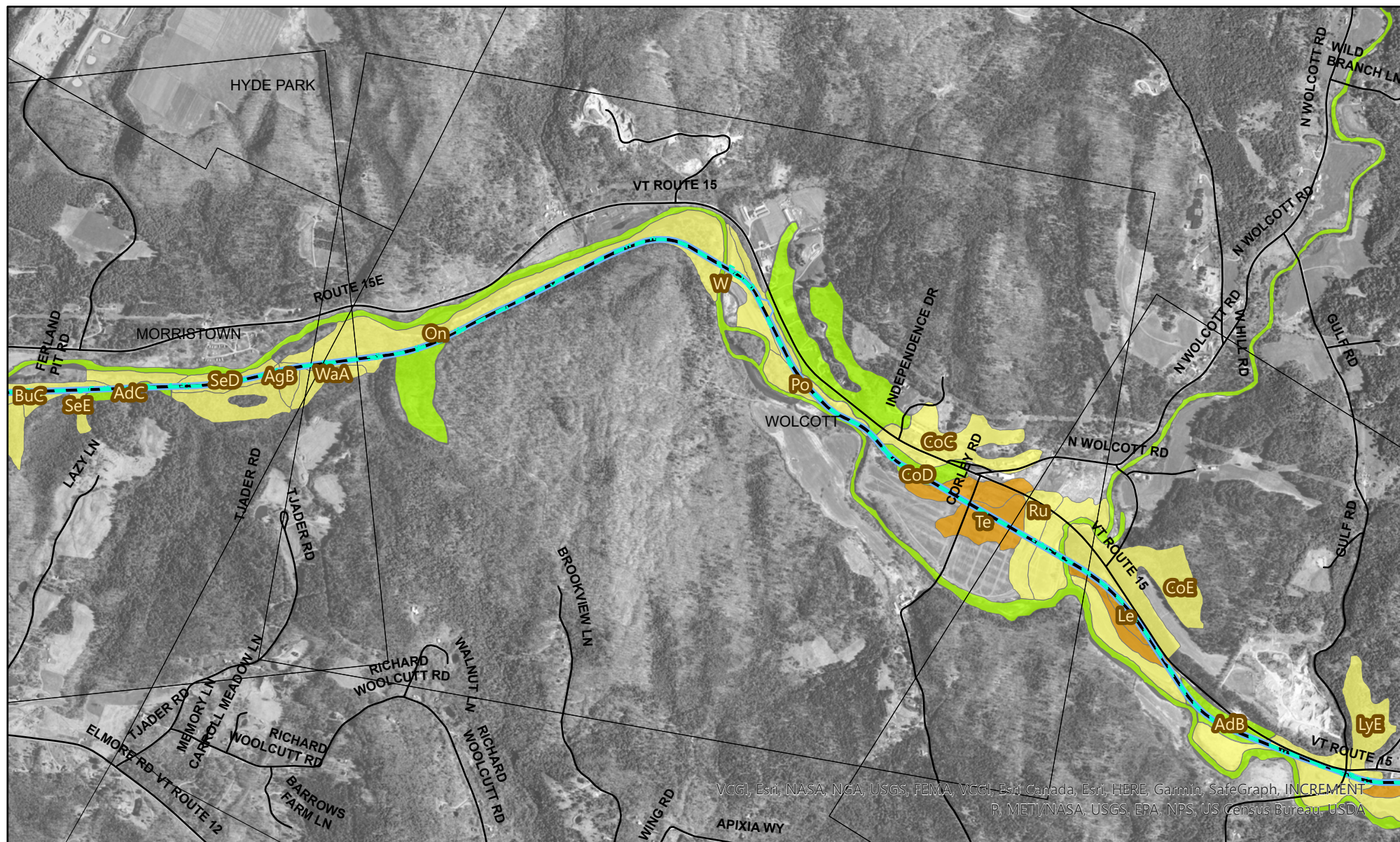
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VTrans (Vermont Department of Transportation)
VHB (2008-2020)

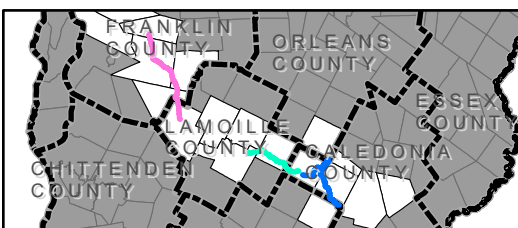
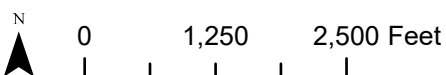


Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

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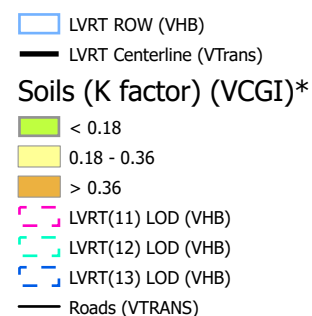


VCGI, Esri, NASA, NGA, USGS, FEMA, VCGI, Esri Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA



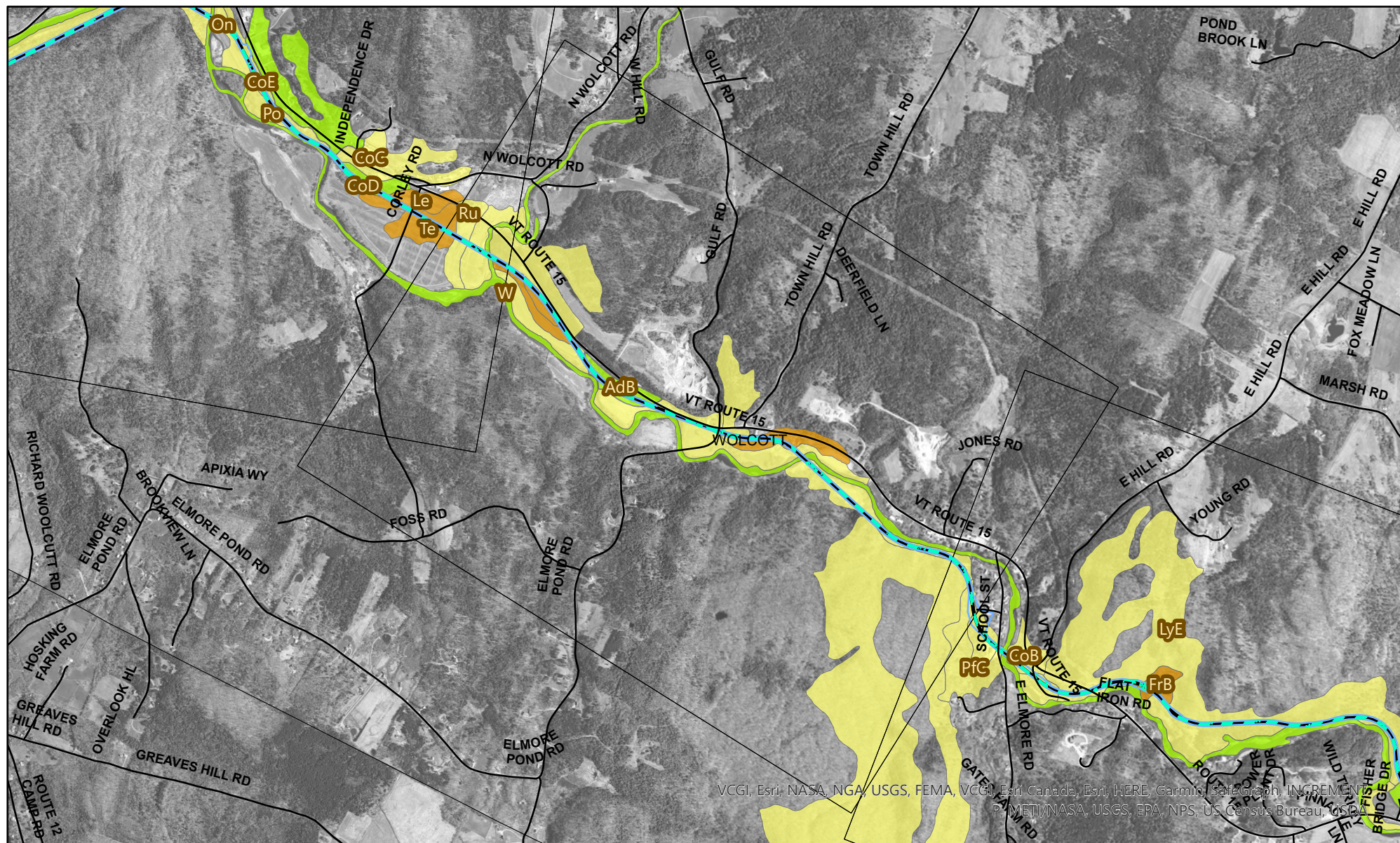
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Sources:
VCGI (Vermont Center for Geographic Information - Various Dates)
VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)

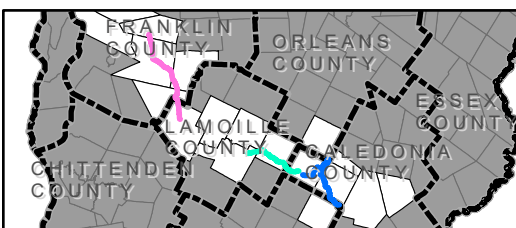
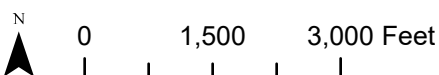


Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

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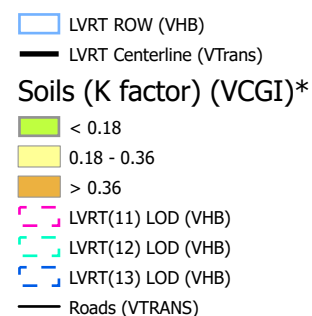


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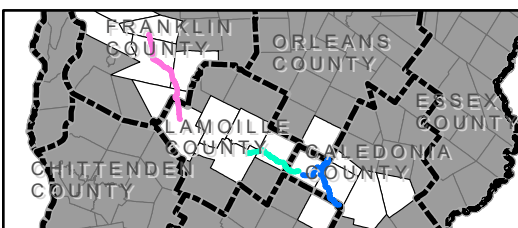
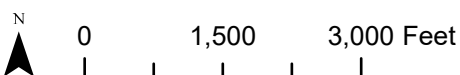
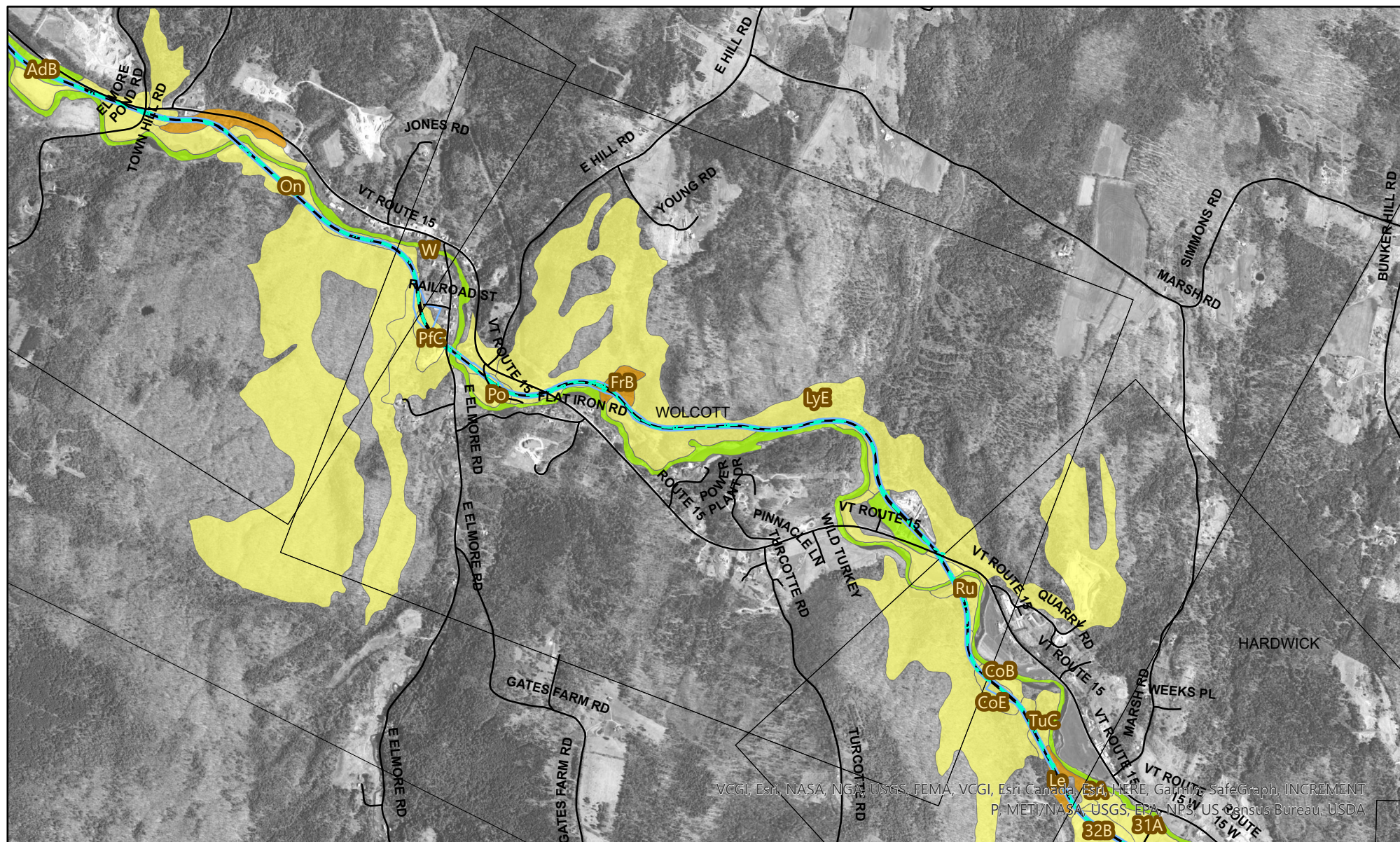
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Sources:
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VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)



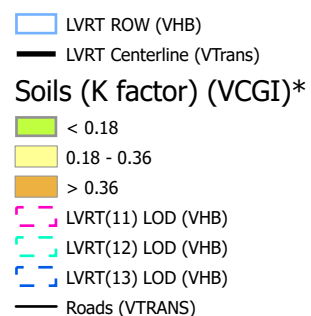
Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

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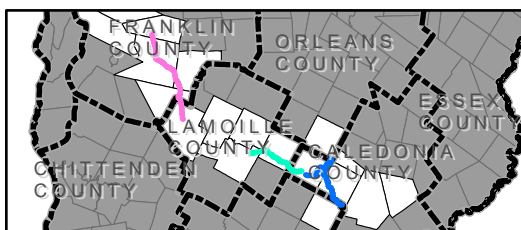
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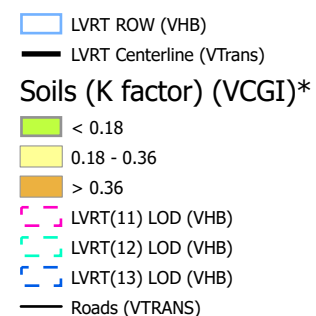
Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

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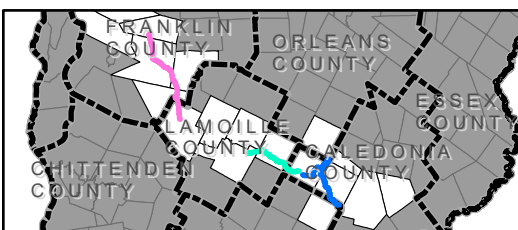
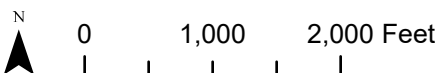
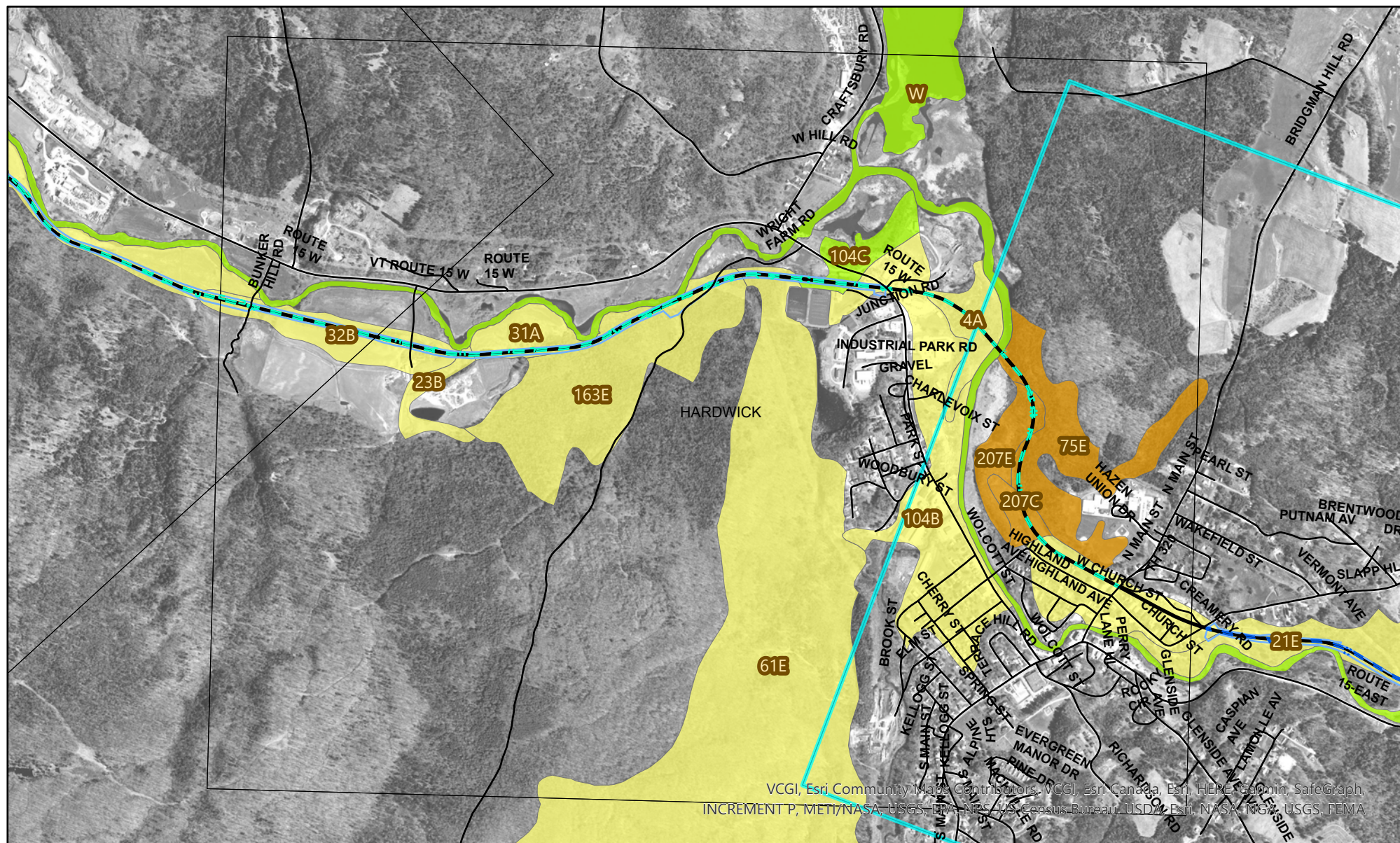
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 VHB (2008-2020)



**Lamoille Valley Rail Trail (LVRT)
STP-LVRT(11), (12) & (13)
Danville to Sheldon, Vermont
Soil K- Factor Map Series**

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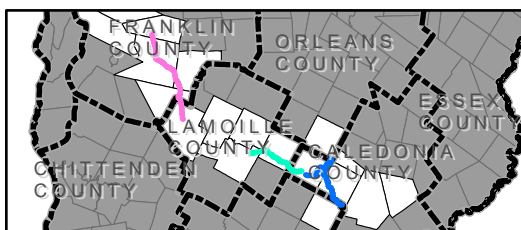


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Sources:
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VTrans (Vermont Department of Transportation)
VHB (2008-2020)










- LVRT ROW (VHB)
- LVRT Centerline (VTrans)
- Soils (K factor) (VCGI)*
 - < 0.18
 - 0.18 - 0.36
 - > 0.36
- LVRT(11) LOD (VHB)
- LVRT(12) LOD (VHB)
- LVRT(13) LOD (VHB)
- Roads (VTRANS)

Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series



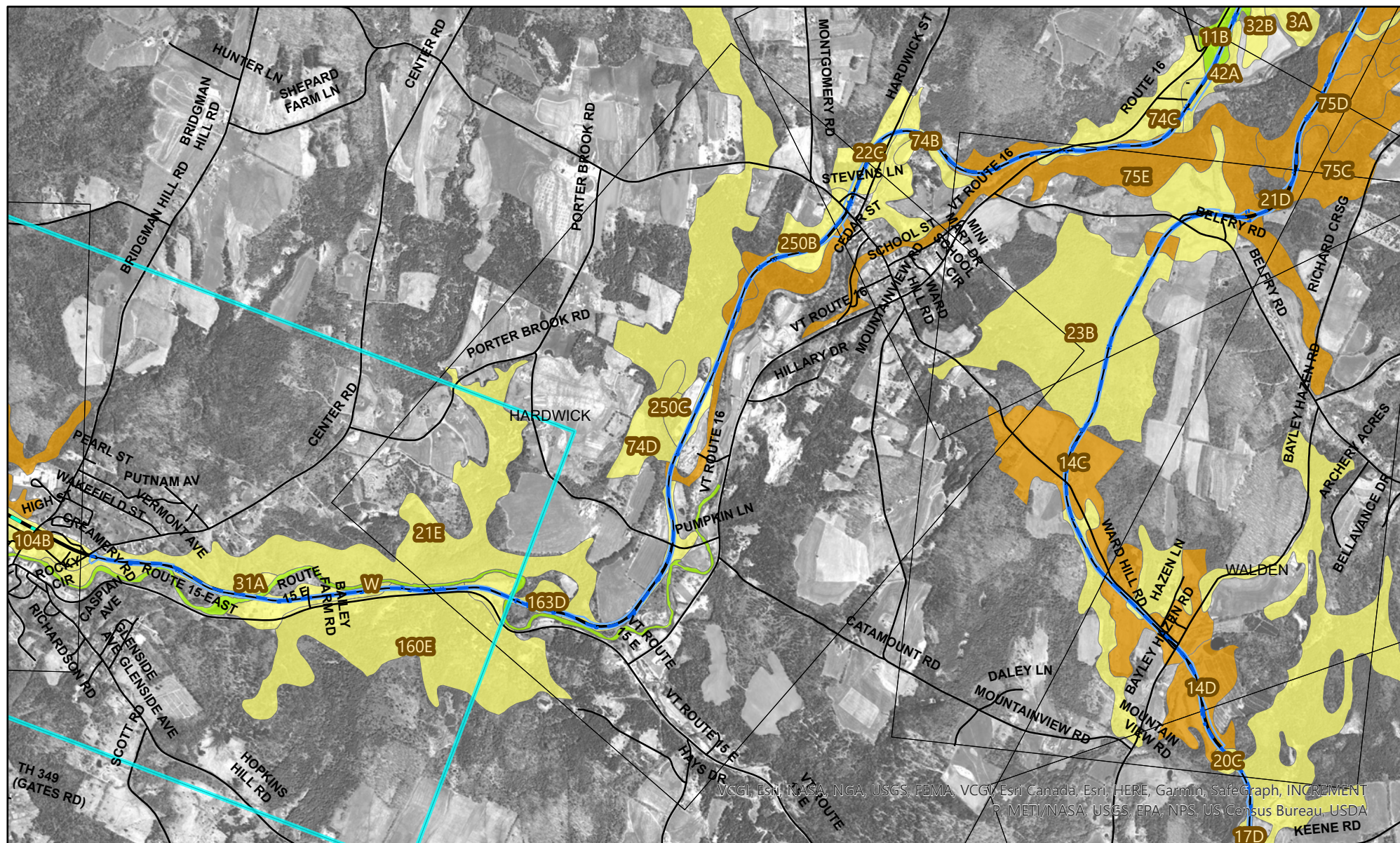
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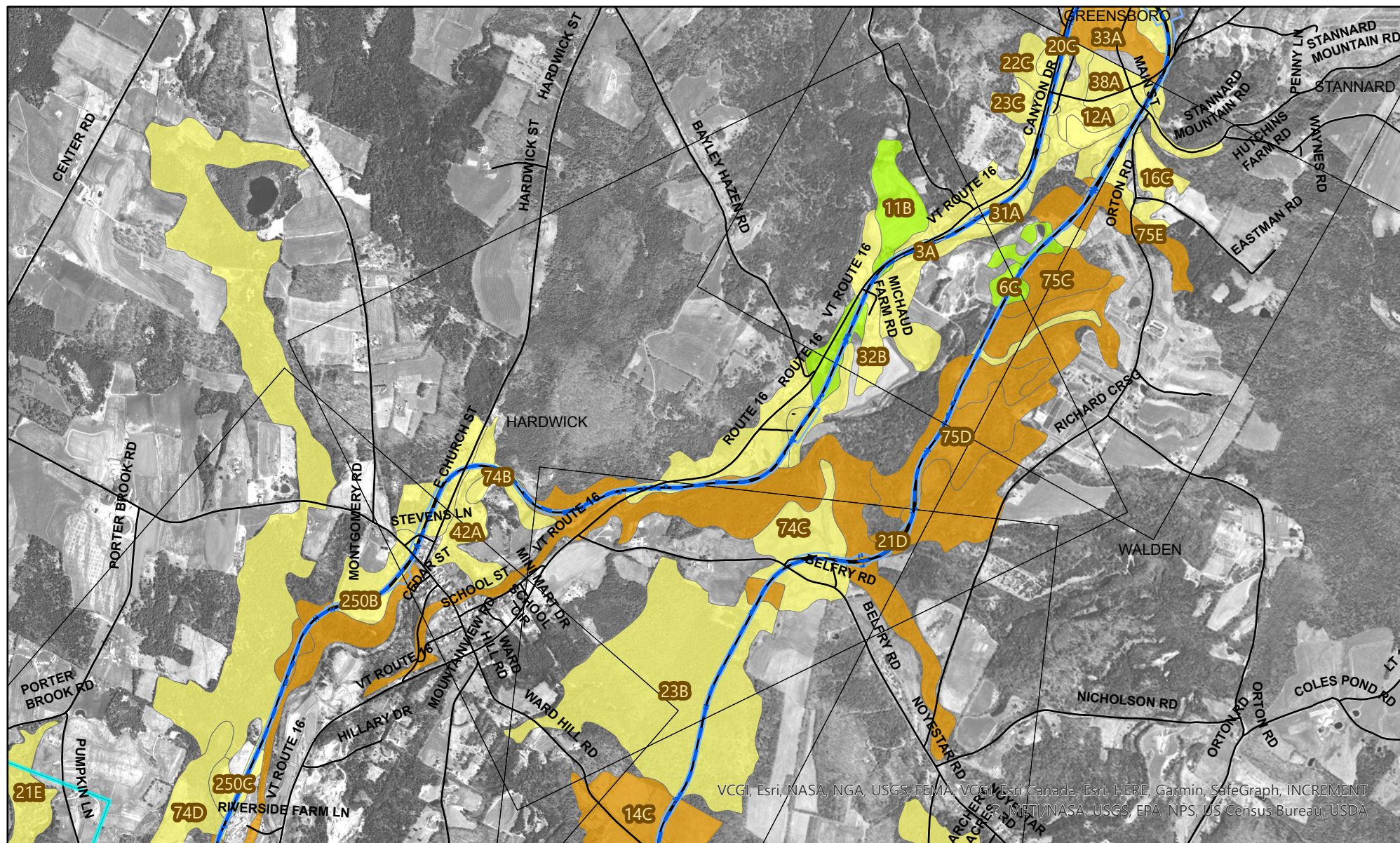
Sources:
 VCGI (Vermont Center for Geographic Information - Various Dates)
 VAST (Vermont Association of Snow Travellers - 2008)
 VTrans (Vermont Department of Transportation)
 VHB (2008-2020)

 LVRT ROW (VHB)
 LVRT Centerline (VTrans)
Soils (K factor) (VCGI)*
 < 0.18
 0.18 - 0.36
 > 0.36
 LVRT(11) LOD (VHB)
 LVRT(12) LOD (VHB)
 LVRT(13) LOD (VHB)
 Roads (VTRANS)

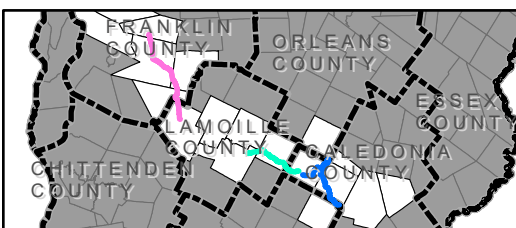
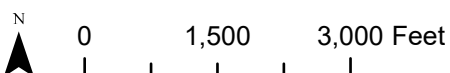
**Lamoille Valley Rail Trail (LVRT)
STP-LVRT(11), (12) & (13)
Danville to Sheldon, Vermont
Soil K- Factor Map Series**

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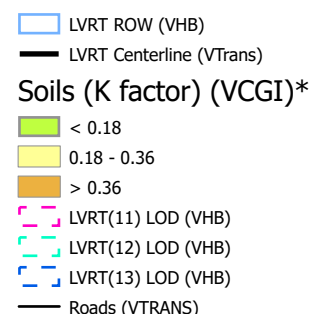


VCGI, Esri, NASA, NGA, USGS, FEMA, VCGI, Esri Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT, Esri, HERE, Garmin, NGA, USGS, EPA, NPS, US Census Bureau, USDA



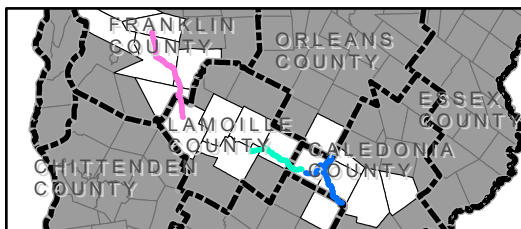
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VAST (Vermont Association of Snow Travellers - 2008)
VTrans (Vermont Department of Transportation)
VHB (2008-2020)










Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

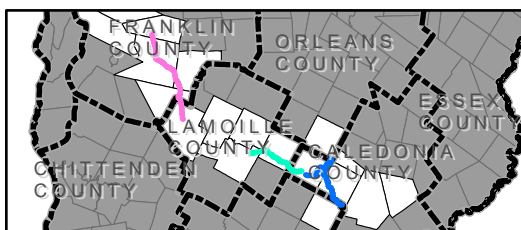
Sheet 19 of 25



Sources:
 VCGI (Vermont Center for Geographic Information - Various Dates)
 VAST (Vermont Association of Snow Travellers - 2008)
 VTrans (Vermont Department of Transportation)
 VHB (2008-2020)










 < 0.18
 0.18 - 0.36
 > 0.36
 LVRT(11) LOD (VHB)
 LVRT(12) LOD (VHB)
 LVRT(13) LOD (VHB)
 Roads (VTRANS)

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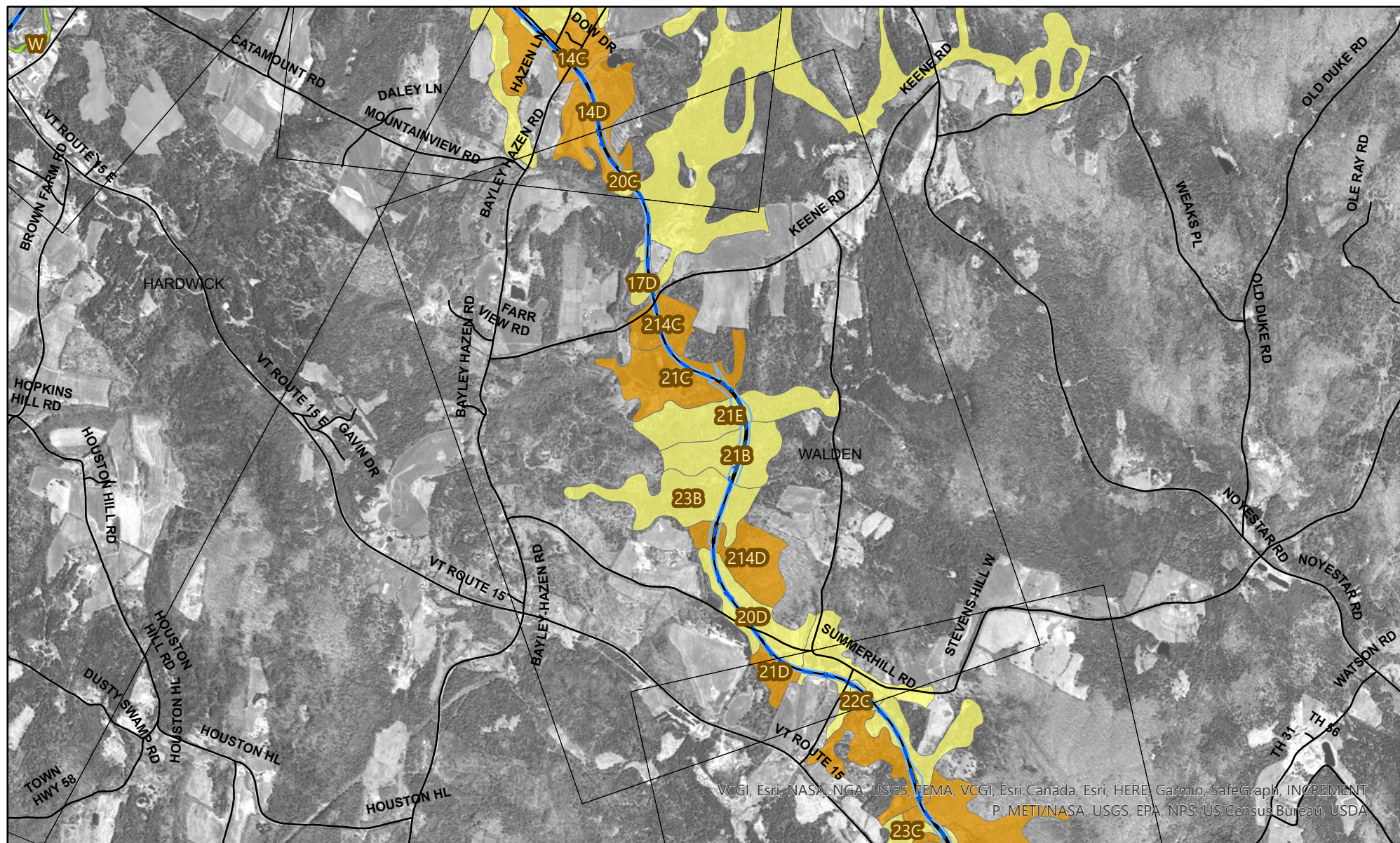
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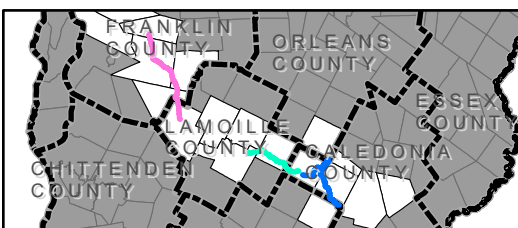
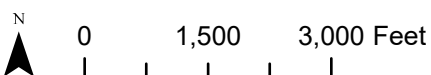
 LVRT ROW (VHB)
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Soils (K factor) (VCGI)*
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 LVRT(11) LOD (VHB)
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 LVRT(13) LOD (VHB)
 Roads (VTRANS)

**Lamoille Valley Rail Trail (LVRT)
STP-LVRT(11), (12) & (13)
Danville to Sheldon, Vermont
Soil K- Factor Map Series**

Sheet 21 of 25

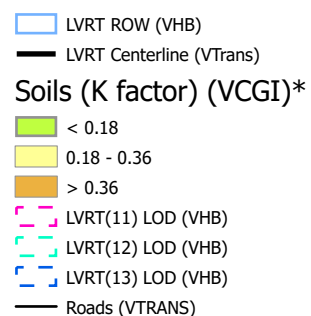


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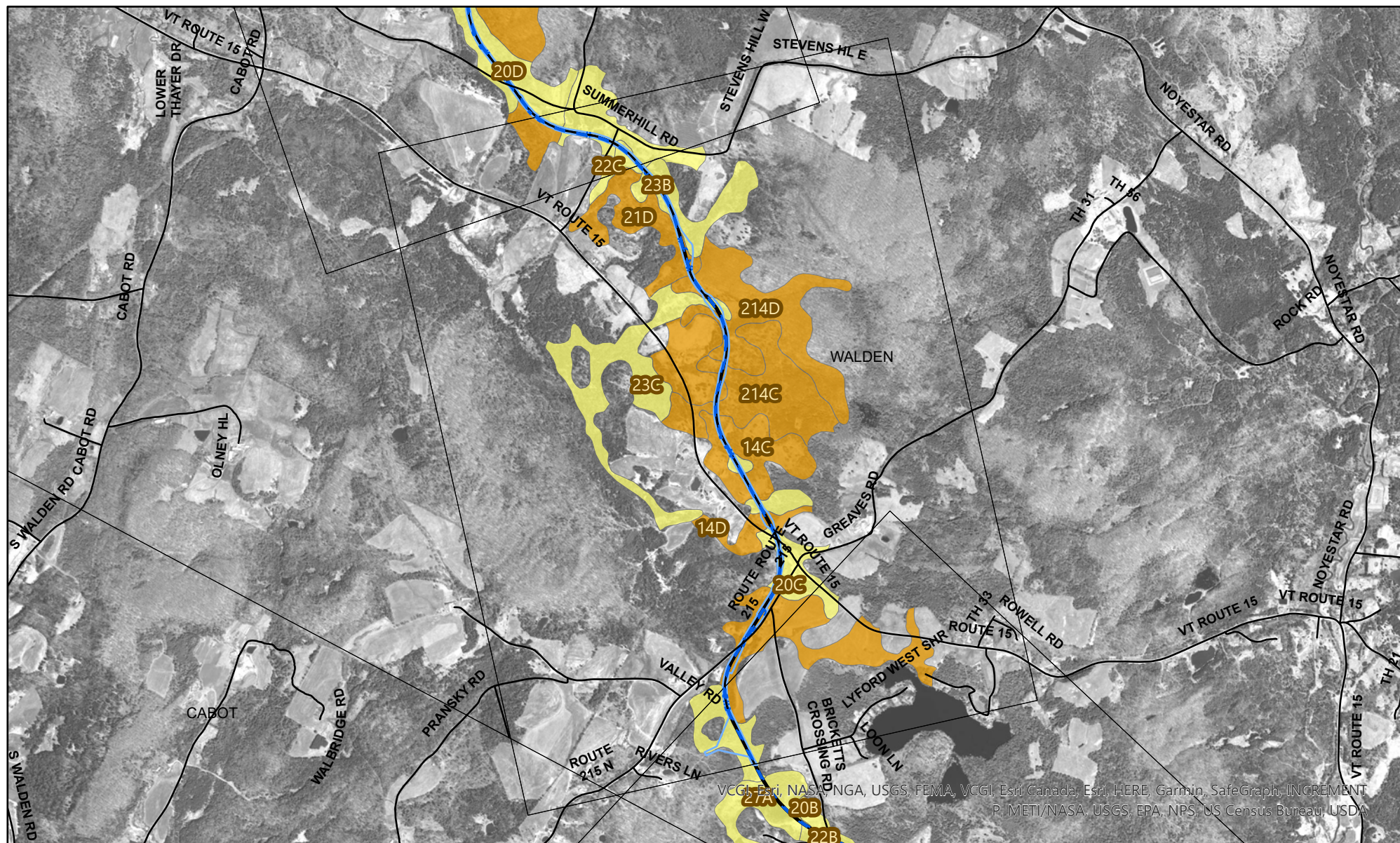


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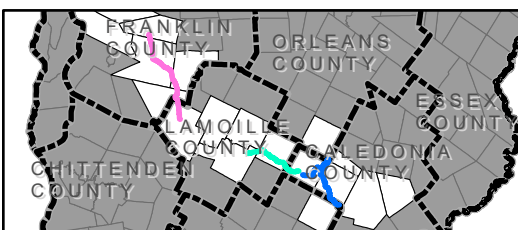
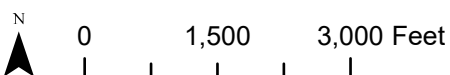
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Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

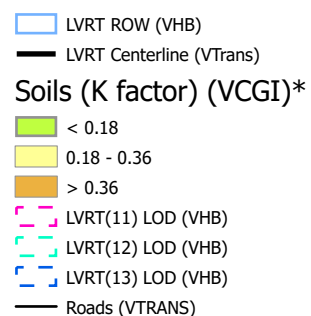


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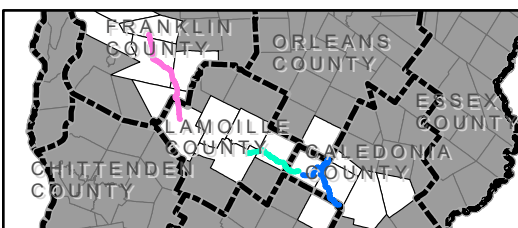
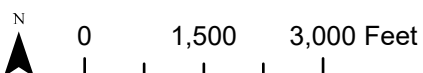
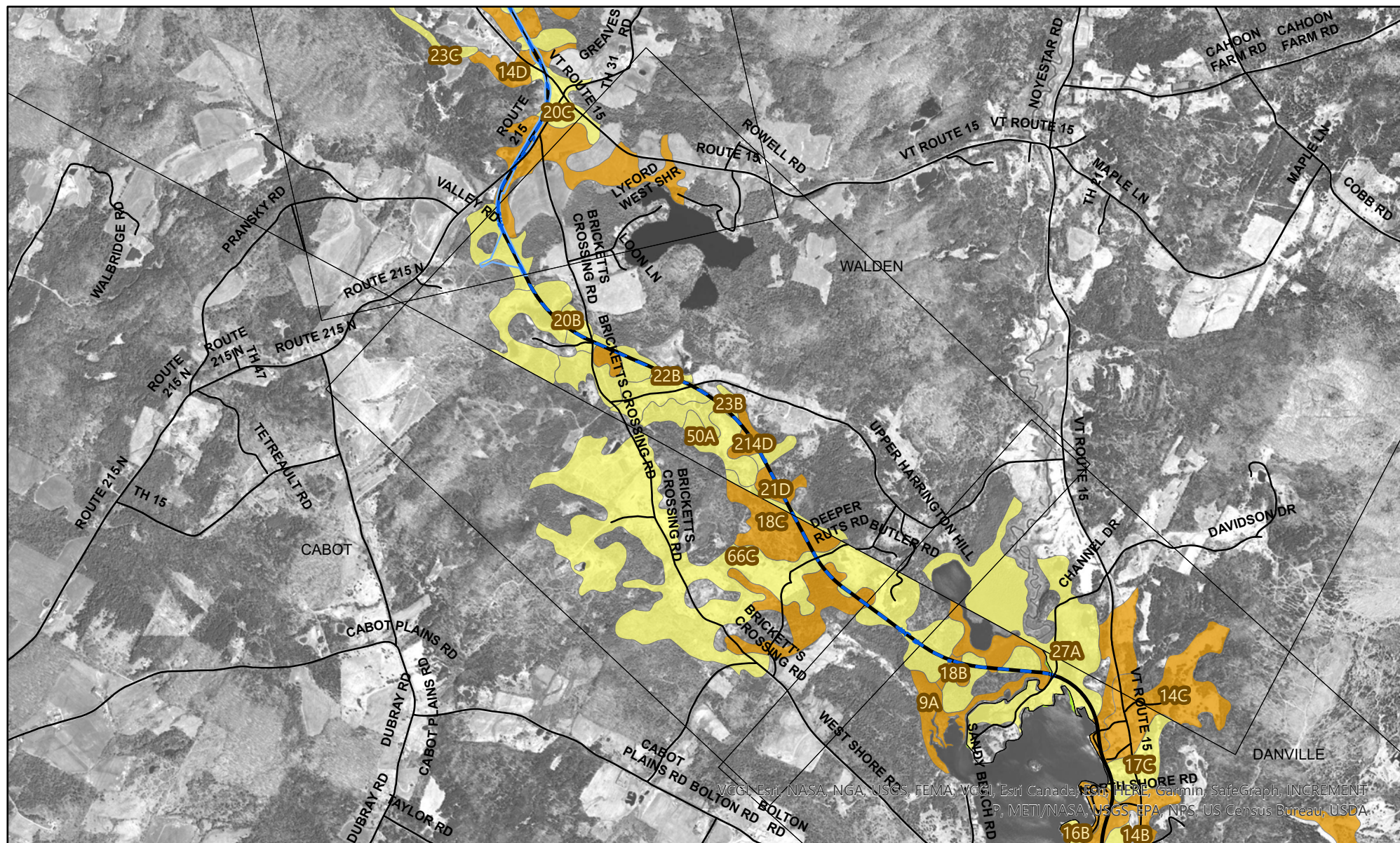
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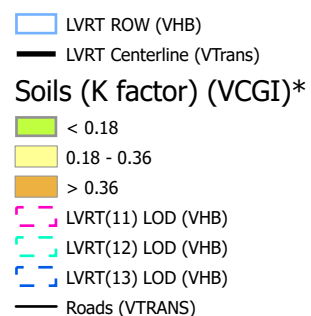
Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

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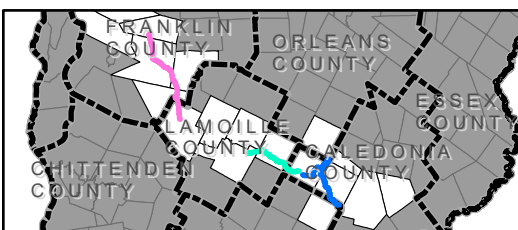
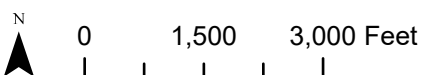
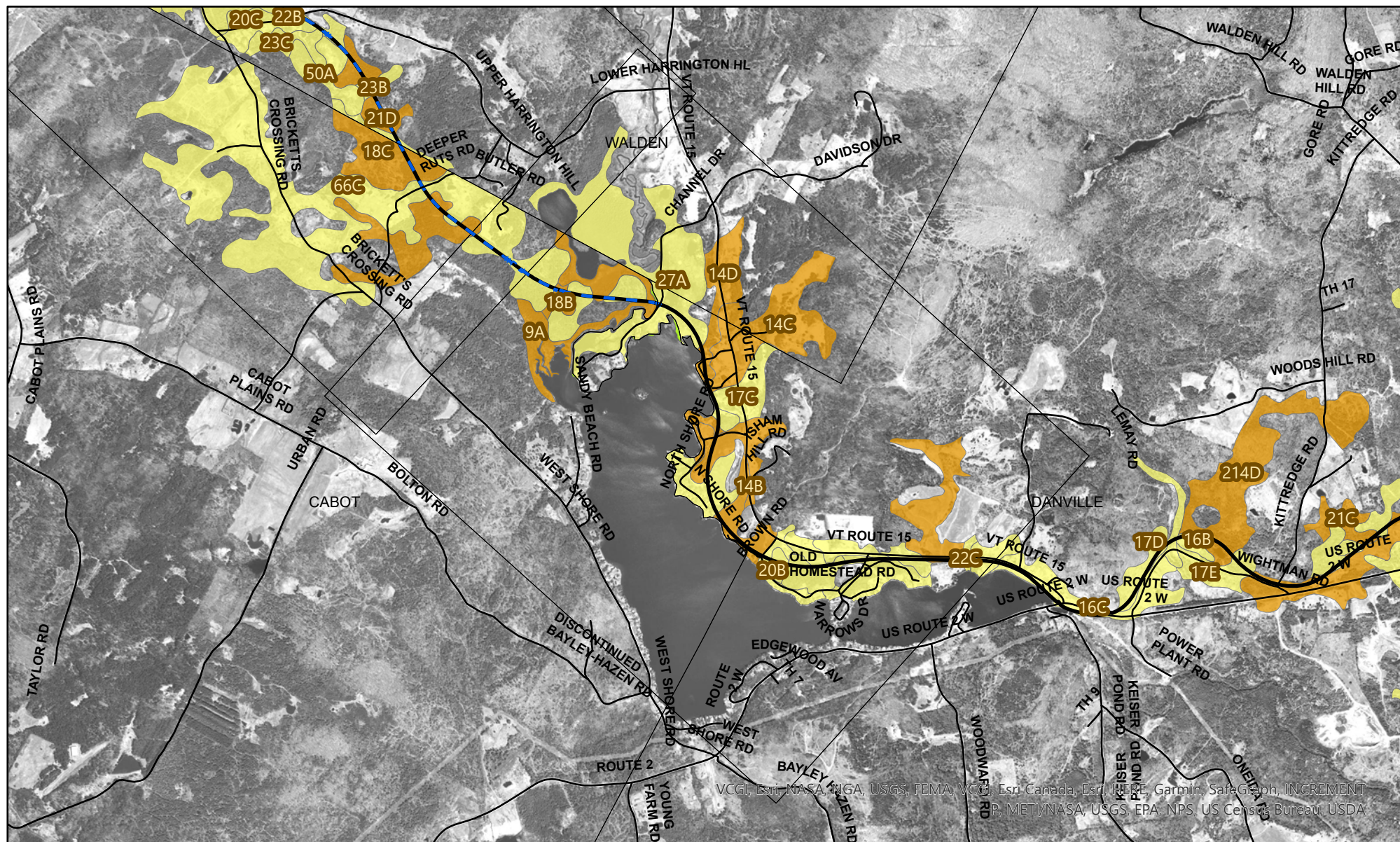
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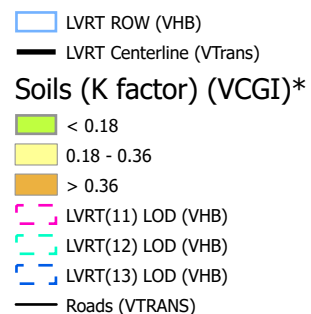
Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

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Sources:
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Lamoille Valley Rail Trail (LVRT) STP-LVRT(11), (12) & (13) Danville to Sheldon, Vermont Soil K- Factor Map Series

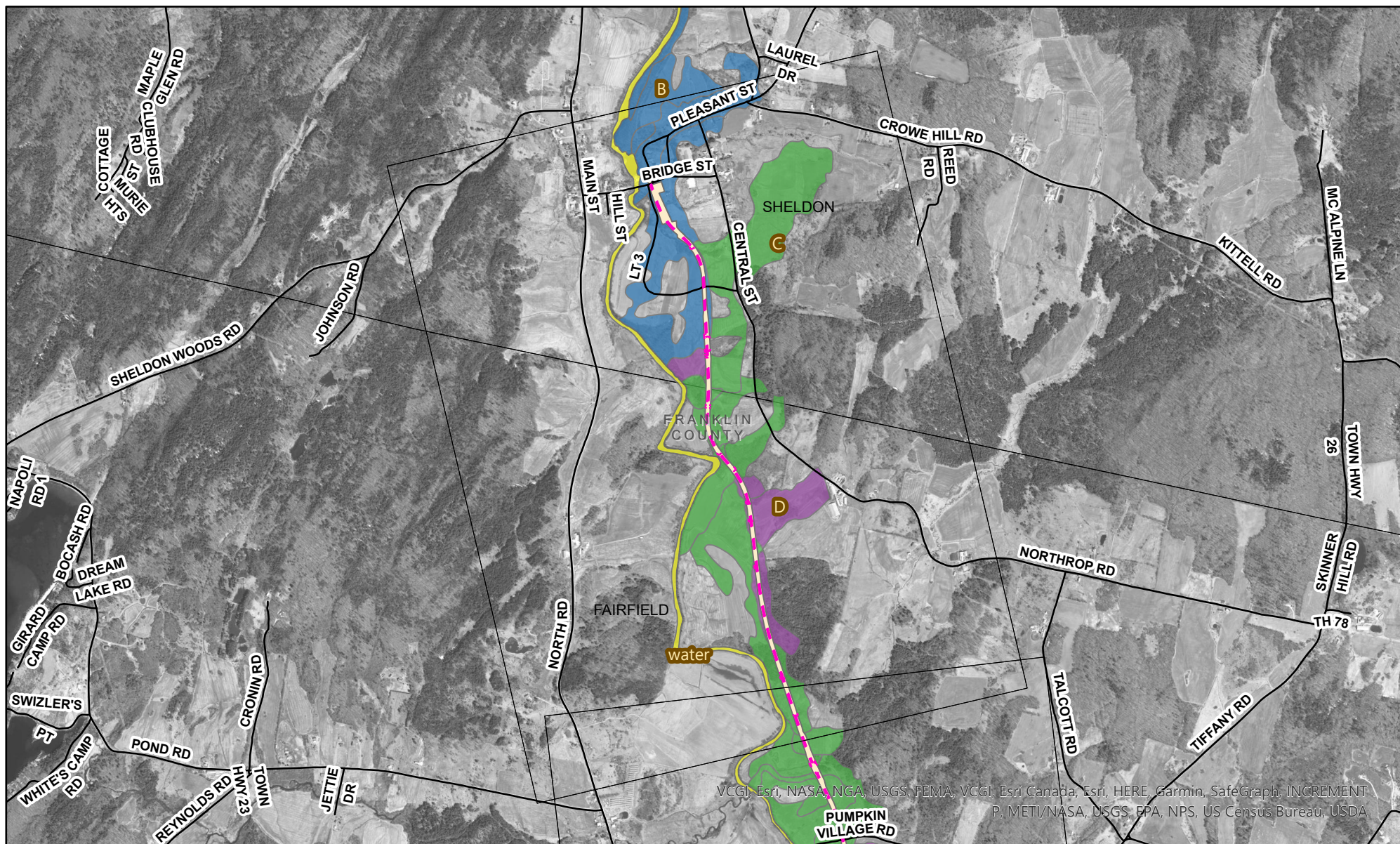
Sheet 25 of 25



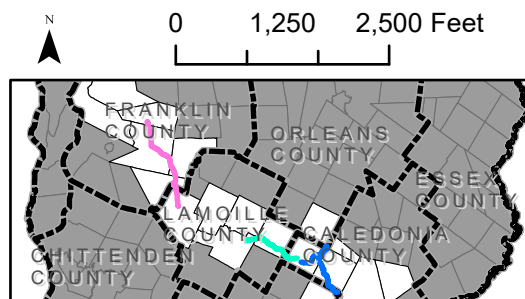
Lamoille Valley Rail Trail – 401 Water Quality Certification Application

Appendix IF. Hydrologic Soil Groups

April 7, 2021



VCGI, Esri, NASA, NGA, USGS, FEMA, VCGI, Esri Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA



Hydrologic Soil Group (VCGI) *

- A
- B
- C
- D
- not rated
- water
- LVRT(11) LOD (VHB)
- LVRT(12) LOD (VHB)
- LVRT(13) LOD (VHB)
- LVRT ROW (VHB)
- Roads (VTRANS)

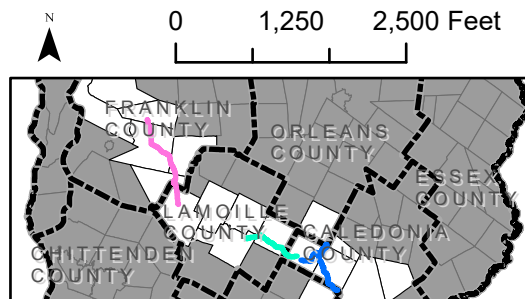
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**Lamoille Valley Rail Trail (LVRT)
 STP-LVRT(11), (12) & (13)
 Danville to Sheldon, Vermont
 Hydrologic Soil Group Map Series**



VCGI, Esri, NASA, NGA, USGS, FEMA, VCGI, Esri, Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI, NASA, USGS, EPA, NPS, US Census Bureau, USDA



0 1,250 2,500 Feet

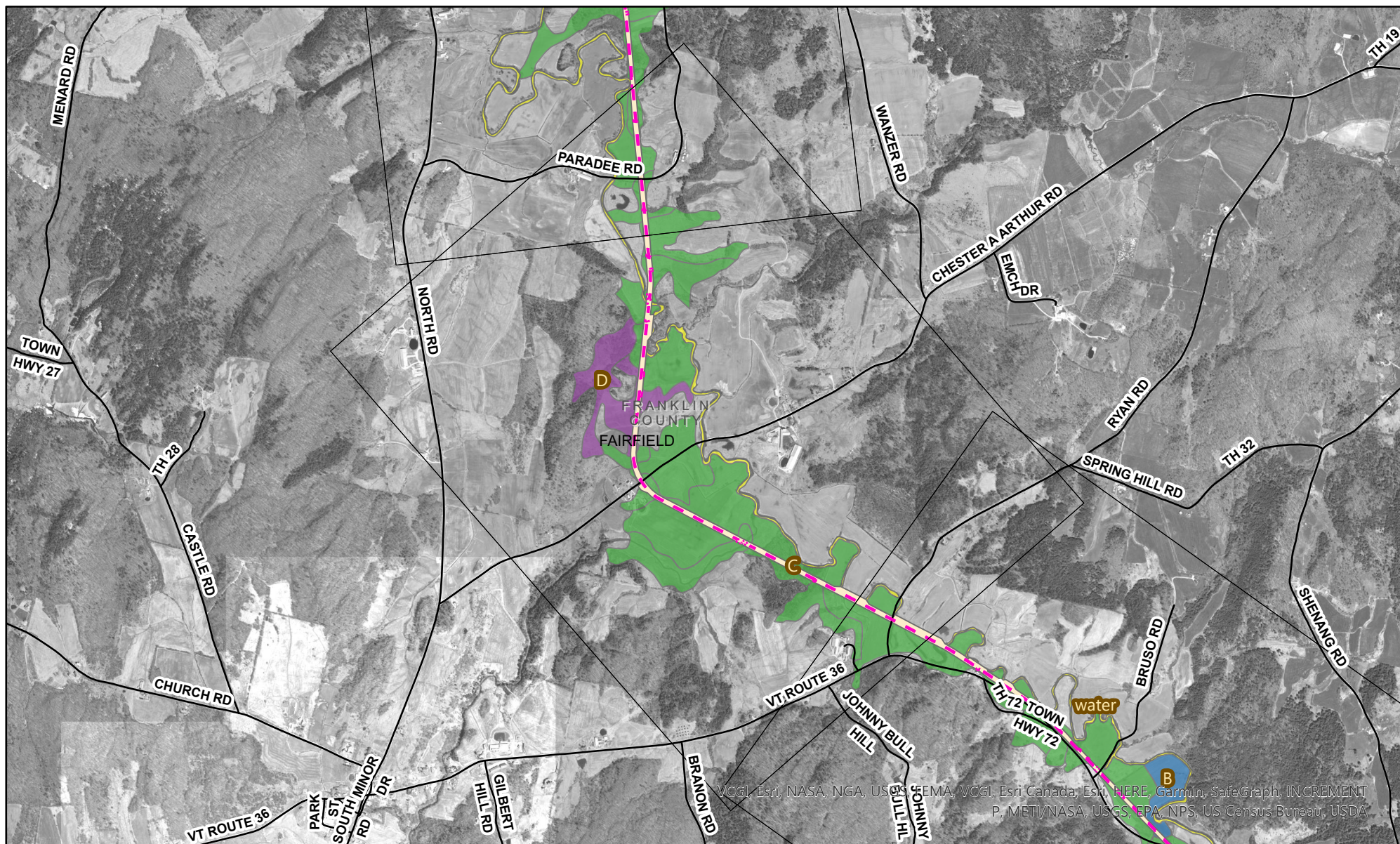
Hydrologic Soil Group (VCGI) *

- A
- B
- C
- D
- not rated
- water
- LVRT(11) LOD (VHB)
- LVRT(12) LOD (VHB)
- LVRT(13) LOD (VHB)
- LVRT ROW (VHB)
- Roads (VTRANS)

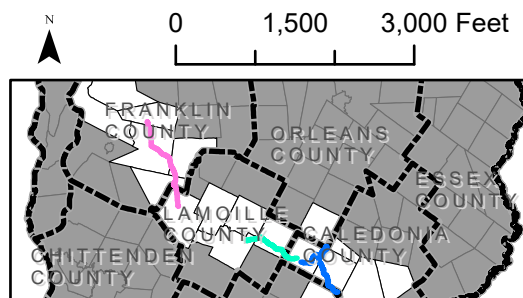
Sources:

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**Lamoille Valley Rail Trail (LVRT)
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 Danville to Sheldon, Vermont
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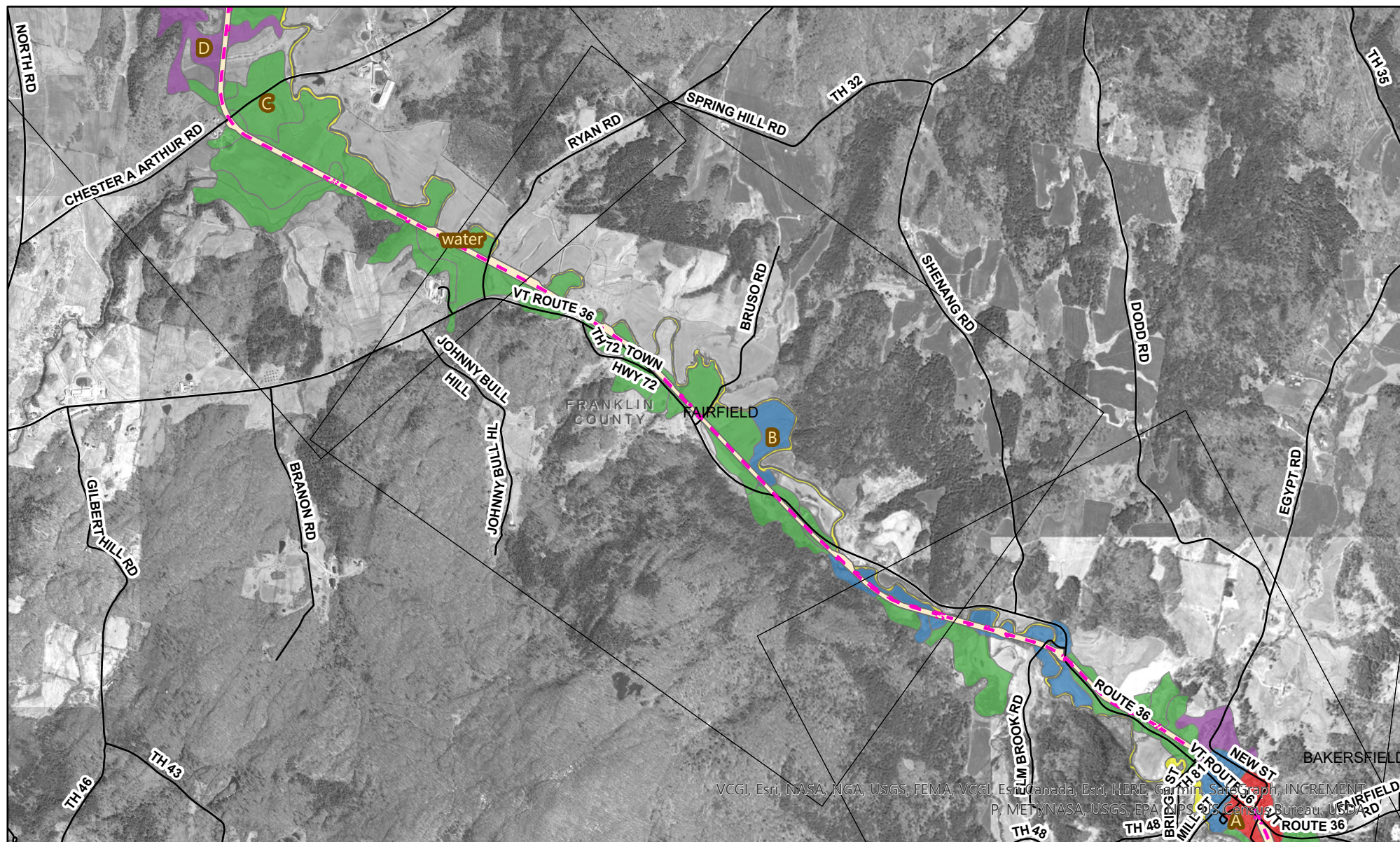
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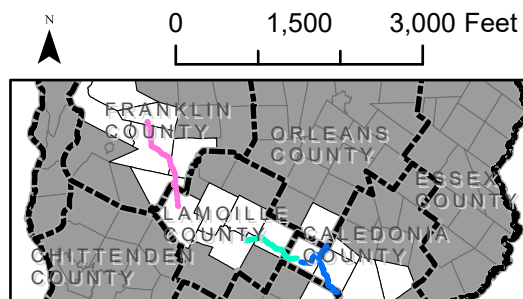
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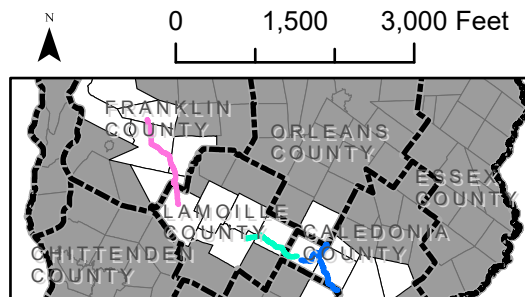
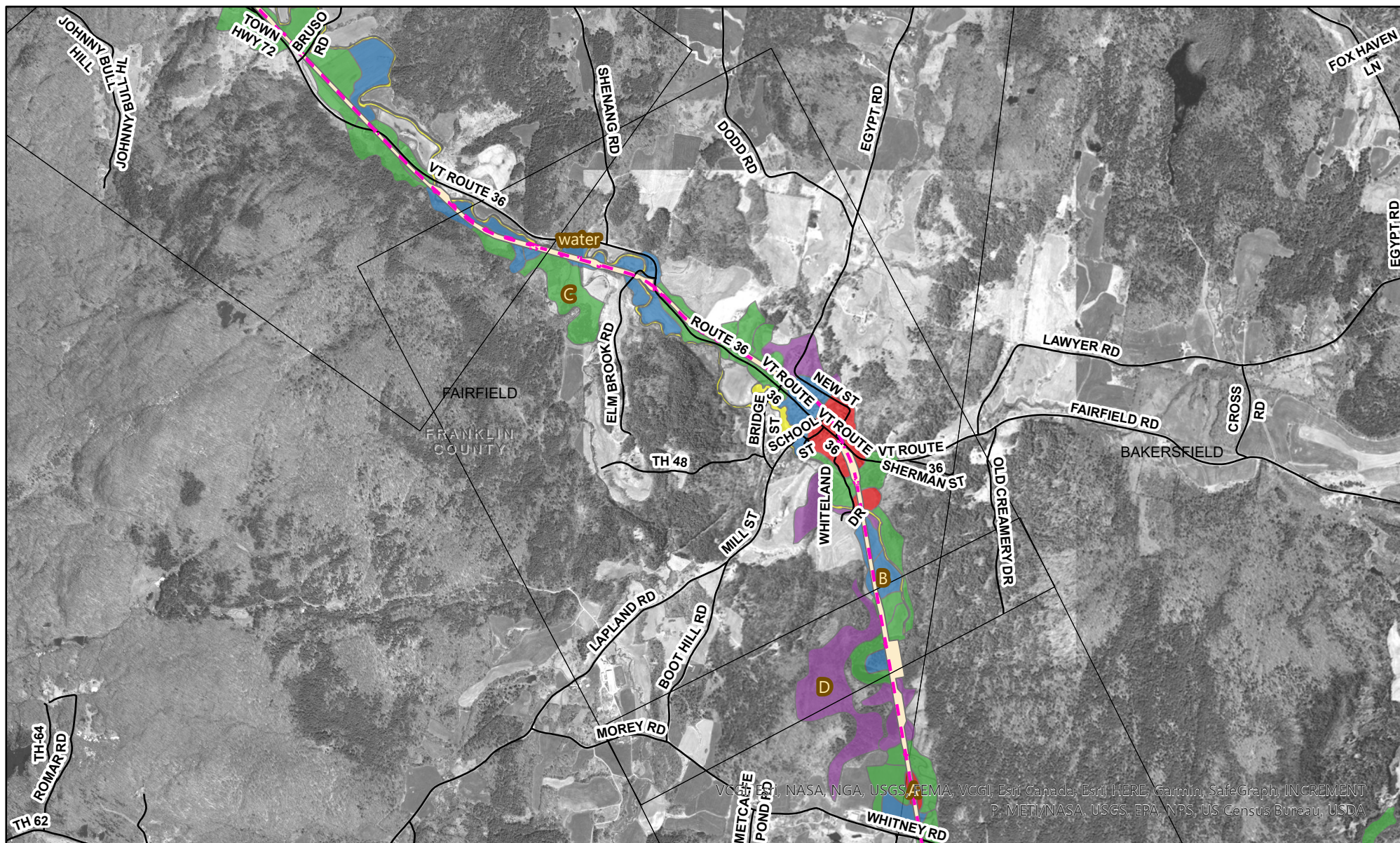
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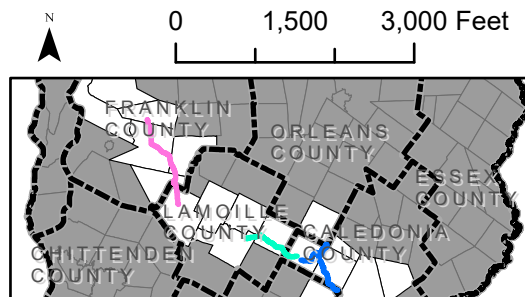
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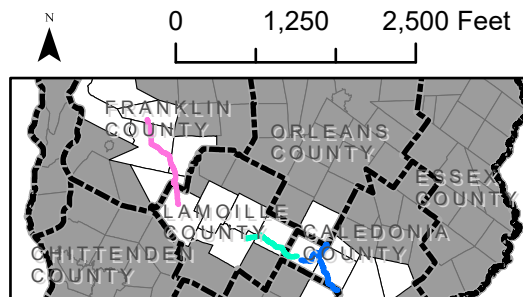
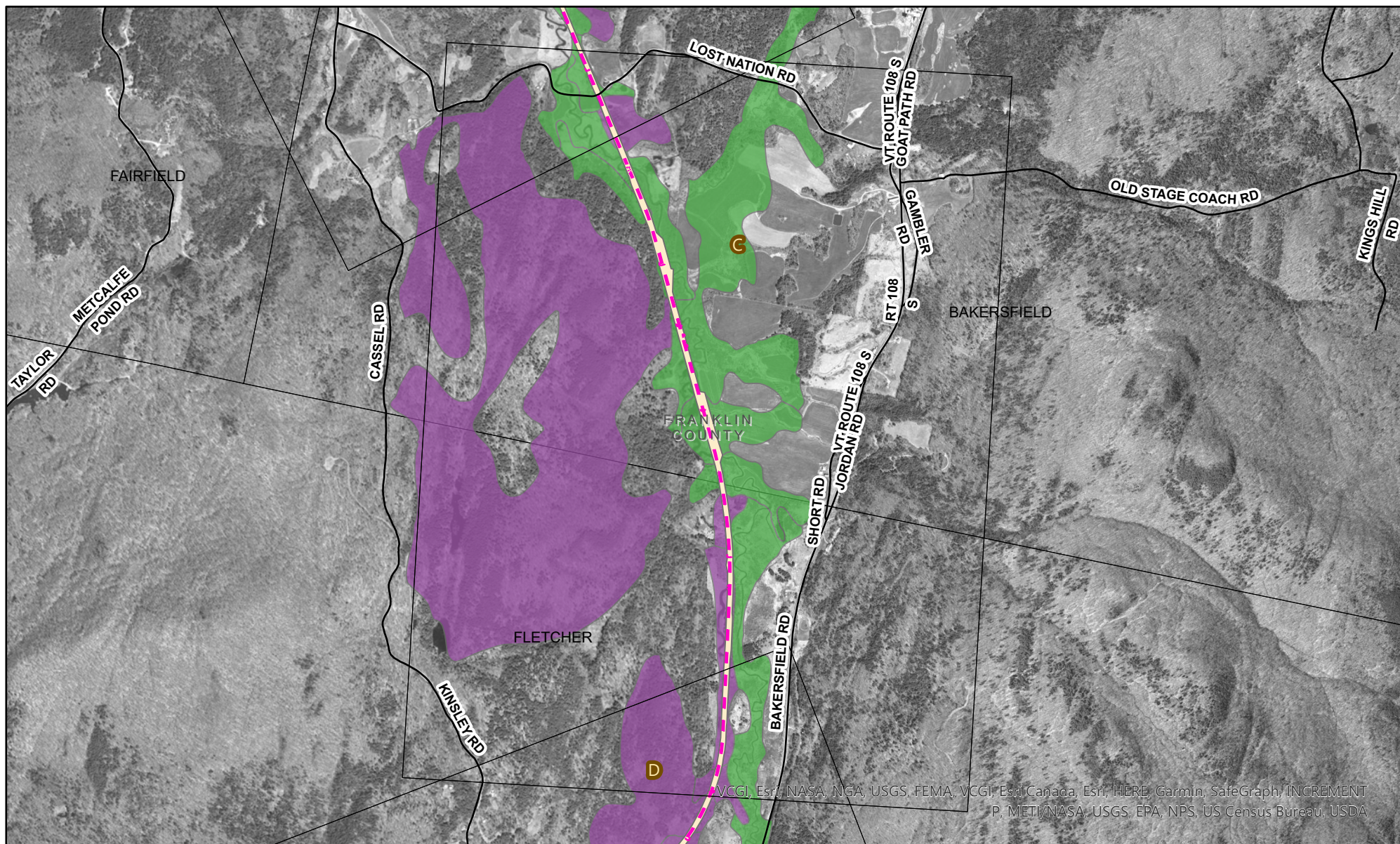
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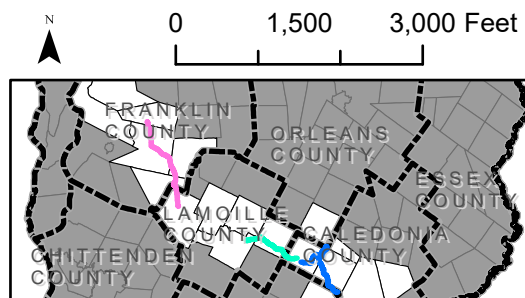
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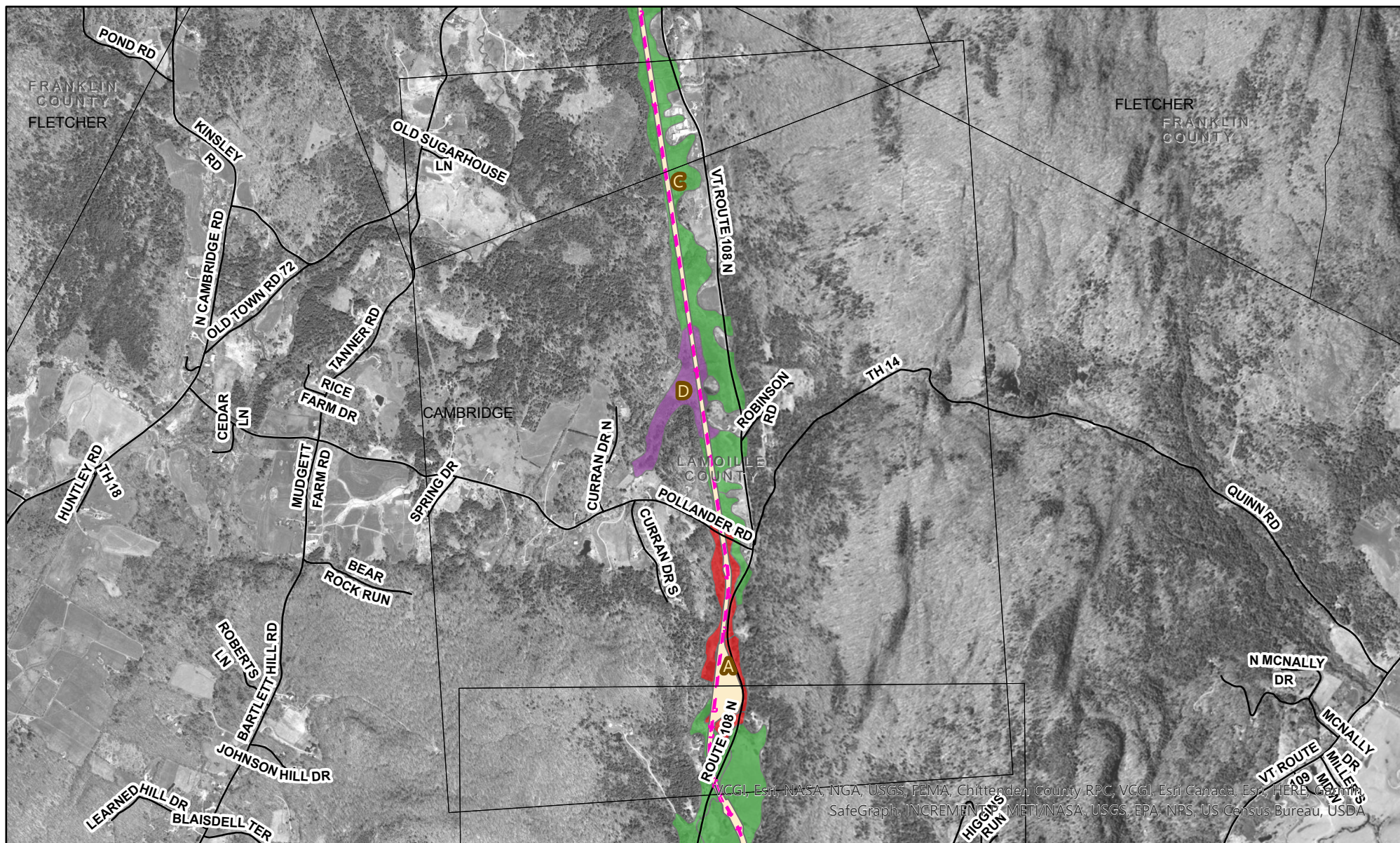
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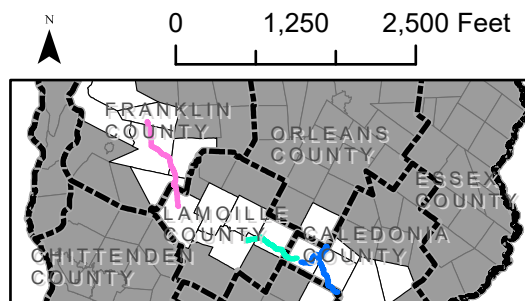
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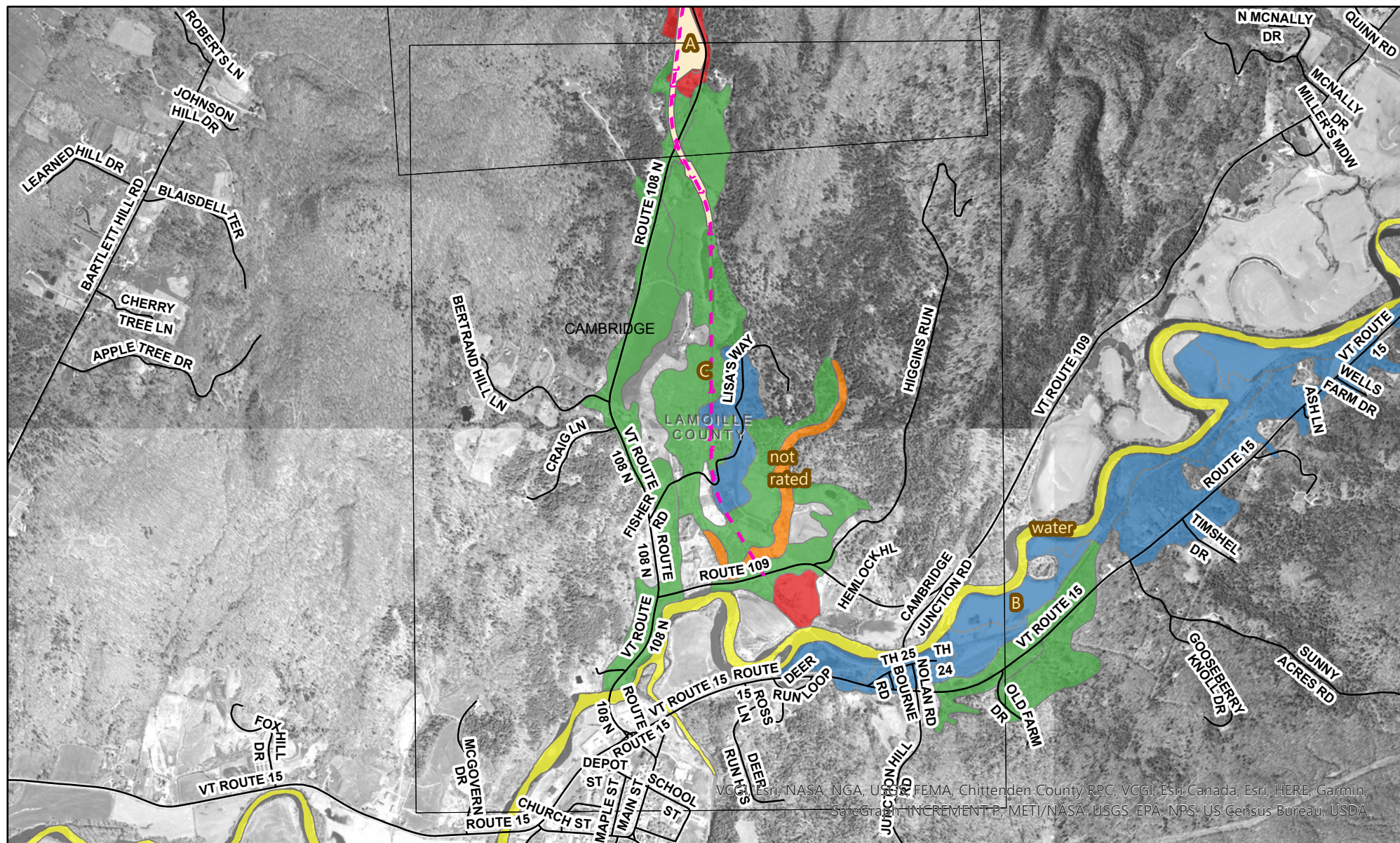
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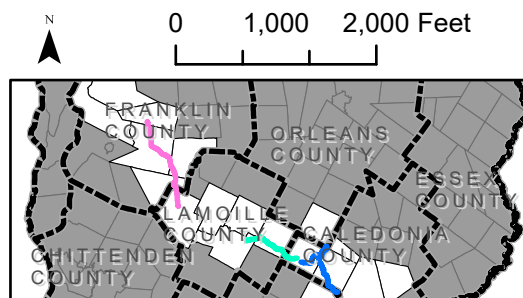
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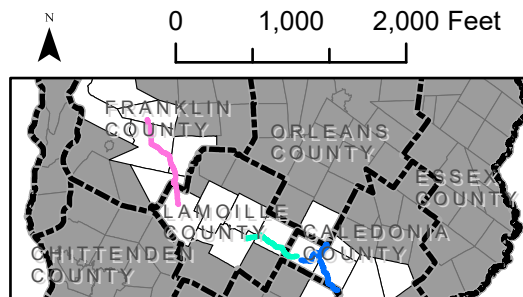
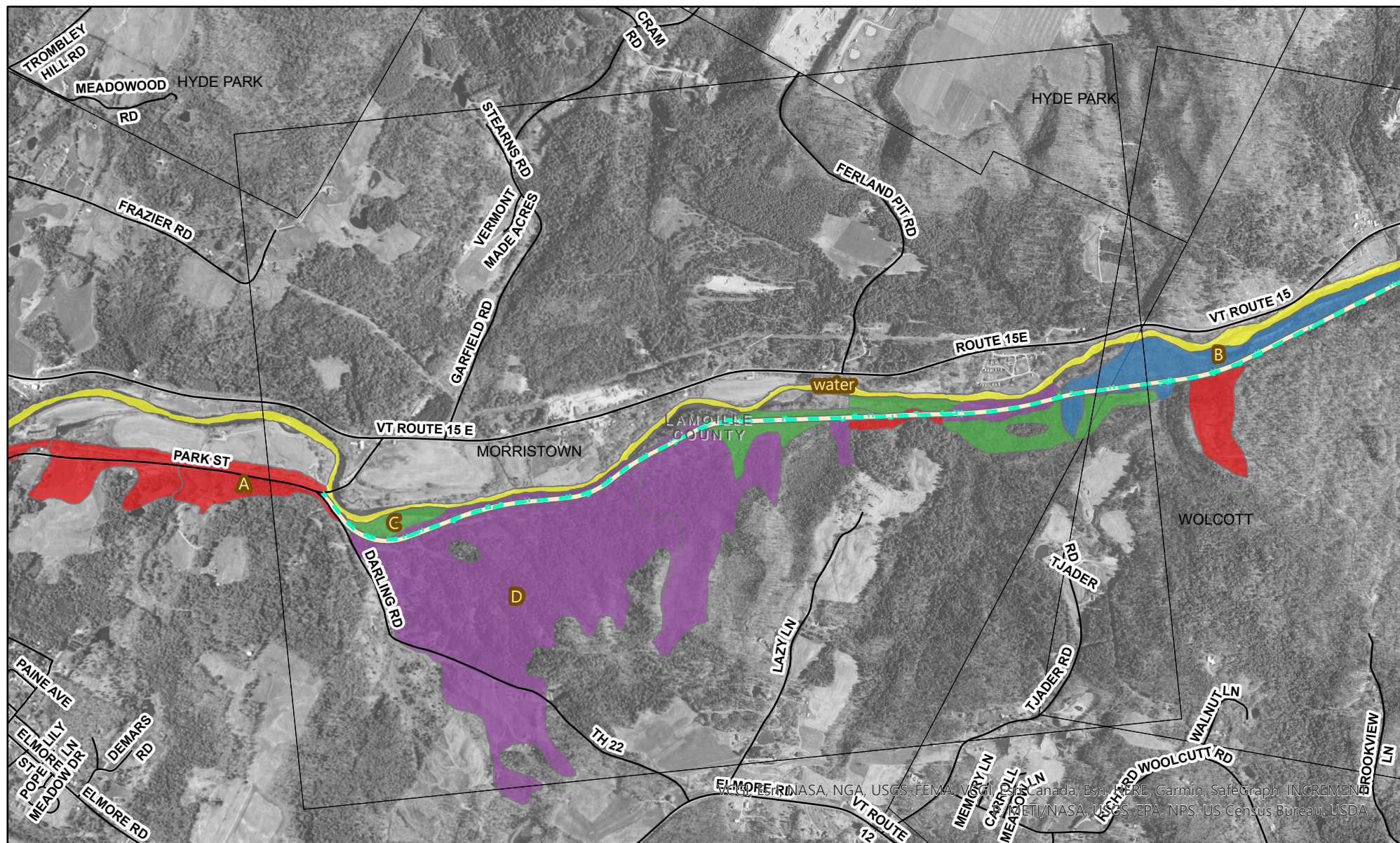
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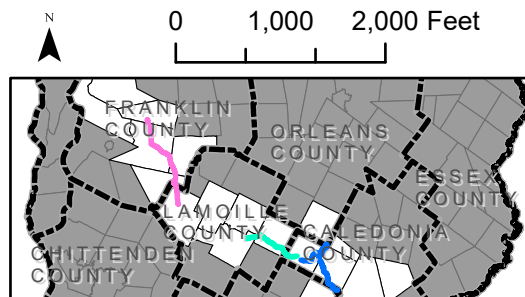
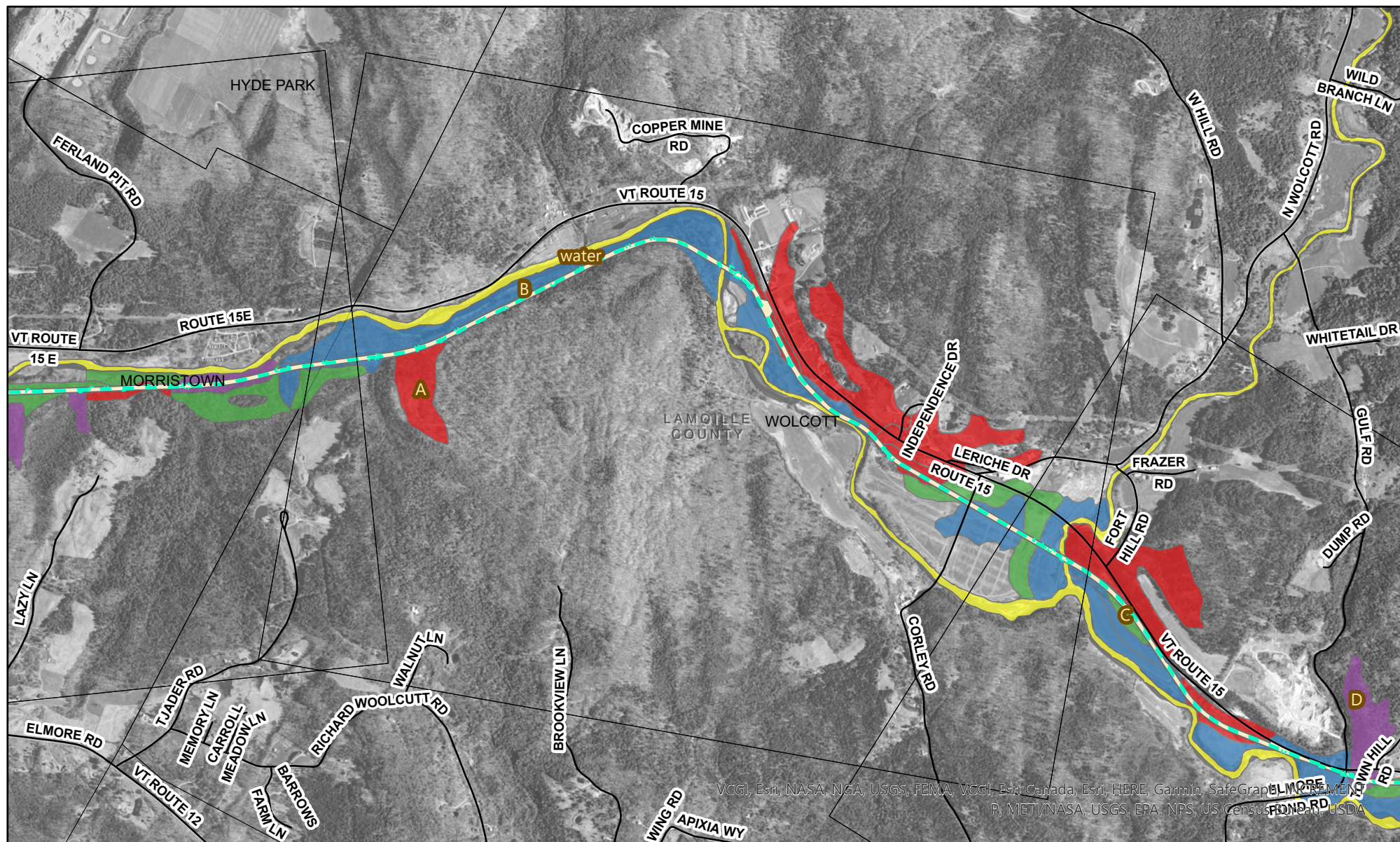
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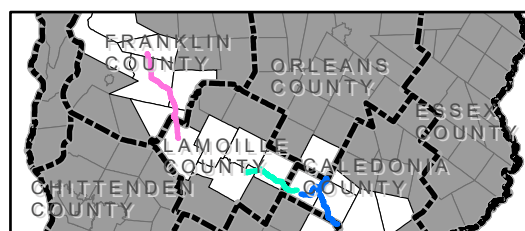
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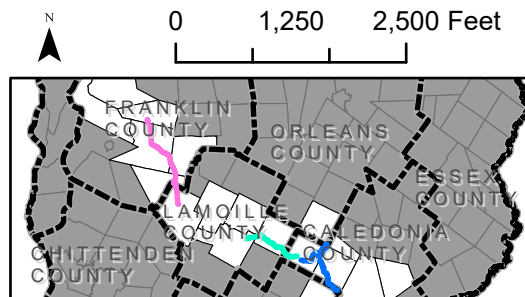
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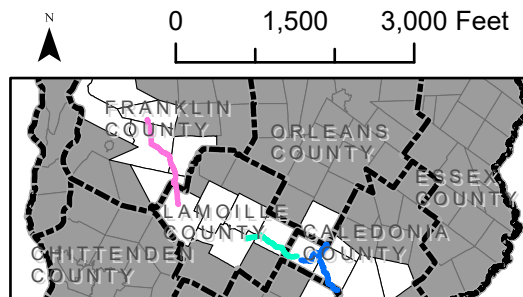
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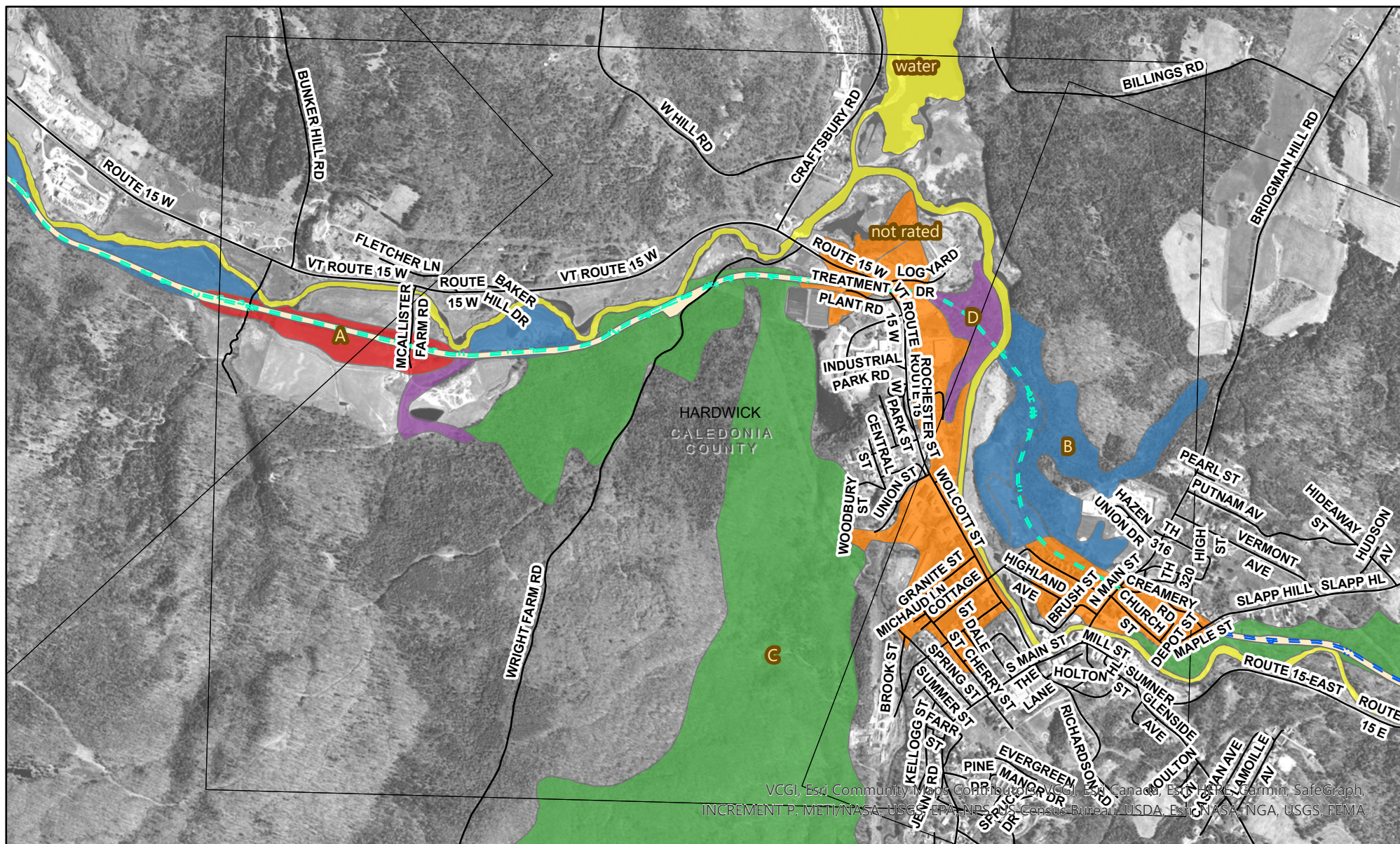
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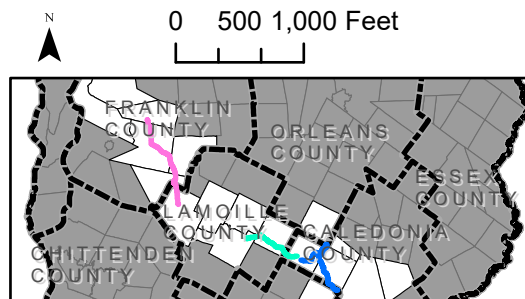
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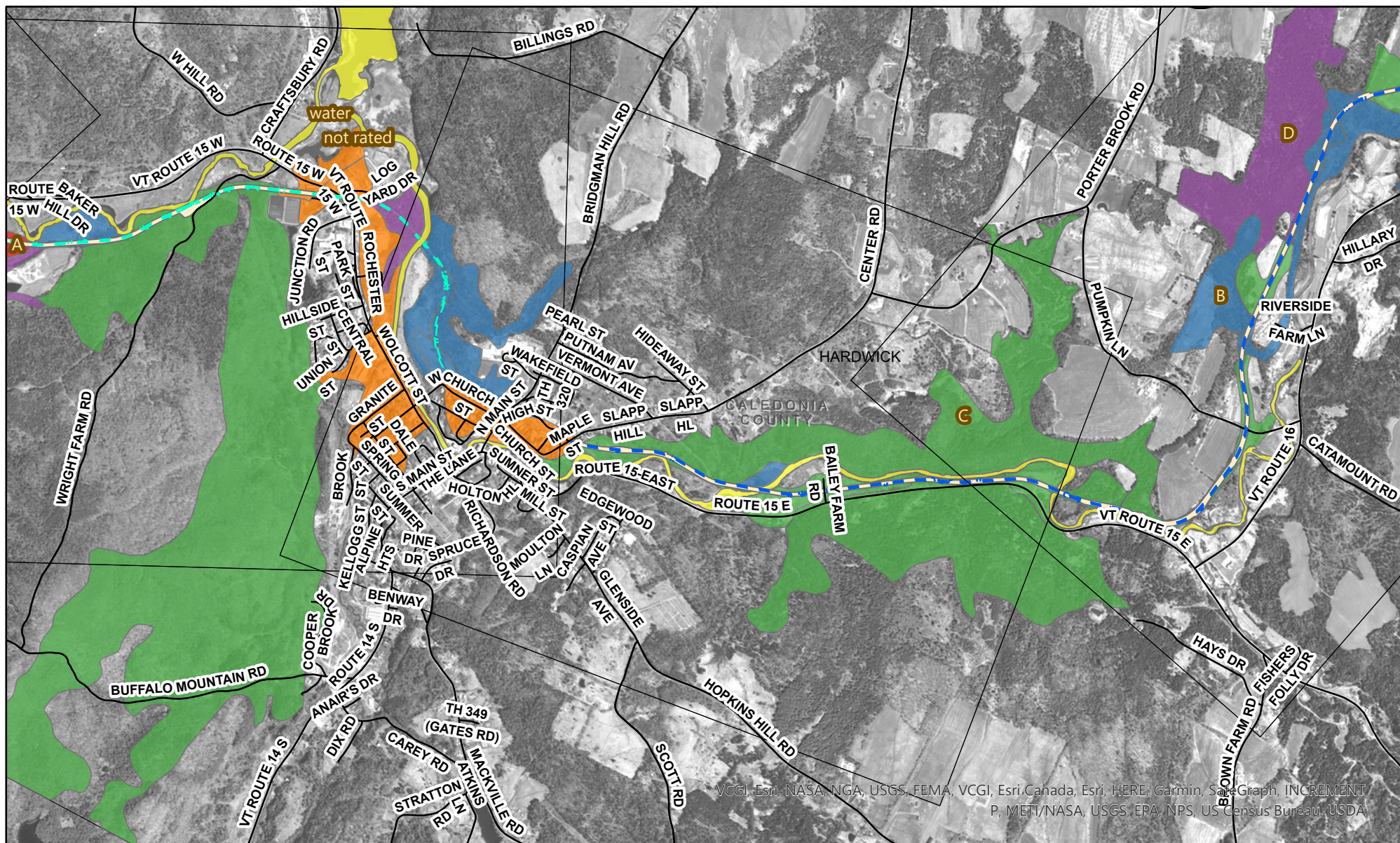
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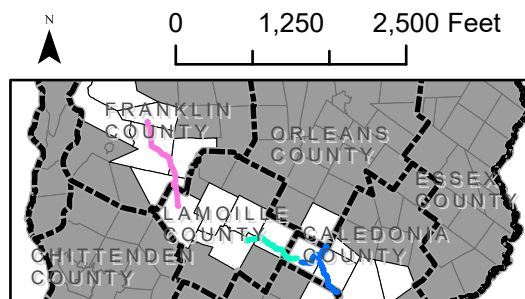
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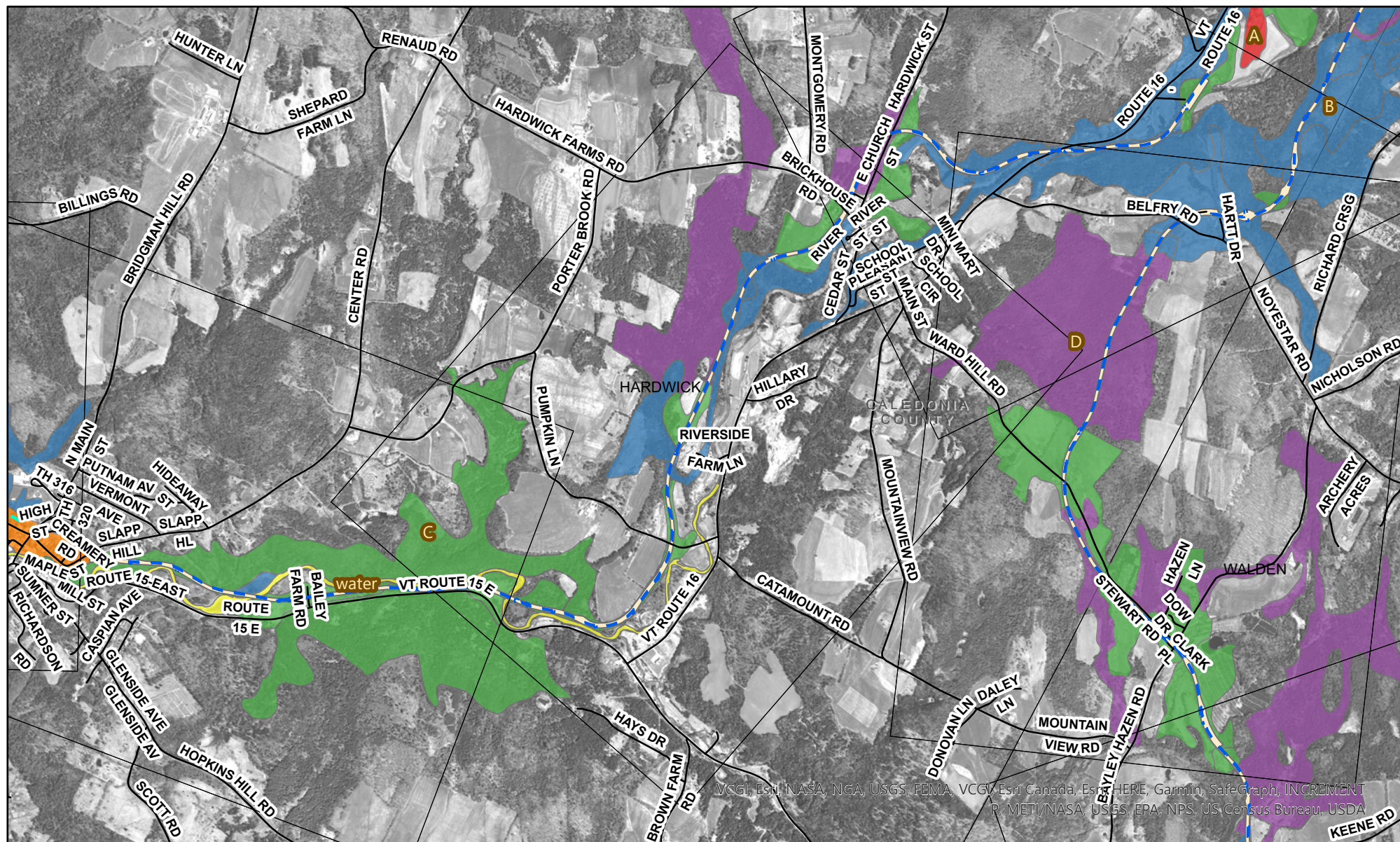
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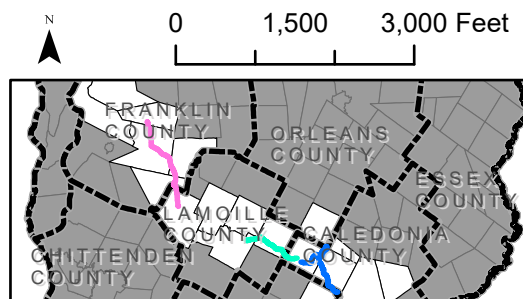
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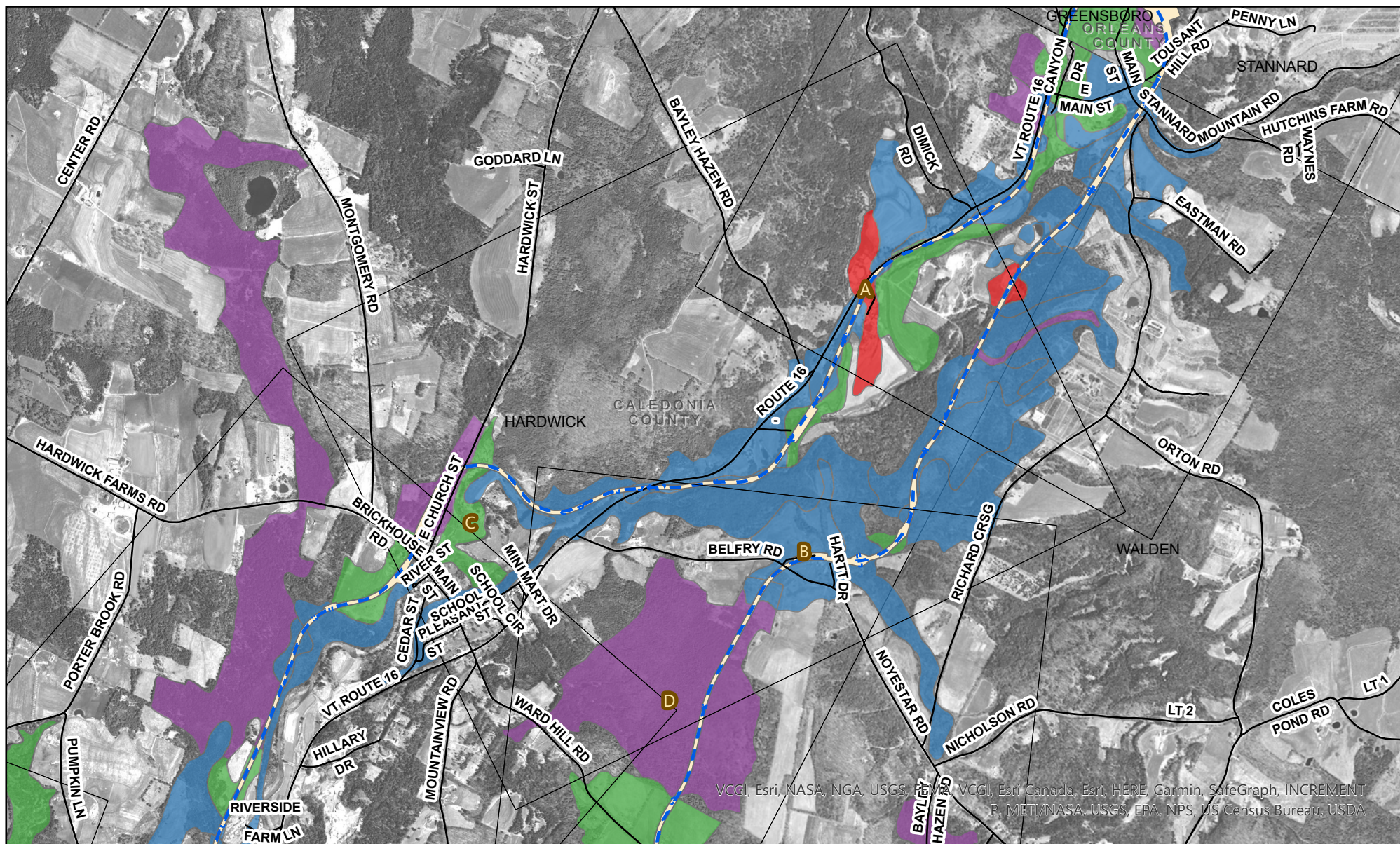
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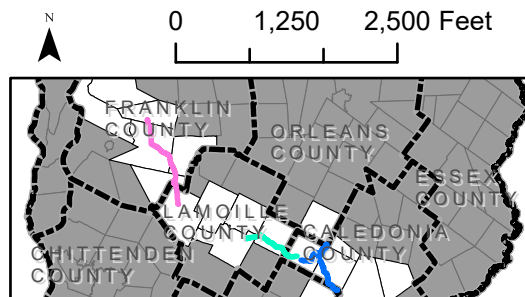
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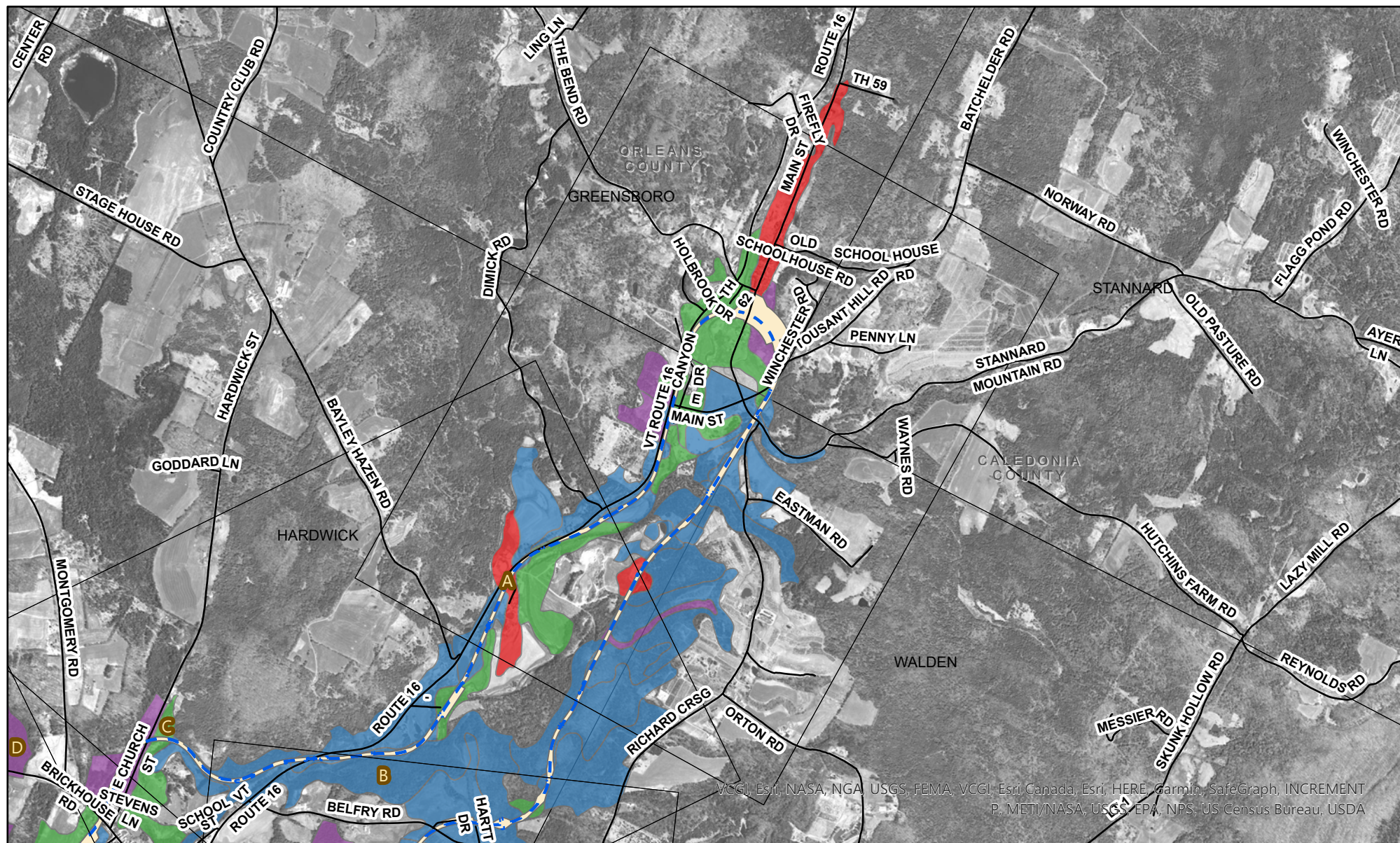
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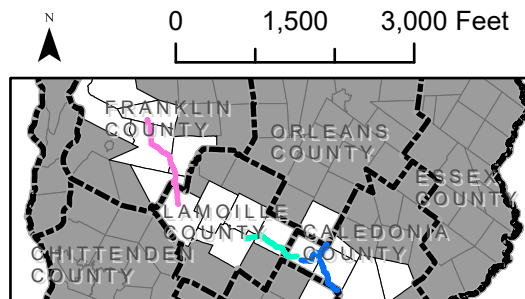
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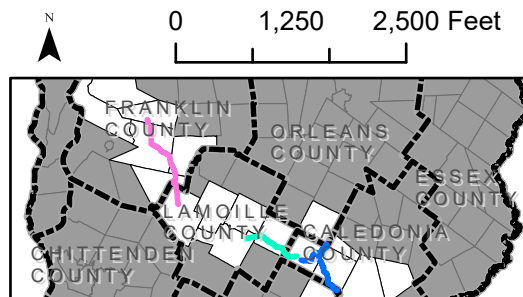
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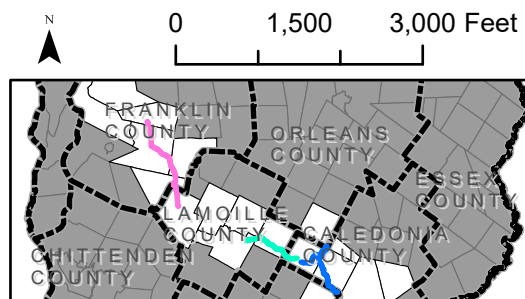
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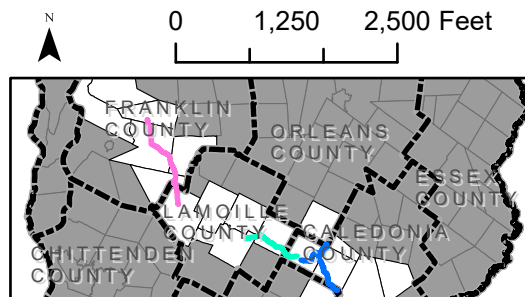
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 Danville to Sheldon, Vermont
 Hydrologic Soil Group Map Series**



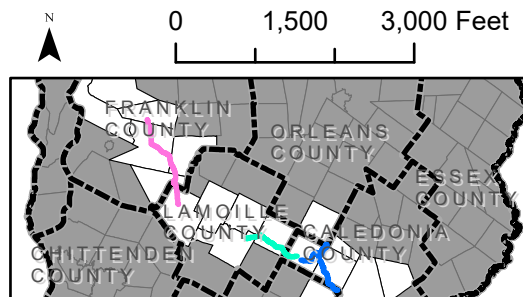
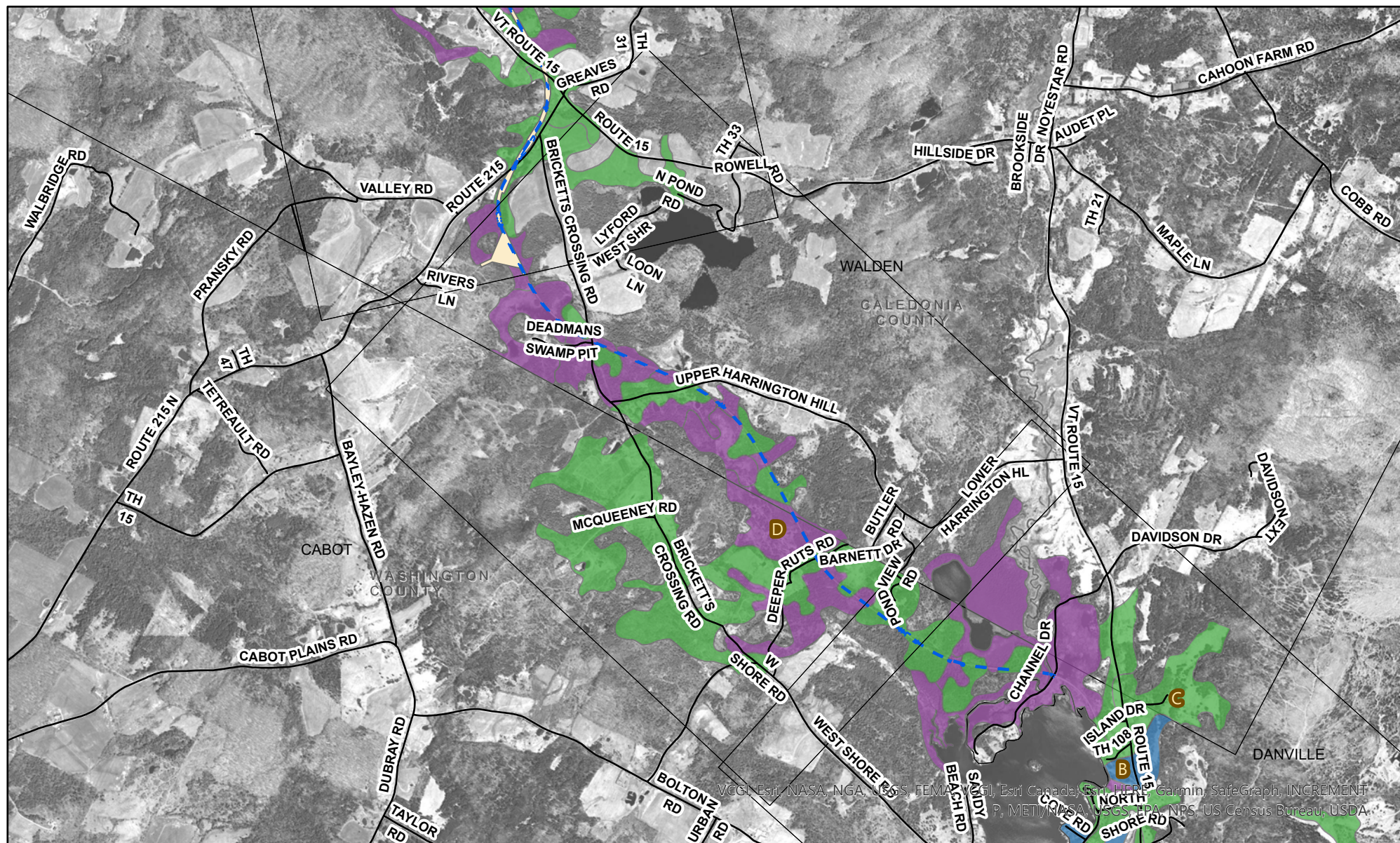
Hydrologic Soil Group (VCGI) *

- A
- B
- C
- D
- not rated
- water
- LVRT(11) LOD (VHB)
- LVRT(12) LOD (VHB)
- LVRT(13) LOD (VHB)
- LVRT ROW (VHB)
- Roads (VTRANS)

Sources:

VCGI (Vermont Center for Geographic Information - Various Dates)
 VAST (Vermont Association of Snow Travellers - 2008)
 VTrans (Vermont Department of Transportation)
 VHB (2008-2020)

**Lamoille Valley Rail Trail (LVRT)
 STP-LVRT(11), (12) & (13)
 Danville to Sheldon, Vermont
 Hydrologic Soil Group Map Series**



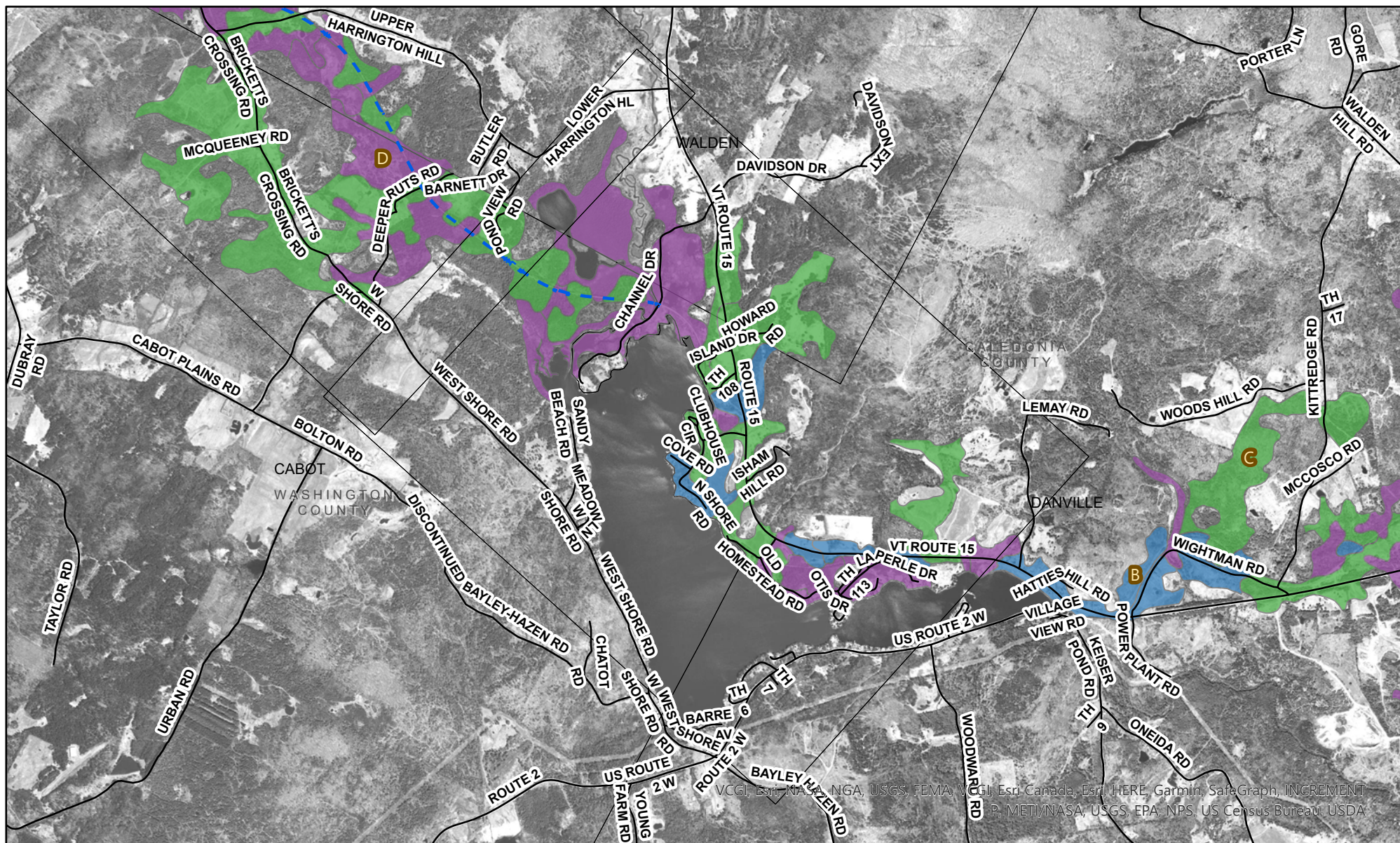
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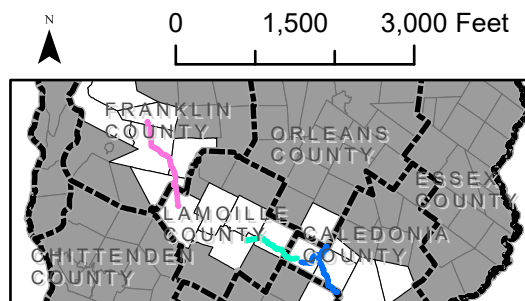
Sources:

VCGI (Vermont Center for Geographic Information - Various Dates)
 VAST (Vermont Association of Snow Travellers - 2008)
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 VHB (2008-2020)

**Lamoille Valley Rail Trail (LVRT)
 STP-LVRT(11), (12) & (13)
 Danville to Sheldon, Vermont
 Hydrologic Soil Group Map Series**



VCGI, Esri, NASA, NGA, USGS, FEMA, VCGI, Esri, Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA



Hydrologic Soil Group (VCGI) *

- A
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Sources:

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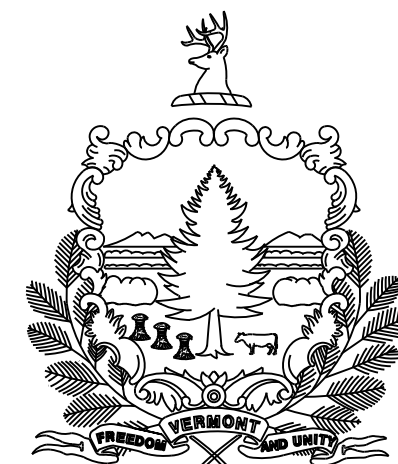


Lamoille Valley Rail Trail – 401 Water Quality Certification Application

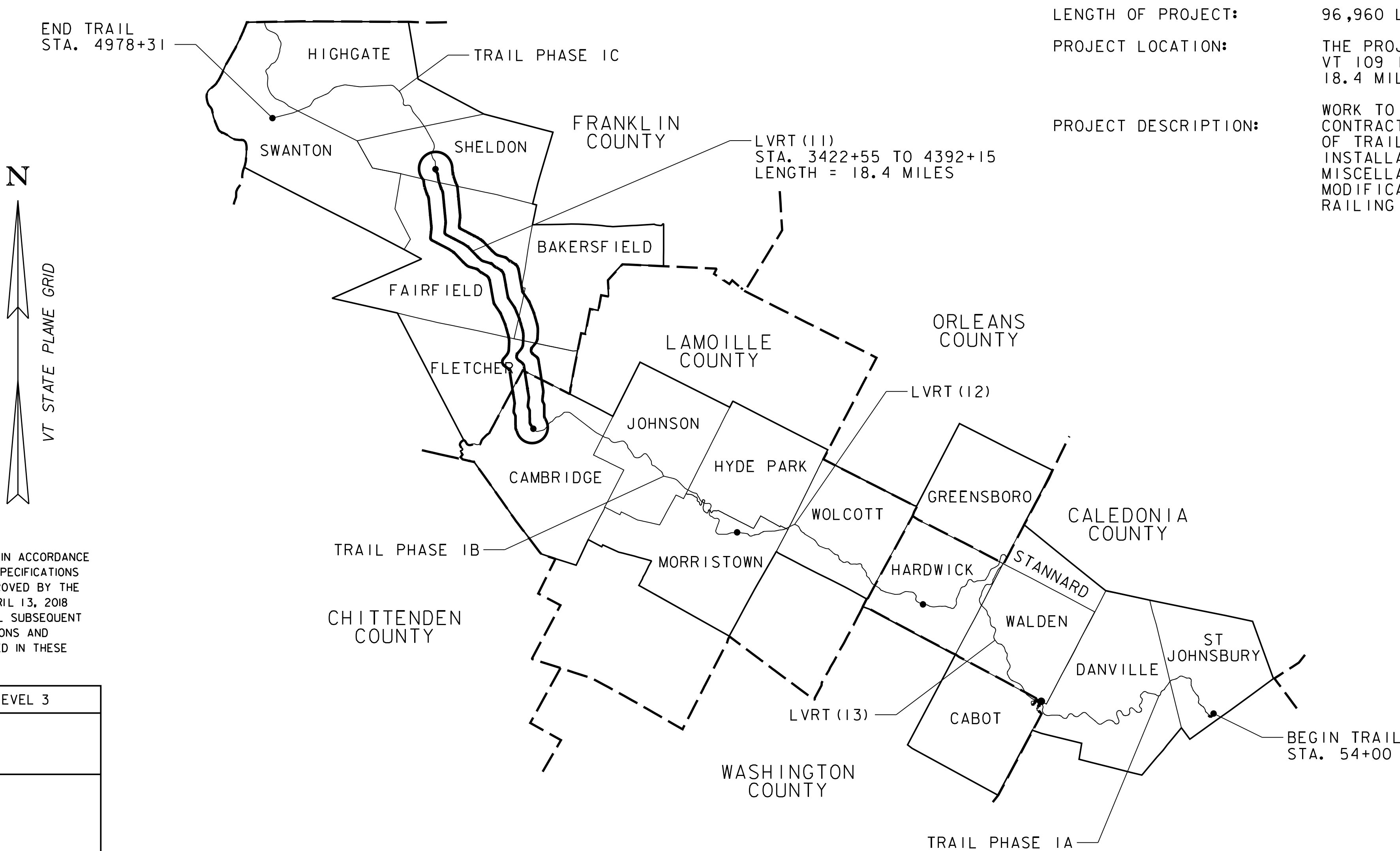
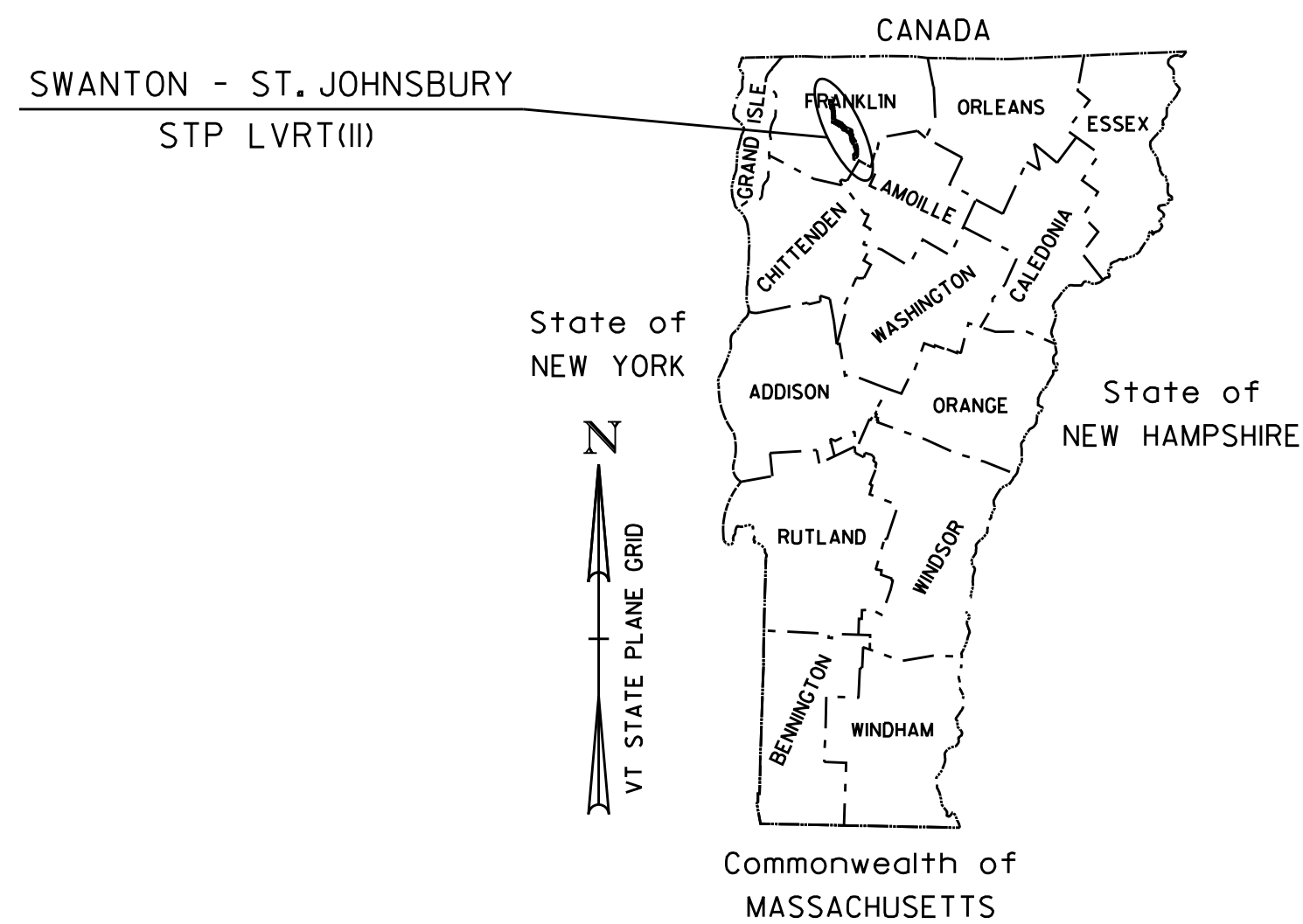
Appendix IG. Erosion Prevention Sediment Control Plans

March 23, 2021

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
LAMOILLE VALLEY RAIL TRAIL
SWANTON - ST. JOHNSBURY STP LVRT(11)



LENGTH OF PROJECT: 96,960 LF (18.4 MILES)
PROJECT LOCATION: THE PROJECT BEGINS AT THE INTERSECTION OF VT 109 IN CAMBRIDGE AND EXTENDS WESTERLY 18.4 MILES TO BRIDGE STREET IN SHELDON.
PROJECT DESCRIPTION: WORK TO BE PERFORMED UNDER THIS CONTRACT INCLUDES CONSTRUCTION OF TRAIL SURFACE, CLEARING, DITCHING, INSTALLATION OF CULVERTS, SIGNING, MISCELLANEOUS STRUCTURE REPAIRS AND BRIDGE MODIFICATIONS INCLUDING DECKING AND RAILING INSTALLATION.

CONSTRUCTION STORMWATER
PERMIT PLANS
MARCH 2021

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 3
SURVEYED BY : N/A
SURVEYED DATE : N/A
DATUM
VERTICAL ASSUMED
HORIZONTAL ASSUMED

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATOR
APPROVED _____ DATE _____
HIGHWAY DIVISION, CHIEF ENGINEER
APPROVED _____ DATE _____
PROJECT MANAGER : JOEL PERRIGO
PROJECT NAME : SWANTON - ST. JOHNSBURY
PROJECT NUMBER : STP LVRT (11)
SHEET 1 OF 84 SHEETS



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12	TYPICAL APPROACH RAIL SHEET
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14-23	STRUCTURES DETAILS SHEETS
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25-26	BOX CULVERT TYPICAL SECTION SHEETS
27	CULVERT REPLACEMENT/REPAIR DETAIL SHEET
28	WASTE AREA DETAILS SHEET
29-30	CROSSING DETAILS SHEETS
31-32	EPSC DETAILS SHEET
33-34	EPSC NARRATIVE
35-45	EPSC BRIDGE SHEETS
46-84	EPSC SITE PLAN SHEETS

VAOT STANDARDS

E-10	07-01-2019	ROLLED EROSION CONTROL PRODUCT, TYPE 1
E-11	07-01-2019	CHECK DAM, TYPE 1
E-12	07-01-2019	STABILIZED CONSTRUCTION ENTRANCE
E-13	07-01-2019	INLET PROTECTION DEVICE, TYPE 1
E-14	07-01-2019	INLET PROTECTION DEVICE, TYPE 2
E-15	07-01-2019	SILT FENCE



PROJECT NAME: SWANTON - ST JOHNSBURY
PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_EPSC Index.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: J.S. GINGRAS
DESIGNED BY: J.S. GINGRAS	CHECKED BY: B.M. ROBERTS
INDEX OF SHEETS	SHEET 2 OF 84

GENERAL INFORMATION

SYMBOLOLOGY LEGEND NOTE

THE SYMBOLOLOGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLOLOGY. THE SYMBOLOLOGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLOLOGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

R.O.W. ABBREVIATIONS (CODES) & SYMBOLS

POINT	CODE	DESCRIPTION
	CH	CHANNEL EASEMENT
	CONST	CONSTRUCTION EASEMENT
	CUL	CULVERT EASEMENT
	D&C	DISCONNECT & CONNECT
	DIT	DITCH EASEMENT
	DR	DRAINAGE EASEMENT
	DRIVE	DRIVEWAY EASEMENT
	EC	EROSION CONTROL
	HWY	HIGHWAY EASEMENT
	I&M	INSTALL & MAINTAIN EASEMENT
	LAND	LANDSCAPE EASEMENT
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BDNS	BOUND SET
▣	BDNS	BOUND TO BE SET
◎	IPNF	IRON PIN FOUND
●	IPNS	IRON PIN TO BE SET
⊠	CALC	EXISTING ROW POINT
○	PROW	PROPOSED ROW POINT
[LENGTH]		LENGTH CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

POINT	CODE	DESCRIPTION
⌘	APL	BOUND APPARENT LOCATION
◻	BM	BENCHMARK
▣	BND	BOUND
▣	CB	CATCH BASIN
⊕	COMB	COMBINATION POLE
▣	DITHR	DROP INLET THROATED DNC
⊕	EL	ELECTRIC POWER POLE
⊙	FPOLE	FLAGPOLE
○	GASFIL	GAS FILLER
○	GP	GUIDE POST
⌘	GSO	GAS SHUT OFF
⊙	GUY	GUY POLE
⊙	GUYW	GUY WIRE
⌘	GV	GATE VALVE
⊕	H	TREE HARDWOOD
△	HCTRL	CONTROL HORIZONTAL
▲	HVCTRL	CONTROL HORIZ. & VERTICAL
◇	HYD	HYDRANT
⊙	IP	IRON PIN
⊙	IPIPE	IRON PIPE
⊕	LI	LIGHT - STREET OR YARD
⊕	MB	MAILBOX
○	MH	MANHOLE (MH)
▣	MM	MILE MARKER
⊙	PM	PARKING METER
▣	PMK	PROJECT MARKER
⊕	POST	POST STONE/WOOD
⊕	RRSIG	RAILROAD SIGNAL
⊕	RRSL	RAILROAD SWITCH LEVER
⊕	S	TREE SOFTWOOD
⊕	SAT	SATELLITE DISH
⊕	SHRUB	SHRUB
⊕	SIGN	SIGN
⊕	STUMP	STUMP
⊕	TEL	TELEPHONE POLE
⊙	TIE	TIE
⊕	TSIGN	SIGN W/DOUBLE POST
⊕	VCTRL	CONTROL VERTICAL
⊙	WELL	WELL
⌘	WSO	WATER SHUT OFF

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

PROPOSED GEOMETRY CODES

CODE	DESCRIPTION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
CC	CENTER OF CURVE
PT	POINT OF TANGENCY
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
STA	STATION PREFIX
AH	AHEAD STATION SUFFIX
BK	BACK STATION SUFFIX
D	CURVE DEGREE OF (100FT)
R	CURVE RADUIS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

UTILITY SYMBOLOLOGY

UNDERGROUND UTILITIES	
— UT —	UTILITY (GENERIC-UNKNOWN)
— UE —	TELEPHONE
— UC —	ELECTRIC
— UEC —	CABLE (TV)
— UET —	ELECTRIC+CABLE
— UET —	ELECTRIC+TELEPHONE
— UCT —	CABLE+TELEPHONE
— UECT —	ELECTRIC+CABLE+TELEP.
— G —	GAS LINE
— W —	WATER LINE
— S —	SANITARY SEWER (SEPTIC)

ABOVE GROUND UTILITIES (AERIAL)	
— T —	UTILITY (GENERIC-UNKNOWN)
— E —	TELEPHONE
— C —	ELECTRIC
— EC —	CABLE (TV)
— EC —	ELECTRIC+CABLE
— ET —	ELECTRIC+TELEPHONE
— AER E&T —	ELECTRIC+TELEPHONE
— CT —	CABLE+TELEPHONE
— ECT —	ELECTRIC+CABLE+TELEP.
— ... —	UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOLOGY	
— -- -- CZ — -- --	CLEAR ZONE
—————	PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES	
▲ —▲ —▲ —▲	TOP OF CUT SLOPE
○ —○ —○ —○	TOE OF FILL SLOPE
⊗ ⊗ ⊗ ⊗ ⊗	STONE FILL
-----	BOTTOM OF DITCH
=====	CULVERT PROPOSED
-----	STRUCTURE SUBSURFACE
PDF — PDF —	PROJECT DEMARCATION FENCE
BF — — — BF — — —	BARRIER FENCE
xxxxxxxxxxxxxxxxxxxx	TREE PROTECTION ZONE (TPZ)
//////////	STRIPING LINE REMOVAL
~~~~~	SHEET PILES

CONVENTIONAL BOUNDARY SYMBOLOLOGY

BOUNDARY LINES	
————— TOWN LINE —————	TOWN BOUNDARY LINE
————— COUNTY LINE —————	COUNTY BOUNDARY LINE
————— STATE LINE —————	STATE BOUNDARY LINE
——— / / / ———	PROPOSED STATE R.O.W. (LIMITED ACCESS)
——— / / / ———	PROPOSED STATE R.O.W.
——— / / / ———	STATE ROW (LIMITED ACCESS)
——— / / / ———	STATE ROW
——— / / / ———	TOWN ROW
— - - - -	PERMANENT EASEMENT LINE (P)
— - - - -	TEMPORARY EASEMENT LINE (T)
— - - - -	SURVEY LINE
— P — — — P —	PROPERTY LINE (P/L)
— L — — — L —	
▲ — SR —○ — SR —▲ — SR —○ —	SLOPE RIGHTS
6f ————— 6f —————	6F PROPERTY BOUNDARY
4f ————— 4f —————	4F PROPERTY BOUNDARY
HAZ ————— HAZ —————	HAZARDOUS WASTE

EPSC LAYOUT PLAN SYMBOLOLOGY

EPSC MEASURES	
ONNOONNOONNO	FILTER CURTAIN
▣ —▣ —▣ —▣	SILT FENCE
▣ —X —X —X —X —▣	SILT FENCE WOVEN WIRE
▶ —▶ —▶ —▶	CHECK DAM
▣	DISTURBED AREAS REQUIRING RE-VEGETATION
▣	EROSION MATTING

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOLOGY

ENVIRONMENTAL RESOURCES	
▼ —▼ —	WETLAND BOUNDARY
-----	RIPARIAN BUFFER ZONE
-----	WETLAND BUFFER ZONE
-----	SOIL TYPE BOUNDARY
——— T&E ———	THREATENED & ENDANGERED SPECIES
HAZ — HAZ —	HAZARDOUS WASTE AREA
——— AG ———	AGRICULTURAL LAND
——— HABITAT ———	FISH & WILDLIFE HABITAT
——— FLOOD PLAIN ———	FLOOD PLAIN
— OHW —	ORDINARY HIGH WATER (OHW)
— — — — —	STORM WATER
— — — — —	USDA FOREST SERVICE LANDS
— — — — —	WILDLIFE HABITAT SUIT/CONN

ARCHEOLOGICAL & HISTORIC	
——— ARCH ———	ARCHEOLOGICAL BOUNDARY
——— HISTORIC DIST ———	HISTORIC DISTRICT BOUNDARY
——— HISTORIC ———	HISTORIC AREA
(H)	HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLOLOGY	
EXISTING FEATURES	
-----	ROAD EDGE PAVEMENT
-----	ROAD EDGE GRAVEL
-----	DRIVEWAY EDGE
-----	DITCH
———	FOUNDATION
× —× —× —× —×	FENCE (EXISTING)
▣ —▣ —▣ —▣ —▣	FENCE WOOD POST
○ —○ —○ —○ —○	FENCE STEEL POST
~~~~~	GARDEN
○ —○ —○ —○ —○	ROAD GUARDRAIL
	RAILROAD TRACKS
-----	CULVERT (EXISTING)
○○○○○○○○○○○○○○○○	STONE WALL
-----	WALL
~~~~~	WOOD LINE
~~~~~	BRUSH LINE
~~~~~	HEDGE
=====	BODY OF WATER EDGE
=====	LEDGE EXPOSED

PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(II)
FILE NAME:	z20f237_legend.sheet.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	VTRANS
CONVENTIONAL SYMBOLOLOGY LEGEND SHEET	PLOT DATE: 3/23/2021 DRAWN BY: VTRANS CHECKED BY: VTRANS SHEET 3 OF 84





PROJECT NOTES

GENERAL

1.

ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2018, AND ITS LATEST REVISIONS, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, AND ITS LATEST REVISIONS, THE AASHTO LRFD GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES 2ND EDITION, AND MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES 2009 EDITION AND ITS LATEST REVISIONS.
2.

PER AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG), PATH CROSS SLOPES SHALL NOT EXCEED 2%.
3.

ALL SHARED USE PATH LONGITUDINAL RAMPS AT ROADWAY AND DRIVEWAY CROSSINGS SHALL NOT EXCEED 5%.
4.

THE STRUCTURES ON THIS PROJECT ARE DESIGNED FOR H-10 LOADING UNLESS OTHERWISE NOTED.
5.

THE PROPOSED TRAIL CENTERLINE SHOWN IN THE EPSC SITE PLAN SHEETS SHALL BE CENTERED WITHIN THE EXISTING RAILROAD BED. THE STATIONED BASELINE PROVIDED IN THE PLANS IS PROVIDED FOR INFORMATIONAL PURPOSES AND IS NOT INTENDED TO REPRESENT A DESIGNED CONSTRUCTION CENTERLINE.
6.

ALL WORK AND ANY ASSOCIATED ACTIVITY ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY LIMITS UNLESS OTHERWISE NOTED.
7.

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT SILTATION OR POLLUTION, ESPECIALLY THE DISCHARGE OF RAW CONCRETE, INTO ANY BROOK, STREAM, OR RIVER. THE CONTRACTOR SHALL FOLLOW ALL EROSION AND SEDIMENT CONTROL MEASURES AS SPECIFIED IN THE EPSC SHEETS SHOWN IN THIS PLANSET. THE EPSC SHEETS SHOW THE PERMITTED EROSION AND SEDIMENT CONTROL MEASURED PER THE INDC PERMIT FOR THIS PROJECT.
8.

FEATURES SHOWN ON THE EPSC SITE PLANS HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING FEATURES AND LIMITED FIELD INVESTIGATION AND MAY NOT ACCURATELY REFLECT ACTUAL FIELD CONDITIONS. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAKING FIELD MEASUREMENTS OF ALL EXISTING STRUCTURE COMPONENTS IMPACTED BY THE NEW WORK TO ASSURE CONSISTENCY WITH THE PROPOSED MODIFICATIONS. ANY DISCREPANCIES IN DIMENSIONS, CHARACTER, OR EXTENT OF THE EXISTING FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE ADVANCING THE WORK. ALL COSTS ASSOCIATED WITH THE VERIFICATION OF PROPOSED WORK SHALL BE INCLUDED IN ITEM 635.11, “MOBILIZATION/DEMOBILIZATION”.
9.

ALL SOIL DEPOSITS WHICH ARE FOUND ON THE TRAIL SHALL BE REMOVED DOWN TO THE EXISTING BALLAST ELEVATION. COST SHALL BE COVERED UNDER ITEM 203.17, “UNCLASSIFIED EXCAVATION”. BALLAST SHALL THEN BE CLEANED IN ACCORDANCE WITH ITEM 900.640, “SPECIAL PROVISION (WINDROWING BALLAST)” AND CHOKED IN ACCORDANCE WITH ITEM 900.640, “SPECIAL PROVISION (CHOKING BALLAST)”. SEE TRAIL CONSTRUCTION NOTES ON TYPICAL TRAIL SECTIONS SHEET FOR ADDITIONAL DETAILS.
10.

THE EXISTING STRUCTURAL STEEL MAY BE PAINTED WITH A MATERIAL THAT CONTAINS LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN HANDLING AND WORKING WITH THIS STEEL. ANY REMOVED STRUCTURAL STEEL, IF APPLICABLE, IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE AND ITS OFFICERS AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR’S USE OR DISPOSITION OF THE REMOVED EXISTING STRUCTURAL STEEL.
11.

DESIGN LOADS (UNLESS OTHERWISE NOTED):  
H-10 (MAINTENANCE VEHICLE)  
85 PSF PEDESTRIAN LOADING
12.

EXISTING TRAILER BRIDGE OVER CULVERT 91F SHALL BE SALVAGED BY THE CONTRACTOR AND DELIVERED TO KEN BROWN AT VAST. PAYMENT FOR REMOVAL OF TRAILER BRIDGE AND DELIVERY TO VAST SHALL BE MADE UNDER ITEM 529.15, “REMOVAL OF STRUCTURE”.  
KEN BROWN  
VAST TRAILS MANAGER  
TELEPHONE: 802-229-0005 x18

TRAIL ACCESS

13.

ACCESS TO THE TRAIL SHALL BE FROM PUBLIC CROSSINGS. ACCESS FROM TOWN HIGHWAYS SHALL BE PERMITTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

a.

WORK HOURS ARE 7AM TO 6PM MONDAY THRU FRIDAY.

b.

THE CONTRACTOR SHALL HAVE CONSTRUCTION SIGNAGE AND TRAFFIC CONTROL AT ACCESS POINTS WHICH MEET THE REQUIREMENTS OF THE 2009 MUTCD AND ITS LATEST REVISIONS.

c.

ROAD CLOSURES OR STOPPING TRAFFIC SHALL NOT BE PERMITTED WITHOUT PRIOR APPROVAL BY THE TOWN OR STATE.

d.

THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO ROADS, DITCHES, SHOULDERS, ETC. AND RESTORE THEM TO PRE-CONSTRUCTION CONDITIONS AT THE CONTRACTOR’S EXPENSE. ENGINEER TO VERIFY PRE-CONSTRUCTION CONDITIONS

TRAIL CONSTRUCTION

14.

SEE TRAIL TYPICAL SECTIONS SHEETS FOR TRAIL CONSTRUCTION NOTES.

TIMBER

15.

LUMBER AND TIMBER SHALL MEET THE REQUIREMENTS OF SECTION 522. TIMBER AND LUMBER PRESERVATIVES SHALL BE IN ACCORDANCE WITH SECTION 726 AND BE PENTACHLOROPHENOL: SOLVENT FOR PENTACHLOROPHENOL - HEAVY OIL HYDROCARBON SOLVENT, TYPE A.

STRUCTURE REPAIR NOTES

16.

PROPOSED WORK HAS BEEN ESTIMATED BASED ON LIMITED FIELD INVESTIGATION PERFORMED BY VHB. ACTUAL WORK SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY ENGINEER.
17.

THE REMOVAL AND DISPOSAL OF CATTLEPASS 91 AND COLLAPSING OF CATTLEPASS 91E-2 SHALL BE INCIDENTAL TO ITEM 201.10, “CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS”. BACKFILLING OF THESE TWO LOCATIONS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237.pn.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.O. CRONIN  
PROJECT NOTES SHEET

PLOT DATE: 3/23/2021  
DRAWN BY: K.C. BARRY  
CHECKED BY: E.P. DETRICK  
SHEET 4 OF 84



QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES														TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
														BIKE/TRANSPOR TATION PATH	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
														1	1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10	-			
														30	30		CY	COMMON EXCAVATION	203.15	2.6			
														900	900		CY	UNCLASSIFIED EXCAVATION	203.17	-			
														10	10		CY	CHANNEL EXCAVATION OF EARTH	203.25				
														6825	6825		CY	GRANULAR BORROW	203.32	25.37			
														7390	7390		CY	STRUCTURE EXCAVATION	204.25	13.15			
														770	770		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	4.53			
														1	1		LS	PRECAST CONCRETE STRUCTURE 6x4 BOX CULVERT (91F)	540.10				
														215	215		LF	18" CPEP(SL)	601.2615				
														540	540		LF	24" CPEP(SL)	601.2620				
														165	165		LF	36" CPEP(SL)	601.2630				
														20	20		LF	48" CPEP(SL)	601.2640				
														360	360		CY	REBUILT STONE MASONRY	602.35	2.2			
														25	25		CY	STONE FILL, STREAM BED MATERIAL	613.06				
														4510	4510		CY	STONE FILL, TYPE I	613.10	2.8			
														120	120		SY	PORTLAND CEMENT CONCRETE SIDEWALK, 8 INCH	618.11	2.3			
														320	320		SF	DETECTABLE WARNING SURFACE	618.30	-			
														1	1		LS	MOBILIZATION/DEMOBILIZATION	635.11	-			
														1	1		LS	TRAFFIC CONTROL	641.10	-			
														160	160		LF	12 INCH WHITE LINE, WATERBORNE PAINT	646.241	-			
														4740	4740		SY	GEOTEXTILE UNDER STONE FILL	649.31				
														690	690		LB	SEED	651.15	6.86			
														5500	5500		LB	FERTILIZER	651.18				
														25	25		TON	AGRICULTURAL LIMESTONE	651.20				
														3090	3090		CY	TOPSOIL	651.35	14.63			
														30	30		TON	HAY MULCH	653.10				
														66800	66800		SY	ROLLED EROSION CONTROL PRODUCT, TYPE II	653.21	1.1			
														850	850		SF	TRAFFIC SIGN, TYPE A	675.20	-			
														1620	1620		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341	-			
														5990	5990		CY	SPECIAL PROVISION (AGGREGATE SURFACE COURSE, TRAIL)	900.608	50.8			
														8	8		EACH	SPECIAL PROVISION (BEAVER FENCE)	900.620				
														32	32		EACH	SPECIAL PROVISION (BOULDERS)	900.620				
														49	49		EACH	SPECIAL PROVISION (CLEARING CULVERT)	900.620	-			
														38	38		EACH	SPECIAL PROVISION (MILE POSTS INSTALLATION)	900.620	-			
														600	600		LF	SPECIAL PROVISION (APPROACH RAIL, PRESSURE TREATED)	900.640				
														56	56		LF	SPECIAL PROVISION (BRIDGE RAIL, PRESSURE TREATED)	900.640	-			
														65000	65000		LF	SPECIAL PROVISION (CHOKING BALLAST)	900.640	56			
														97000	97000		LF	SPECIAL PROVISION (DITCHING)	900.640	-			
														40	40		LF	SPECIAL PROVISION (GUARD RAIL, PRESSURE TREATED)	900.640	-			
														96960	96960		LF	SPECIAL PROVISION (WINDROWING BALLAST)	900.640	-			

PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_quantities.dgn

PROJECT LEADER: E.P. DETRICK

DESIGNED BY: B.M. ROBERTS

QUANTITY SHEET (1 OF 2)

PLOT DATE: 3/23/2021

DRAWN BY: B.M. ROBERTS

CHECKED BY: B.O. CRONIN

SHEET 5 OF 84





PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(II)	
FILE NAME: z20f237_quantities.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: B.M. ROBERTS
DESIGNED BY: B.M. ROBERTS	CHECKED BY: B.O. CRONIN
QUANTITY SHEET (2 OF 2)	SHEET 6 OF 84



# ITEM DETAIL SHEET

CULVERTS				
NUMBER	STATION	TYPE	SIZE	REMARKS
			FT	
68A	3425+13	STONE BOX	4 x 6	NO ACTION NEEDED
* 68B	3437+99	STONE BOX	3 x 3	EXCAVATE AND REPLACE
68(9)C	3442+00	STONE BOX	3 x 3	EXCAVATE AND REPLACE
69A	3450+21	STONE BOX	3 x 3	EXCAVATE AND REPLACE
69B	3470+82	STONE BOX	2 x 2	REPAIR INLET AND OUTLET
69C	3472+76	CMP	2.0	EXCAVATE AND REPLACE
69D	3478+99	STONE BOX	2 x 2	CLEAN INLET AND OUTLET, REPAIR INLET AND BANKING
69F	3493+45	STONE BOX	2 x 2	EXCAVATE AND REPLACE
69F(2)	3494+85	N/A	N/A	INSTALL NEW CULVERT TO REDUCE SCOUR BETWEEN DRIVE/TRAIL
69G	3497+36	STONE BOX	4 x 6	CLEAN AND REGRADE INLET, INSTALL BEAVER FENCE
69G(2)	3497+36	CMP	4.0	NO ACTION NEEDED
69I	3509+36	STONE BOX	4 x 4	REPAIR AND REGRADE INLET, INSTALL BEAVER FENCE
69J	3514+37	STONE BOX	2 x 2	CLEAN INLET AND OUTLET, REPAIR INLET
* 69L	3548+27	STONE BOX	3 x 3	EXCAVATE AND REPLACE
69L-2	3588+13	CMP	1.0	EXCAVATE AND REPLACE
* 69M	3601+99	STONE BOX	2 x 2	EXCAVATE AND REPLACE
69N	3614+88	STONE BOX	2 x 2	REGRADE AROUND INLET AND OUTLET
69O	3627+43	CAST IRON	2.0	CLEAN INLET AND OUTLET, INSTALL BEAVER FENCE
69O-2	3655+24	HDPE	2.0	CLEAN INLET/OUTLET, REPAIR BANKING, INSTALL BEAVER FENCE
73B	3681+06	STONE BOX	3 x 3	EXCAVATE AND REPLACE
73C	3689+54	STONE BOX	2 x 2	EXCAVATE AND REPLACE
* 75	3719+88	STONE BOX	4 x 4	CLEAN INLET, EXCAVATE AND REPAIR
75A	3724+54	STONE BOX	3 x 3	EXCAVATE AND REPLACE, REPAIR BANKING
* 75B	3734+86	CAST IRON	1.5	CLEAN INLET AND OUTLET
75B(2)	3746+85	HDPE	1.5	CLEAN AND REPAIR INLET, INSTALL BEAVER FENCE
75C	3753+04	HDPE	3.0	CLEAN INLET, INSTALL BEAVER FENCE
75D	3759+69	STONE BOX	2 x 2	EXCAVATE AND REPLACE
75E	3769+44	STONE BOX	2 x 2	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET
76B	3800+22	IRON (STONE)	1.5 (2 x 2)	CLEAN INLET AND OUTLET, REPAIR OUTLET, REPAIR BANKING
* 76D	3807+85	STONE BOX	5 x 4	CLEAN OUTLET, REGRADE AROUND OUTLET
76E	3818+11	CAST IRON	3.0	REPLACE CULVERT, REPAIR BANKING, REGRADE AROUND OUTLET
* 76F	3823+37	STONE BOX	2 x 2	EXCAVATE AND REPAIR
* 76G	3827+02	STONE BOX	2 x 2	CLEAN INLET AND OUTLET
* 76H	3836+31	STONE BOX	2 x 2	EXCAVATE AND REPLACE, REPAIR BANKING
76I	3852+65	CMP	2.0	CLEAN INLET AND OUTLET
77A	3870+74	ONE BOX (CMP)	2 x 2 (2.0)	EXCAVATE AND REPAIR
79	3890+62	CONCRETE	2.5	EXCAVATE AND REPLACE, INSTALL BEAVER FENCE
* 81A	3934+82	STONE BOX	4 x 4	CLEAN INLET, REGRADE INLET AND OUTLET, REPAIR BANKING
* 81B	3935+89	STONE BOX	3 x 3	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET
81C	3938+54	CMP	2.0	CLEAN OUTLET, REGRADE AROUND INLET, REPAIR BANKING
81D	3940+18	CMP	1.5	CLEAN INLET AND OUTLET
81E	3944+80	STONE BOX	2 x 2	EXCAVATE AND REPLACE, REGRADE INLET AND OUTLET
82A	3957+48	STONE BOX	2 x 2	EXCAVATE AND REPLACE, REPAIR BANKING
82C	3969+47	CONCRETE	2.0	CLEAN INLET AND OUTLET
83A	3983+36	HDPE	3.0	CLEAN AND REPAIR INLET, INSTALL BEAVER FENCE
83A(1)	3986+99	HDPE	2.5	REGRADE AROUND OUTLET, REPAIR BANKING
83A-2	3990+21	HDPE	3.5	STABILIZE OUTLET
* 85A	4016+28	STONE BOX	3 x 3	CLEAN INLET, REPAIR INLET AND OUTLET, REPAIR BANKING
* 85(6)B	4027+66	CAST IRON	1.5	CLEAN OUTLET
86B	4049+79	HDPE	3.0	NO ACTION
86C	4050+58	N/A	N/A	EXCAVATE AND REPLACE
86D	4055+65	CAST IRON	3.0	CLEAN INLET
* 86E **	4073+29	STONE BOX	1 x 3	NO ACTION NEEDED
86G	4078+80	STONE BOX	2 x 2	EXCAVATE AND REPLACE
* 86I **	4094+30	HDPE	4.0	NO ACTION NEEDED
86J **	4106+00	HDPE	4.0	NO ACTION NEEDED
86K	4112+02	CMP	1.0	EXCAVATE AND REPLACE
87B	4152+00	CMP	2.5	NO ACTION NEEDED
* 87C	4158+38	HDPE	1.0	CLEAN INLET
87O **	4177+60	CMP	2.0	REPLACE CULVERT
* 87P	4186+31	N/A	N/A	INSTALL NEW CULVERT, RESTORE EMBANKMENT OVER CULVERT
88A	4189+01	STONE BOX	4 x 5	REGRADE AROUND OUTLET
88B	4196+31	STONE BOX	4 x 4	EXCAVATE AND REPLACE
88C **	4213+36	CMP	1.5	REPLACE CULVERT, REPAIR BANKING, REGRADE AROUND INLET
* 89A	4228+22	STONE BOX	3 x 3	NO ACTION NEEDED
* 89B	4232+55	STONE BOX	4 x 5	REPAIR INLET, REPAIR BANKING
* 89C	4234+59	STONE BOX	5 x 5	CLEAN INLET AND OUTLET, REGRADE AROUND INLET AND OUTLET
89C(2)	4236+92	HDPE	VARIES	NO ACTION NEEDED
89D	4244+62	CAST IRON	1.5	CLEAN INLET AND OUTLET
89E	4253+25	CMP	2.0	EXCAVATE AND REPLACE
* 89F	4261+27	STONE BOX	2x 4 x 5	CLEAN INLET, REPAIR OUTLET AND BANKING
* 89G	4271+15	STONE BOX	3 x 4	CLEAN INLET AND OUTLET, REPAIR OUTLET
89H	4280+29	STONE BOX	2 x 2	EXCAVATE AND REPLACE, RESTORE DITCHLINES
90A	4298+12	STONE BOX	3 x 3	EXCAVATE AND REPLACE
* 90B	4304+49	STONE BOX	2 x 2	REPAIR INLET AND OUTLET, REPAIR BANKING
* 90C	4323+41	STONE BOX	2 x 2	CLEAN INLET, REPAIR INLET AND OUTLET, REPAIR BANKING
90D	4331+33	CAST IRON	1.0	REPLACE CULVERT
**	THESE CULVERTS WERE IMPACTED BY THE HALLOWEEN STORM IN 2019, AND ARE SCHEDULED TO BE REPAIRED UNDER A FEMA PROJECT. ACTUAL CONDITIONS MAY VARY FROM WHAT IS INDICATED ON THESE PLANS. CERTAIN ELEMENTS OF WORK ON THESE CULVERTS MAY BE DELETED OR ADDED AS DIRECTED BY THE ENGINEER			
*	NATIONAL HISTORIC REGISTER ELIGIBLE			

CATTLEPASSES				
NUMBER	STATION	TYPE	SIZE	REMARKS
			FT	
69	3443+33	CONCRETE	6 x 6	INSTALL GUARDRAIL
69E	3481+30	STONE	2 x 1	REPLACE WITH CULVERT
N/A	4144+62	METAL	5 x 4	INSTALL GUARDRAIL
91	4326+52	WOOD	5 x 12	REMOVE CATTLEPASS AND FILL HOLE
91E-2	4357+79	STONE	2 x 3	COLLAPSE CATTLEPASS AND FILL HOLE



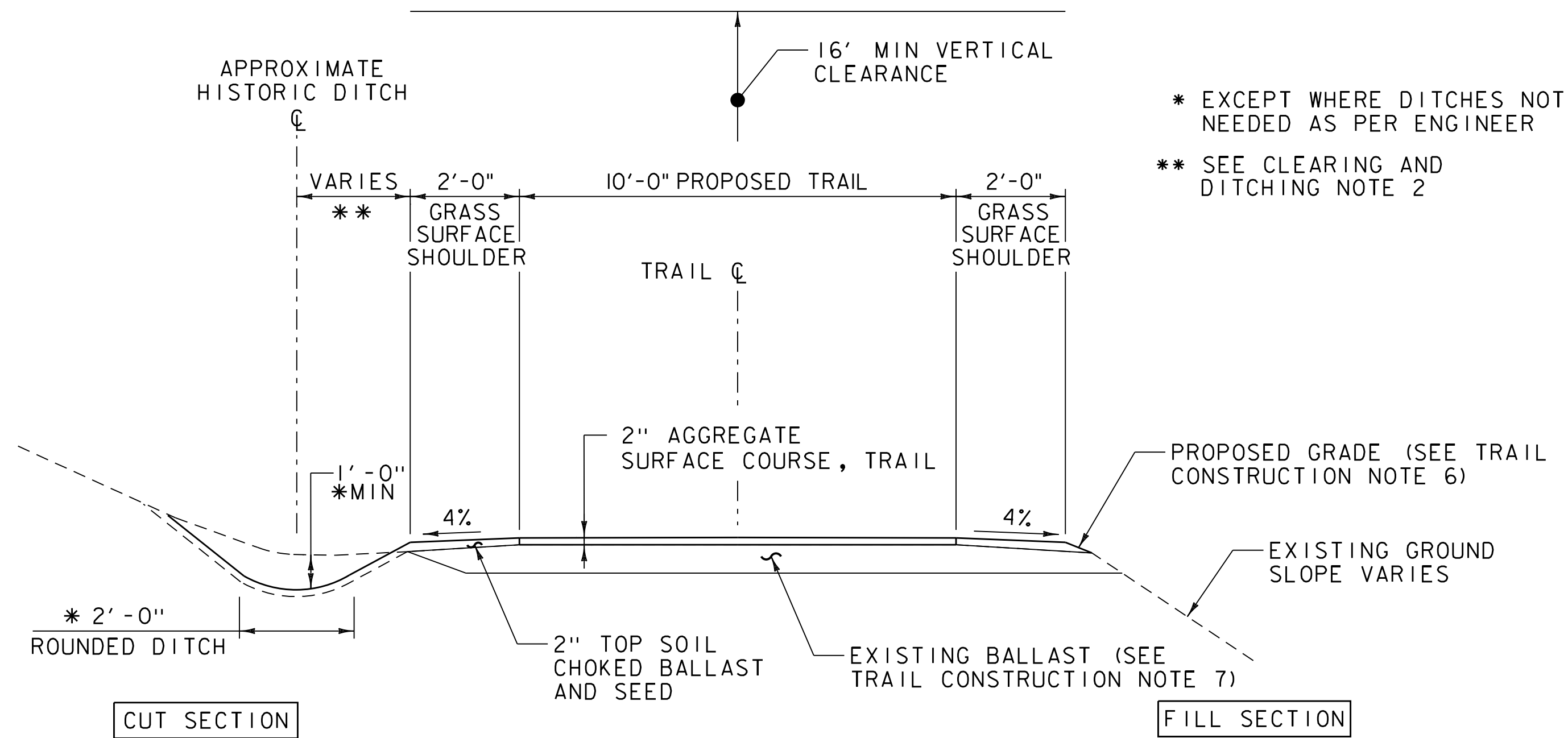
ITEM DETAIL SHEET																
RAILING					WASHOUTS					CROSSINGS						
BEGIN STATION	END STATION	LENGTH	TYPE	REMARKS	BEGIN STATION	END STATION	LENGTH	TYPE	REMARKS	NUMBER	STATION	TYPE	MATERIAL	CURRENTLY PERMITTED	REMARKS	
		FT					FT									
3443+28	3443+38	10	GUARDRAIL	CATTLEPASS, BOTH SIDES	3644+10	3645+60	150	ADJACENT WETLAND	RAISE GRADE 6 INCHES TO RE-ESTABLISH A SUITABLE TRAIL BED	173	3422+37	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING ON NORTHERN SIDE ONLY	
3634+37	3634+52	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						174	3436+89	DRIVEWAY	GRAVEL	YES	INSTALL CROSSING SIGNS	
3634+52	3634+82	30	BRIDGE	BRIDGE RAIL, BOTH SIDES	3649+93	3654+63	470	ADJACENT WETLAND	RAISE GRADE 6 INCHES TO RE-ESTABLISH A SUITABLE TRAIL BED	175	3444+95	SNOWMOBILE	GRASS	NO	NO ACTION NEEDED	
3634+82	3634+97	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						N/A	3475+07	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
3641+67	3641+82	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	3748+06	3750+06	200	ADJACENT WETLAND	RAISE GRADE 6 INCHES TO RE-ESTABLISH A SUITABLE TRAIL BED	176	3486+52	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING	
3641+82	3642+10	28	BRIDGE	BRIDGE RAIL, BOTH SIDES						177	3495+16	DRIVEWAY	GRAVEL	YES	DITCH BETWEEN DRIVE AND TRAIL ON SOUTHWEST CORNER AND INSTALL CULVERT	
3642+10	3642+25	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	3751+71	3753+11	140	ADJACENT WETLAND	RAISE GRADE 6 INCHES TO RE-ESTABLISH A SUITABLE TRAIL BED	N/A	3506+52	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
3660+90	3661+05	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						178	3514+96	FARM	GRASS	YES	SIGN CROSSING	
3661+05	3661+47	42	BRIDGE	BRIDGE RAIL, BOTH SIDES	3755+35	3755+85	50	ADJACENT WETLAND	RAISE GRADE 6 INCHES TO RE-ESTABLISH A SUITABLE TRAIL BED	179	3516+78	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
3661+47	3661+62	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						180	3523+63	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING	
3783+77	3783+92	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	3894+80	3900+80	600	DITCH FAILURE	RAISE GRADE 6 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	N/A	3541+39	SNOWMOBILE	BOARDWALK	NO	TBD	
3783+92	3784+57	65	BRIDGE	BRIDGE RAIL, BOTH SIDES						N/A	3542+07	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
3784+57	3784+72	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	3938+29	3938+79	50	CULVERT FAILURE	RAISE GRADE 24 INCHES OVER CULVERT	181	3624+82	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
3914+44	3915+74	130	GUARDRAIL	BRIDGE RAIL, BOTH SIDES						182	3642+90	TOWN ROAD	GRAVEL	YES	CLEAR VEGETATION TO IMPROVE SIGHT DISTANCE AND CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING	
3920+06	3920+21	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	3940+38	3940+88	50	CULVERT FAILURE	RAISE GRADE 24 INCHES OVER CULVERT	183	3667+52	PRIVATE	GRASS	YES	DITCH AROUND CROSSING TO PREVENT WASHOUT OF TRAIL	
3920+21	3920+61	40	BRIDGE	BRIDGE RAIL, BOTH SIDES						N/A	3727+84	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
3920+61	3920+76	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	4023+92	4026+92	300	ADJACENT WETLAND	RAISE GRADE 6 INCHES TO RE-ESTABLISH A SUITABLE TRAIL BED	184	3786+37	PRIVATE	GRAVEL	YES	RESTORE DITCH THROUGH CROSSING	
3952+18	3952+68	50	GUARDRAIL	BRIDGE RAIL, BOTH SIDES	4034+79	4035+54	75	PONDING	FILL LOW AREA WITH 6 INCHES OF GRANULAR BORROW	185	3796+16	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING	
3994+55	3994+70	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						186	3849+56	GRAVEL PIT	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
3994+70	3995+00	30	BRIDGE	BRIDGE RAIL, BOTH SIDES	4083+50	4093+75	1025	PONDING	RAISE GRADE 12 INCHES TO RE-ESTABLISH A SUITABLE TRAIL BED	187	3855+16	TOWN ROAD	GRAVEL	YES	CLEAR VEGETATION TO IMPROVE SIGHT DISTANCE AND CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING	
3995+00	3995+15	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						188	3859+80	FARM	GRASS	YES	SIGN CROSSING	
4125+83	4125+98	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	4096+77	4106+77	1000	PONDING	RAISE GRADE 12 INCHES TO RE-ESTABLISH A SUITABLE TRAIL BED	N/A	3882+47	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
4125+98	4127+03	105	BRIDGE	BRIDGE RAIL, BOTH SIDES						N/A	3904+52	ATV ACCESS	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
4127+03	4127+18	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	4219+57	4220+87	130	BEAVERS TRAIL ERROSION	REPAIR WASHOUTS WITH STONE FILL, TYPE I	189	3907+38	FARM	GRAVEL	YES	RESTORE GRADE THROUGH CROSSING, DITCH ALONG TRAIL TO PREVENT EROSION	
4144+57	4144+67	10	GUARDRAIL	CATTLEPASS, BOTH SIDES						190	3916+62	FARM	GRAVEL	YES	SIGN CROSSING	
4179+90	4180+05	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	4244+72	4246+72	200	FARMING	RAISE GRADE 12 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	N/A	3924+62	ATV ACCESS	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
4180+05	4181+15	110	BRIDGE	BRIDGE RAIL, BOTH SIDES						191	3927+92	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING	
4181+15	4181+30	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	4247+17	4250+67	350	FARMING	RAISE GRADE 12 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	192	3929+86	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING	
4289+28	4289+90	62	GUARDRAIL	BRIDGE RAIL, BOTH SIDES						193	3934+39	ATV ACCESS	GRAVEL	NO	NO ACTION NEEDED	
					4253+87	4258+37	450	FARMING	RAISE GRADE 12 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	N/A	3934+95	ATV ACCESS	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										N/A	3943+41	ATV ACCESS	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
					4372+30	4374+30	200	PONDING	RAISE GRADE 6 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	N/A	3945+35	ATV ACCESS	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										194	3954+13	FARM	GRAVEL	YES	SIGN CROSSING	
										195	3972+46	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING	
										196	3976+88	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING	
										197	3991+06	ATV ACCESS	GRASS/BRIDGE	NO	TBD	
										N/A	4000+47	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										198	4031+62	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING	
										199	4035+72	FARM	GRASS	YES	SIGN CROSSING	
										200	4050+00	PRIVATE	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING	
										201	4060+88	FARM	GRASS	YES	SIGN CROSSING	
										202	4066+99	FARM	GRAVEL	YES	SIGN CROSSING	
										203	4079+07	FARM	GRASS	YES	CLEAR VEGETATION AND SIGN CROSSING	
										N/A	4084+55	FARM	GRASS	NO	RESTORE DITCH THROUGH CROSSING	
										N/A	4088+10	FARM	GRASS	NO	RESTORE DITCH THROUGH CROSSING	
										204	4096+51	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING	
										205	4107+58	FARM	EARTH	YES	SIGN CROSSING	
										N/A	4117+14	SUGARING	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										206	4122+76	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										207	4147+99	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING	
										N/A	4152+66	FARM	GRAVEL	NO	RESTORE DITCH THROUGH CROSSING	
										N/A	4158+71	FARM	GRAVEL	NO	RESTORE DITCH THROUGH CROSSING	
										N/A	4164+12	FARM	GRAVEL	NO	RESTORE DITCH THROUGH CROSSING	
										N/A	4179+00	FARM	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										208	4202+82	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING	
										N/A	4221+87	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										209	4236+92	FARM	GRAVEL	YES	SIGN CROSSING	
										N/A	4244+02	FARM	GRASS	NO	RESTORE DITCH THROUGH CROSSING	
										210	4247+17	FARM	GRAVEL	YES	SIGN CROSSING	
										N/A	4250+27	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										211	4253+77	FARM	GRASS	NO	RESTORE DITCH THROUGH CROSSING	
										N/A	4257+37	ATV ACCESS	BRIDGE	NO	REMOVE BRIDGE AND BLOCK ACCESS AS DIRECTED BY ENGINEER	
										N/A	4262+27	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER	
										N/A	4268+57	FARM	GRASS	NO	RESTORE DITCH THROUGH CROSSING	
										212	4275+57	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING	
										213	4279+13	FARM	GRAVEL	NO	TBD	
										214	4280+31	FARM	GRAVEL	NO	TBD	
										215	4292+32	FARM	GRAVEL	NO	RESTORE DITCH THROUGH CROSSING	
										216	4293+10	FARM	GRASS	NO	RESTORE DITCH THROUGH CROSSING	
										218	4307+28	ATV ACCESS	GRASS	NO	RESTORE DITCH THROUGH CROSSING	
										219	4330+27	FARM	GRAVEL	NO	TBD	
										220	4345+83	FARM	GRAVEL	YES	SIGN CROSSING	
										N/A	4350+57	ATV ACCESS	GRASS	NO	RESTORE DITCH THROUGH CROSSING	
										221	4372+30	FARM	GRAVEL	NO	TBD	
										222	4392+21	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING (SOUTH SIDE ONLY)	



# ITEM DETAIL SHEET

[illegible]



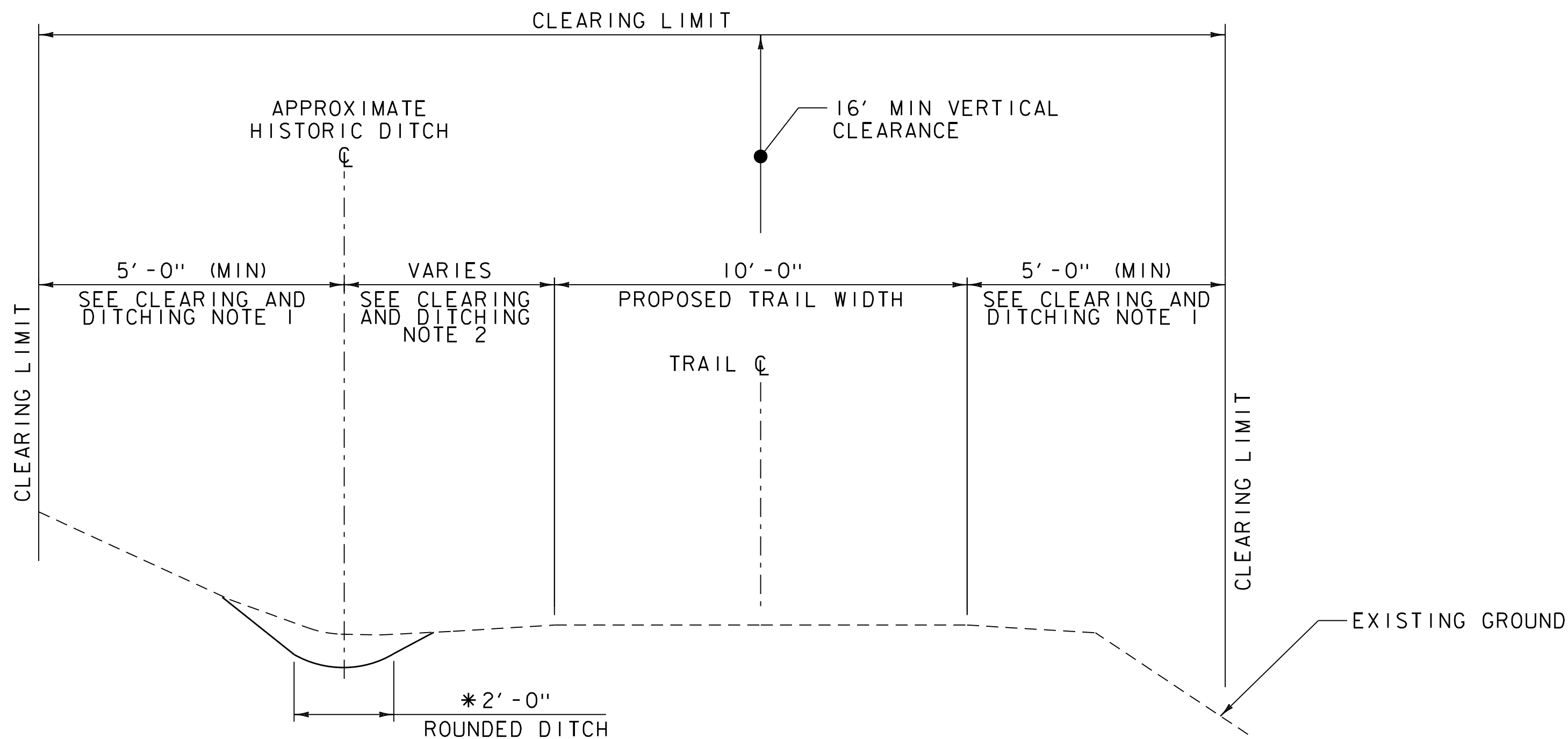


TRAIL TYPICAL SECTION

SHOULDER WIDTH TABLE

SIDE SLOPE	SHOULDER WIDTH	
	MIN.	PREFERRED
< 1:4	1'-0"	2'-0"
1:3	1'-0"	3'-0"
1:2	1'-0"	5'-0"
> 1:2	1'-0"	5'-0"

SEE TRAIL CONSTRUCTION NOTE 8



CLEARING AND DITCHING TYPICAL SECTION

NOT TO SCALE

TRAIL CONSTRUCTION NOTES:

- IF THE EXISTING RAIL BED HAS ANY WASHOUTS OR HOLES, THEY SHALL BE FILLED WITH GRANULAR BORROW TO THE REQUIRED ELEVATION FOR THE INSTALLATION OF 2" OF ITEM 900.608, "SPECIAL PROVISION (AGGREGATE SURFACE COURSE, TRAIL)".
- ENTIRE TRAIL SURFACE SHALL BE BANKED 2% TO THE INSIDE OF CURVES. TRAIL SHALL OTHERWISE BE GRADED TO DRAIN OR SLOPED TO ONE SIDE IN FLAT AREAS WITH 2% CROSS SLOPE MAXIMUM.
- THE CONTRACTOR SHALL REMOVE RAILROAD TIES AND RAIL FROM BALLAST AND DISPOSE OF BY METHODS APPROVED BY THE VT AGENCY OF NATURAL RESOURCES. REMOVAL OF TIES AND RAIL SHALL BE PAID INCIDENTAL TO ITEM 201.10, "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".
- 1V:4H IS THE PREFERRED FILL SIDE SLOPE UNLESS THE FILL WOULD EXTEND BEYOND THE CLEARING LIMITS, IN WHICH CASE STEEPER SLOPES SHALL BE USED.
- SIDE SLOPES DISTURBED DURING CONSTRUCTION STEEPER THAN 1V:3H SHALL BE SEEDED AND PROTECTED WITH ITEM 653.20, "ROLLED EROSION CONTROL PRODUCT, TYPE 1" UNLESS STEEPER THAN 1V:2H, THEN ITEM 613.10, "STONE FILL, TYPE 1" SHALL BE USED. SIDE SLOPES STEEPER THAN 1V:1.5H SHALL BE PROTECTED WITH ITEM 613.11 "STONE FILL, TYPE 1" OR AS SPECIFIED IN THE PLANS OR BY THE ENGINEER. PAYMENT FOR ALL SIDE SLOPE PROTECTION MEASURES SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.
- STONE FILL SLOPES ABOVE THE ORDINARY HIGH WATER LINE SHALL BE GRUBBED WITH 6" OF GRUBBING MATERIAL. GRUBBING MATERIAL SHALL BE PAID FOR UNDER ITEM 651.40 "GRUBBING MATERIAL".
- IF THE EXISTING RAIL BED LACKS 8" OF SALVAGEABLE BALLAST OR WELL DRAINED GRANULAR MATERIAL, GRANULAR BORROW SHALL BE ADDED TO ACHIEVE THE REQUIRED 8" BASE.
- THE PREFERRED SHOULDER DIMENSIONS SHALL BE USED UNLESS CONSTRAINED BY THE WIDTH OF THE EXISTING RAIL BED AND STEEP SIDE SLOPES. SHOULDER WIDTHS BELOW THE PREFERRED WIDTH SHALL BE USED WHEN DIRECTED BY THE ENGINEER. CERTAIN EXISTING RAIL BED WIDTHS AND SIDE SLOPE CONDITIONS MAY WARRANT SHOULDER WIDTHS BELOW THE MINIMUM WIDTHS SHOWN. TO AVOID THE USE OF GUARDRAIL TO PROTECT STEEP SLOPES WITHOUT AN ADEQUATE BARRIER OF VEGETATION OR OTHER IMPASSABLE OBJECTS, THE ENGINEER MAY DIRECT THE CONTRACTOR TO LOWER THE PROFILE OF THE EXISTING TRAIL TO ACHIEVE THE PREFERRED SHOULDER WIDTH.
- BALLAST GRADING AND COMPACTION SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (BALLAST GRADING AND SHAPING)".
- GRASS SHOULDERS MAY BE OMITTED IF GRASSED BERMS EXIST AT THE EDGES OF THE PROPOSED TRAIL. OMISSION OF SHOULDERS MUST BE APPROVED BY THE ENGINEER.
- FOR LOCATIONS NOTED AS A WASHOUT, ON ITEM DETAIL SHEET 3, WHERE THE PROPOSED ACTION IS TO RAISE GRADE, THE LONGITUDINAL SLOPE OF THE TRAIL SHALL NOT EXCEED 5%.

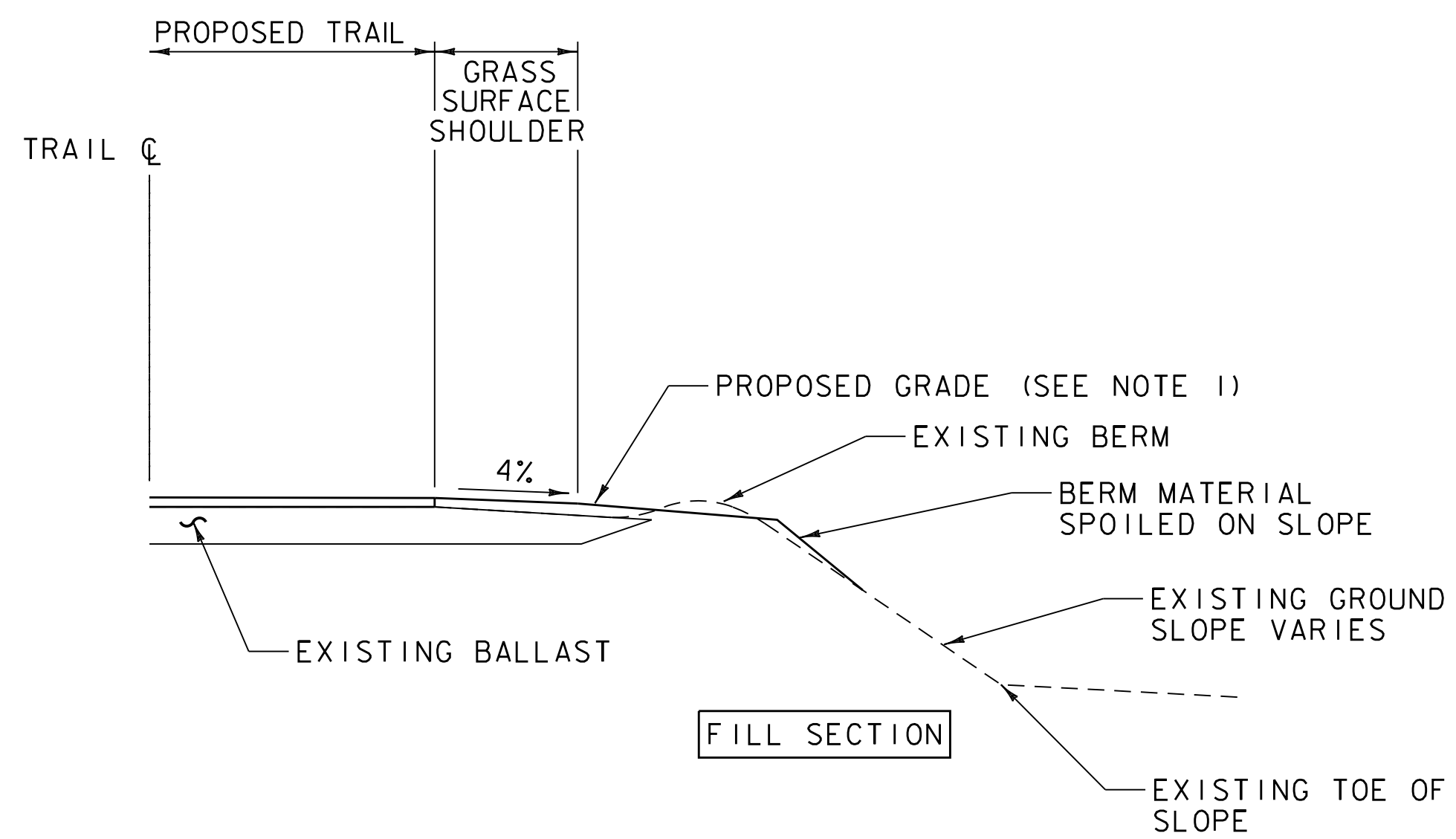
CLEARING AND DITCHING NOTES:

- CLEARING LIMIT ON EMBANKMENT SLOPES STEEPER THAN 1V:2H SHALL NOT BE MORE THAN 1'-0" BEYOND THE TOP OF SLOPE. ACTUAL CLEARING LIMITS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. IN ROCK CUT AREAS, CLEAR THE WIDTH OF THE BALLAST AND DITCHES ALONG WITH ANY OVERHANGING VEGETATION. DO NOT CLEAR OR DAMAGE HEALTHY TREES GREATER THAN 5" IN DIAMETER ON STEEP EMBANKMENTS OFF THE EDGE OF THE BALLAST UNLESS WITHIN 1'-0" OF THE BALLAST. DO NOT REMOVE ROOTS OR STUMPS ON SLOPES. PRUNE BRANCHES WITHIN CLEARING LIMITS AND REMOVE DEAD TREES 3'-0" BEYOND THE TOP OF SLOPE. CLEARING TO BE PAID UNDER ITEM 201.10, "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".
- RE-ESTABLISH APPROXIMATE UNMAINTAINED HISTORIC DITCHES. ACTUAL DITCH OFFSET AND BOTTOM ELEVATION SHALL BE SET IN THE FIELD BY THE ENGINEER. SALVAGE CLEAN BALLAST FROM DITCHES TO RAIL BED. DITCH EXCAVATION DEPTH VARIES TO ACCOMMODATE HISTORIC LOCATIONS, BACK SLOPES, DITCH PROFILE, AND CROSS CULVERT INVERT ELEVATIONS. DITCHING WORK SHALL BE PAID UNDER ITEM 900.640, "SPECIAL PROVISION (DITCHING)".
- WASTE SILT AND EXCAVATED MATERIALS ONTO DESIGNATED SHOULDERS AND EMBANKMENT SLOPES THAT HAVE BEEN MARKED BY THE ENGINEER. SEE WASTE AREA DETAILS SHEET FOR WASTING DETAILS. CLEAR WASTE AREAS PRIOR TO WASTING MATERIAL. RAKE SEED AND MULCH THE DRESSED SLOPES WITHIN 72 HOURS, OR IMMEDIATELY IF EXPECTING RAIN WITHIN 24 HOURS. COSTS FOR WASTING MATERIAL SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.
- IN WETLANDS OR ON BANKS OF WATER BODIES DO NOT CLEAR PAST THE EDGE OF BALLAST OR TOP OF BANK, OR OTHER LIMITS SET BY PERMIT CONDITIONS.
- ON BALLAST TRAIL SHOULDERS AND DITCHES, REMOVE ALL TREES, BRUSH, WEEDS, LEAVES, BRANCHES, TRASH, ROOTS, STUMPS; TOPSOIL MAY BE SALVAGED FOR THE USE ON TRAIL GRASS SURFACE.
- ON LATERAL DITCHES OR SHOULDERS, CLEAR CUT AND REMOVE ALL TREES, BRUSH, WEEDS, LEAVES, BRANCHES TO WITHIN 4" OF SOIL SURFACE.
- ORGANIC MATERIAL THAT HAS BEEN CHIPPED, GROUND, OR MULCHED MAY REMAIN. IF IT IS TO REMAIN THEN SPREAD EVENLY ON SHOULDERS AND ADJACENT R.O.W. LAND. REMOVE AND LEGALLY DISPOSE OF ANY TRASH AND DEBRIS OFF SITE. THE COST OF DISPOSAL OF TRASH AND DEBRIS SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.

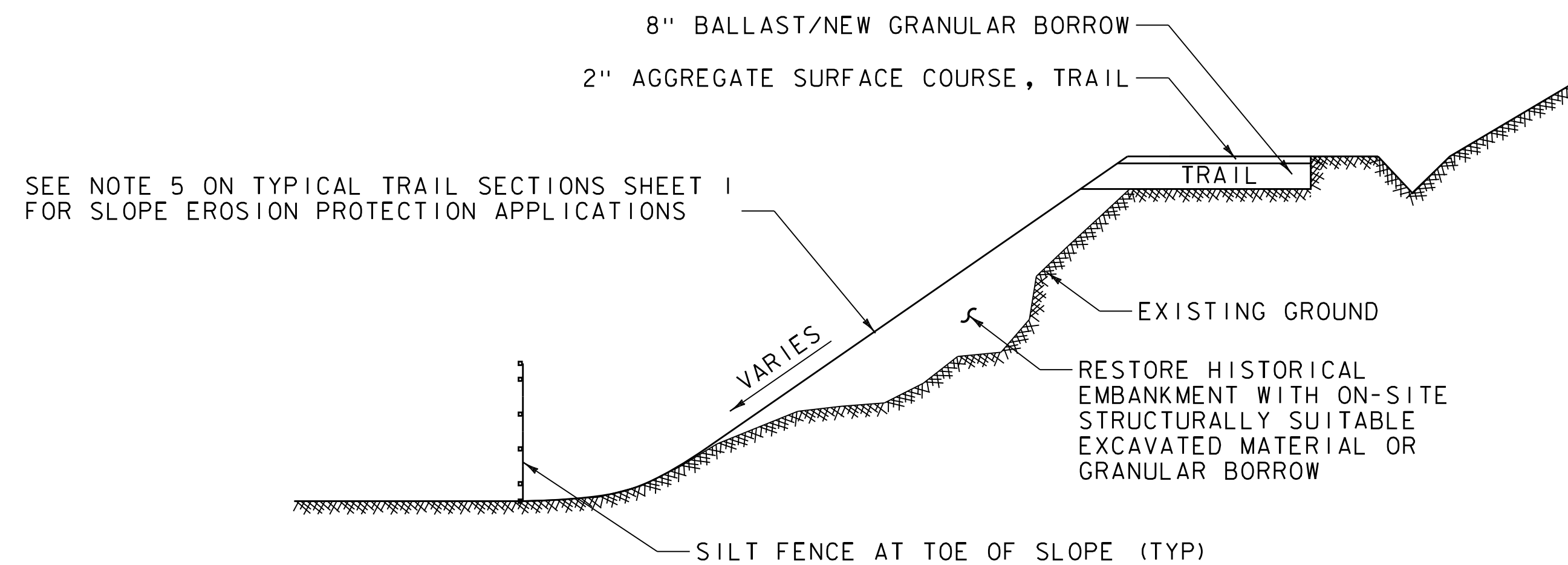


PROJECT NAME:	SWANTON - ST. JOHNSBURY		
PROJECT NUMBER:	STP LVRT(II)		
FILE NAME:	z20f237_typ_trail.sections.dgn	PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P. DETRICK	DRAWN BY:	B.M. ROBERTS
DESIGNED BY:	B.M. ROBERTS	CHECKED BY:	E.P. DETRICK
TYPICAL TRAIL SECTIONS SHEET (1 OF 2)		SHEET 10 OF 84	





SLOPE ROUNDING DETAIL  
NOT TO SCALE



EMBANKMENT SLOPE REPAIR  
NOT TO SCALE

NOTES:

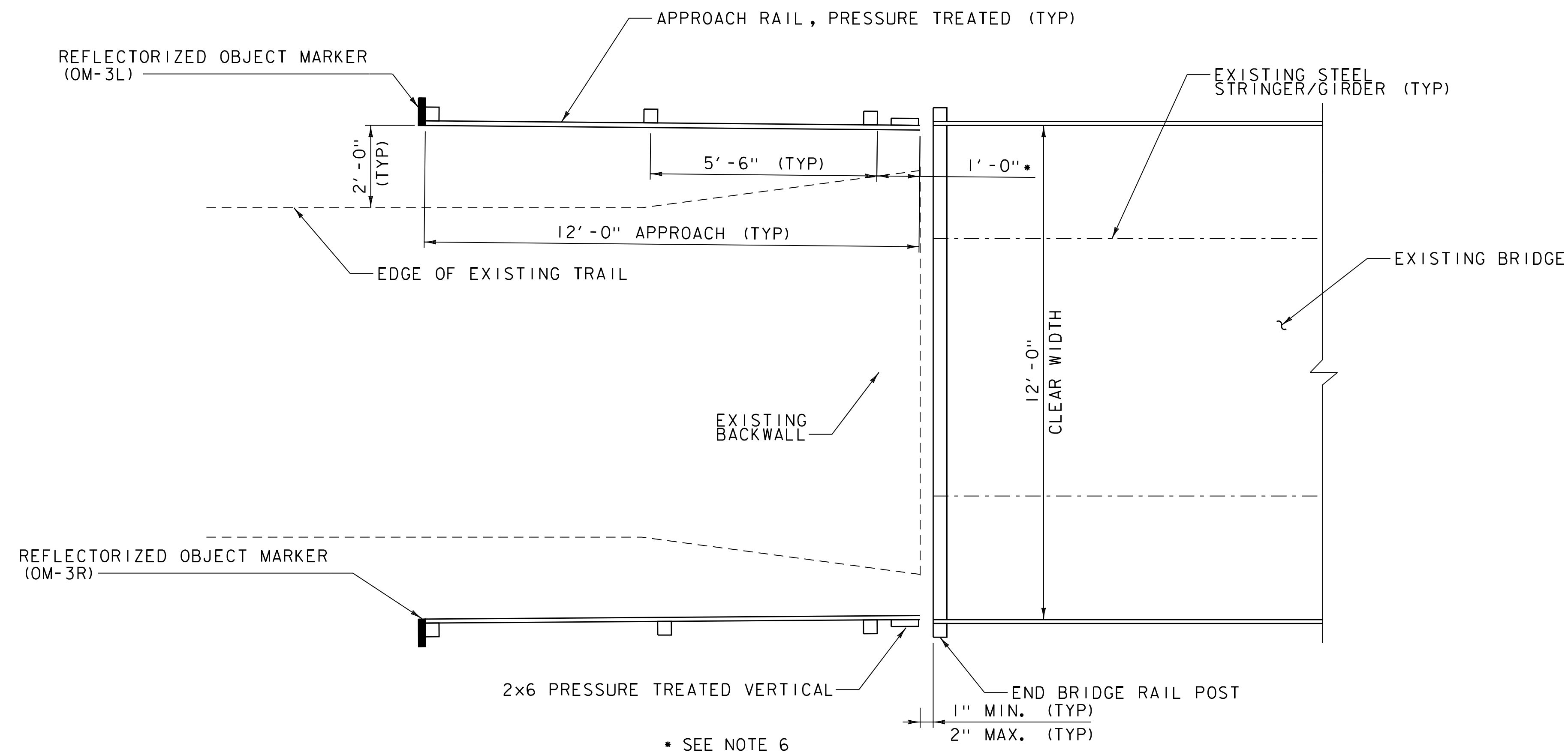
1. SEE TRAIL TYPICAL SECTIONS (SHEET 1 OF 2) FOR TRAIL CONSTRUCTION NOTES.
2. BERMS LOCATED AT THE TOP OF EMBANKMENTS SHALL BE ROUNDED TO PROMOTE SHEET FLOW FROM THE TRAIL DOWN THE EXISTING RAIL EMBANKMENT. BERM MATERIAL REMOVED SHALL BE PUSHED OVER THE EMBANKMENT IF THAT MATERIAL DOES NOT GO BEYOND THE EXISTING TOE OF THE SLOPE. IF THE BERM MATERIAL WOULD EXTEND BEYOND THE EXISTING TOE OF THE SLOPE, THE MATERIAL SHALL BE SPOILED IN A PRE- APPROVED DISPOSAL LOCATION OR PAUSE PLACE. PAYMENT FOR SLOPE ROUNDING SHALL BE MADE UNDER ITEM 201.10 CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS.



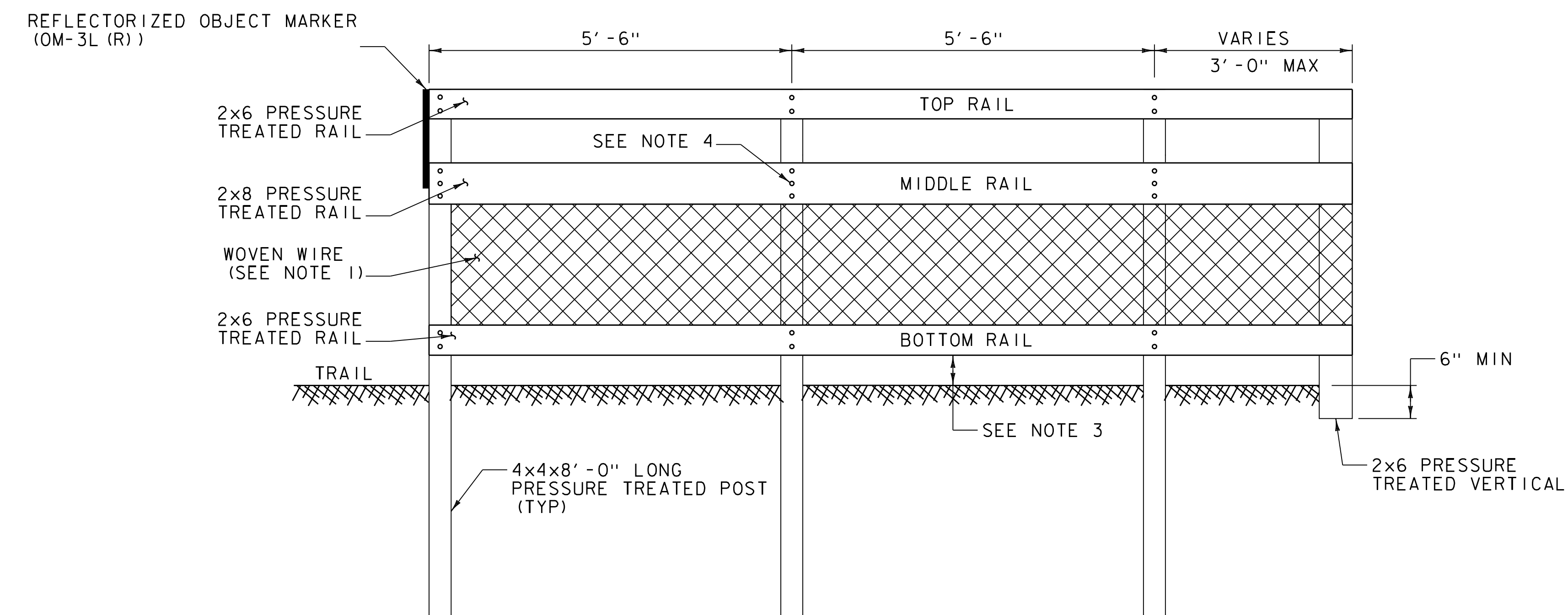
PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_typ_trail_sections.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: B.M. ROBERTS  
DESIGNED BY: B.M. ROBERTS CHECKED BY: E.P. DETRICK  
TYPICAL TRAIL SECTIONS SHEET (2 OF 2) SHEET II OF 84

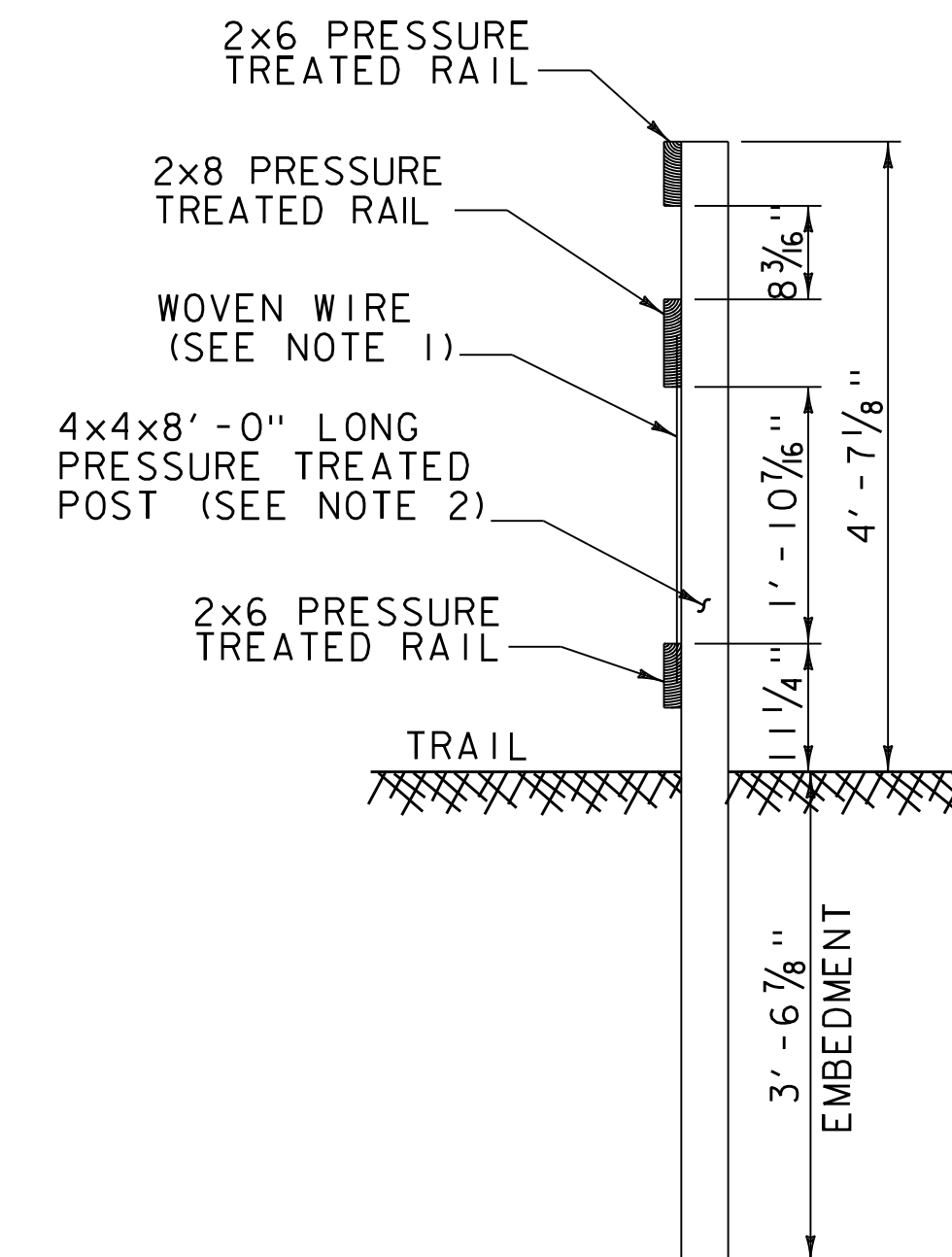




TYPICAL APPROACH RAIL LAYOUT  
SCALE  $\frac{1}{2}$ " = 1'-0"



APPROACH RAIL ELEVATION  
SCALE  $\frac{3}{4}$ " = 1'-0"



APPROACH RAIL SECTION  
NOT TO SCALE

NOTES:

1. THE WOVEN WIRE SHALL BE VINYL COATED, 2"x4" 11 GAUGE, BLACK.
2. WOODEN POSTS AND RAILS SHALL BE PRESSURE TREATED AND MEET THE REQUIREMENTS OF ITEM 522.25, "STRUCTURAL LUMBER AND TIMBER, TREATED".
3. THE TOP, MIDDLE, AND BOTTOM RAIL ARE TO BE SET AT THE SAME SLOPE AS THE TRAIL PROFILE GRADE AT THE EDGE OF THE TRAIL. IF THE OPENING BELOW THE BOTTOM RAIL EXCEEDS SIX (6) INCHES, THEN A FOURTH RAIL, 2x6 PRESSURE TREATED RAIL, SHALL BE INSTALLED UNDER THE BOTTOM RAIL.
4. THE TOP AND BOTTOM RAILS ARE TO BE ATTACHED TO THE POSTS WITH TWO  $\frac{1}{2}$ " DIA. GALVANIZED CARRIAGE BOLTS WITH A  $\frac{3}{4}$ " WASHER UNDER THE NUT. THREE  $\frac{1}{2}$ " DIA. GALVANIZED CARRIAGE BOLTS WITH A  $\frac{3}{4}$ " WASHER UNDER THE NUT SHALL BE USED FOR CONNECTING THE MIDDLE RAIL TO POST. ALL CARRIAGE BOLTS SHALL BE ASTM A307.
5. ALL COSTS ASSOCIATED WITH FABRICATING AND INSTALLING THE APPROACH/GUARD RAIL SHALL BE INCLUDED IN ITEM 900.640, "SPECIAL PROVISION (APPROACH RAIL, PRESSURE TREATED)".
6. PRESSURE TREATED RAIL CAN BE CANTILEVERED A MAX. OF 2'-0" BEYOND THE END OF POST.
7. ALL LUMBER TO BE DRESSED LUMBER. DIMENSIONS SHOWN ARE NOMINAL.

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(II)

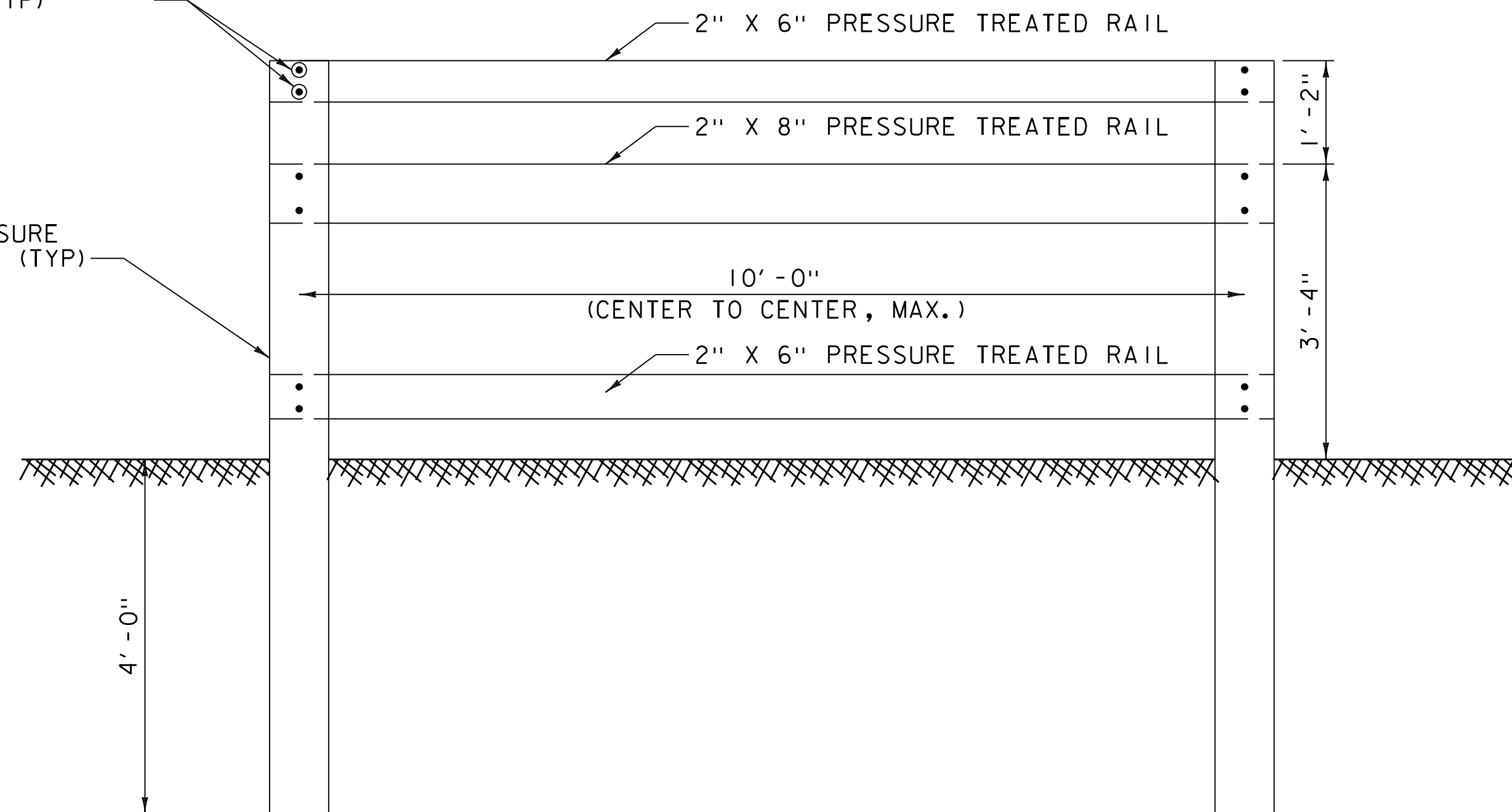
FILE NAME: z20f237_approach_guardrail.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: B.M. ROBERTS  
DESIGNED BY: B.M. ROBERTS CHECKED BY: B.O. CROWIN





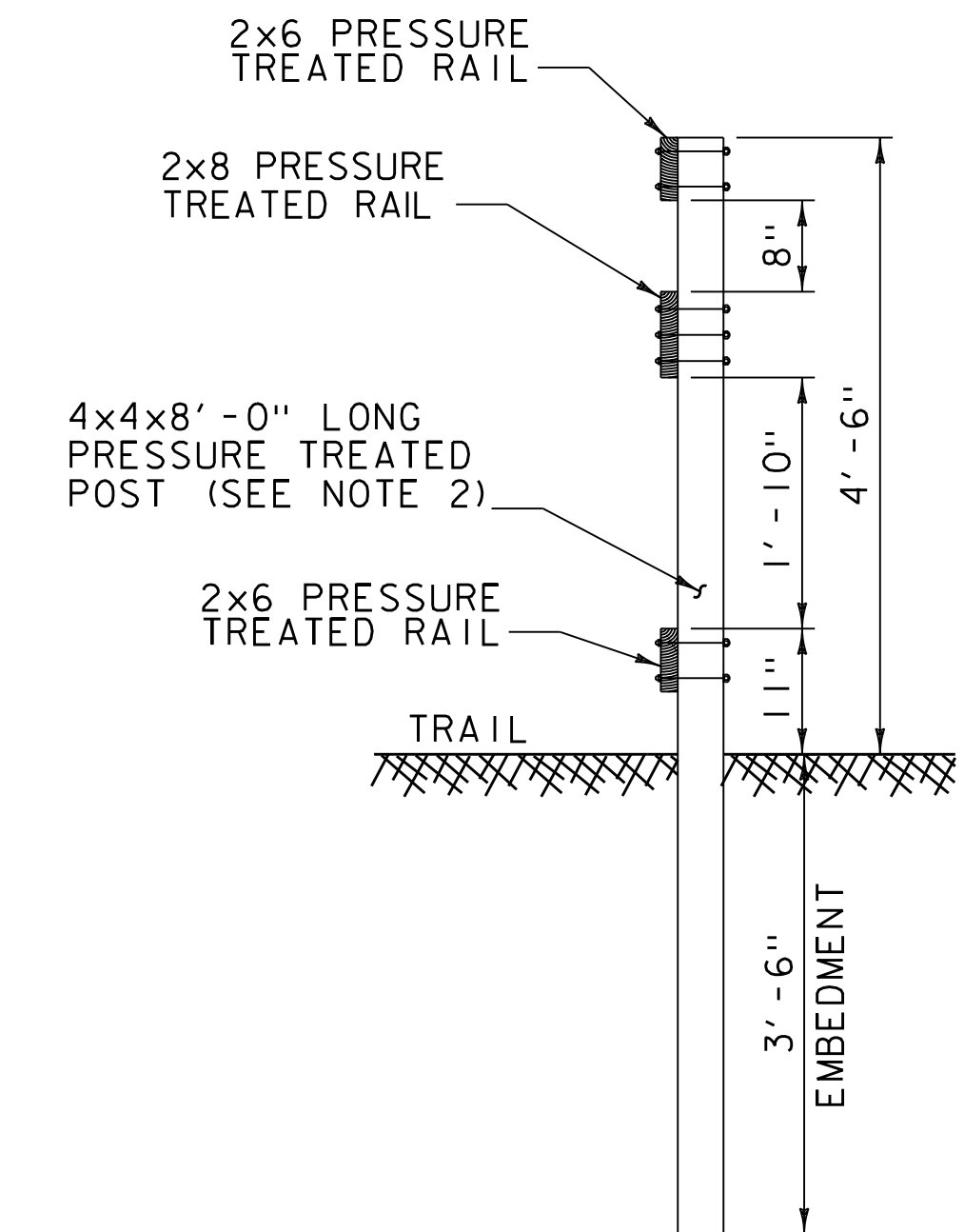
(2) 1/2" CARRIAGE BOLTS  
EACH CONNECTION WITH 3/4"  
O.D. WASHERS (TYP)

4" X 4" PRESSURE  
TREATED POST (TYP)



TYPICAL GUARDRAIL ELEVATION

SCALE 3/4" = 1'-0"



GUARDRAIL SECTION

SCALE 3/4" = 1'-0"

NOTES:

1. WOODEN POSTS AND BOARDS SHALL MEET THE REQUIREMENTS OF SUBSECTION 709.11.
2. THE TOP, MIDDLE, AND BOTTOM RAIL ARE TO BE SET AT THE SAME SLOPE AS THE TRAIL PROFILE GRADE AT THE EDGE OF THE TRAIL. IF THE OPENING BELOW THE BOTTOM RAIL EXCEEDS SIX (6) INCHES, THEN A FOURTH RAIL, 2x6 PRESSURE TREATED RAIL, SHALL BE INSTALLED UNDER THE BOTTOM RAIL.
3. ALL RAILS ARE TO BE ATTACHED TO THE POSTS WITH TWO 1/2" DIA. GALVANIZED CARRIAGE BOLTS WITH A 3/4" WASHER UNDER THE NUT. ALL CARRIAGE BOLTS SHALL BE ASTM A307.
4. ALL COSTS ASSOCIATED WITH FABRICATING AND INSTALLING THE GUARD RAIL SHALL BE CONSIDERED INCIDENTAL TO ITEM 900.640, "SPECIAL PROVISION (GUARD RAIL, PRESSURE TREATED)".



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_approach_guardrail.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: K.C. BARRY

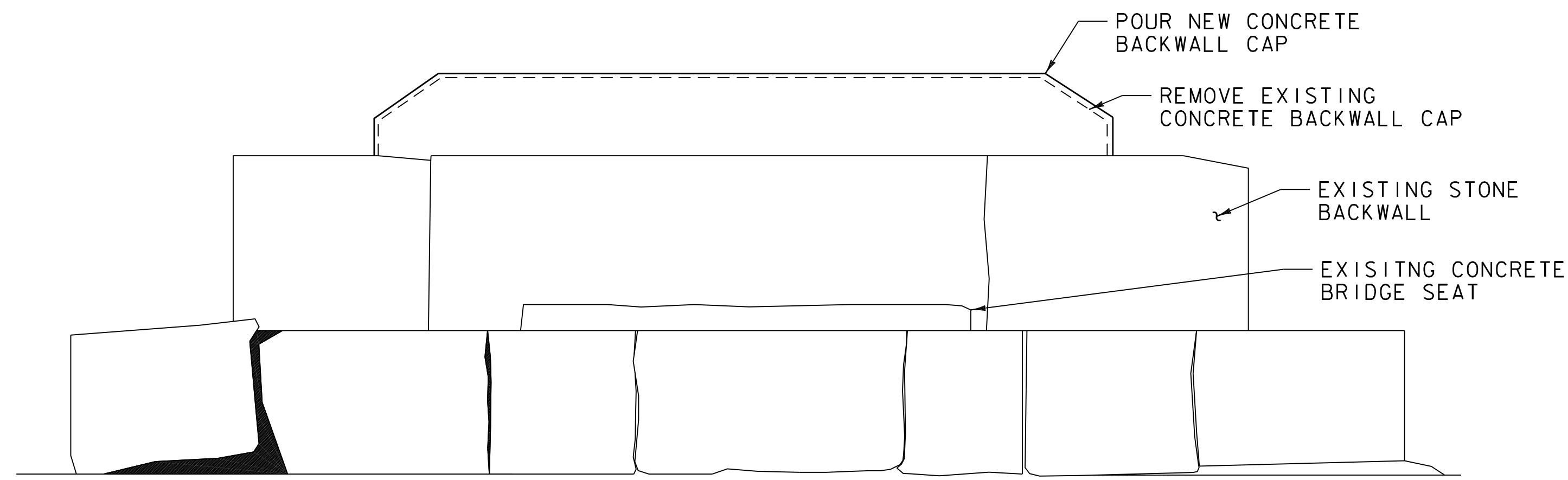
DESIGNED BY: G.L. BAKOS

CHECKED BY: M.E. OOMS

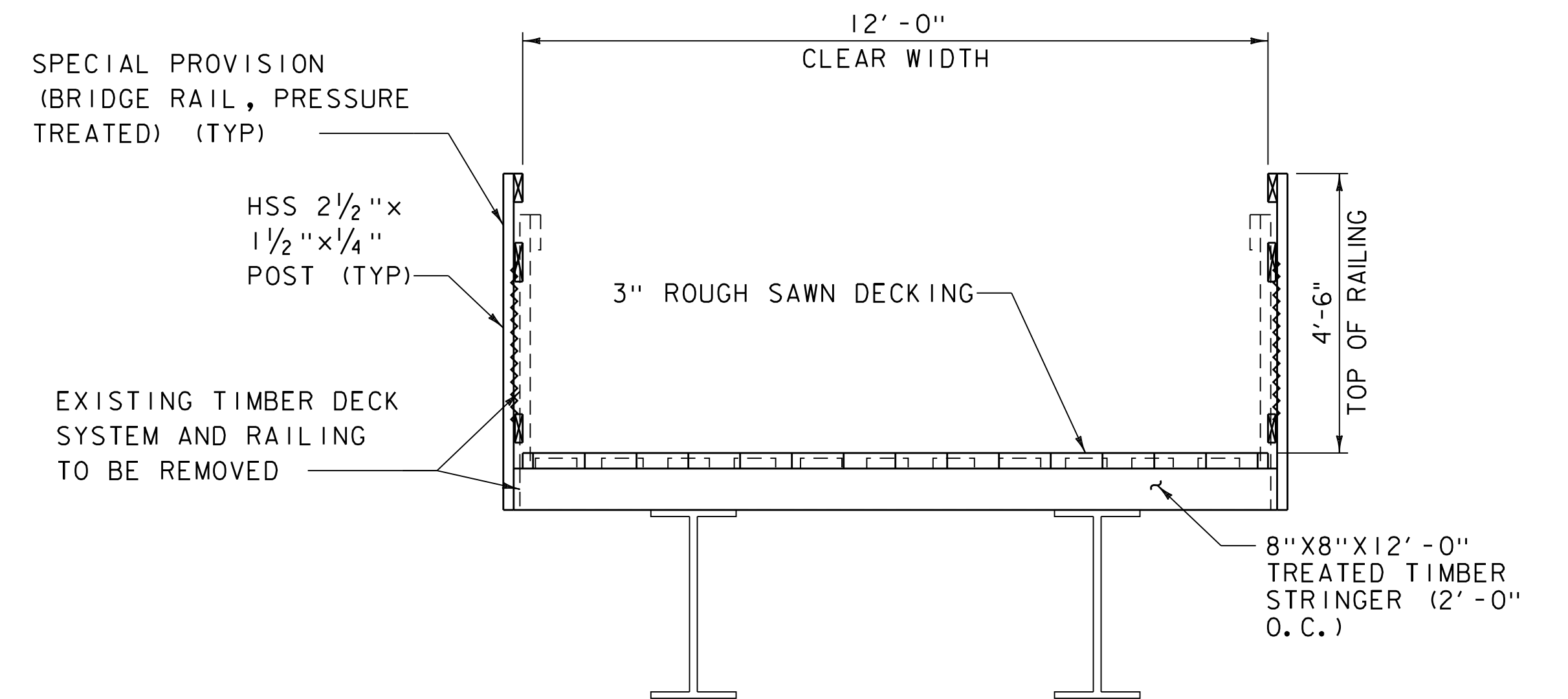
TYPICAL GUARD RAIL SHEET

SHEET 13 OF 84

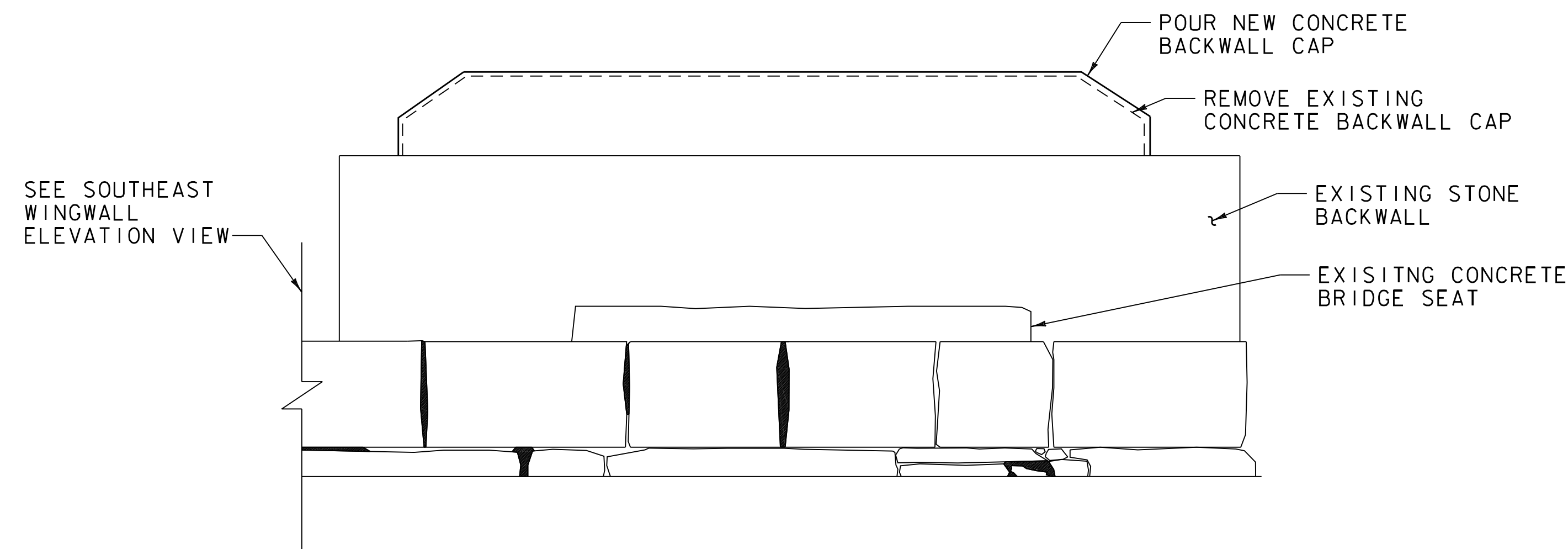




BRIDGE 70 WEST ABUTMENT ELEVATION  
NOT TO SCALE



BRIDGE 70 TYPICAL SECTION  
SCALE: 1/2" = 1'-0"



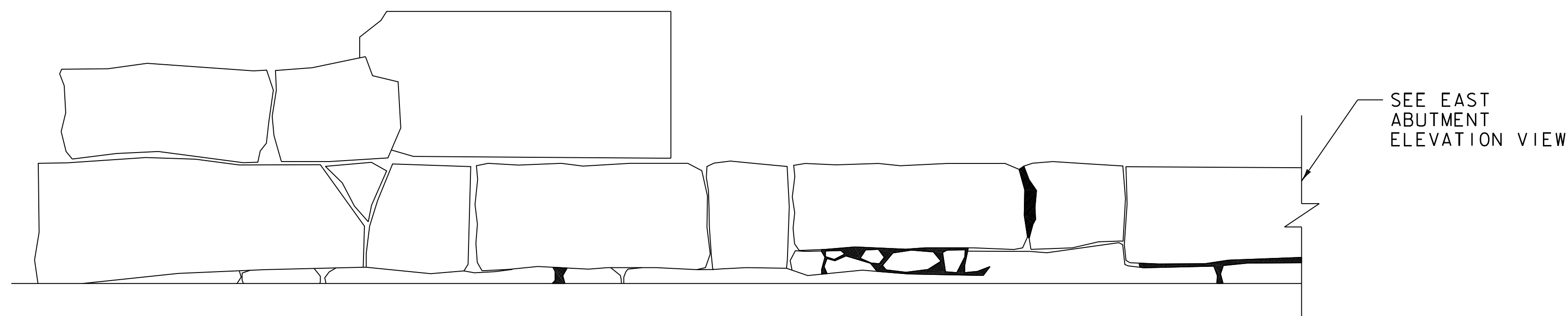
BRIDGE 70 EAST ABUTMENT ELEVATION  
NOT TO SCALE

LEGEND:



NOTES:

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF EAST AND WEST ABUTMENTS AND WINGWALLS SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS IN THE ABUTMENTS AND WINGWALLS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".

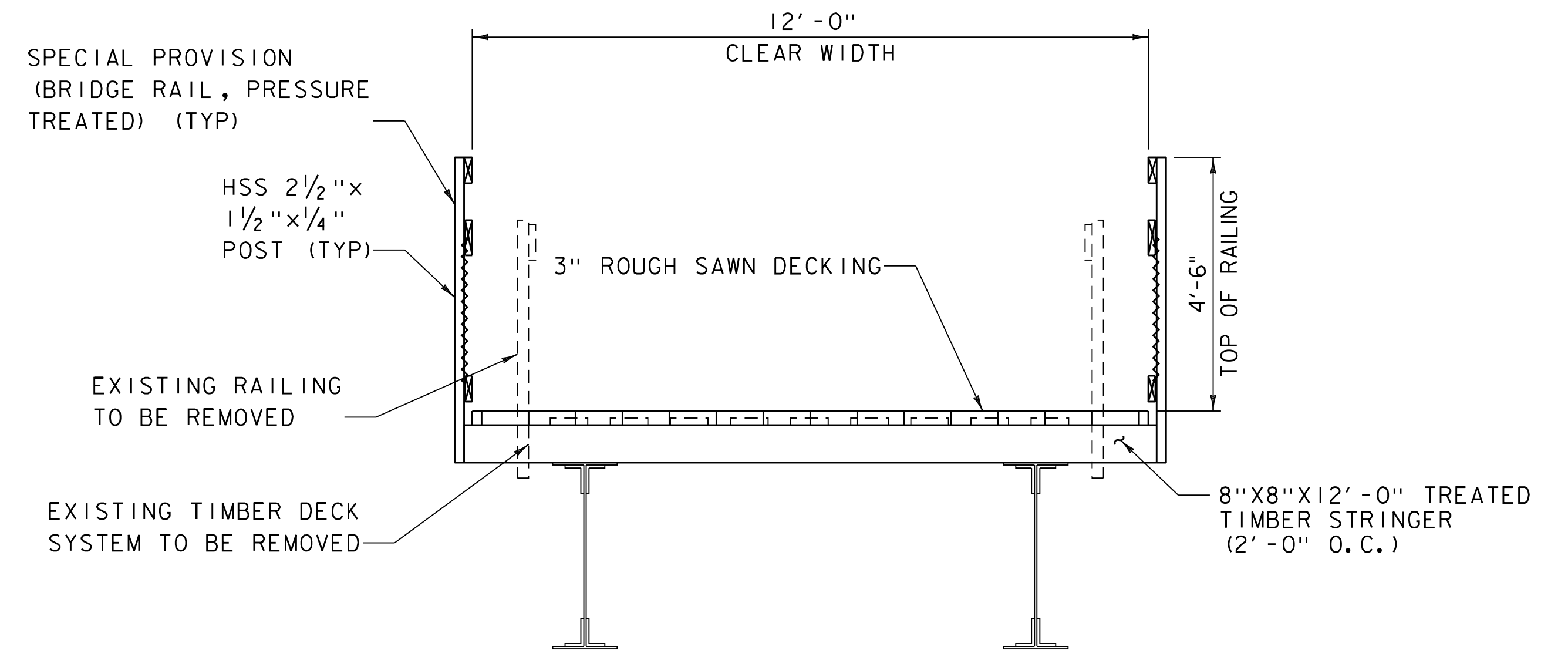


BRIDGE 70 SOUTHEAST WINGWALL ELEVATION  
NOT TO SCALE



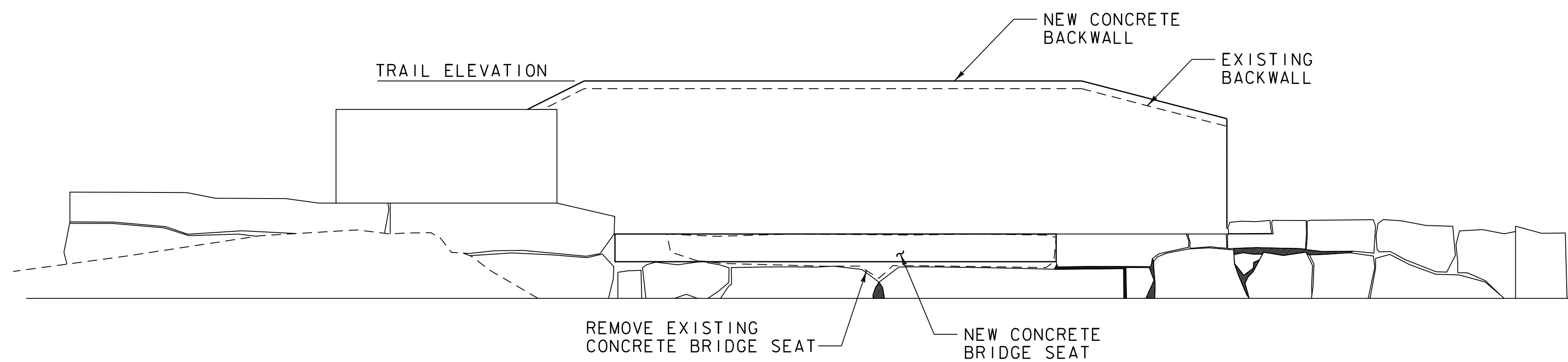
PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(II)	
FILE NAME: z20f237_structure.details.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: C.K. FORD
DESIGNED BY: J.D. KEENER	CHECKED BY: J.D. KEENER
BRIDGE 70 TYPICAL SECTIONS	SHEET 14 OF 84





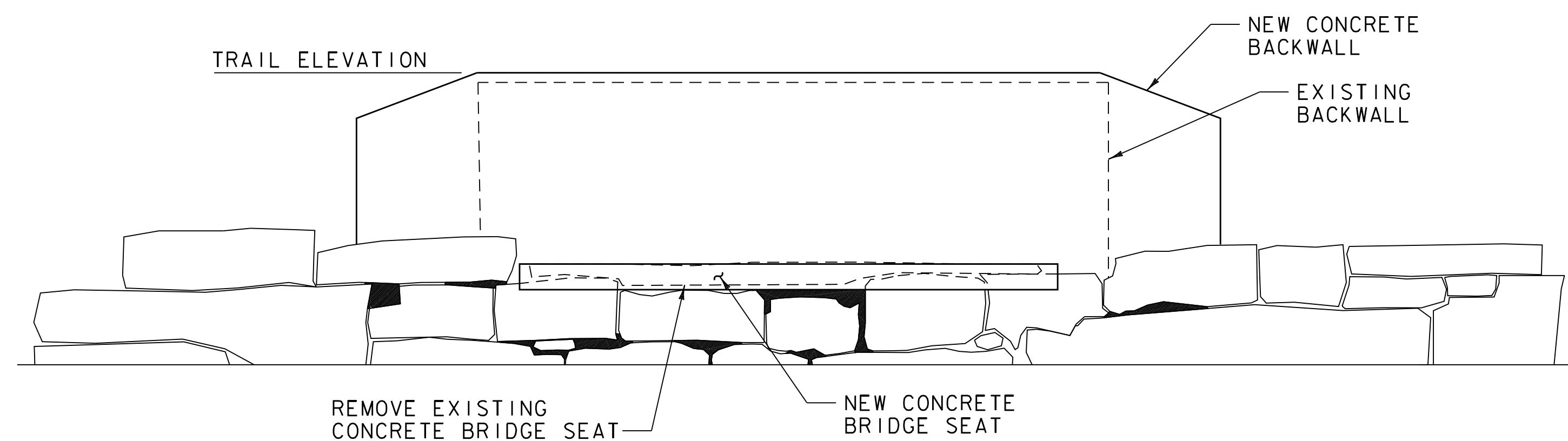
BRIDGE 71 TYPICAL SECTION

SCALE: 1/2" = 1'-0"



BRIDGE 71 EAST ABUTMENT ELEVATION

NOT TO SCALE



BRIDGE 71 WEST ABUTMENT ELEVATION

NOT TO SCALE

LEGEND:

APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

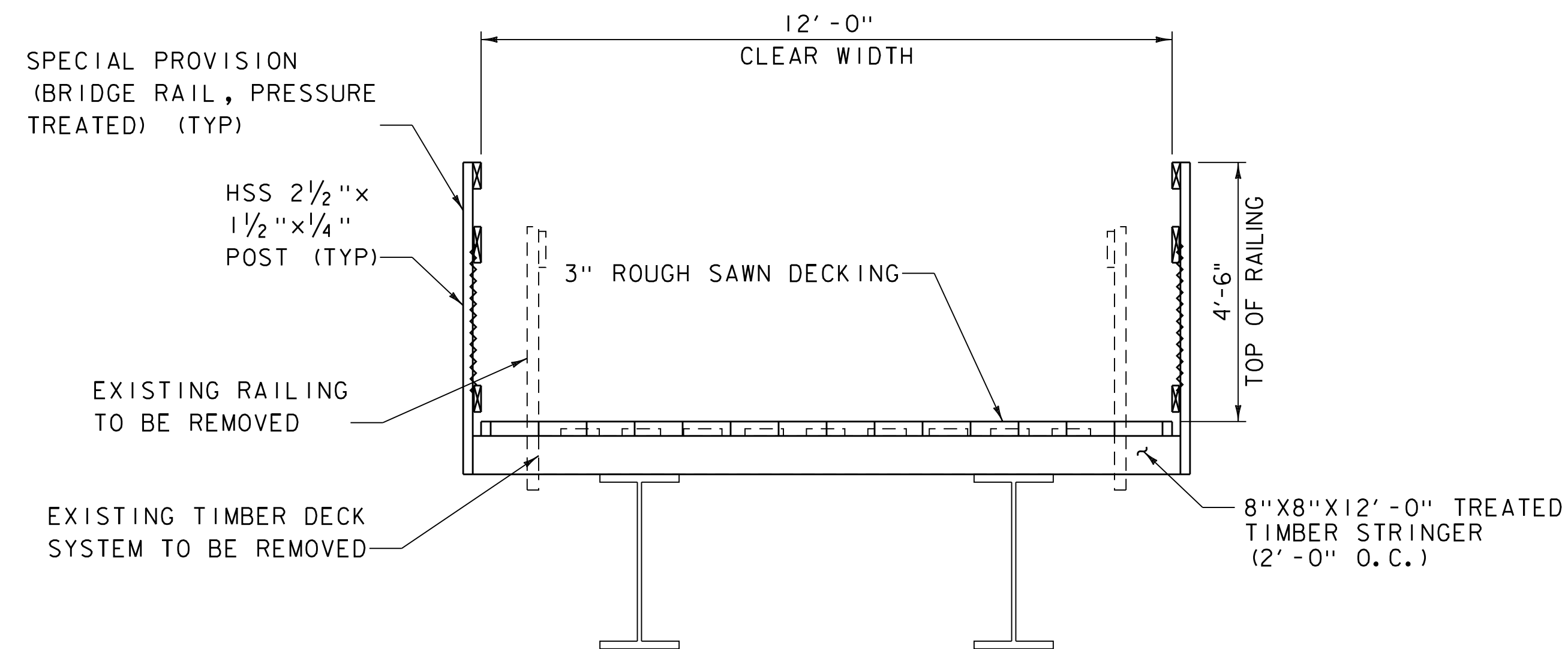
NOTES:

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF BOTH EAST AND WEST ABUTMENTS SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS IN THE ABUTMENTS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".

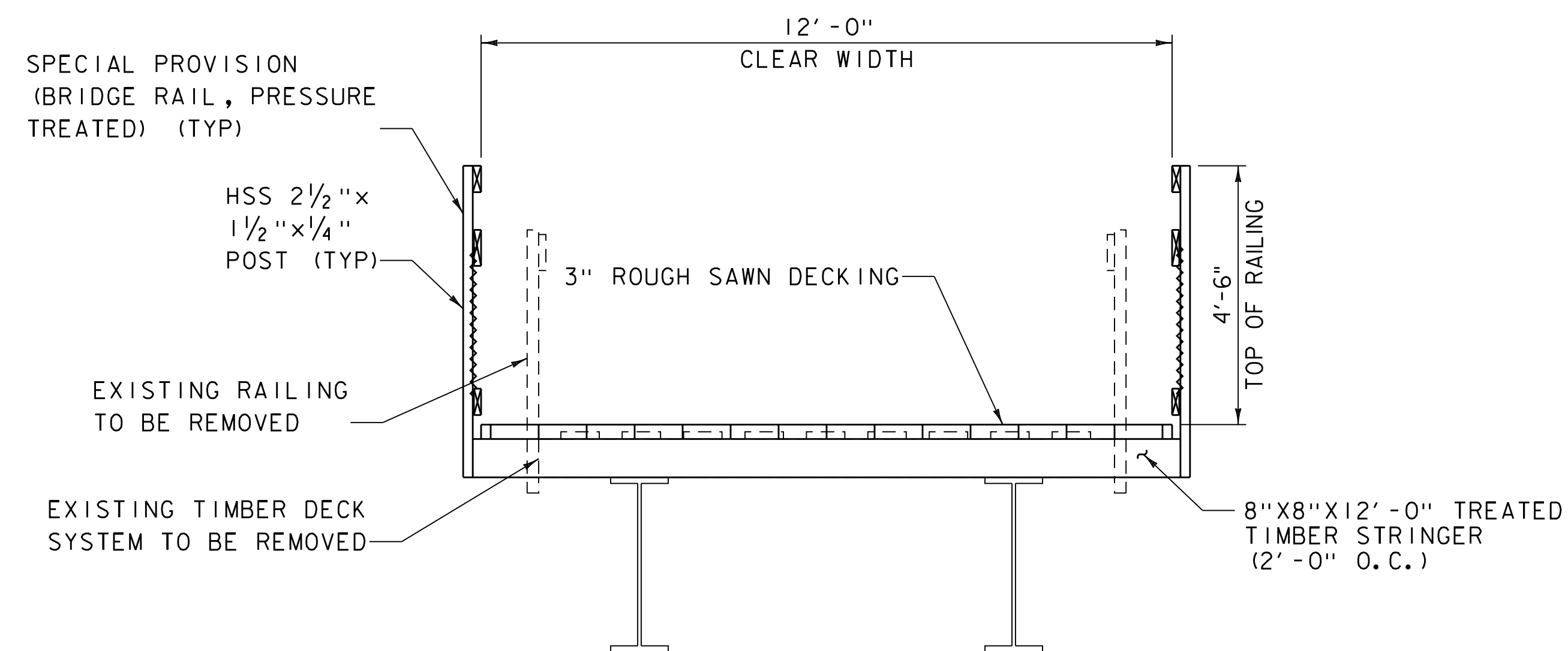


PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(II)
FILE NAME:	z20f237_structure.details.dgn
PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P. DETRICK
DRAWN BY:	C.K. FORD
DESIGNED BY:	J.D. KEENER
CHECKED BY:	J.D. KEENER
BRIDGE 71 TYPICAL SECTIONS	SHEET 15 OF 84





BRIDGE 73 TYPICAL SECTION  
SCALE: 1/2" = 1' - 0"

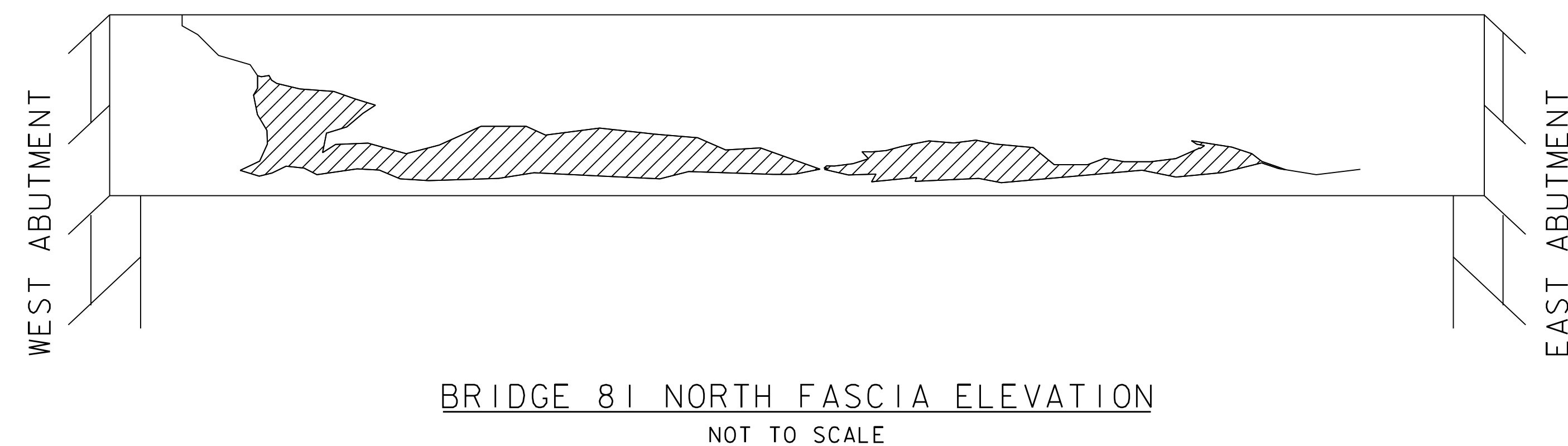
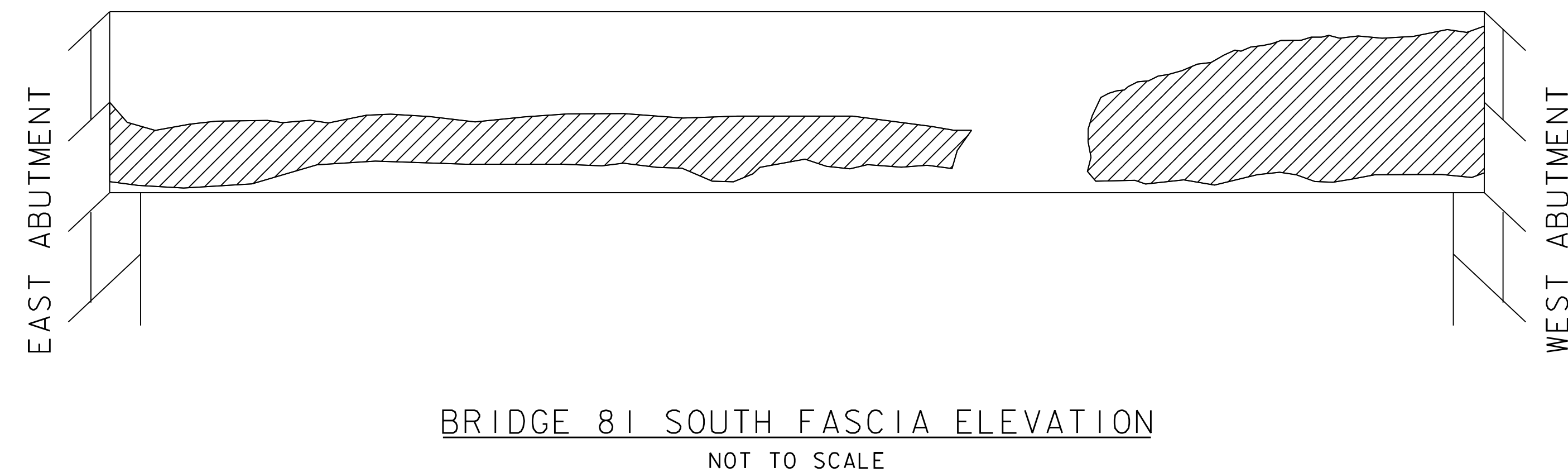
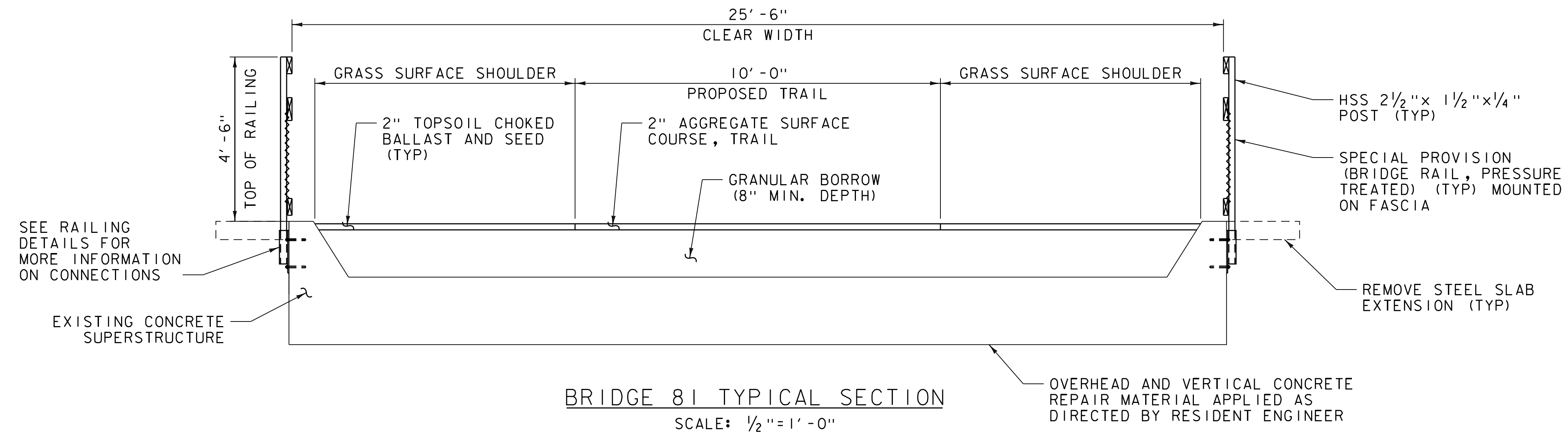


BRIDGE 76 TYPICAL SECTION  
SCALE: 1/2" = 1' - 0"



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(II)	
FILE NAME: z20f237_structure_details.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: C.K. FORD
DESIGNED BY: J.D. KEENER	CHECKED BY: J.D. KEENER
BRIDGE 73 & BRIDGE 76 TYPICAL SECTIONS	SHEET 16 OF 84





#### LEGEND:

 APPROXIMATE LOCATIONS OF CONCRETE REPAIRS

#### NOTES:

1. PAYMENT FOR SUPERSTRUCTURE CONCRETE REPAIR, INCLUDING REPAIR MATERIALS, WILL BE MADE UNDER ITEM 580.10, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS 1" AND ITEM 580.11, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS 11" AS APPROPRIATE.
2. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF THE SOUTHEAST WINGWALL SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
3. THE ENTIRE SOUTHEAST WINGWALL SHALL BE RESET. RESETTING WILL BE PAID FOR UNDER ITEM 602.35 "REBUILT STONE MASONRY".
4. REPAIR OF THE CRACKS ON THE UNDERSIDE OF THE CONCRETE SUPERSTRUCTURE SHALL BE PAID FOR UNDER ITEM 580.18, "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL".

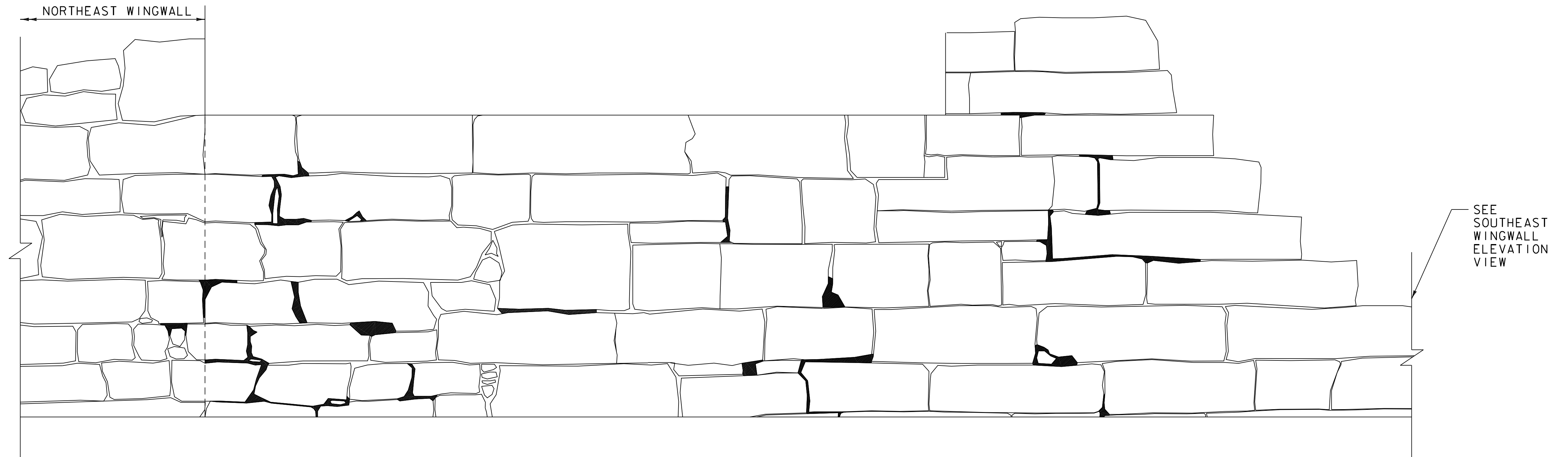
PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(II)

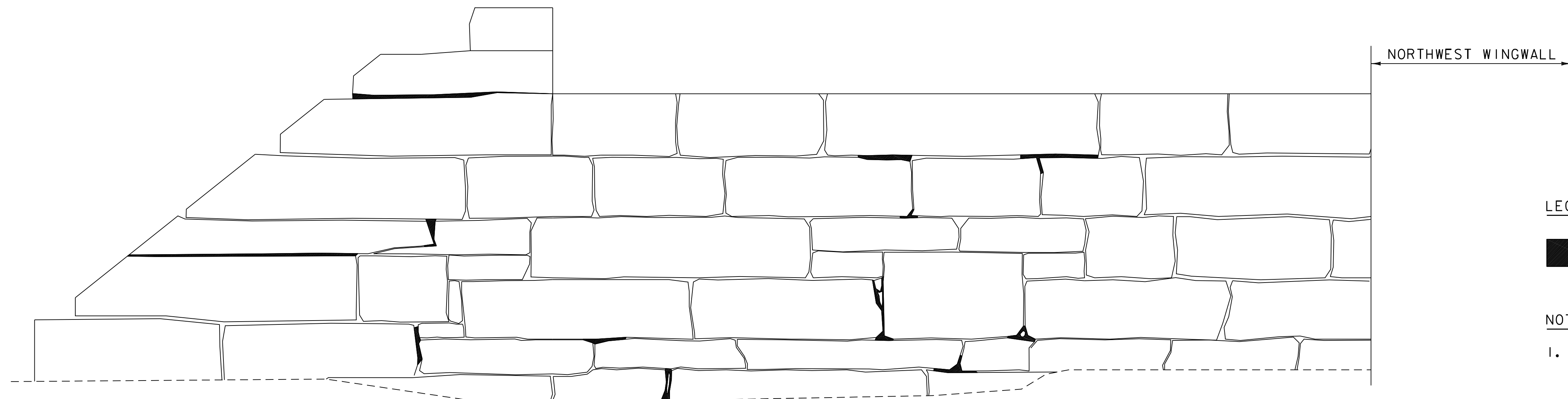
FILE NAME: z20f237_structure.details.dgn PLOT DATE: 3/23/2021  
 PROJECT LEADER: E.P. DETRICK DRAWN BY: C.K. FORD  
 DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
 BRIDGE 81 TYPICAL SECTIONS SHEET 17 OF 84







BRIDGE 81 EAST ABUTMENT ELEVATION  
NOT TO SCALE



BRIDGE 81 WEST ABUTMENT ELEVATION  
NOT TO SCALE

LEGEND:

 APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

NOTES:

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF BOTH EAST AND WEST ABUTMENTS SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS IN THE ABUTMENTS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_structure.details.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: C.K. FORD

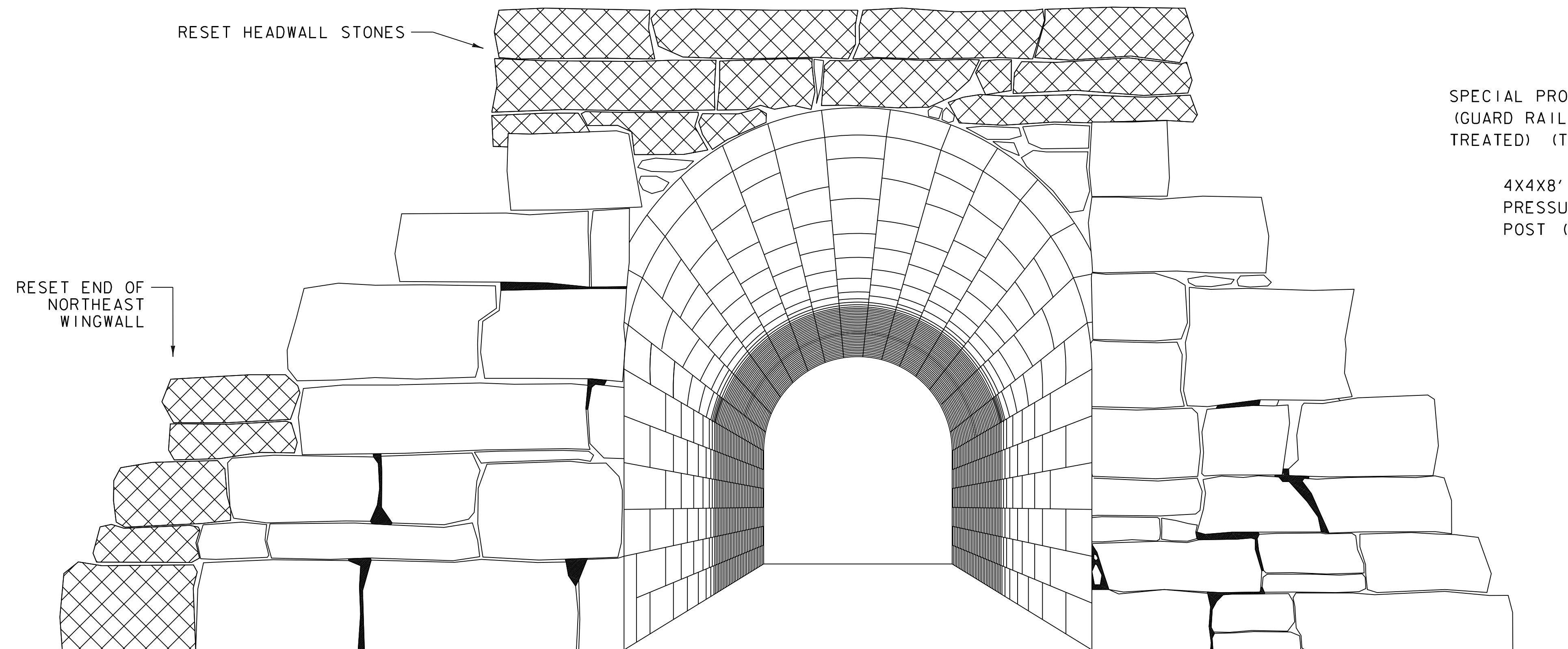
DESIGNED BY: J.D. KEENER

CHECKED BY: J.D. KEENER

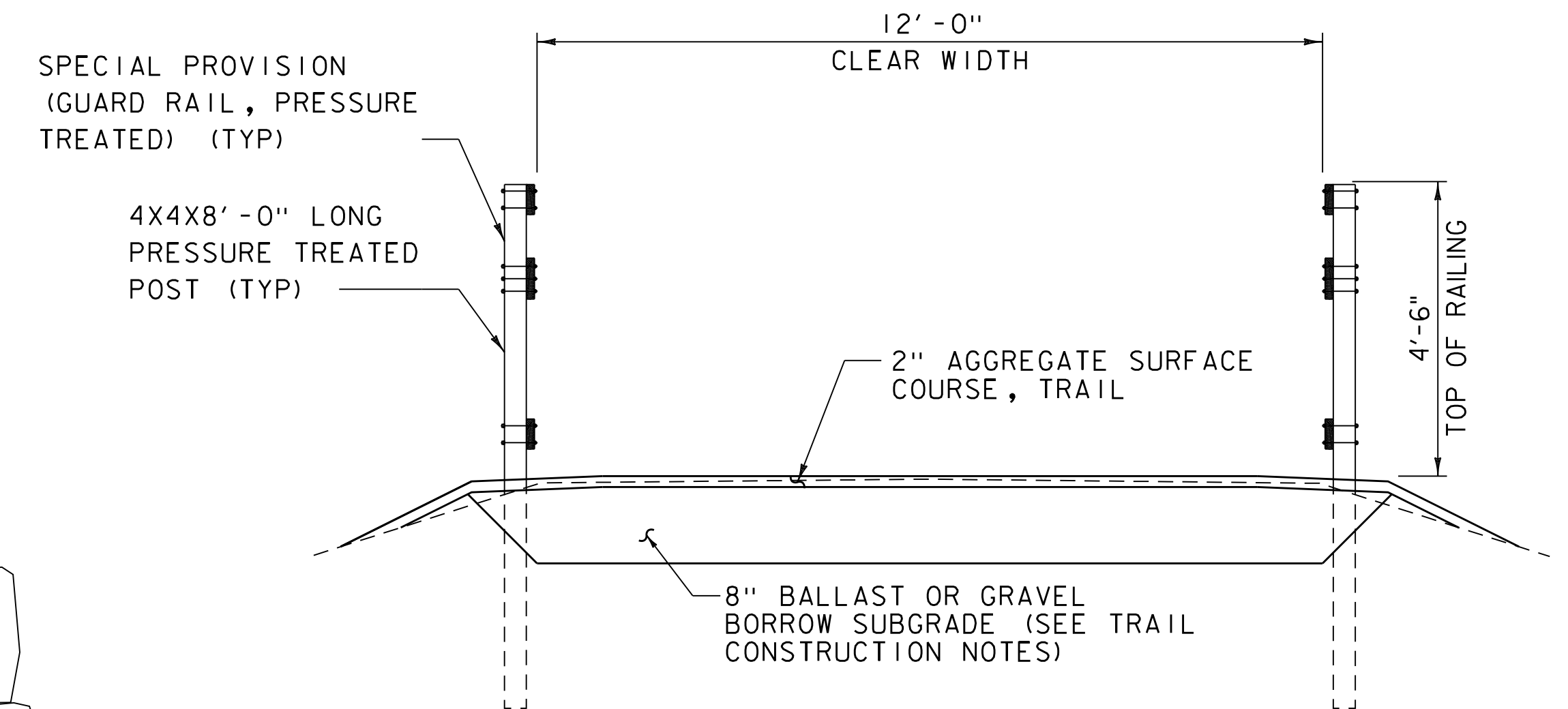
BRIDGE 81 ELEVATION VIEWS

SHEET 18 OF 84

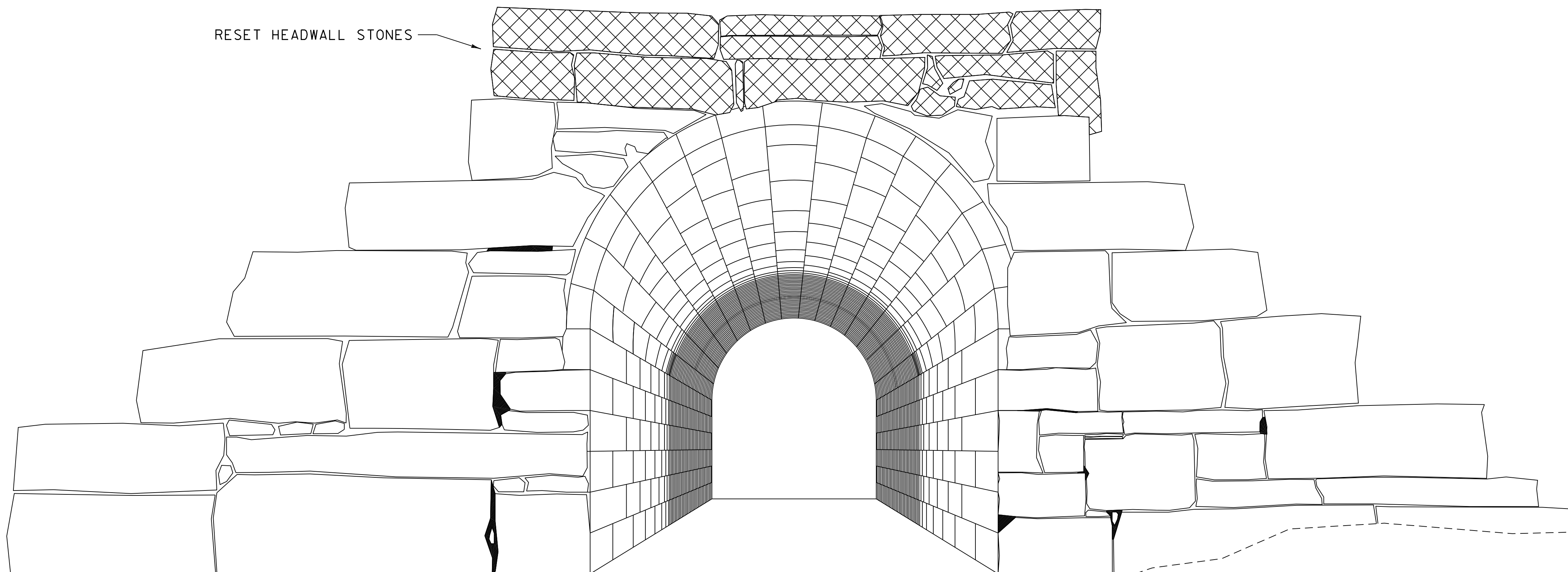




BRIDGE 82 UPSTREAM ELEVATION  
NOT TO SCALE

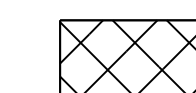


BRIDGE 82 TYPICAL SECTION  
SCALE: 1/2"=1'-0"



BRIDGE 82 DOWNSTREAM ELEVATION  
NOT TO SCALE

LEGEND:



HEADWALL AND WINGWALL STONES TO BE RESET



APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

NOTES:

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF THE BRIDGE ABUTMENTS AND WINGWALLS SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".
3. REMOVING AND RESETTING HEADWALL AND WINGWALL STONES WILL BE PAID FOR UNDER ITEM 602.35 "REBUILT STONE MASONRY".

PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_structure_details.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: C.K. FORD

DESIGNED BY: J.D. KEENER

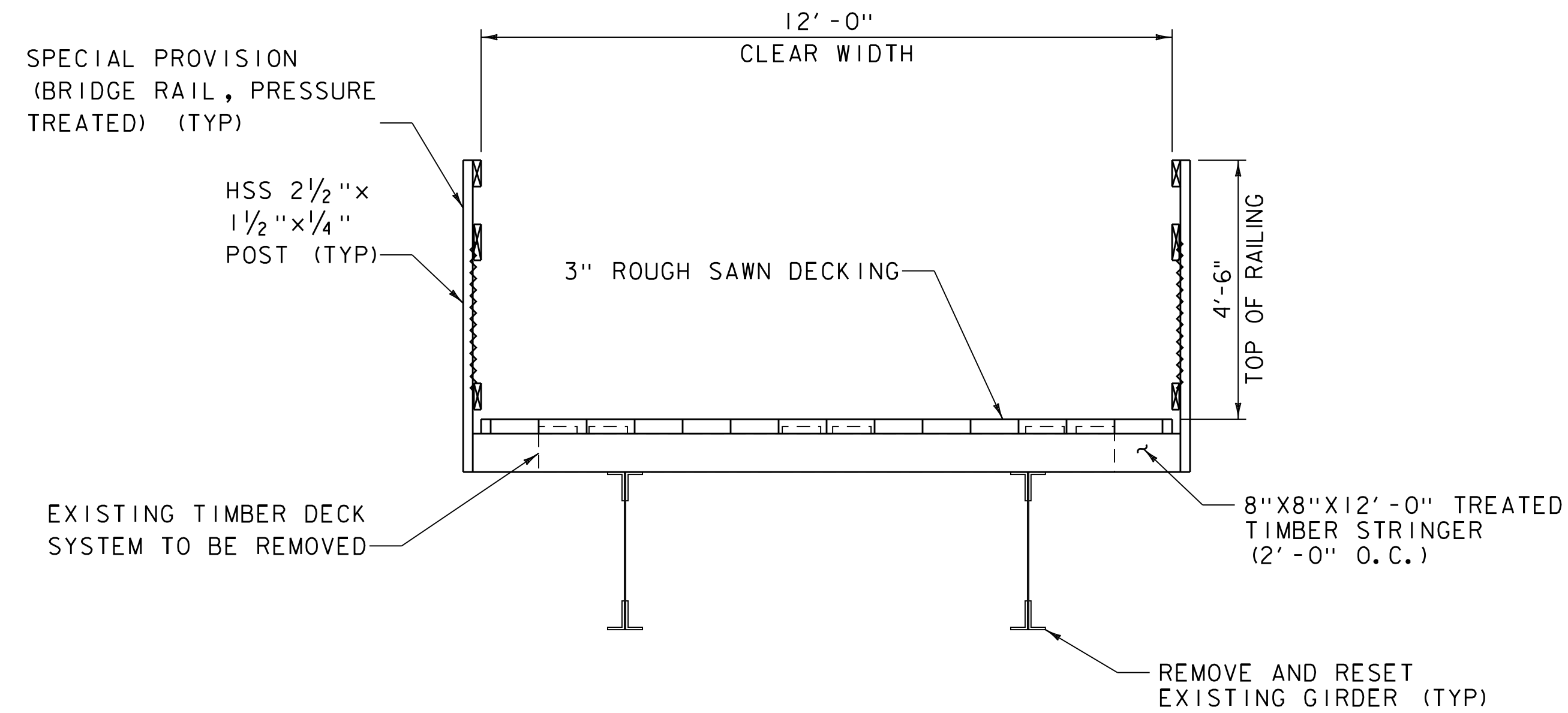
CHECKED BY: J.D. KEENER

BRIDGE 82 TYPICAL SECTIONS

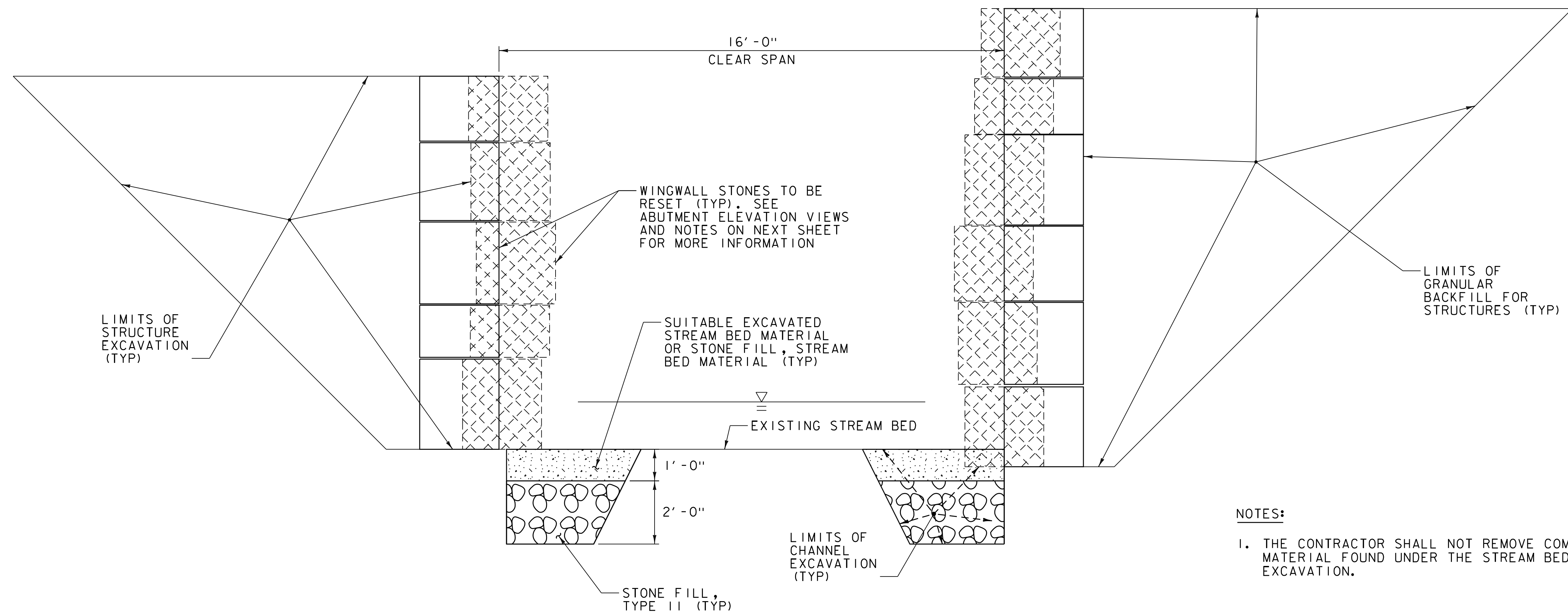
SHEET 19 OF 84







BRIDGE 85 TYPICAL SECTION  
SCALE: 1/2" = 1' - 0"



NOTES:

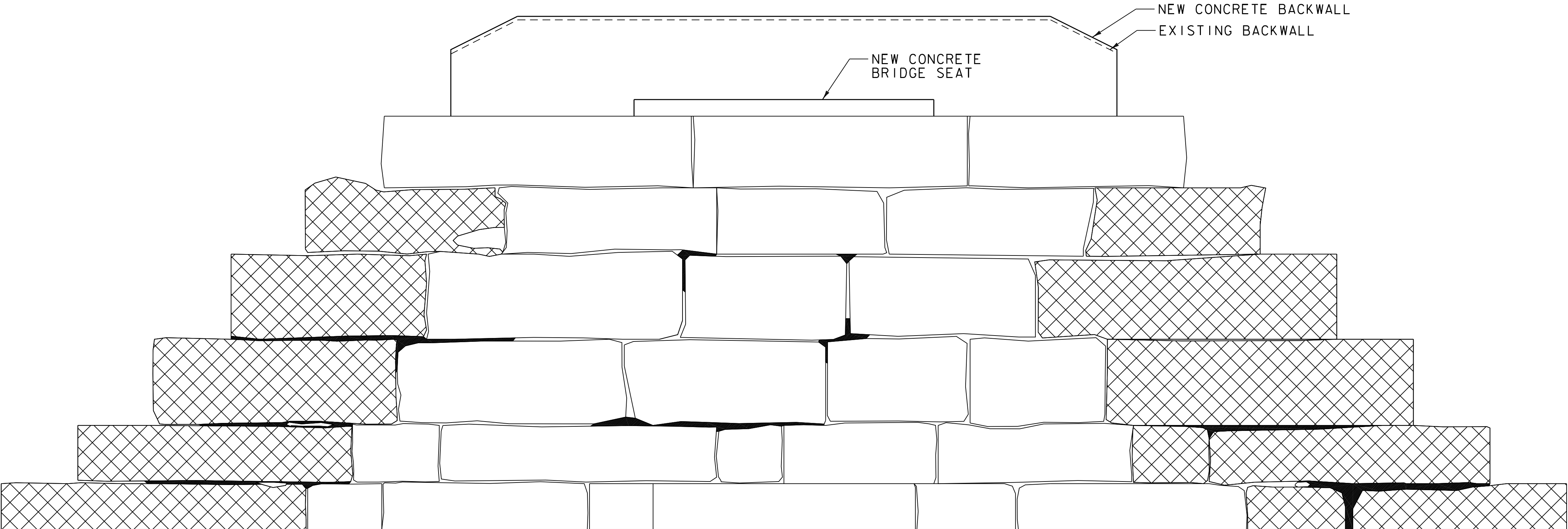
1. THE CONTRACTOR SHALL NOT REMOVE COMPETENT MATERIAL FOUND UNDER THE STREAM BED DURING EXCAVATION.

BRIDGE 85 UPSTREAM/DOWNSTREAM TYPICAL SECTION  
NOT TO SCALE

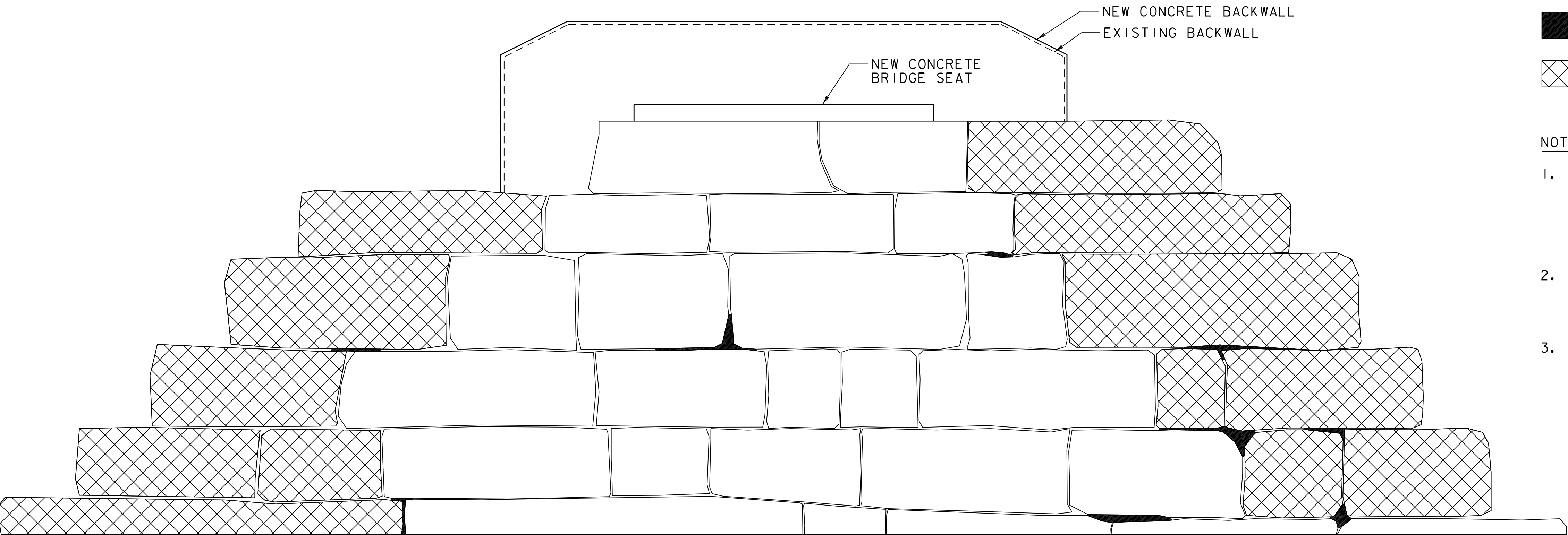


PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(II)
FILE NAME:	z20f237_structure_details.dgn
PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P. DETRICK
DRAWN BY:	C.K. FORD
DESIGNED BY:	J.D. KEENER
CHECKED BY:	J.D. KEENER
BRIDGE 85 TYPICAL SECTIONS	SHEET 20 OF 84



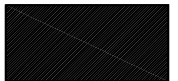
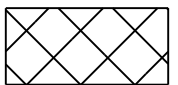


BRIDGE 85 EAST ABUTMENT ELEVATION  
NOT TO SCALE



BRIDGE 85 WEST ABUTMENT ELEVATION  
NOT TO SCALE

LEGEND:

-  APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED
-  WINGWALL STONES TO BE RESET

NOTES:

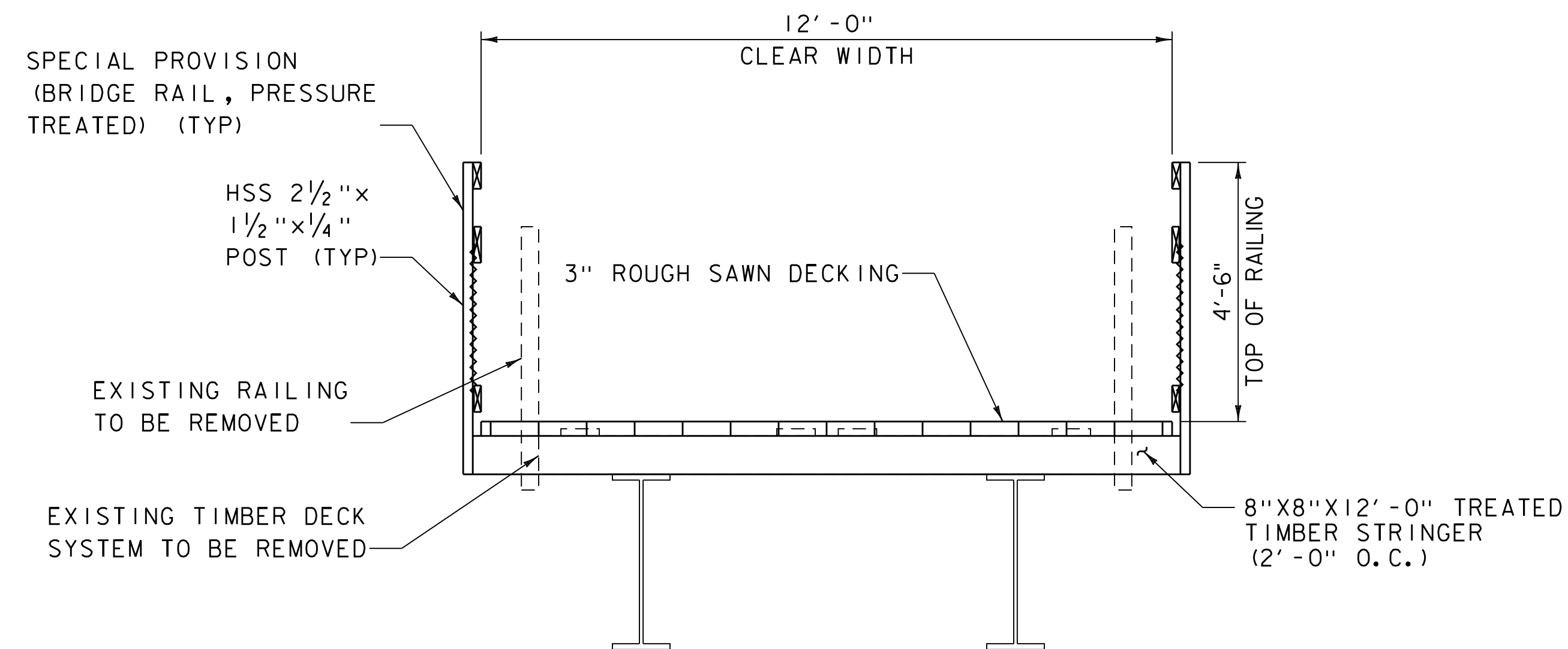
1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF THE BRIDGE ABUTMENTS AND WINGWALLS SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".
3. THE ENDS OF BOTH WINGWALLS IN THE EAST AND WEST ABUTMENTS SHALL BE RESET TO MAINTAIN A CONSISTENT 16'-0" CLEAR SPAN. REMOVE AND RESET STONE WINGWALLS WILL BE PAID FOR UNDER ITEM 602.35 "REBUILT STONE MASONRY".

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(II)

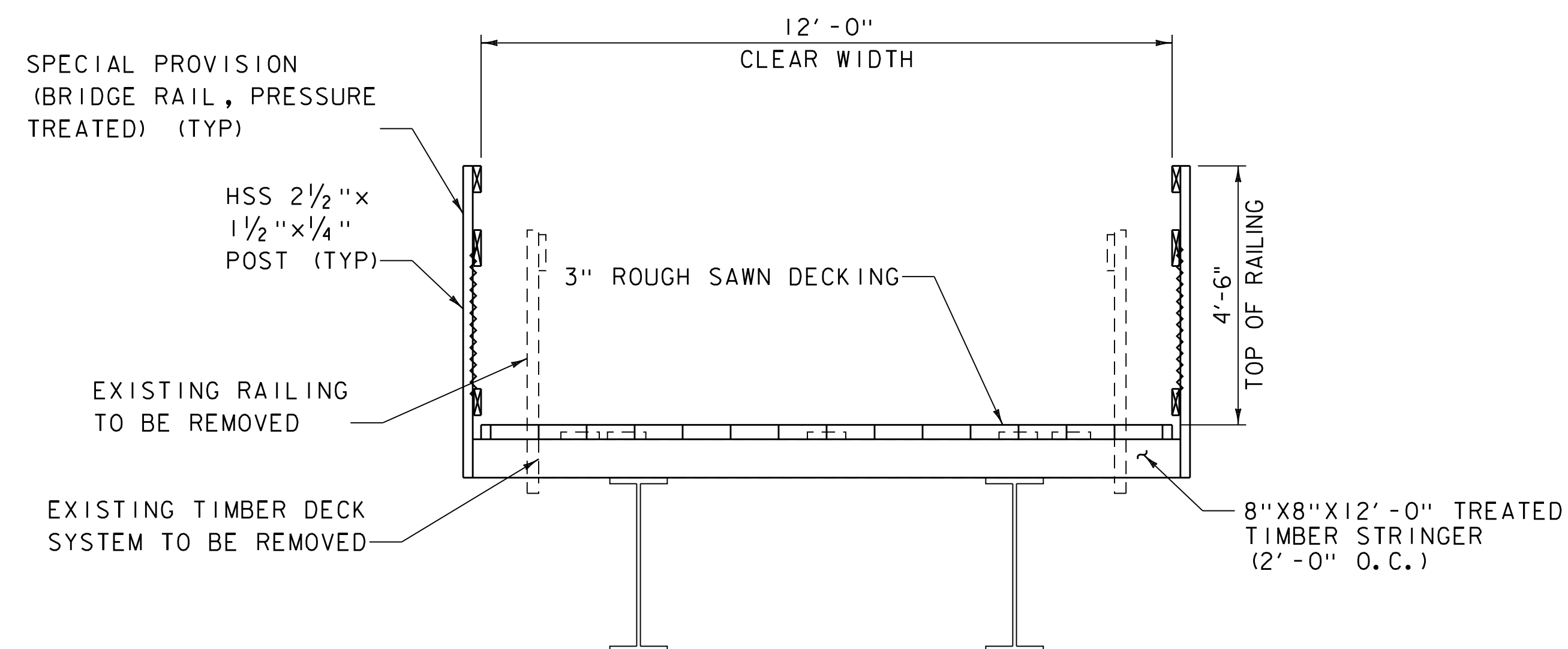
FILE NAME: z20f237_structure.details.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: C.K. FORD  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
BRIDGE 85 ABUTMENT ELEVATIONS SHEET 21 OF 84







BRIDGE 87 TYPICAL SECTION  
SCALE: 1/2" = 1' - 0"

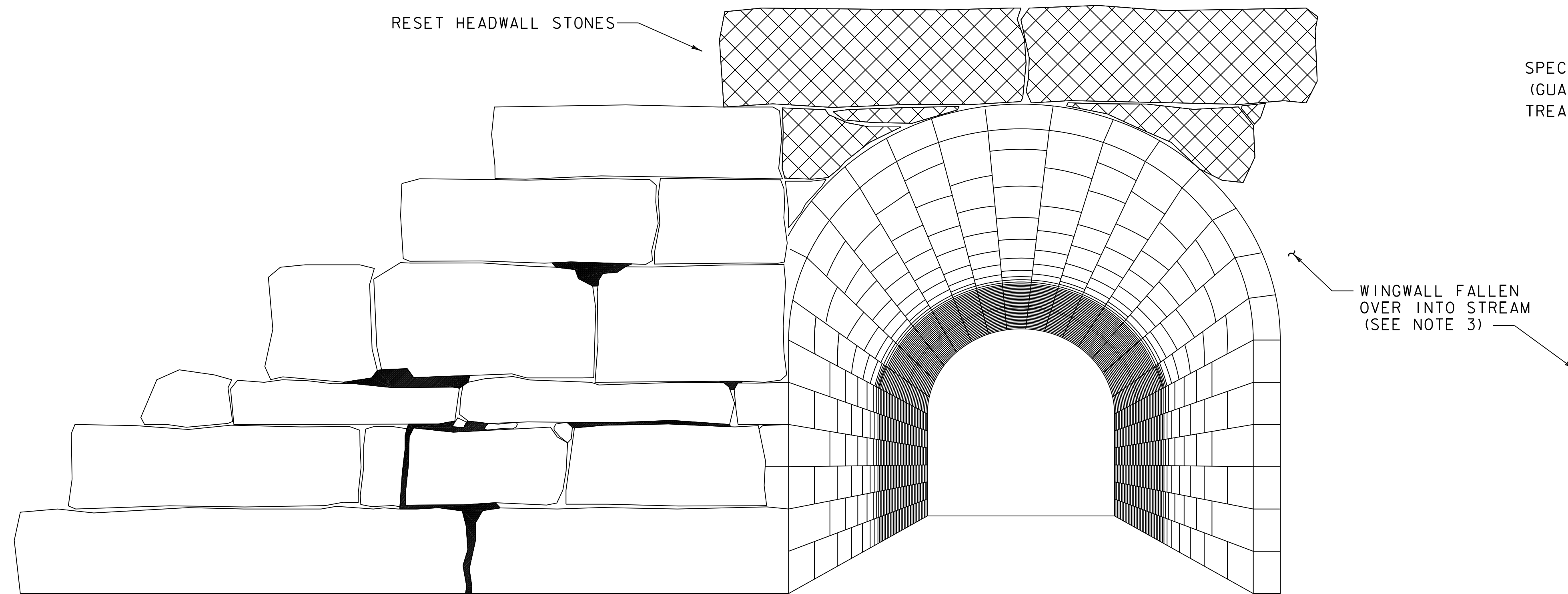


BRIDGE 88 TYPICAL SECTION  
SCALE: 1/2" = 1' - 0"

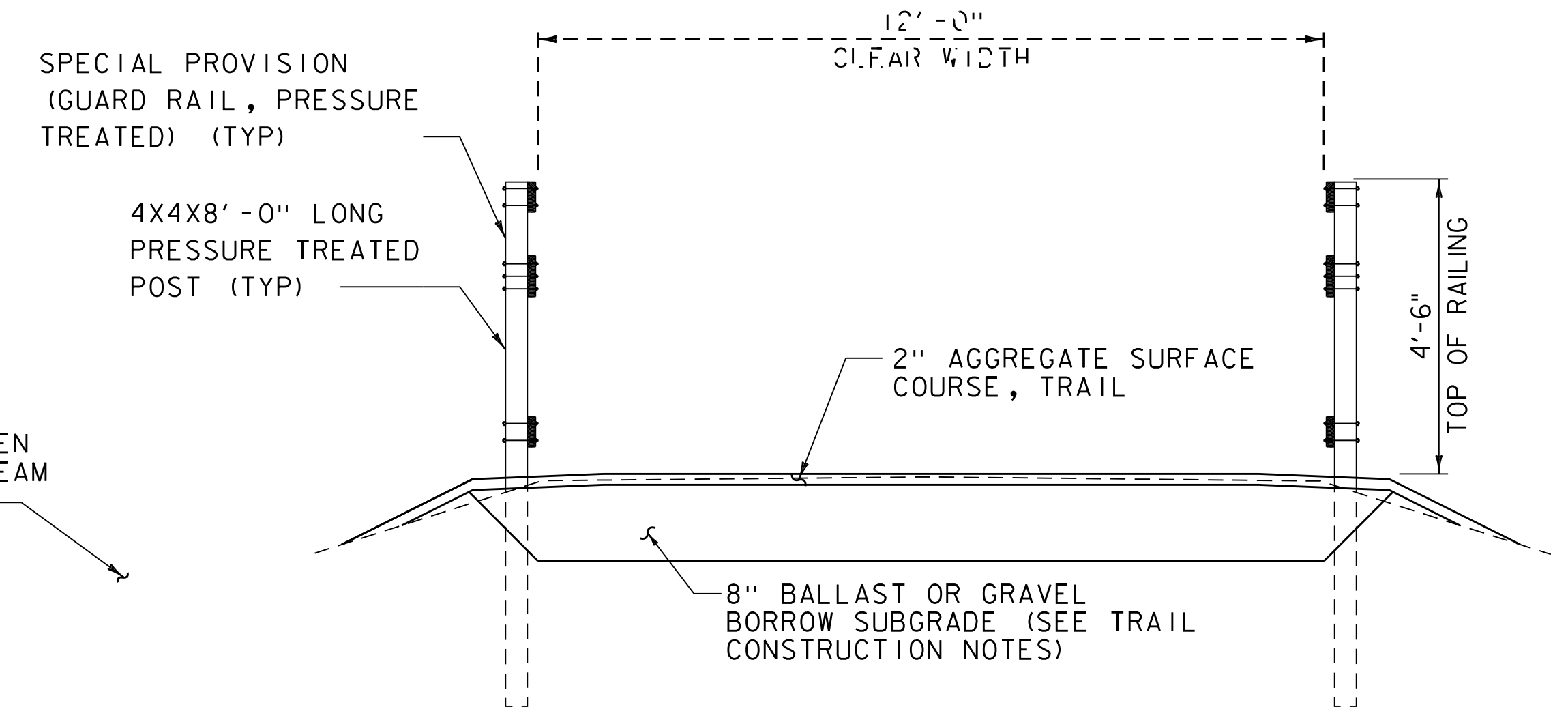


PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(II)	
FILE NAME: z20f237_structure_details.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: C.K. FORD
DESIGNED BY: J.D. KEENER	CHECKED BY: J.D. KEENER
BRIDGE 87 & BRIDGE 88 TYPICAL SECTIONS	SHEET 22 OF 84

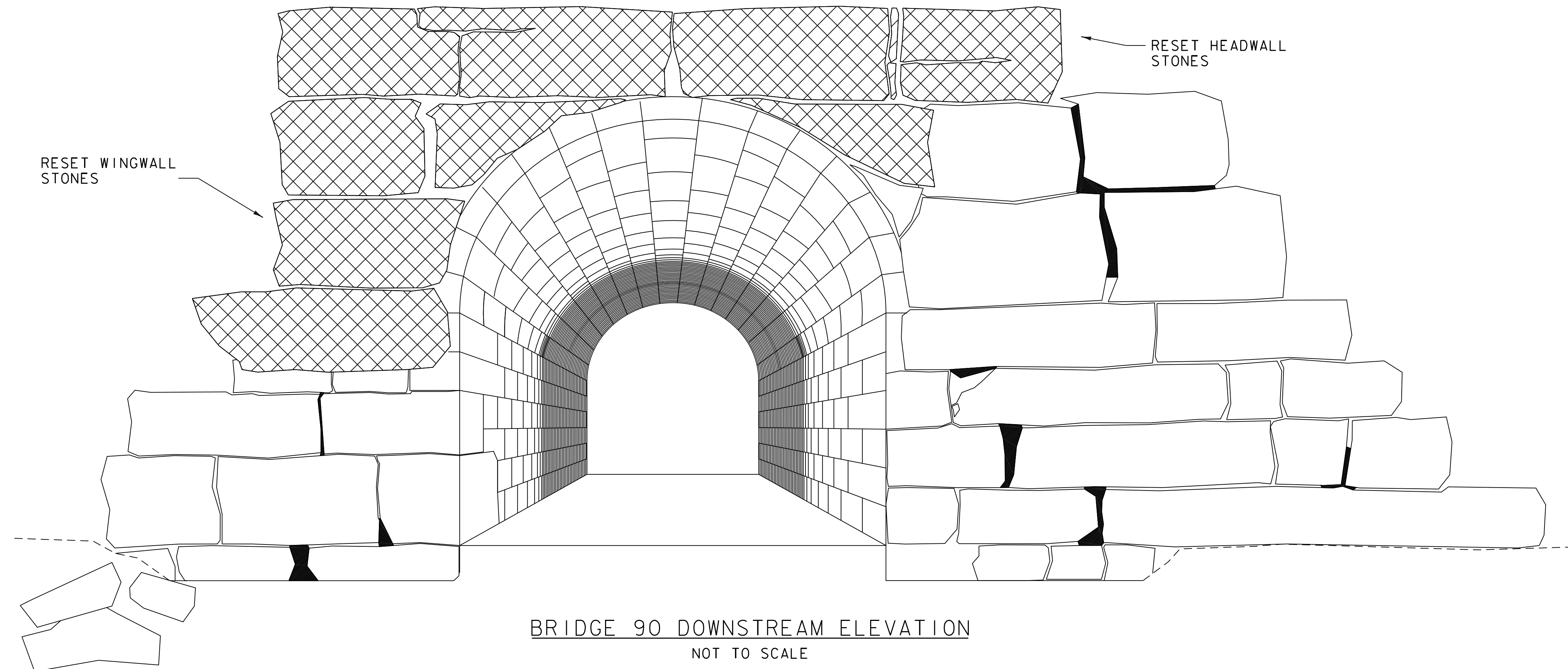




BRIDGE 90 UPSTREAM ELEVATION  
NOT TO SCALE

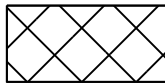
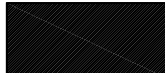


BRIDGE 90 TYPICAL SECTION  
SCALE: 1/2" = 1'-0"



BRIDGE 90 DOWNSTREAM ELEVATION  
NOT TO SCALE

LEGEND:

-  HEADWALL AND WINGWALL STONES TO BE RESET
-  APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

NOTES:

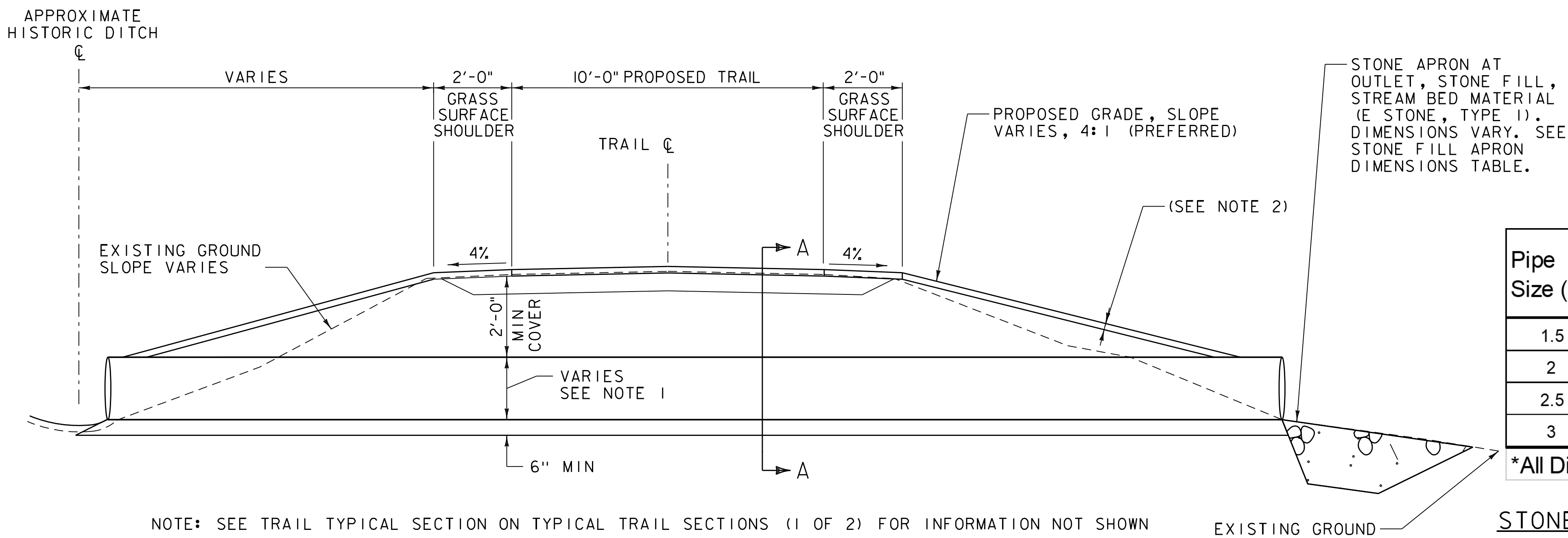
1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF THE BRIDGE ABUTMENTS AND WINGWALLS SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".
3. THE UPSTREAM WINGWALL THAT HAS FALLEN OVER INTO THE STREAM SHALL BE REBUILT WITH THE EXISTING STONES. PAYMENT SHALL BE MADE UNDER ITEM 602.35 "REBUILT STONE MASONRY".

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_structure.details.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: C.K. FORD  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
BRIDGE 90 TYPICAL SECTIONS SHEET 23 OF 84

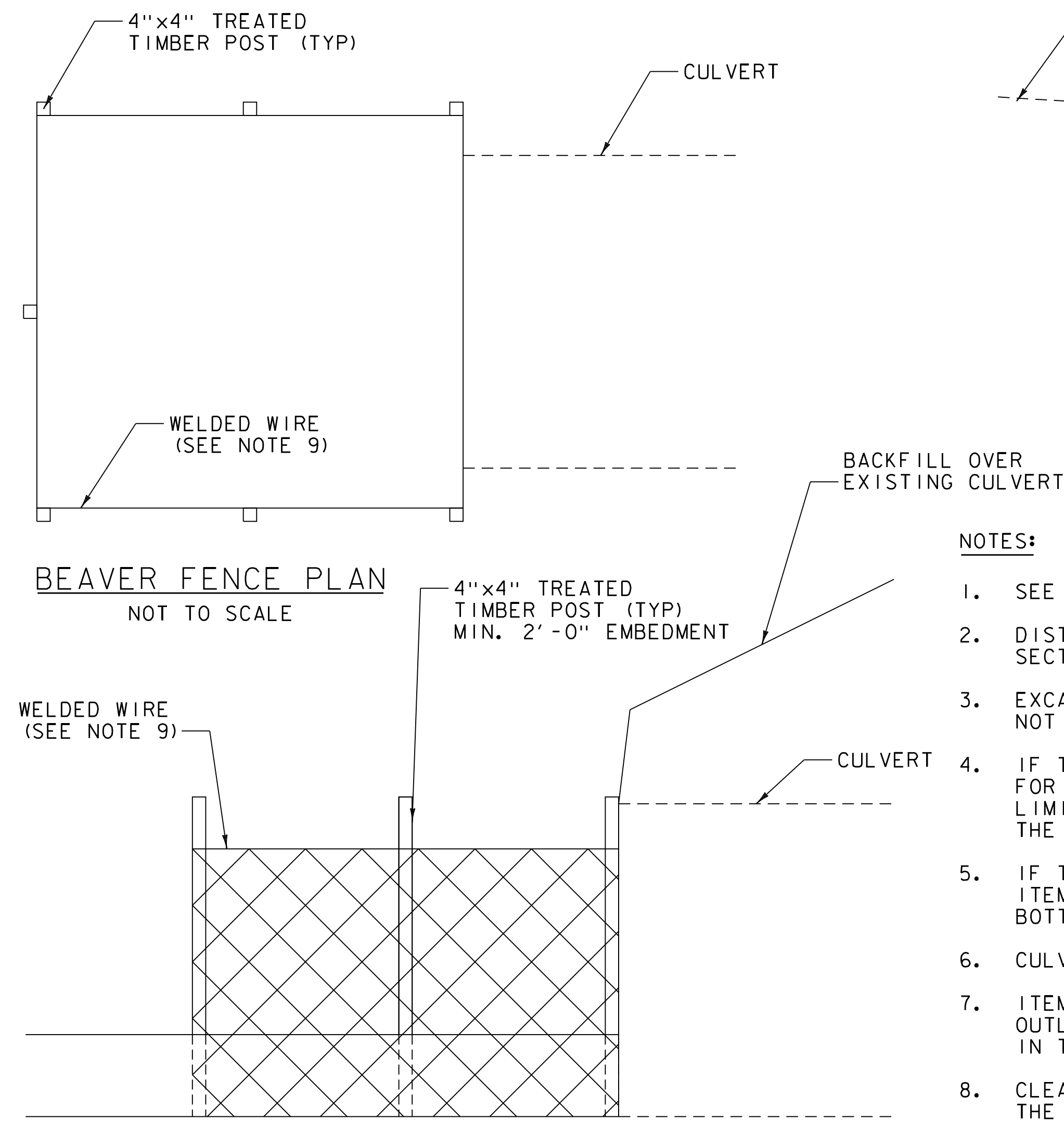






NOTE: SEE TRAIL TYPICAL SECTION ON TYPICAL TRAIL SECTIONS (1 OF 2) FOR INFORMATION NOT SHOWN

TYPICAL CULVERT REPLACEMENT/INSTALLATION DETAIL (ROUND PIPE)  
NOT TO SCALE



BEAVER FENCE SECTION  
NOT TO SCALE

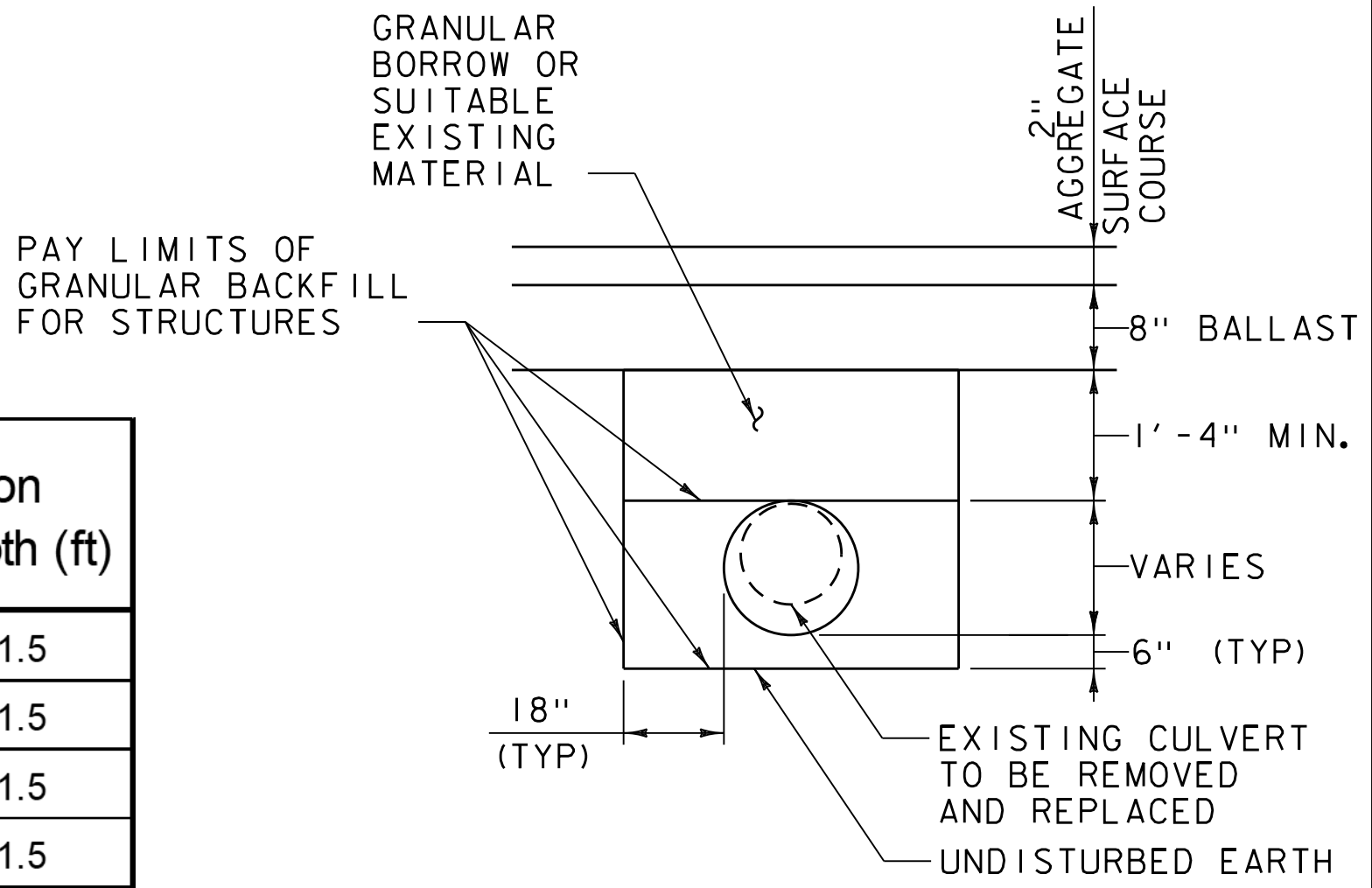
NOTES:

1. SEE TABLE AND ITEM DETAIL SHEET FOR SIZE, TYPE, AND LOCATION OF CULVERTS.
2. DISTURBED SLOPES SHALL HAVE 2" OF TOPSOIL, SEED AND MULCH. SEE NOTE 5 ON TYPICAL TRAIL SECTIONS (SHEET 1 OF 2) FOR ADDITIONAL SLOPE CONDITIONS STEEPER THAN 1V:3H.
3. EXCAVATION, REMOVAL AND DISPOSAL OF EXISTING CULVERTS AND DISPOSAL OF SURROUNDING MATERIAL NOT TO BE REUSED SHALL BE PAID UNDER ITEM 204.25, "STRUCTURE EXCAVATION".
4. IF THE EXISTING CULVERT IS A STONE BOX CULVERT THE CONTRACTOR SHALL SALVAGE STONES REMOVED FOR THE INSTALLATION OF THE NEW CULVERT AND STOCKPILE THEM IN A LOCATION WITHIN THE PROJECT LIMITS AS DESIGNATED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH SALVAGING AND STOCKPILING THE STONES SHALL BE INCIDENTAL TO STRUCTURE EXCAVATION.
5. IF THE EXISTING CULVERT TO BE REMOVED IS AT A LOWER DEPTH THAN THE NEW ONE TO BE PLACED, ITEM 203.32 GRANULAR BORROW SHALL BE USED TO FILL THE VOID UP TO THE ELEVATION 6" BELOW THE BOTTOM OF THE NEW CULVERT.
6. CULVERT SHALL BE CONSTRUCTED ON A SLOPE WHICH MATCHES UPSTREAM AND DOWNSTREAM OF CHANNEL.
7. ITEM 613.06 STONE FILL, STREAM BED MATERIAL (E-STONE TYPE 1) SHALL BE USED AT THE INLET AND OUTLET OF CULVERTS BEING REPAIRED OR REPLACED TO FILL VOIDS OR REPLACE UNSUITABLE MATERIALS IN THE STREAM CHANNEL AS NEEDED. SEE TYPICAL BOX CULVERT SECTIONS FOR MORE INFORMATION.
8. CLEANING AT THE INLET AND OUTLET OF EXISTING CULVERTS TO BE REPLACED SHALL BE INCIDENTAL TO THE REPLACEMENT OF THE CULVERT
9. THE WELDED WIRE SHALL BE 2"x4" 11 GAUGE GALVANIZED. FENCE TO EXTEND A MINIMUM OF 3' -0" ABOVE NORMAL HIGH WATER. 4"x4" TREATED TIMBER POSTS TO BE SPACED AT 3' -0".
10. THE BEAVER FENCE SHALL BE PAID FOR UNDER ITEM 900.620, "SPECIAL PROVISION (BEAVER FENCE)".

Pipe Size (ft)	Apron Length (ft)	Apron Width (ft)	Apron Depth (ft)
1.5	9	4.5	1.5
2	11	6	1.5
2.5	13	7.5	1.5
3	15	9	1.5

*All Dimensions based on E-Stone Type I

STONE FILL APRON DIMENSIONS



SECTION A-A  
NOT TO SCALE

Culvert ID	Station	Existing Size (ft)	Existing Material	Proposed CPEP (SL) Pipe Size (ft)	Est. Culvert Length (ft)
68B	3437+99	3 x 3	STONE BOX	2.0	18
68(9)C	3442+00	3 x 3	STONE BOX	1.5	54
69A	3450+21	3 x 3	STONE BOX	3.0	34
69C	3472+76	2.0	CMP	2.0	22
69E	3481+30	2 x 1	STONE CATTLEPASS	2.0	18
69F	3493+45	2 x 2	STONE BOX	2.0	34
69F(2)	3494+85	N/A	N/A	1.5	34
69L	3548+27	3 x 3	STONE BOX	3.0	18
69L-2	3588+13	1.0	CMP	2.0	22
69M	3601+99	2 x 2	STONE BOX	2.0	22
73B	3681+06	3 x 3	STONE BOX	3.0	34
73C	3689+54	2 x 2	STONE BOX	1.5	18
75A	3724+54	3 x 3	STONE BOX	2.0	26
75D	3759+69	2 x 2	STONE BOX	2.0	18
76E	3818+11	3.17	CAST IRON	3.0	34
76H	3836+31	2 x 2	STONE BOX	3.0	42
79	3890+62	2.5	CONCRETE	3.0	54
81E	3944+80	2 x 2	STONE BOX	2.0	74
82A	3957+48	2 x 2	STONE BOX	2.0	34
86C	4050+58	N/A	N/A	1.5	18
86G	4078+80	2 x 2	STONE BOX	2.0	18
86K	4112+02	1.0	CMP	1.5	34
87O	4177+60	2.0	CMP	2.0	18
87P	4186+31	N/A	N/A	2.0	18
88B	4196+31	4 x 4	STONE BOX	4.0	18
88C	4213+36	1.5	CMP	2.0	34
89E	4253+25	2.0	CMP	2.0	54
89H	4280+29	2 x 2	STONE BOX	2.0	34
90A	4298+12	3 x 3	STONE BOX	2.0	54
90D	4331+33	1.0	CAST IRON	1.5	18
91A	4334+42	2.0	CMP	2.0	18
91C	4344+09	N/A	N/A	1.5	18

CULVERT SUMMARY TABLE (ROUND PIPE)

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_typ_culvert.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: J.M. DUFFY  
TYPICAL CULVERT SECTION SHEET

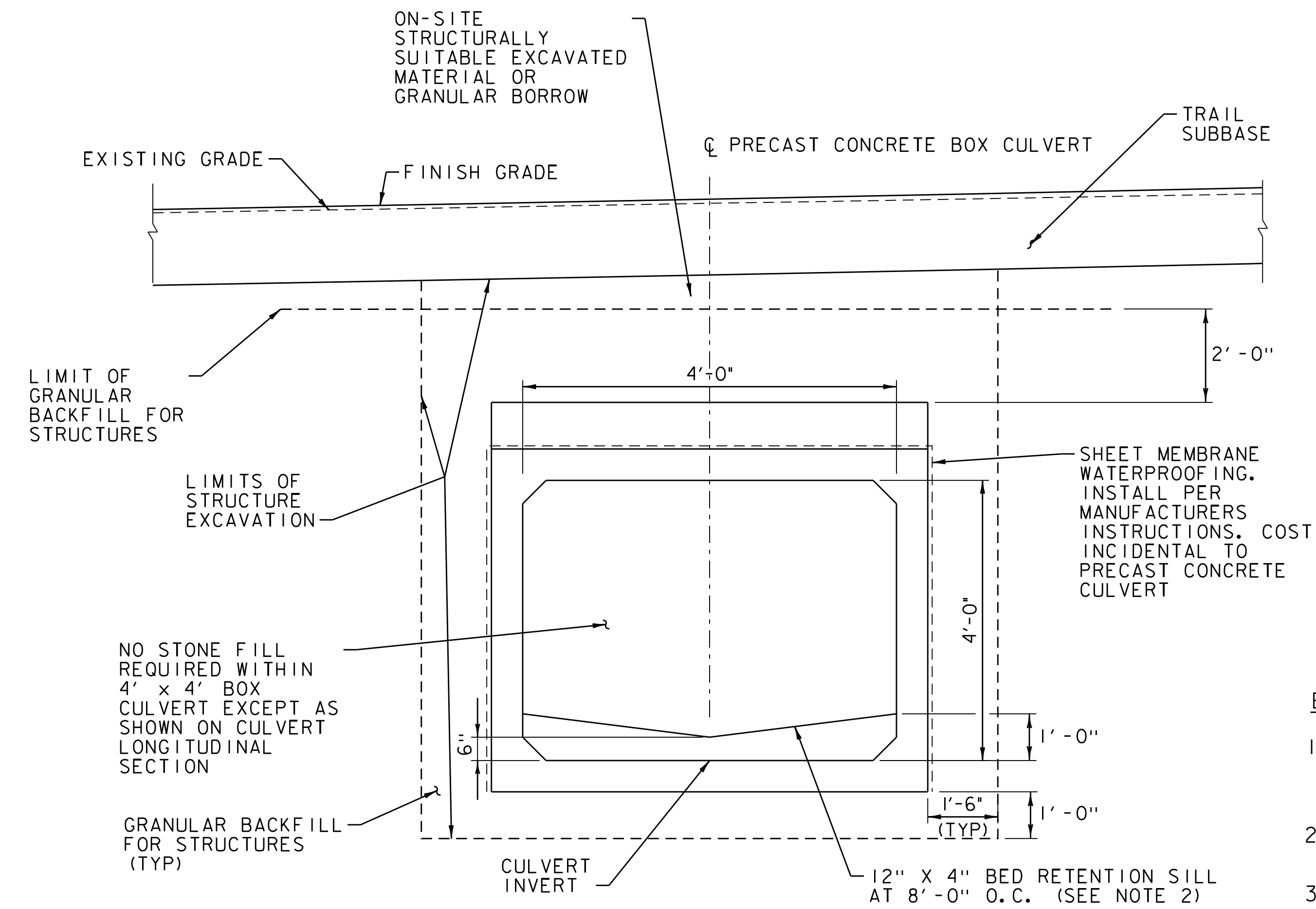
PLOT DATE: 3/23/2021  
DRAWN BY: J.M. DUFFY  
CHECKED BY: E.P. DETRICK  
SHEET 24 OF 84





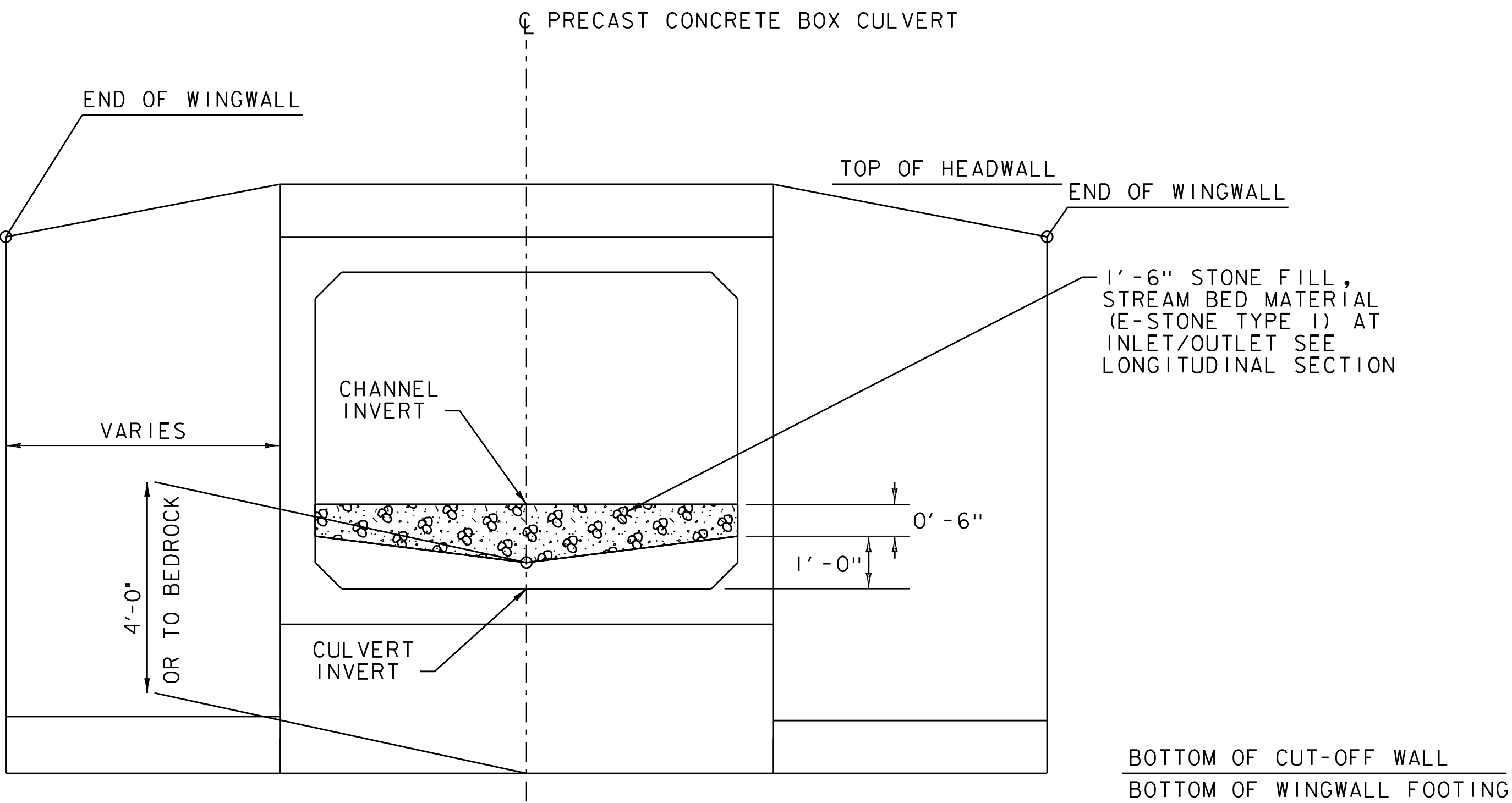
Culvert ID	Station	Existing Size (ft)	Existing Material	Proposed Concrete Box Size (ft)	Est. Culvert Length (ft)
91F	4360+57	2.0	CONCRETE	6 x 6	74

BOX CULVERT SUMMARY TABLE



TYPICAL 4 X 4 PRECAST BOX CULVERT SECTION

NOT TO SCALE



TYPICAL INLET/OUTLET ELEVATION VIEW

NOT TO SCALE

NOTES:

- BURY BOX CULVERT INVERT MINIMUM 1'-6" BELOW PROPOSED CHANNEL INVERT TO ALLOW RETENTION OF BED MATERIALS WITHIN THE STRUCTURE .
- BED RETENTION SILLS SHALL BE 12" HIGH AT THE EDGES OF THE BOX AND 6" HIGH IN THE CENTER. SILLS SHALL BE 4" THICK AND SHALL HAVE A POSITIVE CONNECTION TO PRECAST BOX.
- TYPICAL CHANNEL SECTION TO BE CONSTRUCTED TO TIE PROPOSED STRUCTURE INTO EXISTING CHANNEL (SEE TYPICAL CULVERT SECTION SHEET).
- SEE NOTES ON "TYPICAL CULVERT SECTION SHEET" FOR ADDITIONAL CULVERT REPLACEMENT / INSTALLATION NOTES.
- PROPOSED CULVERT LENGTHS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO ORDERING MATERIALS.
- BOX CULVERTS ON ANY PERENNIAL STREAM SHALL BE REVIEWED IN THE FIELD WITH PATRICK ROSS, VT DEC RIVER MANAGEMENT ENGINEER. CONSTRUCTION SURVEY WILL BE REQUIRED TO APPROPRIATELY SET THE STRUCTURE GRADIENT AND INVERT ELEVATIONS.

E-STONE NOTES:

- E-STONE TYPE II SHALL BE USED BELOW OHW AND AS AN EMBEDMENT MATERIAL IN BOX STRUCTURE WITH A VERTICAL CLEARANCE OF 6' OR GREATER.
- STONE PLACED INSIDE OF A CLOSED STRUCTURE SHALL BE PLACED SUCH THAT THE STRUCTURE IS NOT DAMAGED.
- CARE SHALL BE TAKEN TO LIMIT SEGREGATION OF THE MATERIALS
- ADD NATIVE STREAMBED MATERIAL OR SAND BORROW AS NEEDED TO SEAL THE BED AND PREVENT SUBSURFACE FLOW. COST OF NATIVE MATERIAL AND SAND BORROW IS INCIDENTAL TO STONE FILL , STREAM BED MATERIAL.
- THERE SHALL BE NO SUBSURFACE FLOW UPON FINAL INSPECTION.



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_typ_box_culvert.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

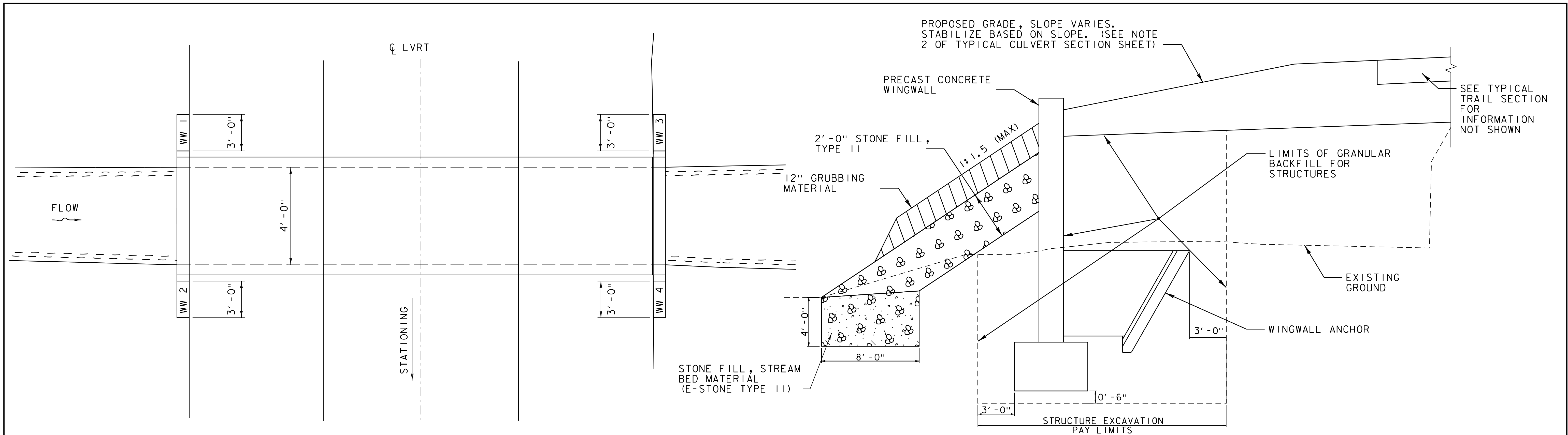
DRAWN BY: D.M. DUFFY

DESIGNED BY: J.M. DUFFY

CHECKED BY: B.M. ROBERTS

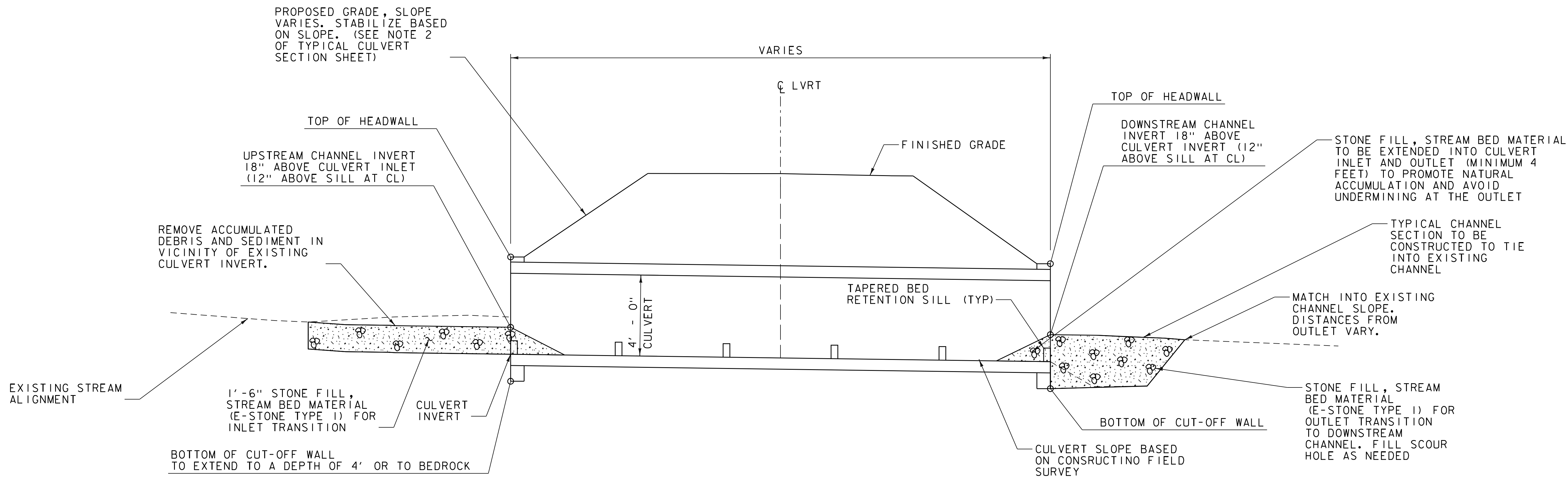
BOX CULVERT TYP. SECTIONS (SHEET 1 OF 2) SHEET 25 OF 84





PRECAST 4x4 BOX CULVERT PLAN  
NOT TO SCALE

TYPICAL PRECAST CONCRETE WINGWALL EXCAVATION SECTION  
NOT TO SCALE



PRECAST 4x4 BOX CULVERT LONGITUDINAL SECTION  
NOT TO SCALE

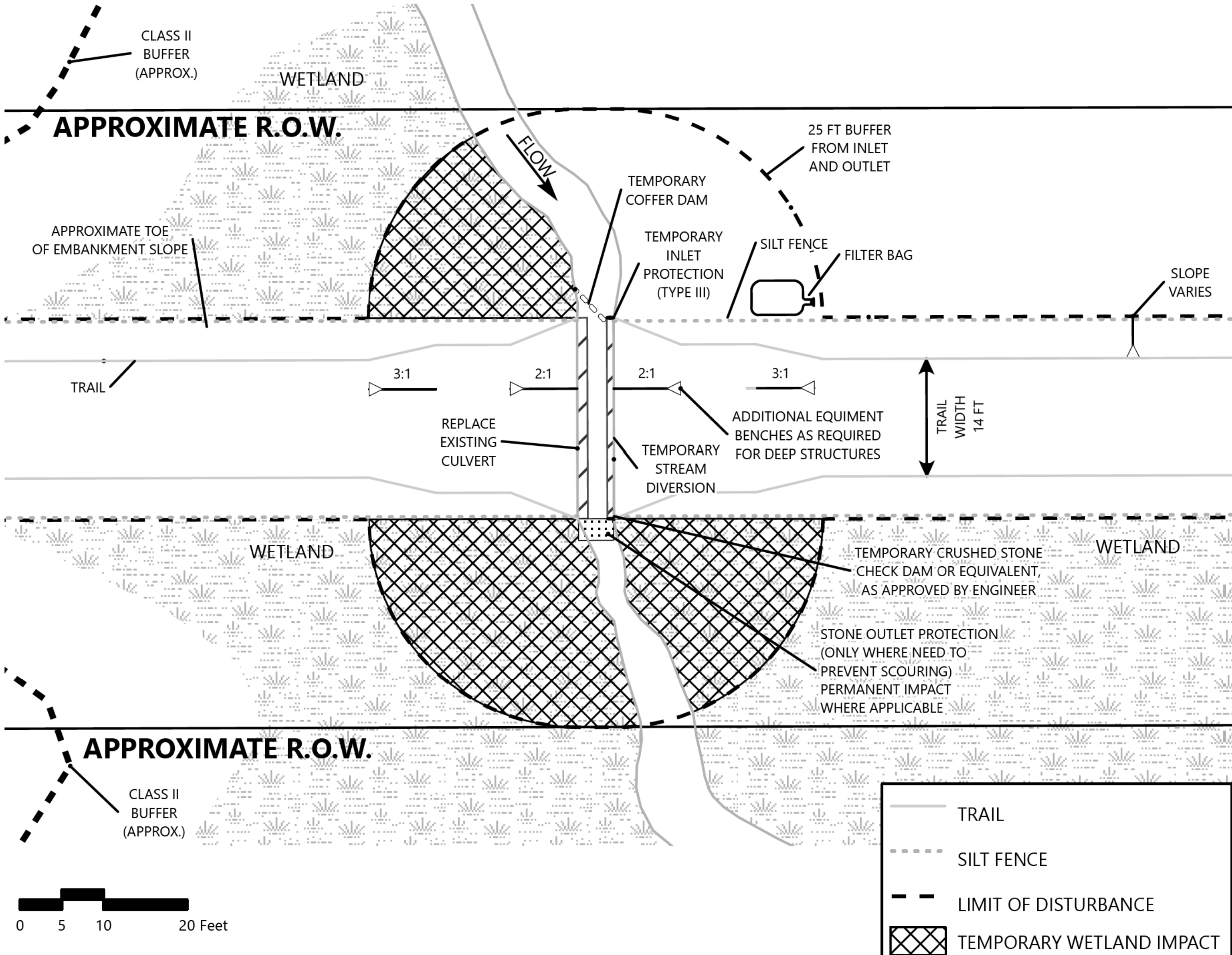
PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_pro_box_culvert.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: R.M. OBRIEN  
DESIGNED BY: B.M. ROBERTS CHECKED BY: B.M. ROBERTS  
BOX CULVERT TYP. SECTIONS (SHEET 2 OF 2) SHEET 26 OF 84

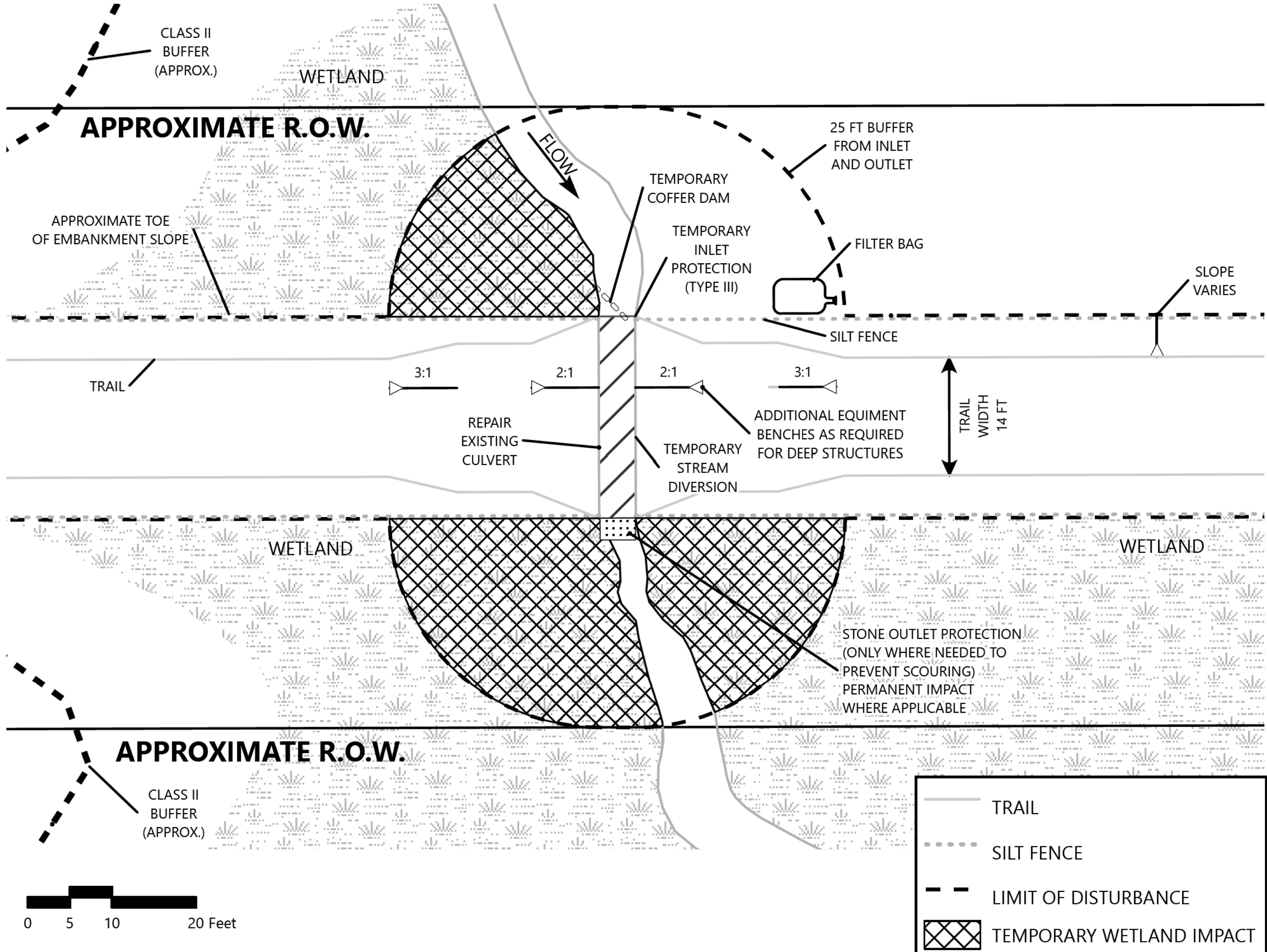




# CULVERT REPLACEMENT TYPICAL



# CULVERT REPAIR TYPICAL



## NOTES

1. ALL WORK TO BE PERFORMED FROM TRAIL EMBANKMENT WHERE FEASIBLE.
2. APPROXIMATE IMPACT AREAS AT CULVERT INLET/OUTLET HAVE BEEN ASSUMED TO ACCOUNT FOR EQUIPMENT ACCESS AND ANY WORK REQUIRED TO COMPLETE THE IMPROVEMENTS. THESE IMPACTS SHALL BE MINIMIZED TO THE EXTENT PRACTICABLE IN THE FIELD.
3. REPAIR OR REPLACEMENT OF EXISTING CULVERTS SHALL BE PERFORMED IN DRY CONDITIONS TO THE EXTENT PRACTICABLE.
4. INSTALL TEMPORARY STREAM DIVERSION AND OTHER WATER CONTROL MEASURES AS NEEDED PRIOR TO EXCAVATION OF IN-STREAM MATERIALS OR REMOVAL OF EXISTING STRUCTURES.
5. LOCATION AND TYPE OF SEDIMENT CONTROL PRACTICES SHOWN ABOVE ARE FOR REFERENCE ONLY. ADDITIONAL MEASURES MAY BE REQUIRED TO MINIMIZE POTENTIAL SEDIMENT RELEASE.
6. SEE ITEM DETAIL SHEETS AND LAYOUT PLANS FOR LOCATIONS WHERE THESE DETAILS ARE TO BE APPLIED.
7. WETLAND AREA DISTURBED DURING CONSTRUCTION SHALL BE SEEDDED WITH WET AREA SEED MIX AND MULCHED WITH WEED FREE STRAW.



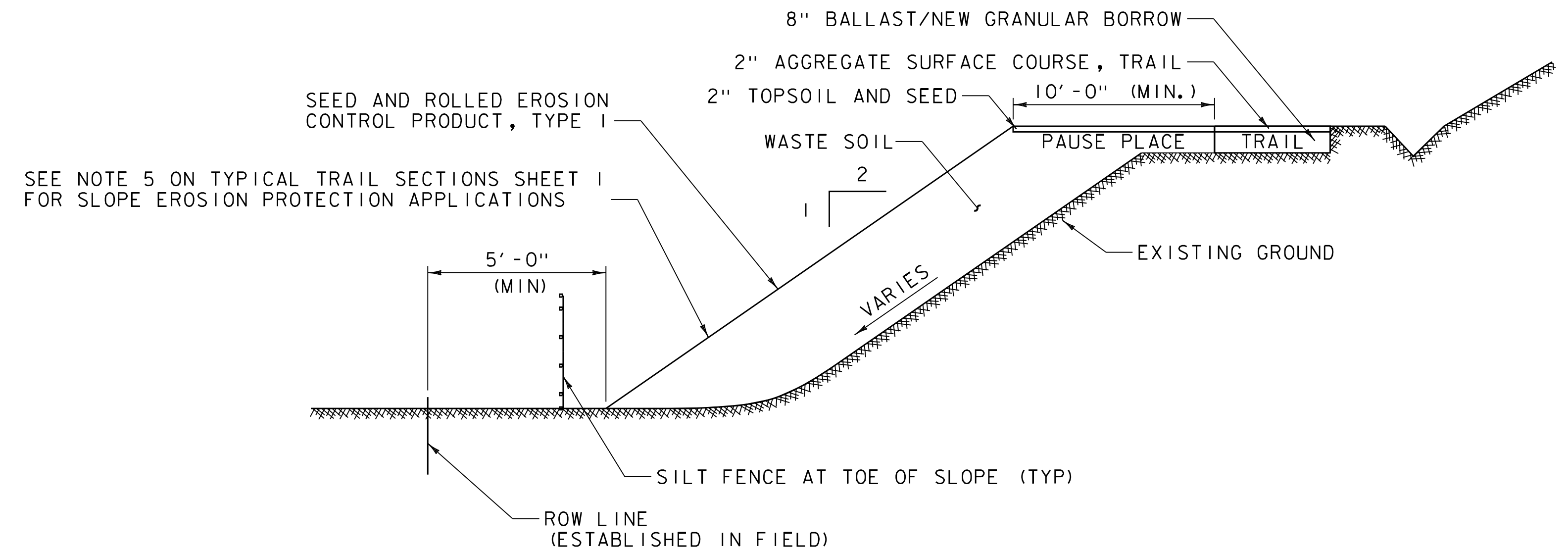
NOTES:

1. ALL EXCAVATED MATERIAL SHALL BE SPOILED ON SITE EITHER WITHIN CONSTRUCTION OF THE TRAIL, PAUSE PLACE LOCATIONS OR WASTE AREA MOUNDS.
2. STRUCTURALLY SUITABLE MATERIAL EXCAVATED DURING CONSTRUCTION SHALL BE USED IN PLACE OF GRANULAR BORROW PRIOR TO BEING SPOILED ON SITE.
3. PAUSE PLACES ARE CONSTRUCTED TRAIL PULL-OFF AREAS WHERE EXCESS MATERIAL FROM DITCHING CAN BE WASTED.
4. PAUSE PLACES SHALL NOT BLOCK DRAINAGE SWALES.
5. PAUSE PLACES SHALL NOT INTERSECT ROAD CROSSINGS AT FULL WIDTH TO AVOID PROVIDING UNWANTED PARKING AREAS FOR PATH USERS.
6. PAUSE PLACES SHALL NOT INTERSECT DELINEATED WETLANDS, WETLAND BUFFERS, STREAMS AND FEMA FLOOD HAZARD AREAS.
7. INSTALL SILT FENCE AND OTHER EPSC MEASURES DOWNGRADIENT FROM WORK AREA PRIOR TO PLACEMENT OF EXCESS MATERIAL.
8. TEMPORARILY STABILIZE WASTE SOIL WITHIN 14 DAYS OF INITIAL DISTURBANCE/PLACEMENT AND WITHIN 48 HOURS OF FINAL GRADING/SHAPING. MAINTAIN UNTIL SITE IS FULLY STABILIZED.
9. SILT FENCE TYPE II REQUIRED WITHIN 100 FEET OF A WATERBODY OR WETLAND.
10. FISH AND WILDLIFE PULL-OFFS TO BE CONSTRUCTED FOLLOWING PAUSE PLACE GUIDELINES EXCEPT FOR MINIMUM LENGTH REQUIREMENTS.
11. SLOPE SHALL BE CLEARED, NOT GRUBBED PRIOR TO PLACEMENT.
12. PLACEMENT OF WASTING MATERIAL SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.
13. WASTE AREA MOUNDS MAY BE CONSTRUCTED ATOP APPROVED PAUSE PLACE LOCATIONS INDICATED BY AN ASTERISK (*). THIS METHOD TO SPOIL ADDITIONAL MATERIAL SHALL NOT BE UTILIZED UNTIL ALL OTHER SOIL WASTING METHODS HAVE BEEN EXHAUSTED WITHIN THE PROJECT.

PAUSE PLACE LOCATIONS

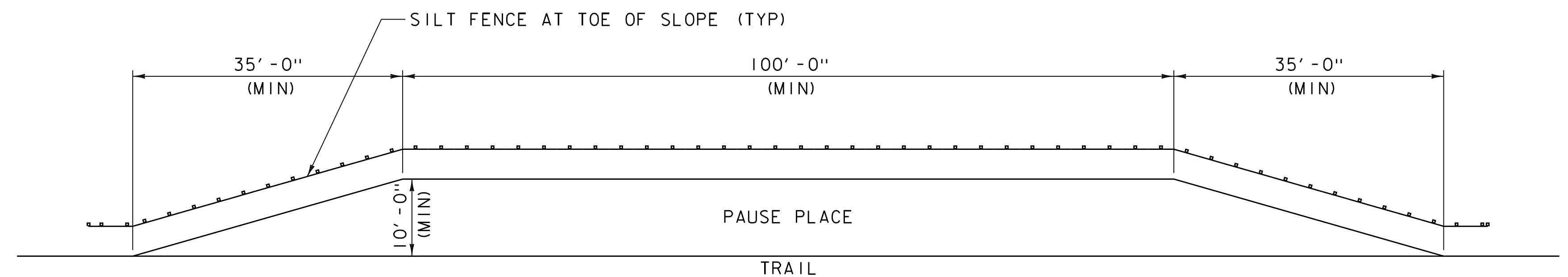
(STATIONING DOES NOT INCLUDE TAPERS)

3443+67 - 3444+67, LT  
3483+77 - 3485+77, LT  
3517+57 - 3518+57, LT  
3756+85 - 3757+85, RT  
3845+52 - 3846+52, LT  
3970+97 - 3971+97, LT  
3996+00 - 4000+50, RT  
4004+75 - 4011+75, RT  
4053+37 - 4054+87, RT  
4164+02 - 4167+52, RT  
4361+77 - 4363+77, LT  
4362+00 - 4363+50, LT/RT



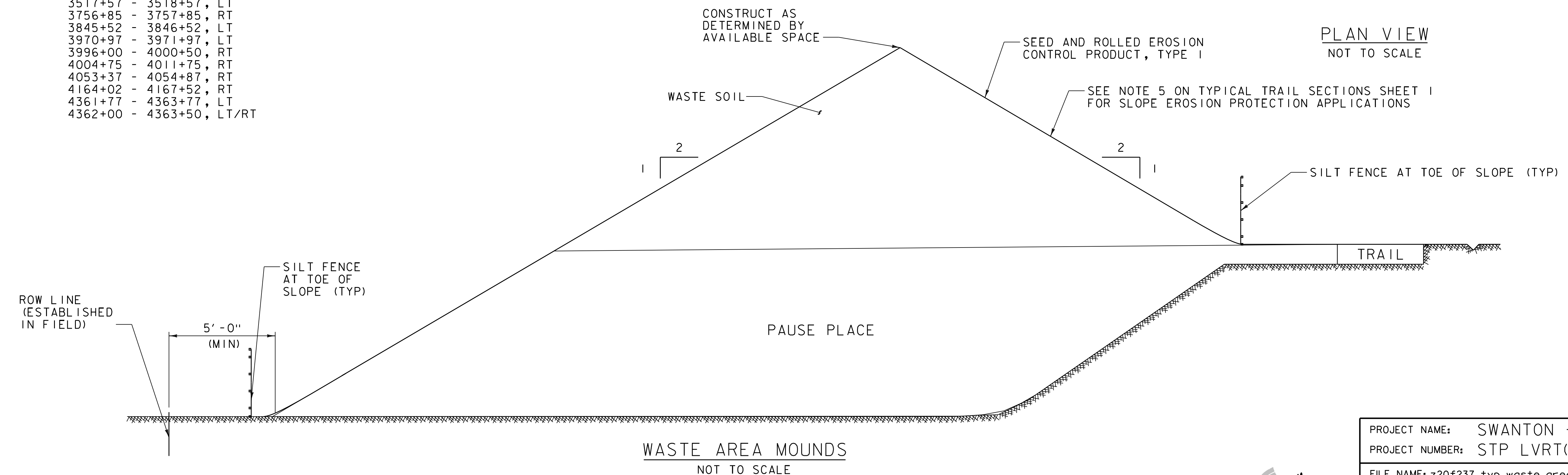
WASTE AREA ON  
EMBANKMENT SHOULDERS

NOT TO SCALE



PLAN VIEW

NOT TO SCALE



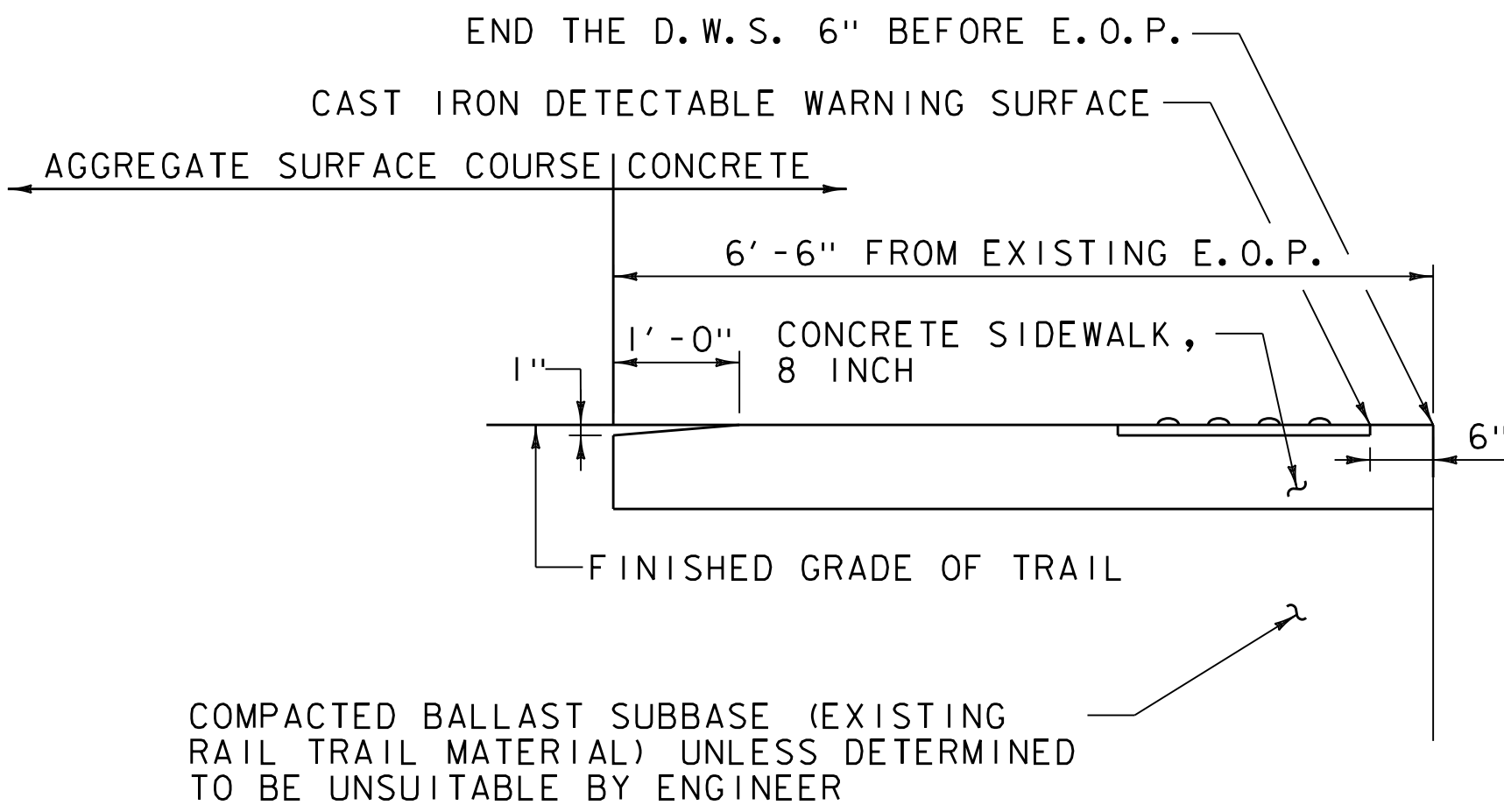
## WASTE AREA MOUNDS

NOT TO SCALE



NOTES:

- Ø SHALL BE 75° TO 90°, CROSSINGS WHICH CANNOT MEET THE MINIMUM 75° ANGLE SHALL BE RECONFIGURED TO IMPROVE THE CROSSING ANGLE TO THE EXTENT SITE CONDITIONS AND ROW ALLOW.
- CONCRETE RAMP WIDTH TO MATCH APPROACHING TRAIL WIDTH AT INTERSECTION WITH ROADWAY.
- SEE TRAFFIC SIGN SUMMARY SHEETS AND ETIQUETTE SIGN SHEET FOR ADDITIONAL INFORMATION.
- SIGNS SHALL BE PLACED SUCH THAT THE EDGE OF THE SIGN IS NO CLOSER THAN 3' AND NO FURTHER THAN 5' FROM THE EDGE OF TRAIL AND 5' FROM THE TRAIL SURFACE TO THE BOTTOM OF THE SIGN.
- ALL COSTS ASSOCIATED WITH THE INSTALLATION OF THE ACCESSIBLE ROAD CROSSINGS INCLUDING EXCAVATION, CONCRETE, DETECTABLE WARNING SURFACE AND REFLECTIVE PAINT STOP BAR SHALL BE PAID UNDER THEIR APPROPRIATE PAY ITEMS.
- SIGNS SHALL BE MOUNTED ON 2" SQUARE STEEL POSTS. THE POSTS WILL BE PAID UNDER ITEM 675.341 "SQUARE TUBE SIGN POST AND ANCHOR".
- W11-5 SIGN TO BE LOCATED AT ALL FARM AND FARM ROAD CROSSINGS.
- THE W11-15a AND W16-2p SIGN ASSEMBLIES ARE NOT REQUIRED ON ROADWAYS WITH SPEEDS OF 35 MPH OR LOWER.
- SEE VTRANS TE1 18-200 AND STANDARD DRAWING E-121 FOR SIGN LOCATIONS AND SPACING REQUIREMENTS.

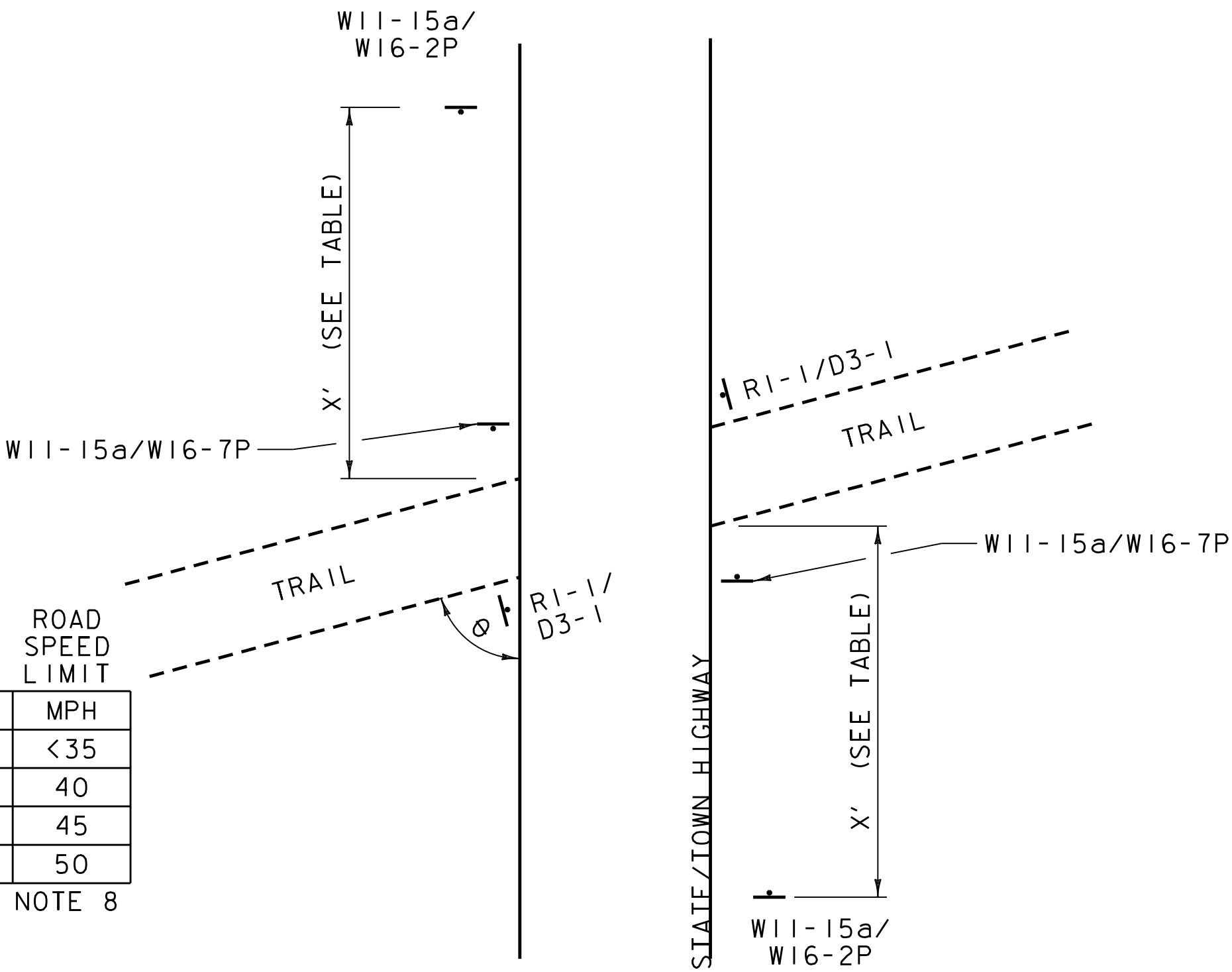


SECTION A-A  
NOT TO SCALE

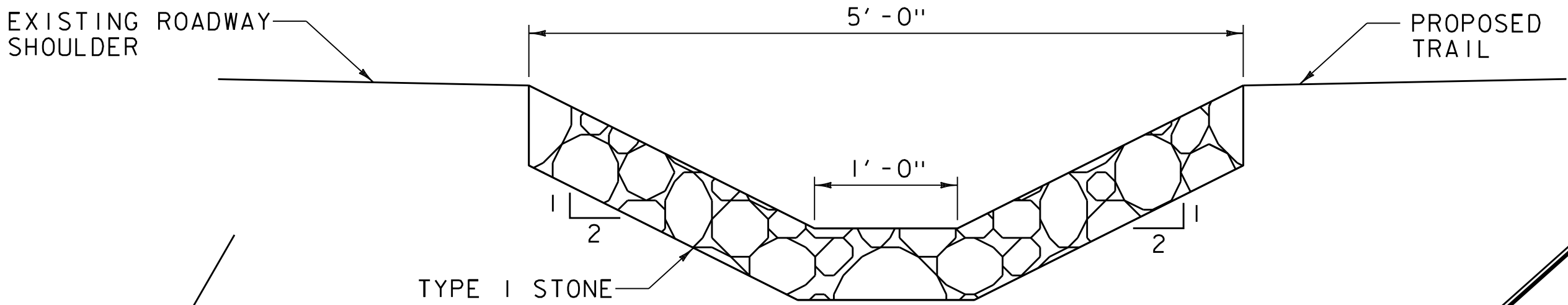
ACCESSIBLE ROAD CROSSING APPROACH

DIST. (FT)	ROAD SPEED LIMIT MPH
X'	MPH
*	<35
125'	40
175'	45
250'	50

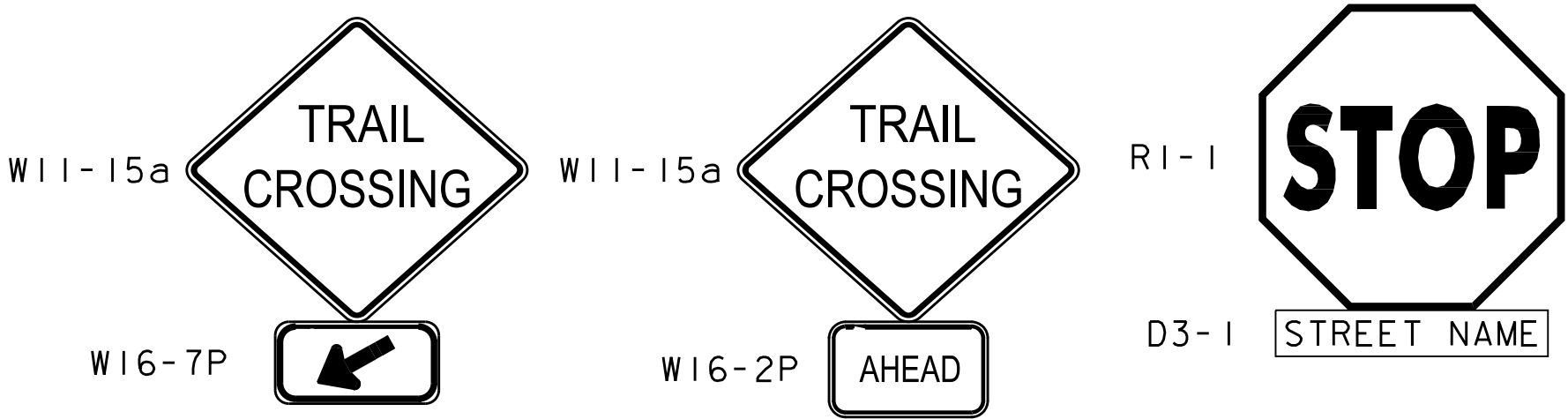
* SEE NOTE 8



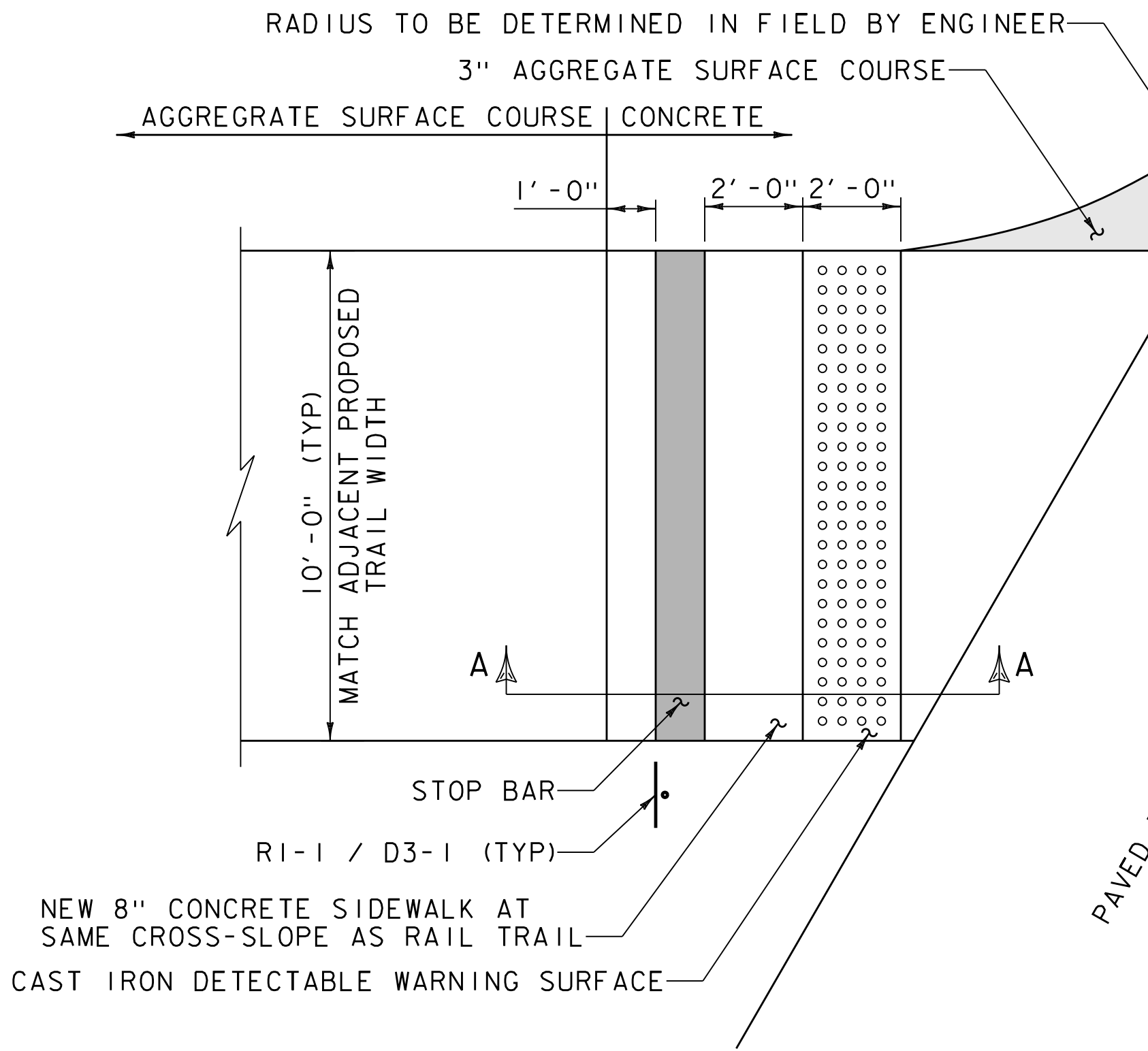
TYPICAL STATE AND TOWN  
HIGHWAY CROSSING SIGN  
LAYOUT



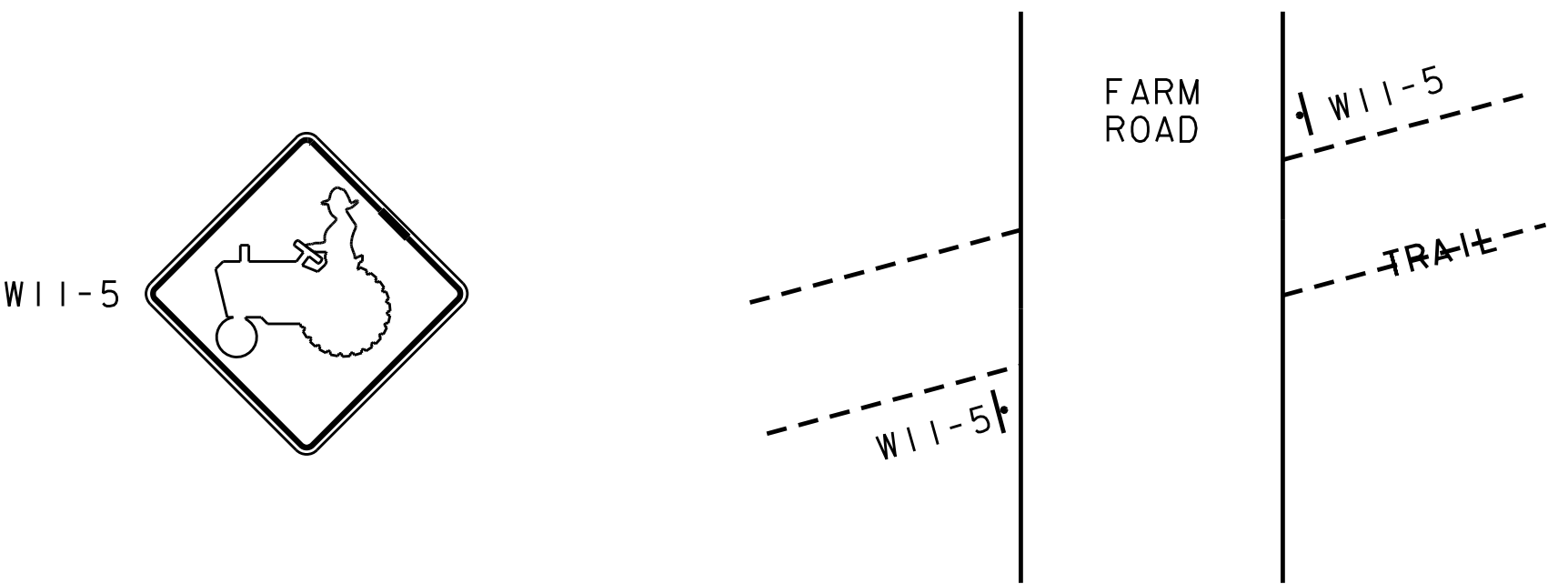
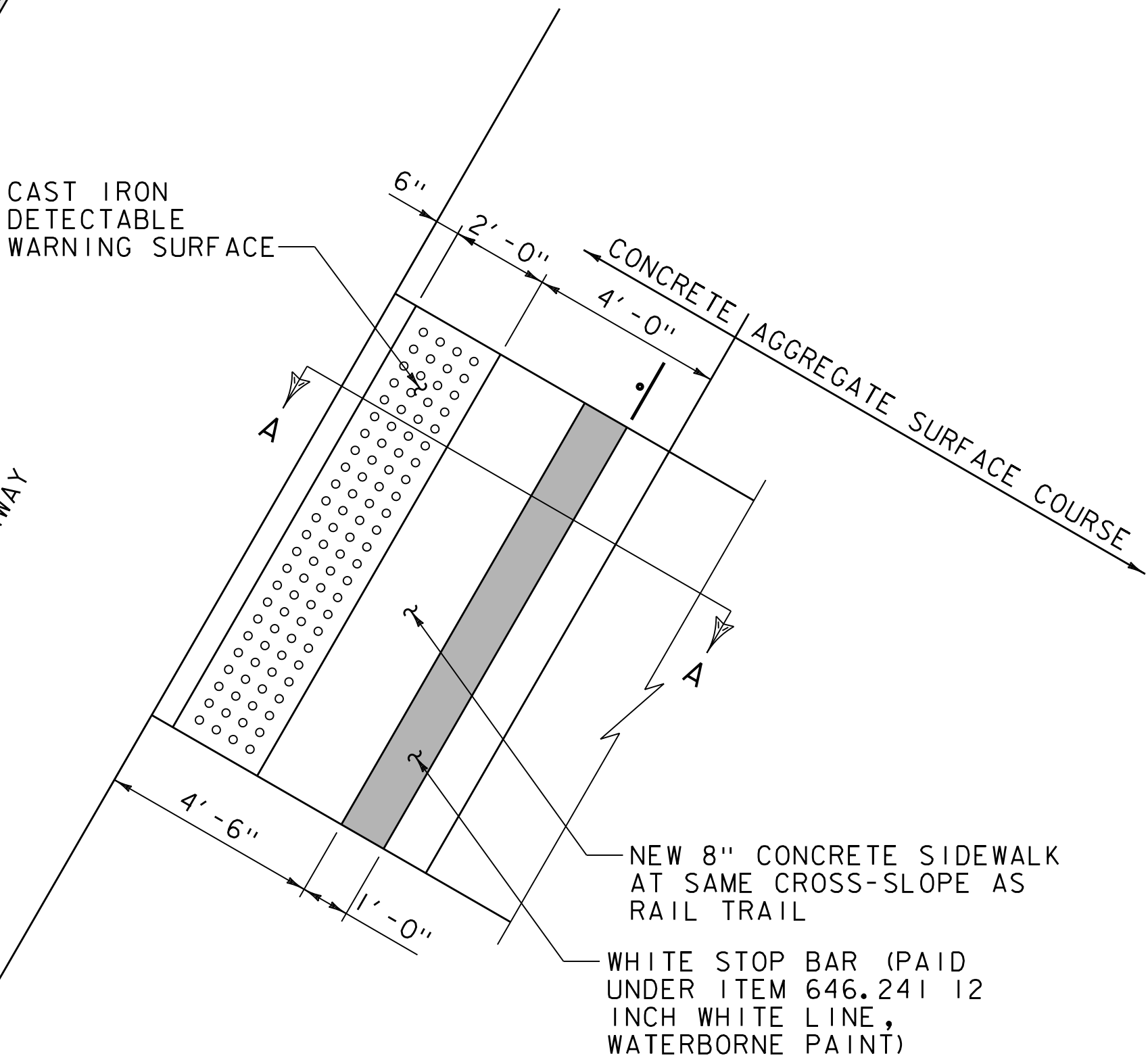
STONE SWALE  
NOT TO SCALE



STANDARD ROAD CROSSING SIGNS



ACCESSIBLE ROAD CROSSING APPROACH  
NOT TO SCALE



STANDARD FARM CROSSING SIGNS

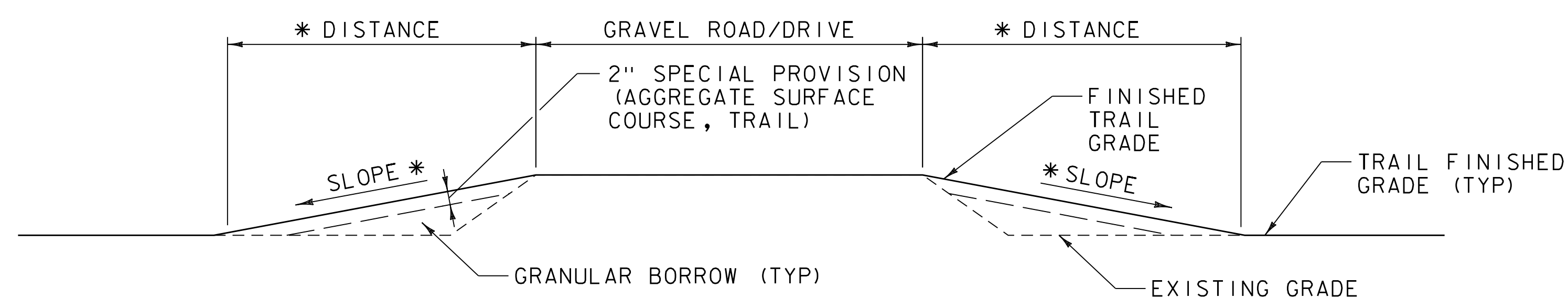
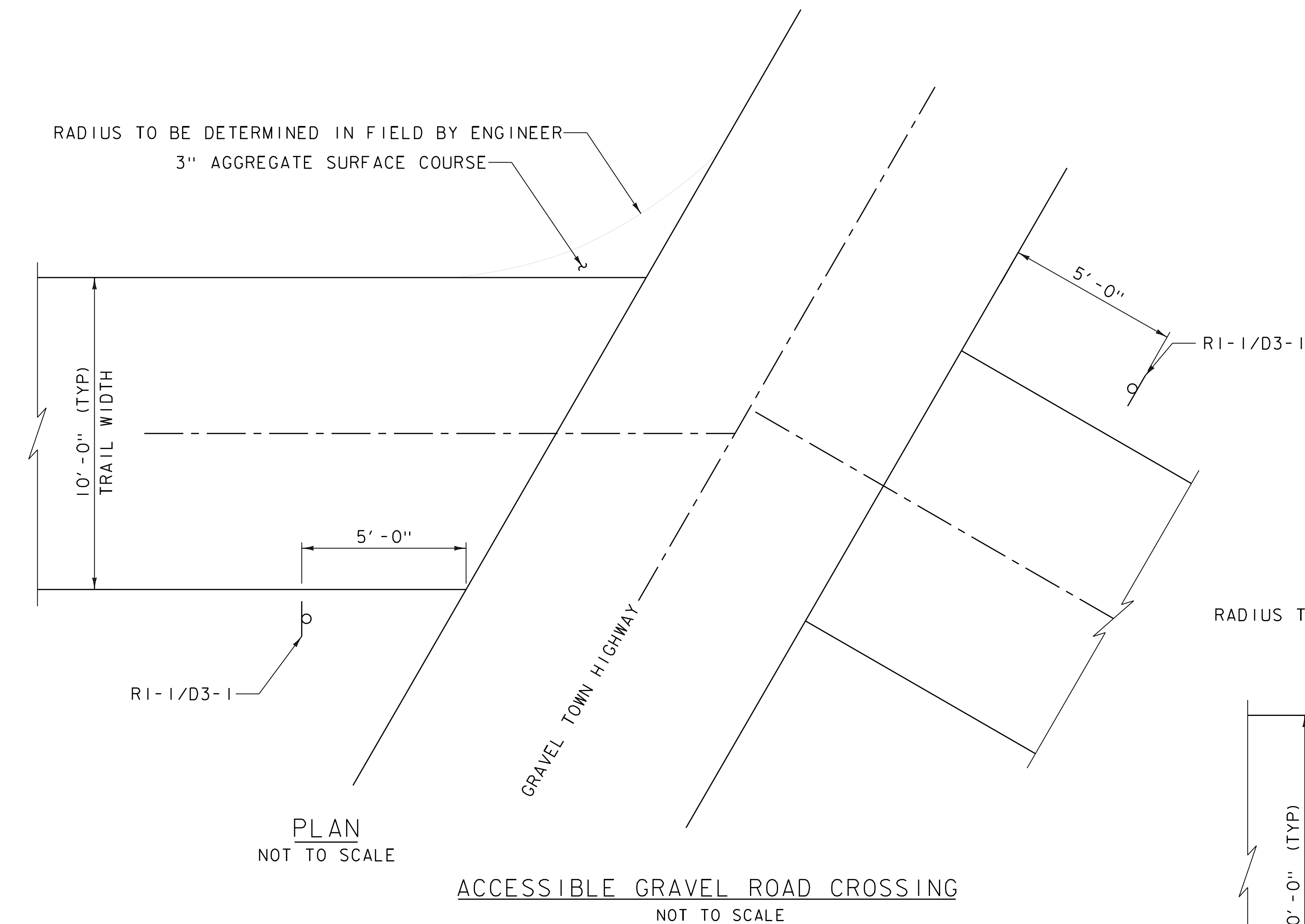
PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_crossings.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: D.A. GINGRAS  
CROSSING DETAILS SHEET (10F 6)

PLOT DATE: 3/23/2021  
DRAWN BY: D.A. GINGRAS  
CHECKED BY: B.M. ROBERTS  
SHEET 29 OF 84







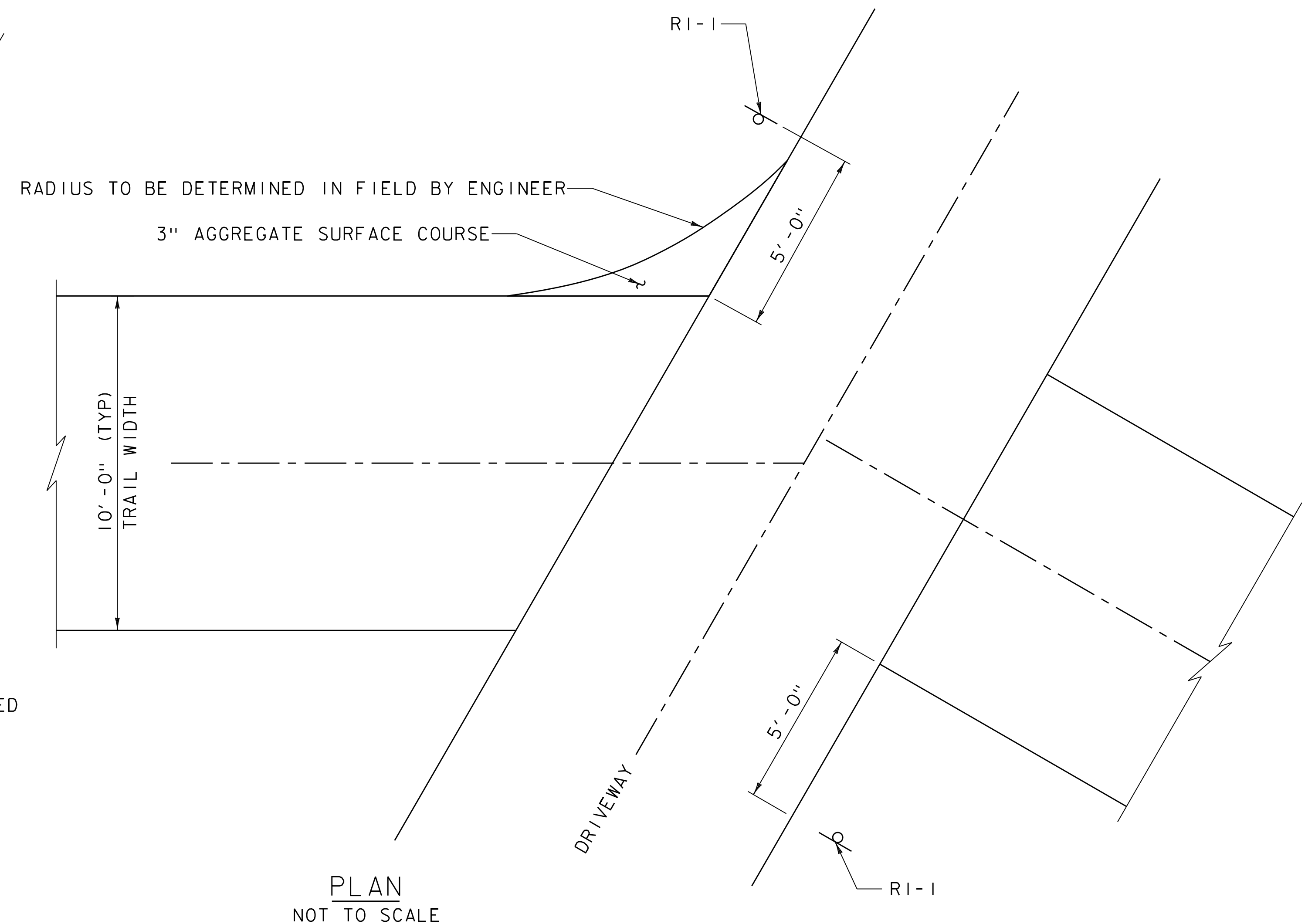
* - SEE NOTE 1 BELOW

TYPICAL GRAVEL ROAD/DRIVE CROSSING SECTION

NOT TO SCALE

NOTES:

1. GRANULAR BORROW SHALL BE ADDED TO FEATHER TRAIL GRADE SUCH THAT FINAL GRADE ALONG TRAIL IS 5% OR LESS.
2. GRANULAR BORROW SHALL BE TOPPED WITH 2" ITEM 900.608 "SPECIAL PROVISION (AGGREGATE SURFACE COURSE, TRAIL)" TO ACHIEVE FINAL GRADE ELEVATIONS AS SHOWN IN TYPICAL TRAIL CROSS SECTIONS .



PRIVATE DRIVE CROSSING

NOT TO SCALE



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(II)	
FILE NAME: z20f237_crossings.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: R.M. OBRIEN
DESIGNED BY: R.M. OBRIEN	CHECKED BY: E.P. DETRICK
CROSSING DETAILS SHEET (2 OF 6)	SHEET 30 OF 84



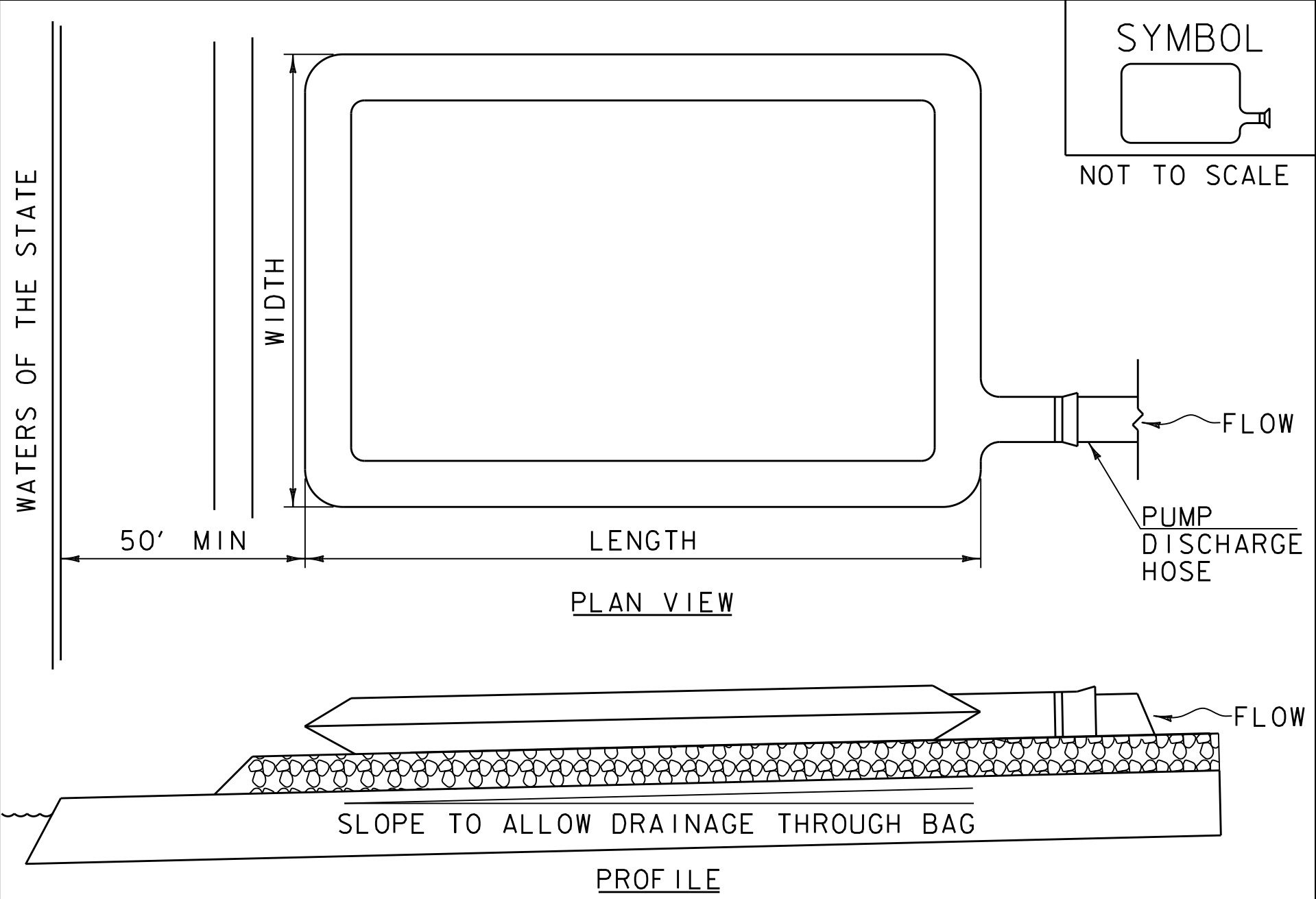
VAOT RURAL AREA MIX						
LBS/AC			NAME	LATIN NAME	GERM	PURITY
WEIGHT	BROADCAST	HYDROSEED				
37.5%	22.5	45	CREeping RED FESCUE	FESTUCA RUBRA VAR. RUBRA	85%	98%
37.5%	22.5	45	TALL FESCUE	FESTUCA ARUNDINACEA	90%	95%
5.0%	3	6	RED TOP	AGROSTIS GIGANTEA	90%	95%
15.0%	9	18	WHITE FIELD CLOVER	TRIFOLIUM REPENS	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	LOLIUM MULTIFLORUM	85%	95%
100%	60	120				

WET AREA SEED MIX	
SEED	% WEIGHT
VIRGINIA WILD RYE GRASS	20
FOX SEDGE	10
AMERICAN MANNAGRASS	20
GIANT BUR-REED	10
COMMON THREE-SQUARE	20
SOFT-STEM BULRUSH	10
CANADA RUSH	10
RATE OF APPLICATION: 10# PER ACRE (UP TO 15# PER ACRE IF HYDROSEEDDED)	

CONSTRUCTION GUIDANCE

1. SEED MIX: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER ON WHICH SEED MIX TO USE.
2. SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
4. FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER.
5. HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
6. STRAW MULCH: TO BE PLACED ON EARTH SLOPES IN WETLANDS AND WETLAND BUFFERS AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
7. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED PROPOSED FOR USE WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED.
8. TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

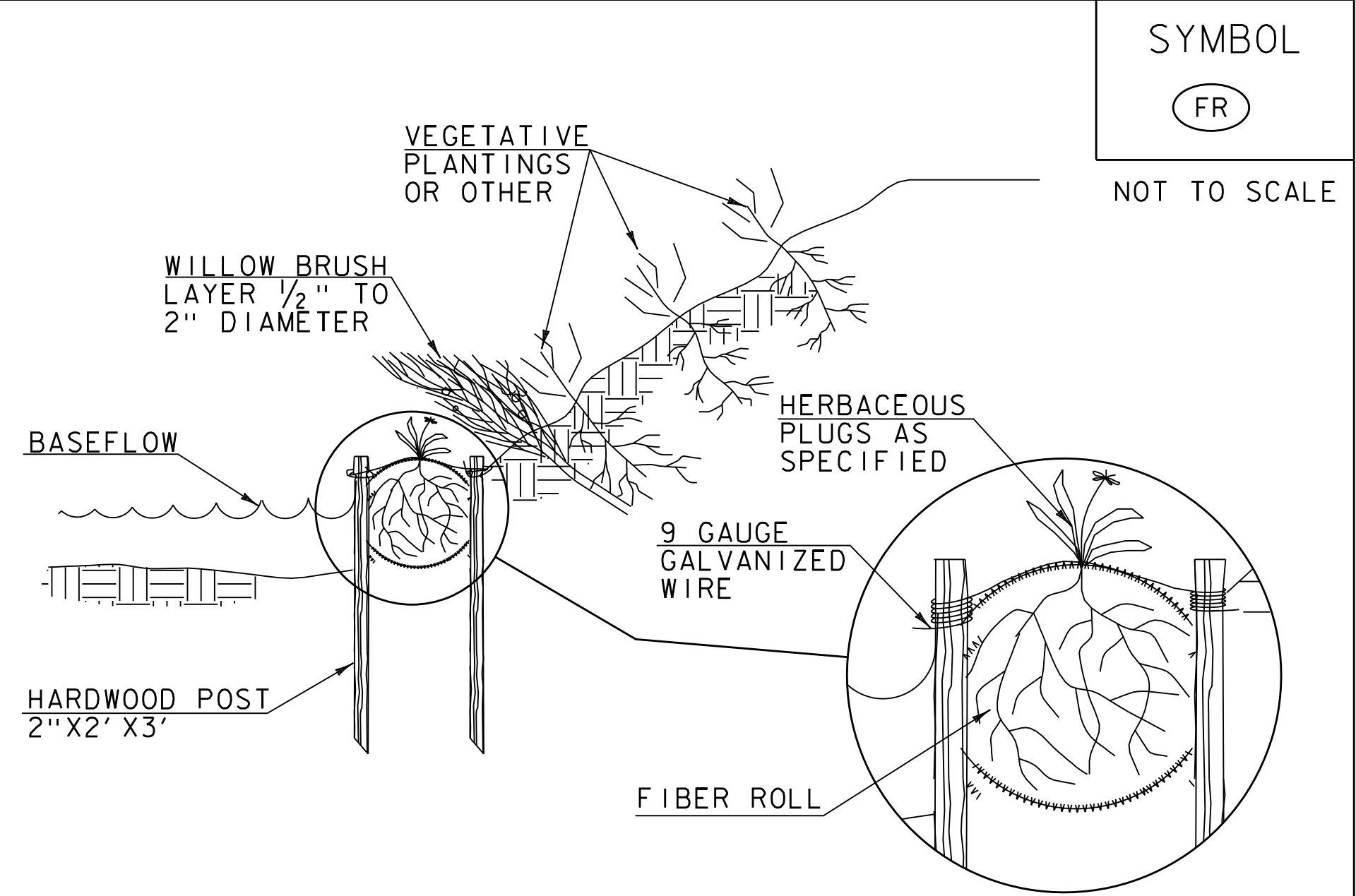
ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES	TURF ESTABLISHMENT
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 FOR SEED (PAY ITEM 651.15)	REVISIONS JANUARY 12, 2015    WHF



CONSTRUCTION SPECIFICATIONS

1. THE PRIMARY PURPOSE OF FILTER BAG IS TO RETAIN SILT, SAND, AND FINES DURING DEWATERING OPERATIONS.
2. FILTER BAGS SHALL BE INSTALLED ON A VEGETATED SLOPE GRADED TO ALLOW INCOMING WATER TO FLOW THROUGH THE BAG.
3. FILTER BAGS MAY ALSO BE PLACED ON COARSE AGGREGATE, STONE, OR HAYBALES TO INCREASE FILTRATION EFFICIENCY.
4. FILTER BAGS SHALL BE LOCATED A MINIMUM OF 50' FROM WATERS OF THE STATE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. THE NECK OF THE FILTER BAG SHALL BE STRAPPED TIGHTLY TO THE DISCHARGE HOSE.
6. A FILTER BAG IS FULL WHEN IT NO LONGER CAN EFFICIENTLY FILTER SEDIMENT OR ALLOW WATER TO PASS AT A REASONABLE RATE.
7. FILTER BAG SHALL BE DISPOSED OF AS APPROVED IN THE EPSC PLAN OR AS DIRECTED BY THE ENGINEER.

NOTES: REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.	
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR FILTER BAG (PAY ITEM 653.45) AND AS SPECIFIED IN THE CONTRACT.	REVISIONS MARCH 24, 2008    WHF JANUARY 13, 2009    WHF



CONSTRUCTION SPECIFICATIONS

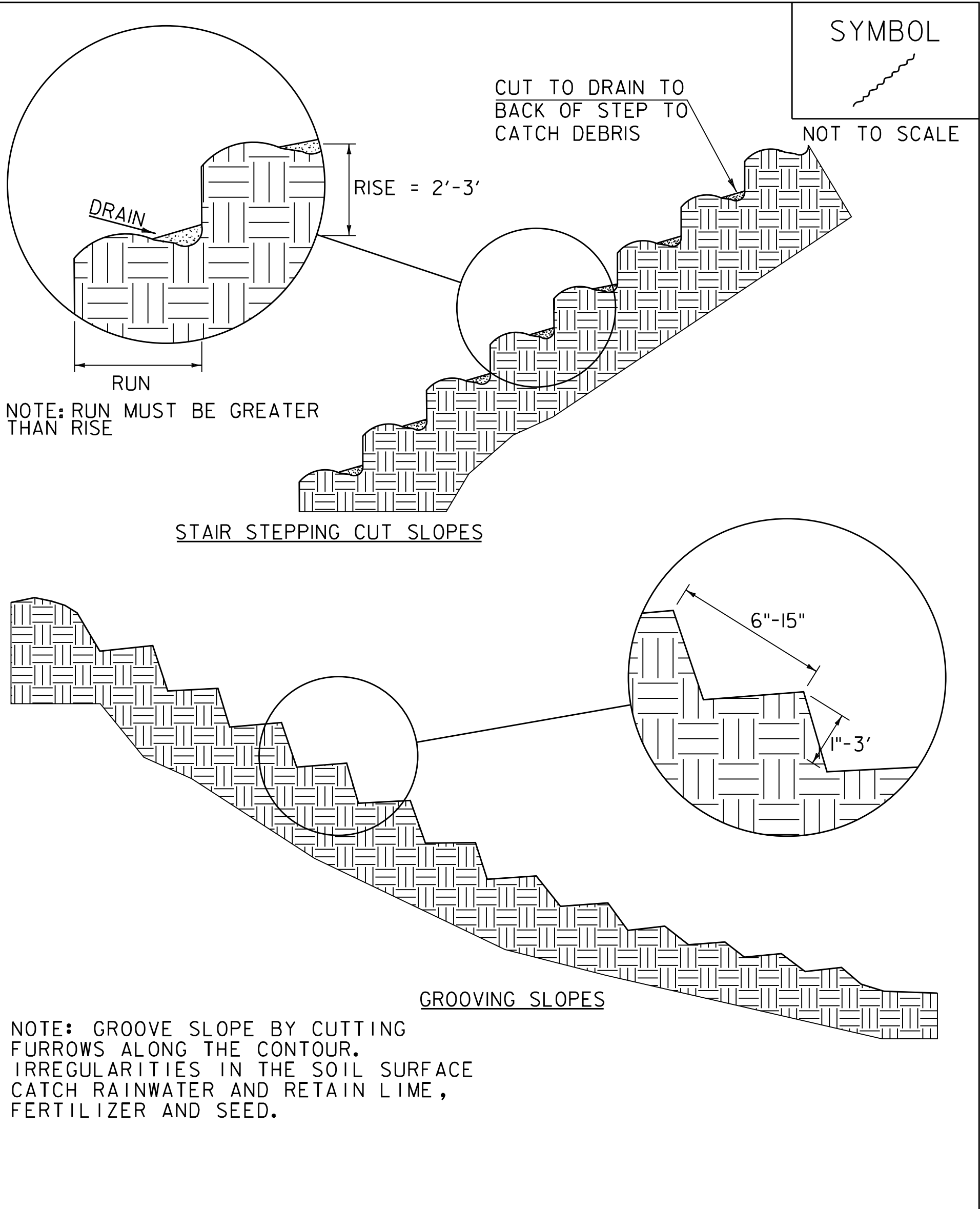
1. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW BASEFLOW OR A 4" TRENCH ON SLOPE CONTOURS
2. PLACE THE ROLL IN THE TRENCH AND ANCHOR WITH 2"X2" POSTS PLACED ON BOTH SIDES FO THE ROLL AND SPACED LATERALLY ON 2' TO 4' CENTERS. TRIM THE TOP OF THE POSTS EVEN WITH THE EDGE OF THE ROLL , IF NECESSARY.
3. NOTCH THE POSTS AND TIE TOGETHER, ACROSS THE ROLL , WITH 9 GAUGE GALVANIZED WIRE OR 1/8" DIAMETER BRAIDED NYLON ROPE.
4. PLACE SOIL EXCAVATED FROM THE TRENCH BEHIND THE ROLL AND HAND TAMP. PLANTWITH SUITABLE HERBACEOUS OR WOODY VEGETATION AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS. VEGETATION SHALL BE PLACED IMMEDIATELY ADJACENT TO THE ROLL TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION, IF SPECIFIED, SHALL BE PLANTED INTO THE FIBER ROLL.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION	FIBER ROLL (EROSION LOG)
NOTES: REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.	REVISIONS MARCH 21, 2008    WHF JANUARY 13, 2009    WHF
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR EROSION LOG (PAY ITEM 653.60)	



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(II)	
FILE NAME: z20f237_EPSC_det.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: VTRANS
DESIGNED BY: VTRANS	CHECKED BY: J.S. GINGRAS
EPSC DETAIL SHEET (1 OF 2)	SHEET 31 OF 84





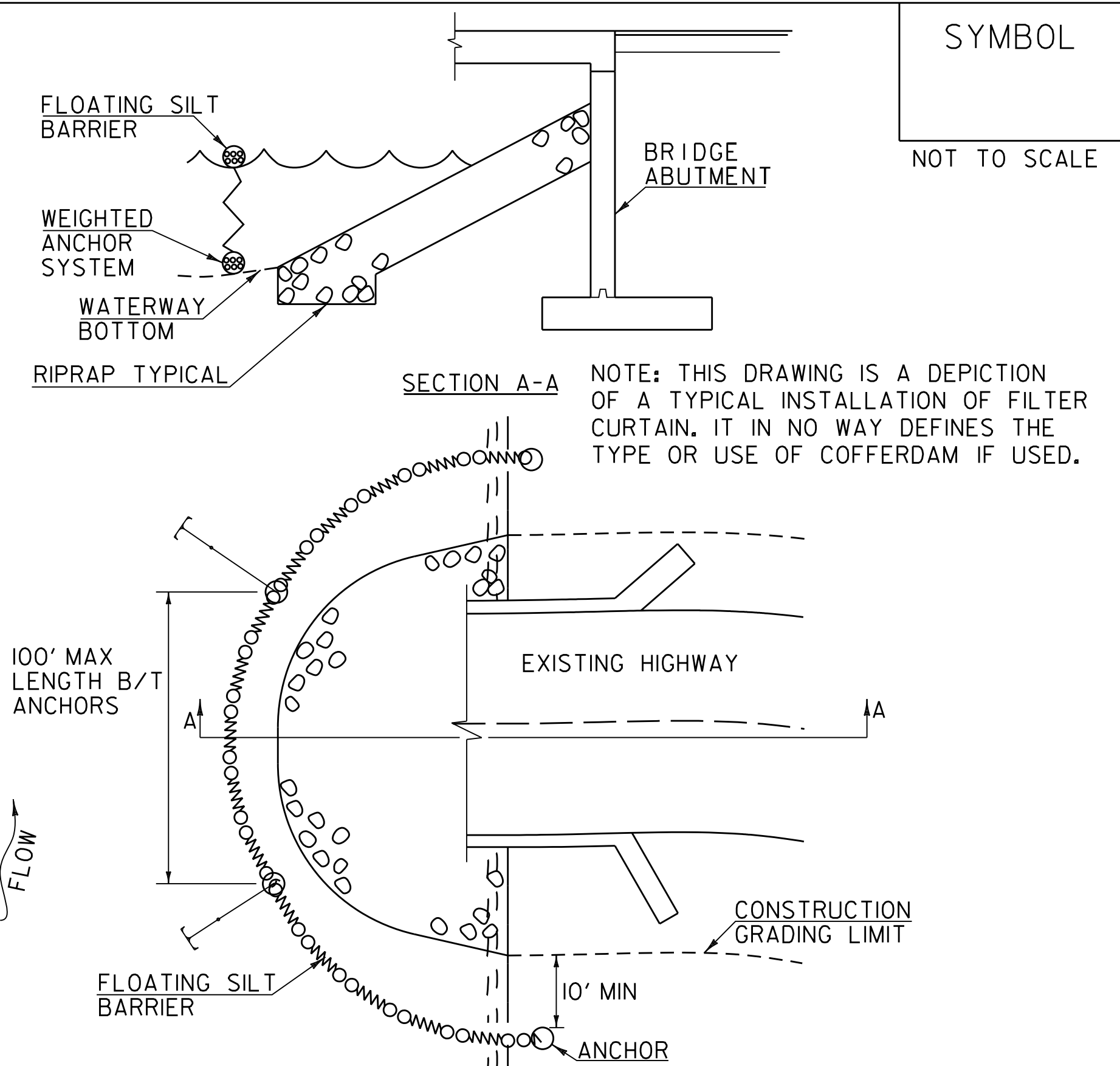
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
ORIGINALLY DEVELOPED BY USDA-NRCS  
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SURFACE ROUGHENING

NOTES:  
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR  
EROSION PREVENTION & SEDIMENT CONTROL -2006- " FROM  
THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL  
GUIDANCE.

THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE  
CONTRACT

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	



- CONSTRUCTION SPECIFICATIONS
1. FILTER CURTAIN SHALL NOT BE PLACED ACROSS A FLOWING WATERWAY, OR IN A WATERWAY WITH STREAM VELOCITIES GREATER THAN 1.5 FEET/SECOND.
  2. MAXIMUM 100' LENGTH BETWEEN ANCHORS.
  3. LAST SECTION SHALL TERMINATE A MINIMUM OF 10' BEYOND LIMIT OF DISTURBANCE.
  4. THE WEIGHTED ANCHOR SYSTEM SHALL BE A TYPE WHICH ALLOWS THE CURTAIN TO CONFORM TO THE BOTTOM OF THE WATERWAY.
  5. THE CURTAIN SHALL BE REMOVED BY SLOWLY PULLING TOWARD THE SHORE MINIMIZING THE ESCAPE OF SEDIMENTS INTO WATERWAY.

FILTER CURTAIN

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH  
SECTION 649 FOR GEOTEXTILE FOR FILTER CURTAIN (PAY  
ITEM 649.6I).

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	
SEPTEMBER 4, 2009	WHF	



PROJECT NAME: SWANTON - ST JOHNSBURY  
PROJECT NUMBER: STP LVRT(II)

FILE NAME: z20f237_EPSC_det.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: VTRANS  
EPSC DETAIL SHEET (2 OF 2)

PLOT DATE: 3/23/2021  
DRAWN BY: VTRANS  
CHECKED BY: J.S. GINGRAS  
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EPSC PLAN NARRATIVE

1. PROJECT DESCRIPTION

THE OVERALL PROJECT INVOLVES REHABILITATION OF THE LAMOILLE VALLEY RAIL TRAIL. THE SPECIFIC WORK INCLUDED IN CONTRACT STP LVRT(11) BEGINS AT THE INTERSECTION OF VT 109 IN CAMBRIDGE AND EXTENDS WESTERLY 18.4 MILES TO BRIDGE STREET IN SHELDON. WORK TO BE PERFORMED UNDER THIS CONTRACT INCLUDES CONSTRUCTION OF TRAIL SURFACES, CLEARING, DITCHING, INSTALLATION OF CULVERTS, SIGNING, MISCELLANEOUS STRUCTURE REPAIRS AND BRIDGE MODIFICATIONS INCLUDING DECKING AND RAILING INSTALLATION.

IT IS ANTICIPATED THAT CONSTRUCTION WILL LAST TWO CONSTRUCTION SEASONS.

2. AMOUNT OF DISTURBANCE & RISK EVALUATION

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN FOR CONTRACT STP LVRT(11) IS APPROXIMATELY **60.7 ACRES**.

IN CONJUNCTION WITH OTHER LVRT CONTRACTS, STP LVRT(11) HAS RECEIVED COVERAGE UNDER AN INDIVIDUAL PERMIT FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES. COMPONENTS OF THE PROJECT MAY BE CONSTRUCTED CONCURRENTLY WITH OTHER LVRT PROJECTS, INCLUDING STP LVRT(10), STP LVRT(12), AND STP LVRT(13).

THE MAXIMUM CONCURRENT EARTH DISTURBANCE FOR THE COMBINED LVRT PROJECTS PERMITTED UNDER THE INDC IS **16.3 ACRES**. THE MAXIMUM CONCURRENT EARTH DISTURBANCE ASSOCIATED WITH STP LVRT(11) IS **5.0 ACRES**. THE CONTRACTOR MUST COORDINATE WITH THE VTRANS RESIDENT ENGINEER AND DESIGNATED ENVIRONMENTAL SPECIALIST TO ENSURE THAT THIS LIMIT IS NOT EXCEEDED DURING THE COURSE OF THE PROJECT.

ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

3. MAJOR COMPONENTS & SEQUENCING

THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT OPEN TO EROSION AT ANY GIVEN TIME.

DUE TO THE LINEAR NATURE OF THIS PROJECT, IT IS POSSIBLE THAT MULTIPLE PORTIONS OF TRAIL WILL BE UNDER CONSTRUCTION SIMULTANEOUSLY. EACH SITE VARIES IN NECESSARY ACTIVITIES, ALTHOUGH THE GENERAL MAJOR COMPONENTS AND SEQUENCE IS LISTED BELOW, AS NEEDED. THE CONTRACTOR SHALL DETERMINE THE FINAL SEQUENCING USED.

- ESTABLISH PERIMETER CONTROLS AND MARK PROJECT BOUNDARIES AT LOCATIONS WHERE NEEDED OR AS DIRECTED BY THE RESIDENT ENGINEER
- INSTALL SEDIMENT CONTROL MEASURES
- TREE / VEGETATION CLEARING
- CONSTRUCT TEMPORARY ACCESS ROADS AS NEEDED
- DEMOLISH AND REMOVE EXISTING INFRASTRUCTURE AS NEEDED
- CONSTRUCT PROPOSED INFRASTRUCTURE AS NEEDED
- REGRADE / BUILD FINAL TRAIL SURFACE TRAIL
- FINAL STABILIZATION WITH TRAIL MATERIAL, SEED AND RECP OR STONE FILL
- REMOVE SEDIMENT CONTROLS AND PERIMETER CONTROLS UPON ESTABLISHMENT OF FINAL STABILIZATION

4. SITE DESCRIPTION

4.1 VEGETATED BUFFERS

MAINTAINING VEGETATED BUFFERS ALONG STREAM BANKS, WETLANDS OR OTHER SENSITIVE AREAS IS A CRUCIAL EROSION AND SEDIMENT CONTROL MEASURE THAT SHOULD BE IMPLEMENTED WHEREVER POSSIBLE.

THIS PROJECT DOES NOT RELY ON VEGETATED BUFFERS AS A MITIGATING RISK FACTOR. CULVERT AND BRIDGE REPAIR WORK WILL OCCUR WITHIN OR IMMEDIATELY ADJACENT TO STREAM BANKS. AT SOME LOCATIONS, IN-STREAM WORK IS REQUIRED TO REPLACEMENT THE EXISTING STRUCTURES. WORK WITHIN WETLANDS AND OTHER RESOURCE AREAS HAS BEEN AVOIDED AND MINIMIZED TO THE EXTENT PRACTICABLE.

4.2 STREAM CROSSINGS

THIS PROJECT INCLUDES 24 STREAM CROSSINGS, AS DESCRIBED IN SECTION 5.1 BELOW. WORK WITHIN THE WATER IS BEING AUTHORIZED THROUGH THE VT ANR DEC RIVER MANAGEMENT PROGRAM AND THE US ARMY CORPS OF ENGINEERS.

4.3 WETLANDS

THE LVRT(11) PROJECT INVOLVES 88,000 SF OF WETLAND AND 52,000 SF OF WETLAND BUFFER IMPACTS. THE WORK WITHIN THESE AREAS IS BEING AUTHORIZED THROUGH THE VT ANR WETLANDS OFFICE AND/OR THE US ARMY CORPS OF ENGINEERS.

4.4 TOPOGRAPHY

THE TOPOGRAPHY OF THE OVERALL PROJECT AREA IS GENERALLY SLOPED FROM THE TOP OF THE RAILWAY EMBANKMENT TO THE TOE OF THE SLOPE. IN SOME CASES, THE TOE OF SLOPE IS NEAR THE EDGE OF A STREAM CHANNELS OR ROADWAY CROSSINGS. THE PROJECT IS GENERALLY LOCATED IN RURAL AREAS WITH MINIMAL SURROUNDING DEVELOPMENT.

4.5 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF A MIXTURE OF GRASSES, SHRUBS, AND TREES. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE PROJECT. UPON COMPLETION, THE DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES AS DESCRIBED IN THE TURF ESTABLISHMENT DETAIL, UNLESS NOTED OTHERWISE. CERTAIN EMBANKMENTS WILL BE REGRADED SUCH THAT FINAL STABILIZATION REQUIRES THE PLACEMENT OF STONE FILL.

4.6 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE. SOILS ON THE PROJECT SITE INCLUDE:

ADAMS LOAMY FINE SAND, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.15  
AU GRES LOAMY FINE SAND, 0 TO 6 PERCENT SLOPES, "K FACTOR" = 0.10  
BELGRADE SILT LOAM, 2 TO 8 PERCENT SLOPES, "K FACTOR" = 0.43  
BELGRADE SILT LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.43  
BINGHAMVILLE SILT LOAM, "K FACTOR" = 0.43  
BOOTHBAY SILT LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.43  
BOOTHBAY SILT LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.43  
BOOTHBAY SILT LOAM, 15 TO 25 PERCENT SLOPES, "K FACTOR" = 0.43  
BOROHEMISTS, MODERATELY DEEP OVER LOAMY SUBSTRATUM, "K FACTOR" = 0.49  
BUXTON SILT LOAM, 15 TO 25 PERCENT SLOPES, "K FACTOR" = 0.32  
BUXTON SILT LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.32  
CARLISLE MUCK, "K FACTOR" = 0.00  
COLTON GRAVELLY LOAMY SAND, 2 TO 8 PERCENT SLOPES, "K FACTOR" = 0.05  
DEERFIELD LOAMY FINE SAND, 0 TO 8 PERCENT SLOPES, "K FACTOR" = 0.24  
DEERFIELD LOAMY FINE SAND, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.24  
ELDRIDGE LOAMY FINE SAND, 0 TO 3 PERCENT SLOPES, "K FACTOR" = 0.2  
ELDRIDGE LOAMY FINE SAND, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.2  
ELDRIDGE LOAMY FINE SAND, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.2  
ENOSBURG LOAMY FINE SAND, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.2  
HINESBURG LOAMY FINE SAND, 15 TO 25 PERCENT SLOPES, "K FACTOR" = 0.17  
HINESBURG LOAMY FINE SAND, 25 TO 60 PERCENT SLOPES, "K FACTOR" = 0.17  
HINESBURG LOAMY FINE SAND, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.17  
HISTIC FLUVAQUENTS, FREQUENTLY FLOODED, "K FACTOR" = 0.37  
LIMERICK SILT LOAM, "K FACTOR" = 0.43  
MISSISQUOI LOAMY SAND, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.15  
MUNSON SILT LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.49  
MUNSON SILT LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.49  
PEACHAM MUCKY PEAT, 0 TO 8 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.43  
PERU STONY FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.37  
PERU STONY FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.37  
PODUNK VARIANT SILT LOAM, "K FACTOR" = 0.49  
RAYNHAM SILT LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.49  
RUMNEY VARIANT SILT LOAM, "K FACTOR" = 0.32  
SALMON VERY FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, ERODED, "K FACTOR" = 0.32  
SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES, "K FACTOR" = 0.37  
STOWE STONY FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.20  
STOWE STONY FINE SANDY LOAM, 15 TO 25 PERCENT SLOPES, "K FACTOR" = 0.24  
SWANVILLE SILT LOAM, 0 TO 6 PERCENT SLOPES, "K FACTOR" = 0.28  
TERRIC MEDISAPRISTS, "K FACTOR" = 0.49  
TUNBRIDGE-WOODSTOCK FINE SANDY LOAMS, VERY ROCKY, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.27  
TUNBRIDGE-WOODSTOCK FINE SANDY LOAMS, VERY ROCKY, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.24  
WALLKILL SILT LOAM, "K FACTOR" = 0.37  
WAREHAM LOAMY FINE SAND, "K FACTOR" = 0.20  
WESTBURY STONY FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.20

WESTBURY STONY FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.20  
WINDSOR LOAMY FINE SAND, 0 TO 3 PERCENT SLOPES, "K FACTOR" = 0.20  
WINDSOR LOAMY FINE SAND, 15 TO 25 PERCENT SLOPES, "K FACTOR" = 0.20  
WINDSOR LOAMY FINE SAND, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.20  
WINOOSKI SILT LOAM, "K FACTOR" = 0.43  
WOODSTOCK-ROCK OUTCROP COMPLEX, 15 TO 25 PERCENT SLOPES, "K FACTOR" = 0.32  
WOODSTOCK-ROCK OUTCROP COMPLEX, 25 TO 60 PERCENT SLOPES, "K FACTOR" = 0.32

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING:  
0.0-0.23 = LOW EROSION POTENTIAL  
0.24-0.36 = MODERATE EROSION POTENTIAL  
0.37 AND HIGHER = HIGH EROSION POTENTIAL

4.7 OTHER SENSITIVE RESOURCES

NO ADDITIONAL SENSITIVE RESOURCE AREAS ARE ANTICIPATED TO BE IMPACTED BY THE PROJECT.

5. DRAINAGE

5.1 RECEIVING WATERS

THIS PROJECT INVOLVES IMPROVEMENTS AT EXISTING OR REPLACEMENT STRUCTURES (CULVERT OR BRIDGE) AT 24 EPHEMERAL, INTERMITTENT, AND PERENNIAL STREAM CROSSINGS. IMPROVEMENTS AT BRIDGE 77 (BLACK CREEK), BRIDGE 80 (BLACK CREEK), AND BRIDGE 83 (BLACK CREEK) HAVE BEEN PREVIOUSLY AUTHORIZED AS PART OF PROJECT STP LVRT(10).

THE MAJOR RECEIVING WATER FOR THE PROJECT IS BLACK CREEK AND ITS TRIBUTARIES.

5.2 DISCHARGE POINTS

DUE TO THE NATURE OF THE PROJECT AREA, THERE ARE NO DISCRETE DISCHARGE POINTS ASSOCIATED WITH THE TRAIL WORK ON THIS PROJECT. RUNOFF FROM THE PROJECT AREA WILL DRAIN OFF THE TRAIL EMBANKMENT TOWARD THE CLOSEST RECEIVING WATER, MAY ENTER THE RECEIVING WATERS IN MULTIPLE LOCATIONS.

5.3 CONVEYANCE/FLOW PATH FROM PROJECT TO WATERS

THE MAJORITY OF THE PROJECT IS NOT CURBED AND RUNOFF DRAINS OVERLAND ACROSS ADJACENT VEGETATED SIDE SLOPES BEFORE REACHING THE RECEIVING WATER. DUE TO THE NATURE OF THE PROJECT, IN-STREAM WORK WILL BE REQUIRED AT SOME SITES, THEREFORE WILL HAVE A LIMITED VEGETATED DISCONNECTION AREA. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES WILL LIMIT SEDIMENT DISCHARGE AT THESE LOCATIONS.

6. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

THE MEASURES INCLUDED IN THIS PLAN ARE PROVIDED AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. IT IS EXPECTED THAT THE CONTRACTOR MAY USE THIS PLAN, WITH ADJUSTMENTS AS NECESSARY, BASED ON THEIR SPECIFIC MEANS AND METHODS OF CONSTRUCTION.

APPLYING THESE MEASURES THROUGHOUT CONSTRUCTION IS CRITICAL TO THEIR SUCCESS IN MINIMIZING SEDIMENT TRANSPORT TO THE RECEIVING WATERS. REFER TO THE DETAILS INCLUDED IN THESE PLANS AND THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR SPECIFIC GUIDANCE.

6.1 IDENTIFY LIMITS OF DISTURBANCE

SITE BOUNDARIES AND AREAS CONSTRUCTION EQUIPMENT CAN ACCESS SHALL BE DELINEATED.

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC.).

6.2 LIMIT CONCURRENT DISTURBANCE

LIMITING THE AMOUNT OF SOIL EXPOSED AT ONE TIME REDUCES THE POTENTIAL EROSION ON SITE. CONCURRENT EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY AND EMPLOYING STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE.



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(II)	
FILE NAME: z20f237_EPSC_narrative.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P.DETRICK	DRAWN BY: R.A.WILDEY
DESIGNED BY: R.A.WILDEY	CHECKED BY: E.P.DETRICK
EPSC NARRATIVE (SHEET 1 OF 2)	SHEET 33 OF 84



6.3 STABILIZE DISTURBED AREAS

6.3.1 ACCESS POINTS/ENTRANCE/EXITS

TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTORS PROGRESS SCHEDULE.

6.3.2 TEMPORARY MEASURES FOR EXPOSED AREAS DURING CONSTRUCTION

ALL AREAS OF EARTH DISTURBANCE MUST HAVE STABILIZATION IN PLACE WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.

6.3.3 PERMANENT STABILIZATION AT FINAL GRADE

EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.

SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, ROLLED EROSION CONTROL PRODUCT, TYPE I SHALL BE USED INSTEAD OF MULCH. FOR SLOPES STEEPER THAN 1:2, FINAL STABILIZATION WITH STONE RIPRAP IS PROPOSED. STONE ARMORING OF STREAM EMBANKMENTS ARE PROPOSED TO BE STABILIZED WITH THE APPROPRIATELY SIZED STONE BASED ON HYDRAULIC MODELING, AS SHOWN IN THE PLANS.

6.4 DIVERT UPLAND RUNOFF

DIVERSIONARY MEASURES SHALL BE USED TO INTERCEPT RUNOFF FROM ABOVE THE CONSTRUCTION AND DIRECT IT AROUND THE DISTURBED AREA SO THAT CLEAN WATER DOES NOT BECOME MUDDIED WHILE TRAVELING OVER EXPOSED SOILS ON THE CONSTRUCTION SITE.

RUNOFF FROM UPGRAIDENT AREAS MAY NEED TO BE DIVERTED AWAY FROM THE PROJECT AREA. THE CONTRACTOR SHALL REFER TO THE LOW RISK HANDBOOK FOR GUIDANCE.

6.5 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS (E.G. SILT FENCE AND EROSION LOGS) SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED ON THE DOWNHILL SIDE OF CONSTRUCTION ACTIVITIES, PRIOR TO ANY UP-SLOPE WORK.

DUE TO THE LINEAR NATURE OF THE PROJECT AND THE VEGETATED CONDITION OF THE EXISTING EMBANKMENT, SEDIMENT BARRIERS ARE NOT REQUIRED ALONG THE ENTIRE LENGTH OF THE PROJECT. AREAS WHERE SEDIMENT BARRIERS ARE REQUIRED INCLUDE SITES WHERE BRIDGE AND CULVERT REPLACEMENT OR REPAIRS ARE BEING MADE, PAUSE PLACES ARE BEING CONSTRUCTED, OR OTHER ACTIVITIES ARE OCCURRING THAT DISTURB EMBANKMENT SIDE SLOPES AND COULD POTENTIALLY RESULT IN SEDIMENT BEING DISCHARGED.

WHERE REQUIRED, SEDIMENT BARRIERS WILL BE INSTALLED ALONG THE CONTOUR AND AS PROPOSED ON THE EPSC PLAN. WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF WETLANDS AND RECEIVING WATERS. ADDITIONAL SEDIMENT BARRIERS ARE TO BE DEPLOYED AS NECESSARY DURING CONSTRUCTION TO MINIMIZE SEDIMENT DISCHARGE OR AS DIRECTED BY THE RESIDENT ENGINEER.

6.6 SLOW DOWN CHANNELIZED RUNOFF

CHECK STRUCTURES SHALL BE UTILIZED TO REDUCE THE VELOCITY, AND THUS THE EROSION POTENTIAL, OF CONCENTRATED FLOW IN CHANNELS.

TEMPORARY STONE CHECK DAMS MAY BE REQUIRED IN CONJUNCTION WITH WATER CONTROL AT CULVERT REPAIR AND REPLACEMENT SITES.

7. CONSTRUCT PERMANENT CONTROLS

PERMANENT STORMWATER TREATMENT DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH PERMIT CONDITIONS.

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED TO BE NEEDED OR DESIGNED.

8. DEWATERING

DISCHARGE FROM DEWATERING ACTIVITIES THAT FLOWS OFF OF THE CONSTRUCTION SITE MUST NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE VERMONT WATER QUALITY STANDARDS. DEWATERED STORMWATER OR GROUNDWATER MUST BE FILTERED AND ROUTED IN A MANNER THAT DOES NOT RESULT IN VISIBLY TURBID DISCHARGES TO WATERS.

DEWATERING OF SURFACE WATER WITHIN A COFFERDAM IS ANTICIPATED DURING THE REPAIR OR REPLACEMENT OF STRUCTURES ADJACENT TO WETLANDS AND WATERWAYS. THE FILTER BAG DETAIL AND PAY ITEM HAVE BEEN INCLUDED AS A POTENTIAL TREATMENT MEASURE FOR THIS PURPOSE, HOWEVER THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE SHALL BE PAID FOR UNDER CONTRACT ITEM 653.45.

9. OFF-SITE AREAS

OFF-SITE WASTE AND BORROW AREAS HAVE NOT BEEN IDENTIFIED FOR THIS PROJECT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PERMIT, AS NECESSARY, ANY OFF-SITE AREAS THAT ARE NEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 105.25 - 105.28. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES NECESSARY FOR WASTE, BORROW, AND STAGING AREAS OUTSIDE THE PROJECT LIMITS SHALL BE PAID FOR PER 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

VEHICLE AND EQUIPMENT STORAGE AREAS OR AREAS ADJACENT TO CONSTRUCTION TRAILERS OR OTHER HIGH TRAFFIC AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 12” OF GRAVEL. FOLLOWING COMPLETION OF CONSTRUCTION, ALL NON-NATIVE MATERIALS SHALL BE REMOVED FROM THE STAGING AREA. COMPACTED, RUTTED, OR OTHERWISE DISTURBED SOILS SHALL BE TILLED, RAKED, SEEDED AND MULCHED.

ERODIBLE MATERIALS STOCKPILED WITHIN THE MATERIAL STORAGE AREAS SHALL BE ISOLATED WITH SILT FENCE OR OTHER ACCEPTABLE SEDIMENT BARRIER. SOIL STOCKPILED ON THE SITE SHALL BE SEEDED AND MULCHED.

10. WINTER CONSTRUCTION

CONSTRUCTION ACTIVITIES MAY CONTINUE INTO THE WINTER CONSTRUCTION SEASON, DEPENDING ON ACTUAL FIELD AND WEATHER CONDITIONS. IF ACTIVITIES ARE ON-GOING BETWEEN OCTOBER 15 AND APRIL 15, THE CONTRACTOR SHALL FOLLOW REQUIREMENTS FOR WINTER CONSTRUCTION, AS DEFINED IN SPECIFIC PERMIT CONDITIONS AND AS FOLLOWS:

- ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- LIMITS OF DISTURBANCE MOVED OR REPLACED TO REFLECT BOUNDARY OF WINTER WORK.
- DEVELOPMENT OF A SNOW MANAGEMENT PLAN THAT INCLUDES:
  - ADEQUATE STORAGE AND CONTROL OF MELT-WATER
  - STORAGE OF CLEARED SNOW TO BE PLACED DOWN SLOPE OF DISTURBED AREAS AND OUT OF STORMWATER TREATMENT STRUCTURES
- AREAS OF DISTURBANCE WITHIN 100 FT OF A WATERBODY MUST HAVE REINFORCED (WOVEN WIRE) SILT FENCE INSTALLED ACROSS THE SLOPE, DOWNGRAIDENT OF THE EARTH DISTURBANCE. ALTERNATIVELY, REGULAR, NON-WOVEN WIRE SILT FENCE MAY BE USED IF COMBINED WITH EROSION CONTROL BERM, EROSION LOG, OR STRAW WATTLE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
- MULCH TO BE APPLIED AT A MINIMUM OF 2 INCHES DEPTH WITH 80-90% COVERAGE.
- AREAS OF DISTURBED SOILS MUST BE STABILIZED PRIOR TO ANY RUNOFF-PRODUCING EVENT, WITH THE FOLLOWING EXCEPTION:
  - STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH NO OUTLET AND A DEPTH OF 2 FT OR GREATER (OPEN UTILITY TRENCHES), PROVIDED THAT ANY DEWATERING, IF NECESSARY, IS CONDUCTED AS REQUIRED.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1" THICKNESS.
- USE STONE TO STABILIZE AREAS WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED.

11. INSPECTION & MAINTENANCE

INSPECTION AND MONITORING OF THE PROJECT’S EPSC MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD SPECIFICATION 653.04 MONITORING EROSION PREVENTION AND SEDIMENT CONTROL PLAN, ALONG WITH PERMIT SPECIFIC INSPECTION REQUIREMENTS.

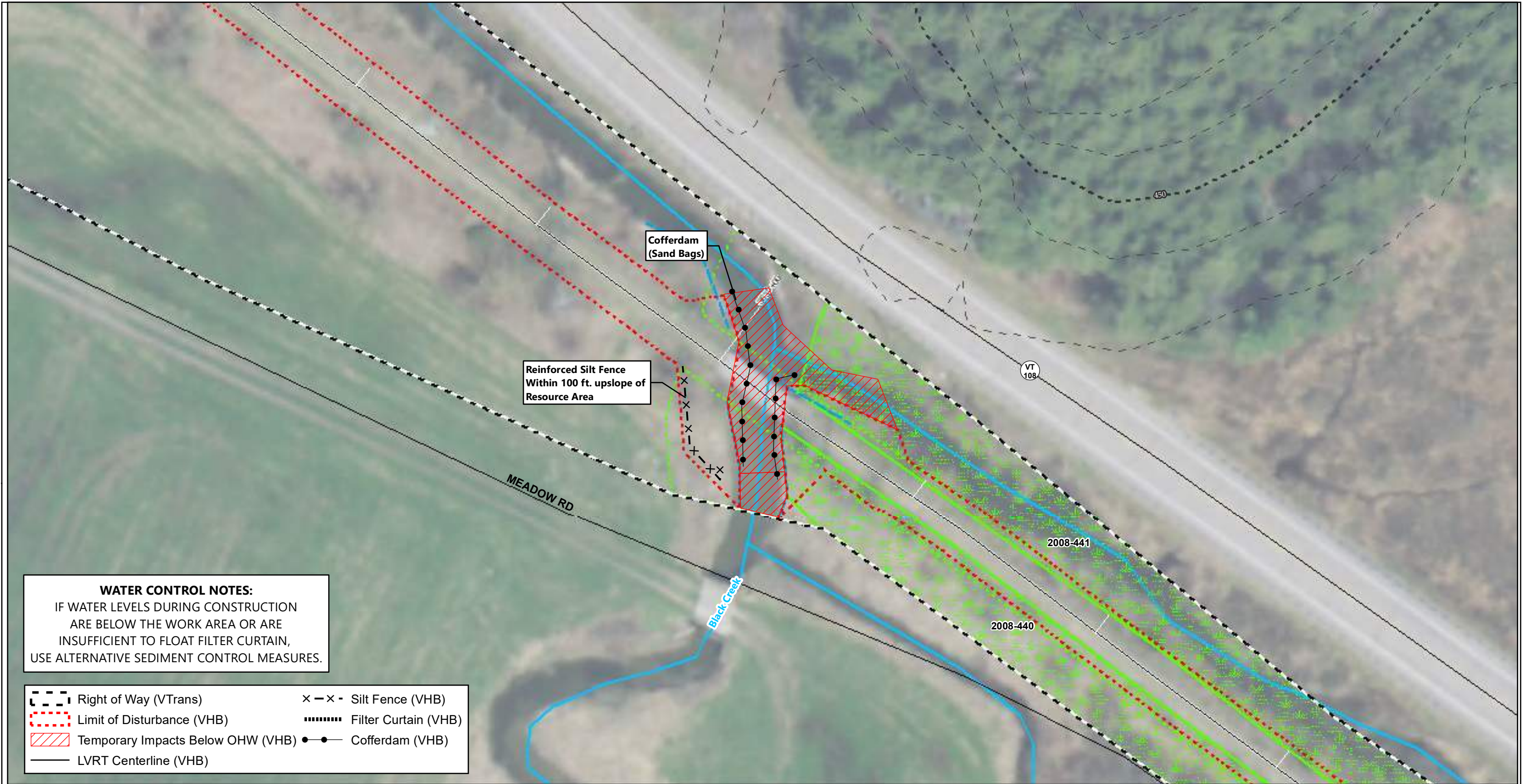
THE CONTRACTOR SHALL PROVIDE A COPY OF THEIR INSPECTION FORM AS PART OF THEIR EPSC PLAN.

ALL EPSC MEASURES SHALL BE REGULARLY MAINTAINED AND SHALL BE CHECKED FOR SEDIMENT BUILD-UP. SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED SITE WHERE IT WILL NOT BE SUBJECT TO EROSION.



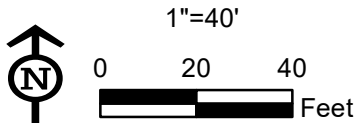
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PROJECT NUMBER: STP LVRT(II)	
FILE NAME: z20f237_EPSC_narrative.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P.DETRICK	DRAWN BY: R.A.WILDEY
DESIGNED BY: R.A.WILDEY	CHECKED BY: E.P.DETRICK
EPSC NARRATIVE (SHEET 2 OF 2)	SHEET 34 OF 84





LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 70 SITE PLAN

APPLICATION BY:  
VTrans

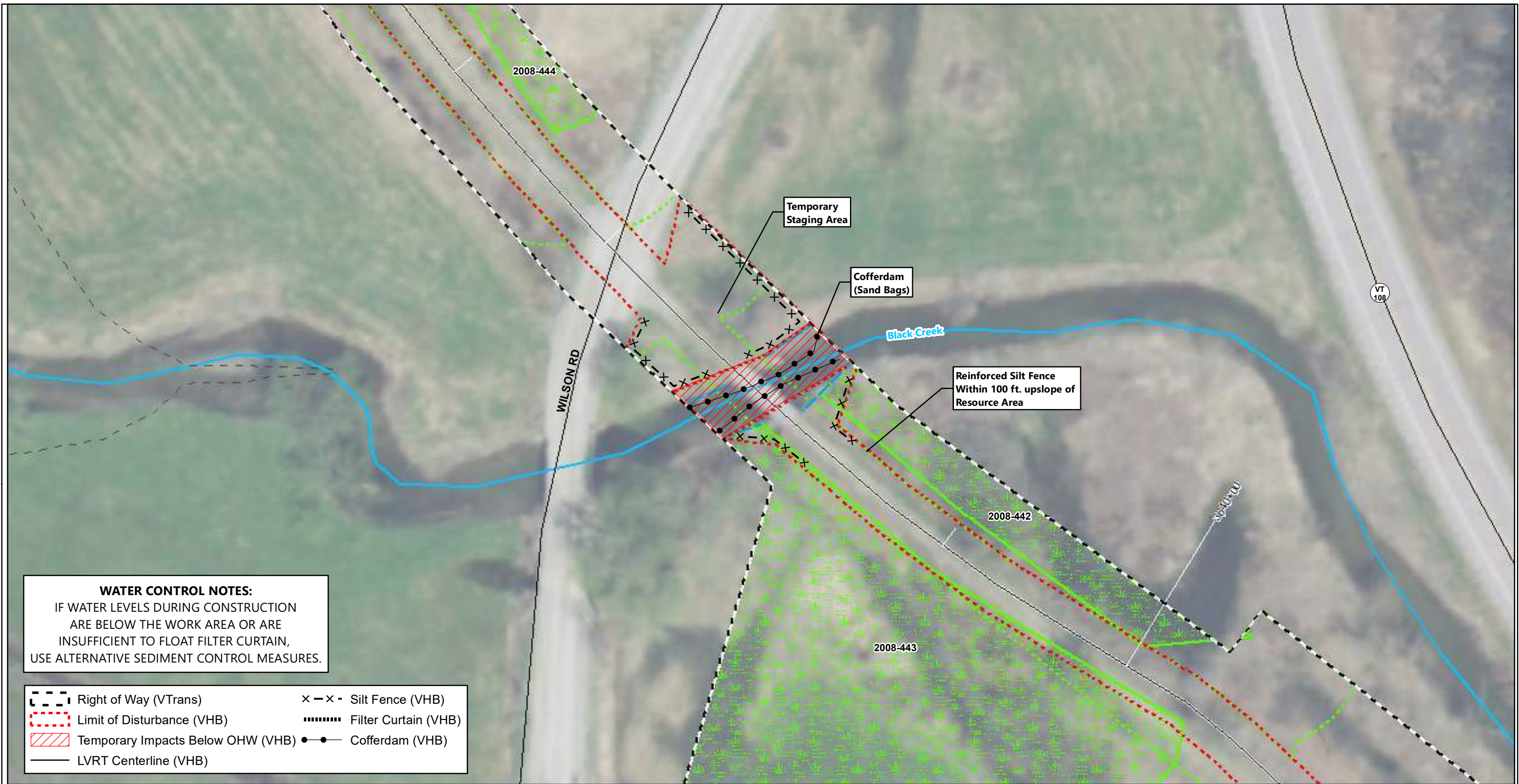


PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 71 SITE PLAN

APPLICATION BY:  
VTrans



1"=40'  
0 20 40  
Feet

PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 73 SITE PLAN**

**APPLICATION BY:**  
VTrans



1"=40'  
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Feet

**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

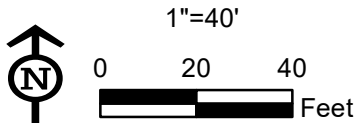
Sheet 37 of 84





LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 76 SITE PLAN

APPLICATION BY:  
VTrans

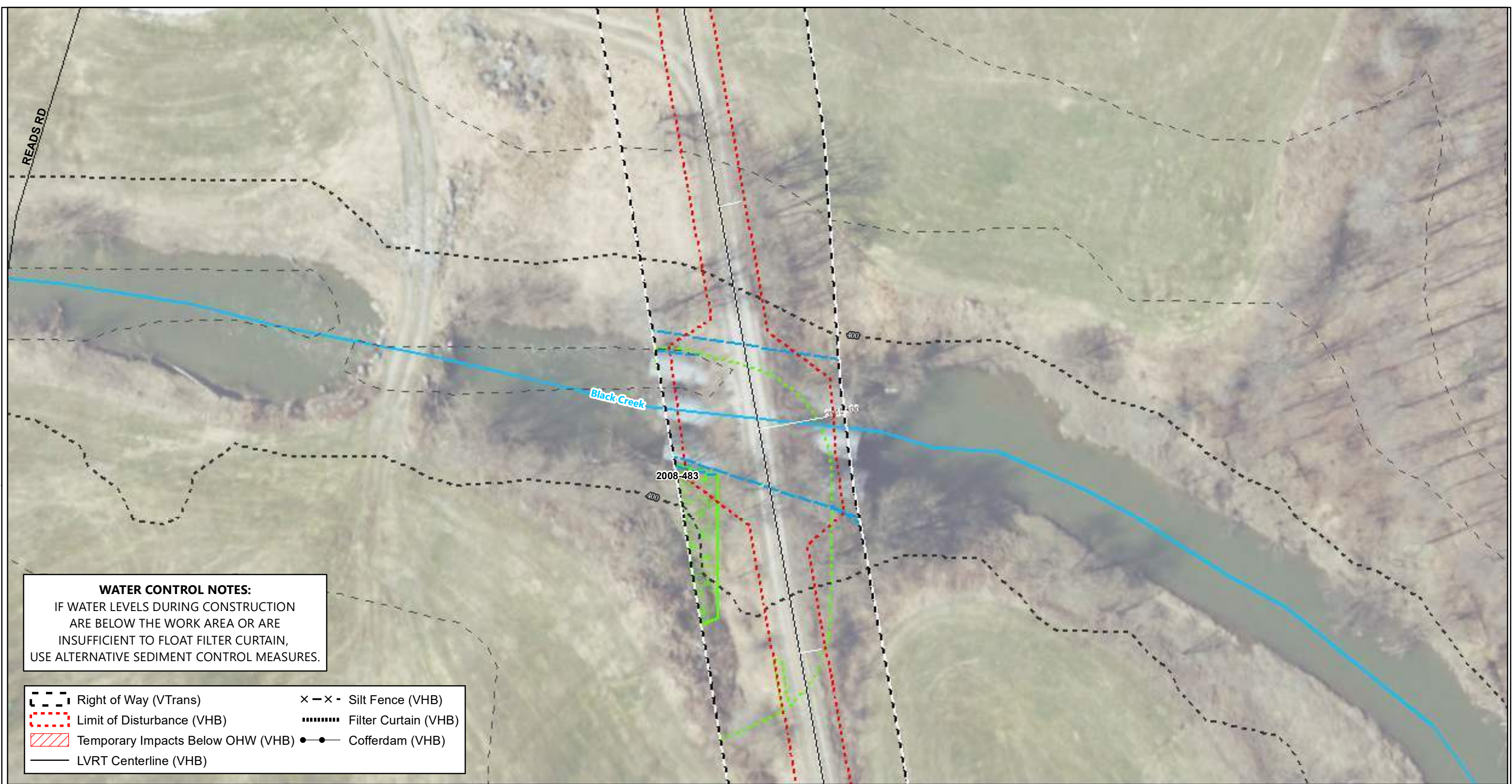


PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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## LAMOILLE VALLEY RAIL TRAIL HARDWICK BRIDGE 80 SITE PLAN

APPLICATION BY:  
VTrans



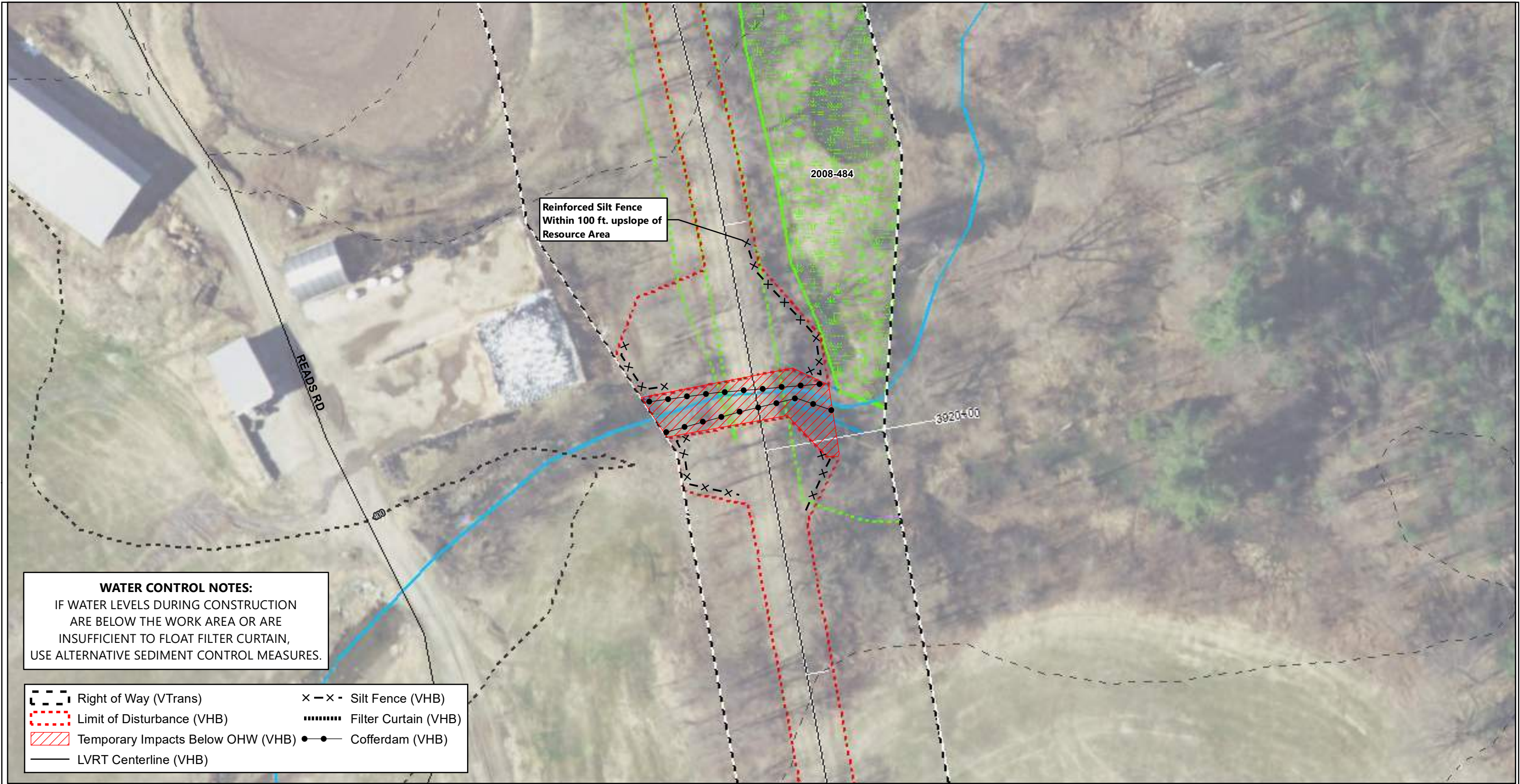
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**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

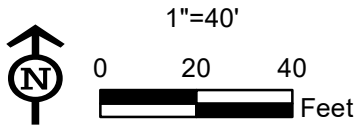
Sheet 39 of 84





LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 81 SITE PLAN

APPLICATION BY:  
VTrans

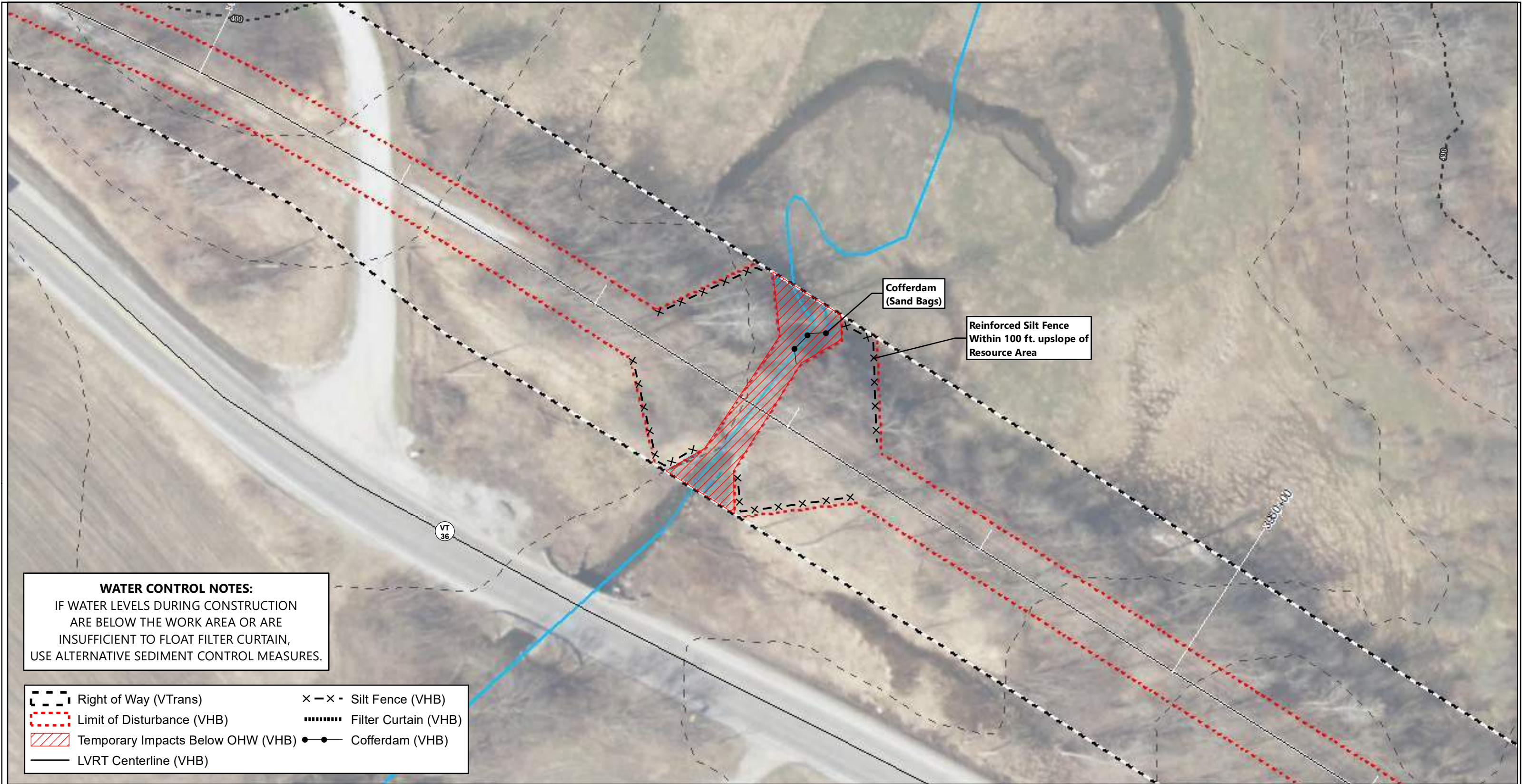


PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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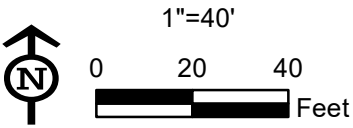
**WATER CONTROL NOTES:**  
IF WATER LEVELS DURING CONSTRUCTION  
ARE BELOW THE WORK AREA OR ARE  
INSUFFICIENT TO FLOAT FILTER CURTAIN,  
USE ALTERNATIVE SEDIMENT CONTROL MEASURES.

- |                                       |                            |
|---------------------------------------|----------------------------|
| --- Right of Way (VTrans)             | -x-x- Silt Fence (VHB)     |
| -.-.- Limit of Disturbance (VHB)      | ..... Filter Curtain (VHB) |
| /// Temporary Impacts Below OHW (VHB) | ●-●- Cofferdam (VHB)       |
| — LVRT Centerline (VHB)               |                            |



**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 82 SITE PLAN**

**APPLICATION BY:**  
VTrans

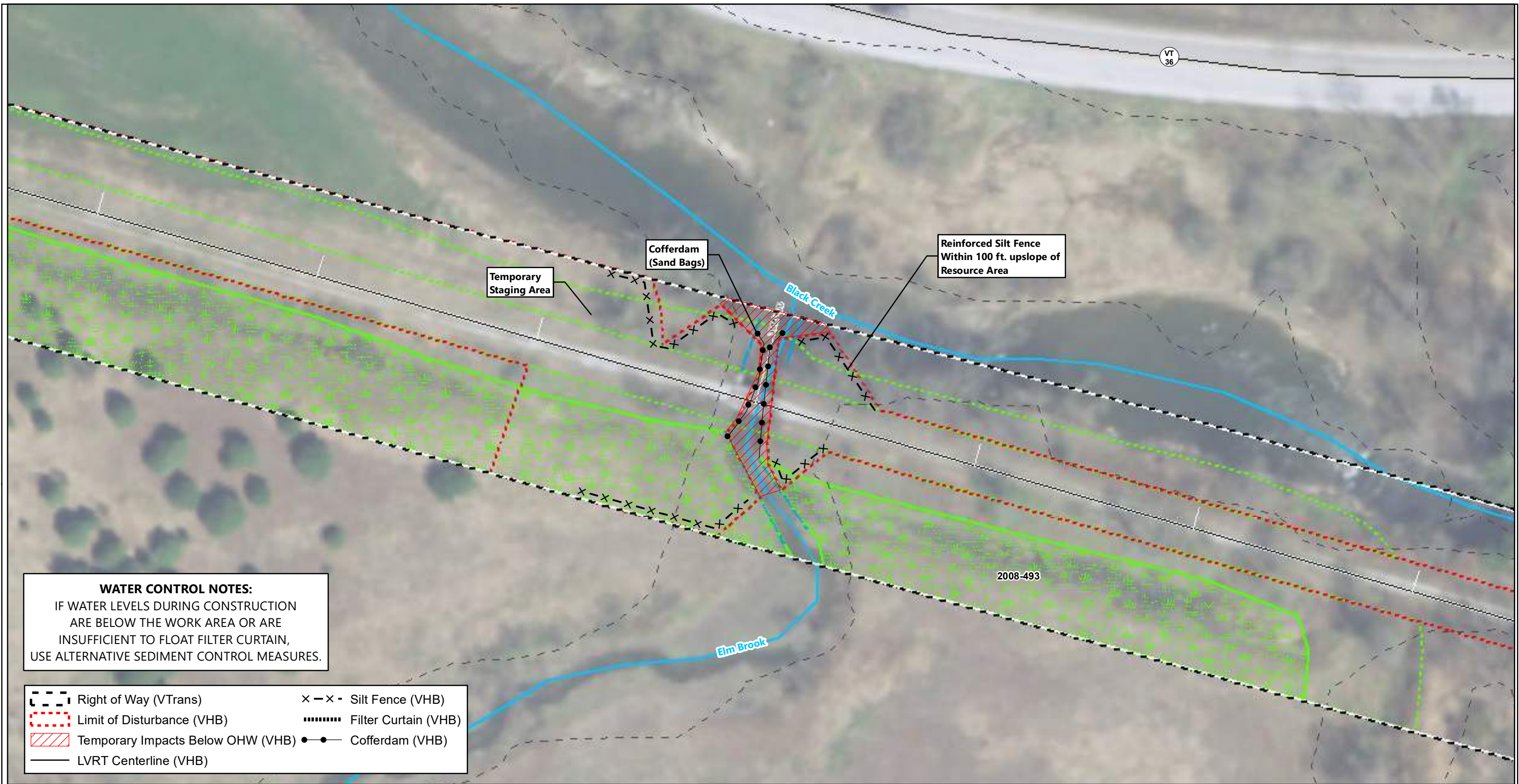


**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

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# LAMOILLE VALLEY RAIL TRAIL HARDWICK BRIDGE 85 SITE PLAN

APPLICATION BY:  
VTrans



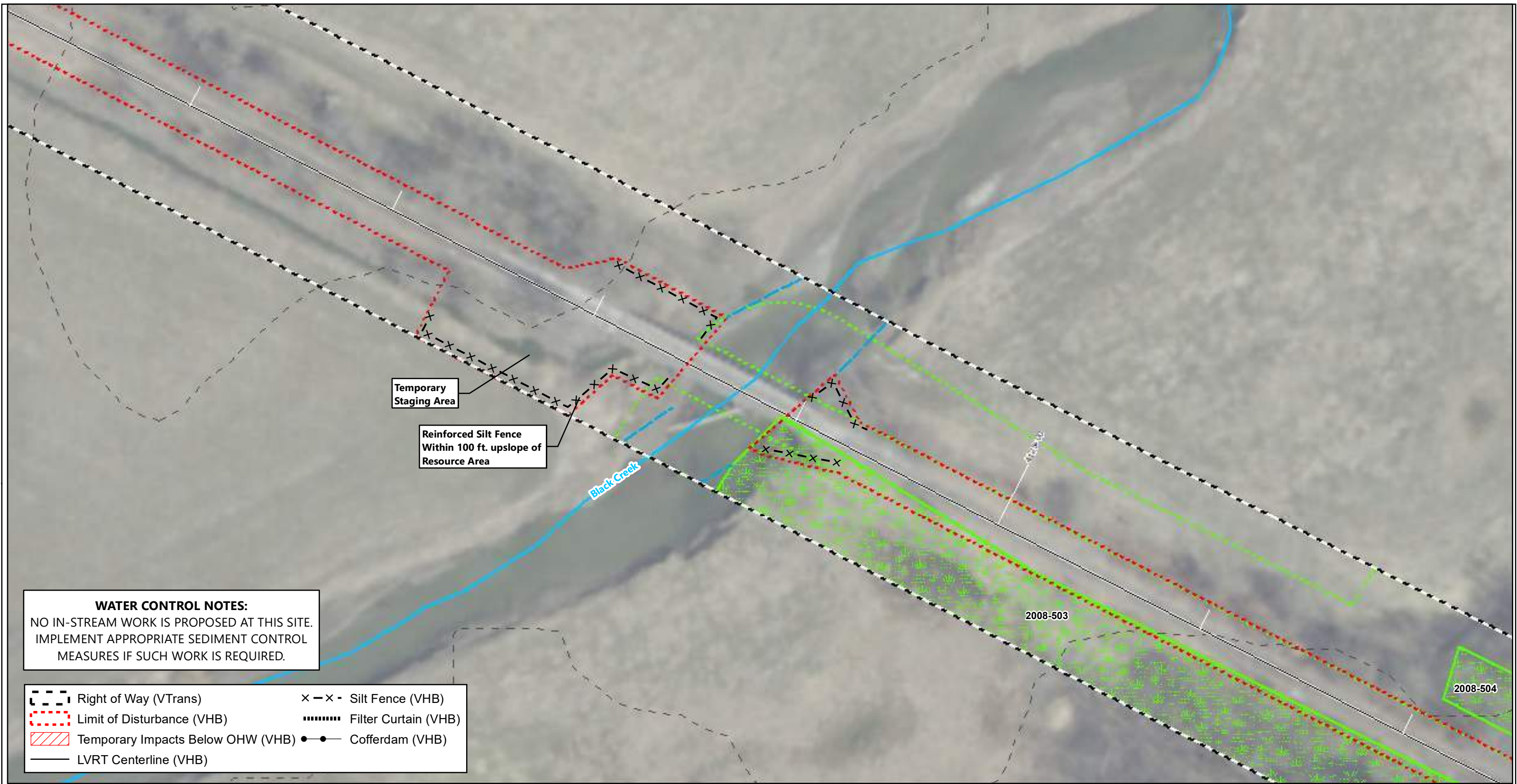
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Feet

PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 87 SITE PLAN

APPLICATION BY:  
VTrans



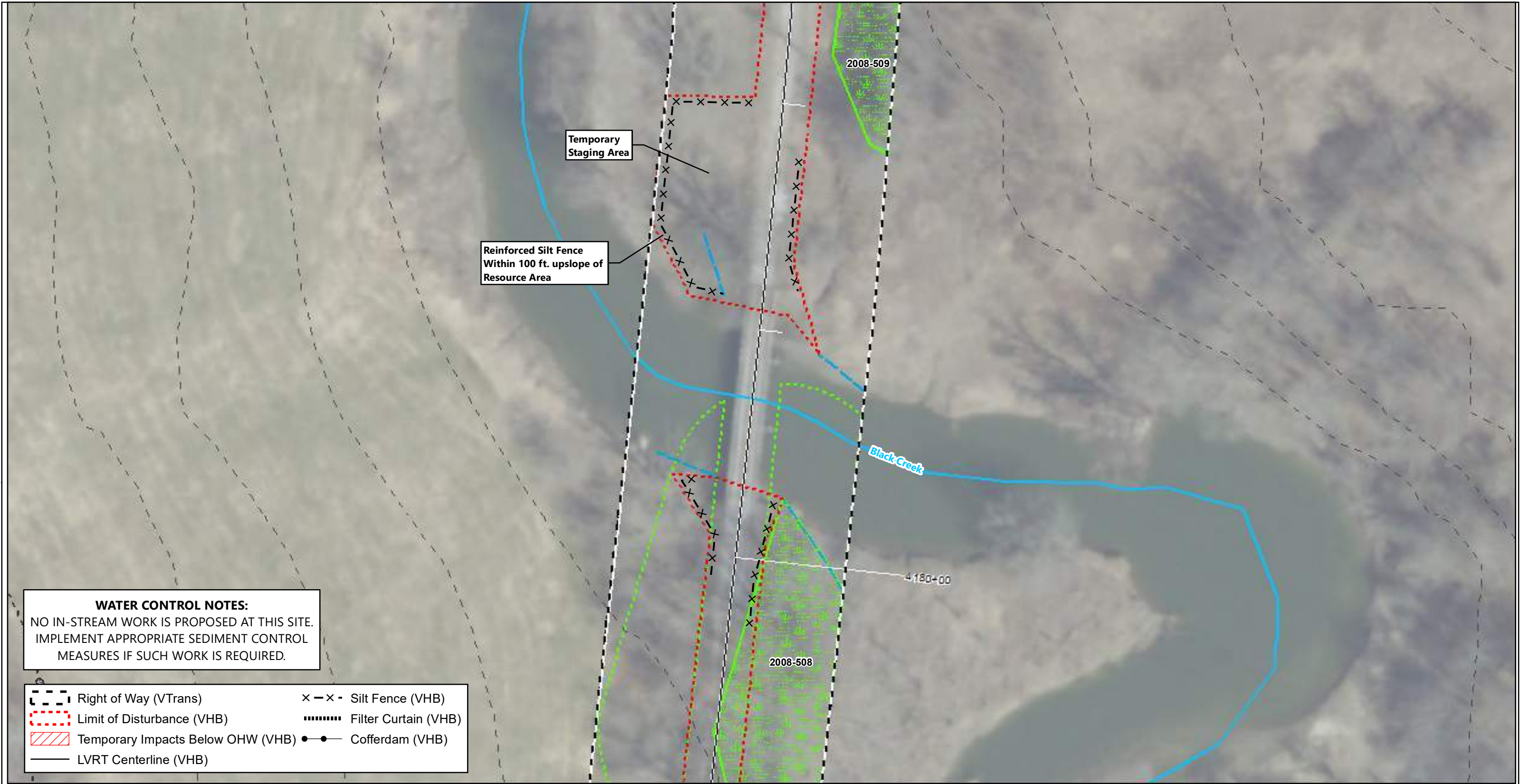
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Feet

PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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## LAMOILLE VALLEY RAIL TRAIL HARDWICK BRIDGE 88 SITE PLAN

APPLICATION BY:  
VTrans



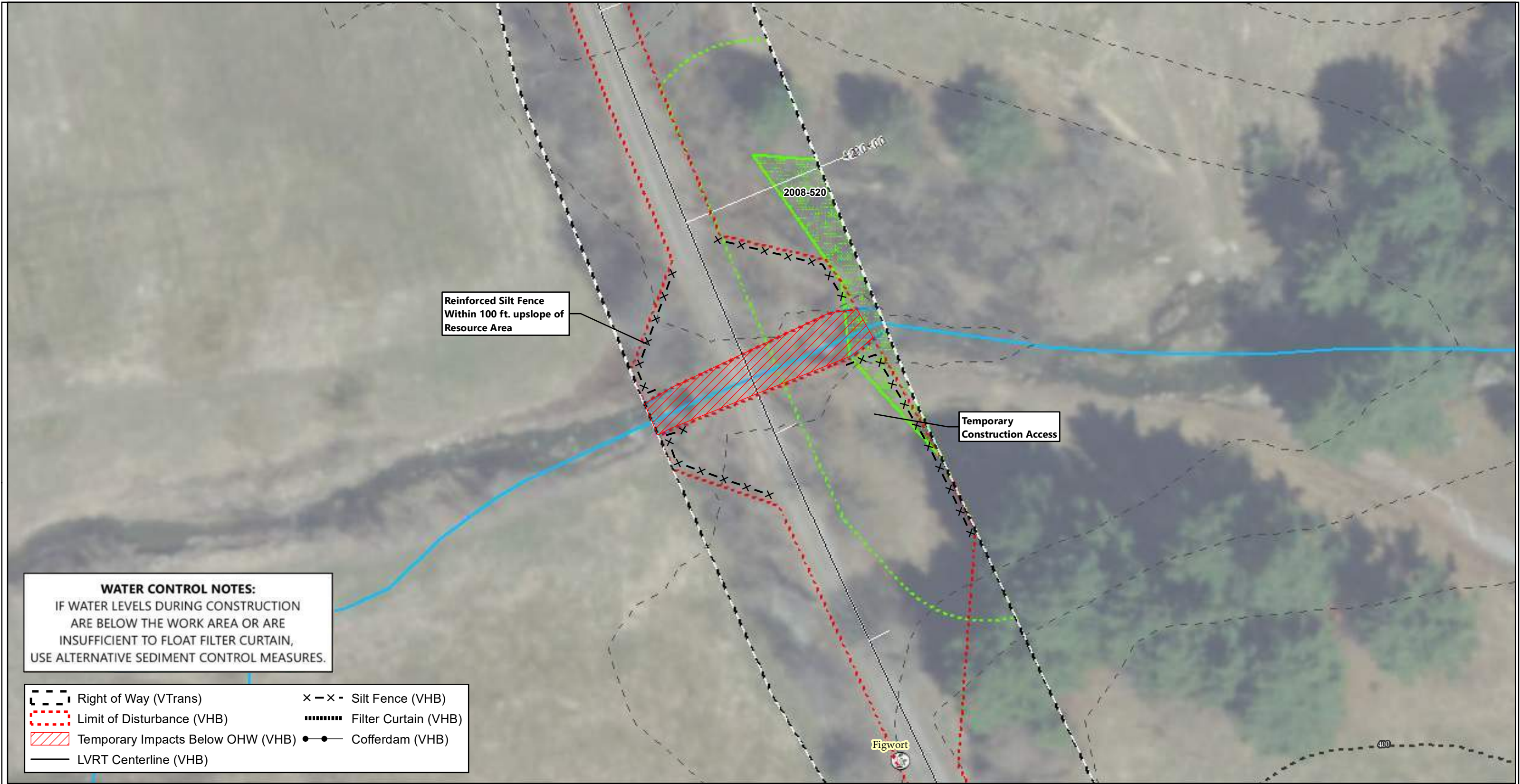
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Feet

PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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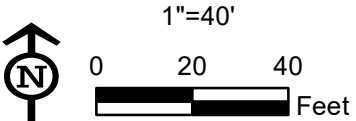
**WATER CONTROL NOTES:**  
IF WATER LEVELS DURING CONSTRUCTION  
ARE BELOW THE WORK AREA OR ARE  
INSUFFICIENT TO FLOAT FILTER CURTAIN,  
USE ALTERNATIVE SEDIMENT CONTROL MEASURES.

- |                                       |                            |
|---------------------------------------|----------------------------|
| --- Right of Way (VTrans)             | - x - Silt Fence (VHB)     |
| - - - Limit of Disturbance (VHB)      | ..... Filter Curtain (VHB) |
| /// Temporary Impacts Below OHW (VHB) | ● - ● Cofferdam (VHB)      |
| — LVRT Centerline (VHB)               |                            |



**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 90 SITE PLAN**

**APPLICATION BY:**  
VTrans



**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

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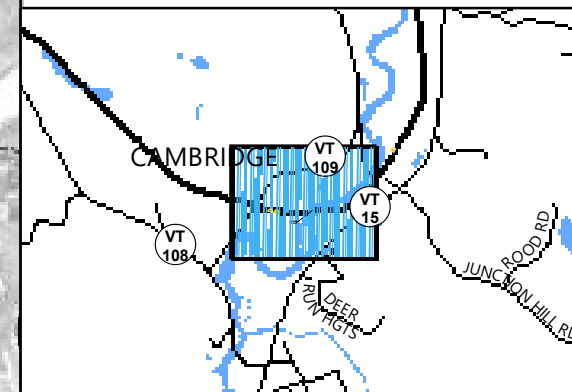


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline
- ⬢ Right of Way
- ⬢ Limit of Disturbance
- ⬢ Temp. Impacts Below OHW
- Culvert
- ⬢ Cattlepass
- ⬢ Crossing
- ⬢ Unauthorized Crossing
- ⬢ Trailhead
- ⬢ Bridges
- W001: Wetlands
- TB001: Top of Bank
- SC001: Stream Center
- ⬢ Proposed Pause Place
- ⬢ Washouts
- ⬢ RTE Site
- ⬢ RTE Area (2008)
- ⬢ Class II Wetland Buffer (50ft)
- ⬢ Delineated Wetland (2017-2020)
- ⬢ Delineated Stream (2017)
- ⬢ Delineated Stream (2008)
- ⬢ VSWI Wetland
- ⬢ VHD Stream
- ⬢ Other Existing Trail
- ⬢ Electric Transmission Lines
- ⬢ Parcel Boundary
- ⬢ Historic Site



Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).

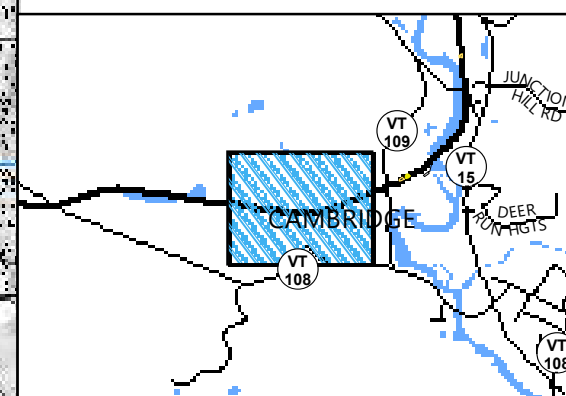
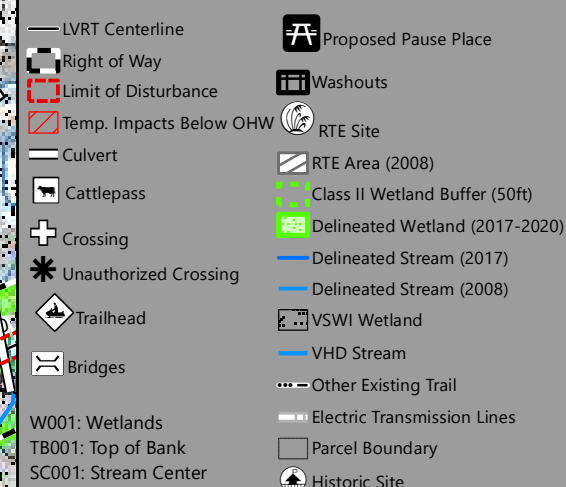
**EPSC PLAN IMPLEMENTATION:**  
SEE EPSC NOTES, DETAILS, AND NARRATIVE ON EPSC DETAIL SHEETS 21-24 AND VAOT STANDARD DETAILS E-10, E-11, E-12, E-13, E-14, E-15.  
  
SEE ITEM DETAIL SHEETS FOR SPECIFIC ACTIONS AT EACH STRUCTURE (SHEETS 7-9), TYPICAL TRAIL SECTION DETAILS (SHEETS 10-11), TYPICAL CULVERT SECTION DETAILS (SHEETS 24-26), AND WASTE AREA DETAILS (SHEET 28).





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March 23, 2021



0 100 200 400 Feet

Sources:  
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TYPICAL TRAIL SECTION DETAILS (SHEETS 10-11),  
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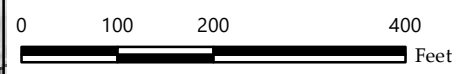
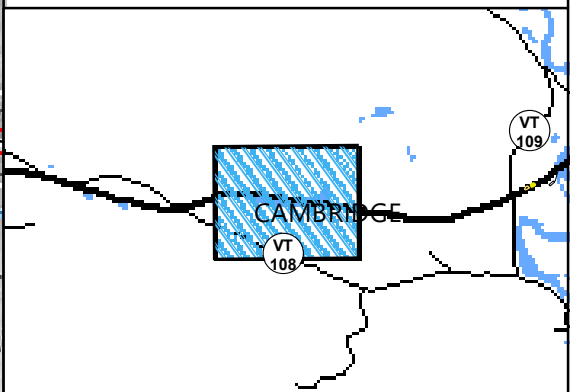
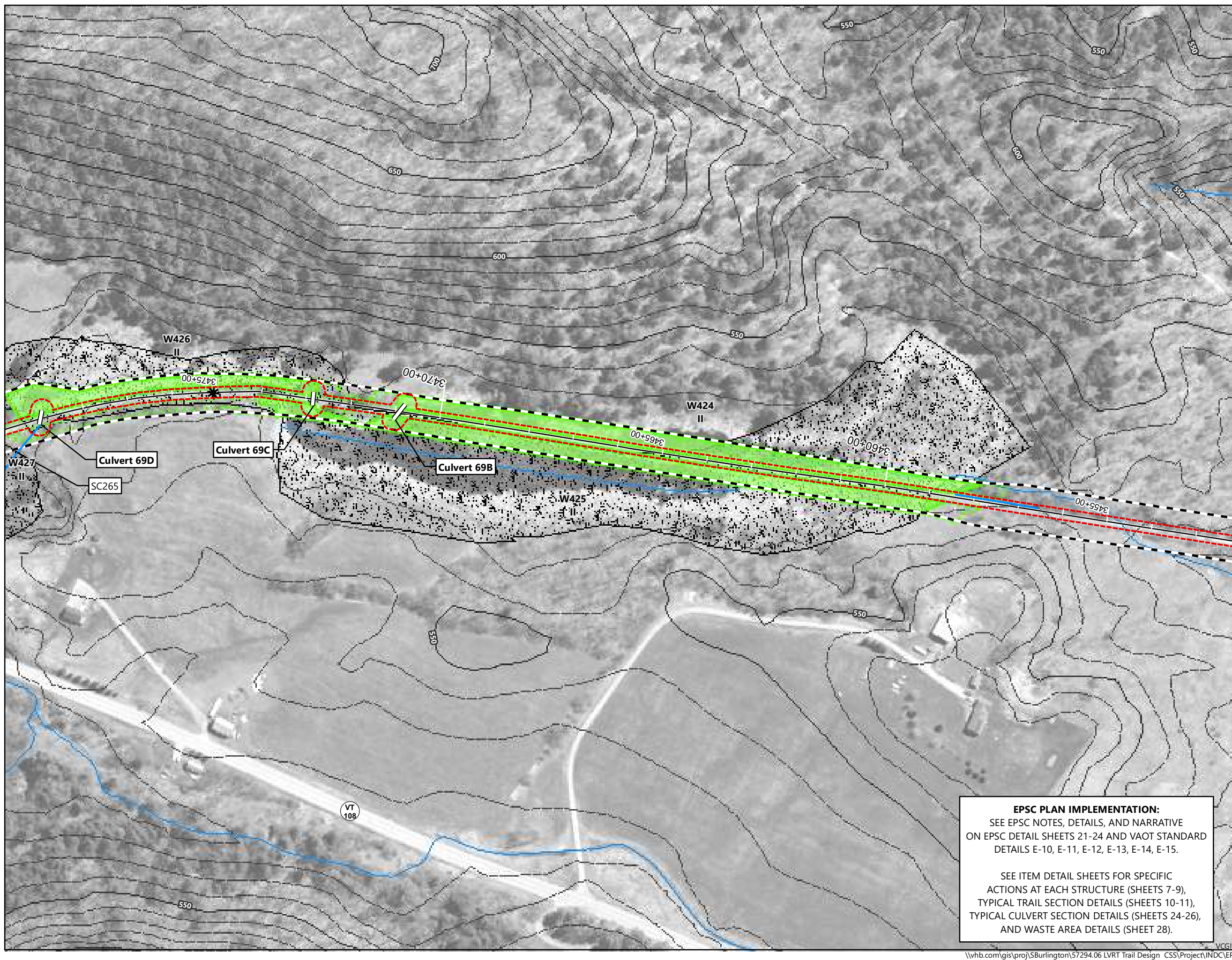


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
  - ⬢ Cattlepass
  - ⊕ Crossing
  - ✱ Unauthorized Crossing
  - ⬢ Trailhead
  - ⬢ Bridges
  - ⬢ Proposed Pause Place
  - ⬢ Washouts
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  - Delineated Stream (2017)
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  - ⬢ Electric Transmission Lines
  - ⬢ Parcel Boundary
  - ⬢ Historic Site
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



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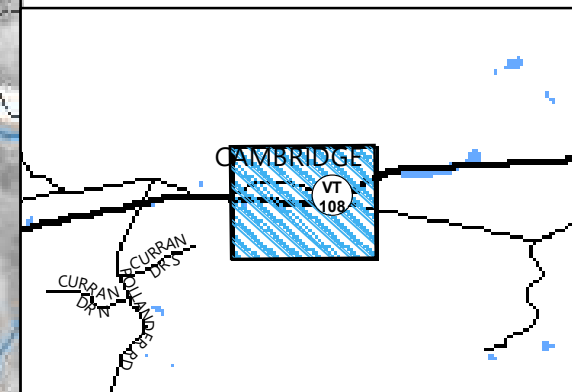
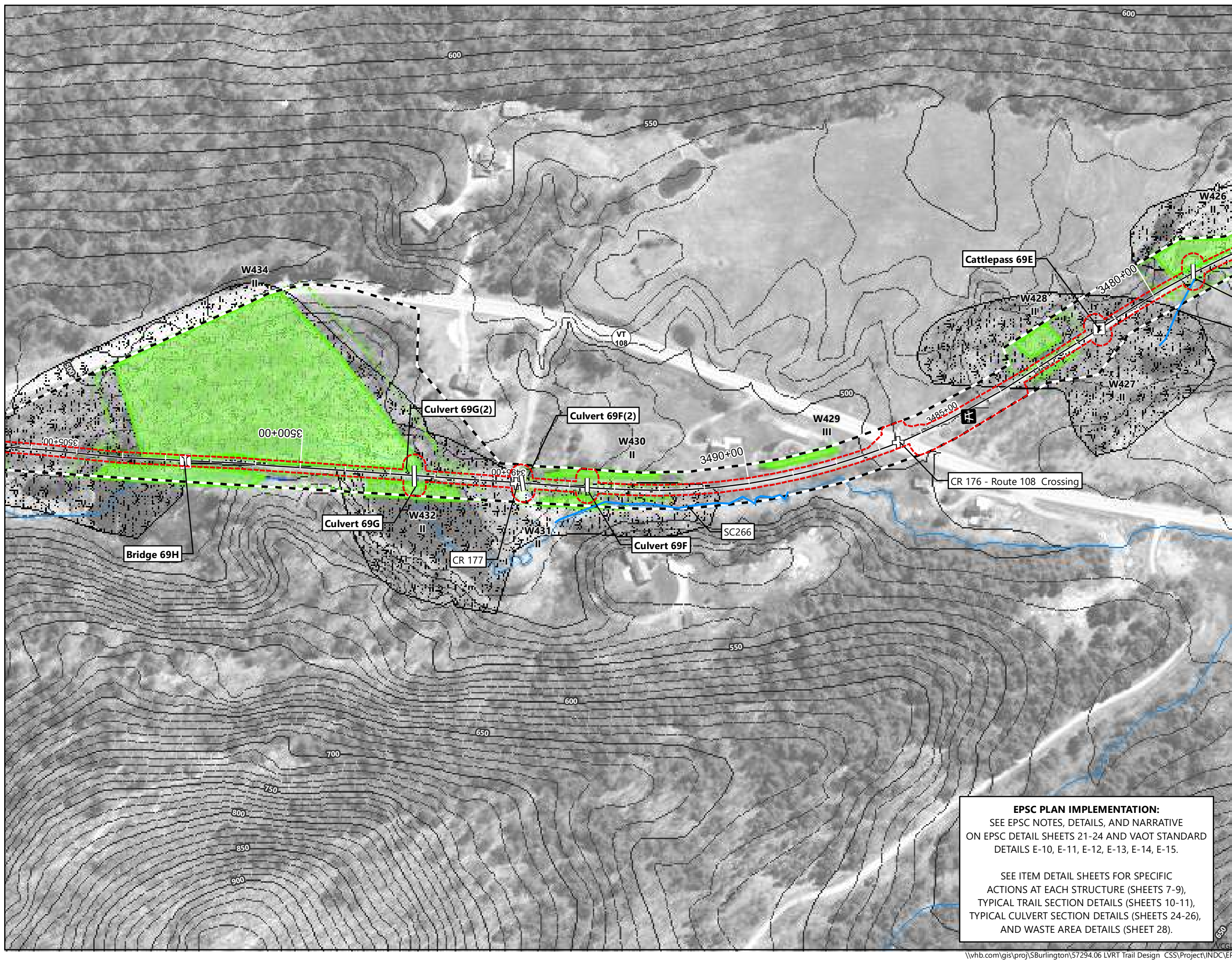


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline
  - Right of Way
  - Limit of Disturbance
  - Temp. Impacts Below OHW
  - Culvert
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**EPSC PLAN IMPLEMENTATION:**  
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ON EPSC DETAIL SHEETS 21-24 AND VAOT STANDARD  
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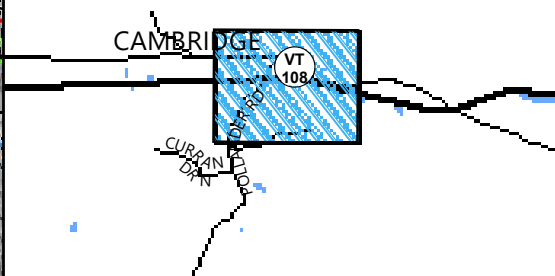


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

Sheet 50 of 84

March 23, 2021

- LVRT Centerline
  - ⬢ Right of Way
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Sources:  
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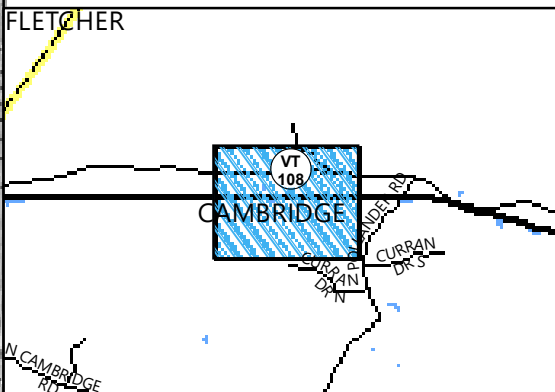


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬢ Right of Way            | 🚚 Washouts                       |
| ⬢ Limit of Disturbance    | 🌊 RTE Site                       |
| ⬢ Temp. Impacts Below OHW | ▨ RTE Area (2008)                |
| — Culvert                 | 🌿 Class II Wetland Buffer (50ft) |
| 🚚 Cattlepass              | 🌿 Delineated Wetland (2017-2020) |
| ⊕ Crossing                | — Delineated Stream (2017)       |
| ✱ Unauthorized Crossing   | — Delineated Stream (2008)       |
| 📍 Trailhead               | 🌿 VSWI Wetland                   |
| 🌉 Bridges                 | — VHD Stream                     |
| W001: Wetlands            | ⋯ Other Existing Trail           |
| TB001: Top of Bank        | — Electric Transmission Lines    |
| SC001: Stream Center      | ▭ Parcel Boundary                |
|                           | 🏠 Historic Site                  |



Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).

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St. Johnsbury - Swanton  
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Layout Plan

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March 23, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Unauthorized Crossing

Trailhead

Bridges

W001: Wetlands

TB001: Top of Bank

SC001: Stream Center
- Proposed Pause Place

Washouts

RTE Site

RTE Area (2008)

Class II Wetland Buffer (50ft)

Delineated Wetland (2017-2020)

Delineated Stream (2017)

Delineated Stream (2008)

VSWI Wetland

VHD Stream

Other Existing Trail

Electric Transmission Lines

Parcel Boundary

Historic Site

FLETCHER

CAMBRIDGE

0 100 200 400 Feet

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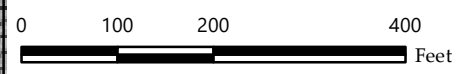
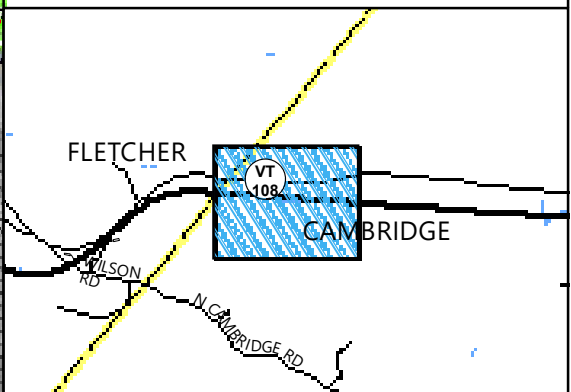
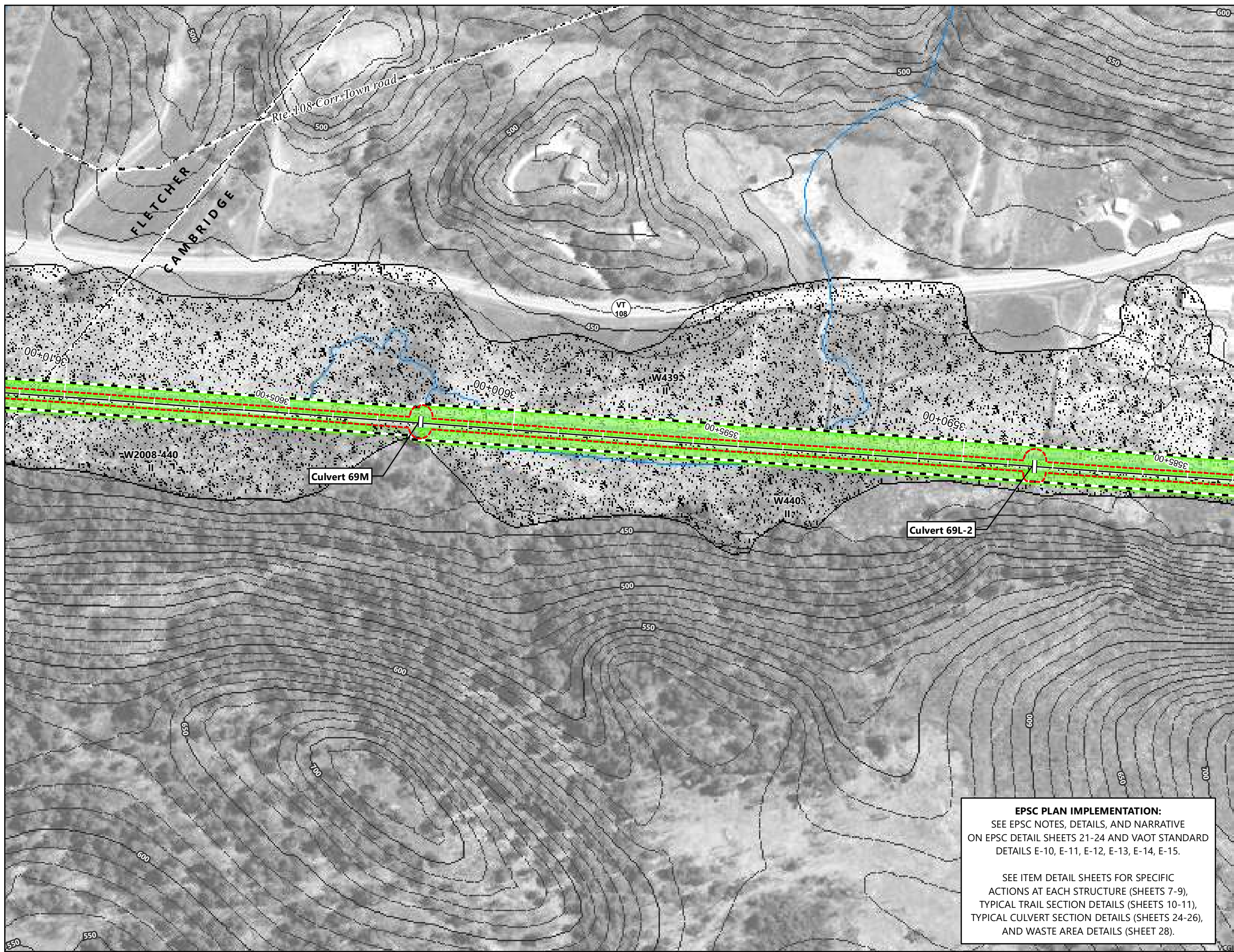


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
  - ⬢ Cattlepass
  - ⊕ Crossing
  - ✱ Unauthorized Crossing
  - ⬢ Trailhead
  - ⬢ Bridges
  - ⬢ Proposed Pause Place
  - ⬢ Washouts
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  - ⬢ Delineated Stream (2008)
  - ⬢ VSWI Wetland
  - ⬢ VHD Stream
  - ⬢ Other Existing Trail
  - ⬢ Electric Transmission Lines
  - ⬢ Parcel Boundary
  - ⬢ Historic Site
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



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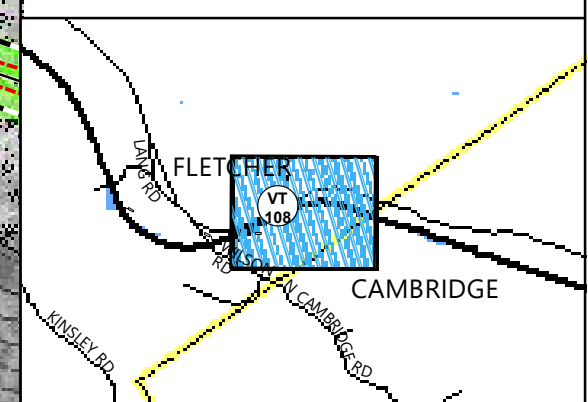


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

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  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
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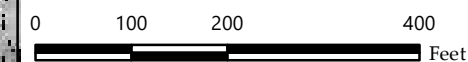
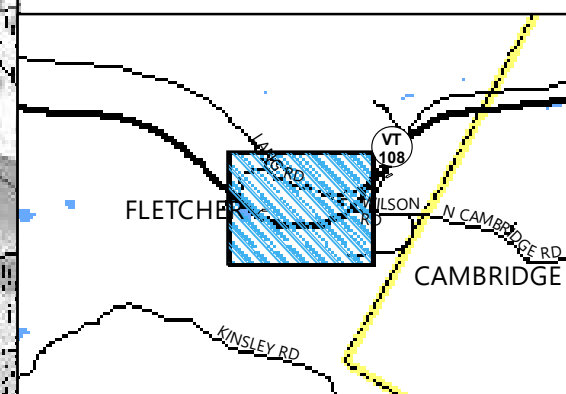
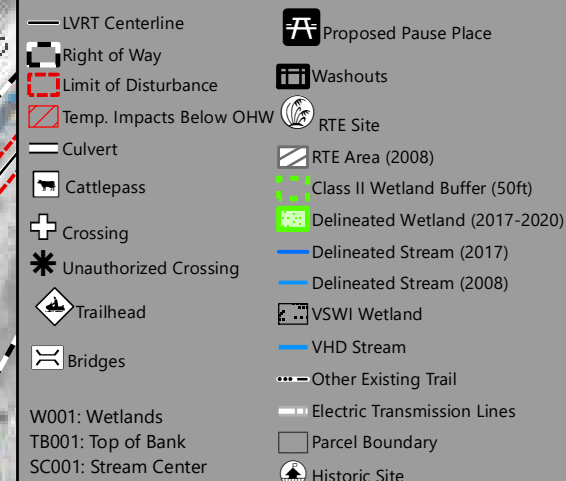
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March 23, 2021



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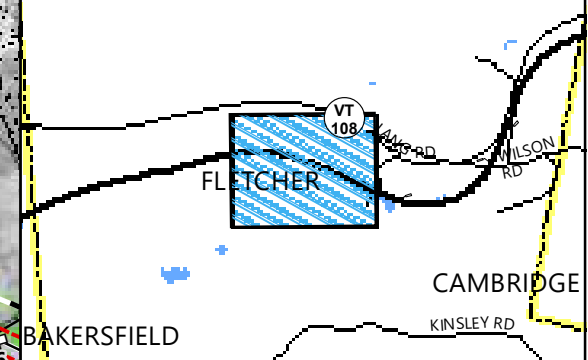


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬢ Right of Way            | 🚚 Washouts                       |
| ⬢ Limit of Disturbance    | 🌀 RTE Site                       |
| ⬢ Temp. Impacts Below OHW | ▨ RTE Area (2008)                |
| — Culvert                 | 🌿 Class II Wetland Buffer (50ft) |
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| ✳ Unauthorized Crossing   | 📏 Delineated Stream (2008)       |
| 📍 Trailhead               | 🌿 VSWI Wetland                   |
| 🌉 Bridges                 | 📏 VHD Stream                     |
|                           | ⋯ Other Existing Trail           |
|                           | ⚡ Electric Transmission Lines    |
| W001: Wetlands            | ▭ Parcel Boundary                |
| TB001: Top of Bank        | 🏠 Historic Site                  |
| SC001: Stream Center      |                                  |



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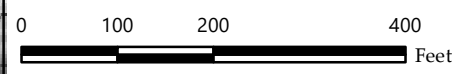
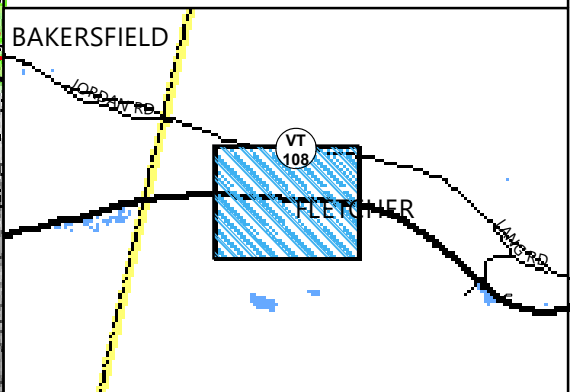
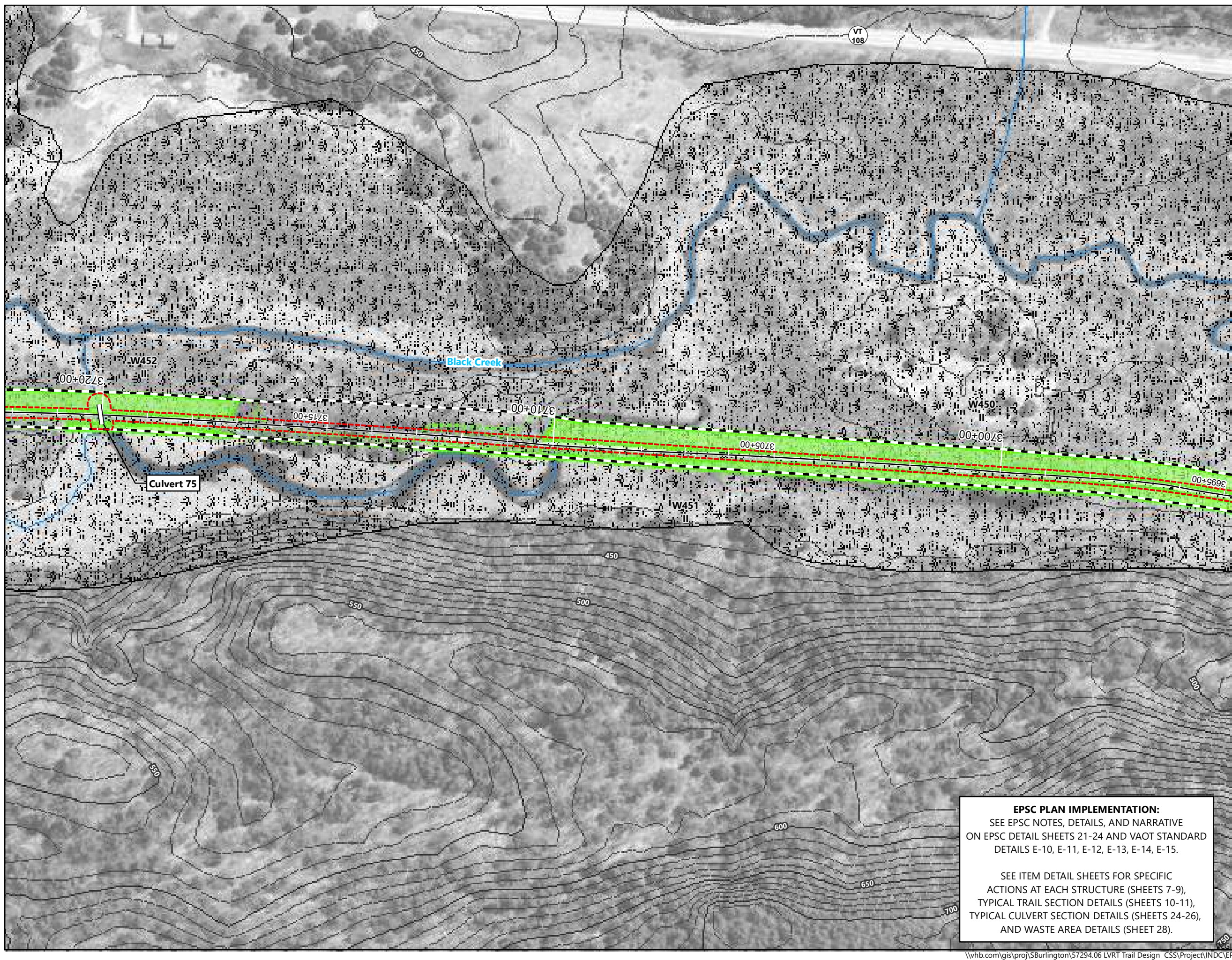


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

Sheet 57 of 84

March 23, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
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| ⬢ Right of Way            | 🚚 Washouts                       |
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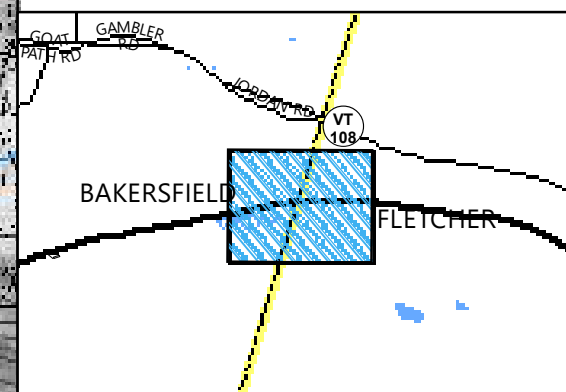
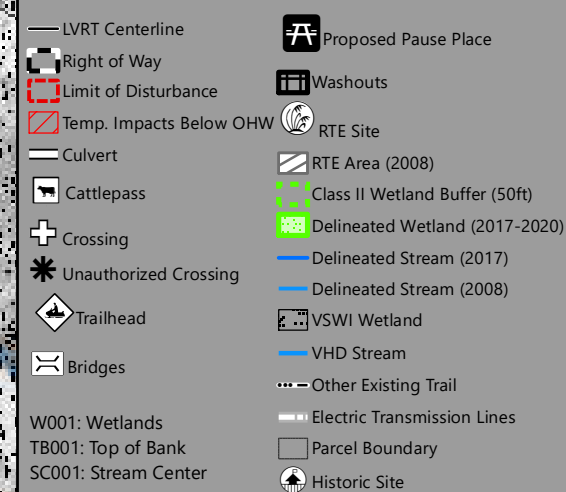
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March 23, 2021



0 100 200 400 Feet

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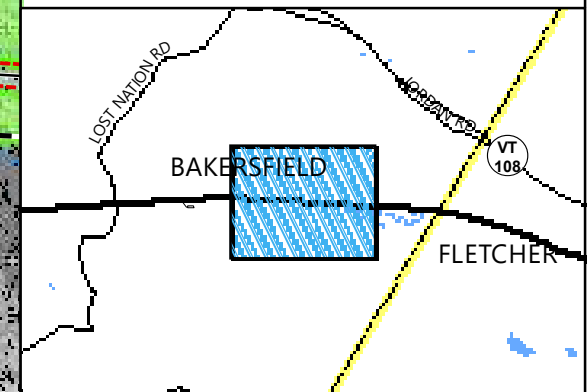
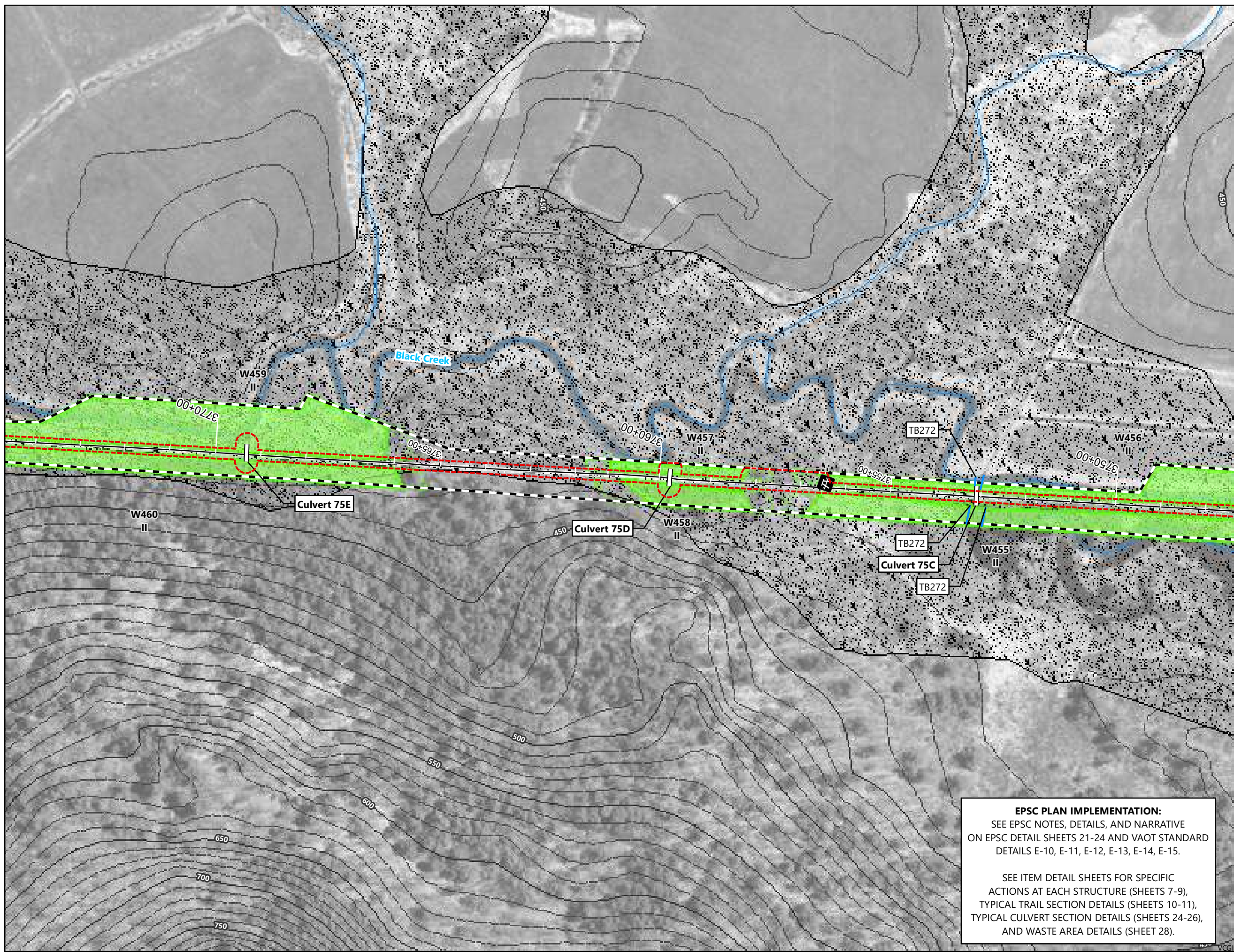


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
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March 23, 2021

- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
  - ⬢ Cattlepass
  - ⊕ Crossing
  - ✱ Unauthorized Crossing
  - ⬢ Trailhead
  - ⬢ Bridges
  - ⬢ Proposed Pause Place
  - ⬢ Washouts
  - ⬢ RTE Site
  - ⬢ RTE Area (2008)
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  - ⬢ Delineated Stream (2017)
  - ⬢ Delineated Stream (2008)
  - ⬢ VSWI Wetland
  - ⬢ VHD Stream
  - ⬢ Other Existing Trail
  - ⬢ Electric Transmission Lines
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SC001: Stream Center



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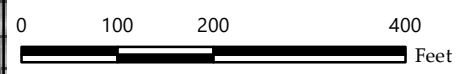
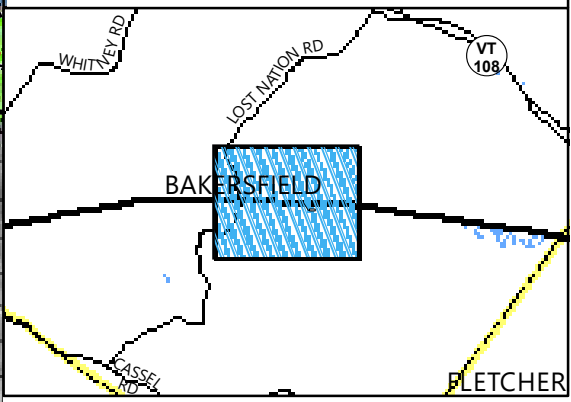
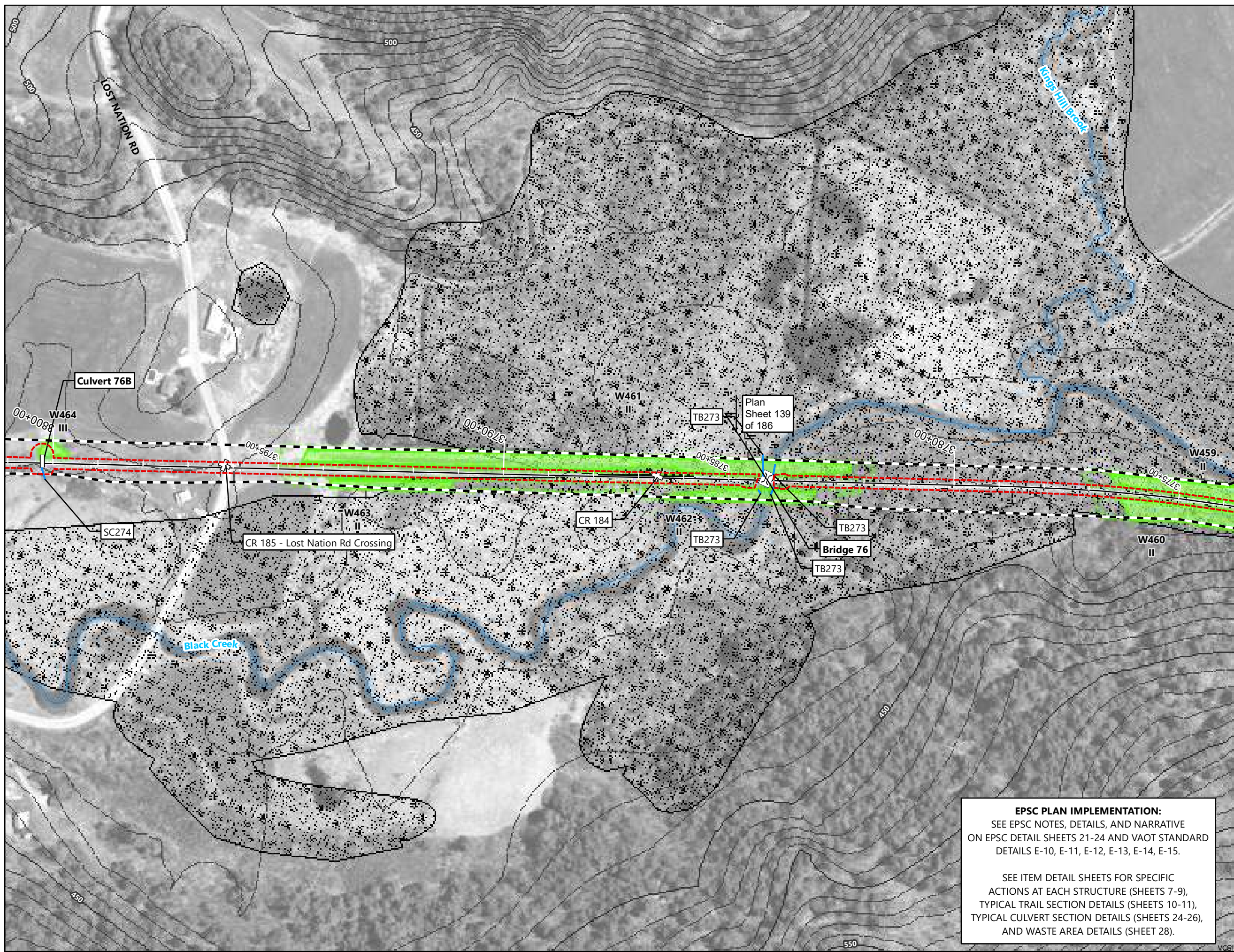


St. Johnsbury - Swanton  
STP-LVRT(11)  
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Layout Plan

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March 23, 2021

- |                           |                                  |
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| ⬢ Right of Way            | 🚚 Washouts                       |
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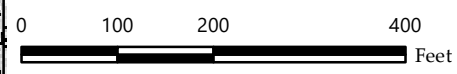
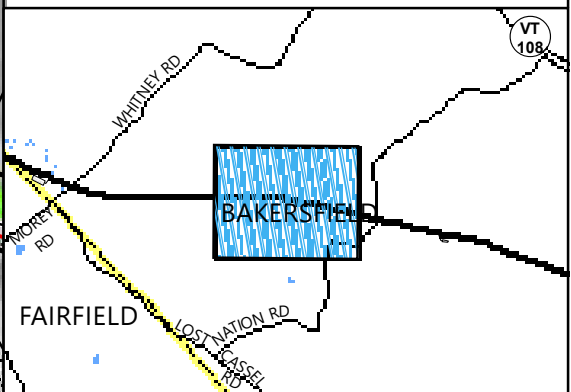
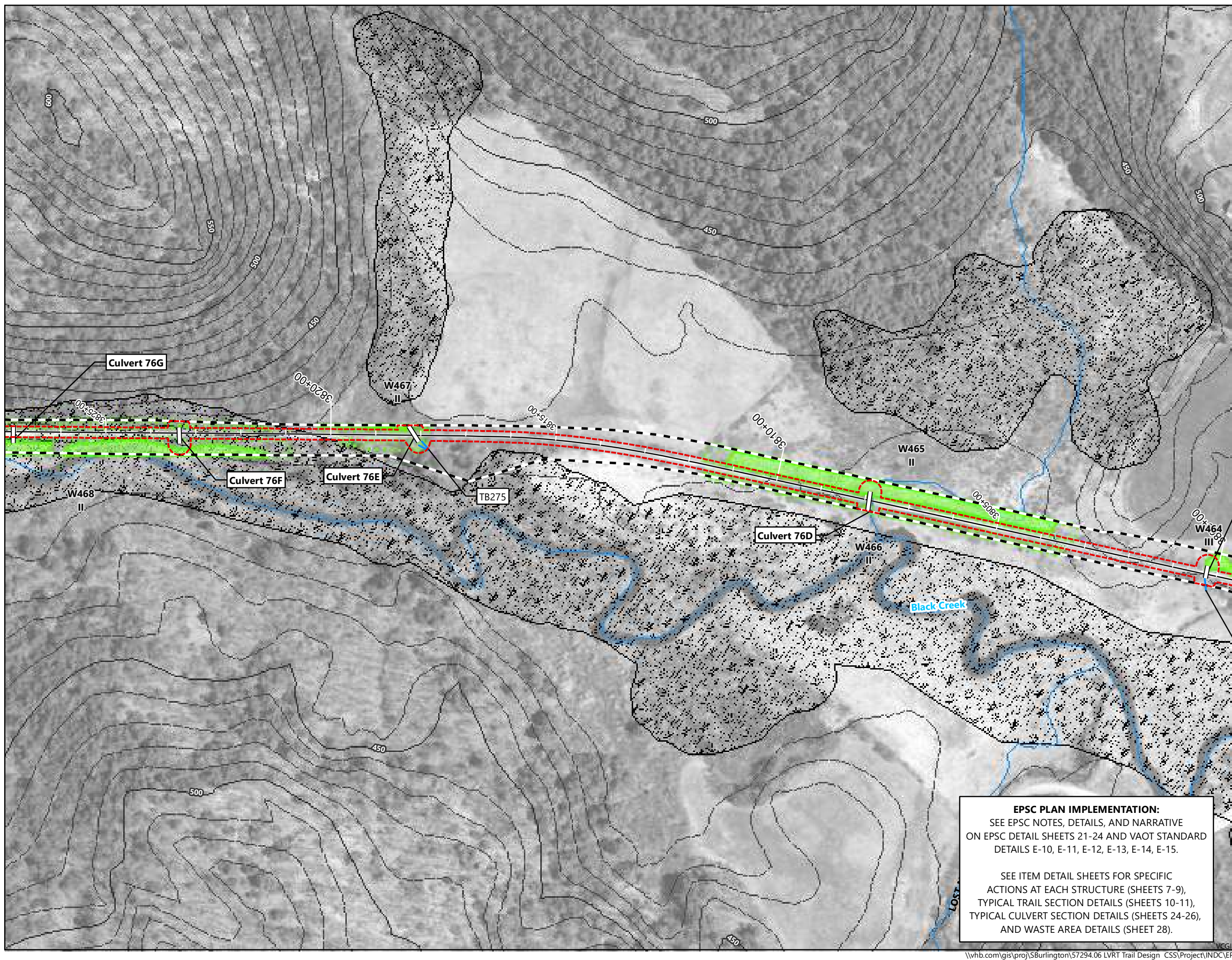


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
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March 23, 2021

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  - ⬢ Temp. Impacts Below OHW
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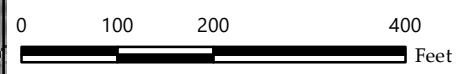
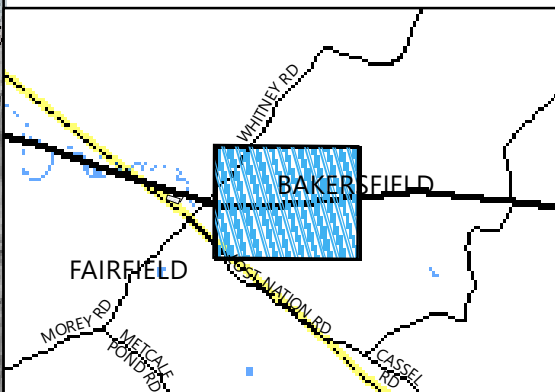


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
  - ⬢ Cattlepass
  - ⊕ Crossing
  - ✱ Unauthorized Crossing
  - ⬢ Trailhead
  - ⬢ Bridges
  - ⬢ Proposed Pause Place
  - ⬢ Washouts
  - ⬢ RTE Site
  - ⬢ RTE Area (2008)
  - ⬢ Class II Wetland Buffer (50ft)
  - ⬢ Delineated Wetland (2017-2020)
  - ⬢ Delineated Stream (2017)
  - ⬢ Delineated Stream (2008)
  - ⬢ VSWI Wetland
  - ⬢ VHD Stream
  - ⬢ Other Existing Trail
  - ⬢ Electric Transmission Lines
  - ⬢ Parcel Boundary
  - ⬢ Historic Site
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



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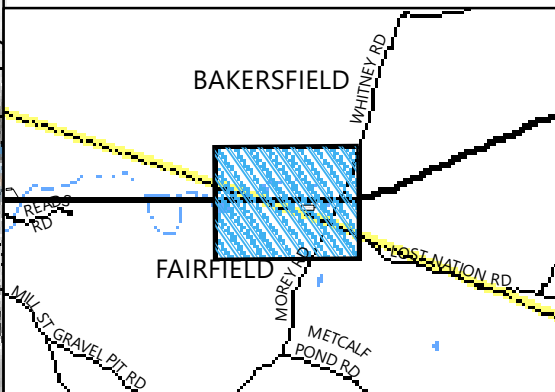
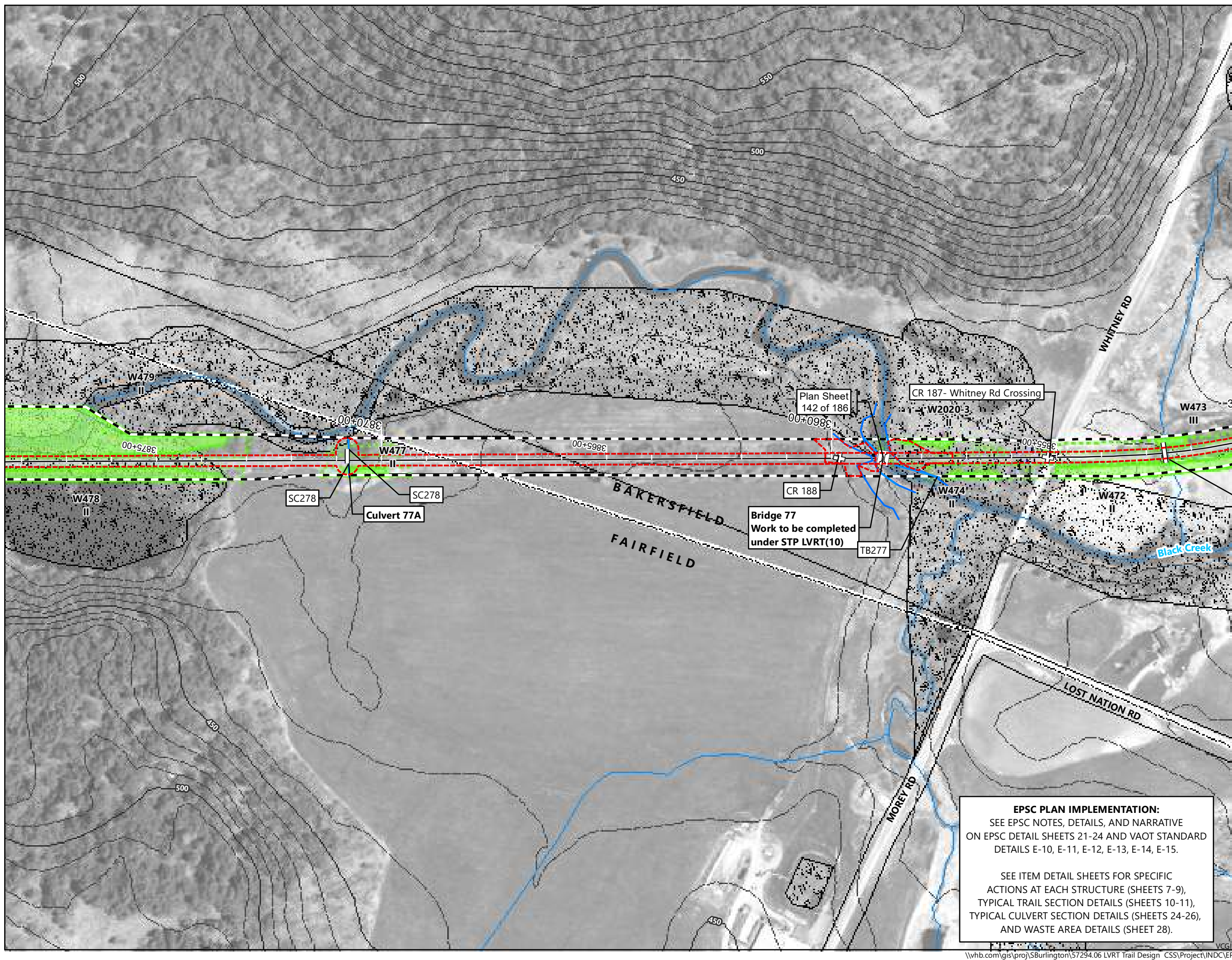


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

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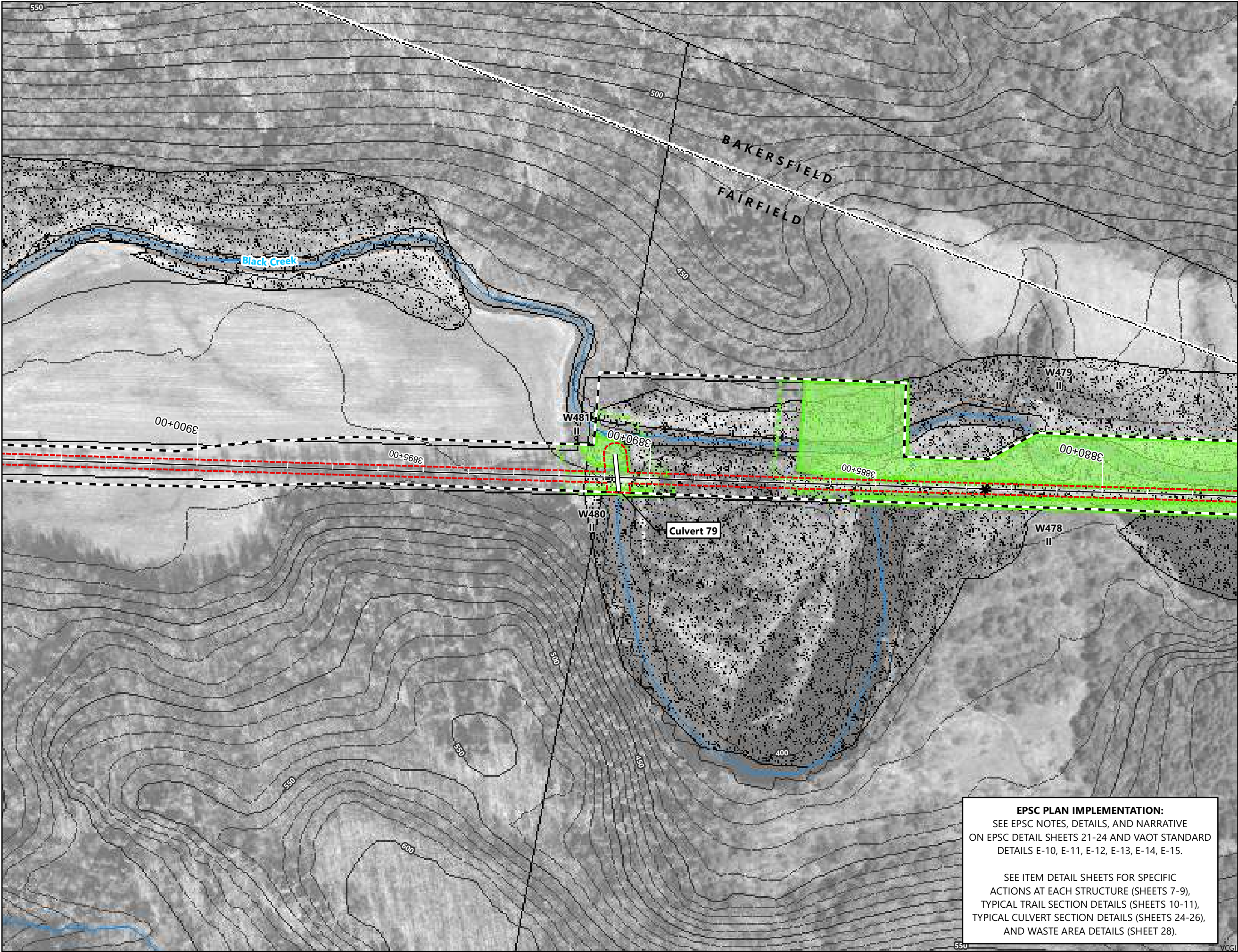


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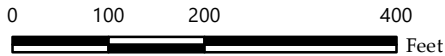
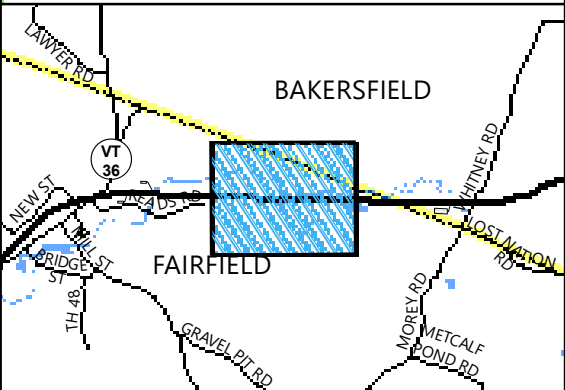


St. Johnsbury - Swanton  
STP-LVRT(11)  
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March 23, 2021

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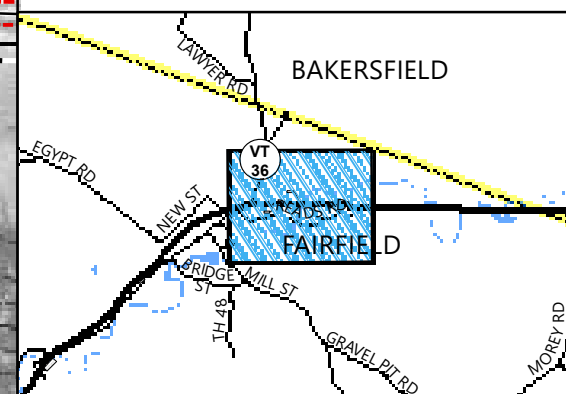
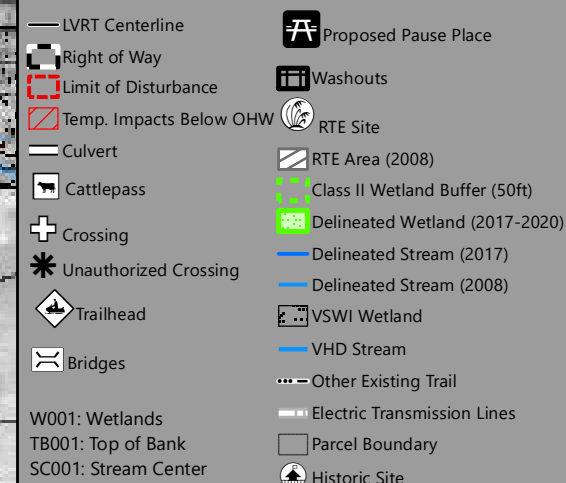
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March 23, 2021



0 100 200 400 Feet

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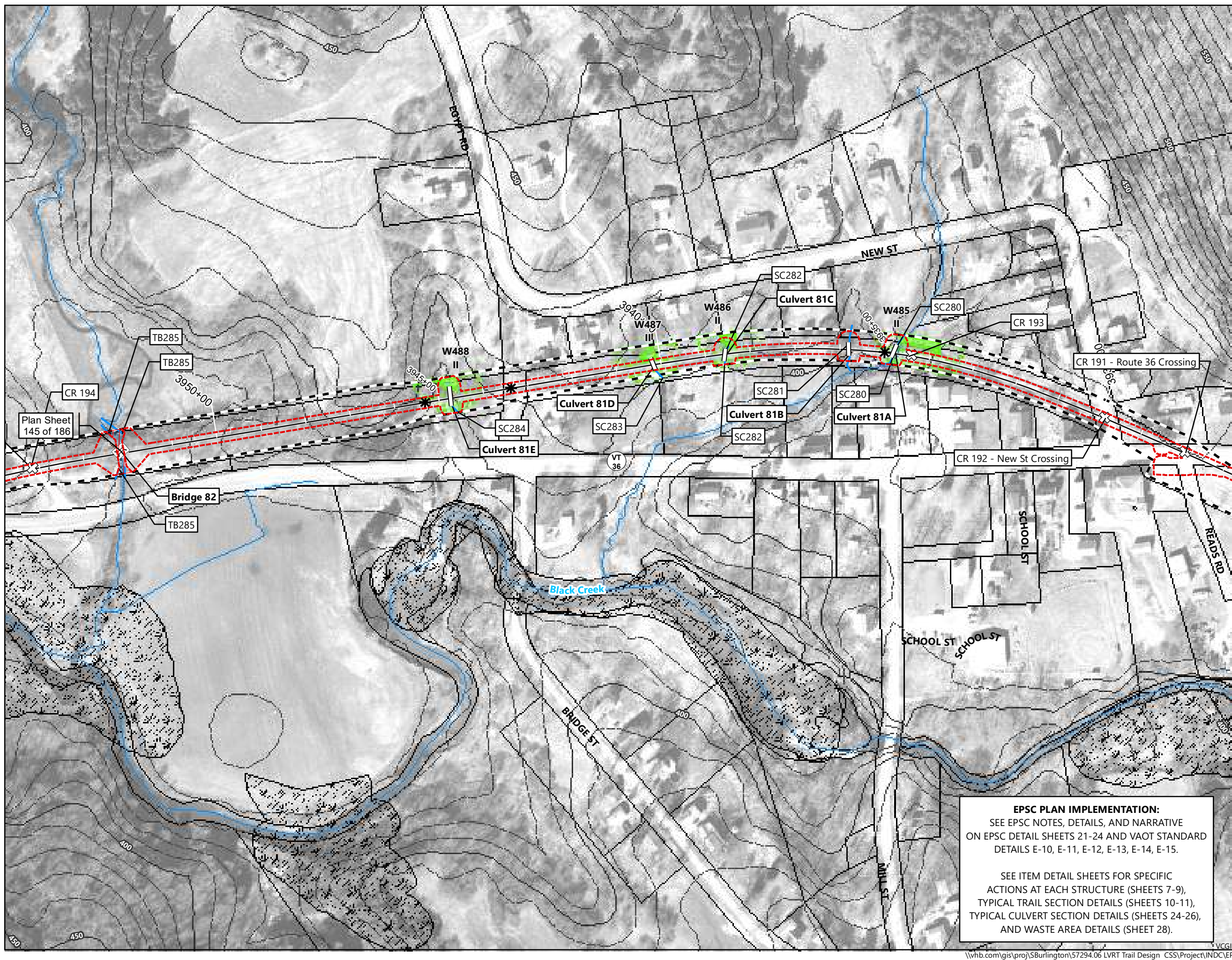




St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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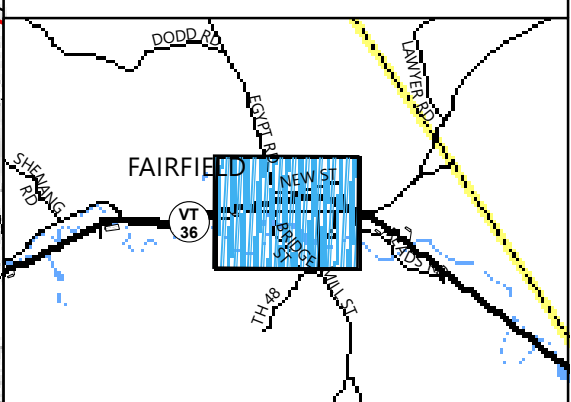
March 23, 2021



— LVRT Centerline  
— Right of Way  
— Limit of Disturbance  
— Temp. Impacts Below OHW  
— Culvert  
— Cattlepass  
+ Crossing  
* Unauthorized Crossing  
— Trailhead  
— Bridges

Proposed Pause Place  
Washouts  
RTE Site  
RTE Area (2008)  
Class II Wetland Buffer (50ft)  
Delineated Wetland (2017-2020)  
Delineated Stream (2017)  
Delineated Stream (2008)  
VSWI Wetland  
VHD Stream  
Other Existing Trail  
Electric Transmission Lines  
Parcel Boundary  
Historic Site

W001: Wetlands  
TB001: Top of Bank  
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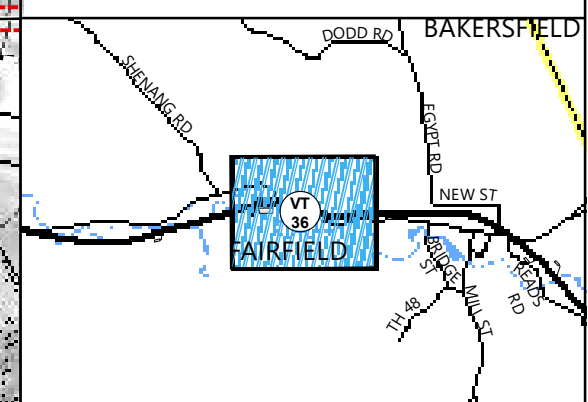
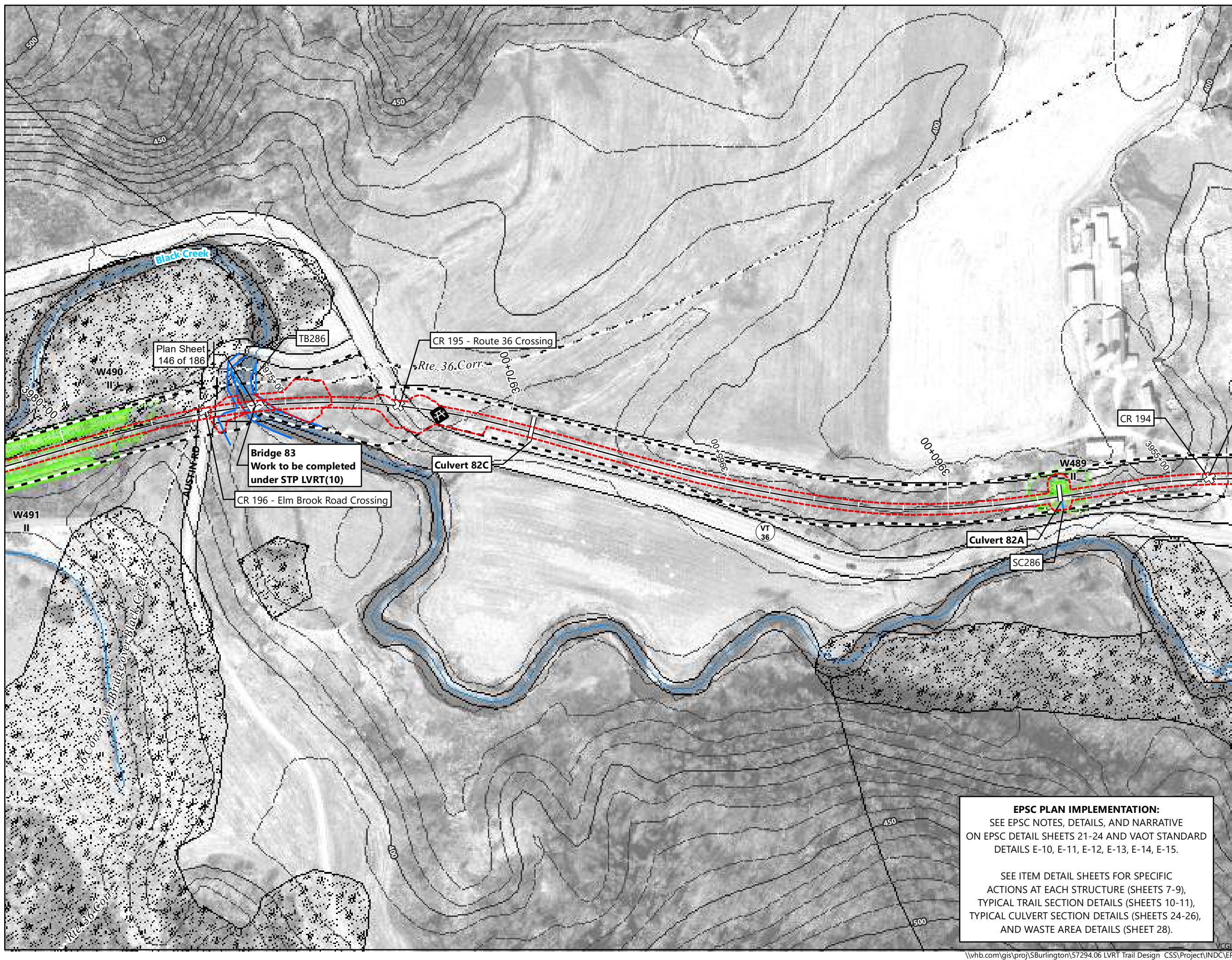


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
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  - Culvert
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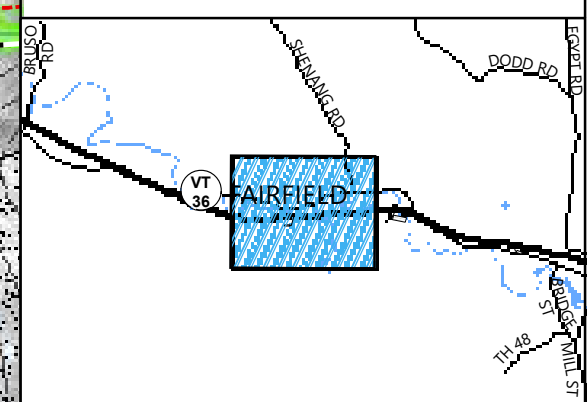
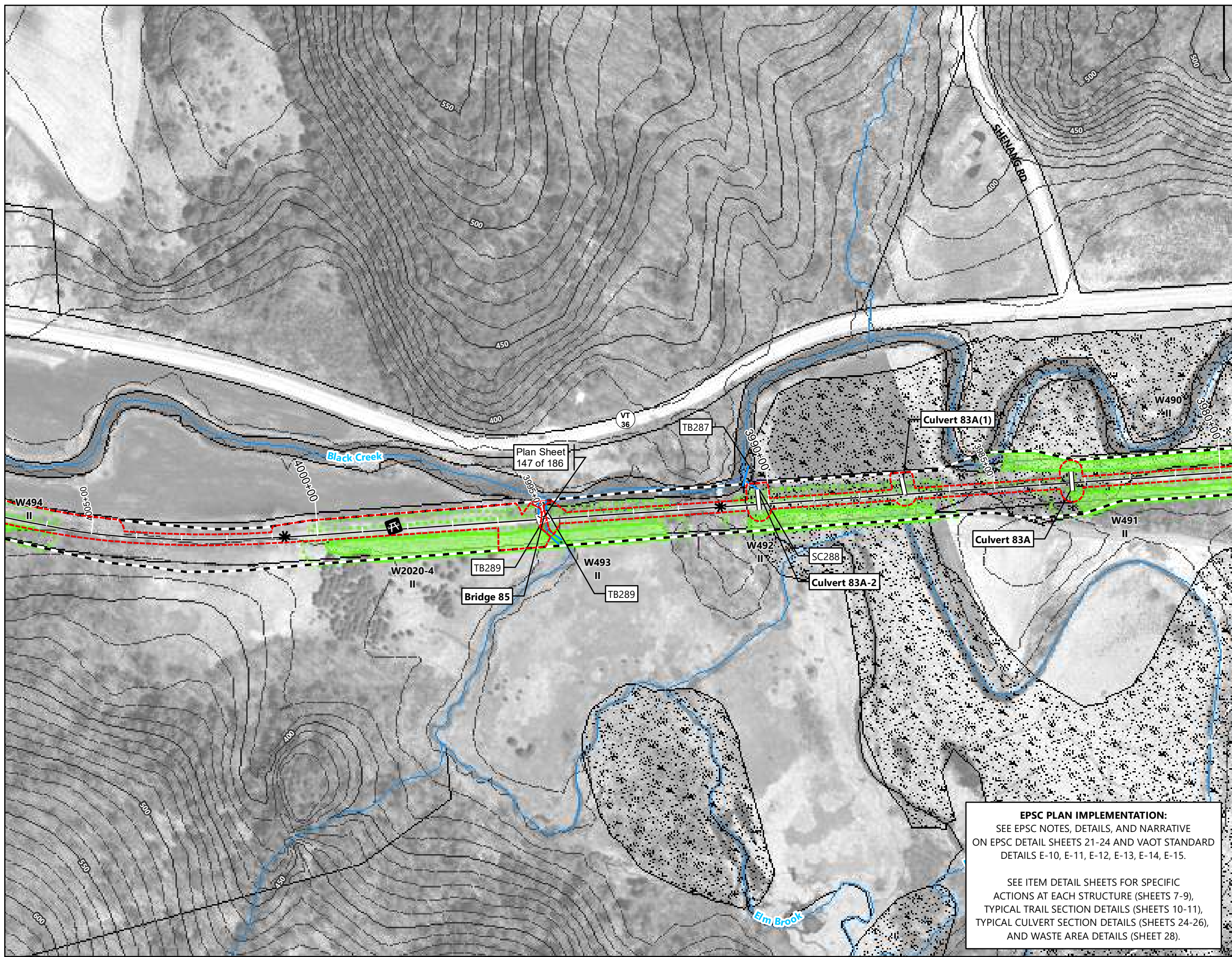


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

Sheet 68 of 84

March 23, 2021

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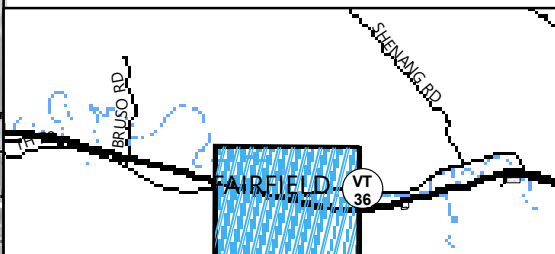


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬢ Right of Way            | 🚚 Washouts                       |
| ⬢ Limit of Disturbance    | 🌊 RTE Site                       |
| ⬢ Temp. Impacts Below OHW | ▨ RTE Area (2008)                |
| — Culvert                 | 🌿 Class II Wetland Buffer (50ft) |
| 🚚 Cattlepass              | 🌿 Delineated Wetland (2017-2020) |
| ⊕ Crossing                | — Delineated Stream (2017)       |
| ✱ Unauthorized Crossing   | — Delineated Stream (2008)       |
| 🏠 Trailhead               | 🌿 VSWI Wetland                   |
| 🌉 Bridges                 | — VHD Stream                     |
|                           | ⋯ Other Existing Trail           |
|                           | — Electric Transmission Lines    |
|                           | ▭ Parcel Boundary                |
|                           | 🏠 Historic Site                  |
- W001: Wetlands  
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0 100 200 400  
Feet

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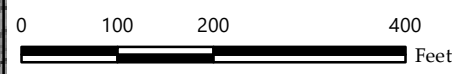
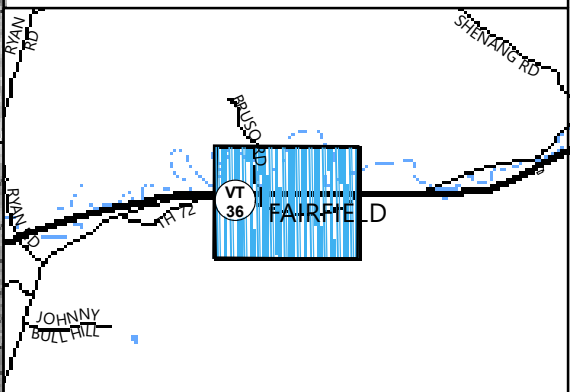
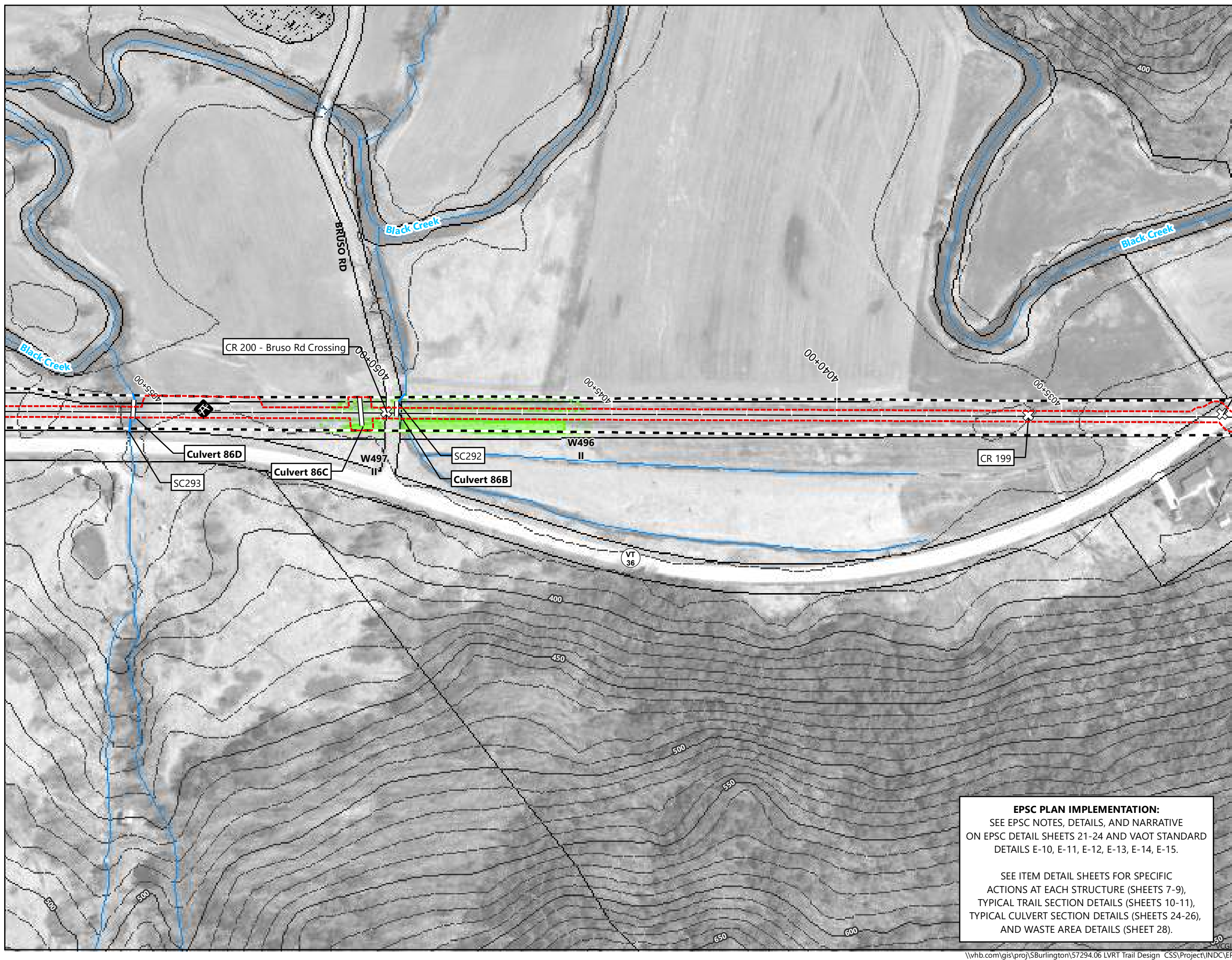


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

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  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
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  - ⬢ Crossing
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St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Unauthorized Crossing

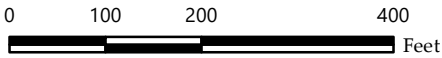
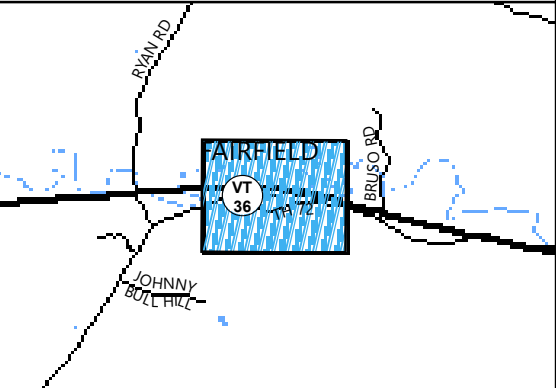
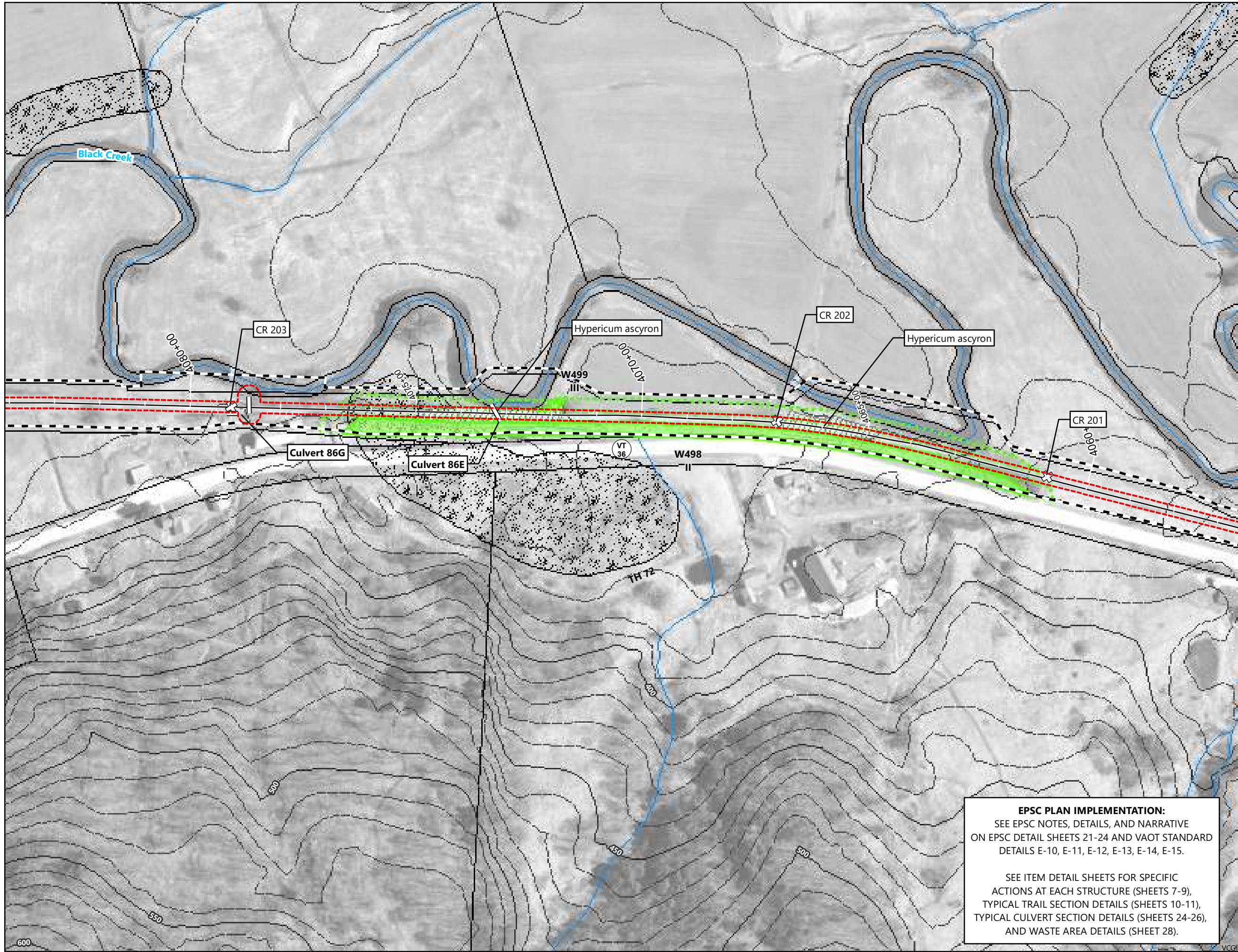
Trailhead

Bridges
- Proposed Pause Place
- Washouts
- RTE Site
- RTE Area (2008)
- Class II Wetland Buffer (50ft)
- Delineated Wetland (2017-2020)
- Delineated Stream (2017)
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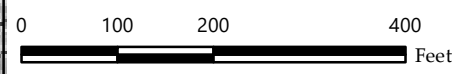
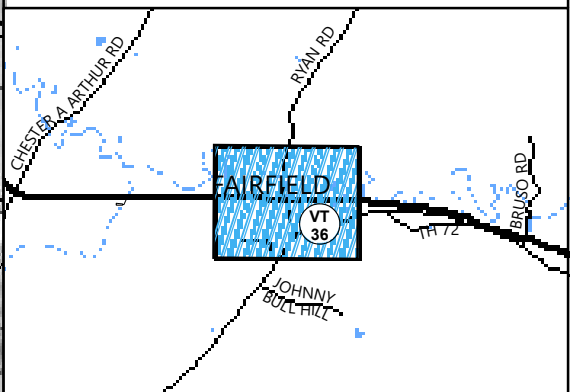
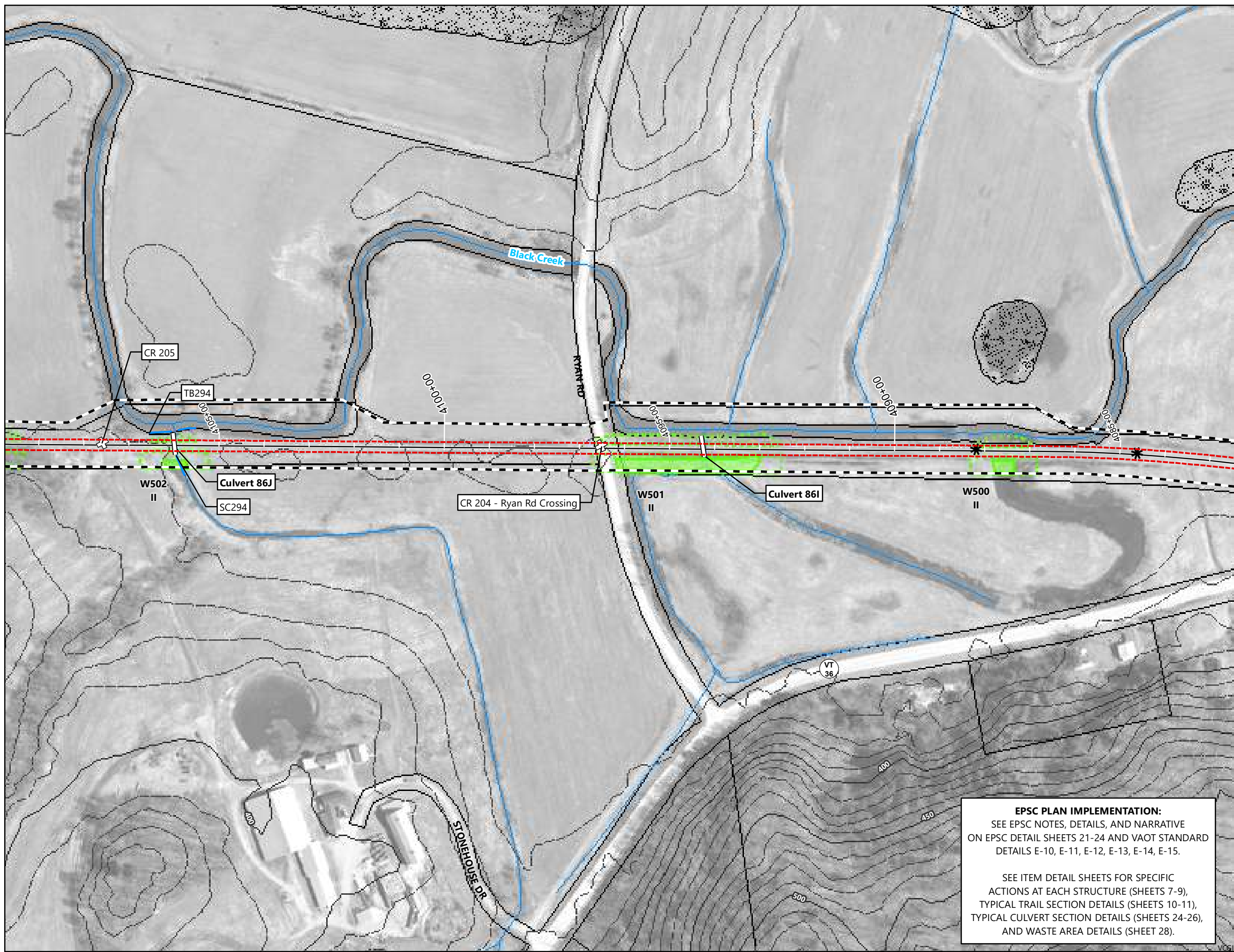


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- |                         |                                |
|-------------------------|--------------------------------|
| — LVRT Centerline       | Proposed Pause Place           |
| Right of Way            | Washouts                       |
| Limit of Disturbance    | RTE Site                       |
| Temp. Impacts Below OHW | RTE Area (2008)                |
| — Culvert               | Class II Wetland Buffer (50ft) |
| Cattlepass              | Delineated Wetland (2017-2020) |
| Crossing                | Delineated Stream (2017)       |
| Unauthorized Crossing   | Delineated Stream (2008)       |
| Trailhead               | VSWI Wetland                   |
| Bridges                 | VHD Stream                     |
|                         | Other Existing Trail           |
|                         | Electric Transmission Lines    |
| W001: Wetlands          | Parcel Boundary                |
| TB001: Top of Bank      | Historic Site                  |
| SC001: Stream Center    |                                |



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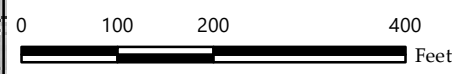
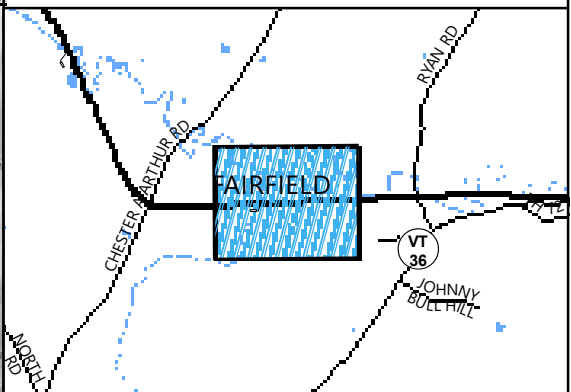
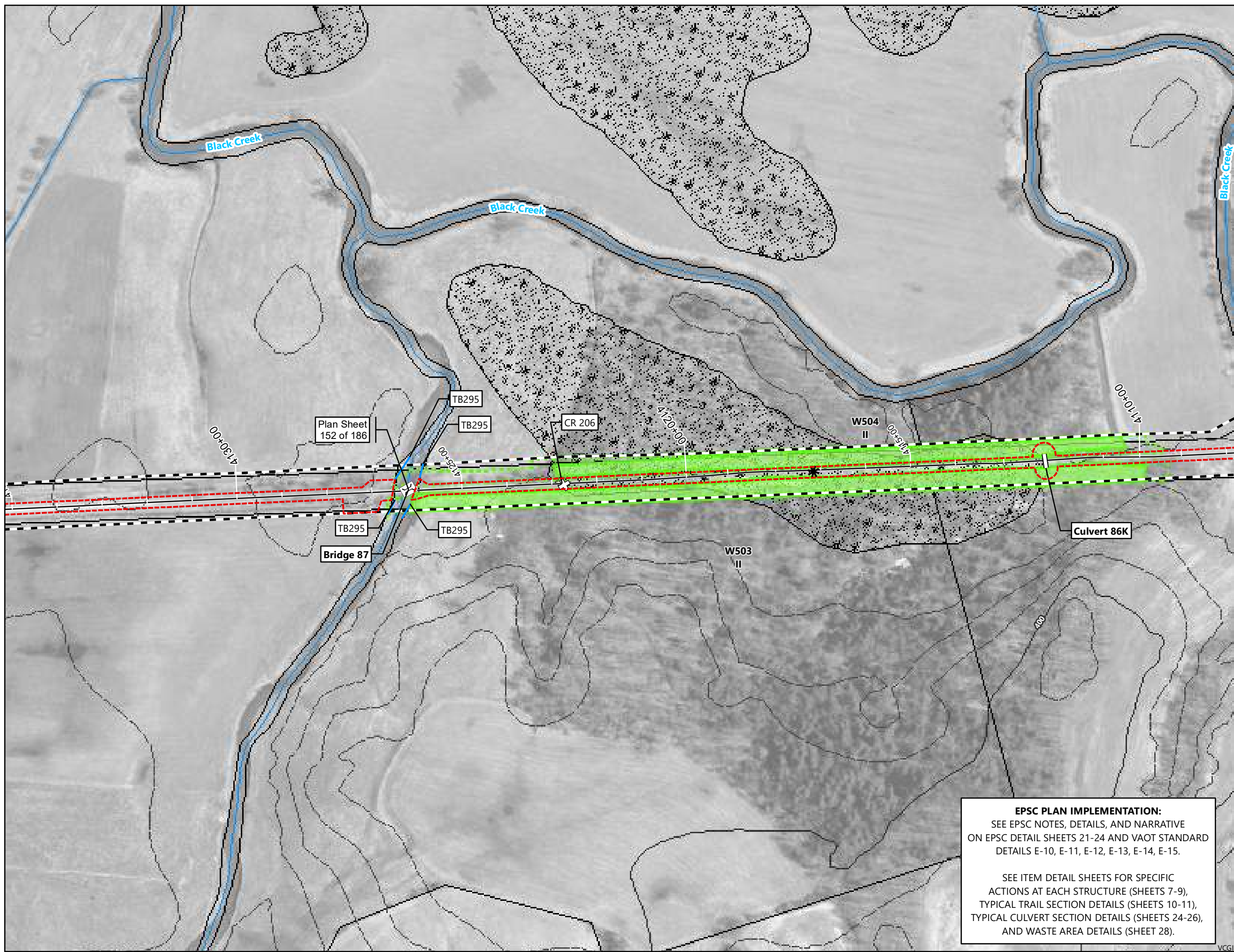


St. Johnsbury - Swanton  
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- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
  - ⬢ Cattlepass
  - ⊕ Crossing
  - ✱ Unauthorized Crossing
  - ⬢ Trailhead
  - ⬢ Bridges
  - ⬢ Proposed Pause Place
  - ⬢ Washouts
  - ⬢ RTE Site
  - ⬢ RTE Area (2008)
  - ⬢ Class II Wetland Buffer (50ft)
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  - ⬢ Delineated Stream (2008)
  - ⬢ VSWI Wetland
  - ⬢ VHD Stream
  - ⬢ Other Existing Trail
  - ⬢ Electric Transmission Lines
  - ⬢ Parcel Boundary
  - ⬢ Historic Site
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



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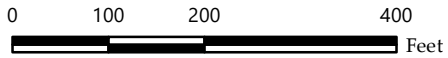
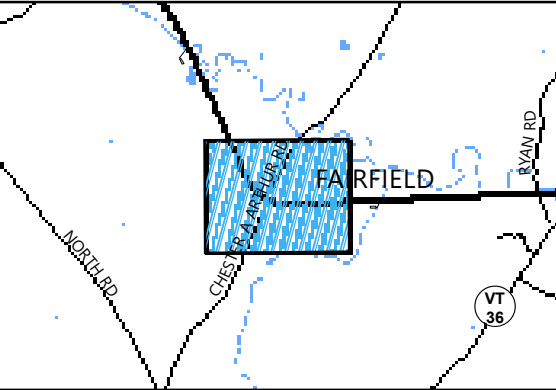


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- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬢ Right of Way            | 🚚 Washouts                       |
| ⬢ Limit of Disturbance    | 🌀 RTE Site                       |
| ⬢ Temp. Impacts Below OHW | ▨ RTE Area (2008)                |
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| 🚚 Cattlepass              | ▨ Delineated Wetland (2017-2020) |
| ⊕ Crossing                | — Delineated Stream (2017)       |
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| 📍 Trailhead               | ▨ VSWI Wetland                   |
| 🌉 Bridges                 | — VHD Stream                     |
|                           | ⋯ Other Existing Trail           |
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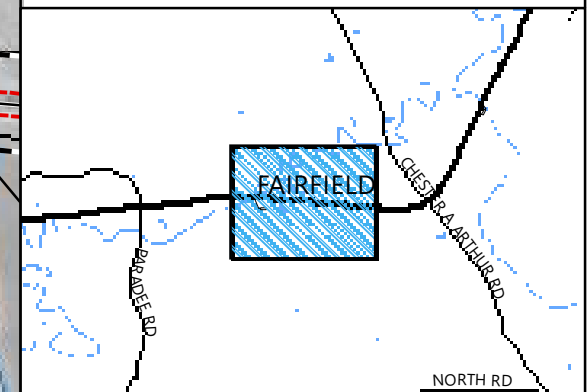
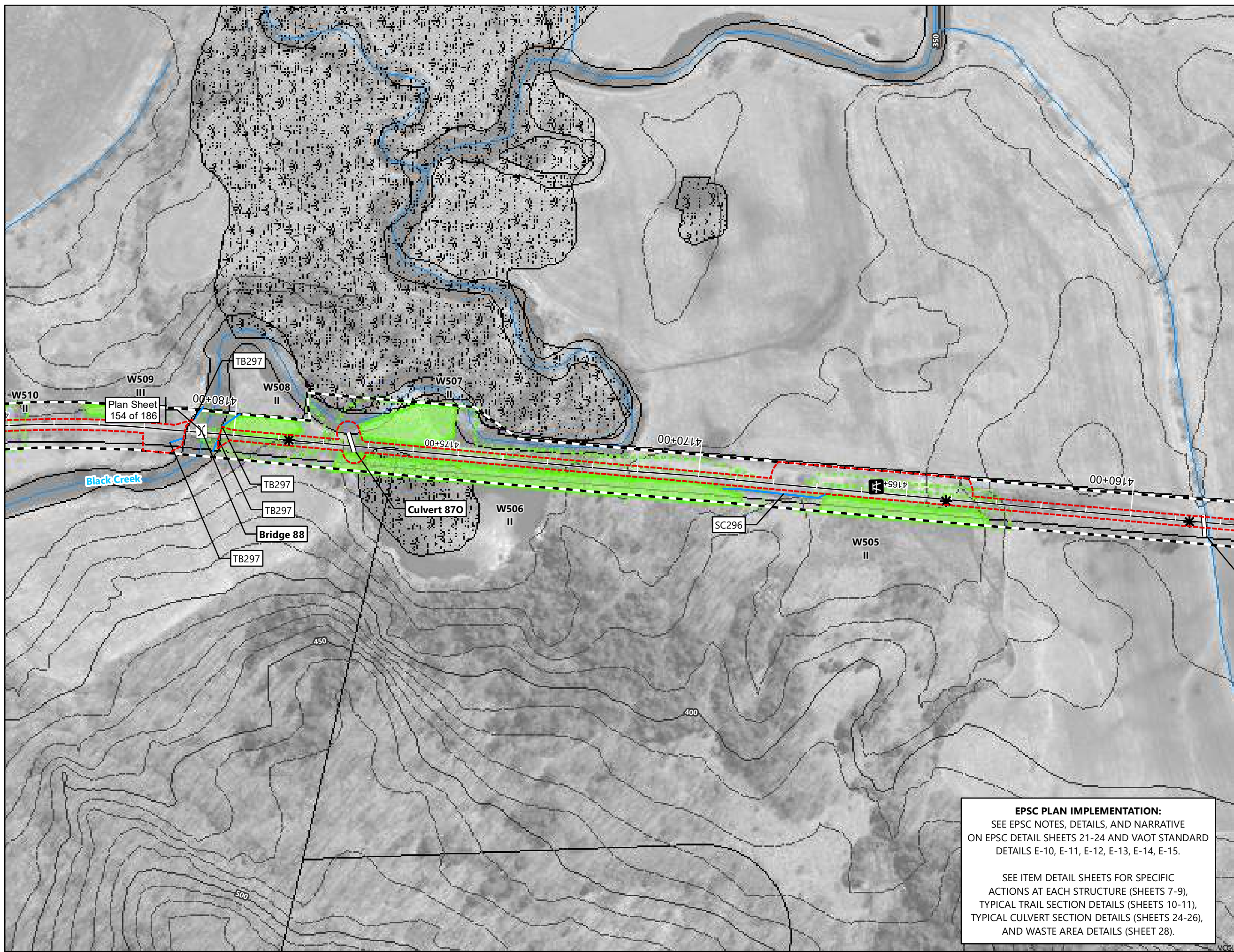


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- |                           |                                  |
|---------------------------|----------------------------------|
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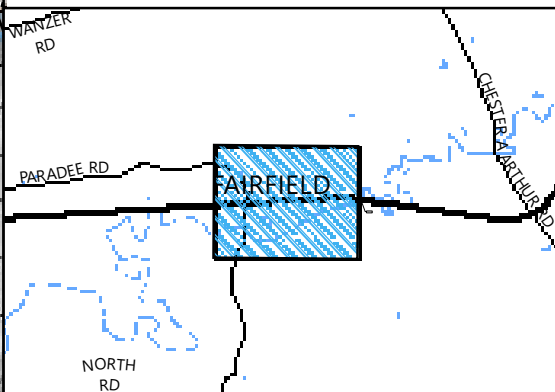
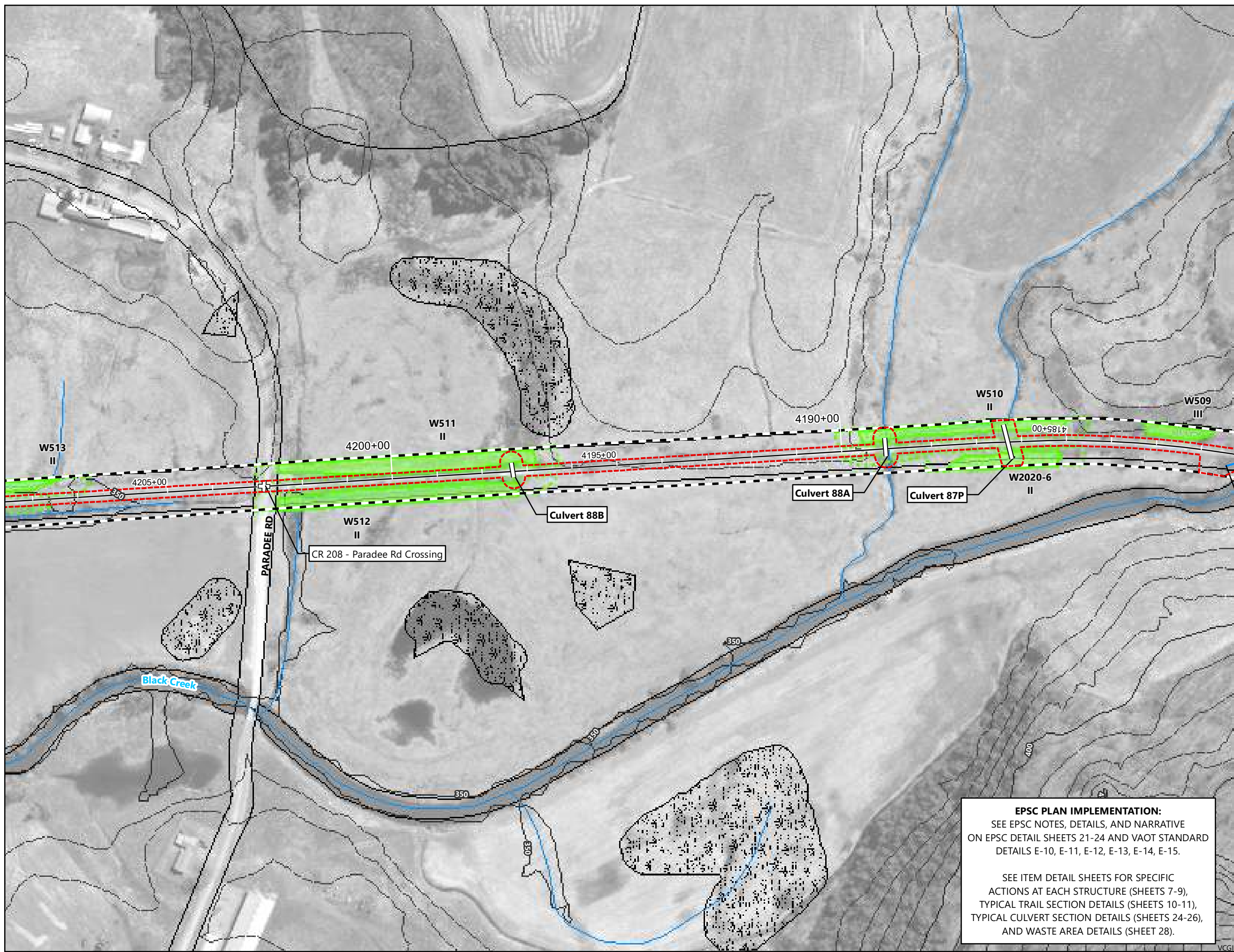


St. Johnsbury - Swanton  
STP-LVRT(11)  
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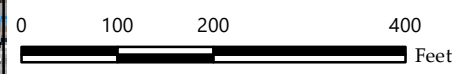
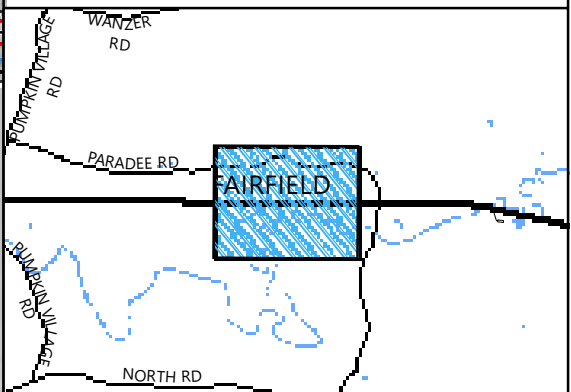
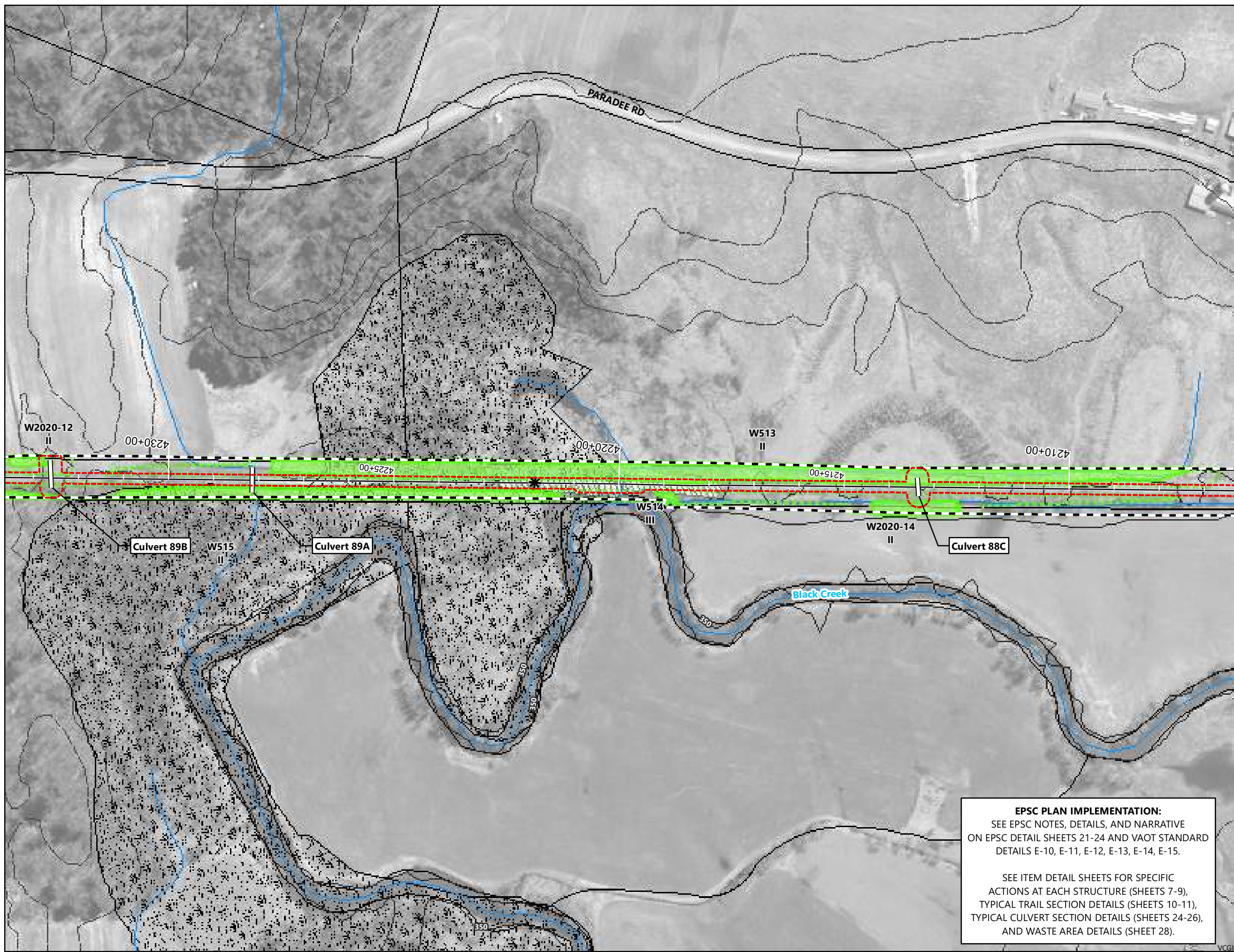


St. Johnsbury - Swanton  
STP-LVRT(11)  
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Layout Plan

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- |                           |                                  |
|---------------------------|----------------------------------|
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| ⬜ Right of Way            | 🚚 Washouts                       |
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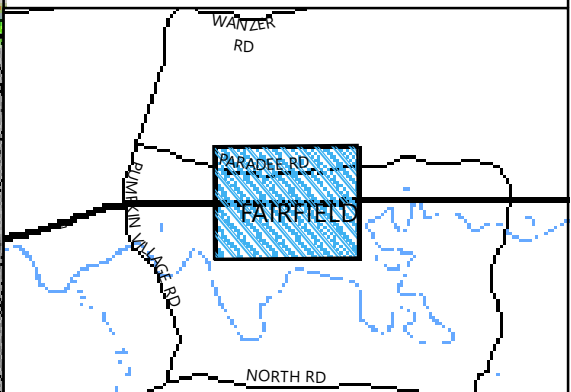
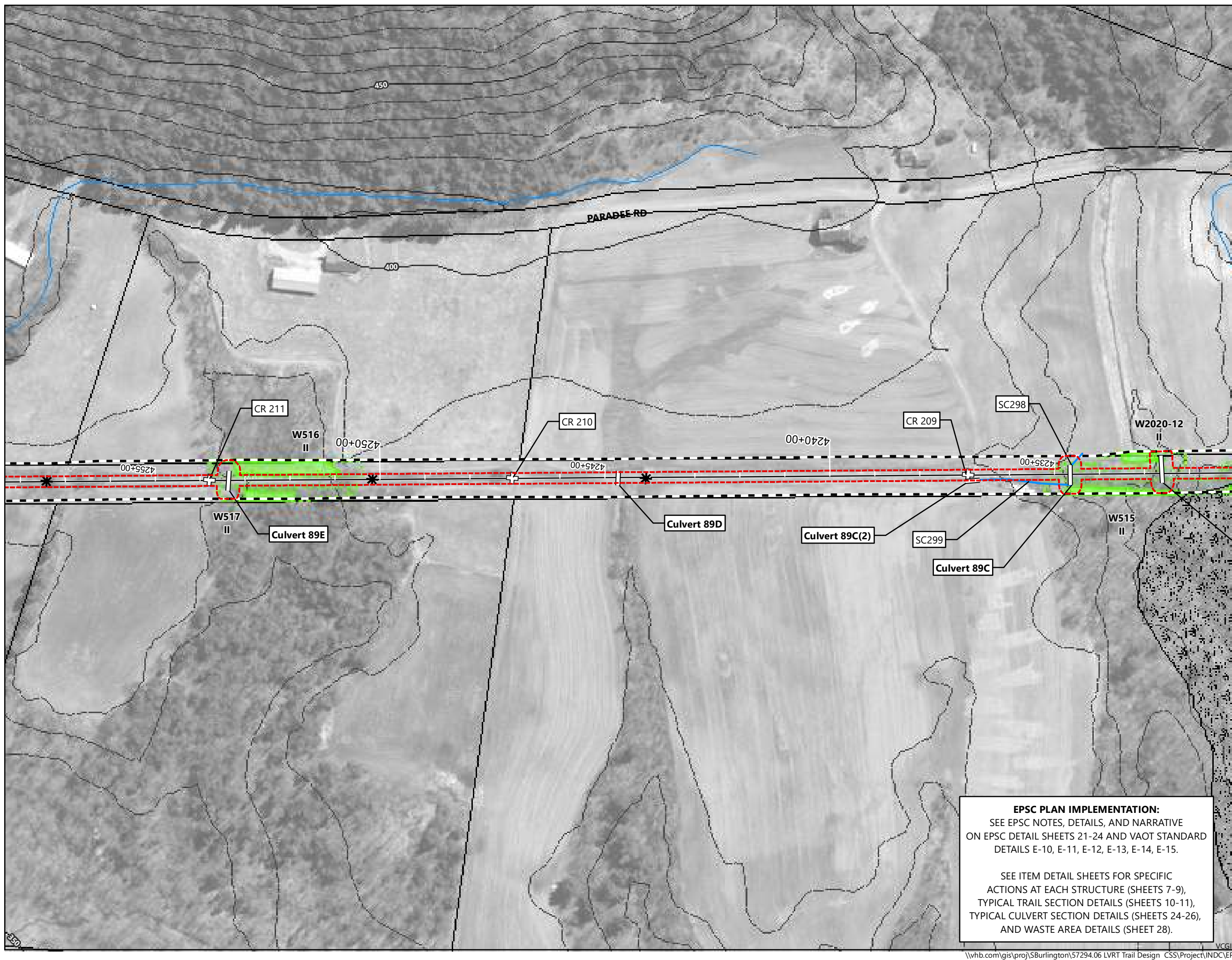


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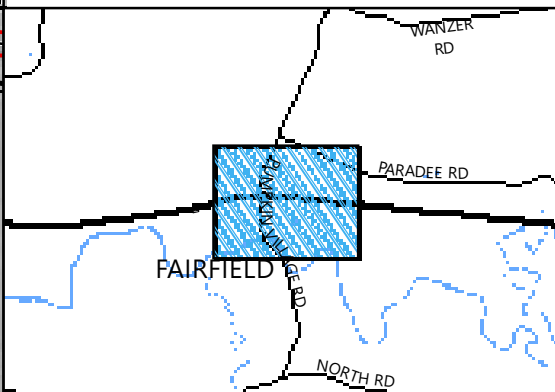


St. Johnsbury - Swanton  
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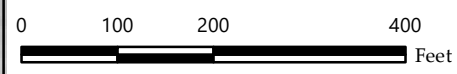
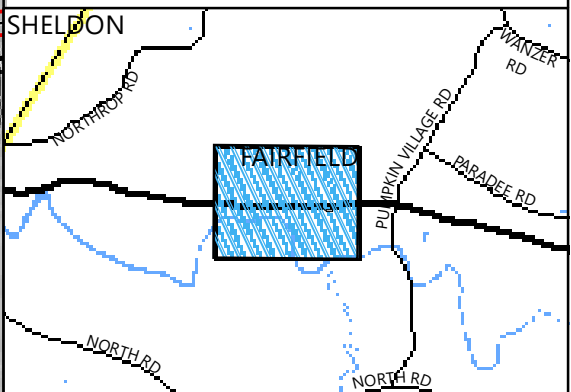
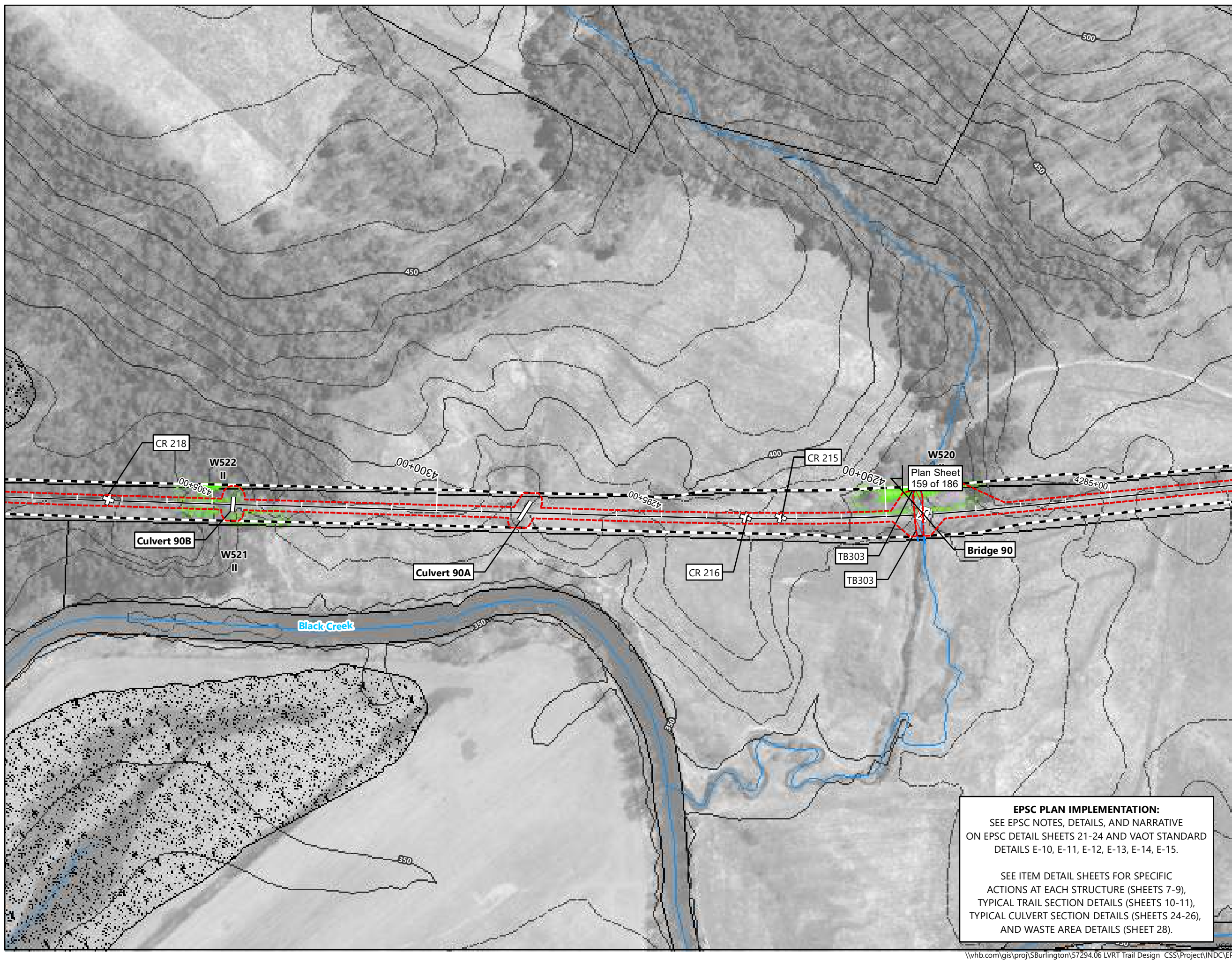


St. Johnsbury - Swanton  
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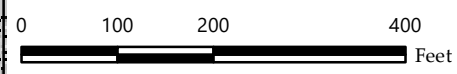
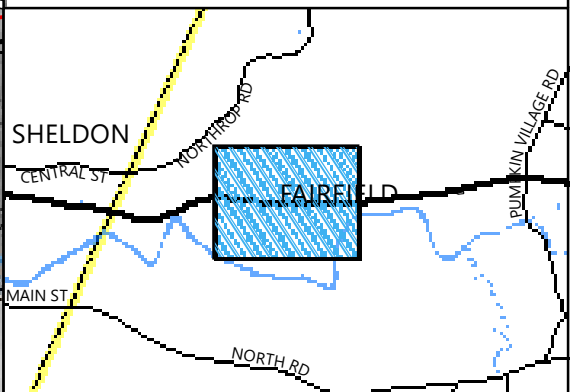
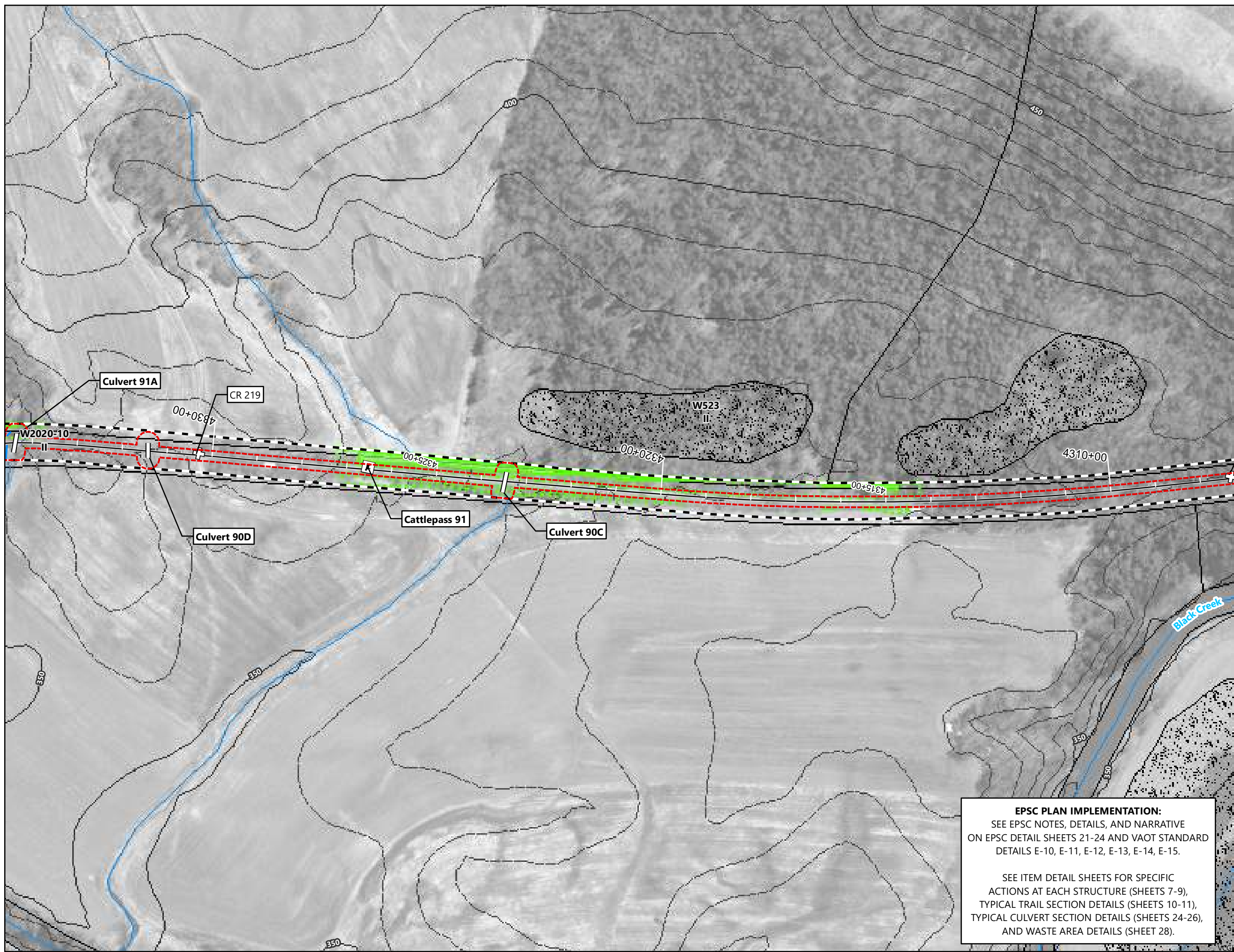


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- |                           |                                  |
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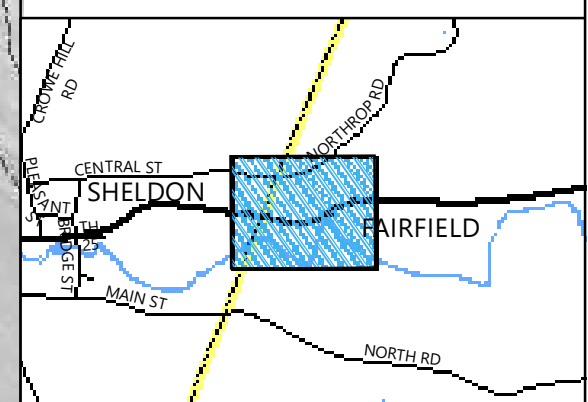


St. Johnsbury - Swanton  
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SEE ITEM DETAIL SHEETS FOR SPECIFIC ACTIONS AT EACH STRUCTURE (SHEETS 7-9), TYPICAL TRAIL SECTION DETAILS (SHEETS 10-11), TYPICAL CULVERT SECTION DETAILS (SHEETS 24-26), AND WASTE AREA DETAILS (SHEET 28).



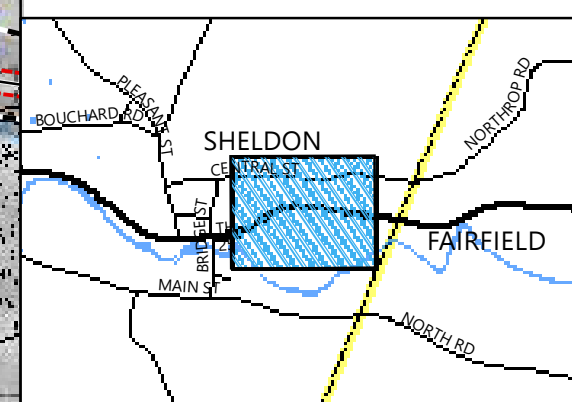


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

Sheet 83 of 84

March 23, 2021

- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
  - ⬢ Cattlepass
  - ⬢ Crossing
  - ⬢ Unauthorized Crossing
  - ⬢ Trailhead
  - ⬢ Bridges
  - ⬢ Proposed Pause Place
  - ⬢ Washouts
  - ⬢ RTE Site
  - ⬢ RTE Area (2008)
  - ⬢ Class II Wetland Buffer (50ft)
  - ⬢ Delineated Wetland (2017-2020)
  - ⬢ Delineated Stream (2017)
  - ⬢ Delineated Stream (2008)
  - ⬢ VSWI Wetland
  - ⬢ VHD Stream
  - ⬢ Other Existing Trail
  - ⬢ Electric Transmission Lines
  - ⬢ Parcel Boundary
  - ⬢ Historic Site
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).

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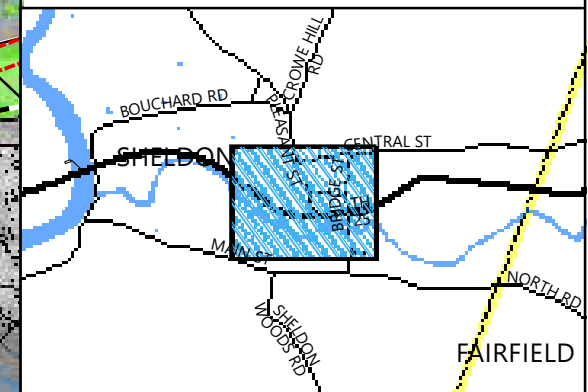
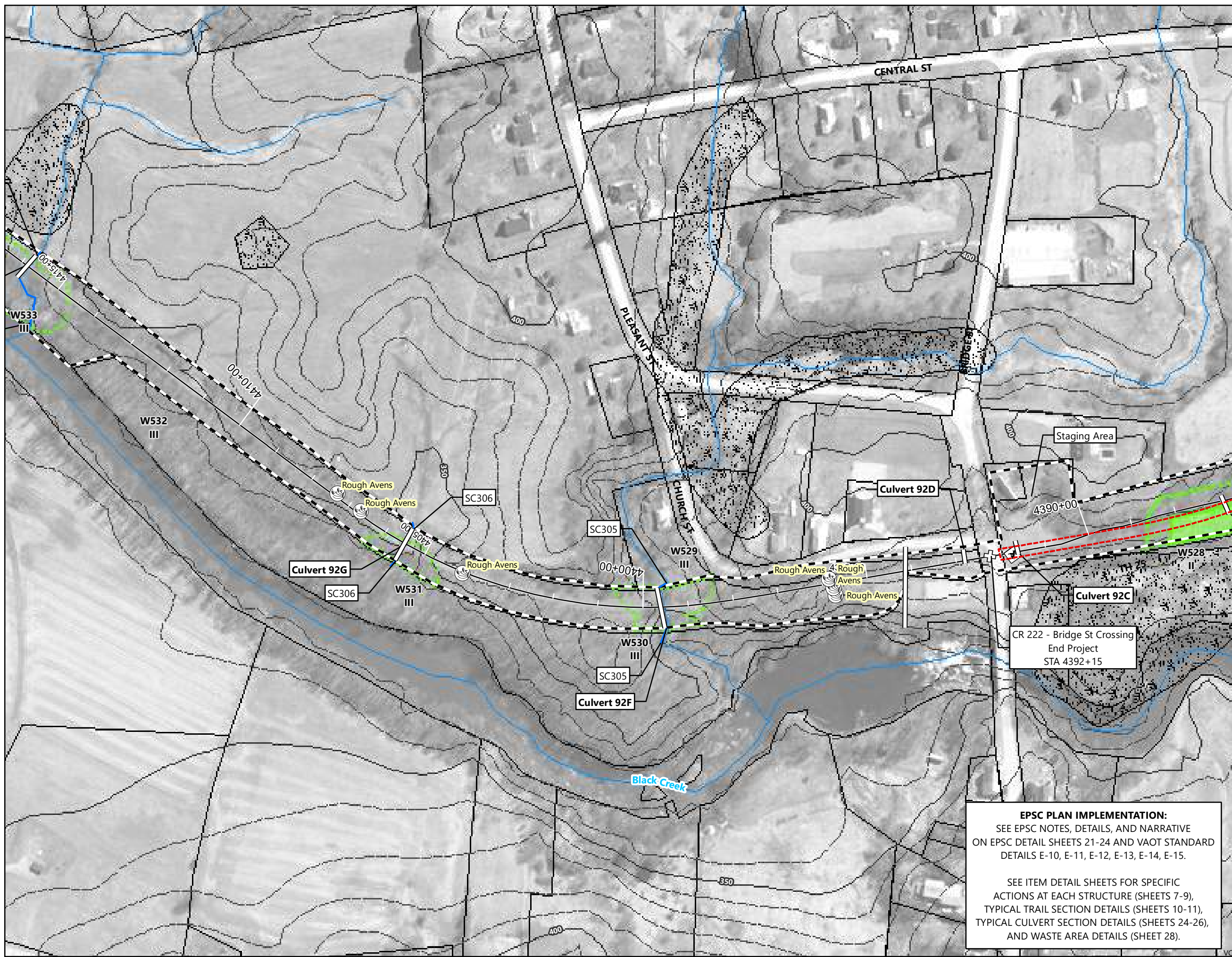


St. Johnsbury - Swanton  
STP-LVRT(11)  
Lamoille Valley Rail Trail  
Layout Plan

Sheet 84 of 84

March 23, 2021

- LVRT Centerline
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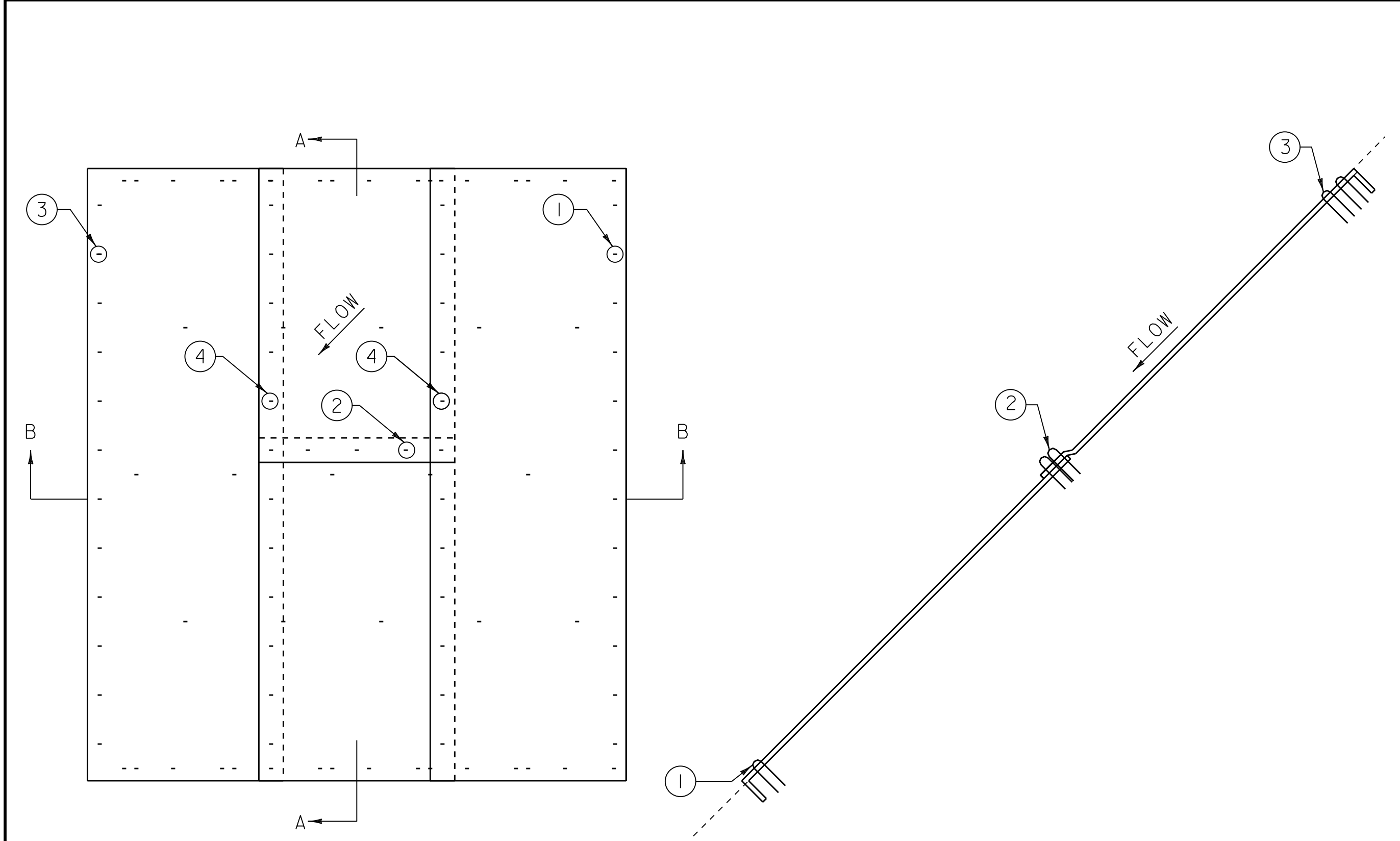


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Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).

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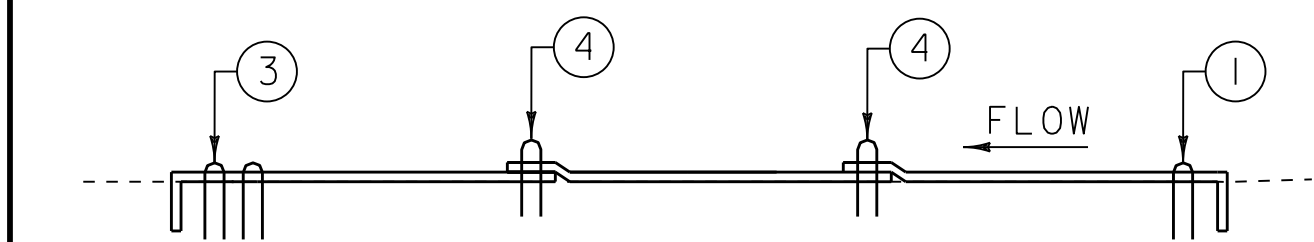






PLAN

SECTION A-A



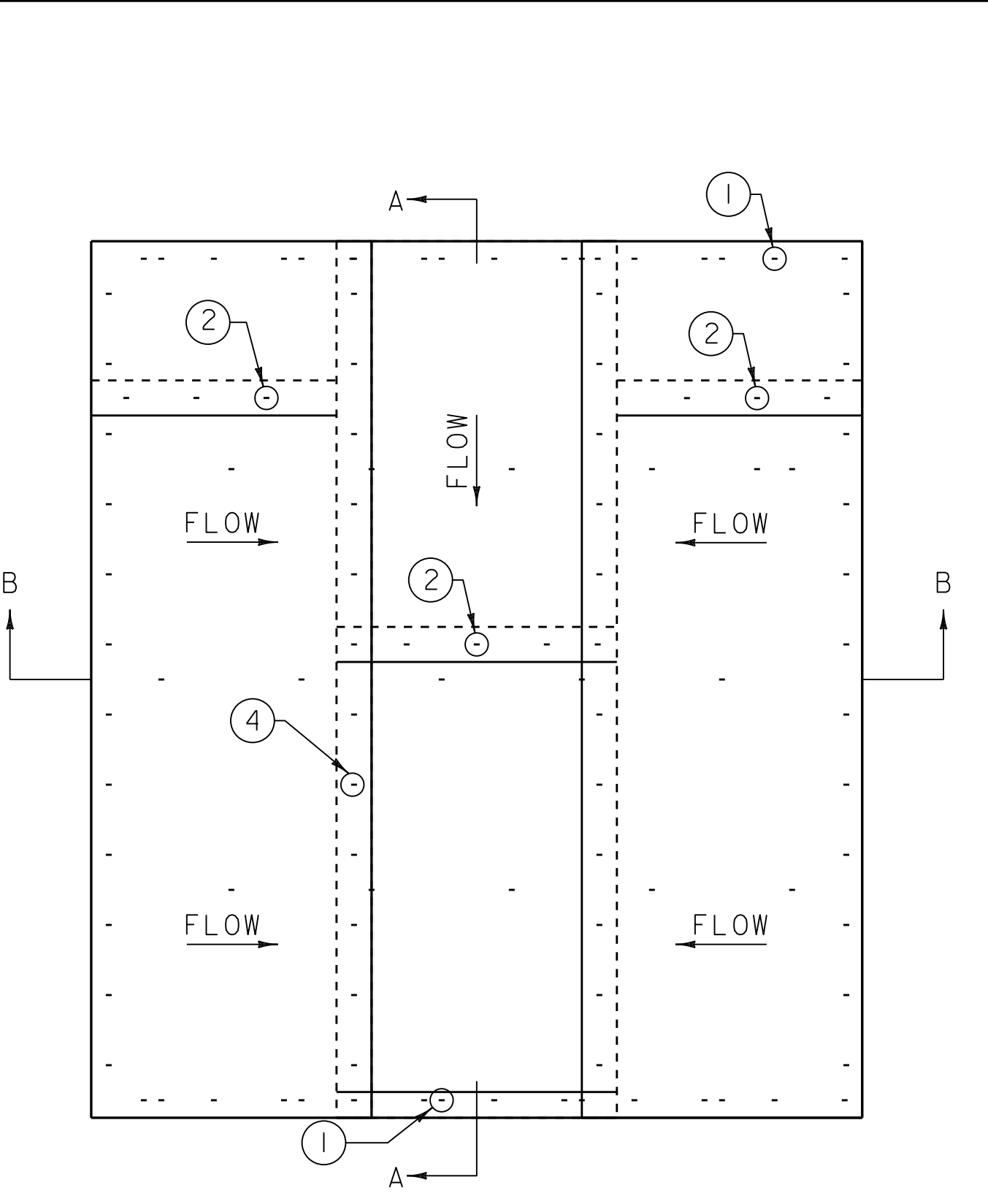
SECTION B-B

ON SLOPE

NOTE:

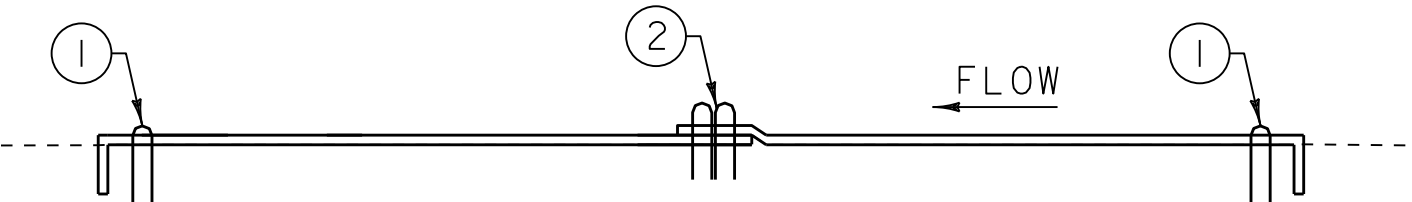
1. APPLY TO SLOPES GREATER THAN 1V:3H OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		



PLAN

SECTION B-B

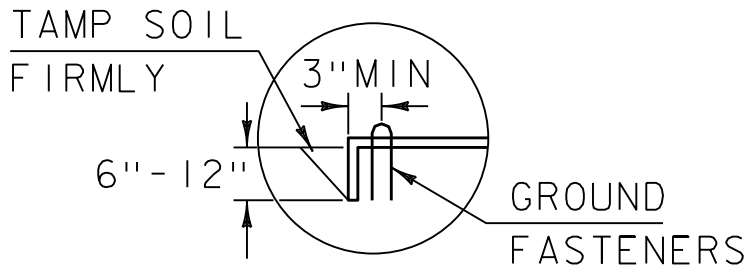


SECTION A-A

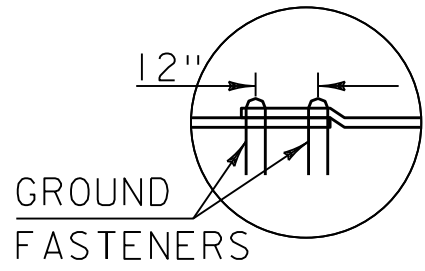
IN DITCH

NOTE:

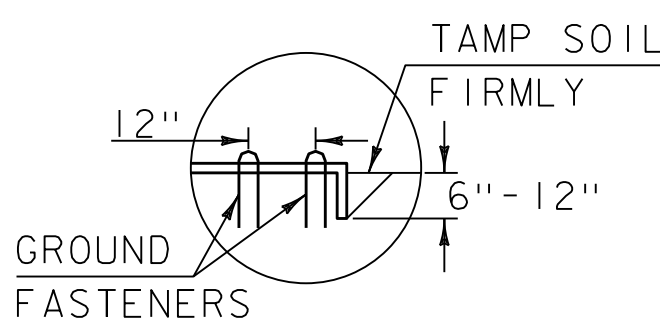
1. PARABOLIC DITCHES MAY REQUIRE ADDITIONAL FASTENERS TO ENSURE SUITABLE CONTACT WITH SOIL.



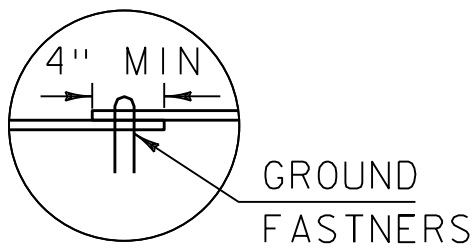
1 TERMINAL FOLD



2 JUNCTION SLOT



3 ANCHOR SLOT



4 LAP JOINT

GROUND FASTNER DETAILS

GENERAL NOTES:

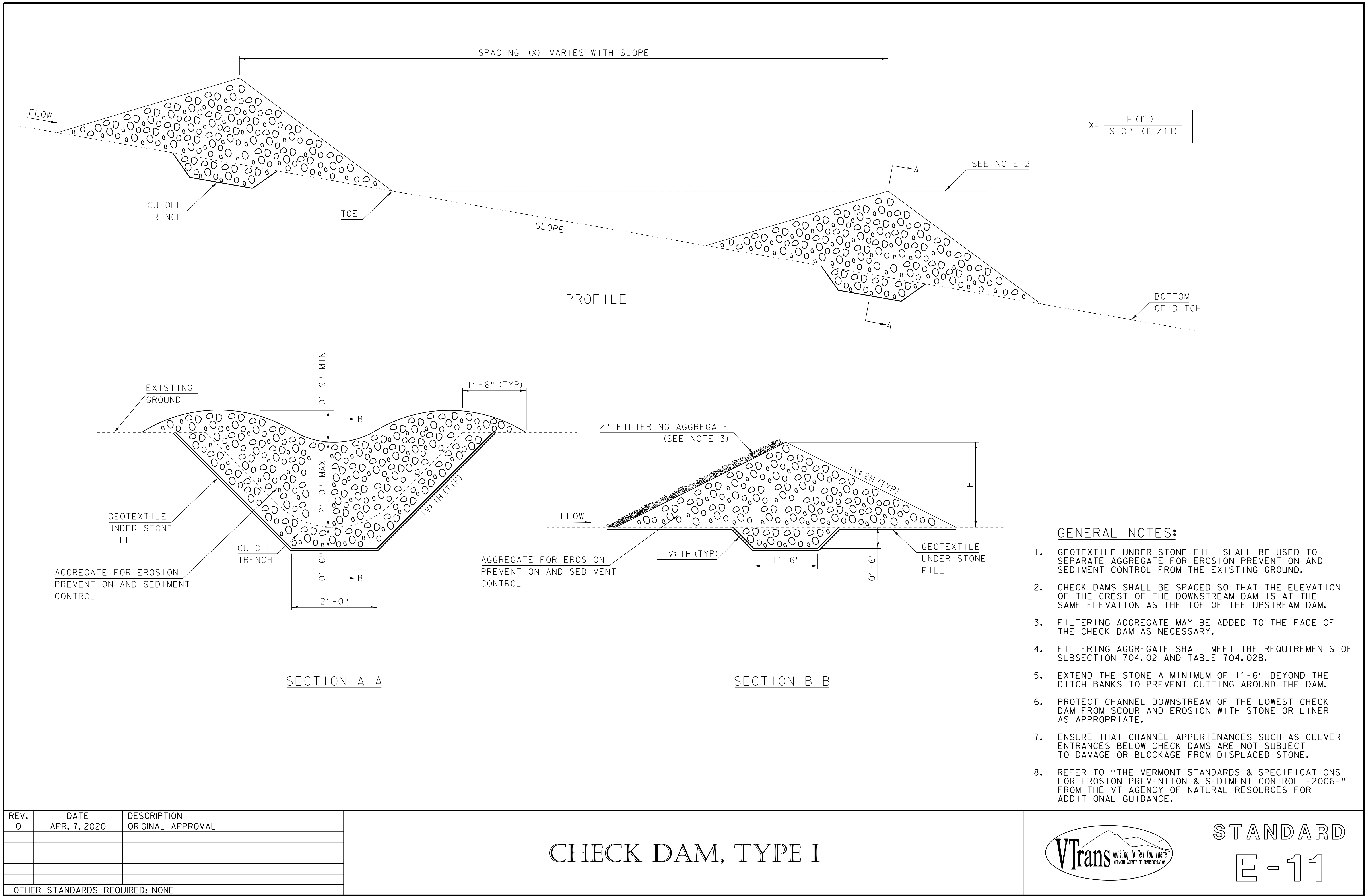
- FASTENERS ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART.
- SHOWN SPACING IS FOR GENERAL GUIDANCE. MANUFACTURER'S SPECIFICATIONS SHOULD BE FOLLOWED TO ENSURE PROPER INSTALLATION.
- DISTURBED AREAS SHALL BE SMOOTHLY GRADED. ROLLED EROSION CONTROL PRODUCT SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
- ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE SECURED AT APPROXIMATELY 12" INTERVALS.
- REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

ROLLED EROSION CONTROL PRODUCT , TYPE I

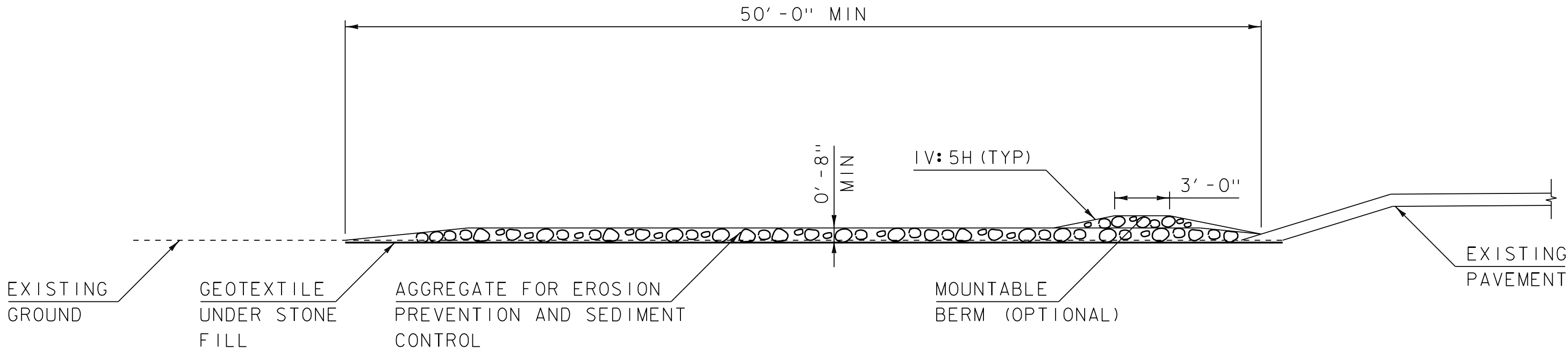


STANDARD  
E-10

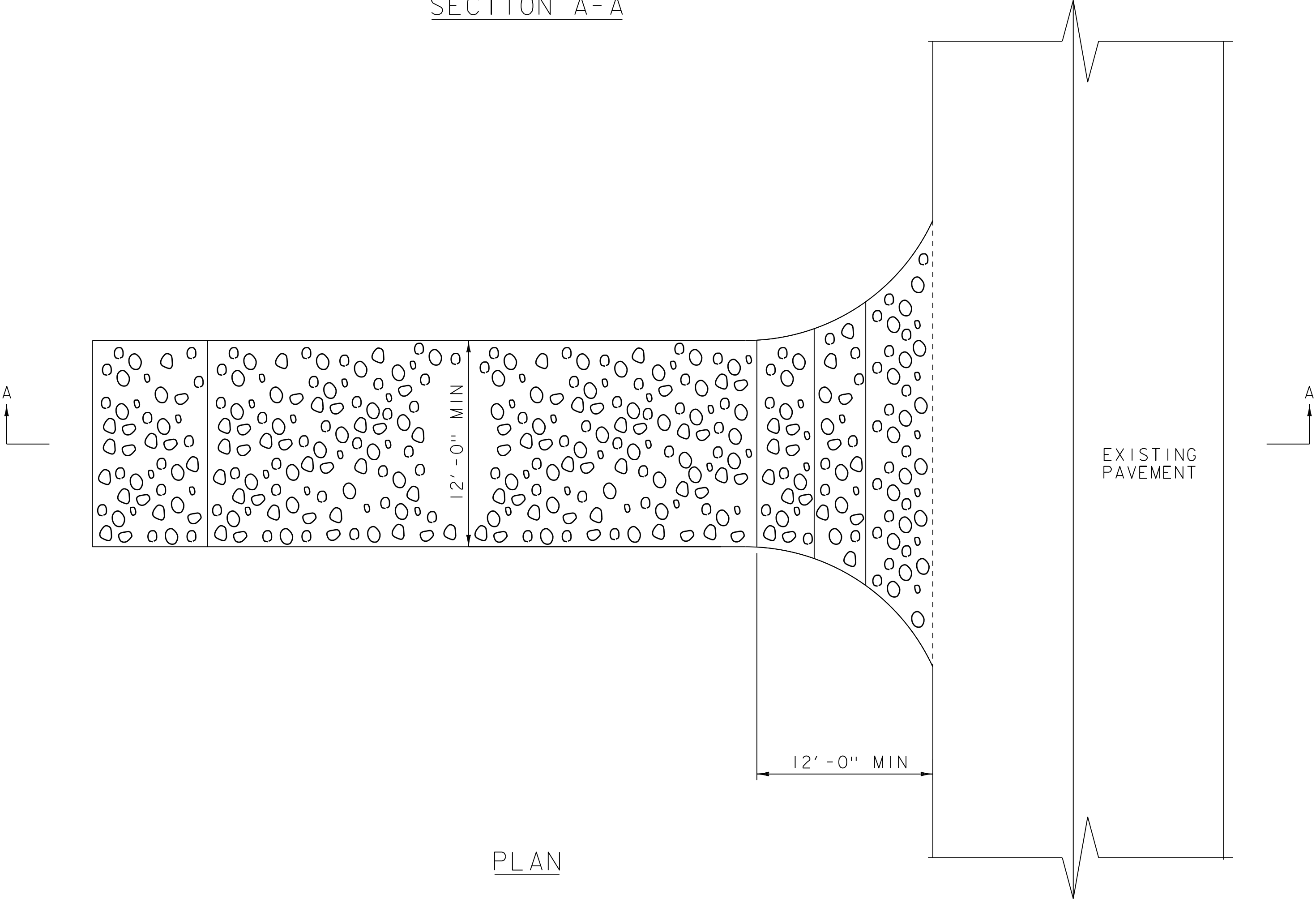








SECTION A-A



PLAN

GENERAL NOTES:

- 1. LENGTH- NOT LESS THAN 50' UNLESS APPROVED BY THE ENGINEER.
- 2. GEOTEXTILE UNDER STONE FILL SHALL BE USED TO SEPARATE AGGREGATE FOR EROSION PREVENTION AND SEDIMENT CONTROL FROM THE EXISTING GROUND.
- 3. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 1V:5H SLOPES WILL BE PERMITTED.
- 4. REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

STABILIZED CONSTRUCTION ENTRANCE

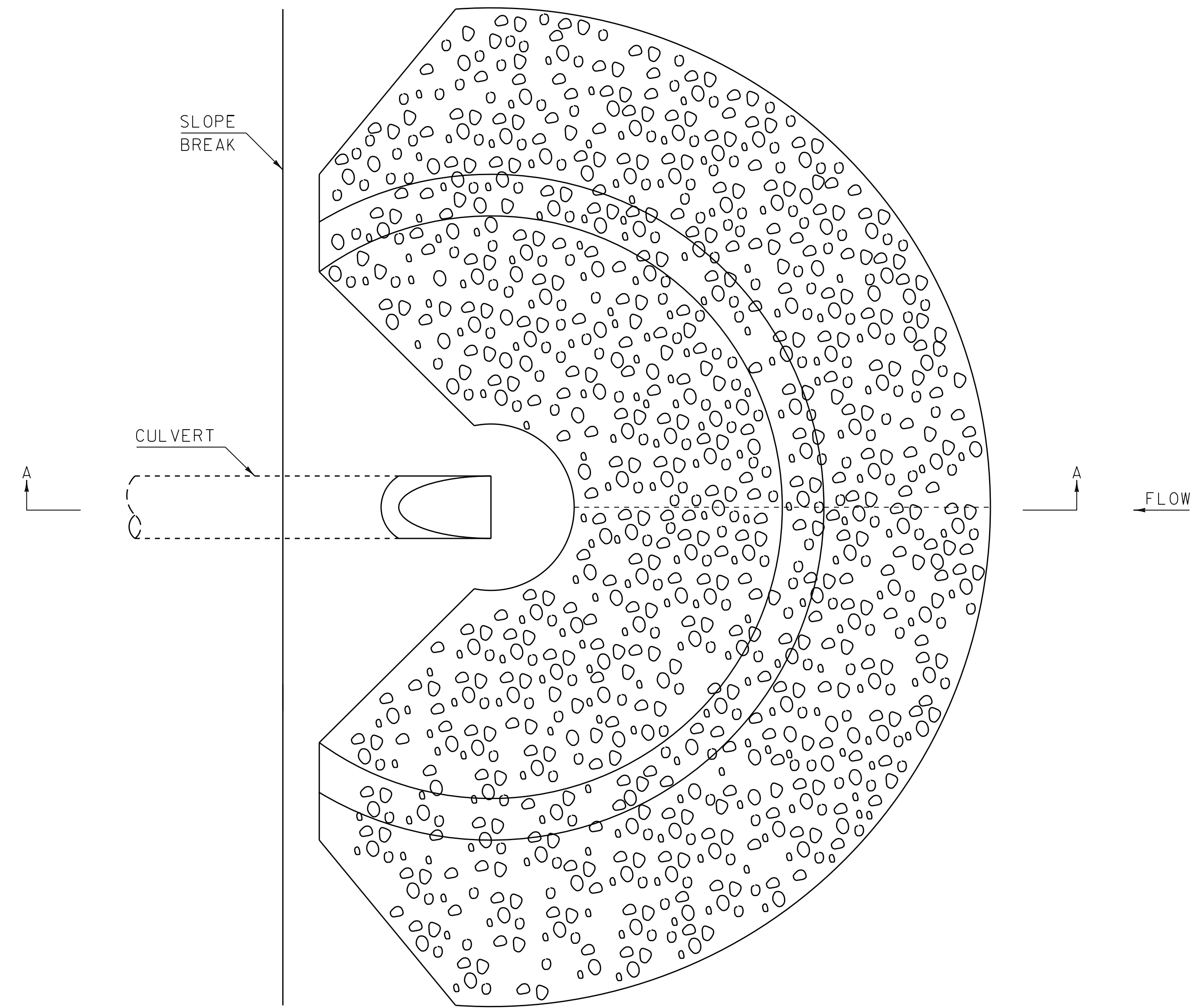


STANDARD  
E-12



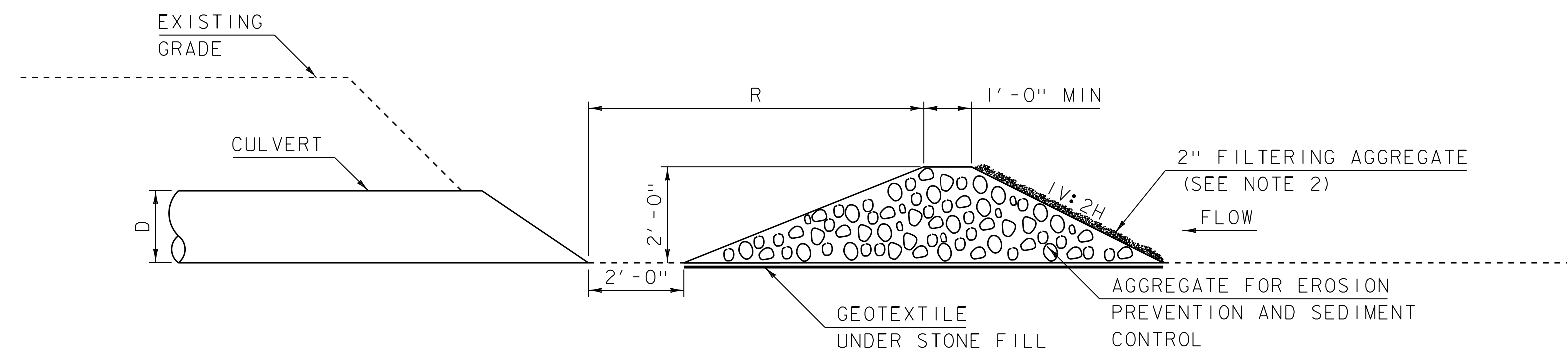






PIPE DIA.	
"D"	"R"
≤ 24"	7'
30"	8'

PLAN



SECTION A-A

GENERAL NOTES:

1. GEOTEXTILE UNDER STONE FILL SHALL BE USED TO SEPARATE AGGREGATE FOR EROSION PREVENTION AND SEDIMENT CONTROL FROM THE EXISTING GROUND.
2. FILTERING AGGREGATE MAY BE ADDED AS NECESSARY.
3. FILTERING AGGREGATE SHALL MEET THE REQUIREMENTS OF SUBSECTION 704.02 AND TABLE 704.02B.
3. INDIVIDUAL CONSIDERATION SHALL BE GIVEN FOR PIPE DIAMETERS GREATER THAN 30".

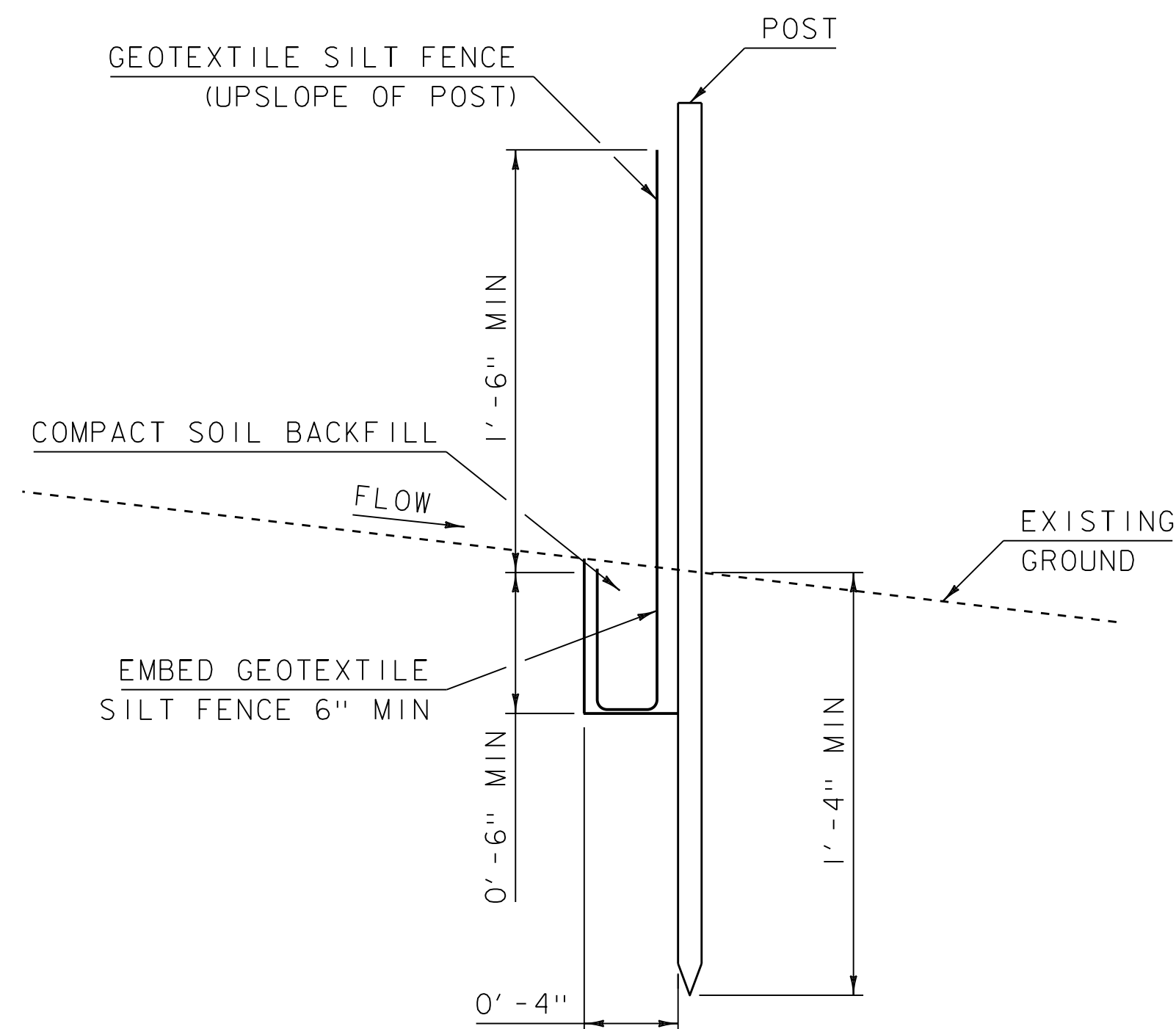
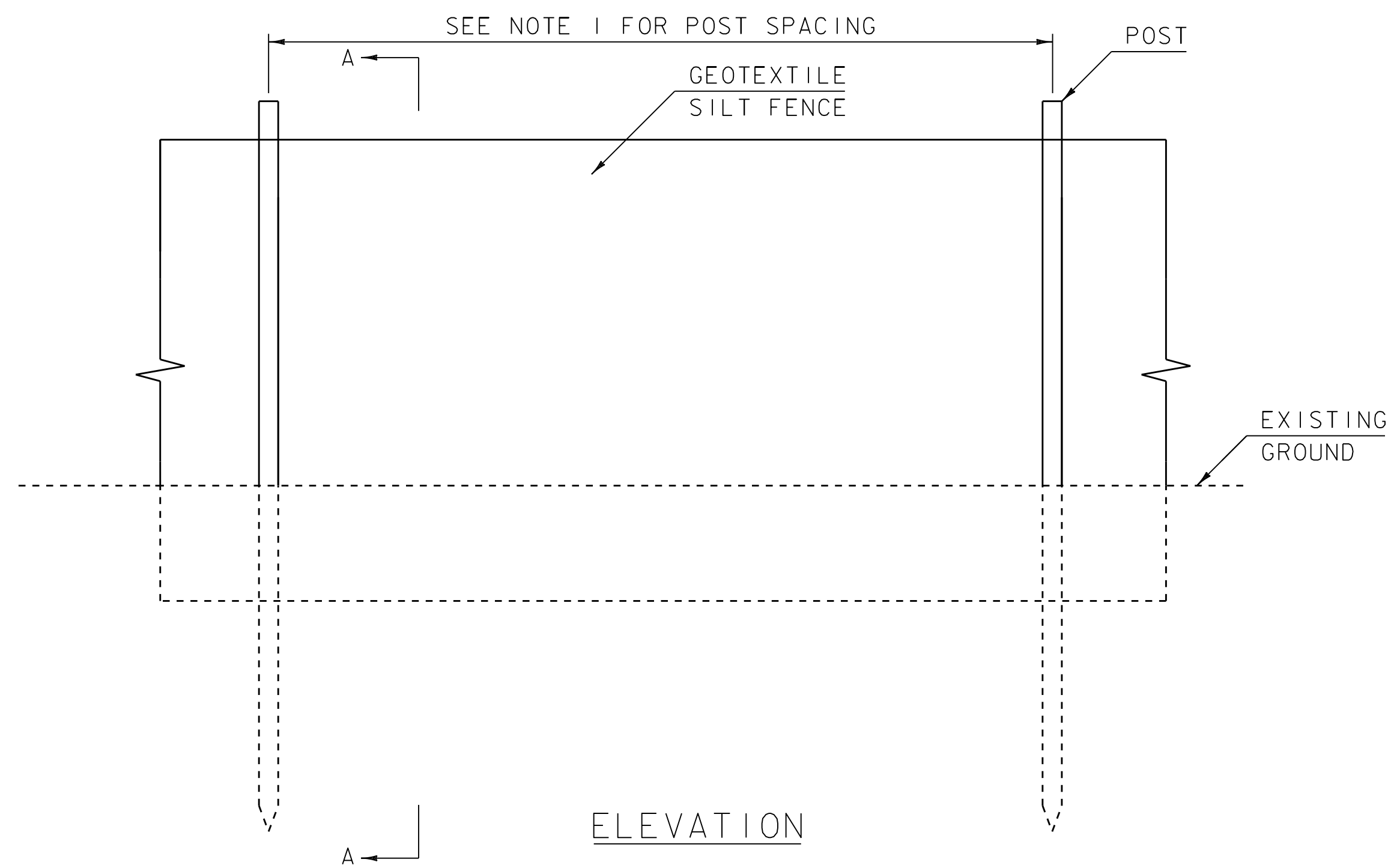
REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

# INLET PROTECTION DEVICE, TYPE III



STANDARD  
E-14



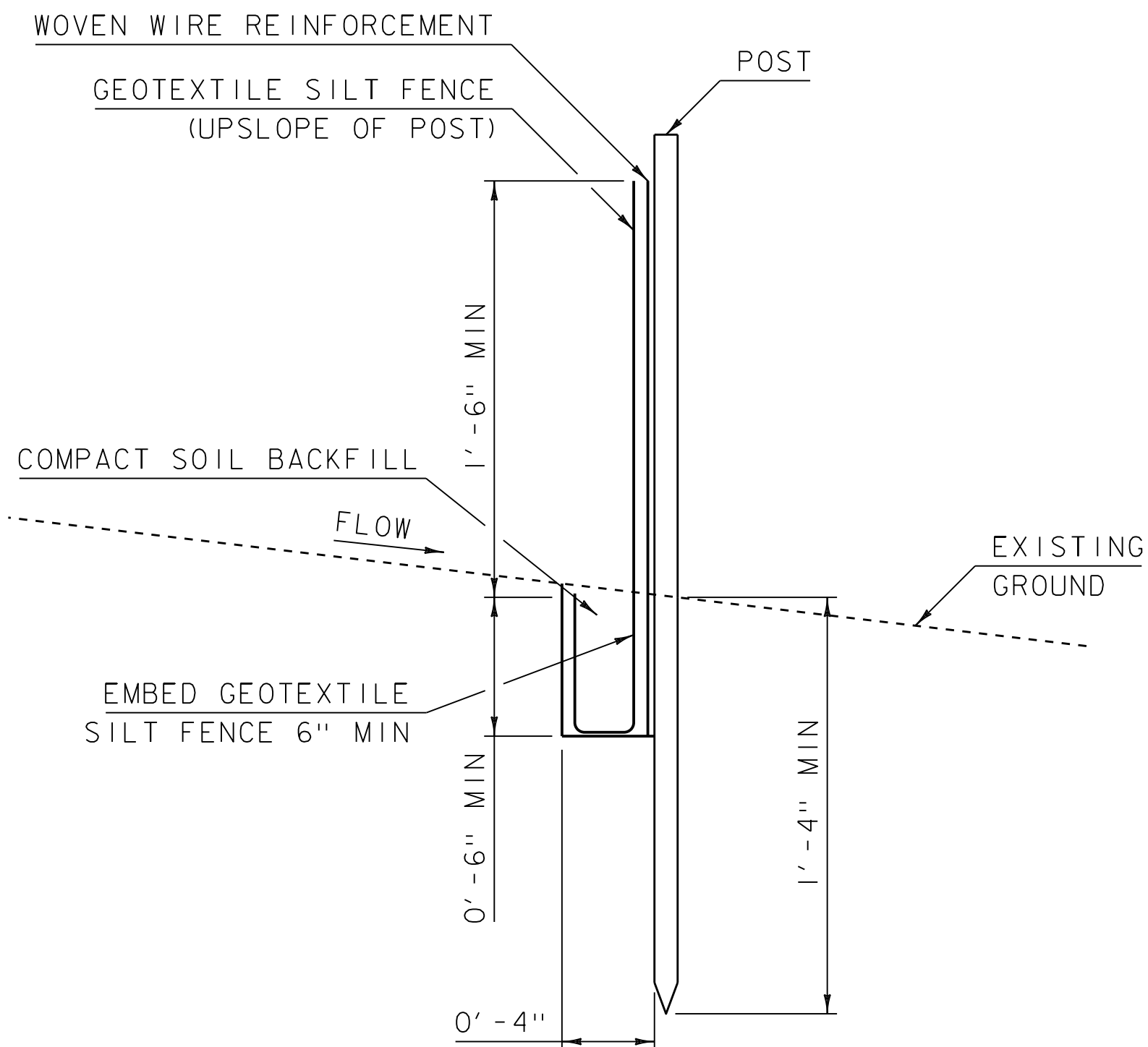
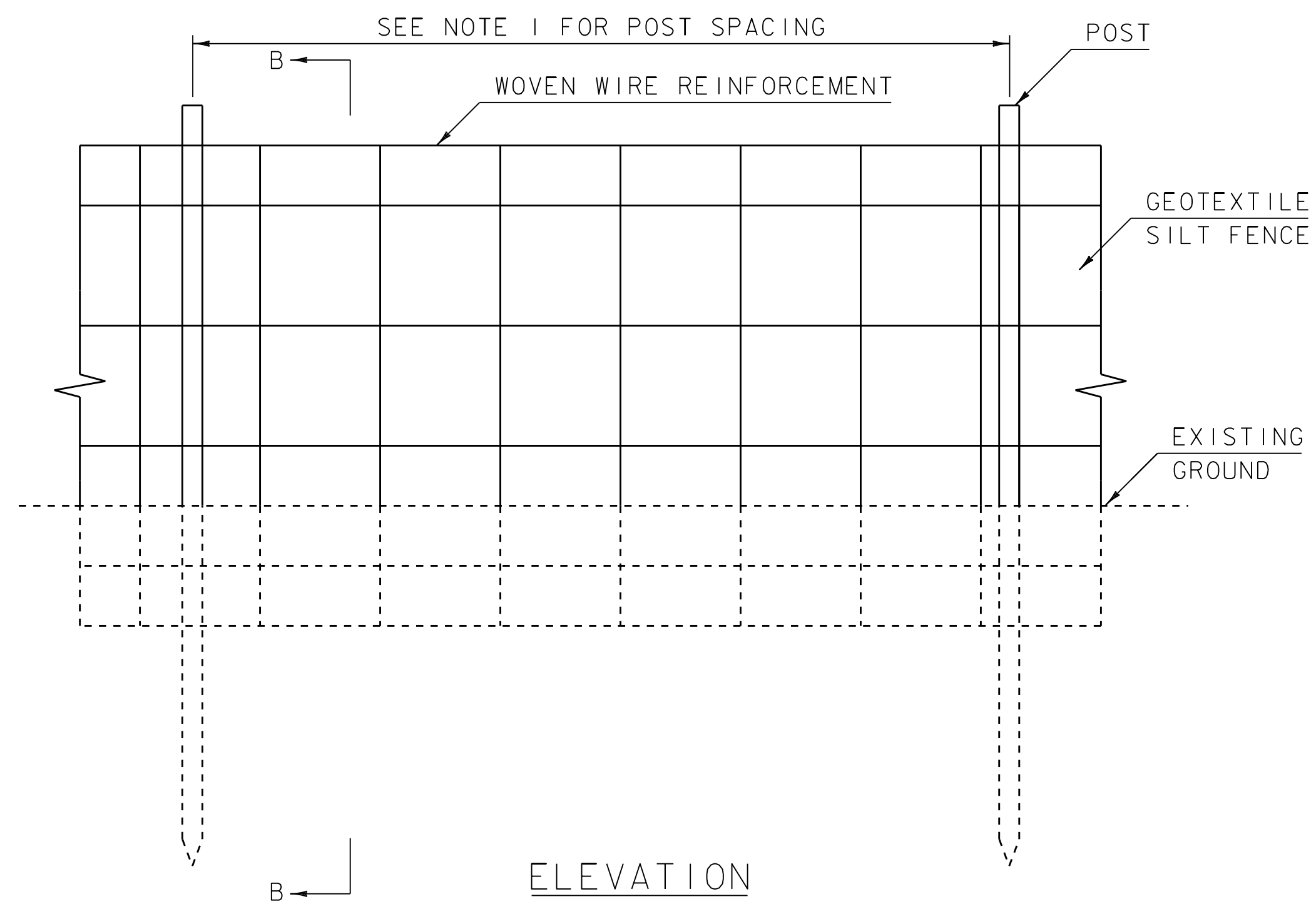


SECTION A-A

SILT FENCE, TYPE I

**NOTE:**

1. POST SPACING FOR SILT FENCE SHALL NOT EXCEED 4' WHEN ELONGATION IS GREATER THAN 50% AND SHALL NOT EXCEED 6' WHEN ELONGATION IS LESS THAN 50%.

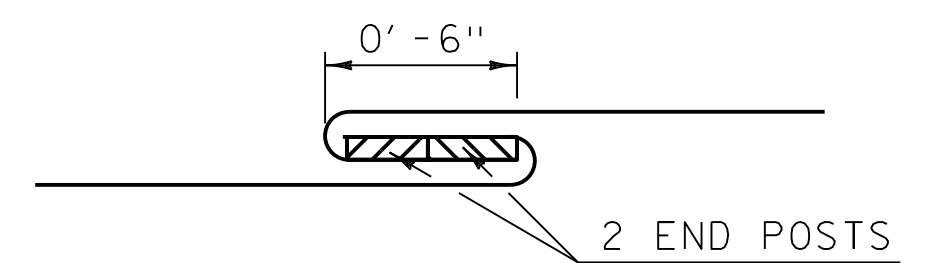


SECTION B-B

SILT FENCE, TYPE II

**NOTES:**

1. POST SPACING FOR SILT FENCE, WOVEN WIRE REINFORCED SHALL NOT EXCEED 10'.
2. WOVEN WIRE REINFORCEMENT IS TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. GEOTEXTILE FOR SILT FENCE IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.



GEOTEXTILE FOR SILT FENCE  
OVER LAP DETAIL

**GENERAL NOTES:**

1. REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.
2. TAMP SOIL BACKFILL FOR SECTION OF EMBEDDED GEOTEXTILE.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

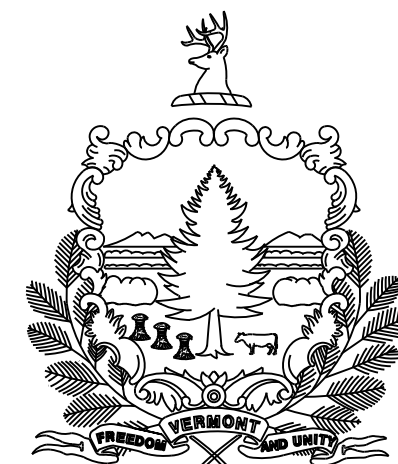
## SILT FENCE



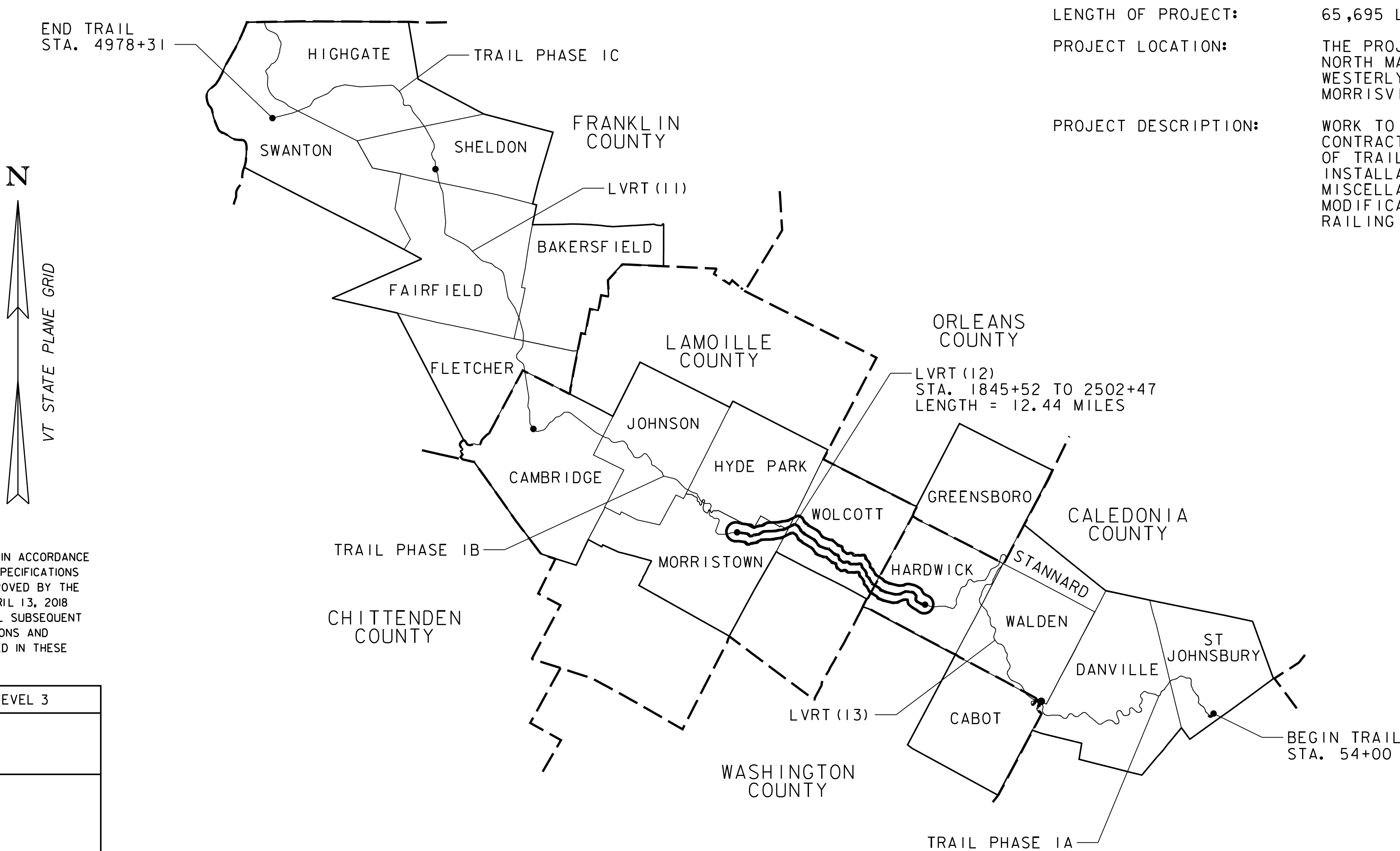
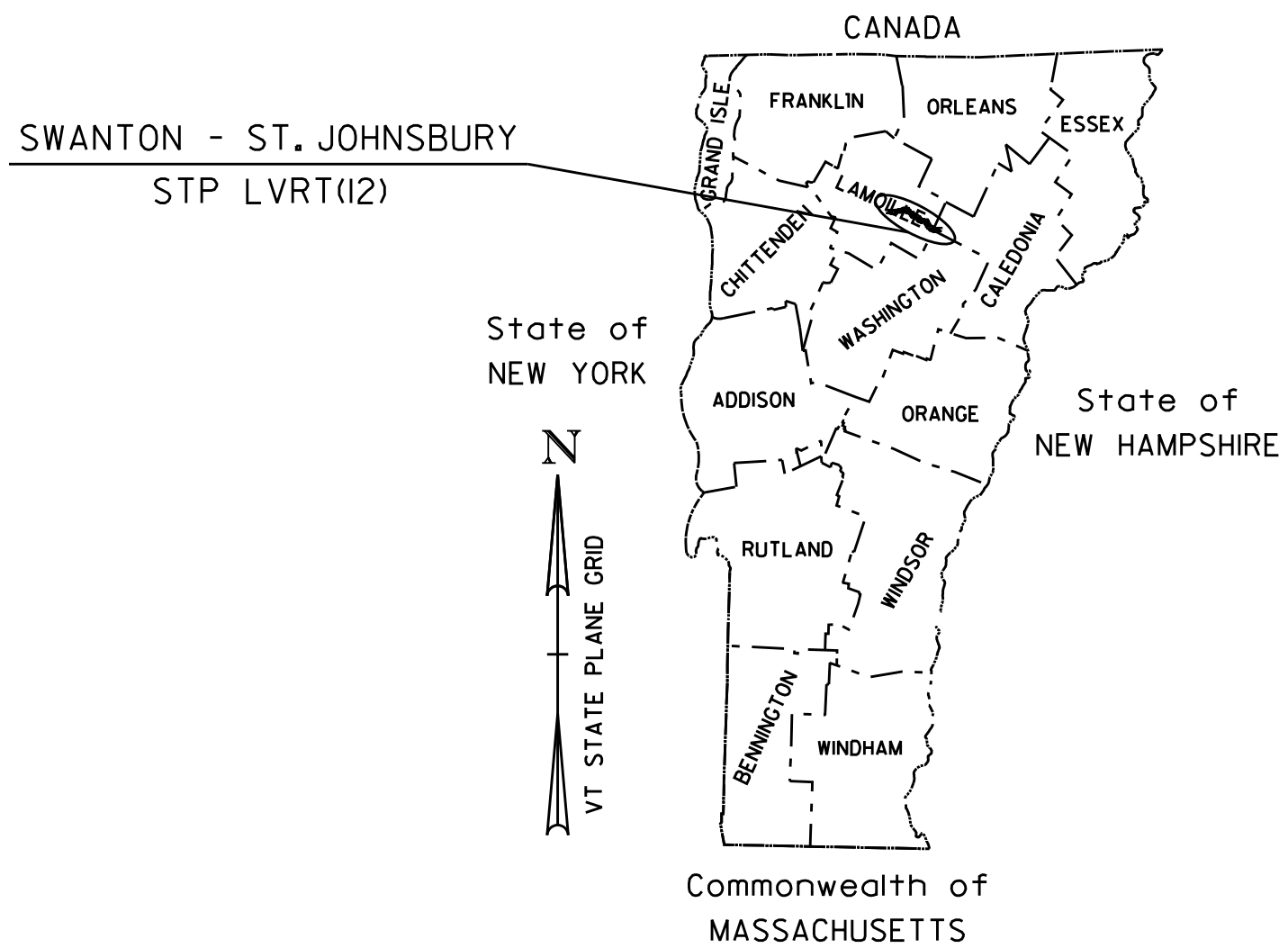
STANDARD  
E-15



STATE OF VERMONT  
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT  
LAMOILLE VALLEY RAIL TRAIL  
SWANTON - ST. JOHNSBURY STP LVRT(12)



LENGTH OF PROJECT: 65,695 LF (12.44 MILES)  
PROJECT LOCATION: THE PROJECT BEGINS AT THE INTERSECTION OF NORTH MAIN STREET IN HARDWICK AND EXTENDS WESTERLY 12.44 MILES TO VT ROUTE 15A IN MORRISVILLE.  
PROJECT DESCRIPTION: WORK TO BE PERFORMED UNDER THIS CONTRACT INCLUDES CONSTRUCTION OF TRAIL SURFACE, CLEARING, DITCHING, INSTALLATION OF CULVERTS, SIGNING, MISCELLANEOUS STRUCTURE REPAIRS AND BRIDGE MODIFICATIONS INCLUDING DECKING AND RAILING INSTALLATION.

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 3
SURVEYED BY : N/A
SURVEYED DATE : N/A
DATUM
VERTICAL ASSUMED
HORIZONTAL ASSUMED

CONSTRUCTION STORMWATER  
PERMIT PLANS  
MARCH 2021

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATOR
APPROVED _____ DATE _____
HIGHWAY DIVISION, CHIEF ENGINEER
APPROVED _____ DATE _____
PROJECT MANAGER : JOEL PERRIGO
PROJECT NAME : SWANTON - ST. JOHNSBURY
PROJECT NUMBER : STP LVRT (12)
SHEET 1 OF 102 SHEETS





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2	INDEX OF SHEETS
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8-10	ITEM DETAIL SHEETS
11-12	TYPICAL TRAIL SECTIONS SHEETS
13	TRAIL LOWERING DETAIL SHEET
14	TYPICAL CULVERT SECTION SHEET
15-16	BOX CULVERT TYPICAL SECTION SHEETS
17	CULVERT REPLACEMENT/REPAIR DETAIL SHEET
18-21	CULVERT DETAILS SHEETS
22	WASTE AREA DETAILS SHEET
23	BRIDGE DECKING DETAILS SHEET
24-43	STRUCTURES DETAIL SHEETS
44	BRIDGE TYPICAL SECTIONS SHEET
45	BRIDGE 49 PLAN & PROFILE
46	BRIDGE 52 PLAN & PROFILE
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53-54	RAILING DETAILS SHEETS
55	TYPICAL APPROACH RAIL
56	TYPICAL GUARDRAIL
57-58	CROSSING DETAILS SHEETS
59-60	EPSC DETAILS SHEETS
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63-76	EPSC BRIDGE SHEETS
77-102	EPSC SITE PLAN SHEETS

VAOT STANDARDS

E-10	07-01-2019	ROLLED EROSION CONTROL PRODUCT, TYPE 1
E-11	07-01-2019	CHECK DAM, TYPE 1
E-12	07-01-2019	STABILIZED CONSTRUCTION ENTRANCE
E-13	07-01-2019	INLET PROTECTION DEVICE, TYPE 1
E-14	07-01-2019	INLET PROTECTION DEVICE, TYPE 2
E-15	07-01-2019	SILT FENCE



PROJECT NAME: SWANTON - ST JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_EPSC Index.dgn

PROJECT LEADER: E.P. DETRICK

DESIGNED BY: J.S. GINGRAS

INDEX OF SHEETS

PLOT DATE: 3/23/2021

DRAWN BY: J.S. GINGRAS

CHECKED BY: B.M. ROBERTS

SHEET 2 OF 102



GENERAL INFORMATION

SYMBOLOLOGY LEGEND NOTE

THE SYMBOLOLOGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLOLOGY. THE SYMBOLOLOGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLOLOGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

R.O.W. ABBREVIATIONS (CODES) & SYMBOLS

POINT	CODE	DESCRIPTION
	CH	CHANNEL EASEMENT
	CONST	CONSTRUCTION EASEMENT
	CUL	CULVERT EASEMENT
	D&C	DISCONNECT & CONNECT
	DIT	DITCH EASEMENT
	DR	DRAINAGE EASEMENT
	DRIVE	DRIVEWAY EASEMENT
	EC	EROSION CONTROL
	HWY	HIGHWAY EASEMENT
	I&M	INSTALL & MAINTAIN EASEMENT
	LAND	LANDSCAPE EASEMENT
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BDNS	BOUND SET
▣	BDNS	BOUND TO BE SET
◎	IPNF	IRON PIN FOUND
●	IPNS	IRON PIN TO BE SET
⊠	CALC	EXISTING ROW POINT
○	PROW	PROPOSED ROW POINT
[LENGTH]		LENGTH CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

POINT	CODE	DESCRIPTION
⌘	APL	BOUND APPARENT LOCATION
◻	BM	BENCHMARK
▣	BND	BOUND
▣	CB	CATCH BASIN
⊕	COMB	COMBINATION POLE
▣	DITHR	DROP INLET THROATED DNC
⊕	EL	ELECTRIC POWER POLE
⊙	FPOLE	FLAGPOLE
○	GASFIL	GAS FILLER
○	GP	GUIDE POST
⌘	GSO	GAS SHUT OFF
⊙	GUY	GUY POLE
⊙	GUYW	GUY WIRE
⌘	GV	GATE VALVE
⊕	H	TREE HARDWOOD
△	HCTRL	CONTROL HORIZONTAL
▲	HVCTRL	CONTROL HORIZ. & VERTICAL
◇	HYD	HYDRANT
⊙	IP	IRON PIN
⊙	IPIPE	IRON PIPE
⊕	LI	LIGHT - STREET OR YARD
⊕	MB	MAILBOX
○	MH	MANHOLE (MH)
▣	MM	MILE MARKER
⊙	PM	PARKING METER
▣	PMK	PROJECT MARKER
POST	POST	POST STONE/WOOD
RRSIG	RRSIG	RAILROAD SIGNAL
RRSL	RRSL	RAILROAD SWITCH LEVER
S	S	TREE SOFTWOOD
SAT	SAT	SATELLITE DISH
SHRUB	SHRUB	SHRUB
SIGN	SIGN	SIGN
STUMP	STUMP	STUMP
TEL	TEL	TELEPHONE POLE
TIE	TIE	TIE
TSIGN	TSIGN	SIGN W/DOUBLE POST
VCTRL	VCTRL	CONTROL VERTICAL
WELL	WELL	WELL
WSO	WSO	WATER SHUT OFF

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

PROPOSED GEOMETRY CODES

CODE	DESCRIPTION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
CC	CENTER OF CURVE
PT	POINT OF TANGENCY
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
STA	STATION PREFIX
AH	AHEAD STATION SUFFIX
BK	BACK STATION SUFFIX
D	CURVE DEGREE OF (100FT)
R	CURVE RADUIS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

UTILITY SYMBOLOLOGY

UNDERGROUND UTILITIES	
UTILITY (GENERIC-UNKNOWN)	— UT —
TELEPHONE	— UE —
ELECTRIC	— UC —
CABLE (TV)	— UEC —
ELECTRIC+CABLE	— UET —
ELECTRIC+TELEPHONE	— UCT —
CABLE+TELEPHONE	— UECT —
ELECTRIC+CABLE+TELEP.	— G —
GAS LINE	— W —
WATER LINE	— S —
SANITARY SEWER (SEPTIC)	

ABOVE GROUND UTILITIES (AERIAL)	
UTILITY (GENERIC-UNKNOWN)	— T —
TELEPHONE	— E —
ELECTRIC	— C —
CABLE (TV)	— EC —
ELECTRIC+CABLE	— ET —
ELECTRIC+TELEPHONE	— AER E&T —
ELECTRIC+TELEPHONE	— CT —
ELECTRIC+CABLE+TELEP.	— ECT —
UTILITY POLE GUY WIRE	— ... —

PROJECT CONSTRUCTION SYMBOLOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOLOGY	
CLEAR ZONE	— -- -- CZ — -- --
PLAN LAYOUT MATCHLINE	—————

PROJECT CONSTRUCTION FEATURES	
TOP OF CUT SLOPE	▲ —▲ —▲ —▲
TOE OF FILL SLOPE	○ —○ —○ —○
STONE FILL	⊗ ⊗ ⊗ ⊗ ⊗
BOTTOM OF DITCH	-----
CULVERT PROPOSED	=====
STRUCTURE SUBSURFACE	-----
PROJECT DEMARCATION FENCE	PDF ——— PDF ———
BARRIER FENCE	BF — x — x — x — BF — x — x —
TREE PROTECTION ZONE (TPZ)	xxxxxxxxxxxxxxxxxxxxxxxx
STRIPING LINE REMOVAL	//////////
SHEET PILES	~~~~~

CONVENTIONAL BOUNDARY SYMBOLOLOGY

BOUNDARY LINES	
TOWN BOUNDARY LINE	————— TOWN LINE ———
COUNTY BOUNDARY LINE	————— COUNTY LINE ———
STATE BOUNDARY LINE	————— STATE LINE ———
PROPOSED STATE R.O.W. (LIMITED ACCESS)	——— / / / ———
PROPOSED STATE R.O.W.	——— ———
STATE ROW (LIMITED ACCESS)	——— / / / ———
STATE ROW	——— ———
TOWN ROW	——— ———
PERMANENT EASEMENT LINE (P)	— - - - -
TEMPORARY EASEMENT LINE (T)	- - - - -
SURVEY LINE	+ ——— + ——— + ———
PROPERTY LINE (P/L)	P ——— L ——— P ——— L ———
SLOPE RIGHTS	▲ — SR —○ — SR —▲ — SR —○ —
6F PROPERTY BOUNDARY	6f ——— 6f ———
4f PROPERTY BOUNDARY	4f ——— 4f ———
HAZARDOUS WASTE	HAZ ——— HAZ ———

EPSC LAYOUT PLAN SYMBOLOLOGY

EPSC MEASURES	
FILTER CURTAIN	ONNOONNOONNO
SILT FENCE	▣ —▣ —▣ —▣
SILT FENCE WOVEN WIRE	▣ — x —▣ — x —▣ — x —▣
CHECK DAM	▶ —▶ —▶ —
DISTURBED AREAS REQUIRING RE-VEGETATION	▣
EROSION MATTING	▣
SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOLOGY	

ENVIRONMENTAL RESOURCES	
WETLAND BOUNDARY	———
RIPARIAN BUFFER ZONE	-----
WETLAND BUFFER ZONE	-----
SOIL TYPE BOUNDARY	-----
THREATENED & ENDANGERED SPECIES	—— T&E ——
HAZARDOUS WASTE AREA	HAZ ——— HAZ ———
AGRICULTURAL LAND	—— AG ——
FISH & WILDLIFE HABITAT	—— HABITAT ——
FLOOD PLAIN	—— FLOOD PLAIN ——
ORDINARY HIGH WATER (OHW)	—— OHW ——
STORM WATER	——●——●——●——
USDA FOREST SERVICE LANDS	—— - - - ——
WILDLIFE HABITAT SUIT/CONN	—— ... ——

ARCHEOLOGICAL & HISTORIC	
ARCHEOLOGICAL BOUNDARY	—— ARCH ——
HISTORIC DISTRICT BOUNDARY	—— HISTORIC DIST ——
HISTORIC AREA	—— HISTORIC ——
HISTORIC STRUCTURE	(H)

CONVENTIONAL TOPOGRAPHIC SYMBOLOLOGY	
EXISTING FEATURES	
ROAD EDGE PAVEMENT	-----
ROAD EDGE GRAVEL	-----
DRIVEWAY EDGE	-----
DITCH	-----
FOUNDATION	———
FENCE (EXISTING)	x — x — x — x —
FENCE WOOD POST	▣ —▣ —▣ —▣
FENCE STEEL POST	○ —○ —○ —○
GARDEN	~~~~~
ROAD GUARDRAIL	○ —○ —○ —○ —○
RAILROAD TRACKS	
CULVERT (EXISTING)	=====
STONE WALL	○○○○○○○○○○○○○○○○
WALL	-----
WOOD LINE	~~~~~
BRUSH LINE	~~~~~
HEDGE	~~~~~
BODY OF WATER EDGE	=====
LEDGE EXPOSED	~~~~~

PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238_legend_sheet.dgn
PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P. DETRICK
DRAWN BY:	VTRANS
DESIGNED BY:	VTRANS
CHECKED BY:	VTRANS
CONVENTIONAL SYMBOLOLOGY LEGEND SHEET	SHEET 3 OF 102





PROJECT NOTES

GENERAL

1.

ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2018, AND ITS LATEST REVISIONS, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, AND ITS LATEST REVISIONS, THE AASHTO LRFD GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES 2ND EDITION, AND MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES 2009 EDITION AND ITS LATEST REVISIONS.
2.

ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.
3.

PER AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG), PATH CROSS SLOPES SHALL NOT EXCEED 2%.
4.

ALL SHARED USE PATH LONGITUDINAL RAMPS AT ROADWAY AND DRIVEWAY CROSSINGS SHALL NOT EXCEED 5%.
5.

THE STRUCTURES ON THIS PROJECT ARE DESIGNED FOR H-10 LOADING UNLESS OTHERWISE NOTED.
6.

THE PROPOSED TRAIL CENTERLINE SHOWN IN THE EPSC SITE PLAN SHEETS SHALL BE CENTERED WITHIN THE EXISTING RAILROAD BED. THE STATIONED BASELINE PROVIDED IN THE PLANS IS PROVIDED FOR INFORMATIONAL PURPOSES AND IS NOT INTENDED TO REPRESENT A DESIGNED CONSTRUCTION CENTERLINE.
7.

ALL WORK AND ANY ASSOCIATED ACTIVITY ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY LIMITS UNLESS OTHERWISE NOTED.
8.

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT SILTATION OR POLLUTION, ESPECIALLY THE DISCHARGE OF RAW CONCRETE, INTO ANY BROOK, STREAM, OR RIVER. THE CONTRACTOR SHALL FOLLOW ALL EROSION AND SEDIMENT CONTROL MEASURES AS SPECIFIED IN THE EPSC SHEETS SHOWN IN THIS PLANSET. THE EPSC SHEETS SHOW THE PERMITTED EROSION AND SEDIMENT CONTROL MEASURED PER THE INDC PERMIT FOR THIS PROJECT.
9.

FEATURES SHOWN ON THE EPSC SITE PLANS HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING FEATURES AND LIMITED FIELD INVESTIGATION AND MAY NOT ACCURATELY REFLECT ACTUAL FIELD CONDITIONS. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAKING FIELD MEASUREMENTS OF ALL EXISTING STRUCTURE COMPONENTS IMPACTED BY THE NEW WORK TO ASSURE CONSISTENCY WITH THE PROPOSED MODIFICATIONS. ANY DISCREPANCIES IN DIMENSIONS, CHARACTER, OR EXTENT OF THE EXISTING FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE ADVANCING THE WORK. ALL COSTS ASSOCIATED WITH THE VERIFICATION OF PROPOSED WORK SHALL BE INCLUDED IN ITEM 635.11, “MOBILIZATION/DEMOBILIZATION”.
10.

ITEM 529.20, “PARTIAL REMOVAL OF STRUCTURE” AND ITEM 529.15, “REMOVAL OF STRUCTURE” SHALL INCLUDE THE COMPLETE REMOVAL AND DISPOSAL OF THE EXISTING BRIDGE SUBSTRUCTURE AND SUPERSTRUCTURE EXCEPT AS NOTED IN THESE PLANS. THIS SHALL INCLUDE BUT IS NOT LIMITED TO ALL BRIDGE RAILINGS, RAILROAD TRACKS, TIMBER PILE PIERS, BEARINGS, ANCHOR BOLTS, STEEL GIRDERS, TIMBER RAIL TIES, AND SUBSTRUCTURE ELEMENTS TO THE LIMITS SHOWN ON THE PLANS OR TO THE SATISFACTION OF THE ENGINEER.
11.

ALL SOIL DEPOSITS WHICH ARE FOUND ON THE TRAIL SHALL BE REMOVED DOWN TO THE EXISTING BALLAST ELEVATION. COST SHALL BE COVERED UNDER ITEM 203.17, “UNCLASSIFIED EXCAVATION”. BALLAST SHALL THEN BE CLEANED IN ACCORDANCE WITH ITEM 900.640, “SPECIAL PROVISION (WINDROWING BALLAST)” AND CHOKED IN ACCORDANCE WITH ITEM 900.640, “SPECIAL PROVISION (CHOKING BALLAST)”. SEE TRAIL CONSTRUCTION NOTES ON TYPICAL TRAIL SECTIONS SHEET FOR ADDITIONAL DETAILS.
12.

THE EXISTING STRUCTURAL STEEL MAY BE PAINTED WITH A MATERIAL THAT CONTAINS LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN HANDLING AND WORKING WITH THIS STEEL. ANY REMOVED STRUCTURAL STEEL, IF APPLICABLE, IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE AND ITS OFFICERS AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR’S USE OR DISPOSITION OF THE REMOVED EXISTING STRUCTURAL STEEL.
13.

CONSTRUCTION LOAD SURCHARGE FROM HEAVY EQUIPMENT OR STOCKPILED MATERIALS ARE NOT PERMITTED AGAINST SUBSTRUCTURES OR RETAINING WALLS. ALL CONSTRUCTION LOADS, WITH THE EXCEPTION OF A PLATE COMPACTOR, SHALL MAINTAIN AN ADEQUATE DISTANCE, BASED ON THE DEPTH OF THE BOTTOM OF THE STRUCTURE, FROM THE BACK OF THE ABUTMENT OR WINGWALL SO THAT NO CONSTRUCTION SURCHARGE LOAD IS EXERTED ON THE SUBSTRUCTURE ELEMENT. IF CONSTRUCTION LOADS RESULTING IN A SURCHARGE ON THE ABUTMENTS OR WINGWALLS ARE REQUIRED, THE CONTRACTOR MAY CONTACT THE ENGINEER AND PROVIDE ANTICIPATED LOADS TO DETERMINE THE DISTANCE THAT IS REQUIRED TO BE MAINTAINED FROM THE BACK OF THE ABUTMENT OR WINGWALL. FOR THE ABUTMENTS TO BE DESIGNED BY THE CONTRACTOR (SEE ABUTMENTS ON PILES NOTES) IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR’S ENGINEER TO DETERMINE THE DISTANCE THAT IS REQUIRED FROM THE BACK OF THE ABUTMENT OR WINGWALL TO THE CONSTRUCTION SURCHARGE LOAD.
14.

CLEARING OF VEGETATION TO IMPROVE SIGHT DISTANCE AT CROSSINGS SHALL BE PAID FOR UNDER ITEM 201.30, “THINNING AND TRIMMING.”

TRAIL ACCESS

15.

ACCESS TO THE TRAIL SHALL BE FROM PUBLIC CROSSINGS. ACCESS FROM TOWN HIGHWAYS SHALL BE PERMITTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

a.

WORK HOURS ARE 7AM TO 6PM MONDAY THRU FRIDAY.

b.

HAVE CONSTRUCTION SIGNAGE AND TRAFFIC CONTROL AT ACCESS POINTS WHICH MEET THE REQUIREMENTS OF THE 2009 MUTCD AND ITS LATEST REVISIONS.

c.

ROAD CLOSURES OR STOPPING TRAFFIC SHALL NOT BE PERMITTED WITHOUT PRIOR APPROVAL BY THE TOWN OR STATE.

d.

THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO ROADS, DITCHES, SHOULDERS, ETC. AND RESTORE THEM TO PRE-CONSTRUCTION CONDITIONS AT THE CONTRACTOR’S EXPENSE. ENGINEER TO VERIFY PRE-CONSTRUCTION CONDITIONS

TRAIL CONSTRUCTION

16.

SEE TRAIL TYPICAL SECTIONS SHEETS FOR TRAIL CONSTRUCTION NOTES.

TIMBER

17.

SEE SPECIAL PROVISION (PREFABRICATED MULTI-MODAL BRIDGE) FOR LUMBER AND TIMBER PRESERVATIVES AND TREATMENT OF PREFABRICATED BRIDGES.

STRUCTURE REPAIR NOTES

18.

PROPOSED WORK HAS BEEN ESTIMATED BASED ON LIMITED FIELD INVESTIGATION PERFORMED BY VHB. ACTUAL WORK SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY ENGINEER.
19.

THE REMOVAL AND DISPOSAL OF CATTLEPASS 41E AND 48D SHALL BE INCIDENTAL TO ITEM 201.10, “CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS”. BACKFILLING OF CATTLEPASS 48D SHALL BE PAID FOR UNDER THE RESPECTIVE ITEMS.
20.

DESIGN REQUIREMENTS:

a.

TWELVE (12) FOOT CLEAR WIDTH BETWEEN BRIDGE HAND RAILING

b.

THE TABLE BELOW LISTS THE STRUCTURES AND THEIR DESIGN PARAMETERS. THE BRIDGE AND ITS COMPONENTS SHALL BE DESIGNED FOR A LIVE LOAD OF 60 PSF SNOW LOAD, 90 PSF PEDESTRIAN LOAD OR THE DEISGN LIVE LOAD LISTED IN THE TABLE BELOW, WHICHEVER IS GREATER.

BRIDGE/ CULVERT #	SPAN LENGTH (FT)	DESIGN LL	DECK TYPE	SUPERSTRUCTURE
40I	20	H10/PED	TIMBER	STEEL H-PILE BEAM
53G	13	H10/PED	TIMBER	STEEL H-PILE BEAMS
43	10	H10/PED	TIMBER	PRECAST CONCRETE
44	18	H10/PED	TIMBER	PRECAST CONCRETE
45	48, 40	H10/PED	TIMBER	COVERED BRIDGE
46	16	H10/PED	TIMBER	STEEL GIRDER
47	110	H10/PED	TIMBER	STEEL THROUGH TRUSS
53	44	H10/PED	TIMBER	STEEL GIRDER

CONCRETE

21.

ALL CAST-IN-PLACE CONCRETE SHALL CONFORM TO SPECIAL PROVISION (CONCRETE, HIGH PERFORMANCE, CLASS B).
22.

ALL REINFORCING STEEL SHALL BE LEVEL I, EPOXY COATED AND MEET THE REQUIREMENTS OF SECTION 507. ALL REINFORCING STEEL SHALL BE PAID FOR UNDER ITEM 507.11, “REINFORCING STEEL, LEVEL I”. ALL LIFTING AND FASTENING HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 726.08 OF THE STANDARD SPECIFICATIONS.
23.

MINIMUM COVER FOR REINFORCING STEEL SHALL BE 3”, UNLESS OTHERWISE NOTED.
24.

REINFORCING STEEL PLACEMENT TOLERANCES SHALL BE

SPACING

+/-

1”

CLEARANCE

+/-

¼”

25.

THE CONTRACTOR AND PREFABRICATED BRIDGE MANUFACTURER AFTER FINAL APPROVAL OF THE PREFABRICATED BRIDGE BEARINGS SHALL PROVIDE THE LOADS ON THE ANCHOR BOLTS TO THE ENGINEER. THE ENGINEER WILL VERIFY THAT THE MINIMUM ANCHOR BOLT SIZE SPECIFIED BELOW IS ADEQUATE TO SUPPORT THOSE LOADS. IF NOT, THEN THE ENGINEER WILL DESIGN THE ANCHOR BOLTS BASED ON THE LOADINGS PROVIDED BY THE CONTRACTOR AND PROVIDE THE ANCHOR BOLT DESIGN TO THE CONTRACTOR FOR THEIR USE. THE COST FOR THE ANCHOR BOLTS AND COORDINATION WITH THE ENGINEER WILL BE INCIDENTAL TO ITEM 900.645, SPECIAL PROVISION (ABUTMENT ON PILES) OR 900.608 SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, CLASS B), AS APPROPRIATE. THE CONTRACTOR CAN USE THE FOLLOWING INFORMATION FOR BEARING ANCHOR BOLT ESTIMATION, SUBJECT TO FINAL DESIGN:

- MIN. ANCHOR BOLT SIZE: 24” LONG x 1-1/2” DIAMETER STRAIGHT, FULLY THREADED, WITH 2 HEAVY HEX NUTS AND A WASHER.

- MATERIAL: ASTM F1554 GR. 105, GALVANIZED

- BEARING ANCHOR BOLT QUANTITY: 8 PER BRIDGE
26.

THE BEARING ANCHOR BOLTS SHALL BE CAST INTO THE ABUTMENT STEMS.
27.

SURFACES OF BRIDGE SEATS UNDER BEARING DEVICES SHALL BE LEVEL. OTHER BRIDGE SEAT AREAS SHALL BE SLOPED ¼” PER FOOT TOWARDS MID-SPAN. THE ENTIRE BRIDGE SEAT SURFACE SHALL BE SMOOTH STEEL TROWEL FINISHED.
28.

WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES.
29.

ALL EXPOSED EDGES SHALL BE CHAMFERED 1”x1”.

PREFABRICATED MULTI-MODAL BRIDGE

30.

THE COST OF THE DESIGN, FABRICATION, SHIPPING, AND INSTALLATION OF THE BRIDGE, SACRIFICIAL LONGITUDINAL DECKING, AND BEARINGS SHALL BE INCIDENTAL TO ITEM 900.645 “SPECIAL PROVISION (PREFABRICATED MULTI-MODAL BRIDGE)”.
31.

DESIGN REQUIREMENTS:

a.

MINIMUM PEDESTRIAN RAILING HEIGHT IS 4’-6”

b.

TWELVE (12) FOOT CLEAR WIDTH BETWEEN BRIDGE HAND RAILING

c.

4” TREATED TIMBER DECK

d.

3” TREATED SACRIFICIAL LONGITUDINAL DECKING

e.

THE TABLE BELOW LISTS THE PREFABRICATED MULTI-MODAL BRIDGE STRUCTURES, THEIR LOCATIONS, AND DESIGN PARAMETERS. THE BRIDGE AND ITS COMPONENTS SHALL BE DESIGNED FOR A LIVE LOAD OF 60 PSF SNOW LOAD, 90 PSF PEDESTRIAN LOAD OR THE DESIGN LIVE LOAD LISTED IN THE TABLE BELOW, WHICHEVER IS GREATER.

BRIDGE #	CROSSING	TOWN	SPAN LENGTH (FT)	DESIGN LL	DECK TYPE	STEEL COATING
49	WILD BRANCH	WOLCOTT	178	H10/PED	TIMBER	GALVANIZED
52	LAMOILLE RIVER	WOLCOTT	168	H10/PED	TIMBER	WEATHERING STEEL

32.

THE 3” TREATED SACRIFICIAL WEARING SURFACE SHALL BE FASTENED TO THE WOOD DECKING WITH WOOD SCREWS AS IT WILL NEED TO BE REPLACED AS PART OF NORMAL MAINTENANCE ACTIVITIES.
33.

FABRICATION DRAWINGS SHALL BE SUBMITTED IN ACCORDANCE WITH SECTION 105.03 AND SHALL INCLUDE AN ASSEMBLY PLAN WITH TEMPORARY BRACING REQUIREMENTS AS REQUIRED FOR ERECTION AND INSTALLATION. ALL COSTS SHALL BE INCIDENTAL TO THE PREFABRICATED MULTI-MODAL BRIDGE ITEM. SEE ADDITIONAL REQUIREMENTS IN THE PROJECT SPECIAL PROVISION FOR ITEM 900.645 “SPECIAL PROVISION (PREFABRICATED MULTI-MODAL BRIDGE)”.

ABUTMENTS ON PILES

34.

ABUTMENT NO. 2 ON BRIDGE 49 SHALL BE SUPPORTED ON STEEL H-PILES.
35.

IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DESIGN THE STEEL H-PILES AND THE CAST-IN-PLACE CONCRETE ABUTMENTS SUPPORTED ON THOSE PILES. THIS WORK SHALL INCLUDE ADDITIONAL GEOTECHNICAL INVESTIGATIONS AS REQUIRED AND DESIGN CALCULATIONS AND WORKING DRAWINGS FOR REVIEW BY THE ENGINEER AND FOR USE BY THE CONTRACTOR FOR THE INSTALLATION AND CONSTRUCTION OF THESE SUBSTRUCTURES. SEE THE “CONCRETE ABUTMENT ON PILES” SPECIAL PROVISION FOR ADDITIONAL INFORMATION.

PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.pn.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.O. CRONIN  
PROJECT NOTES SHEET

PLOT DATE: 3/23/2021  
DRAWN BY: K.C. BARRY  
CHECKED BY: E.P. DETRICK  
SHEET 4 OF 102





STATE OF VERMONT AGENCY OF TRANSPORTATION														QUANTITY SHEET 1									
SUMMARY OF ESTIMATED QUANTITIES														TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
									EROSION CONTROL	BIKE/TRANSPOR TATION PATH	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS		
										1			1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10	-					
										1			1		ACRE	THINNING AND TRIMMING	201.30	-					
										1110			1110		CY	COMMON EXCAVATION	203.15	6.035					
										45			45		CY	SOLID ROCK EXCAVATION	203.16	3.5					
										600			600		CY	UNCLASSIFIED EXCAVATION	203.17	-					
										1815			1815		CY	CHANNEL EXCAVATION OF EARTH	203.25	8.289					
										490			490		CY	GRANULAR BORROW	203.32	4.815					
										6950			6950		CY	STRUCTURE EXCAVATION	204.25	2.85					
										1040			1040		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	4.44					
											40		40		CY	HIGH PERFORMANCE CONCRETE, CLASS PCS	501.38	3.4					
											2		2		EACH	SHORING SUPERSTRUCTURE BEARINGS	502.11	-					
											6415		6415		LB	STRUCTURAL STEEL, ROLLED BEAM	506.50	2.5					
											14175		14175		LB	REINFORCING STEEL, LEVEL I	507.11	8.1					
											10		10		LF	DRILLING AND GROUTING DOWELS	507.16	-					
											21		21		MFBM	STRUCTURAL LUMBER AND TIMBER, UNTREATED	522.20	0.3					
											1		1		EACH	REMOVAL OF STRUCTURE (BRIDGE 44)	529.15	-					
											1		1		EACH	REMOVAL OF STRUCTURE (BRIDGE 52)	529.15	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 41)	529.20	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 43)	529.20	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 45)	529.20	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 46)	529.20	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 47)	529.20	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 49 ABUTMENT NO. 1)	529.20	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 52 ABUTMENT NO. 1)	529.20	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 52 ABUTMENT NO. 2)	529.20	-					
											1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 53)	529.20	-					
											9		9		EACH	BEARING DEVICE ASSEMBLY, PLAIN ELASTOMERIC PAD	531.16	-					
											66		66		EACH	REMOVE AND REPLACE EXISTING ANCHOR BOLT	531.19	-					
											1		1		LS	PRECAST CONCRETE STRUCTURE (BRIDGE 43)	540.10	-					
											1		1		LS	PRECAST CONCRETE STRUCTURE (BRIDGE 44)	540.10	-					
											1		1		LS	PRECAST CONCRETE STRUCTURE 4x4 BOX CULVERT (41D(2))	540.10	-					
											1		1		LS	PRECAST CONCRETE STRUCTURE 4x4 BOX CULVERT (41E)	540.10	-					
											1		1		LS	PRECAST CONCRETE STRUCTURE 4x4 BOX CULVERT (50A(2))	540.10	-					
											1		1		LS	PRECAST CONCRETE STRUCTURE 4x4 BOX CULVERT (51)	540.10	-					
											1		1		LS	PRECAST CONCRETE STRUCTURE 4x4 BOX CULVERT (53P)	540.10	-					
											1		1		LS	PRECAST CONCRETE STRUCTURE 6x4 BOX CULVERT (48C)	540.10	-					
										65			65		CY	CONCRETE, CLASS B	541.25	1.8					
											20		20		SY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I	580.13	0.1					
											10		10		SY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II	580.14	-					
											4		4		CY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III	580.15	-					



QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES														TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
										EROSION CONTROL	BIKE/TRANSPOR TATION PATH	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
											450			450		LF	18" CPEP(SL)	601.2615	2			
											295			295		LF	24" CPEP(SL)	601.2620	3			
											100			100		LF	30" CPEP(SL)	601.2625	2			
											30			30		LF	36" CPEP(SL)	601.2630	4			
											50			50		LF	RE-LAYING PIPE CULVERTS	601.99	2			
											85			85		SY	REPOINTING MASONRY	602.30	2.74			
											350			350		CY	REBUILT STONE MASONRY	602.35	6.67			
											4			4		SY	REPAIRING STONE MASONRY	602.40	-			
											140			140		CY	STONE FILL, STREAM BED MATERIAL	613.06	2.18			
											1090			1090		CY	STONE FILL, TYPE I	613.10	12.99			
											545			545		CY	STONE FILL, TYPE II	613.11	2.73			
											260			260		CY	STONE FILL, TYPE III	613.12	4.44			
											1505			1505		CY	STONE FILL, TYPE IV	613.13	2.39			
											80			80		SY	PORTLAND CEMENT CONCRETE SIDEWALK, 8 INCH	618.11	0.56			
											220			220		SF	DETECTABLE WARNING SURFACE	618.30	-			
													1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16	-			
													1	1		LS	TESTING EQUIPMENT, GROUT	631.19	-			
											1			1		LS	MOBILIZATION/DEMOBILIZATION	635.11	-			
											1			1		LS	TRAFFIC CONTROL	641.10	-			
											110			110		LF	12 INCH WHITE LINE, WATERBORNE PAINT	646.241	-			
											180			180		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11	2.22			
										950				950		LB	SEED	651.15	21.93			
										3870				3870		LB	FERTILIZER	651.18	3.06			
										20				20		TON	AGRICULTURAL LIMESTONE	651.20	4.53			
											2080			2080		CY	TOPSOIL	651.35	0.45			
											1170			1170		SY	GRUBBING MATERIAL	651.40	12.4			
											15			15		TON	HAY MULCH	653.10	3.4			
											5			5		TON	STRAW MULCH	653.12	1.13			
											4950			4950		SY	ROLLED EROSION CONTROL PRODUCT, TYPE I	653.20	32.9			
											575			575		SF	TRAFFIC SIGN, TYPE A	675.20	5.08			
											980			980		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341	-			
											4060			4060		CY	SPECIAL PROVISION (AGGREGATE SURFACE COURSE, TRAIL)	900.608	4.75			
												20		20		CY	SPECIAL PROVISION (HPC CLASS B)	900.608	4.6			
											30			30		EACH	SPECIAL PROVISION (BOULDERS)	900.620	4.5			
											58			58		EACH	SPECIAL PROVISION (CLEARING CULVERT)	900.620	-			
											13			13		EACH	SPECIAL PROVISION (MILE POSTS INSTALLATION)	900.620	-			
											2			2		EACH	SPECIAL PROVISION BEAVER FENCE	900.620	-			
												690		690		LF	SPECIAL PROVISION (APPROACH RAIL, PRESSURE TREATED)	900.640	2			
												410		410		LF	SPECIAL PROVISION (BRIDGE RAIL TYPE I, PRESSURE TREATED)	900.640	-			
												100		100		LF	SPECIAL PROVISION (BRIDGE RAIL TYPE II, PRESSURE TREATED)	900.640	-			

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)



FILE NAME: z20f238_quantities.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.M. ROBERTS  
QUANTITY SHEET (2 OF 3)

PLOT DATE: 3/23/2021  
DRAWN BY: B.M. ROBERTS  
CHECKED BY: E.P. DETRICK  
SHEET 6 OF 102



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(12)	
FILE NAME: z20f238_quantities.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: B.M. ROBERTS
DESIGNED BY: B.M. ROBERTS	CHECKED BY: E.P. DETRICK
QUANTITY SHEET (3 OF 3)	SHEET 7 OF 102





ITEM DETAIL SHEET	
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CULVERTS					CATTLEPASSES					BRIDGES					
NUMBER	STATION	TYPE	SIZE	REMARKS	NUMBER	STATION	TYPE	SIZE	REMARKS	NUMBER	BEGIN STATION	END STATION	TYPE	LENGTH	REMARKS
			FT					FT						FT	
40H	1861+92	CAST IRON	2.0	EXCAVATE AND REPLACE, RESTORE DITCH LINES	41E	1921+41	STONE	N/A	REPLACE WITH CULVERT, DITCH FROM 1919+50 LEFT TO CULVERT	40I	1868+40	1868+62	STEEL GIRDER	22	REMOVE EXISTING CULVERT, CONSTRUCT PRECAST CONCRETE ABUTMENTS, CONSTRUCT BRIDGE USING RECYCLED H-PILES PROVIDED BY VAST
40I	1868+51	STONE BOX	2 x 5	REMOVE CULVERT, CONST. BRIDGE, RESTORE GRADE AT OUTLET	* 41I	1941+96	STONE	5 x 5	CLEAR INLET AND OUTLET, INSTALL GUARDRAIL	41	1878+58	1879+60	STEEL THROUGH-PLATE	102	REPAIR EAST ABUTMENT, REPLACE/RAISE DECK, INSTALL GUARDRAILS
40J	1870+56	CPEP	4.0	RESTORE GRADE AT INLET & OUTLET, RESET EXIST. CULVERT	48D	2254+47	STEEL I-BEAM, WOOD	3 x 12	REMOVE AND FILL HOLE WITH ON-SITE STRUCTURALLY SUITABLE EXCAVATED MATERIAL	42	1966+93	1967+07	CONCRETE	14	INSTALL GUARDRAILS, REPAIR FASCIA, REPAIR ABUTMENTS
40J-2	1872+52	CMP	2.0	REPLACE CULVERT, RECONST. BANK, RESTORE GRADE AT INLET						43	2011+69	2011+79	CONCRETE	10	REPLACE DECK, REMOVE AND RESET ABUTMENT STONES, CONSTRUCT NEW BRIDGE SEATS AND BACKWALLS, INSTALL GUARDRAILS
41B	1897+20	CMP	1.5	EXCAVATE AND REPLACE						44 **	2019+23	2019+43	CONCRETE	20	REPLACE DECK, CONSTRUCT NEW CONCRETE ABUTMENTS, INSTALL GUARDRAILS
41C **	1903+30	STONE BOX	3 x 3	CLEAN OUTLET						* 45 **	2065+63	2066+66	STEEL I-BEAM, COVERED	103	REPAIR SIDING, REPLACE DECK, REPAIR ABUTMENTS, CONSTRUCT NEW BRIDGE SEATS AND BACKWALLS, WIDEN APPROACH
41C(2)	1913+22	CMP	1.0	NO ACTION NEEDED						46	2094+56	2094+76	STEEL I-BEAM	20	REPLACE DECK, REMOVE AND RESET GIRDERS, REPAIR ABUTMENTS, CONSTRUCT NEW BRIDGE SEATS AND BACKWALLS, INSTALL GUARDRAILS
41D	1914+00	CAST IRON	1.7	EXCAVATE AND REPLACE						* 47	2162+58	2163+72	STEEL THROUGH-TRUSS	114	REPLACE DECK, CONSTRUCT NEW CONCRETE ABUTMENTS, INSTALL GUARDRAILS
41D(2)	1917+20	N/A	N/A	INSTALL NEW CULVERT, DITCH FROM 1919+50 LEFT TO CULVERT						48	2211+89	2213+42	PREFABRICATED MULTI-MODAL	153	BRIDGE WORK COMPLETED DURING LVRT(10) CONSTRUCTION
41E(2)	1925+38	N/A	N/A	INSTALL NEW CULVERT						49	2276+75	2278+57	N/A	182	ERECT PREFABRICATED MULTI-MODAL BRIDGE, CONSTRUCT NEW CONCRETE ABUTMENTS
* 41F	1925+95	STONE BOX	3 x 4	RESET HEADWALL, REPAIR BANKING AT OUTLET						51	2306+28	2306+35	STEEL I-BEAM	7	REMOVE STRUCTURE, INSTALL 4x4 BOX CULVERT
* 41G	1928+69	STONE BOX	4 x 4	CLEAN INLET AND OUTLET						* 52	2339+24	2340+96	STEEL THROUGH-TRUSS	172	ERECT PREFABRICATED MULTI-MODAL BRIDGE, CONSTRUCT NEW CONCRETE ABUTMENTS
41G(2)	1935+26	N/A	N/A	INSTALL NEW CULVERT						53	2391+93	2392+38	STEEL I-BEAM	45	REPLACE DECK, REPOINT ABUTMENTS
* 41H	1937+58	STONE BOX	3 x 3	EXCAVATE AND REPAIR						53G	2418+28	2418+43	CONCRETE CULVERT	15	REMOVE EXISTING CULVERT, CONSTRUCT PRECAST CONCRETE ABUTMENTS, CONSTRUCT BRIDGE USING RECYCLED H-PILES PROVIDED BY VAST
* 41J	1942+88	STONE BOX	4 x 5	EXCAVATE AND REPAIR						* 54	2494+37	2494+67	STONE ARCH	30	INSTALL GUARDRAILS, REPOINT ABUTMENTS
41J-2	1946+15	CMP	1.5	EXCAVATE AND REPLACE											
41K	1950+40	PVC/METAL	0.5	EXCAVATE AND REPLACE											
42A	1973+28	STONE BOX	2 x 3	EXCAVATE AND REPLACE											
42A(2)	1977+39	N/A	N/A	INSTALL NEW CULVERT											
42B	1981+09	CAST IRON	2.0	CLEAN OUTLET											
42D	1998+36	CAST IRON	2.0	CLEAN INLET AND OUTLET											
* 43A	2014+57	STONE BOX	2 x 2	CLEAN INLET AND OUTLET											
* 44A	2027+66	STONE BOX	2 x 2	REPAIR INLET AND BANKING											
44B	2038+89	CMP	2.0	EXCAVATE AND REPLACE											
44C-1	2042+75	CAST IRON	1.0	EXCAVATE AND REPLACE											
44D **	2049+68	STONE BOX	3 x 3	NO ACTION NEEDED											
44E	2053+43	STONE BOX	4 x 3	CLEAN AND REPAIR BANKING AT OUTLET											
44F	2058+97	N/A	N/A	INSTALL NEW CULVERT											
* 45A	2083+84	STONE BOX	3 x 3	CLEAN INLET, REPAIR OUTLET											
* 46A	2103+29	STONE BOX	2 x 2	CLEAN INLET AND OUTLET											
46A(2)	2107+48	N/A	N/A	EXCAVATE AND REPLACE, INSTALL BEAVER FENCE AT INLET											
46C	2115+84	HDPE	1.3	RESTORE GRADE AT INLET											
* 46D	2122+35	STONE BOX	4 x 6	CLEAN INLET											
46D(2)	2123+82	CONCRETE	2.5	EXCAVATE AND REPLACE											
* 46E	2130+65	STONE BOX	2 x 2	CLEAN INLET AND OUTLET											
* 46F	2134+62	STONE BOX	2 x 2	NO ACTION NEEDED											
* 46G	2136+98	STONE BOX	3 x 4	RESTORE GRADE AT INLET											
* 46H	2143+76	STONE BOX	2 x 2	CLEAN INLET AND OUTLET											
46H-2	2145+47	CONCRETE	2.0	CLEAN INLET AND OUTLET											
46H-3	2148+01	CONCRETE	2.0	CLEAN INLET AND OUTLET											
47A	2166+63	STONE BOX	3 x 3	EXCAVATE AND REPLACE											
47B	2179+39	STONE BOX	1 x 1	EXCAVATE AND REPLACE											
47C	2180+88	N/A	N/A	INSTALL NEW CULVERT											
47E	2192+90	CAST IRON	1.5	CLEAN OUTLET											
* 47F	2208+26	STONE BOX	3 x 3	CLEAN INLET, REPAIR OUTLET											
* 48A	2218+03	STONE BOX	3 x 3	EXCAVATE AND REPAIR											
48A-2	2224+77	CMP	2.5	EXCAVATE AND REPLACE											
48C	2226+75	CMP	2 x 3	EXCAVATE AND REPLACE											
48C-1	2228+05	CAST IRON	1.5	EXCAVATE AND REPLACE											
48C-2	2236+52	CMP	1.3	EXCAVATE AND REPLACE, STABILIZE EMBANKMENT AT OUTLET											
48C-3	2253+16	CAST IRON	2.0	CLEAN INLET AND OUTLET											
48C-4	2283+64	CMP	3.0	CLEAN INLET AND OUTLET											
50A	2296+26	STONE BOX	2 x 2	CLEAN INLET AND OUTLET											
50A-2	2304+83	WOOD-RAIL	2 x 2	EXCAVATE AND REPLACE											
51A	2312+93	CAST IRON	2.0	CLEAN INLET AND OUTLET											
51A(2)	2324+05	N/A	N/A	INSTALL NEW CULVERT											
51B	2329+97	STONE BOX	3 x 3	EXCAVATE AND REPLACE											
52A	2351+00	CAST IRON	0.5	EXCAVATE AND REPLACE											
52B	2354+51	CAST IRON	1.0	EXCAVATE AND REPLACE											
52C	2361+79	STONE BOX	2 x 1	CLEAN OUTLET, REPAIR INLET AND BANKING											
52D	2366+17	N/A	N/A	INSTALL NEW CULVERT											
52E	2373+30	CMP	2.0	EXCAVATE AND REPLACE, INSTALL BEAVER FENCE AT INLET											
52F	2380+57	CAST IRON	1.0	EXCAVATE AND REPLACE, STABILIZE OUTLET											
** 52F(2)	2382+99	N/A	N/A	INSTALL NEW CULVERT											
* 52G	2386+40	STONE BOX	2.0	CLEAN AND REPAIR INLET AND OUTLET											
52G-2	2390+58	CONCRETE	3.0	CLEAN INLET AND OUTLET											
* 53A	2399+15	STONE BOX	3 x 3	REPAIR OUTLET											
* 53B	2401+73	CAST IRON	1.3	CLEAN OUTLET											
* 53C	2406+40	STONE BOX	3 x 3	CLEAN INLET AND OUTLET											
53E	2412+33	CMP	2.0	CLEAN INLET AND OUTLET											
53F	2413+84	CMP	2.5	CLEAN OUTLET											
53G	2418+34	CONCRETE	4.5	REPLACE CULVERT WITH BRIDGE											
* 53H	2423+68	STONE BOX	1 x 3	CLEAN INLET AND OUTLET, REPAIR OUTLET											
53I	2426+81	CAST IRON	1.0	EXCAVATE AND REPLACE											
53J	2429+37	CAST IRON	2.0	CLEAN INLET AND OUTLET, RESTORE GRADE AT OUTLET											
* 53K	2431+37	CAST IRON	2.0	EXCAVATE AND REPLACE, STABILIZE INLET AND OUTLET											
* 53L	2432+83	STONE BOX	4 x 3	CLEAN INLET AND OUTLET, RESTORE GRADE AT OUTLET											
**	THESE CULVERTS WERE IMPACTED BY THE HALLOWEEN STORM IN 2019, AND ARE SCHEDULED TO BE REPAIRED UNDER A FEMA PROJECT. ACTUAL CONDITIONS MAY VARY FROM WHAT IS INDICATED ON THESE PLANS. CERTAIN ELEMENTS OF WORK ON THESE CULVERTS MAY BE DELETED OR ADDED AS DIRECTED BY THE ENGINEER									**	THESE BRIDGES WERE IMPACTED BY THE HALLOWEEN STORM IN 2019, AND ARE SCHEDULED TO BE REPAIRED UNDER A FEMA PROJECT. ACTUAL CONDITIONS MAY VARY FROM WHAT IS INDICATED ON THESE PLANS. CERTAIN ELEMENTS OF WORK ON THESE BRIDGES MAY BE DELETED OR ADDED AS DIRECTED BY THE ENGINEER				
*	NATIONAL HISTORIC REGISTER ELIGIBLE				*	NATIONAL HISTORIC REGISTER ELIGIBLE				*	NATIONAL HISTORIC REGISTER ELIGIBLE				



ITEM DETAIL SHEET

[illegible]

PROJECT NUMBER: STP LVRT(12)

FILE NAME: z20f238_ids.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.M. ROBERTS  
ITEM DETAIL SHEET (2 OF 3)

PLOT DATE: 3/23/2021  
DRAWN BY: B.M. ROBERTS  
CHECKED BY: E.P. DETRICK  
SHEET 9 OF 102





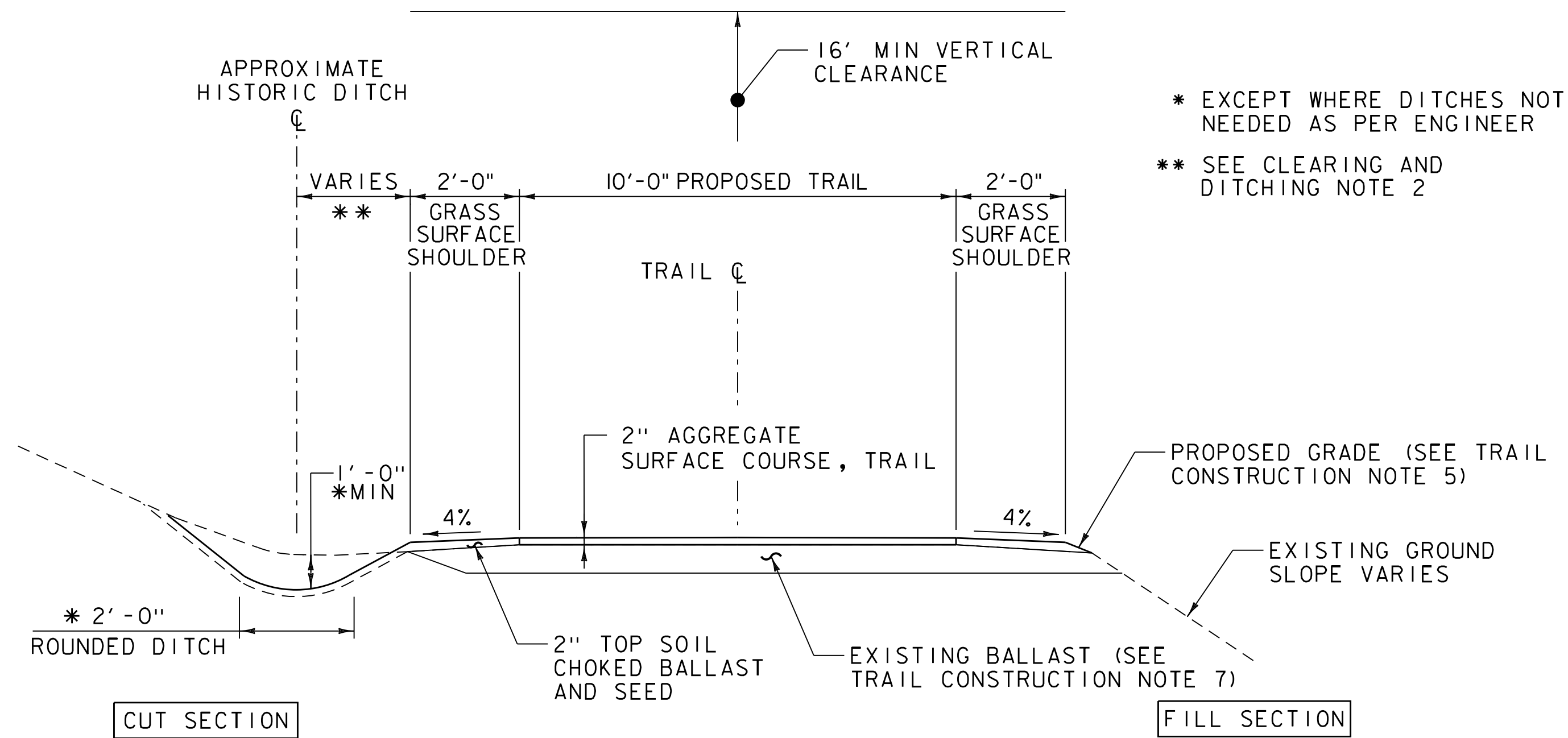
## ITEM DETAIL SHEET

RAILING					WASHOUTS					CROSSINGS					
BEGIN STATION	END STATION	LENGTH	TYPE	REMARKS	BEGIN STATION	END STATION	LENGTH	TYPE	REMARKS	NUMBER	STATION	TYPE	MATERIAL	CURRENTLY PERMITTED	REMARKS
		FT					FT								
1865+50	1866+50	100	GUARDRAIL	SLOPE PROTECTION, LT	1870+32	1871+32	100	WASHOUT OVER CULVERT	AFTER CULVERT 40J WORK COMPLETED, RE-ESTABLISH SLOPE AND ADD SLOPE PROTECTION	91	1845+42	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING ON WESTERN SIDE ONLY
1868+25	1868+40	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	1872+02	1873+02	100	WASHOUT OVER CULVERT	AFTER CULVERT 40J-2 WORK COMPLETED, RE-ESTABLISH SLOPE AND ADD SLOPE PROTECTION	92	1873+02	TOWN TRAIL	EARTH	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
1868+40	1868+62	44	GUARDRAIL	BRIDGE RAIL, BOTH SIDES	1902+52	1903+52	100	SAG IN TRAIL	FILL SAG WITH ON-SITE STRUCTURALLY SUITABLE EXCAVATED MATERIAL AND REGRADE TRAIL	N/A	1875+02	ATV ACCESS	EARTH	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
1868+62	1868+77	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	1916+80	1922+10	530	SLOPE FAILURE / TRAIL EROSION	RE-PROFILE TRAIL, INSTALL NEW CULVERT, DITCH ON LEFT SIDE	93	1893+52	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
1874+10	1877+50	340	GUARDRAIL	SLOPE PROTECTION, LT	1924+82	1925+32	50	PONDING	RAISE GRADE 6 INCHES AND RE-ESTABLISH DITCHING ON RIGHT SIDE	95	1913+22	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
1875+00	1877+50	250	GUARDRAIL	SLOPE PROTECTION, RT	1973+28	1973+33	5	SINKHOLE	REPAIR CULVERT THEN FILL SINK HOLE WITH GRANULAR BORROW	N/A	1929+59	LOGGING	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
1878+43	1878+58	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	1978+78	1979+78	100	SINKHOLES	FILL SINKHOLES, REPAIR BANKING	N/A	1934+82	LOGGING	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
1878+58	1879+60	102	BRIDGE	BRIDGE RAIL, BOTH SIDES	2109+00	2111+50	250	LEDGE SECTION	RAISE GRADE 12 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	96	1948+97	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
1879+60	1879+75	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	2137+47	2139+47	200	SLOPE FAILURE / TRAIL EROSION	RE-PROFILE TRAIL, RESTORE GRADE AT CULVERT INLET	97	1967+27	FARM	GRAVEL	YES	SIGN CROSSING
1941+91	1942+01	10	GUARDRAIL	CATTLEPASS, BOTH SIDES	2150+17	2151+42	125	PONDING	RAISE GRADE 12 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	N/A	1974+44	FARM	GRAVEL	NO	DITCH THROUGH CROSSING
1966+78	1966+93	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	2163+52	2164+02	50	DEPRESSION	RAISE GRADE 2 FEET	N/A	2009+67	FARM	GRAVEL/STAIRS	NO	NO ACTION NEEDED
1966+93	1967+07	14	BRIDGE	BRIDGE RAIL, BOTH SIDES	2182+55	2184+55	200	LEDGE SECTION	RAISE GRADE 6 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	99	2013+34	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
1967+07	1967+22	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	2185+92	2186+92	100	SLOPE FAILURE / TRAIL EROSION	REPAIR BANKING, STABILIZE SLOPE WITH STONE FILL, TYPE III	N/A	2020+09	FARM	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2011+54	2011+69	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	2187+47	2187+77	30	SLOPE FAILURE / TRAIL EROSION	REPAIR BANKING, STABILIZE SLOPE WITH STONE FILL, TYPE III	N/A	2034+52	HIKING	EARTH	NO	DITCH THROUGH CROSSING
2011+69	2011+79	10	BRIDGE	BRIDGE RAIL, BOTH SIDES	2188+52	2189+02	50	SLOPE FAILURE / TRAIL EROSION	REPAIR BANKING, STABILIZE SLOPE WITH STONE FILL, TYPE III	101	2043+28	DRIVEWAY	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2011+79	2011+94	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	2193+27	2193+77	50	SLOPE FAILURE / TRAIL EROSION	REPAIR BANKING, STABILIZE SLOPE WITH STONE FILL, TYPE III	102	2071+22	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
2019+08	2019+23	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	2356+65	2358+65	200	PONDING	RAISE GRADE 6 INCHES AND RE-ESTABLISH DITCHING ON BOTH SIDES	N/A	2132+99	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2019+23	2019+43	20	BRIDGE	BRIDGE RAIL, BOTH SIDES	2365+17	2368+67	350	PONDING	RAISE GRADE 6 INCHES AND RE-ESTABLISH DITCHING ON LEFT SIDE	N/A	2144+19	FARM	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2019+43	2019+58	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	2382+00	2385+00	300	PONDING	DITCH ALONG TRAIL, INSTALL NEW CULVERT	104	2146+55	STATE ROAD	TUNNEL	YES	INSTALL OMB SIGNS ON ALL FOUR CORNERS OF TUNNEL
2065+43	2065+63	40	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						105	2156+72	DRIVEWAY	PAVED	YES	SIGN CROSSING, CLEAR VEGETATION TO IMPROVE SIGHT DISTANCE, CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
2065+63	2066+66	103	BRIDGE	BRIDGE RAIL, BOTH SIDES						106	2164+40	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
2066+66	2066+86	40	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						107	2172+23	FARM	GRASS	NO	DITCH THROUGH CROSSING, BLOCK ACCESS AS DIRECTED BY ENGINEER
2084+41	2084+56	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						N/A	2176+47	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2084+56	2084+76	20	BRIDGE	BRIDGE RAIL, BOTH SIDES						N/A	2213+02	PRIVATE TRAIL	GRASS	NO	RESTRICT FOR PEDESTRIAN ACCESS ONLY
2084+76	2084+91	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						N/A	2213+47	PRIVATE TRAIL	GRASS	NO	RESTRICT FOR PEDESTRIAN ACCESS ONLY
2137+10	2138+70	160	GUARDRAIL	STEEP SLOPE, LT						109	2220+09	FARM	GRASS	YES	SIGN CROSSING
2188+50	2191+00	250	GUARDRAIL	STEEP SLOPE, ALONG RIVER, RT						N/A	2226+92	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2162+43	2162+58	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						110	2227+93	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING, ADD ADDITIONAL WARNING SIGNS ON ROUTE 15
2162+58	2163+72	114	BRIDGE	BRIDGE RAIL, BOTH SIDES						111	2241+56	FARM	GRASS	YES	SIGN CROSSING
2163+72	2163+87	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						112	2253+84	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2211+74	2211+89	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						N/A	2281+57	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2211+89	2213+42	160	BRIDGE	BRIDGE RAIL, BOTH SIDES						113	2286+07	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2213+42	2213+57	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						114	2292+66	TOWN ROAD	GRAVEL	YES	CLEAR VEGETATION TO IMPROVE SIGHT DISTANCE, CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
2236+15	2236+95	80	GUARDRAIL	STEEP SLOPE, ALONG RIVER, LT						N/A	2308+67	CONSTRUCTION	GRASS	NO	BLOCK ACCESS AS DIRECTED BY ENGINEER
2241+56	2242+56	100	GUARDRAIL	BLOCK ACCESS, RT						115	2324+43	FARM	GRASS	YES	DITCH THROUGH CROSSING TO PREVENT EROSION ON TRAIL FROM CROSSING
2276+60	2276+75	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						116	2335+40	XC-SKI TRAIL	GRASS	NO	RESTRICT FOR PEDESTRIAN ACCESS ONLY
2276+75	2278+57	182	BRIDGE	BRIDGE RAIL, BOTH SIDES						N/A	2497+07	SNOWMOBILE	GRASS	NO	NO ACTION NEEDED
2278+57	2278+72	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						117	2502+47	STATE ROAD	PAVED	YES	NO ACTION NEEDED
2306+13	2306+28	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2306+28	2306+35	7	BRIDGE	BRIDGE RAIL, BOTH SIDES											
2306+35	2306+50	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2339+09	2339+24	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2339+24	2340+96	172	BRIDGE	BRIDGE RAIL, BOTH SIDES											
2340+96	2341+11	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2391+78	2391+93	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2391+93	2392+38	45	BRIDGE	BRIDGE RAIL, BOTH SIDES											
2392+38	2392+53	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2418+13	2418+28	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2418+28	2418+43	15	BRIDGE	BRIDGE RAIL, BOTH SIDES											
2418+43	2418+58	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2494+22	2494+37	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											
2494+37	2494+67	30	BRIDGE	BRIDGE RAIL, BOTH SIDES											
2494+67	2494+82	30	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES											

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TRAIL TYPICAL SECTION

SHOULDER WIDTH TABLE

SIDE SLOPE	SHOULDER WIDTH	
	MIN.	PREFERRED
< 1:4	1'-0"	2'-0"
1:3	1'-0"	3'-0"
1:2	1'-0"	5'-0"
> 1:2	1'-0"	5'-0"

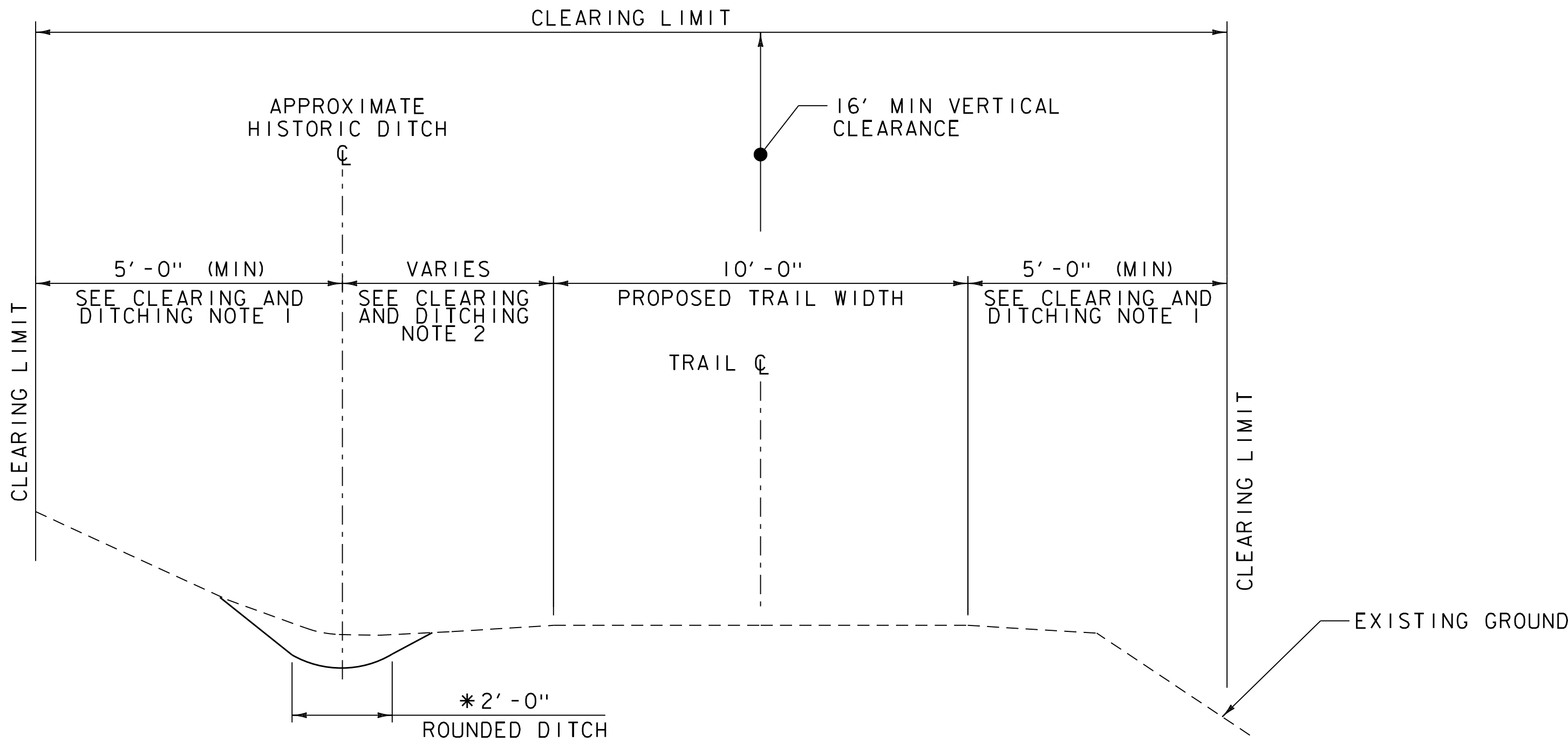
SEE TRAIL CONSTRUCTION NOTE 8

TRAIL CONSTRUCTION NOTES:

- IF THE EXISTING RAIL BED HAS ANY WASHOUTS OR HOLES, THEY SHALL BE FILLED WITH GRANULAR BORROW TO THE REQUIRED ELEVATION FOR THE INSTALLATION OF 2" OF ITEM 900.608, "SPECIAL PROVISION (AGGREGATE SURFACE COURSE, TRAIL)".
- ENTIRE TRAIL SURFACE SHALL BE BANKED 2% TO THE INSIDE OF CURVES. TRAIL SHALL OTHERWISE BE GRADED TO DRAIN OR SLOPED TO ONE SIDE IN FLAT AREAS WITH 2% CROSS SLOPE MAXIMUM.
- THE CONTRACTOR SHALL REMOVE RAILROAD TIES AND RAIL FROM BALLAST AND DISPOSE OF BY METHODS APPROVED BY THE VT AGENCY OF NATURAL RESOURCES. REMOVAL OF TIES AND RAIL SHALL BE PAID INCIDENTAL TO ITEM 201.10, "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".
- 1V:4H IS THE PREFERRED FILL SIDE SLOPE UNLESS THE FILL WOULD EXTEND BEYOND THE CLEARING LIMITS, IN WHICH CASE STEEPER SLOPES SHALL BE USED.
- SIDE SLOPES DISTURBED DURING CONSTRUCTION STEEPER THAN 1V:3H SHALL BE SEEDED AND PROTECTED WITH ITEM 653.20, "ROLLED EROSION CONTROL PRODUCT, TYPE 1" UNLESS STEEPER THAN 1V:2H, THEN ITEM 613.10, "STONE FILL, TYPE 1" SHALL BE USED. SIDE SLOPES STEEPER THAN 1V:1.5H SHALL BE PROTECTED WITH ITEM 613.11 "STONE FILL, TYPE 1" OR AS SPECIFIED IN THE PLANS OR BY THE ENGINEER. PAYMENT FOR ALL SIDE SLOPE PROTECTION MEASURES SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.
- STONE FILL SLOPES ABOVE THE ORDINARY HIGH WATER LINE SHALL BE GRUBBED WITH 6" OF GRUBBING MATERIAL. GRUBBING MATERIAL SHALL BE PAID FOR UNDER ITEM 651.40 "GRUBBING MATERIAL".
- IF THE EXISTING RAIL BED LACKS 8" OF SALVAGEABLE BALLAST OR WELL DRAINED GRANULAR MATERIAL, GRANULAR BORROW SHALL BE ADDED TO ACHIEVE THE REQUIRED 8" BASE.
- THE PREFERRED SHOULDER DIMENSIONS SHALL BE USED UNLESS CONSTRAINED BY THE WIDTH OF THE EXISTING RAIL BED AND STEEP SIDE SLOPES. SHOULDER WIDTHS BELOW THE PREFERRED WIDTH SHALL BE USED WHEN DIRECTED BY THE ENGINEER. CERTAIN EXISTING RAIL BED WIDTHS AND SIDE SLOPE CONDITIONS MAY WARRANT SHOULDER WIDTHS BELOW THE MINIMUM WIDTHS SHOWN. TO AVOID THE USE OF GUARDRAIL TO PROTECT STEEP SLOPES WITHOUT AN ADEQUATE BARRIER OF VEGETATION OR OTHER IMPASSABLE OBJECTS, THE ENGINEER MAY DIRECT THE CONTRACTOR TO LOWER THE PROFILE OF THE EXISTING TRAIL TO ACHIEVE THE PREFERRED SHOULDER WIDTH.
- BALLAST GRADING AND COMPACTION SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (BALLAST GRADING AND SHAPING)".
- GRASS SHOULDERS MAY BE OMITTED IF GRASSED BERMS EXIST AT THE EDGES OF THE PROPOSED TRAIL. OMISSION OF SHOULDERS MUST BE APPROVED BY THE ENGINEER.
- FOR LOCATIONS NOTED AS A WASHOUT, ON ITEM DETAIL SHEET 3, WHERE THE PROPOSED ACTION IS TO RAISE GRADE, THE LONGITUDINAL SLOPE OF THE TRAIL SHALL NOT EXCEED 5%.

CLEARING AND DITCHING NOTES:

- CLEARING LIMIT ON EMBANKMENT SLOPES STEEPER THAN 1V:2H SHALL NOT BE MORE THAN 1'-0" BEYOND THE TOP OF SLOPE. ACTUAL CLEARING LIMITS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. IN ROCK CUT AREAS, CLEAR THE WIDTH OF THE BALLAST AND DITCHES ALONG WITH ANY OVERHANGING VEGETATION. DO NOT CLEAR OR DAMAGE HEALTHY TREES GREATER THAN 5" IN DIAMETER ON STEEP EMBANKMENTS OFF THE EDGE OF THE BALLAST UNLESS WITHIN 1'-0" OF THE BALLAST. DO NOT REMOVE ROOTS OR STUMPS ON SLOPES. PRUNE BRANCHES WITHIN CLEARING LIMITS AND REMOVE DEAD TREES 3'-0" BEYOND THE TOP OF SLOPE. CLEARING TO BE PAID UNDER ITEM 201.10, "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".
- RE-ESTABLISH APPROXIMATE UNMAINTAINED HISTORIC DITCHES. ACTUAL DITCH OFFSET AND BOTTOM ELEVATION SHALL BE SET IN THE FIELD BY THE ENGINEER. SALVAGE CLEAN BALLAST FROM DITCHES TO RAIL BED. DITCH EXCAVATION DEPTH VARIES TO ACCOMMODATE HISTORIC LOCATIONS, BACK SLOPES, DITCH PROFILE, AND CROSS CULVERT INVERT ELEVATIONS. DITCHING WORK SHALL BE PAID UNDER ITEM 900.640, "SPECIAL PROVISION (DITCHING)".
- WASTE SILT AND EXCAVATED MATERIALS ONTO DESIGNATED SHOULDERS AND EMBANKMENT SLOPES THAT HAVE BEEN MARKED BY THE ENGINEER. SEE WASTE AREA DETAILS SHEET FOR WASTING DETAILS. CLEAR WASTE AREAS PRIOR TO WASTING MATERIAL. RAKE SEED AND MULCH THE DRESSED SLOPES WITHIN 72 HOURS, OR IMMEDIATELY IF EXPECTING RAIN WITHIN 24 HOURS. COSTS FOR WASTING MATERIAL SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.
- IN WETLANDS OR ON BANKS OF WATER BODIES DO NOT CLEAR PAST THE EDGE OF BALLAST OR TOP OF BANK, OR OTHER LIMITS SET BY PERMIT CONDITIONS.
- ON BALLAST TRAIL SHOULDERS AND DITCHES, REMOVE ALL TREES, BRUSH, WEEDS, LEAVES, BRANCHES, TRASH, ROOTS, STUMPS; TOPSOIL MAY BE SALVAGED FOR THE USE ON TRAIL GRASS SURFACE.
- ON LATERAL DITCHES OR SHOULDERS, CLEAR CUT AND REMOVE ALL TREES, BRUSH, WEEDS, LEAVES, BRANCHES TO WITHIN 4" OF SOIL SURFACE.
- ORGANIC MATERIAL THAT HAS BEEN CHIPPED, GROUND, OR MULCHED MAY REMAIN. IF IT IS TO REMAIN THEN SPREAD EVENLY ON SHOULDERS AND ADJACENT R.O.W. LAND. REMOVE AND LEGALLY DISPOSE OF ANY TRASH AND DEBRIS OFF SITE. THE COST OF DISPOSAL OF TRASH AND DEBRIS SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.



CLEARING AND DITCHING TYPICAL SECTION

NOT TO SCALE

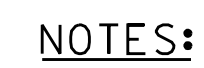


PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_typ_trail.sections.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: B.M. ROBERTS  
DESIGNED BY: B.M. ROBERTS CHECKED BY: E.P. DETRICK  
TYPICAL TRAIL SECTIONS SHEET (1 OF 2) SHEET II OF 102





- BRIDGE 49 TYPICAL PLACED RIP RAP WALL SECTION

NOT TO SCALE



NOT TO SCALE



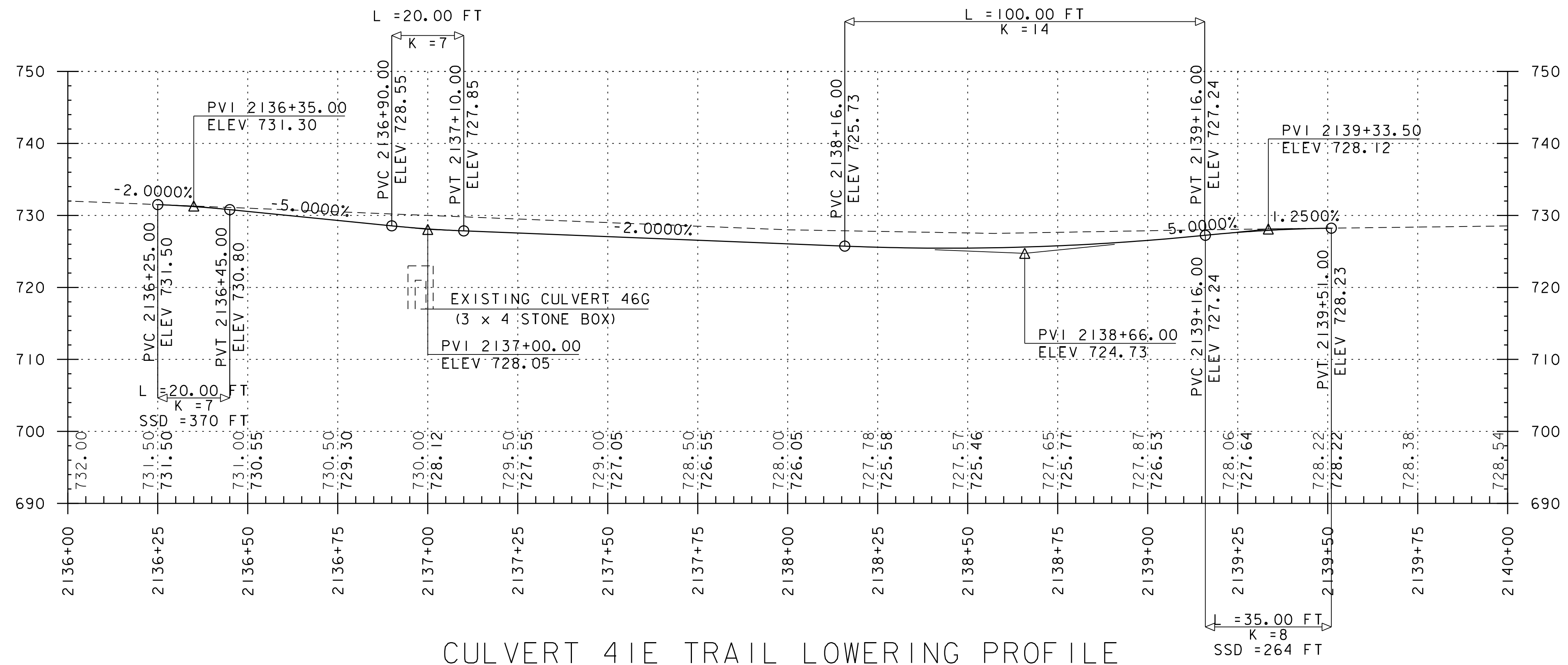
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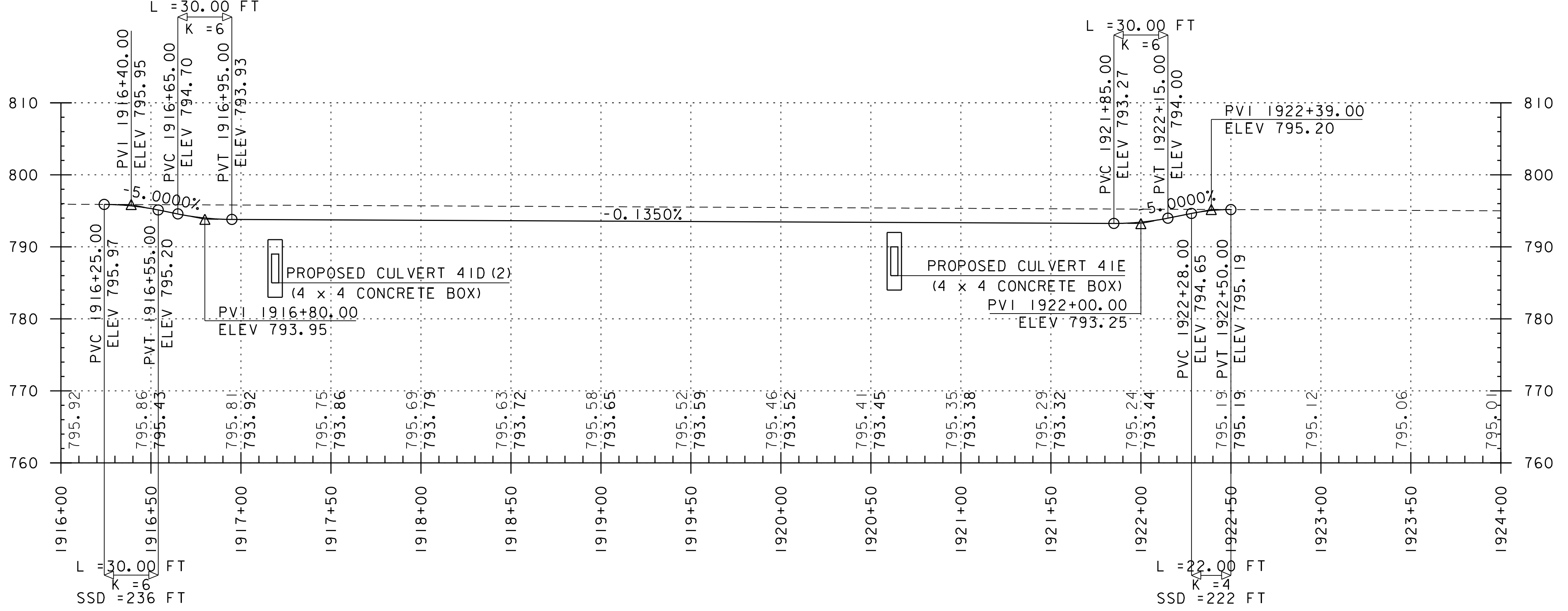
1. SEE TRAIL TYPICAL SECTIONS (SHEET 1 OF 2) FOR TRAIL CONSTRUCTION NOTES.
2. BERMS LOCATED AT THE TOP OF EMBANKMENTS SHALL BE ROUNDED TO PROMOTE SHEET FLOW FROM THE TRAIL DOWN THE EXISTING RAIL EMBANKMENT. BERM MATERIAL REMOVED SHALL BE PUSHED OVER THE EMBANKMENT IF THAT MATERIAL DOES NOT GO BEYOND THE EXISTING TOE OF THE SLOPE. IF THE BERM MATERIAL WOULD EXTEND BEYOND THE EXISTING TOE OF THE SLOPE, THE MATERIAL SHALL BE SPOILED IN A PRE- APPROVED DISPOSAL LOCATION OR PAUSE PLACE. PAYMENT FOR SLOPE ROUNDING SHALL BE MADE UNDER ITEM 201.10 CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS.



CULVERT 46G TRAIL LOWERING PROFILE



CULVERT 41E TRAIL LOWERING PROFILE

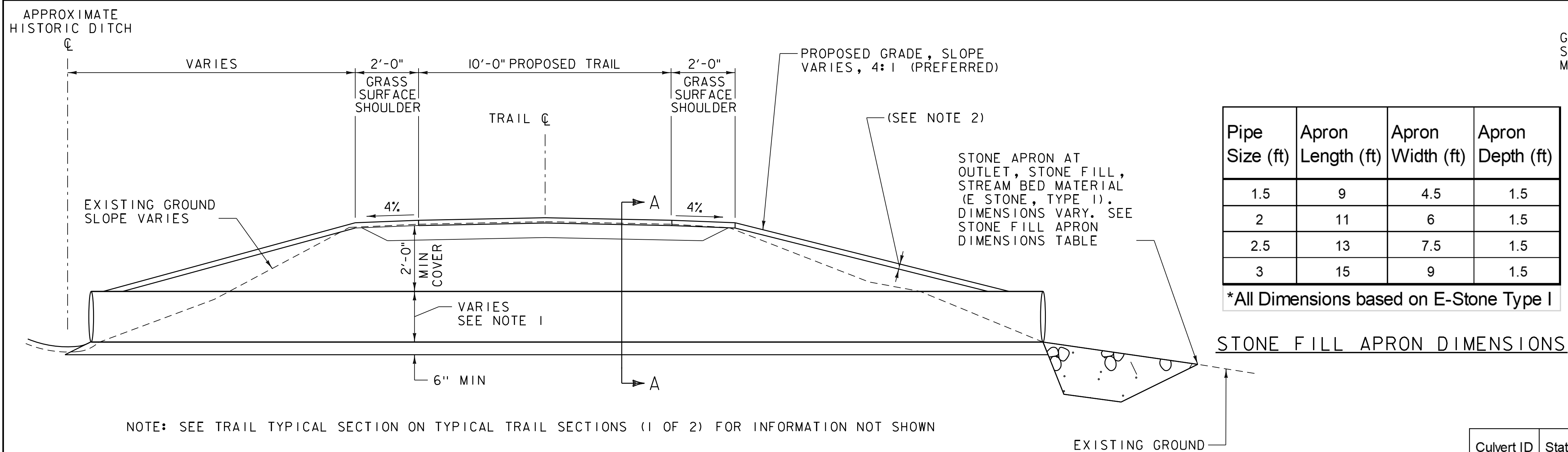


- NOTES
- ALL ELEVATIONS SHOWN IN THIS PROFILE IS THE ENGINEERS BEST INTERPRETATION OF LIDAR DATA. TRUE ELEVATIONS AND DESIGN SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER BEFORE CONSTRUCTION.
  - STATIONING AND ELEVATIONS IN FEET (TYP.).

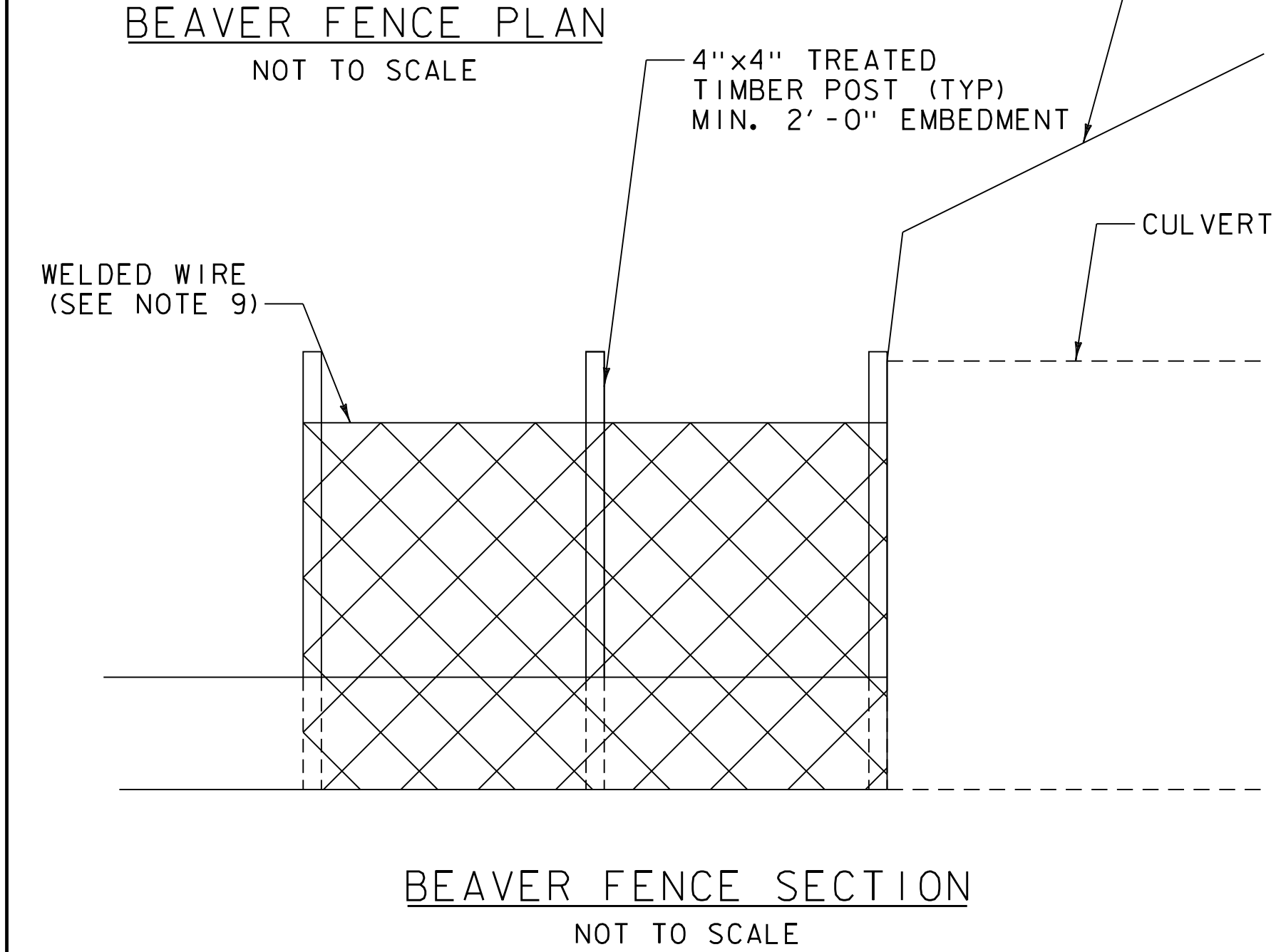
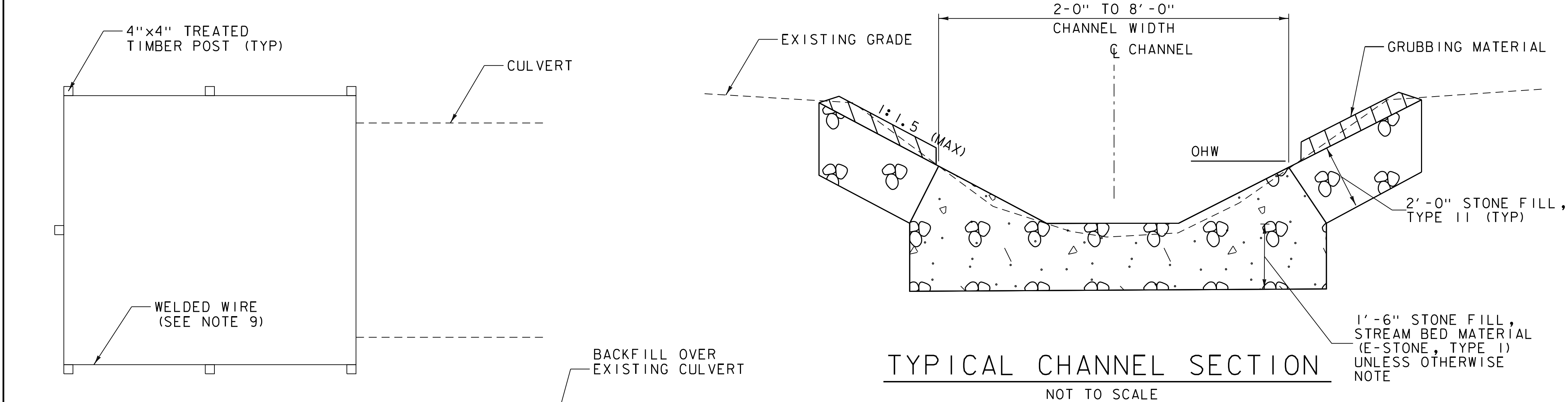


PROJECT NAME:	SWANTON - ST JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238_trail_lowering.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	B.M. ROBERTS
TRAIL LOWERING DETAIL SHEET	
PLOT DATE:	3/23/2021
DRAWN BY:	B.M. ROBERTS
CHECKED BY:	E.P. DETRICK
SHEET	13 OF 102





TYPICAL CULVERT REPLACEMENT/INSTALLATION DETAIL (ROUND PIPE)  
NOT TO SCALE



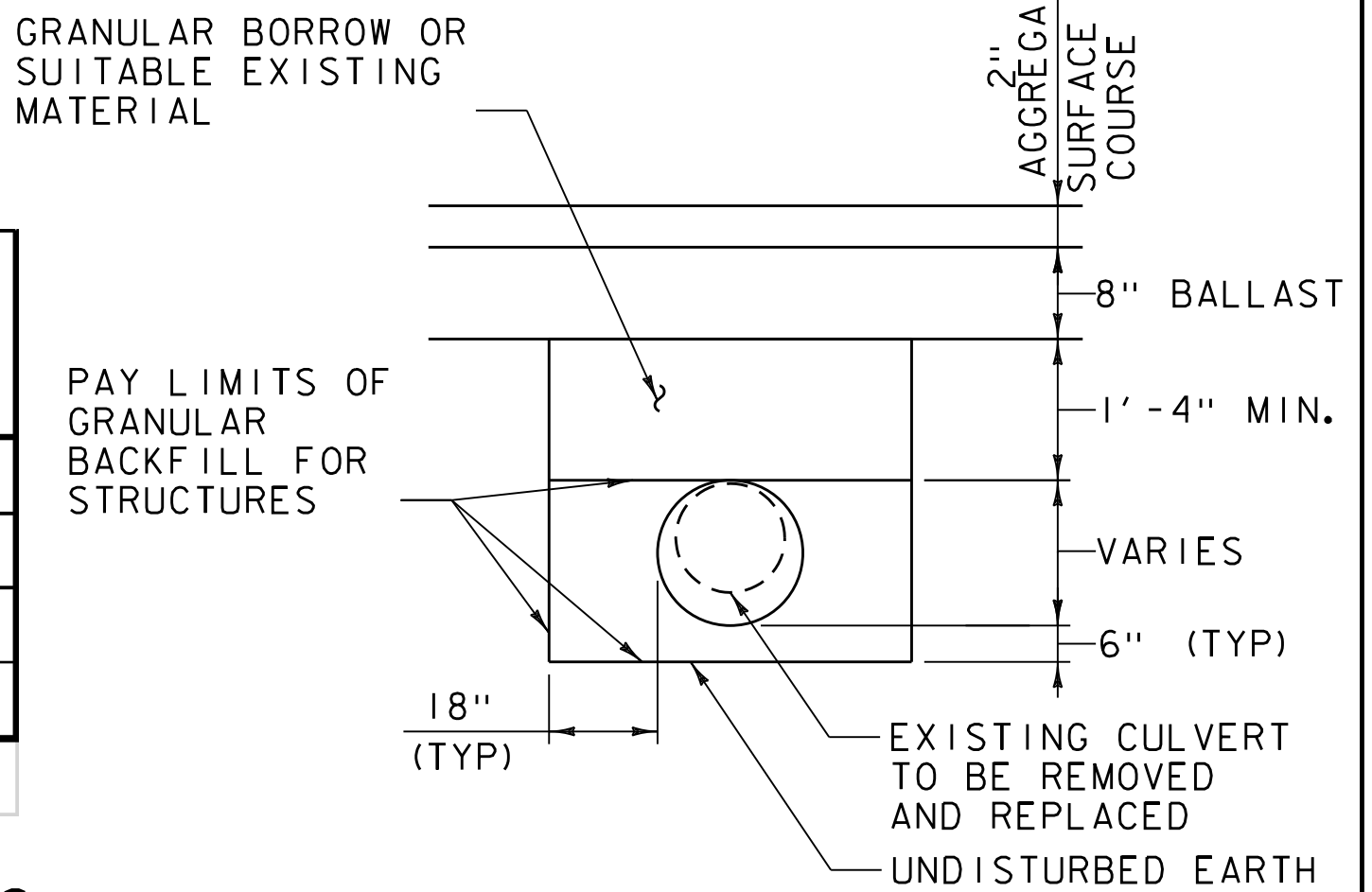
NOTES:

- SEE TABLE AND ITEM DETAIL SHEET FOR SIZE, TYPE, AND LOCATION OF CULVERTS.
- DISTURBED SLOPES SHALL HAVE 2" OF TOPSOIL, SEED AND MULCH. SEE NOTE 5 ON TYPICAL TRAIL SECTIONS (SHEET 1 OF 2) FOR ADDITIONAL SLOPE CONDITIONS STEEPER THAN 1V:3H.
- EXCAVATION, REMOVAL AND DISPOSAL OF EXISTING CULVERTS AND DISPOSAL OF SURROUNDING MATERIAL NOT TO BE REUSED SHALL BE PAID UNDER ITEM 204.25, "STRUCTURE EXCAVATION".
- IF THE EXISTING CULVERT IS A STONE BOX CULVERT THE CONTRACTOR SHALL SALVAGE STONES REMOVED FOR THE INSTALLATION OF THE NEW CULVERT AND STOCKPILE THEM IN A LOCATION WITHIN THE PROJECT LIMITS AS DESIGNATED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH SALVAGING AND STOCKPILING THE STONES SHALL BE INCIDENTAL TO STRUCTURE EXCAVATION.
- IF THE EXISTING CULVERT TO BE REMOVED IS AT A LOWER DEPTH THAN THE NEW ONE TO BE PLACED, ITEM 203.32 GRANULAR BORROW SHALL BE USED TO FILL THE VOID UP TO THE ELEVATION 6" BELOW THE BOTTOM OF THE NEW CULVERT.
- CULVERT SHALL BE CONSTRUCTED ON A SLOPE WHICH MATCHES UPSTREAM AND DOWNSTREAM OF CHANNEL.
- ITEM 613.06 STONE FILL, STREAM BED MATERIAL (E-STONE TYPE I) SHALL BE USED AT THE INLET AND OUTLET OF CULVERTS BEING REPAIRED OR REPLACED TO FILL VOIDS OR REPLACE UNSUITABLE MATERIALS IN THE STREAM CHANNEL AS NEEDED. SEE TYPICAL BOX CULVERT SECTIONS FOR MORE INFORMATION.
- CLEANING AT THE INLET AND OUTLET OF EXISTING CULVERT TO BE REPLACED SHALL BE INCIDENTAL TO THE REPLACEMENT OF THE CULVERT.
- THE WELDED WIRE SHALL BE 2"x4" 11 GAUGE GALVANIZED. FENCE TO EXTEND A MINIMUM OF 3'-0" ABOVE NORMAL HIGH WATER. 4"x4" TREATED TIMBER POSTS TO BE SPACED AT 3'-0".
- THE BEAVER FENCE SHALL BE PAID FOR UNDER ITEM 900.620, "SPECIAL PROVISION (BEAVER FENCE)".

Pipe Size (ft)	Apron Length (ft)	Apron Width (ft)	Apron Depth (ft)
1.5	9	4.5	1.5
2	11	6	1.5
2.5	13	7.5	1.5
3	15	9	1.5

*All Dimensions based on E-Stone Type I

STONE FILL APRON DIMENSIONS



SECTION A-A  
NOT TO SCALE

Culvert ID	Station	Existing Size (ft)	Existing Material	Proposed CPEP (SL) Pipe Size (ft)	Est. Culvert Length (ft)
40H	1861+92	2.0	CAST IRON	2.0	22
40J-2	1872+52	2.0	CMP	2.0	54
41B	1897+20	1.5	CMP	2.0	34
41D	1914+00	1.7	CAST IRON	2.0	22
41E(2)	1925+38	N/A	N/A	1.5	18
41G(2)	1935+26	N/A	N/A	1.5	18
41J-2	1946+15	1.5	CMP	1.5	26
41K	1950+40	0.5	PVC/METAL	1.5	18
42A	1973+28	2 x 3	STONE BOX	2.0	22
42A(2)	1977+39	N/A	N/A	1.5	22
44B	2038+89	2.0	CMP	2.0	34
44C-1	2042+75	1.0	CAST IRON	1.5	18
44F	2058+97	N/A	N/A	1.5	18
46A(2)	2107+48	N/A	N/A	2.5	22
46D(2)	2123+82	N/A	CONCRETE	2.5	18
47A	2166+63	3 x 3	STONE BOX	3.0	26
47B	2179+39	1 x 1	STONE BOX	2.0	26
47C	2180+88	N/A	N/A	1.5	18
48A-2	2224+77	2.5	STONE BOX	1.5	18
48C-1	2228+05	N/A	CAST IRON	1.5	18
48C-2	2236+52	1.33	CMP	1.5	54
51A(2)	2324+05	N/A	N/A	1.5	18
51B	2329+97	3 x 3	STONE BOX	3.0	34
52A	2351+00	0.5	CAST IRON	1.5	22
52B	2354+51	1.0	CAST IRON	1.5	30
52D	2366+17	N/A	N/A	1.5	18
52E	2373+30	2.0	CMP	2.0	26
52F	2380+57	1.0	CAST IRON	1.5	34
52F(2)	2382+99	N/A	N/A	1.5	18
53I	2426+81	1.0	CAST IRON	1.5	22
53K	2431+37	2.0	CAST IRON	2.0	18
53S	2463+61	2.0	CAST IRON	2.0	34
53U	2469+08	1.2	CAST IRON	1.5	22
53W	2474+22	2 x 3	STONE BOX	2.5	26
53X	2479+13	2 x 3	STONE BOX	2.5	34
53Z	2483+69	1.0	CAST IRON	1.5	18

CULVERT SUMMARY TABLE (ROUND PIPE)

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_typ_culvert.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: J.M. DUFFY  
TYPICAL CULVERT SECTION SHEET

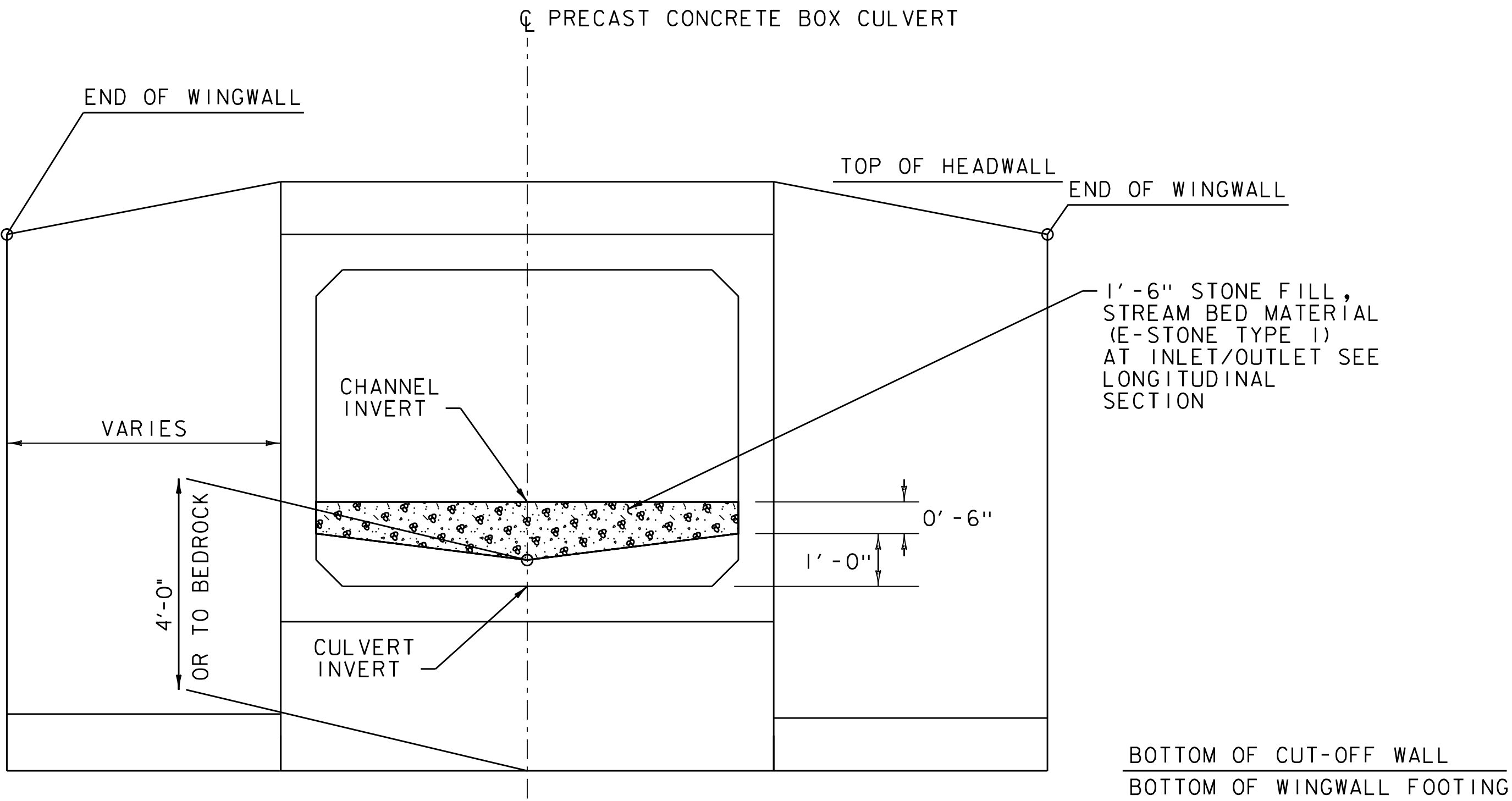
PLOT DATE: 3/23/2021  
DRAWN BY: J.M. DUFFY  
CHECKED BY: E.P. DETRICK  
SHEET 14 OF 102





Culvert ID	Station	Existing Size (ft)	Existing Material	Proposed Concrete Box Size (ft)	Est. Culvert Length (ft)
41D(2)	1917+20	N/A	N/A	4 x 4	22
41E	1921+41	N/A	STONE CATTLEPASS	4 x 4	22
48C	2226+75	2- 3	CMP	6 x 6	34
50A-2	2304+83	2 x 2	WOOD-RAIL	4 x 4	18
51	2306+23	BRIDGE	STEEL I-BEAM	4 x 4	18
53P	2454+34	3.0	CMP	4 x 4	34

BOX CULVERT SUMMARY TABLE



TYPICAL INLET/OUTLET ELEVATION VIEW

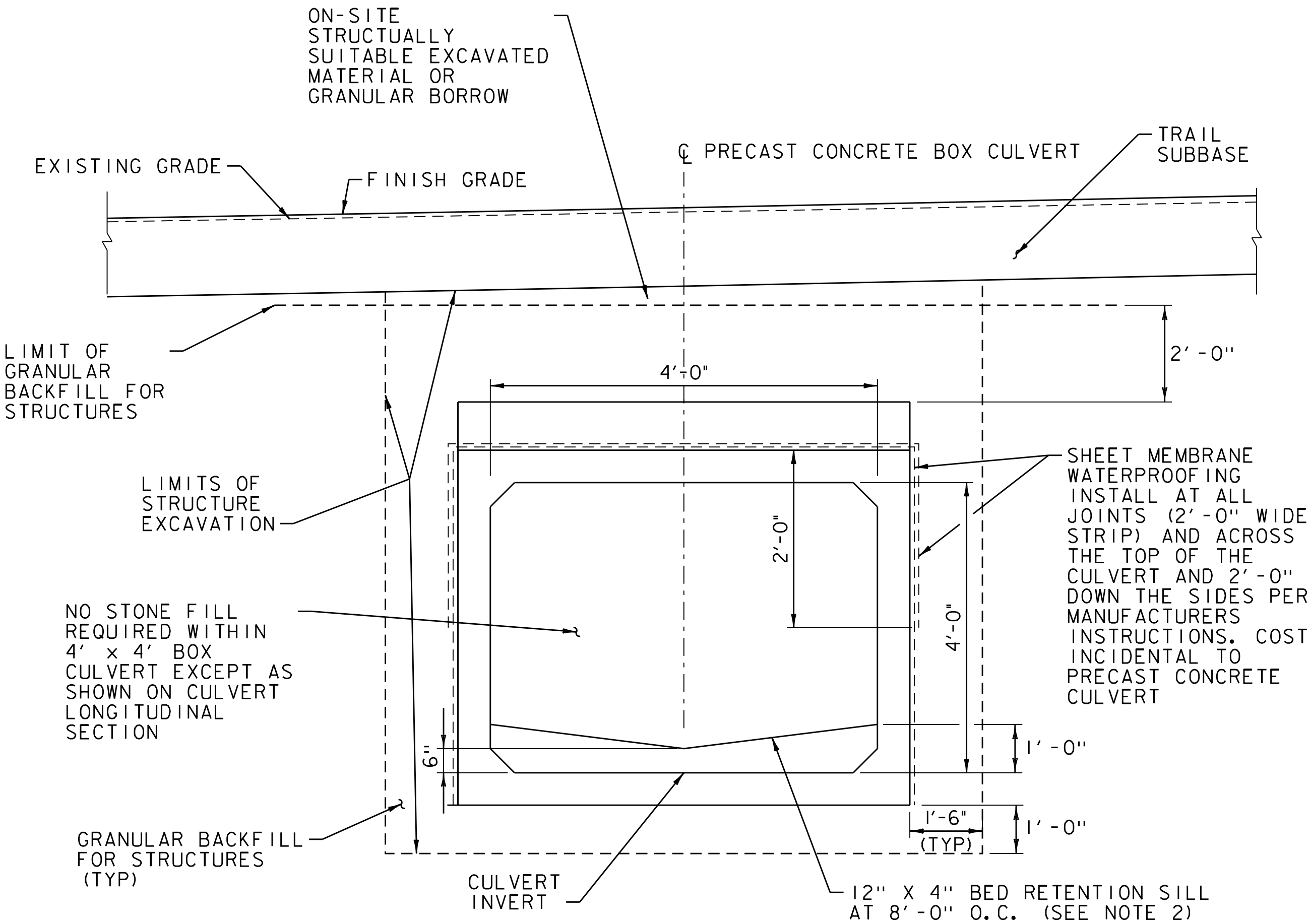
NOT TO SCALE

NOTES:

- BURY BOX CULVERT INVERT MINIMUM 1'-6" BELOW PROPOSED CHANNEL INVERT TO ALLOW RETENTION OF BED MATERIALS WITHIN THE STRUCTURE .
- BED RETENTION SILLS SHALL BE 12" HIGH AT THE EDGES OF THE BOX AND 6" HIGH IN THE CENTER. SILLS SHALL BE 4" THICK AND SHALL HAVE A POSITIVE CONNECTION TO PRECAST BOX.
- TYPICAL CHANNEL SECTION TO BE CONSTRUCTED TO TIE PROPOSED STRUCTURE INTO EXISTING CHANNEL (SEE TYPICAL CULVERT SECTION SHEET).
- SEE NOTES ON "TYPICAL CULVERT SECTION SHEET" FOR ADDITIONAL CULVERT REPLACEMENT / INSTALLATION NOTES.
- PROPOSED CULVERT LENGTHS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO ORDERING MATERIALS.
- BOX CULVERTS ON ANY PERENNIAL STREAM SHALL BE REVIEWED IN THE FIELD WITH PATRICK ROSS, VT DEC RIVER MANAGEMENT ENGINEER. CONSTRUCTION SURVEY WILL BE REQUIRED TO APPROPRIATELY SET THE STRUCTURE GRADIENT AND INVERT ELEVATIONS.
- BOX CULVERT REINFORCING SHALL BE LEVEL I EPOXY COATED IN ACCORDANCE WITH SECTION 507. ALL CONNECTING HARDWARD INCLUDING THREADED ROD, WASHERS, AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 726.08

E-STONE NOTES:

- E-STONE TYPE II SHALL BE USED BELOW OHW AND AS AN EMBEDMENT MATERIAL IN BOX STRUCTURE WITH A VERTICAL CLEARANCE OF 6' OR GREATER.
- STONE PLACED INSIDE OF A CLOSED STRUCTURE SHALL BE PLACED SUCH THAT THE STRUCTURE IS NOT DAMAGED.
- CARE SHALL BE TAKEN TO LIMIT SEGREGATION OF THE MATERIALS
- ADD NATIVE STREAMBED MATERIAL OR SAND BORROW AS NEEDED TO SEAL THE BED AND PREVENT SUBSURFACE FLOW. COST OF NATIVE MATERIAL AND SAND BORROW IS INCIDENTAL TO STONE FILL, STREAM BED MATERIAL.
- THERE SHALL BE NO SUBSURFACE FLOW UPON FINAL INSPECTION.



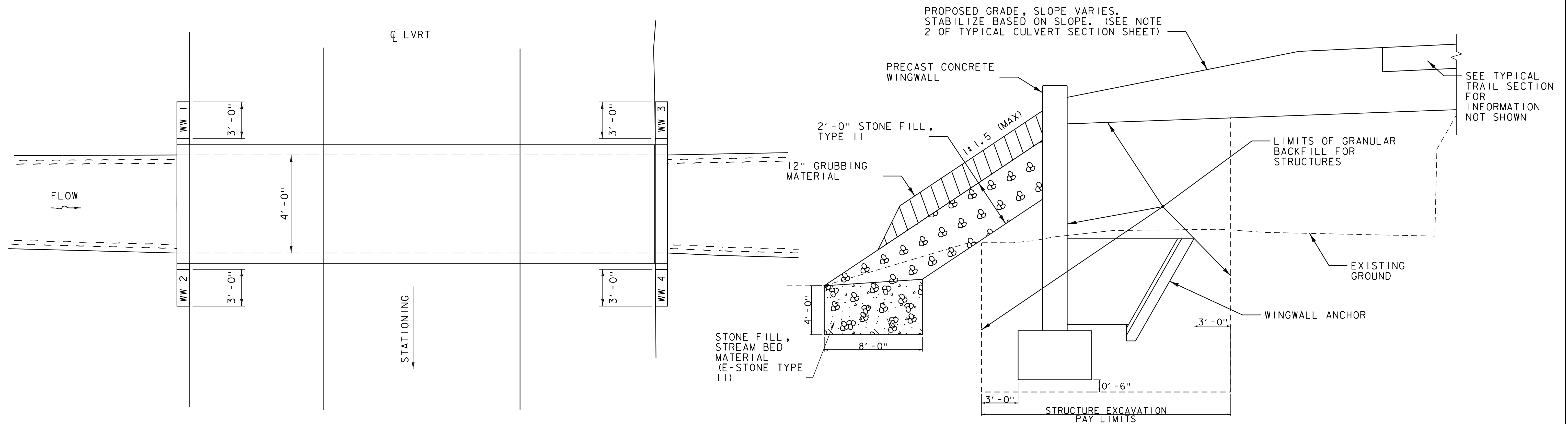
TYPICAL 4 X 4 PRECAST BOX CULVERT SECTION

NOT TO SCALE



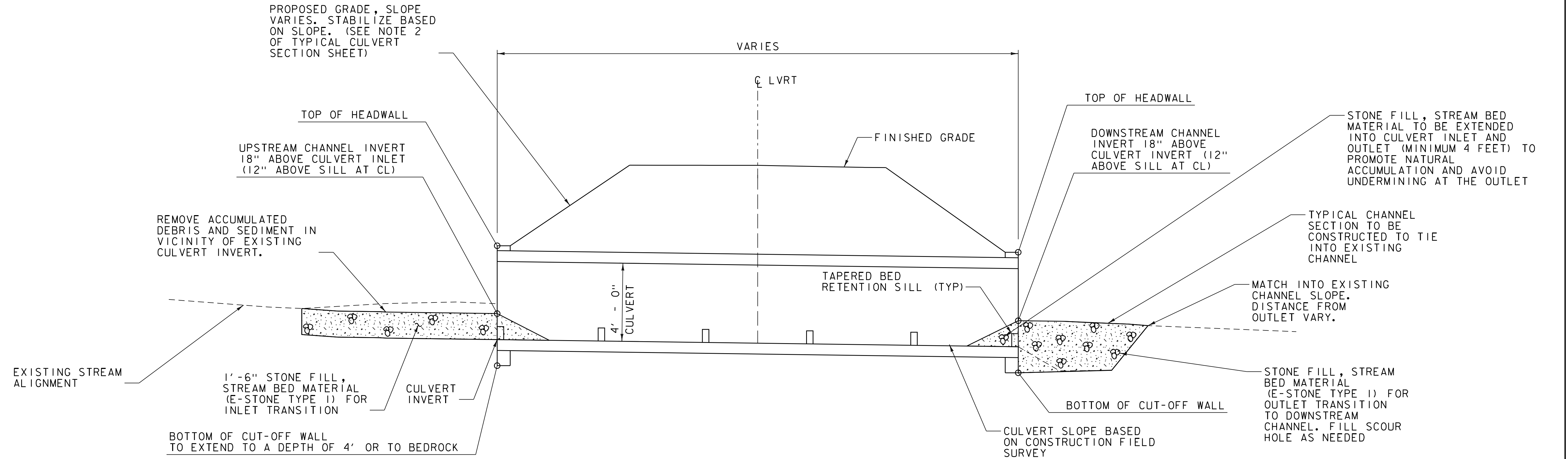
PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238_typ_box_culvert.dgn
PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P.DETRICK
DRAWN BY:	J.M. DUFFY
DESIGNED BY:	J.M. DUFFY
CHECKED BY:	B.M. ROBERTS
BOX CULVERT TYP. SECTION (SHEET 1 OF 2)	SHEET 15 OF 102





PRECAST 4x4 BOX CULVERT PLAN  
NOT TO SCALE

TYPICAL PRECAST CONCRETE WINGWALL EXCAVATION SECTION  
NOT TO SCALE



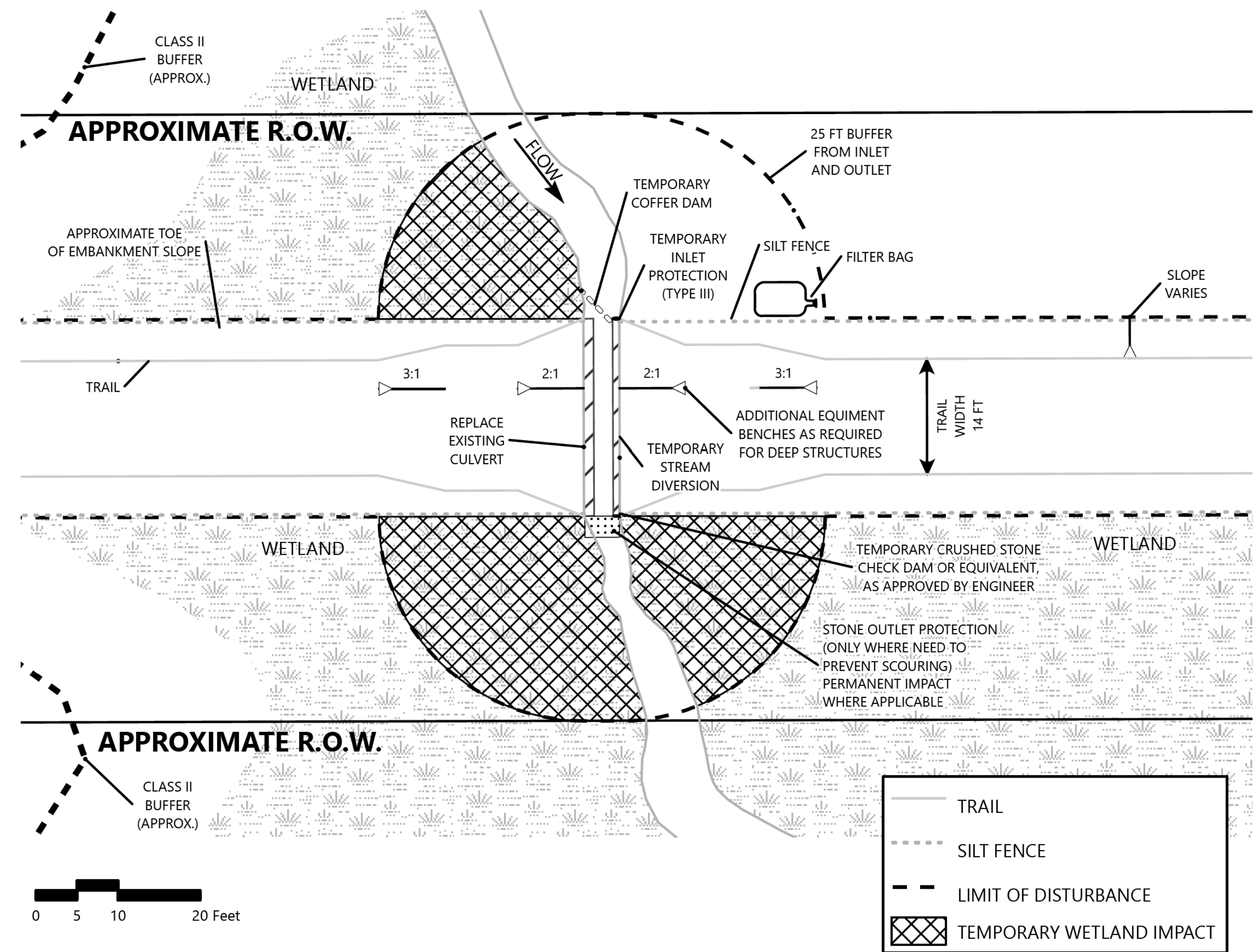
PRECAST 4x4 BOX CULVERT LONGITUDINAL SECTION  
NOT TO SCALE

PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238_pro_box_culvert.dgn
PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P. DETRICK
DRAWN BY:	J.M. DUFFY
DESIGNED BY:	J.M. DUFFY
CHECKED BY:	B.M. ROBERTS
BOX CULVERT TYP. SECTION (SHEET 2 OF 2)	SHEET 16 OF 102

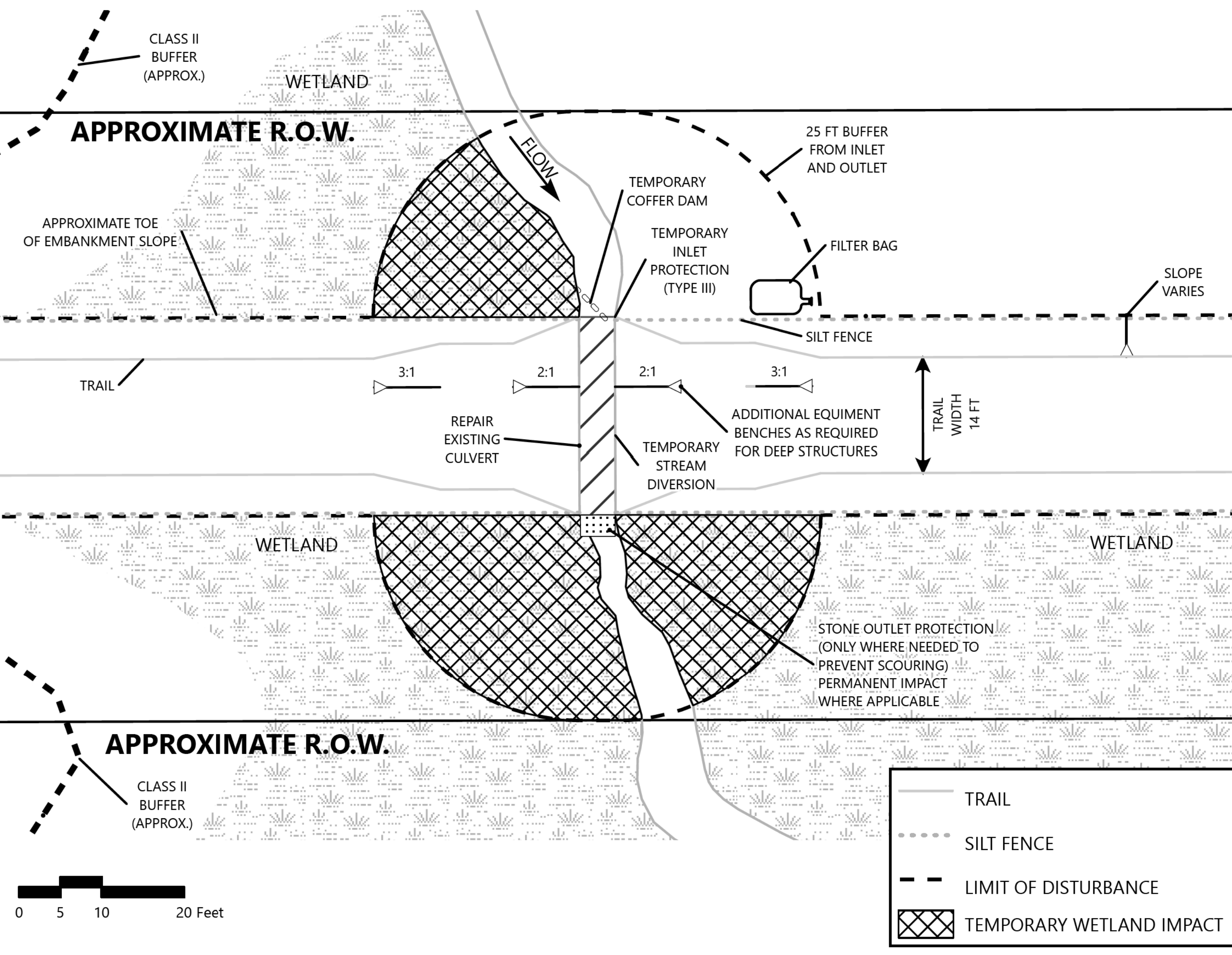




## CULVERT REPLACEMENT TYPICAL



## CULVERT REPAIR TYPICAL



### NOTES:

1. ALL WORK TO BE PERFORMED FROM TRAIL EMBANKMENT WHERE FEASIBLE.
2. APPROXIMATE IMPACT AREAS AT CULVERT INLET/OUTLET HAVE BEEN ASSUMED TO ACCOUNT FOR EQUIPMENT ACCESS AND ANY WORK REQUIRED TO COMPLETE THE IMPROVEMENTS. THESE IMPACTS SHALL BE MINIMIZED TO THE EXTENT PRACTICABLE IN THE FIELD.
3. REPAIR OR REPLACEMENT OF EXISTING CULVERTS SHALL BE PERFORMED IN DRY CONDITIONS TO THE EXTENT PRACTICABLE.
4. INSTALL TEMPORARY STREAM DIVERSION AND OTHER WATER CONTROL MEASURES AS NEEDED PRIOR TO EXCAVATION OF IN-STREAM MATERIALS OR REMOVAL OF EXISTING STRUCTURES.
5. LOCATION AND TYPE OF SEDIMENT CONTROL PRACTICES SHOWN ABOVE ARE FOR REFERENCE ONLY. ADDITIONAL MEASURES MAY BE REQUIRED TO MINIMIZE POTENTIAL SEDIMENT RELEASE.
6. SEE ITEM DETAIL SHEETS AND LAYOUT PLANS FOR LOCATIONS WHERE THESE DETAILS ARE TO BE APPLIED.
7. WETLAND AREA DISTURBED DURING CONSTRUCTION SHALL BE SEEDED WITH WET AREA SEED MIX AND MULCHED WITH WEED FREE STRAW.

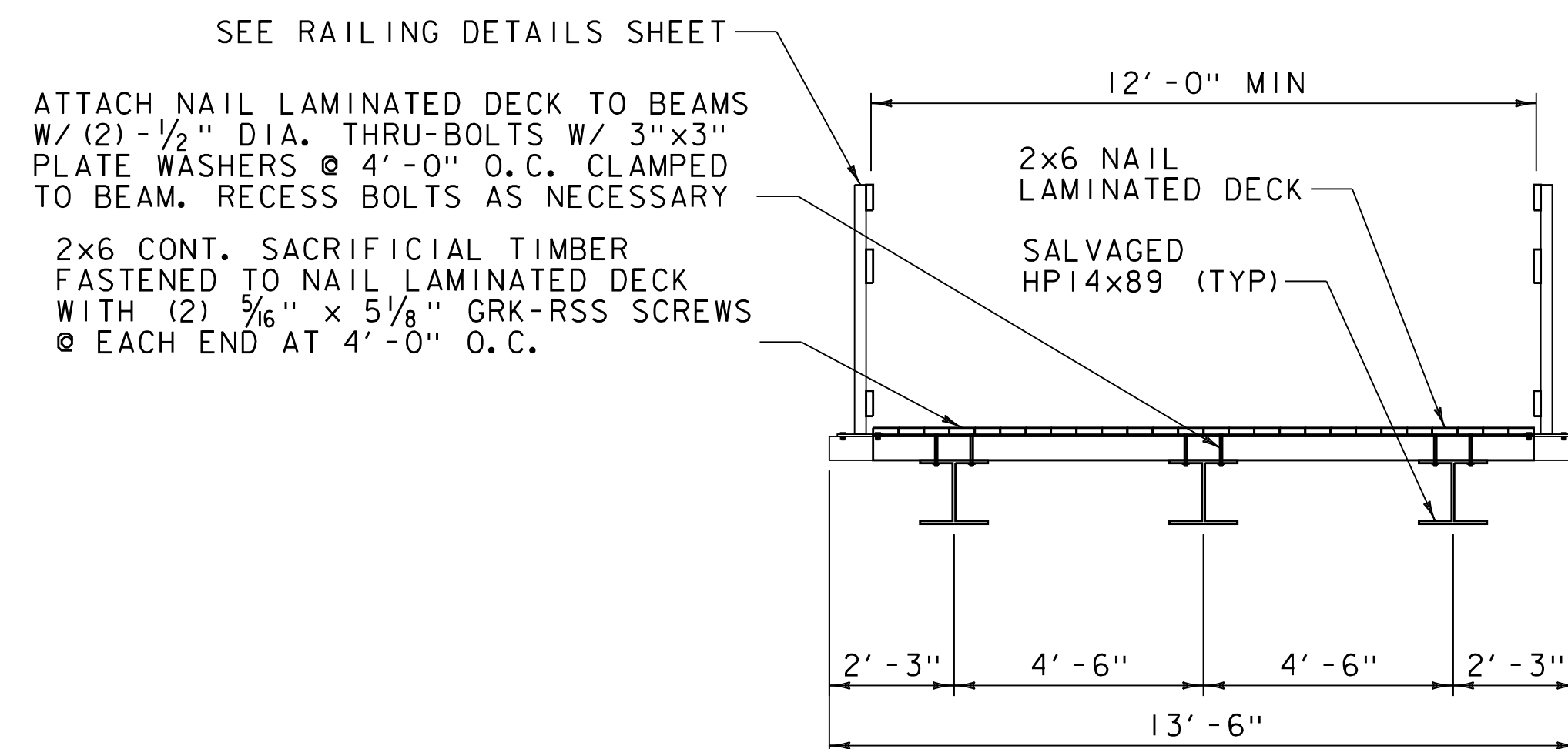


PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_culvert_repair.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: J.M. DUFFY  
CULVERT REPLACEMENT/REPAIR TYP. DETAIL

PLOT DATE: 3/23/2021  
DRAWN BY: J. GROSSMAN  
CHECKED BY: J.M. DUFFY  
SHEET 17 OF 102

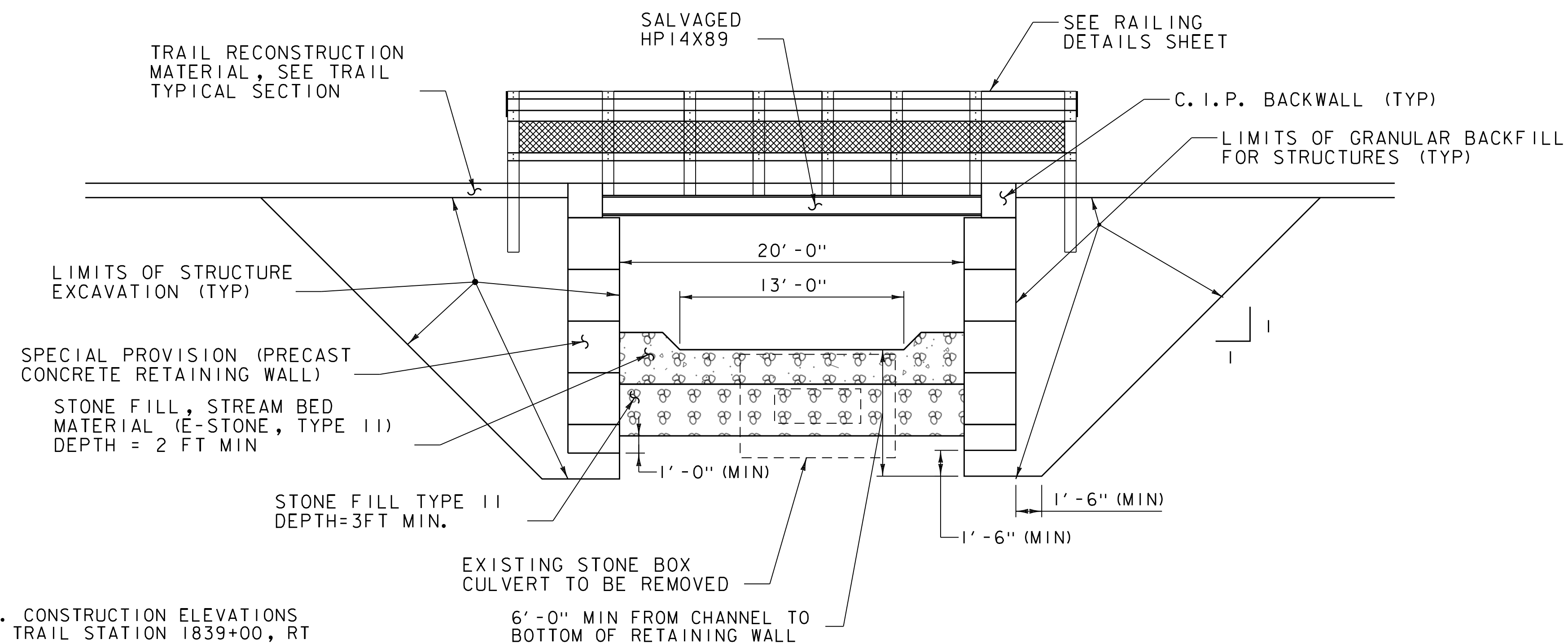




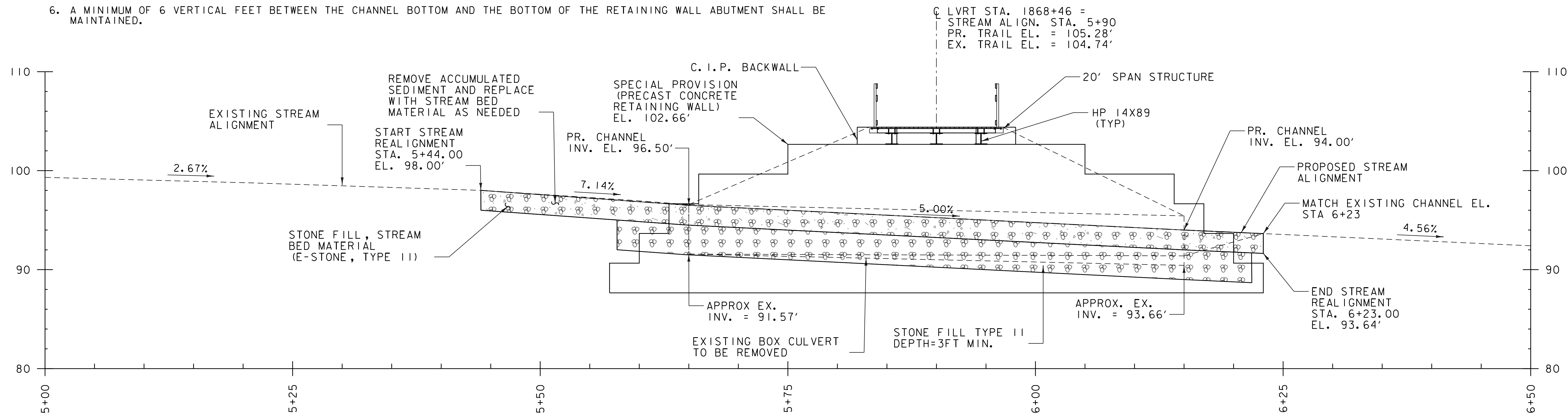
**CULVERT 401 TYPICAL SECTION**  
SCALE: 3/8" = 1'-0"

**NOTES:**

- ELEVATIONS ARE APPROXIMATE AND BASED ON A LOCAL DATUM SET OFF A BENCHMARK IN THE FIELD. CONSTRUCTION ELEVATIONS SHALL BE BASED OFF THE NAIL PLACED IN A TREE WITH PINK SURVEYORS TAPE AT APPROXIMATELY TRAIL STATION 1839+00, RT 50' WITH AN ASSUMED ELEVATION OF 100.00'.
- EXISTING STRUCTURE CONSISTS OF A STONE BOX CULVERT, TO BE REMOVED AND BACKFILLED WITH STRUCTURALLY SUITABLE ON-SITE MATERIAL.
- TYPICAL CHANNEL SECTIONS TO BE CONSTRUCTED TO TIE PROPOSED STRUCTURE INTO EXISTING CHANNEL (SEE TYPICAL CULVERT SECTION SHEET).
- PROPOSED BRIDGE LENGTH TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO ORDERING MATERIALS.
- BRIDGE DESIGN SHALL BE REVIEWED IN THE FIELD WITH PATRICK ROSS, VT DEC RIVER MANAGEMENT ENGINEER. CONSTRUCTION SURVEY WILL BE REQUIRED TO APPROPRIATELY SET THE STRUCTURE GRADIENT, INVERT ELEVATIONS, AND PROPOSED ALIGNMENT.
- A MINIMUM OF 6 VERTICAL FEET BETWEEN THE CHANNEL BOTTOM AND THE BOTTOM OF THE RETAINING WALL ABUTMENT SHALL BE MAINTAINED.



**CULVERT 401 CROSS SECTION**  
SCALE: 1" = 5'-0"



**CULVERT 401 LONGITUDINAL SECTION**

0 5 10  
SCALE IN FEET

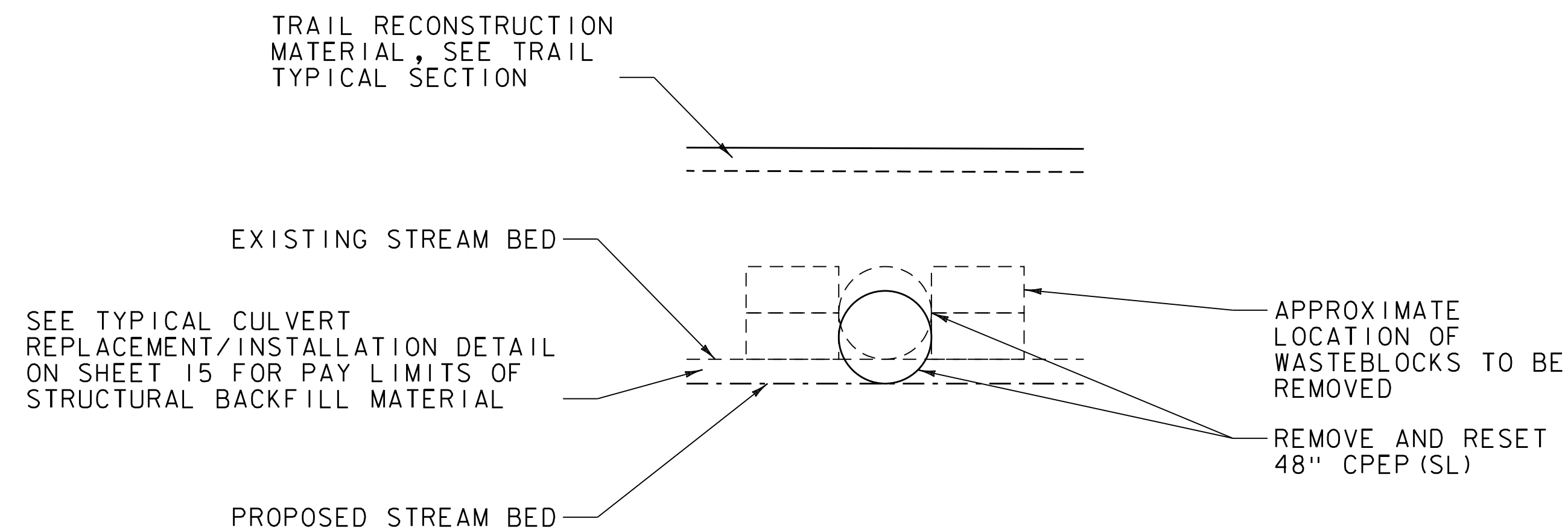


PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

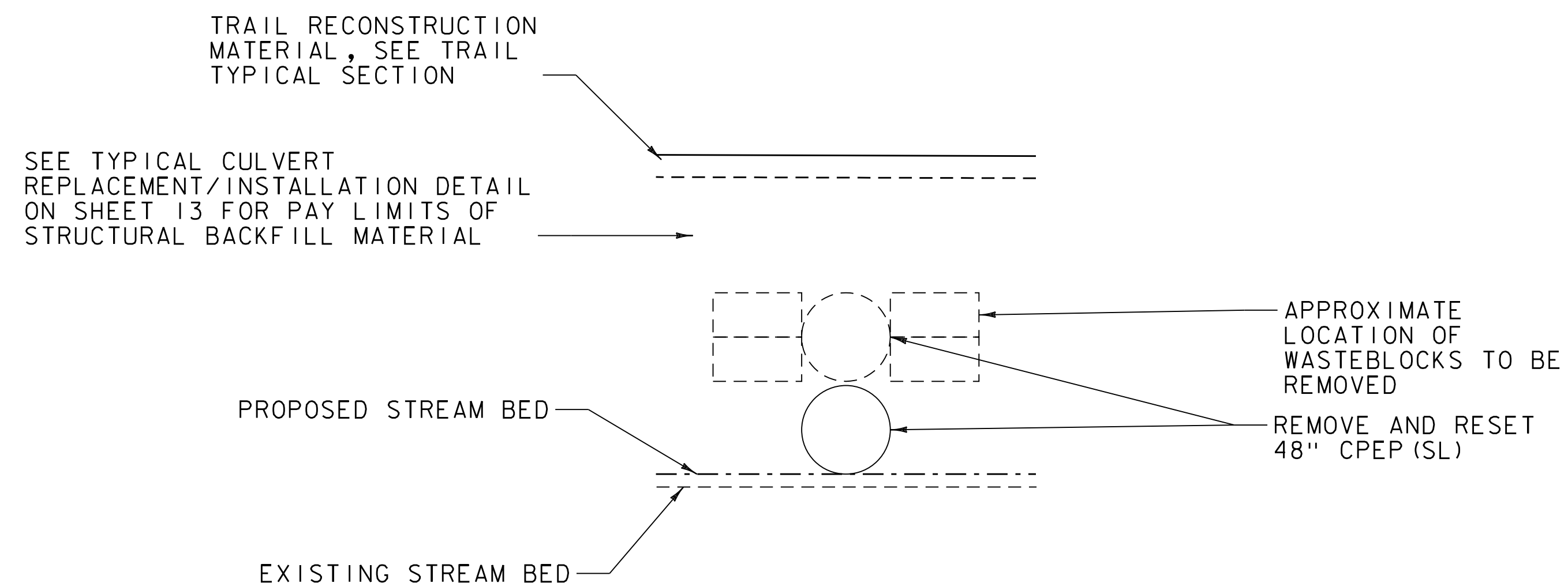
FILE NAME: z20f238_culvert+401.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: J.M. DUFFY  
CULVERT 401DETAIL SHEET

PLOT DATE: 3/23/2021  
DRAWN BY: J.M. DUFFY  
CHECKED BY: B.M. ROBERTS  
SHEET 18 OF 102

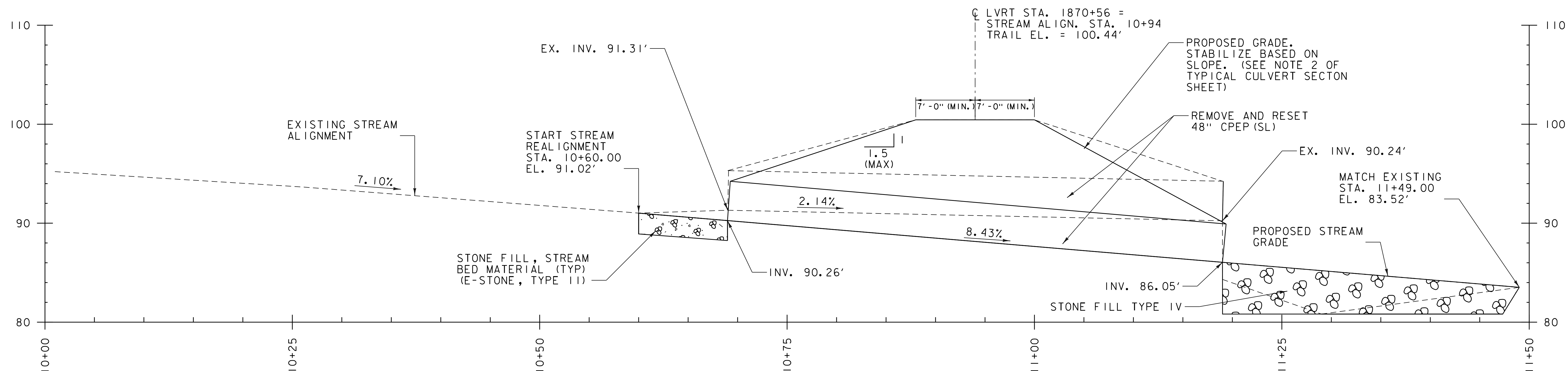




CULVERT 40J CROSS SECTION (UPSTREAM)  
NOT TO SCALE



CULVERT 40J CROSS SECTION (DOWNSTREAM)  
NOT TO SCALE



CULVERT 40J LONGITUDINAL SECTION

ELEVATIONS ARE APPROXIMATE AND BASED ON A LOCAL DATUM SET OFF A BENCHMARK IN THE FIELD. CONSTRUCTION ELEVATIONS SHALL BE BASED OFF THE NAIL PLACED IN A TREE WITH PINK SURVEYORS TAPE AT APPROXIMATELY TRAIL STATION 1839+00, RT 50' WITH AN ASSUMED ELEVATION OF 100.00'.

0 5 10  
SCALE IN FEET



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_culvert+40J.dgn

PROJECT LEADER: E.P. DETRICK

DESIGNED BY: J.M. DUFFY

CULVERT 40J DETAIL SHEET

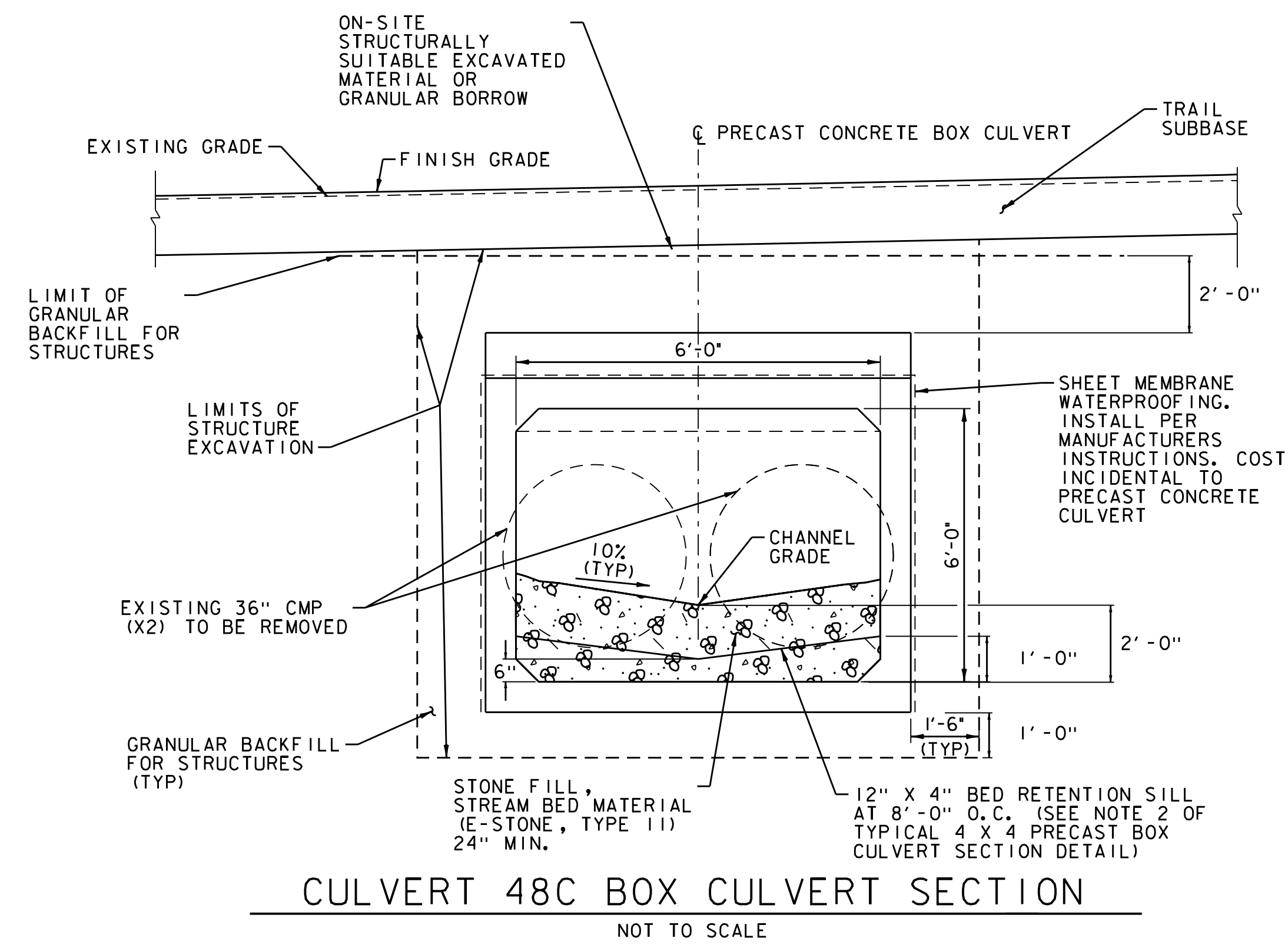
PLOT DATE: 3/23/2021

DRAWN BY: J.M. DUFFY

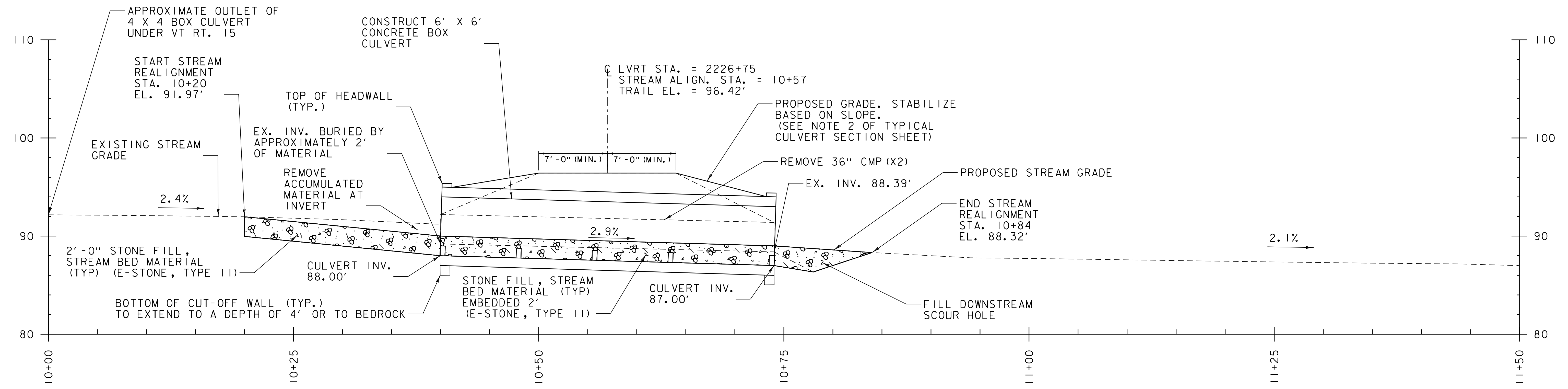
CHECKED BY: B.M. ROBERTS

SHEET 19 OF 102

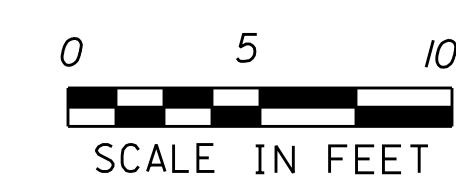




- NOTES:
1. ELEVATIONS ARE APPROXIMATE AND BASED ON A LOCAL RELATIVE DATUM. CONSTRUCTION ELEVATIONS SHALL BE BASED OFF THE EXISTING CMP CULVERT OUTLET WITH AN ASSUMED ELEVATION OF 88.39'.
  2. EXISTING STRUTURE CONSISTS OF TWO PARALLEL 36" CORRAGATED METAL PIPES, TO BE REMOVED.
  2. TYPICAL CHANNEL SECTION TO BE CONSTRUCTED TO TIE PROPOSED STRUCTURE INTO EXISTING CHANNEL (SEE TYPICAL CULVERT SECTION SHEET).
  3. PROPOSED CULVERT LENGTHS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO ORDERING MATERIALS.
  4. BOX CULVERT DESIGN SHALL BE REVIEWED IN THE FIELD WITH PATRICK ROSS, VT DEC RIVER MANAGEMENT ENGINEER. CONSTRUCTION SURVEY WILL BE REQUIRED TO APPROPRIATELY SET THE STRUCTURE GRADIENT AND INVERT ELEVATIONS.

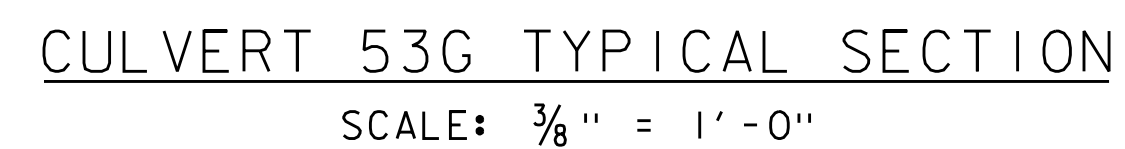


CULVERT 48C LONGITUDINAL SECTION

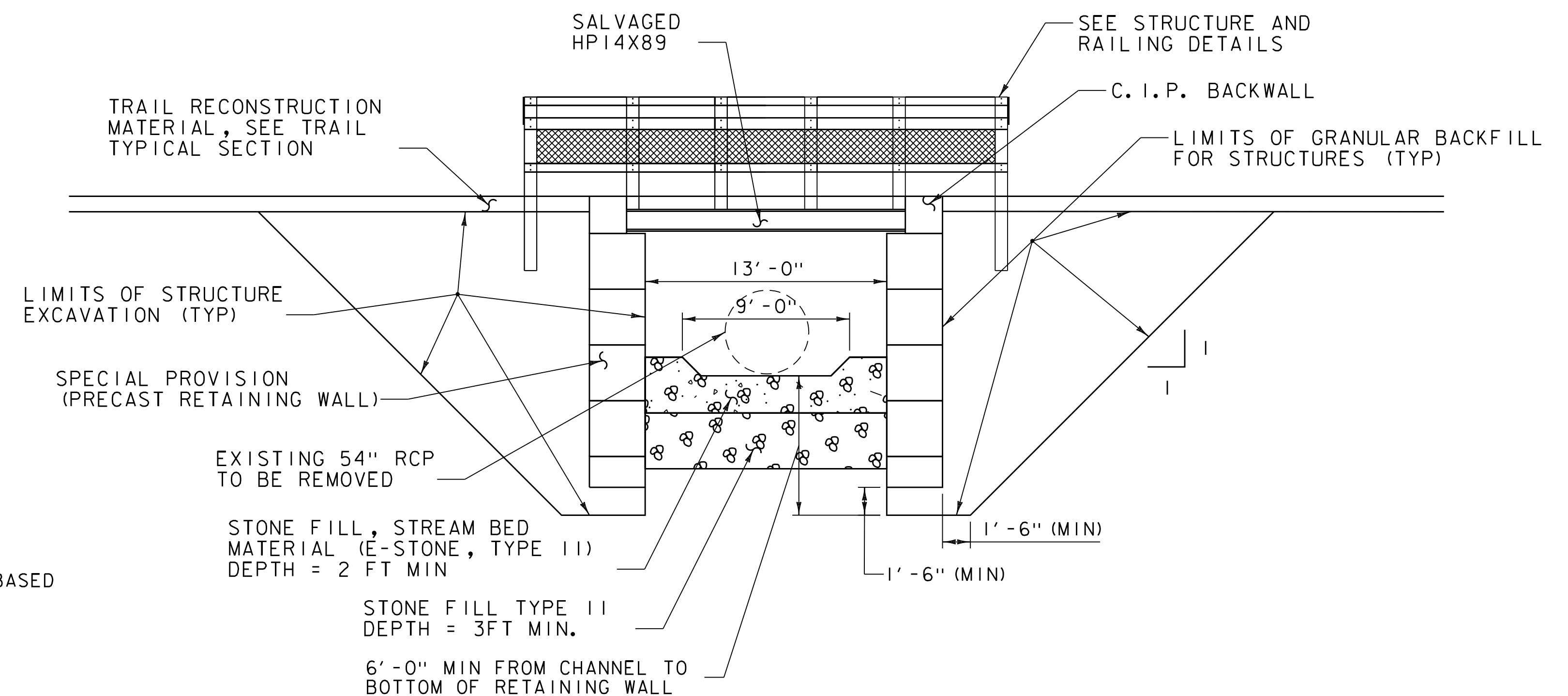


PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238_culvert+48C.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	J.M. DUFFY
CULVERT 48C DETAIL SHEET	
PLOT DATE:	3/23/2021
DRAWN BY:	J.M. DUFFY
CHECKED BY:	B.M. ROBERTS
SHEET	20 OF 102

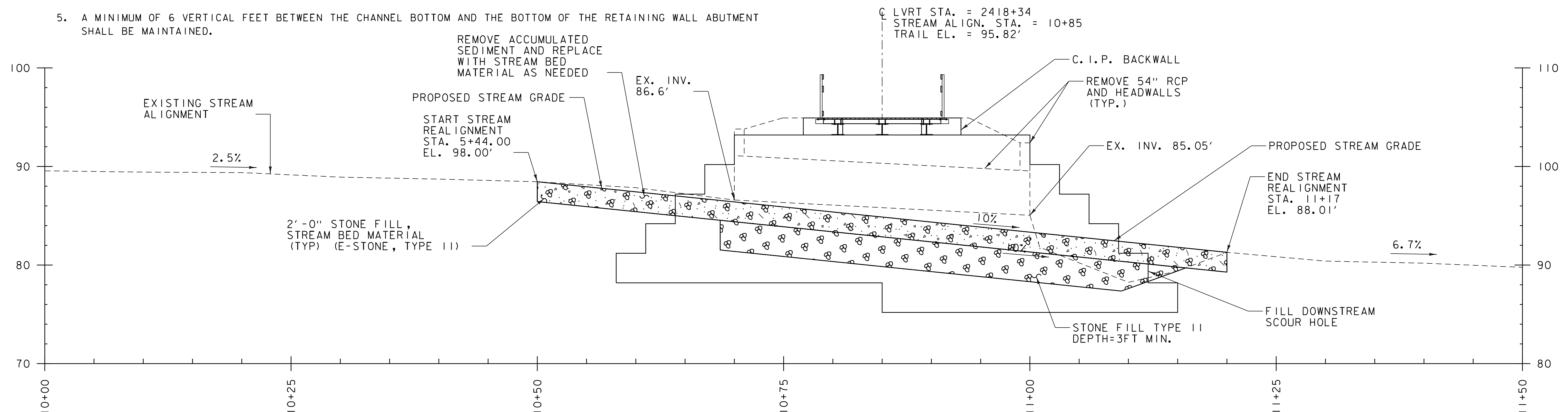




1. ELEVATIONS ARE APPROXIMATE AND BASED ON A LOCAL RELATIVE DATUM. CONSTRUCTION ELEVATIONS SHALL BE BASED OFF THE EXISTING RCP CULVERT INLET WITH AN ASSUMED ELEVATION OF 86.60'.
2. EXISTING STRUTURE CONSISTS OF A 54" REINFORCED CONCRETE PIPE WITH HEADWALLS, TO BE REMOVED.
2. TYPICAL CHANNEL SECTION TO BE CONSTRUCTED TO TIE PROPOSED STRUCTURE INTO EXISTING CHANNEL (SEE TYPICAL CULVERT SECTION SHEET).
3. PROPOSED BRIDGE LENGTH TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO ORDERING MATERIALS.
4. BRIDGE DESIGN SHALL BE REVIEWED IN THE FIELD WITH PATRICK ROSS, VT DEC RIVER MANAGEMENT ENGINEER. CONSTRUCTION SURVEY WILL BE REQUIRED TO APPROPRIATELY SET THE STRUCTURE GRADIENT, INVERT ELEVATIONS, AND PROPOSED ALIGNMENT.
5. A MINIMUM OF 6 VERTICAL FEET BETWEEN THE CHANNEL BOTTOM AND THE BOTTOM OF THE RETAINING WALL ABUTMENT SHALL BE MAINTAINED.



NOT TO SCALE



CULVERT 53G LONGITUDINAL SECTION





NOTES:

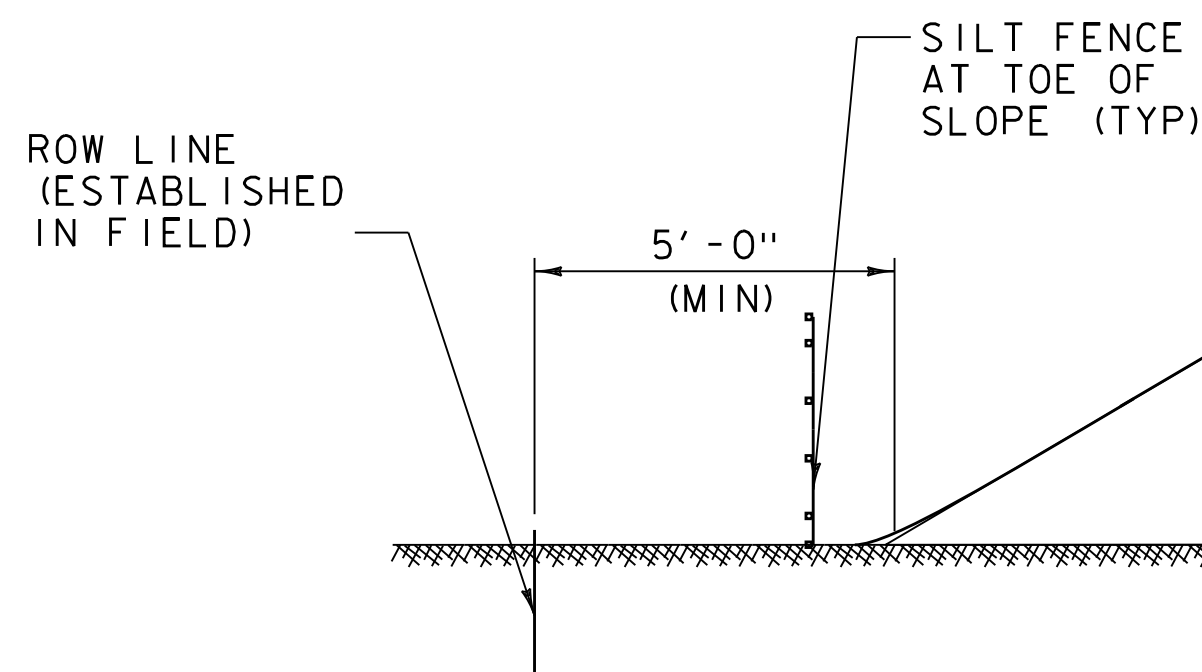
1. ALL EXCAVATED MATERIAL SHALL BE SPOILED ON SITE EITHER WITHIN CONSTRUCTION OF THE TRAIL, PAUSE PLACE LOCATIONS OR WASTE AREA MOUNDS.
2. STRUCTURALLY SUITABLE MATERIAL EXCAVATED DURING CONSTRUCTION SHALL BE USED IN PLACE OF GRANULAR BORROW PRIOR TO BEING SPOILED ON SITE.
3. PAUSE PLACES ARE CONSTRUCTED TRAIL PULL-OFF AREAS WHERE EXCESS MATERIAL FROM DITCHING CAN BE WASTED.
4. PAUSE PLACES SHALL NOT BLOCK DRAINAGE SWALES.
5. PAUSE PLACES SHALL NOT INTERSECT ROAD CROSSINGS AT FULL WIDTH TO AVOID PROVIDING UNWANTED PARKING AREAS FOR PATH USERS.
6. PAUSE PLACES SHALL NOT INTERSECT DELINEATED WETLANDS, WETLAND BUFFERS, STREAMS AND FEMA FLOOD HAZARD AREAS.
7. INSTALL SILT FENCE AND OTHER EPSC MEASURES DOWNGRADIENT FROM WORK AREA PRIOR TO PLACEMENT OF EXCESS MATERIAL.
8. TEMPORARILY STABILIZE WASTE SOIL WITHIN 14 DAYS OF INITIAL DISTURBANCE/PLACEMENT AND WITHIN 48 HOURS OF FINAL GRADING/SHAPING. MAINTAIN UNTIL SITE IS FULLY STABILIZED.
9. SILT FENCE TYPE II REQUIRED WITHIN 100 FEET OF A WATERBODY OR WETLAND.
10. FISH AND WILDLIFE PAUSE PLACE LOCATIONS TO BE CONSTRUCTED FOLLOWING PAUSE PLACE GUIDELINES EXCEPT FOR MINIMUM LENGTH REQUIREMENTS.
11. SLOPE SHALL BE CLEARED, NOT GRUBBED PRIOR TO PLACEMENT.
12. PLACEMENT OF WASTING MATERIAL SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.
13. WASTE AREA MOUNDS MAY BE CONSTRUCTED ATOP APPROVED PAUSE PLACE LOCATIONS INDICATED BY AN ASTERISK (*). THIS METHOD TO SPOIL ADDITIONAL MATERIAL SHALL NOT BE UTILIZED UNTIL ALL OTHER SOIL WASTING METHODS HAVE BEEN EXHAUSTED WITHIN THE PROJECT.

PAUSE PLACE LOCATIONS  
(STATIONING DOES NOT INCLUDE TAPERS)

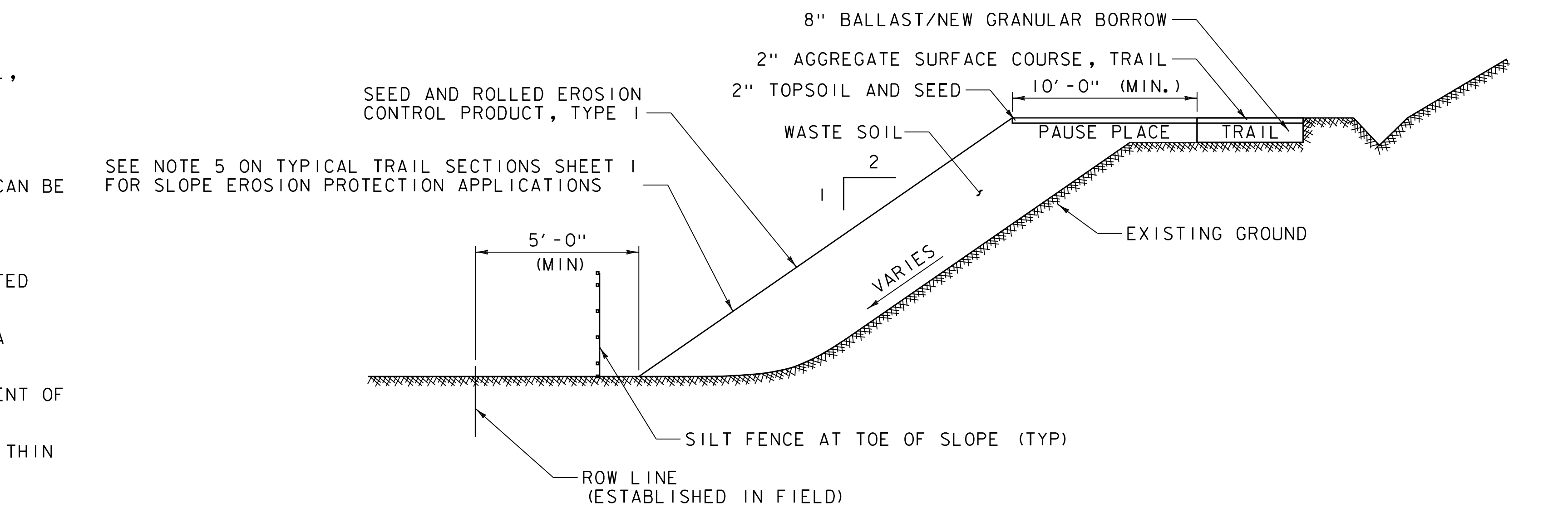
*1906+97 - 1907+97, LT  
*1911+72 - 1912+72, LT  
1968+47 - 1970+47, RT  
1996+17 - 1997+67, RT  
2032+97 - 2033+97, RT  
*2050+17 - 2051+67, LT  
2062+52 - 2064+02, LT/RT  
2137+30 - 2138+80, RT  
2143+92 - 2145+42, LT  
2154+87 - 2156+37, RT  
2165+52 - 2167+52, RT  
2210+02 - 2211+02, LT  
2228+17 - 2231+17, LT  
2336+12 - 2338+12, LT/RT  
*2447+02 - 2449+52, RT

FISH AND WILDLIFE PAUSE PLACE LOCATIONS  
(STATIONING DOES NOT INCLUDE TAPERS)

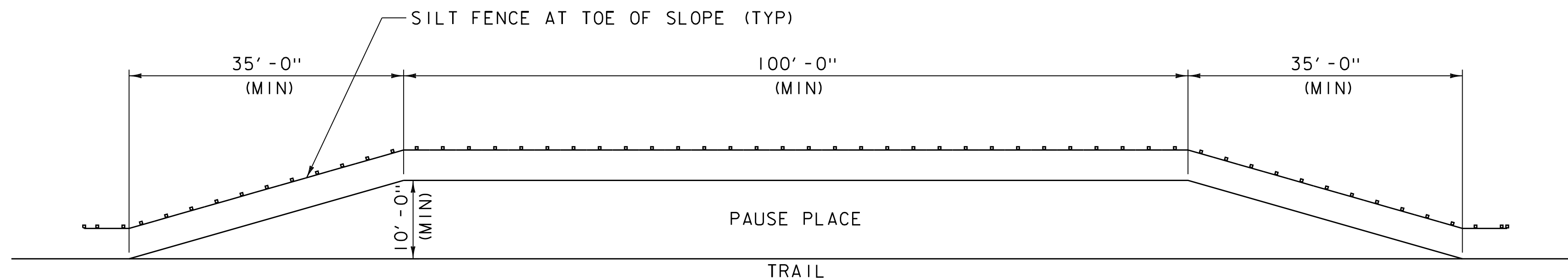
2281+65 - 2282+15, RT  
2404+50 - 2405+50, RT  
2419+25 - 2420+25, RT  
2477+75 - 2478+75, RT



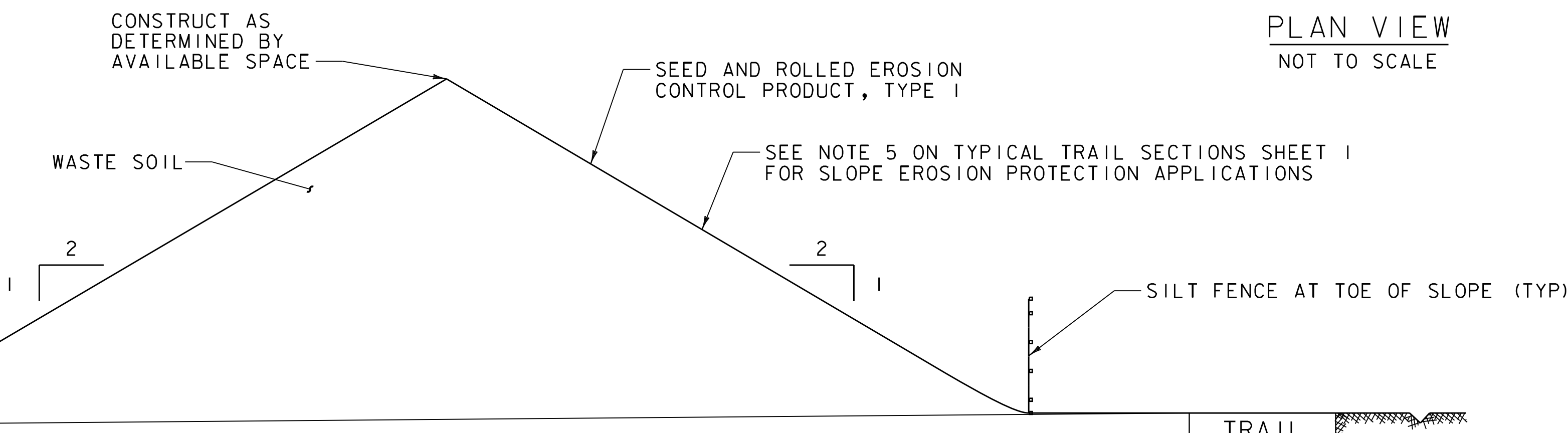
WASTE AREA MOUNDS  
NOT TO SCALE



WASTE AREA ON  
EMBANKMENT SHOULDERS  
NOT TO SCALE



PLAN VIEW  
NOT TO SCALE

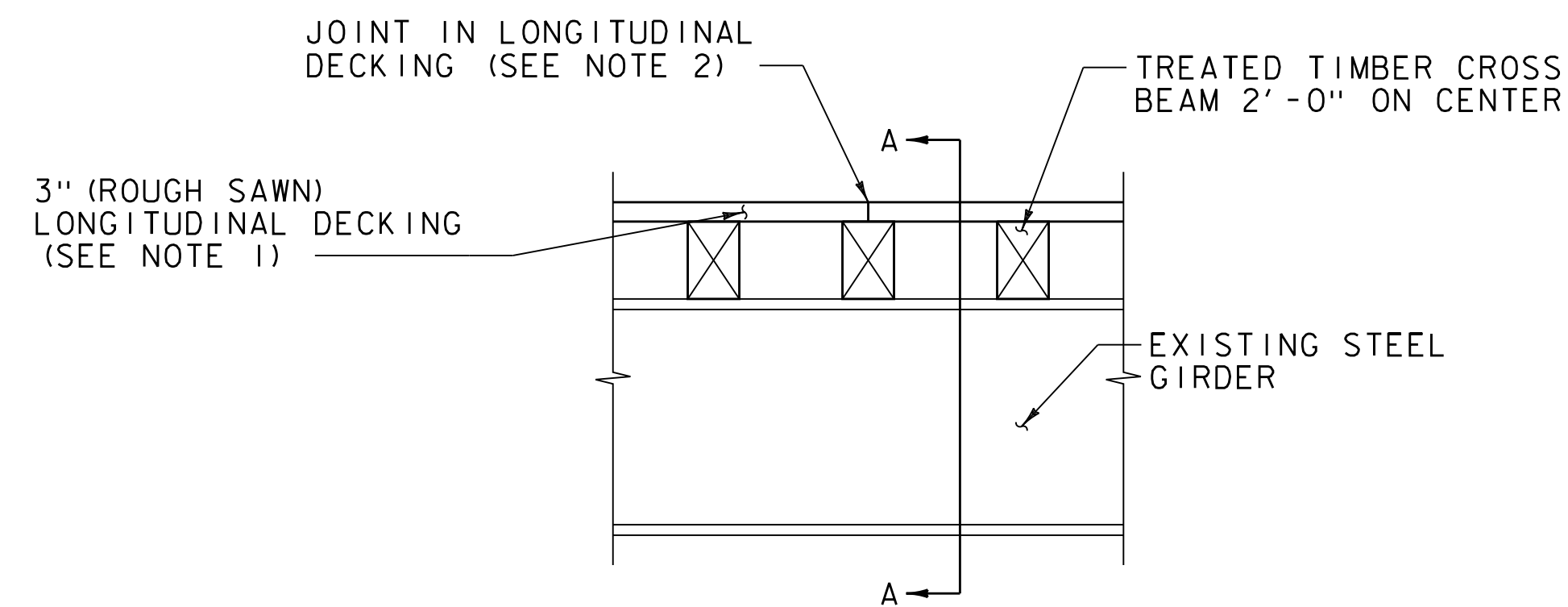


PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_typ.waste.area.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: B.M. ROBERTS  
DESIGNED BY: B.M. ROBERTS CHECKED BY: E.P. DETRICK  
WASTE AREA DETAILS SHEET SHEET 22 OF 102

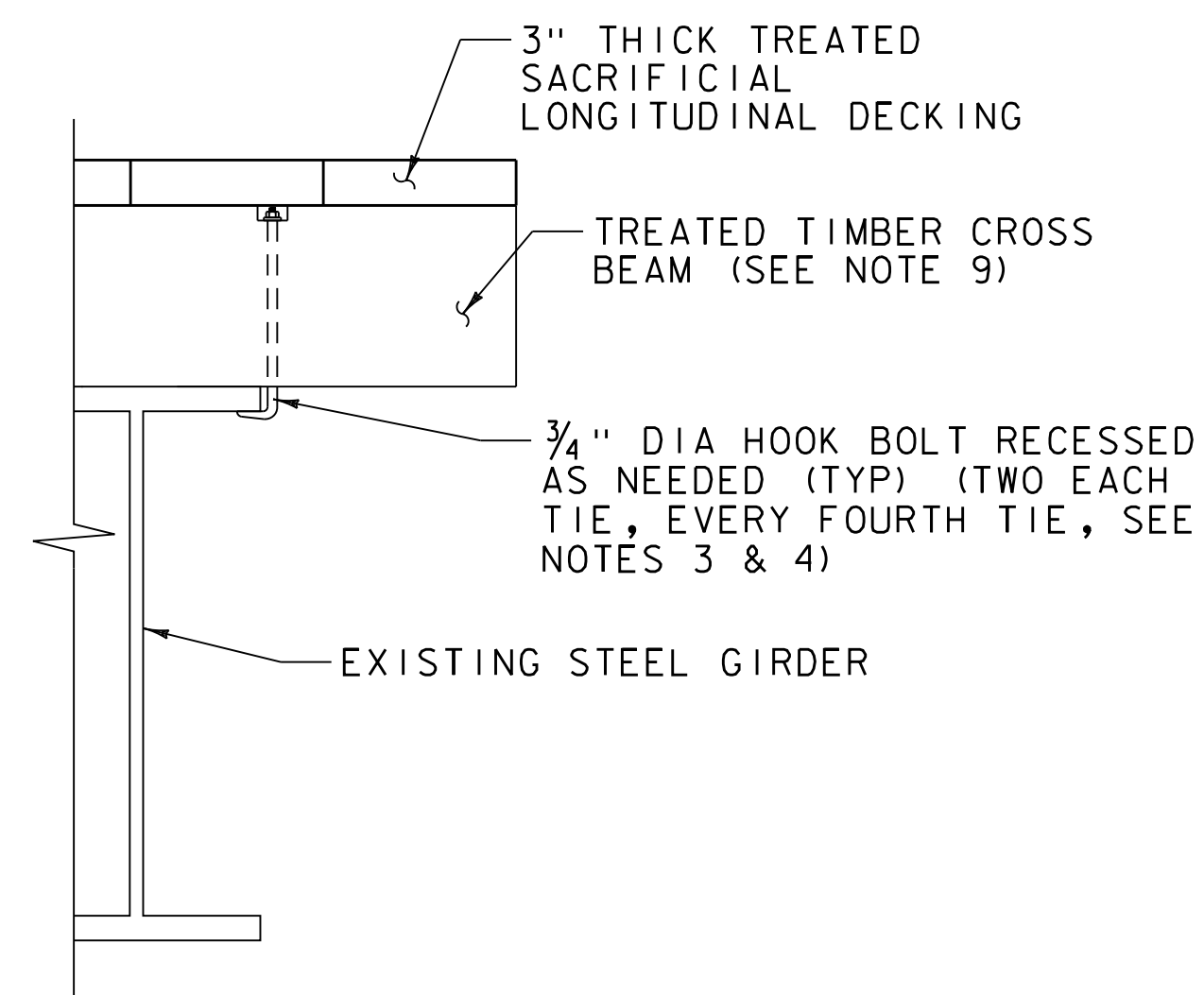






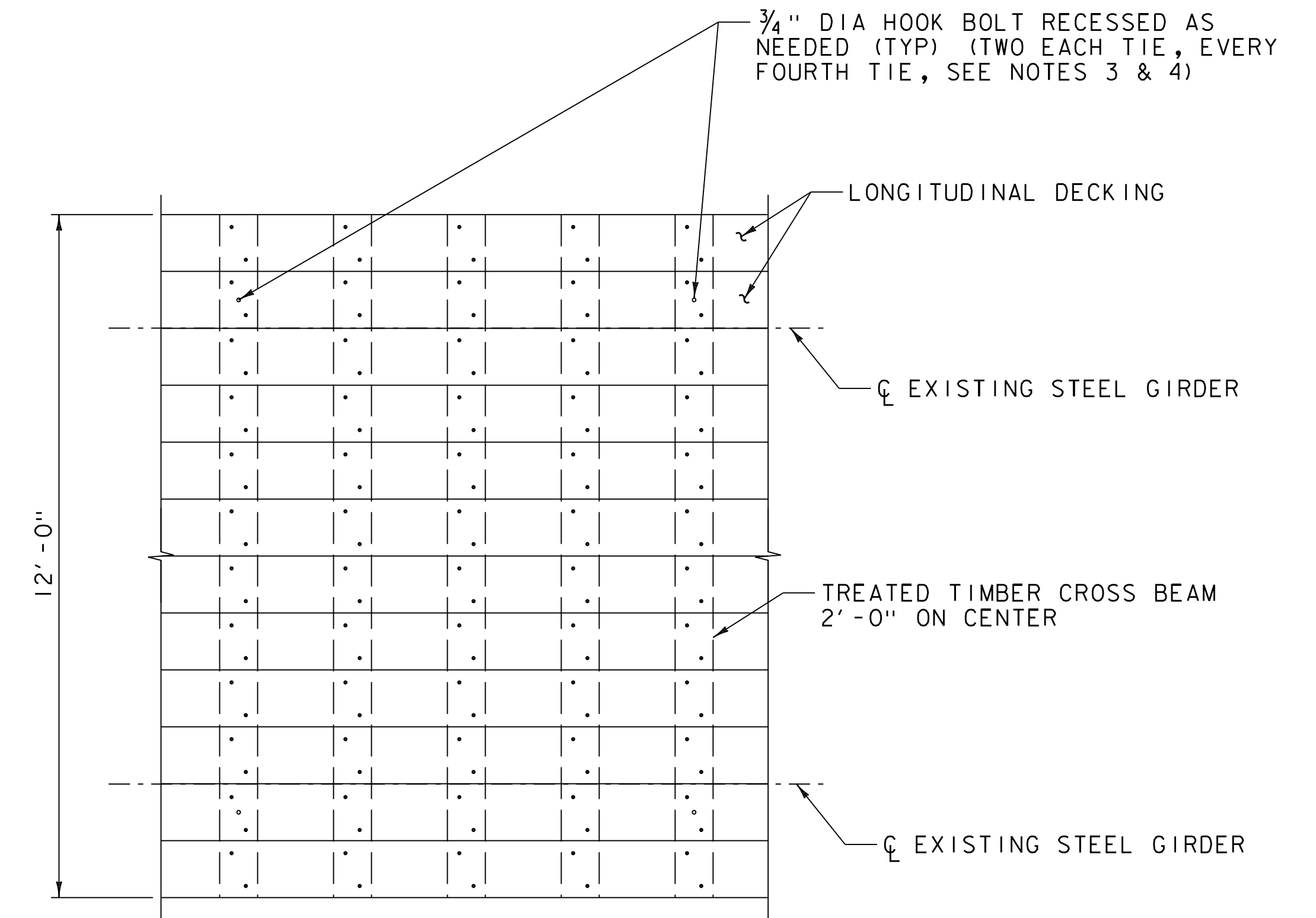
TYPICAL DECKING SECTION

SCALE  $\frac{1}{2}$ " = 1'-0"



SECTION A-A

SCALE 1" = 1'-0"



DECK LAYOUT

SCALE  $\frac{1}{2}$ " = 1'-0"

NOTES:

1. 3" THICK TREATED SACRIFICIAL LONGITUDINAL DECKING SHALL HAVE  $\frac{3}{8}$ " MAX GAP BETWEEN DRY TIMBER PLANKS. SEE ITEM 900.670, "SPECIAL PROVISION (DECKING)" FOR MORE INFORMATION.
2. TIMBER DECKING JOINTS SHALL OCCUR AT TREATED TIMBER CROSS BEAM LOCATIONS. JOINTS SHALL BE STAGGERED SUCH THAT NO TWO JOINTS ARE ADJACENT.
3. HOOK BOLTS SHALL BE RECESSED SUCH THAT TOP OF BOLT IS FLUSH WITH TOP OF TIE. RECESSED HOLES SHALL BE FILLED WITH EPOXY AFTER BOLT INSTALLATION. HOOK BOLTS ARE TO BE INSTALLED ON NEW TREATED TIMBER CROSS BEAMS.
4. PRE-BORE HOLES FOR ALL HOOK BOLTS.
5. CONNECTIONS TO BE MADE WITH  $\frac{1}{4}$ "  $\times$  5" LONG SCREWS WITH A  $\frac{5}{16}$ " HEX WITH OVERSIZED WASHER HEAD MADE OF TREATED STEEL AND COATED WITH A MULTI-COATED CORROSION PROTECTOR COMPATIBLE WITH ACQ. THE MIN. THREADED LENGTH SHALL BE  $2\frac{3}{4}$ ". THESE SCREWS SHALL BE COUNTERSUNK A MIN. OF  $\frac{3}{8}$ " AND LOCATED AT END OF EACH PLANK AND TWO AT EACH TIMBER STRINGER. SEE ITEM 900.670, "SPECIAL PROVISION (DECKING)" FOR MORE INFORMATION.
6. COST FOR TREATED TIMBER CROSS BEAMS SHALL BE PAID FOR UNDER ITEM 522.25, "STRUCTURAL LUMBER AND TIMBER, TREATED".
7. DIVOTS CAUSED BY COUNTER SINKING SCREWS IN DECK PLANKS SHALL BE FILLED WITH CAULKING. SEE ITEM 900.670, "SPECIAL PROVISION (DECKING)" FOR MORE INFORMATION ON CAULKING AND METHOD OF INSTALLATION.
8. REMOVAL AND PROPER DISPOSAL OF EXISTING TIES, DECKING, RAILING, AND OTHER REQUIRED DECK COMPONENTS WILL BE PAID UNDER ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE".
9. REFER TO TYPICAL SECTIONS FOR BRIDGES 45, 46, 47, AND 53 FOR ADDITIONAL INFORMATION ON TREATED TIMBER CROSS BEAM DIMENSIONS.

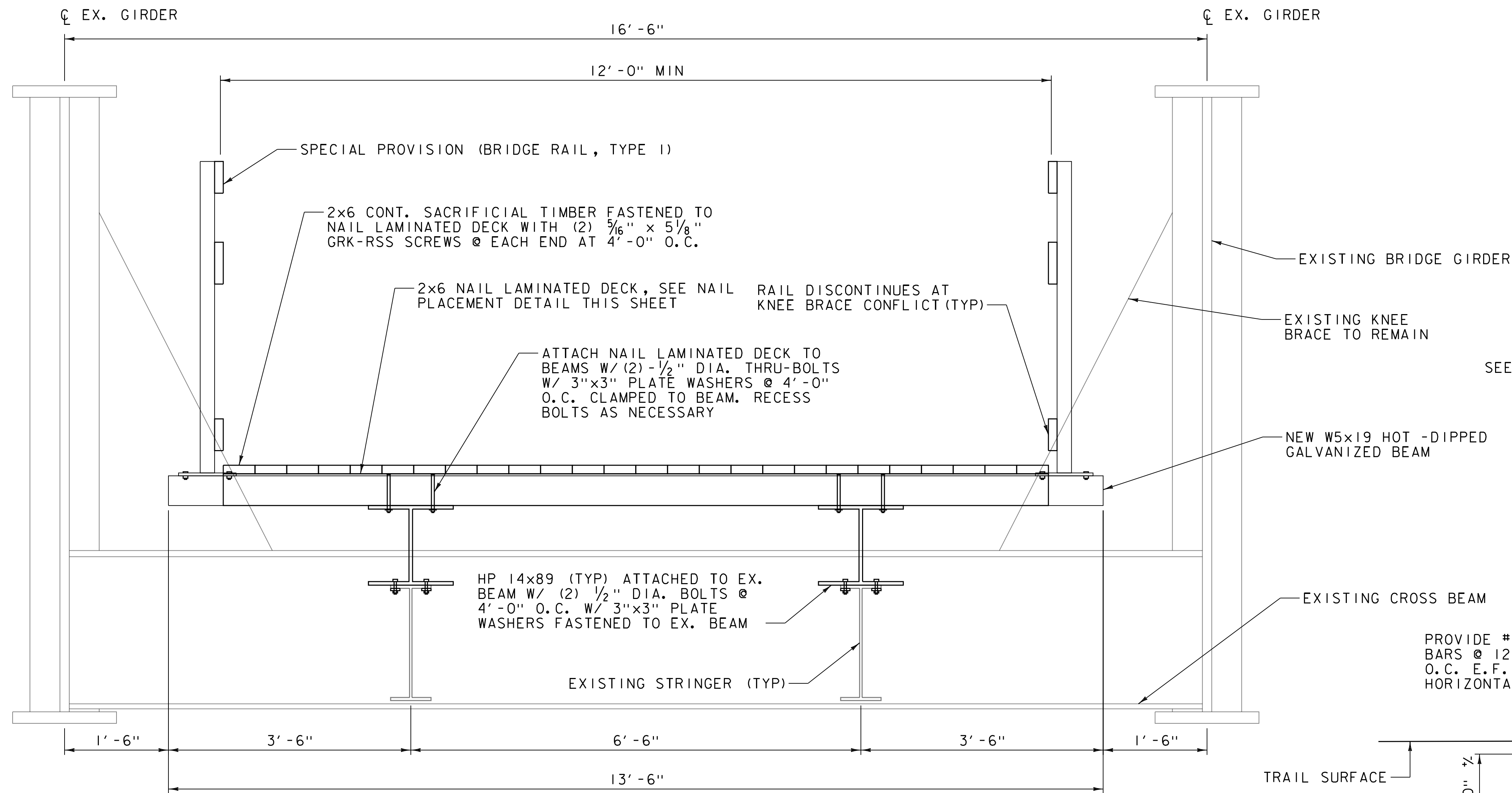


PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

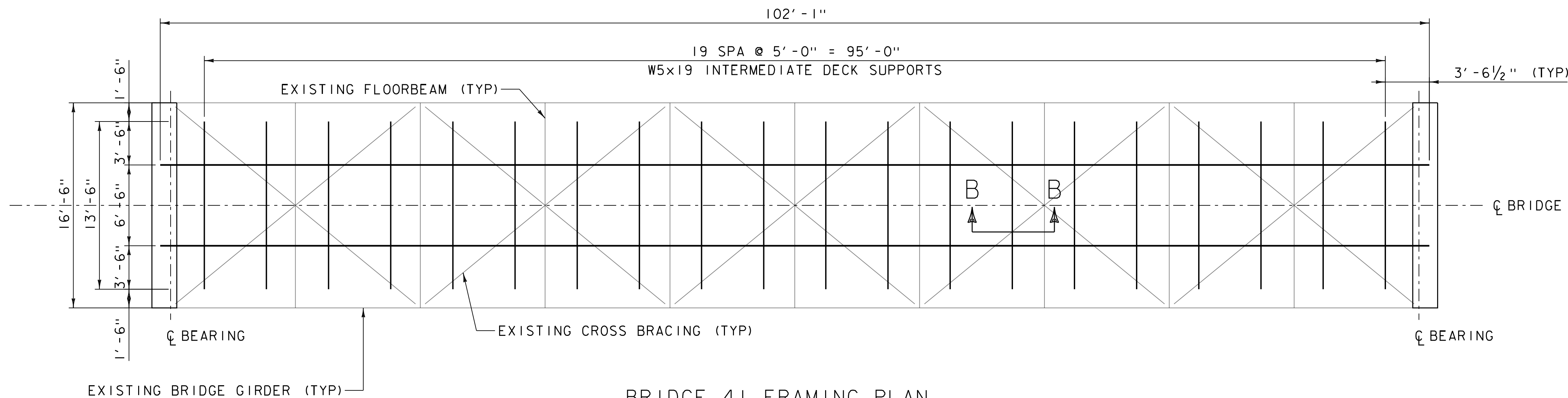
FILE NAME: z20f238_typ_deck_section.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: N.A. TRUSLOW
DESIGNED BY: J.D. KEENER	CHECKED BY: J.D. KEENER
BRIDGE DECKING DETAILS SHEET	SHEET 23 OF 102





BRIDGE 41 TYPICAL SECTION

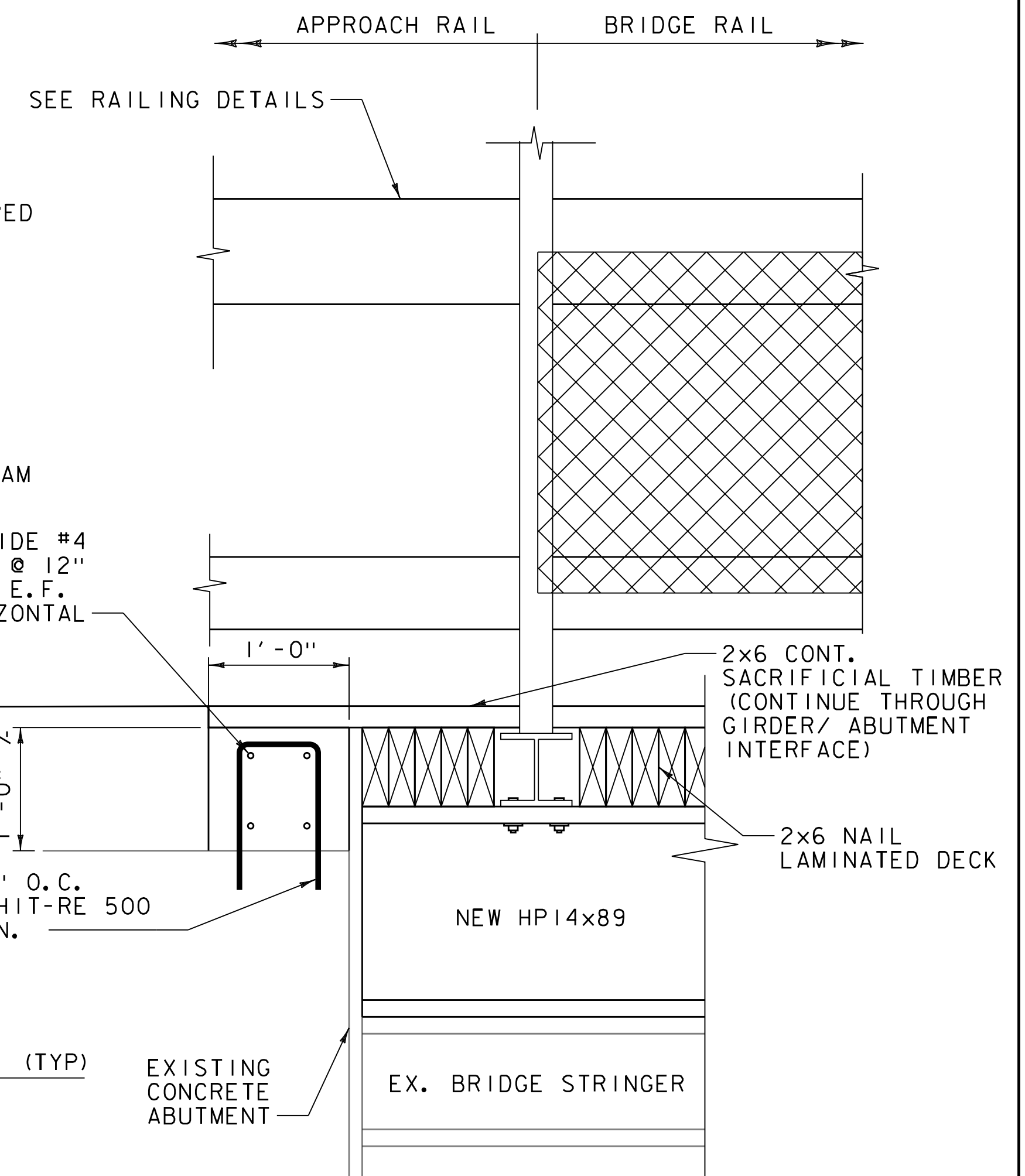
SCALE: 1" = 1' - 0"



BRIDGE 41 FRAMING PLAN

SCALE:  $\frac{3}{16}$ " = 1' - 0"

EXISTING BRIDGE DIMENSIONS  
ARE APPROXIMATE AND  
SHOULD BE FIELD VERIFIED



BRIDGE 41 END CAP DETAIL

NOT TO SCALE

NOTES:

- BRIDGE END CAP TO MATCH THE ELEVATION OF THE PROPOSED BRIDGE SURFACE AND TIE INTO EXISTING GRADE AT THE APPROACH.
- SECTION A-A DIAPHRAGM CONNECTION DETAIL CAN BE FOUND ON STRUCTURE DETAIL SHEET 2.

PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: R.J. FORBES

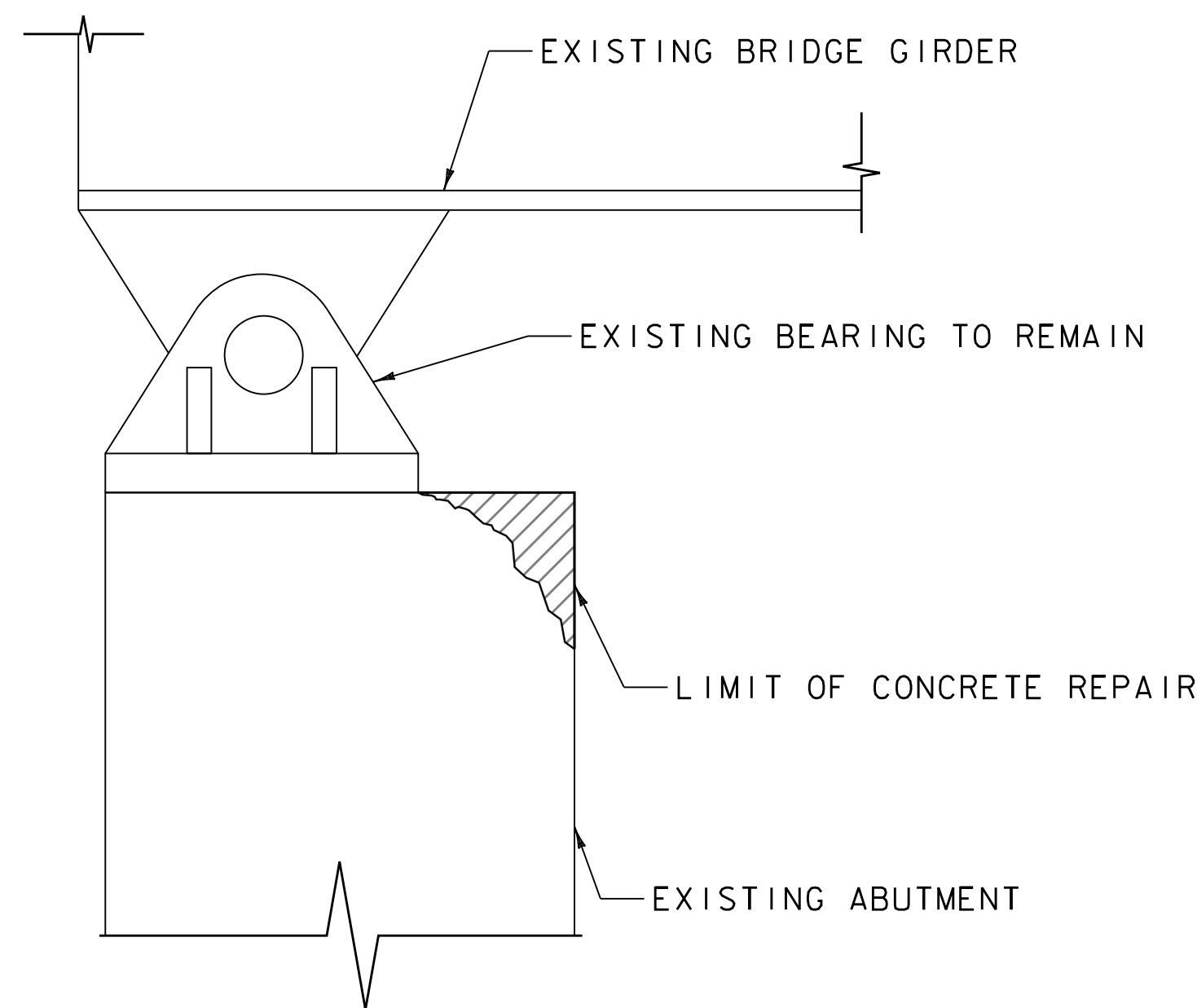
DESIGNED BY: J.D. KEENER

CHECKED BY: J.D. KEENER

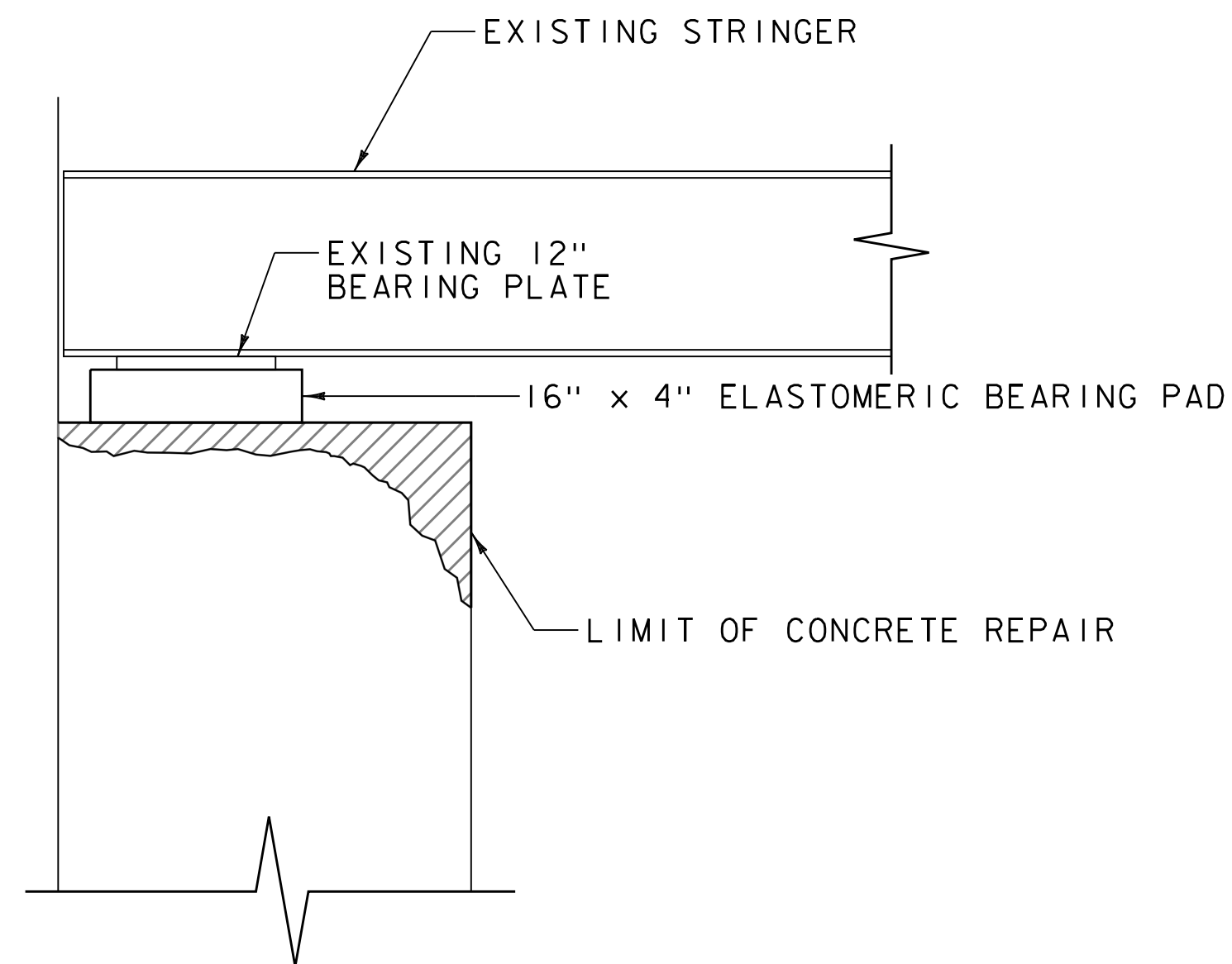
BRIDGE 41 TYPICAL SECTIONS

SHEET 24 OF 102

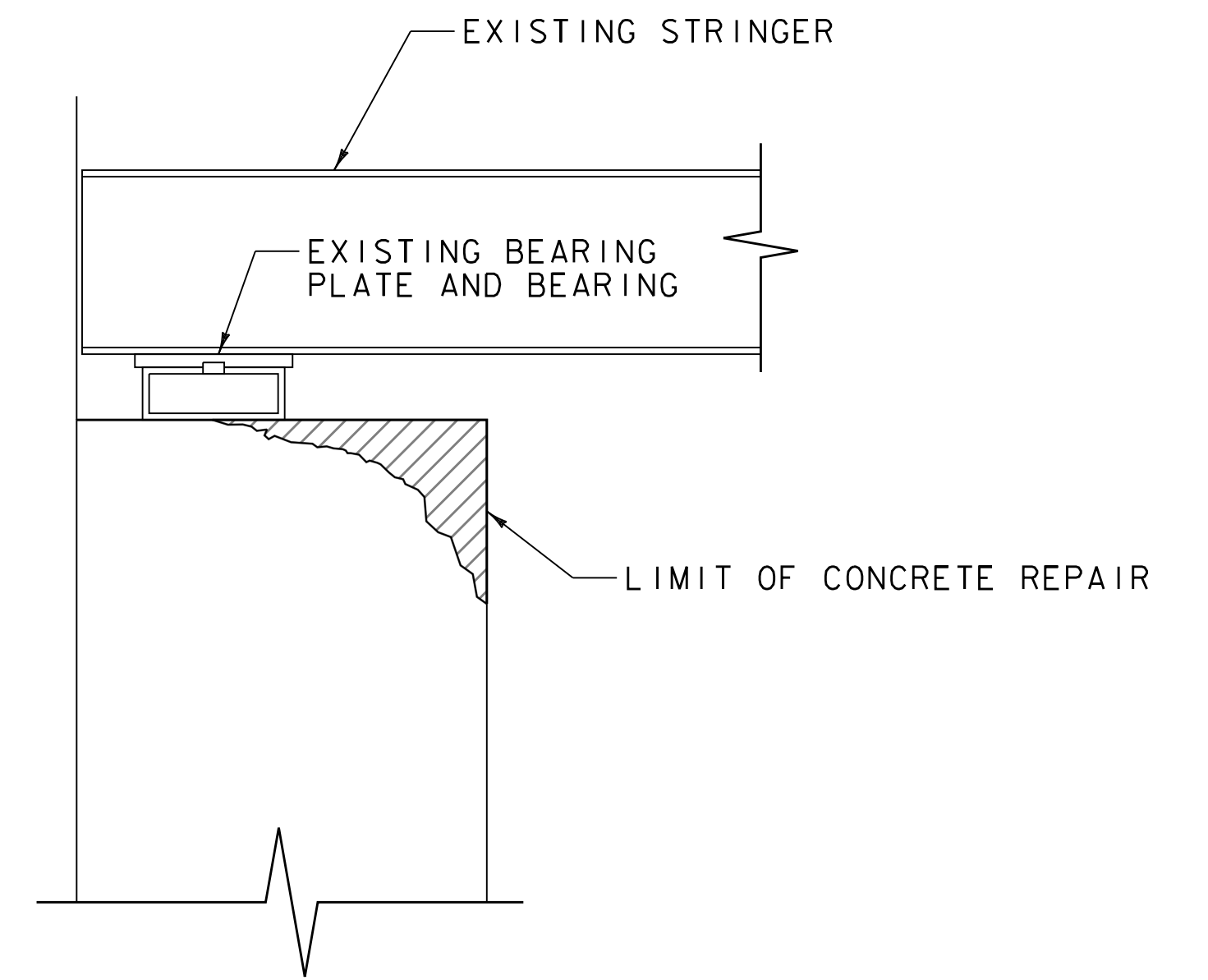




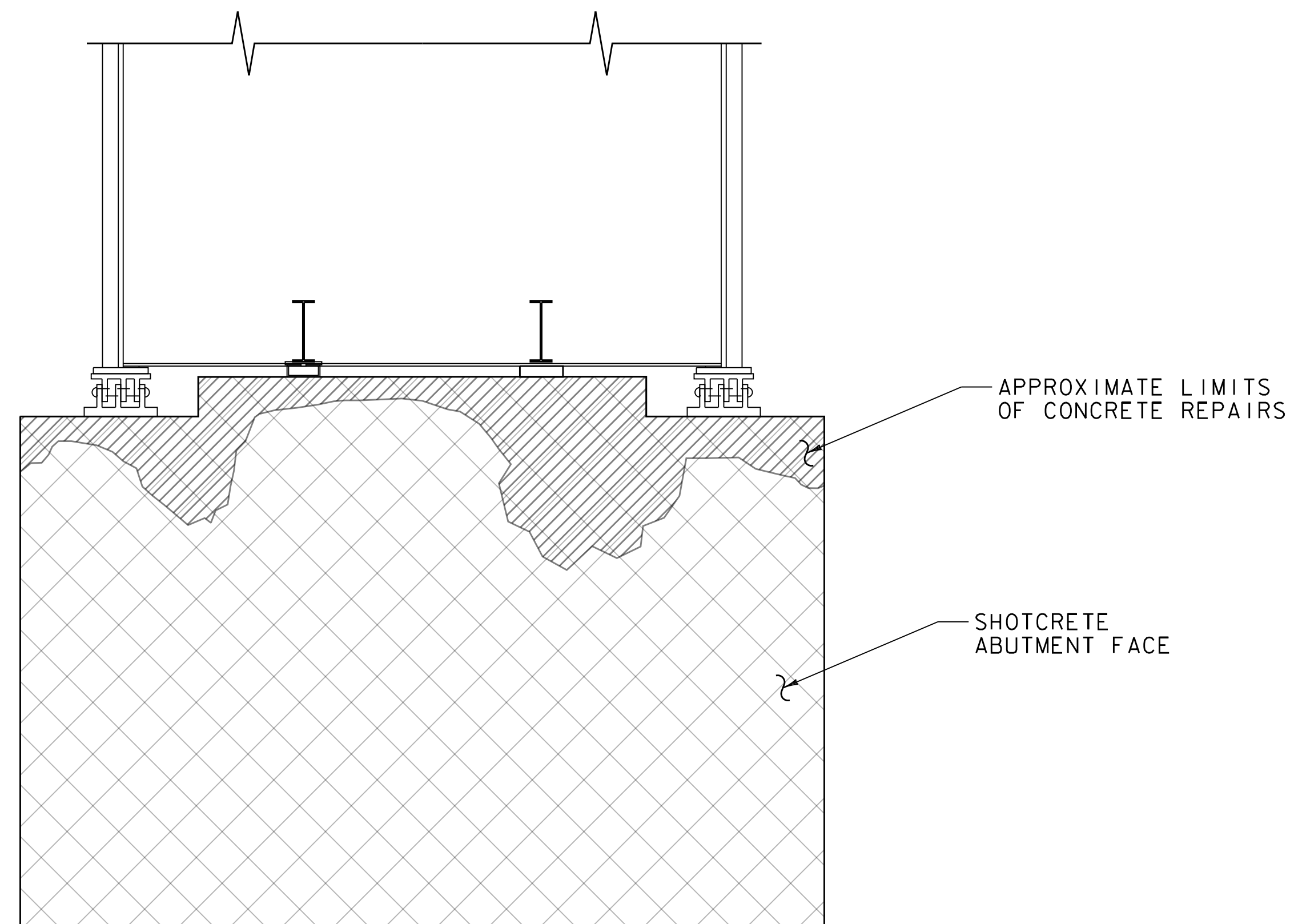
EAST ABUTMENT CONCRETE  
REPAIR ELEVATION  
NOT TO SCALE



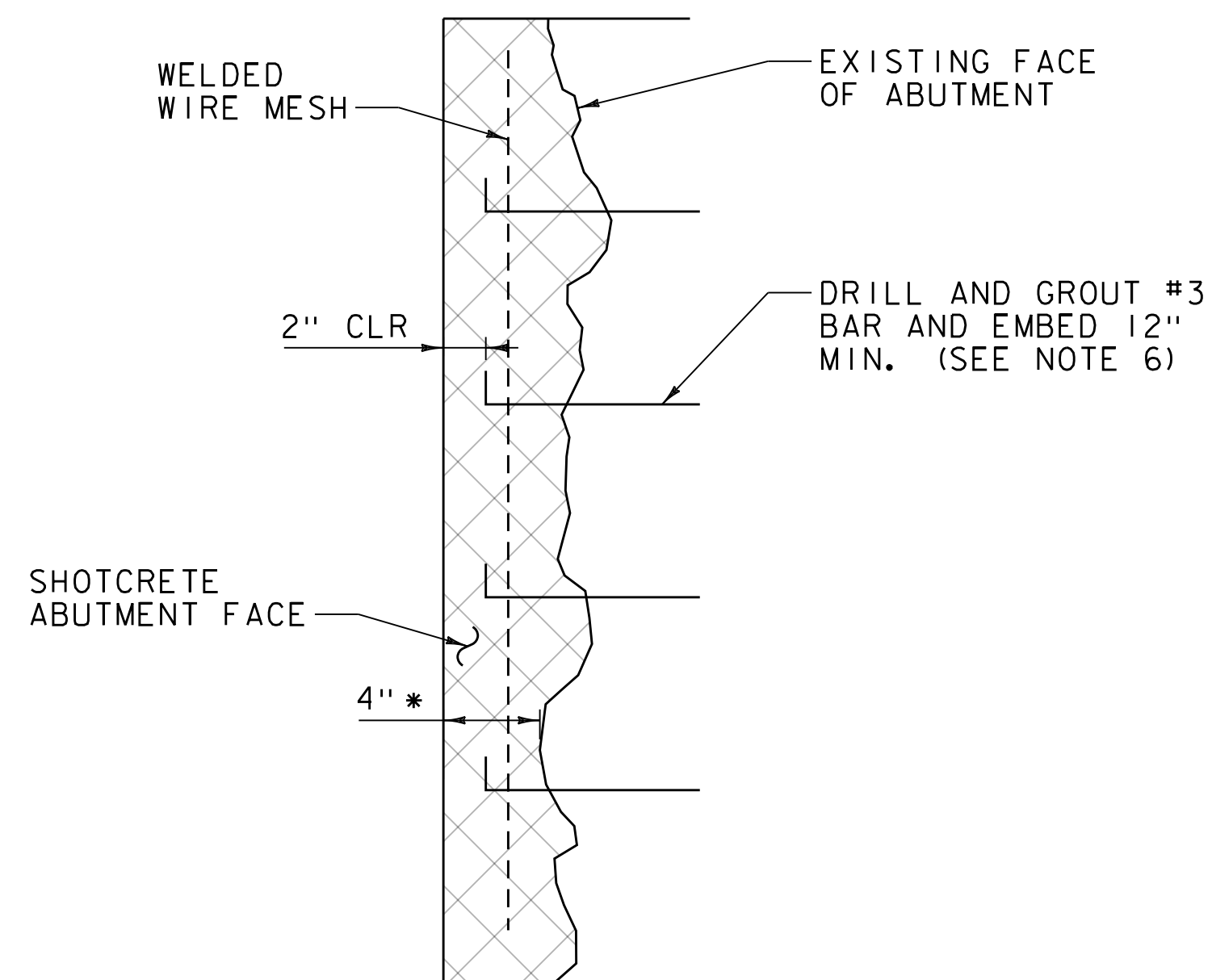
SOUTHEAST STRINGER WITH MISSING  
BEARING REPAIR ELEVATION  
NOT TO SCALE



NORTHEAST STRINGER WITH EXISTING  
BEARING REPAIR ELEVATION  
NOT TO SCALE



EAST ABUTMENT REPAIR ELEVATION  
NOT TO SCALE



EAST ABUTMENT REPAIR SECTION  
NOT TO SCALE

* 4" FROM ORIGINAL FINISHED FACE OF ABUTMENT

**NOTES:**

1. DIMENSIONS SHOWN FOR REFERENCE ONLY.
2. PRIOR TO THE START OF CONCRETE REMOVAL, THE RESIDENT ENGINEER AND THE CONTRACTOR SHALL SOUND THE CONCRETE AND AGREE ON THE REPAIR LIMITS.
3. CONCRETE REPAIRS TO THE SUBSTRUCTURE SHALL BE IN ACCORDANCE WITH SECTION 580. PAYMENT FOR SUBSTRUCTURE CONCRETE REPAIR, INCLUDING REPAIR MATERIALS, WILL BE MADE UNDER ITEM 580.13, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I", ITEM 580.14, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II", AND ITEM 580.15, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III" AS APPROPRIATE.
4. SHOTCRETE ENTIRE FACE OF ABUTMENT AS NECESSARY TO ESTABLISH A VERTICAL FACE, CONFER WITH RESIDENT ENGINEER AS NECESSARY.
5. REMOVE AND REPLACE ANCHOR BOLTS FOR ALL ANCHOR BOLT LOCATIONS AT EAST ABUTMENT BEARINGS.
6. SPACE BARS A MAXIMUM OF 2'-0" ON CENTER.

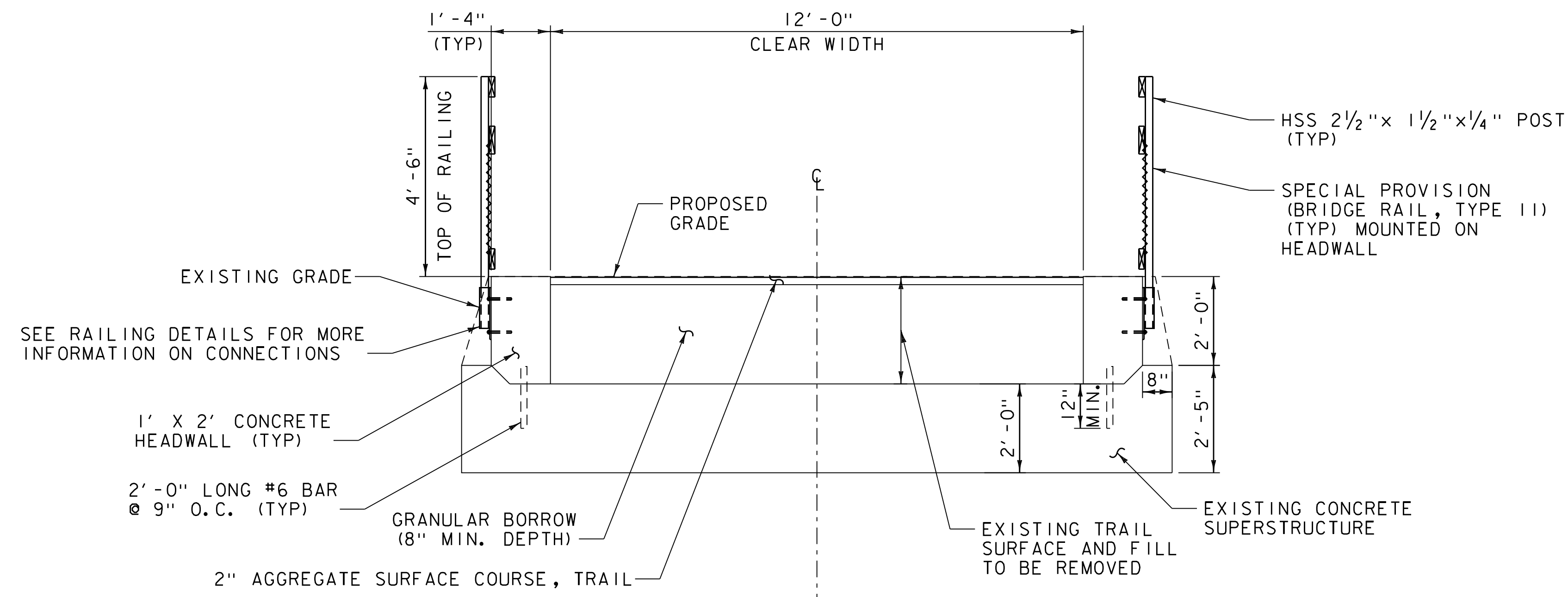
PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: R.J. FORBES  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
BRIDGE 4I ELEVATION VIEWS SHEET 25 OF 102

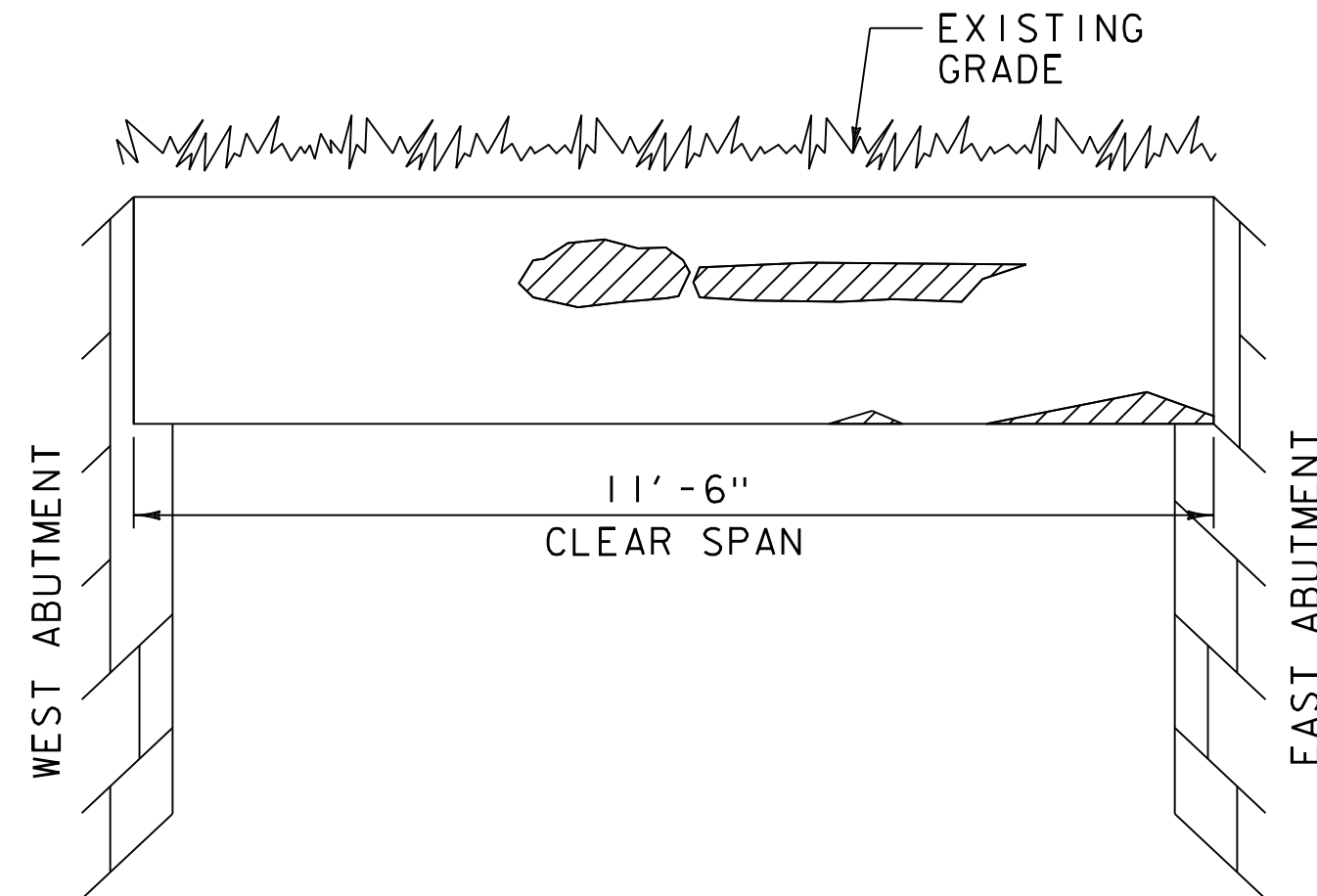






TYPICAL SECTION (BRIDGE 42)

SCALE: 1/2" = 1' - 0"

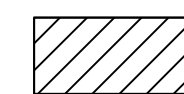


SOUTH FASCIA TYPICAL SECTION (BRIDGE 42)

SCALE: 1/2" = 1' - 0"

NOTES:

1. PRIOR TO THE START OF CONCRETE REMOVAL, THE RESIDENT ENGINEER AND THE CONTRACTOR SHALL SOUND THE CONCRETE AND AGREE ON THE REPAIR LIMITS.
2. PAYMENT FOR CONCRETE SUPERSTRUCTURE REPAIR, INCLUDING REPAIR MATERIALS, WILL BE MADE UNDER ITEM 580.13, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS I", AND ITEM 580.14, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS II" AS APPROPRIATE.



APPROXIMATE LOCATIONS OF REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS II

PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: N.A. TRUSLOW

DESIGNED BY: J.D. KEENER

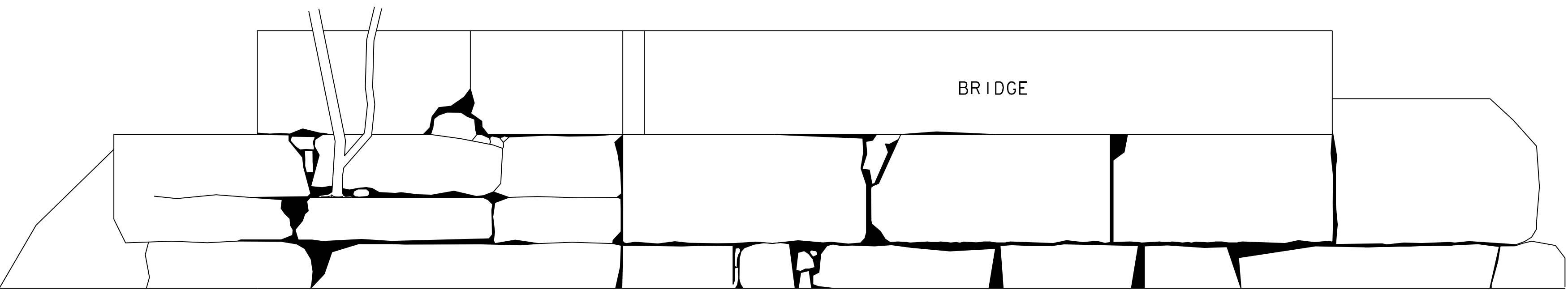
CHECKED BY: J.D. KEENER

BRIDGE 42 TYPICAL SECTIONS

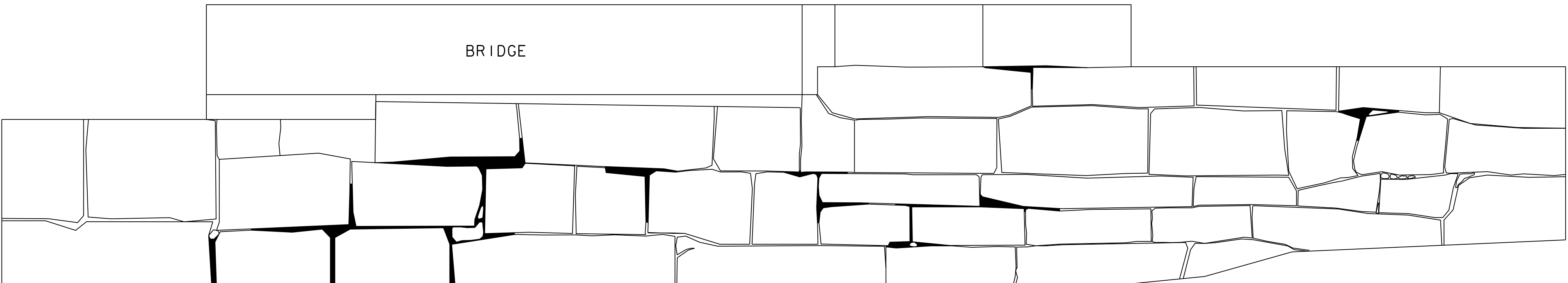
SHEET 26 OF 102







EXISTING ELEVATION VIEW (BRIDGE 42 WEST ABUTMENT)  
NOT TO SCALE



EXISTING ELEVATION VIEW (BRIDGE 42 EAST ABUTMENT)  
NOT TO SCALE

LEGEND:

 APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

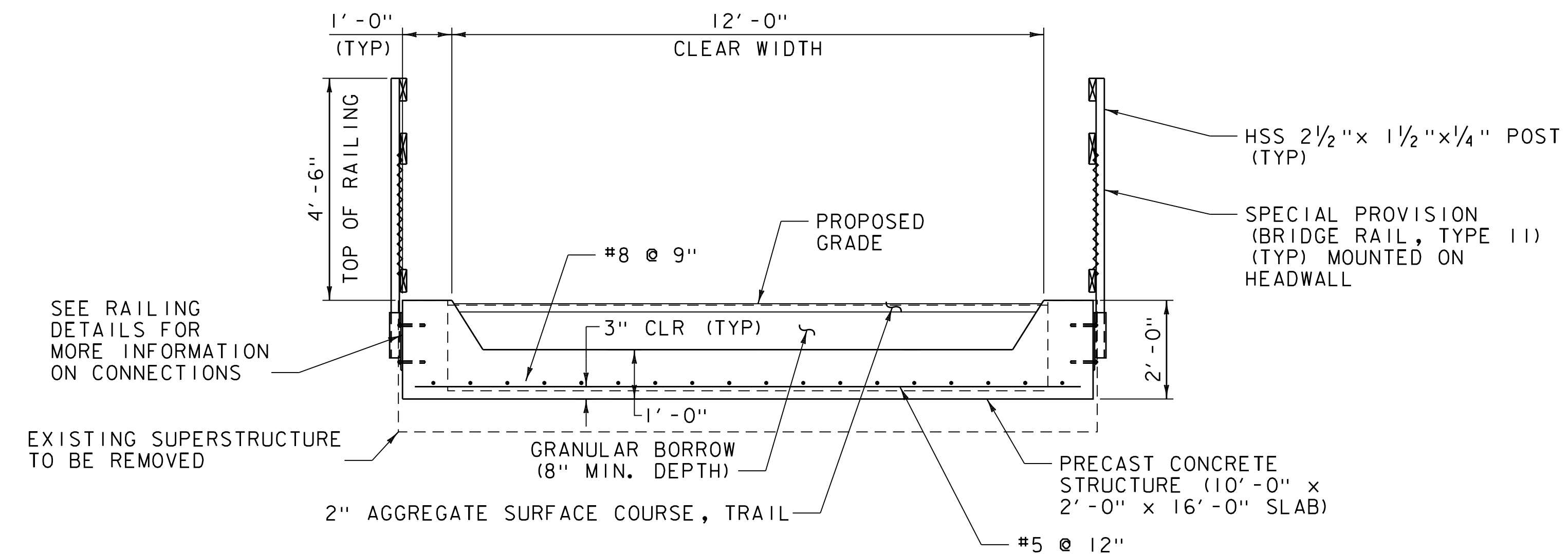
NOTES:

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF BOTH EAST AND WEST ABUTMENTS SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS IN THE ABUTMENTS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".



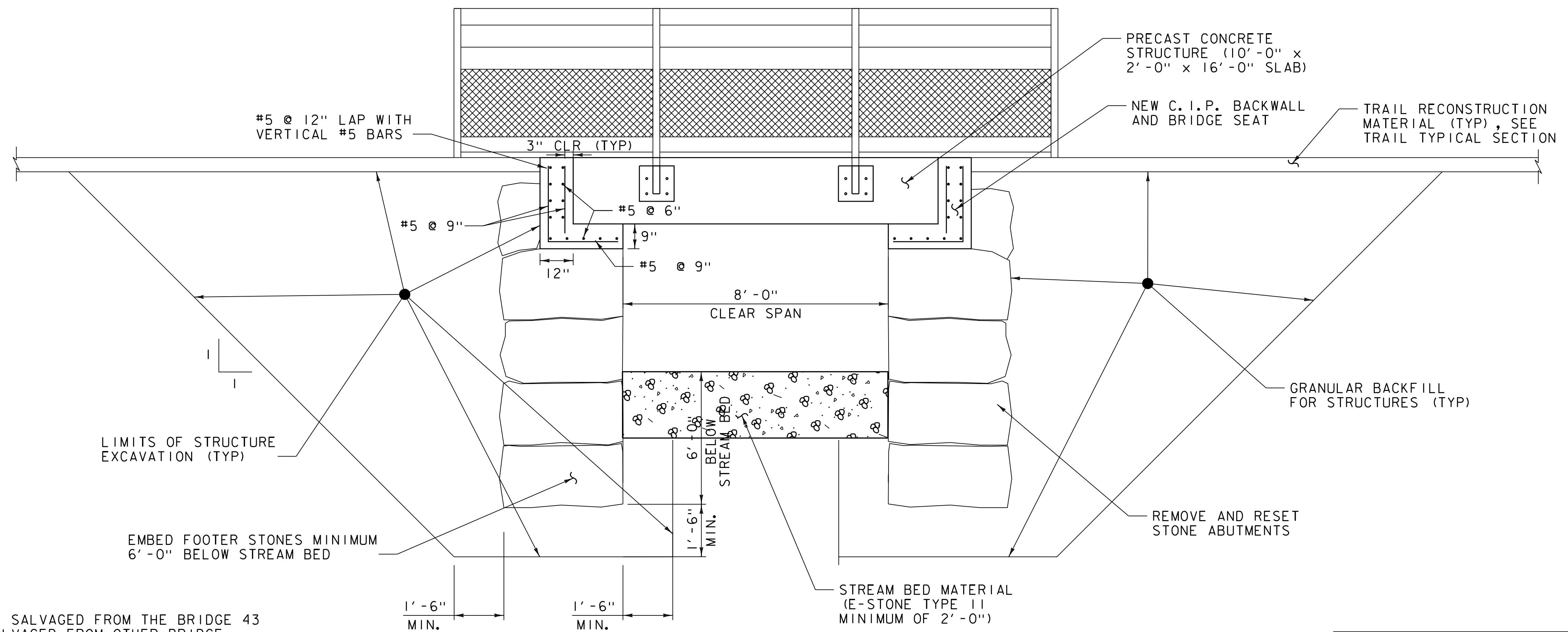
PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I2)	
FILE NAME: z20f238.structure.details.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: N.A. TRUSLOW
DESIGNED BY: J.D. KEENER	CHECKED BY: J.D. KEENER
BRIDGE 42 ABUTMENT ELEVATIONS	SHEET 27 OF 102





TYPICAL SECTION (BRIDGE 43)

SCALE: 1/2" = 1'-0"



NOTES:

- IF ENOUGH STONE CANNOT BE SALVAGED FROM THE BRIDGE 43 LOCATION, STONE MAY BE SALVAGED FROM OTHER BRIDGE REPLACEMENT PROJECTS AND USED AT THE BRIDGE 43 LOCATION. REMOVE AND RESET STONE ABUTMENTS WILL BE PAID UNDER ITEM 602.35, "REBUILT STONE MASONRY."

ELEVATION VIEW (BRIDGE 43)

NOT TO SCALE



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: N.A. TRUSLOW

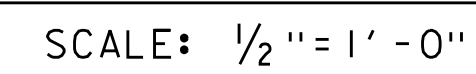
DESIGNED BY: J.D. KEENER

CHECKED BY: J.D. KEENER

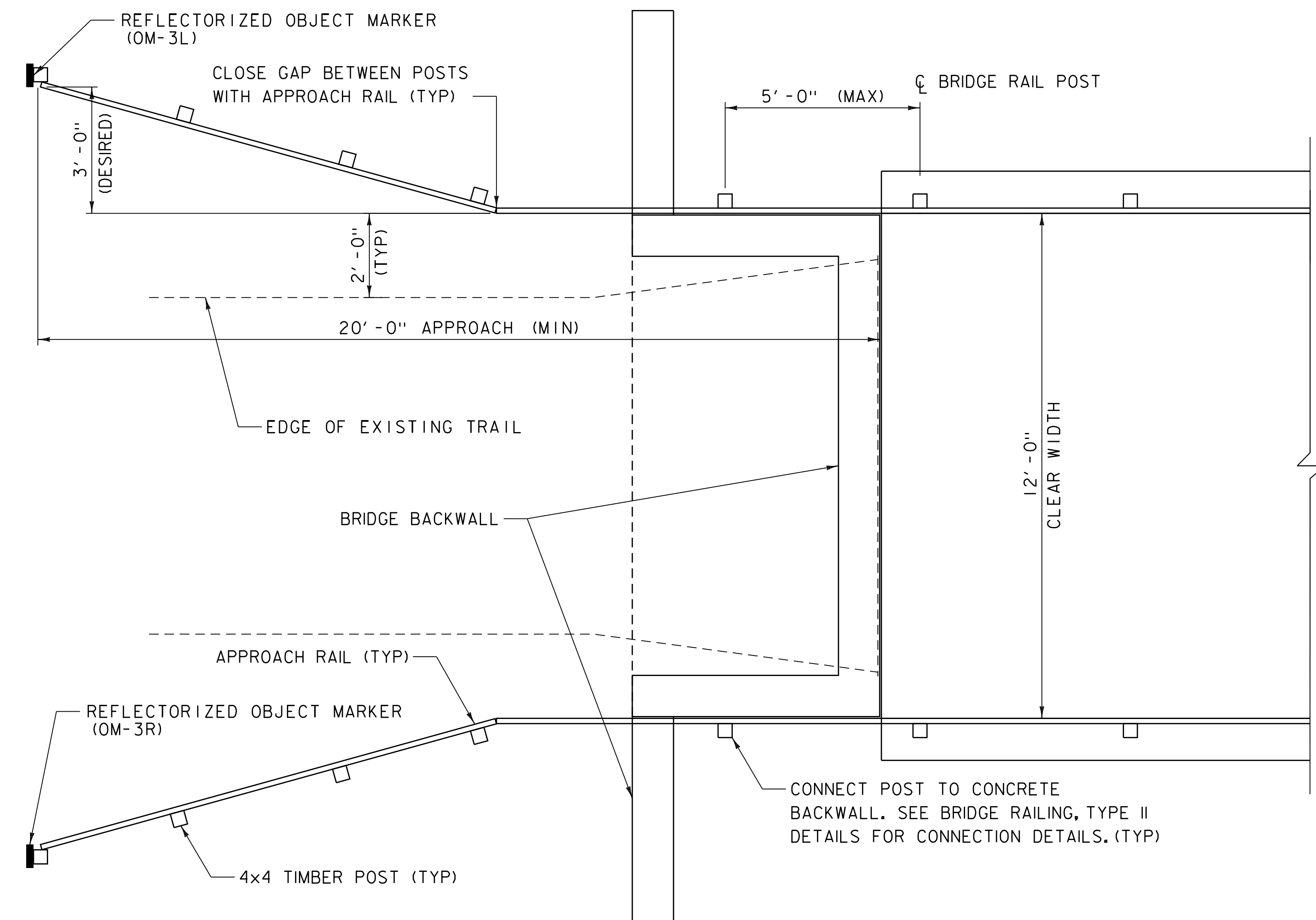
BRIDGE 43 TYPICAL SECTIONS

SHEET 28 OF 102

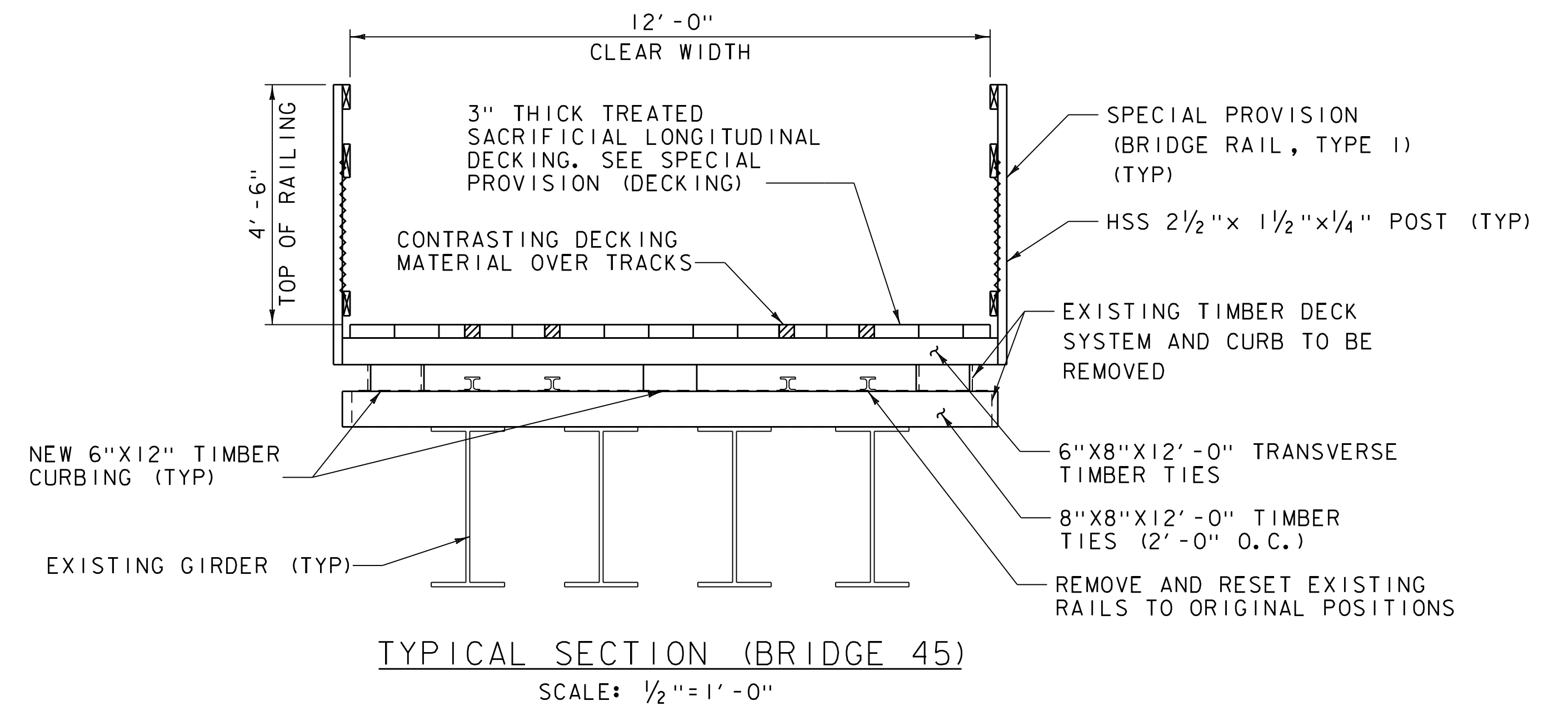








BRIDGE 45 APPROACH RAIL LAYOUT  
NOT TO SCALE



#### REPAIR NOTES:

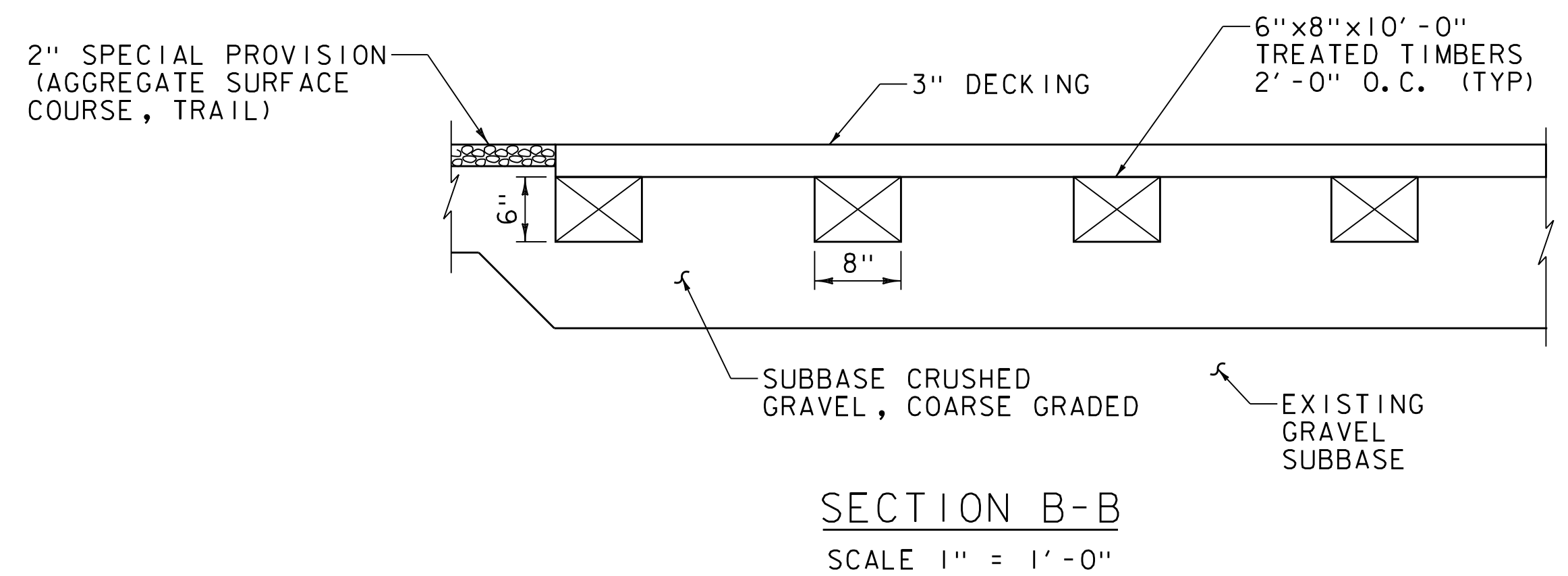
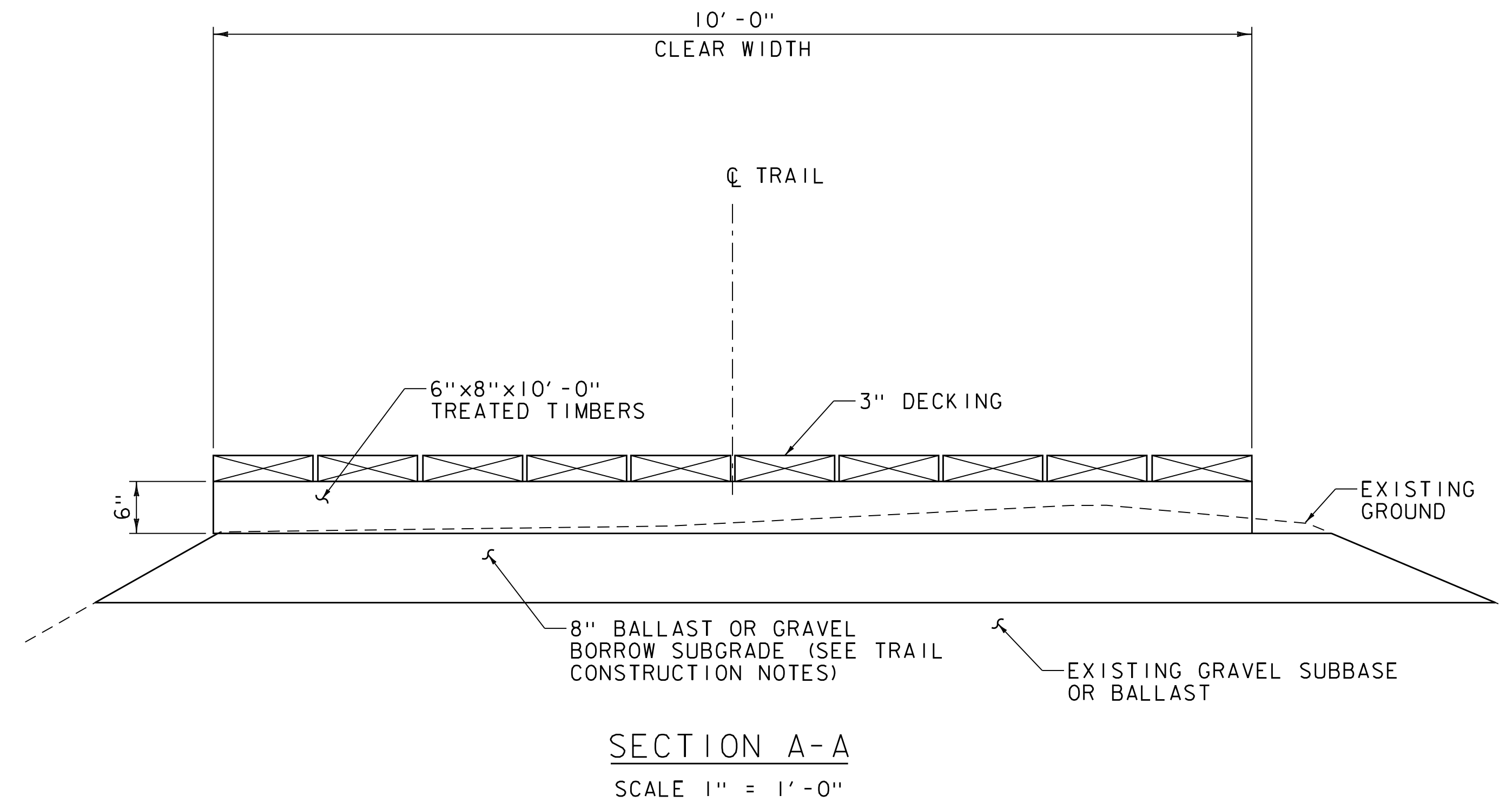
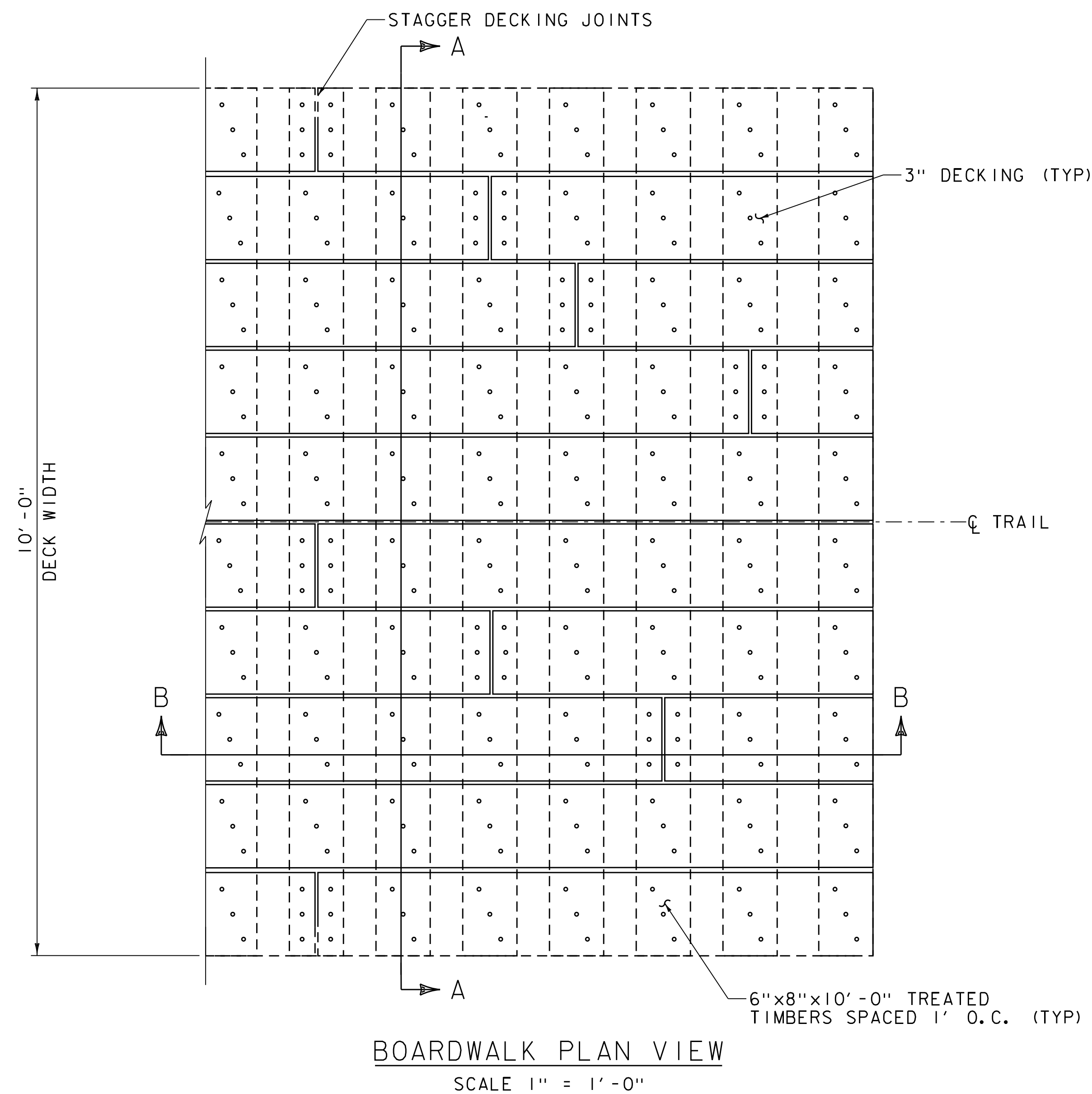
- EXISTING BRIDGE TIES AND TIMBER CURB ARE TO BE REMOVED. NEW 8"x8"x12'-0" BRIDGE TIES SHALL BE INSTALLED ON THE EXISTING STEEL GIRDERS ALONG WITH A NEW 6"x12" CONTINUOUS TIMBER CURB. AN ADDITIONAL TIMBER CURB SHALL BE INSTALLED ALONG THE CL OF THE BRIDGE TO SUPPORT THE TRANSVERSE 6"x8"x12'-0" TIMBER TIES. THE EXISTING RAIL ON TOP OF THE EXISTING BRIDGE TIES SHALL BE REMOVED AND RESET ON TOP OF NEW BRIDGE TIES. 3" ROUGH CUT LONGITUDINAL DECKING SHALL BE PLACED ON TOP OF THE NEW 6"x8"x12'-0" TIMBERS. THE LONGITUDINAL DECKING BOARD IMMEDIATELY ABOVE THE EXISTING RAIL SHALL BE STAINED WITH A BLACK COLORED STAIN TO REPRESENT THE RAIL IN THE LONGITUDINAL DECKING THAT IS BEING COVERED BY THE LONGITUDINAL DECKING. BRIDGE TIES AND TIMBER CURB WILL BE PAID FOR UNDER ITEM 522.20, "STRUCTURAL LUMBER AND TIMBER, UNTREATED". LONGITUDINAL DECKING BOARDS WILL BE PAID FOR UNDER ITEM 900.640, "SPECIAL PROVISION (DECKING)".
- THE APPROACHES SHALL BE RAISED USING A SLOPED BOARDWALK TO TIE INTO THE LONGITUDINAL DECKING BOARD. SEE NEXT SHEET FOR ADDITIONAL DETAILS.



PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: N.A. TRUSLOW  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
BRIDGE 45 DETAIL (SHEET 1 OF 6) SHEET 30 OF 102





#### NOTES:

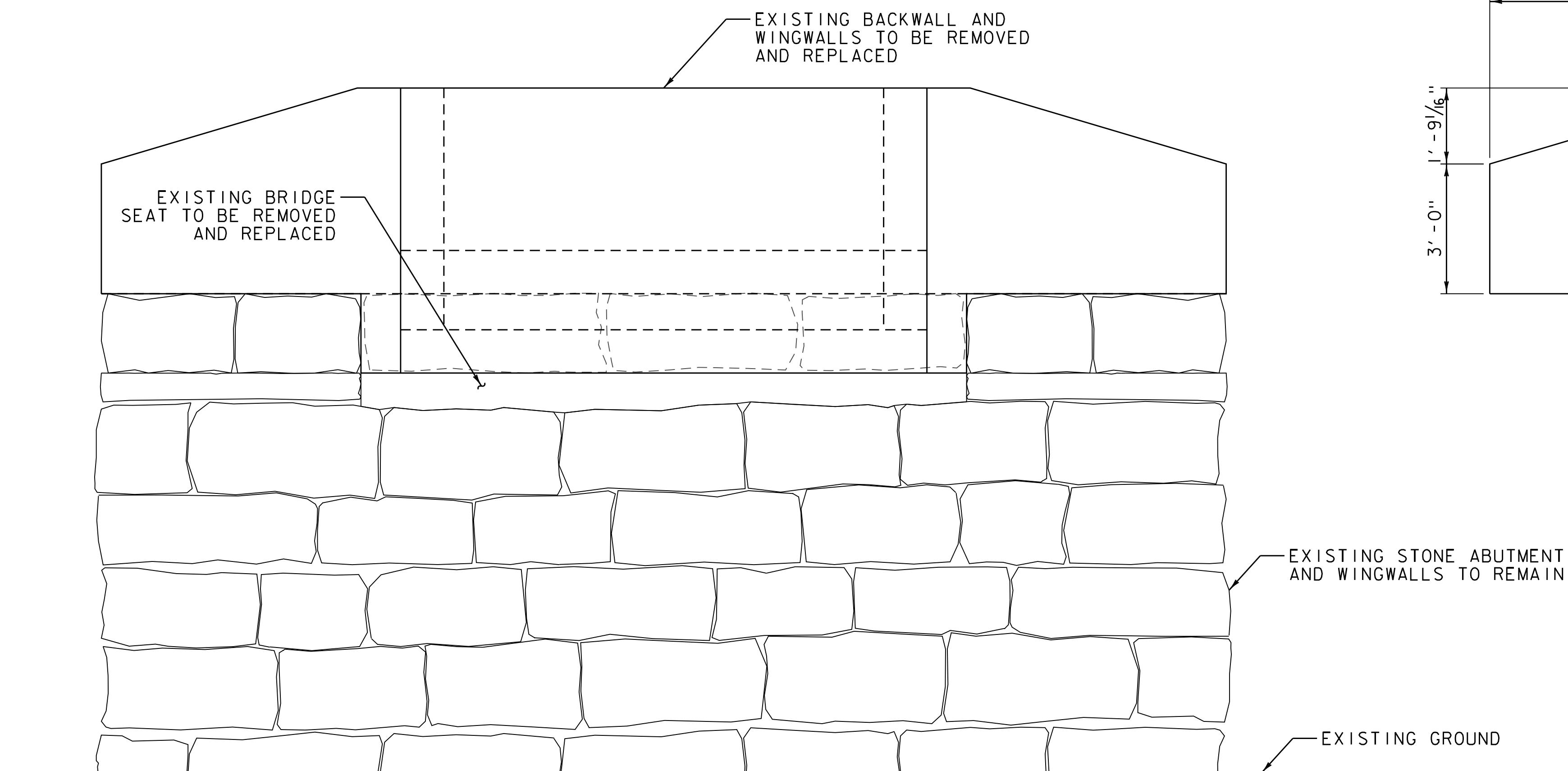
1. TIMBER DECKING JOINTS SHALL OCCUR AT TIE LOCATIONS. JOINTS SHALL BE STAGGERED SUCH THAT NO TWO JOINTS ARE ADJACENT.
2. DECK PLANKING CONNECTIONS TO BE MADE WITH  $\frac{1}{4}$ " X 5" LONG SCREWS WITH A  $\frac{5}{16}$ " HEX WITH OVERSIZED WASHER HEAD MADE OF TREATED STEEL AND COATED WITH A MULTI-COATED CORROSION PROTECTOR COMPATIBLE WITH ACO. THE MIN. THREAD LENGTH IS  $2\frac{3}{4}$ ". THESE SCREWS SHALL BE COUNTERSUNK A MIN. OF  $\frac{3}{8}$ " AND LOCATED AT THE END OF EACH PLANK.
3. THE 6"x8" TREATED TIMBER SPACING IS AT 2'-0" O.C. AND IS CAPABLE OF SUPPORTING H-10 LOADING ONLY.
4. THE COST FOR THE TREATED TIMBERS FOR THE BOARDWALK SHALL BE PAID FOR UNDER ITEM 522.25, "STRUCTURE LUMBER AND TIMBER, TREATED". THE COST FOR THE 3" DECKING AND FASTENERS SHALL BE PAID UNDER ITEM 900.640, "SPECIAL PROVISION (DECKING)".
5. THE FINAL LENGTH AND LOCATIONS OF BOARDWALK WILL BE DETERMINED BY THE ENGINEER PRIOR TO THE START OF CONSTRUCTION. 500 FT OF BOARDWALK HAS BEEN USED FOR ESTIMATING PURPOSES.



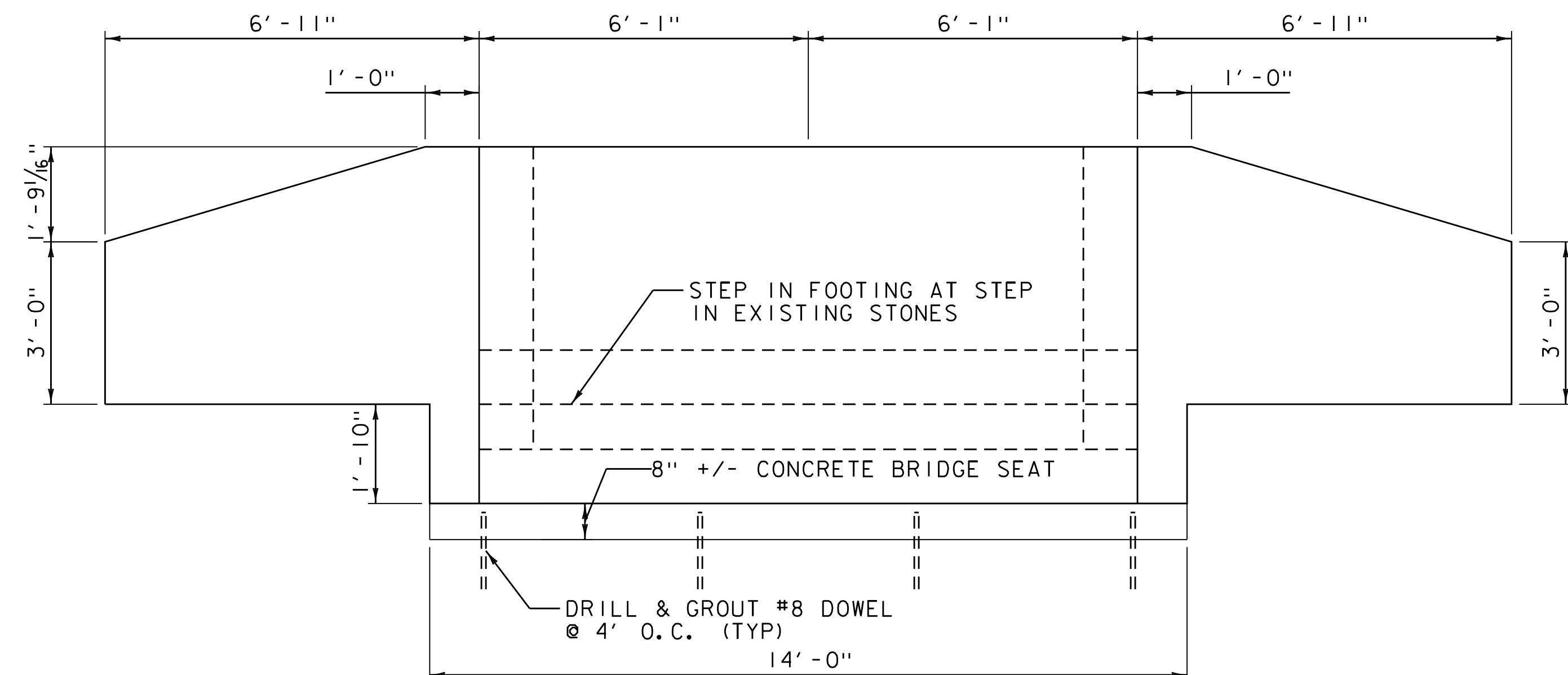
PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: N.A. TRUSLOW  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
BRIDGE 45 DETAILS (SHEET 2 OF 6) SHEET 31 OF 102





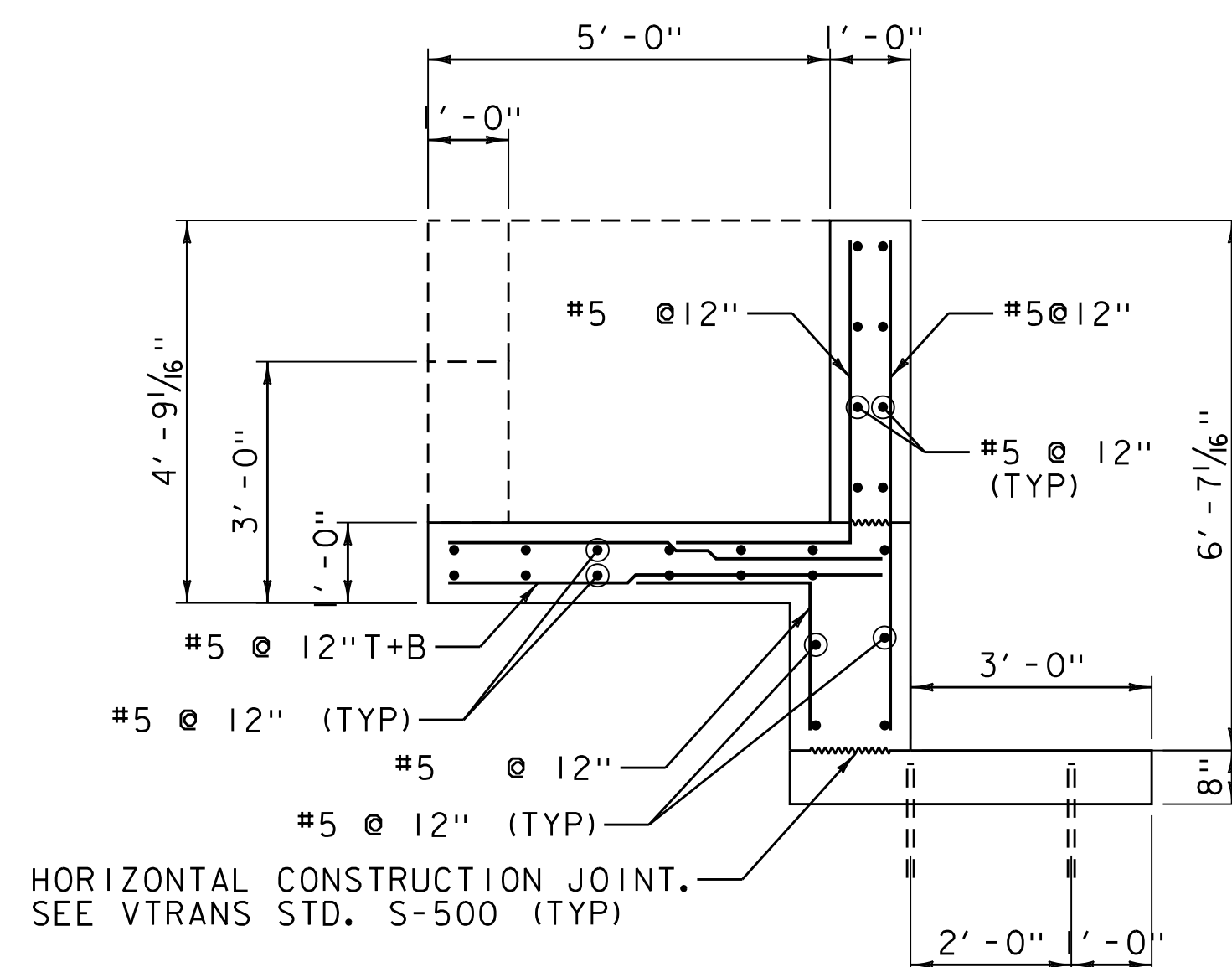
BRIDGE 45 ABUTMENT I ELEVATION  
SCALE: 1/2" = 1' - 0"



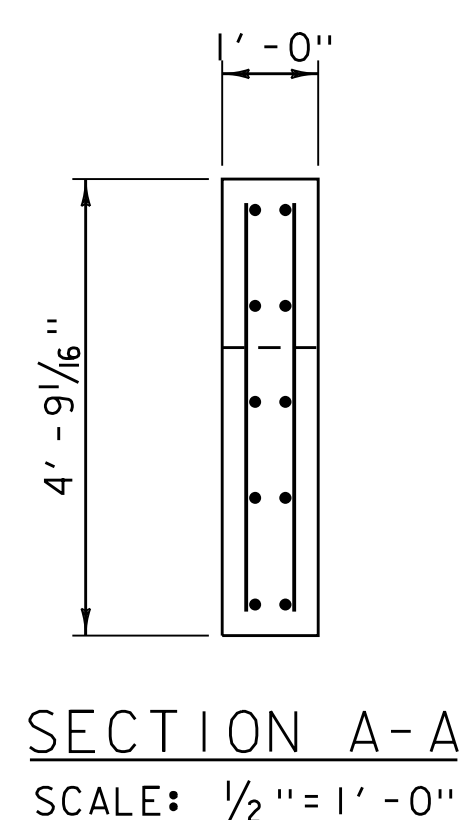
BRIDGE 45 ABUTMENT I BACKWALL ELEVATION  
SCALE: 1/2" = 1' - 0"

REPAIR NOTES:

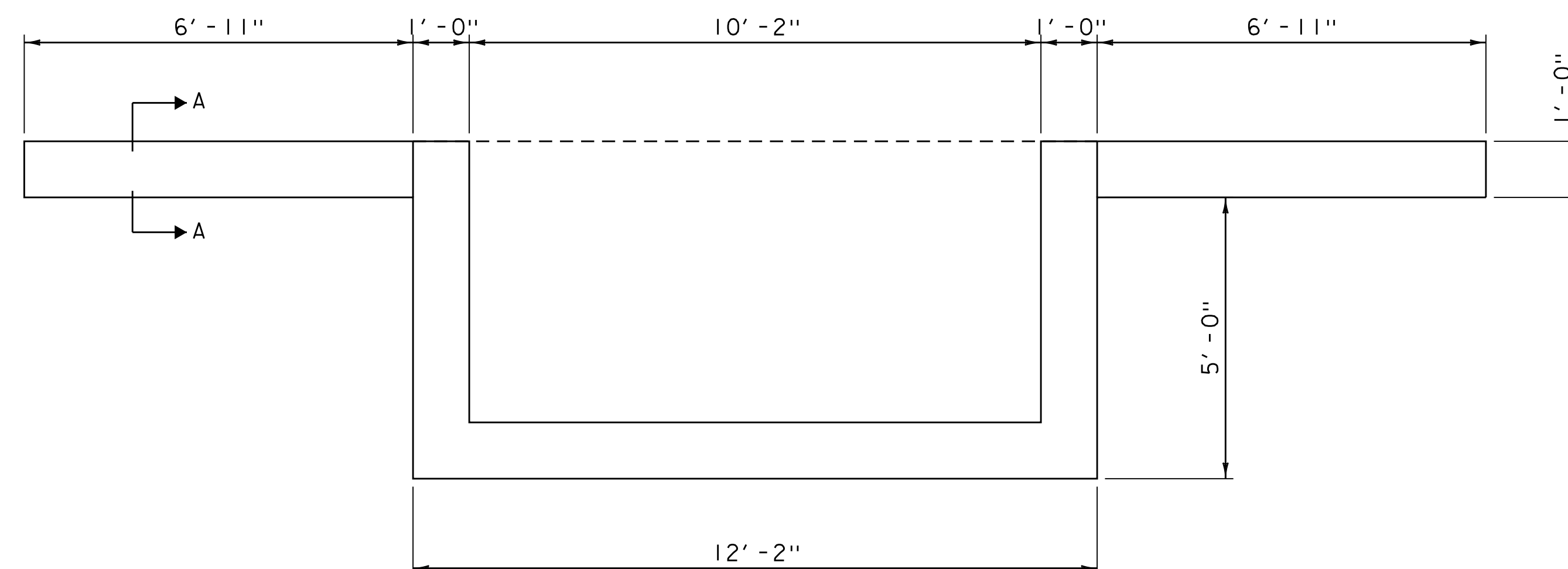
1. BACKWALLS AND BRIDGE SEATS AT BOTH ABUTMENTS SHALL BE REMOVED AND REPLACED.
2. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF STONE ABUTMENTS WILL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.



BRIDGE 45 ABUTMENT I BACKWALL TYPICAL SECTION  
SCALE: 1/2" = 1' - 0"



SECTION A-A  
SCALE: 1/2" = 1' - 0"

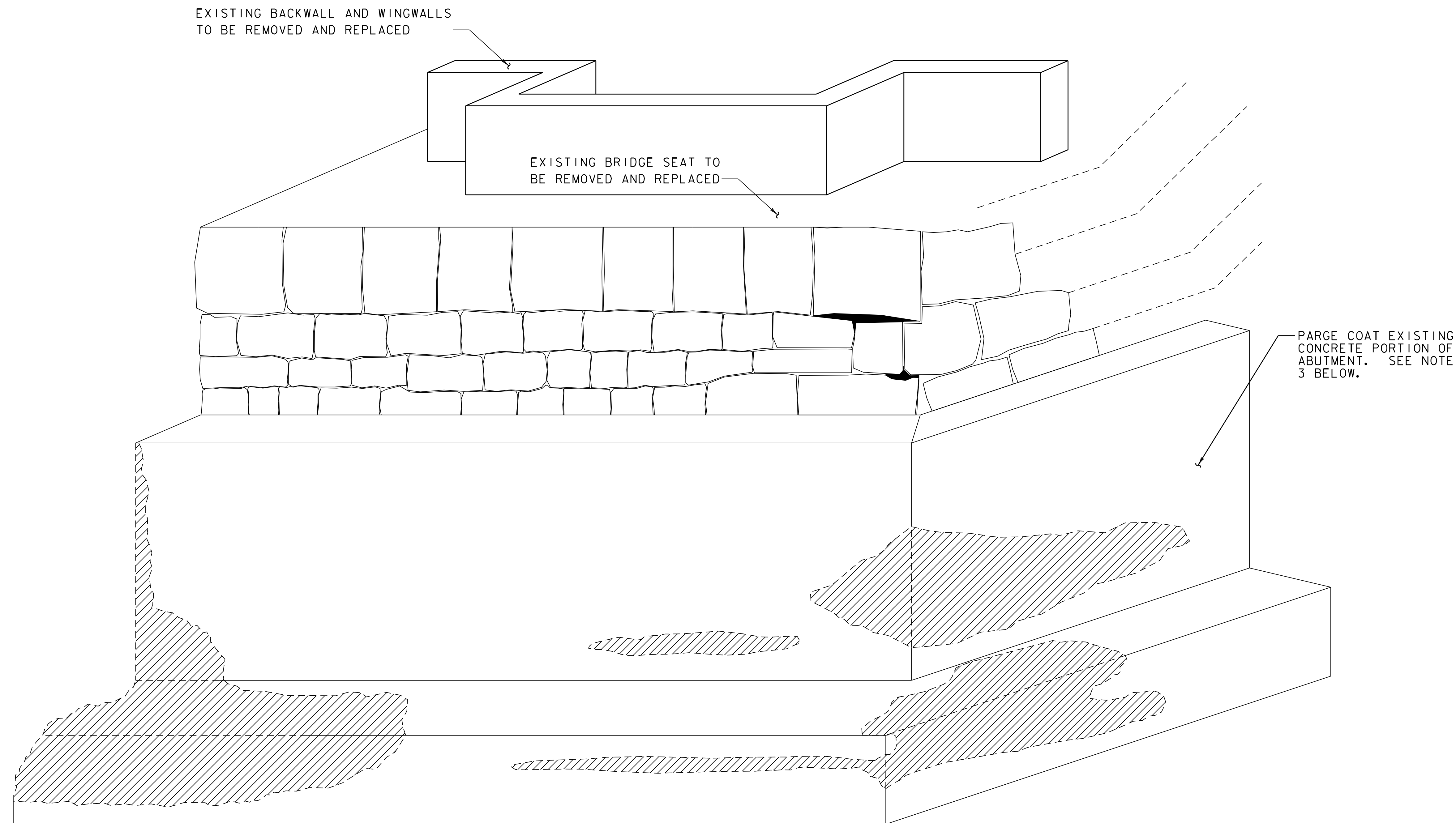


BRIDGE 45 ABUTMENT I BACKWALL PLAN VIEW  
SCALE: 1/2" = 1' - 0"



PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238.structure.details.dgn
PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P. DETRICK
DRAWN BY:	N.A. TRUSLOW
DESIGNED BY:	J.D. KEENER
CHECKED BY:	J.D. KEENER
BRIDGE 45 DETAILS (SHEET 3 OF 6)	SHEET 32 OF 102





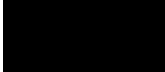

ELEVATION VIEW (BRIDGE 45 WEST ABUTMENT)

NOT TO SCALE

REPAIR NOTES:

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF STONE ABUTMENTS WILL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. PAYMENT FOR SUBSTRUCTURE CONCRETE REPAIR, INCLUDING REPAIR MATERIALS, WILL BE MADE UNDER ITEM 580.13, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I" AND ITEM 580.14, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II" AS APPROPRIATE.
3. THE CONTRACTOR SHALL APPLY A 1/2" THICK PARGE COAT OF CONCRETE TO THE ENTIRE FACE OF THE EXISTING CONCRETE PORTION OF THE ABUTMENT TO ENSURE A CONSISTENT APPEARANCE FOR THE ENTIRE ABUTMENT. THE PARGE COAT MATERIAL SHALL BE A MORTAR WITH A HIGH BOND STRENGTH TO ENSURE ADHESION TO THE EXISTING CONCRETE AND SHALL MEET THE REQUIREMENTS OF THE PROJECT SPECIAL PROVISIONS.

LEGEND:

-  APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED
-  APPROXIMATE LOCATIONS OF CONCRETE REPAIRS

PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: N.A. TRUSLOW

DESIGNED BY: J.D. KEENER

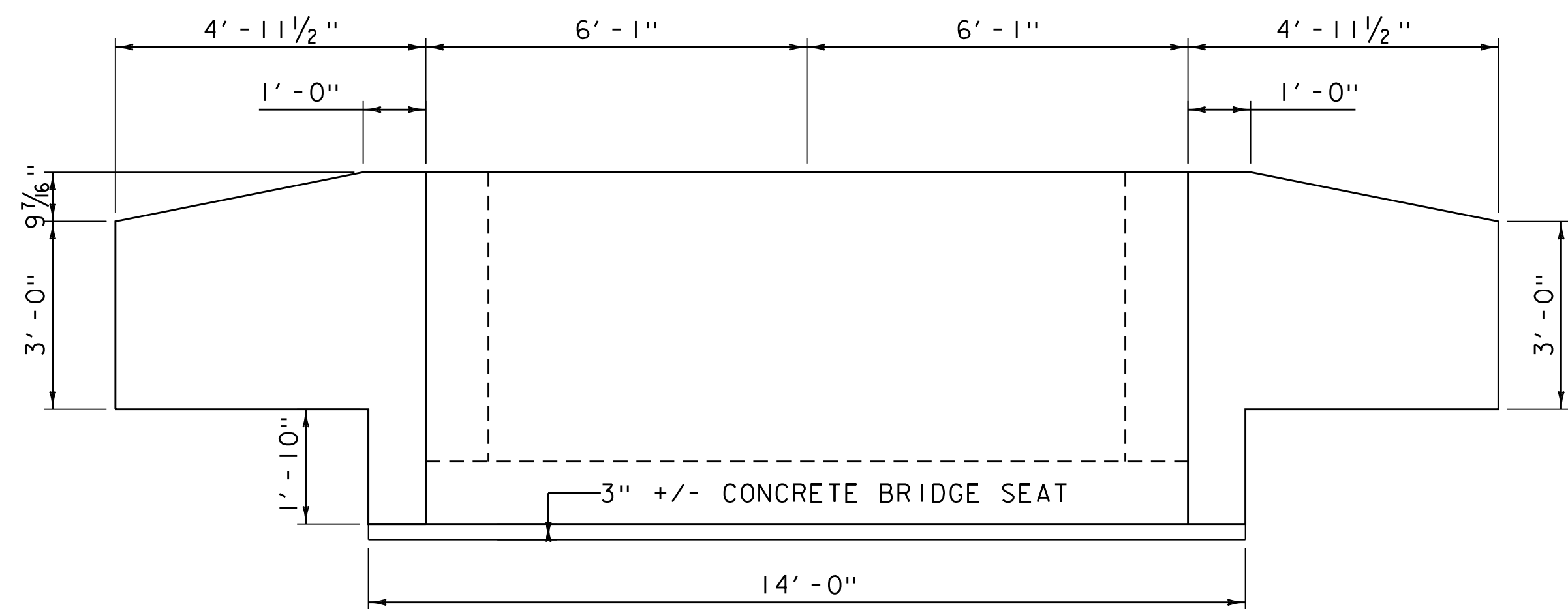
CHECKED BY: J.D. KEENER

BRIDGE 45 DETAILS (SHEET 4 OF 6)

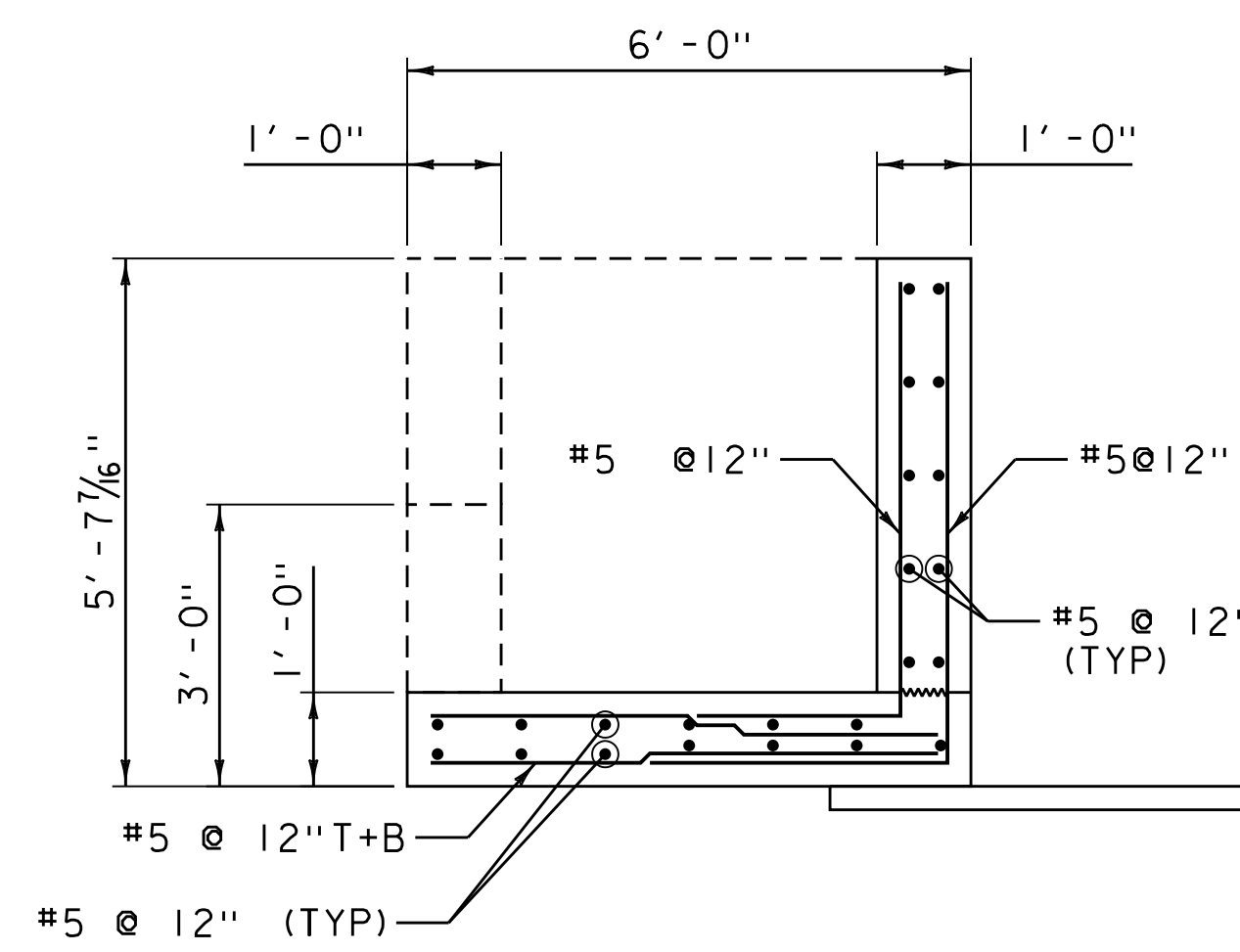
SHEET 33 OF 102



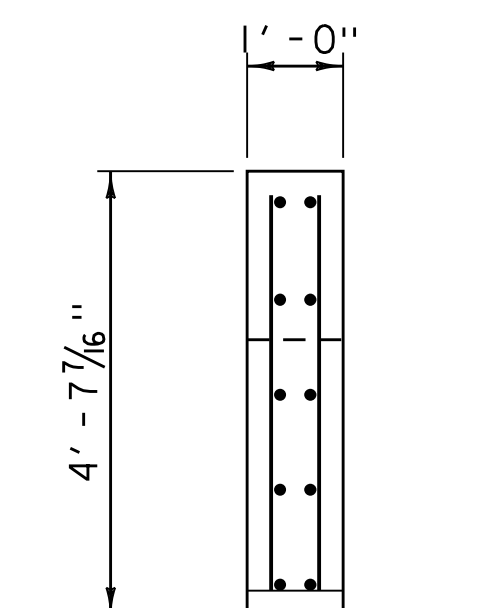




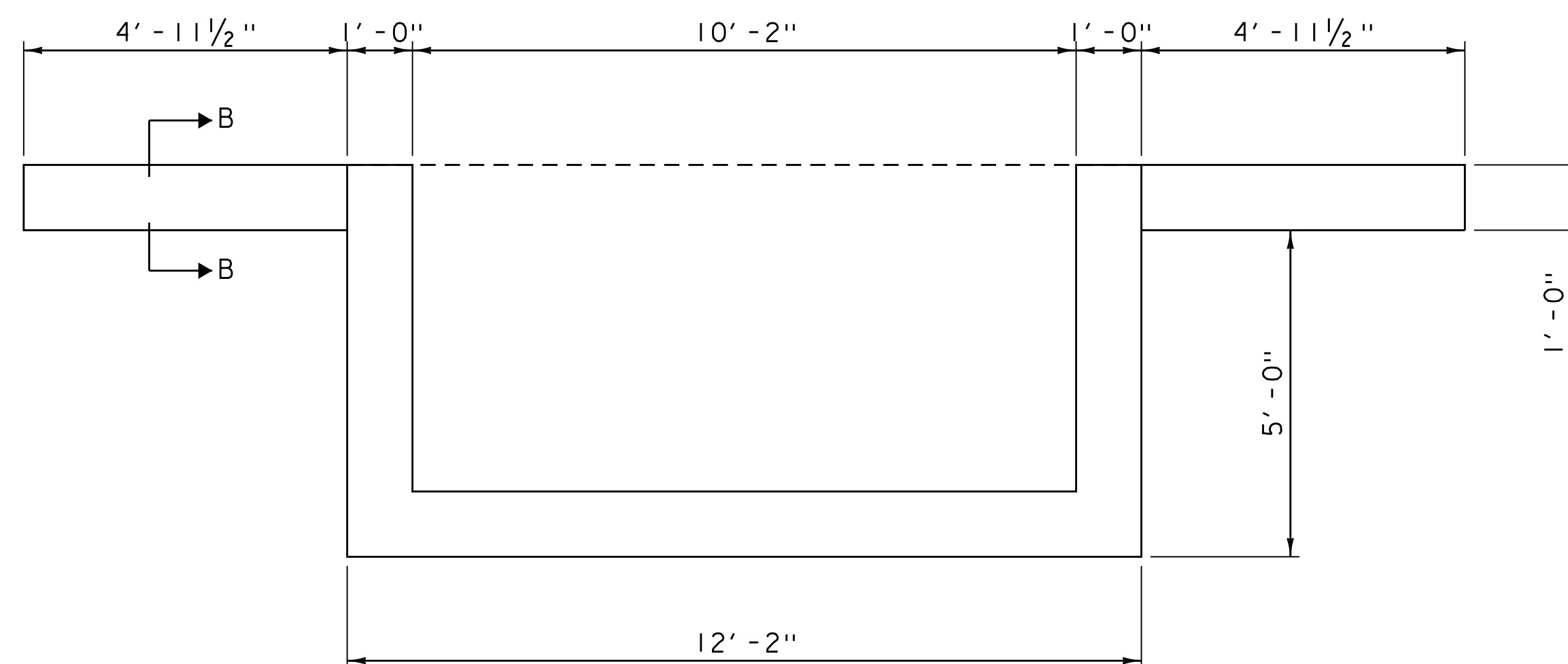
BRIDGE 45 ABUTMENT 2 BACKWALL ELEVATION  
SCALE: 1/2" = 1' - 0"



BRIDGE 45 ABUTMENT 2 BACKWALL TYPICAL SECTION  
SCALE: 1/2" = 1' - 0"



SECTION B-B  
SCALE: 1/2" = 1' - 0"

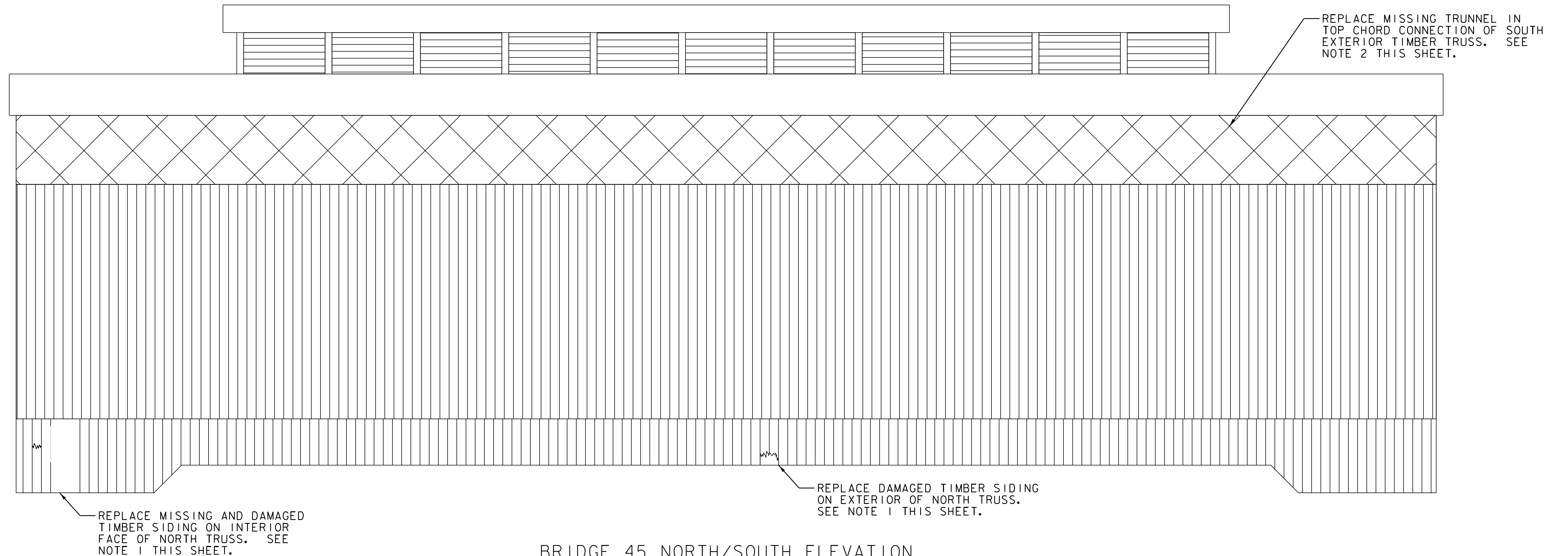


BRIDGE 45 ABUTMENT 2 BACKWALL PLAN VIEW  
SCALE: 1/2" = 1' - 0"



PROJECT NAME:	SWANTON - ST. JOHNSBURY		
PROJECT NUMBER:	STP LVRT(I2)		
FILE NAME:	z20f238.structure.details.dgn	PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P. DETRICK	DRAWN BY:	N.A. TRUSLOW
DESIGNED BY:	J.D. KEENER	CHECKED BY:	J.D. KEENER
BRIDGE 45 DETAILS (SHEET 5 OF 6)		SHEET	34 OF 102



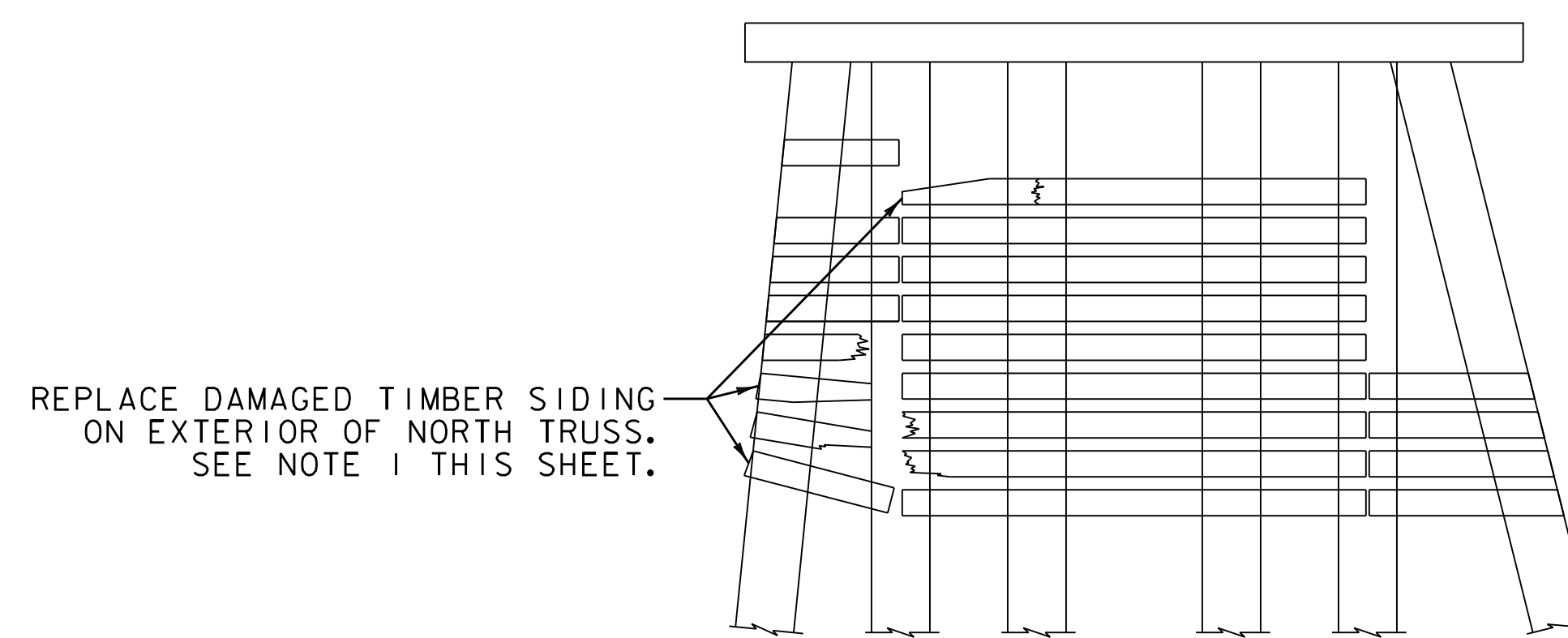


BRIDGE 45 NORTH/SOUTH ELEVATION

NOT TO SCALE

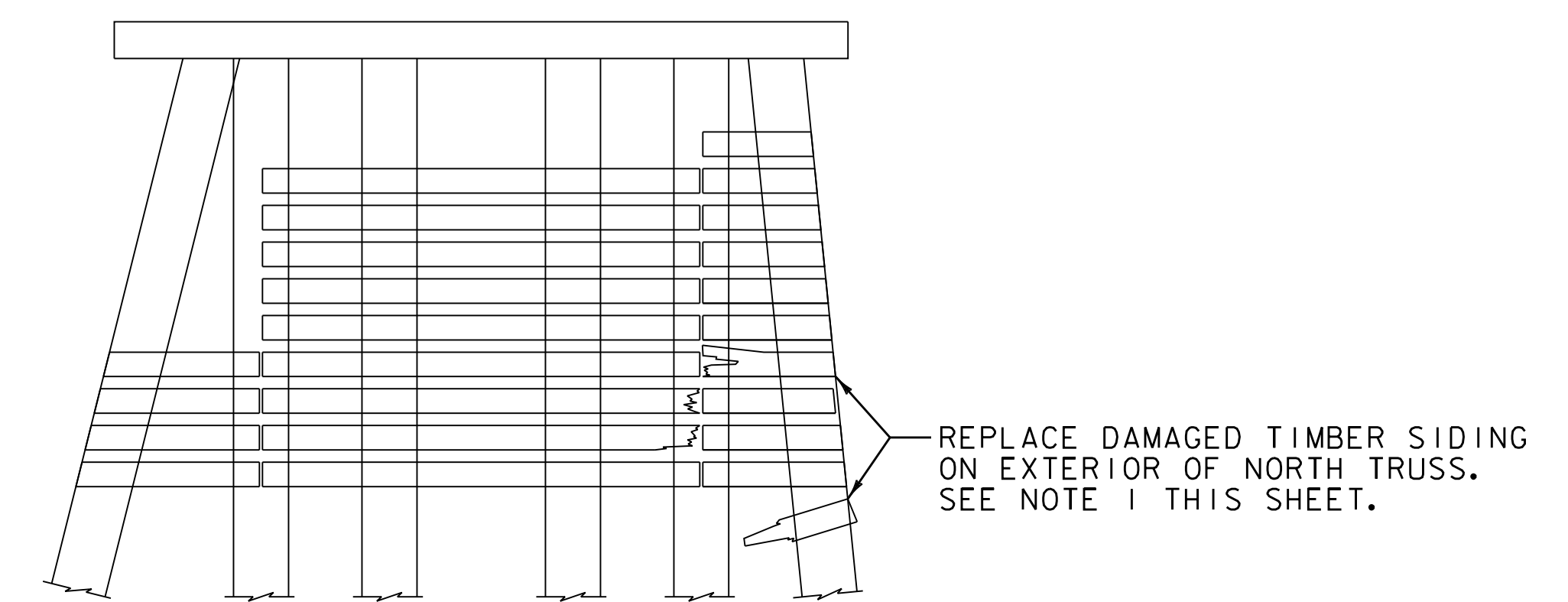
REPAIR NOTES:

1. SIDING ON EXTERIOR AND INTERIOR OF BRIDGE SHALL BE REMOVED AND REPLACED AS SHOWN HERE AND AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL MATCH THE EXISTING SIDING DIMENSIONS USING ROUGH CUT HEMLOCK. THE HEMLOCK WILL BE UNTREATED. REMOVAL AND REPLACEMENT OF SIDING WILL BE PAID FOR UNDER ITEM 522.30, "NONSTRUCTURAL LUMBER AND TIMBER, UNTREATED"
2. A MISSING TRUNNEL HAS BEEN IDENTIFIED ON THE TOP CHORD OF THE SOUTH EXTERIOR TRUSS SUPPORTING THE COVERED BRIDGE IN THE APPROXIMATE LOCATION SHOWN. THE MISSING TRUNNEL IS APPROXIMATELY 10" LONG X 2" DIA. THE CONTRACTOR SHALL LOCATE AND REPLACE THE MISSING TRUNNEL WITH A TRUNNEL OF APPROPRIATE LENGTH DIAMETER AND SPECIES OF TIMBER. ALL COSTS ASSOCIATED WITH LOCATING, SIZING, SUPPLYING, AND INSTALLING REPLACEMENT TRUNNEL SHALL BE PAID FOR UNDER ITEM 522.20, STRUCTURAL LUMBER AND TIMBER, UNTREATED.
3. DAMAGED TIMBER BRACING ATTACHED TO THE WOODEN PILES AT THE PIER SHALL BE REMOVED AND REPLACED. REMOVING AND REPLACING OF TIMBER BRACING WILL BE PAID FOR UNDER ITEM 522.25, "STRUCTURAL LUMBER AND TIMBER, TREATED".
4. LOCATIONS AND QUANTITIES OF REPAIRS TO THE COVERED BRIDGE TRUSSES AND PIERS ARE BASED UPON LIMITED FIELD INVESTIGATION. ACTUAL QUANTITIES AND AREAS TO BE REPAIRED SHALL BE DETERMINED BY THE CONTRACTOR AND AGREED UPON BY THE ENGINEER.
5. A FIRE RETARDANT COATING SHALL BE APPLIED TO ALL EXPOSED FACES OF TIMBER MEMBERS AND SIDING OF THE COVERED BRIDGE STRUCTURE. FIRE RETARDANT SHALL BE APPLIED PER THE PROJECT SPECIAL PROVISIONS AND SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (TIMBER COATING, FIRE RETARDANT)".
6. PER THE PROJECT SPECIAL PROVISIONS THE CONTRACTOR SHALL PROVIDE APPROPRIATE MEASURES TO PROTECT THE PUBLIC, THE BRIDGE STRUCTURE, SUBSTRUCTURE, WORK AREA, RIVER, AND SURROUNDING ENVIRONMENT. ALL COSTS ASSOCIATED WITH PROVIDING AND IMPLEMENTING THIS PROTECTION SHALL BE PAID FOR UNDER ITEM 900.645 "SPECIAL PROVISION (TIMBER COATING, ENVIRONMENTAL PROTECTION)".



WEST ELEVATION OF PIER

NOT TO SCALE



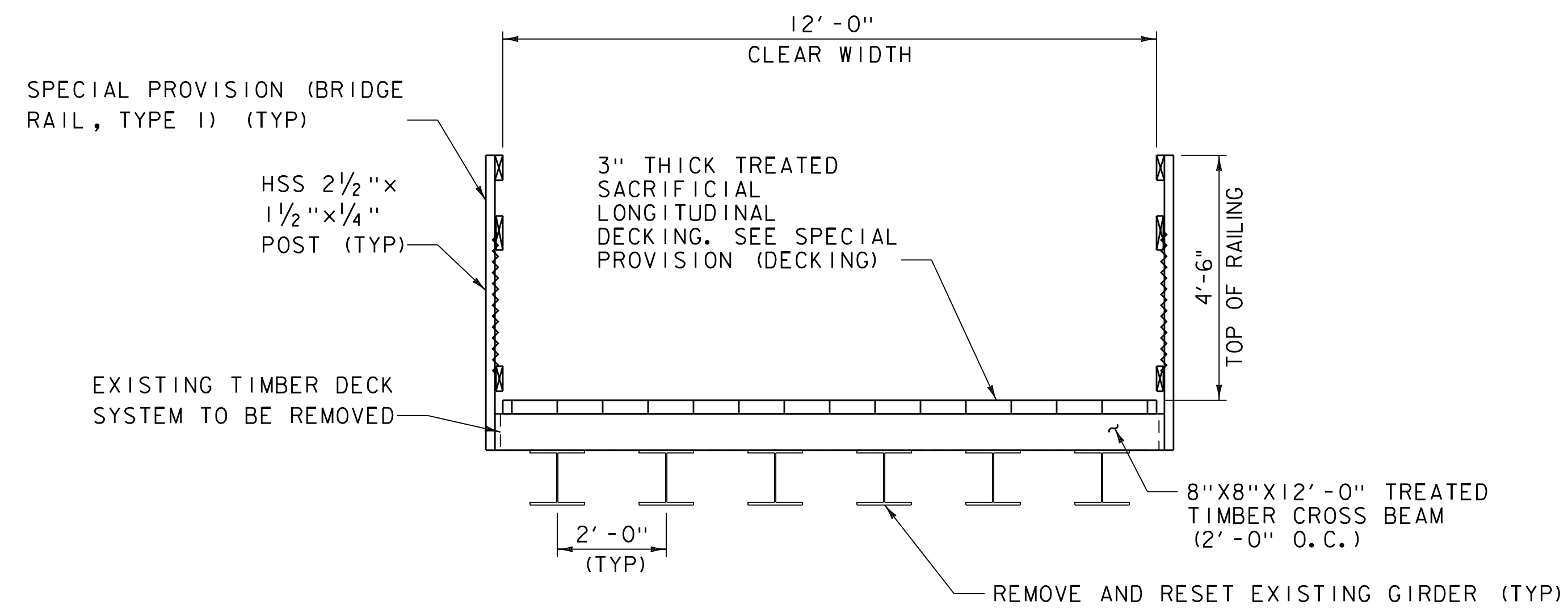
EAST ELEVATION OF PIER

NOT TO SCALE

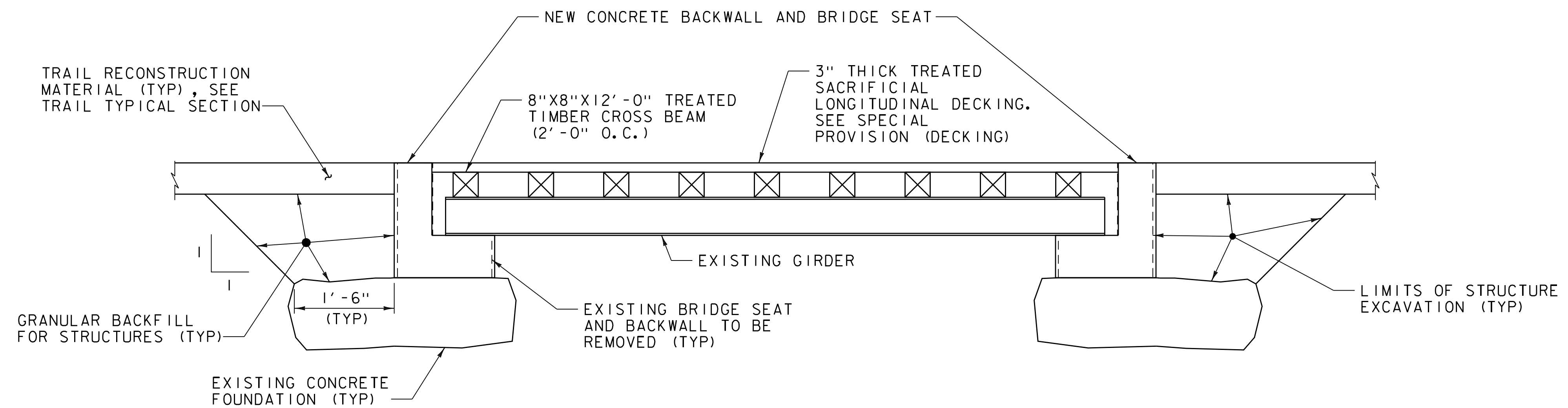


PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I2)	
FILE NAME: z20f238.structure.details.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: J.D. KEENER
DESIGNED BY: J.D. KEENER	CHECKED BY: M.E. OOMS
BRIDGE 45 DETAILS (SHEET 6 OF 6)	SHEET 35 OF 102





TYPICAL SECTION (BRIDGE 46)  
SCALE: 1/2" = 1' - 0"



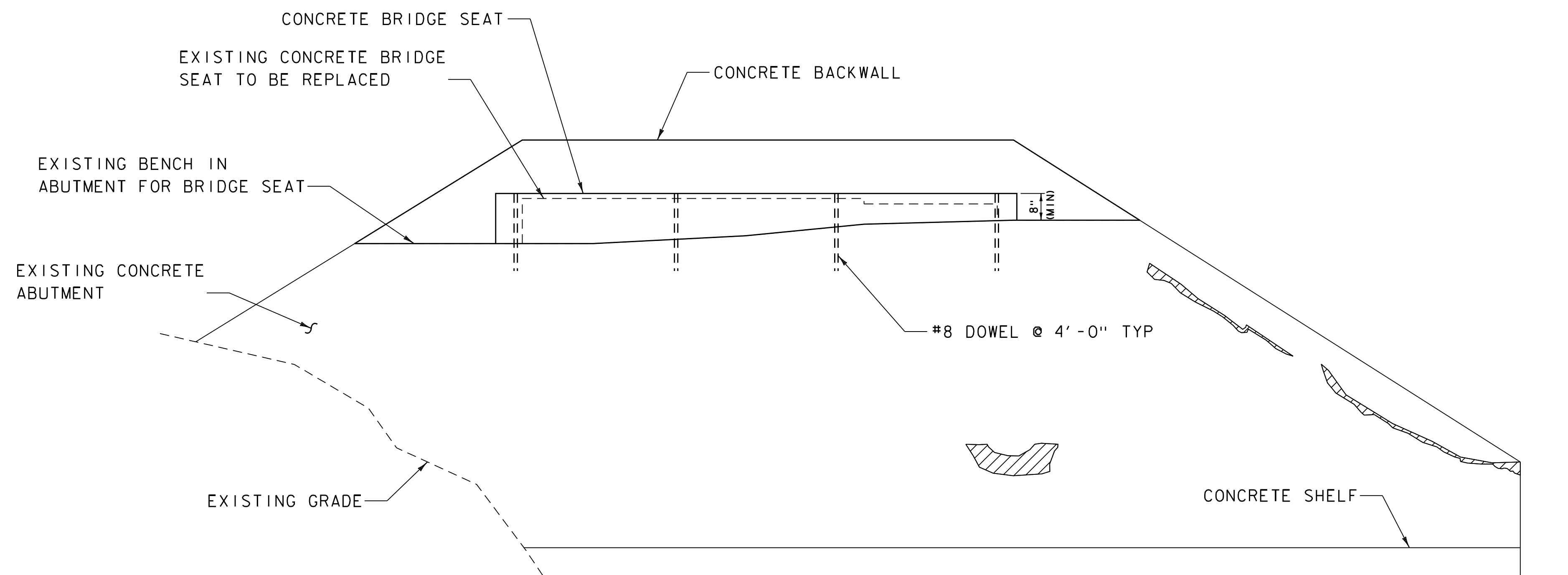
ELEVATION VIEW (BRIDGE 46)  
NOT TO SCALE

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

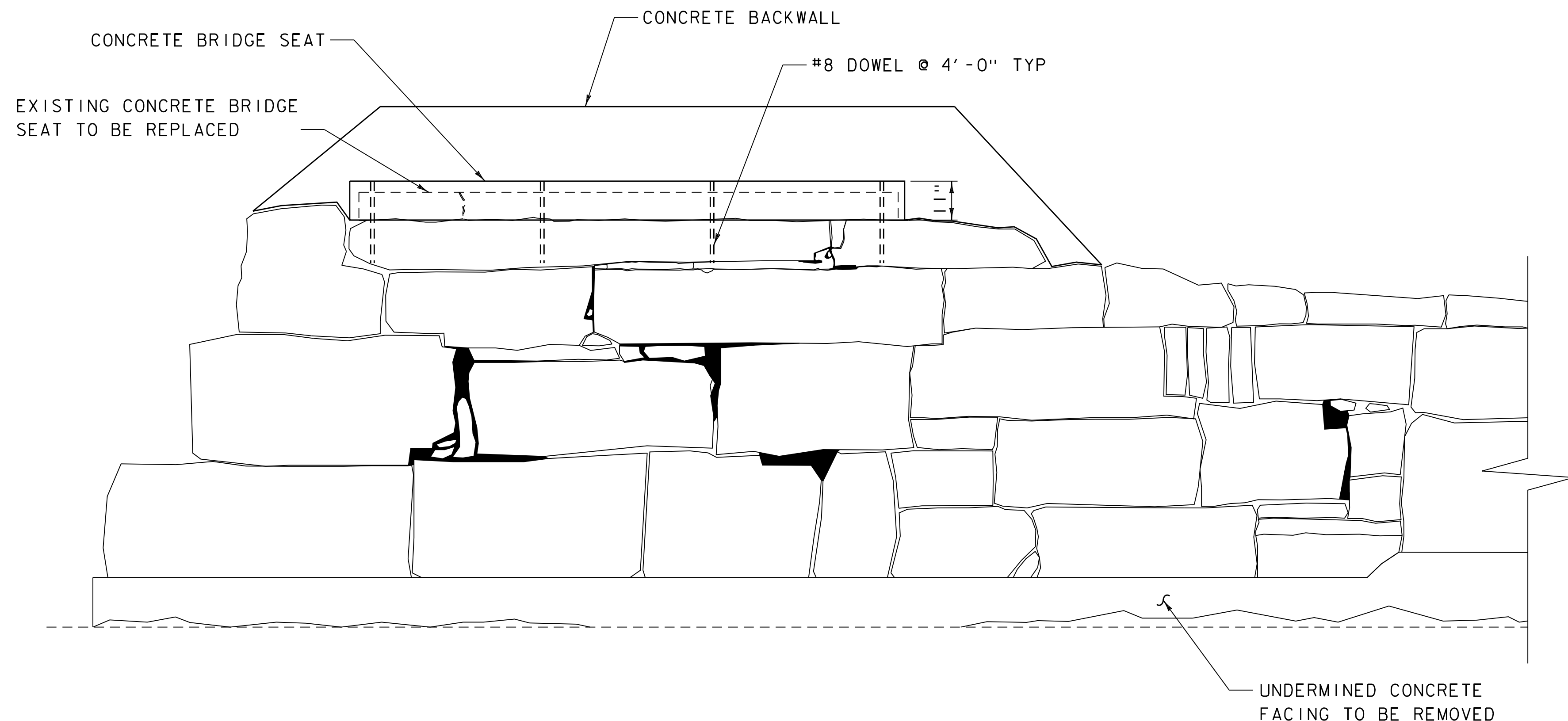
FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: N.A. TRUSLOW  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
BRIDGE 46 TYPICAL SECTIONS SHEET 36 OF 102



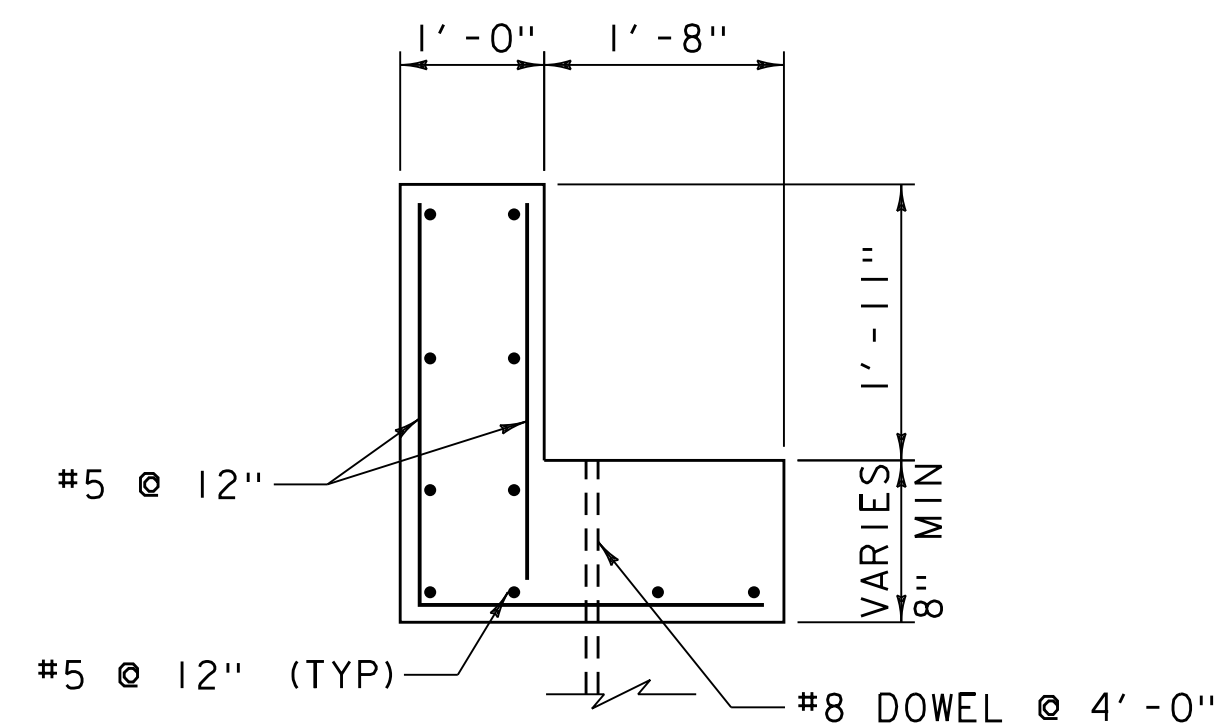




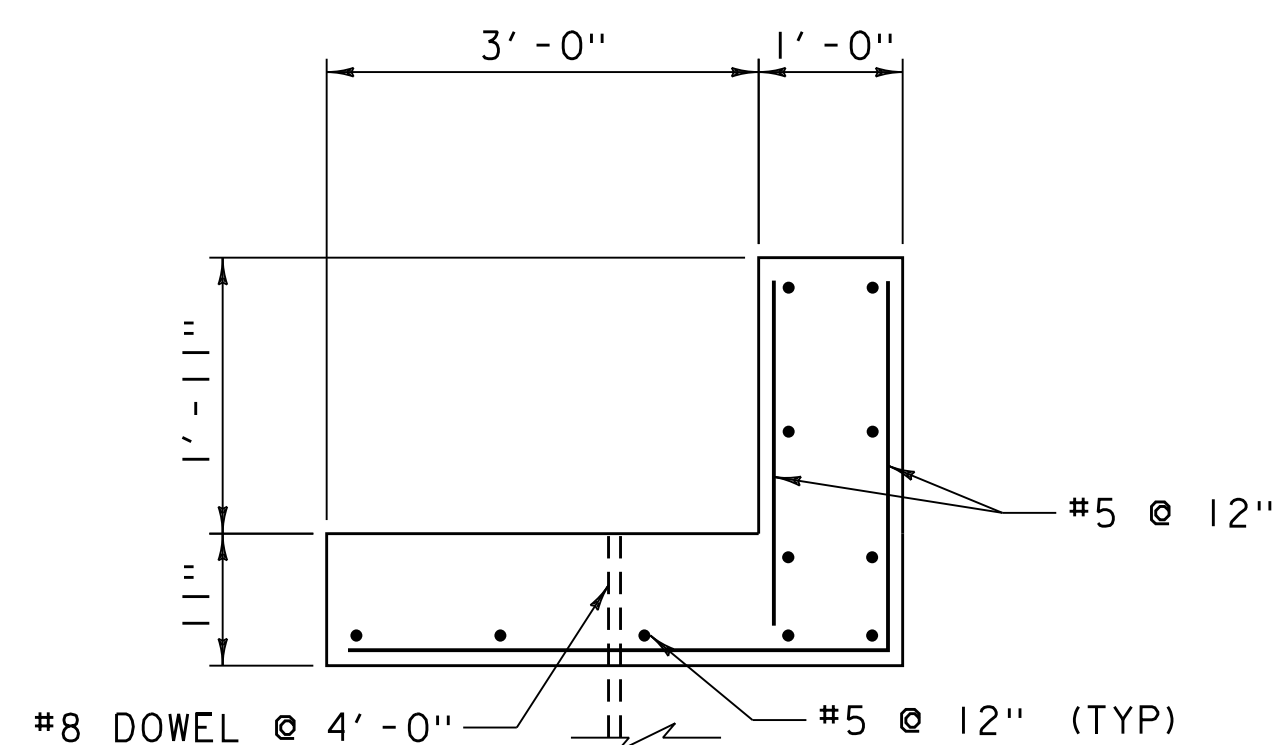
ELEVATION VIEW (BRIDGE 46 EAST ABUTMENT)  
NOT TO SCALE



ELEVATION VIEW (BRIDGE 46 WEST ABUTMENT)  
NOT TO SCALE



EAST BACKWALL SECTION  
SCALE:  $\frac{3}{4}$ " = 1'-0"



WEST BACKWALL SECTION  
SCALE:  $\frac{3}{4}$ " = 1'-0"

LEGEND:

- APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED
- APPROXIMATE LOCATIONS OF CONCRETE REPAIRS

NOTES:

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF THE EAST ABUTMENT WILL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS IN THE ABUTMENTS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".
3. VOIDS AT WEST ABUTMENT BELOW THE CONCRETE FACING WILL BE FILLED WITH GROUT BAGS. GROUT BAGS WILL BE PAID FOR UNDER ITEM 900.608, "SPECIAL PROVISION (GROUT BAG)".
4. PAYMENT FOR SUBSTRUCTURE CONCRETE REPAIR, INCLUDING REPAIR MATERIALS, WILL BE MADE UNDER ITEM 580.13, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS 1" AND ITEM 580.14, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS 11" AS APPROPRIATE.
5. DIMENSIONS SHOWN FOR BRIDGE SEAT AND BACKWALL ARE APPROXIMATE BASED ON FIELD MEASUREMENTS. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS BEFORE PROCURING MATERIAL.

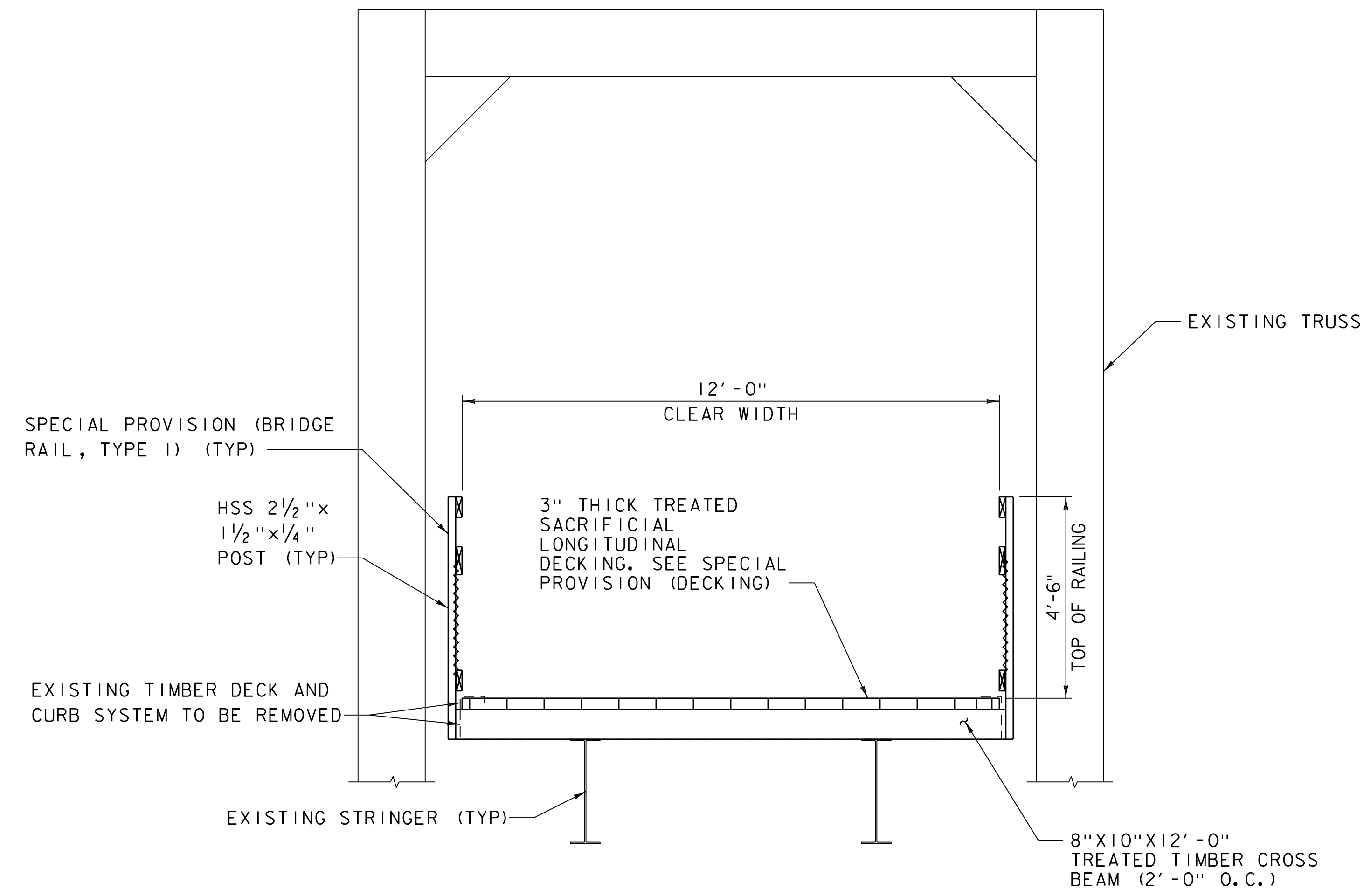


PROJECT NAME: SWANTON - ST. JOHNSBURY

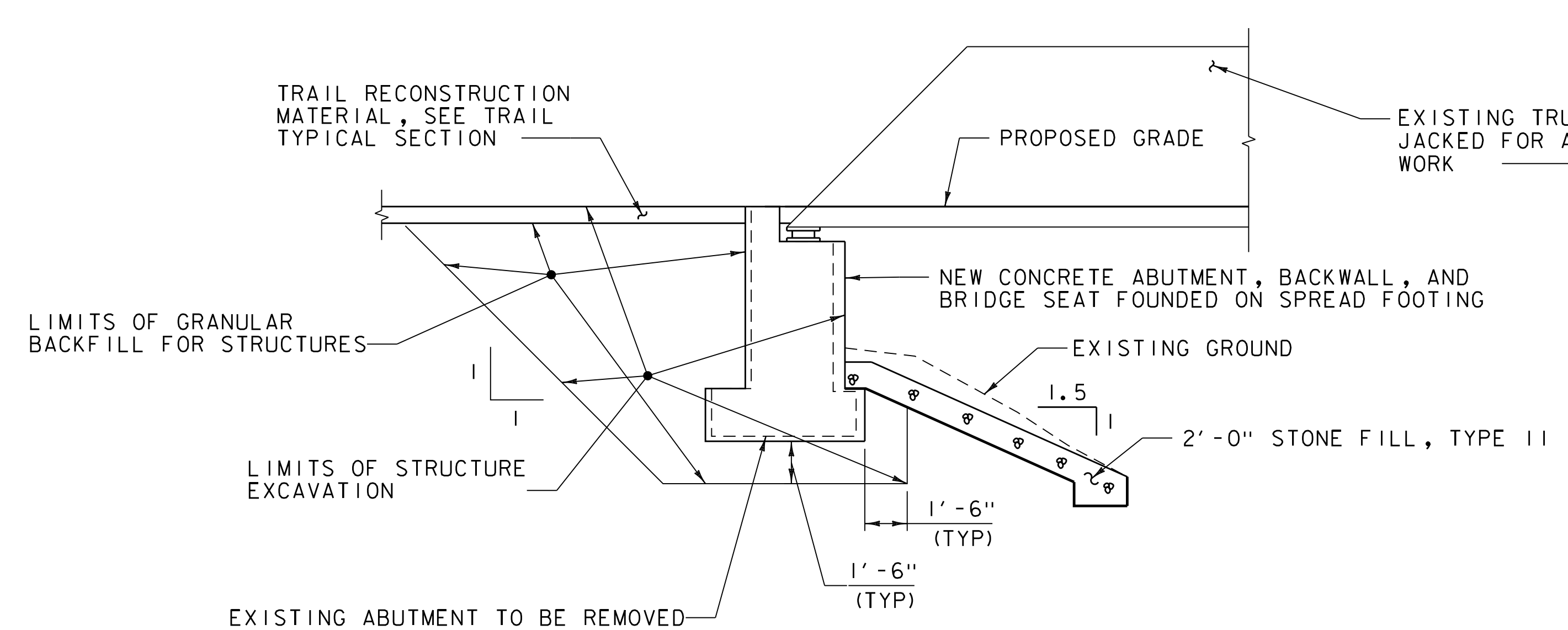
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021  
 PROJECT LEADER: E.P. DETRICK DRAWN BY: N.A. TRUSLOW  
 DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
 BRIDGE 46 ABUTMENT ELEVATIONS SHEET 37 OF 102

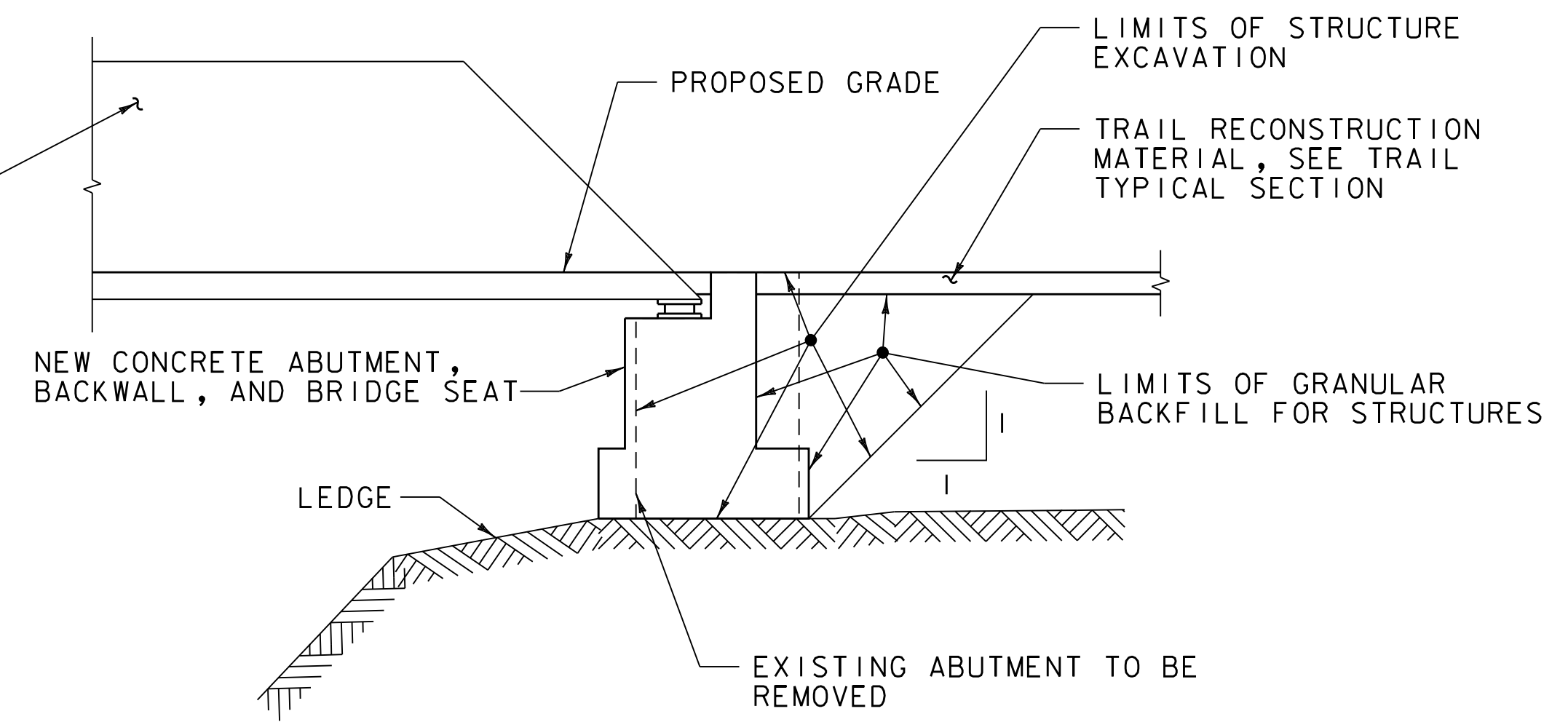




TYPICAL SECTION (BRIDGE 47)  
SCALE: 1/2" = 1' - 0"



EAST ABUTMENT SECTION  
NOT TO SCALE

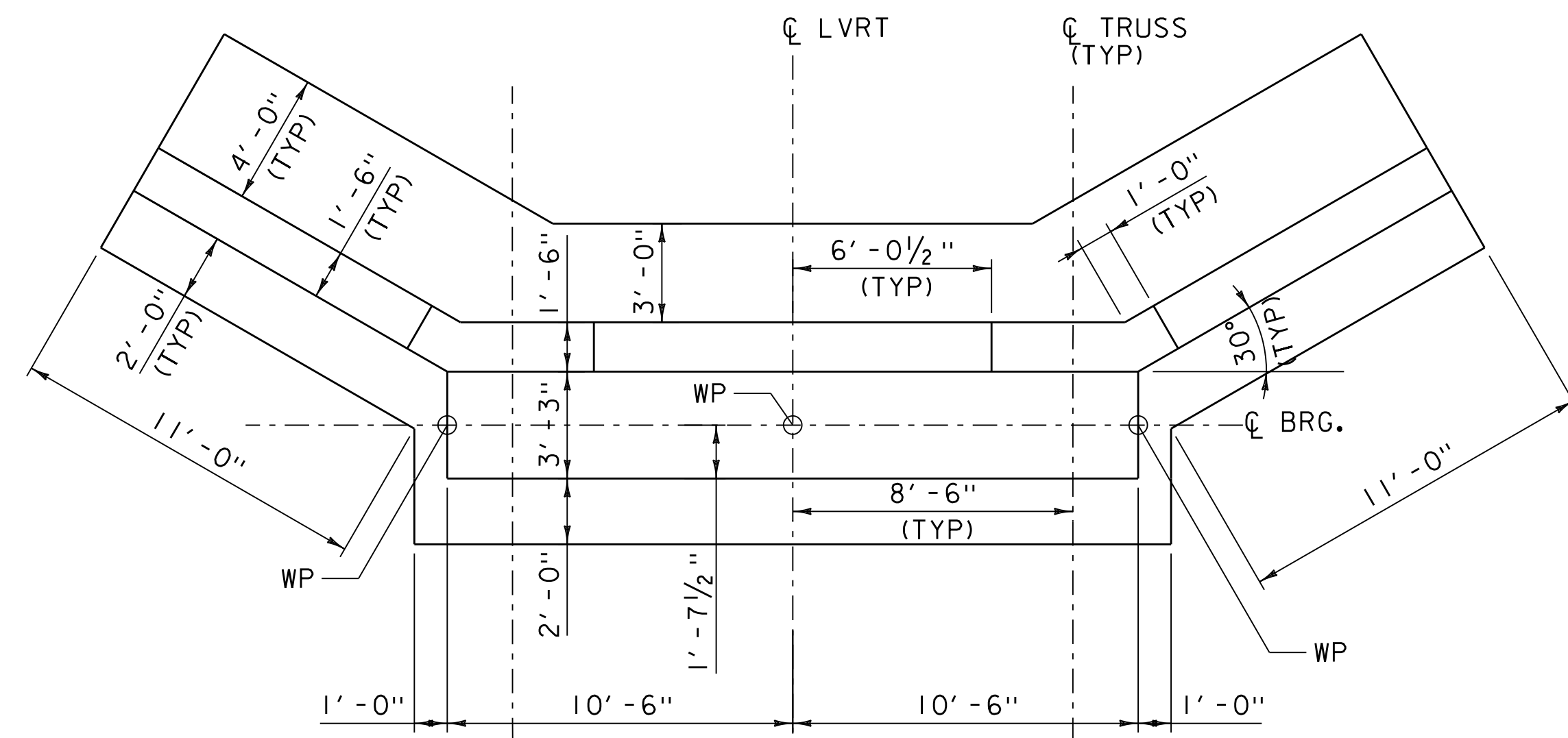


WEST ABUTMENT SECTION  
NOT TO SCALE

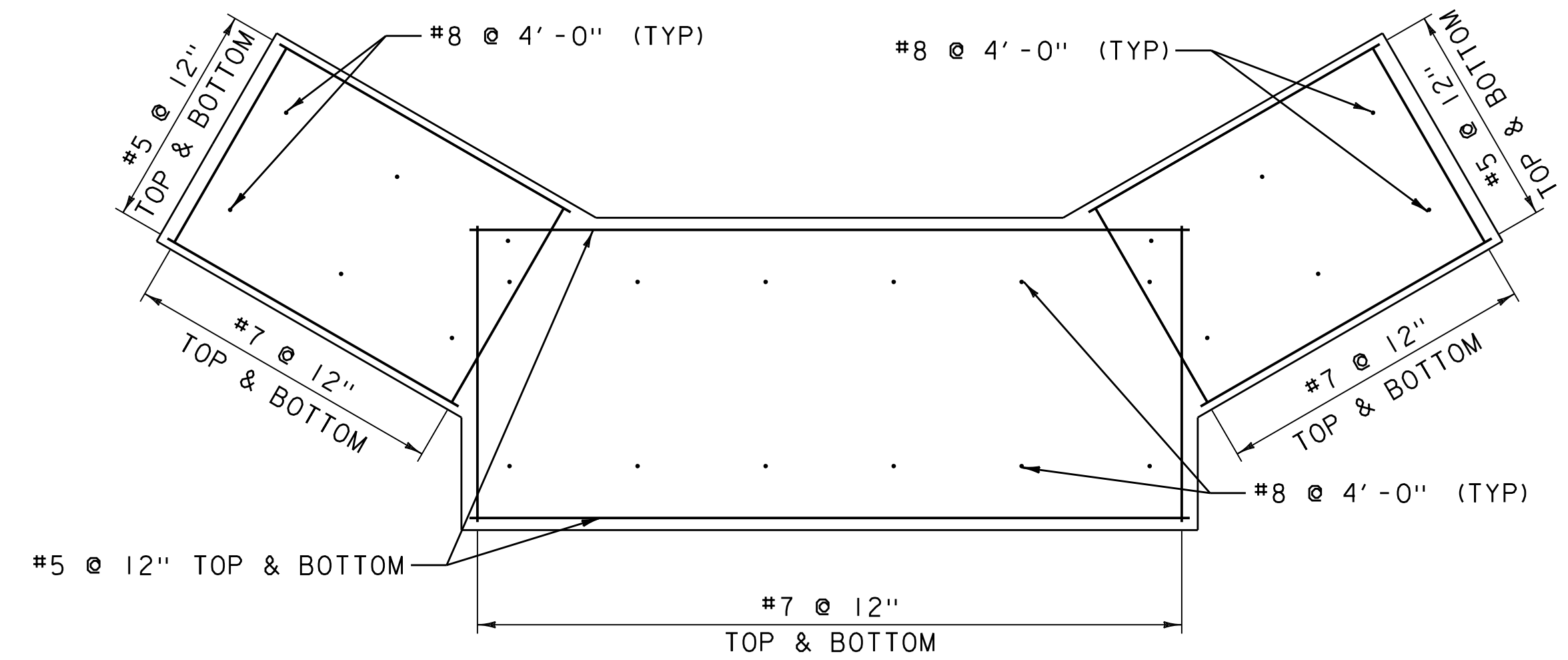


PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I2)	
FILE NAME: z20f238.structure.details.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: N.A. TRUSLOW
DESIGNED BY: J.D. KEENER	CHECKED BY: J.D. KEENER
BRIDGE 47 TYPICAL SECTIONS	SHEET 38 OF 102

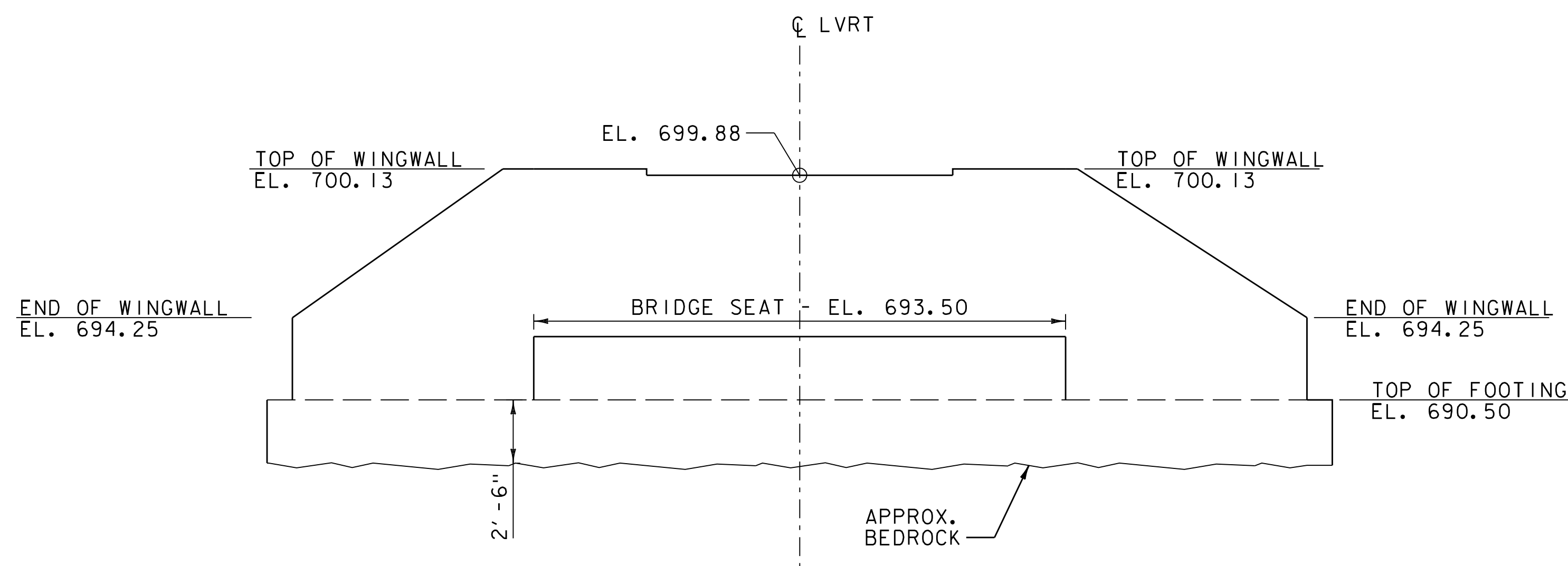




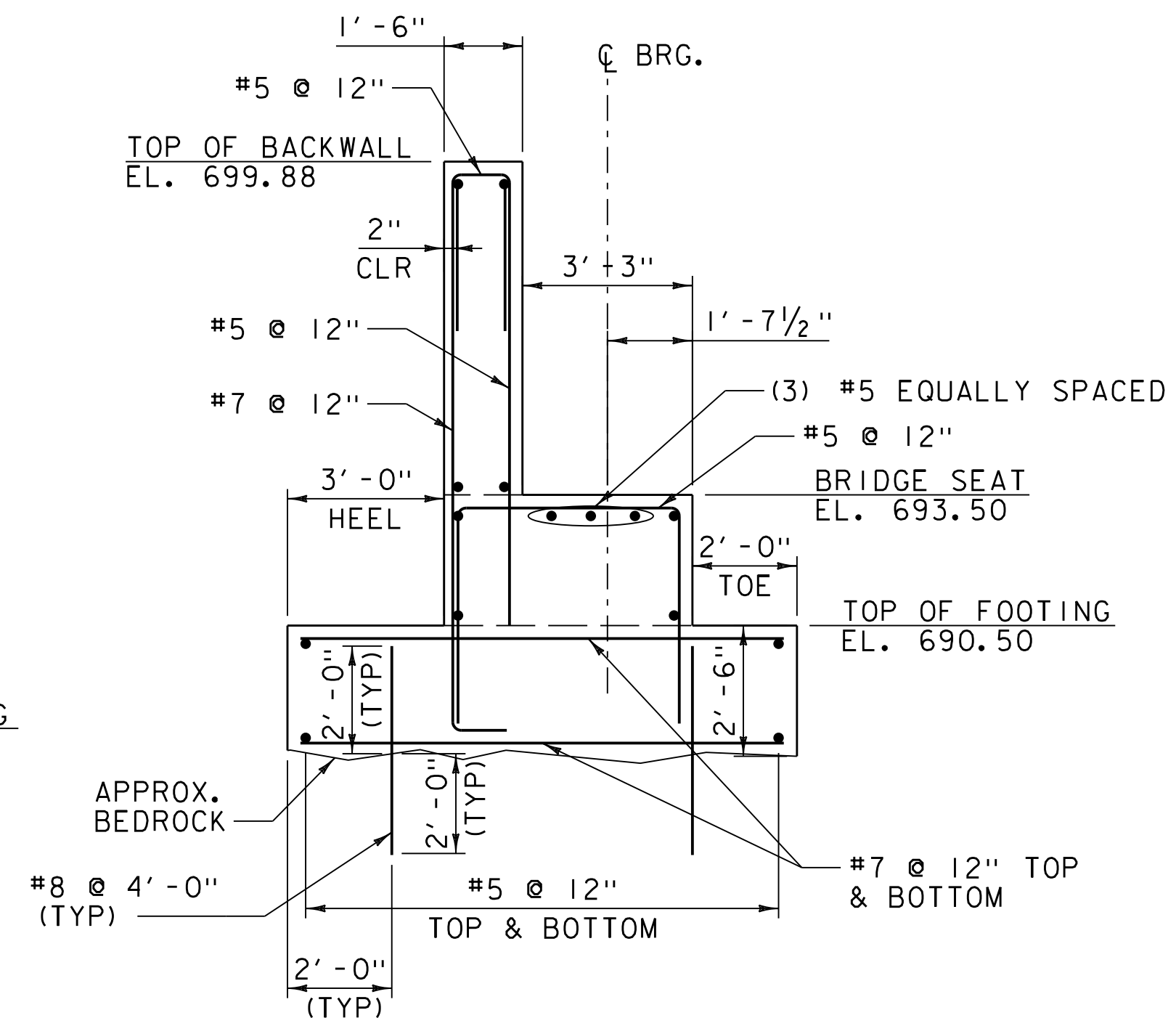
WEST ABUTMENT PLAN  
SCALE:  $\frac{1}{2}$ " = 1' - 0"



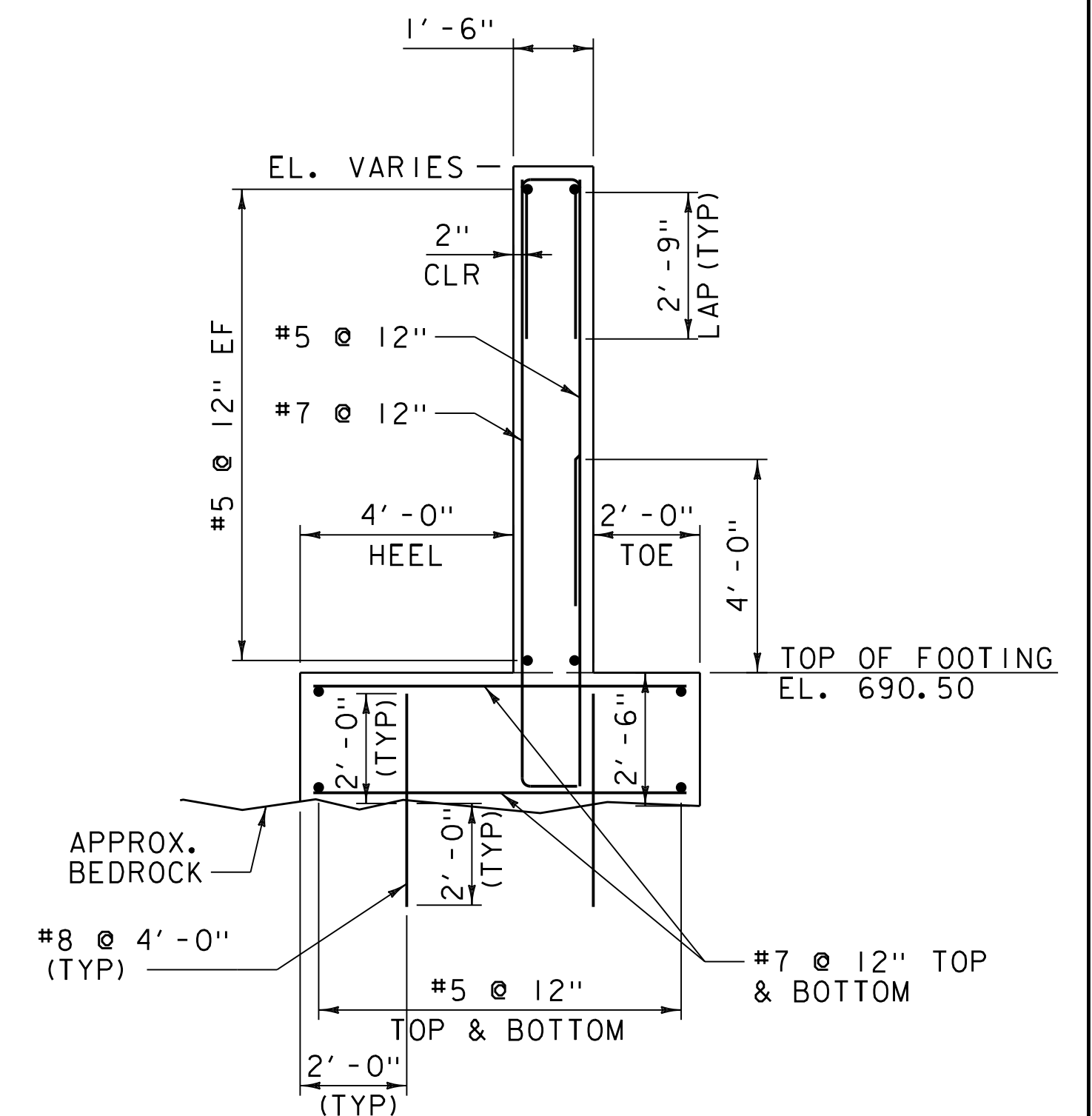
WEST ABUTMENT FOOTING REINFORCEMENT PLAN  
SCALE:  $\frac{1}{2}$ " = 1' - 0"



WEST ABUTMENT ELEVATION  
SCALE:  $\frac{1}{2}$ " = 1' - 0"



WEST ABUTMENT SECTION  
SCALE:  $\frac{3}{4}$ " = 1' - 0"  
NOTE: 3" CLR UNLESS NOTED OTHERWISE.

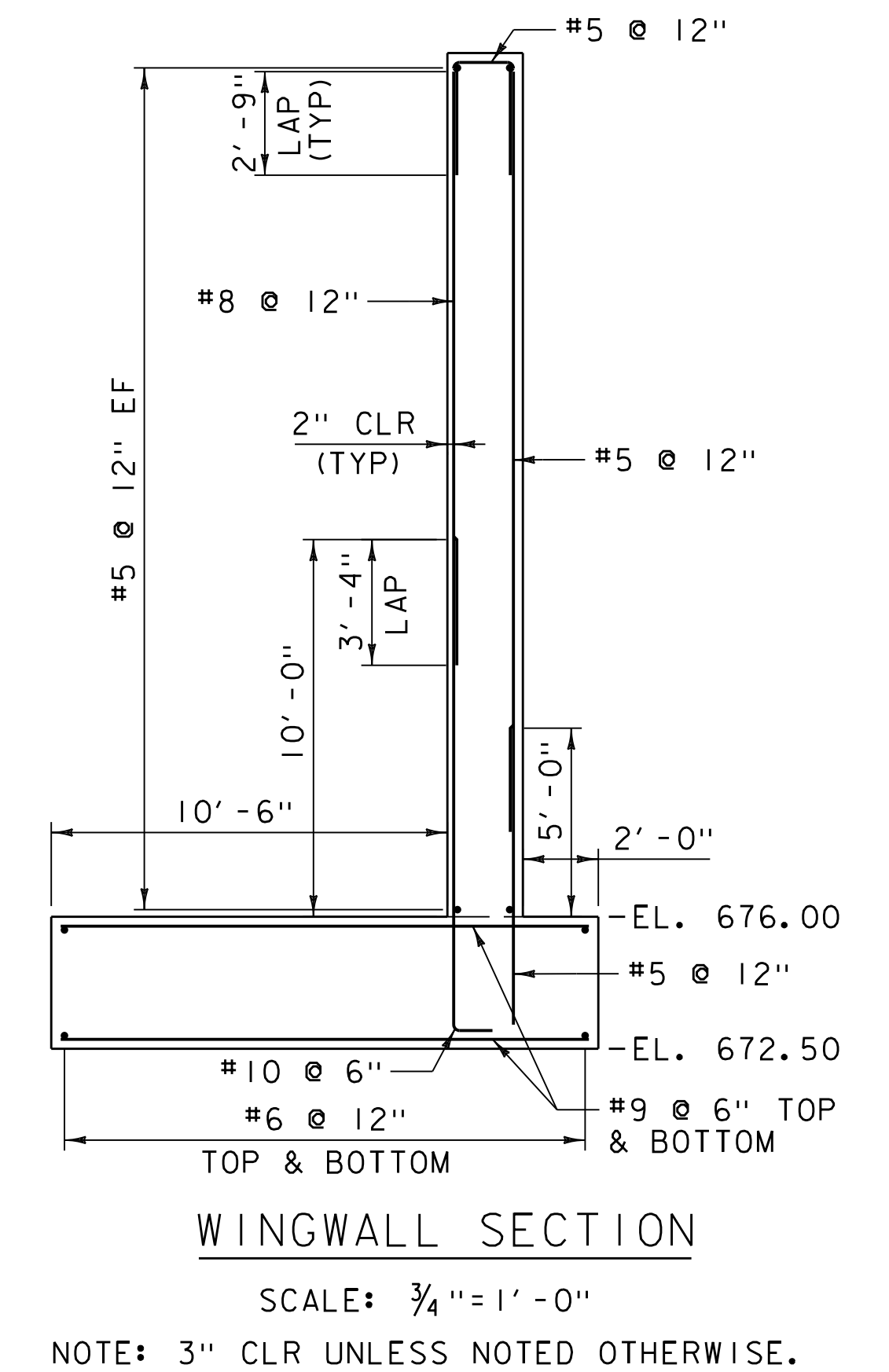
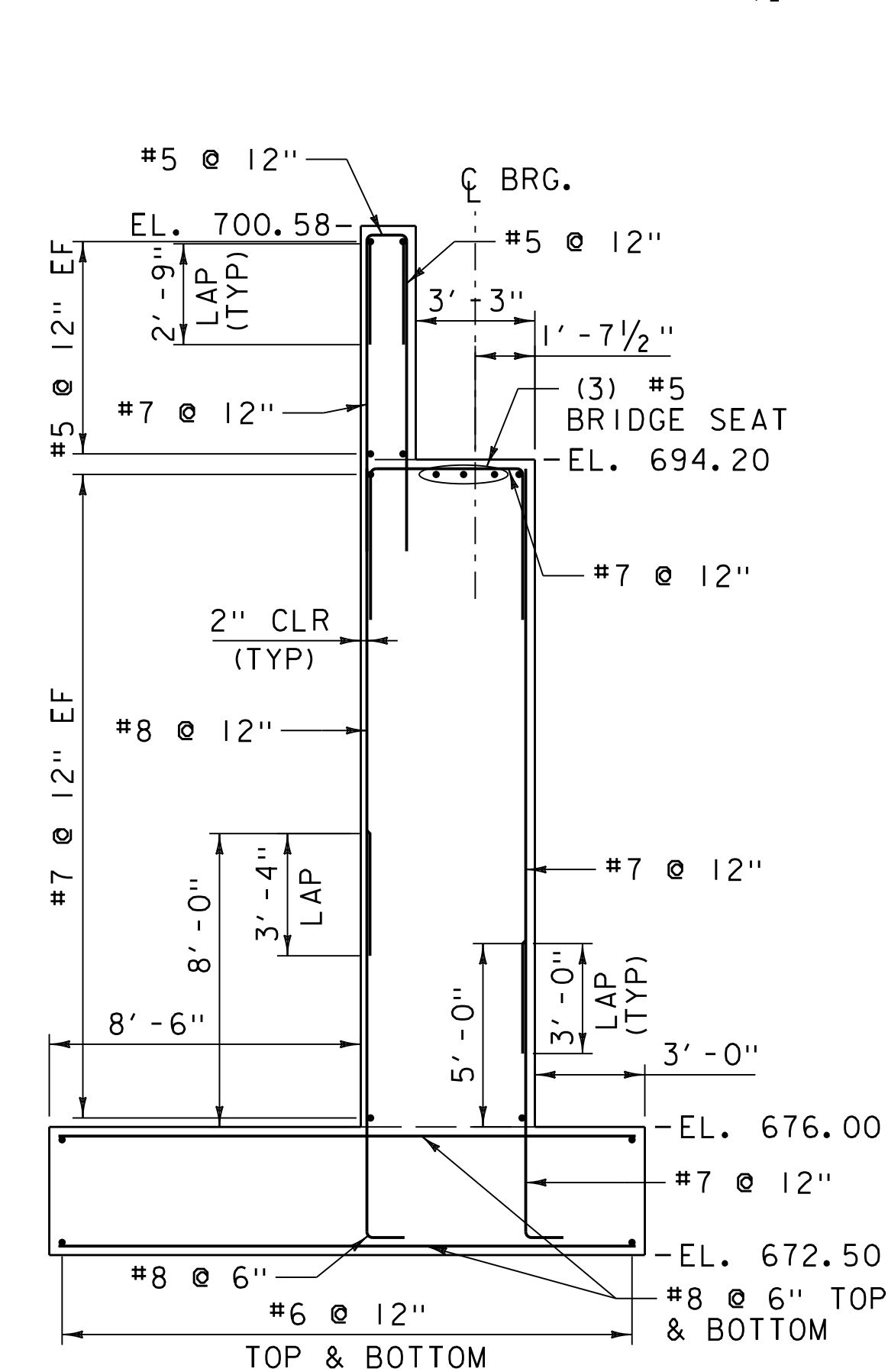
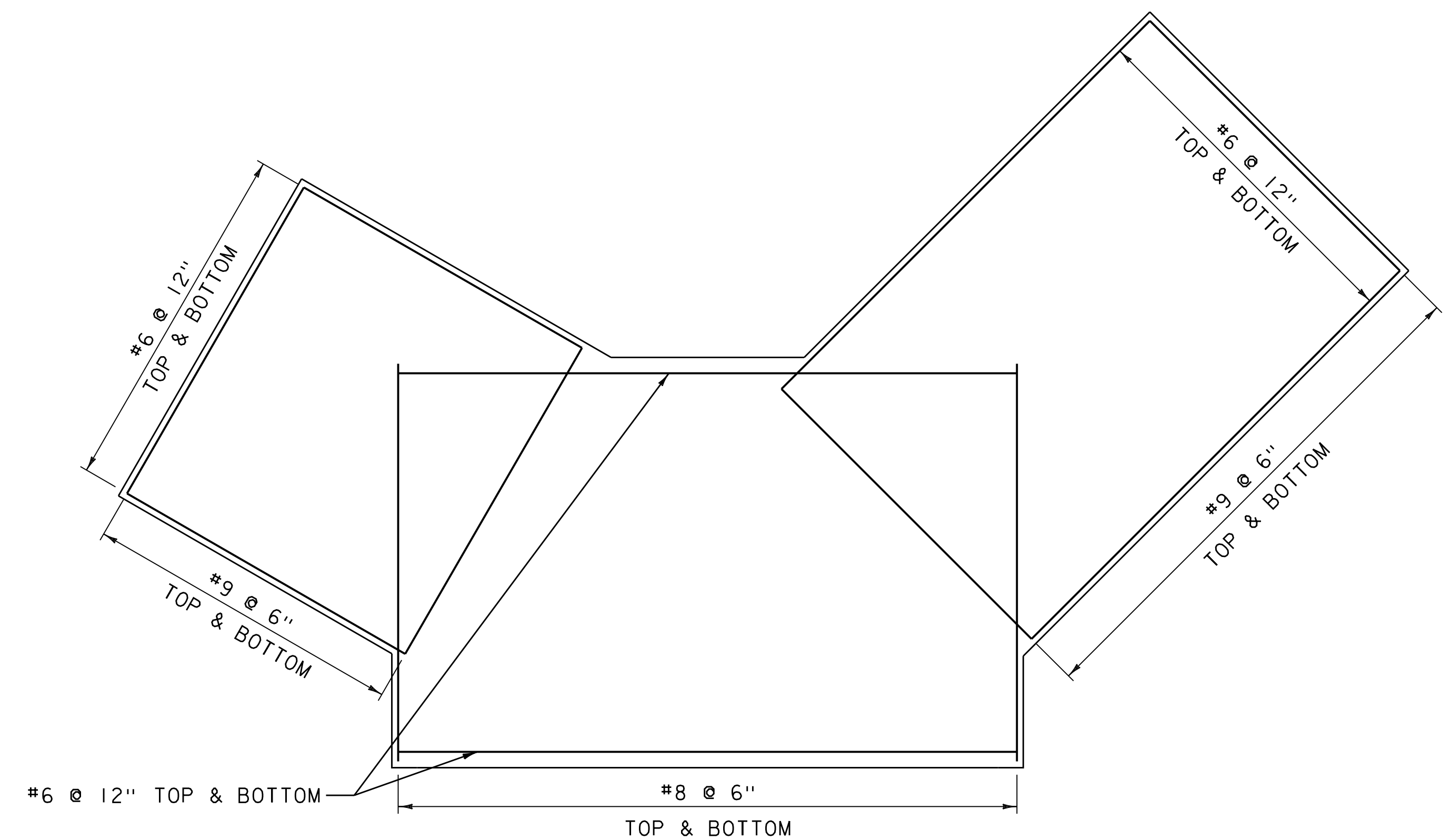
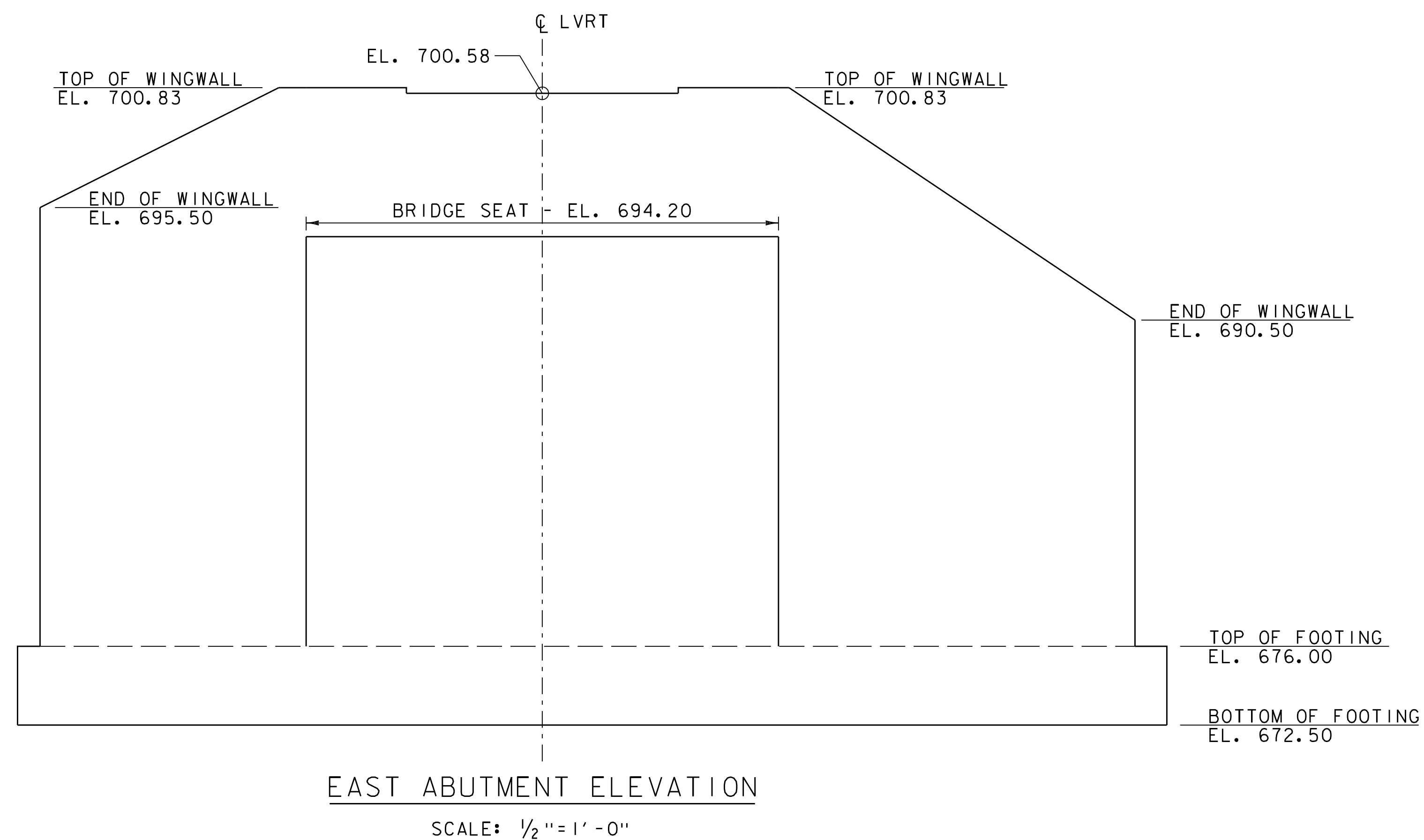
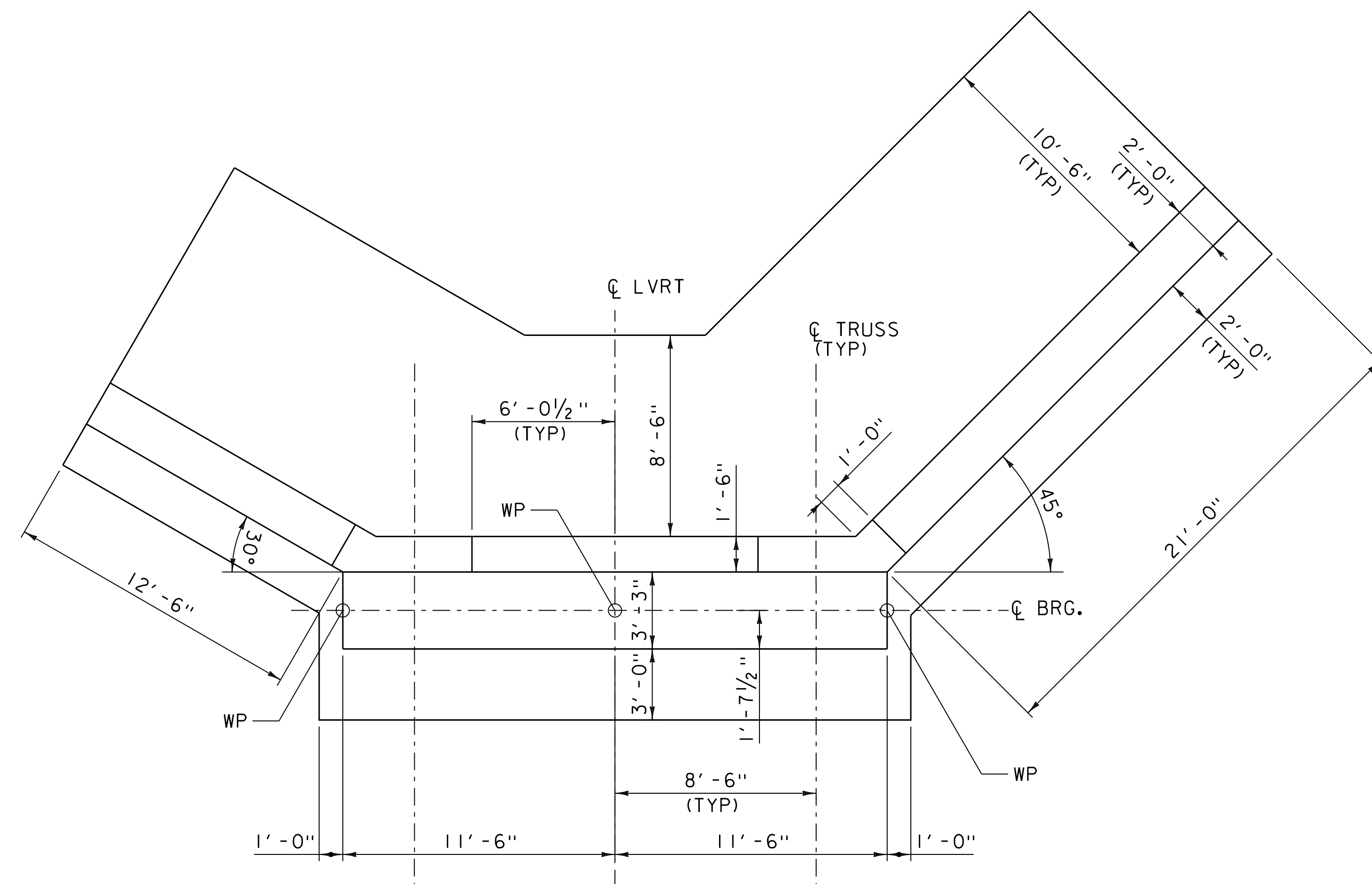


WINGWALL SECTION  
SCALE:  $\frac{3}{4}$ " = 1' - 0"  
NOTE: 3" CLR UNLESS NOTED OTHERWISE.

PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238_BR47_abut.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	J.D. KEENER
BRIDGE 47 WEST ABUTMENT	
PLOT DATE:	3/23/2021
DRAWN BY:	N.A. TRUSLOW
CHECKED BY:	J.D. KEENER
SHEET	39 OF 102







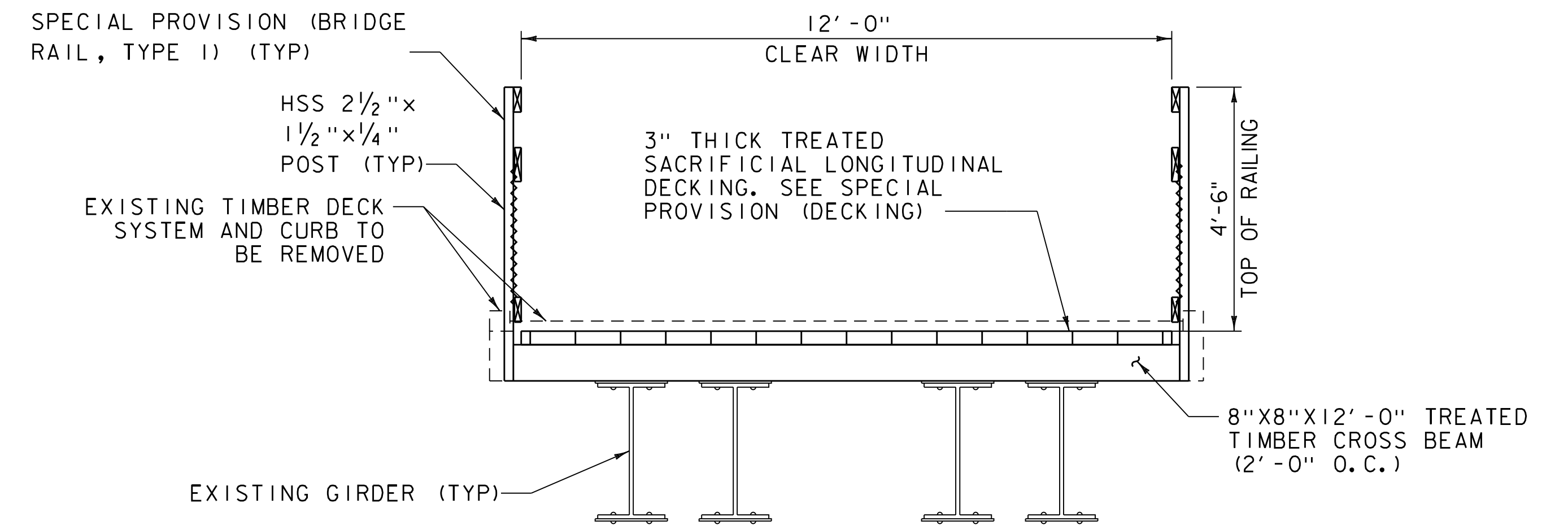
PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)

FILE NAME: z20f238_BR47_abut.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: J.D. KEENER  
BRIDGE 47 EAST ABUTMENT

PLOT DATE: 3/23/2021  
DRAWN BY: N.A. TRUSLOW  
CHECKED BY: J.D. KEENER  
SHEET 40 OF 102

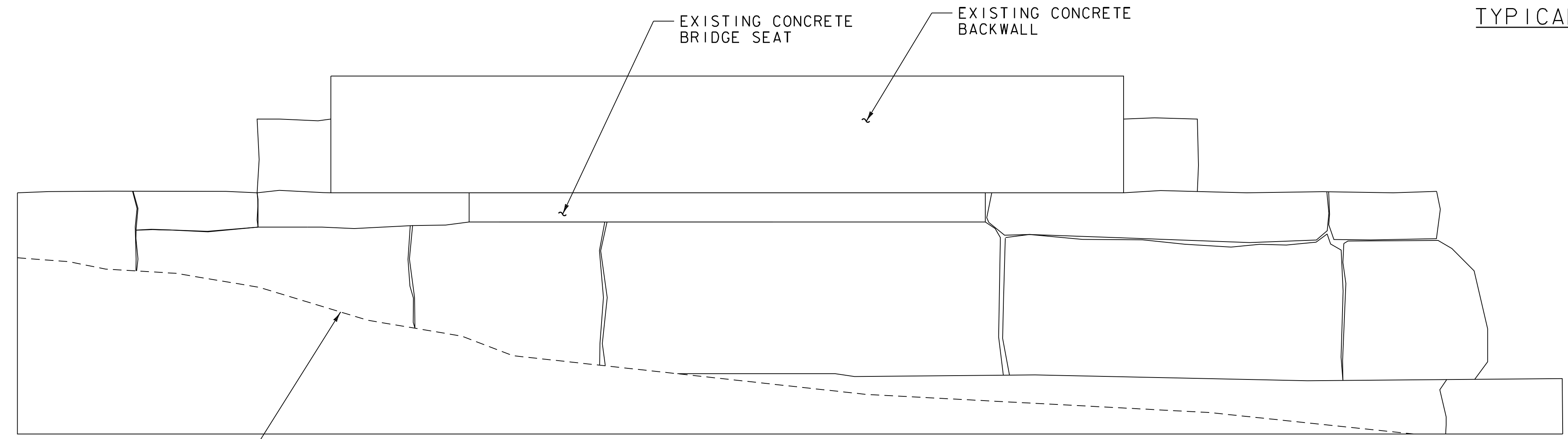






TYPICAL SECTION (BRIDGE 53)

SCALE: 1/2" = 1' - 0"

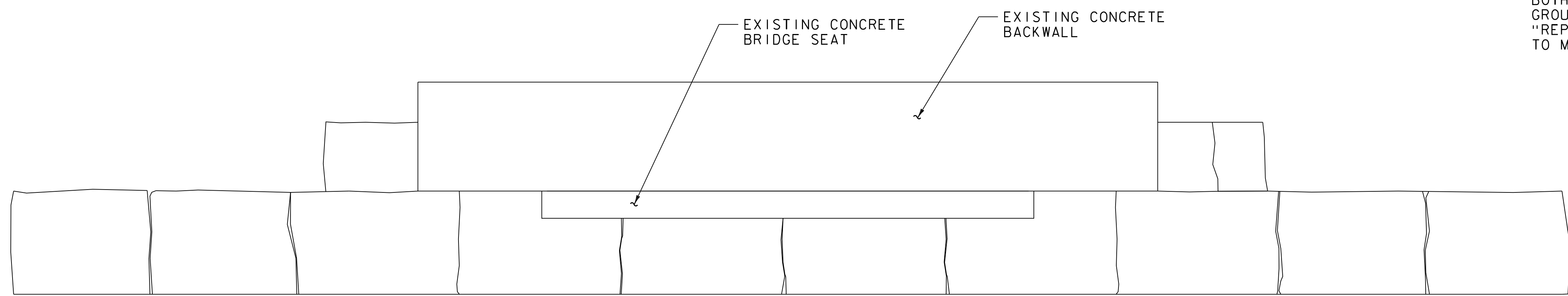


EXISTING ELEVATION VIEW (BRIDGE 53 WEST ABUTMENT)

NOT TO SCALE

NOTES:

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF BOTH EAST AND WEST ABUTMENTS WILL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.



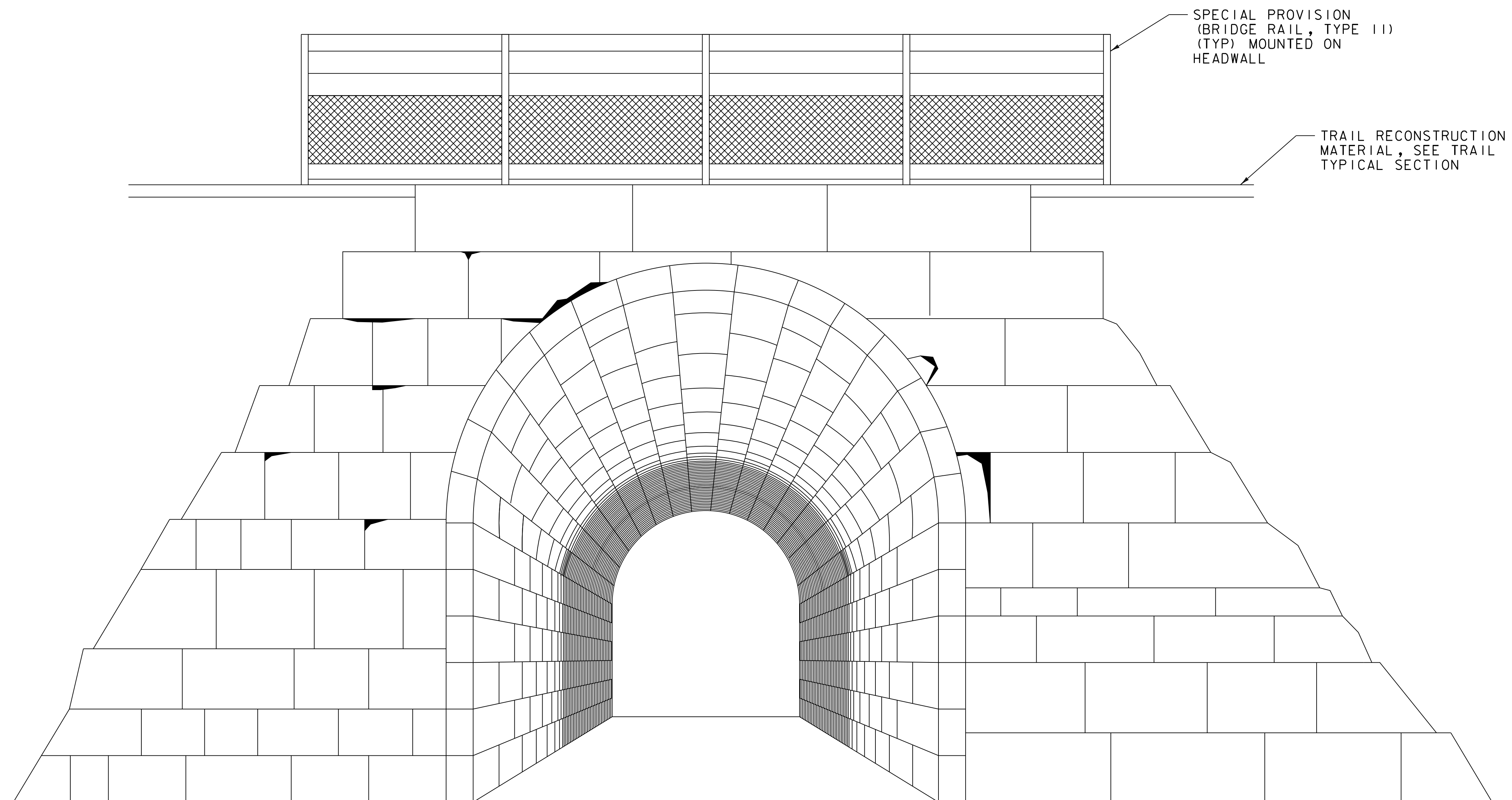
EXISTING ELEVATION VIEW (BRIDGE 53 EAST ABUTMENT)

NOT TO SCALE



PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238.structure.details.dgn
PLOT DATE:	3/23/2021
PROJECT LEADER:	E.P. DETRICK
DRAWN BY:	N.A. TRUSLOW
DESIGNED BY:	J.D. KEENER
CHECKED BY:	J.D. KEENER
BRIDGE 53 TYPICAL SECTION	SHEET 41 OF 102





EXISTING DOWNSTREAM ELEVATION VIEW (BRIDGE 54)

NOT TO SCALE

**LEGEND:**

 APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

**NOTES:**

1. ALL JOINT LINES ACROSS THE ENTIRE EXPOSED SURFACE OF THE BRIDGE ABUTMENTS AND WINGWALLS STONE SHALL BE REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30 "REPOINTING, MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS, INCLUDING VOIDS BETWEEN THE STONES AND BELOW THE BOTTOM COURSE OF STONES, SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40 "REPAIRING STONE MASONRY".



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.structure.details.dgn PLOT DATE: 3/23/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: N.A. TRUSLOW

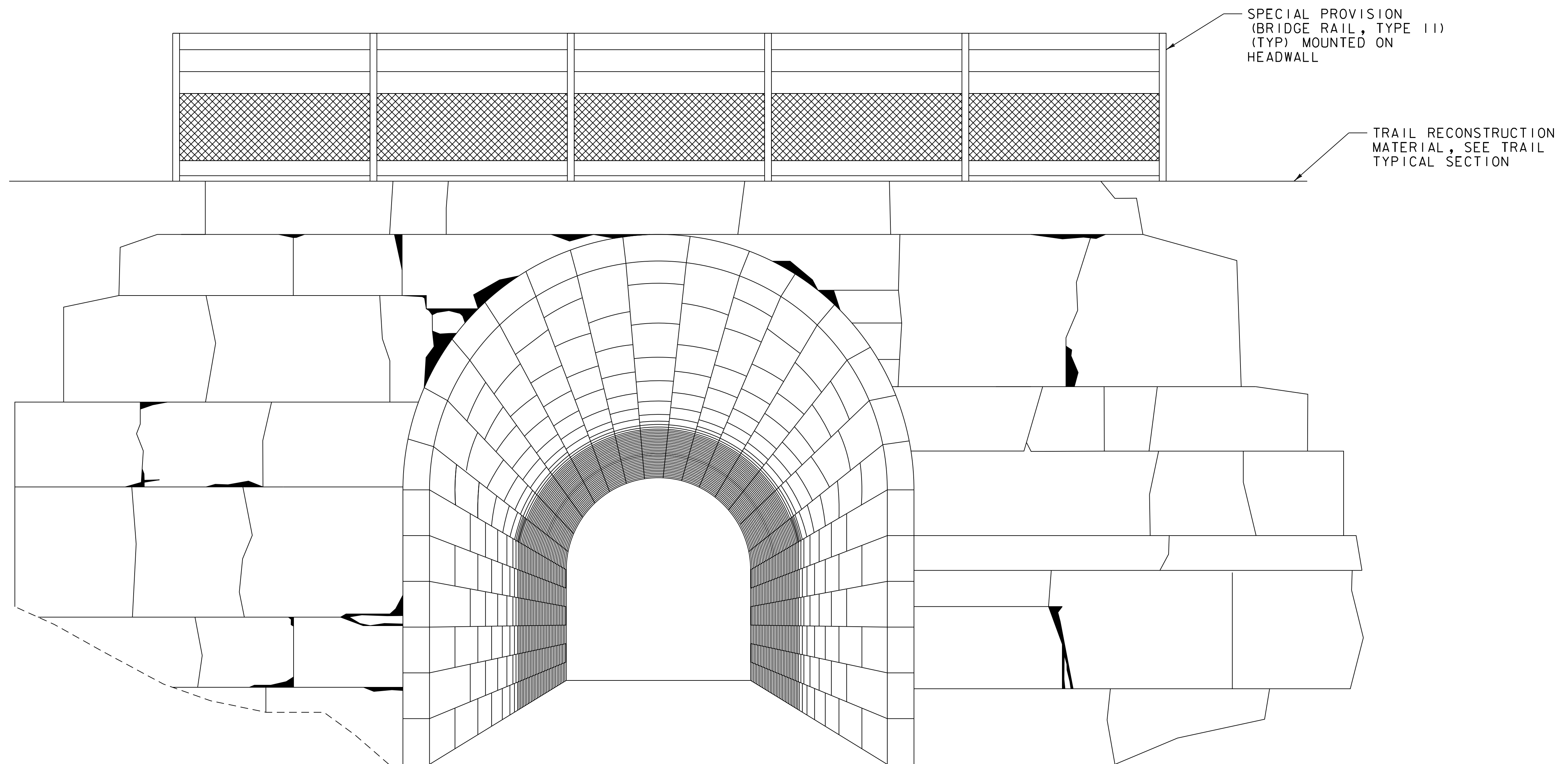
DESIGNED BY: J.D. KEENER

CHECKED BY: J.D. KEENER

BRIDGE 54 DOWNSTREAM ELEVATION

SHEET 42 OF 102





EXISTING UPSTREAM ELEVATION VIEW (BRIDGE 54)  
NOT TO SCALE

**LEGEND:**

 APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

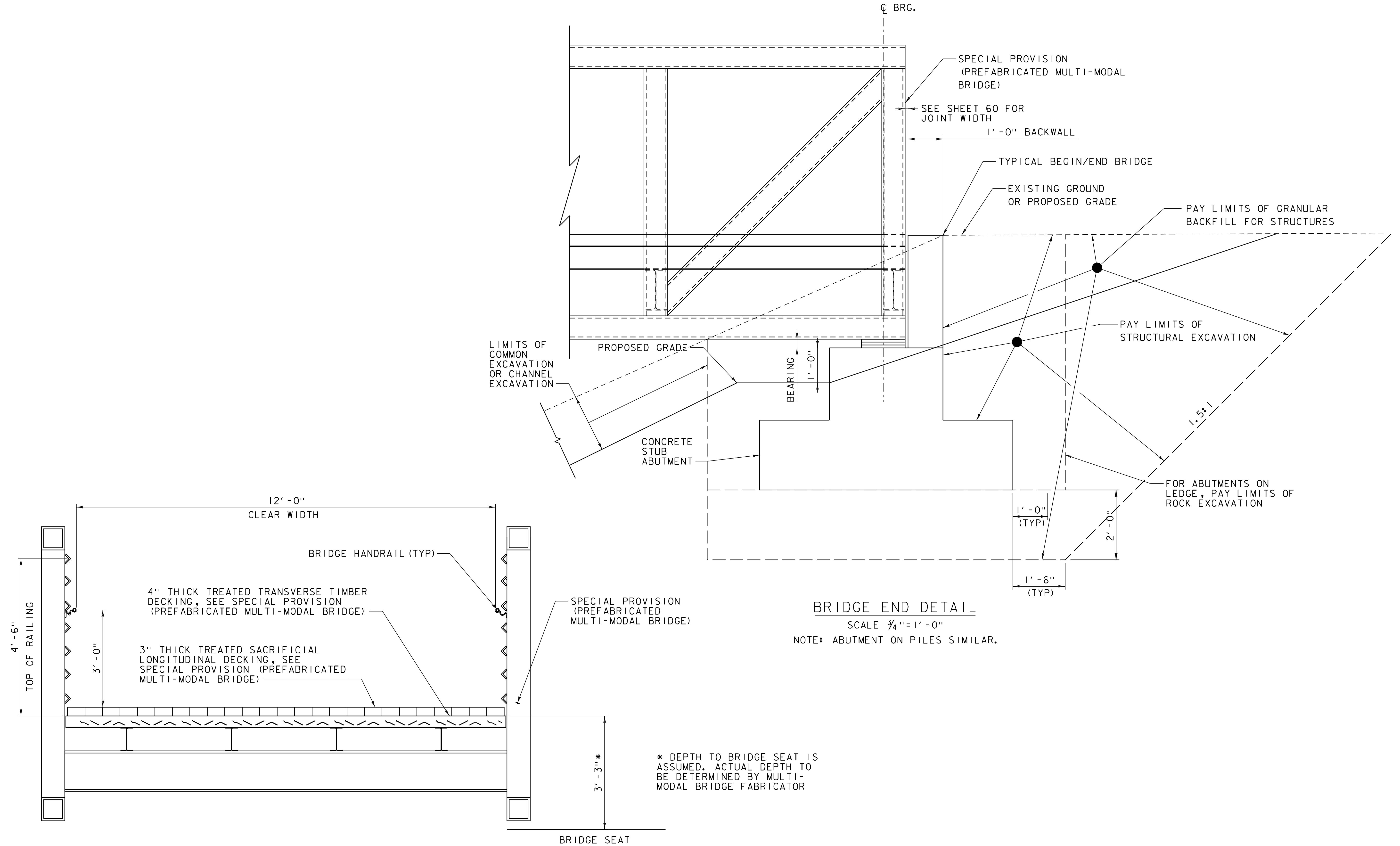
**NOTES:**

1. SEE NOTES ON PREVIOUS SHEET.



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I2)	
FILE NAME: z20f238.structure.details.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: N.A. TRUSLOW
DESIGNED BY: J.D. KEENER	CHECKED BY: J.D. KEENER
BRIDGE 54 UPSTREAM ELEVATION	SHEET 43 OF 102



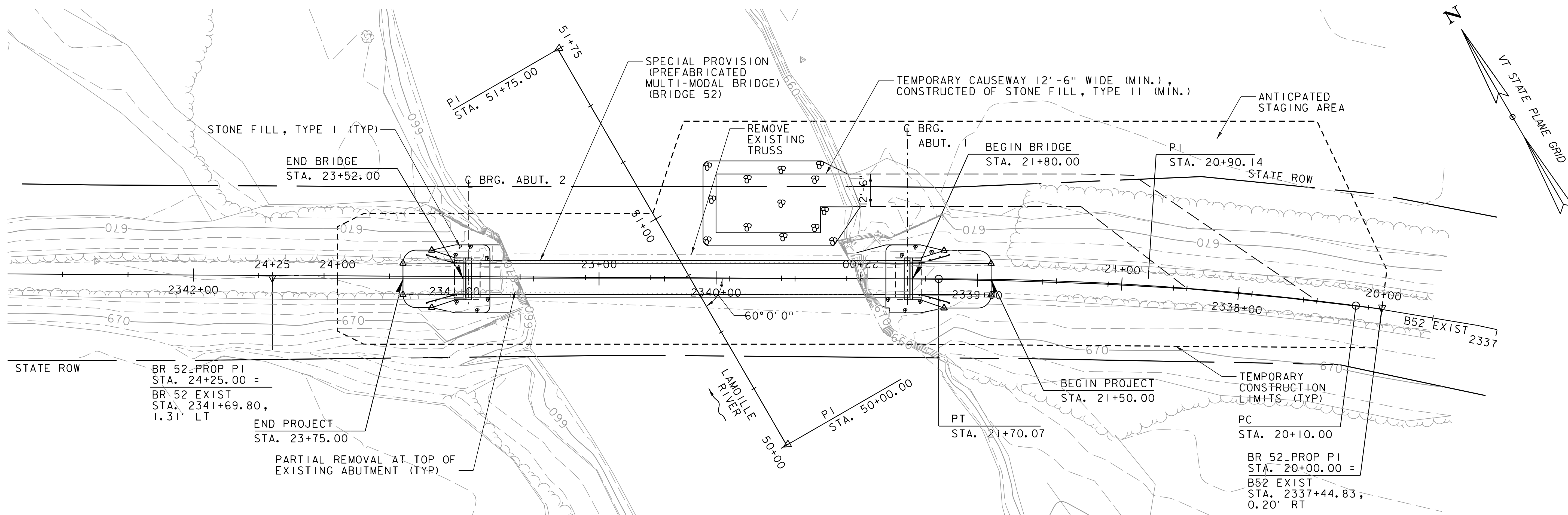


PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(10)	
FILE NAME: z20f238_typ.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: N.A. TRUSLOW
DESIGNED BY: J.D. KEENER	CHECKED BY: J.D. KEENER
BRIDGE TYPICAL SECTIONS SHEET	SHEET 44 OF 102

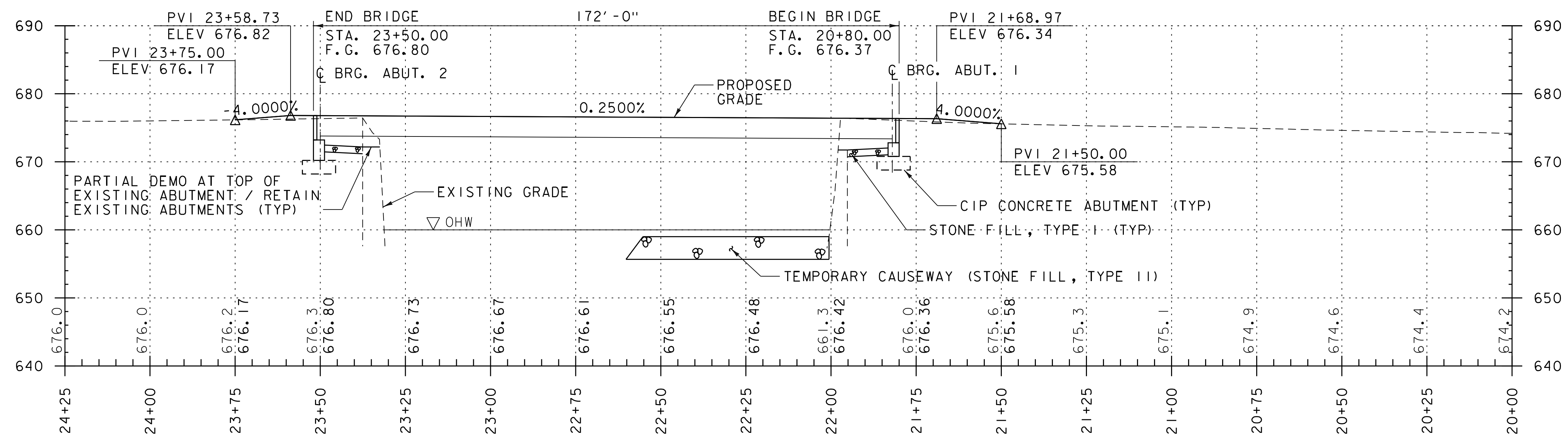
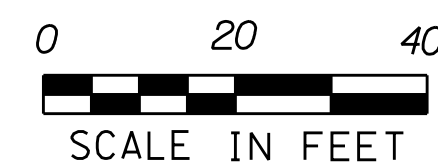








BRIDGE 52 PLAN



BRIDGE 52 PROFILE  
SCALE HORIZONTAL 1" = 20'  
VERTICAL 1" = 10'

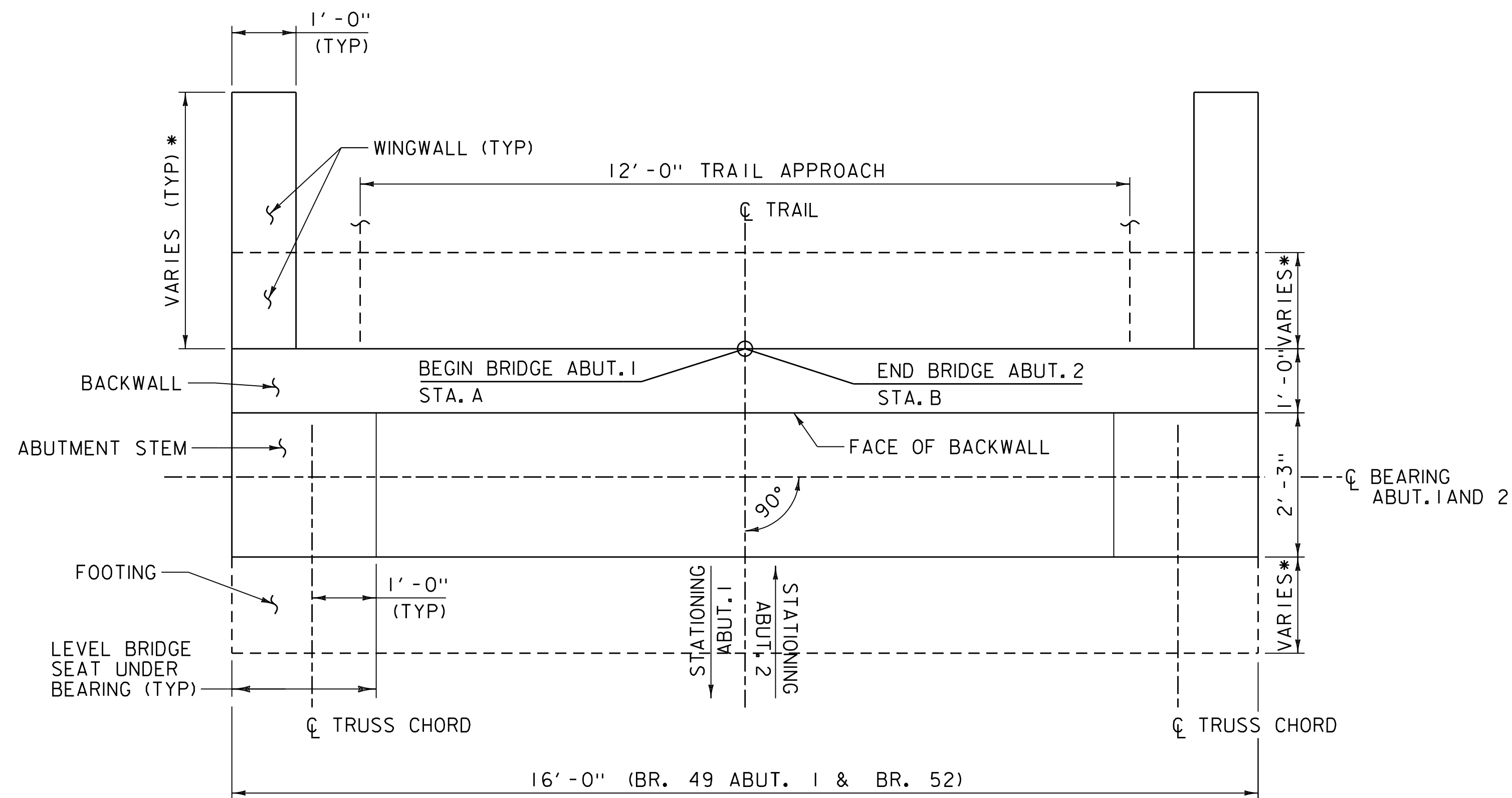
PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: bdr_nul.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: E.F. LAWES  
BRIDGE 52 PLAN & PROFILE

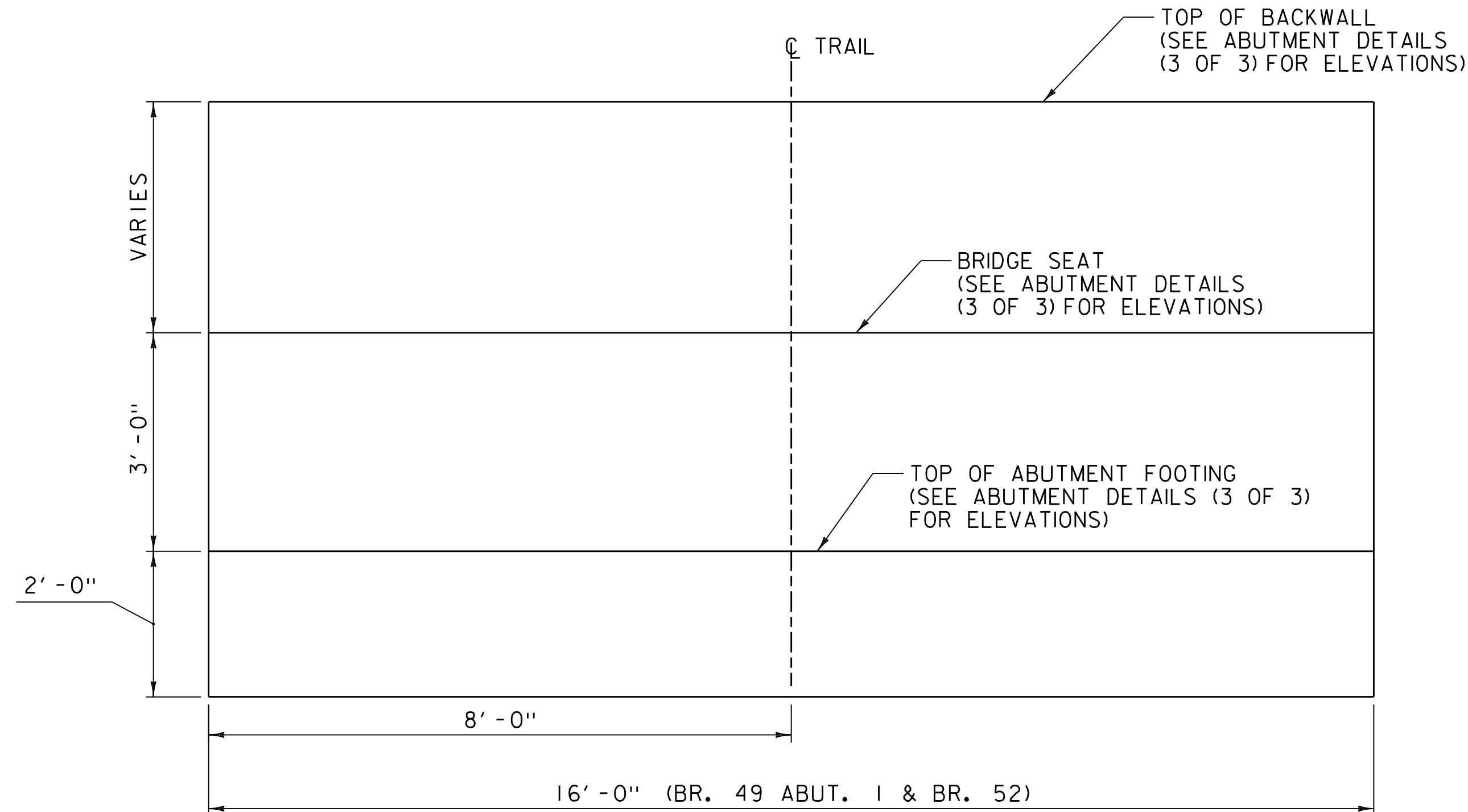
PLOT DATE: 3/23/2021  
DRAWN BY: A.P. MACPHERSON  
CHECKED BY: J.D. KEENER  
SHEET 46 OF 102







TYPICAL ABUTMENT PLAN  
SPREAD FOOTING  
NOT TO SCALE

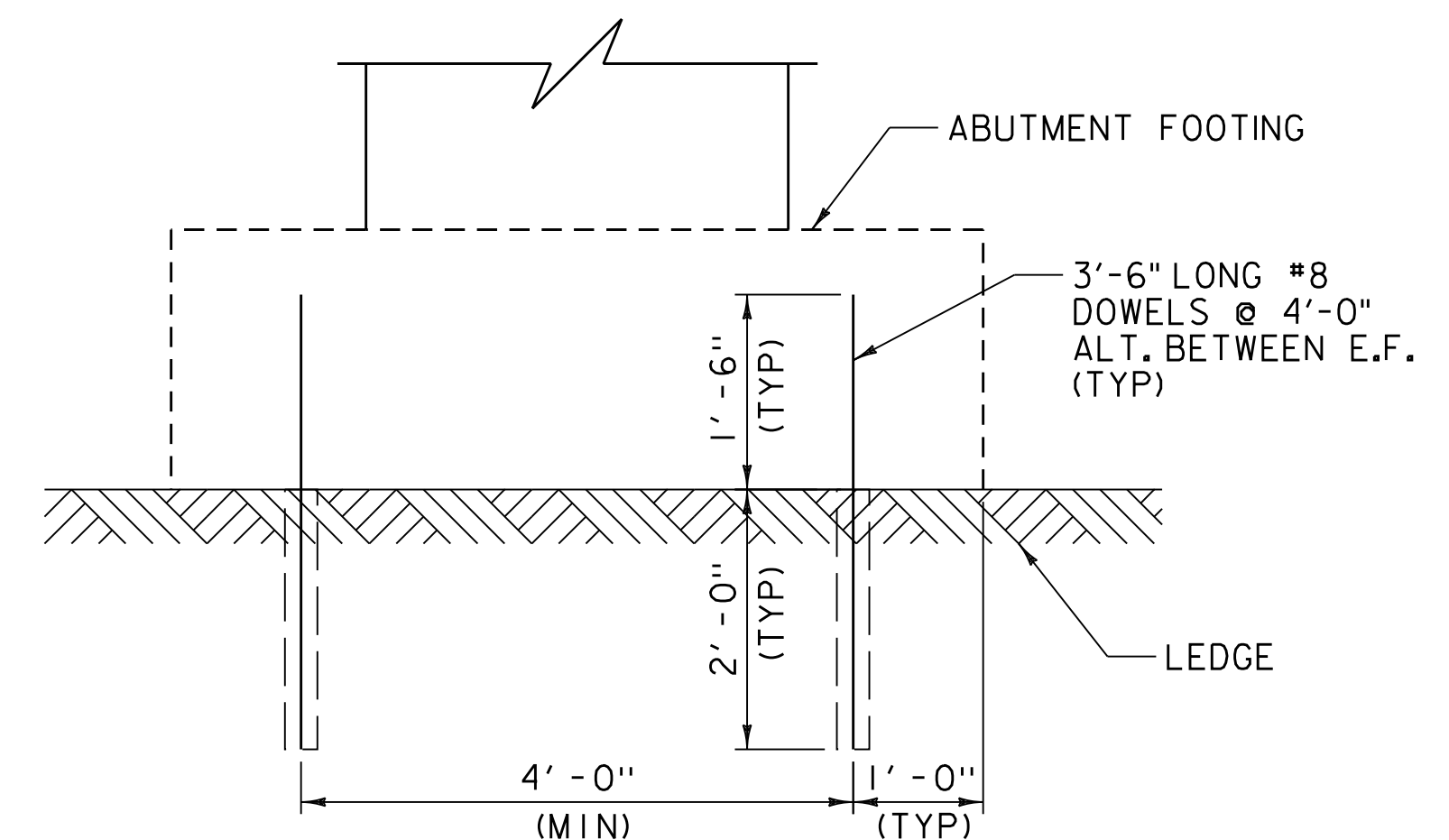


TYPICAL ABUTMENT ELEVATION  
SPREAD FOOTING  
NOT TO SCALE

• SEE ABUTMENT DETAILS (3 OF 3) FOR DIMENSIONS

WORKING POINTS		
	W. P. STATION	
BRIDGE	ABUT. 1 STA. A	ABUT. 2 STA. B
49	20+37.09	22+19.09
52	20+80.00	23+50.00

•• SEE ABUTMENT DETAILS (2 OF 3).



TYPICAL DOWEL DETAIL  
(FOR LEDGE ONLY)  
NOT TO SCALE

NOTES:

1. AT LOCATIONS WHERE LEDGE VARIES BY MORE THAN 12" FROM BOTTOM OF FOOTING ELEVATIONS AS PROVIDED IN THESE PLANS, CONTRACTOR TO COORDINATE WITH ENGINEER TO PROVIDE LONGER STEM OR PROVIDE SUBFOOTING. PAYMENT FOR SUBFOOTING CONCRETE SHALL BE MADE UNDER CONCRETE, CLASS C.
2. THE LOCATION OF CENTERLINE OF TRUSS CHORD AT CENTERLINE OF ABUTMENT BEARING TO BE DETERMINED BY MANUFACTURER.

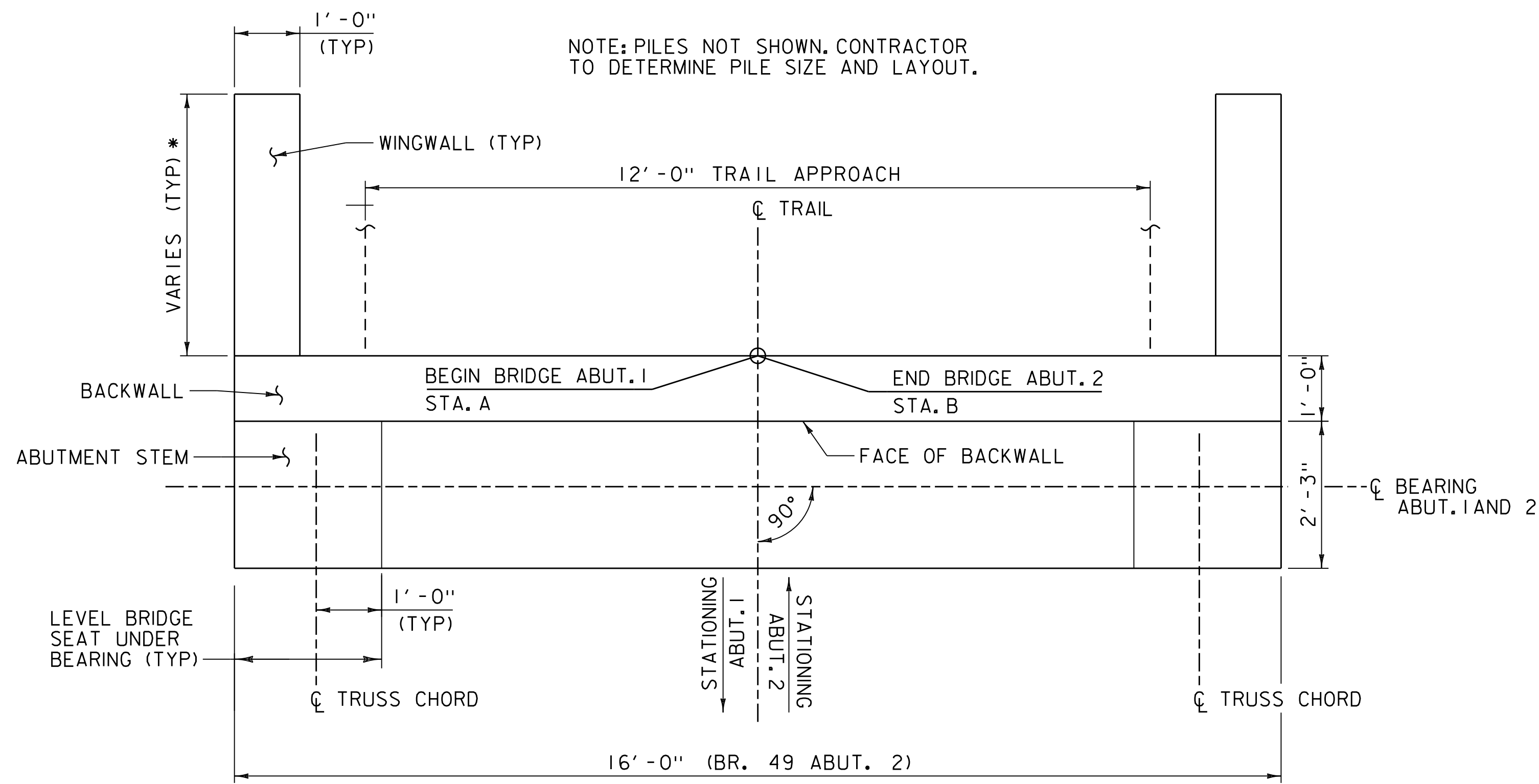
PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_abutplan.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: S.E. GEARY  
ABUTMENT DETAILS (1 OF 3)

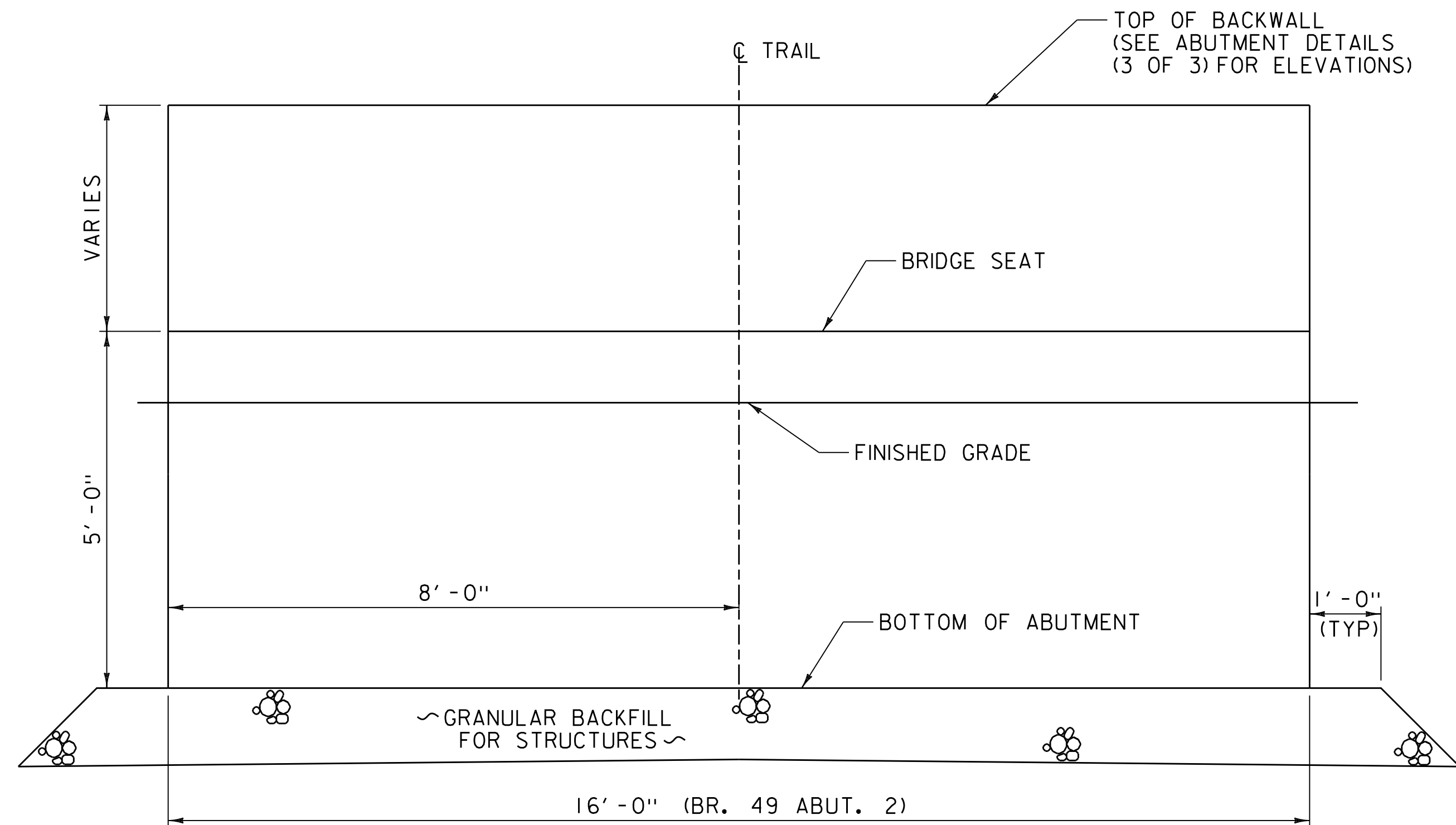
PLOT DATE: 3/23/2021  
DRAWN BY: S.E. GEARY  
CHECKED BY: W.P. RAUSEO  
SHEET 47 OF 102







TYPICAL ABUTMENT PLAN  
ABUTMENT ON PILES  
NOT TO SCALE

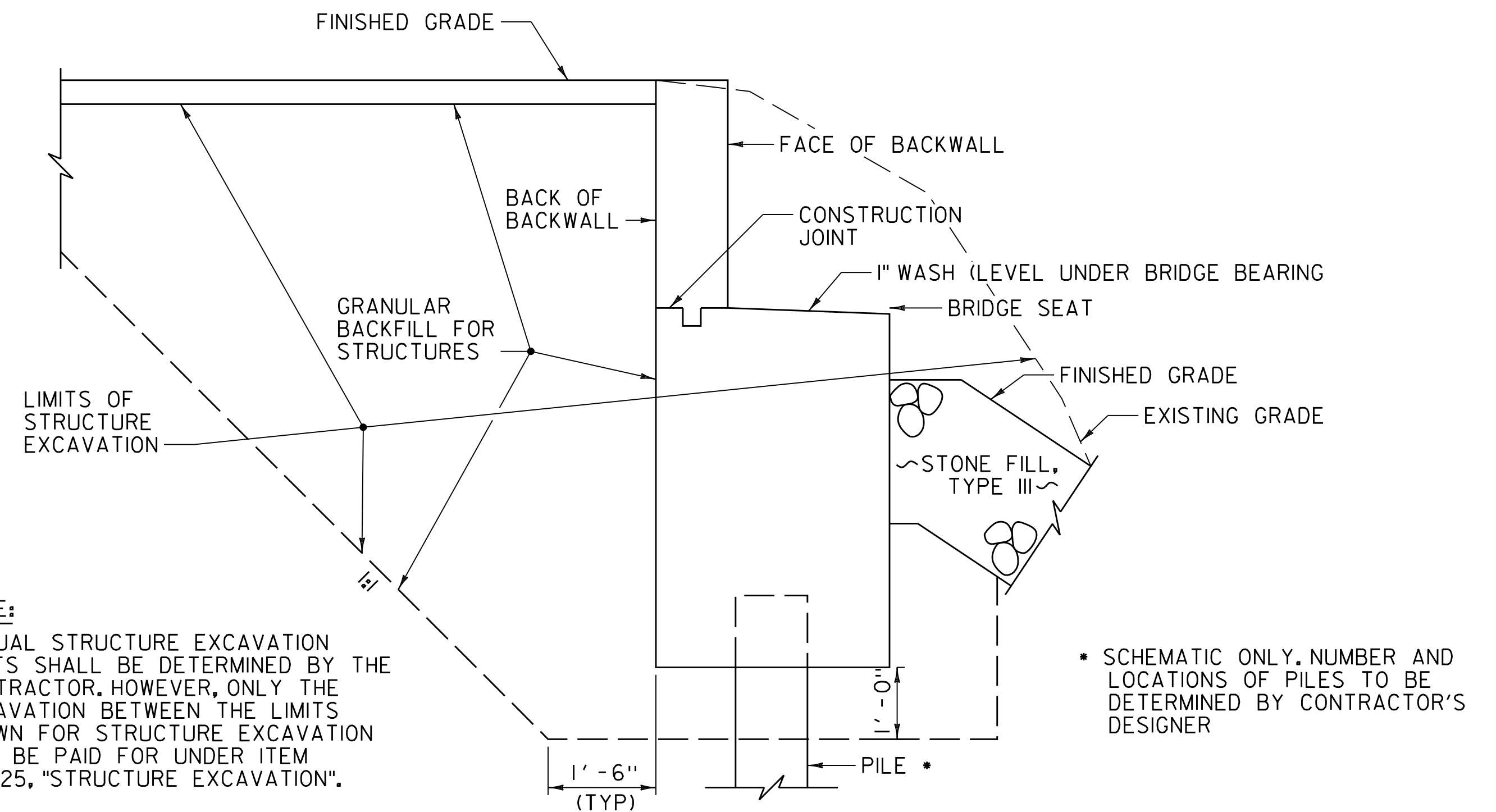


TYPICAL ABUTMENT ELEVATION  
ON PILES  
NOT TO SCALE

* SEE ABUTMENT DETAILS (3 OF 3) FOR DIMENSIONS

## ABUTMENT ON PILES NOTES:

1. CONTRACTOR'S ENGINEER SHALL WORK CLOSELY WITH THE BRIDGE MANUFACTURER TO DETERMINE FOUNDATION LOADINGS (BOTH AXIAL AND LATERAL) AND TOLERANCE OF THE BRIDGE FOR TOTAL AND DIFFERENTIAL SETTLEMENT PRIOR TO COMMENCING DESIGN WORK ON THE PILES OR CONCRETE ABUTMENTS. CONTRACTOR'S ENGINEER IS REFERRED TO THE PROJECT GEOTECHNICAL BORINGS FOR INFORMATION. A GEOTECHNICAL REPORT IS NOT AVAILABLE.
2. ALL DRAWINGS AND CALCULATIONS FOR THE PILES AND STEEL REINFORCED CONCRETE ABUTMENTS SHALL BE IN ACCORDANCE WITH SPECIAL PROVISION (ABUTMENT ON PILES).
3. BRIDGE ABUTMENT DIMENSIONS HAVE BEEN PROVIDED AND ARE TO BE CONSIDERED APPROXIMATE. THESE DIMENSIONS INCLUDE THOSE FOR THE OVERALL ABUTMENT WIDTH, BEARING SEAT WIDTH, AND BACKWALL HEIGHT. THESE DIMENSIONS SHALL BE VERIFIED OR ADJUSTED BY THE CONTRACTOR'S ENGINEER DURING THE SHOP SUBMITTAL PROCESS TO ACCOMMODATE THE CONTRACTOR'S CHOSEN SUPERSTRUCTURE MANUFACTURER'S DESIGN AND CLEARANCE REQUIREMENTS.
4. THE BEARING SEAT SHALL HAVE A 1" WASH (LEVEL UNDER BRIDGE BEARING).
5. ALL SUBSTRUCTURE CONCRETE SHALL BE PLACED IN THE DRY.
6. ALL REINFORCING STEEL SHALL HAVE A MINIMUM OF 3" CLEAR COVER.
7. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1".



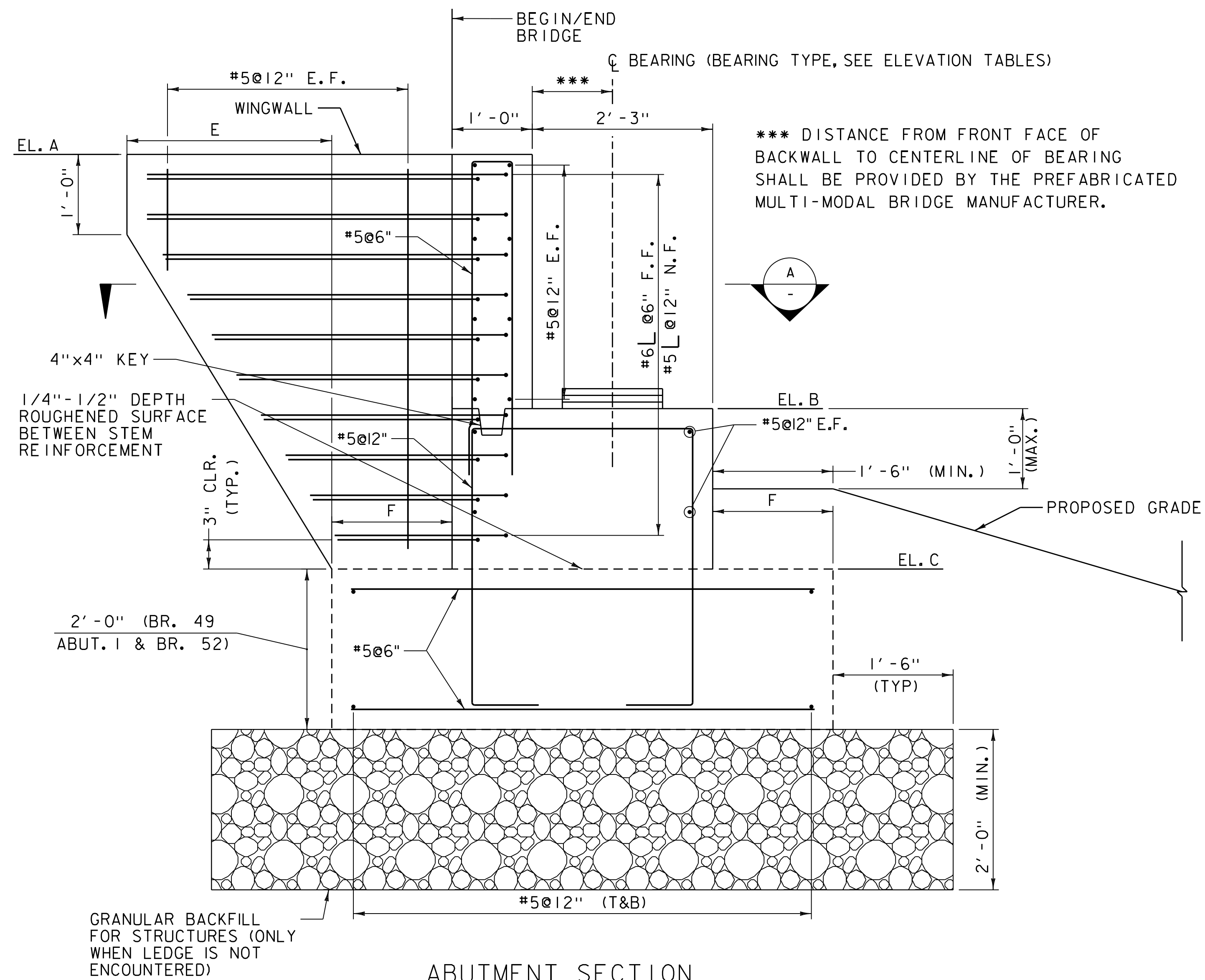
TYPICAL ABUTMENT SECTION  
ON PILES  
NOT TO SCALE

* SCHEMATIC ONLY. NUMBER AND LOCATIONS OF PILES TO BE DETERMINED BY CONTRACTOR'S DESIGNER

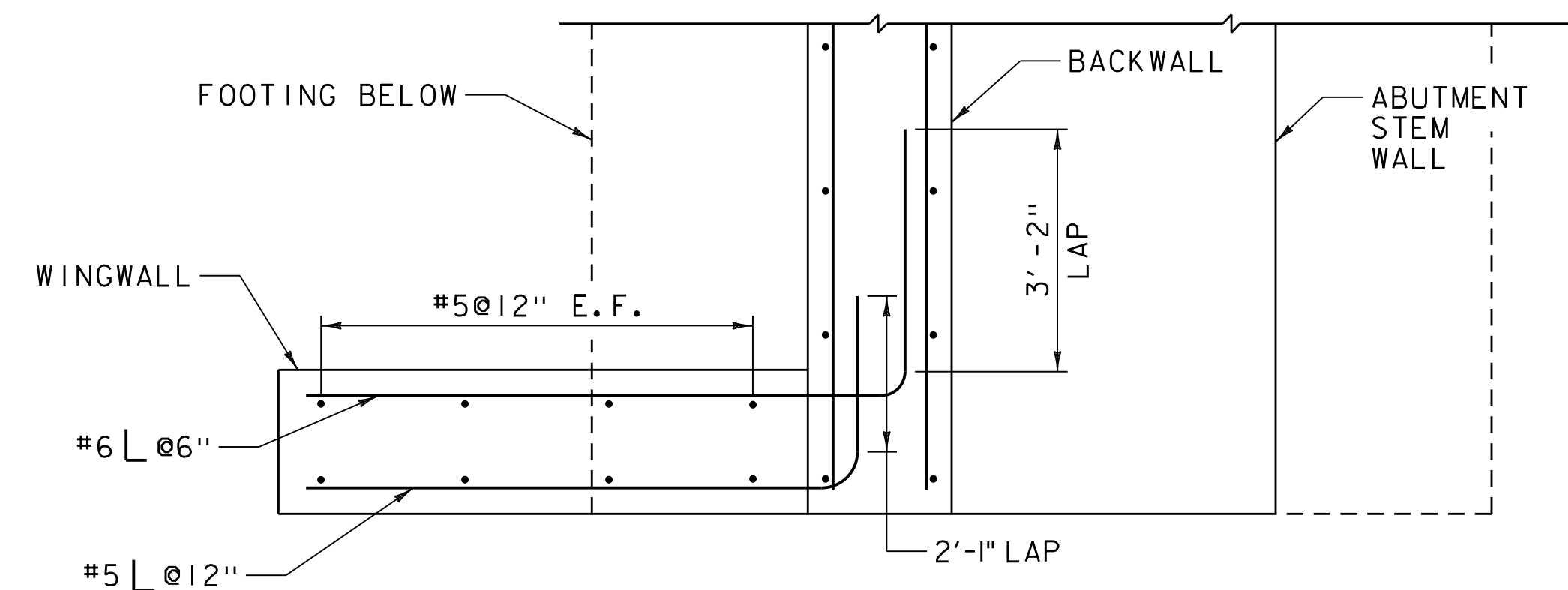


PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238_abutplan.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	E.F. LAWES
ABUTMENT DETAILS (2 OF 3)	
PLOT DATE:	3/23/2021
DRAWN BY:	E.F. LAWES
CHECKED BY:	W.P. RAUSEO
SHEET	48 OF 102

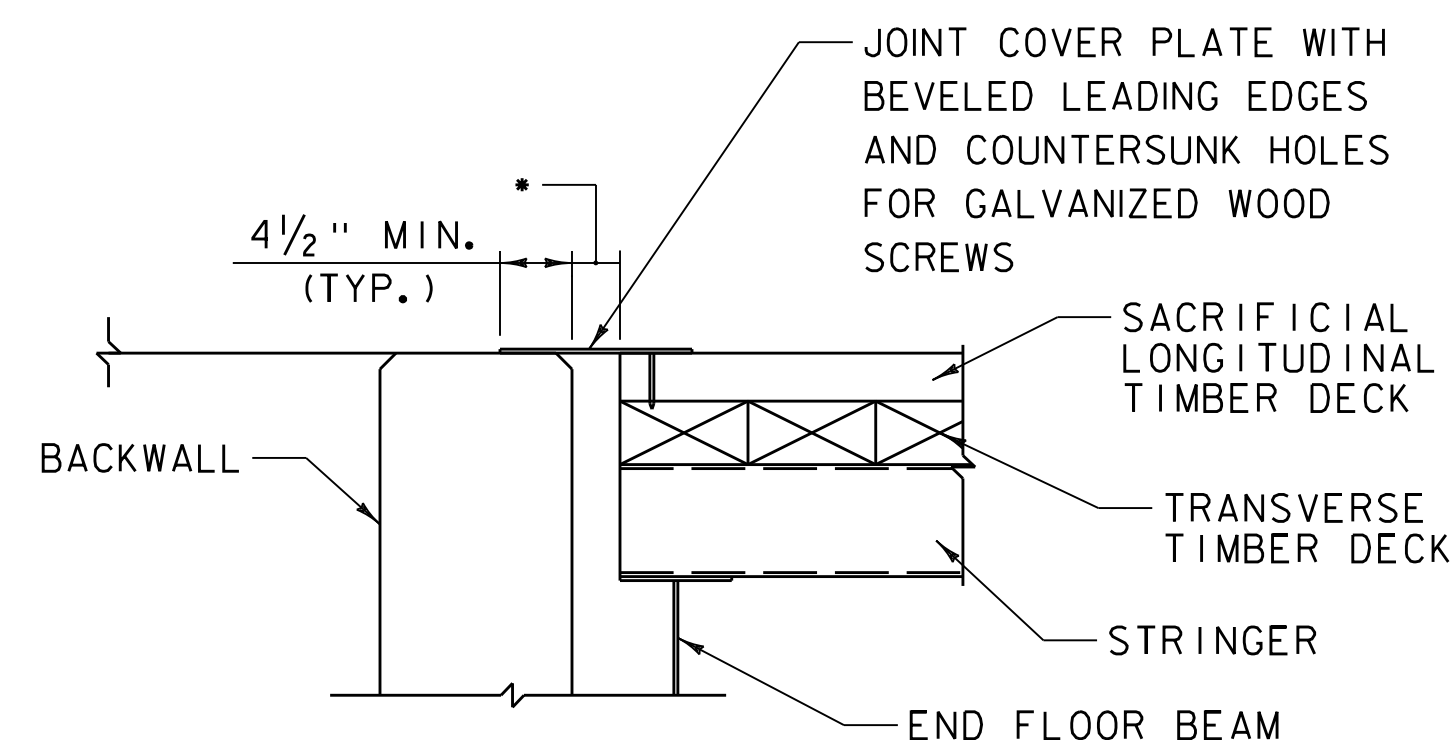




ABUTMENT SECTION  
NOT TO SCALE



SECTION THRU WINGWALL  
NOT TO SCALE



TYPICAL COVER PLATE DETAIL  
NOT TO SCALE

* JOINT WIDTH, COVER PLATE SIZE, AND JOINT PLATE FASTENERS SHALL BE DETERMINED BY THE PREFABRICATED MULTI-MODAL BRIDGE MANUFACTURER. MINIMUM JOINT WIDTH SHALL BE 1". COVER PLATE REQUIRED AT EACH END OF BRIDGE.

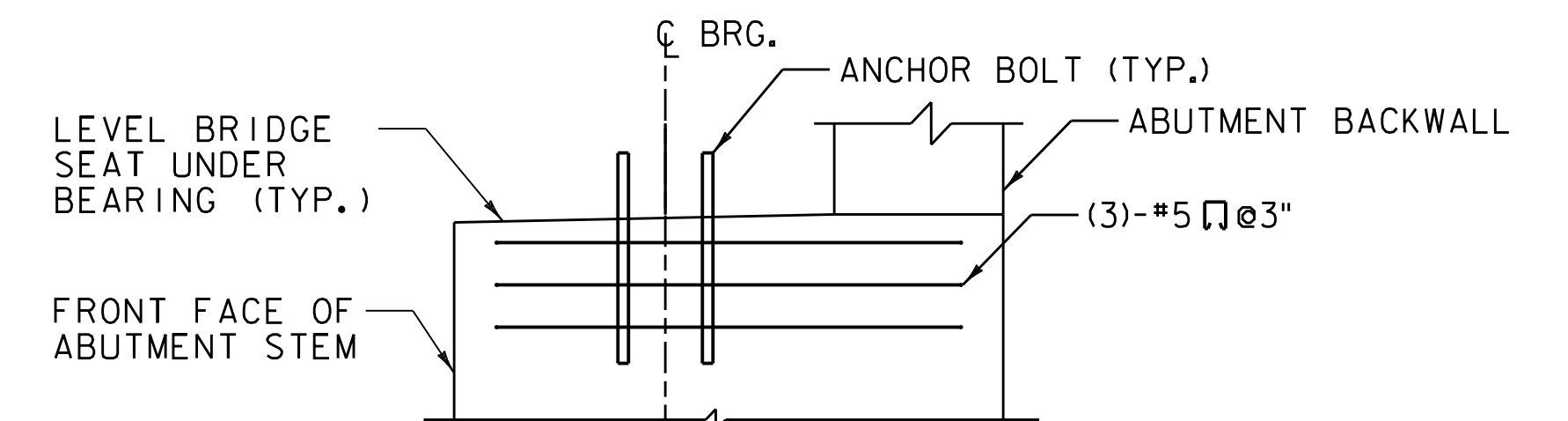
ABUTMENT 1 ELEVATIONS		
	BRIDGE	
ELEVATION (FT) **	49	52
A	682.72	676.37
B	679.14	672.79
C	676.14	669.79
BEARING TYPE	FIXED	FIXED

ABUTMENT 2 ELEVATIONS		
	BRIDGE	
ELEVATION (FT) **	49	52
A	679.45	676.80
B	N/A	673.22
C	N/A	670.22
BEARING TYPE	EXPANSION	EXPANSION

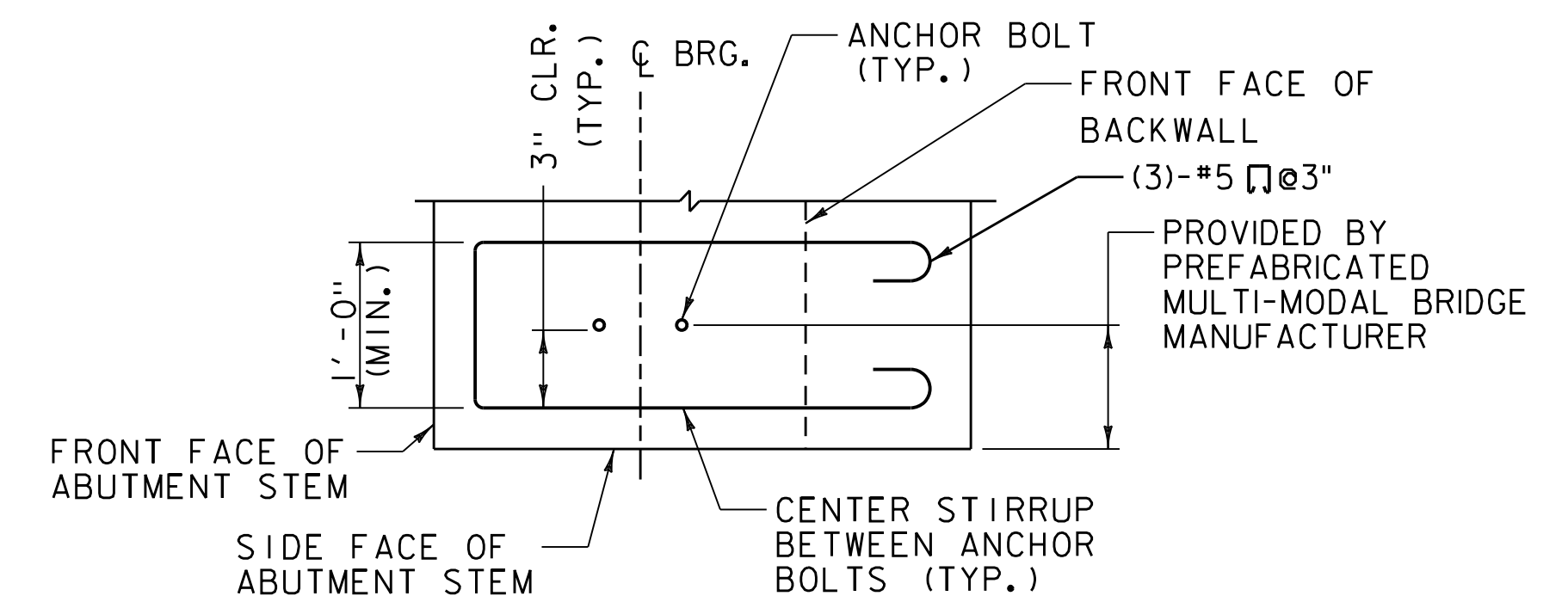
ABUTMENT AND WINGWALL DIMENSIONS		
	BRIDGE	
DIMENSION (FT)	49	52
E	2.00	0.0
F	2.00	3.25

NOTE: BRIDGE 49 ABUTMENT 1 TO BE DESIGNED ON PILES BY CONTRACTOR.

** ELEVATIONS ARE SUBJECT TO CHANGE AFTER PREFABRICATED MULTI-MODAL BRIDGE MANUFACTURER PROVIDES THE HEIGHT FROM THE TOP OF THE RUNNING BOARDS TO THE BOTTOM CHORD AND THE HEIGHT OF THE BEARING ASSEMBLY AS THIS WILL IMPACT THE HEIGHT OF THE BACKWALL.



NOTE: ABUTMENT REINFORCEMENT NOT SHOWN FOR CLARITY  
TYPICAL ANCHOR BOLT SECTION  
NOT TO SCALE



NOTE: ABUTMENT REINFORCEMENT NOT SHOWN FOR CLARITY  
TYPICAL ANCHOR BOLT PLAN  
NOT TO SCALE

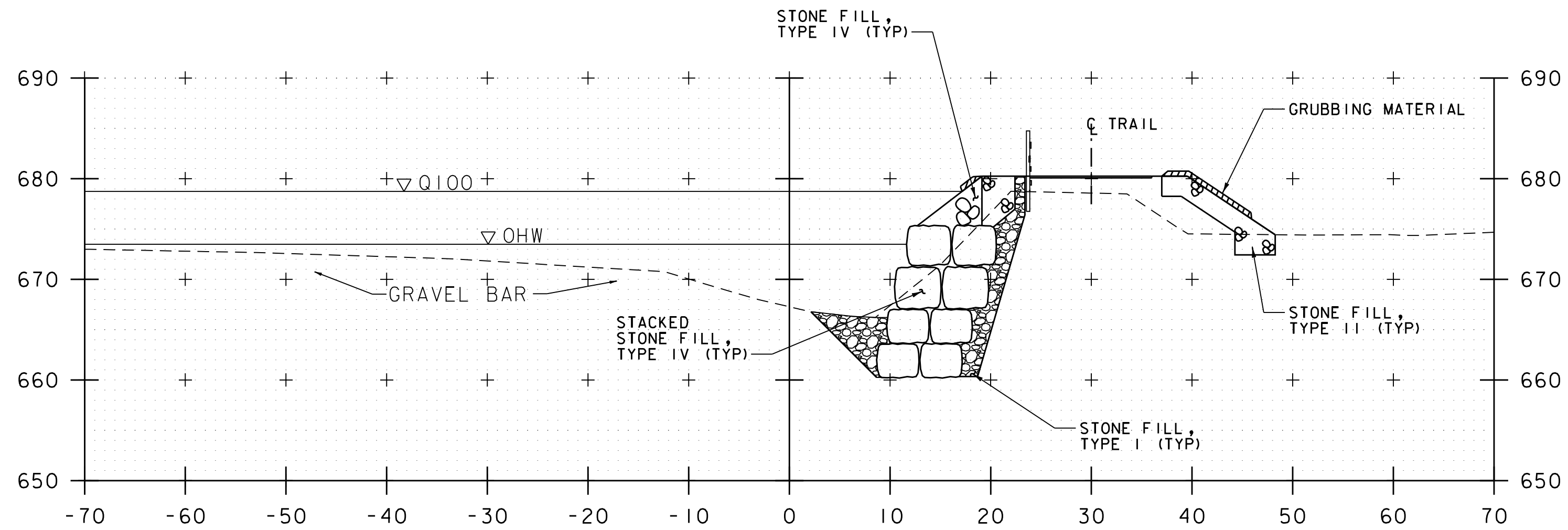
PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_abut.typ.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: S.E. GEARY  
ABUTMENT DETAILS (3 OF 3)

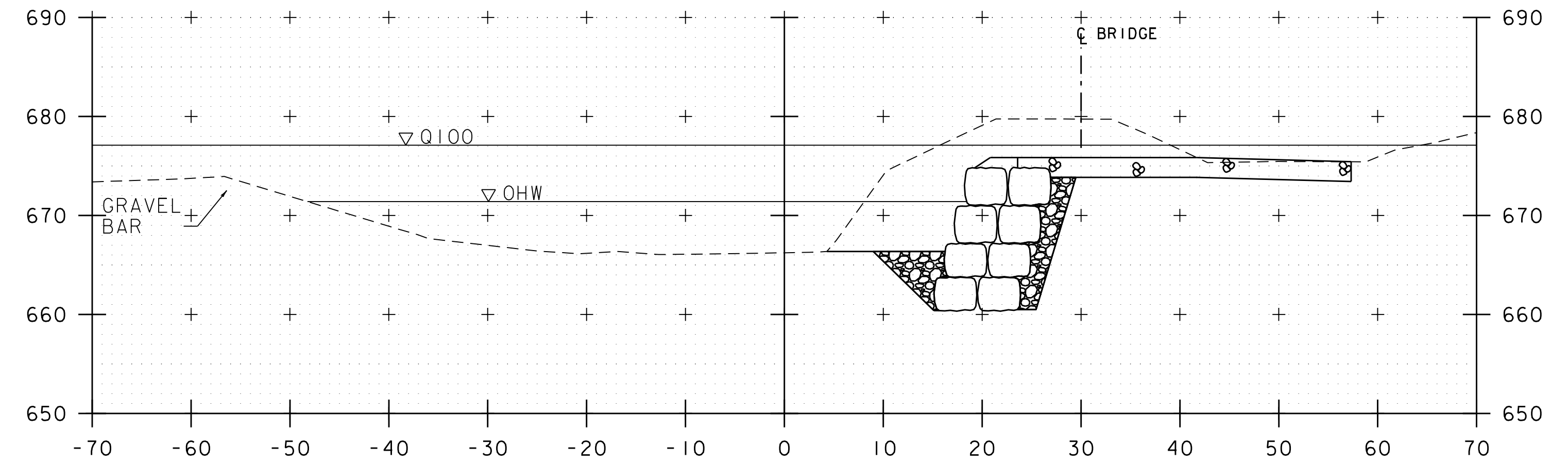
PLOT DATE: 3/23/2021  
DRAWN BY: S.E. GEARY  
CHECKED BY: W.P. RAUSEO  
SHEET 49 OF 102



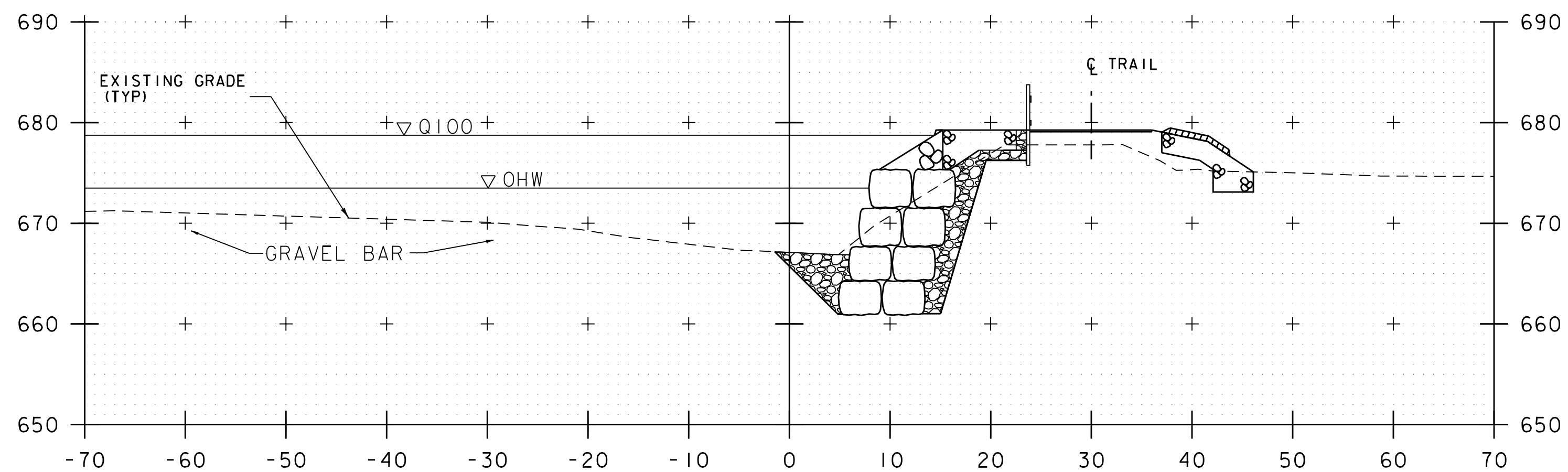




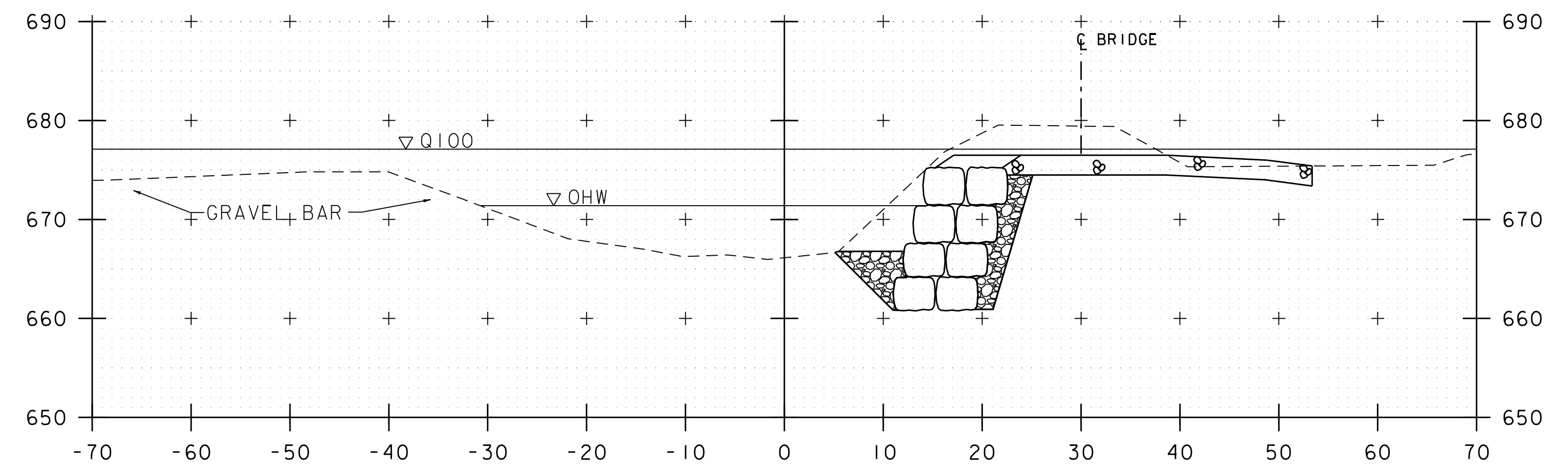
50+50



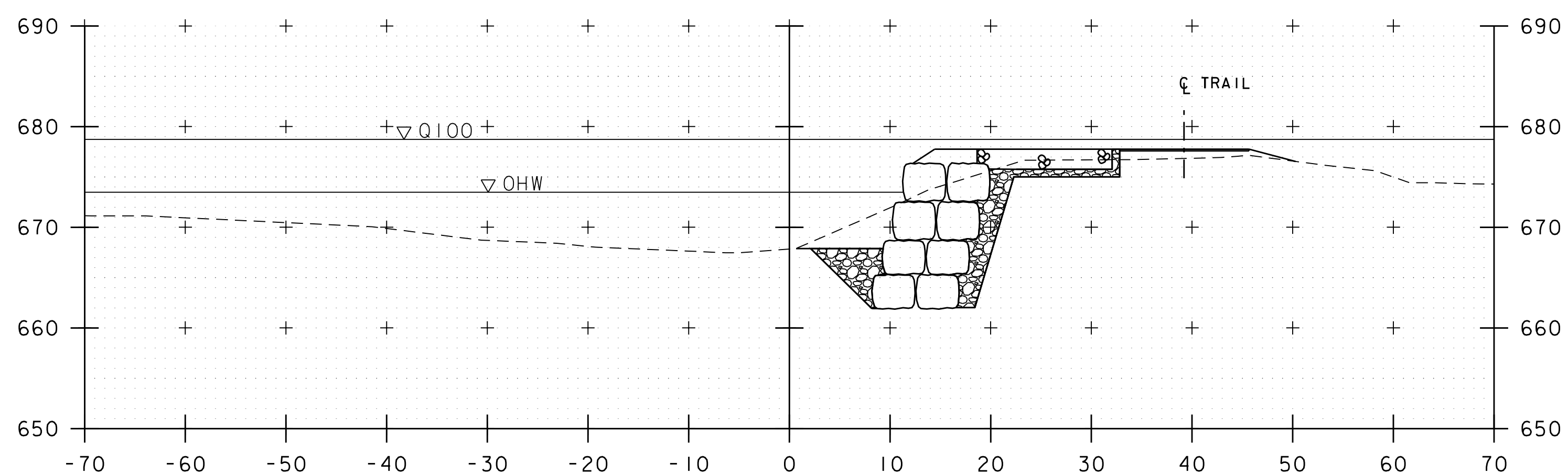
51+25



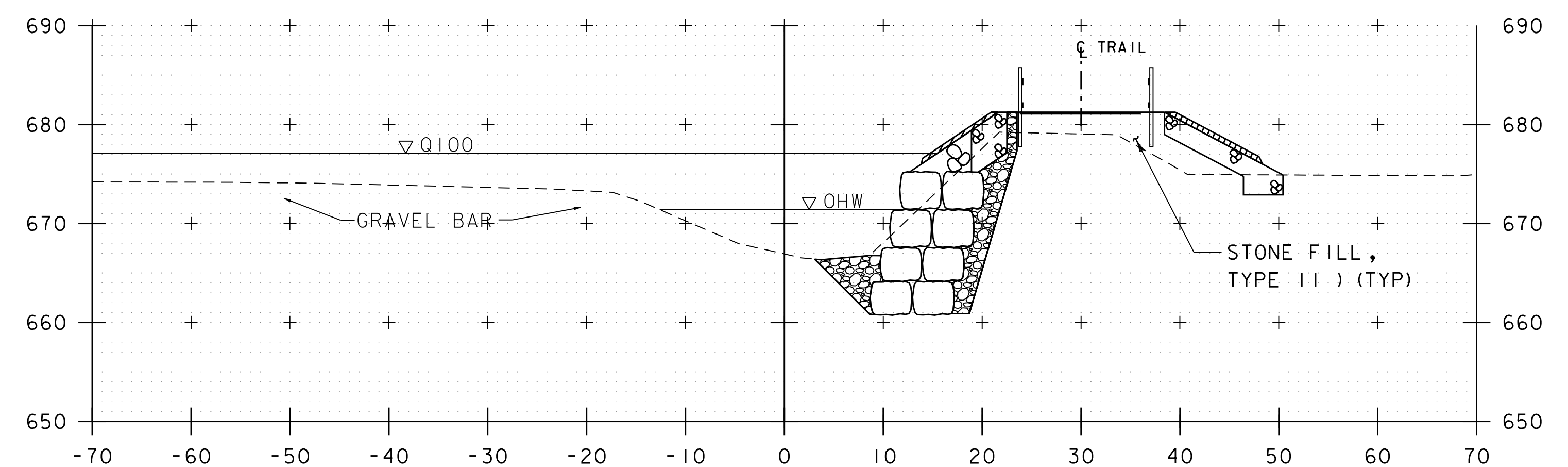
50+25



51+00



50+00



50+75

## BRIDGE 49 CHANNEL SECTIONS

STA. 50+00 TO STA. 51+25  
SCALE: 1/2" = 1'-0"

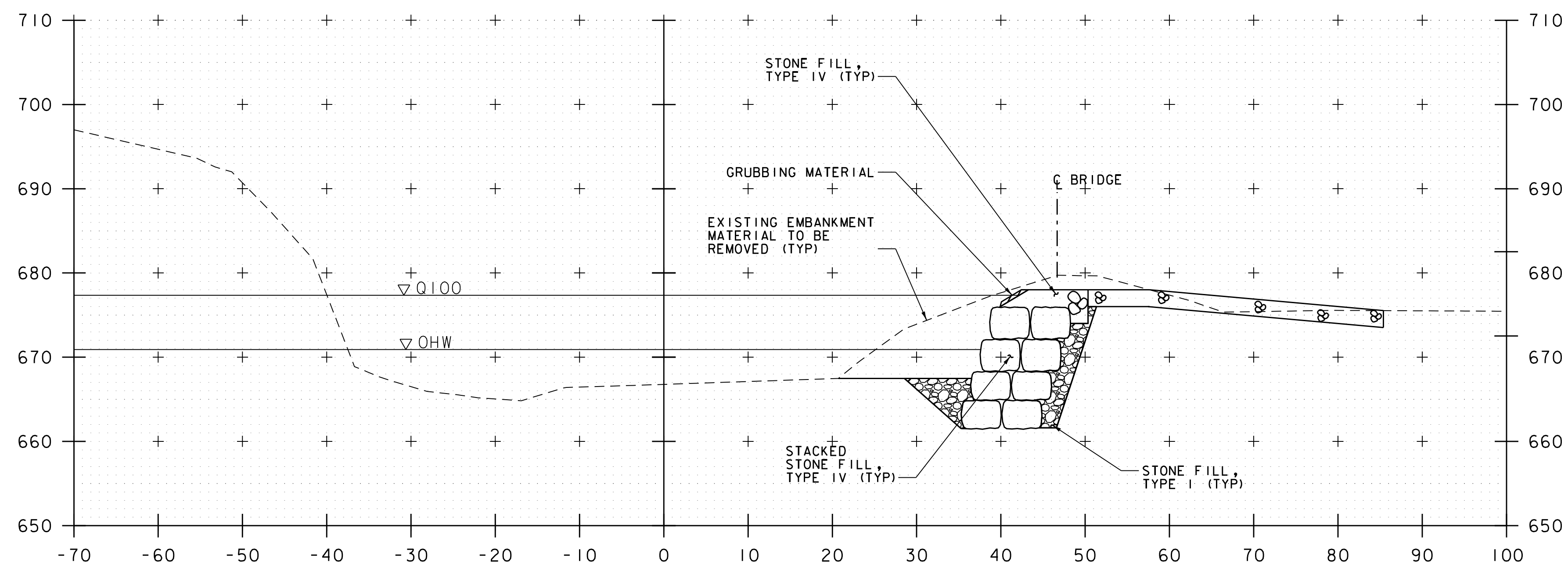


PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(12)

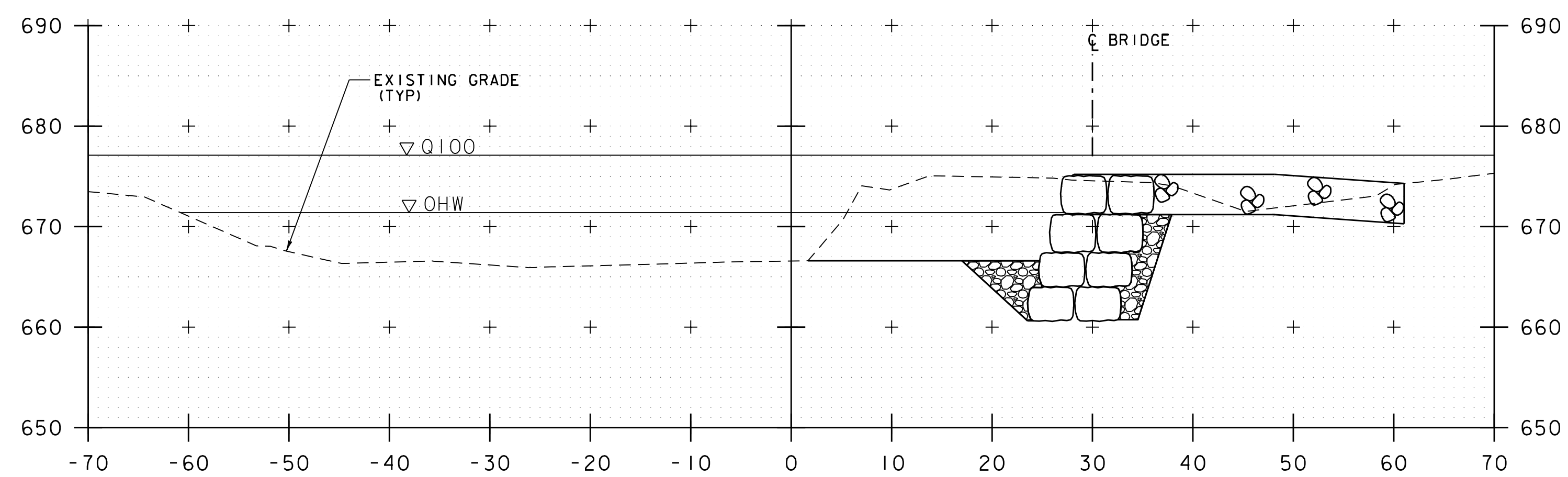
FILE NAME: z20f238_Br49_xs.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: E.F. LAWES  
BR. 49 CHANNEL CROSS SECTIONS (10 OF 4)

PLOT DATE: 3/23/2021  
DRAWN BY: A.P. MACPHERSON  
CHECKED BY: E.P. DETRICK  
SHEET 50 OF 102





51+75



51+50

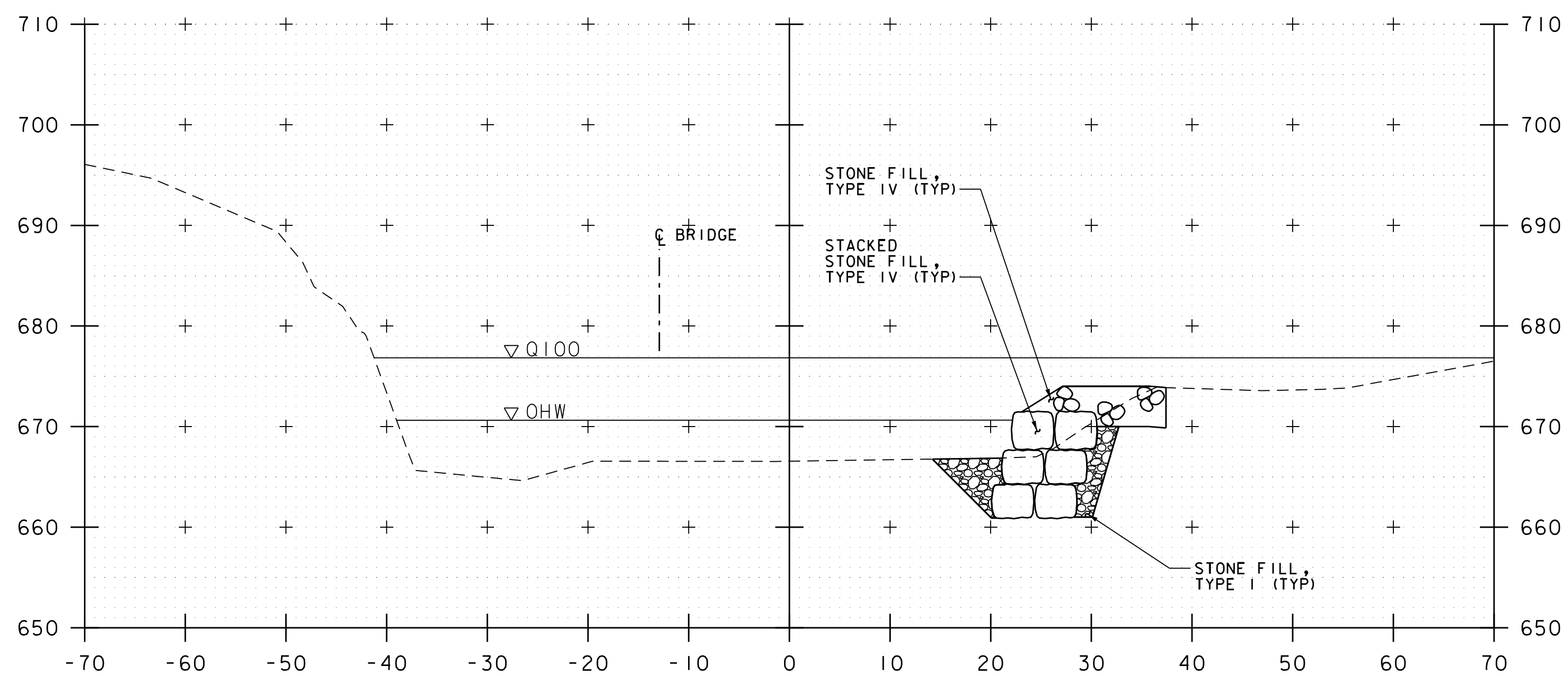
# BRIDGE 49 CHANNEL SECTIONS

STA. 51+50 TO STA. 51+75  
SCALE: 1/2" = 1'-0"

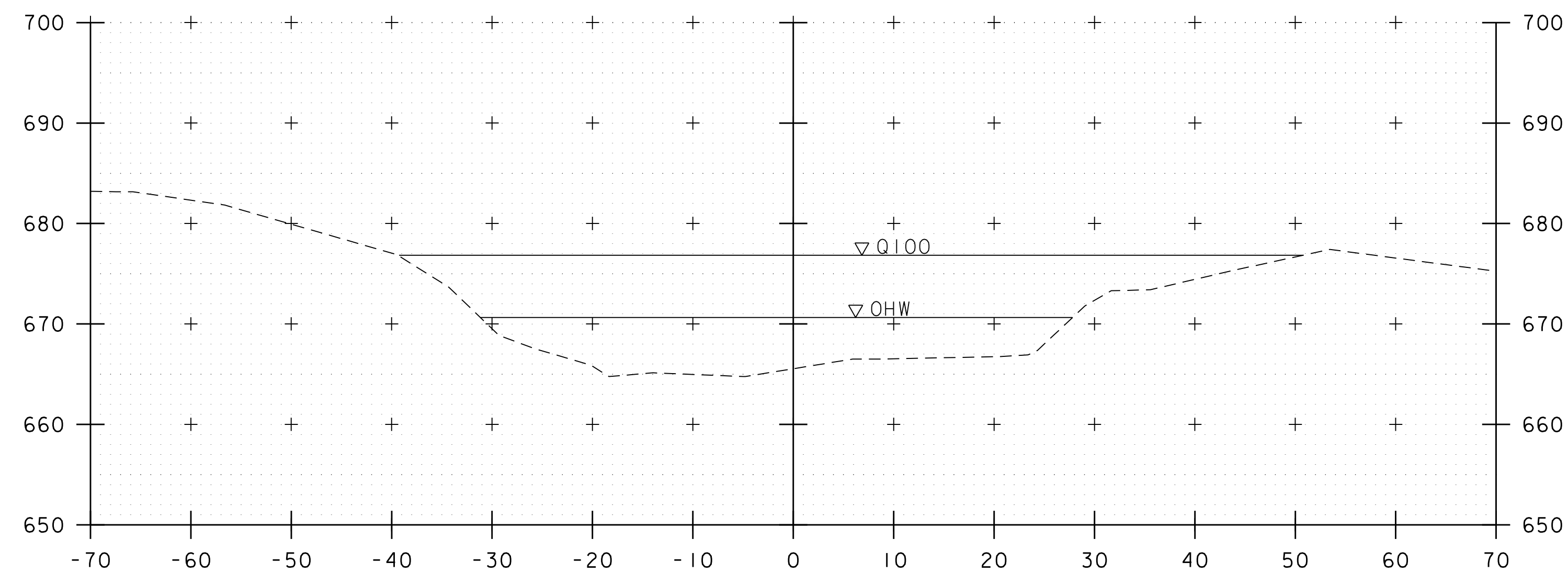


PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I2)	
FILE NAME: z20f238.Br49_xs.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: A.P. MACPHERSON
DESIGNED BY: E.F. LAWES	CHECKED BY: E.P. DETRICK
BR. 49 CHANNEL CROSS SECTIONS (2 OF 4)	SHEET 51 OF 102

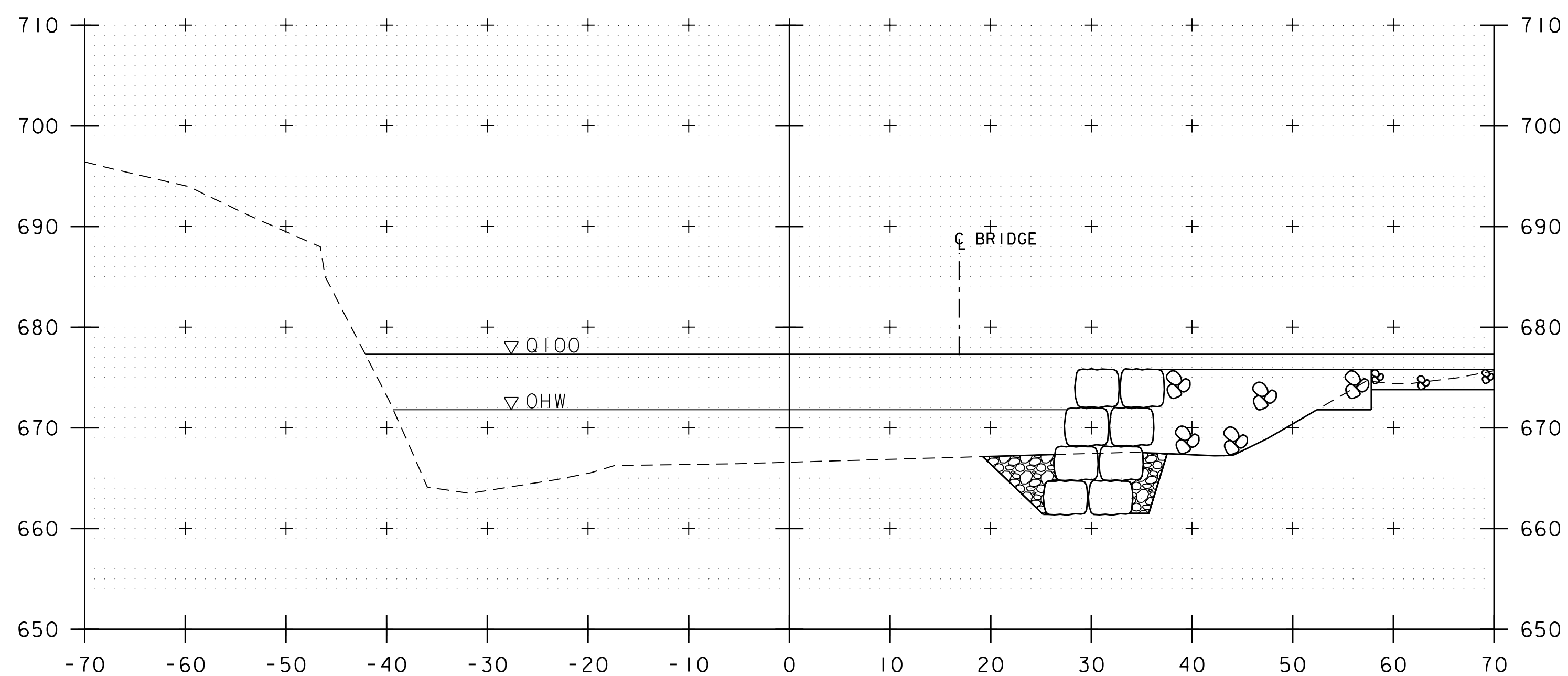




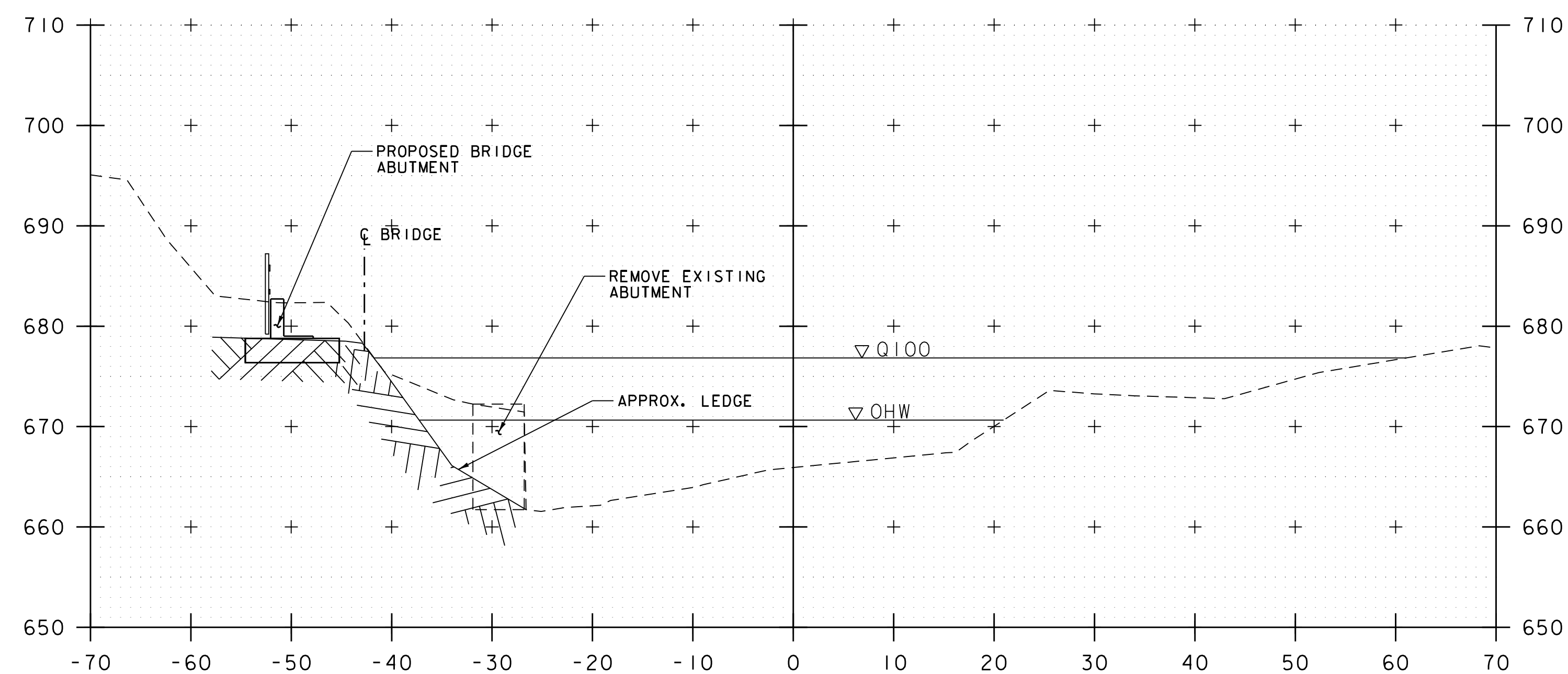
52+25



52+75



52+00



52+50

## BRIDGE 49 CHANNEL SECTIONS

STA. 52+00 TO STA. 52+75  
SCALE: 1/2" = 1'-0"

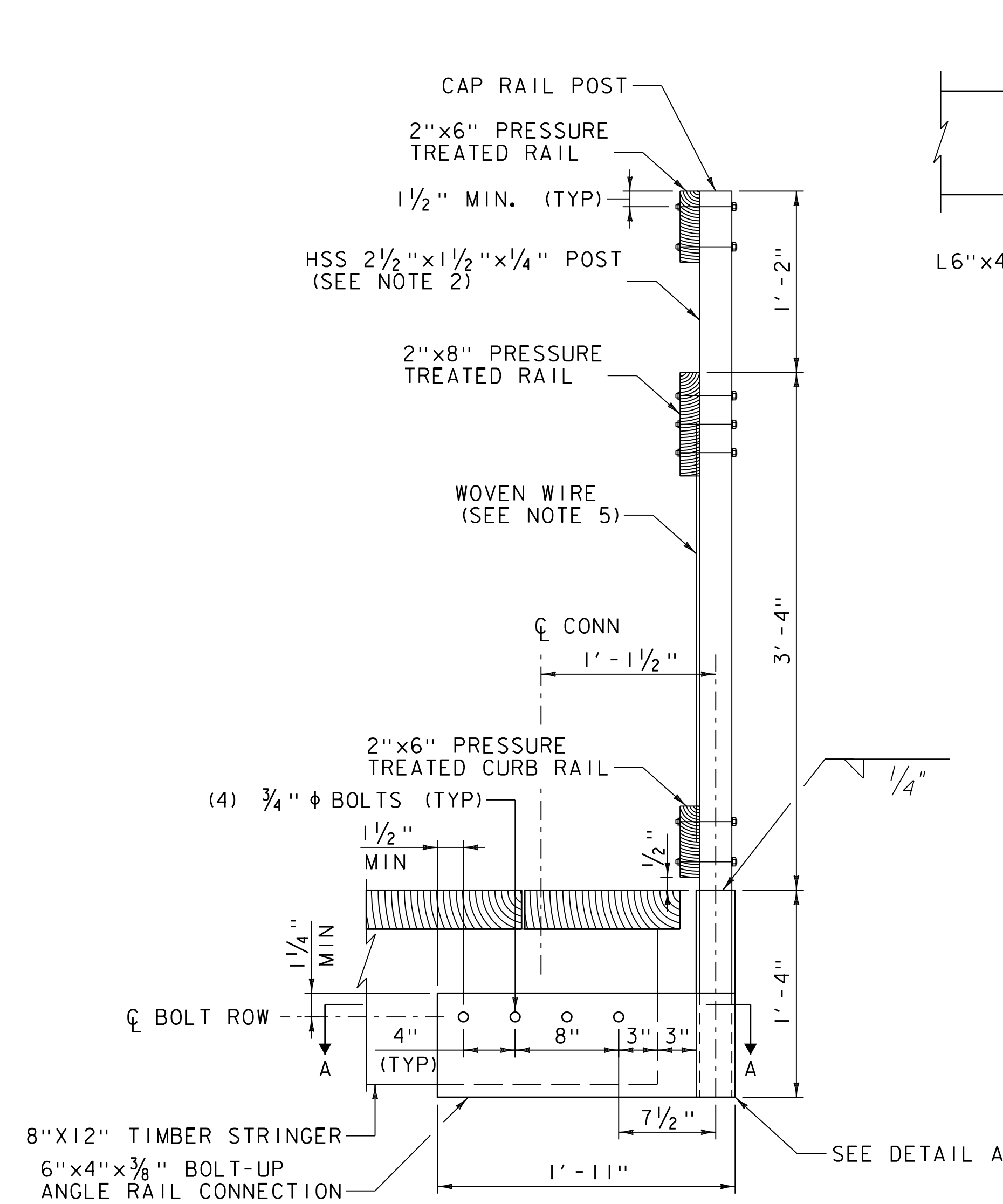


PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.Br49_xs.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: E.F. LAWES  
BR. 49 CHANNEL CROSS SECTIONS (3 OF 4)

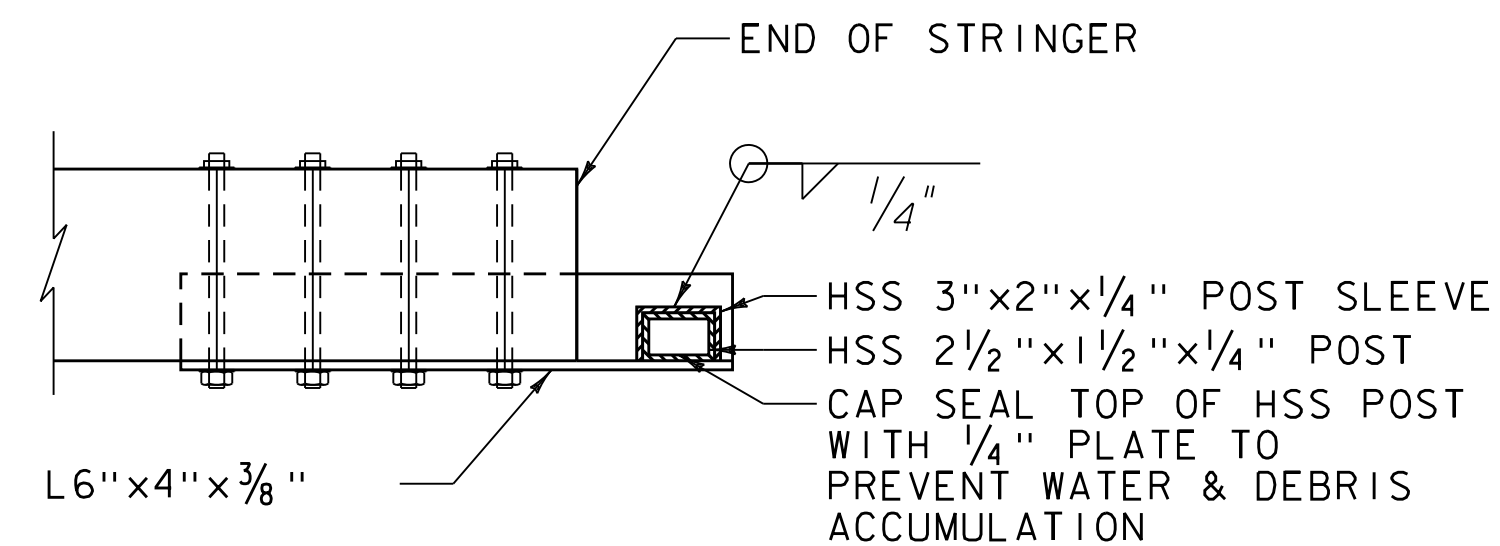
PLOT DATE: 3/23/2021  
DRAWN BY: A.P. MACPHERSON  
CHECKED BY: E.P. DETRICK  
SHEET 52 OF 102



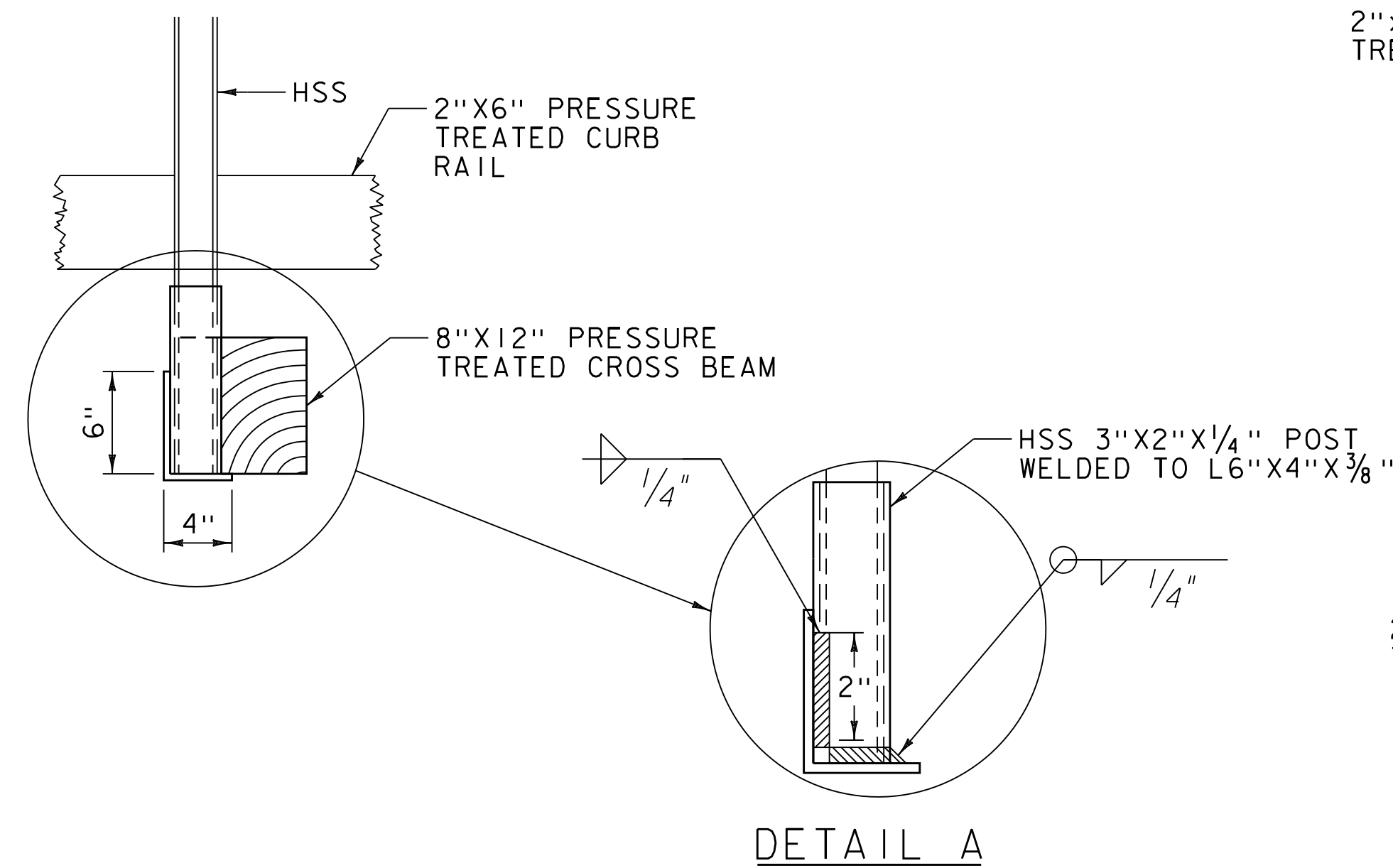


BRIDGE RAILING, TYPE I SECTION  
SCALE 1 1/2" = 1'-0"

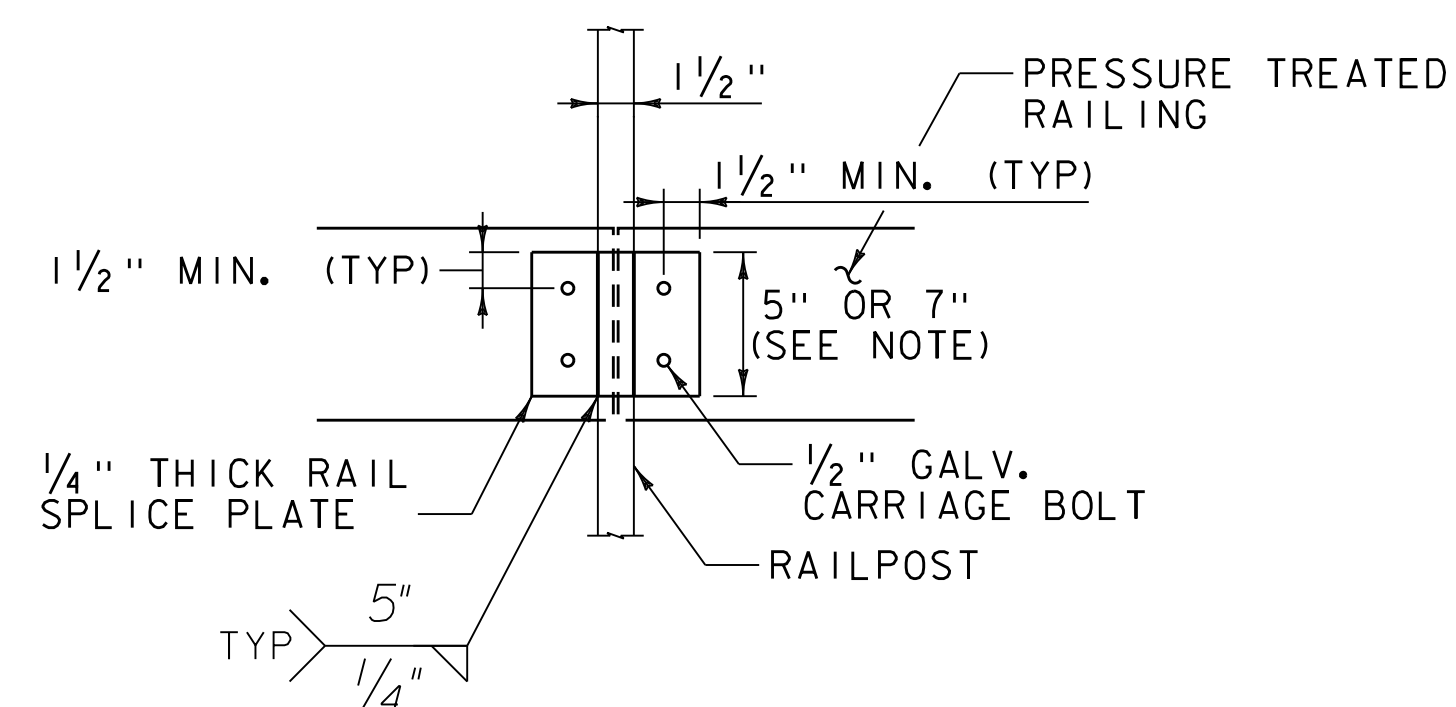
BRIDGE RAILING NOTES:



SECTION A-A  
SCALE 1 1/2" = 1'-0"

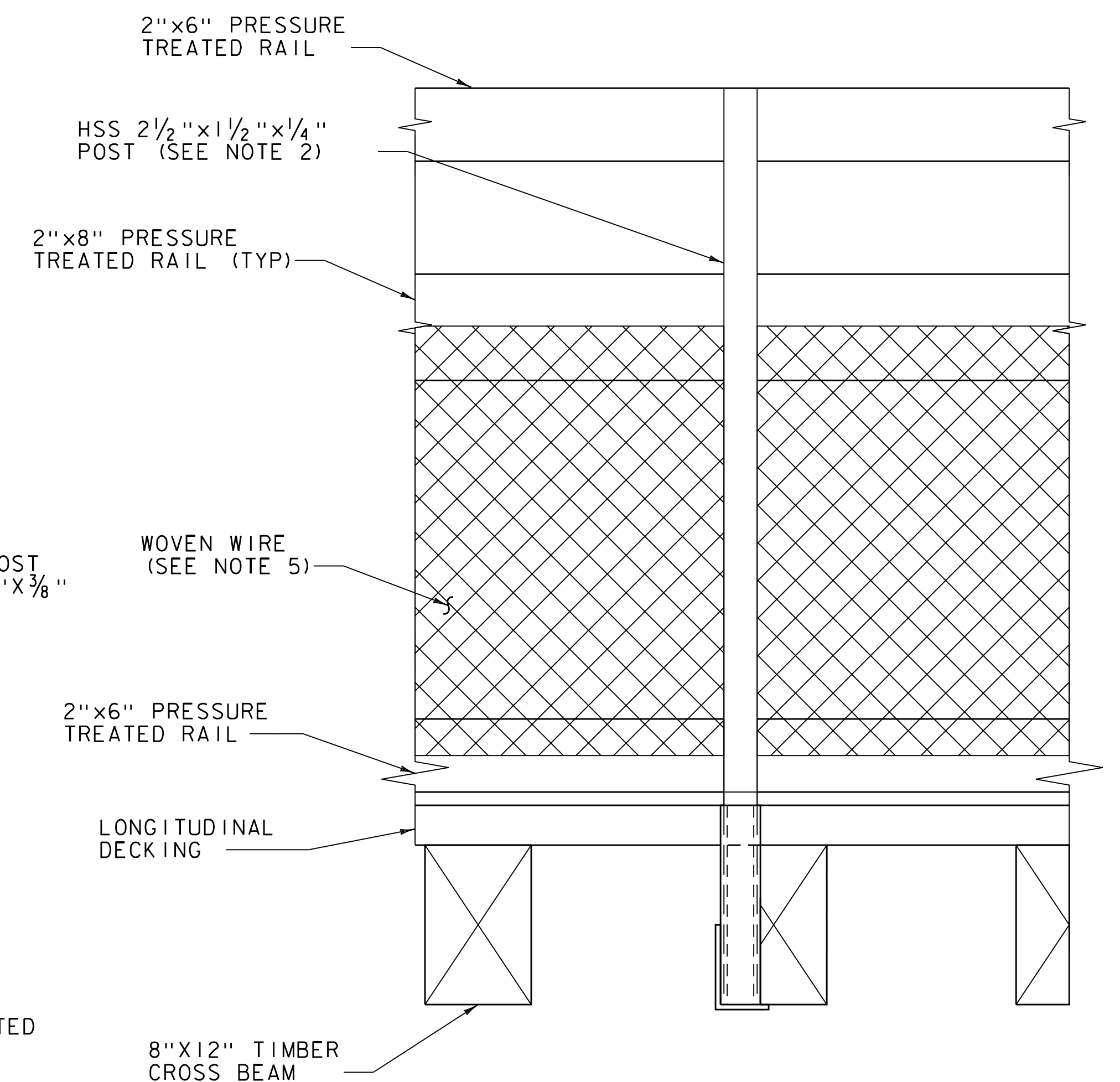


DETAIL A



NOTE: FOR 2x6, RAIL SPLICE PLATE SHALL BE 5"x5" AND TWO BOLTS PER RAIL. FOR 2x8, RAIL SPLICE PLATE SHALL BE 7"x5" WITH THREE BOLTS PER RAIL.

BRIDGE RAILING SPLICE DETAIL

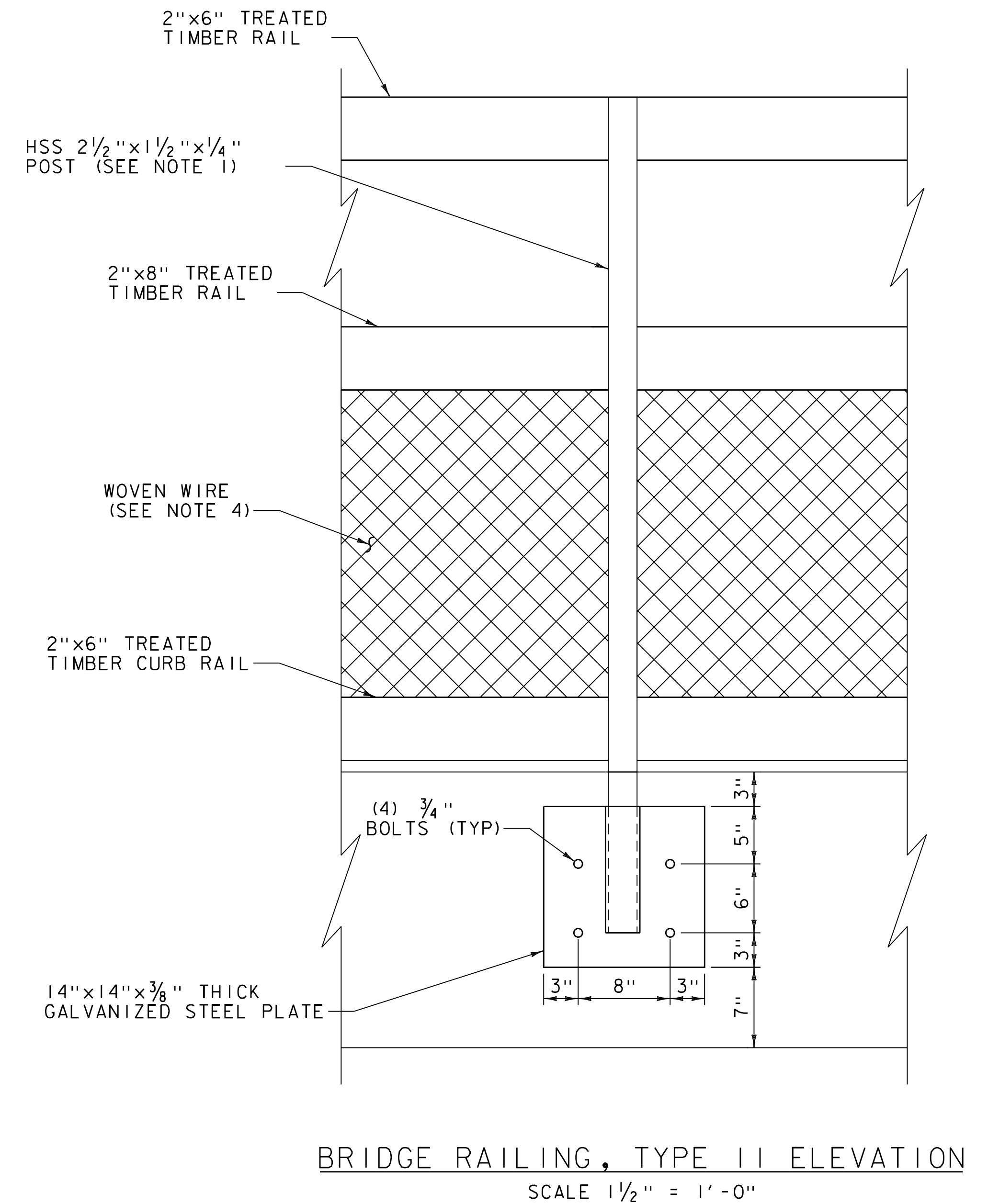
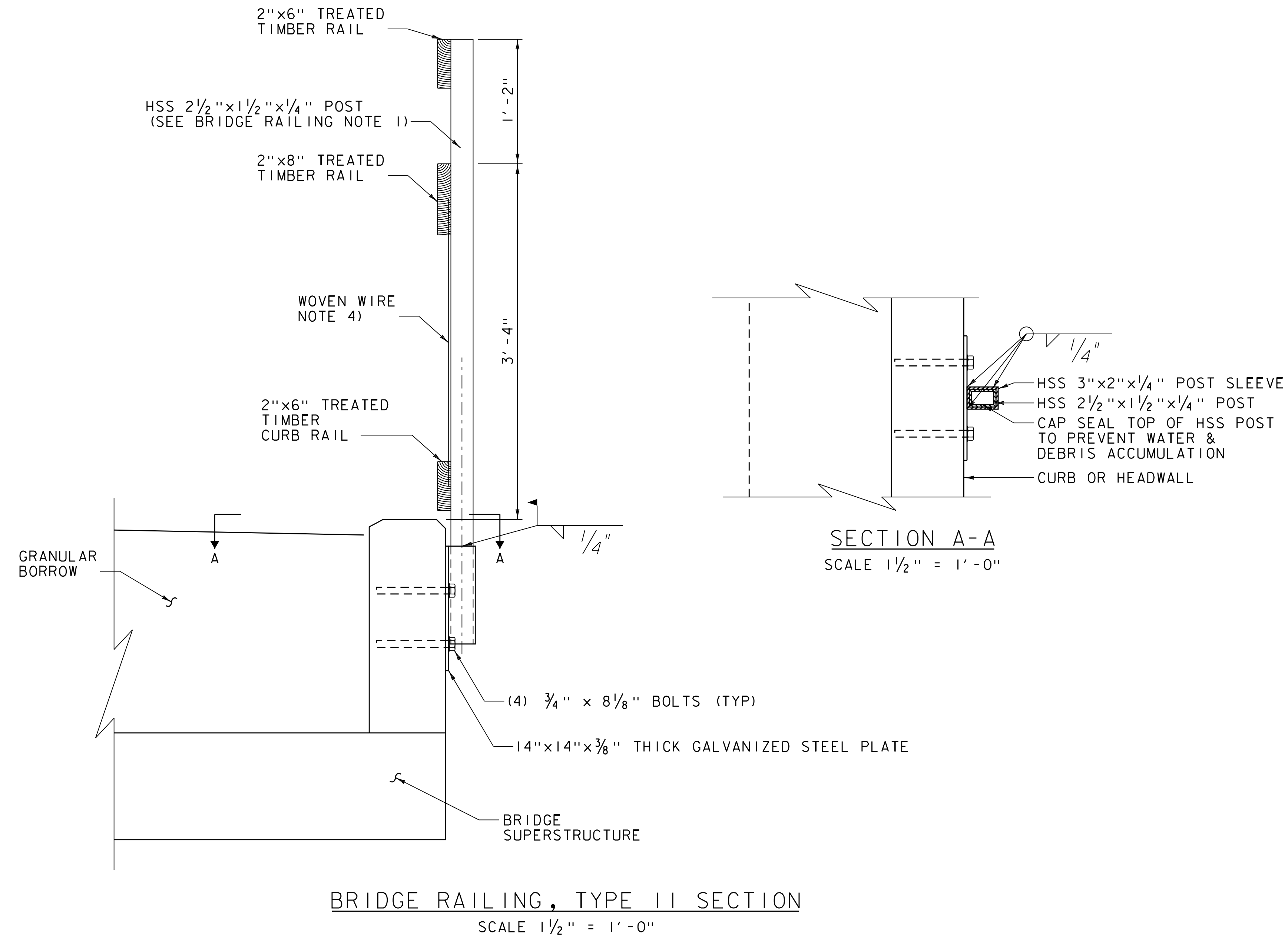


BRIDGE RAILING, TYPE I ELEVATION  
SCALE 1 1/2" = 1'-0"



PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I2)
FILE NAME:	z20f238_railing_details.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	VAST
RAILING DETAILS (SHEET 1 OF 2)	
PLOT DATE:	3/23/2021
DRAWN BY:	K.C. BARRY
CHECKED BY:	M.E. OOMS
SHEET	53 OF 102





#### BRIDGE RAILING NOTES:

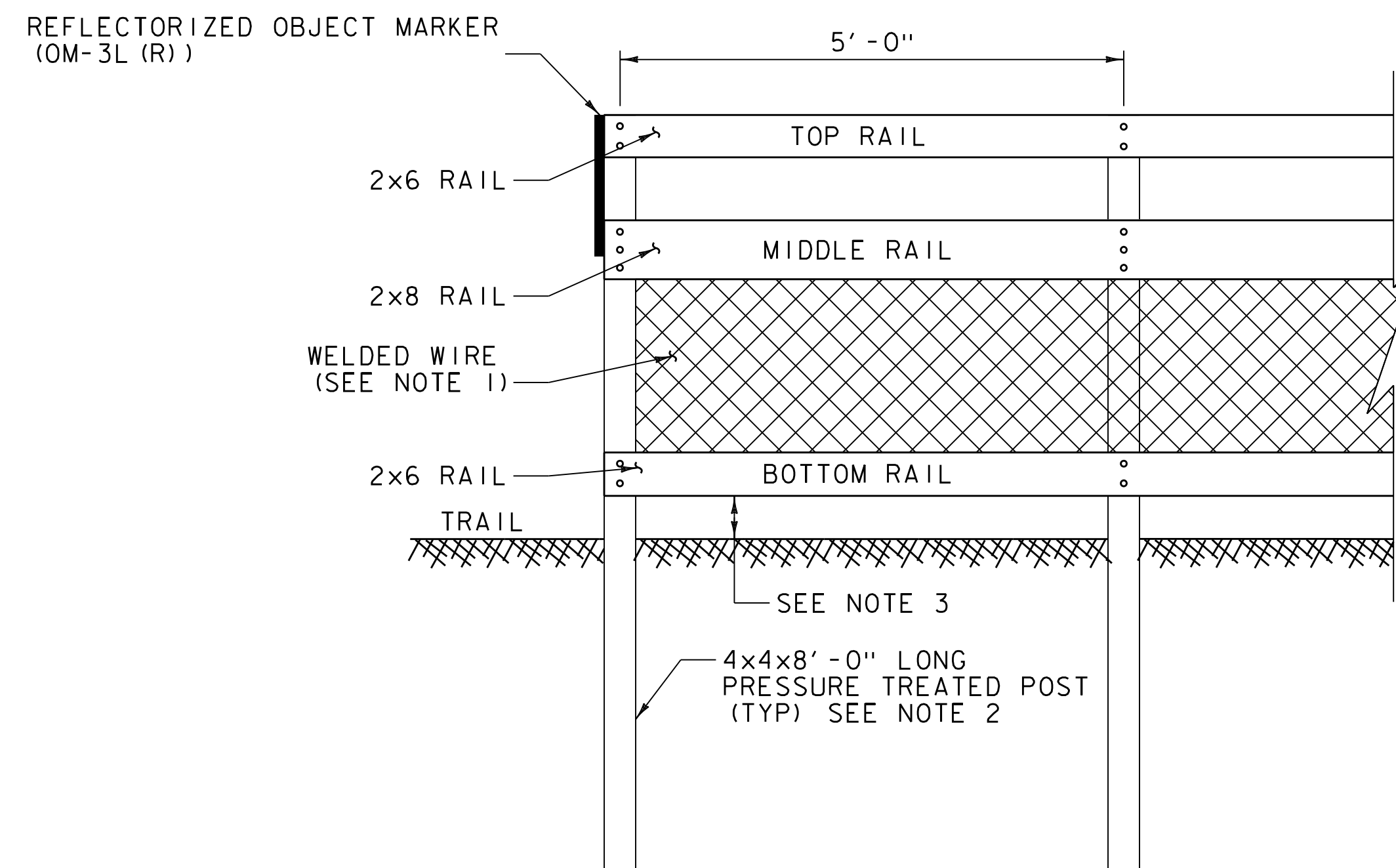
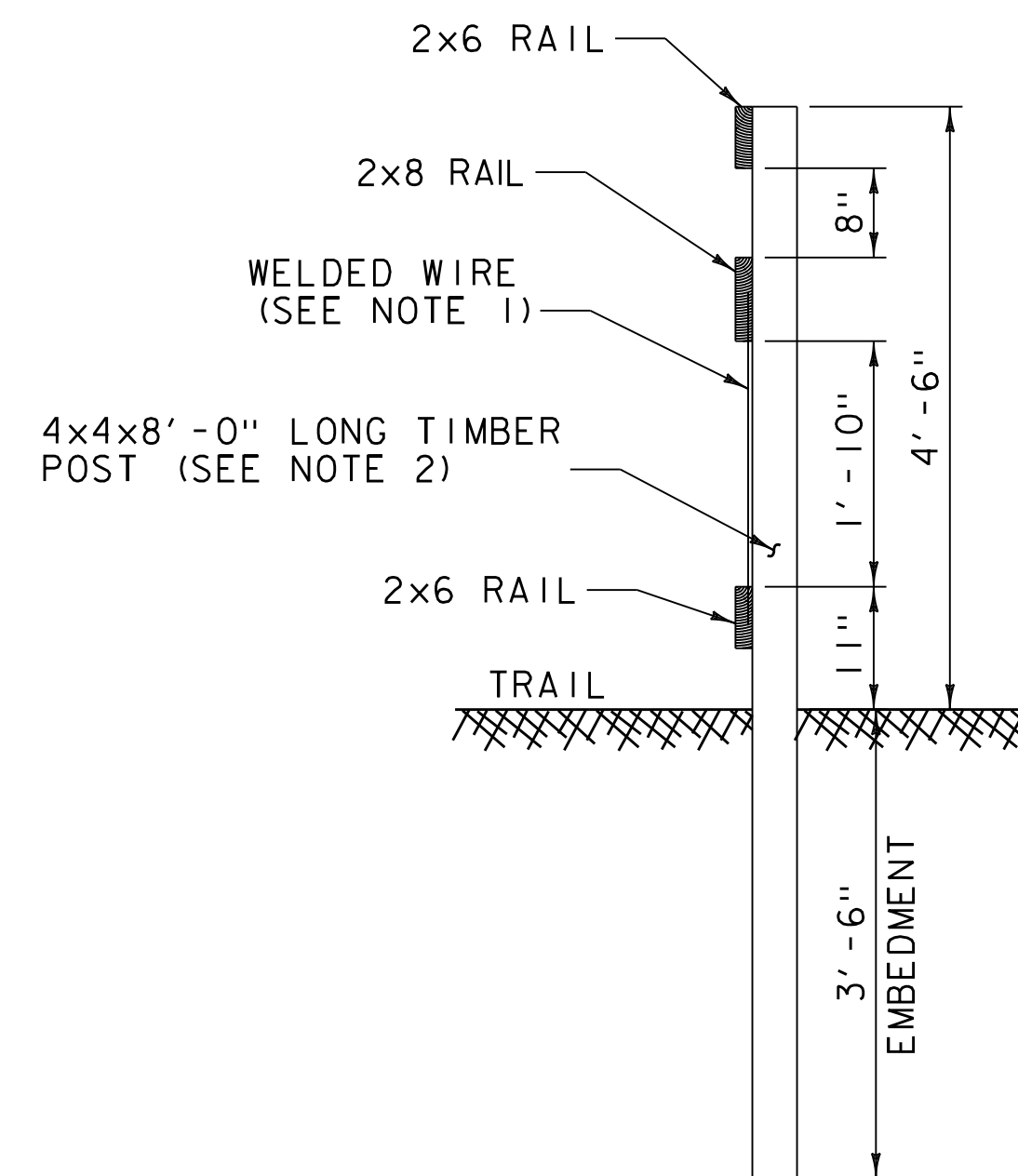
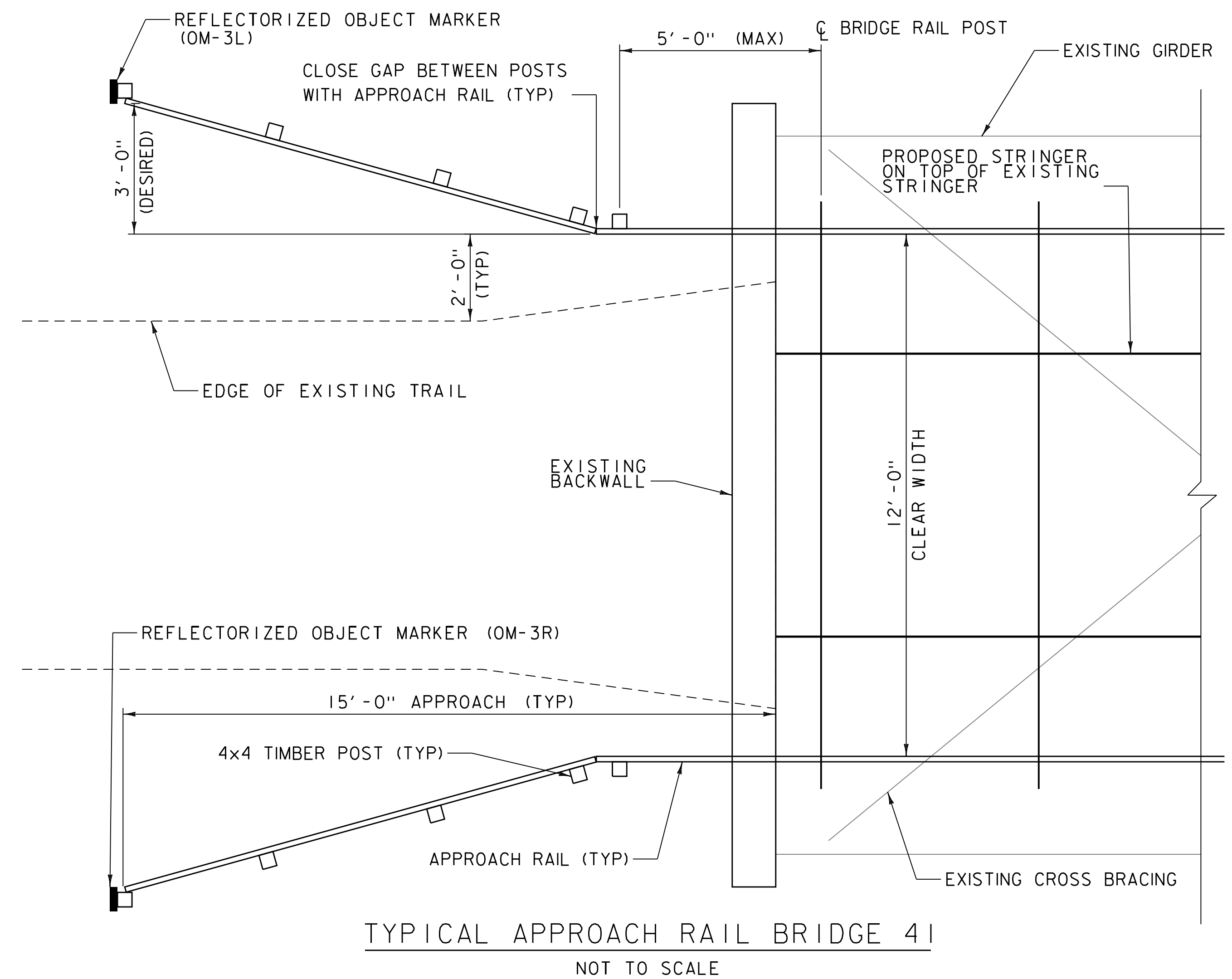
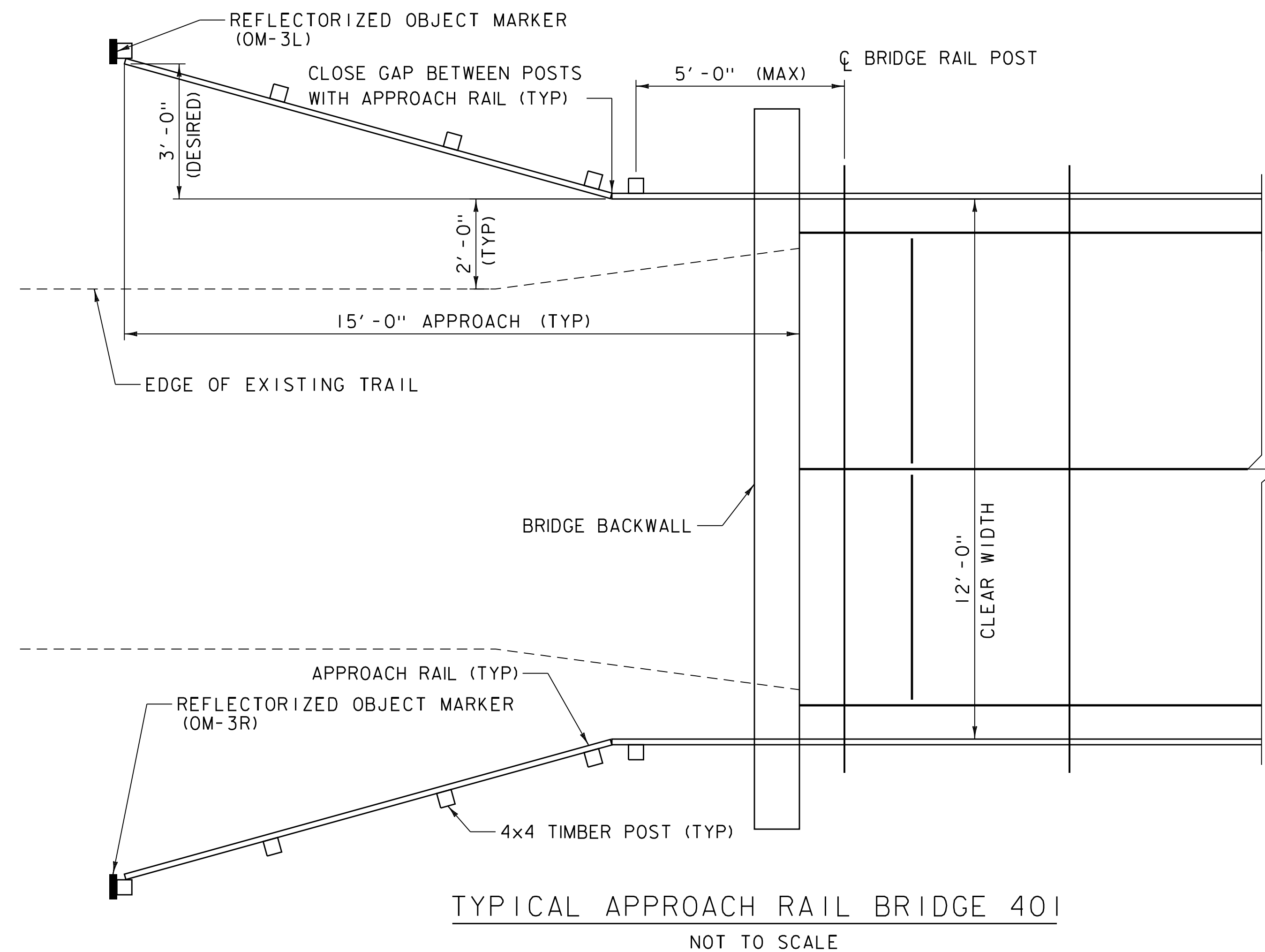
1. THIS CONCEPT ALLOWS THE RAILING TO BE ATTACHED TO CONCRETE SLAB STRUCTURES GREATER THAN 8' IN LENGTH. SEE NOTE 5 FOR STRUCTURES LESS THAN 8' IN LENGTH.
2. POST SPACING 6'-0".
3. ALL WELD LOCATIONS SHOULD BE FILLET WELDS OF 1/4" THROAT AND AT LEAST 2" IN LENGTH.
4. THE WOVEN WIRE SHALL BE VINYL PVC COATED, 2"x4" 11 GAUGE BLACK.
5. IF THE STRUCTURE SPANS 8'-0" OR LESS, CONTRACTOR MAY USE 6"x4" AND 8"x4" TREATED TIMBER RAILING (SPACED AS SHOWN IN THE RAILING SECTION) WITH 6"x6" TREATED TIMBER POST INSTALLED AT EACH END OF BRIDGE WITH 3'-6" EMBEDMENT INTO THE GROUND INSTEAD OF INSTALLING A METAL POST ON THE STRUCTURE. NUMBER OF METAL POSTS NEEDED SHALL BE FIELD VERIFIED PRIOR TO ORDERING MATERIALS.
6. THE TOP AND BOTTOM RAILS ARE TO BE ATTACHED TO THE POSTS WITH TWO 1/2" DIA. GALVANIZED CARRIAGE BOLTS WITH 3/4" WASHER UNDER THE NUT. THREE 1/2" DIA. CARRIAGE BOLTS WITH A 3/4" WASHER UNDER THE NUT SHALL BE USED FOR CONNECTING THE MIDDLE RAIL TO POSTS. ALL CARRIAGE BOLTS SHALL BE ASTM A307.



PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_railing_details.dgn PLOT DATE: 3/23/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: N.A. TRUSLOW  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
RAILING DETAILS (SHEET 2 OF 2) SHEET 54 OF 102





#### NOTES:

1. THE WELDED WIRE SHALL BE VINYL COATED, 2"x4" 11 GAUGE, BLACK.
2. WOODEN POSTS AND RAILS SHALL BE PRESSURE TREATED AND MEET THE REQUIREMENTS OF ITEM 522.25, "STRUCTURAL LUMBER AND TIMBER, TREATED".
3. THE TOP, MIDDLE, AND BOTTOM RAIL ARE TO BE SET AT THE SAME SLOPE AS THE TRAIL PROFILE GRADE AT THE EDGE OF THE TRAIL. IF THE OPENING BELOW THE BOTTOM RAIL EXCEEDS SIX (6) INCHES, THEN A FOURTH RAIL, 2x6 PRESSURE TREATED RAIL, SHALL BE INSTALLED UNDER THE BOTTOM RAIL.
4. THE TOP AND BOTTOM RAILS ARE TO BE ATTACHED TO THE POSTS WITH TWO 1/2" DIA. GALVANIZED CARRIAGE BOLTS WITH A 3/4" WASHER UNDER THE NUT. THREE 1/2" DIA. GALVANIZED CARRIAGE BOLTS WITH A 3/4" WASHER UNDER THE NUT SHALL BE USED FOR CONNECTING THE MIDDLE RAIL TO POST. ALL CARRIAGE BOLTS SHALL BE ASTM A307.
5. ALL COSTS ASSOCIATED WITH FABRICATING AND INSTALLING THE APPROACH/GUARD RAIL SHALL BE INCLUDED IN ITEM 900.640, "SPECIAL PROVISION (APPROACH RAIL, PRESSURE TREATED)".
6. PRESSURE TREATED RAIL CAN BE CANTILEVERED A MAX. OF 2'-0" BEYOND THE END OF POST.
7. ALL LUMBER TO BE DRESSED LUMBER. DIMENSIONS SHOWN ARE NOMINAL.

PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_approach_rail.dgn

PROJECT LEADER: E.P. DETRICK

DESIGNED BY: B.M. ROBERTS

TYPICAL APPROACH RAIL SHEET

PLOT DATE: 3/23/2021

DRAWN BY: B.M. ROBERTS

CHECKED BY: B.O. CRONIN

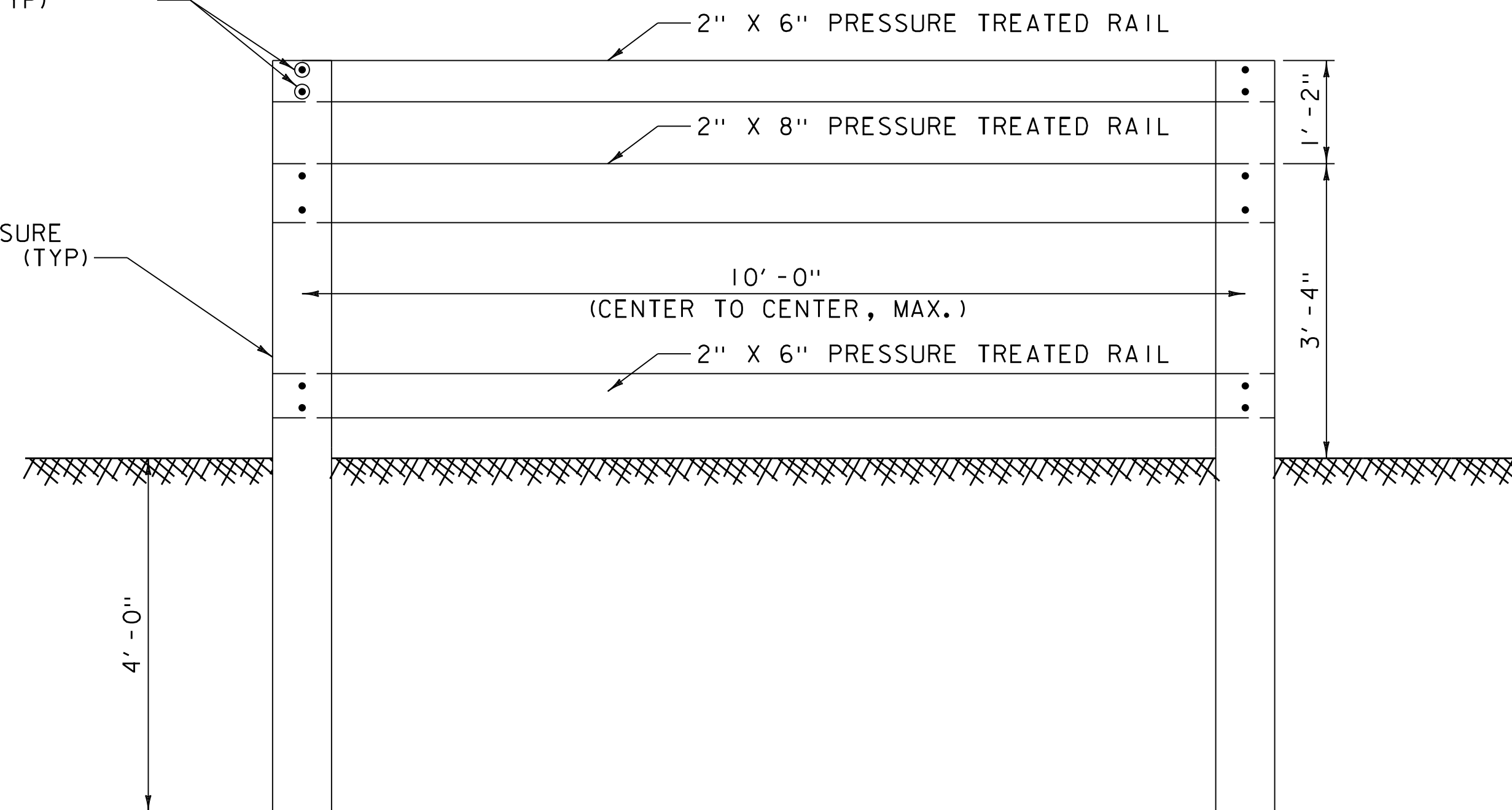
SHEET 55 OF 102





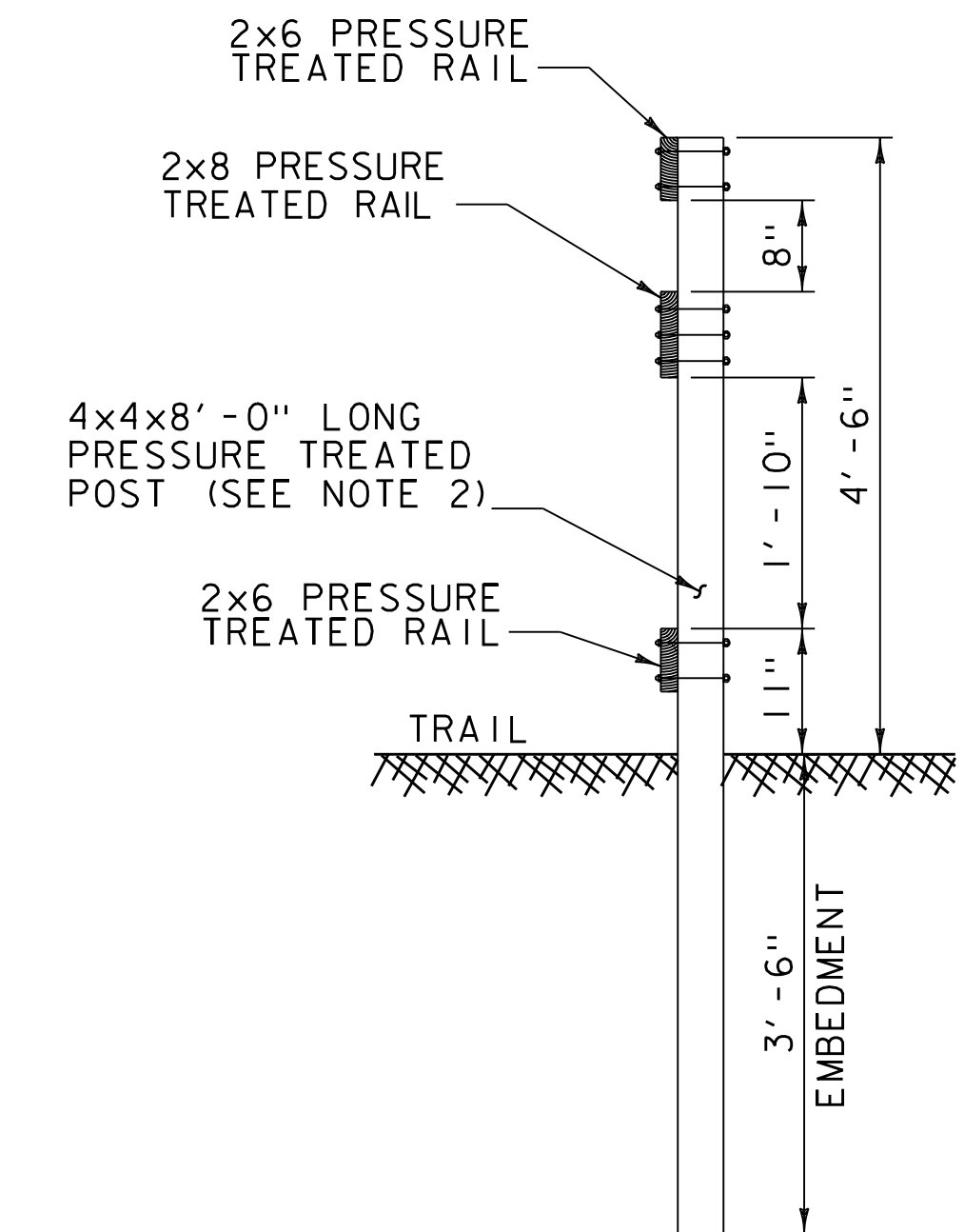
(2) 1/2" CARRIAGE BOLTS  
EACH CONNECTION WITH 3/4" O.D. WASHERS (TYP)

4" X 4" PRESSURE  
TREATED POST (TYP)



TYPICAL GUARDRAIL ELEVATION

SCALE 3/4" = 1' - 0"



GUARDRAIL SECTION

SCALE 3/4" = 1' - 0"

NOTES:

1. WOODEN POSTS AND BOARDS SHALL MEET THE REQUIREMENTS OF SUBSECTION 709.11.
2. THE TOP, MIDDLE, AND BOTTOM RAIL ARE TO BE SET AT THE SAME SLOPE AS THE TRAIL PROFILE GRADE AT THE EDGE OF THE TRAIL. IF THE OPENING BELOW THE BOTTOM RAIL EXCEEDS SIX (6) INCHES, THEN A FOURTH RAIL, 2x6 PRESSURE TREATED RAIL, SHALL BE INSTALLED UNDER THE BOTTOM RAIL.
3. ALL RAILS ARE TO BE ATTACHED TO THE POSTS WITH TWO 1/2" DIA. GALVANIZED CARRIAGE BOLTS WITH A 3/4" WASHER UNDER THE NUT. ALL CARRIAGE BOLTS SHALL BE ASTM A307.
4. ALL COSTS ASSOCIATED WITH FABRICATING AND INSTALLING THE GUARD RAIL SHALL BE CONSIDERED INCIDENTAL TO ITEM 900.640, "SPECIAL PROVISION (GUARD RAIL, PRESSURE TREATED)".



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238_guardrail.dgn

PROJECT LEADER: E.P. DETRICK

DESIGNED BY: G.L. BAKOS

TYPICAL GUARD RAIL SHEET

PLOT DATE: 3/23/2021

DRAWN BY: K.C. BARRY

CHECKED BY: M.E. OOMS

SHEET 56 OF 102



1. Q SHALL BE 75° TO 90°, CROSSINGS WHICH CANNOT MEET THE MINIMUM 75° ANGLE SHALL BE RECONFIGURED TO IMPROVE THE CROSSING ANGLE TO THE EXTENT SITE CONDITIONS ALLOW.
2. CONCRETE RAMP WIDTH TO MATCH APPROACHING TRAIL WIDTH AT INTERSECTION WITH ROADWAY.
3. SEE TRAFFIC SIGN SUMMARY SHEETS AND ETIQUETTE SIGN SHEET FOR ADDITIONAL INFORMATION.
4. SIGNS, AS INDICATED IN THE TRAFFIC SIGN SUMMARY SHEET, SHALL BE PLACED SUCH THAT THE EDGE OF THE SIGN IS NO CLOSER THAN 3' AND NO FURTHER THAN 5' FROM THE EDGE OF TRAIL AND 5' FROM THE TRAIL SURFACE TO THE BOTTOM OF THE SIGN.
5. SIGNS SHALL BE MOUNTED ON 2" SQUARE STEEL POSTS. THE POSTS WILL BE PAID UNDER ITEM 675.341 "SQUARE TUBE SIGN POST AND ANCHOR".
6. W11-5 SIGN TO LOCATED AT ALL FARM AND FARM ROAD CROSSINGS.
7. THE W11-15a AND W16-2p SIGN ASSEMBLIES ARE NOT REQUIRED ON ROADWAYS WITH SPEEDS OF 35 MPH OR LOWER.
8. SEE VTRANS TEL 18-200 AND STANDARD DRAWING E-121 FOR SIGN LOCATIONS AND SPACING REQUIREMENTS.

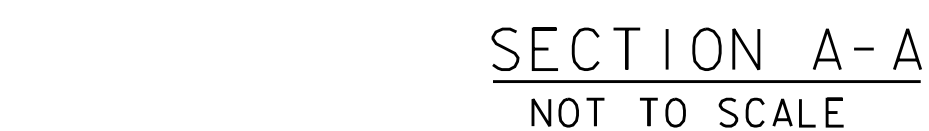


Diagram illustrating the determination of the distance  $X'$  from a road to a railroad crossing, based on the Road Speed Limit.

**Left Diagram:** Shows a road crossing a railroad track. The distance  $X'$  is measured perpendicular to the road. The railroad track is labeled  $RI-15a/WI6-2P$ . The road is labeled  $WII-15a/WI6-7P$ . The distance  $X'$  is labeled  $X' \text{ (SEE TABLE)}$ .

**Right Diagram:** Shows a road crossing a railroad track. The distance  $X'$  is measured along the road from a point on the road to the crossing. The railroad track is labeled  $RI-15a/WI6-2P$ . The road is labeled  $WII-15a/WI6-7P$ . The distance  $X'$  is labeled  $X' \text{ (SEE TABLE)}$ .

**Table:**

DIST. (FT)	ROAD SPEED LIMIT
$X'$	MPH
*	<35
125'	40
175'	45
250'	50

* SEE NOTE 7

The drawing illustrates an accessible road crossing approach, showing both a plan view and a cross-section view.

**Plan View (Left):**

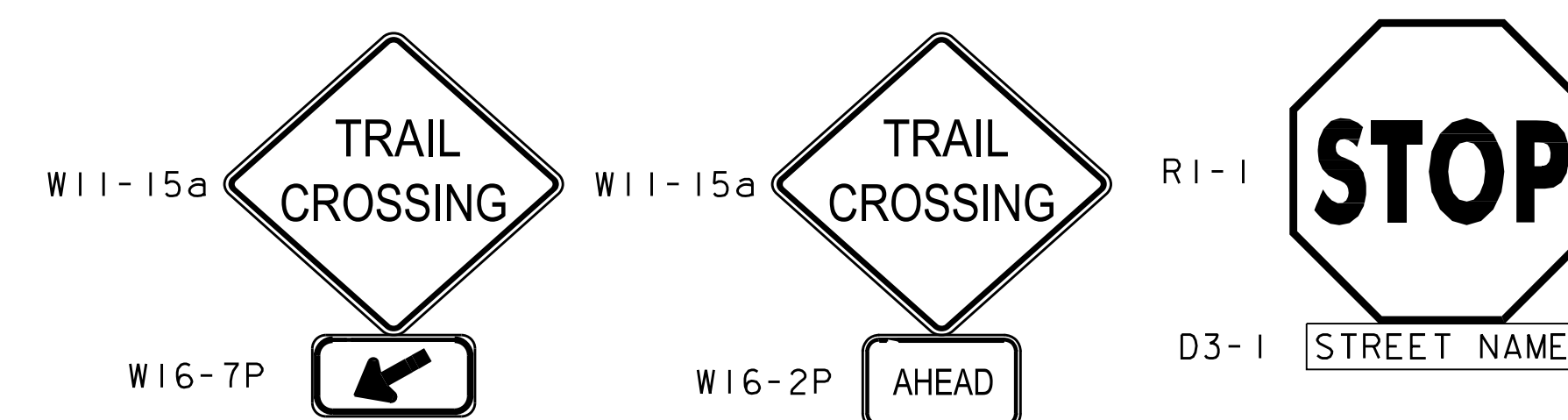
- Shows the layout of the crossing approach, including the "PAVED TOWN/STATE HIGHWAY" and the "PROPOSED TRAIL".
- Dimensions include a "10'-0" (TYP) MATCH ADJACENT PROPOSED TRAIL WIDTH" and a "RADIUS TO BE DETERMINED IN FIELD BY ENGINEER".
- Materials and layers are specified: "3" AGGREGATE SURFACE COURSE", "CONCRETE", and "AGGREGATE SURFACE COURSE".
- Other features include a "12" WHITE STOP BAR", "RI-1/D3-1" (reflective material), and a "NEW 8" CONCRETE SIDEWALK AT SAME CROSS-SLOPE AS RAIL TRAIL".
- Labels "SEE NOTE 1" point to specific details.
- The plan is labeled "PLAN NOT TO SCALE".

**Cross-Section View (Right):**

- Shows the vertical profile of the crossing approach, including the "EXISTING ROADWAY", "SHOULDER", and "PROPOSED TRAIL".
- Dimensions include a "5'-0" total width" and a "1'-0" width" for the central section.
- Materials and layers are specified: "TYPE 1 STONE", "STONE SWALE", and "CONCRETE".
- Other features include a "NEW 8" CONCRETE SIDEWALK AT SAME CROSS-SLOPE AS RAIL TRAIL" and a "12" WHITE STOP BAR".
- The cross-section is labeled "STONE SWALE NOT TO SCALE".

**Additional Labels:**

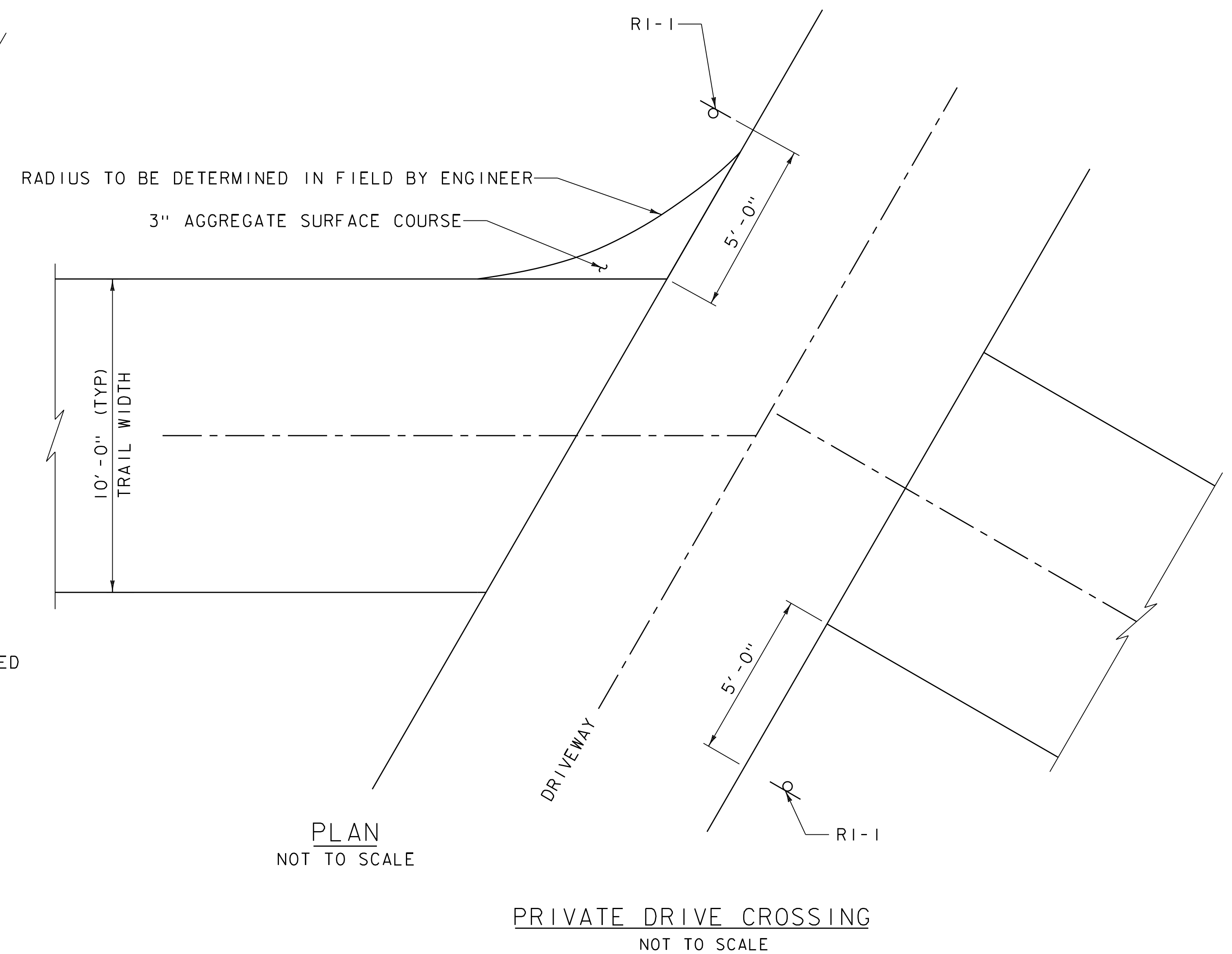
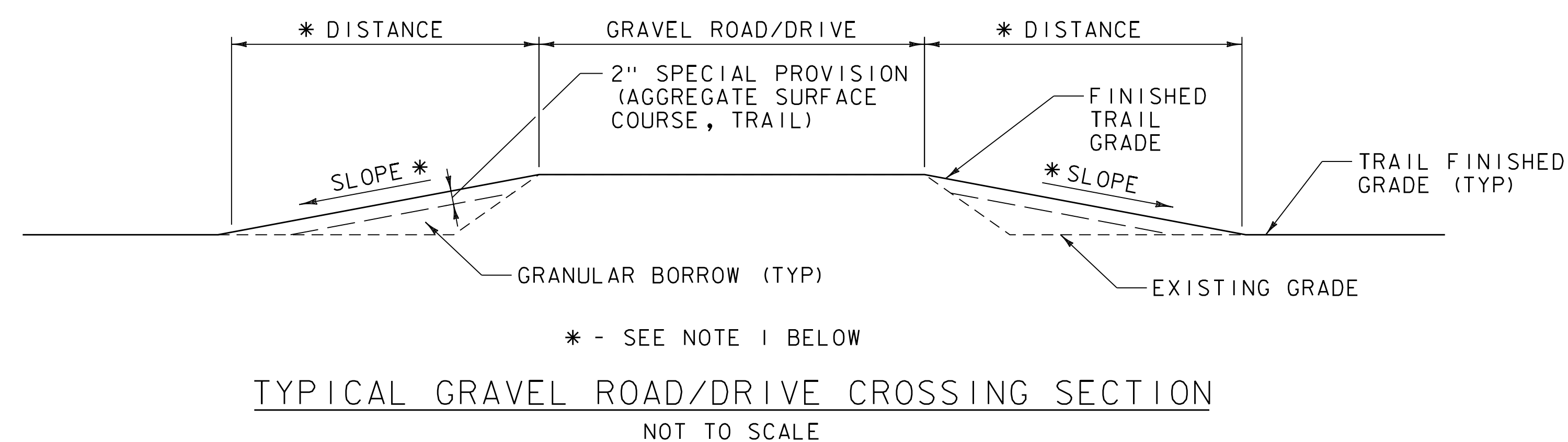
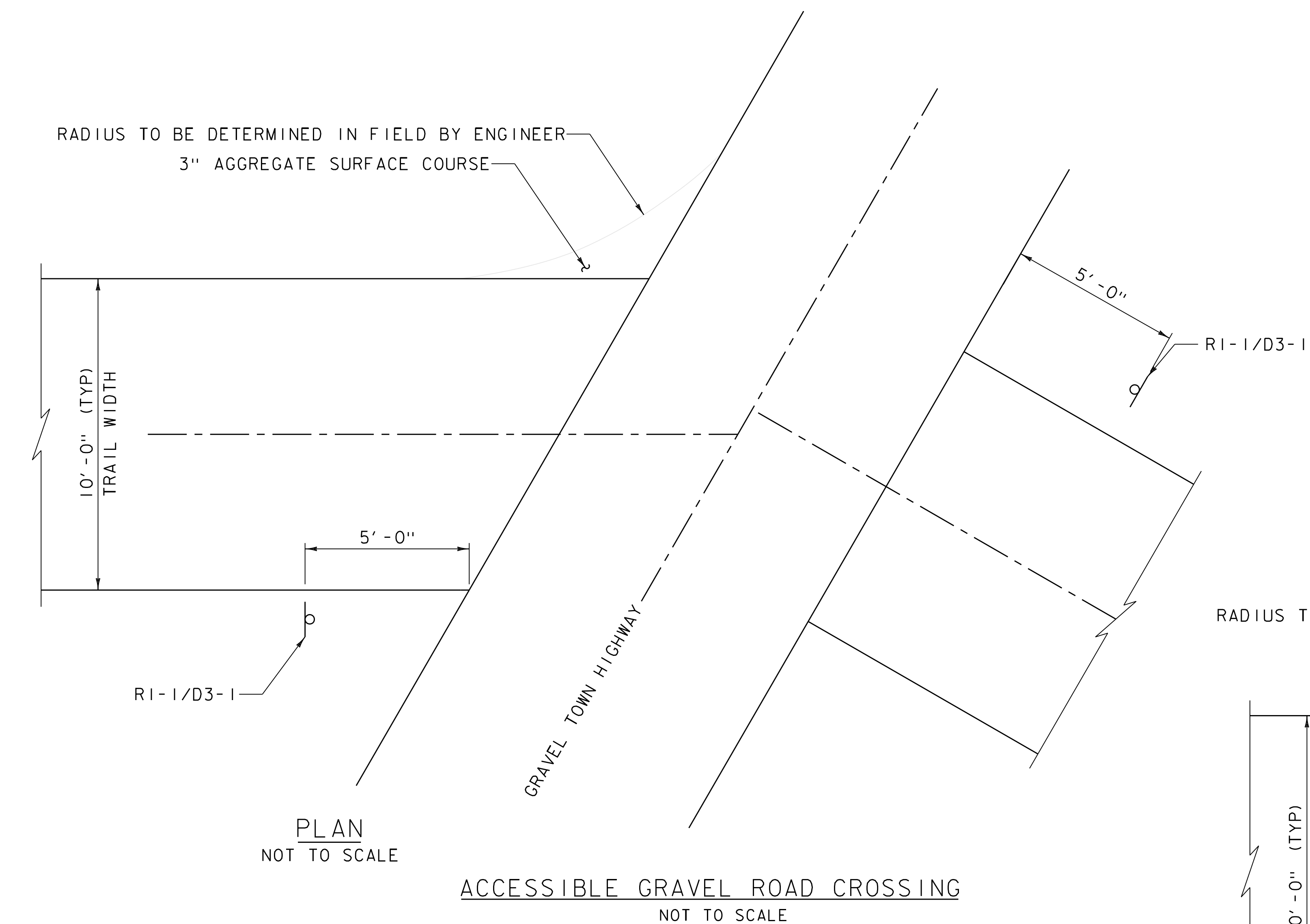
- "W11-15a" and "W16-7P" are likely reference codes for the drawing.
- "ACCESSIBLE ROAD CROSSING APPROACH NOT TO SCALE" is the overall title.



The diagram illustrates a road intersection. On the left, a diamond-shaped warning sign depicts a sheep crossing a road. To the left of the sign is the text 'W11-5'. A dashed line representing a 'FARM ROAD' intersects a solid vertical line representing a main road. On the main road, a 'W11-5' marker is positioned near the intersection.

## STANDARD FARM CROSSING SIGNS





NOTES:

1. GRANULAR BORROW SHALL BE ADDED TO FEATHER TRAIL GRADE SUCH THAT FINAL GRADE ALONG TRAIL IS 5% OR LESS.
2. GRANULAR BORROW SHALL BE TOPPED WITH 2" ITEM 900.608 "SPECIAL PROVISION (AGGREGATE SURFACE COURSE, TRAIL)" TO ACHIEVE FINAL GRADE ELEVATIONS AS SHOWN IN TYPICAL TRAIL CROSS SECTIONS .





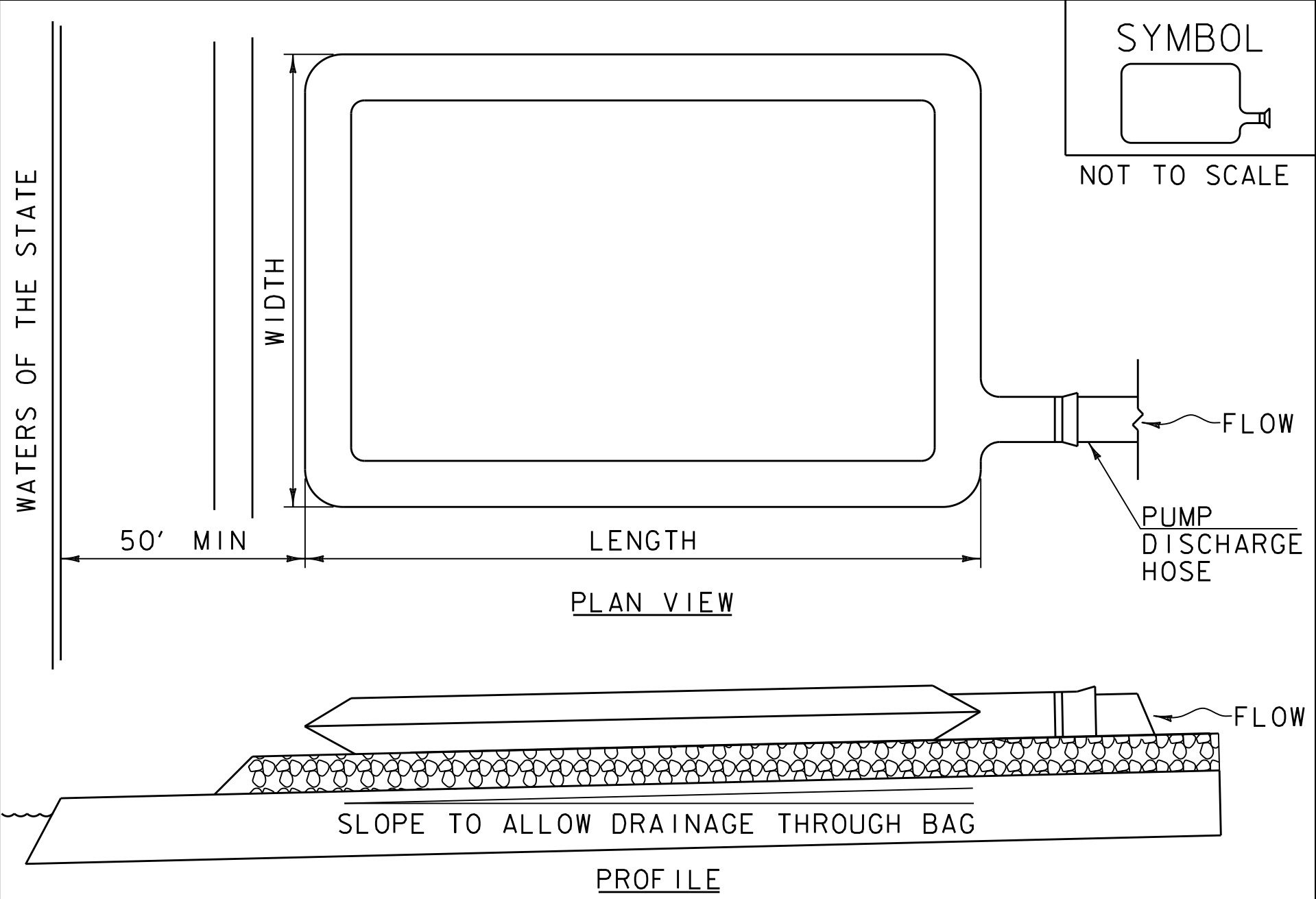
VAOT RURAL AREA MIX						
LBS/AC			NAME	LATIN NAME	GERM	PURITY
WEIGHT	BROADCAST	HYDROSEED				
37.5%	22.5	45	CREeping RED FESCUE	FESTUCA RUBRA VAR. RUBRA	85%	98%
37.5%	22.5	45	TALL FESCUE	FESTUCA ARUNDINACEA	90%	95%
5.0%	3	6	RED TOP	AGROSTIS GIGANTEA	90%	95%
15.0%	9	18	WHITE FIELD CLOVER	TRIFOLIUM REPENS	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	LOLIUM MULTIFLORUM	85%	95%
100%	60	120				

WET AREA SEED MIX	
SEED	% WEIGHT
VIRGINIA WILD RYE GRASS	20
FOX SEDGE	10
AMERICAN MANNAGRASS	20
GIANT BUR-REED	10
COMMON THREE-SQUARE	20
SOFT-STEM BULRUSH	10
CANADA RUSH	10
RATE OF APPLICATION: 10# PER ACRE (UP TO 15# PER ACRE IF HYDROSEEDDED)	

CONSTRUCTION GUIDANCE

1. SEED MIX: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER ON WHICH SEED MIX TO USE.
2. SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
4. FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER.
5. HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
6. STRAW MULCH: TO BE PLACED ON EARTH SLOPES IN WETLANDS AND WETLAND BUFFERS AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
7. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED PROPOSED FOR USE WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED.
8. TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

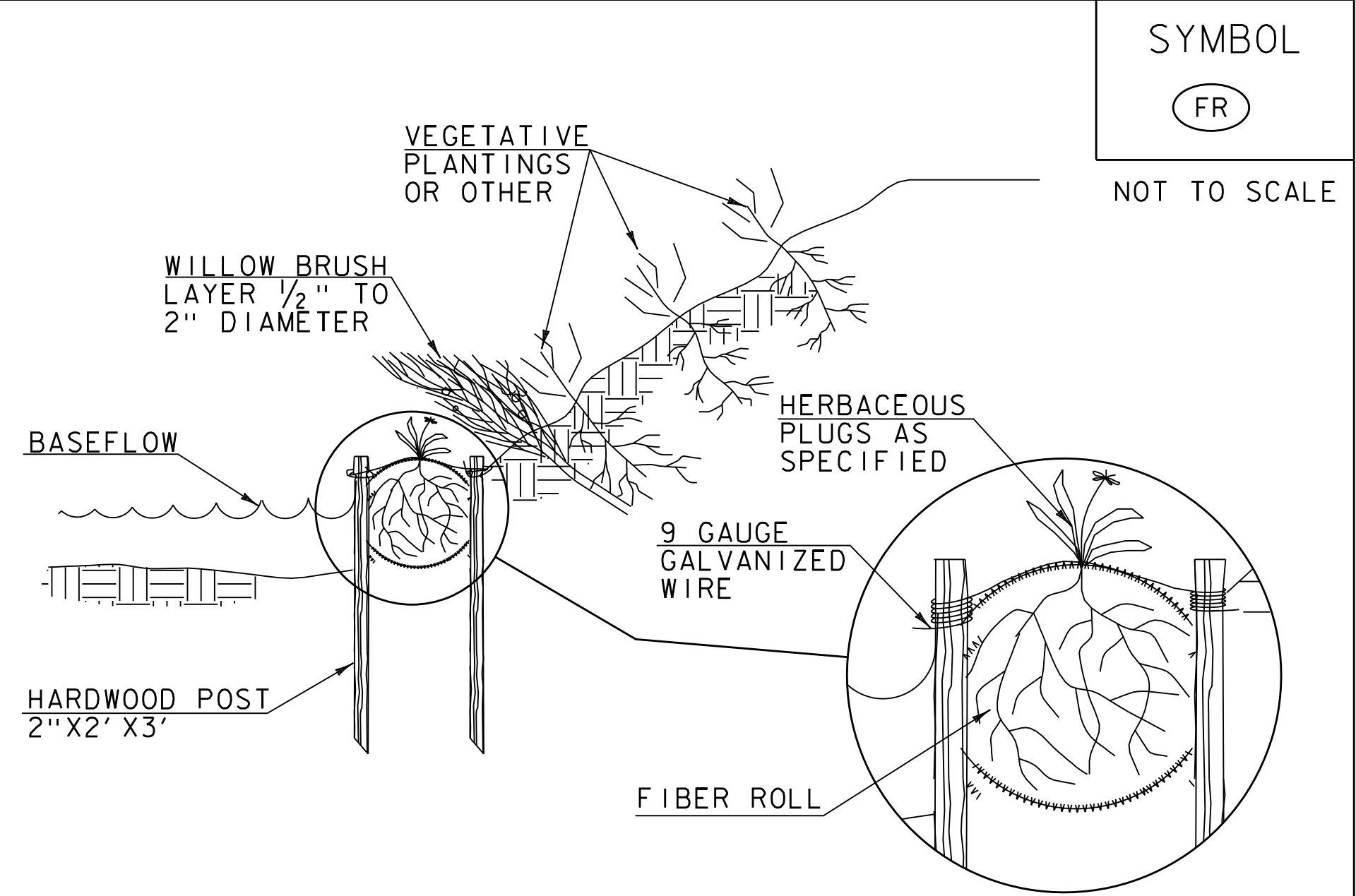
ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES	TURF ESTABLISHMENT
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 FOR SEED (PAY ITEM 651.15)	REVISIONS JANUARY 12, 2015    WHF



CONSTRUCTION SPECIFICATIONS

1. THE PRIMARY PURPOSE OF FILTER BAG IS TO RETAIN SILT, SAND, AND FINES DURING DEWATERING OPERATIONS.
2. FILTER BAGS SHALL BE INSTALLED ON A VEGETATED SLOPE GRADED TO ALLOW INCOMING WATER TO FLOW THROUGH THE BAG.
3. FILTER BAGS MAY ALSO BE PLACED ON COARSE AGGREGATE, STONE, OR HAYBALES TO INCREASE FILTRATION EFFICIENCY.
4. FILTER BAGS SHALL BE LOCATED A MINIMUM OF 50' FROM WATERS OF THE STATE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. THE NECK OF THE FILTER BAG SHALL BE STRAPPED TIGHTLY TO THE DISCHARGE HOSE.
6. A FILTER BAG IS FULL WHEN IT NO LONGER CAN EFFICIENTLY FILTER SEDIMENT OR ALLOW WATER TO PASS AT A REASONABLE RATE.
7. FILTER BAG SHALL BE DISPOSED OF AS APPROVED IN THE EPSC PLAN OR AS DIRECTED BY THE ENGINEER.

NOTES: REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.	
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR FILTER BAG (PAY ITEM 653.45) AND AS SPECIFIED IN THE CONTRACT.	REVISIONS MARCH 24, 2008    WHF JANUARY 13, 2009    WHF



CONSTRUCTION SPECIFICATIONS

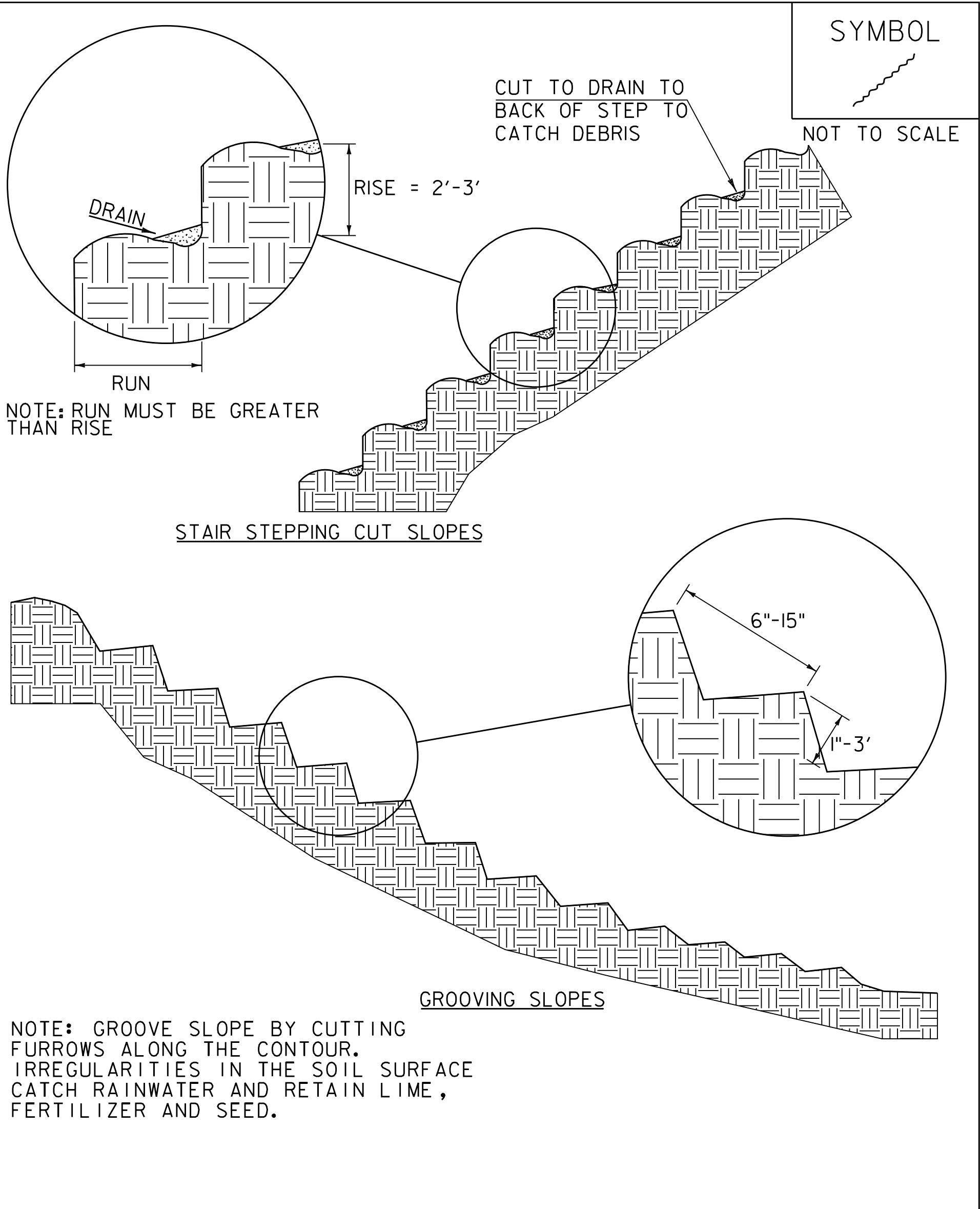
1. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW BASEFLOW OR A 4" TRENCH ON SLOPE CONTOURS
2. PLACE THE ROLL IN THE TRENCH AND ANCHOR WITH 2"x2" POSTS PLACED ON BOTH SIDES FO THE ROLL AND SPACED LATERALLY ON 2' TO 4' CENTERS. TRIM THE TOP OF THE POSTS EVEN WITH THE EDGE OF THE ROLL , IF NECESSARY.
3. NOTCH THE POSTS AND TIE TOGETHER, ACROSS THE ROLL , WITH 9 GAUGE GALVANIZED WIRE OR 1/8" DIAMETER BRAIDED NYLON ROPE.
4. PLACE SOIL EXCAVATED FROM THE TRENCH BEHIND THE ROLL AND HAND TAMP. PLANTWITH SUITABLE HERBACEOUS OR WOODY VEGETATION AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS. VEGETATION SHALL BE PLACED IMMEDIATELY ADJACENT TO THE ROLL TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION, IF SPECIFIED, SHALL BE PLANTED INTO THE FIBER ROLL.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION	FIBER ROLL (EROSION LOG)
NOTES: REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.	REVISIONS MARCH 21, 2008    WHF JANUARY 13, 2009    WHF
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR EROSION LOG (PAY ITEM 653.60)	



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I2)	
FILE NAME: z20f238.EPSC.det.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: VTRANS
DESIGNED BY: VTRANS	CHECKED BY: J.S. GINGRAS
EPSC DETAIL SHEET (10F 2)	SHEET 59 OF 102



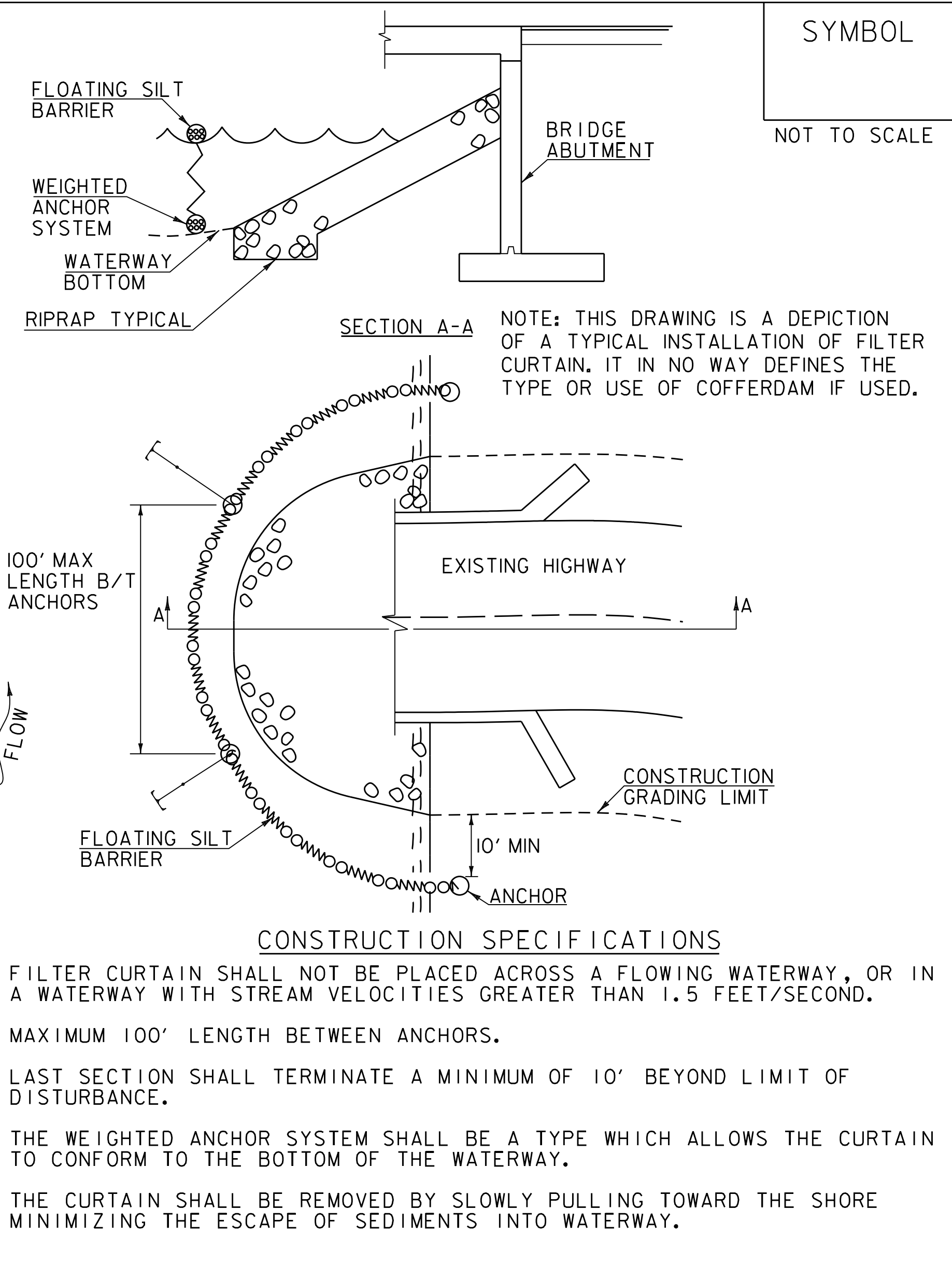


ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
ORIGINALLY DEVELOPED BY USDA-NRCS  
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SURFACE ROUGHENING

NOTES:  
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR  
EROSION PREVENTION & SEDIMENT CONTROL -2006- " FROM  
THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL  
GUIDANCE.  
  
THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE  
CONTRACT

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	



FILTER CURTAIN

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH  
SECTION 649 FOR GEOTEXTILE FOR FILTER CURTAIN (PAY  
ITEM 649.6I).

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	
SEPTEMBER 4, 2009	WHF	



PROJECT NAME: SWANTON - ST JOHNSBURY

PROJECT NUMBER: STP LVRT(I2)

FILE NAME: z20f238.EPSC.det.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: VTRANS  
EPSC DETAIL SHEET (2 OF 2)

PLOT DATE: 3/23/2021  
DRAWN BY: VTRANS  
CHECKED BY: J.S. GINGRAS  
SHEET 60 OF 102



EPSC PLAN NARRATIVE

1. PROJECT DESCRIPTION

THE OVERALL PROJECT INVOLVES REHABILITATION OF THE LAMOILLE VALLEY RAIL TRAIL. THE SPECIFIC WORK INCLUDED IN CONTRACT STP LVRT(12) BEGINS AT THE INTERSECTION OF NORTH MAIN STREET IN HARDWICK AND EXTENDS WESTERLY 12.5 MILES TO VT ROUTE 15A IN MORRISVILLE. WORK TO BE PERFORMED UNDER THIS CONTRACT INCLUDES CONSTRUCTION OF TRAIL SURFACES, CLEARING, DITCHING, INSTALLATION OF CULVERTS, SIGNING, MISCELLANEOUS STRUCTURE REPAIRS AND BRIDGE MODIFICATIONS INCLUDING DECKING AND RAILING INSTALLATION.

IT IS ANTICIPATED THAT CONSTRUCTION WILL LAST TWO CONSTRUCTION SEASONS.

2. AMOUNT OF DISTURBANCE & RISK EVALUATION

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN FOR CONTRACT STP LVRT(12) IS APPROXIMATELY **42.3 ACRES**.

IN CONJUNCTION WITH OTHER LVRT CONTRACTS, STP LVRT(12) HAS RECEIVED COVERAGE UNDER AN INDIVIDUAL PERMIT FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES. COMPONENTS OF THE PROJECT MAY BE CONSTRUCTED CONCURRENTLY WITH OTHER LVRT PROJECTS, INCLUDING STP LVRT(10), STP LVRT(11), AND STP LVRT(13).

THE MAXIMUM CONCURRENT EARTH DISTURBANCE FOR THE COMBINED LVRT PROJECTS PERMITTED UNDER THE INDC IS **16.3 ACRES**. THE MAXIMUM CONCURRENT EARTH DISTURBANCE ASSOCIATED WITH STP LVRT(12) IS **4 ACRES**. THE CONTRACTOR MUST COORDINATE WITH THE VTRANS RESIDENT ENGINEER AND DESIGNATED ENVIRONMENTAL SPECIALIST TO ENSURE THAT THIS LIMIT IS NOT EXCEEDED DURING THE COURSE OF THE PROJECT.

ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

3. MAJOR COMPONENTS & SEQUENCING

THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT OPEN TO EROSION AT ANY GIVEN TIME.

DUE TO THE LINEAR NATURE OF THIS PROJECT, IT IS POSSIBLE THAT MULTIPLE PORTIONS OF TRAIL WILL BE UNDER CONSTRUCTION SIMULTANEOUSLY. EACH SITE VARIES IN NECESSARY ACTIVITIES, ALTHOUGH THE GENERAL MAJOR COMPONENTS AND SEQUENCE IS LISTED BELOW, AS NEEDED. THE CONTRACTOR SHALL DETERMINE THE FINAL SEQUENCING USED.

- ESTABLISH PERIMETER CONTROLS AND MARK PROJECT BOUNDARIES AT LOCATIONS WHERE NEEDED OR AS DIRECTED BY THE RESIDENT ENGINEER
- INSTALL SEDIMENT CONTROL MEASURES
- TREE / VEGETATION CLEARING
- CONSTRUCT TEMPORARY ACCESS ROADS AS NEEDED
- DEMOLISH AND REMOVE EXISTING INFRASTRUCTURE AS NEEDED
- CONSTRUCT PROPOSED INFRASTRUCTURE AS NEEDED
- REGRADE / BUILD FINAL TRAIL SURFACE TRAIL
- FINAL STABILIZATION WITH TRAIL MATERIAL, SEED AND RECP OR STONE FILL
- REMOVE SEDIMENT CONTROLS AND PERIMETER CONTROLS UPON ESTABLISHMENT OF FINAL STABILIZATION

4. SITE DESCRIPTION

4.1 VEGETATED BUFFERS

MAINTAINING VEGETATED BUFFERS ALONG STREAM BANKS, WETLANDS OR OTHER SENSITIVE AREAS IS A CRUCIAL EROSION AND SEDIMENT CONTROL MEASURE THAT SHOULD BE IMPLEMENTED WHEREVER POSSIBLE.

THIS PROJECT DOES NOT RELY ON VEGETATED BUFFERS AS A MITIGATING RISK FACTOR. CULVERT AND BRIDGE REPAIR WORK WILL OCCUR WITHIN OR IMMEDIATELY ADJACENT TO STREAM BANKS. AT SOME LOCATIONS, IN-STREAM WORK IS REQUIRED TO REPLACEMENT THE EXISTING STRUCTURES. WORK WITHIN WETLANDS AND OTHER RESOURCE AREAS HAS BEEN AVOIDED AND MINIMIZED TO THE EXTENT PRACTICABLE.

4.2 STREAM CROSSINGS

THIS PROJECT INCLUDES 42 STREAM CROSSINGS, AS DESCRIBED IN SECTION 5.1 BELOW. WORK WITHIN THE WATER IS BEING AUTHORIZED THROUGH THE VT ANR DEC RIVER MANAGEMENT PROGRAM AND THE US ARMY CORPS OF ENGINEERS.

4.3 WETLANDS

THE LVRT(12) PROJECT INVOLVES 36,000 SF OF WETLAND AND 31,000 SF OF WETLAND BUFFER IMPACTS. THE WORK WITHIN THESE AREAS IS BEING AUTHORIZED THROUGH THE VT ANR WETLANDS OFFICE AND/OR THE US ARMY CORPS OF ENGINEERS.

4.4 TOPOGRAPHY

THE TOPOGRAPHY OF THE OVERALL PROJECT AREA IS GENERALLY SLOPED FROM THE TOP OF THE RAILWAY EMBANKMENT TO THE TOE OF THE SLOPE. IN SOME CASES, THE TOE OF SLOPE IS NEAR THE EDGE OF A STREAM CHANNELS OR ROADWAY CROSSINGS. THE PROJECT IS GENERALLY LOCATED IN RURAL AREAS WITH MINIMAL SURROUNDING DEVELOPMENT.

4.5 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF A MIXTURE OF GRASSES, SHRUBS, AND TREES. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE PROJECT. UPON COMPLETION, THE DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES AS DESCRIBED IN THE TURF ESTABLISHMENT DETAIL, UNLESS NOTED OTHERWISE. CERTAIN EMBANKMENTS WILL BE REGRADED SUCH THAT FINAL STABILIZATION REQUIRES THE PLACEMENT OF STONE FILL.

4.6 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE. SOILS ON THE PROJECT SITE INCLUDE:

ADAMS LOAMY FINE SAND, 3 TO 8 PERCENT SLOPES, "K FACTOR" = **0.15**  
ADAMS LOAMY FINE SAND, 8 TO 15 PERCENT SLOPES, "K FACTOR" = **0.15**  
ADAMS LOAMY FINE SAND, 15 TO 25 PERCENT SLOPES, "K FACTOR" = **0.15**  
ALLAGASH VERY FINE SANDY LOAM, 2 TO 8 PERCENT SLOPES, "K FACTOR" = **0.32**  
BOOTHBAY SILT LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = **0.43**  
CABOT SILT LOAM, 0 TO 8 PERCENT SLOPES, VERY STONY, "K FACTOR" = **0.49**  
CHARLES SILT LOAM, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED, "K FACTOR" = **0.43**  
COLTON-DUXBURY COMPLEX, 15 TO 25 PERCENT SLOPES, "K FACTOR" = **0.16**  
COLTON-DUXBURY COMPLEX, 2 TO 8 PERCENT SLOPES, "K FACTOR" = **0.16**  
COLTON-DUXBURY COMPLEX, 25 TO 50 PERCENT SLOPES, "K FACTOR" = **0.14**  
COLTON-DUXBURY COMPLEX, 3 TO 8 PERCENT SLOPES, "K FACTOR" = **0.28**  
COLTON-DUXBURY COMPLEX, 8 TO 15 PERCENT SLOPES, "K FACTOR" = **0.28**  
LIMERICK VARIANT SILT LOAM, "K FACTOR" = **0.43**  
LYMAN-TUNBRIDGE FINE SANDY LOAMS, VERY ROCKY, 25 TO 60 PERCENT SLOPES, "K FACTOR" = **0.34**  
MEDOMAK MUCKY SILT LOAM, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED, "K FACTOR" = **0.43**  
MONADNOCK FINE SANDY LOAM, 35 TO 60 PERCENT SLOPES, VERY STONY, "K FACTOR" = **0.37**  
ONDAWA FINE SANDY LOAM, "K FACTOR" = **0.32**  
PERU FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, VERY STONY, "K FACTOR" = **0.32**  
PERU FINE SANDY LOAM, 35 TO 60 PERCENT SLOPES, VERY STONY, "K FACTOR" = **0.32**  
PODUNK FINE SANDY LOAM, "K FACTOR" = **0.24**  
PODUNK FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED, "K FACTOR" = **0.24**  
RUMNEY FINE SANDY LOAM, "K FACTOR" = **0.32**  
SALMON-ADAMANT COMPLEX, 8 TO 15 PERCENT SLOPES, VERY ROCKY, "K FACTOR" = **0.40**  
SALMON-ADAMANT COMPLEX, 25 TO 50 PERCENT SLOPES, VERY ROCKY, "K FACTOR" = **0.40**  
SCANTIC VARIANT BOULDERY SILT LOAM, 25 TO 50 PERCENT SLOPES, "K FACTOR" = **0.32**  
SCANTIC VARIANT BOULDERY SILT LOAM, 8 TO 25 PERCENT SLOPES, "K FACTOR" = **0.32**  
TEEL SILT LOAM, "K FACTOR" = **0.37**  
TUNBRIDGE-LYMAN COMPLEX, 35 TO 60 PERCENT SLOPES, VERY ROCKY, "K FACTOR" = **0.35**  
TUNBRIDGE-LYMAN COMPLEX, 3 TO 8 PERCENT SLOPES, ROCKY, "K FACTOR" = **0.35**  
TUNBRIDGE-LYMAN COMPLEX, 8 TO 15 PERCENT SLOPES, ROCKY, "K FACTOR" = **0.35**  
TUNBRIDGE-LYMAN COMPLEX, 15 TO 25 PERCENT SLOPES, ROCKY, "K FACTOR" = **0.35**  
TUNBRIDGE-MONADNOCK COMPLEX, 35 TO 60 PERCENT SLOPES, VERY STONY, "K FACTOR" = **0.26**  
URBAN LAND-ADAMS-NICHOLVILLE COMPLEX, 0 TO 8 PERCENT SLOPES, "K FACTOR" = **0.00**  
URBAN LAND-ADAMS-NICHOLVILLE COMPLEX, 8 TO 15 PERCENT SLOPES, "K FACTOR" = **0.00**  
WALPOLE FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES, "K FACTOR" = **0.24**

**NOTE:** K-VALUES GENERALLY INDICATE THE FOLLOWING:  
0.0-0.23 = LOW EROSION POTENTIAL  
0.24-0.36 = MODERATE EROSION POTENTIAL  
0.37 AND HIGHER = HIGH EROSION POTENTIAL

4.7 OTHER SENSITIVE RESOURCES

NO ADDITIONAL SENSITIVE RESOURCE AREAS ARE ANTICIPATED TO BE IMPACTED BY THE PROJECT.

5. DRAINAGE

5.1 RECEIVING WATERS

THIS PROJECT INVOLVES IMPROVEMENTS AT EXISTING OR REPLACEMENT STRUCTURES (CULVERT OR BRIDGE) AT 42 EPHEMERAL, INTERMITTENT, AND PERENNIAL STREAM CROSSINGS. IMPROVEMENTS AT BRIDGE 48 (LAMOILLE RIVER) HAS BEEN PREVIOUSLY AUTHORIZED AS PART OF PROJECT STP LVRT(10).

MAJOR RECEIVING WATERS FOR THE PROJECT INCLUDE KATE BROOK, CURRIER BROOK, WILD BRANCH, ELMORE POND BROOK, AND THE LAMOILLE RIVER (AND VARIOUS TRIBUTARIES TO IT).

5.2 DISCHARGE POINTS

DUE TO THE NATURE OF THE PROJECT AREA, THERE ARE NO DISCRETE DISCHARGE POINTS ASSOCIATED WITH THE TRAIL WORK ON THIS PROJECT. RUNOFF FROM THE PROJECT AREA WILL DRAIN OFF THE TRAIL EMBANKMENT TOWARD THE CLOSEST RECEIVING WATER, MAY ENTER THE RECEIVING WATERS IN MULTIPLE LOCATIONS.

5.3 CONVEYANCE/FLOW PATH FROM PROJECT TO WATERS

THE MAJORITY OF THE PROJECT IS NOT CURBED AND RUNOFF DRAINS OVERLAND ACROSS ADJACENT VEGETATED SIDE SLOPES BEFORE REACHING THE RECEIVING WATER. DUE TO THE NATURE OF THE PROJECT, IN-STREAM WORK WILL BE REQUIRED AT SOME SITES, THEREFORE WILL HAVE A LIMITED VEGETATED DISCONNECTION AREA. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES WILL LIMIT SEDIMENT DISCHARGE AT THESE LOCATIONS.

6. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

THE MEASURES INCLUDED IN THIS PLAN ARE PROVIDED AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. IT IS EXPECTED THAT THE CONTRACTOR MAY USE THIS PLAN, WITH ADJUSTMENTS AS NECESSARY, BASED ON THEIR SPECIFIC MEANS AND METHODS OF CONSTRUCTION.

APPLYING THESE MEASURES THROUGHOUT CONSTRUCTION IS CRITICAL TO THEIR SUCCESS IN MINIMIZING SEDIMENT TRANSPORT TO THE RECEIVING WATERS. REFER TO THE DETAILS INCLUDED IN THESE PLANS AND THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION’S VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR SPECIFIC GUIDANCE.

6.1 IDENTIFY LIMITS OF DISTURBANCE

SITE BOUNDARIES AND AREAS CONSTRUCTION EQUIPMENT CAN ACCESS SHALL BE DELINEATED.

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC.).

6.2 LIMIT CONCURRENT DISTURBANCE

LIMITING THE AMOUNT OF SOIL EXPOSED AT ONE TIME REDUCES THE POTENTIAL EROSION ON SITE. CONCURRENT EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY AND EMPLOYING STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE.

6.3 STABILIZE DISTURBED AREAS

6.3.1 ACCESS POINTS/ENTRANCE/EXITS

TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTORS PROGRESS SCHEDULE.

6.3.2 TEMPORARY MEASURES FOR EXPOSED AREAS DURING CONSTRUCTION

ALL AREAS OF EARTH DISTURBANCE MUST HAVE STABILIZATION IN PLACE WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I2)	
FILE NAME: z20f238_EPSC_narrative.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P.DETRICK	DRAWN BY: C.K.FORD
DESIGNED BY: C.K.FORD	CHECKED BY: E.P.DETRICK
EPSC NARRATIVE (SHEET 1 OF 2)	SHEET 61 OF 102



6.3.3 PERMANENT STABILIZATION AT FINAL GRADE

EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.

SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, ROLLED EROSION CONTROL PRODUCT, TYPE I SHALL BE USED INSTEAD OF MULCH. FOR SLOPES STEEPER THAN 1:2, FINAL STABILIZATION WITH STONE RIPRAP IS PROPOSED. STONE ARMORING OF STREAM EMBANKMENTS ARE PROPOSED TO BE STABILIZED WITH THE APPROPRIATELY SIZED STONE BASED ON HYDRAULIC MODELING, AS SHOWN IN THE PLANS.

6.4 DIVERT UPLAND RUNOFF

DIVERSIONARY MEASURES SHALL BE USED TO INTERCEPT RUNOFF FROM ABOVE THE CONSTRUCTION AND DIRECT IT AROUND THE DISTURBED AREA SO THAT CLEAN WATER DOES NOT BECOME MUDDIED WHILE TRAVELING OVER EXPOSED SOILS ON THE CONSTRUCTION SITE.

RUNOFF FROM UPGRADIENT AREAS MAY NEED TO BE DIVERTED AWAY FROM THE PROJECT AREA. THE CONTRACTOR SHALL REFER TO THE LOW RISK HANDBOOK FOR GUIDANCE.

6.5 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS (E.G. SILT FENCE AND EROSION LOGS) SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED ON THE DOWNHILL SIDE OF CONSTRUCTION ACTIVITIES, PRIOR TO ANY UP-SLOPE WORK.

DUE TO THE LINEAR NATURE OF THE PROJECT AND THE VEGETATED CONDITION OF THE EXISTING EMBANKMENT, SEDIMENT BARRIERS ARE NOT REQUIRED ALONG THE ENTIRE LENGTH OF THE PROJECT. AREAS WHERE SEDIMENT BARRIERS ARE REQUIRED INCLUDE SITES WHERE BRIDGE AND CULVERT REPLACEMENT OR REPAIRS ARE BEING MADE, PAUSE PLACES ARE BEING CONSTRUCTED, OR OTHER ACTIVITIES ARE OCCURRING THAT DISTURB EMBANKMENT SIDE SLOPES AND COULD POTENTIALLY RESULT IN SEDIMENT BEING DISCHARGED.

WHERE REQUIRED, SEDIMENT BARRIERS WILL BE INSTALLED ALONG THE CONTOUR AND AS PROPOSED ON THE EPSC PLAN. WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF WETLANDS AND RECEIVING WATERS. ADDITIONAL SEDIMENT BARRIERS ARE TO BE DEPLOYED AS NECESSARY DURING CONSTRUCTION TO MINIMIZE SEDIMENT DISCHARGE OR AS DIRECTED BY THE RESIDENT ENGINEER.

6.6 SLOW DOWN CHANNELIZED RUNOFF

CHECK STRUCTURES SHALL BE UTILIZED TO REDUCE THE VELOCITY, AND THUS THE EROSION POTENTIAL, OF CONCENTRATED FLOW IN CHANNELS.

TEMPORARY STONE CHECK DAMS MAY BE REQUIRED IN CONJUNCTION WITH WATER CONTROL AT CULVERT REPAIR AND REPLACEMENT SITES.

7. CONSTRUCT PERMANENT CONTROLS

PERMANENT STORMWATER TREATMENT DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH PERMIT CONDITIONS.

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED TO BE NEEDED OR DESIGNED.

8. DEWATERING

DISCHARGE FROM DEWATERING ACTIVITIES THAT FLOWS OFF OF THE CONSTRUCTION SITE MUST NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE VERMONT WATER QUALITY STANDARDS. DEWATERED STORMWATER OR GROUNDWATER MUST BE FILTERED AND ROUTED IN A MANNER THAT DOES NOT RESULT IN VISIBLY TURBID DISCHARGES TO WATERS.

DEWATERING OF SURFACE WATER WITHIN A COFFERDAM IS ANTICIPATED DURING THE REPAIR OR REPLACEMENT OF STRUCTURES ADJACENT TO WETLANDS AND WATERWAYS. THE FILTER BAG DETAIL AND PAY ITEM HAVE BEEN INCLUDED AS A POTENTIAL TREATMENT MEASURE FOR THIS PURPOSE, HOWEVER THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE SHALL BE PAID FOR UNDER CONTRACT ITEM 653.45.

9. OFF-SITE AREAS

OFF-SITE WASTE AND BORROW AREAS HAVE NOT BEEN IDENTIFIED FOR THIS PROJECT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PERMIT, AS NECESSARY, ANY OFF-SITE AREAS THAT ARE NEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 105.25 - 105.28. ALL EROSION PREVENTION AND

SEDIMENT CONTROL MEASURES NECESSARY FOR WASTE, BORROW, AND STAGING AREAS OUTSIDE THE PROJECT LIMITS SHALL BE PAID FOR PER 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

VEHICLE AND EQUIPMENT STORAGE AREAS OR AREAS ADJACENT TO CONSTRUCTION TRAILERS OR OTHER HIGH TRAFFIC AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 12” OF GRAVEL. FOLLOWING COMPLETION OF CONSTRUCTION, ALL NON-NATIVE MATERIALS SHALL BE REMOVED FROM THE STAGING AREA. COMPACTED, RUTTED, OR OTHERWISE DISTURBED SOILS SHALL BE TILLED, RAKED, SEEDED AND MULCHED.

ERODIBLE MATERIALS STOCKPILED WITHIN THE MATERIAL STORAGE AREAS SHALL BE ISOLATED WITH SILT FENCE OR OTHER ACCEPTABLE SEDIMENT BARRIER. SOIL STOCKPILED ON THE SITE SHALL BE SEEDED AND MULCHED.

10. WINTER CONSTRUCTION

CONSTRUCTION ACTIVITIES MAY CONTINUE INTO THE WINTER CONSTRUCTION SEASON, DEPENDING ON ACTUAL FIELD AND WEATHER CONDITIONS. IF ACTIVITIES ARE ON-GOING BETWEEN OCTOBER 15 AND APRIL 15, THE CONTRACTOR SHALL FOLLOW REQUIREMENTS FOR WINTER CONSTRUCTION, AS DEFINED IN SPECIFIC PERMIT CONDITIONS AND AS FOLLOWS:

- ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- LIMITS OF DISTURBANCE MOVED OR REPLACED TO REFLECT BOUNDARY OF WINTER WORK.
- DEVELOPMENT OF A SNOW MANAGEMENT PLAN THAT INCLUDES:
  - ADEQUATE STORAGE AND CONTROL OF MELT-WATER
  - STORAGE OF CLEARED SNOW TO BE PLACED DOWN SLOPE OF DISTURBED AREAS AND OUT OF STORMWATER TREATMENT STRUCTURES
- AREAS OF DISTURBANCE WITHIN 100 FT OF A WATERBODY MUST HAVE REINFORCED (WOVEN WIRE) SILT FENCE INSTALLED ACROSS THE SLOPE, DOWNGRADIENT OF THE EARTH DISTURBANCE. ALTERNATIVELY, REGULAR, NON-WOVEN WIRE SILT FENCE MAY BE USED IF COMBINED WITH EROSION CONTROL BERM, EROSION LOG, OR STRAW WATTLE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
- MULCH TO BE APPLIED AT A MINIMUM OF 2 INCHES DEPTH WITH 80-90% COVERAGE.
- AREAS OF DISTURBED SOILS MUST BE STABILIZED PRIOR TO ANY RUNOFF-PRODUCING EVENT, WITH THE FOLLOWING EXCEPTION:
  - STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH NO OUTLET AND A DEPTH OF 2 FT OR GREATER (OPEN UTILITY TRENCHES), PROVIDED THAT ANY DEWATERING, IF NECESSARY, IS CONDUCTED AS REQUIRED.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1” THICKNESS.
- USE STONE TO STABILIZE AREAS WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED.

11. INSPECTION & MAINTENANCE

INSPECTION AND MONITORING OF THE PROJECT’S EPSC MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD SPECIFICATION 653.04 MONITORING EROSION PREVENTION AND SEDIMENT CONTROL PLAN, ALONG WITH PERMIT SPECIFIC INSPECTION REQUIREMENTS.

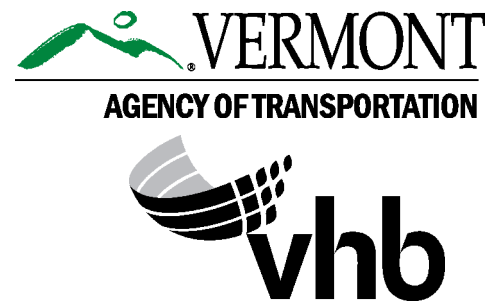
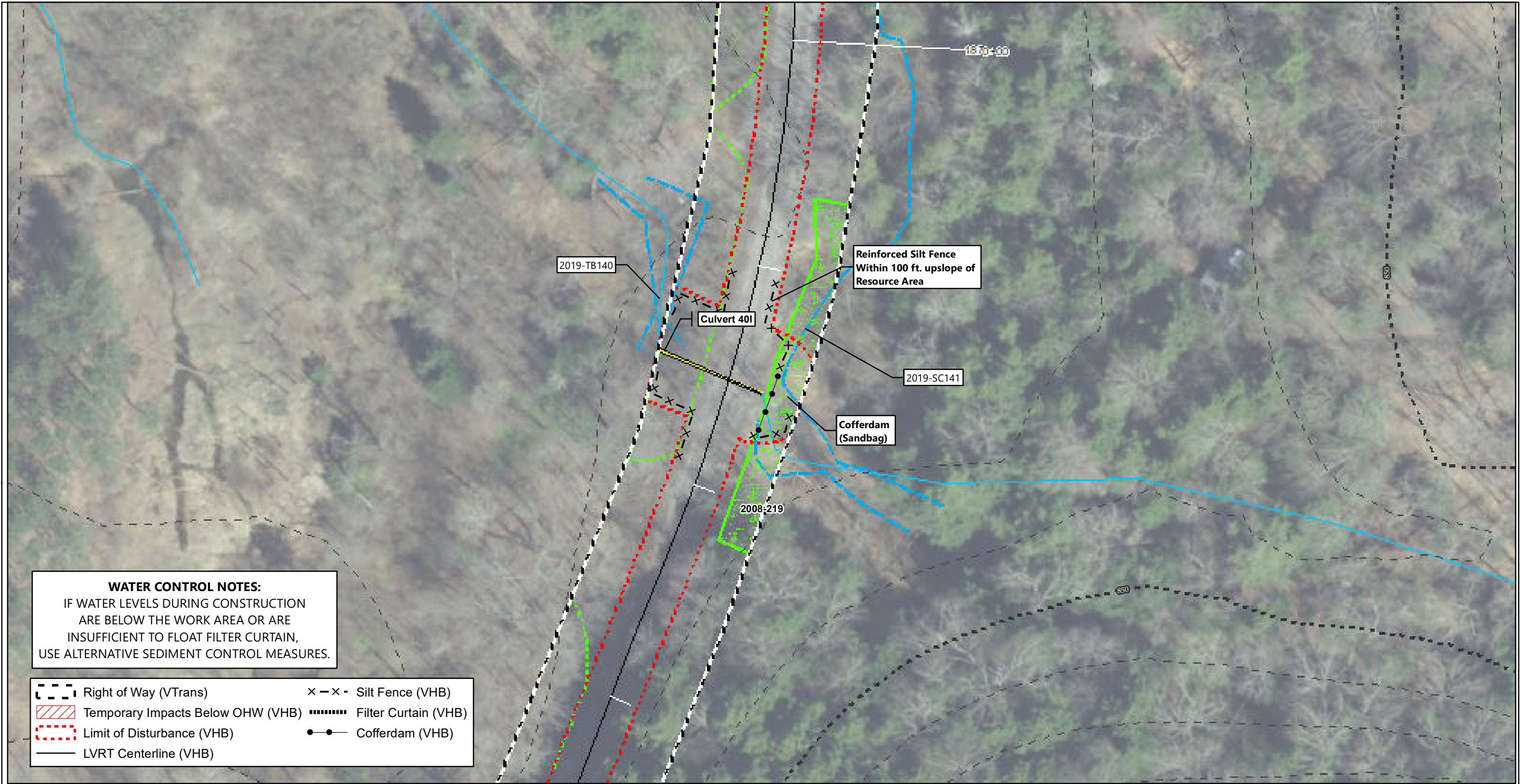
THE CONTRACTOR SHALL PROVIDE A COPY OF THEIR INSPECTION FORM AS PART OF THEIR EPSC PLAN.

ALL EPSC MEASURES SHALL BE REGULARLY MAINTAINED AND SHALL BE CHECKED FOR SEDIMENT BUILD-UP. SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED SITE WHERE IT WILL NOT BE SUBJECT TO EROSION.



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I2)	
FILE NAME: z20f238_EPSC_narrative.dgn	PLOT DATE: 3/23/2021
PROJECT LEADER: E.P.DETRICK	DRAWN BY: C.K.FORD
DESIGNED BY: C.K.FORD	CHECKED BY: E.P.DETRICK
EPSC NARRATIVE (SHEET 2 OF 2)	SHEET 62 OF 102





LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 40I SITE PLAN

APPLICATION BY:  
VTrans



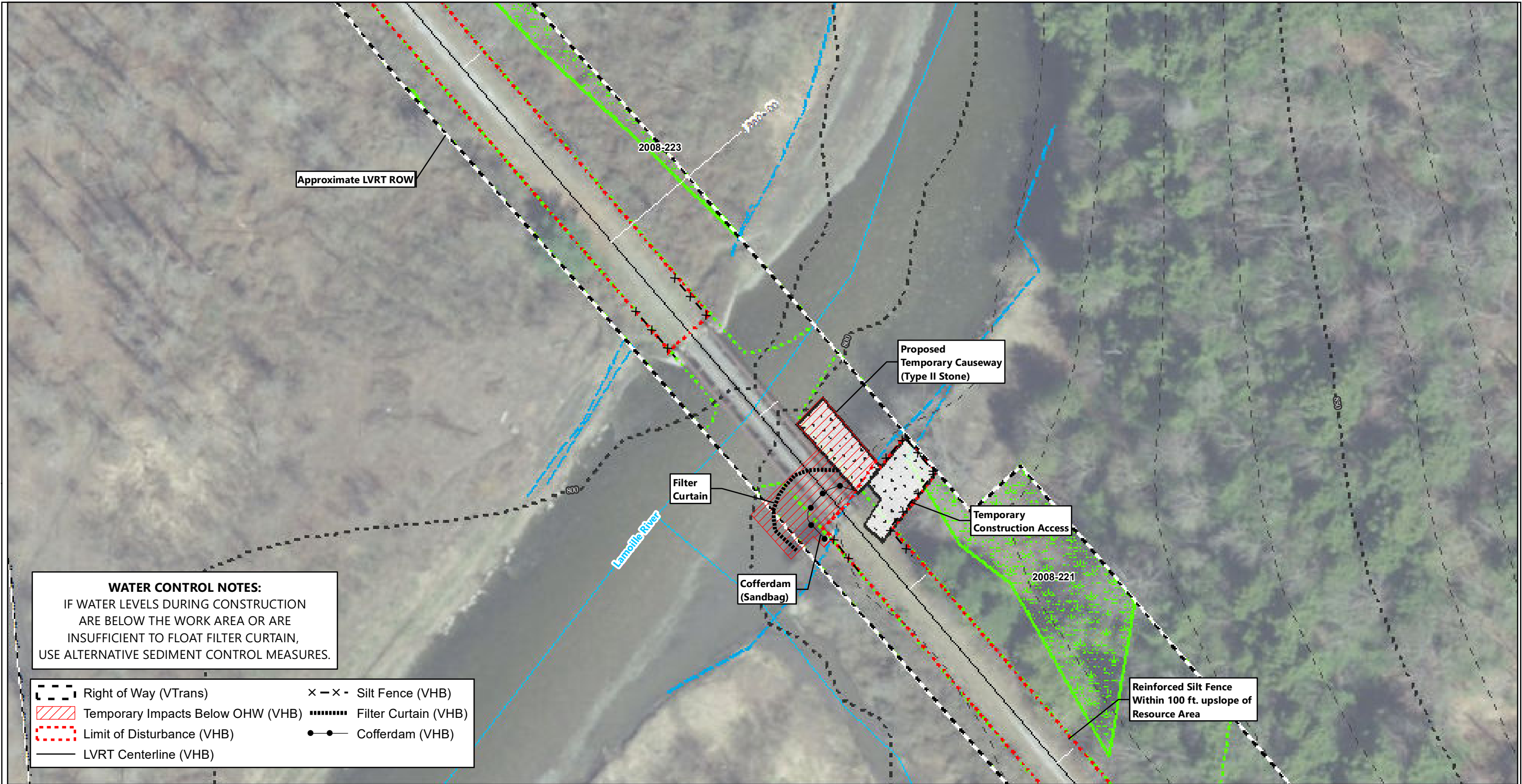
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PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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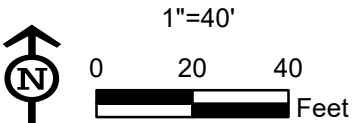
**WATER CONTROL NOTES:**  
IF WATER LEVELS DURING CONSTRUCTION  
ARE BELOW THE WORK AREA OR ARE  
INSUFFICIENT TO FLOAT FILTER CURTAIN,  
USE ALTERNATIVE SEDIMENT CONTROL MEASURES.

- |                                   |                      |
|-----------------------------------|----------------------|
| Right of Way (VTrans)             | Silt Fence (VHB)     |
| Temporary Impacts Below OHW (VHB) | Filter Curtain (VHB) |
| Limit of Disturbance (VHB)        | Cofferdam (VHB)      |
| LVRT Centerline (VHB)             |                      |



**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 41 SITE PLAN**

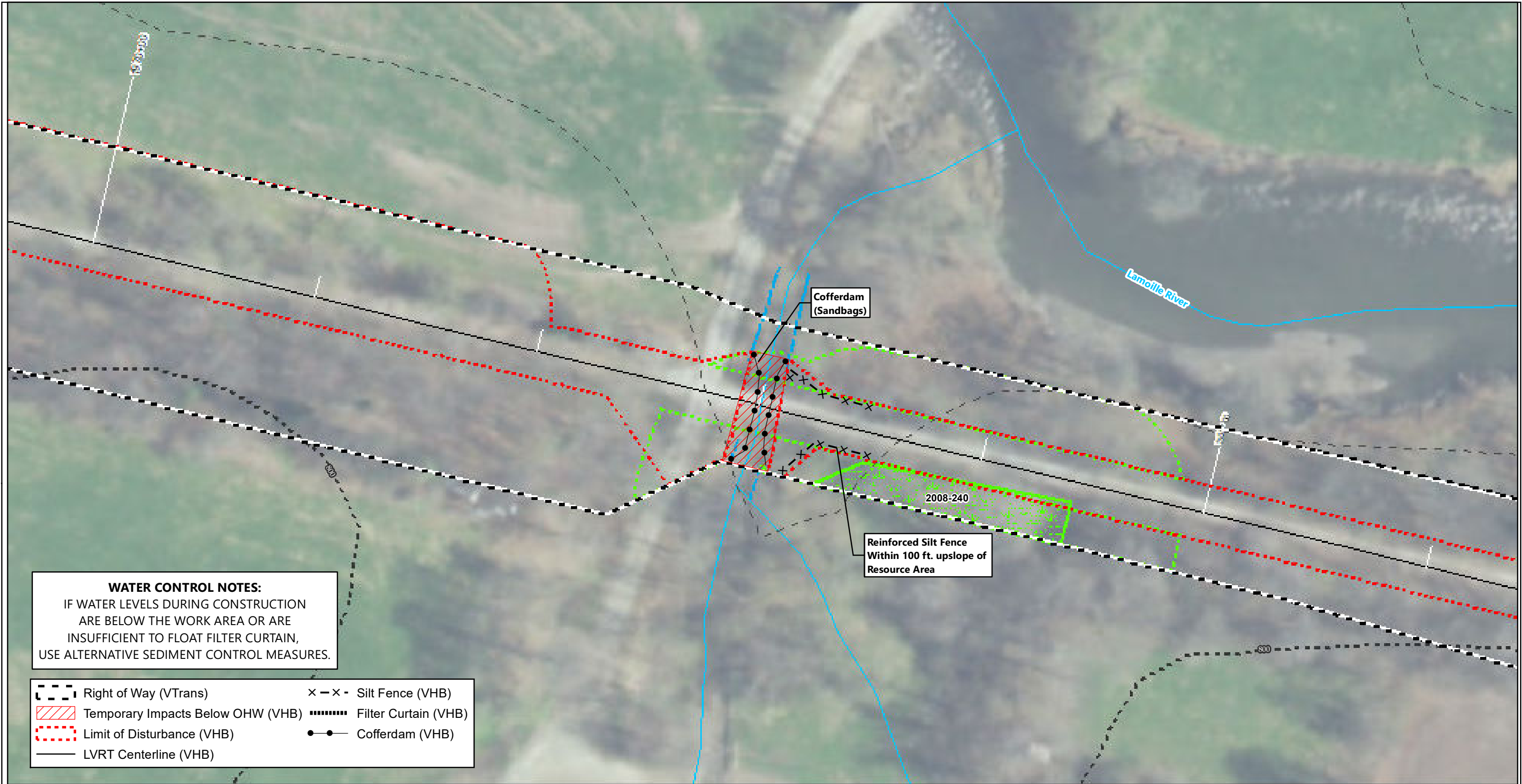
**APPLICATION BY:**  
VTrans



**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021





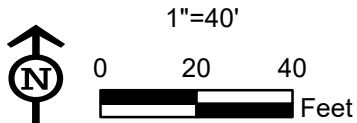
**WATER CONTROL NOTES:**  
IF WATER LEVELS DURING CONSTRUCTION  
ARE BELOW THE WORK AREA OR ARE  
INSUFFICIENT TO FLOAT FILTER CURTAIN,  
USE ALTERNATIVE SEDIMENT CONTROL MEASURES.

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| --- Right of Way (VTrans)         | x - x - Silt Fence (VHB) |
| Temporary Impacts Below OHW (VHB) | Filter Curtain (VHB)     |
| Limit of Disturbance (VHB)        | Cofferdam (VHB)          |
| — LVRT Centerline (VHB)           |                          |



**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 42 SITE PLAN**

**APPLICATION BY:**  
VTrans

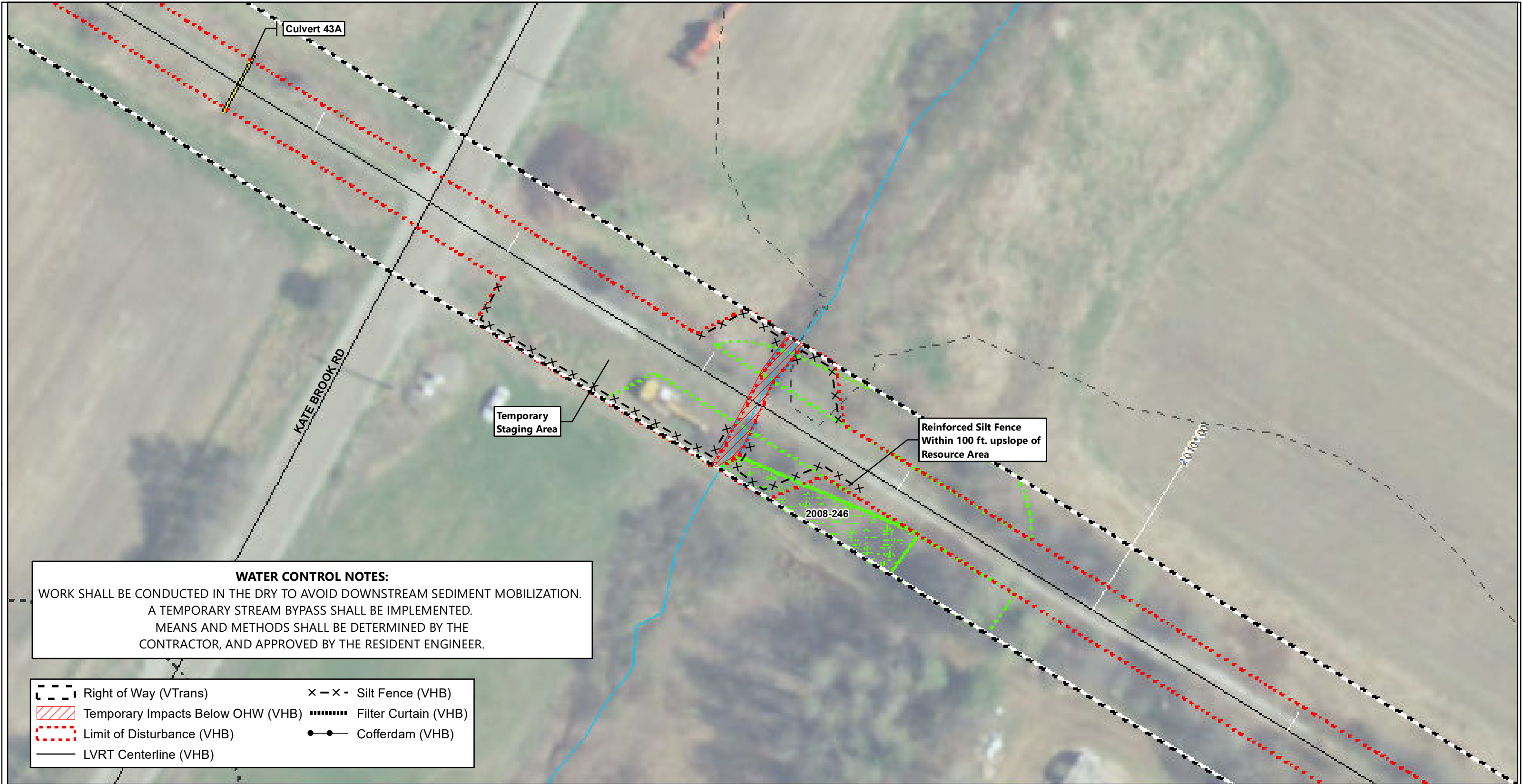


**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

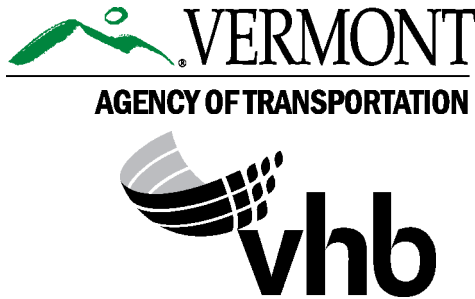
Sheet 65 of 102





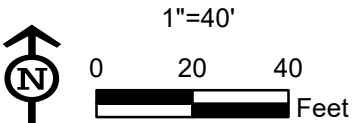
**WATER CONTROL NOTES:**  
WORK SHALL BE CONDUCTED IN THE DRY TO AVOID DOWNSTREAM SEDIMENT MOBILIZATION.  
A TEMPORARY STREAM BYPASS SHALL BE IMPLEMENTED.  
MEANS AND METHODS SHALL BE DETERMINED BY THE CONTRACTOR, AND APPROVED BY THE RESIDENT ENGINEER.

- |                                   |                      |
|-----------------------------------|----------------------|
| Right of Way (VTrans)             | Silt Fence (VHB)     |
| Temporary Impacts Below OHW (VHB) | Filter Curtain (VHB) |
| Limit of Disturbance (VHB)        | Cofferdam (VHB)      |
| LVRT Centerline (VHB)             |                      |



LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 43 SITE PLAN

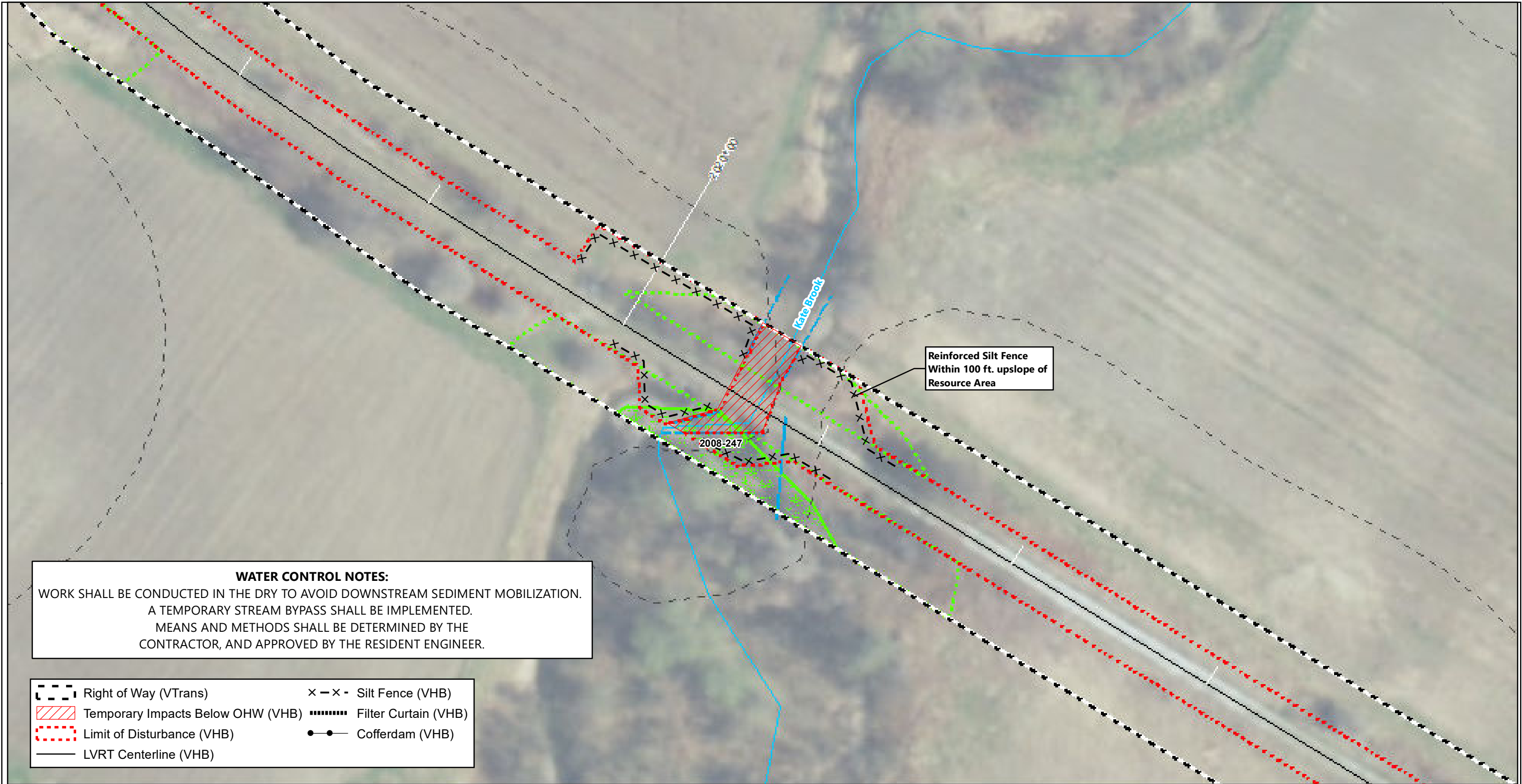
APPLICATION BY:  
VTrans



PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

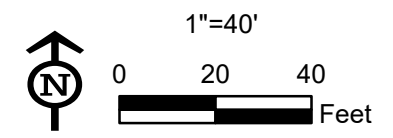
DATE:  
March 23, 2021





**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 44 SITE PLAN**

**APPLICATION BY:**  
VTrans

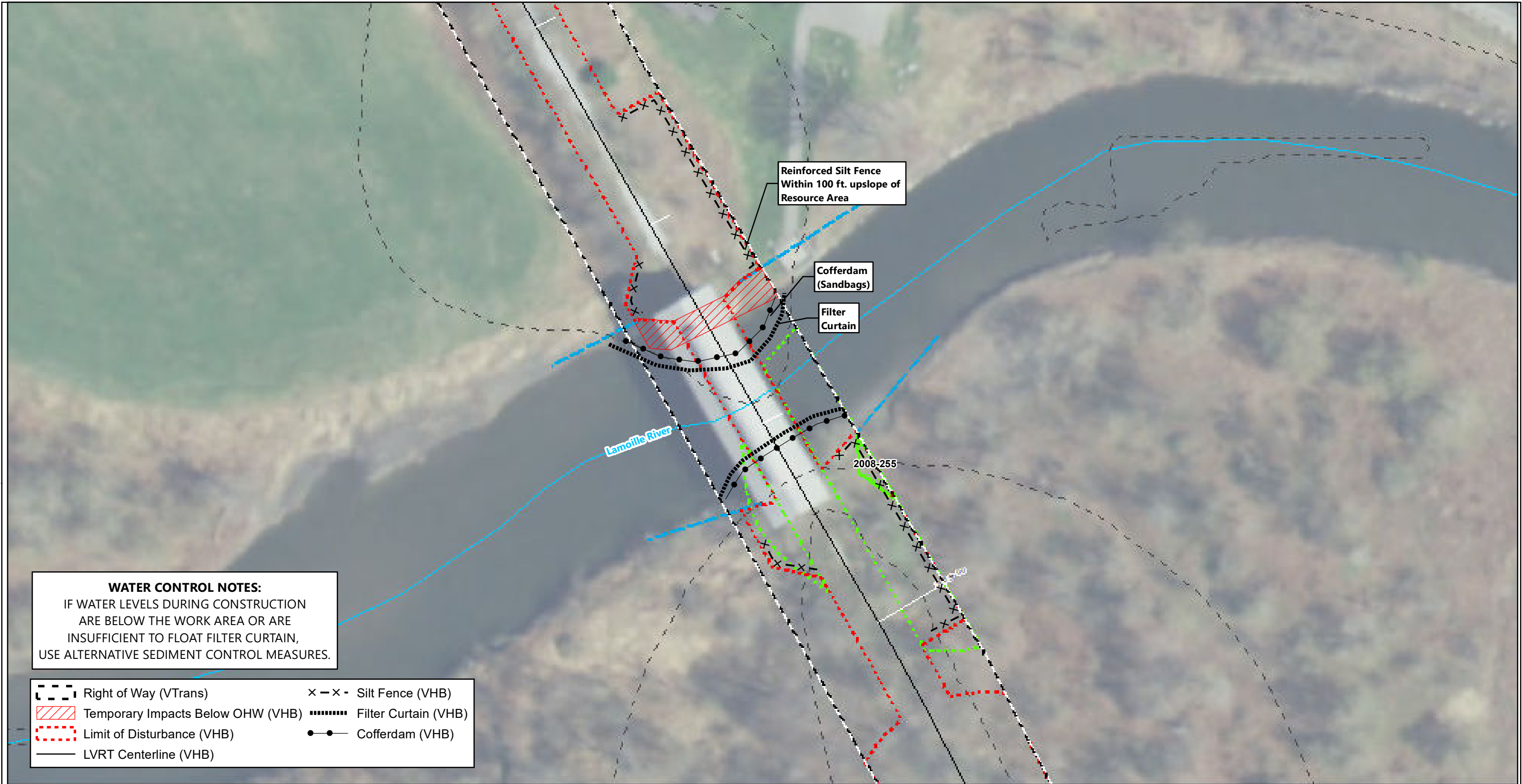


**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

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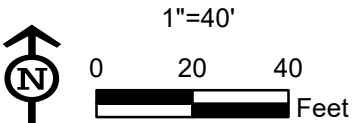
**WATER CONTROL NOTES:**  
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USE ALTERNATIVE SEDIMENT CONTROL MEASURES.

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|-----------------------------------|----------------------|
| Right of Way (VTrans)             | Silt Fence (VHB)     |
| Temporary Impacts Below OHW (VHB) | Filter Curtain (VHB) |
| Limit of Disturbance (VHB)        | Cofferdam (VHB)      |
| LVRT Centerline (VHB)             |                      |



**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 45 SITE PLAN**

**APPLICATION BY:**  
VTrans

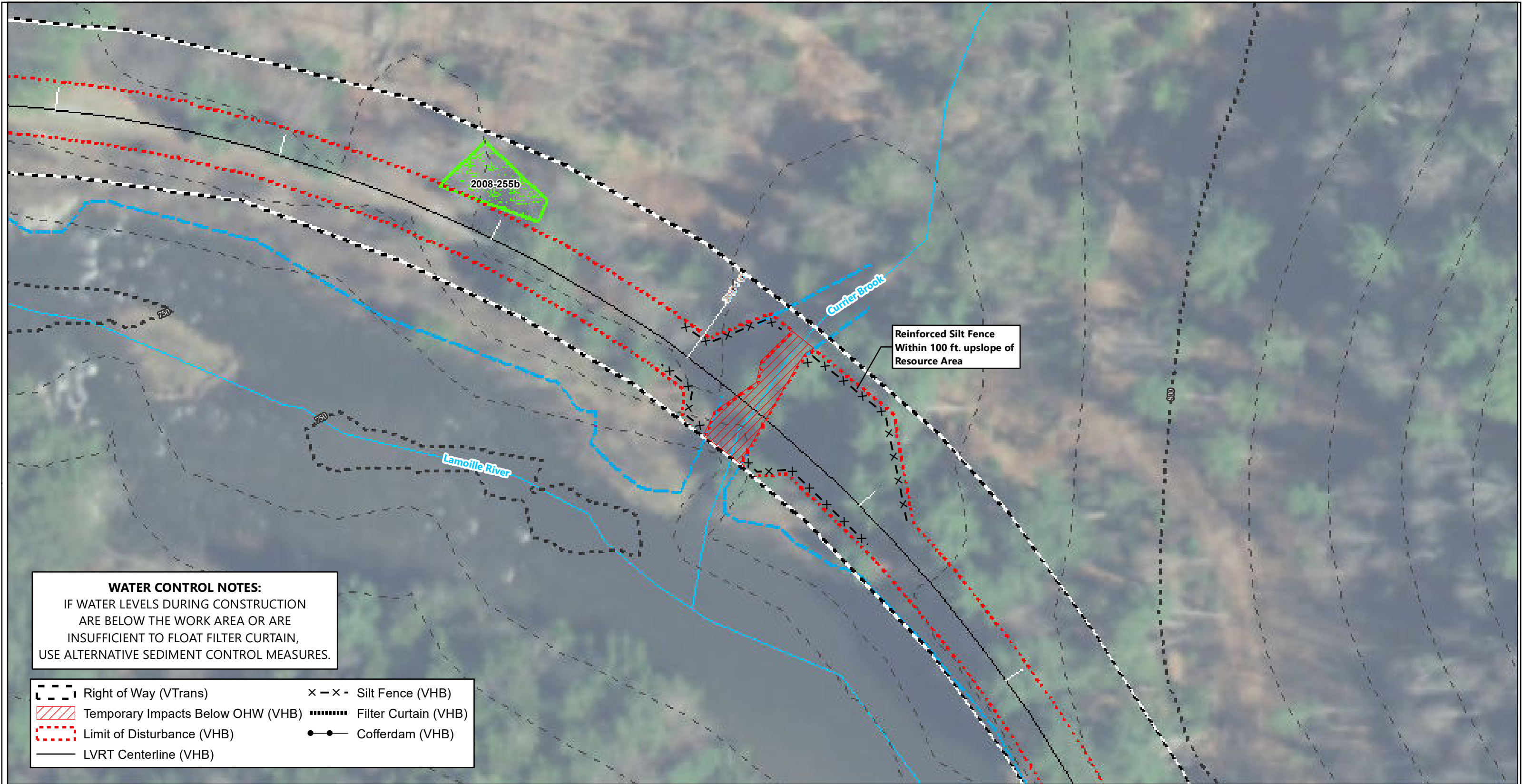


**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

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LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 46 SITE PLAN

APPLICATION BY:  
VTrans



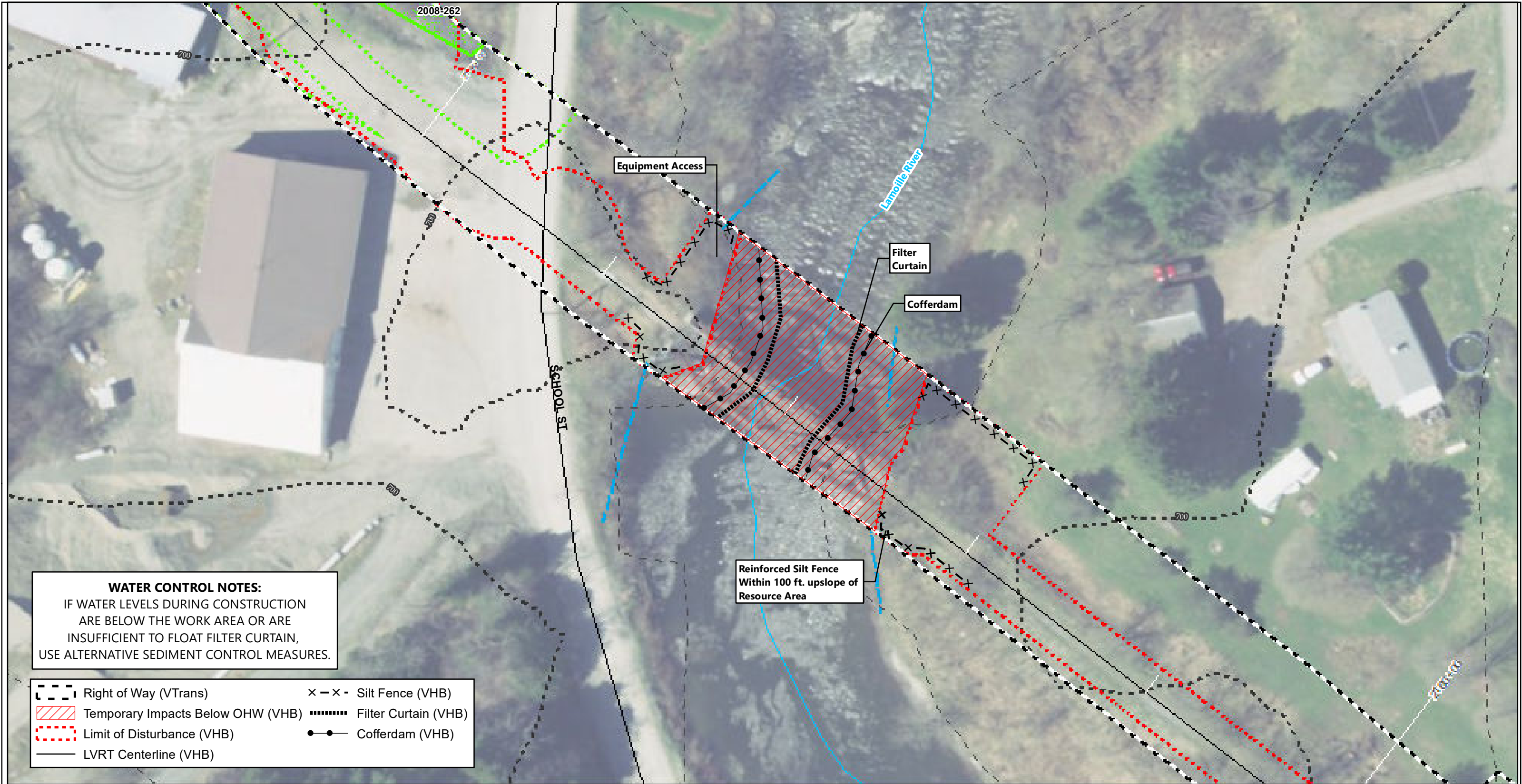
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PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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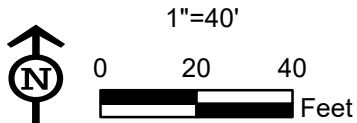
**WATER CONTROL NOTES:**  
IF WATER LEVELS DURING CONSTRUCTION  
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USE ALTERNATIVE SEDIMENT CONTROL MEASURES.

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| Right of Way (VTrans)             | Silt Fence (VHB)     |
| Temporary Impacts Below OHW (VHB) | Filter Curtain (VHB) |
| Limit of Disturbance (VHB)        | Cofferdam (VHB)      |
| LVRT Centerline (VHB)             |                      |



LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 47 SITE PLAN

APPLICATION BY:  
VTrans

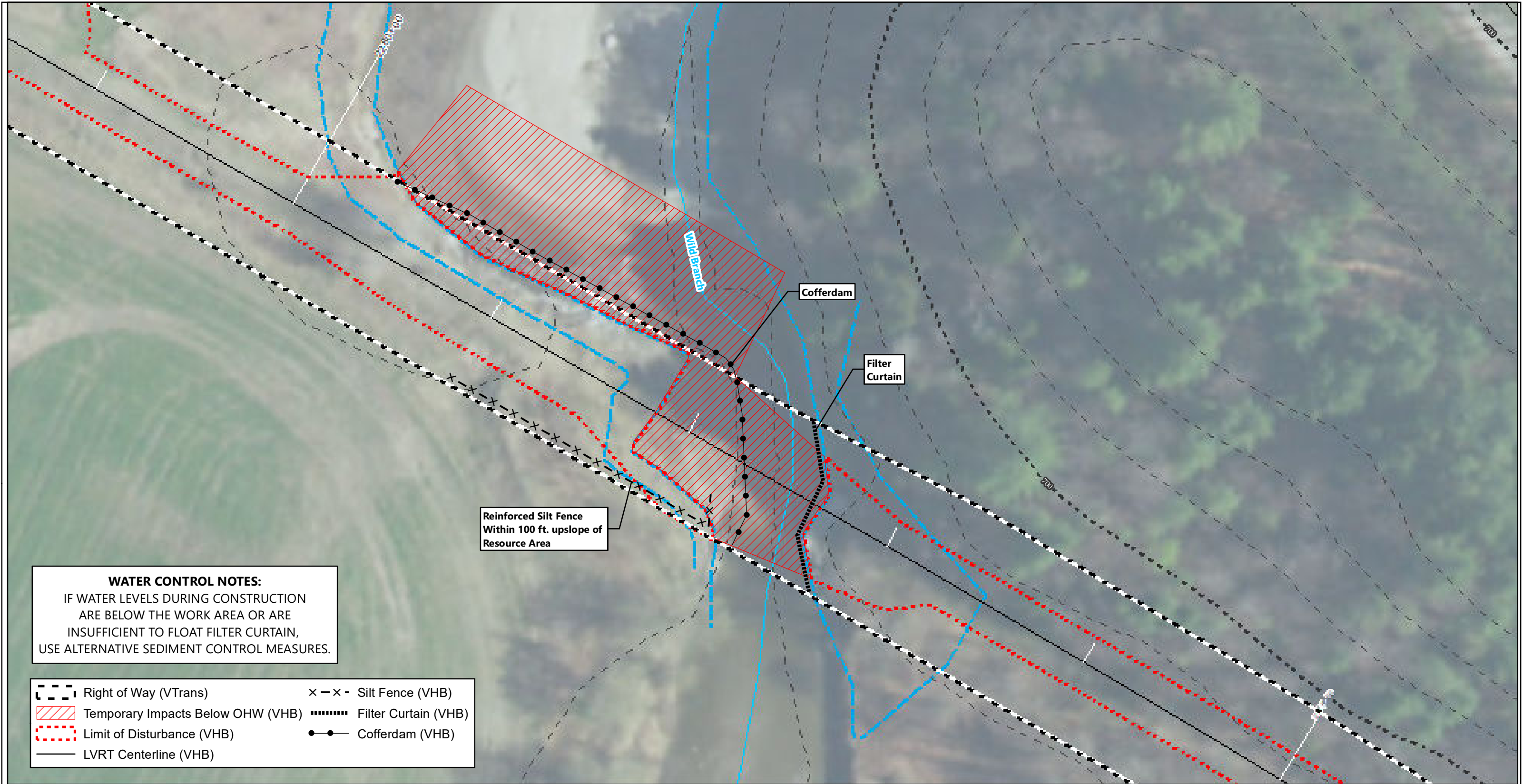


PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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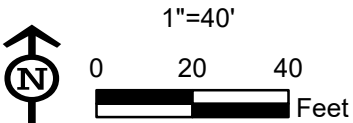
**WATER CONTROL NOTES:**  
IF WATER LEVELS DURING CONSTRUCTION  
ARE BELOW THE WORK AREA OR ARE  
INSUFFICIENT TO FLOAT FILTER CURTAIN,  
USE ALTERNATIVE SEDIMENT CONTROL MEASURES.

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| --- Right of Way (VTrans)         | x - x - Silt Fence (VHB) |
| Temporary Impacts Below OHW (VHB) | Filter Curtain (VHB)     |
| Limit of Disturbance (VHB)        | Cofferdam (VHB)          |
| LVRT Centerline (VHB)             |                          |



**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 49 SITE PLAN**

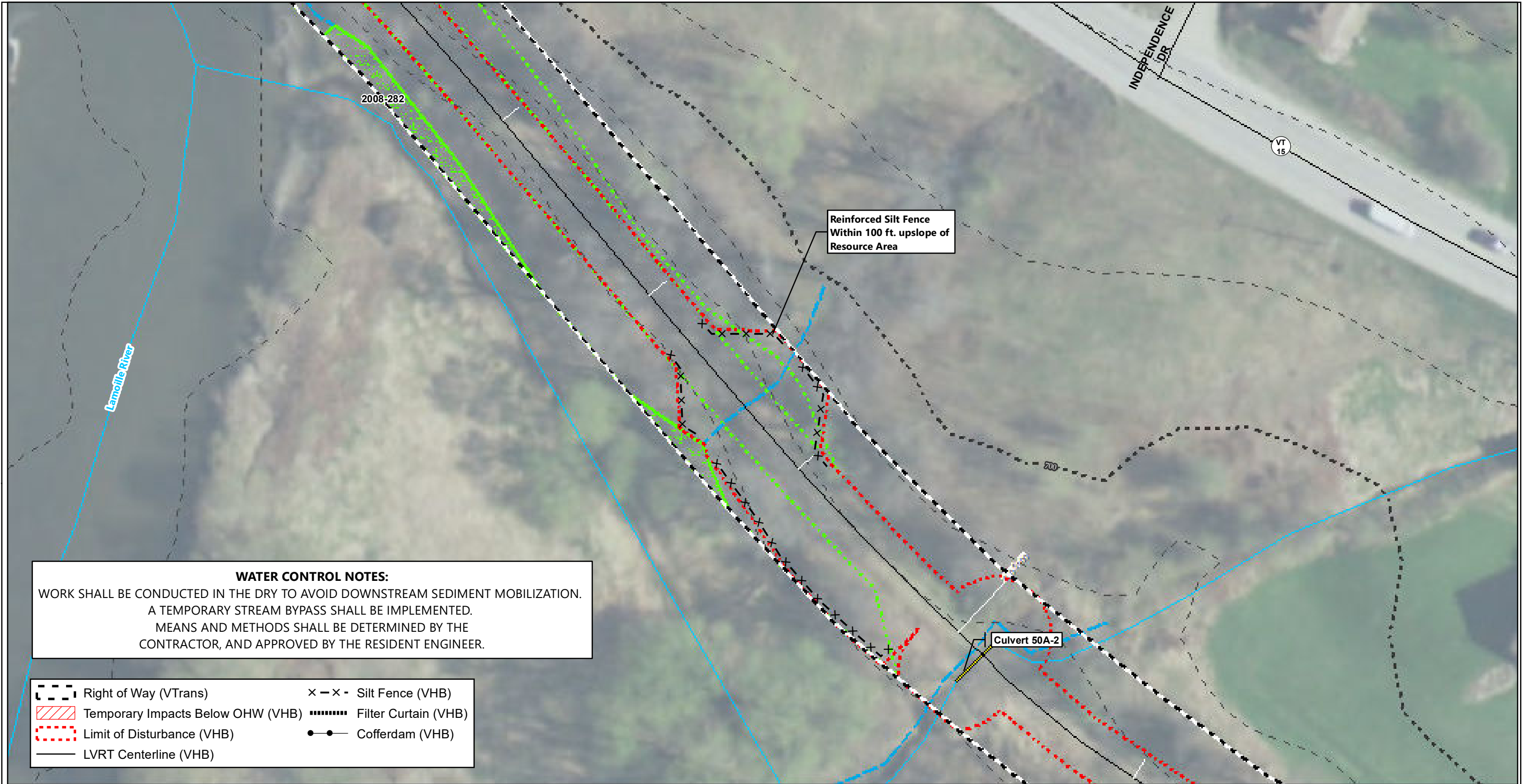
**APPLICATION BY:**  
VTrans



**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021





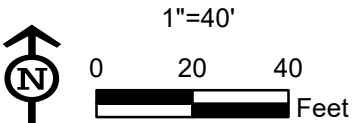
**WATER CONTROL NOTES:**  
WORK SHALL BE CONDUCTED IN THE DRY TO AVOID DOWNSTREAM SEDIMENT MOBILIZATION.  
A TEMPORARY STREAM BYPASS SHALL BE IMPLEMENTED.  
MEANS AND METHODS SHALL BE DETERMINED BY THE CONTRACTOR, AND APPROVED BY THE RESIDENT ENGINEER.

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|-----------------------------------|----------------------|
| Right of Way (VTrans)             | Silt Fence (VHB)     |
| Temporary Impacts Below OHW (VHB) | Filter Curtain (VHB) |
| Limit of Disturbance (VHB)        | Cofferdam (VHB)      |
| LVRT Centerline (VHB)             |                      |



**LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 51 SITE PLAN**

**APPLICATION BY:**  
VTrans

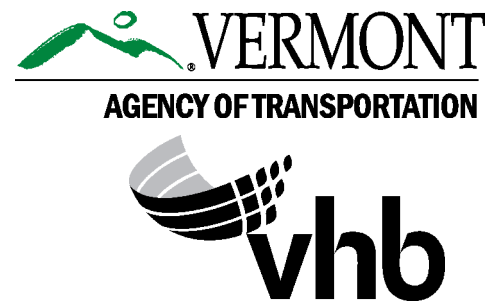
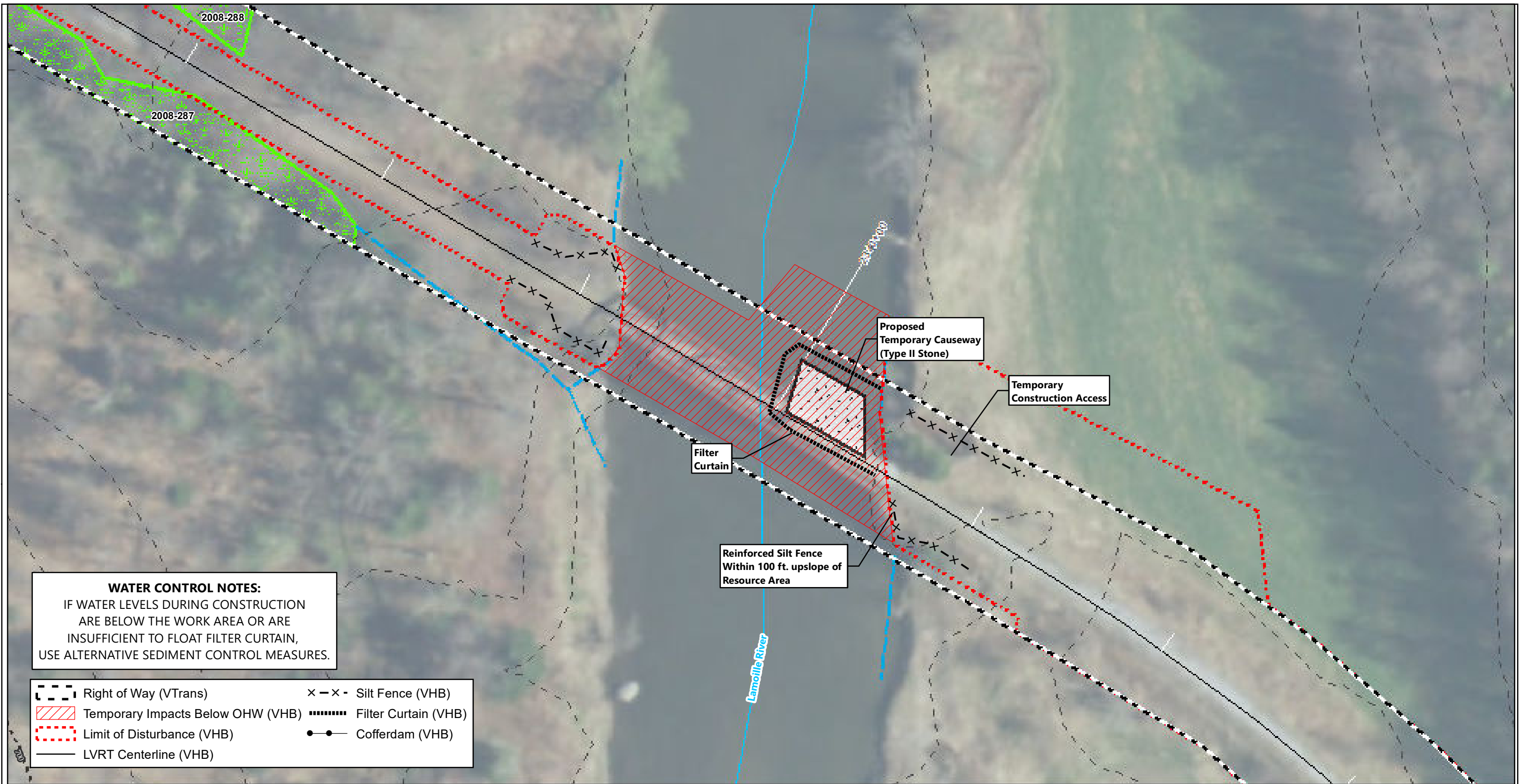


**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

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## LAMOILLE VALLEY RAIL TRAIL HARDWICK BRIDGE 52 SITE PLAN

APPLICATION BY:  
VTrans



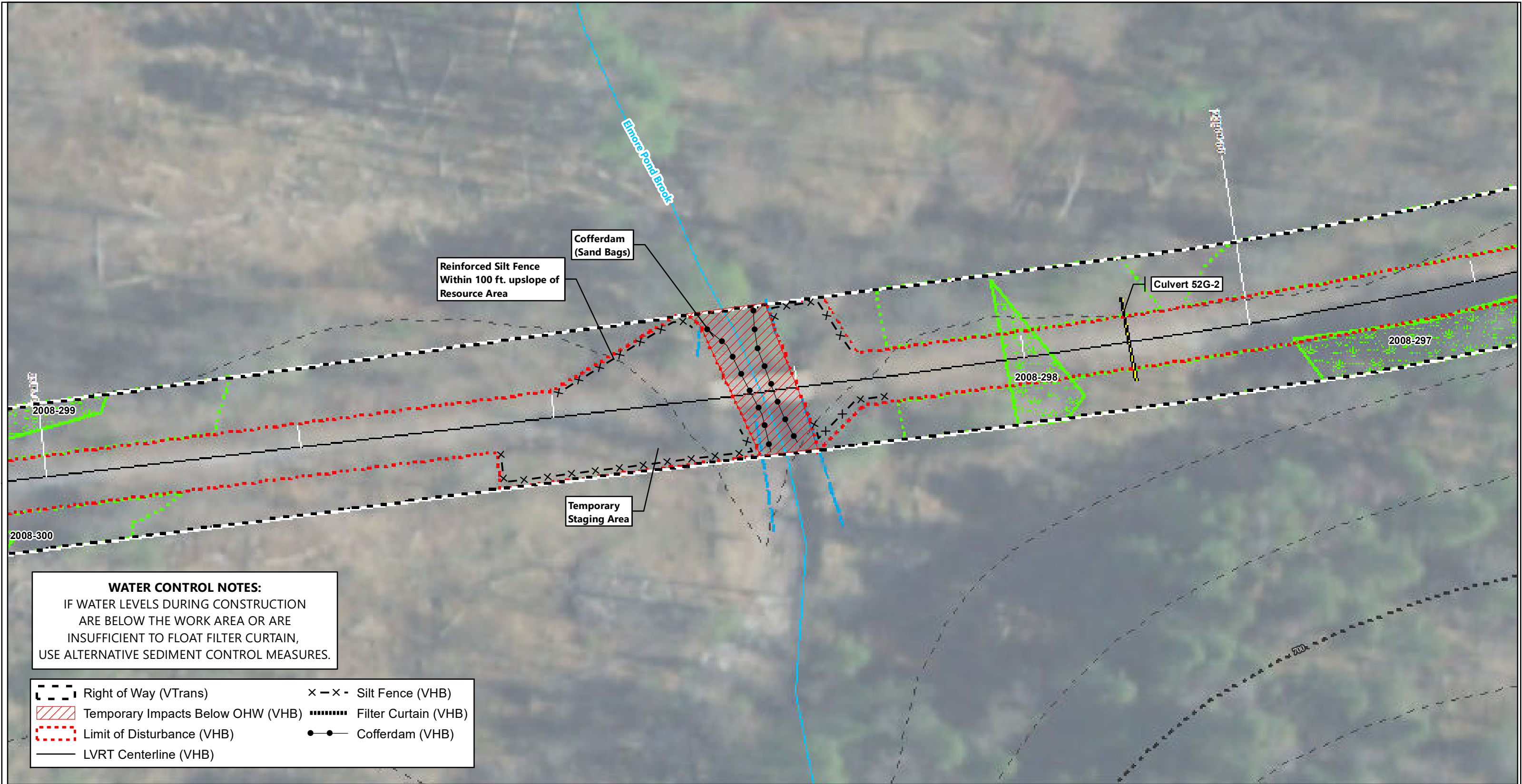
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**PURPOSE:**  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

**DATE:**  
March 23, 2021

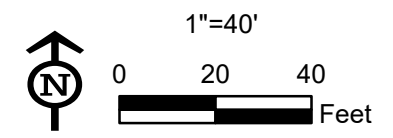
Sheet 73 of 102





LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 53 SITE PLAN

APPLICATION BY:  
VTrans

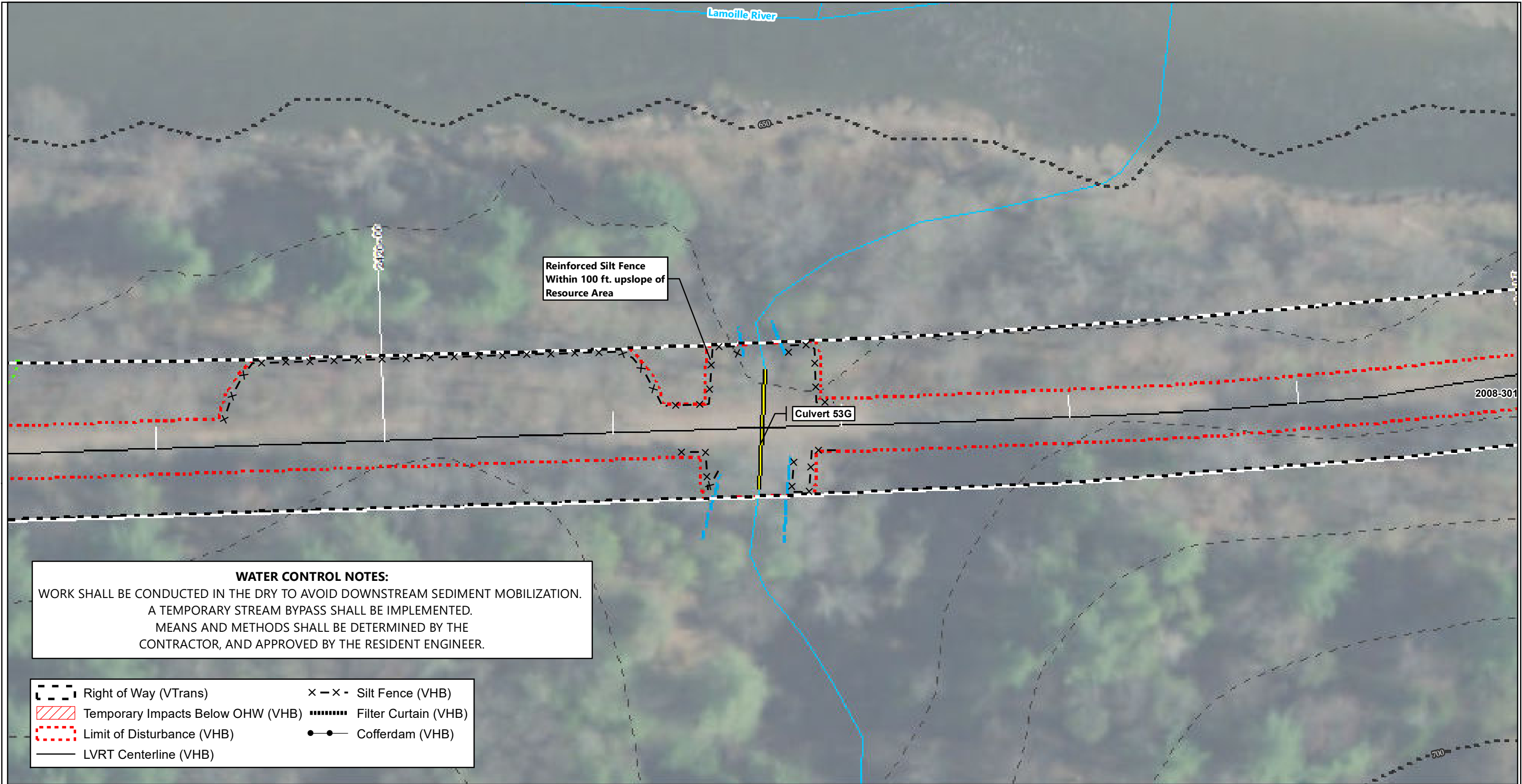


PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 53G SITE PLAN

APPLICATION BY:  
VTrans



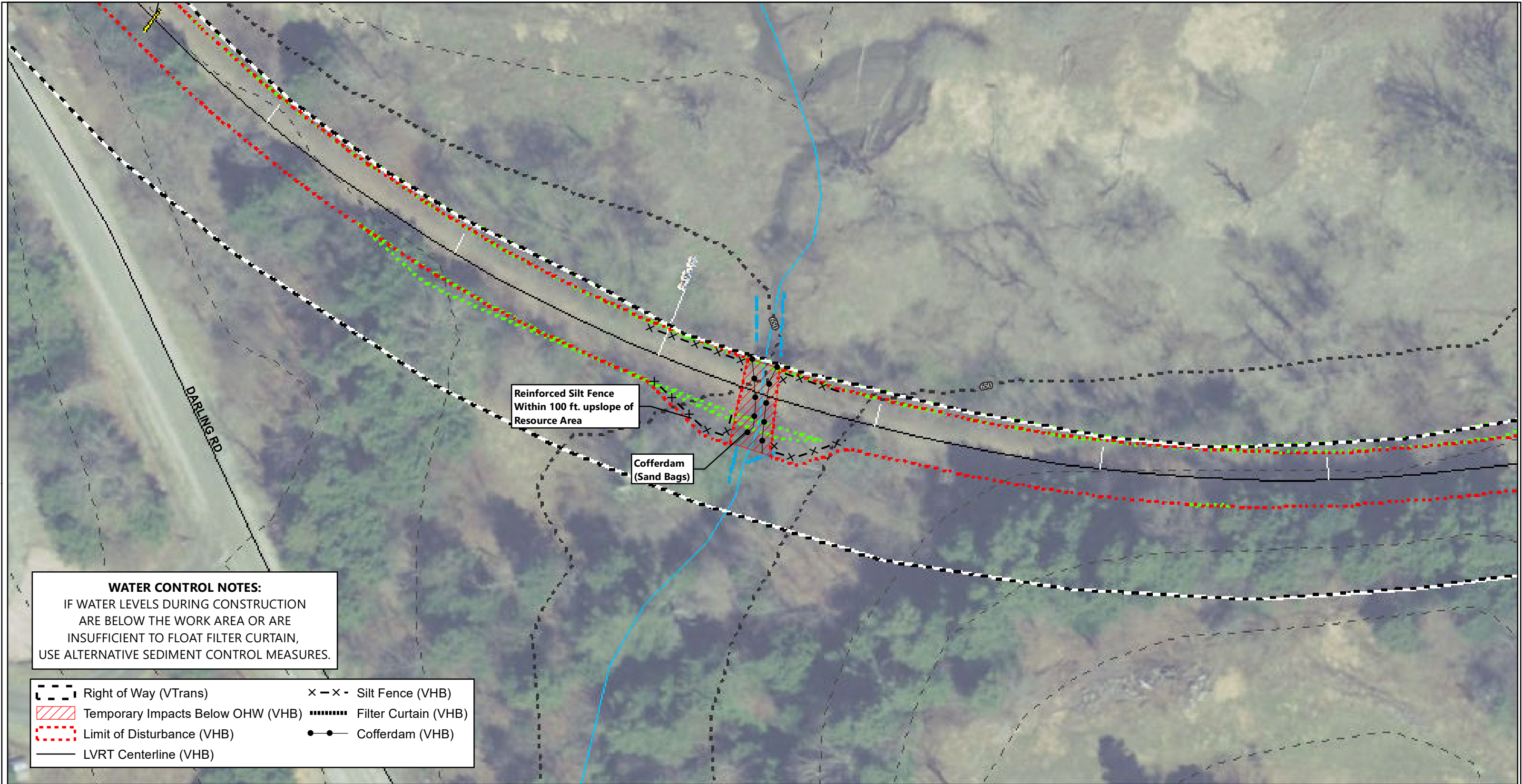
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PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 23, 2021

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LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 54 SITE PLAN

APPLICATION BY: VTrans		
PURPOSE: PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE	DATE: March 23, 2021	



St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Unauthorized Crossing

Trailhead

Bridges

W001: Wetlands

TB001: Top of Bank

SC001: Stream Center

Proposed Pause Place

Washouts

RTE Site

RTE Area (2008)

Class II Wetland Buffer (50ft)

Delineated Wetland (2017-2020)

Delineated Stream (2017)

Delineated Stream (2008)

VSWI Wetland

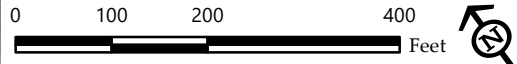
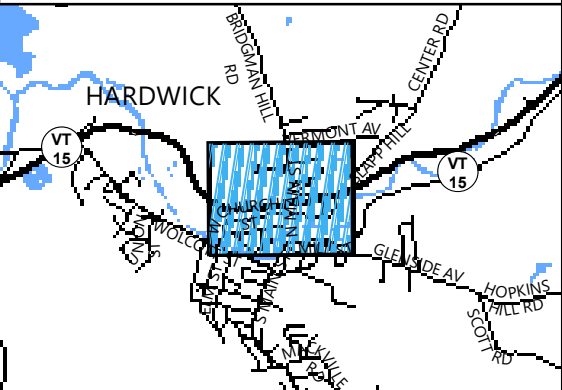
VHD Stream

Other Existing Trail

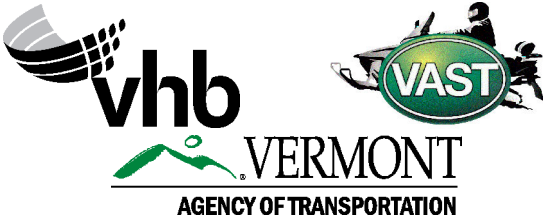
Electric Transmission Lines

Parcel Boundary

Historic Site



Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).



**EPSC PLAN IMPLEMENTATION:**  
SEE EPSC NOTES, DETAILS, AND NARRATIVE  
ON EPSC DETAIL SHEETS 80-83 AND VAOT STANDARD  
DETAILS E-10, E-11, E-12, E-13, E-14, E-15.  
  
SEE ITEM DETAIL SHEETS FOR SPECIFIC  
ACTIONS AT EACH STRUCTURE (SHEETS 8-10),  
TYPICAL TRAIL SECTION DETAILS (SHEETS 11-12),  
TYPICAL CULVERT SECTION DETAILS (SHEETS 14-16),  
AND WASTE AREA DETAILS (SHEET 22).

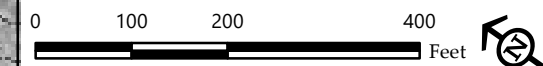
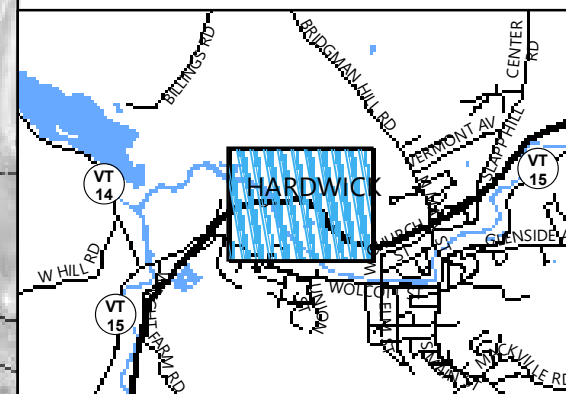


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline
- Right of Way
- Limit of Disturbance
- Temp. Impacts Below OHW
- Culvert
- Cattlepass
- Crossing
- Unauthorized Crossing
- Trailhead
- Bridges
- Proposed Pause Place
- Washouts
- RTE Site
- RTE Area (2008)
- Class II Wetland Buffer (50ft)
- Delineated Wetland (2017-2020)
- Delineated Stream (2017)
- Delineated Stream (2008)
- VSWI Wetland
- VHD Stream
- Other Existing Trail
- Electric Transmission Lines
- Parcel Boundary
- Historic Site
- W001: Wetlands
- TB001: Top of Bank
- SC001: Stream Center



Sources:  
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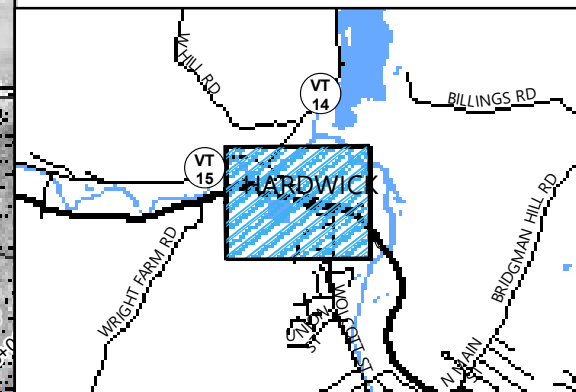
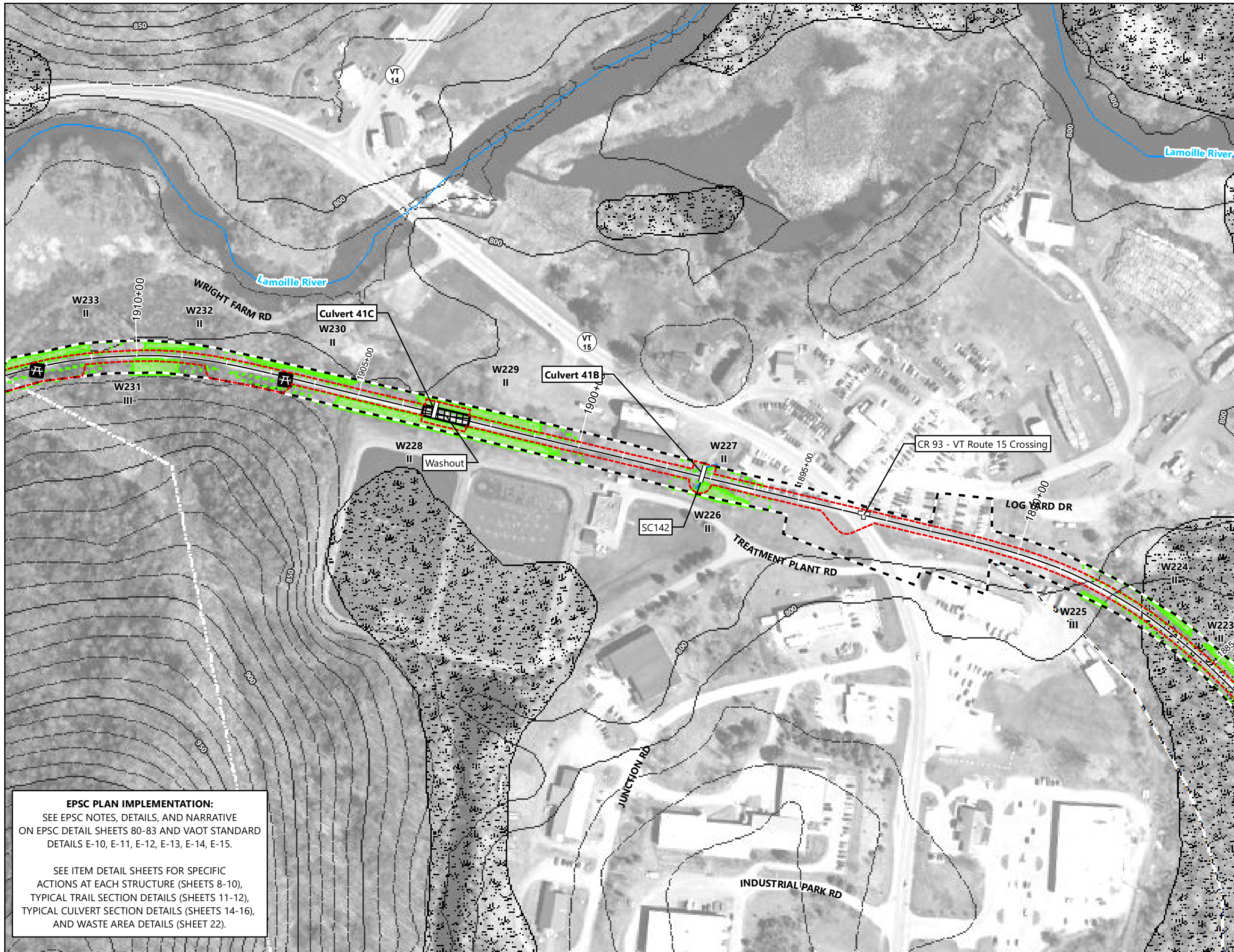


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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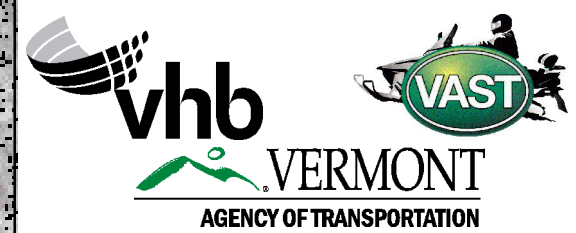
March 23, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬜ Right of Way            | ⬜ Washouts                       |
| ⬜ Limit of Disturbance    | ⬜ RTE Site                       |
| ⬜ Temp. Impacts Below OHW | ⬜ RTE Area (2008)                |
| — Culvert                 | ⬜ Class II Wetland Buffer (50ft) |
| ⬜ Cattlepass              | ⬜ Delineated Wetland (2017-2020) |
| ⬜ Crossing                | — Delineated Stream (2017)       |
| ⬜ Unauthorized Crossing   | — Delineated Stream (2008)       |
| ⬜ Trailhead               | ⬜ VSWI Wetland                   |
| ⬜ Bridges                 | — VHD Stream                     |
|                           | ⬜ Other Existing Trail           |
|                           | ⬜ Electric Transmission Lines    |
| W001: Wetlands            | ⬜ Parcel Boundary                |
| TB001: Top of Bank        | ⬜ Historic Site                  |
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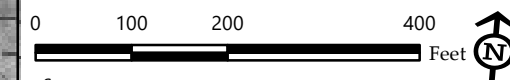
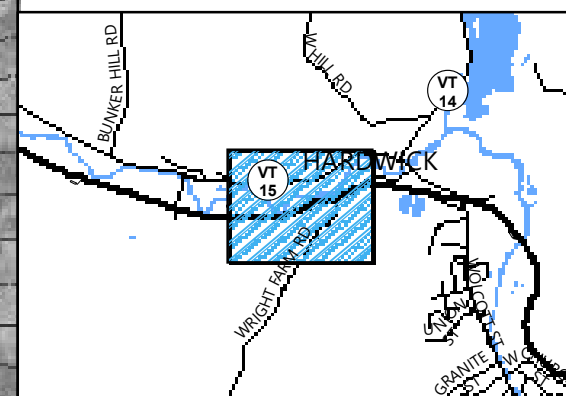


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
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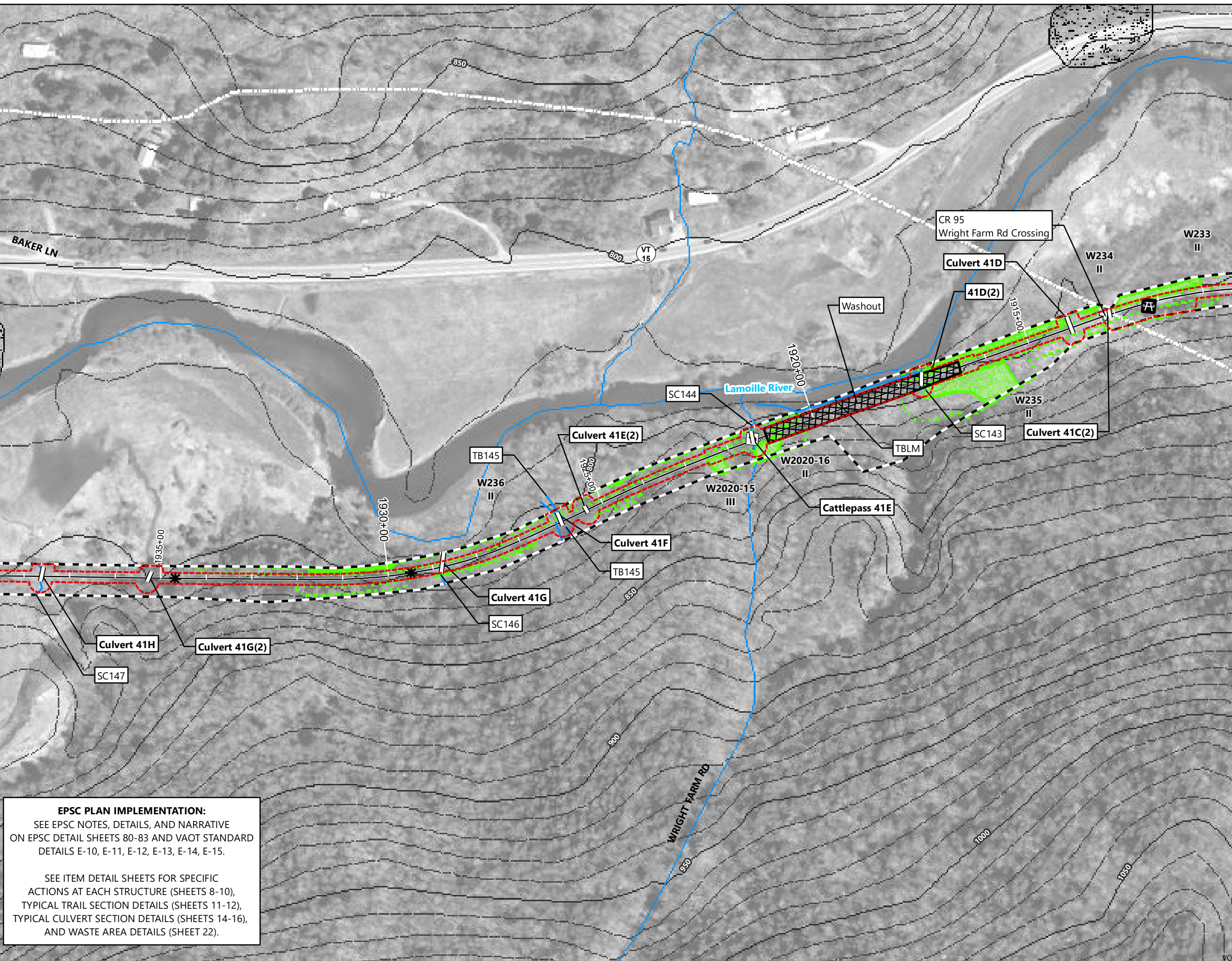
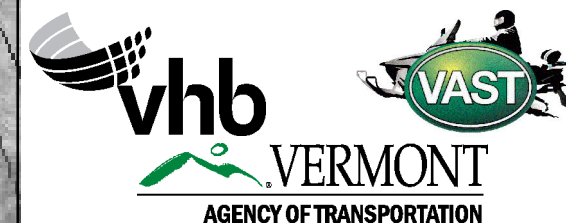
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- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
  - ⬢ Cattlepass
  - ⊕ Crossing
  - ✱ Unauthorized Crossing
  - ⬢ Trailhead
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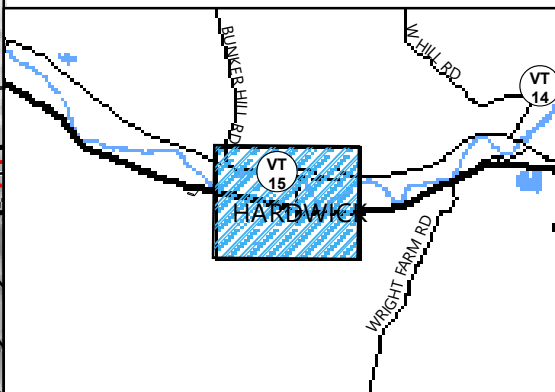


St. Johnsbury - Swanton  
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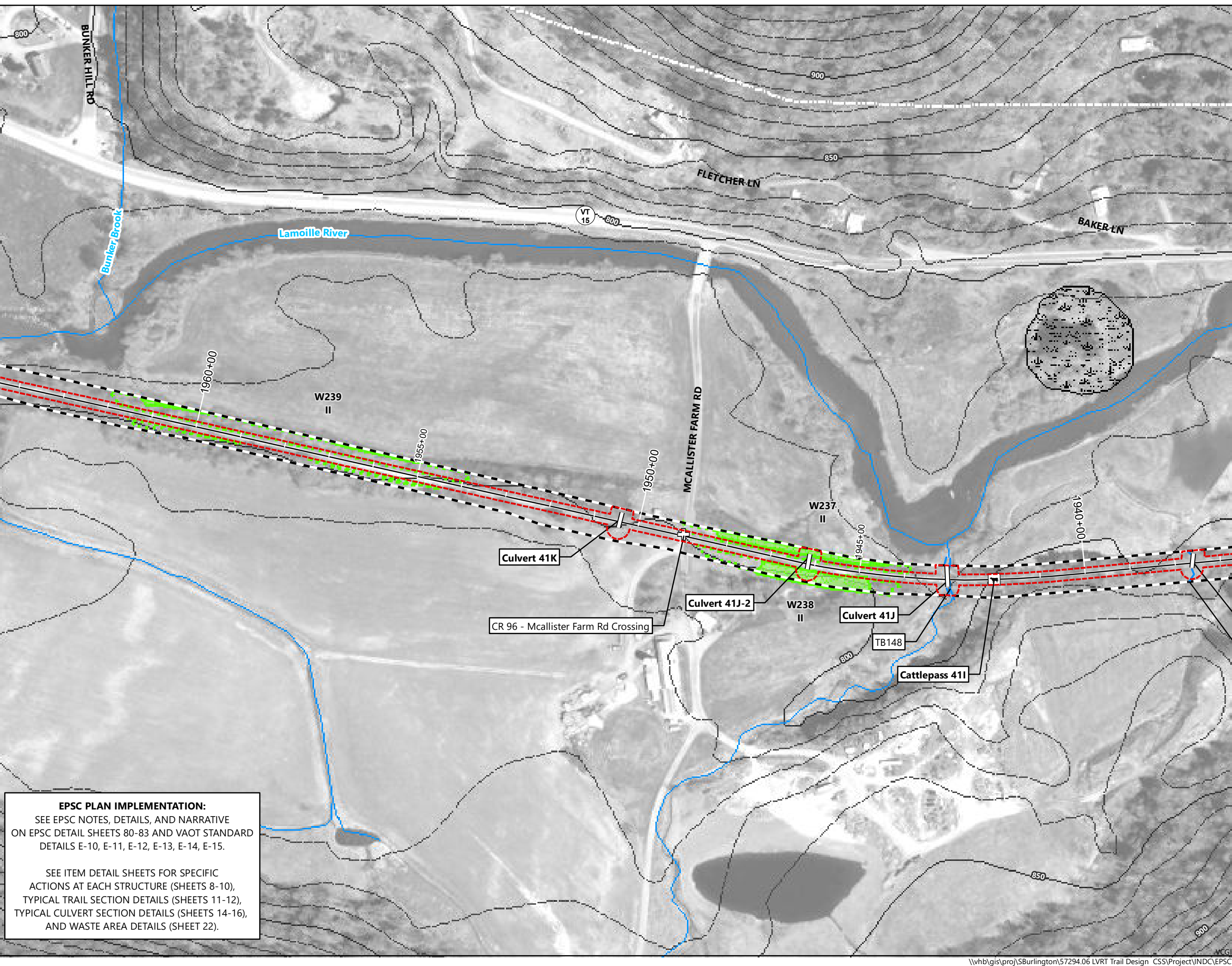
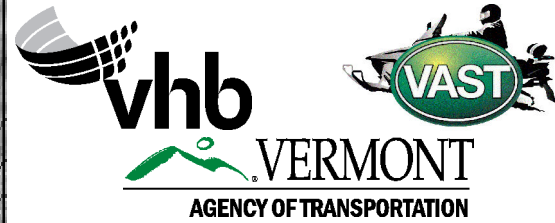
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- |                           |                                  |
|---------------------------|----------------------------------|
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| ⬜ Right of Way            | 🚚 Washouts                       |
| ⬜ Limit of Disturbance    | 📍 RTE Site                       |
| ⬜ Temp. Impacts Below OHW | 📊 RTE Area (2008)                |
| — Culvert                 | 🌿 Class II Wetland Buffer (50ft) |
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| 📍 Trailhead               | 🌿 VSWI Wetland                   |
| 🌉 Bridges                 | 📊 VHD Stream                     |
| W001: Wetlands            | ⋯ Other Existing Trail           |
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| SC001: Stream Center      | 📊 Parcel Boundary                |
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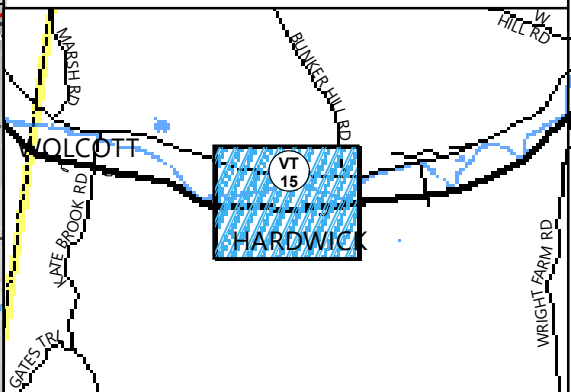
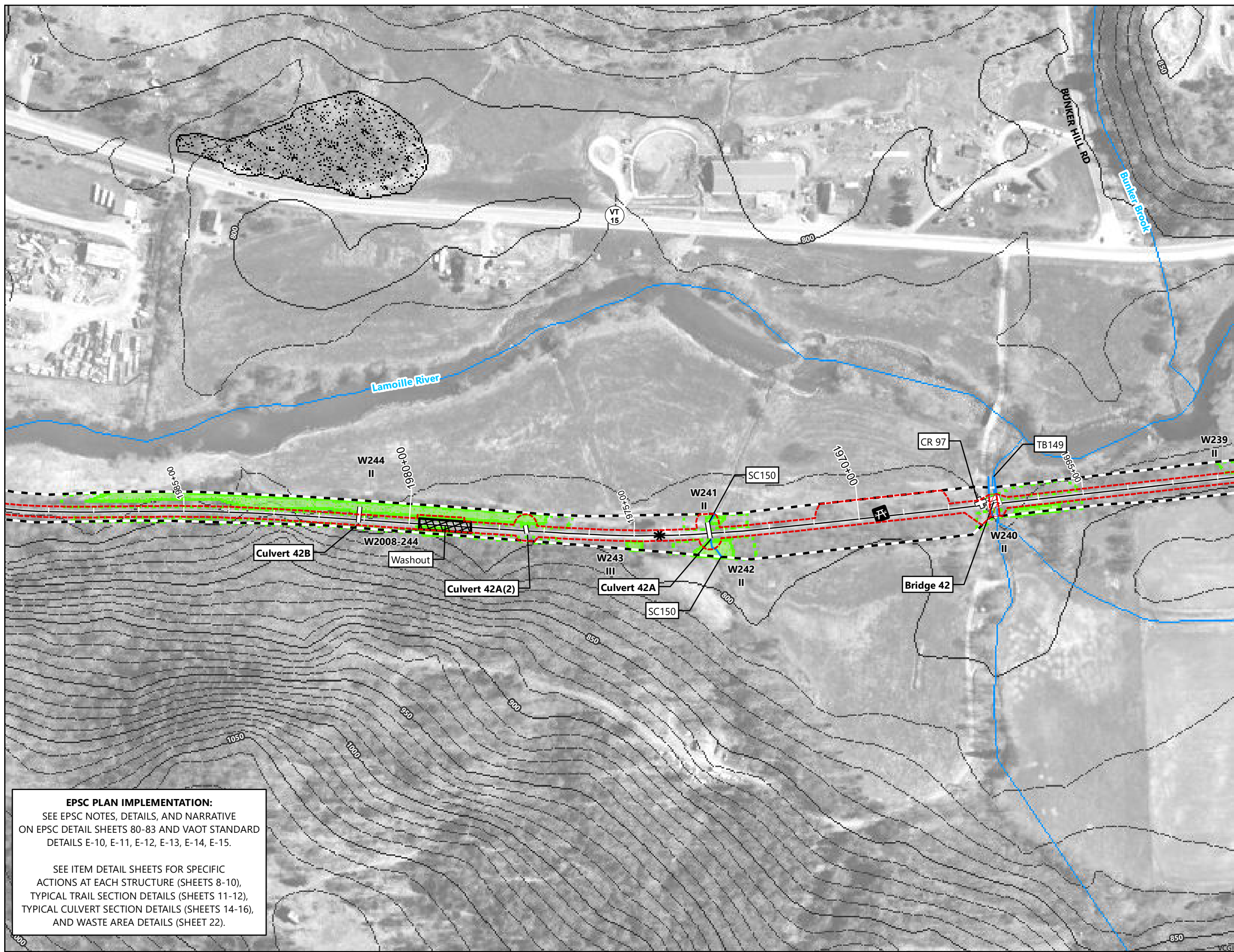


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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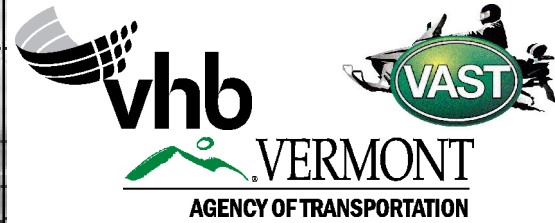
March 23, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
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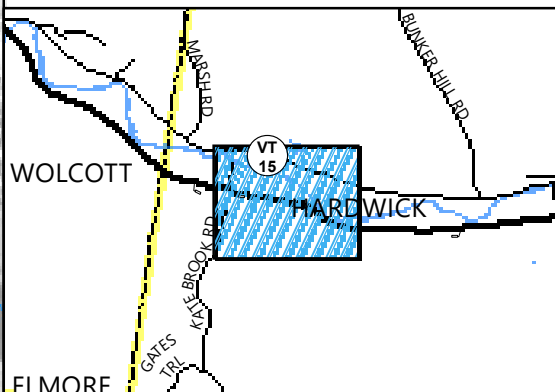


St. Johnsbury - Swanton  
STP-LVRT(12)  
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Layout Plan

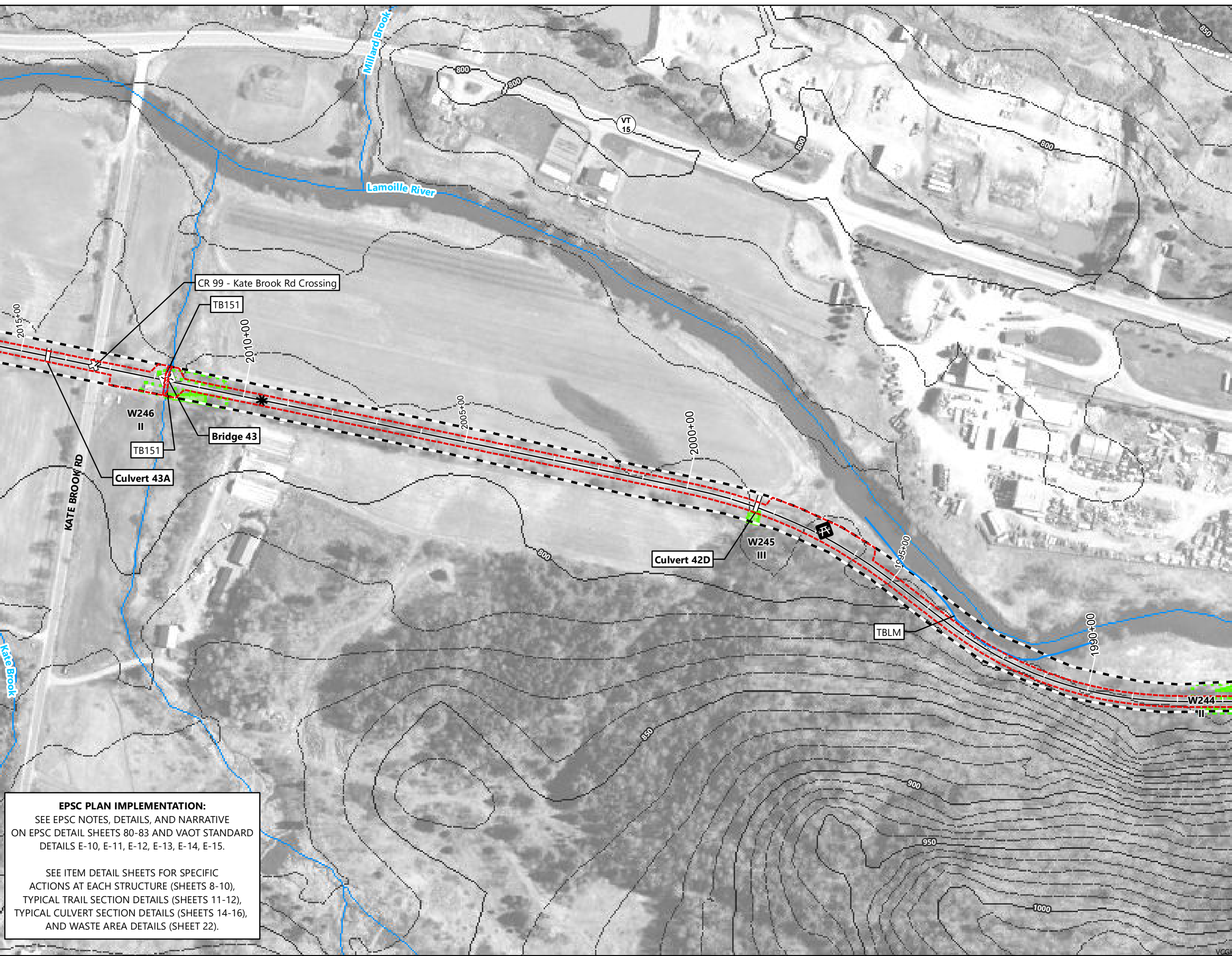
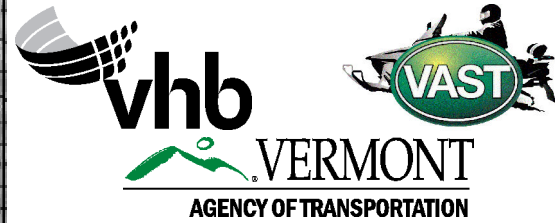
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March 23, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬛ Right of Way            | 🚚 Washouts                       |
| 🔴 Limit of Disturbance    | 📍 RTE Site                       |
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St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Unauthorized Crossing

Trailhead

Bridges

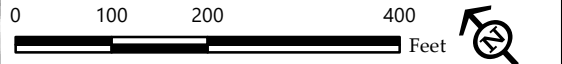
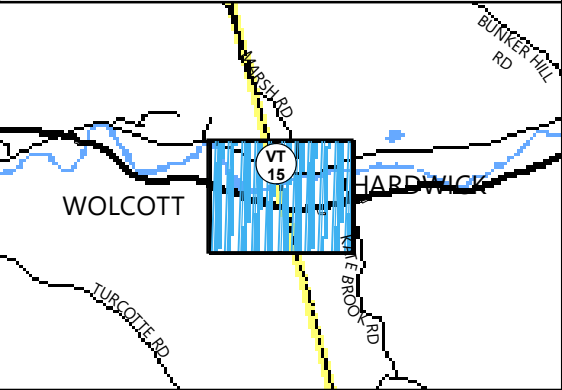
W001: Wetlands

TB001: Top of Bank

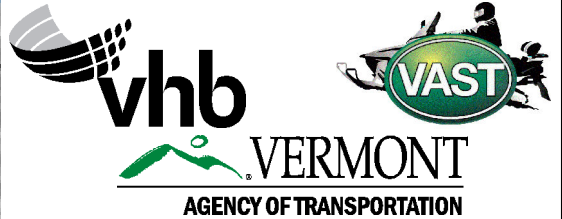
SC001: Stream Center
- Proposed Pause Place
- Washouts
- RTE Site
- RTE Area (2008)
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St. Johnsbury - Swanton  
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March 23, 2021

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Right of Way

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Cattlepass

Crossing

Unauthorized Crossing

Trailhead

Bridges

W001: Wetlands

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SC001: Stream Center
- Proposed Pause Place

Washouts

RTE Site

RTE Area (2008)

Class II Wetland Buffer (50ft)

Delineated Wetland (2017-2020)

Delineated Stream (2017)

Delineated Stream (2008)

VSWI Wetland

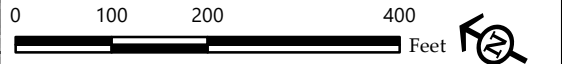
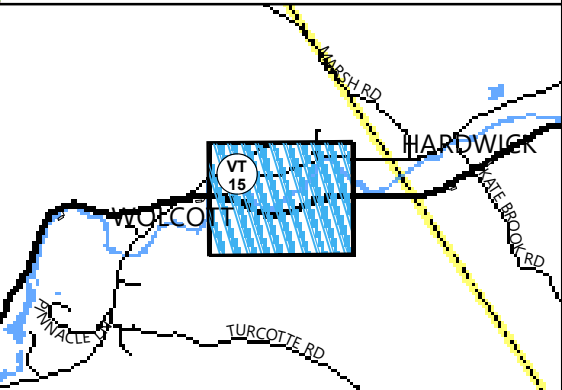
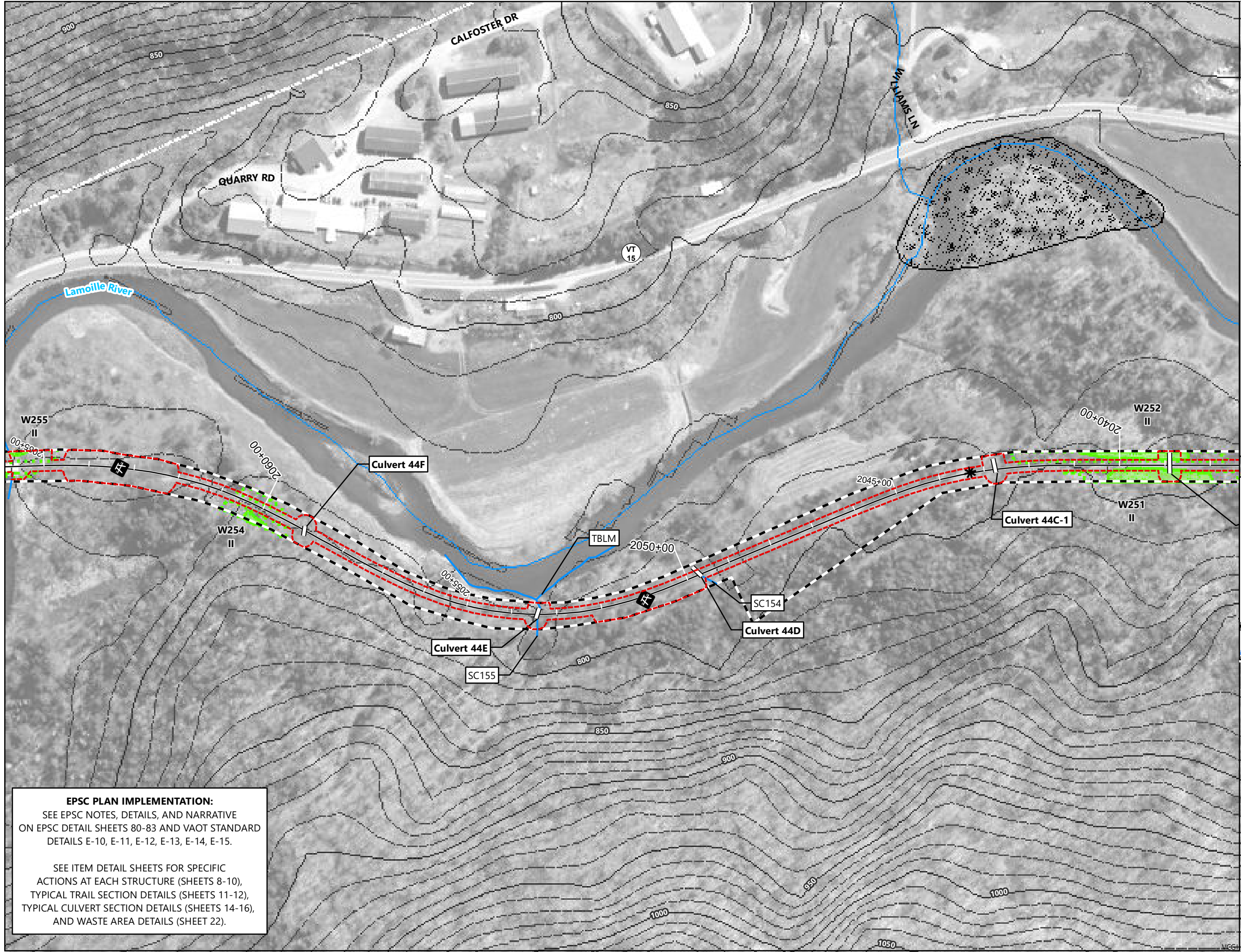
VHD Stream

Other Existing Trail

Electric Transmission Lines

Parcel Boundary

Historic Site



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St. Johnsbury - Swanton  
STP-LVRT(12)  
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March 23, 2021

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Right of Way

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Cattlepass

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Unauthorized Crossing

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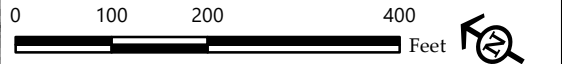
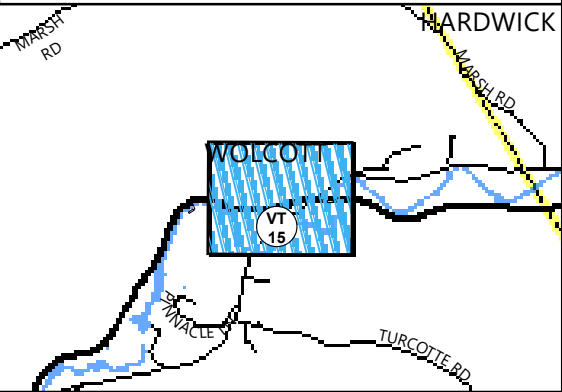
W001: Wetlands

TB001: Top of Bank

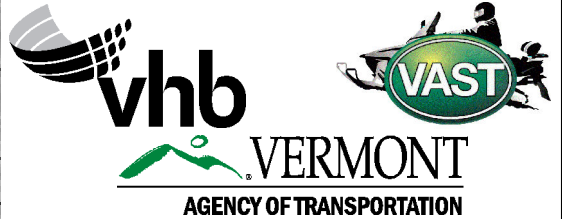
SC001: Stream Center

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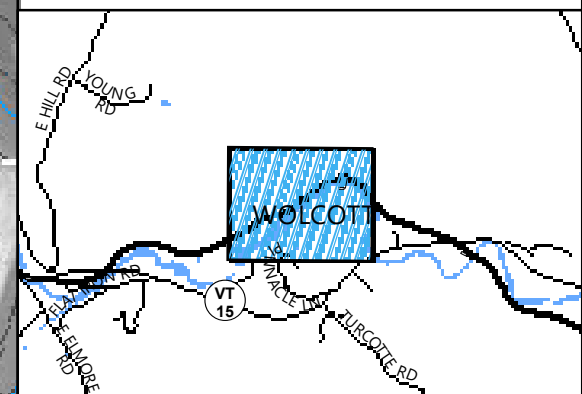


St. Johnsbury - Swanton  
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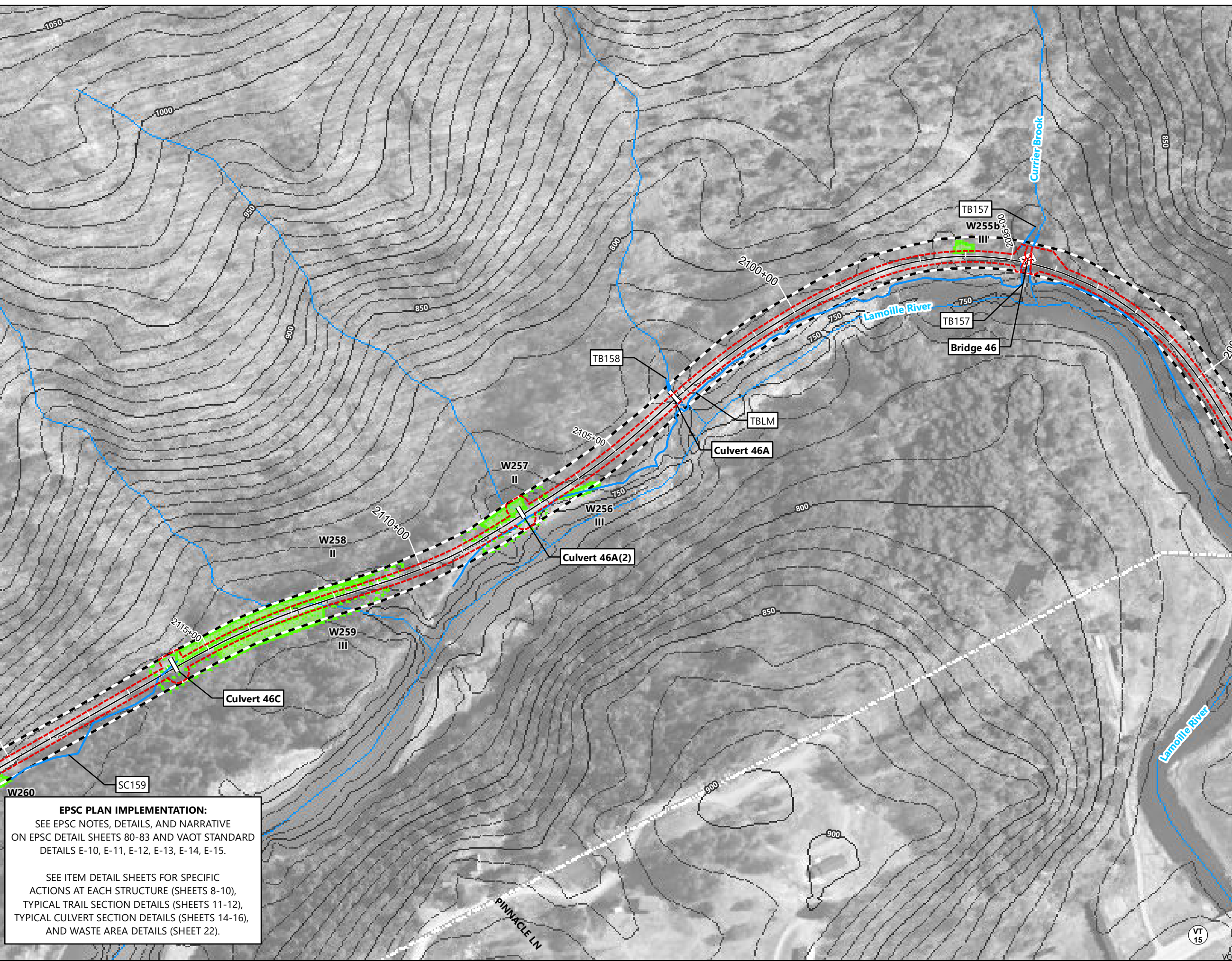
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St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Unauthorized Crossing

Trailhead

Bridges

W001: Wetlands

TB001: Top of Bank

SC001: Stream Center

Proposed Pause Place

Washouts

RTE Site

RTE Area (2008)

Class II Wetland Buffer (50ft)

Delineated Wetland (2017-2020)

Delineated Stream (2017)

Delineated Stream (2008)

VSWI Wetland

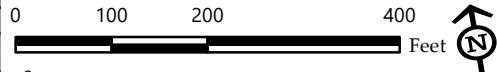
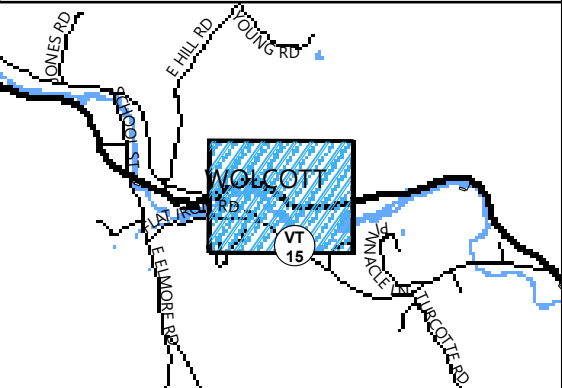
VHD Stream

Other Existing Trail

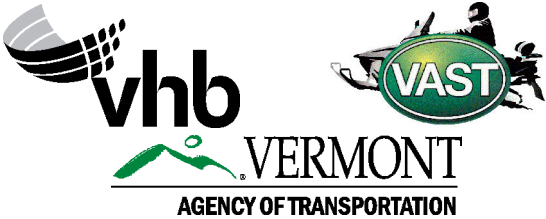
Electric Transmission Lines

Parcel Boundary

Historic Site



Sources:  
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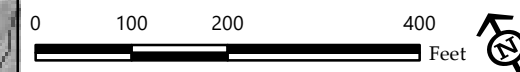
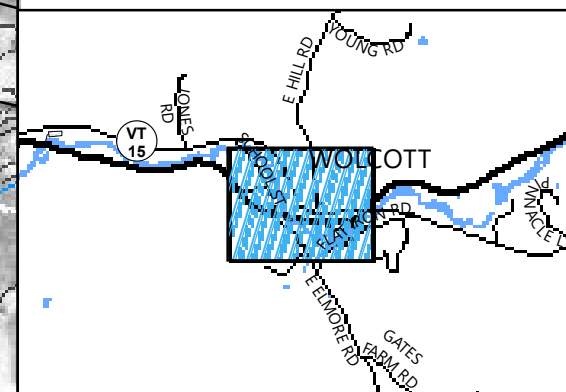


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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— LVRT Centerline	⚠ Proposed Pause Place
⬜ Right of Way	🚚 Washouts
⬜ Limit of Disturbance	📍 RTE Site
⬜ Temp. Impacts Below OHW	📊 RTE Area (2008)
— Culvert	🌿 Class II Wetland Buffer (50ft)
🚶 Cattlepass	🌿 Delineated Wetland (2017-2020)
⊕ Crossing	📊 Delineated Stream (2017)
✳ Unauthorized Crossing	📊 Delineated Stream (2008)
📍 Trailhead	📊 VSWI Wetland
🌉 Bridges	📊 VHD Stream
	⋯ Other Existing Trail
W001: Wetlands	⋯ Electric Transmission Lines
TB001: Top of Bank	📊 Parcel Boundary
SC001: Stream Center	📍 Historic Site



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STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Unauthorized Crossing

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Bridges

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VSWI Wetland

VHD Stream

Other Existing Trail

Electric Transmission Lines

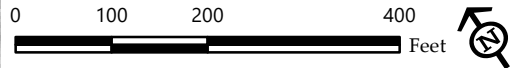
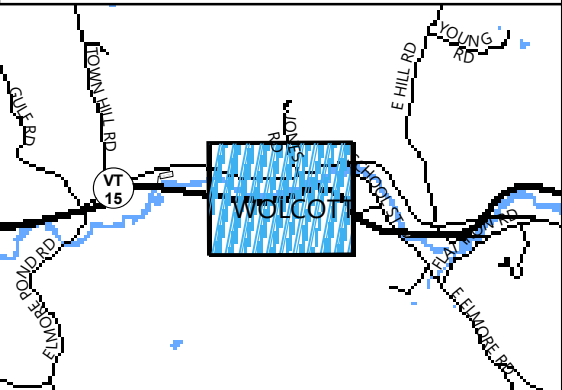
Parcel Boundary

Historic Site

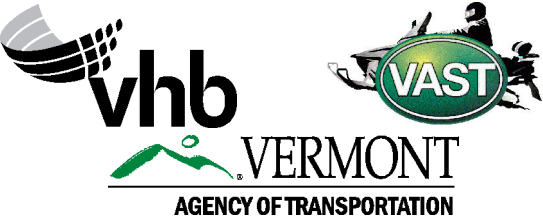
W001: Wetlands

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St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline

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Delineated Stream (2008)

VSWI Wetland

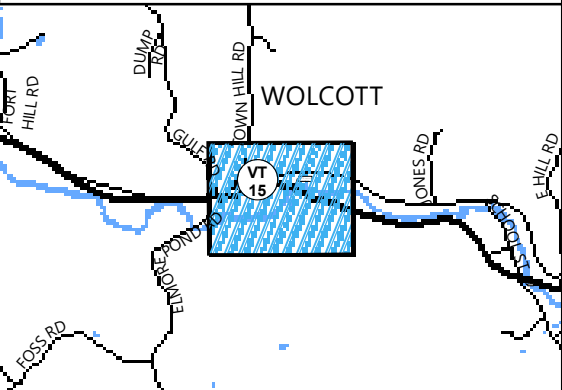
VHD Stream

Other Existing Trail

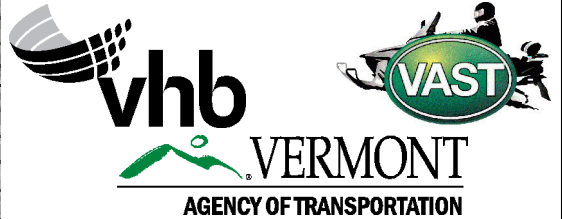
Electric Transmission Lines

Parcel Boundary

Historic Site



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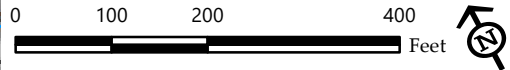
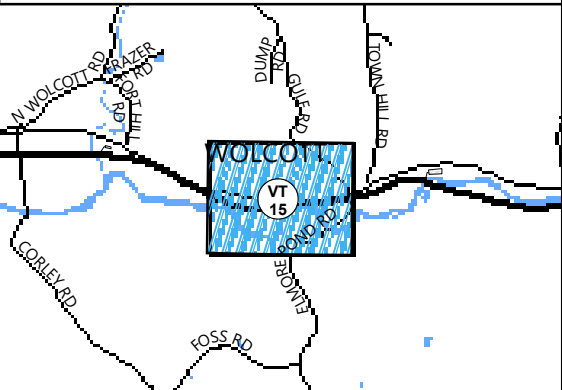


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

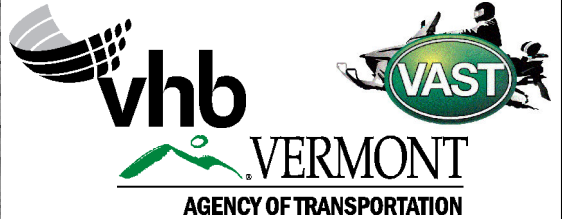
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- LVRT Centerline
- ⬢ Right of Way
- ⬢ Limit of Disturbance
- ⬢ Temp. Impacts Below OHW
- Culvert
- ⬢ Cattlepass
- ⊕ Crossing
- ✱ Unauthorized Crossing
- ⬢ Trailhead
- ⬢ Bridges
- ⬢ Proposed Pause Place
- ⬢ Washouts
- ⬢ RTE Site
- ⬢ RTE Area (2008)
- ⬢ Class II Wetland Buffer (50ft)
- ⬢ Delineated Wetland (2017-2020)
- Delineated Stream (2017)
- Delineated Stream (2008)
- ⬢ VSWI Wetland
- VHD Stream
- ⬢ Other Existing Trail
- ⬢ Electric Transmission Lines
- ⬢ Parcel Boundary
- ⬢ Historic Site
- W001: Wetlands
- TB001: Top of Bank
- SC001: Stream Center



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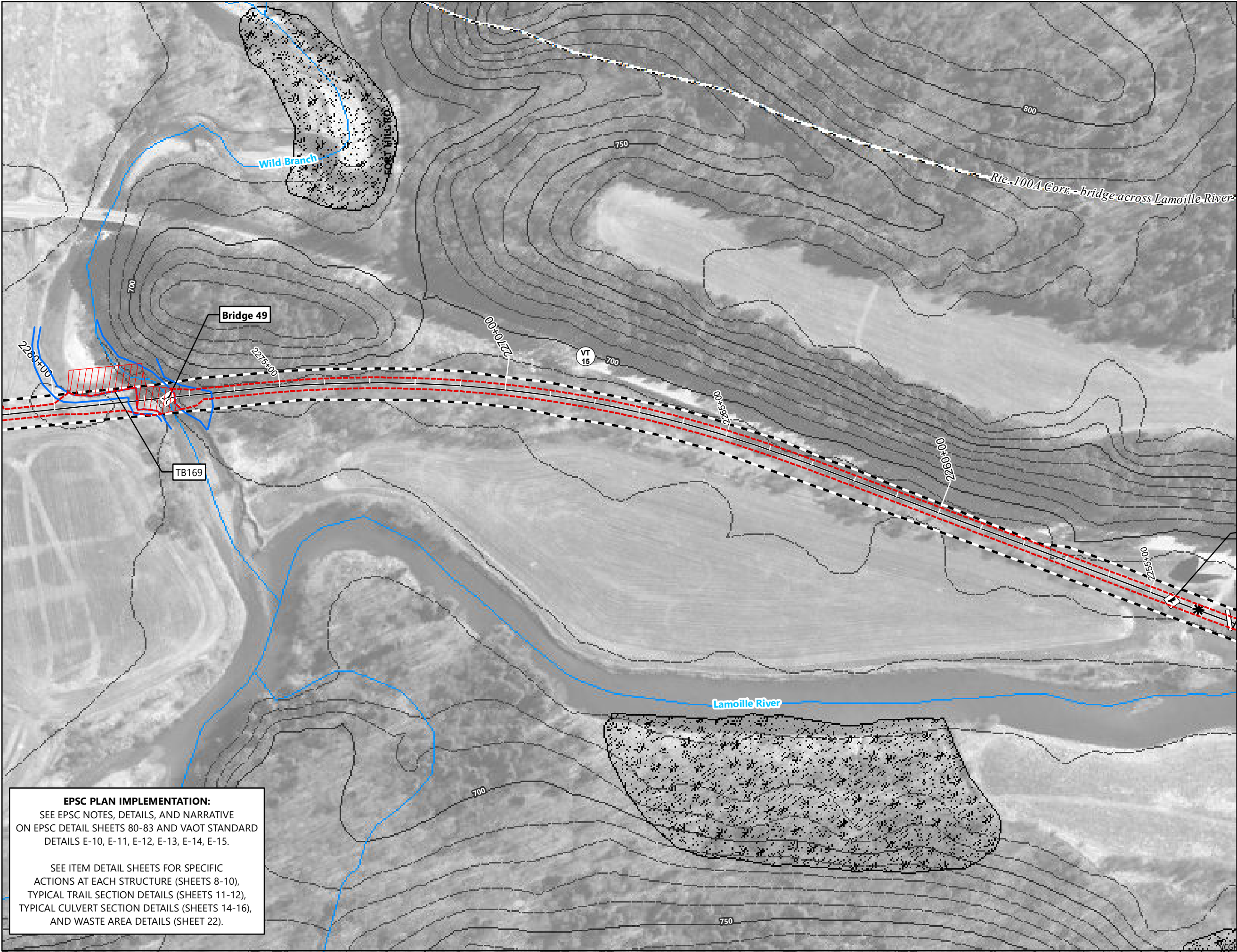
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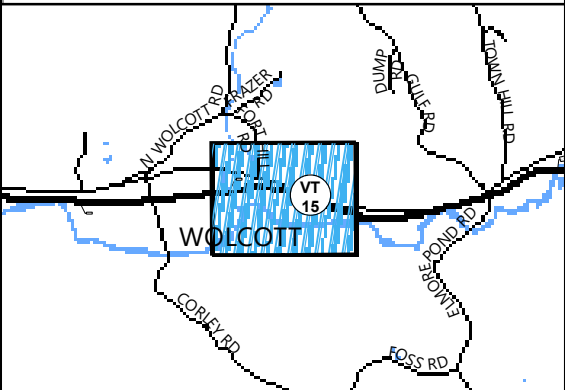
St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021



- LVRT Centerline
- ▬ Right of Way
- ▬ Limit of Disturbance
- ▬ Temp. Impacts Below OHW
- ▬ Culvert
- ▬ Cattlepass
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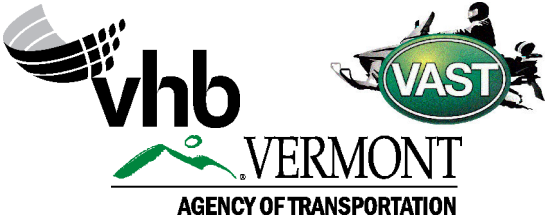


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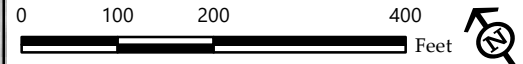
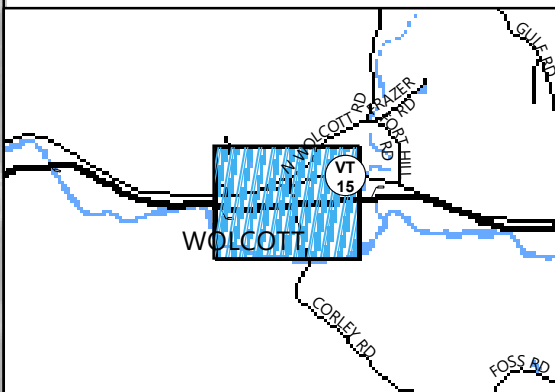


St. Johnsbury - Swanton  
STP-LVRT(12)  
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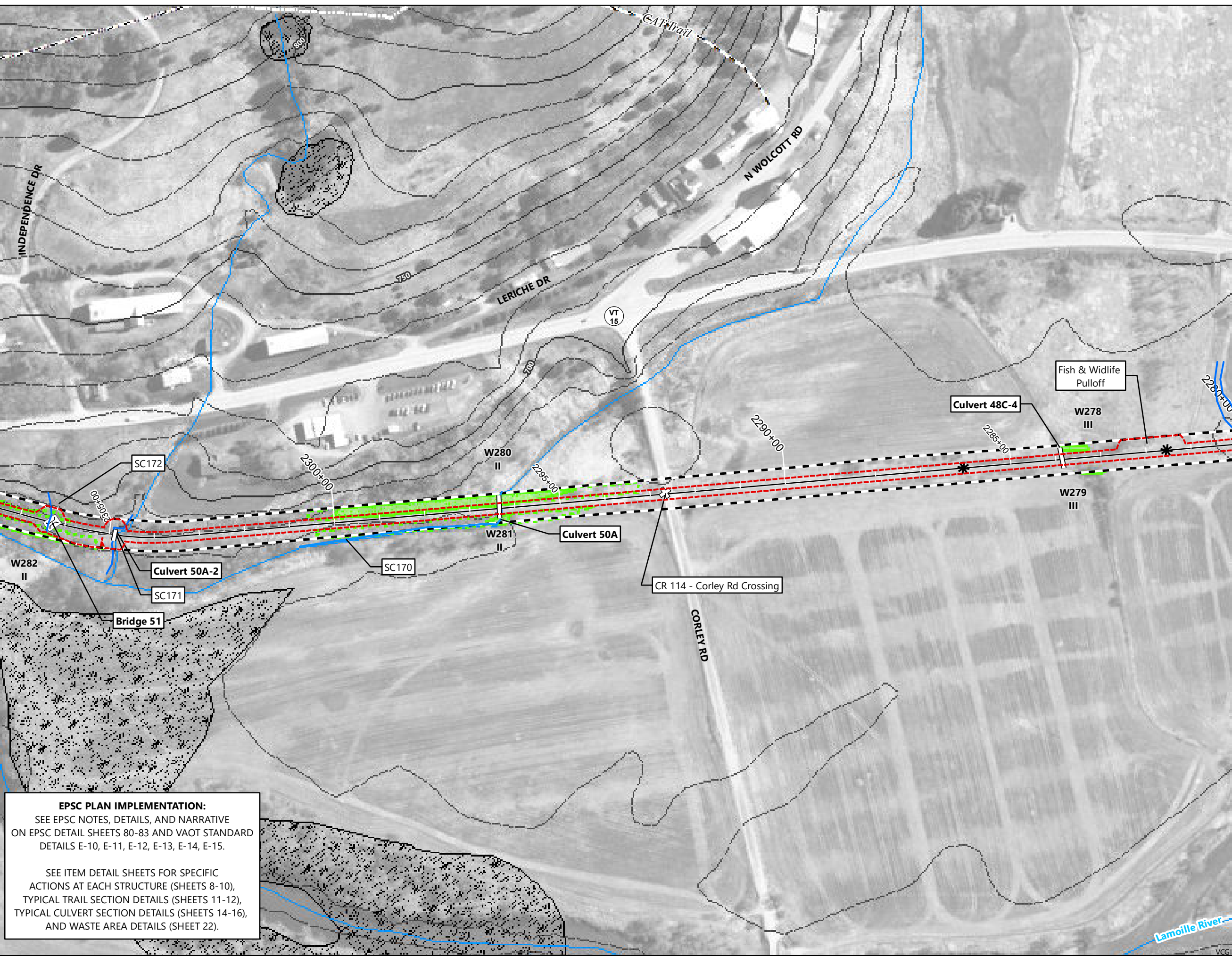
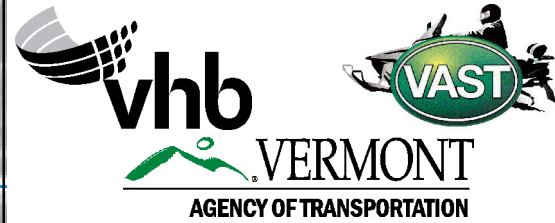
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- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬜ Right of Way            | 🚚 Washouts                       |
| ⬜ Limit of Disturbance    | 📍 RTE Site                       |
| ⬜ Temp. Impacts Below OHW | 📏 RTE Area (2008)                |
| — Culvert                 | 🌿 Class II Wetland Buffer (50ft) |
| 🚶 Cattlepass              | 🌿 Delineated Wetland (2017-2020) |
| ⊕ Crossing                | 📏 Delineated Stream (2017)       |
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| 📍 Trailhead               | 📏 VSWI Wetland                   |
| 🌉 Bridges                 | 📏 VHD Stream                     |
|                           | ⋯ Other Existing Trail           |
|                           | ⋯ Electric Transmission Lines    |
| W001: Wetlands            | 📏 Parcel Boundary                |
| TB001: Top of Bank        | 📍 Historic Site                  |
| SC001: Stream Center      |                                  |



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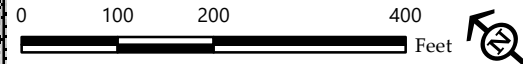
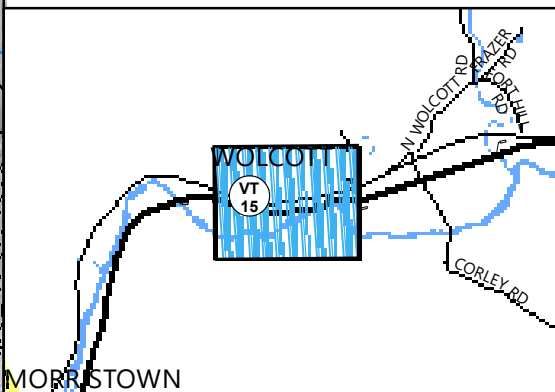


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

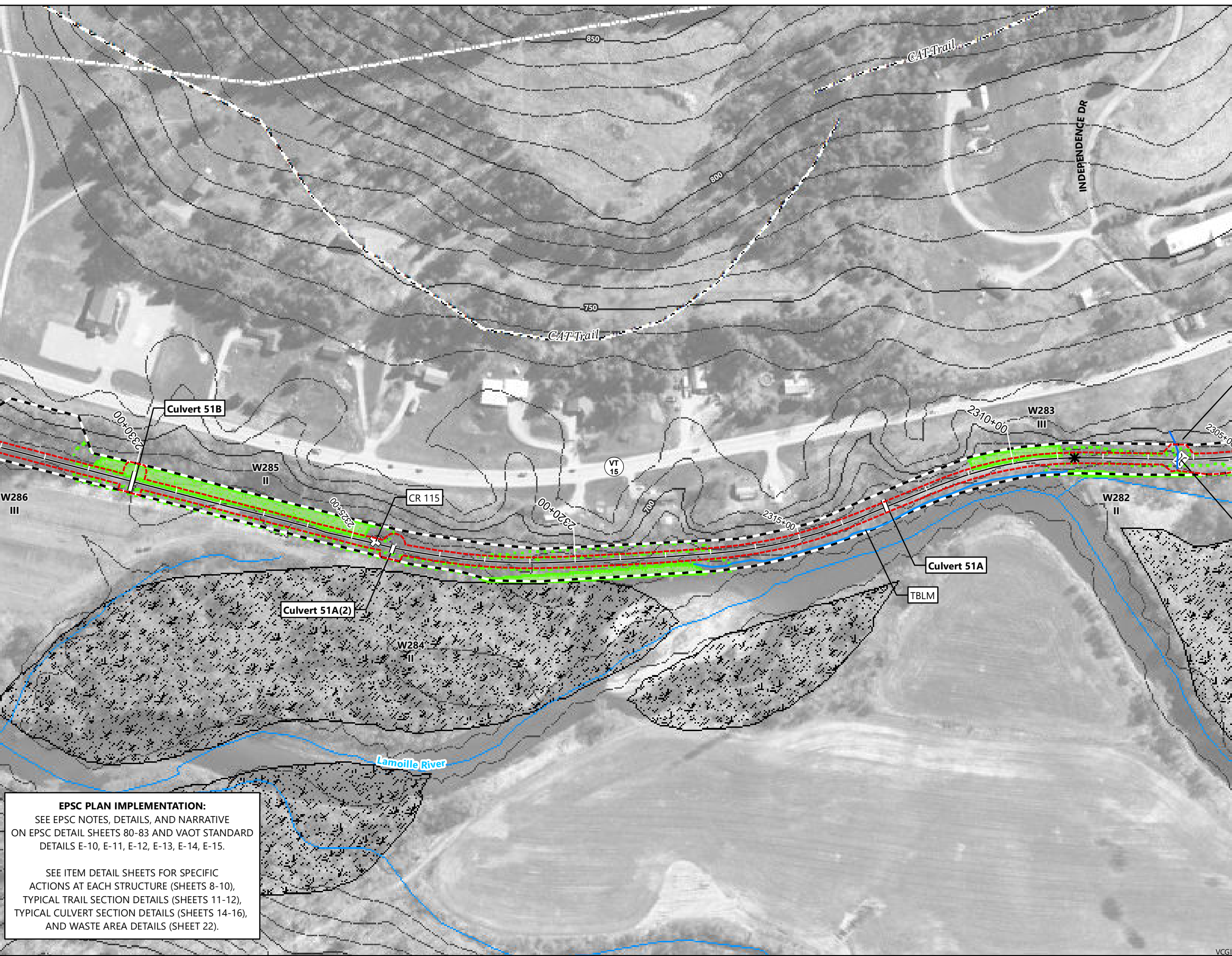
Sheet 95 of 102

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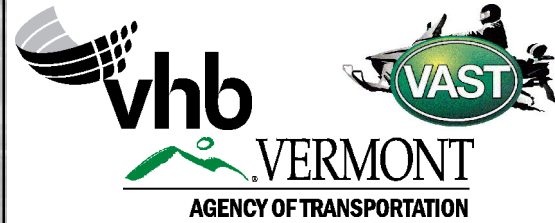
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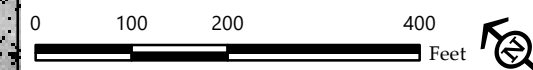
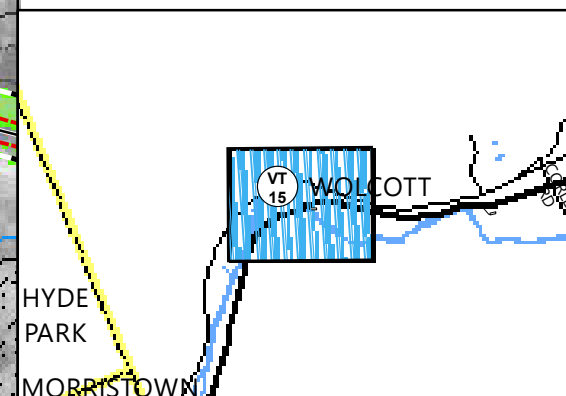


St. Johnsbury - Swanton  
STP-LVRT(12)  
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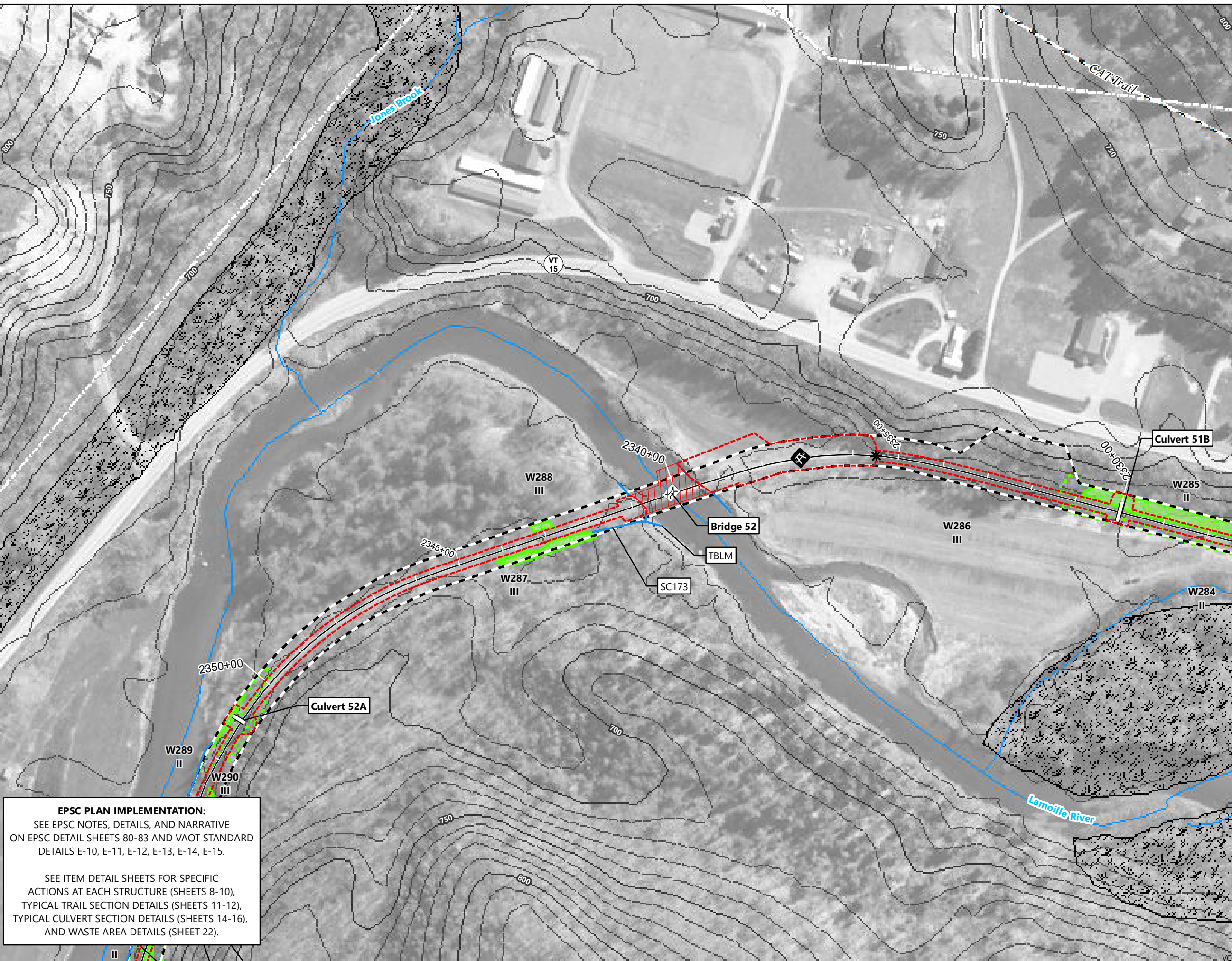
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- |                           |                                  |
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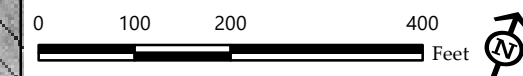
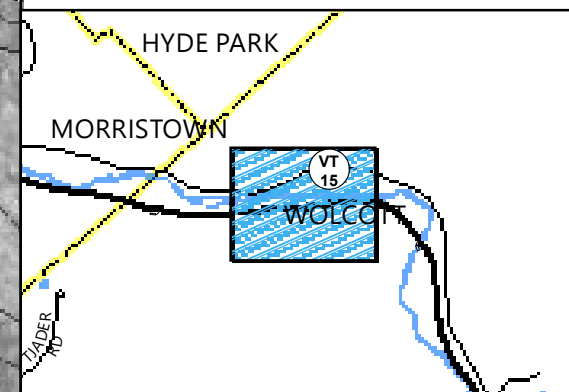
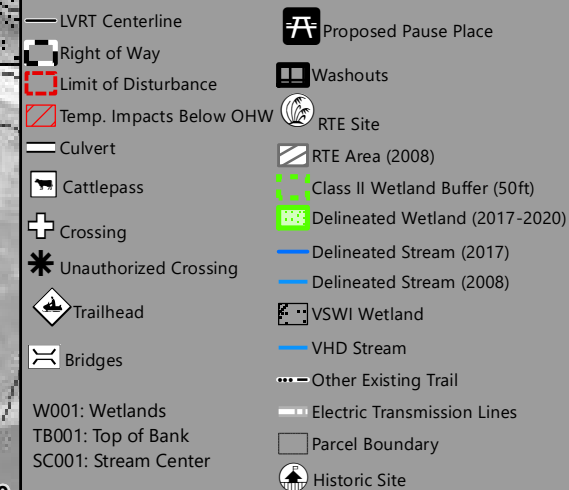
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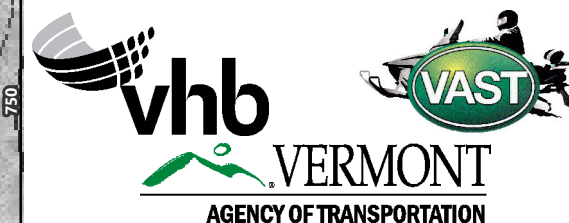
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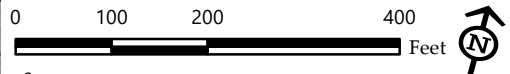
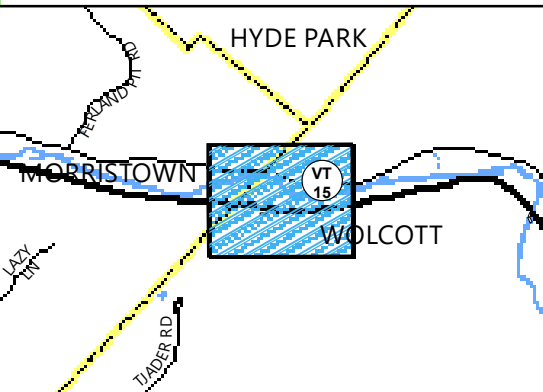


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

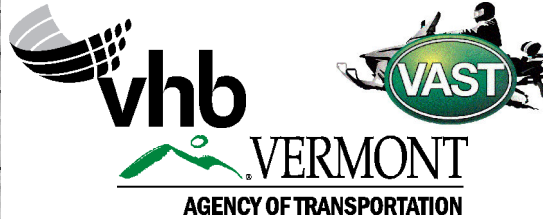
Sheet 98 of 102

March 23, 2021

- LVRT Centerline
  - ⬢ Right of Way
  - ⬢ Limit of Disturbance
  - ⬢ Temp. Impacts Below OHW
  - Culvert
  - ⬢ Cattlepass
  - ⬢ Crossing
  - ⬢ Unauthorized Crossing
  - ⬢ Trailhead
  - ⬢ Bridges
  - ⬢ Proposed Pause Place
  - ⬢ Washouts
  - ⬢ RTE Site
  - ⬢ RTE Area (2008)
  - ⬢ Class II Wetland Buffer (50ft)
  - ⬢ Delineated Wetland (2017-2020)
  - ⬢ Delineated Stream (2017)
  - ⬢ Delineated Stream (2008)
  - ⬢ VSWI Wetland
  - ⬢ VHD Stream
  - ⬢ Other Existing Trail
  - ⬢ Electric Transmission Lines
  - ⬢ Parcel Boundary
  - ⬢ Historic Site
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



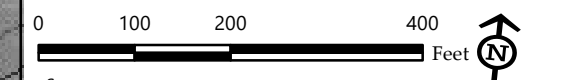
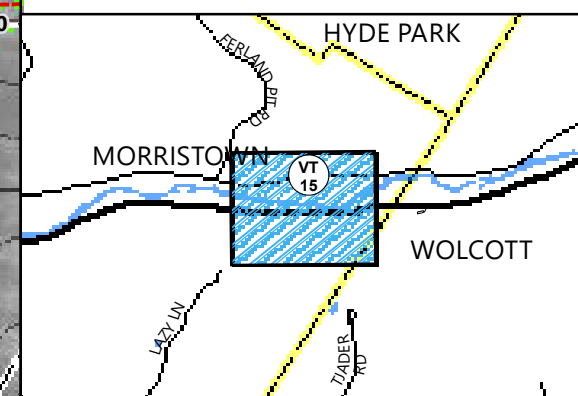
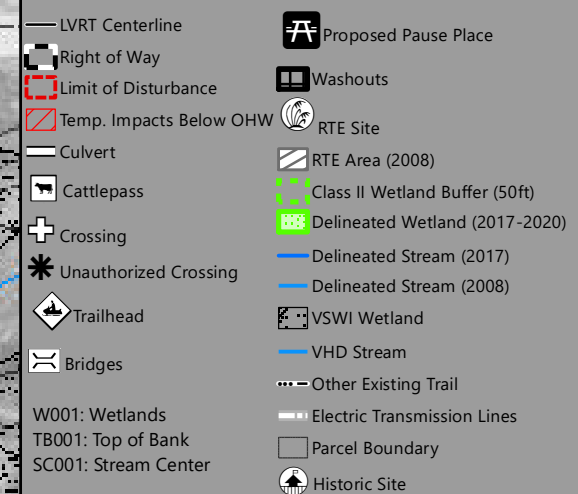
Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).



**EPSC PLAN IMPLEMENTATION:**  
SEE EPSC NOTES, DETAILS, AND NARRATIVE  
ON EPSC DETAIL SHEETS 80-83 AND VAOT STANDARD  
DETAILS E-10, E-11, E-12, E-13, E-14, E-15.  
  
SEE ITEM DETAIL SHEETS FOR SPECIFIC  
ACTIONS AT EACH STRUCTURE (SHEETS 8-10),  
TYPICAL TRAIL SECTION DETAILS (SHEETS 11-12),  
TYPICAL CULVERT SECTION DETAILS (SHEETS 14-16),  
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March 23, 2021



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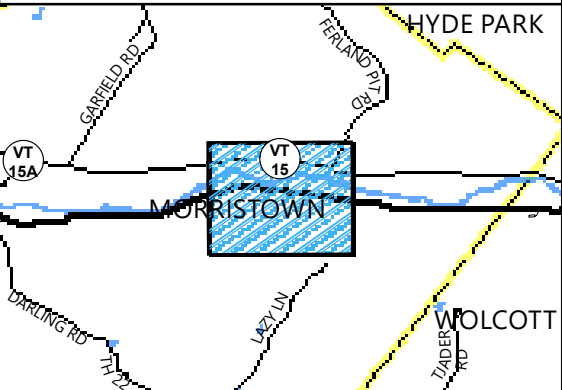


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

Sheet 100 of 102

March 23, 2021

- LVRT Centerline
- ▣ Right of Way
- ▣ Limit of Disturbance
- ▣ Temp. Impacts Below OHW
- Culvert
- ▣ Cattlepass
- ⊕ Crossing
- ✱ Unauthorized Crossing
- ◆ Trailhead
- ⌒ Bridges
- W001: Wetlands
- TB001: Top of Bank
- SC001: Stream Center
- ▣ Proposed Pause Place
- ▣ Washouts
- ⊙ RTE Site
- ▣ RTE Area (2008)
- ▣ Class II Wetland Buffer (50ft)
- ▣ Delineated Wetland (2017-2020)
- Delineated Stream (2017)
- Delineated Stream (2008)
- ▣ VSWI Wetland
- VHD Stream
- ⋯ Other Existing Trail
- Electric Transmission Lines
- ▣ Parcel Boundary
- ⊙ Historic Site



Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).



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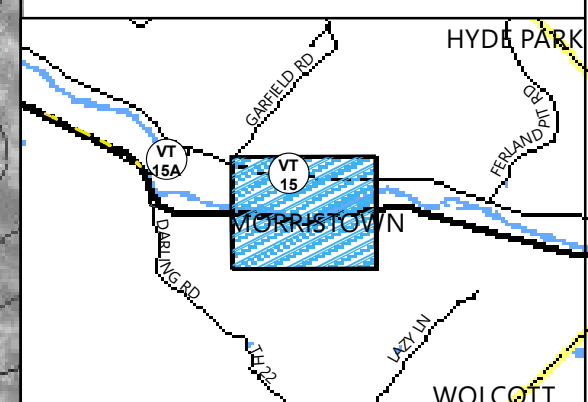
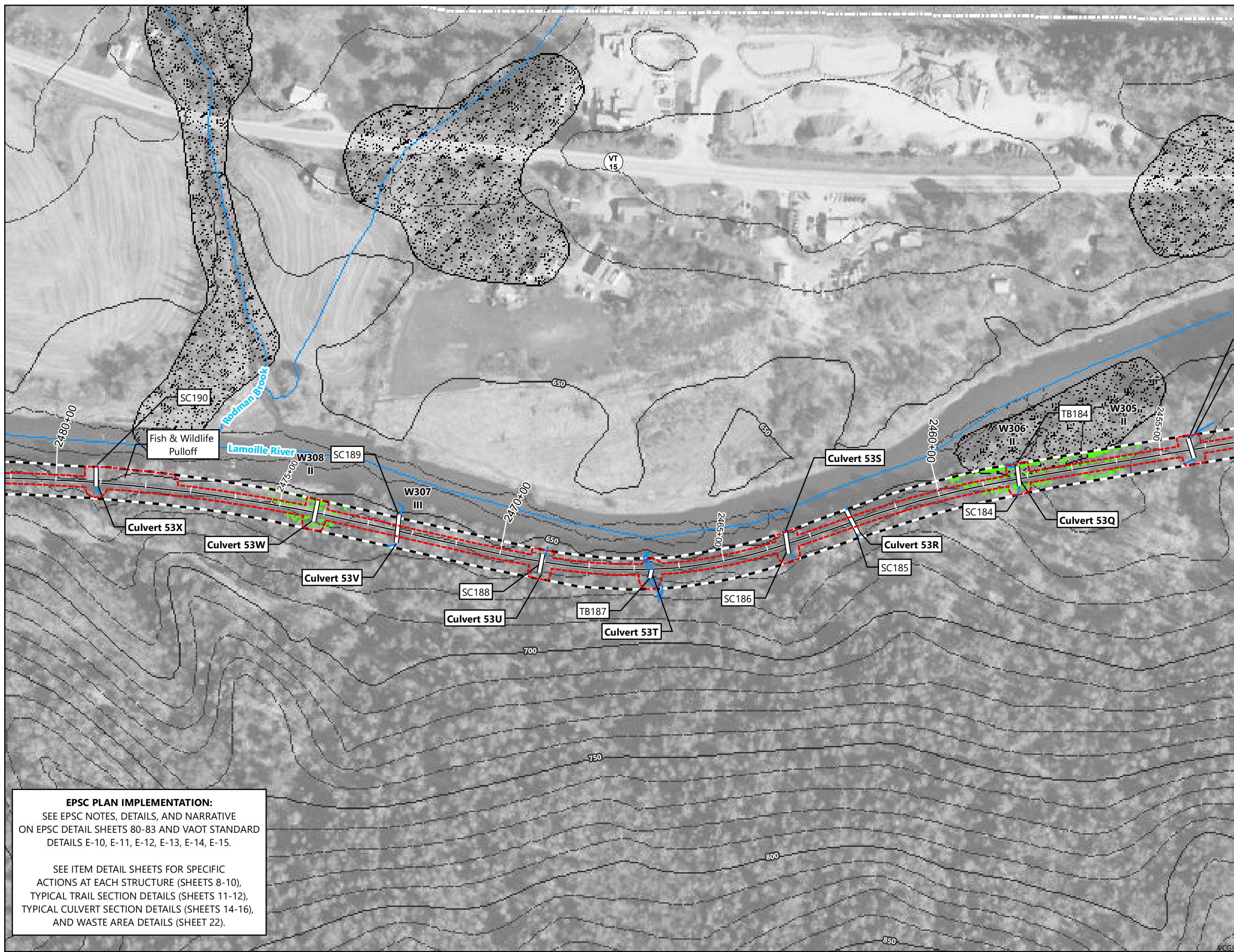


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

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March 23, 2021

- LVRT Centerline
  - ▬ Right of Way
  - ▬ Limit of Disturbance
  - ▬ Temp. Impacts Below OHW
  - ▬ Culvert
  - ▬ Cattlepass
  - ⊕ Crossing
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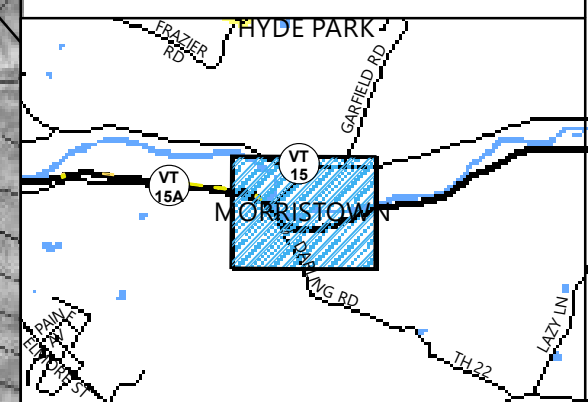


St. Johnsbury - Swanton  
STP-LVRT(12)  
Lamoille Valley Rail Trail  
Layout Plan

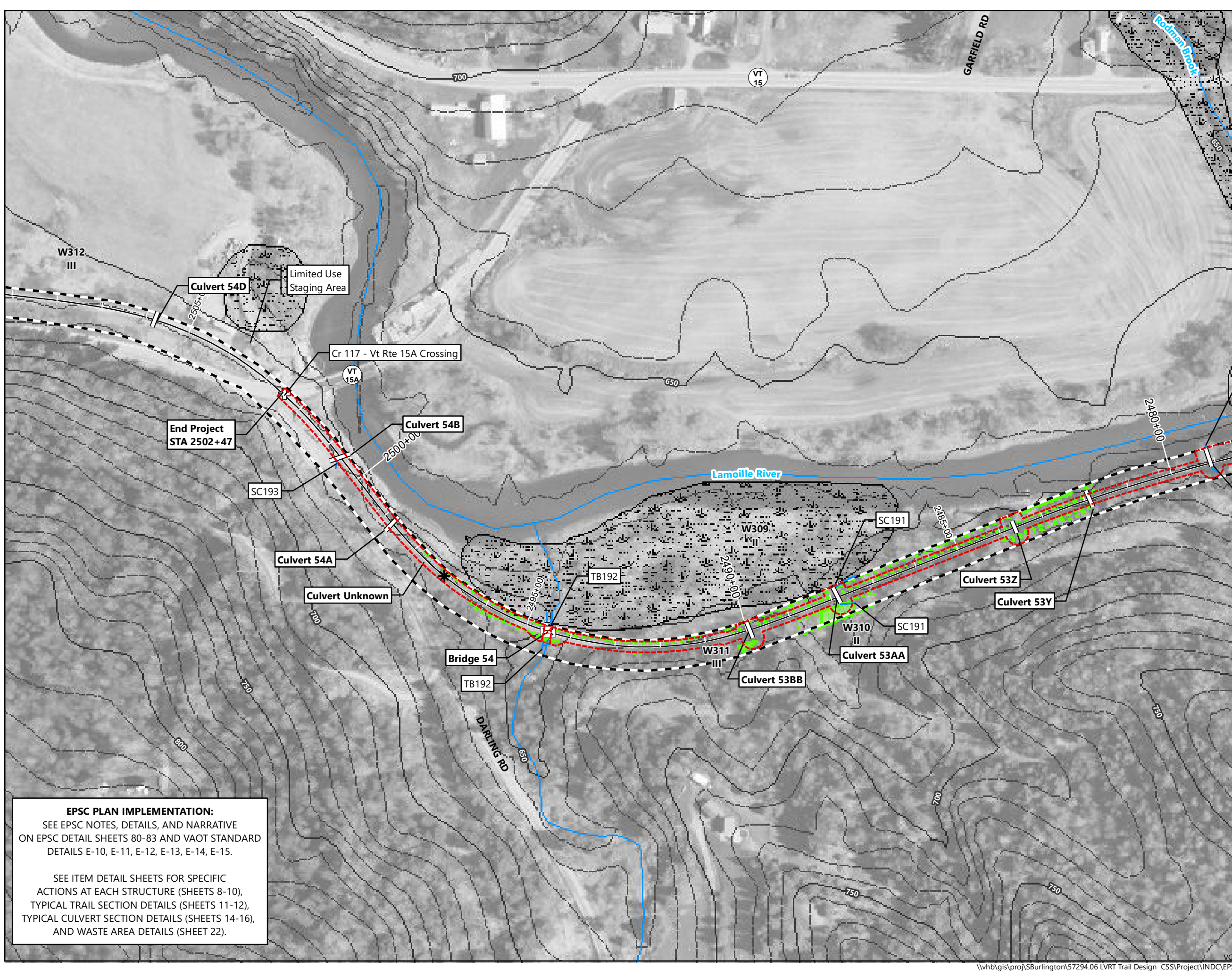
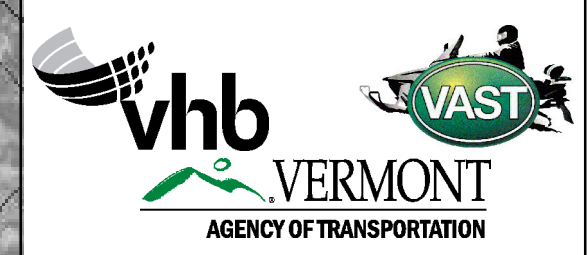
Sheet 102 of 102

March 23, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬭ Right of Way            | 🚚 Washouts                       |
| ⬭ Limit of Disturbance    | 📍 RTE Site                       |
| ⬭ Temp. Impacts Below OHW | ▨ RTE Area (2008)                |
| — Culvert                 | ▨ Class II Wetland Buffer (50ft) |
| 🐄 Cattlepass              | ▨ Delineated Wetland (2017-2020) |
| ⊕ Crossing                | — Delineated Stream (2017)       |
| ✳ Unauthorized Crossing   | — Delineated Stream (2008)       |
| 📍 Trailhead               | ▨ VSWI Wetland                   |
| 🌉 Bridges                 | — VHD Stream                     |
|                           | ⋯ Other Existing Trail           |
| W001: Wetlands            | ⋯ Electric Transmission Lines    |
| TB001: Top of Bank        | ▭ Parcel Boundary                |
| SC001: Stream Center      | 🏠 Historic Site                  |

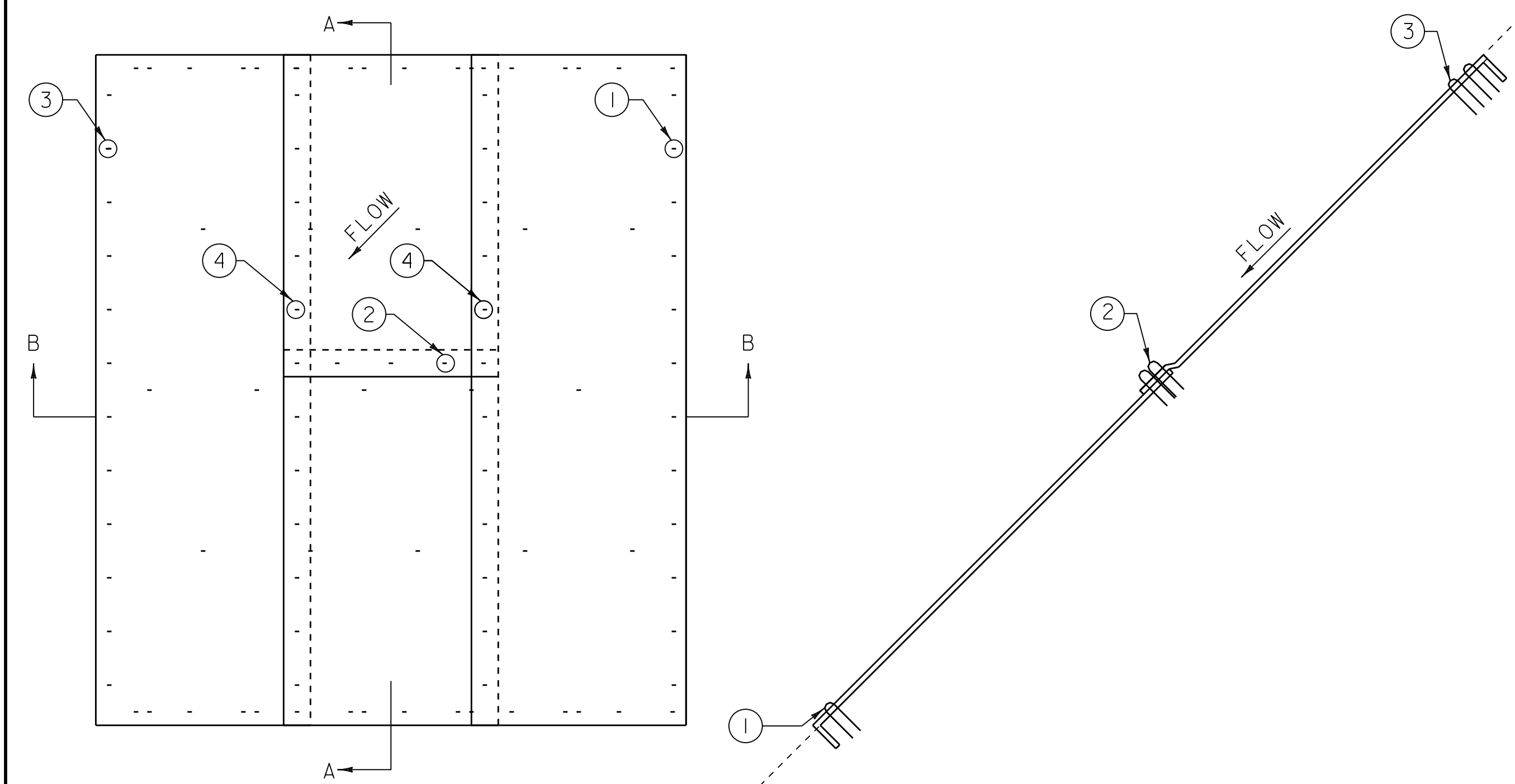


Sources:  
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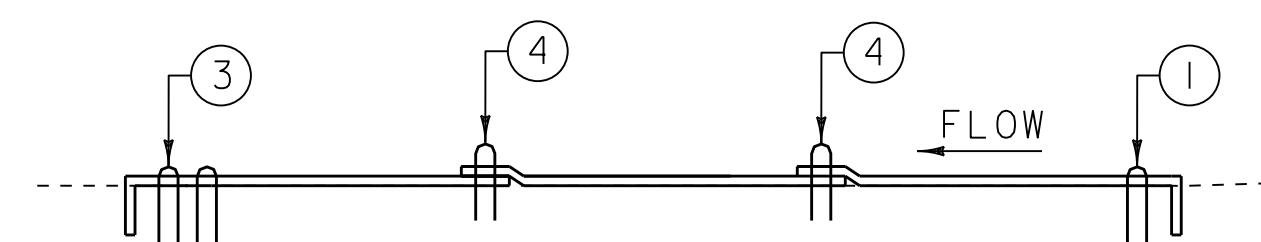
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PLAN

SECTION A-A



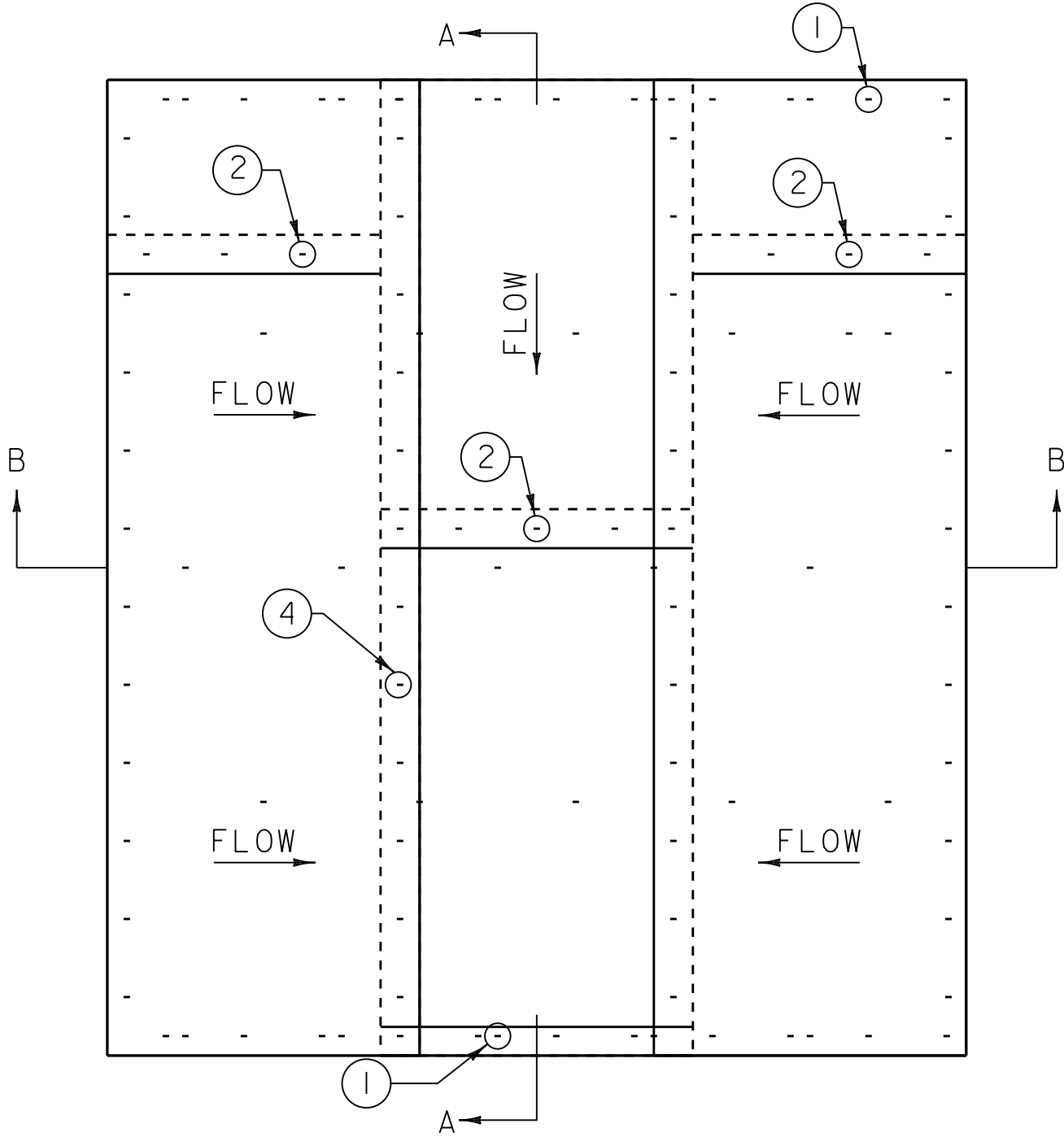
SECTION B-B

ON SLOPE

**NOTE:**

1. APPLY TO SLOPES GREATER THAN 1V:3H OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		



PLAN

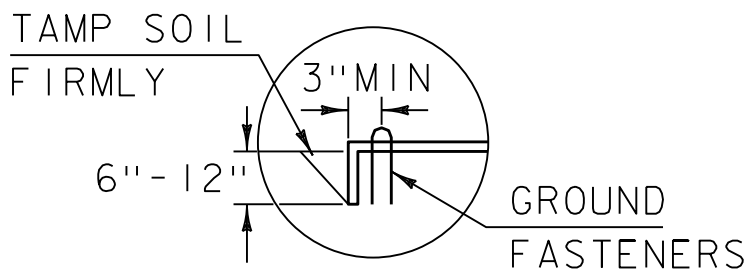
SECTION B-B

SECTION A-A

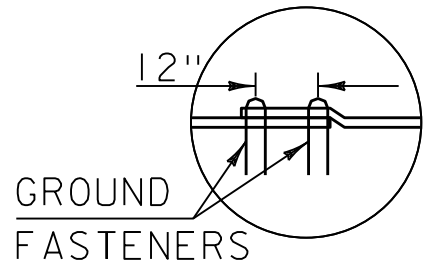
IN DITCH

**NOTE:**

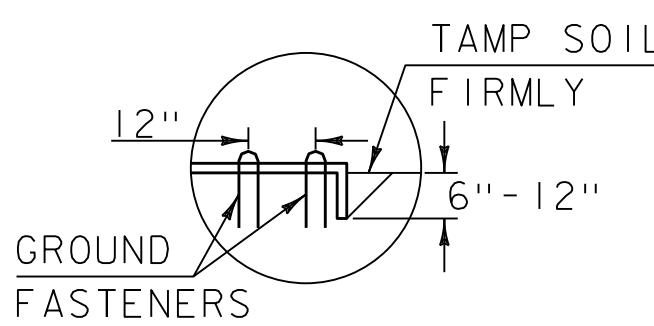
1. PARABOLIC DITCHES MAY REQUIRE ADDITIONAL FASTENERS TO ENSURE SUITABLE CONTACT WITH SOIL.



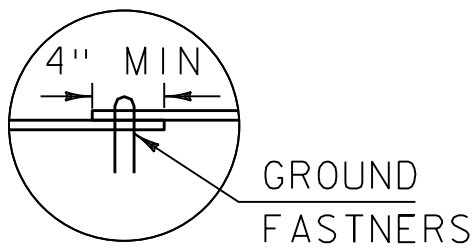
① TERMINAL FOLD



② JUNCTION SLOT



③ ANCHOR SLOT



④ LAP JOINT

GROUND FASTNER DETAILS

**GENERAL NOTES:**

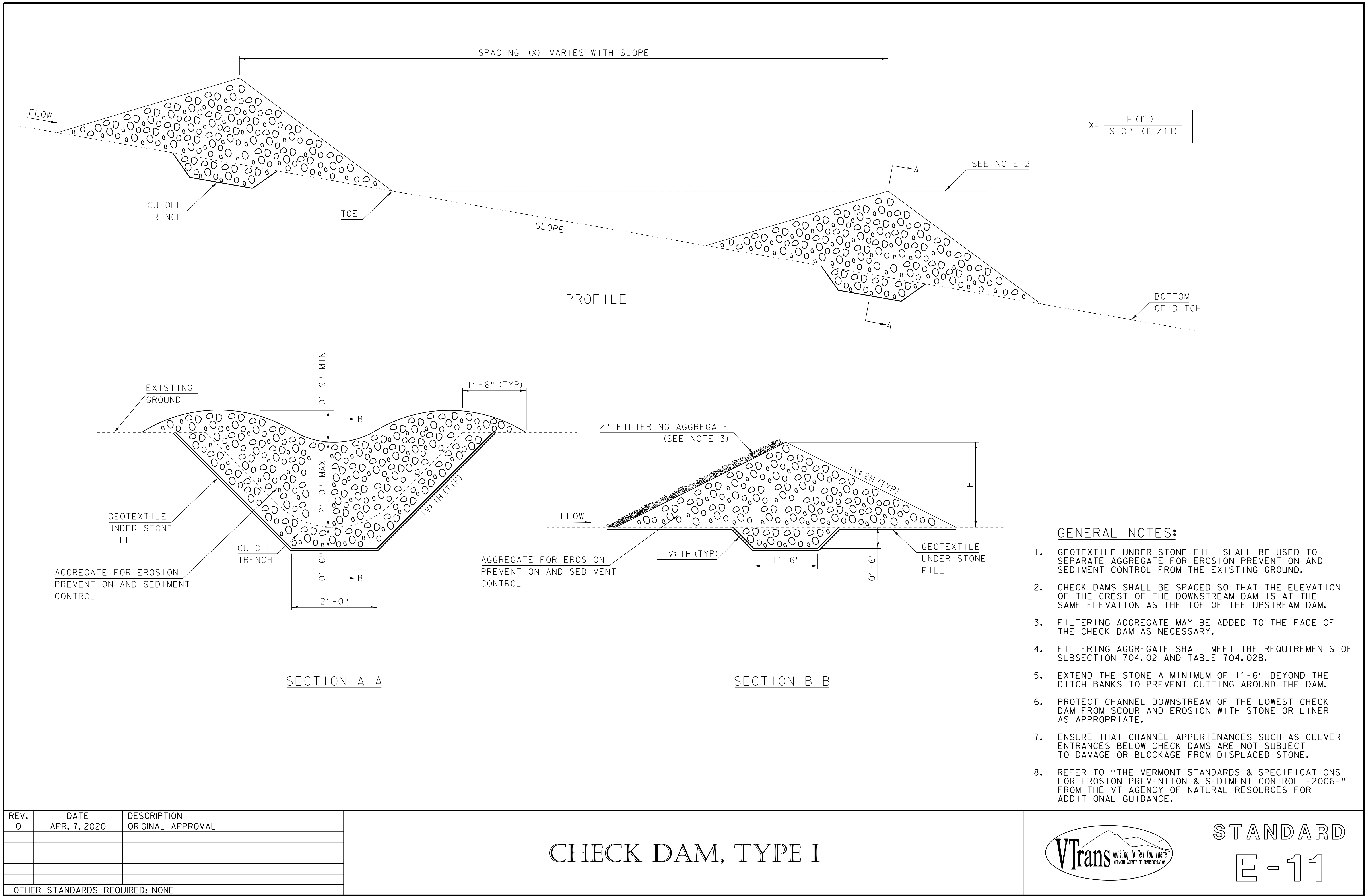
1. FASTENERS ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART.
2. SHOWN SPACING IS FOR GENERAL GUIDANCE. MANUFACTURER'S SPECIFICATIONS SHOULD BE FOLLOWED TO ENSURE PROPER INSTALLATION.
3. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. ROLLED EROSION CONTROL PRODUCT SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
4. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE SECURED AT APPROXIMATELY 12" INTERVALS.
5. REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

# ROLLED EROSION CONTROL PRODUCT , TYPE I



STANDARD  
E-10



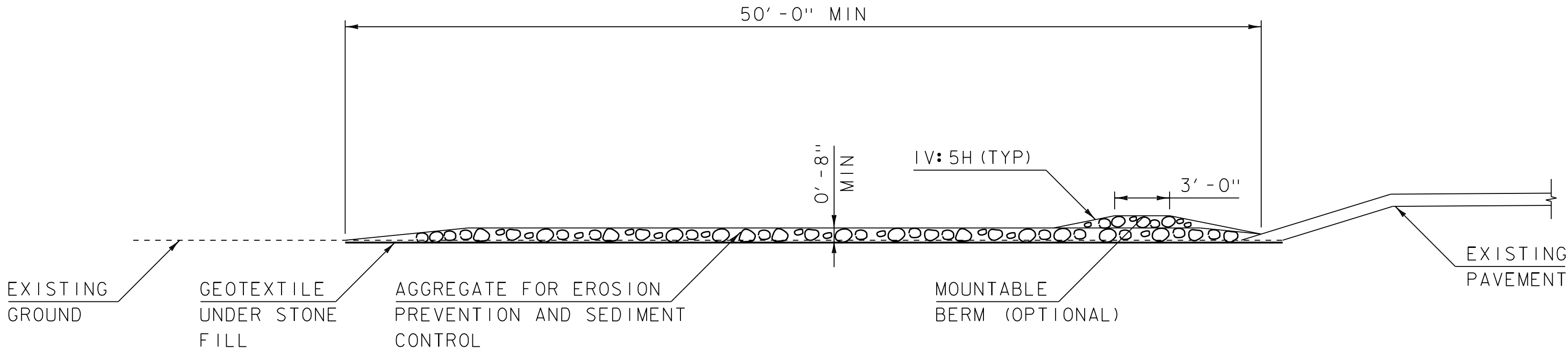


REV.	DATE	DESCRIPTION
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OTHER STANDARDS REQUIRED: NONE		

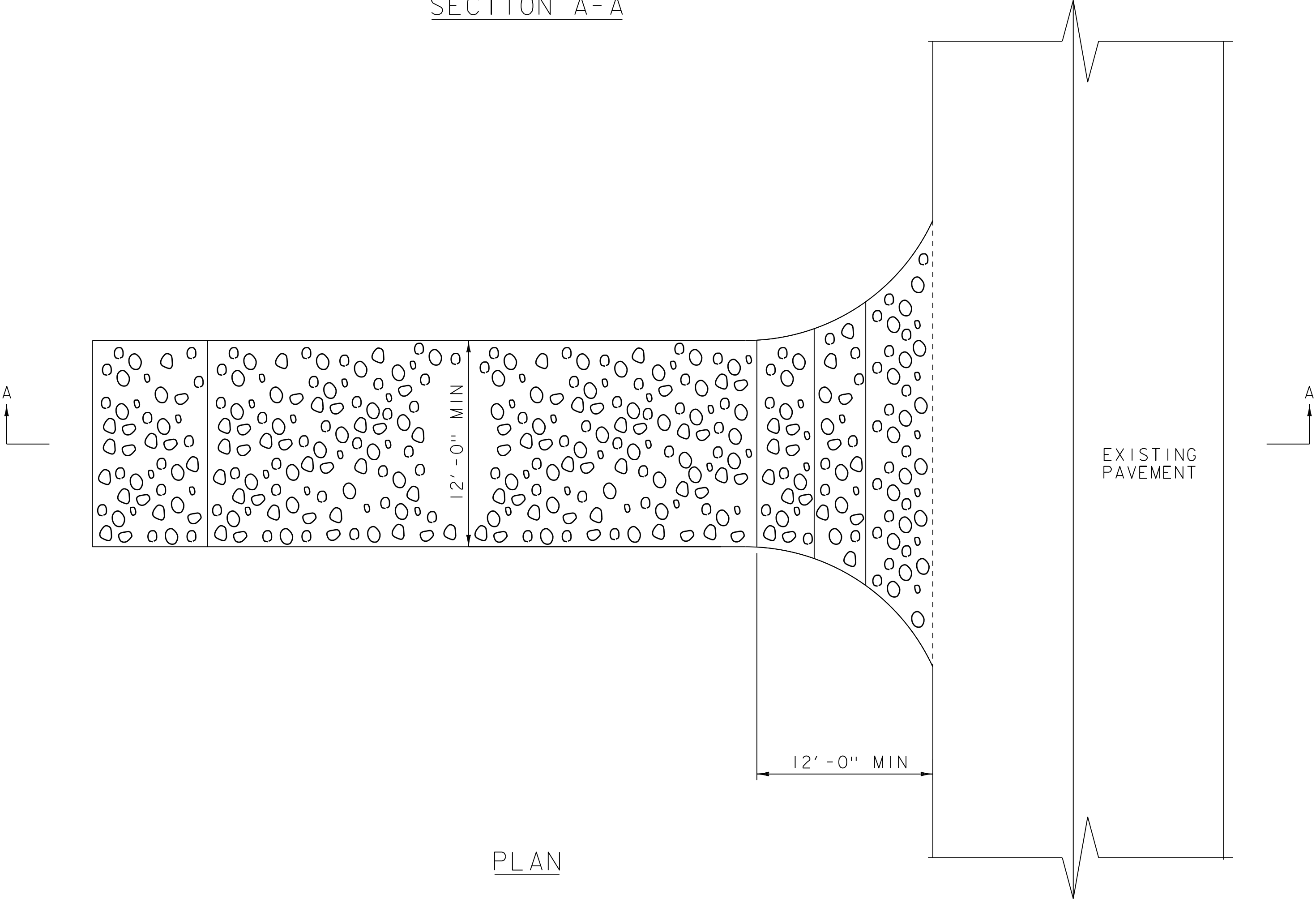
CHECK DAM, TYPE I







SECTION A-A



PLAN

GENERAL NOTES:

1. LENGTH- NOT LESS THAN 50' UNLESS APPROVED BY THE ENGINEER.
2. GEOTEXTILE UNDER STONE FILL SHALL BE USED TO SEPARATE AGGREGATE FOR EROSION PREVENTION AND SEDIMENT CONTROL FROM THE EXISTING GROUND.
3. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 1V:5H SLOPES WILL BE PERMITTED.
4. REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

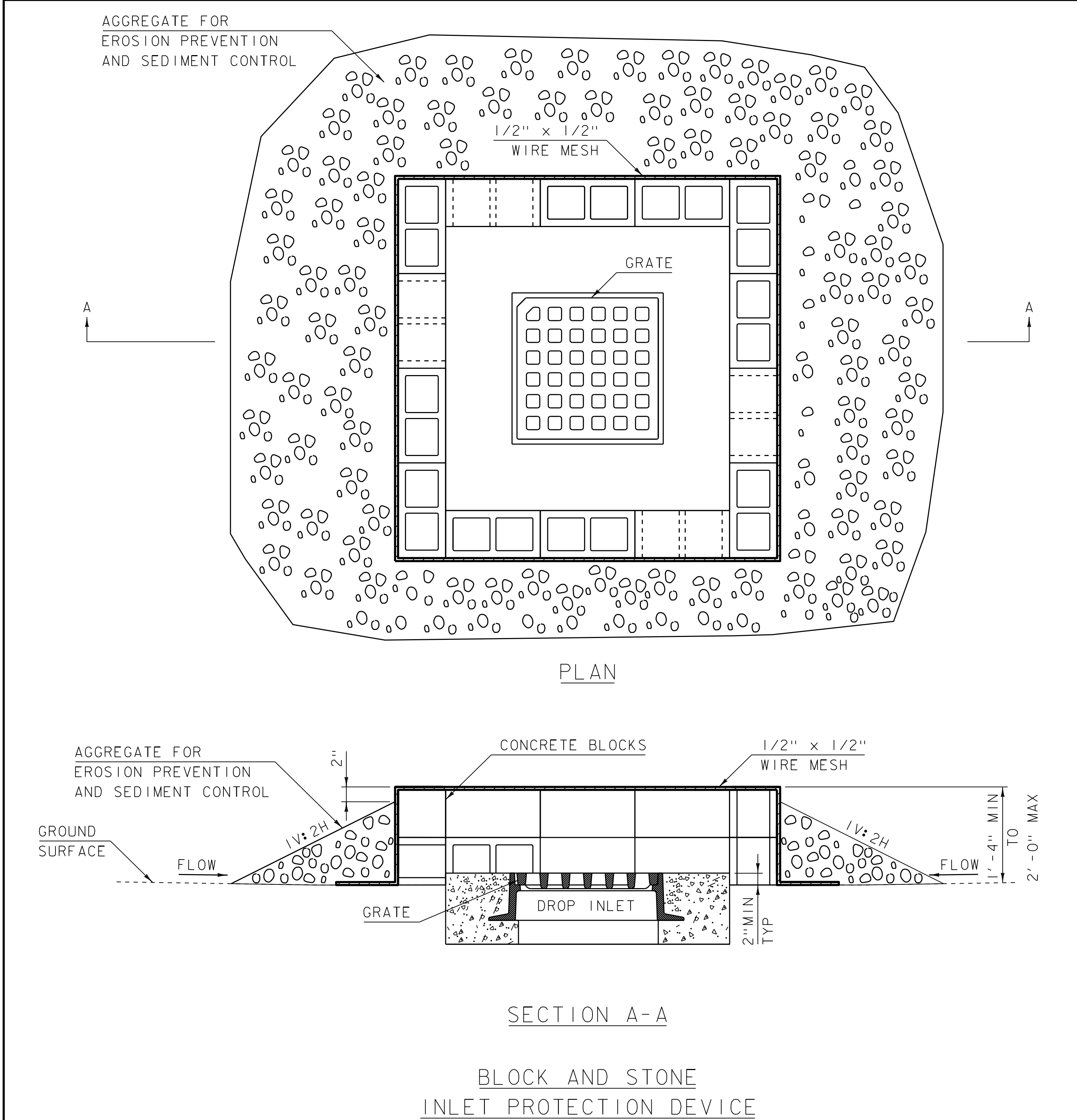
REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

STABILIZED CONSTRUCTION ENTRANCE



STANDARD  
E-12



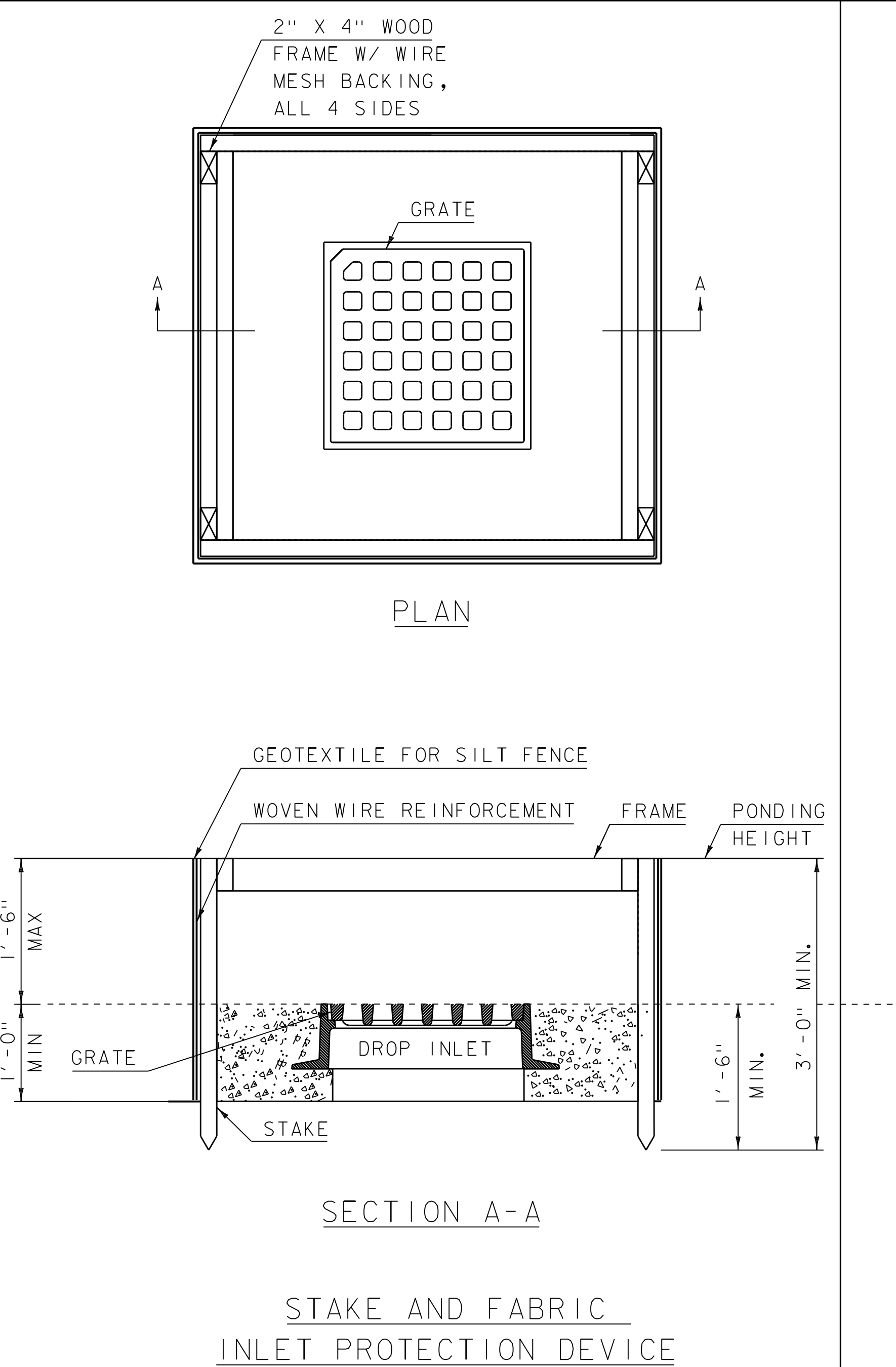


**NOTES:**

- ONE BLOCK ON EACH SIDE SHALL BE PLACED WITH HOLES ORIENTED HORIZONTALLY TO ALLOW WATER TO FLOW INTO THE INLET.
- 1/2" X 1/2" WIRE MESH SHALL BE PLACED OVER THE BLOCK WITH THE HORIZONTALLY ORIENTED HOLES. WIRE MESH SHALL BE OF A GAGE TO WITHSTAND APPLICATION OF THE FILTERING AGGREGATE.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

# INLET PROTECTION DEVICE, TYPE I



**NOTES:**

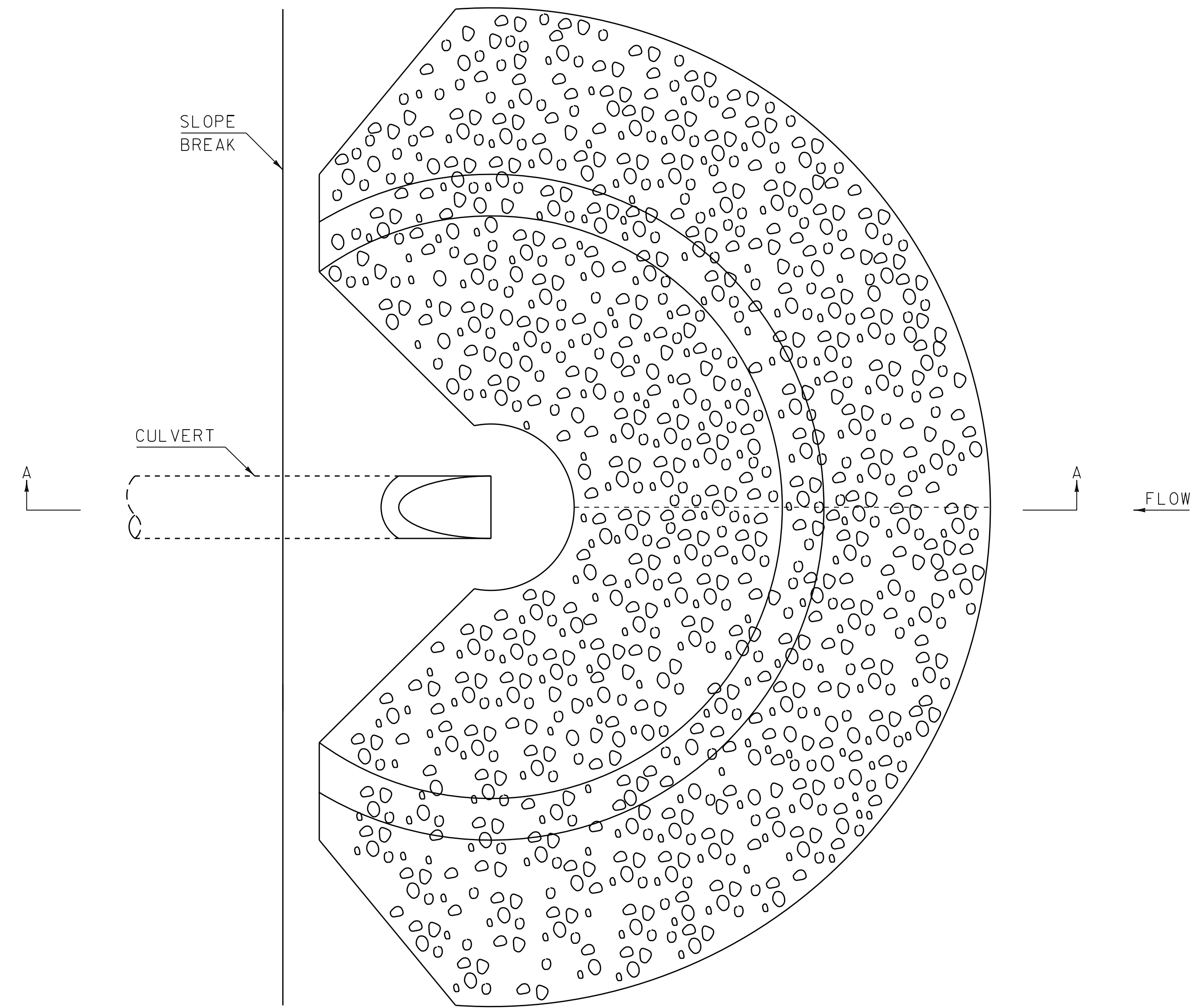
- STAKES AND FRAME SHALL BE STANDARD 2" X 4" LUMBER.
- STAKES SHALL BE SPACED AT A MAXIMUM OF FOUR FEET APART. FOR SIDES GREATER THAN FOUR FEET IN LENGTH, STAKES SHALL BE EQUALLY SPACED.
- BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
- FABRIC SHALL BE ONE CONTINUOUS PIECE AND SHALL BE OVERLAPPED TO THE NEXT STAKE.
- FABRIC SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.

**GENERAL NOTE:**

- REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

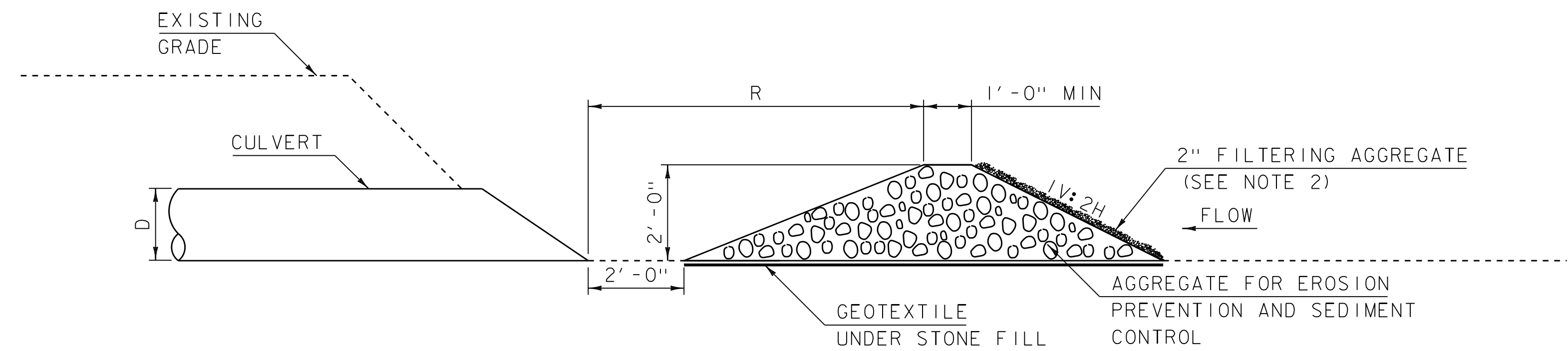






PIPE DIA.	
"D"	"R"
≤ 24"	7'
30"	8'

PLAN



SECTION A-A

GENERAL NOTES:

1. GEOTEXTILE UNDER STONE FILL SHALL BE USED TO SEPARATE AGGREGATE FOR EROSION PREVENTION AND SEDIMENT CONTROL FROM THE EXISTING GROUND.
2. FILTERING AGGREGATE MAY BE ADDED AS NECESSARY.
3. FILTERING AGGREGATE SHALL MEET THE REQUIREMENTS OF SUBSECTION 704.02 AND TABLE 704.02B.
3. INDIVIDUAL CONSIDERATION SHALL BE GIVEN FOR PIPE DIAMETERS GREATER THAN 30".

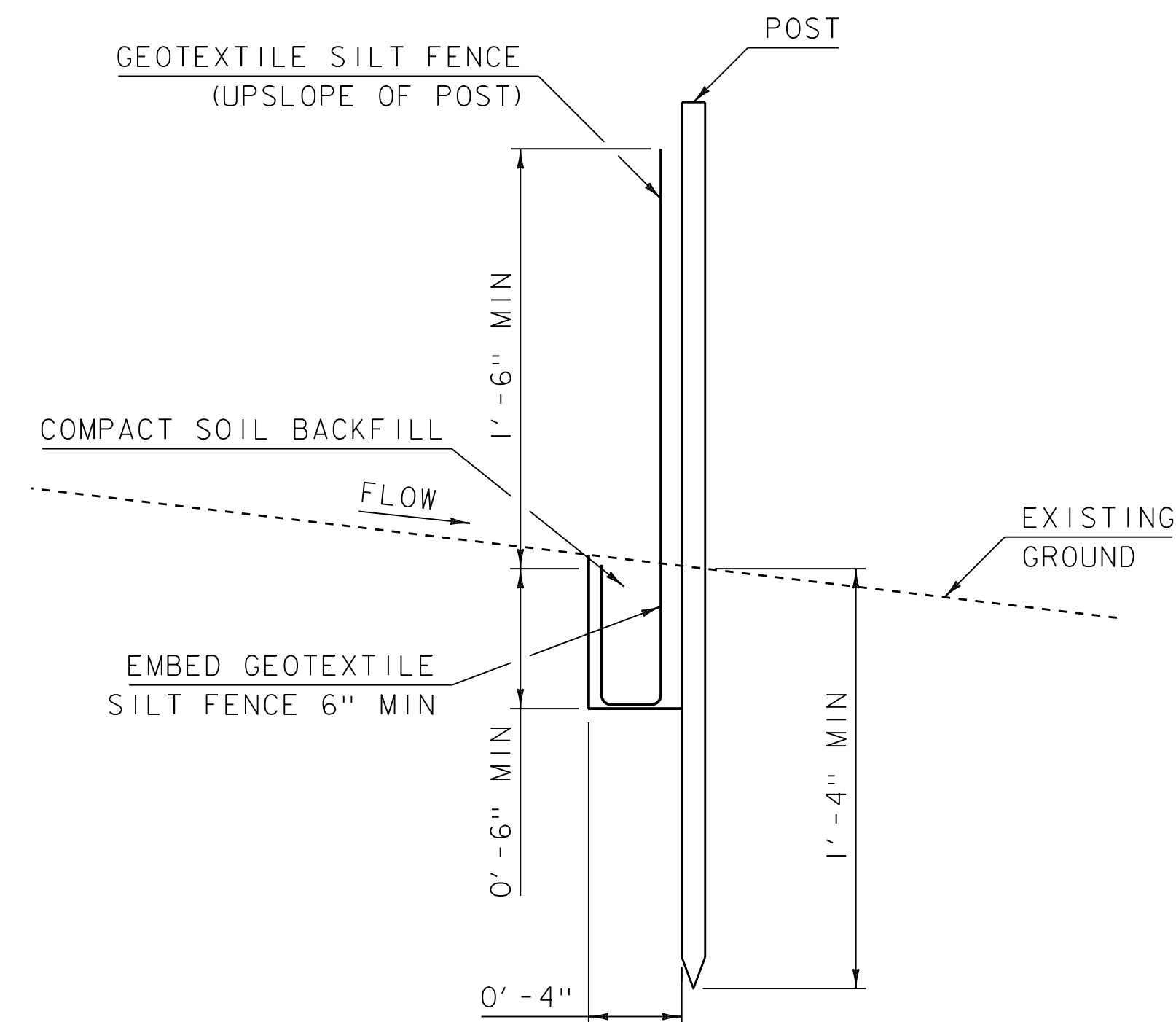
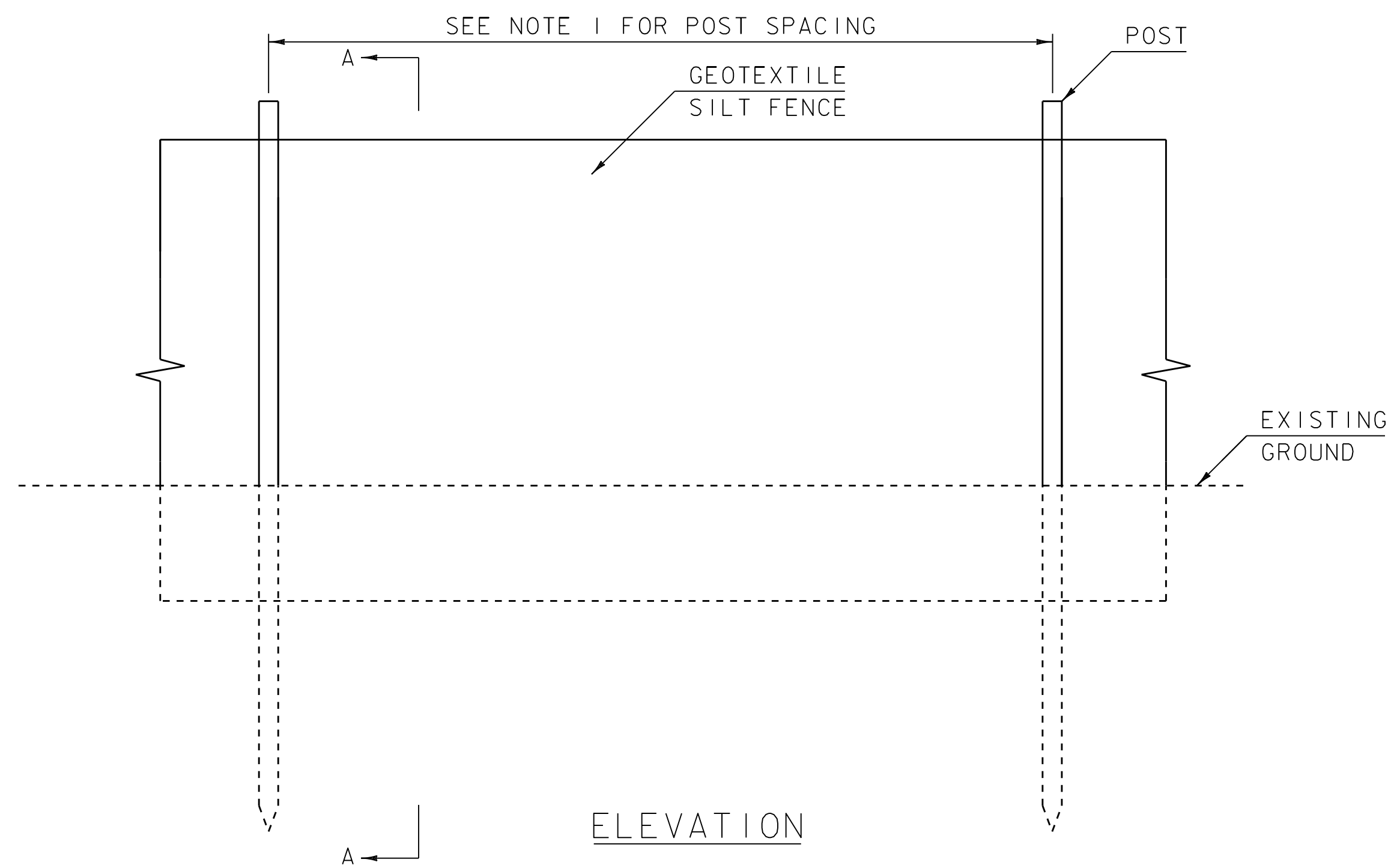
REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

# INLET PROTECTION DEVICE, TYPE III



STANDARD  
E-14



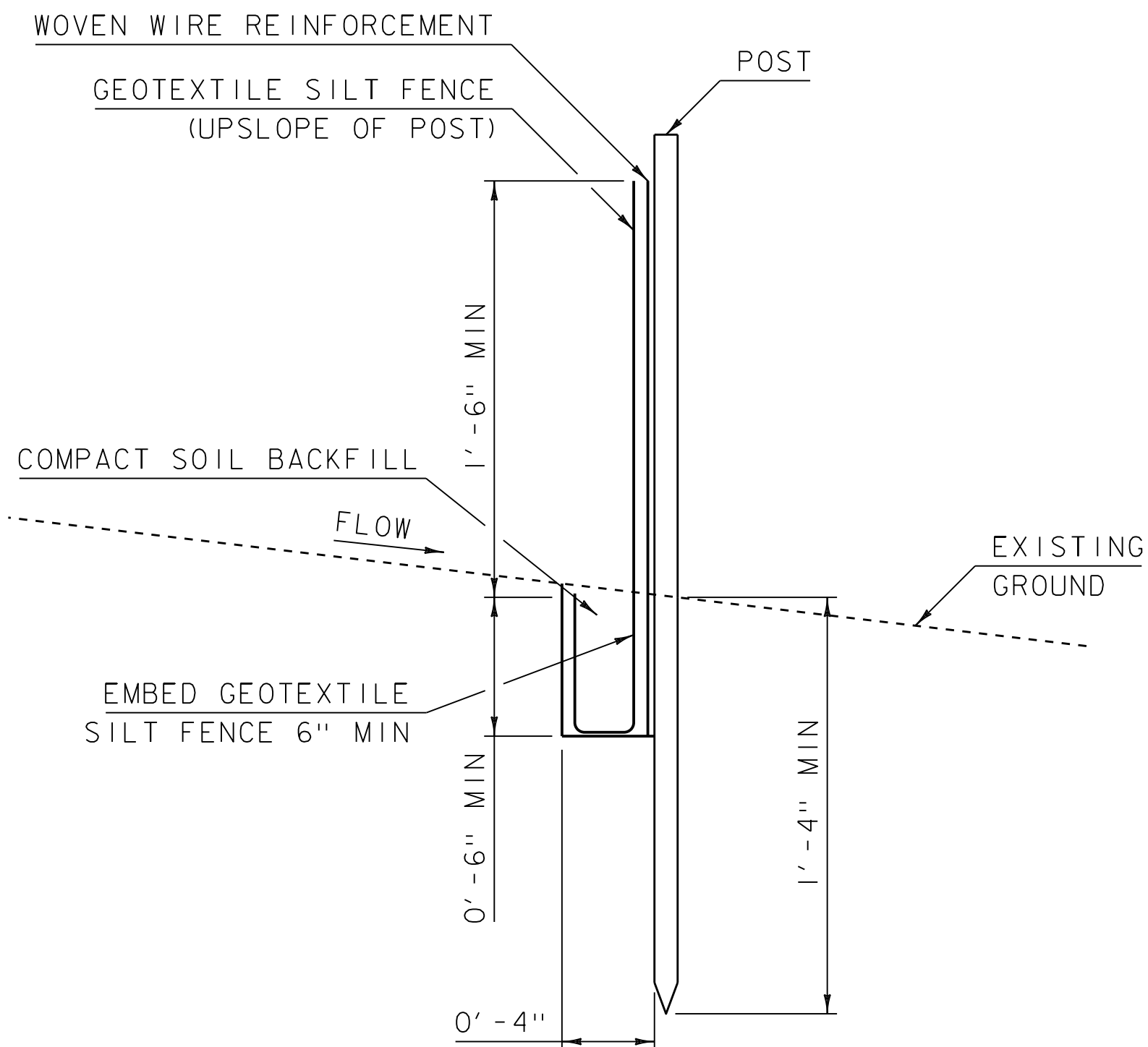
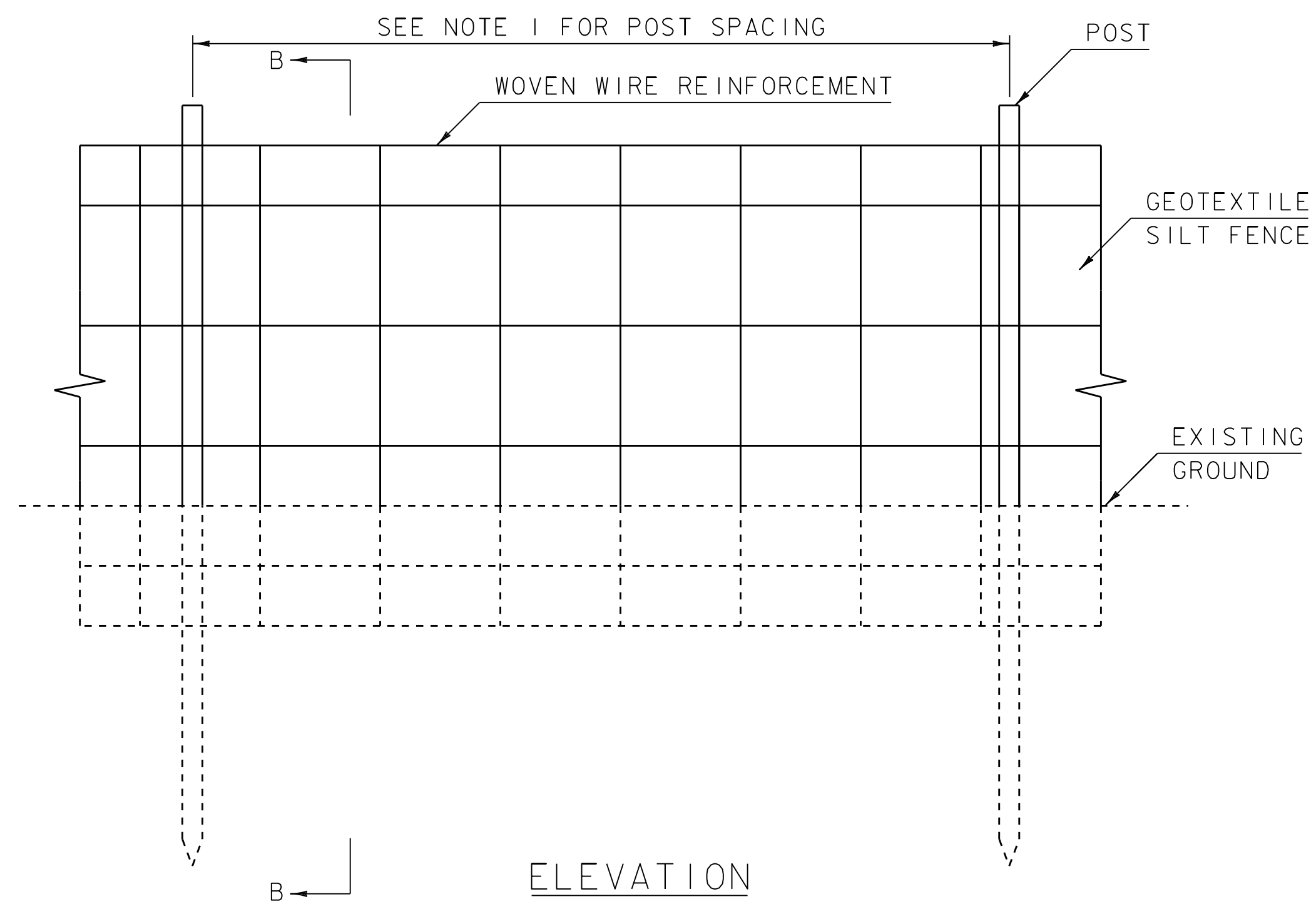


SECTION A-A

SILT FENCE, TYPE I

**NOTE:**

1. POST SPACING FOR SILT FENCE SHALL NOT EXCEED 4' WHEN ELONGATION IS GREATER THAN 50% AND SHALL NOT EXCEED 6' WHEN ELONGATION IS LESS THAN 50%.

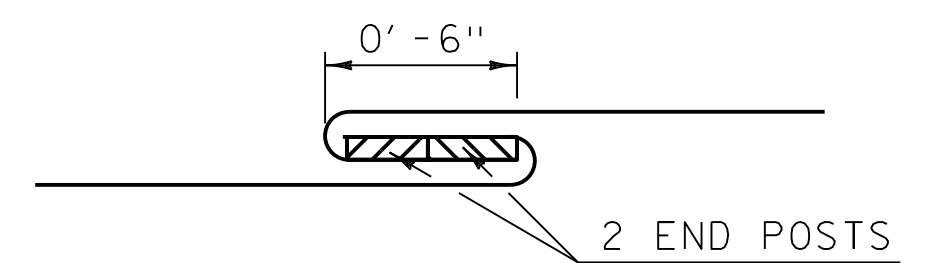


SECTION B-B

SILT FENCE, TYPE II

**NOTES:**

1. POST SPACING FOR SILT FENCE, WOVEN WIRE REINFORCED SHALL NOT EXCEED 10'.
2. WOVEN WIRE REINFORCEMENT IS TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. GEOTEXTILE FOR SILT FENCE IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.



GEOTEXTILE FOR SILT FENCE  
OVER LAP DETAIL

**GENERAL NOTES:**

1. REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.
2. TAMP SOIL BACKFILL FOR SECTION OF EMBEDDED GEOTEXTILE.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

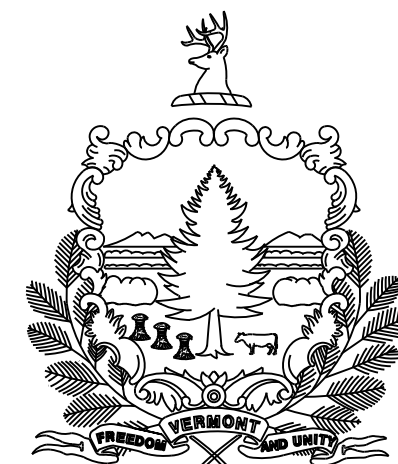
## SILT FENCE



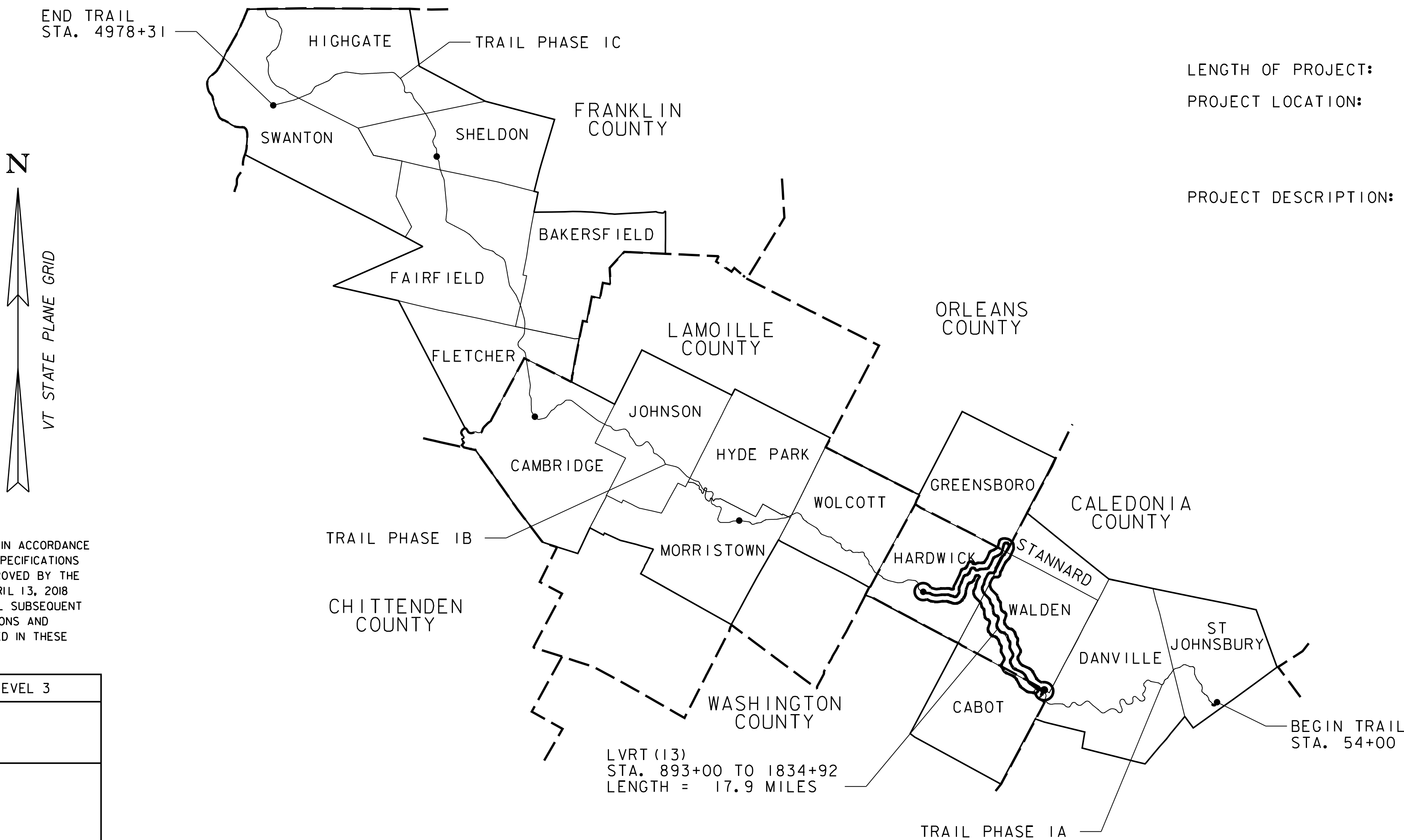
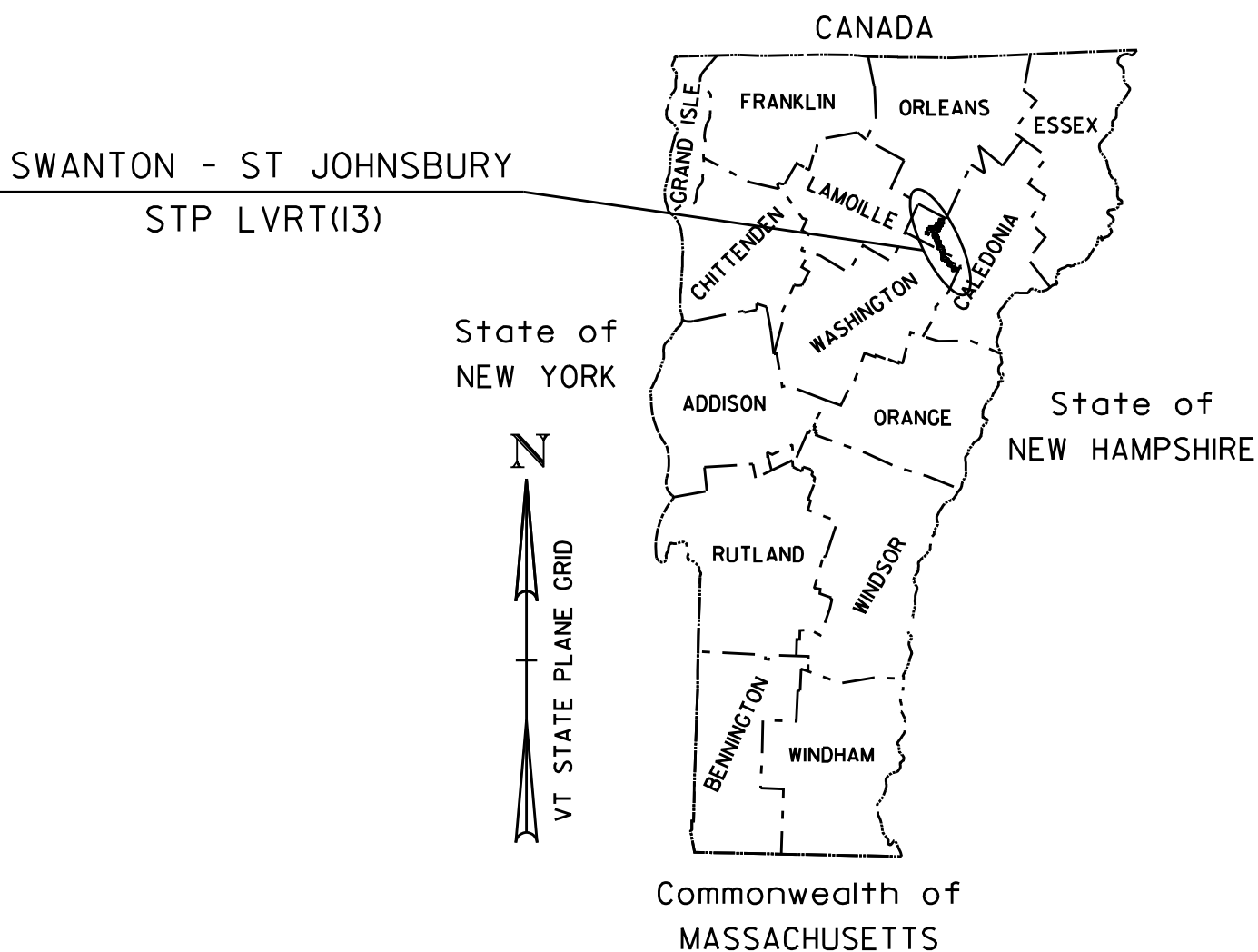
STANDARD  
E-15



STATE OF VERMONT  
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT  
LAMOILLE VALLEY RAIL TRAIL  
SWANTON - ST JOHNSBURY STP LVRT(13)



LENGTH OF PROJECT: 94,220 LF (17.85 MILES)

PROJECT LOCATION: THE PROJECT BEGINS AT THE WESTERN APPROACH OF THE INTERSECTION WITH CHANNEL DRIVE IN WEST DANVILLE AND EXTENDS WESTERLY 17.85 MILES TO THE EASTERN APPROACH OF THE INTERSECTION WITH MAPLE STREET IN HARDWICK.

PROJECT DESCRIPTION: WORK TO BE PERFORMED UNDER THIS CONTRACT INCLUDES CONSTRUCTION OF TRAIL SURFACE, CLEARING, DITCHING, INSTALLATION OF CULVERTS, SIGNING, MISCELLANEOUS STRUCTURE REPAIRS AND BRIDGE MODIFICATIONS INCLUDING DECKING AND RAILING INSTALLATION.

**CONSTRUCTION STORMWATER  
PERMIT PLANS,  
MARCH 2021**

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 3
SURVEYED BY : N/A
SURVEYED DATE : N/A
DATUM
VERTICAL ASSUMED
HORIZONTAL ASSUMED

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATOR
APPROVED _____ DATE _____
HIGHWAY DIVISION, CHIEF ENGINEER
APPROVED _____ DATE _____
PROJECT MANAGER : JOEL PERRIGO
PROJECT NAME : SWANTON - ST. JOHNSBURY
PROJECT NUMBER : STP LVRT (13)
SHEET 1 OF 70 SHEETS





INDEX OF SHEETS

1	TITLE SHEET
2	INDEX OF SHEETS
3	CONVENTIONAL SYMBOLLOGY LEGEND SHEET
4	PROJECT NOTES
5-6	QUANTITY SHEETS
7-9	ITEM DETAIL SHEETS
10-11	TYPICAL TRAIL SECTIONS SHEETS
12	TRAIL LOWERING DETAIL SHEET
13	TYPICAL APPROACH RAIL SHEET
14	TYPICAL GUARDRAIL SHEET
15-18	STRUCTURES DETAILS SHEETS
19	TYPICAL CULVERT SECTION SHEET
20-21	BOX CULVERT TYPICAL SECTION SHEETS
22	CULVERT DETAILS SHEET
23	CULVERT REPLACEMENT/REPAIR DETAIL SHEET
24	WASTE AREA DETAILS SHEET
25-26	CROSSING DETAILS SHEETS
27-28	EPSC DETAILS SHEETS
29-30	EPSC NARRATIVE
31-32	EPSC BRIDGE SHEETS
33-70	EPSC SITE PLAN SHEETS

VAOT STANDARDS

E-10	04-07-2020	ROLLED EROSION CONTROL PRODUCT, TYPE I
E-11	04-07-2020	CHECK DAM, TYPE I
E-12	04-07-2020	STABILIZED CONSTRUCTION ENTRANCE
E-13	04-07-2020	INLET PROTECTION DEVICE, TYPE I
E-14	04-07-2020	INLET PROTECTION DEVICE, TYPE II
E-15	04-07-2020	SILT FENCE



PROJECT NAME: SWANTON - ST JOHNSBURY  
PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239_EPSC Index.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: J.S. GINGRAS
DESIGNED BY: J.S. GINGRAS	CHECKED BY: E.P. DETRICK
INDEX OF SHEETS	SHEET 2 OF 70







PROJECT NOTES

GENERAL

1.

ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2018, AND ITS LATEST REVISIONS, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, AND ITS LATEST REVISIONS, THE AASHTO LRFD GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES 2ND EDITION, AND MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES 2009 EDITION AND ITS LATEST REVISIONS.
2.

PER AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG), PATH CROSS SLOPES SHALL NOT EXCEED 2%.
3.

ALL SHARED USE PATH LONGITUDINAL RAMPs AT ROADWAY AND DRIVEWAY CROSSINGS SHALL NOT EXCEED 5%.
4.

THE STRUCTURES ON THIS PROJECT ARE DESIGNED FOR H-10 LOADING UNLESS OTHERWISE NOTED.
5.

THE PROPOSED TRAIL CENTERLINE SHOWN IN THE EPSC SITE PLAN SHEETS SHALL BE CENTERED WITHIN THE EXISTING RAILROAD BED. THE STATIONED BASELINE PROVIDED IN THE PLANS IS PROVIDED FOR INFORMATIONAL PURPOSES AND IS NOT INTENDED TO REPRESENT A DESIGNED CONSTRUCTION CENTERLINE.
6.

ALL WORK AND ANY ASSOCIATED ACTIVITY ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY LIMITS UNLESS OTHERWISE NOTED.
7.

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT SILTATION OR POLLUTION, ESPECIALLY THE DISCHARGE OF RAW CONCRETE, INTO ANY BROOK, STREAM, OR RIVER. THE CONTRACTOR SHALL FOLLOW ALL EROSION AND SEDIMENT CONTROL MEASURES AS SPECIFIED IN THE EPSC SHEETS SHOWN IN THIS PLANSET. THE EPSC SHEETS SHOW THE PERMITTED EROSION AND SEDIMENT CONTROL MEASURED PER THE INDC PERMIT FOR THIS PROJECT.
8.

FEATURES SHOWN ON THE EPSC SITE PLANS HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING FEATURES AND LIMITED FIELD INVESTIGATION AND MAY NOT ACCURATELY REFLECT ACTUAL FIELD CONDITIONS. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAKING FIELD MEASUREMENTS OF ALL EXISTING STRUCTURE COMPONENTS IMPACTED BY THE NEW WORK TO ASSURE CONSISTENCY WITH THE PROPOSED MODIFICATIONS. ANY DISCREPANCIES IN DIMENSIONS, CHARACTER, OR EXTENT OF THE EXISTING FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE ADVANCING THE WORK. ALL COSTS ASSOCIATED WITH THE VERIFICATION OF PROPOSED WORK SHALL BE INCLUDED IN ITEM 635.11, “MOBILIZATION/DEMObILIZATION”.
9.

ALL SOIL DEPOSITS WHICH ARE FOUND ON THE TRAIL SHALL BE REMOVED DOWN TO THE EXISTING BALLAST ELEVATION. COST SHALL BE COVERED UNDER ITEM 203.17, “UNCLASSIFIED EXCAVATION”. BALLAST SHALL THEN BE CLEANED IN ACCORDANCE WITH ITEM 900.640, “SPECIAL PROVISION (WINDROWING BALLAST)” AND CHOKED IN ACCORDANCE WITH ITEM 900.640, “SPECIAL PROVISION (CHOKING BALLAST)”. SEE TRAIL CONSTRUCTION NOTES ON TYPICAL TRAIL SECTIONS SHEET FOR ADDITIONAL DETAILS.
10.

THE EXISTING STRUCTURAL STEEL MAY BE PAINTED WITH A MATERIAL THAT CONTAINS LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN HANDLING AND WORKING WITH THIS STEEL. ANY REMOVED STRUCTURAL STEEL, IF APPLICABLE, IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE AND ITS OFFICERS AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR’S USE OR DISPOSITION OF THE REMOVED EXISTING STRUCTURAL STEEL.

TRAIL ACCESS

11.

ACCESS TO THE TRAIL SHALL BE FROM PUBLIC CROSSINGS. ACCESS FROM TOWN HIGHWAYS SHALL BE PERMITTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

a.

WORK HOURS ARE 7AM TO 6PM MONDAY THRU FRIDAY.

b.

THE CONTRACTOR SHALL HAVE CONSTRUCTION SIGNAGE AND TRAFFIC CONTROL AT ACCESS POINTS WHICH MEET THE REQUIREMENTS OF THE 2009 MUTCD AND ITS LATEST REVISIONS.

c.

ROAD CLOSURES OR STOPPING TRAFFIC SHALL NOT BE PERMITTED WITHOUT PRIOR APPROVAL BY THE TOWN OR STATE.

d.

THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO ROADS, DITCHES, SHOULDERS, ETC. AND RESTORE THEM TO PRE-CONSTRUCTION CONDITIONS AT THE CONTRACTOR’S EXPENSE. ENGINEER TO VERIFY PRE-CONSTRUCTION CONDITIONS

TRAIL CONSTRUCTION

12.

SEE TRAIL TYPICAL SECTIONS SHEETS FOR TRAIL CONSTRUCTION NOTES.

TIMBER

13.

LUMBER AND TIMBER SHALL MEET THE REQUIREMENTS OF SECTION 522. TIMBER AND LUMBER PRESERVATIVES SHALL BE IN ACCORDANCE WITH SECTION 726 AND BE PENTACHLOROPHENOL: SOLVENT FOR PENTACHLOROPHENOL - HEAVY OIL HYDROCARBON SOLVENT, TYPE A.

STRUCTURE REPAIR

14.

PROPOSED WORK HAS BEEN ESTIMATED BASED ON LIMITED FIELD INVESTIGATION PERFORMED BY VHB. ACTUAL WORK SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY ENGINEER.
15.

THE REMOVAL AND DISPOSAL OF CATTLEPASS 39 AND COLLAPSING OF CATTLEPASS 29H SHALL BE INCIDENTAL TO ITEM 201.10, “CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS”. BACKFILLING OF THESE TWO LOCATIONS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.



PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239.pn.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: K.C. BARRY
DESIGNED BY: B.O. CRONIN	CHECKED BY: E.P. DETRICK
PROJECT NOTES SHEET	SHEET 4 OF 70



# QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES				
								EROSION CONTROL	BIKE/TRANSPOR TATION PATH	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
									1			1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10	-			
									4400			4400		CY	COMMON EXCAVATION	203.15	13.71			
									850			850		CY	UNCLASSIFIED EXCAVATION	203.17	-			
									50			50		CY	CHANNEL EXCAVATION OF EARTH	203.25	3.52			
									5310			5310		CY	GRANULAR BORROW	203.32	9.33			
									7360			7360		CY	STRUCTURE EXCAVATION	204.25	6.19			
									730			730		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	7.93			
										1		1		LS	COFFERDAM	208.40	-			
										875		875		LB	REINFORCING STEEL, LEVEL I	507.11	3.05			
										15		15		LF	DRILLING AND GROUTING DOWELS	507.16	-			
										3.9		3.9		MFBM	STRUCTURAL LUMBER AND TIMBER, TREATED	522.25	0.05			
										1		1		EACH	REMOVAL OF STRUCTURE (BRIDGE 31)	529.15	-			
										1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 27)	529.20	-			
										1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 28)	529.20	-			
										1		1		EACH	PARTIAL REMOVAL OF STRUCTURE (BRIDGE 36)	529.20	-			
										1		1		LS	PRECAST CONCRETE STRUCTURE 4x4 BOX CULVERT (28P)	540.10	-			
										1		1		LS	PRECAST CONCRETE STRUCTURE 4x4 BOX CULVERT (31G)	540.10	-			
										1		1		LS	PRECAST CONCRETE STRUCTURE 8x6 BOX CULVERT (37)	540.10	-			
										5		5		CY	CONCRETE, CLASS A	541.22	3.06			
										5		5		SY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II	580.14	-			
									245			245		LF	18" CPEP(SL)	601.2615	1			
									265			265		LF	24" CPEP(SL)	601.2620	3			
									50			50		LF	30" CPEP(SL)	601.2625	2			
									245			245		LF	36" CPEP(SL)	601.2630	1			
									80			80		SY	REPOINTING MASONRY	602.30	4.89			
									195			195		CY	REBUILT STONE MASONRY	602.35	2.33			
									25			25		SY	REPAIRING STONE MASONRY	602.40	2.33			
									250			250		CY	STONE FILL, STREAM BED MATERIAL	613.06	17.14			
									325			325		CY	STONE FILL, TYPE I	613.10	1.74			
									50			50		CY	STONE FILL, TYPE II	613.11	-			
									110			110		SY	PORTLAND CEMENT CONCRETE SIDEWALK, 8 INCH	618.11	1.67			
									300			300		SF	DETECTABLE WARNING SURFACE	618.30	-			
											1	1		LS	TESTING EQUIPMENT, PROTECTIVE COATINGS	631.18	-			
											1	1		LS	TESTING EQUIPMENT, GROUT	631.19	-			
									1			1		LS	MOBILIZATION/DEMOBILIZATION	635.11	-			
									1			1		LS	TRAFFIC CONTROL	641.10	-			
									150			150		LF	12 INCH WHITE LINE, WATERBORNE PAINT	646.241	-			
									1025			1025		SY	GEOTEXTILE UNDER STONE FILL	649.31	6.73			
								650				650		LB	SEED	651.15	7.5			
								5360				5360		LB	FERTILIZER	651.18	5.79			

PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I3)	
FILE NAME: z20f239_quantities.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: R.M. O'BRIEN
DESIGNED BY: R.M. O'BRIEN	CHECKED BY: B.M. ROBERTS
QUANTITY SUMMARY SHEET (1 OF 2)	SHEET 5 OF 70



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(13)	
FILE NAME: z20f239_quantities.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: R.M. O'BRIEN
DESIGNED BY: R.M. O'BRIEN	CHECKED BY: B.M. ROBERTS
QUANTITY SUMMARY SHEET (2 OF 2)	SHEET 6 OF 70





ITEM DETAIL SHEET																						
CULVERTS						CATTLEPASSES						BRIDGES										
NUMBER	STATION	TYPE	SIZE	REMARKS		NUMBER	STATION	TYPE	SIZE	REMARKS		NUMBER	BEGIN STATION	END STATION	TYPE	LENGTH	REMARKS					
			FT						FT							FT						
27A	922+31	STONE BOX	3 x 3	EXCAVATE AND REPLACE		* 27R	1061+77	STONE	4 x 4	INSTALL GUARDRAIL		27	893+78	894+21	STEEL I-BEAM, PILE BENT	43	REPLACE DECK, INSTALL BRIDGE AND APPROACH RAILS					
* 27B	931+55	STONE BOX	2 x 3	CLEAN INLET AND OUTLET		* 28B	1087+99	STONE	4 x 4	EXCAVATE AND REPAIR		A27	1056+76	1058+30	PREFABRICATED MULTI-MODAL	154	BRIDGE WORK COMPLETED DURING LVVRT(10) CONSTRUCTION					
* 27C	937+72	STONE BOX	2 x 2	CLEAN INLET AND OUTLET		* 28F	1111+99	STONE	4 x 4	NO ACTION NEEDED		28	1073+23	1073+49	STEEL I-BEAM, PILE BENT	26	REPLACE DECK, INSTALL BRIDGE AND APPROACH RAILS					
* 27D **	944+57	STONE BOX	3 x 3	CLEAN INLET		* 28O	1171+54	STONE	3 x 3	INSTALL GUARDRAIL		* 29	1190+25	1191+15	STONE ARCH	90	NO ACTION NEEDED					
27(4)E	957+61	STONE BOX	1 x 2	EXCAVATE AND REPLACE		* 29D	1214+28	STONE	3 x 2	INSTALL GUARDRAIL		31	1261+30	1261+77	STEEL I-BEAM	47	REMOVE BRIDGE AND CONSTRUCT AT GRADE CROSSING					
27F	962+14	CMP	2.0	EXCAVATE AND REPLACE		* 29H	1230+76	STONE	3 x 6	COLLAPSE AND FILL HOLE WITH ON-SITE STRUCTURALLY SUITABLE EXCAVATED MATERIAL		34	1449+52	1450+61	PREFABRICATED MULTI-MODAL	109	BRIDGE WORK COMPLETED DURING LVVRT(10) CONSTRUCTION					
27G	974+88	STONE BOX	2 x 2	CLEAN INLET AND OUTLET, REPAIR INLET AND OUTLET		* 30	1258+52	STONE	10 x 10	REPLACE HEADWALL, FACIA CONCRETE REPAIR AND INSTALL GUARDRAIL		35	1474+79	1476+06	PREFABRICATED MULTI-MODAL	127	BRIDGE WORK COMPLETED DURING LVVRT(10) CONSTRUCTION					
27H(A)	981+20	STONE BOX	5 x 5	INSTALL RAILING ALONG PATH		33	1410+38	CONCRETE	8 x 10	INSTALL GUARDRAIL		36	1552+26	1552+71	STEEL I-BEAM	45	REPLACE DECK, INSTALL BRIDGE AND APPROACH RAILS, BACKWALL RETROFIT, FILL VOIDS AND RE-POINT SUBSTRUCTURE					
* 27I	988+74	STONE BOX	3 x 3	CLEAN INLET		37	1702+78	STONE	6 x 6	REPLACE WITH CULVERT		38	1757+00	1758+50	STEEL DECK PLATE	150	NO ACTION NEEDED					
27J	1010+91	HDPE	2.0	NO ACTION		39	1792+66	WOOD STRINGER	15 x 5	REMOVE AND FILL HOLE WITH ON-SITE STRUCTURALLY SUITABLE EXCAVATED MATERIAL		40	1803+75	1805+75	STEEL THROUGH-PLATE	200	NO ACTION NEEDED					
27M	1029+23	CMP	2.5	EXCAVATE AND REPLACE																		
27O	1041+43	STONE BOX	2 x 2	EXCAVATE AND REPLACE																		
* 27P	1051+33	STONE BOX	2 x 4	REPAIR AND REGRADE OUTLET																		
* 27S	1063+42	STONE BOX	4 x 4	NO ACTION NEEDED																		
* 28A	1087+19	STONE BOX	4 x 5	CLEAN OUTLET																		
* 28B(2)	1092+82	STONE BOX	3 x 3	EXCAVATE AND REPLACE																		
* 28C	1097+43	STONE BOX	3 x 4	CLEAN OUTLET																		
* 28(6)D	1105+75	STONE BOX	3 x 3	REPAIR OUTLET																		
* 28E	1110+48	STONE BOX	2 x 4	CLEAN INLET, REPAIR OUTLET																		
28G	1118+41	CAST IRON	1.5	CLEAN INLET AND OUTLET																		
28H(A)	1122+73	CMP	1.3	EXCAVATE AND REPLACE																		
28I	1129+91	CAST IRON	1.0	CLEAN INLET AND OUTLET																		
28(7)J	1134+23	STONE BOX	3 x 3	CLEAN INLET AND OUTLET, REPAIR OUTLET																		
28K	1144+89	CAST IRON	2.0	NO ACTION NEEDED																		
* 28L	1148+66	STONE BOX	2 x 2	CLEAN INLET																		
28L(2)	1150+72	N/A	N/A	INSTALL NEW CULVERT AT LOW POINT																		
28M	1156+27	CAST IRON	1.5	EXCAVATE AND REPLACE																		
* 28N	1164+89	STONE BOX	3 x 3	CLEAN INLET AND OUTLET																		
28P	1176+52	STONE BOX	2 x 2	EXCAVATE AND REPLACE																		
* 29A	1194+69	STONE BOX	2 x 2	REPAIR INLET AND OUTLET, REPAIR BANKING																		
* 29B	1207+21	STONE BOX	2 x 2	CLEAN INLET AND OUTLET																		
29C	1214+01	STONE BOX	2 x 1.5	CLEAN INLET AND OUTLET																		
* 29E	1217+66	STONE BOX	2 x 2	CLEAN INLET, REPAIR OUTLET AND BANKING																		
* 29G	1228+30	STONE BOX	4 x 5	NO ACTION NEEDED																		
29I	1236+97	CAST IRON	1.5	EXCAVATE AND REPLACE																		
29J	1239+36	CMP	1.0	EXCAVATE AND REPLACE																		
29K	1248+88	STONE BOX	1 x 1	EXCAVATE AND REPLACE																		
* 29L	1257+30	STONE BOX	5 x 5	NO ACTION NEEDED																		
* 31A	1270+00	STONE BOX	2 x 2	CLEAN INLET AND OUTLET																		
* 31B	1280+92	STONE BOX	N/A	ABANDON IN PLACE																		
31C	1291+35	CMP	N/A	EXCAVATE AND REPLACE																		
* 31D	1297+71	CMP	2.0	CLEAN INLET AND REPAIR INLET HEADWALL																		
31E	1301+65	CAST IRON	1.5	EXCAVATE AND REPLACE																		
* 31F	1313+35	STONE BOX	3 x 3	CLEAN INLET AND OUTLET																		
31G	1323+88	STONE BOX	2 x 2	EXCAVATE AND REPLACE																		
31J	1340+62	CAST IRON	2.0	CLEAN INLET, REGRADE OUTLET																		
31K	1353+55	CMP	2.0	CLEAN INLET AND OUTLET																		
* 32A	1362+43	STONE BOX	2 - 5 x 6	CLEAN INLET AND OUTLET AND REGRADE AROUND INLET																		
32B	1370+70	CMP	3.0	CLEAN INLET AND OUTLET																		
* 32C	1374+99	STONE BOX	2 x 2	CLEAN INLET, REPAIR OUTLET AND BANKING																		
* 32D	1384+91	HDPE	3.0	STABILIZE OUTLET																		
32E	1390+06	STONE BOX	2 x 2	EXCAVATE AND REPLACE, REGRADE AROUND INLET																		
* 32F	1401+88	STONE BOX	3 x 3	CLEAN INLET AND OUTLET																		
* 33B	1424+20	STONE BOX	2 x 2	CLEAN INLET																		
* 33C	1435+05	STONE BOX	6 x 8	REPAIR OUTLET																		
34A	1456+28	STONE BOX	1 x 1	EXCAVATE AND REPLACE																		
* 34B	1458+58	STONE BOX	3 x 3	CLEAN INLET AND OUTLET																		
A35	1479+36	CMP	4.0	CLEAN INLET																		
* 35A	1485+62	HDPE	2.0	REPAIR BANKING AT OUTLET																		
35C	1496+60	CAST IRON	2.0	CLEAN INLET AND OUTLET																		
35D	1502+48	STONE BOX	2 x 2	NO ACTION																		
35E	1507+51	CAST IRON	1.3	CLEAN INLET AND OUTLET																		
35E-2	1529+79	CMP	1.3	CLEAN INLET AND OUTLET																		
35E-3	1534+67	CMP	1.0	CLEAN INLET, CONSTRUCT STONE HEADWALL AT INLET & OUTLET																		
36A	1570+49	STONE BOX	3 x 3	EXCAVATE AND REPLACE																		
36B	1575+38	CMP	1.5	CLEAN INLET AND OUTLET																		
36C	1585+74	CAST IRON	1.0	EXCAVATE AND REPLACE																		
36D	1594+68	STONE BOX	3 x 3	EXCAVATE AND REPAIR																		
36E	1597+85	CAST IRON	1.5	REPAIR HEADWALL AT INLET																		
36G	1601+66	CAST IRON	1.0	CLEAN INLET, REGRADE AROUND OUTLET																		
36H	1607+85	CAST IRON	1.0	CLEAN INLET AND OUTLET																		
36H(2)	1613+95	N/A	N/A	INSTALL CULVERT AT LOW POINT																		
* 36I	1627+24	STONE BOX	2 - 4 x 6	CLEAN INLET																		
36I(2)	1633+10	CMP	1.5	EXCAVATE AND REPLACE																		
36J	1645+07	CAST IRON	2.0	EXCAVATE AND REPLACE																		
* 36L	1663+04	STONE BOX	1 x 2	EXCAVATE AND REPAIR																		
* 36M	1666+22	STONE BOX	5 x 4	STABILIZE OUTLET																		

PROJECT NAME: SWANTON - ST JOHNSBURY

PROJECT NUMBER: STP LVVRT(I3)

FILE NAME: z20f239.ids.dgn

PROJECT LEADER: E.P. DETRICK

DESIGNED BY: B.M. ROBERTS

ITEM DETAIL SHEET (1 OF 3)

PLOT DATE: 3/22/2021

DRAWN BY: B.M. ROBERTS

CHECKED BY: E.P. DETRICK

SHEET 7 OF 70





ITEM DETAIL SHEET

[illegible]

PROJECT NUMBER: STP LVRT(13)

FILE NAME: z20f239_ids.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.M. ROBERTS  
ITEM DETAIL SHEET (2 OF 3)

PLOT DATE: 3/22/2021  
DRAWN BY: B.M. ROBERTS  
CHECKED BY: E.P. DETRICK  
SHEET 8 OF 70





# ITEM DETAIL SHEET

RAILING					WASHOUTS					CROSSINGS					
BEGIN STATION	END STATION	LENGTH	TYPE	REMARKS	BEGIN STATION	END STATION	LENGTH	TYPE	REMARKS	NUMBER	STATION	TYPE	MATERIAL	CURRENTLY PERMITTED	REMARKS
		FT					FT								
893+63	893+78	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	1360+26	1360+76	50	PONDING	RAISE GRADE 6", DITCH, REPAIR LEFT BANK	35	892+93	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING ON WEST SIDE ONLY
893+78	894+18	40	BRIDGE	BRIDGE RAIL, BOTH SIDES						36	942+67	PUBLIC	GRASS	YES	SIGN CROSSING
894+18	894+33	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES	1436+87	1446+87	1000	PONDING	RAISE GRADE 12" TO RESTORE DITCH LINE	N/A	949+07	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
980+65	981+05	40	GUARDRAIL	STEEP SLOPE LEFT SIDE						N/A	958+52	SNOW/MOBILE	GRASS	NO	NO ACTION REQUIRED
981+35	981+75	40	GUARDRAIL	STEEP SLOPE RIGHT SIDE	1557+67	1559+97	230	WETLAND	RAISE GRADE 12" TO RESTORE DITCH LINE	N/A	980+87	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
1061+77	1061+97	10	GUARDRAIL	CATTLEPASS, BOTH SIDES						37	981+20	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING AND INSTALL RAILING TO PROTECT USERS FROM ADJACENT STREAM/CULVERT
1062+17	1064+67	250	GUARDRAIL	STEEP SLOPE BOTH SIDES	1588+02	1588+77	75	BANK EROSION	RAISE GRADE 24", REPAIR BANKING	38	1001+02	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
1073+08	1073+23	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						N/A	1026+32	FARM/HIKING	GRASS	NO	NO ACTION REQUIRED
1073+23	1073+51	28	BRIDGE	BRIDGE RAIL, BOTH SIDES	1589+67	1590+17	50	PONDING	RAISE GRADE 12" TO RESTORE DITCH LINE	39	1039+52	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
1073+51	1073+66	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						N/A	1042+62	PARKING ACCESS	GRASS	NO	NO ACTION REQUIRED
1171+49	1171+59	10	GUARDRAIL	CATTLEPASS, BOTH SIDES	1741+66	1741+86	20	BANK EROSION	REPAIR WITH ON-SITE STRUCTURALLY SUITABLE EX. MATERIAL AND TRAIL SURFACE MATERIAL, LT	40	1048+59	DRIVEWAY	GRAVEL	NO	SIGN CROSSING
1188+67	1192+42	375	GUARDRAIL	STEEP SLOPE, BOTH SIDES						N/A	1055+87	ATV ACCESS	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
1214+23	1214+33	10	GUARDRAIL	CATTLEPASS, BOTH SIDES	1765+47	1766+72	125	PONDING	RAISE GRADE 12" AND INSTALL CULVERT	N/A	1066+42	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
1257+67	1257+92	25	GUARDRAIL	CATTLEPASS, BOTH SIDES						41	1069+71	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
1410+23	1410+53	30	GUARDRAIL	CATTLEPASS, BOTH SIDES	1773+87	1774+87	100	PONDING	RAISE GRADE 12" AND INSTALL CULVERT	42	1075+20	SNOW/MOBILE	GRASS	NO	NO ACTION REQUIRED
1552+11	1552+26	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						N/A	1076+86	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
1552+26	1552+71	45	BRIDGE	BRIDGE RAIL, BOTH SIDES						43	1084+97	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
1552+71	1552+86	15	APPROACH	BRIDGE APPROACH RAIL, BOTH SIDES						44	1089+23	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
1565+82	1570+32	450	GUARDRAIL	STEEP SLOPE, LT						45	1106+52	FARM	GRASS	YES	DITCH THROUGH CROSSING
1721+77	1723+52	175	GUARDRAIL	STEEP SLOPE, LT						46	1130+07	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
1823+24	1828+24	500	GUARDRAIL	RESTRICT ACCESS, RT						49	1169+34	FARM	GRAVEL	NO	DITCH THROUGH CROSSING
										N/A	1202+60	SNOW/MOBILE	GRASS	NO	NO ACTION REQUIRED
										50	1216+57	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
										N/A	1220+37	ATV ACCESS	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1226+47	ATV ACCESS	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1249+60	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										52	1253+42	SNOW/MOBILIE	GRASS	YES	NO ACTION REQUIRED
										N/A	1267+02	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										53	1273+52	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										54	1285+92	FARM	GRAVEL	YES	DITCH THROUGH CROSSING TO PREVENT PONDING ON TRAIL
										55	1298+12	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
										56	1301+01	FARM	EARTH	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										57	1332+09	SNOW/MOBILE	GRASS	NO	NO ACTION REQUIRED
										N/A	1343+34	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										59	1349+85	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
										60	1355+53	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1358+42	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										61	1363+92	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1373+82	SUGARING	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1380+02	SUGARING	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1382+02	SUGARING	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1387+22	SUGARING	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										62	1392+54	SUGARING	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1399+02	SUGARING	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										63	1399+73	SUGARING	GRAVEL	YES	SIGN CROSSING
										64	1411+20	FARM	GRAVEL	NO	RE-ESTABLISH HISTORICAL ALIGNMENT THROUGH CROSSING
										65	1426+16	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1437+52	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										66	1458+21	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
										68	1468+21	SNOW/MOBILE	GRASS	NO	NO ACTION REQUIRED
										69	1472+15	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
										N/A	1487+52	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1491+77	DRIVEWAY	PAVED	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										70	1497+17	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
										N/A	1504+25	DRIVEWAY	GRAVEL	NO	SIGN CROSSING
										72	1512+33	FARM	GRAVEL	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										73	1522+34	FARM	GRASS	YES	GRADE TO RETAIN POSSITIVE DRAINAGE OFF TRAIL AT CROSSING
										74	1540+84	DRIVEWAY	GRAVEL	NO	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
										75	1543+92	DRIVEWAY	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
										76	1545+50	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1553+82	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										77	1571+86	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										N/A	1589+92	HIKING	GRASS	NO	RESTRICT TO PEDESTRIAN ACCESS ONLY
										78	1596+62	STATE ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
										79	1623+79	PRIVATE	GRASS	NO	EXISTING GUARDRAIL ON LEFT, BLOCK ACCESS ON RIGHT AS DIRECTED BY THE ENGINEER
										80	1629+72	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
										82	1643+12	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
										83	1646+52	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING
										N/A	1689+52	FARM	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										84	1701+65	FARM	GRASS	YES	DITCH AT CROSSING TO CONTROL WATER FLOW OFF TRAIL
										86	1719+32	TOWN ROAD	GRAVEL	YES	CONSTRUCT ACCESSIBLE GRAVEL ROAD CROSSING
										88	1759+12	TRAIL HEAD	GRAVEL	YES	NO ACTION REQUIRED
										N/A	1793+63	ATV ACCESS	GRASS	NO	BLOCK ACCESS AS DIRECTED BY THE ENGINEER
										89	1794+01	DRIVEWAY	GRAVEL	YES	SIGN CROSSING
										90	1834+92	TOWN ROAD	PAVED	YES	CONSTRUCT ACCESSIBLE PAVED ROAD CROSSING ON EAST SIDE ONLY
											</				

PROJECT NAME: SWANTON - ST. JOHNSBURY

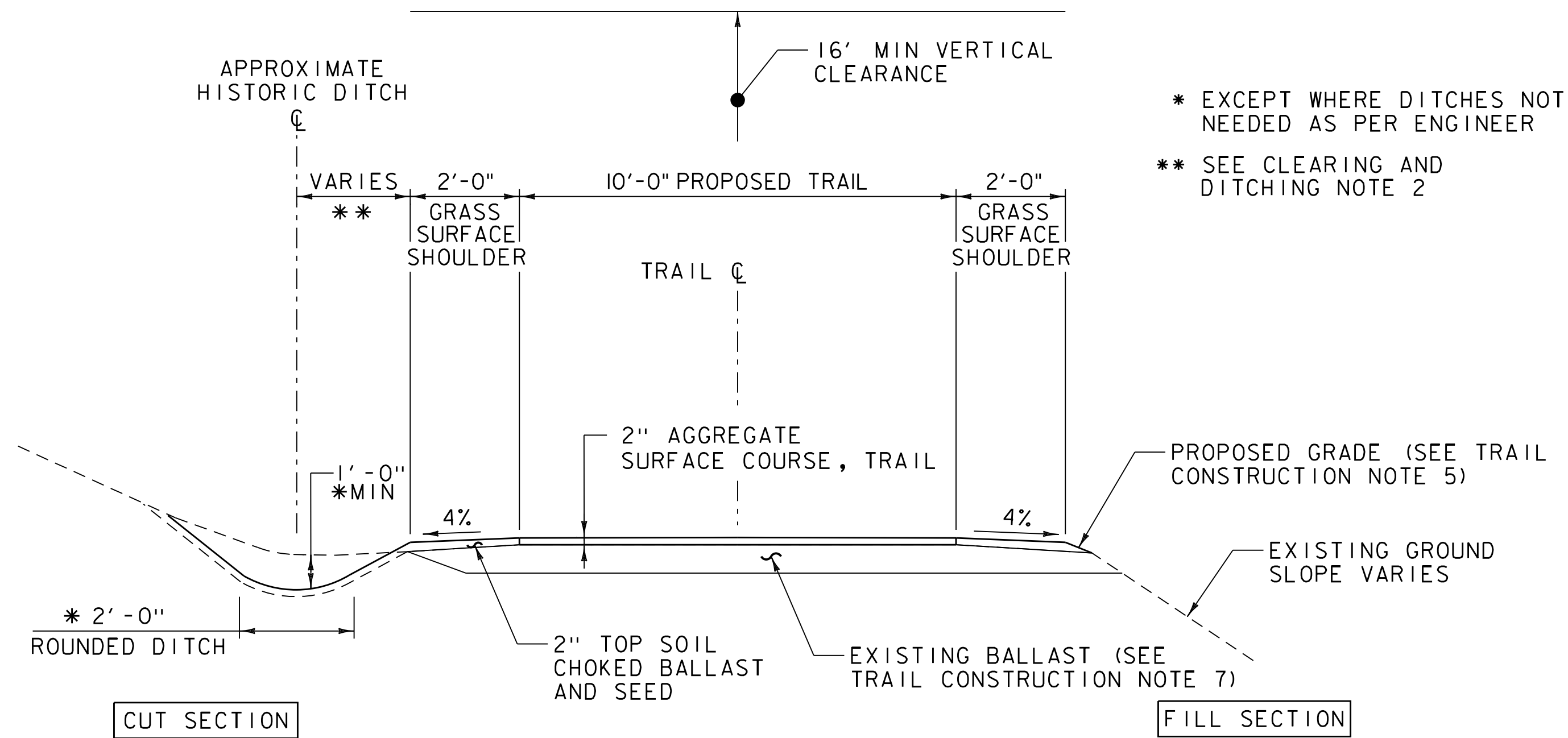
PROJECT NUMBER: STP LVRT(13)

FILE NAME: z20f239_ids.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.M. ROBERTS  
ITEM DETAIL SHEET (3 OF 3)

PLOT DATE: 3/22/2021  
DRAWN BY: B.M. ROBERTS  
CHECKED BY: E.P. DETRICK  
SHEET 9 OF 70







TRAIL TYPICAL SECTION  
NOT TO SCALE

SHOULDER WIDTH TABLE

SIDE SLOPE	SHOULDER WIDTH	
	MIN.	PREFERRED
< 1:4	1'-0"	2'-0"
1:3	1'-0"	3'-0"
1:2	1'-0"	5'-0"
> 1:2	1'-0"	5'-0"

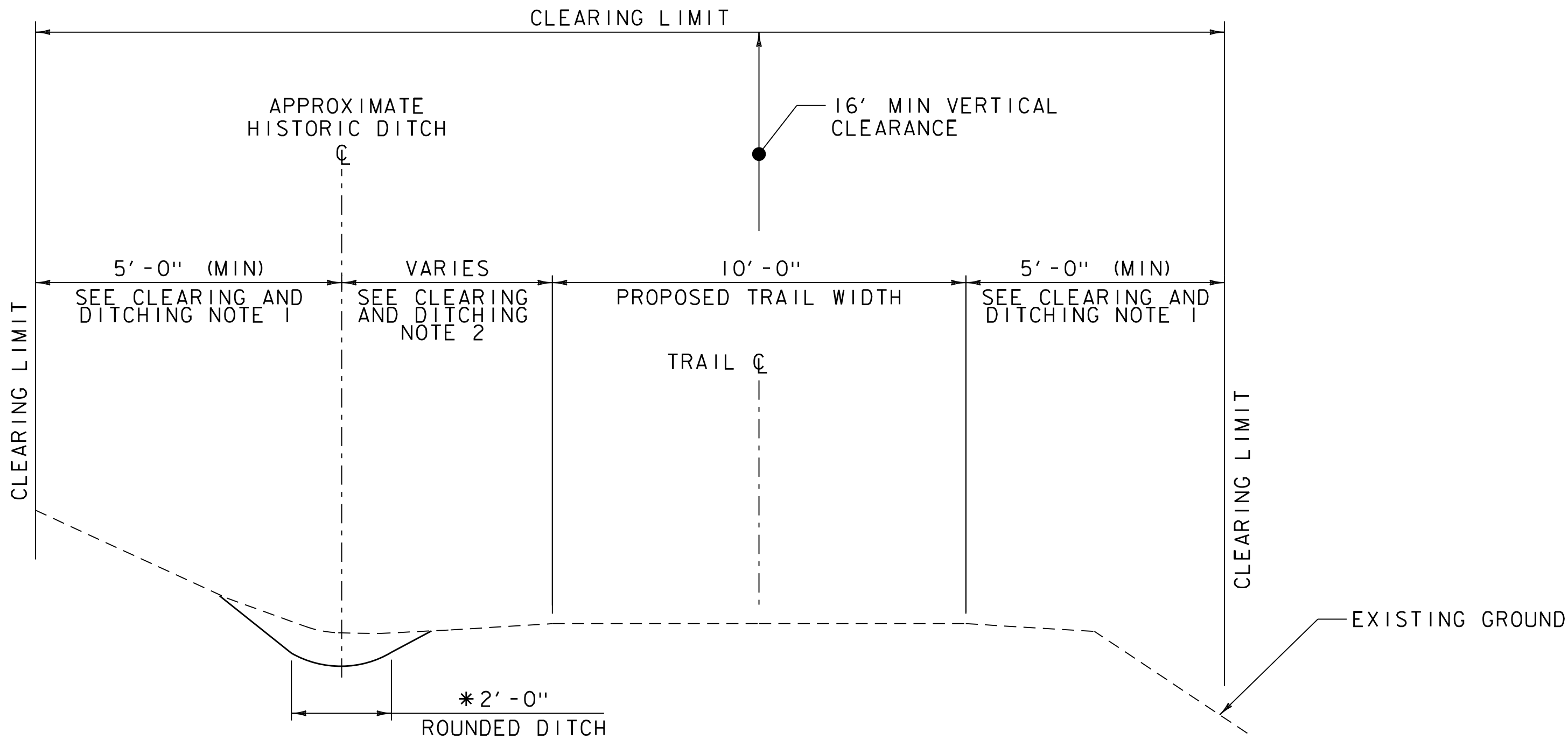
SEE TRAIL CONSTRUCTION NOTE 8

TRAIL CONSTRUCTION NOTES:

- IF THE EXISTING RAIL BED HAS ANY WASHOUTS OR HOLES, THEY SHALL BE FILLED WITH GRANULAR BORROW TO THE REQUIRED ELEVATION FOR THE INSTALLATION OF 2" OF ITEM 900.608, "SPECIAL PROVISION (AGGREGATE SURFACE COURSE, TRAIL)".
- ENTIRE TRAIL SURFACE SHALL BE BANKED 2% TO THE INSIDE OF CURVES. TRAIL SHALL OTHERWISE BE GRADED TO DRAIN OR SLOPED TO ONE SIDE IN FLAT AREAS WITH 2% CROSS SLOPE MAXIMUM.
- THE CONTRACTOR SHALL REMOVE RAILROAD TIES AND RAIL FROM BALLAST AND DISPOSE OF BY METHODS APPROVED BY THE VT AGENCY OF NATURAL RESOURCES. REMOVAL OF TIES AND RAIL SHALL BE PAID INCIDENTAL TO ITEM 201.10, "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".
- 1V:4H IS THE PREFERRED FILL SIDE SLOPE UNLESS THE FILL WOULD EXTEND BEYOND THE CLEARING LIMITS, IN WHICH CASE STEEPER SLOPES SHALL BE USED.
- SIDE SLOPES DISTURBED DURING CONSTRUCTION STEEPER THAN 1V:3H SHALL BE SEEDED AND PROTECTED WITH ITEM 653.20, "ROLLED EROSION CONTROL PRODUCT, TYPE 1" UNLESS STEEPER THAN 1V:2H, THEN ITEM 613.10, "STONE FILL, TYPE 1" SHALL BE USED. SIDE SLOPES STEEPER THAN 1V:1.5H SHALL BE PROTECTED WITH ITEM 613.11 "STONE FILL, TYPE 1" OR AS SPECIFIED IN THE PLANS OR BY THE ENGINEER. PAYMENT FOR ALL SIDE SLOPE PROTECTION MEASURES SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.
- STONE FILL SLOPES ABOVE THE ORDINARY HIGH WATER LINE SHALL BE GRUBBED WITH 6" OF GRUBBING MATERIAL. GRUBBING MATERIAL SHALL BE PAID FOR UNDER ITEM 651.40 "GRUBBING MATERIAL".
- IF THE EXISTING RAIL BED LACKS 8" OF SALVAGEABLE BALLAST OR WELL DRAINED GRANULAR MATERIAL, GRANULAR BORROW SHALL BE ADDED TO ACHIEVE THE REQUIRED 8" BASE.
- THE PREFERRED SHOULDER DIMENSIONS SHALL BE USED UNLESS CONSTRAINED BY THE WIDTH OF THE EXISTING RAIL BED AND STEEP SIDE SLOPES. SHOULDER WIDTHS BELOW THE PREFERRED WIDTH SHALL BE USED WHEN DIRECTED BY THE ENGINEER. CERTAIN EXISTING RAIL BED WIDTHS AND SIDE SLOPE CONDITIONS MAY WARRANT SHOULDER WIDTHS BELOW THE MINIMUM WIDTHS SHOWN. TO AVOID THE USE OF GUARDRAIL TO PROTECT STEEP SLOPES WITHOUT AN ADEQUATE BARRIER OF VEGETATION OR OTHER IMPASSABLE OBJECTS, THE ENGINEER MAY DIRECT THE CONTRACTOR TO LOWER THE PROFILE OF THE EXISTING TRAIL TO ACHIEVE THE PREFERRED SHOULDER WIDTH.
- BALLAST GRADING AND COMPACTION SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (BALLAST GRADING AND SHAPING)".
- GRASS SHOULDERS MAY BE OMITTED IF GRASSED BERMS EXIST AT THE EDGES OF THE PROPOSED TRAIL. OMISSION OF SHOULDERS MUST BE APPROVED BY THE ENGINEER.
- FOR LOCATIONS NOTED AS A WASHOUT, ON ITEM DETAIL SHEET 3, WHERE THE PROPOSED ACTION IS TO RAISE GRADE, THE LONGITUDINAL SLOPE OF THE TRAIL SHALL NOT EXCEED 5%.

CLEARING AND DITCHING NOTES:

- CLEARING LIMIT ON EMBANKMENT SLOPES STEEPER THAN 1V:2H SHALL NOT BE MORE THAN 1'-0" BEYOND THE TOP OF SLOPE. ACTUAL CLEARING LIMITS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. IN ROCK CUT AREAS, CLEAR THE WIDTH OF THE BALLAST AND DITCHES ALONG WITH ANY OVERHANGING VEGETATION. DO NOT CLEAR OR DAMAGE HEALTHY TREES GREATER THAN 5" IN DIAMETER ON STEEP EMBANKMENTS OFF THE EDGE OF THE BALLAST UNLESS WITHIN 1'-0" OF THE BALLAST. DO NOT REMOVE ROOTS OR STUMPS ON SLOPES. PRUNE BRANCHES WITHIN CLEARING LIMITS AND REMOVE DEAD TREES 3'-0" BEYOND THE TOP OF SLOPE. CLEARING TO BE PAID UNDER ITEM 201.10, "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".
- RE-ESTABLISH APPROXIMATE UNMAINTAINED HISTORIC DITCHES. ACTUAL DITCH OFFSET AND BOTTOM ELEVATION SHALL BE SET IN THE FIELD BY THE ENGINEER. SALVAGE CLEAN BALLAST FROM DITCHES TO RAIL BED. DITCH EXCAVATION DEPTH VARIES TO ACCOMMODATE HISTORIC LOCATIONS, BACK SLOPES, DITCH PROFILE, AND CROSS CULVERT INVERT ELEVATIONS. DITCHING WORK SHALL BE PAID UNDER ITEM 900.640, "SPECIAL PROVISION (DITCHING)".
- WASTE SILT AND EXCAVATED MATERIALS ONTO DESIGNATED SHOULDERS AND EMBANKMENT SLOPES THAT HAVE BEEN MARKED BY THE ENGINEER. SEE WASTE AREA DETAILS SHEET FOR WASTING DETAILS. CLEAR WASTE AREAS PRIOR TO WASTING MATERIAL. RAKE SEED AND MULCH THE DRESSED SLOPES WITHIN 72 HOURS, OR IMMEDIATELY IF EXPECTING RAIN WITHIN 24 HOURS. COSTS FOR WASTING MATERIAL SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.
- IN WETLANDS OR ON BANKS OF WATER BODIES DO NOT CLEAR PAST THE EDGE OF BALLAST OR TOP OF BANK, OR OTHER LIMITS SET BY PERMIT CONDITIONS.
- ON BALLAST TRAIL SHOULDERS AND DITCHES, REMOVE ALL TREES, BRUSH, WEEDS, LEAVES, BRANCHES, TRASH, ROOTS, STUMPS; TOPSOIL MAY BE SALVAGED FOR THE USE ON TRAIL GRASS SURFACE.
- ON LATERAL DITCHES OR SHOULDERS, CLEAR CUT AND REMOVE ALL TREES, BRUSH, WEEDS, LEAVES, BRANCHES TO WITHIN 4" OF SOIL SURFACE.
- ORGANIC MATERIAL THAT HAS BEEN CHIPPED, GROUND, OR MULCHED MAY REMAIN. IF IT IS TO REMAIN THEN SPREAD EVENLY ON SHOULDERS AND ADJACENT R.O.W. LAND. REMOVE AND LEGALLY DISPOSE OF ANY TRASH AND DEBRIS OFF SITE. THE COST OF DISPOSAL OF TRASH AND DEBRIS SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.

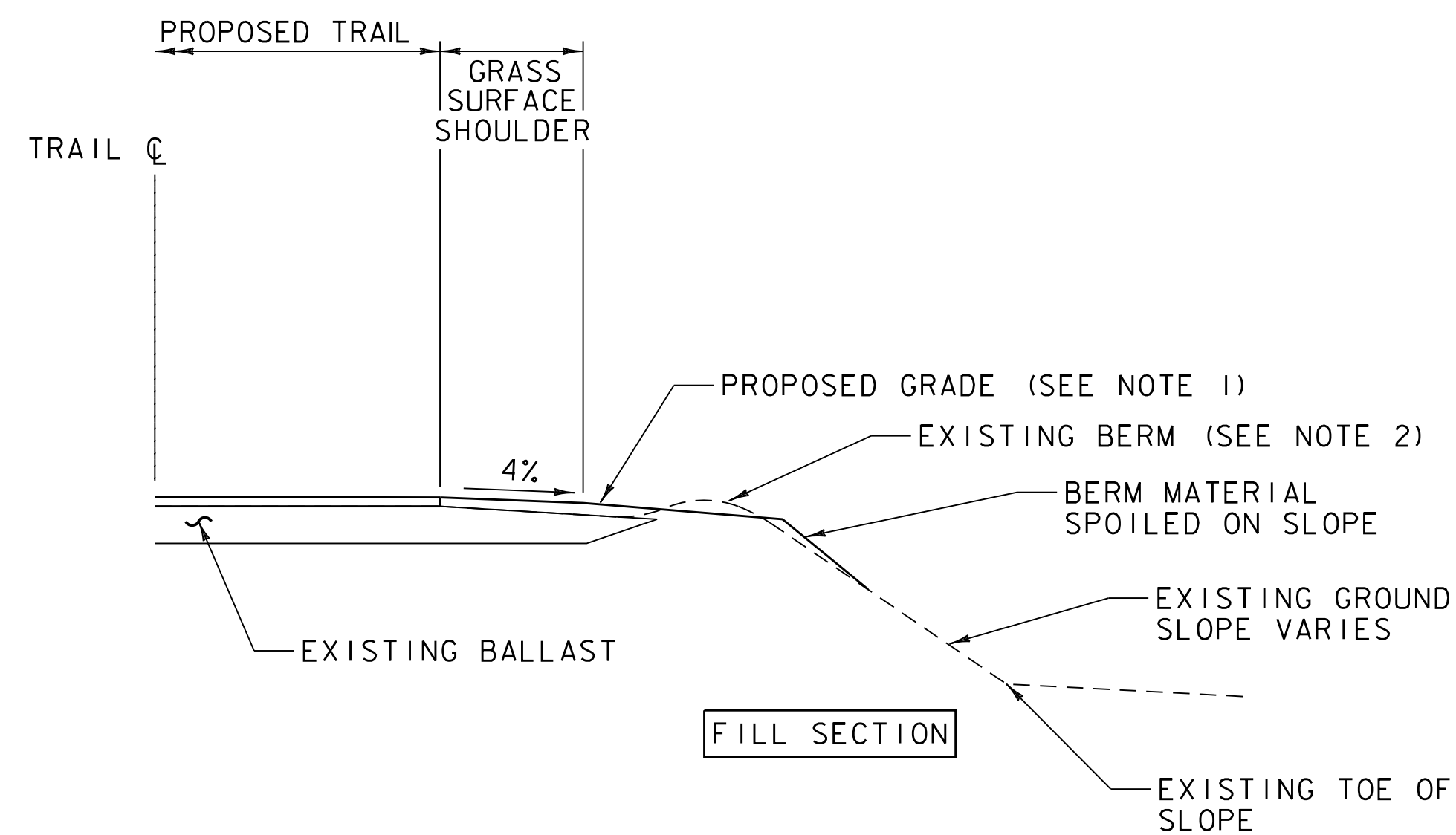


CLEARING AND DITCHING TYPICAL SECTION  
NOT TO SCALE

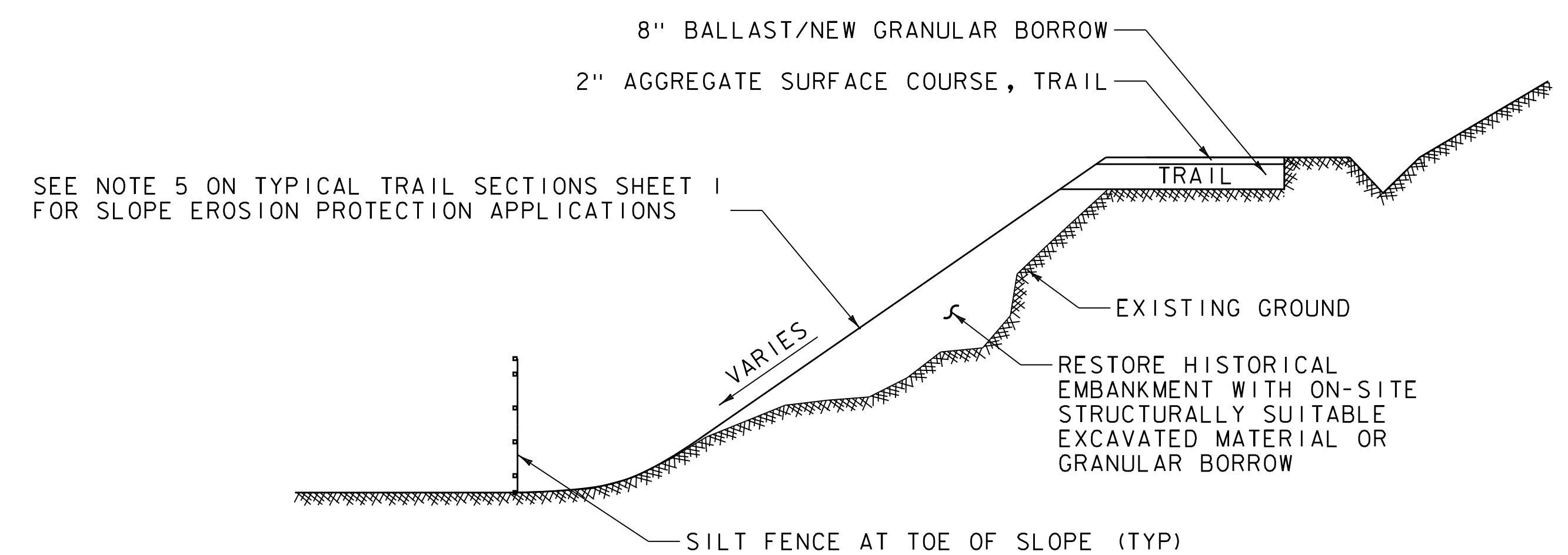


PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I3)
FILE NAME:	z20f239_typ_trail.sections.dgn
PLOT DATE:	3/22/2021
PROJECT LEADER:	E.P. DETRICK
DRAWN BY:	B.M. ROBERTS
DESIGNED BY:	B.M. ROBERTS
CHECKED BY:	E.P. DETRICK
TYPICAL TRAIL SECTIONS SHEET (1 OF 2)	SHEET 10 OF 70





SLOPE ROUNDING DETAIL  
NOT TO SCALE



EMBANKMENT SLOPE REPAIR  
NOT TO SCALE

NOTES:

1. SEE TRAIL TYPICAL SECTIONS (SHEET 1 OF 2) FOR TRAIL CONSTRUCTION NOTES.
2. BERMS LOCATED AT THE TOP OF EMBANKMENTS SHALL BE ROUNDED TO PROMOTE SHEET FLOW FROM THE TRAIL DOWN THE EXISTING RAIL EMBANKMENT. BERM MATERIAL REMOVED SHALL BE PUSHED OVER THE EMBANKMENT IF THAT MATERIAL DOES NOT GO BEYOND THE EXISTING TOE OF THE SLOPE. IF THE BERM MATERIAL WOULD EXTEND BEYOND THE EXISTING TOE OF THE SLOPE, THE MATERIAL SHALL BE SPOILED IN A PRE- APPROVED DISPOSAL LOCATION OR PAUSE PLACE. PAYMENT FOR SLOPE ROUNDING SHALL BE MADE UNDER ITEM 201.10 CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS.



PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239_typ_trail_sections.dgn PLOT DATE: 3/22/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: B.M. ROBERTS

DESIGNED BY: B.M. ROBERTS

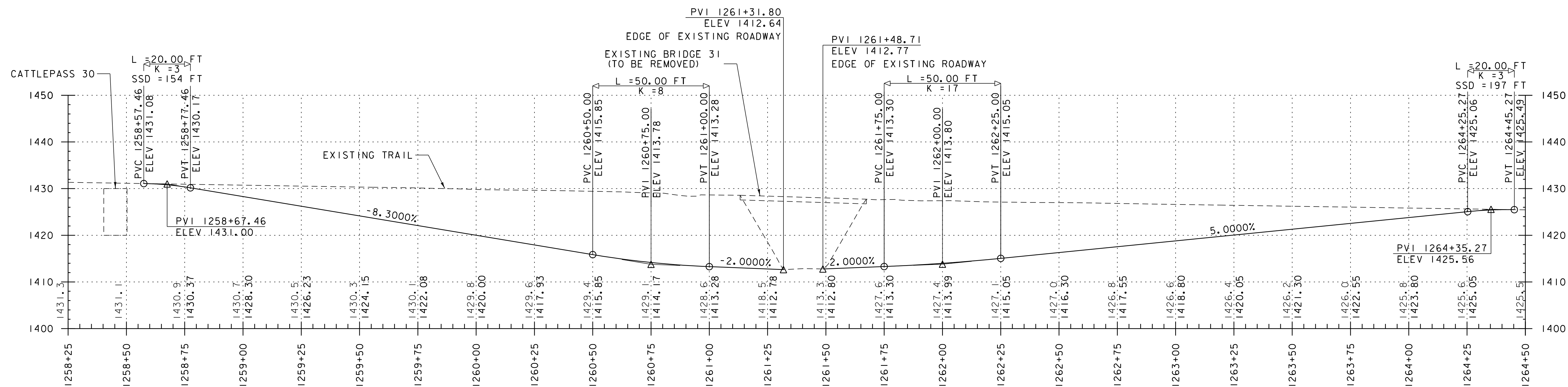
CHECKED BY: E.P. DETRICK

TYPICAL TRAIL SECTIONS SHEET (2 OF 2)

SHEET II OF 70



# BRIDGE 31 REMOVAL



## NOTES

- ALL ELEVATIONS SHOWN IN THIS PROFILE IS THE ENGINEERS BEST INTERPRETATION OF LIDAR DATA. TRUE ELEVATIONS AND DESIGN SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER BEFORE CONSTRUCTION.
- STATIONING AND ELEVATIONS IN FEET (TYP.).

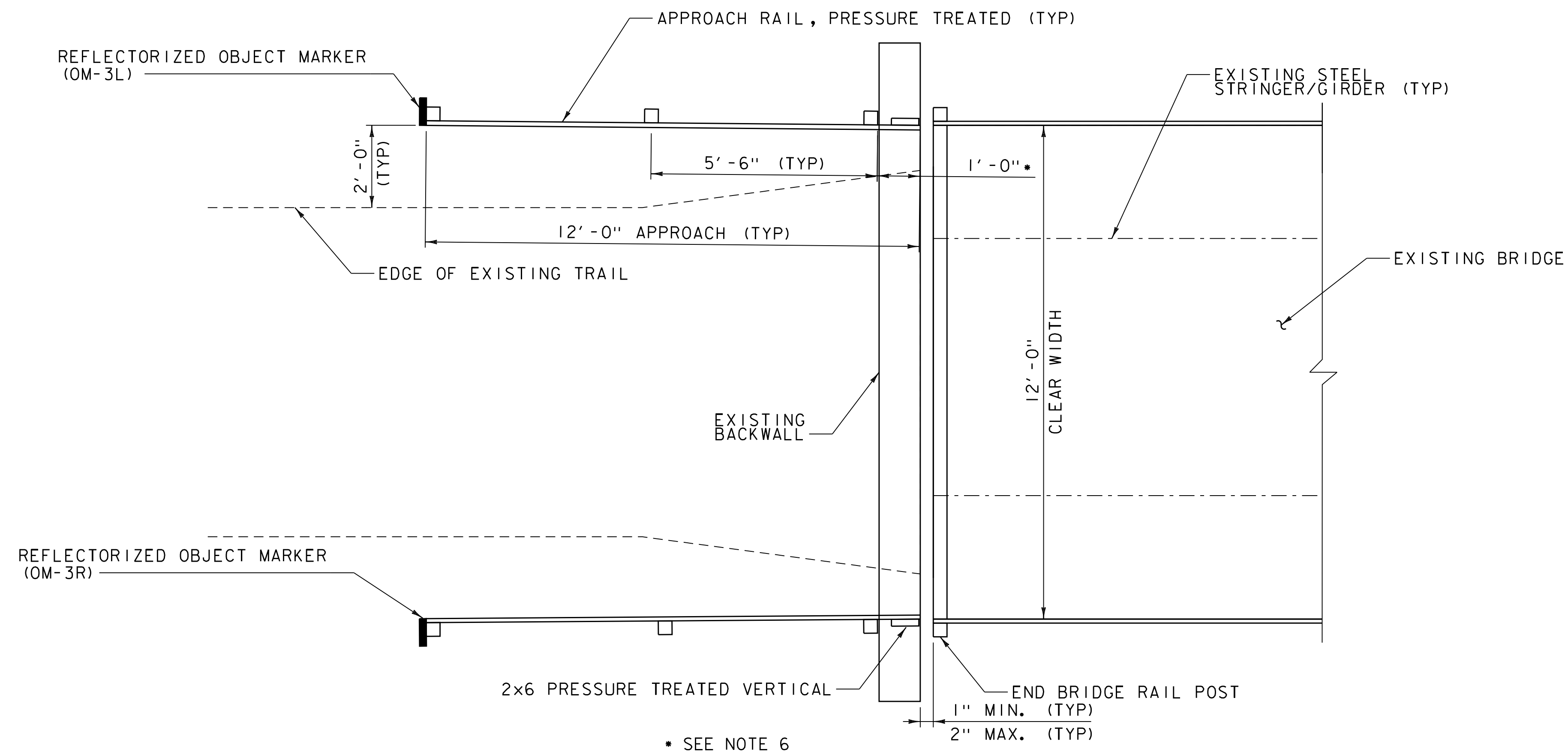
PROJECT NAME: SWANTON - ST JOHNSBURY  
PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239_trail_lowering.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.M. ROBERTS  
TRAIL LOWERING DETAIL

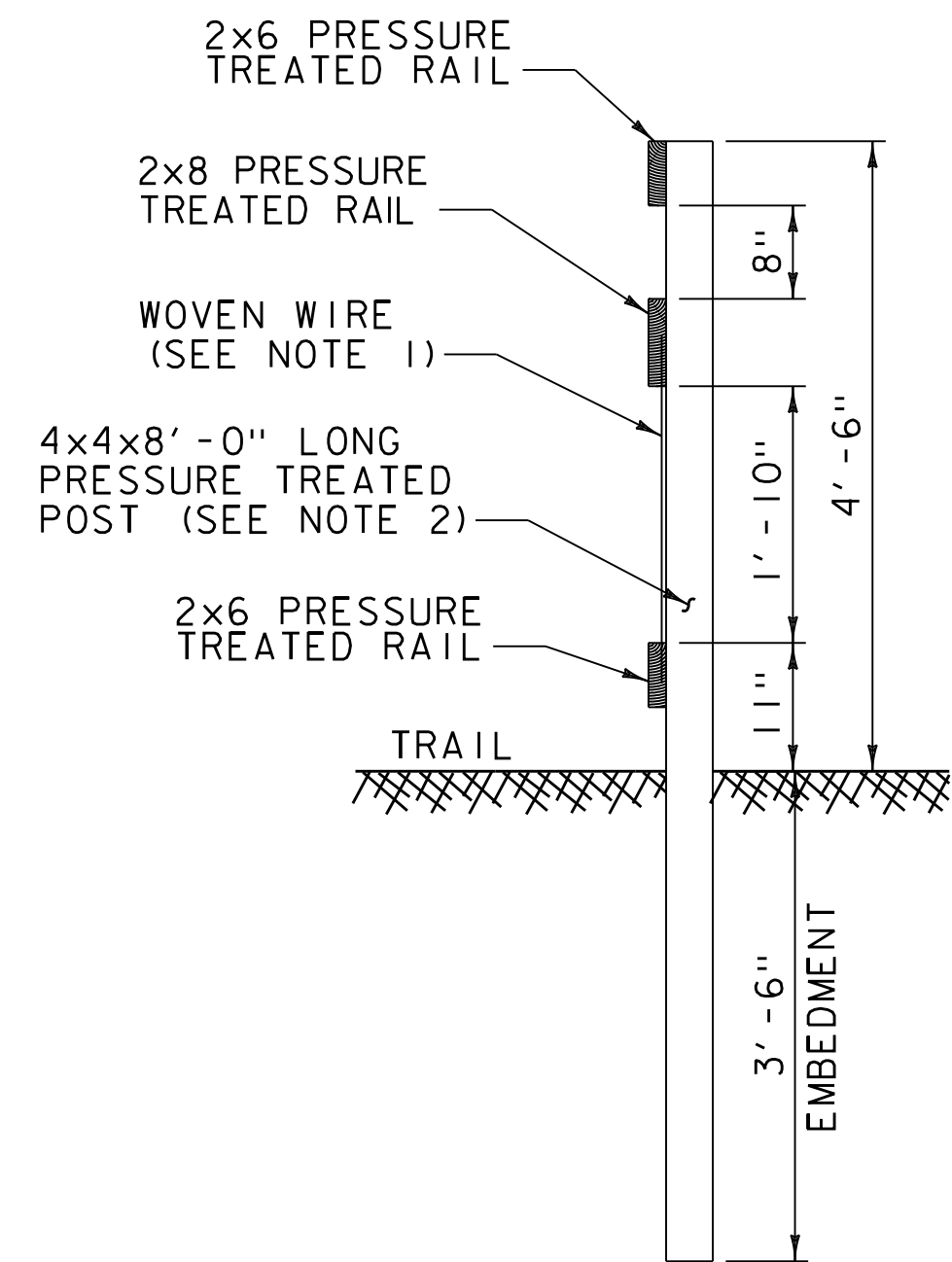
PLOT DATE: 3/22/2021  
DRAWN BY: B.M. ROBERTS  
CHECKED BY: E.P. DETRICK  
SHEET 12 OF 70



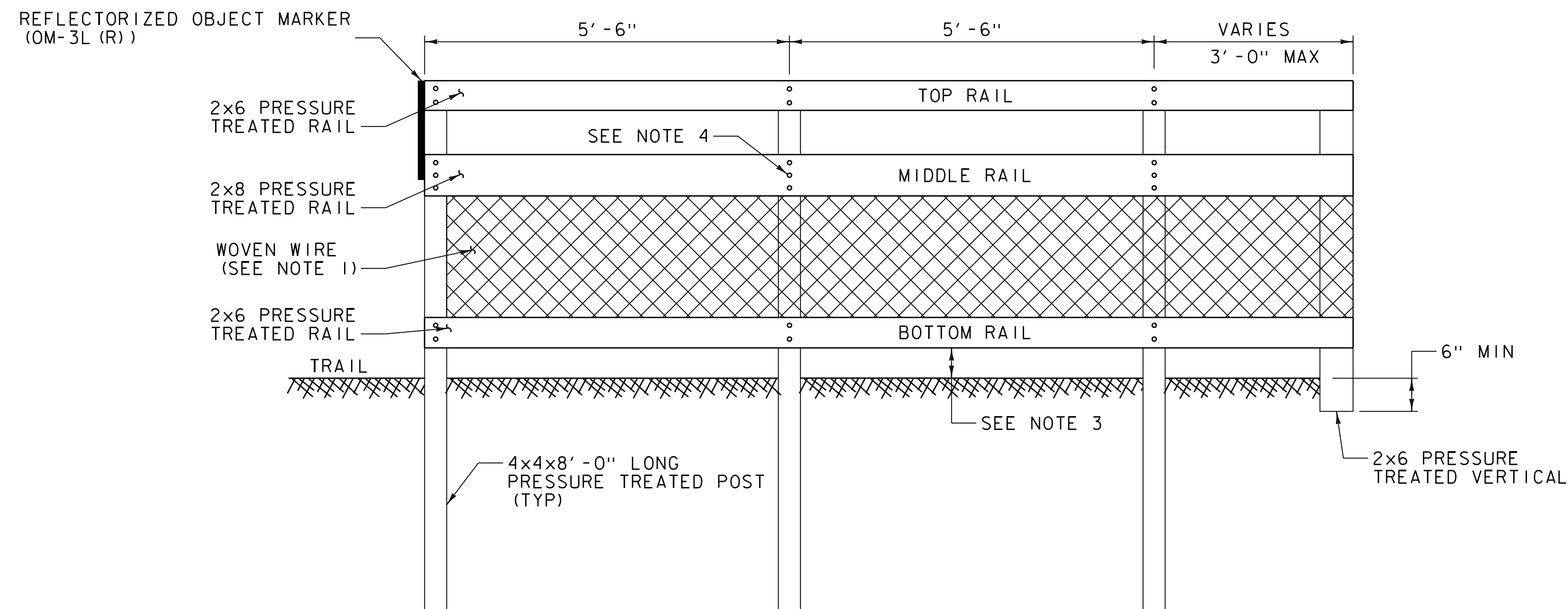




TYPICAL APPROACH RAIL LAYOUT  
SCALE 1/2" = 1'-0"



APPROACH RAIL SECTION  
NOT TO SCALE



APPROACH RAIL ELEVATION  
SCALE 3/4" = 1'-0"

NOTES:

1. THE WOVEN WIRE SHALL BE VINYL COATED, 2"x4" 11 GAUGE, BLACK.
2. WOODEN POSTS AND RAILS SHALL BE PRESSURE TREATED AND MEET THE REQUIREMENTS OF ITEM 522.25, "STRUCTURAL LUMBER AND TIMBER, TREATED".
3. THE TOP, MIDDLE, AND BOTTOM RAIL ARE TO BE SET AT THE SAME SLOPE AS THE TRAIL PROFILE GRADE AT THE EDGE OF THE TRAIL. IF THE OPENING BELOW THE BOTTOM RAIL EXCEEDS SIX (6) INCHES, THEN A FOURTH RAIL, 2x6 PRESSURE TREATED RAIL, SHALL BE INSTALLED UNDER THE BOTTOM RAIL.
4. THE TOP AND BOTTOM RAILS ARE TO BE ATTACHED TO THE POSTS WITH TWO 1/2" DIA. GALVANIZED CARRIAGE BOLTS WITH A 3/4" WASHER UNDER THE NUT. THREE 1/2" DIA. GALVANIZED CARRIAGE BOLTS WITH A 3/4" WASHER UNDER THE NUT SHALL BE USED FOR CONNECTING THE MIDDLE RAIL TO POST. ALL CARRIAGE BOLTS SHALL BE ASTM A307.
5. ALL COSTS ASSOCIATED WITH FABRICATING AND INSTALLING THE APPROACH/GUARD RAIL SHALL BE INCLUDED IN ITEM 900.640, "SPECIAL PROVISION (APPROACH RAIL, PRESSURE TREATED)".
6. PRESSURE TREATED RAIL CAN BE CANTILEVERED A MAX. OF 2'-0" BEYOND THE END OF POST.
7. ALL LUMBER TO BE DRESSED LUMBER. DIMENSIONS SHOWN ARE NOMINAL.



PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I3)

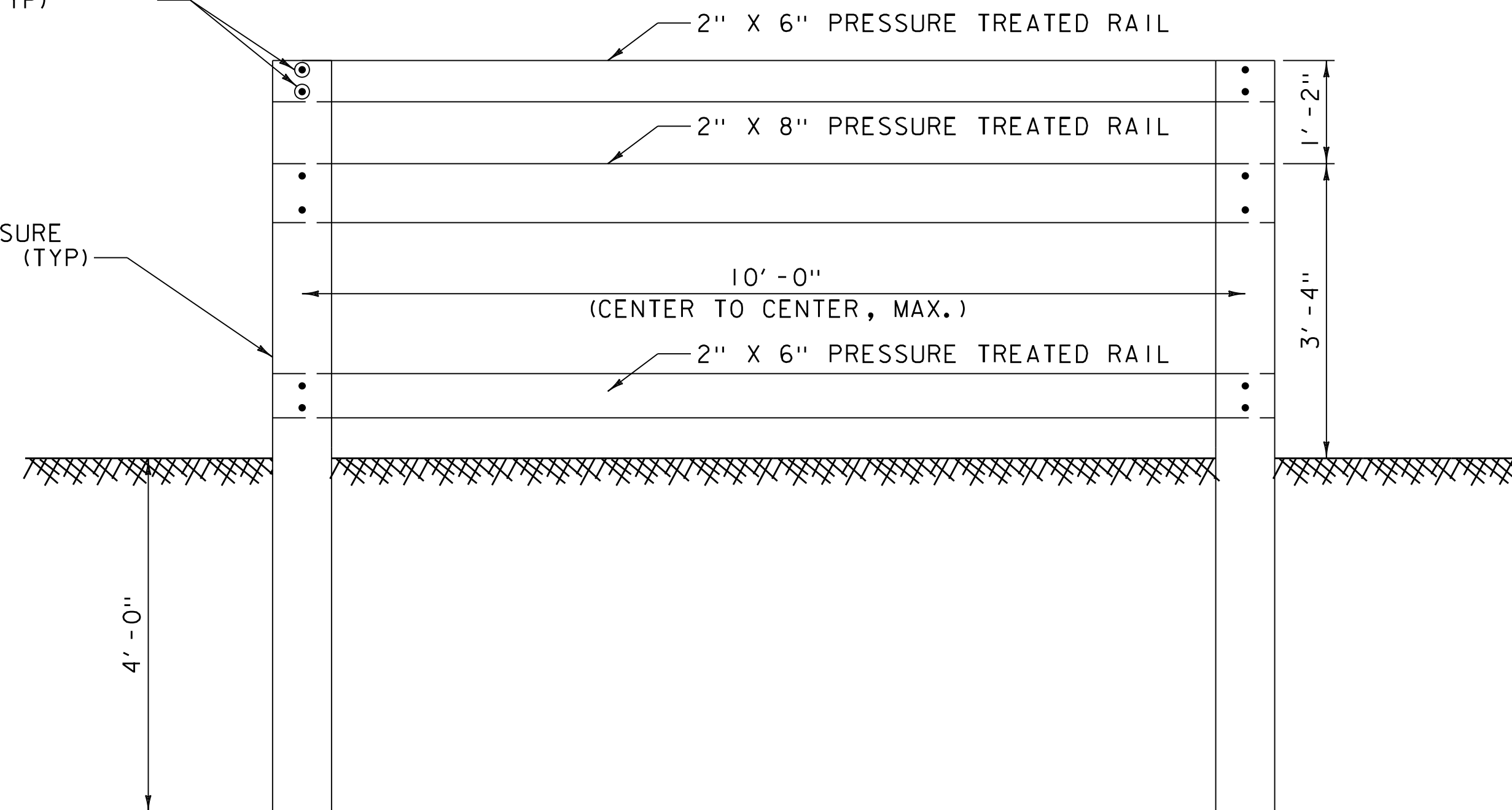
FILE NAME: z20f239_approach_rail.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.M. ROBERTS  
TYPICAL APPROACH RAIL SHEET

PLOT DATE: 3/22/2021  
DRAWN BY: B.M. ROBERTS  
CHECKED BY: B.O. CRONIN  
SHEET 13 OF 70



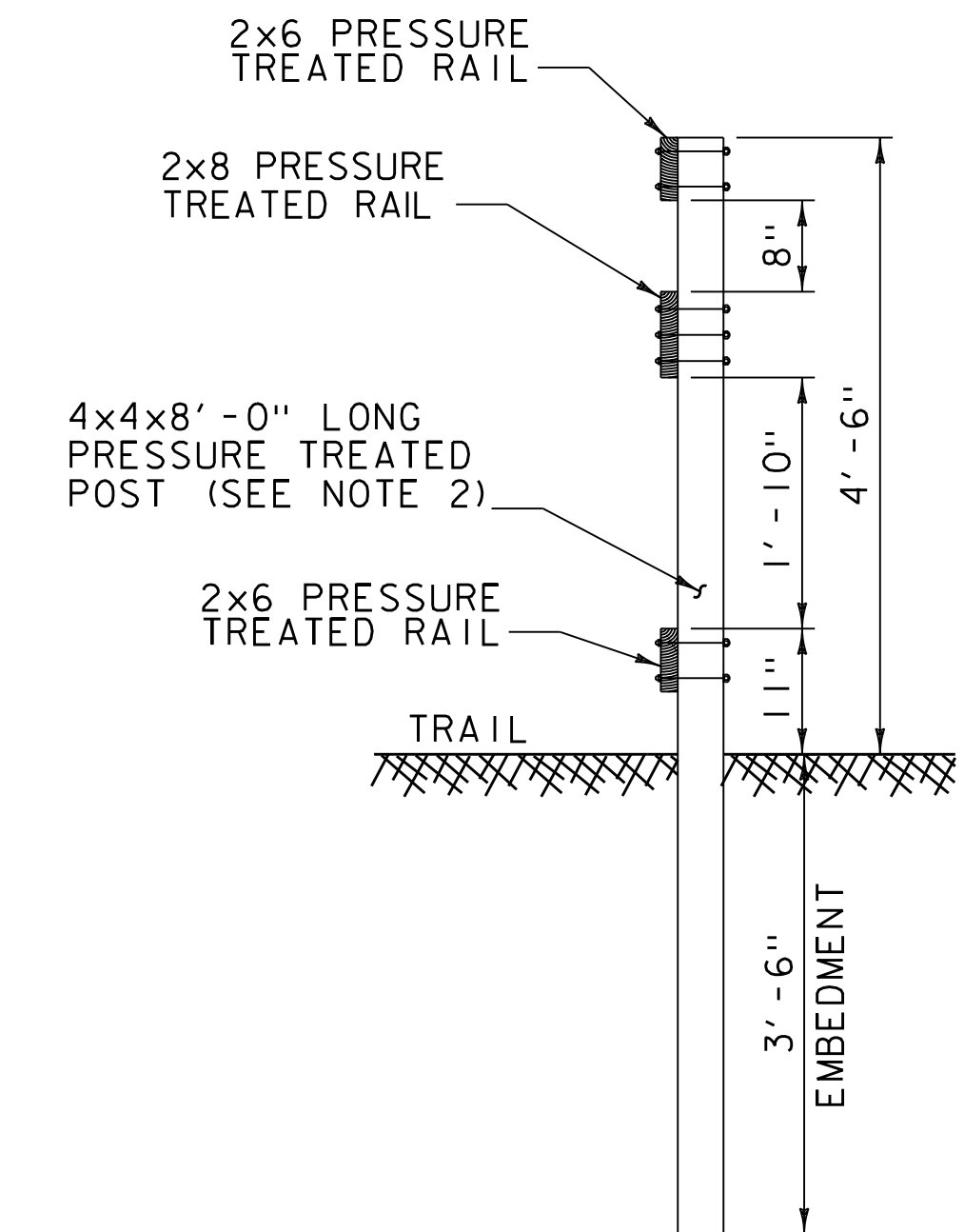
(2) 1/2" CARRIAGE BOLTS  
EACH CONNECTION WITH 3/4"  
O.D. WASHERS (TYP)

4" X 4" PRESSURE  
TREATED POST (TYP)



TYPICAL GUARDRAIL ELEVATION

SCALE 3/4" = 1'-0"



GUARDRAIL SECTION

SCALE 3/4" = 1'-0"

NOTES:

1. WOODEN POSTS AND BOARDS SHALL MEET THE REQUIREMENTS OF SUBSECTION 709.11.
2. THE TOP, MIDDLE, AND BOTTOM RAIL ARE TO BE SET AT THE SAME SLOPE AS THE TRAIL PROFILE GRADE AT THE EDGE OF THE TRAIL. IF THE OPENING BELOW THE BOTTOM RAIL EXCEEDS SIX (6) INCHES, THEN A FOURTH RAIL, 2x6 PRESSURE TREATED RAIL, SHALL BE INSTALLED UNDER THE BOTTOM RAIL.
3. ALL RAILS ARE TO BE ATTACHED TO THE POSTS WITH TWO 1/2" DIA. GALVANIZED CARRIAGE BOLTS WITH A 3/4" WASHER UNDER THE NUT. ALL CARRIAGE BOLTS SHALL BE ASTM A307.
4. ALL COSTS ASSOCIATED WITH FABRICATING AND INSTALLING THE GUARD RAIL SHALL BE CONSIDERED INCIDENTAL TO ITEM 900.640, "SPECIAL PROVISION (GUARD RAIL, PRESSURE TREATED)".



PROJECT NAME: SWANTON - ST JOHNSBURY

PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239_guardrail.dgn

PROJECT LEADER: E.P. DETRICK

DESIGNED BY: G.L. BAKOS

TYPICAL GUARD RAIL SHEET

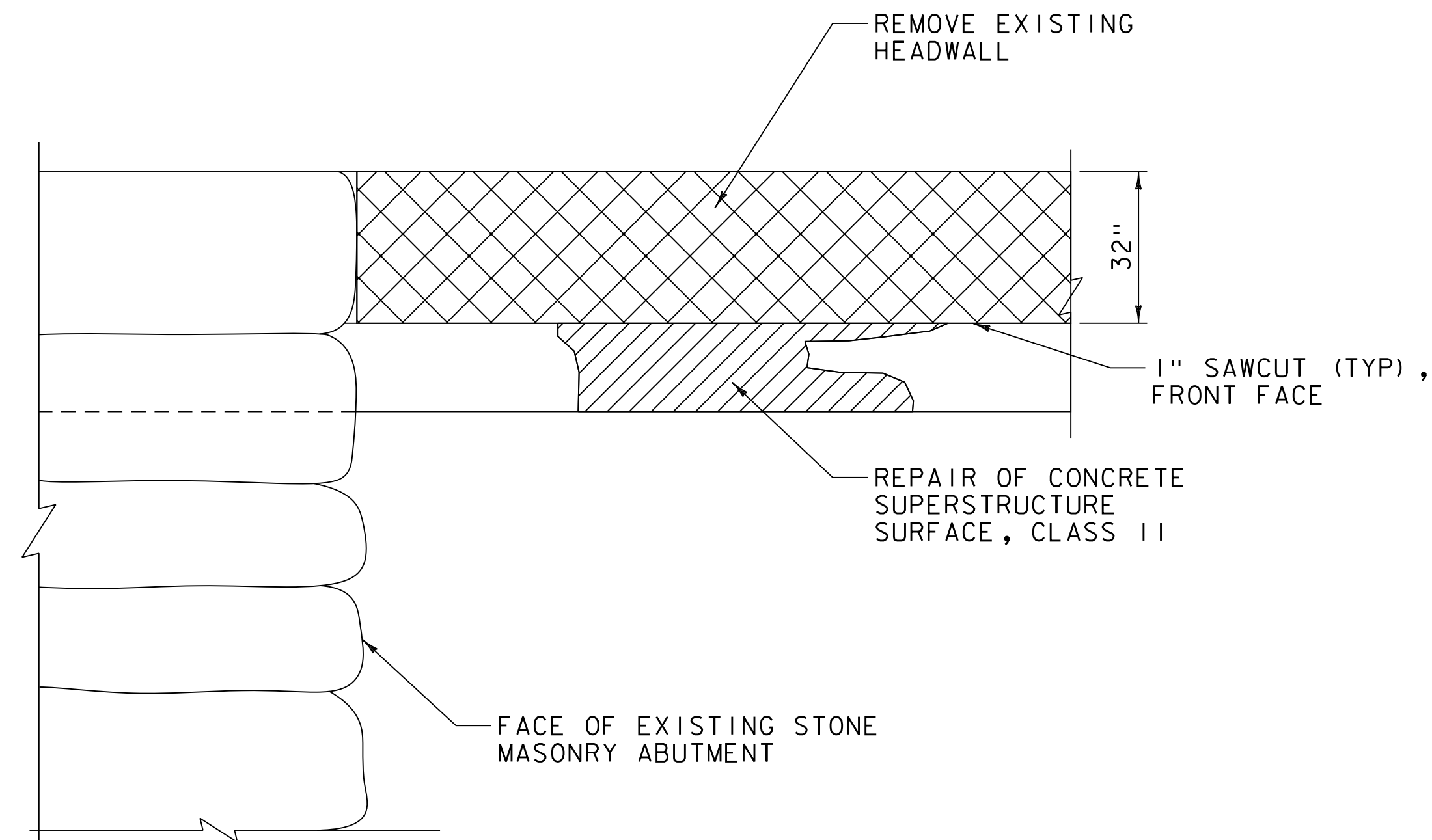
PLOT DATE: 3/22/2021

DRAWN BY: K.C. BARRY

CHECKED BY: M.E. OOMS

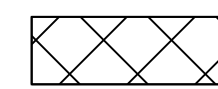
SHEET 14 OF 70



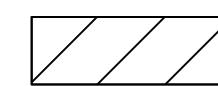


CATTLEPASS 30 EXISTING ELEVATION  
NOT TO SCALE

**LEGEND:**



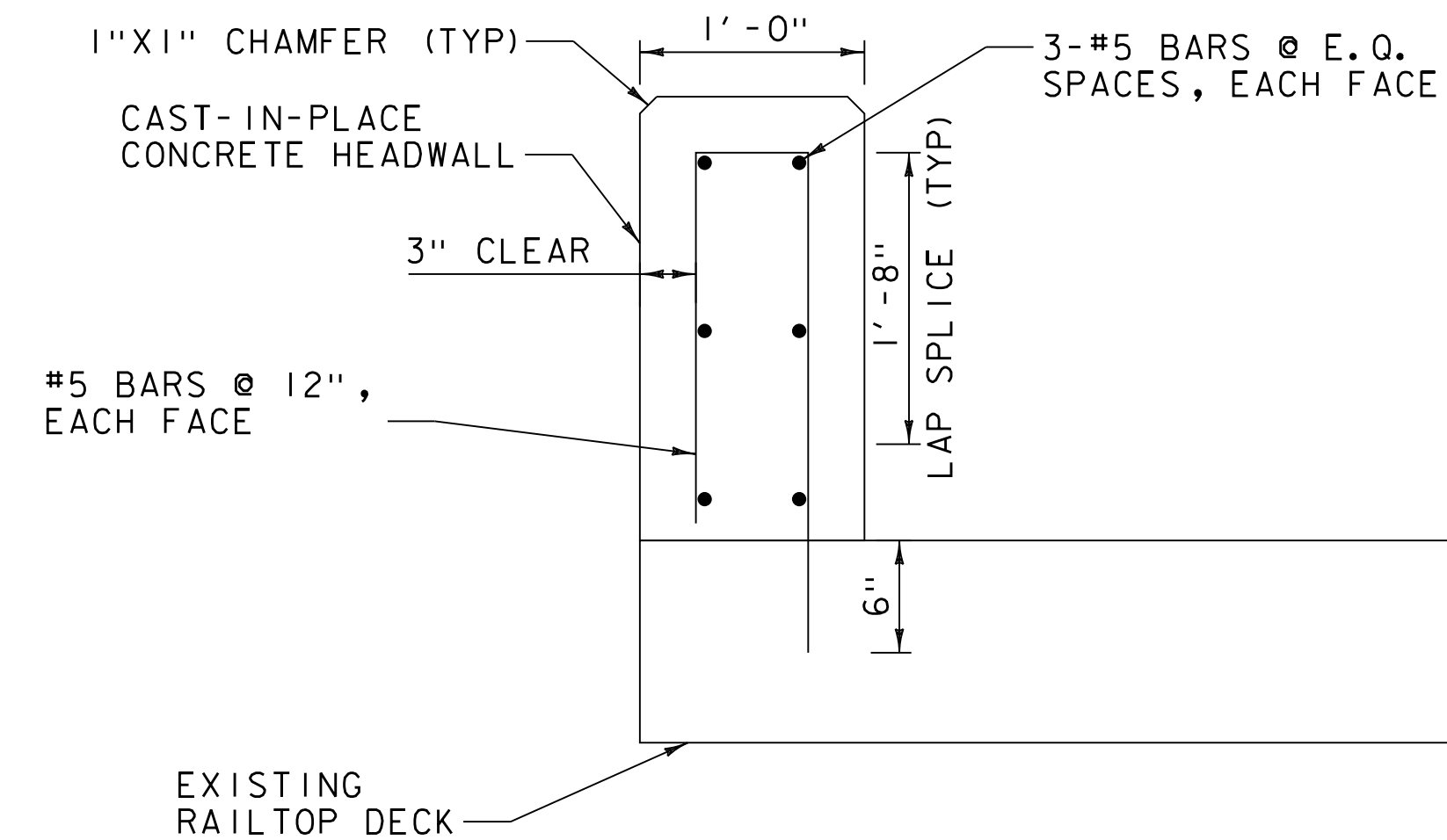
APPROXIMATE LIMITS OF CONCRETE REMOVAL



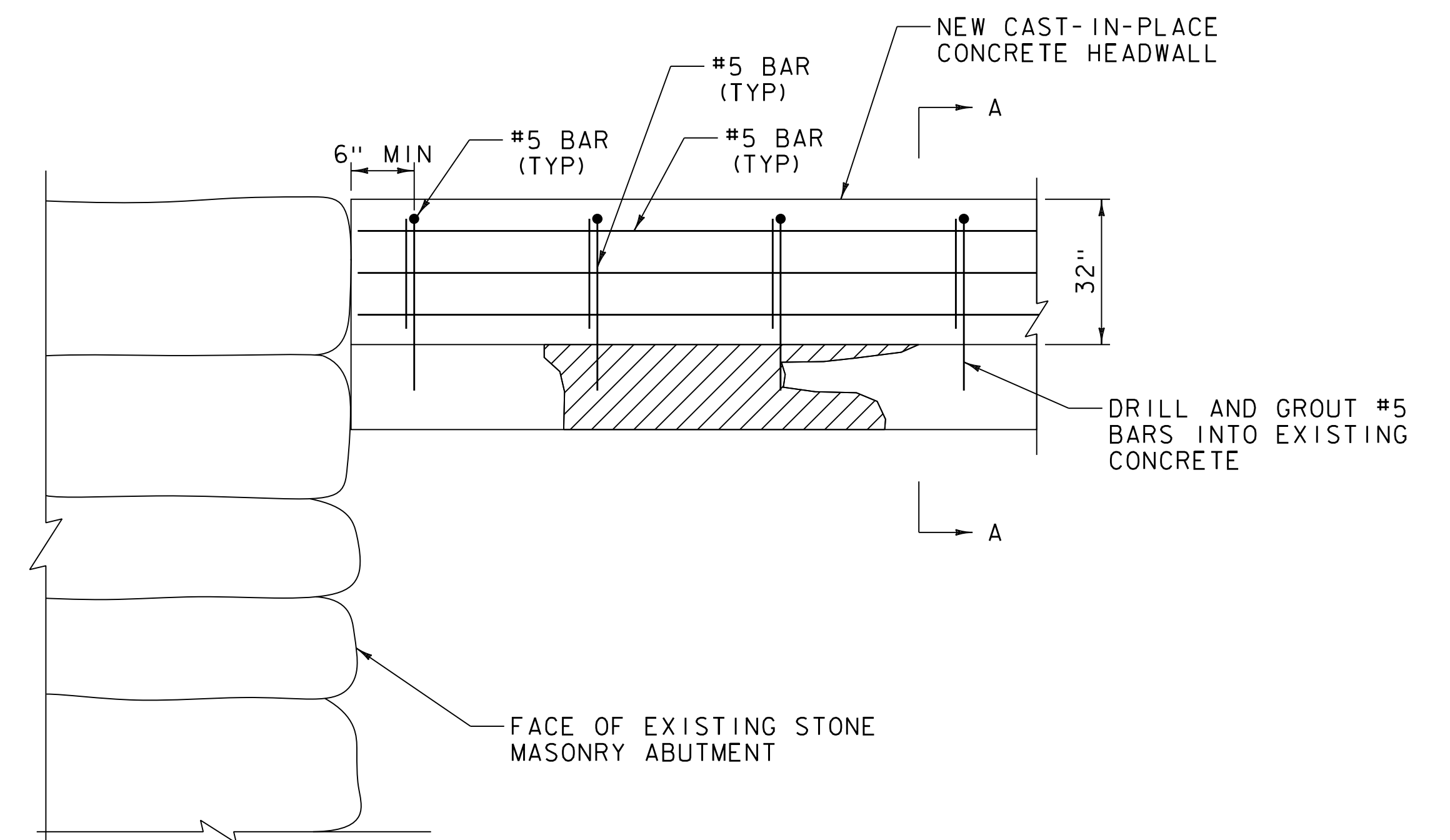
APPROXIMATE LOCATION OF SPALLED CONCRETE TO BE REPAIRED

**NOTES:**

1. PRIOR TO THE START OF CONCRETE REMOVAL, THE RESIDENT ENGINEER AND THE CONTRACTOR SHALL SOUND THE CONCRETE AND AGREE ON REPAIR LIMITS.
2. PAYMENT FOR SUPERSTRUCTURE CONCRETE REPAIR, INCLUDING REPAIR MATERIALS, WILL BE MADE UNDER ITEM 580.11, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS II" AS APPROPRIATE.
3. REINFORCING TO BE LEVEL I REINFORCING, CAST-IN-PLACE CONCRETE FOR HEADWALLS TO BE CLASS A. SAWCUTTING WILL BE CONSIDERED INCIDENTAL TO CONCRETE ITEM 541.22, "CONCRETE, CLASS A".
4. CONTRACTOR SHALL INSTALL BRIDGE RAILING, TYPE II ON BOTH CONCRETE HEADWALLS. REFER TO DETAILS FOR BRIDGE RAILING, TYPE II FOR ADDITIONAL INFORMATION.



SECTION A-A  
NOT TO SCALE



CATTLEPASS 30 PROPOSED ELEVATION  
NOT TO SCALE

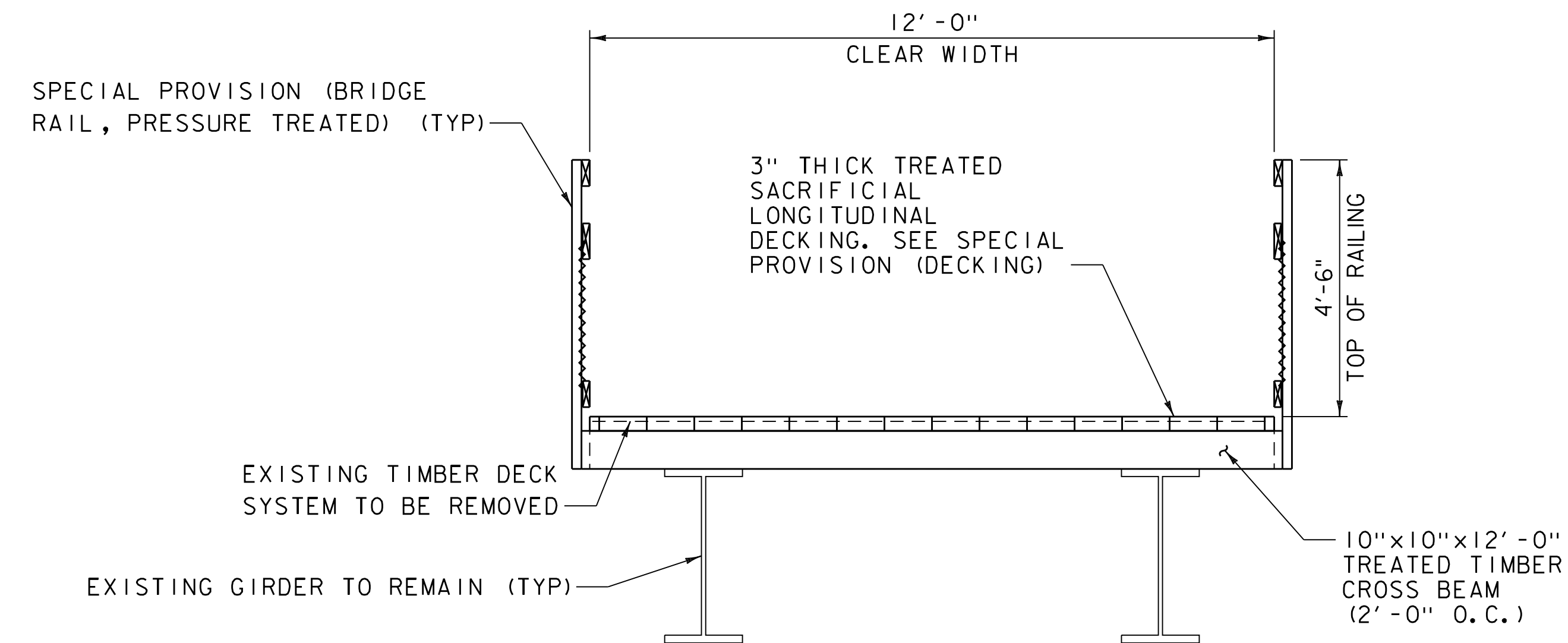


PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I3)

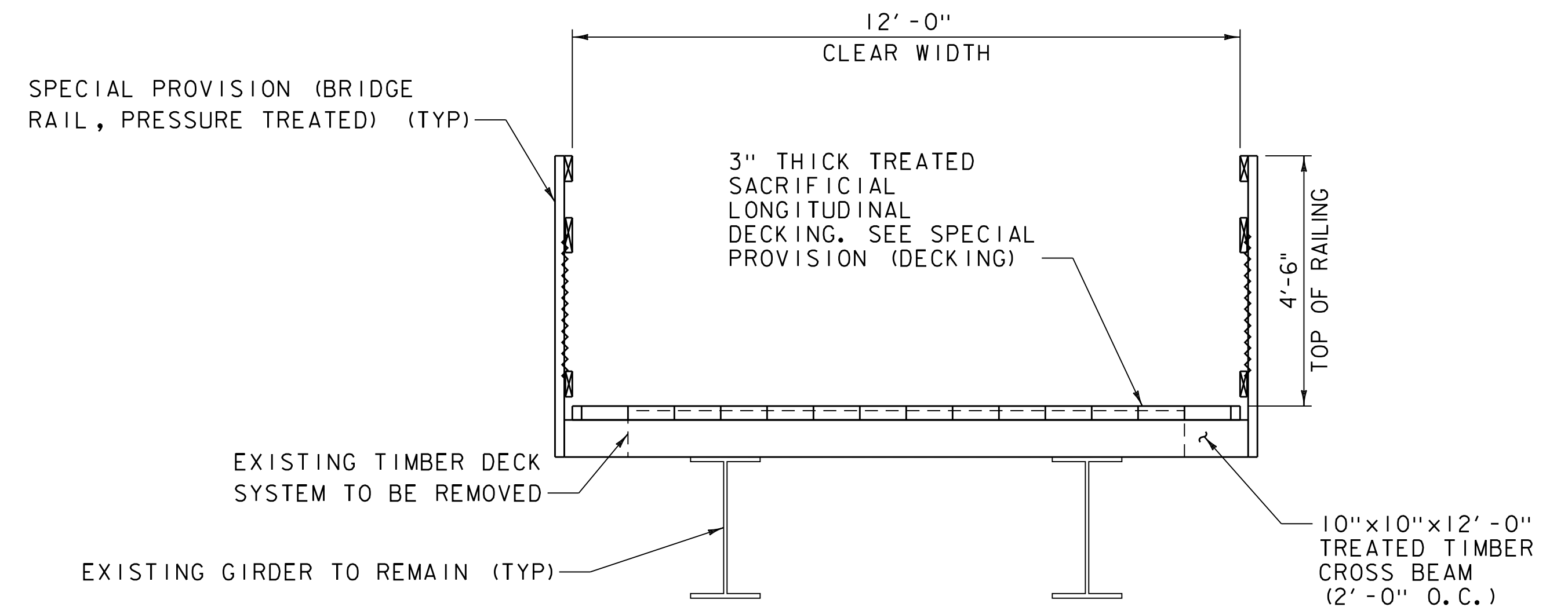
FILE NAME: z20f239_structural_details.dgn PLOT DATE: 3/22/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: N.A. TRUSLOW  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
CATTLEPASS 30 DETAILS SHEET 15 OF 70





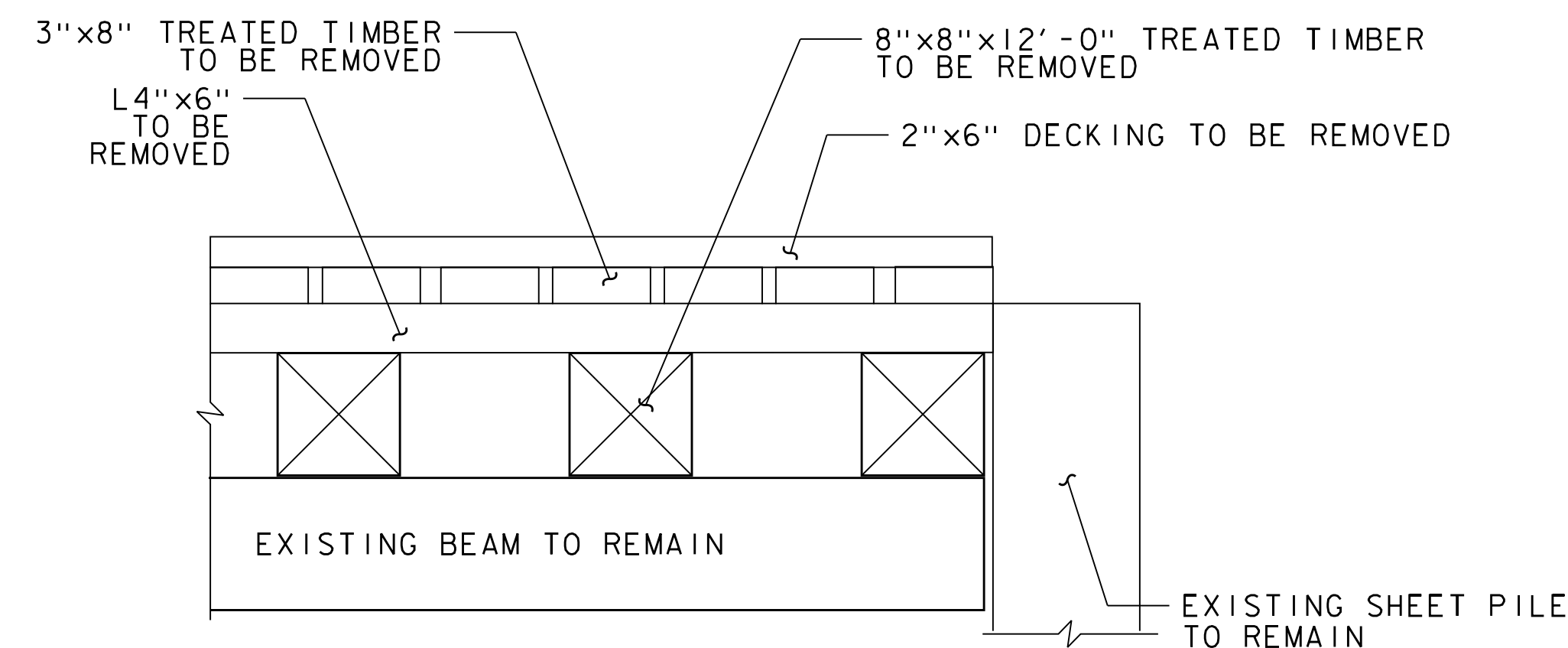
TYPICAL SECTION (BRIDGE 27)

SCALE: 1/2" = 1'-0"



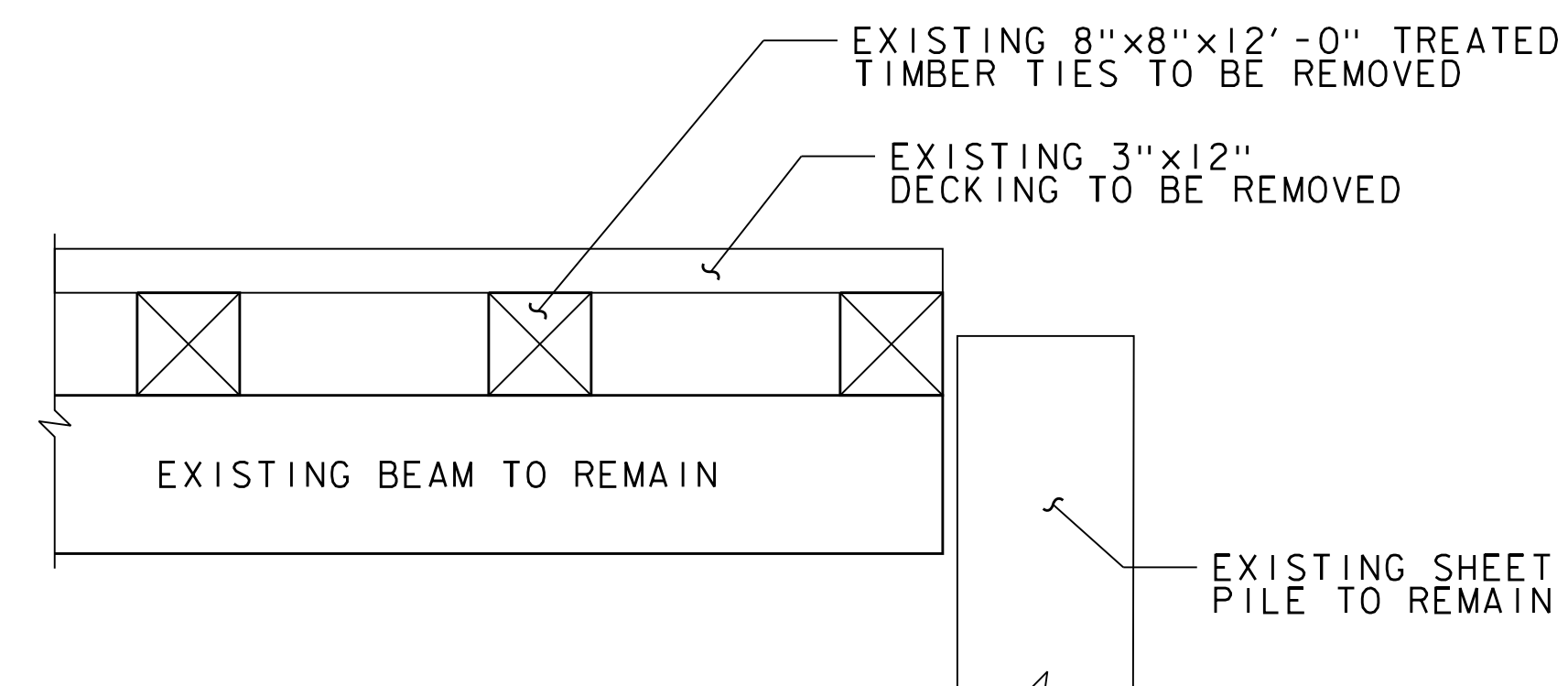
TYPICAL SECTION (BRIDGE 28)

SCALE: 1/2" = 1'-0"



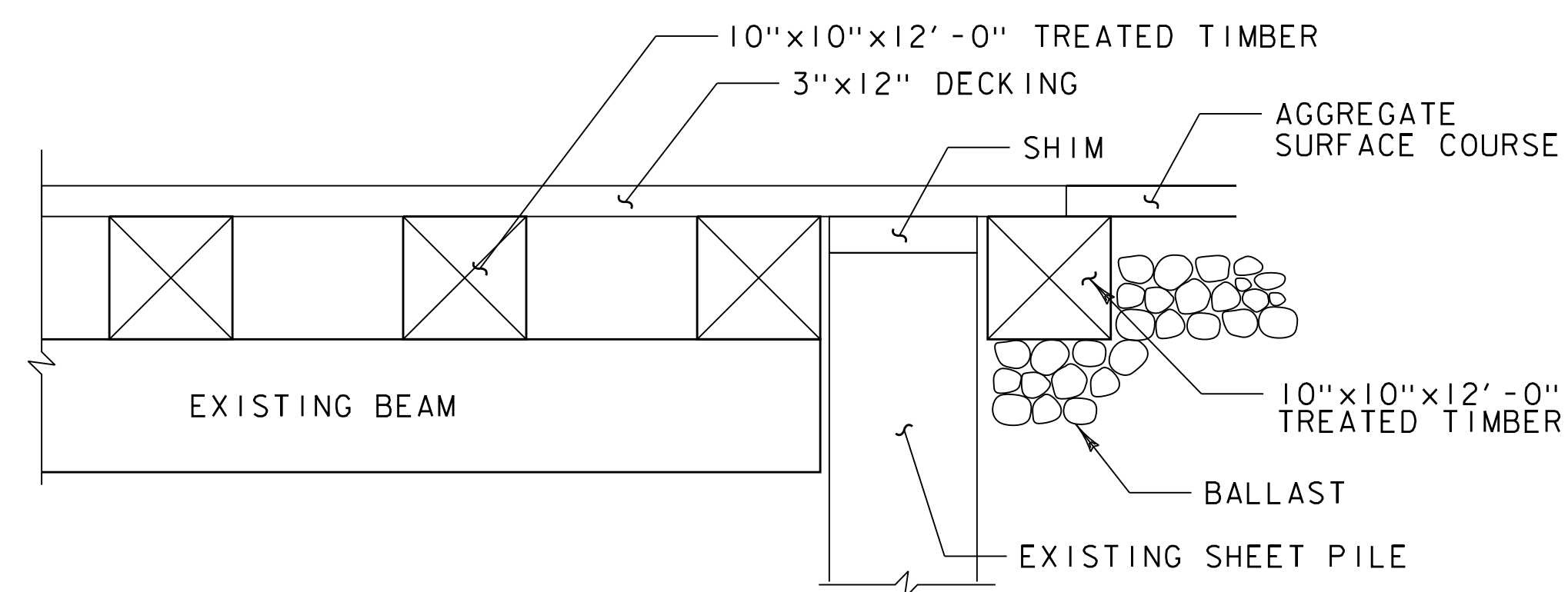
BRIDGE 27 EXISTING BRIDGE END DETAIL

SCALE 1" = 1'-0"



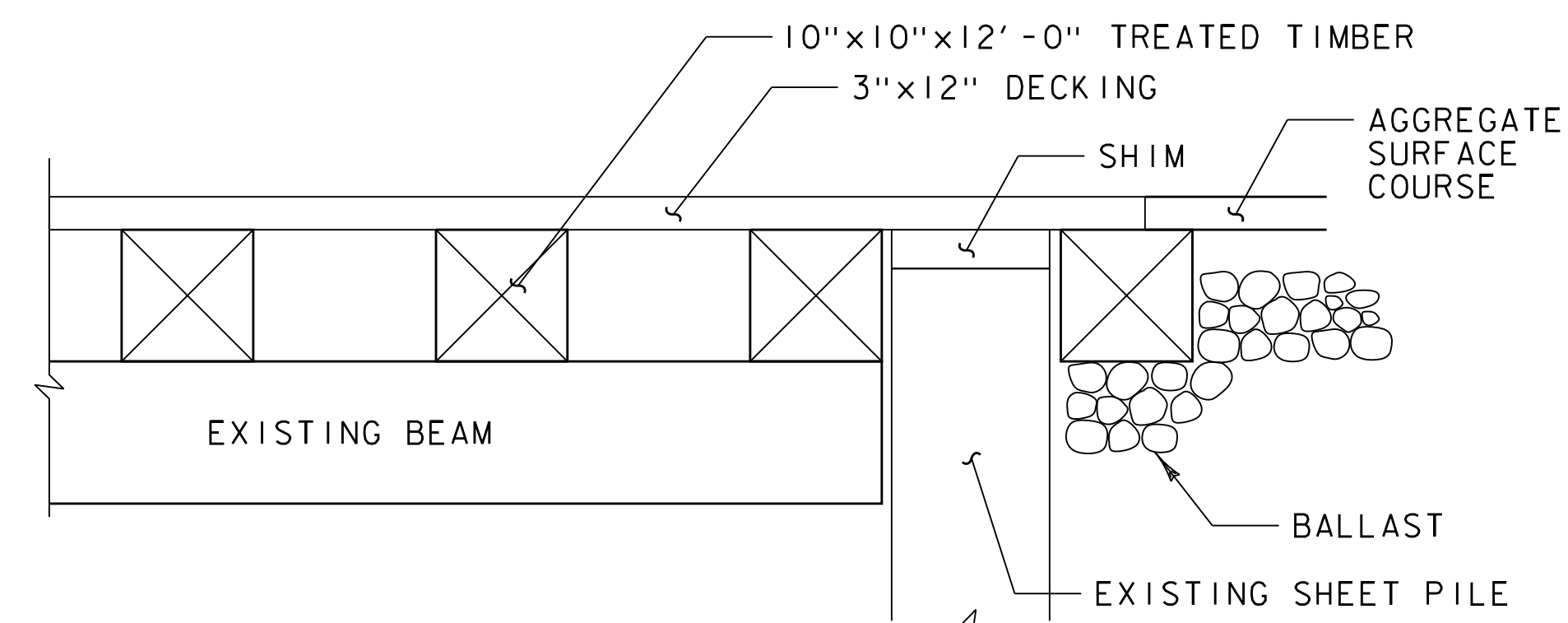
BRIDGE 28 EXISTING BRIDGE END DETAIL

SCALE 1" = 1'-0"



BRIDGE 27 PROPOSED BRIDGE END DETAIL

SCALE 1" = 1'-0"



BRIDGE 28 PROPOSED BRIDGE END DETAIL

SCALE 1" = 1'-0"

NOTES:

1. FOR BRIDGE 27, THE REMOVAL OF EXISTING TIMBER RAILING SYSTEM, 8"x8"x12'-0" TREATED TIMBERS, 3"x8" TREATED TIMBERS, 2"x6" DECKING AND L4"x6" MEMBERS WILL BE PAID FOR UNDER ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (BRIDGE 27)".
2. FOR BRIDGE 28, THE REMOVAL OF EXISTING TIMBER RAILING SYSTEM, EXISTING 7"x7"x10'-0" TREATED TIMBER TIES AND 3"x12" DECKING WILL BE PAID FOR UNDER ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (BRIDGE 28)".
3. CONNECT SHIM TO 3" DECKING WITH 1/4"x5" LONG SCREWS WITH A 5/16" HEX WITH OVERSIZED WASHER HEAD MADE OF TREATED STEEL AND COATED WITH A MULTI-COATED CORROSION PROTECTOR COMPATIBLE WITH ACO. THE MIN. THREADED LENGTH SHALL BE 2 3/4". THESE SCREWS SHALL BE COUNTERSUNK A MIN. OF 3/4" AND LOCATED AT END OF EACH DECK PLANK.

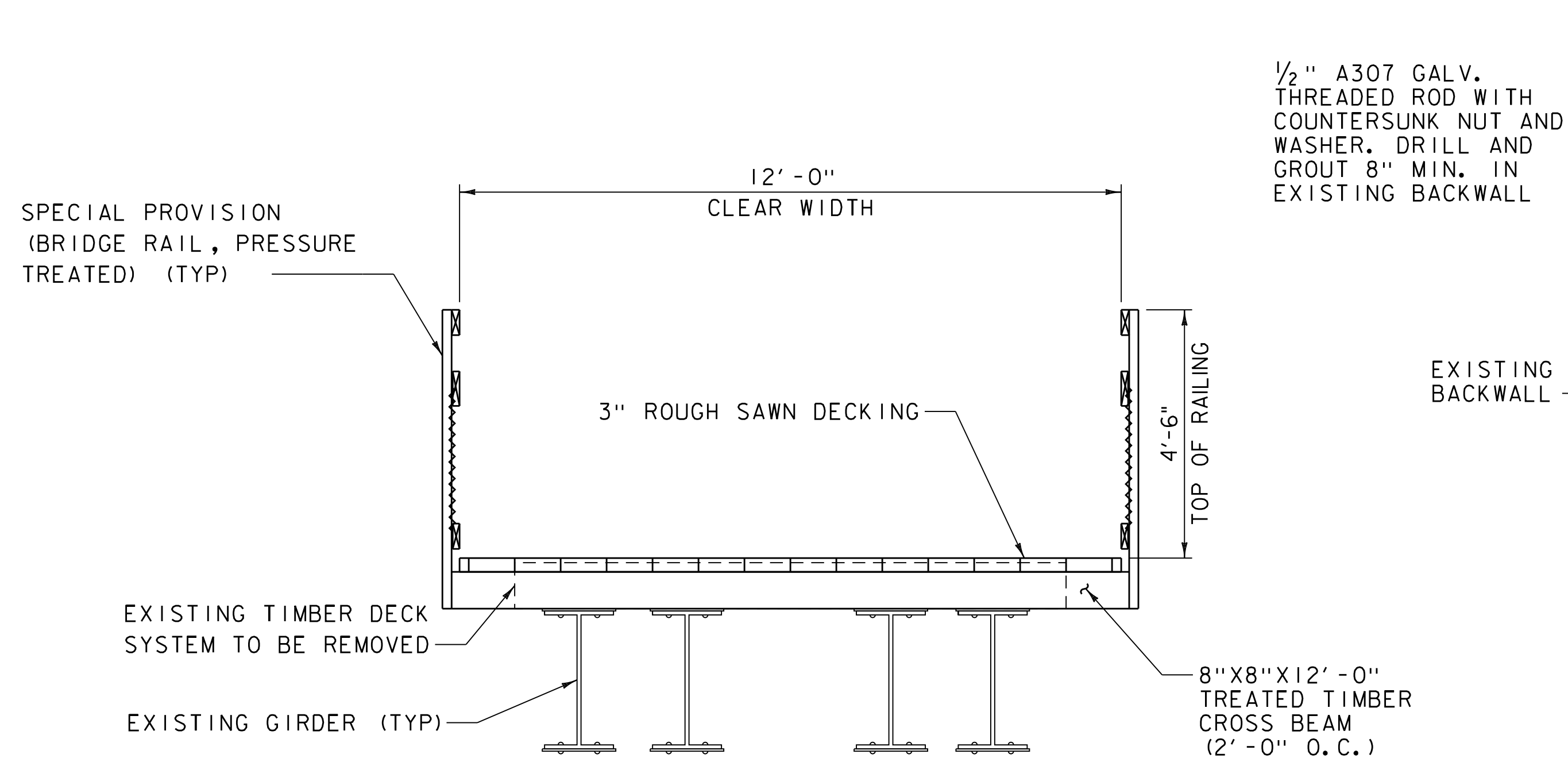
PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I3)

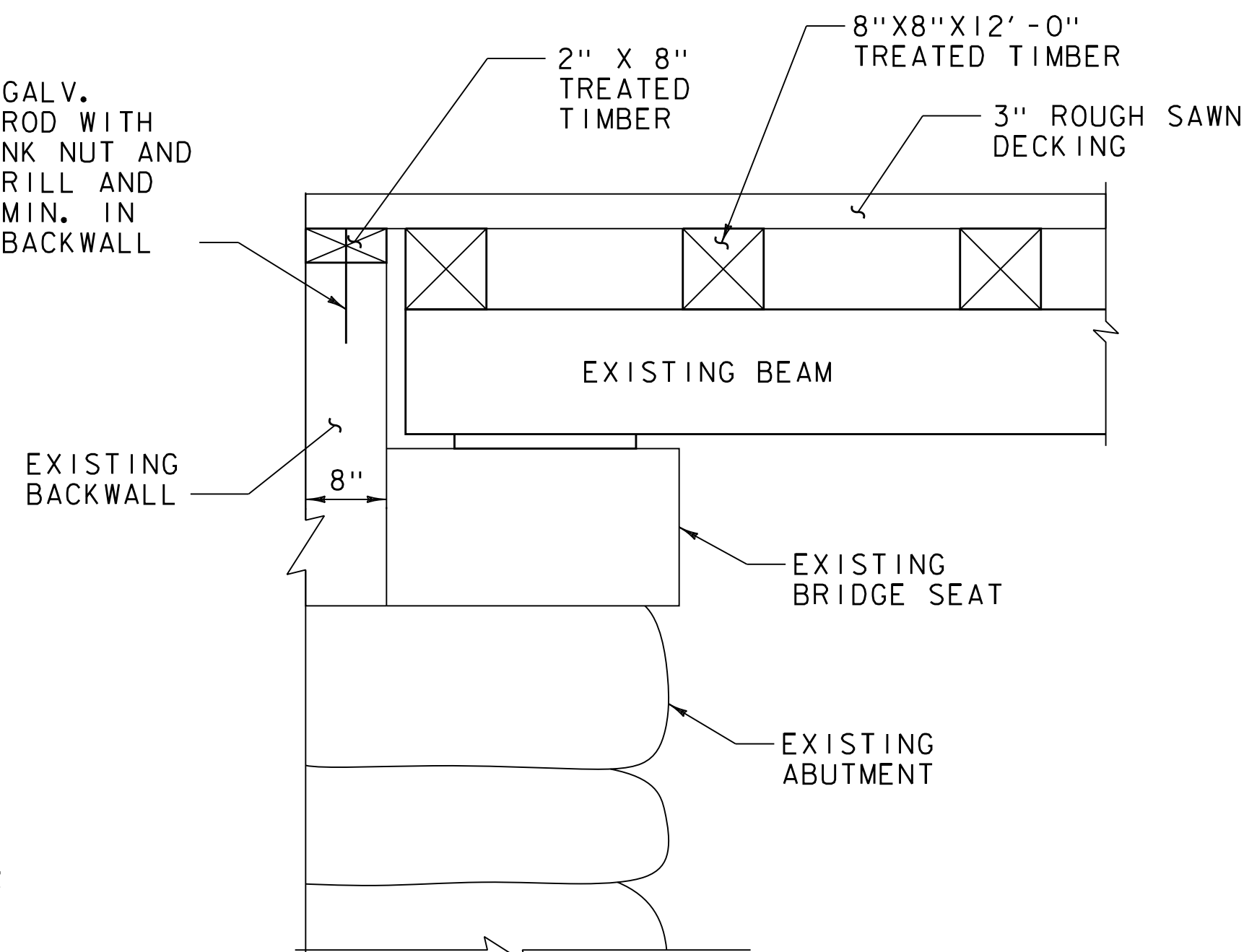
FILE NAME: z20f239_structural_details.dgn PLOT DATE: 3/22/2021  
 PROJECT LEADER: E.P. DETRICK DRAWN BY: N.A. TRUSLOW  
 DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
 BR. 27 & 28 TYPICAL SECTIONS AND DETAILS SHEET 16 OF 70



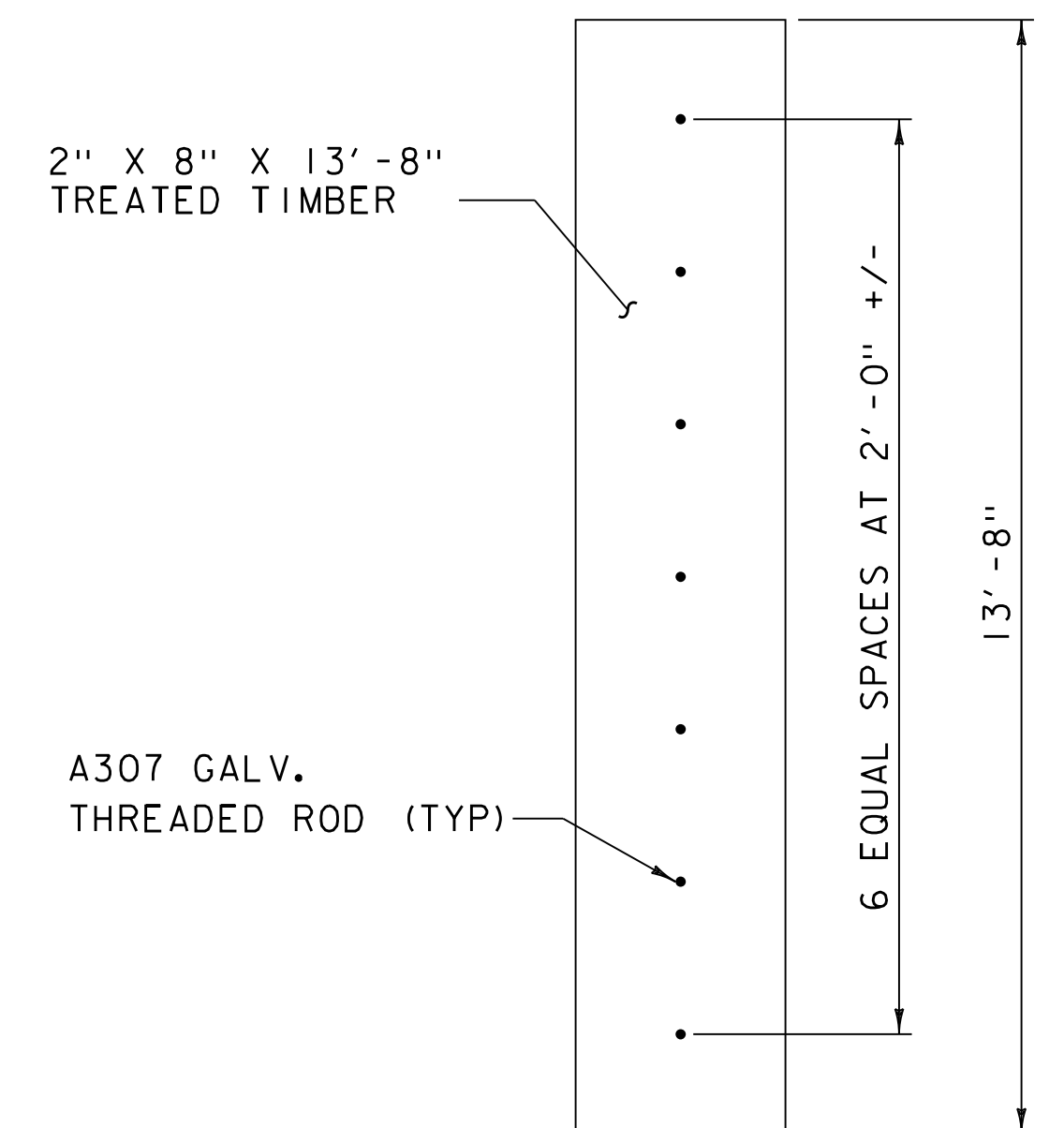




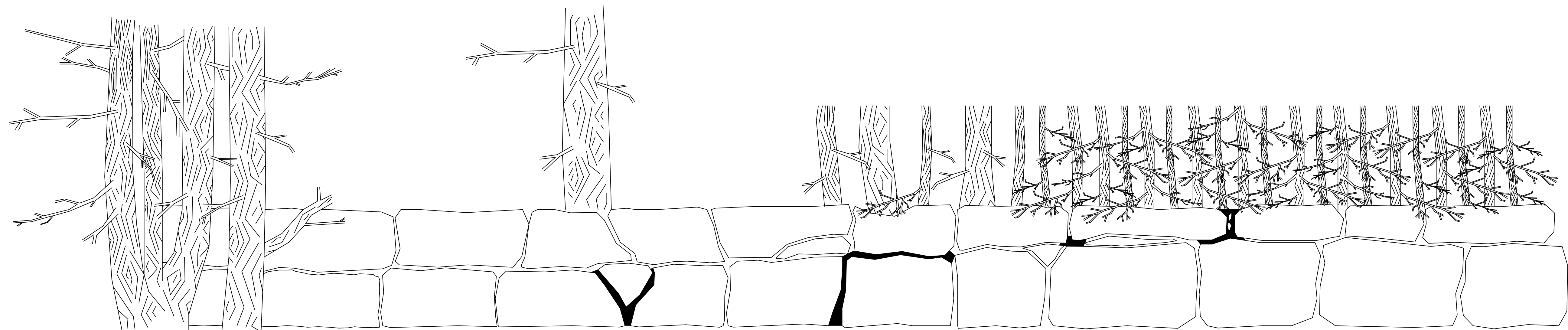
TYPICAL SECTION (BRIDGE 36)  
SCALE: 1/2" = 1' - 0"



BRIDGE 36 ABUTMENT SECTION  
NOT TO SCALE



BRIDGE 36 BACKWALL PLAN  
NOT TO SCALE



EXISTING ELEVATION VIEW - BR. 36 SOUTHEAST WINGWALL

NOT TO SCALE

LEGEND:

APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

NOTES:

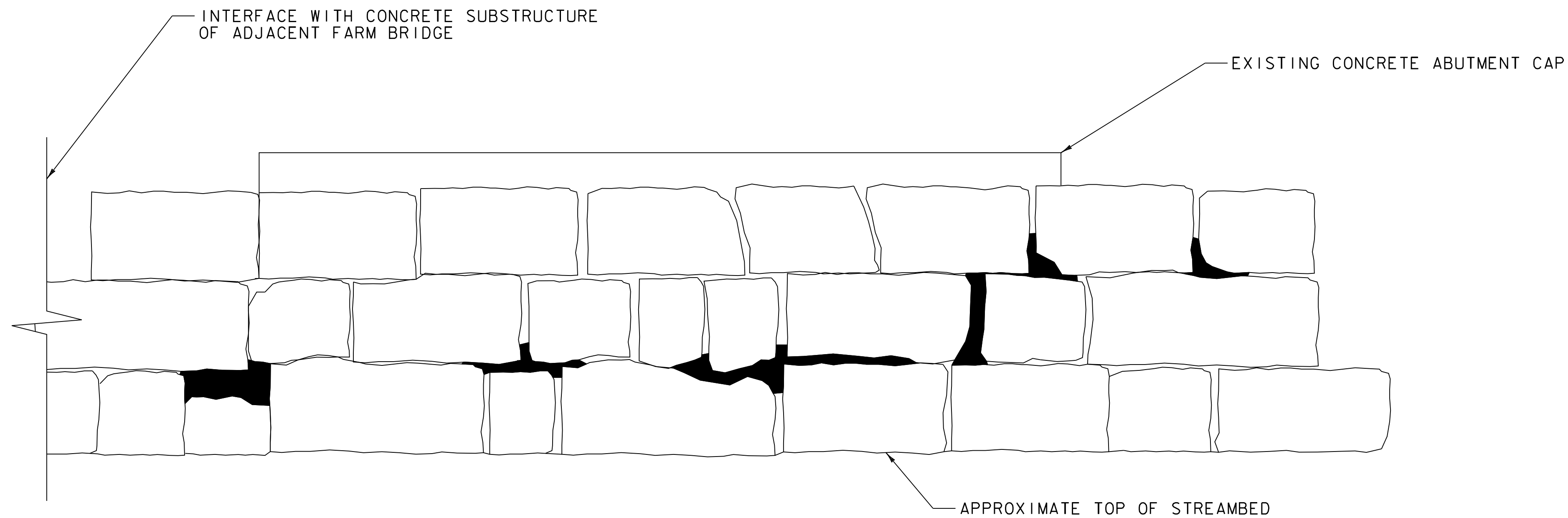
1. THE SOUTHEAST WINGWALL WILL BE UNIVERSALLY REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30, "REPOINTING MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS IN THE SOUTHEAST WINGWALL SHALL BE FILLED WITH GROUT. PRIOR TO REPOINTS, CONTRACTOR SHALL REMOVE ALL TREES, SHRUBS, AND TREE OR SHRUB ROOTS FROM THE VOIDS. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40, "REPAIRING STONE MASONRY".
3. PROPOSED WORK SHOWN HAS BEEN ESTIMATED BASED ON LIMITED FIELD INVESTIGATION PERFORMED BY VHB. ACTUAL WORK SHALL BE DETERMINED BY CONTRACTOR AND APPROVED BY RESIDENT ENGINEER.
4. CONTRACTOR SHALL REMOVE ALL TREES AND SHRUBS ABOVE THE SOUTHEAST WINGWALL AND ALL ROOTS OF TREES AND SHRUBS GROWING INTO THE VOIDS BETWEEN THE WINGWALL STONES. ALL COSTS ASSOCIATED WITH THIS WORK WILL BE PAID FOR UNDER ITEM 201.10, "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".
5. THE REMOVAL OF EXISTING TIMBER RAILING SYSTEM AND EXISTING TIMBER DECK SYSTEM WILL BE PAID FOR UNDER ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (BRIDGE 36)".



PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I3)

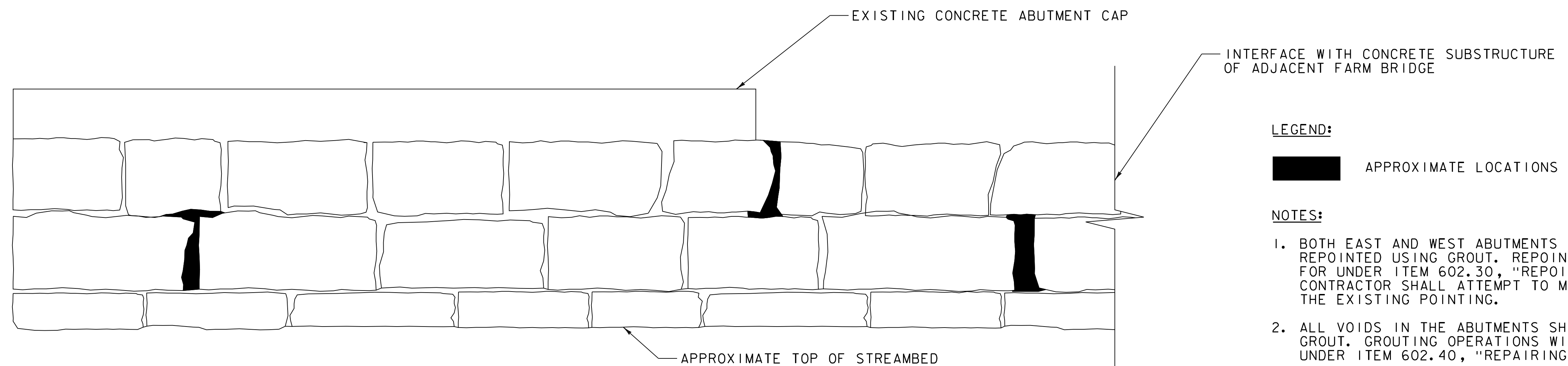
FILE NAME: z20f239_structural_details.dgn PLOT DATE: 3/22/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: N.A. TRUSLOW  
DESIGNED BY: J.D. KEENER CHECKED BY: J.D. KEENER  
BR. 36 TYPICAL SECTIONS SHEET 17 OF 70





EXISTING ELEVATION VIEW - BR. 36 WEST ABUTMENT

SCALE:  $\frac{1}{2}$ " = 1' - 0"



EXISTING ELEVATION VIEW - BR. 36 EAST ABUTMENT

SCALE:  $\frac{1}{2}$ " = 1' - 0"

LEGEND:

 APPROXIMATE LOCATIONS OF VOIDS TO BE FILLED

NOTES:

1. BOTH EAST AND WEST ABUTMENTS WILL BE UNIVERSALLY REPOINTED USING GROUT. REPOINTING WILL BE PAID FOR UNDER ITEM 602.30, "REPOINTING MASONRY". CONTRACTOR SHALL ATTEMPT TO MATCH THE COLOR OF THE EXISTING POINTING.
2. ALL VOIDS IN THE ABUTMENTS SHALL BE FILLED WITH GROUT. GROUTING OPERATIONS WILL BE PAID FOR UNDER ITEM 602.40, "REPAIRING STONE MASONRY".
3. PROPOSED WORK SHOWN HAS BEEN ESTIMATED BASED ON LIMITED FIELD INVESTIGATION PERFORMED BY VHB. ACTUAL WORK SHALL BE DETERMINED BY CONTRACTOR AND APPROVED BY RESIDENT ENGINEER.

PROJECT NAME: SWANTON - ST. JOHNSBURY

PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239_structural_details.dgn PLOT DATE: 3/22/2021

PROJECT LEADER: E.P. DETRICK

DRAWN BY: N.A. TRUSLOW

DESIGNED BY: J.D. KEENER

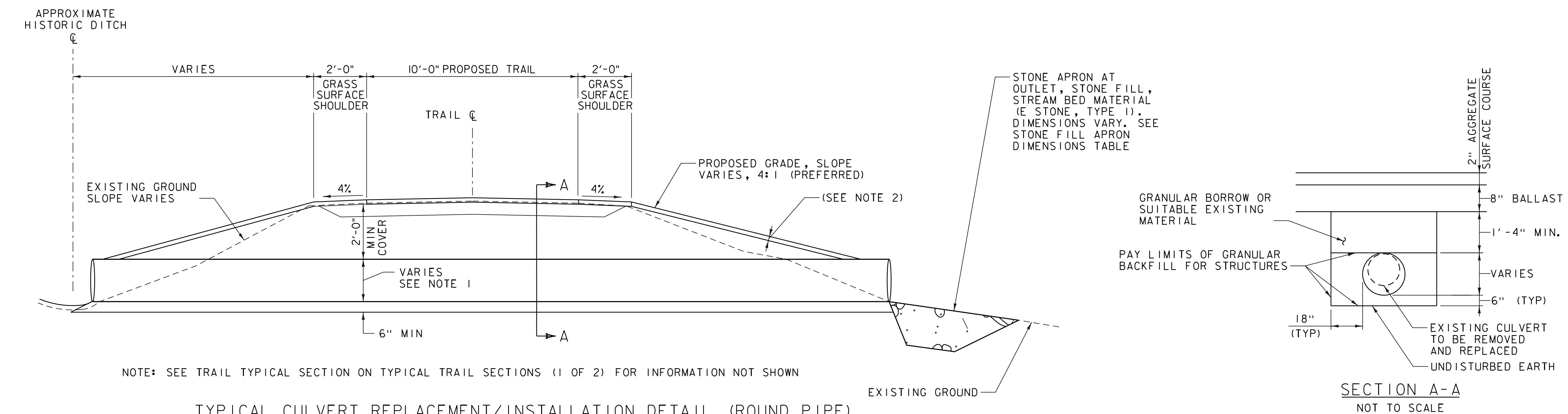
CHECKED BY: J.D. KEENER

BR. 36 ABUTMENT ELEVATIONS

SHEET 18 OF 70







TYPICAL CULVERT REPLACEMENT/INSTALLATION DETAIL (ROUND PIPE)  
NOT TO SCALE

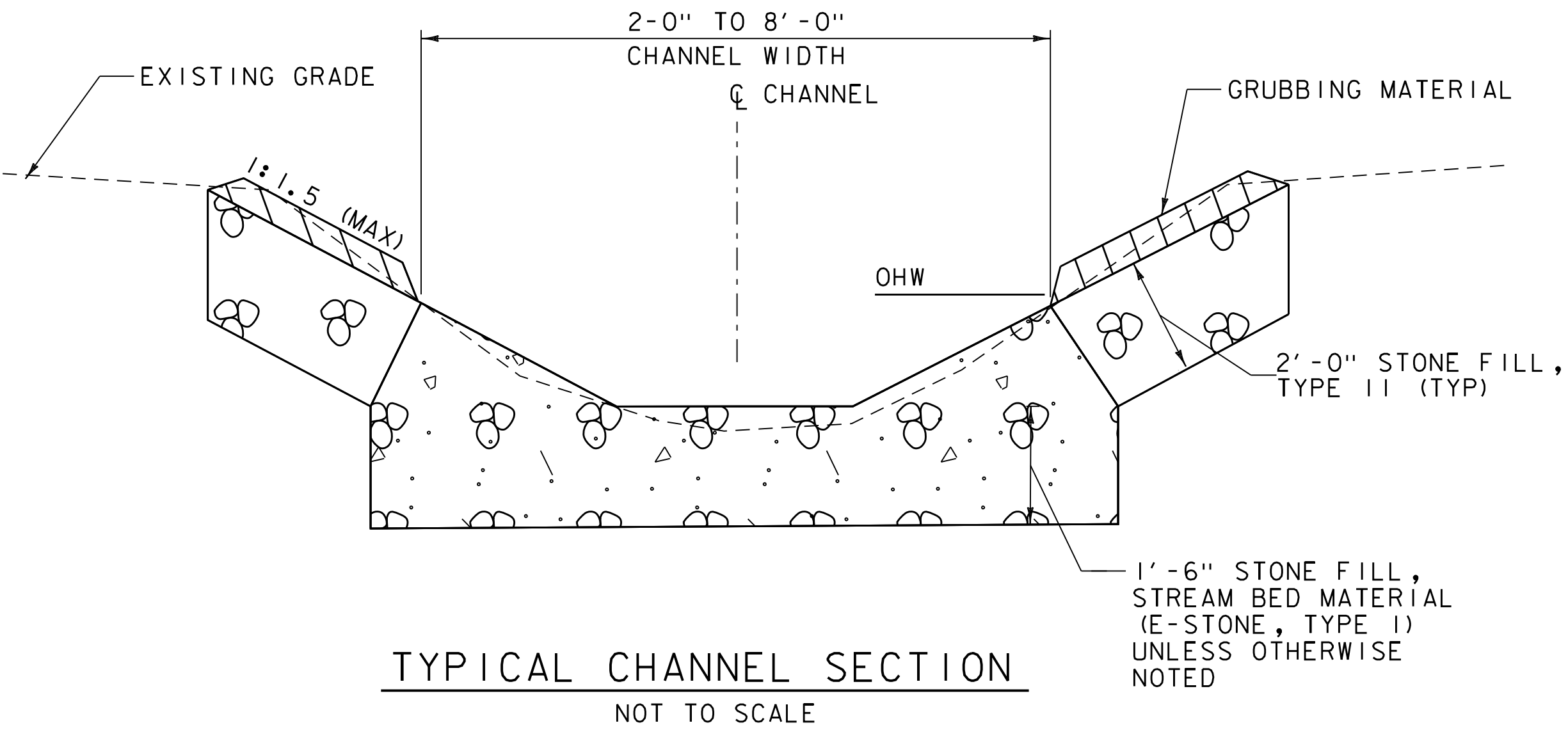
Culvert ID	Station	Existing Size (ft)	Existing Material	Proposed CPEP (SL) Pipe Size (ft)	Est. Culvert Length (ft)
27A	922+31	3 x 3	STONE BOX	3.0	74
27(4)E	957+61	1 x 2	STONE BOX	2.0	18
27F	962+14	2.0	CMP	2.5	26
27M	1029+23	2.5	CMP	2.5	22
27O	1041+43	2 x 2	STONE BOX	2.0	34
28B(2)	1092+82	N/A	STONE BOX	2.0	26
28H(A)	1122+73	1.3	CMP	1.5	18
28L(2)	1150+72	N/A	N/A	1.5	18
28M	1156+27	1.7	CAST IRON	1.5	18
29I	1236+97	1.7	CAST IRON	1.5	22
29J	1239+36	1.0	CMP	1.5	22
29K	1248+88	1 x 1	STONE BOX	1.5	34
31C	1291+35	N/A	CMP	1.5	18
31E	1301+65	1.5	CAST IRON	1.5	22
32E	1390+06	2 x 2	STONE BOX	2.0	54
34A	1456+28	1 x 1	STONE BOX	2.0	34
36A	1570+49	3 x 3	STONE BOX	3.0	54
36C	1585+74	1.0	CAST IRON	2.0	26
36H(2)	1613+95	N/A	N/A	1.5	18
36I(2)	1633+10	1.5	CMP	1.5	18
36J	1645+07	2.0	CAST IRON	2.0	26
37E	1733+73	3 x 3	STONE BOX	3.0	54
37G	1749+14	1.0	STONE BOX	2.0	18
38A(1)	1766+02	N/A	N/A	1.5	18
38B(2)	1773+53	N/A	N/A	1.5	18
39A	1797+68	3 x 3	STONE BOX	2.0	26
40B	1818+52	3 x 3	STONE BOX	3.0	62

CULVERT SUMMARY (ROUND PIPE)

Pipe Size (ft)	Apron Length (ft)	Apron Width (ft)	Apron Depth (ft)
1.5	9	4.5	1.5
2	11	6	1.5
2.5	13	7.5	1.5
3	15	9	1.5

*All Dimensions based on E-Stone Type I

STONE FILL APRON DIMENSIONS



TYPICAL CHANNEL SECTION  
NOT TO SCALE

NOTES:

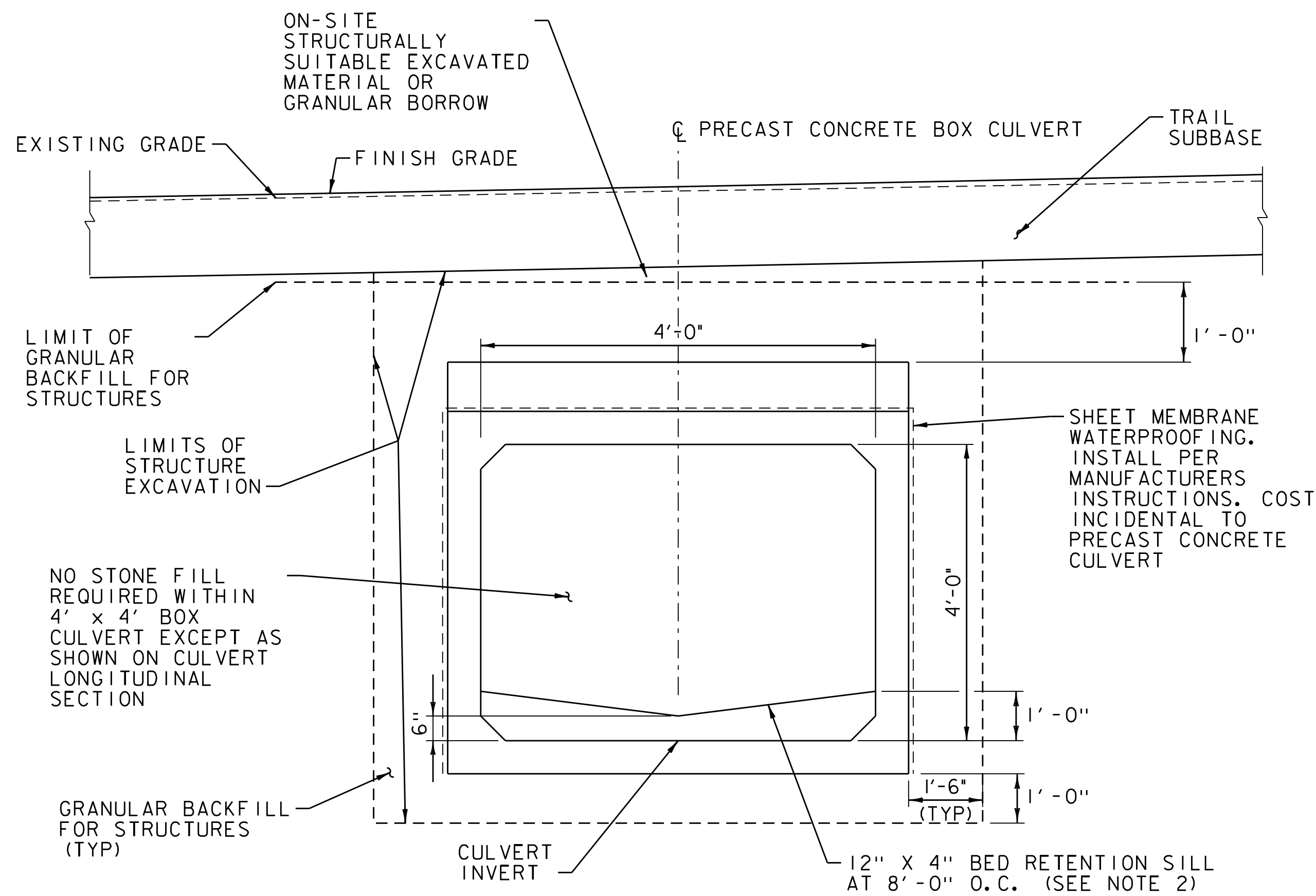
- SEE TABLE AND ITEM DETAIL SHEET FOR SIZE, TYPE, AND LOCATION OF CULVERTS.
- DISTURBED SLOPES SHALL HAVE 2" OF TOPSOIL, SEED AND MULCH. SEE NOTE 5 ON TYPICAL TRAIL SECTIONS (SHEET 1 OF 2) FOR ADDITIONAL SLOPE CONDITIONS STEEPER THAN 1V:3H.
- EXCAVATION, REMOVAL AND DISPOSAL OF EXISTING CULVERTS AND DISPOSAL OF SURROUNDING MATERIAL NOT TO BE REUSED SHALL BE PAID UNDER ITEM 204.25, "STRUCTURE EXCAVATION".
- IF THE EXISTING CULVERT IS A STONE BOX CULVERT THE CONTRACTOR SHALL SALVAGE STONES REMOVED FOR THE INSTALLATION OF THE NEW CULVERT AND STOCKPILE THEM IN A LOCATION WITHIN THE PROJECT LIMITS AS DESIGNATED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH SALVAGING AND STOCKPILING THE STONES SHALL BE INCIDENTAL TO STRUCTURE EXCAVATION.
- IF THE EXISTING CULVERT TO BE REMOVED IS AT A LOWER DEPTH THAN THE NEW ONE TO BE PLACED, ITEM 203.32 GRANULAR BORROW SHALL BE USED TO FILL THE VOID UP TO THE ELEVATION 6" BELOW THE BOTTOM OF THE NEW CULVERT.
- CULVERT SHALL BE CONSTRUCTED ON A SLOPE WHICH MATCHES UPSTREAM AND DOWNSTREAM OF CHANNEL.
- ITEM 613.06 STONE FILL, STREAM BED MATERIAL (E-STONE TYPE I) SHALL BE USED AT THE INLET AND OUTLET OF CULVERTS BEING REPAIRED OR REPLACED TO FILL VOIDS OR REPLACE UNSUITABLE MATERIALS IN THE STREAM CHANNEL AS NEEDED. SEE TYPICAL BOX CULVERT SECTIONS FOR MORE INFORMATION.
- CLEANING AT THE INLET AND OUTLET OF EXISTING CULVERTS TO BE REPLACED SHALL BE INCIDENTAL TO THE REPLACEMENT OF THE CULVERT.

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239_typ_culvert.dgn PLOT DATE: 3/22/2021  
PROJECT LEADER: E.P. DETRICK DRAWN BY: J.M. DUFFY  
DESIGNED BY: J.M. DUFFY CHECKED BY: E.P. DETRICK  
TYPICAL CULVERT SECTION SHEET SHEET 19 OF 70







TYPICAL 4 X 4 PRECAST BOX CULVERT SECTION

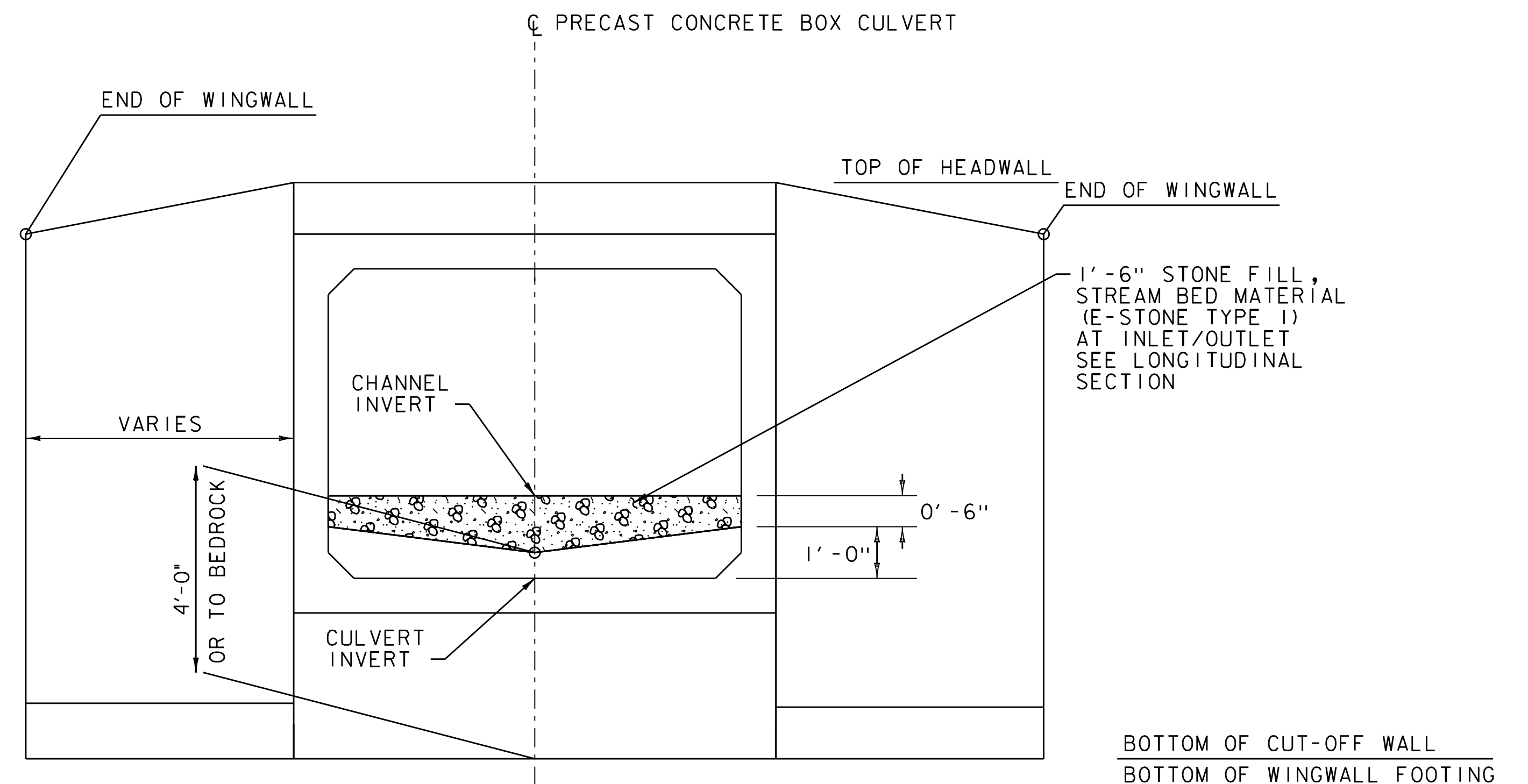
NOT TO SCALE

Culvert ID	Station	Existing Size (ft)	Existing Material	Proposed Concrete Box Size (ft)	Est. Culvert Length (ft)
28P	1176+52	2 x 2	STONE BOX	4 x 4	54
31G	1323+88	2 x 2	WOOD AND STONE	4 x 4	42
37	1702+78	6 x 6	STONE CATTLEPASS	8 x 6	41

### BOX CULVERT SUMMARY

#### E-STONE NOTES:

- E-STONE SHALL BE USED BELOW OHW AND AS AN EMBEDMENT MATERIAL IN BOX STRUCTURES WITH A VERTICAL CLEARANCE OF 6' OR GREATER.
- STONE PLACED INSIDE OF A CLOSED STRUCTURE SHALL BE PLACED SUCH THAT THE STRUCTURE IS NOT DAMAGED.
- CARE SHALL BE TAKEN TO LIMIT SEGREGATION OF THE MATERIALS
- ADD NATIVE STREAMBED MATERIAL OR SAND BORROW AS NEEDED TO SEAL THE BED AND PREVENT SUBSURFACE FLOW. COST OF NATIVE MATERIAL AND SAND BORROW IS INCIDENTAL TO STONE FILL, STREAM BED MATERIAL.
- THERE SHALL BE NO SUBSURFACE FLOW UPON FINAL INSPECTION.



TYPICAL INLET/OUTLET ELEVATION VIEW

NOT TO SCALE

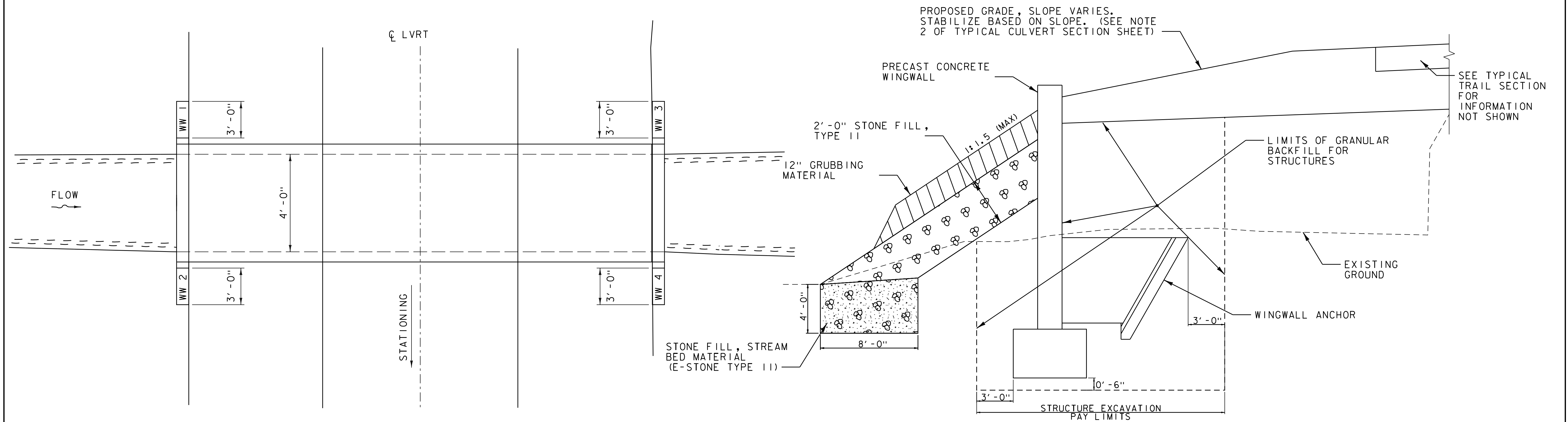
#### NOTES:

- BURY BOX CULVERT INVERT MINIMUM 1'-6" BELOW PROPOSED CHANNEL INVERT TO ALLOW RETENTION OF BED MATERIALS WITHIN THE STRUCTURE .
- BED RETENTION SILLS SHALL BE 12" HIGH AT THE EDGES OF THE BOX AND 6" HIGH IN THE CENTER. SILLS SHALL BE 4" THICK AND SHALL HAVE A POSITIVE CONNECTION TO PRECAST BOX.
- TYPICAL CHANNEL SECTION TO BE CONSTRUCTED TO TIE PROPOSED STRUCTURE INTO EXISTING CHANNEL (SEE TYPICAL CULVERT SECTION SHEET).
- SEE NOTES ON "TYPICAL CULVERT SECTION SHEET" FOR ADDITIONAL CULVERT REPLACEMENT / INSTALLATION NOTES.
- PROPOSED CULVERT LENGTHS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO ORDERING MATERIALS.
- BOX CULVERTS ON ANY PERENNIAL STREAM SHALL BE REVIEWED IN THE FIELD WITH PATRICK ROSS, VT DEC RIVER MANAGEMENT ENGINEER. CONSTRUCTION SURVEY WILL BE REQUIRED TO APPROPRIATELY SET THE STRUCTURE GRADIENT AND INVERT ELEVATIONS. COSTS ASSOCIATED WITH THIS WORK SHALL BE INCIDENTAL TO THE COST OF THE BOX CULVERT.



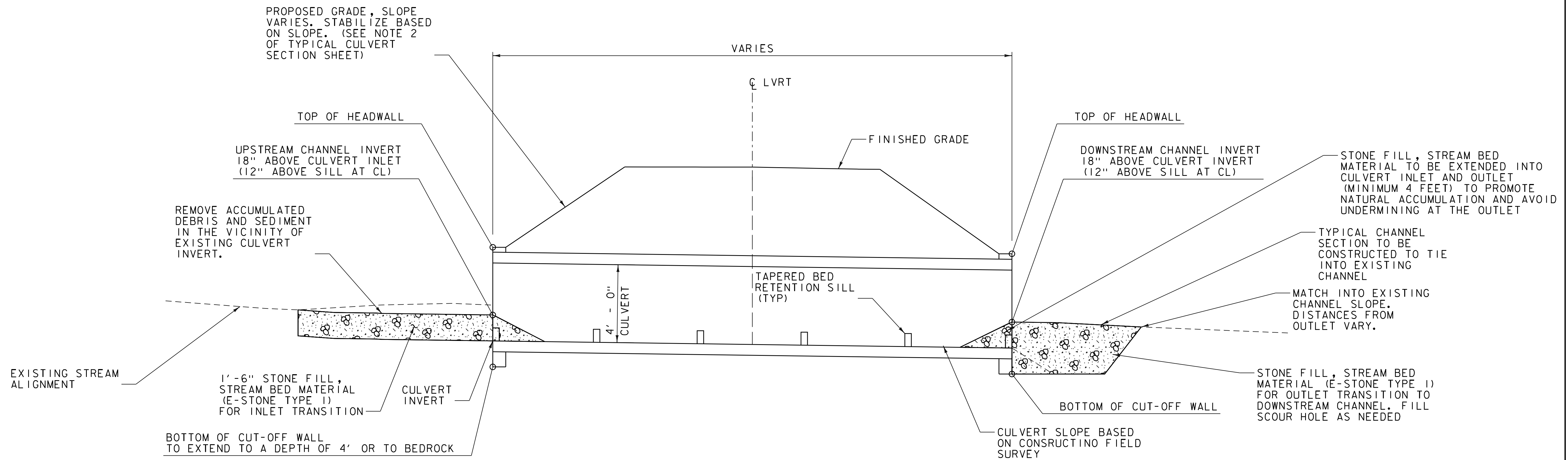
PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I3)
FILE NAME: z20f239_typ_box_culvert.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P.DETRICK	DRAWN BY: J.M. DUFFY
DESIGNED BY: J.M. DUFFY	CHECKED BY: B.M. ROBERTS
TYPICAL BOX CULVERT SHEET (1 OF 2)	SHEET 20 OF 70





PRECAST 4X4 BOX CULVERT PLAN  
NOT TO SCALE

TYPICAL PRECAST CONCRETE WINGWALL EXCAVATION SECTION  
NOT TO SCALE

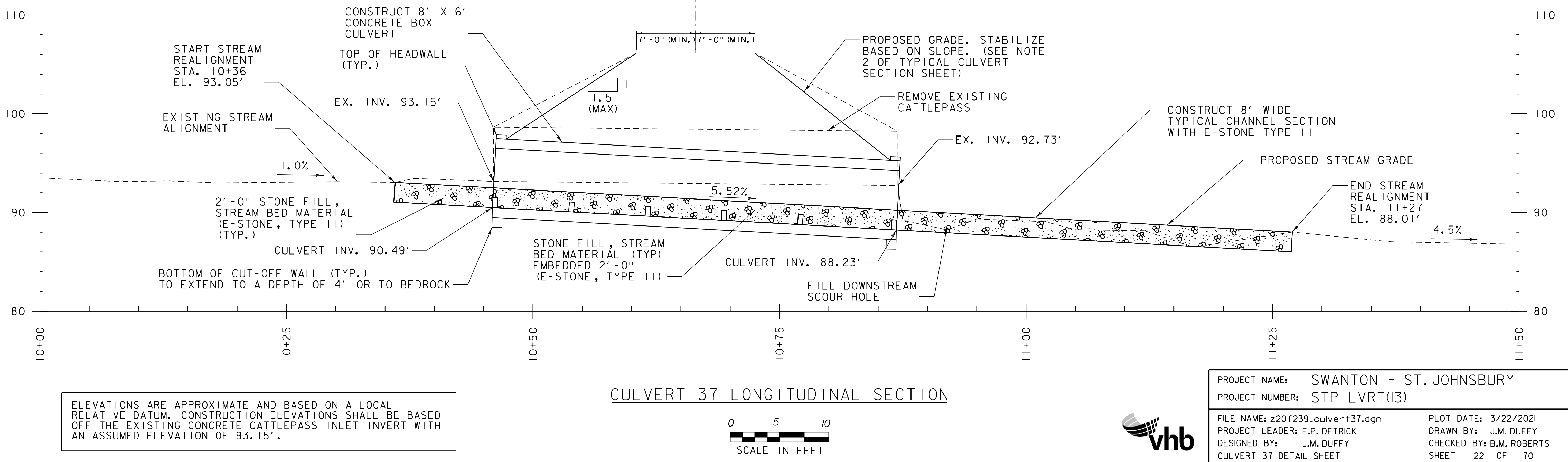
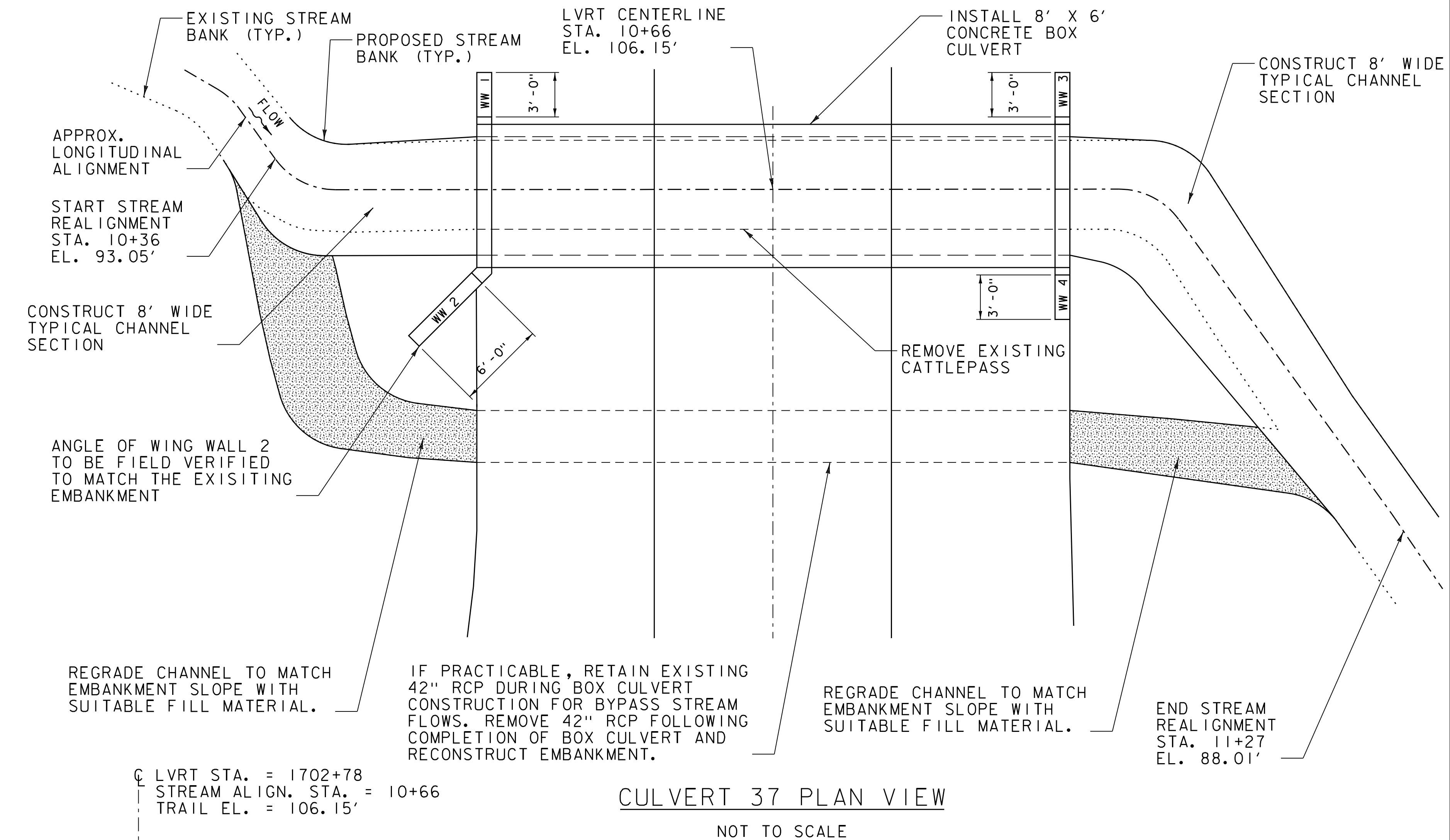
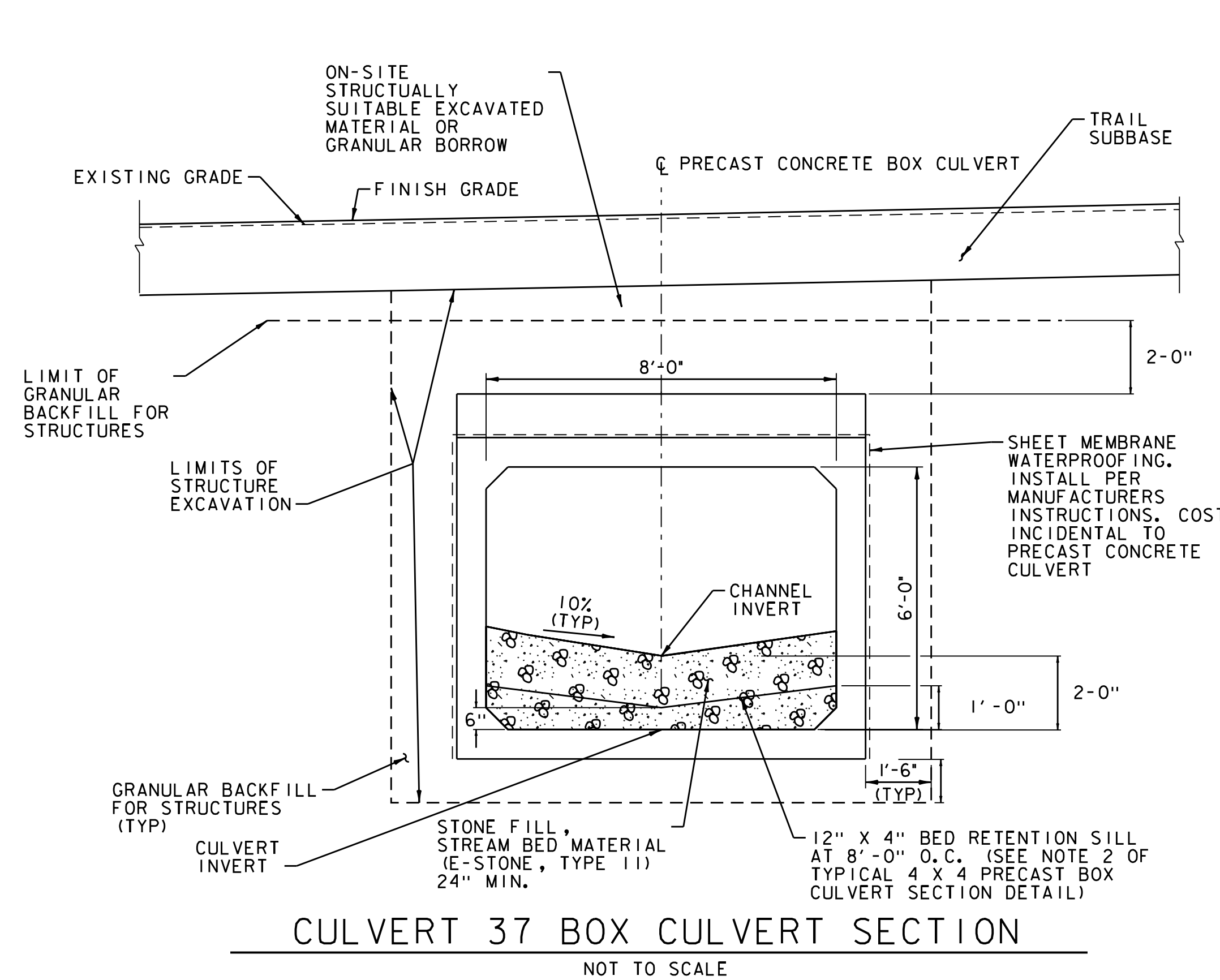


PRECAST 4X4 BOX CULVERT LONGITUDINAL SECTION  
NOT TO SCALE

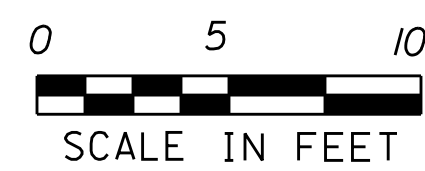
PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I3)
FILE NAME:	z20f239_pro_box_culvert.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	J.M. DUFFY
TYPICAL BOX CULVERT SHEET (2 OF 2)	
PLOT DATE:	3/22/2021
DRAWN BY:	J.M. DUFFY
CHECKED BY:	B.M. ROBERTS
SHEET	21 OF 70







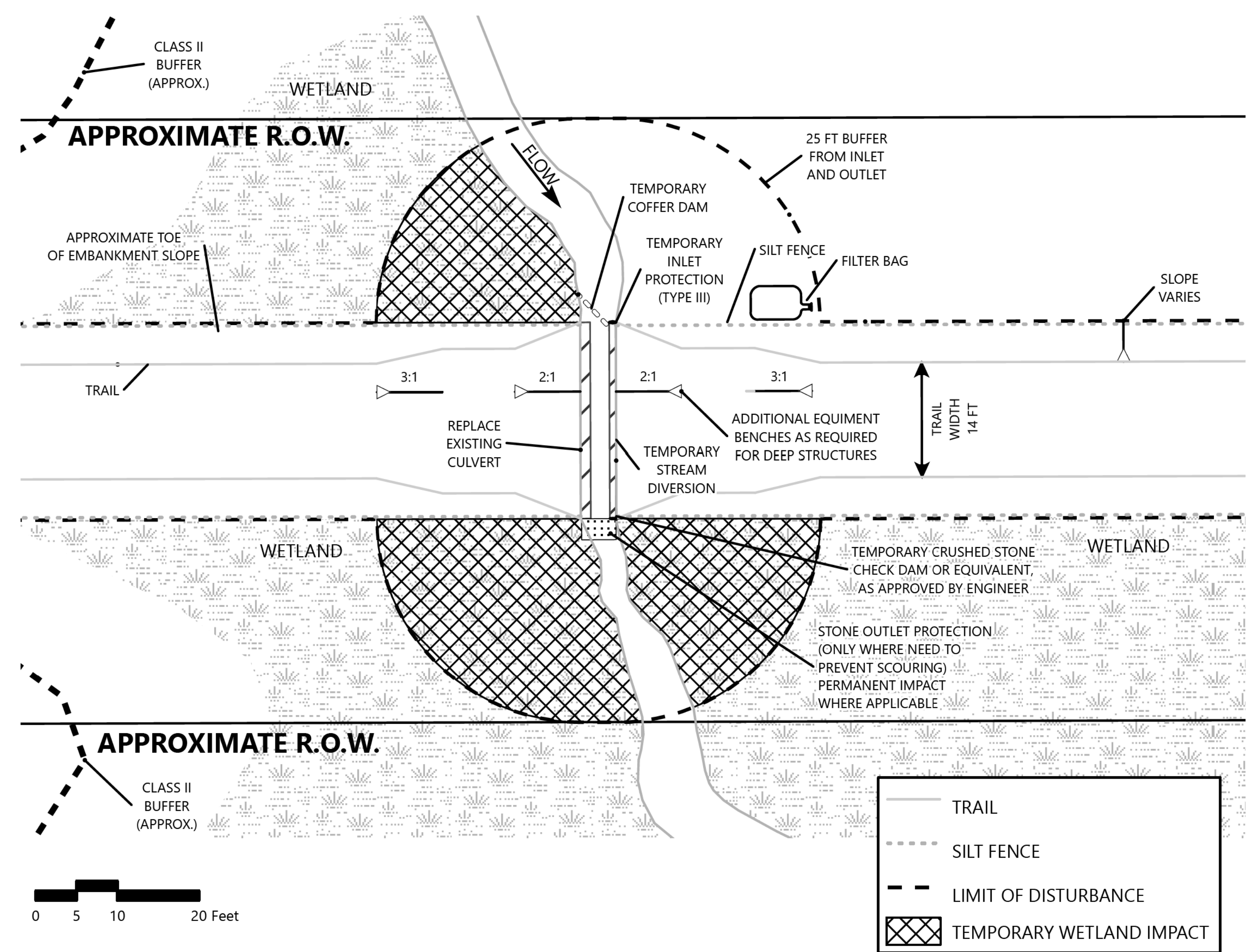
ELEVATIONS ARE APPROXIMATE AND BASED ON A LOCAL RELATIVE DATUM. CONSTRUCTION ELEVATIONS SHALL BE BASED OFF THE EXISTING CONCRETE CATTLEPASS INLET INVERT WITH AN ASSUMED ELEVATION OF 93.15'.



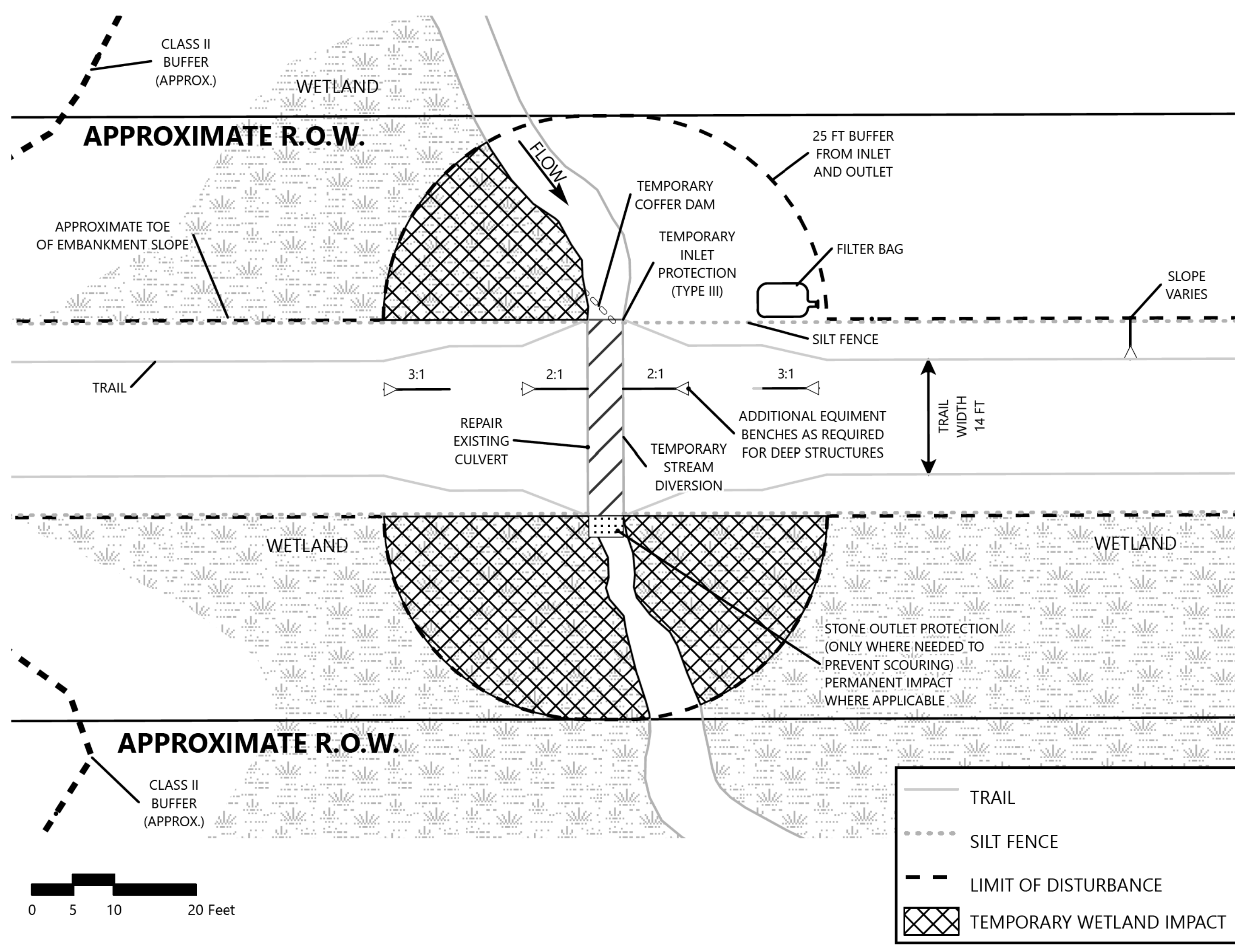
PROJECT NAME:	SWANTON - ST. JOHNSBURY
PROJECT NUMBER:	STP LVRT(I3)
FILE NAME:	z20f239_culvert+37.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	J.M. DUFFY
CULVERT 37 DETAIL SHEET	
PLOT DATE:	3/22/2021
DRAWN BY:	J.M. DUFFY
CHECKED BY:	B.M. ROBERTS
SHEET	22 OF 70



CULVERT REPLACEMENT TYPICAL



CULVERT REPAIR TYPICAL



- NOTES:
1. ALL WORK TO BE PERFORMED FROM TRAIL EMBANKMENT WHERE FEASIBLE.
  2. APPROXIMATE IMPACT AREAS AT CULVERT INLET/OUTLET HAVE BEEN ASSUMED TO ACCOUNT FOR EQUIPMENT ACCESS AND ANY WORK REQUIRED TO COMPLETE THE IMPROVEMENTS. THESE IMPACTS SHALL BE MINIMIZED TO THE EXTENT PRACTICABLE IN THE FIELD.
  3. REPAIR OR REPLACEMENT OF EXISTING CULVERTS SHALL BE PERFORMED IN DRY CONDITIONS TO THE EXTENT PRACTICABLE.
  4. INSTALL TEMPORARY STREAM DIVERSION AND OTHER WATER CONTROL MEASURES AS NEEDED PRIOR TO EXCAVATION OF IN-STREAM MATERIALS OR REMOVAL OF EXISTING STRUCTURES.
  5. LOCATION AND TYPE OF SEDIMENT CONTROL PRACTICES SHOWN ABOVE ARE FOR REFERENCE ONLY. ADDITIONAL MEASURES MAY BE REQUIRED TO MINIMIZE POTENTIAL SEDIMENT RELEASE.
  6. SEE ITEM DETAIL SHEETS AND LAYOUT PLANS FOR LOCATIONS WHERE THESE DETAILS ARE TO BE APPLIED.
  7. WETLAND AREA DISTURBED DURING CONSTRUCTION SHALL BE SEEDED WITH WET AREA SEED MIX AND MULCHED WITH WEED FREE STRAW.



PROJECT NAME:	SWANTON - ST JOHNSBURY	PLOT DATE:	3/22/2021
PROJECT NUMBER:	STP LVRT(I3)	DRAWN BY:	J. GROSSMAN
FILE NAME:	z20f239_culvert_t_repair.dgn	DESIGNED BY:	J.M. DUFFY
PROJECT LEADER:	E.P. DETRICK	CHECKED BY:	J.M. DUFFY
DESIGNED BY:	J.M. DUFFY	CULVERT REPLACEMENT/REPAIR TYP. DETAIL	SHEET 23 OF 70



NOTES:

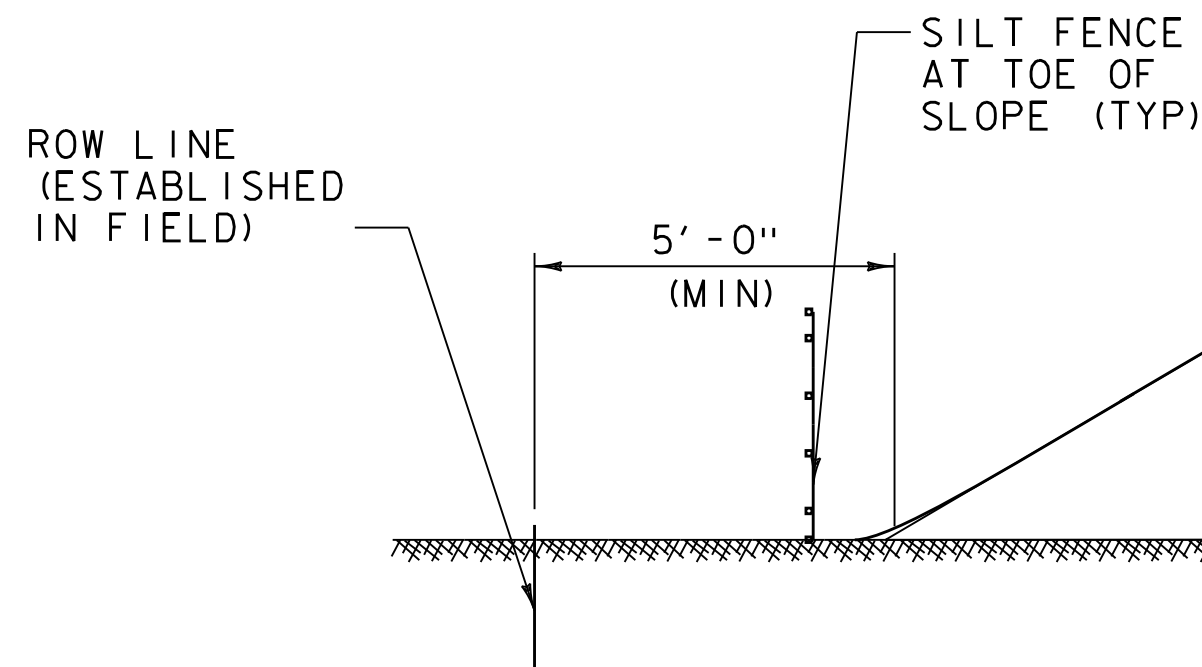
1. ALL EXCAVATED MATERIAL SHALL BE SPOILED ON SITE EITHER WITHIN CONSTRUCTION OF THE TRAIL, PAUSE PLACE LOCATIONS OR WASTE AREA MOUNDS.
2. STRUCTURALLY SUITABLE MATERIAL EXCAVATED DURING CONSTRUCTION SHALL BE USED IN PLACE OF GRANULAR BORROW PRIOR TO BEING SPOILED ON SITE.
3. PAUSE PLACES ARE CONSTRUCTED TRAIL PULL-OFF AREAS WHERE EXCESS MATERIAL FROM DITCHING CAN BE WASTED.
4. PAUSE PLACES SHALL NOT BLOCK DRAINAGE SWALES.
5. PAUSE PLACES SHALL NOT INTERSECT ROAD CROSSINGS AT FULL WIDTH TO AVOID PROVIDING UNWANTED PARKING AREAS FOR PATH USERS.
6. PAUSE PLACES SHALL NOT INTERSECT DELINEATED WETLANDS, WETLAND BUFFERS, STREAMS AND FEMA FLOOD HAZARD AREAS.
7. INSTALL SILT FENCE AND OTHER EPSC MEASURES DOWNGRADIENT FROM WORK AREA PRIOR TO PLACEMENT OF EXCESS MATERIAL.
8. TEMPORARILY STABILIZE WASTE SOIL WITHIN 14 DAYS OF INITIAL DISTURBANCE/PLACEMENT AND WITHIN 48 HOURS OF FINAL GRADING/SHAPING. MAINTAIN UNTIL SITE IS FULLY STABILIZED.
9. SILT FENCE TYPE II REQUIRED WITHIN 100 FEET OF A WATERBODY OR WETLAND.
10. FISH AND WILDLIFE PAUSE PLACE LOCATIONS TO BE CONSTRUCTED FOLLOWING PAUSE PLACE GUIDELINES EXCEPT FOR MINIMUM LENGTH REQUIREMENTS.
11. SLOPE SHALL BE CLEARED, NOT GRUBBED PRIOR TO PLACEMENT.
12. PLACEMENT OF WASTING MATERIAL SHALL BE INCIDENTAL TO ALL CONTRACT ITEMS.
13. WASTE AREA MOUNDS MAY BE CONSTRUCTED ATOP APPROVED PAUSE PLACE LOCATIONS INDICATED BY AN ASTERISK (*). THIS METHOD TO SPOIL ADDITIONAL MATERIAL SHALL NOT BE UTILIZED UNTIL ALL OTHER SOIL WASTING METHODS HAVE BEEN EXHAUSTED WITHIN THE PROJECT.

PAUSE PLACE LOCATIONS  
(STATIONING DOES NOT INCLUDE TAPERS)

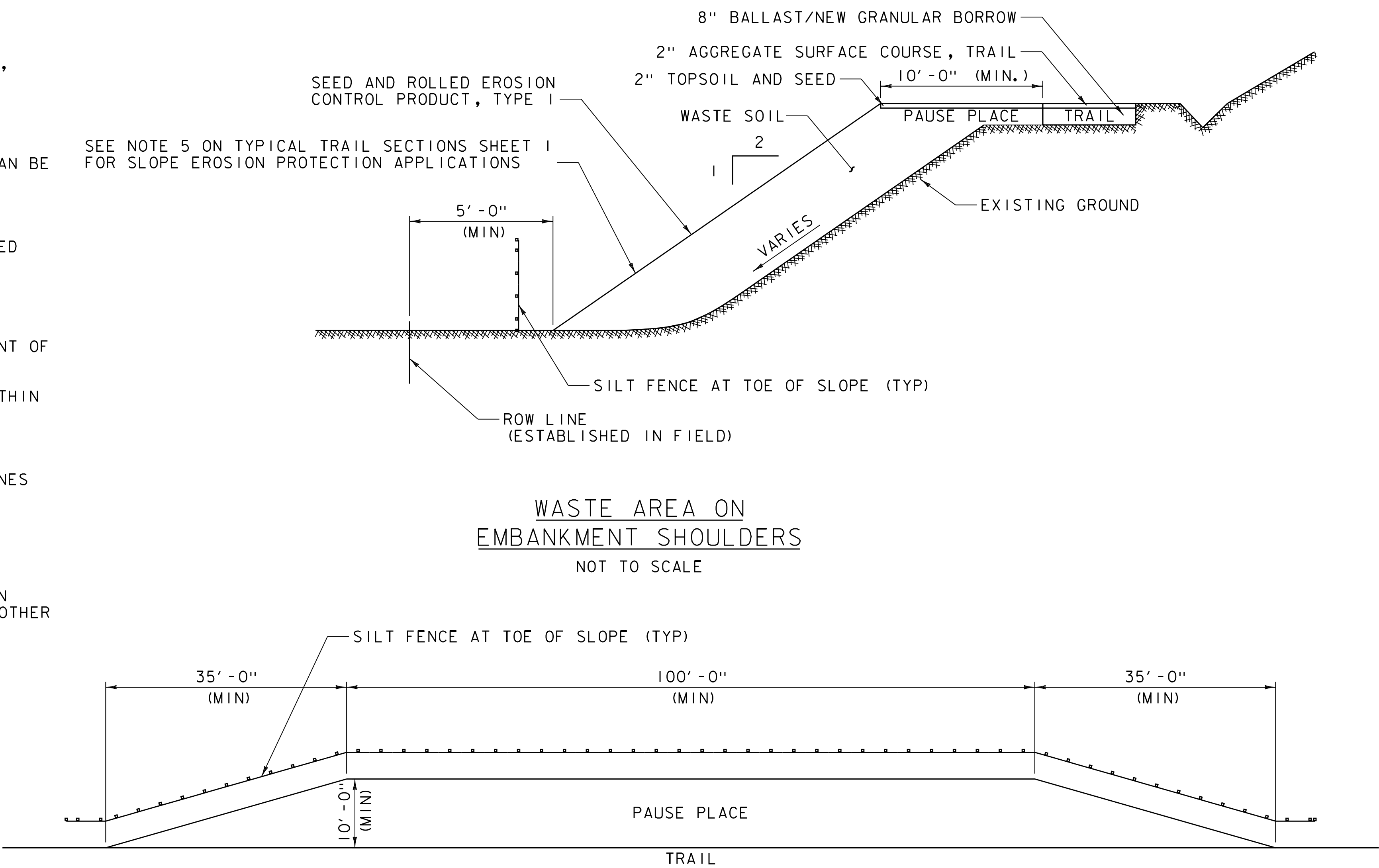
* 909+92 - 911+92, LT  
919+27 - 920+77, LT/RT  
1028+52 - 1030+02, LT/RT  
1042+42 - 1045+42, RT  
1075+22 - 1076+22, LT  
* 1091+22 - 1092+72, LT  
1107+17 - 1108+67, RT  
* 1142+67 - 1144+17, LT  
1157+72 - 1159+72, LT  
1177+82 - 1179+82, LT  
1246+82 - 1247+82, LT  
1307+62 - 1308+62, LT  
1392+02 - 1393+52, LT  
1415+57 - 1417+57, LT  
1451+02 - 1452+02, RT  
1519+17 - 1521+92, RT  
1608+32 - 1610+82, LT  
1643+62 - 1644+62, RT  
1674+52 - 1677+52, LT  
1754+17 - 1755+67, LT/RT  
1797+67 - 1799+17, LT

FISH AND WILDLIFE PAUSE PLACE LOCATIONS  
(STATIONING DOES NOT INCLUDE TAPERS)

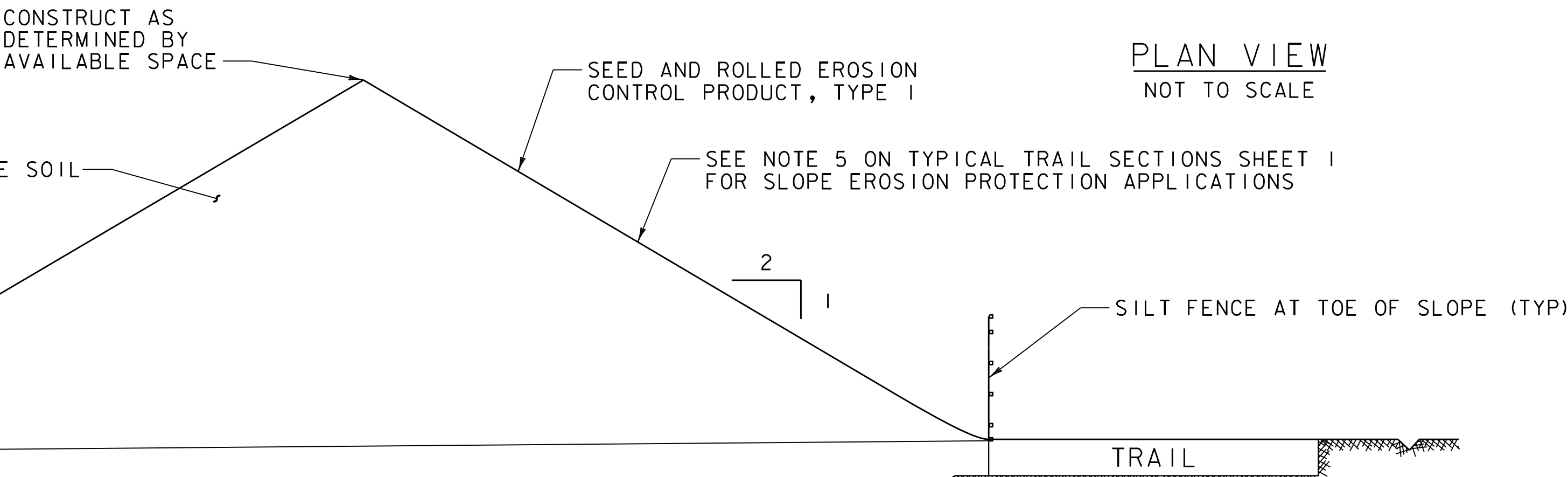
1564+50 - 1565+25, LT



WASTE AREA MOUNDS  
NOT TO SCALE



WASTE AREA ON EMBANKMENT SHOULDERS  
NOT TO SCALE



PLAN VIEW  
NOT TO SCALE

PROJECT NAME: SWANTON - ST. JOHNSBURY  
PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239_typ.waste.area.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: B.M. ROBERTS  
WASTE AREA DETAILS SHEET

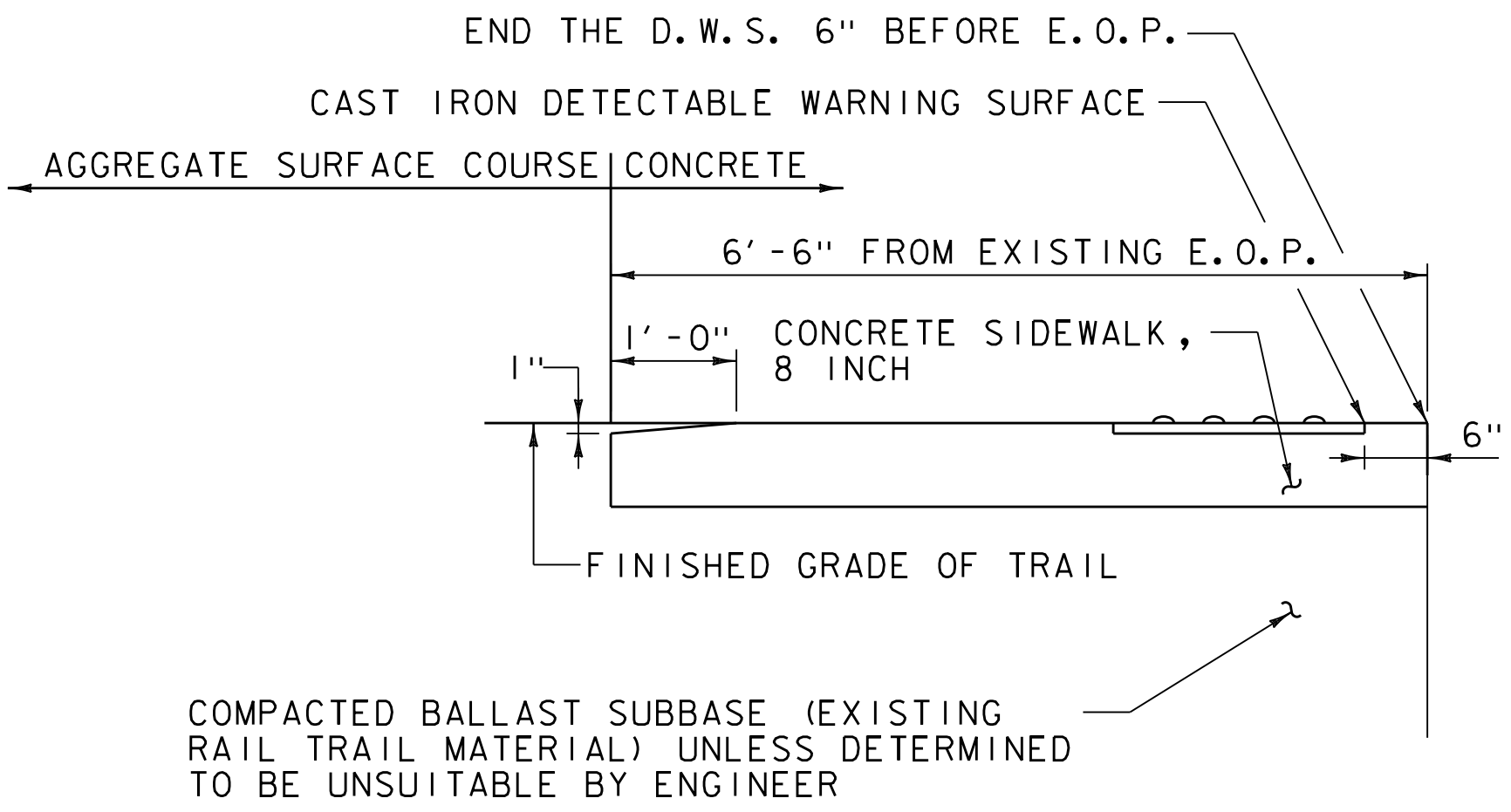
PLOT DATE: 3/22/2021  
DRAWN BY: B.M. ROBERTS  
CHECKED BY: E.P. DETRICK  
SHEET 24 OF 70





NOTES:

- Ø SHALL BE 75° TO 90°, CROSSINGS WHICH CANNOT MEET THE MINIMUM 75° ANGLE SHALL BE RECONFIGURED TO IMPROVE THE CROSSING ANGLE TO THE EXTENT SITE CONDITIONS AND ROW ALLOW.
- CONCRETE RAMP WIDTH TO MATCH APPROACHING TRAIL WIDTH AT INTERSECTION WITH ROADWAY.
- SEE TRAFFIC SIGN SUMMARY SHEETS AND ETIQUETTE SIGN SHEET FOR ADDITIONAL INFORMATION.
- SIGNS SHALL BE PLACED SUCH THAT THE EDGE OF THE SIGN IS NO CLOSER THAN 3' AND NO FURTHER THAN 5' FROM THE EDGE OF TRAIL AND 5' FROM THE TRAIL SURFACE TO THE BOTTOM OF THE SIGN.
- ALL COSTS ASSOCIATED WITH THE INSTALLATION OF THE ACCESSIBLE ROAD CROSSINGS INCLUDING EXCAVATION, CONCRETE, DETECTABLE WARNING SURFACE AND REFLECTIVE PAINT STOP BAR SHALL BE PAID UNDER THEIR APPROPRIATE PAY ITEMS.
- SIGNS SHALL BE MOUNTED ON 2" SQUARE STEEL POSTS. THE POSTS WILL BE PAID UNDER ITEM 675.341 "SQUARE TUBE SIGN POST AND ANCHOR".
- W11-5 SIGN TO BE LOCATED AT ALL FARM AND FARM ROAD CROSSINGS.
- THE W11-15a AND W16-2p SIGN ASSEMBLIES ARE NOT REQUIRED ON ROADWAYS WITH SPEEDS OF 35 MPH OR LOWER.
- SEE VTRANS TE1 18-200 AND STANDARD DRAWING E-121 FOR SIGN LOCATIONS AND SPACING REQUIREMENTS.

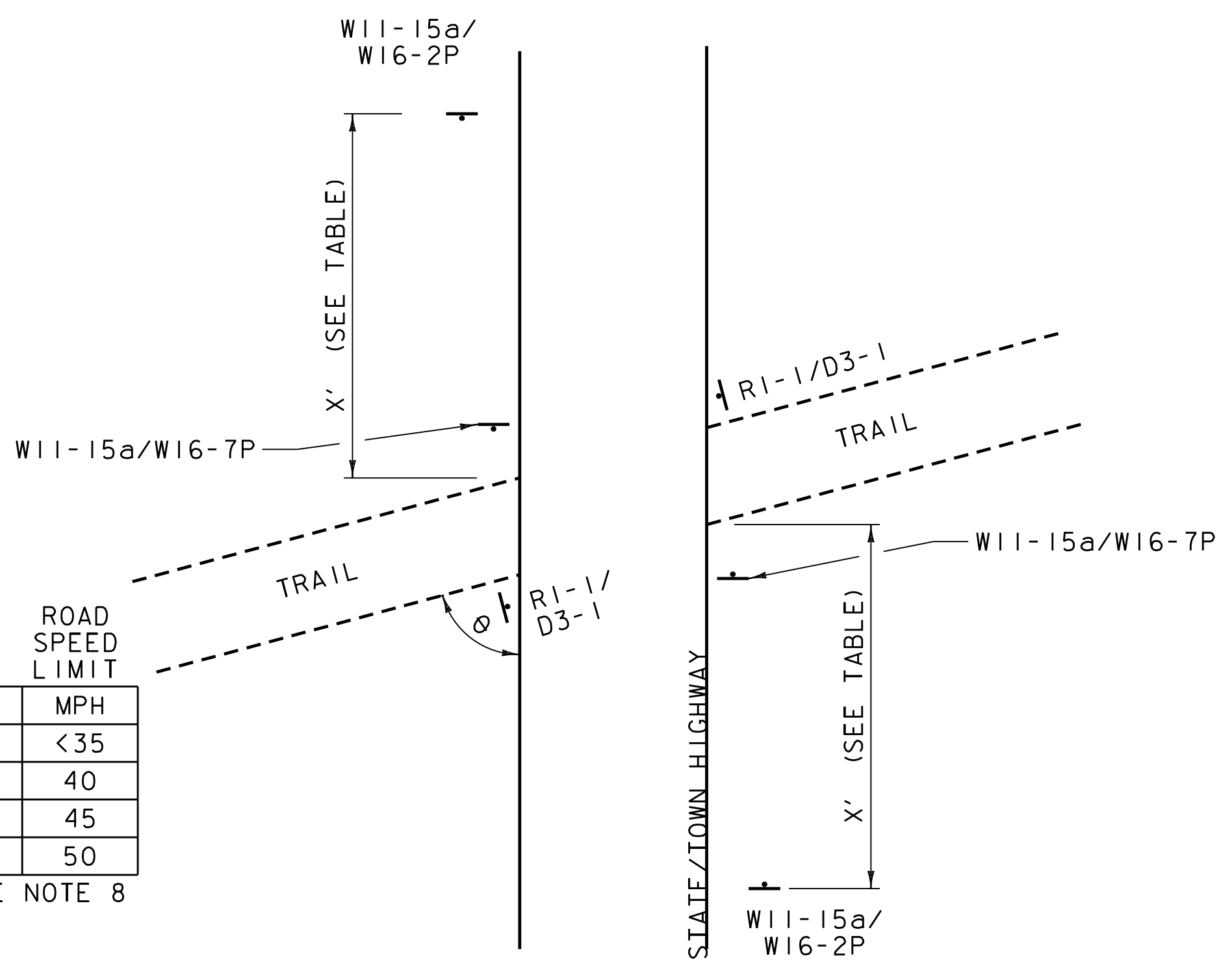


SECTION A-A  
NOT TO SCALE

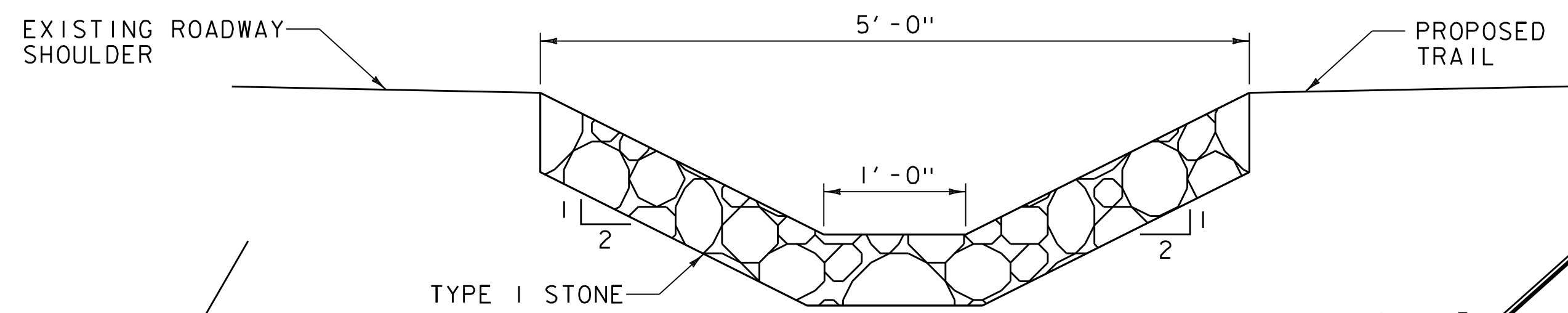
ACCESSIBLE ROAD CROSSING APPROACH

DIST. (FT)	ROAD SPEED LIMIT
X'	MPH
*	<35
125'	40
175'	45
250'	50

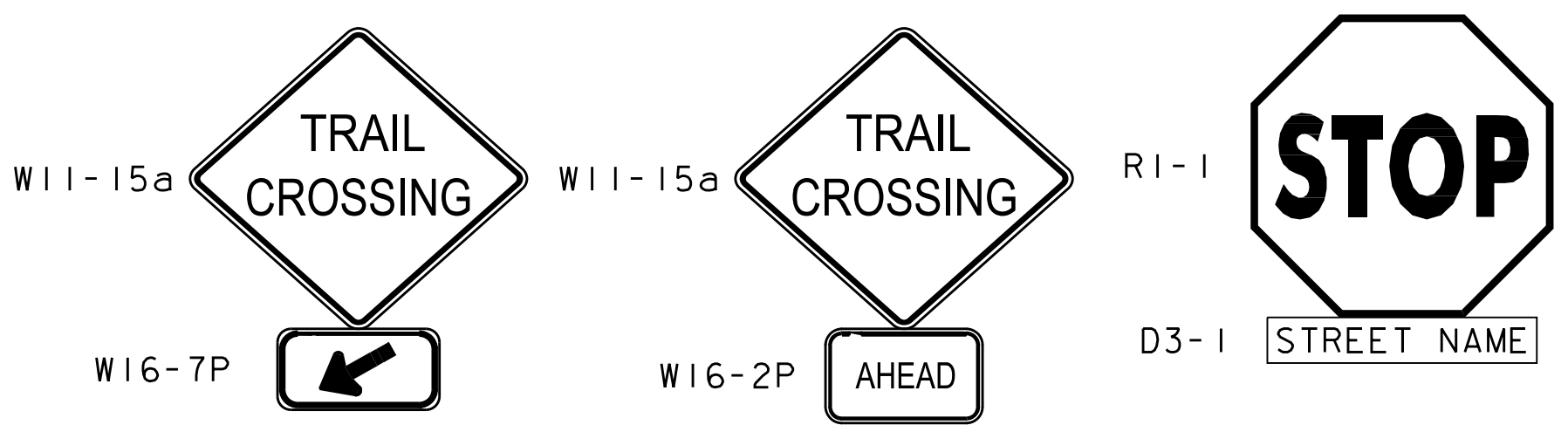
* SEE NOTE 8



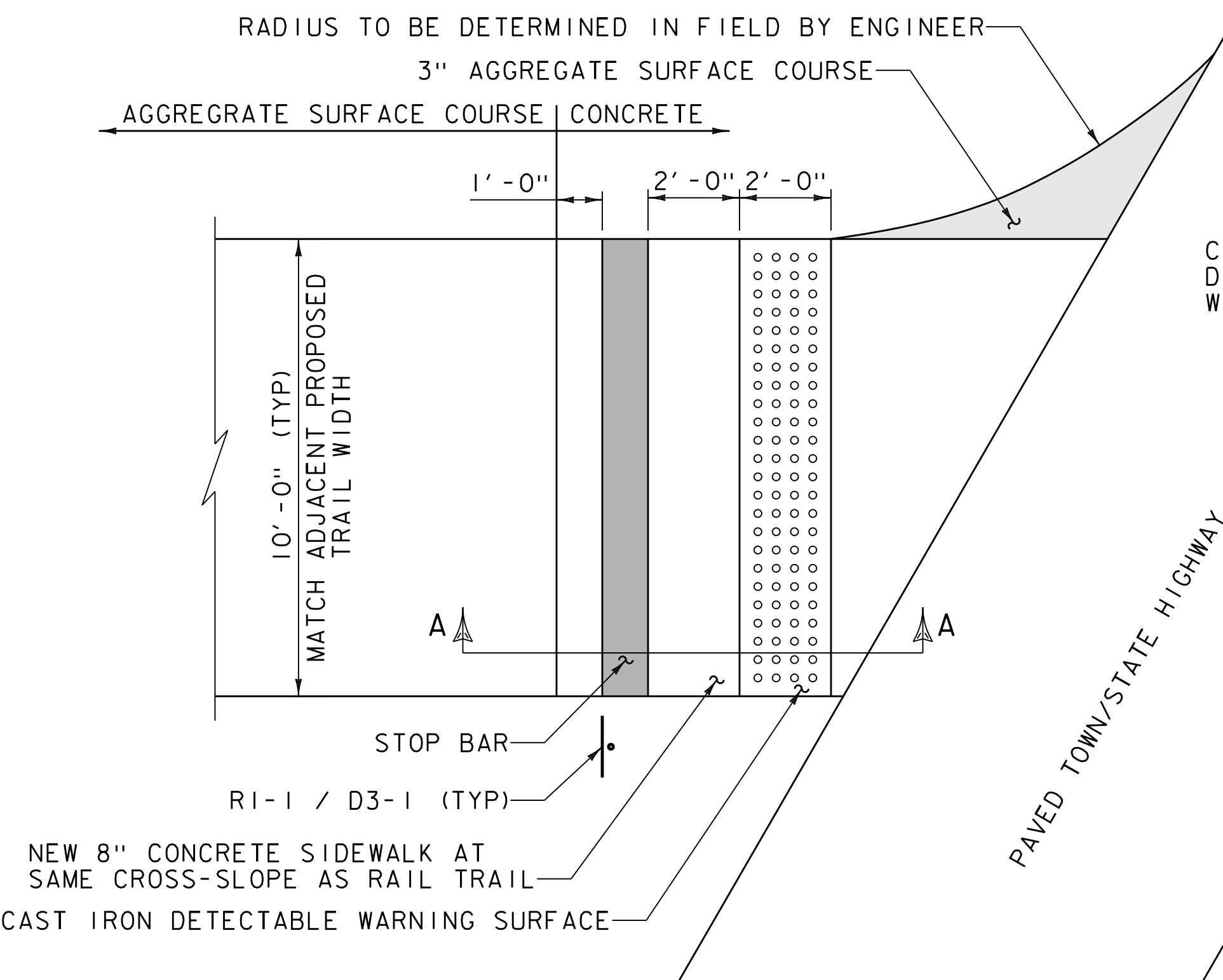
TYPICAL STATE AND TOWN  
HIGHWAY CROSSING SIGN  
LAYOUT



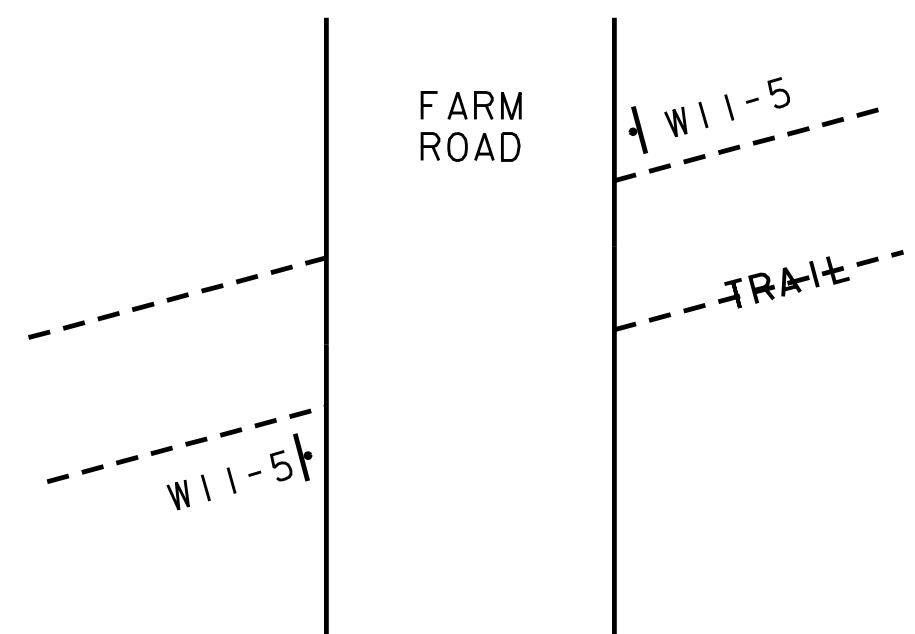
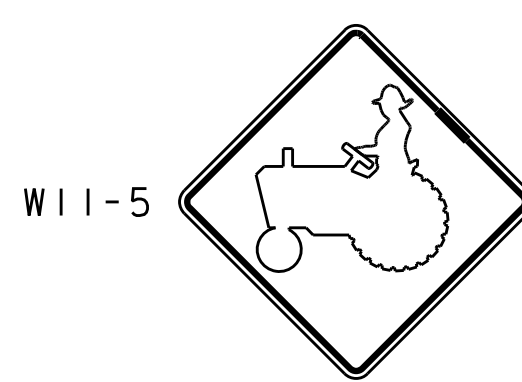
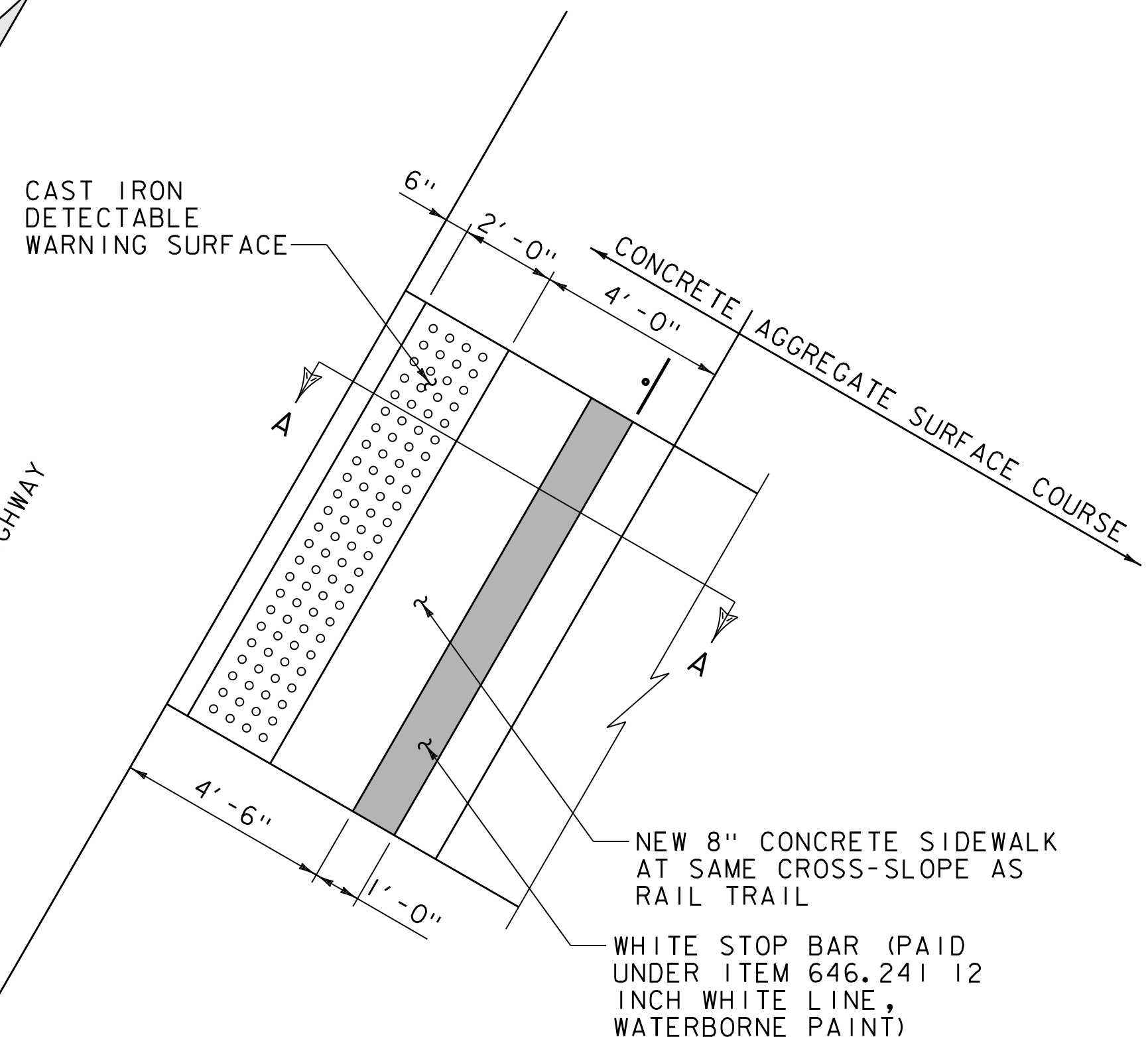
STONE SWALE  
NOT TO SCALE



STANDARD ROAD CROSSING SIGNS



ACCESSIBLE ROAD CROSSING APPROACH  
NOT TO SCALE

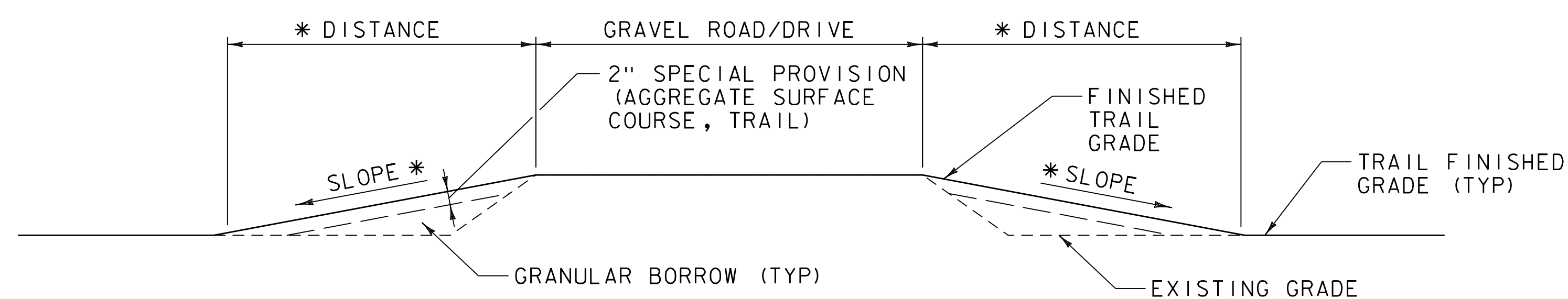
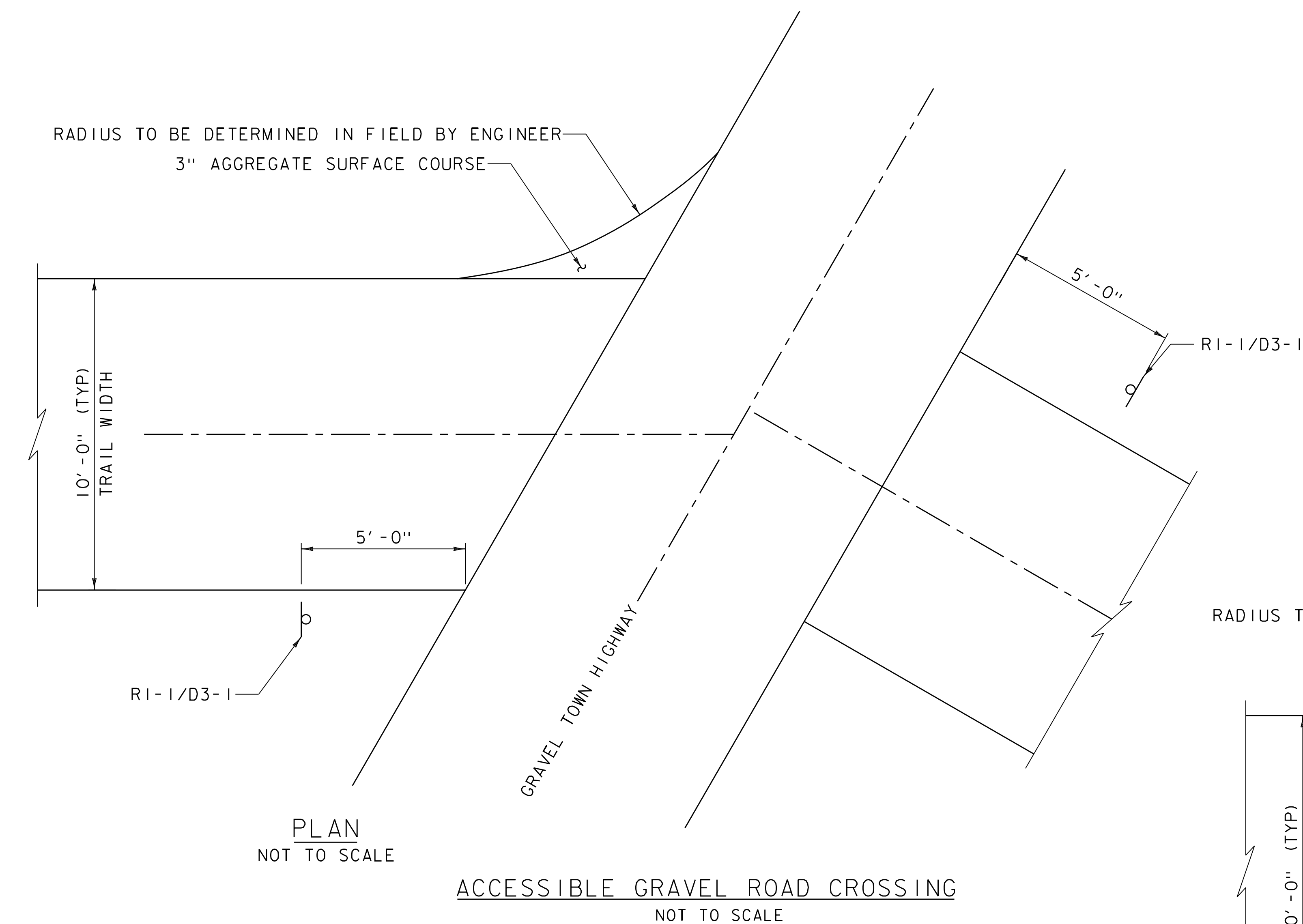


STANDARD FARM CROSSING SIGNS

PROJECT NAME:	SWANTON - ST JOHNSBURY
PROJECT NUMBER:	STP LVRT(I3)
FILE NAME:	z20f239_crossings.dgn
PROJECT LEADER:	E.P. DETRICK
DESIGNED BY:	D.A. GINGRAS
CROSSING DETAILS SHEET (1 OF 4)	
PLOT DATE:	3/22/2021
DRAWN BY:	D.A. GINGRAS
CHECKED BY:	B.M. ROBERTS
SHEET	25 OF 70





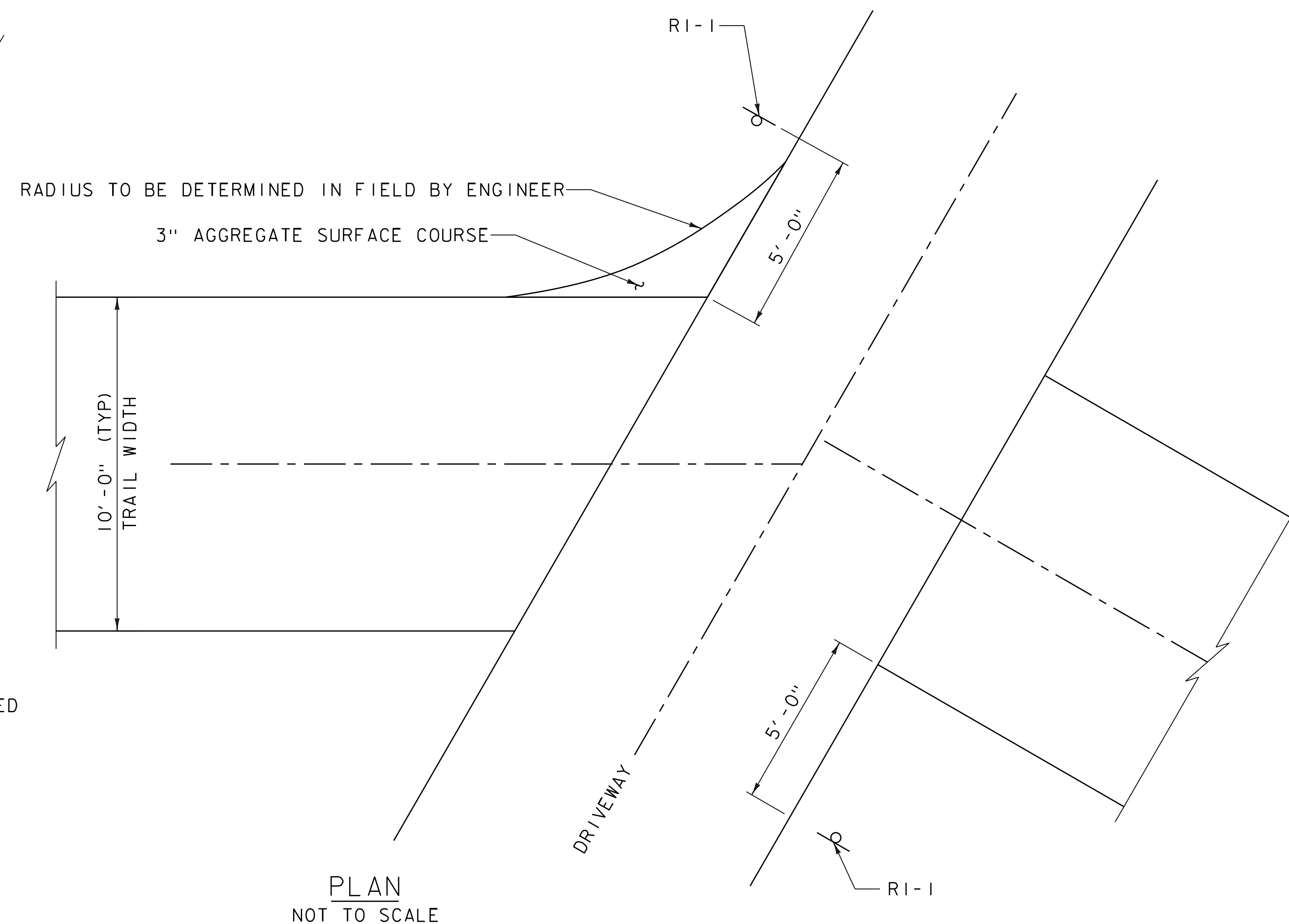


* - SEE NOTE 1 BELOW

TYPICAL GRAVEL ROAD/DRIVE CROSSING SECTION  
NOT TO SCALE

NOTES:

1. GRANULAR BORROW SHALL BE ADDED TO FEATHER TRAIL GRADE SUCH THAT FINAL GRADE ALONG TRAIL IS 5% OR LESS.
2. GRANULAR BORROW SHALL BE TOPPED WITH 2" ITEM 900.608 "SPECIAL PROVISION (AGGREGATE SURFACE COURSE, TRAIL)" TO ACHIEVE FINAL GRADE ELEVATIONS AS SHOWN IN TYPICAL TRAIL CROSS SECTIONS .



PRIVATE DRIVE CROSSING  
NOT TO SCALE



PROJECT NAME: SWANTON - ST. JOHNSBURY	
PROJECT NUMBER: STP LVRT(I3)	
FILE NAME: z20f239_crossings.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: R.M. OBRIEN
DESIGNED BY: R.M. OBRIEN	CHECKED BY: E.P. DETRICK
CROSSING DETAILS SHEET (2 OF 4)	SHEET 26 OF 70



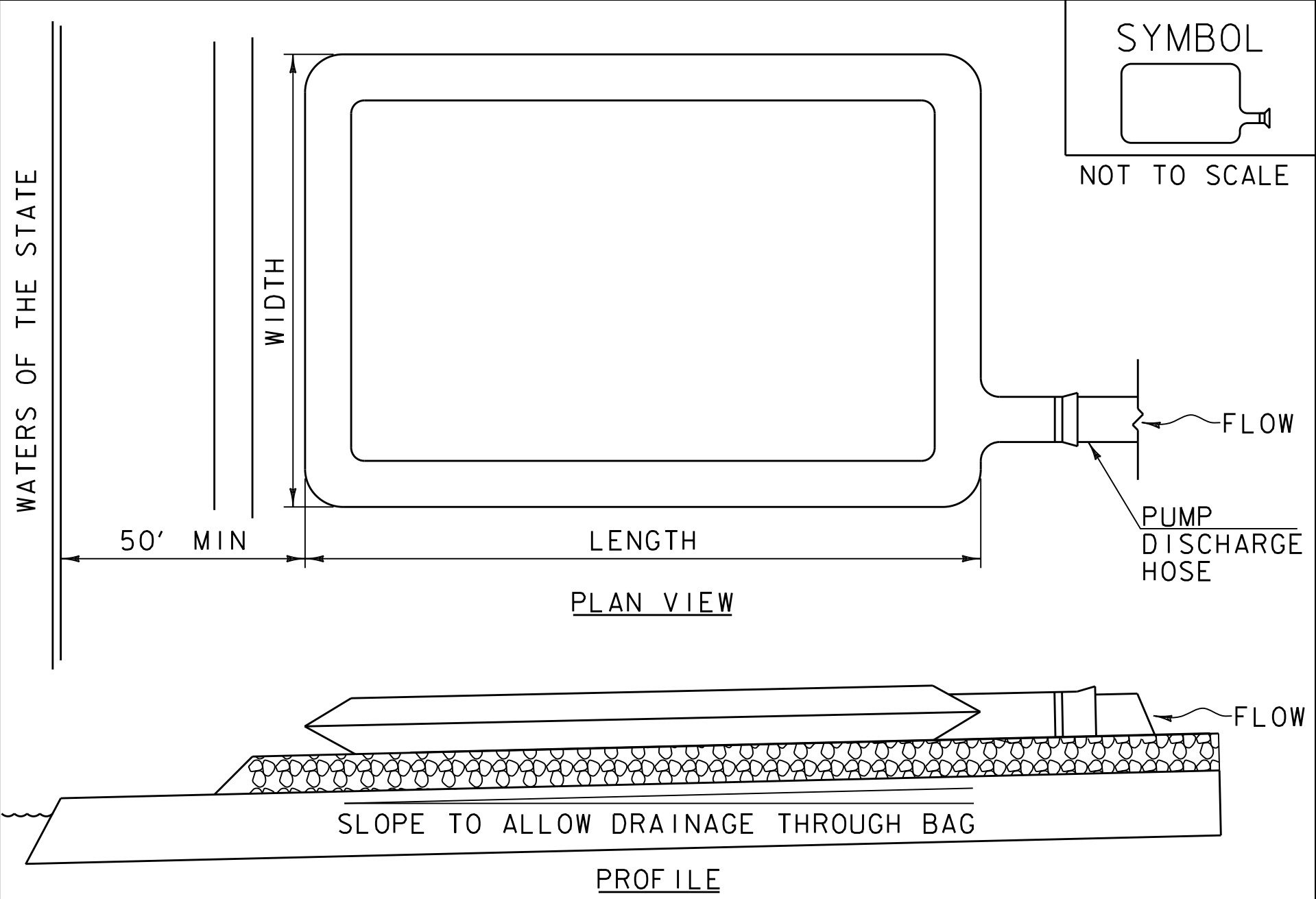
VAOT RURAL AREA MIX						
LBS/AC			NAME	LATIN NAME	GERM	PURITY
WEIGHT	BROADCAST	HYDROSEED				
37.5%	22.5	45	CREeping RED FESCUE	FESTUCA RUBRA VAR. RUBRA	85%	98%
37.5%	22.5	45	TALL FESCUE	FESTUCA ARUNDINACEA	90%	95%
5.0%	3	6	RED TOP	AGROSTIS GIGANTEA	90%	95%
15.0%	9	18	WHITE FIELD CLOVER	TRIFOLIUM REPENS	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	LOLIUM MULTIFLORUM	85%	95%
100%	60	120				

WET AREA SEED MIX	
SEED	% WEIGHT
VIRGINIA WILD RYE GRASS	20
FOX SEDGE	10
AMERICAN MANNAGRASS	20
GIANT BUR-REED	10
COMMON THREE-SQUARE	20
SOFT-STEM BULRUSH	10
CANADA RUSH	10
RATE OF APPLICATION: 10# PER ACRE (UP TO 15# PER ACRE IF HYDROSEEDDED)	

CONSTRUCTION GUIDANCE

1. SEED MIX: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER ON WHICH SEED MIX TO USE.
2. SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
4. FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER.
5. HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
6. STRAW MULCH: TO BE PLACED ON EARTH SLOPES IN WETLANDS AND WETLAND BUFFERS AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
7. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED PROPOSED FOR USE WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED.
8. TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

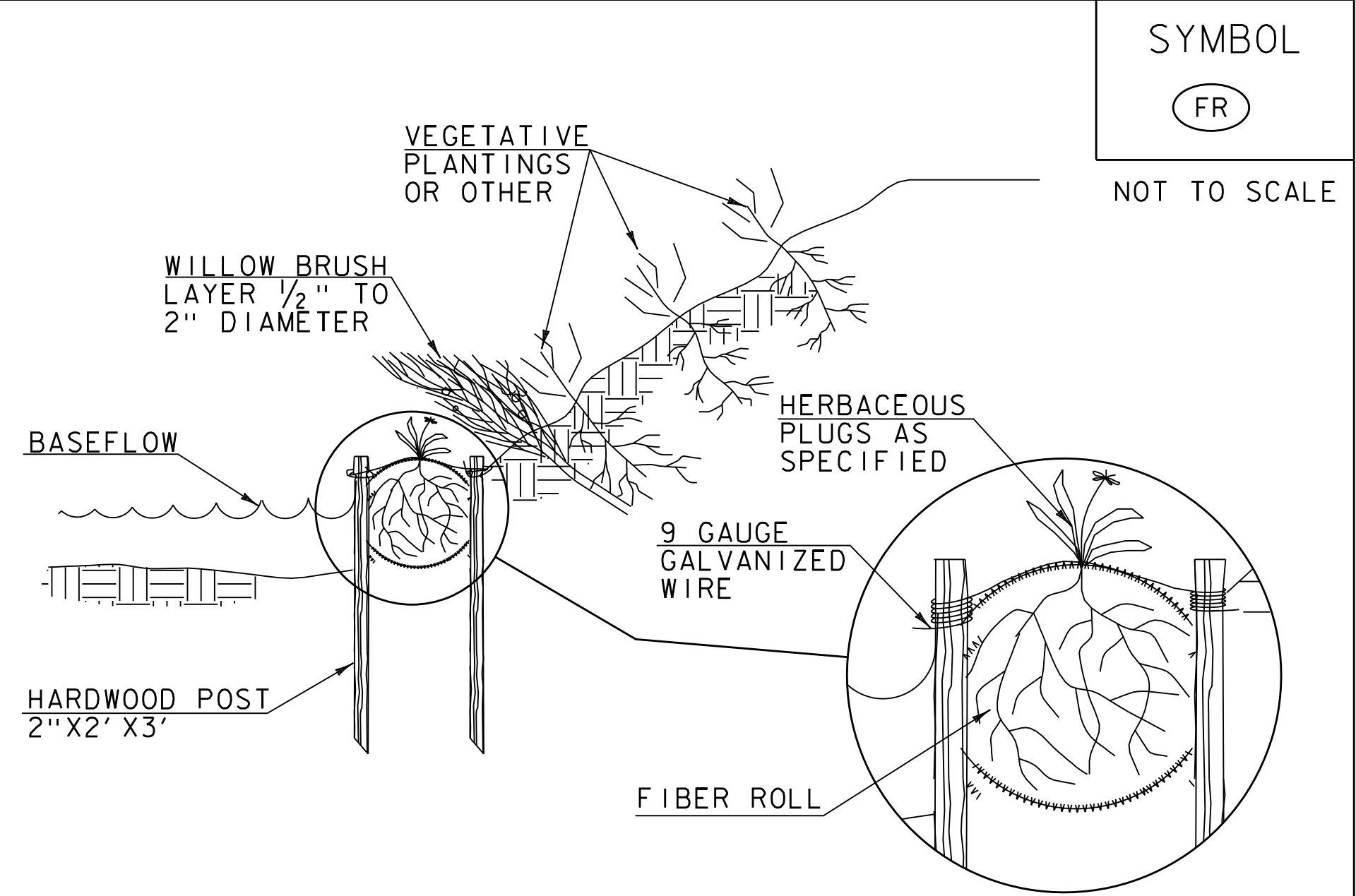
ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES	TURF ESTABLISHMENT
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 FOR SEED (PAY ITEM 651.15)	REVISIONS JANUARY 12, 2015    WHF



CONSTRUCTION SPECIFICATIONS

1. THE PRIMARY PURPOSE OF FILTER BAG IS TO RETAIN SILT, SAND, AND FINES DURING DEWATERING OPERATIONS.
2. FILTER BAGS SHALL BE INSTALLED ON A VEGETATED SLOPE GRADED TO ALLOW INCOMING WATER TO FLOW THROUGH THE BAG.
3. FILTER BAGS MAY ALSO BE PLACED ON COARSE AGGREGATE, STONE, OR HAYBALES TO INCREASE FILTRATION EFFICIENCY.
4. FILTER BAGS SHALL BE LOCATED A MINIMUM OF 50' FROM WATERS OF THE STATE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. THE NECK OF THE FILTER BAG SHALL BE STRAPPED TIGHTLY TO THE DISCHARGE HOSE.
6. A FILTER BAG IS FULL WHEN IT NO LONGER CAN EFFICIENTLY FILTER SEDIMENT OR ALLOW WATER TO PASS AT A REASONABLE RATE.
7. FILTER BAG SHALL BE DISPOSED OF AS APPROVED IN THE EPSC PLAN OR AS DIRECTED BY THE ENGINEER.

NOTES: REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.	
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR FILTER BAG (PAY ITEM 653.45) AND AS SPECIFIED IN THE CONTRACT.	REVISIONS MARCH 24, 2008    WHF JANUARY 13, 2009    WHF



CONSTRUCTION SPECIFICATIONS

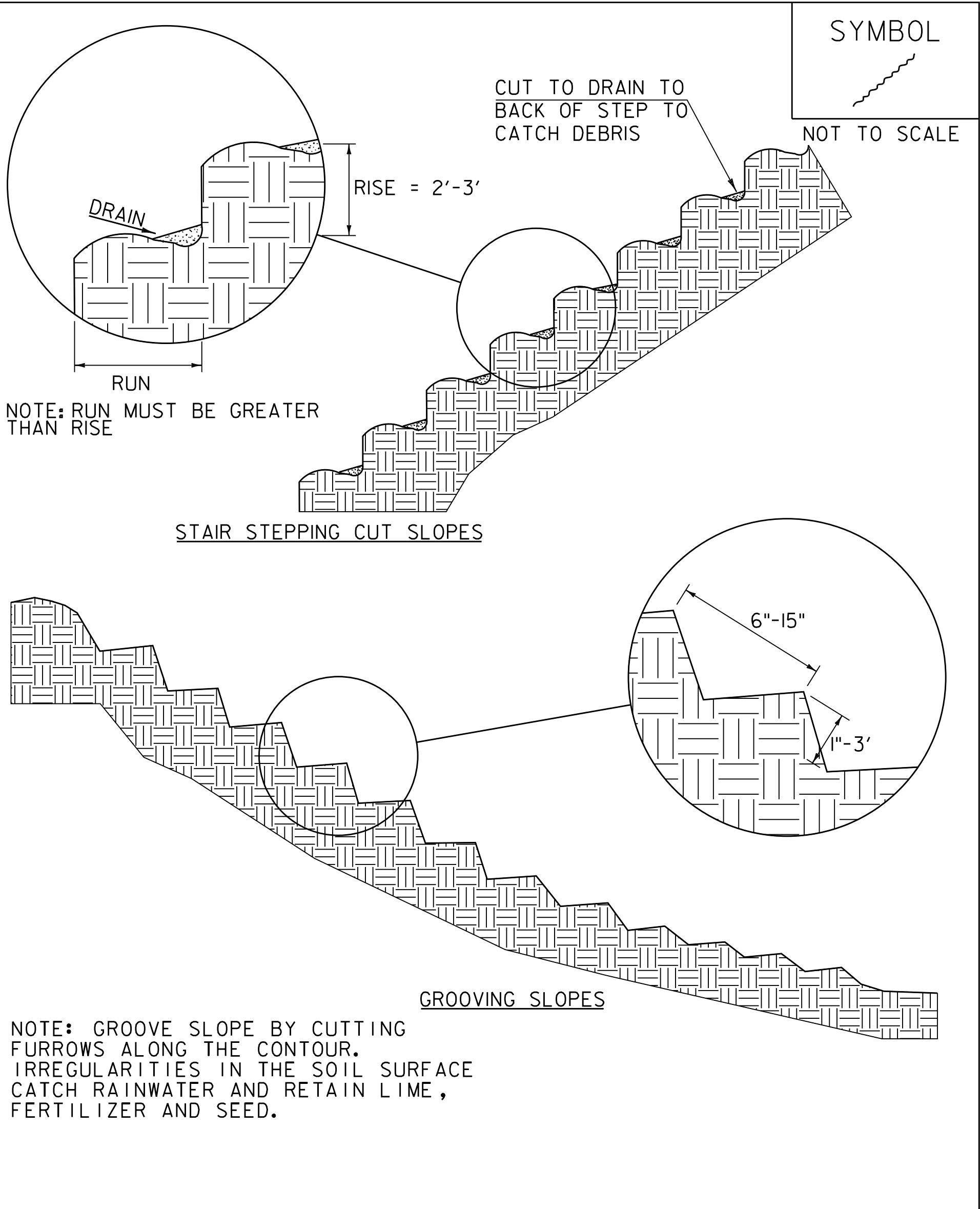
1. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW BASEFLOW OR A 4" TRENCH ON SLOPE CONTOURS
2. PLACE THE ROLL IN THE TRENCH AND ANCHOR WITH 2"x2" POSTS PLACED ON BOTH SIDES FO THE ROLL AND SPACED LATERALLY ON 2' TO 4' CENTERS. TRIM THE TOP OF THE POSTS EVEN WITH THE EDGE OF THE ROLL , IF NECESSARY.
3. NOTCH THE POSTS AND TIE TOGETHER, ACROSS THE ROLL , WITH 9 GAUGE GALVANIZED WIRE OR 1/8" DIAMETER BRAIDED NYLON ROPE.
4. PLACE SOIL EXCAVATED FROM THE TRENCH BEHIND THE ROLL AND HAND TAMP. PLANTWITH SUITABLE HERBACEOUS OR WOODY VEGETATION AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS. VEGETATION SHALL BE PLACED IMMEDIATELY ADJACENT TO THE ROLL TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION, IF SPECIFIED, SHALL BE PLANTED INTO THE FIBER ROLL.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION	FIBER ROLL (EROSION LOG)
NOTES: REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.	REVISIONS MARCH 21, 2008    WHF JANUARY 13, 2009    WHF
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR EROSION LOG (PAY ITEM 653.60)	



PROJECT NAME: SWANTON - ST JOHNSBURY	
PROJECT NUMBER: STP LVRT(I3)	
FILE NAME: z20f239.EPSC.det.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P. DETRICK	DRAWN BY: VTRANS
DESIGNED BY: VTRANS	CHECKED BY: B.M. ROBERTS
EPSC DETAIL SHEET (1 OF 2)	SHEET 27 OF 70





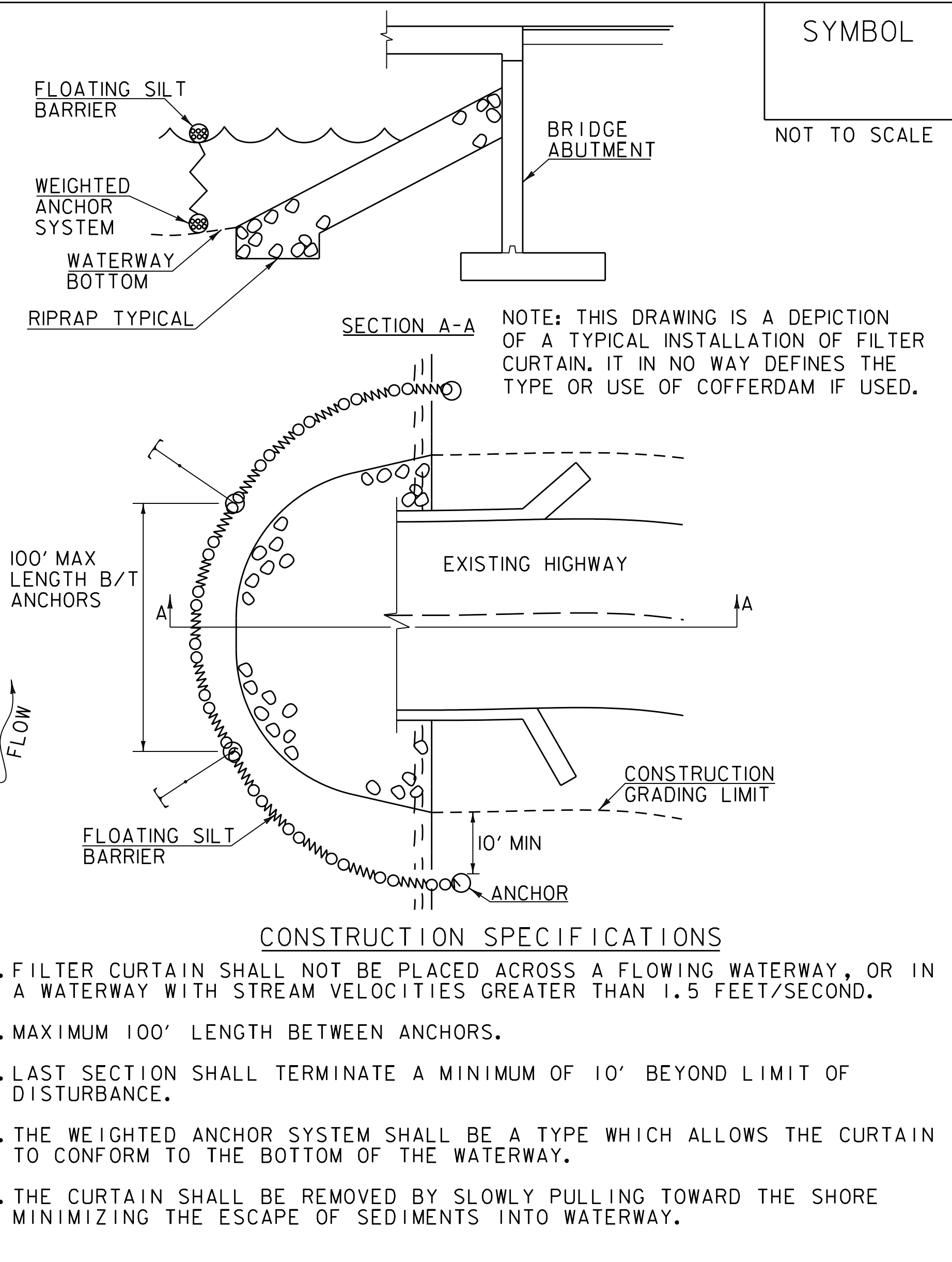
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
ORIGINALLY DEVELOPED BY USDA-NRCS  
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SURFACE ROUGHENING

NOTES:  
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR  
EROSION PREVENTION & SEDIMENT CONTROL -2006- " FROM  
THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL  
GUIDANCE.

THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE  
CONTRACT

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	



FILTER CURTAIN

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH  
SECTION 649 FOR GEOTEXTILE FOR FILTER CURTAIN (PAY  
ITEM 649.6I).

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	
SEPTEMBER 4, 2009	WHF	



PROJECT NAME: SWANTON - ST JOHNSBURY  
PROJECT NUMBER: STP LVRT(I3)

FILE NAME: z20f239.EPSC.det.dgn  
PROJECT LEADER: E.P. DETRICK  
DESIGNED BY: VTRANS  
EPSC DETAIL SHEET (2 OF 2)

PLOT DATE: 3/22/2021  
DRAWN BY: VTRANS  
CHECKED BY: B.M. ROBERTS  
SHEET 28 OF 70



EPSC PLAN NARRATIVE

1. PROJECT DESCRIPTION

THE OVERALL PROJECT INVOLVES REHABILITATION OF THE LAMOILLE VALLEY RAIL TRAIL. THE SPECIFIC WORK INCLUDED IN CONTRACT STP LVRT(13) BEGINS AT THE INTERSECTION OF CHANNEL DRIVE IN WEST DANVILLE AND EXTENDS WESTERLY 17.9 MILES TO MAPLE STREET IN HARDWICK. WORK TO BE PERFORMED UNDER THIS CONTRACT INCLUDES CONSTRUCTION OF TRAIL SURFACES, CLEARING, DITCHING, INSTALLATION OF CULVERS, SIGNING, MISCELLANEOUS STRUCTURE REPAIRS AND BRIDGE MODIFICATIONS INCLUDING DECKING AND RAILING INSTALLATION.

IT IS ANTICIPATED THAT CONSTRUCTION WILL LAST TWO CONSTRUCTION SEASONS.

2. AMOUNT OF DISTURBANCE & RISK EVALUATION

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN FOR CONTRACT STP LVRT(13) IS APPROXIMATELY **59.0 ACRES**.

IN CONJUNCTION WITH OTHER LVRT CONTRACTS, STP LVRT(13) HAS RECEIVED COVERAGE UNDER AN INDIVIDUAL PERMIT FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES. COMPONENTS OF THE PROJECT MAY BE CONSTRUCTED CONCURRENTLY WITH OTHER LVRT PROJECTS, INCLUDING STP LVRT(10), STP LVRT(11), AND STP LVRT(12).

THE MAXIMUM CONCURRENT EARTH DISTURBANCE FOR THE COMBINED LVRT PROJECTS PERMITTED UNDER THE INDC IS **16.3 ACRES**. THE MAXIMUM CONCURRENT EARTH DISTURBANCE ASSOCIATED WITH STP LVRT(13) IS **5.0 ACRES**. THE CONTRACTOR MUST COORDINATE WITH THE VTRANS RESIDENT ENGINEER AND DESIGNATED ENVIRONMENTAL SPECIALIST TO ENSURE THAT THIS LIMIT IS NOT EXCEEDED DURING THE COURSE OF THE PROJECT.

ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

3. MAJOR COMPONENTS & SEQUENCING

THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT OPEN TO EROSION AT ANY GIVEN TIME.

DUE TO THE LINEAR NATURE OF THIS PROJECT, IT IS POSSIBLE THAT MULTIPLE PORTIONS OF TRAIL WILL BE UNDER CONSTRUCTION SIMULTANEOUSLY. EACH SITE VARIES IN NECESSARY ACTIVITIES, ALTHOUGH THE GENERAL MAJOR COMPONENTS AND SEQUENCE IS LISTED BELOW, AS NEEDED. THE CONTRACTOR SHALL DETERMINE THE FINAL SEQUENCING USED.

- ESTABLISH PERIMETER CONTROLS AND MARK PROJECT BOUNDARIES AT LOCATIONS WHERE NEEDED OR AS DIRECTED BY THE RESIDENT ENGINEER
- INSTALL SEDIMENT CONTROL MEASURES
- TREE / VEGETATION CLEARING
- CONSTRUCT TEMPORARY ACCESS ROADS AS NEEDED
- DEMOLISH AND REMOVE EXISTING INFRASTRUCTURE AS NEEDED
- CONSTRUCT PROPOSED INFRASTRUCTURE AS NEEDED
- REGRADE / BUILD FINAL TRAIL SURFACE TRAIL
- FINAL STABILIZATION WITH TRAIL MATERIAL, SEED AND RECP OR STONE FILL
- REMOVE SEDIMENT CONTROLS AND PERIMETER CONTROLS UPON ESTABLISHMENT OF FINAL STABILIZATION

4. SITE DESCRIPTION

4.1 VEGETATED BUFFERS

MAINTAINING VEGETATED BUFFERS ALONG STREAM BANKS, WETLANDS OR OTHER SENSITIVE AREAS IS A CRUCIAL EROSION AND SEDIMENT CONTROL MEASURE THAT SHOULD BE IMPLEMENTED WHEREVER POSSIBLE.

THIS PROJECT DOES NOT RELY ON VEGETATED BUFFERS AS A MITIGATING RISK FACTOR. CULVERT AND BRIDGE REPAIR WORK WILL OCCUR WITHIN OR IMMEDIATELY ADJACENT TO STREAM BANKS. AT SOME LOCATIONS, IN-STREAM WORK IS REQUIRED TO REPLACE THE EXISTING STRUCTURES. WORK WITHIN WETLANDS AND OTHER RESOURCE AREAS HAS BEEN AVOIDED AND MINIMIZED TO THE EXTENT PRACTICABLE.

4.2 STREAM CROSSINGS

THIS PROJECT INCLUDES 24 STREAM CROSSINGS, AS DESCRIBED IN SECTION 5.1 BELOW. WORK WITHIN THE WATER IS BEING AUTHORIZED THROUGH THE VT ANR DEC RIVER MANAGEMENT PROGRAM AND THE US ARMY CORPS OF ENGINEERS.

4.3 WETLANDS

THE LVRT(13) PROJECT INVOLVES 23,500 SF OF WETLAND AND 14,500 SF OF WETLAND BUFFER IMPACTS. THE WORK WITHIN THESE AREAS IS BEING AUTHORIZED THROUGH THE VT ANR WETLANDS OFFICE AND/OR THE US ARMY CORPS OF ENGINEERS.

4.4 TOPOGRAPHY

THE TOPOGRAPHY OF THE OVERALL PROJECT AREA IS GENERALLY SLOPED FROM THE TOP OF THE RAILWAY EMBANKMENT TO THE TOE OF THE SLOPE. IN SOME CASES, THE TOE OF SLOPE IS NEAR THE EDGE OF A STREAM CHANNELS OR ROADWAY CROSSINGS. THE PROJECT IS GENERALLY LOCATED IN RURAL AREAS WITH MINIMAL SURROUNDING DEVELOPMENT.

4.5 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF A MIXTURE OF GRASSES, SHRUBS, AND TREES. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE PROJECT. UPON COMPLETION, THE DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES AS DESCRIBED IN THE TURF ESTABLISHMENT DETAIL, UNLESS NOTED OTHERWISE. CERTAIN EMBANKMENTS WILL BE REGRADED SUCH THAT FINAL STABILIZATION REQUIRES THE PLACEMENT OF STONE FILL.

4.6 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE. SOILS ON THE PROJECT SITE INCLUDE:

ADAMS LOAMY FINE SAND, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.15  
BUCKLAND FINE SANDY LOAM, 15 TO 25 PERCENT SLOPES, "K FACTOR" = 0.32  
BUCKLAND FINE SANDY LOAM, 15 TO 35 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.32  
BUCKLAND FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.32  
BUCKLAND FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.32  
BUCKLAND FINE SANDY LOAM, 35 TO 60 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.32  
BUCKLAND FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.32  
BUCKLAND FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.32  
BUCKSPORT MUCK, 0 TO 2 PERCENT SLOPES, "K FACTOR" = 0.00  
CABOT SILT LOAM, 0 TO 8 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.49  
CABOT SILT LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.43  
CABOT SILT LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.43  
CABOT SILT LOAM, 8 TO 15 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.43  
CHARLES SILT LOAM, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED, "K FACTOR" = 0.43  
COLTON-DUXBURY COMPLEX, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.28  
CROGHAN LOAMY FINE SAND, 0 TO 3 PERCENT SLOPES, "K FACTOR" = 0.24  
DUMMERSTON VERY FINE SANDY LOAM, 15 TO 35 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.37  
DUMMERSTON VERY FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.37  
IRASBURG LOAMY FINE SAND, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.20  
IRASBURG LOAMY FINE SAND, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.20  
MONADNOCK FINE SANDY LOAM, 15 TO 25 PERCENT SLOPES, "K FACTOR" = 0.32  
MONADNOCK FINE SANDY LOAM, 15 TO 35 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.37  
MONADNOCK FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.32  
MONADNOCK FINE SANDY LOAM, 35 TO 60 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.37  
MONADNOCK FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, "K FACTOR" = 0.32  
MONADNOCK FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.37  
MOOSILAUKE VERY FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES, "K FACTOR" = 0.37  
PEACHAM MUCKY PEAT, 0 TO 8 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.43  
PODUNK FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED, "K FACTOR" = 0.24  
RIFLE MUCK, 0 TO 2 PERCENT SLOPES, PONDED, "K FACTOR" = 0.43  
RUMNEY FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED, "K FACTOR" = 0.20  
SHEEPSCOT GRAVELLY FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, "K FACTOR" = 0.15  
TUNBRIDGE-MONADNOCK COMPLEX, 15 TO 35 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.26  
URBAN LAND-ADAMS-NICHOLVILLE COMPLEX, 0 TO 8 PERCENT SLOPES, "K FACTOR" = 0.00  
VERSHIRE-DUMMERSTON COMPLEX, 8 TO 15 PERCENT SLOPES, ROCKY, "K FACTOR" = 0.36  
VERSHIRE-LOMBARD COMPLEX, 15 TO 25 PERCENT SLOPES, ROCKY, "K FACTOR" = 0.43  
VERSHIRE-LOMBARD COMPLEX, 15 TO 35 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.41  
VERSHIRE-LOMBARD COMPLEX, 8 TO 15 PERCENT SLOPES, ROCKY, "K FACTOR" = 0.43  
VERSHIRE-LOMBARD COMPLEX, 8 TO 15 PERCENT SLOPES, VERY STONY, "K FACTOR" = 0.41  
WONSQUEAK AND PONDICHERRY MUCKS, 0 TO 2 PERCENT SLOPES, "K FACTOR" = 0.32

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING:  
0.0-0.23 = LOW EROSION POTENTIAL  
0.24-0.36 = MODERATE EROSION POTENTIAL  
0.37 AND HIGHER = HIGH EROSION POTENTIAL

4.7 OTHER SENSITIVE RESOURCES

NO ADDITIONAL SENSITIVE RESOURCE AREAS ARE ANTICIPATED TO BE IMPACTED BY THE PROJECT.

5. DRAINAGE

5.1 RECEIVING WATERS

THIS PROJECT INVOLVES IMPROVEMENTS AT EXISTING OR REPLACEMENT STRUCTURES (CULVERT OR BRIDGE) AT 24 EPHEMERAL, INTERMITTENT, AND PERENNIAL STREAM CROSSINGS. IMPROVEMENTS AT BRIDGE 34 (STANNARD BROOK) AND BRIDGE 35 (LAMOILLE RIVER) HAVE BEEN PREVIOUSLY AUTHORIZED AS PART OF PROJECT STP LVRT(10).

MAJOR RECEIVING WATERS FOR THE PROJECT INCLUDE JOE’S BROOK, PERKINS MEADOW BROOK, AN UNNAMED TRIBUTARY TO PERKINS MEADOW BROOK, MORRILL BROOK, AN UNNAMED TRIBUTARY TO HAYNESVILLE BROOK, STEVENS BROOK, STANNARD BROOK, GREENSBORO BROOK, BAILEY BROOK, AND THE LAMOILLE RIVER (AND VARIOUS TRIBUTARIES TO IT).

5.2 DISCHARGE POINTS

DUE TO THE NATURE OF THE PROJECT AREA, THERE ARE NO DISCRETE DISCHARGE POINTS ASSOCIATED WITH THE TRAIL WORK ON THIS PROJECT. RUNOFF FROM THE PROJECT AREA WILL DRAIN OFF THE TRAIL EMBANKMENT TOWARD THE CLOSEST RECEIVING WATER, MAY ENTER THE RECEIVING WATERS IN MULTIPLE LOCATIONS.

5.3 CONVEYANCE/FLOW PATH FROM PROJECT TO WATERS

THE MAJORITY OF THE PROJECT IS NOT CURBED AND RUNOFF DRAINS OVERLAND ACROSS ADJACENT VEGETATED SIDE SLOPES BEFORE REACHING THE RECEIVING WATER. DUE TO THE NATURE OF THE PROJECT, IN-STREAM WORK WILL BE REQUIRED AT SOME SITES, THEREFORE WILL HAVE A LIMITED VEGETATED DISCONNECTION AREA. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES WILL LIMIT SEDIMENT DISCHARGE AT THESE LOCATIONS.

6. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

THE MEASURES INCLUDED IN THIS PLAN ARE PROVIDED AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. IT IS EXPECTED THAT THE CONTRACTOR MAY USE THIS PLAN, WITH ADJUSTMENTS AS NECESSARY, BASED ON THEIR SPECIFIC MEANS AND METHODS OF CONSTRUCTION.

APPLYING THESE MEASURES THROUGHOUT CONSTRUCTION IS CRITICAL TO THEIR SUCCESS IN MINIMIZING SEDIMENT TRANSPORT TO THE RECEIVING WATERS. REFER TO THE DETAILS INCLUDED IN THESE PLANS AND THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION’S VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR SPECIFIC GUIDANCE.

6.1 IDENTIFY LIMITS OF DISTURBANCE

SITE BOUNDARIES AND AREAS CONSTRUCTION EQUIPMENT CAN ACCESS SHALL BE DELINEATED.

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC.).

6.2 LIMIT CONCURRENT DISTURBANCE

LIMITING THE AMOUNT OF SOIL EXPOSED AT ONE TIME REDUCES THE POTENTIAL EROSION ON SITE. CONCURRENT EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY AND EMPLOYING STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE.

6.3 STABILIZE DISTURBED AREAS  
6.3.1 ACCESS POINTS/ENTRANCE/EXITS

TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTORS PROGRESS SCHEDULE.



PROJECT NAME: SWANTON - ST JOHNSBURY	
PROJECT NUMBER: STP LVRT(I3)	
FILE NAME: z20f239_EPSC_narrative.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P.DETRICK	DRAWN BY: C.K.FORD
DESIGNED BY: C.K.FORD	CHECKED BY: E.P.DETRICK
EPSC NARRATIVE (SHEET 1 OF 2)	SHEET 29 OF 70



6.3.2 TEMPORARY MEASURES FOR EXPOSED AREAS DURING CONSTRUCTION

ALL AREAS OF EARTH DISTURBANCE MUST HAVE STABILIZATION IN PLACE WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.

6.3.3 PERMANENT STABILIZATION AT FINAL GRADE

EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.

SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, ROLLED EROSION CONTROL PRODUCT, TYPE I SHALL BE USED INSTEAD OF MULCH. FOR SLOPES STEEPER THAN 1:2, FINAL STABILIZATION WITH STONE RIPRAP IS PROPOSED. STONE ARMORING OF STREAM EMBANKMENTS ARE PROPOSED TO BE STABILIZED WITH THE APPROPRIATELY SIZED STONE BASED ON HYDRAULIC MODELING, AS SHOWN IN THE PLANS.

6.4 DIVERT UPLAND RUNOFF

DIVERSIONARY MEASURES SHALL BE USED TO INTERCEPT RUNOFF FROM ABOVE THE CONSTRUCTION AND DIRECT IT AROUND THE DISTURBED AREA SO THAT CLEAN WATER DOES NOT BECOME MUDDIED WHILE TRAVELING OVER EXPOSED SOILS ON THE CONSTRUCTION SITE.

RUNOFF FROM UPGRADIENT AREAS MAY NEED TO BE DIVERTED AWAY FROM THE PROJECT AREA. THE CONTRACTOR SHALL REFER TO THE LOW RISK HANDBOOK FOR GUIDANCE.

6.5 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS (E.G. SILT FENCE AND EROSION LOGS) SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED ON THE DOWNHILL SIDE OF CONSTRUCTION ACTIVITIES, PRIOR TO ANY UP-SLOPE WORK.

DUE TO THE LINEAR NATURE OF THE PROJECT AND THE VEGETATED CONDITION OF THE EXISTING EMBANKMENT, SEDIMENT BARRIERS ARE NOT REQUIRED ALONG THE ENTIRE LENGTH OF THE PROJECT. AREAS WHERE SEDIMENT BARRIERS ARE REQUIRED INCLUDE SITES WHERE BRIDGE AND CULVERT REPLACEMENT OR REPAIRS ARE BEING MADE, PAUSE PLACES ARE BEING CONSTRUCTED, OR OTHER ACTIVITIES ARE OCCURRING THAT DISTURB EMBANKMENT SIDE SLOPES AND COULD POTENTIALLY RESULT IN SEDIMENT BEING DISCHARGED.

WHERE REQUIRED, SEDIMENT BARRIERS WILL BE INSTALLED ALONG THE CONTOUR AND AS PROPOSED ON THE EPSC PLAN. WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF WETLANDS AND RECEIVING WATERS. ADDITIONAL SEDIMENT BARRIERS ARE TO BE DEPLOYED AS NECESSARY DURING CONSTRUCTION TO MINIMIZE SEDIMENT DISCHARGE OR AS DIRECTED BY THE RESIDENT ENGINEER.

6.6 SLOW DOWN CHANNELIZED RUNOFF

CHECK STRUCTURES SHALL BE UTILIZED TO REDUCE THE VELOCITY, AND THUS THE EROSION POTENTIAL, OF CONCENTRATED FLOW IN CHANNELS.

TEMPORARY STONE CHECK DAMS MAY BE REQUIRED IN CONJUNCTION WITH WATER CONTROL AT CULVERT REPAIR AND REPLACEMENT SITES.

7. CONSTRUCT PERMANENT CONTROLS

PERMANENT STORMWATER TREATMENT DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH PERMIT CONDITIONS.

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED TO BE NEEDED OR DESIGNED.

8. DEWATERING

DISCHARGE FROM DEWATERING ACTIVITIES THAT FLOWS OFF OF THE CONSTRUCTION SITE MUST NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE VERMONT WATER QUALITY STANDARDS. DEWATERED STORMWATER OR GROUNDWATER MUST BE FILTERED AND ROUTED IN A MANNER THAT DOES NOT RESULT IN VISIBLY TURBID DISCHARGES TO WATERS.

DEWATERING OF SURFACE WATER WITHIN A COFFERDAM IS ANTICIPATED DURING THE REPAIR OR REPLACEMENT OF STRUCTURES ADJACENT TO WETLANDS AND WATERWAYS. THE FILTER BAG DETAIL AND PAY ITEM HAVE BEEN INCLUDED AS A POTENTIAL TREATMENT MEASURE FOR THIS PURPOSE, HOWEVER THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE SHALL BE PAID FOR UNDER CONTRACT ITEM 653.45.

9. OFF-SITE AREAS

OFF-SITE WASTE AND BORROW AREAS HAVE NOT BEEN IDENTIFIED FOR THIS PROJECT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PERMIT, AS NECESSARY, ANY OFF-SITE AREAS THAT ARE NEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 105.25 - 105.28. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES NECESSARY FOR WASTE, BORROW, AND STAGING AREAS OUTSIDE THE PROJECT LIMITS SHALL BE PAID FOR PER 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

VEHICLE AND EQUIPMENT STORAGE AREAS OR AREAS ADJACENT TO CONSTRUCTION TRAILERS OR OTHER HIGH TRAFFIC AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 12” OF GRAVEL. FOLLOWING COMPLETION OF CONSTRUCTION, ALL NON-NATIVE MATERIALS SHALL BE REMOVED FROM THE STAGING AREA. COMPACTED, RUTTED, OR OTHERWISE DISTURBED SOILS SHALL BE TILLED, RAKED, SEEDED AND MULCHED.

ERODIBLE MATERIALS STOCKPILED WITHIN THE MATERIAL STORAGE AREAS SHALL BE ISOLATED WITH SILT FENCE OR OTHER ACCEPTABLE SEDIMENT BARRIER. SOIL STOCKPILED ON THE SITE SHALL BE SEEDED AND MULCHED.

10. WINTER CONSTRUCTION

CONSTRUCTION ACTIVITIES MAY CONTINUE INTO THE WINTER CONSTRUCTION SEASON, DEPENDING ON ACTUAL FIELD AND WEATHER CONDITIONS. IF ACTIVITIES ARE ON-GOING BETWEEN OCTOBER 15 AND APRIL 15, THE CONTRACTOR SHALL FOLLOW REQUIREMENTS FOR WINTER CONSTRUCTION, AS DEFINED IN SPECIFIC PERMIT CONDITIONS AND AS FOLLOWS:

- ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- LIMITS OF DISTURBANCE MOVED OR REPLACED TO REFLECT BOUNDARY OF WINTER WORK.
- DEVELOPMENT OF A SNOW MANAGEMENT PLAN THAT INCLUDES:
  - ADEQUATE STORAGE AND CONTROL OF MELT-WATER
  - STORAGE OF CLEARED SNOW TO BE PLACED DOWN SLOPE OF DISTURBED AREAS AND OUT OF STORMWATER TREATMENT STRUCTURES
- AREAS OF DISTURBANCE WITHIN 100 FT OF A WATERBODY MUST HAVE REINFORCED (WOVEN WIRE) SILT FENCE INSTALLED ACROSS THE SLOPE, DOWNGRADIENT OF THE EARTH DISTURBANCE. ALTERNATIVELY, REGULAR, NON-WOVEN WIRE SILT FENCE MAY BE USED IF COMBINED WITH EROSION CONTROL BERM, EROSION LOG, OR STRAW WATTLE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
- MULCH TO BE APPLIED AT A MINIMUM OF 2 INCHES DEPTH WITH 80-90% COVERAGE.
- AREAS OF DISTURBED SOILS MUST BE STABILIZED PRIOR TO ANY RUNOFF-PRODUCING EVENT, WITH THE FOLLOWING EXCEPTION:
  - STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH NO OUTLET AND A DEPTH OF 2 FT OR GREATER (OPEN UTILITY TRENCHES), PROVIDED THAT ANY DEWATERING, IF NECESSARY, IS CONDUCTED AS REQUIRED.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1" THICKNESS.
- USE STONE TO STABILIZE AREAS WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED.

11. INSPECTION & MAINTENANCE

INSPECTION AND MONITORING OF THE PROJECT’S EPSC MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD SPECIFICATION 653.04 MONITORING EROSION PREVENTION AND SEDIMENT CONTROL PLAN, ALONG WITH PERMIT SPECIFIC INSPECTION REQUIREMENTS.

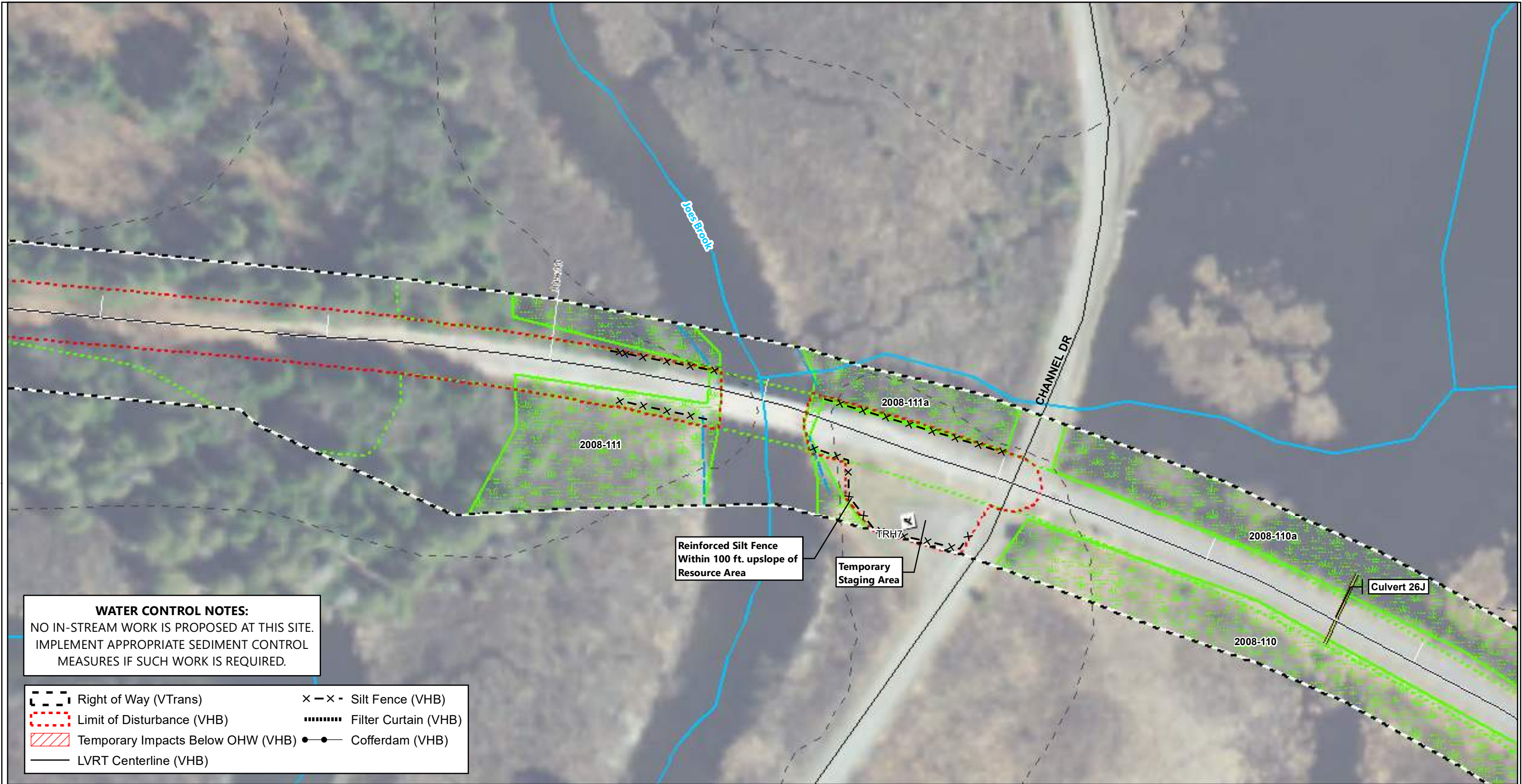
THE CONTRACTOR SHALL PROVIDE A COPY OF THEIR INSPECTION FORM AS PART OF THEIR EPSC PLAN.

ALL EPSC MEASURES SHALL BE REGULARLY MAINTAINED AND SHALL BE CHECKED FOR SEDIMENT BUILD-UP. SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED SITE WHERE IT WILL NOT BE SUBJECT TO EROSION.



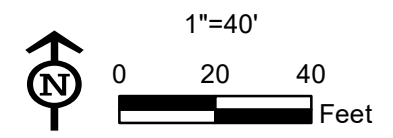
PROJECT NAME: SWANTON - ST JOHNSBURY	
PROJECT NUMBER: STP LVRT(I3)	
FILE NAME: z20f239_EPSC_narrative.dgn	PLOT DATE: 3/22/2021
PROJECT LEADER: E.P.DETRICK	DRAWN BY: C.K.FORD
DESIGNED BY: C.K.FORD	CHECKED BY: E.P.DETRICK
EPSC NARRATIVE (SHEET 2 OF 2)	SHEET 30 OF 70





LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 27 SITE PLAN

APPLICATION BY:  
VTrans

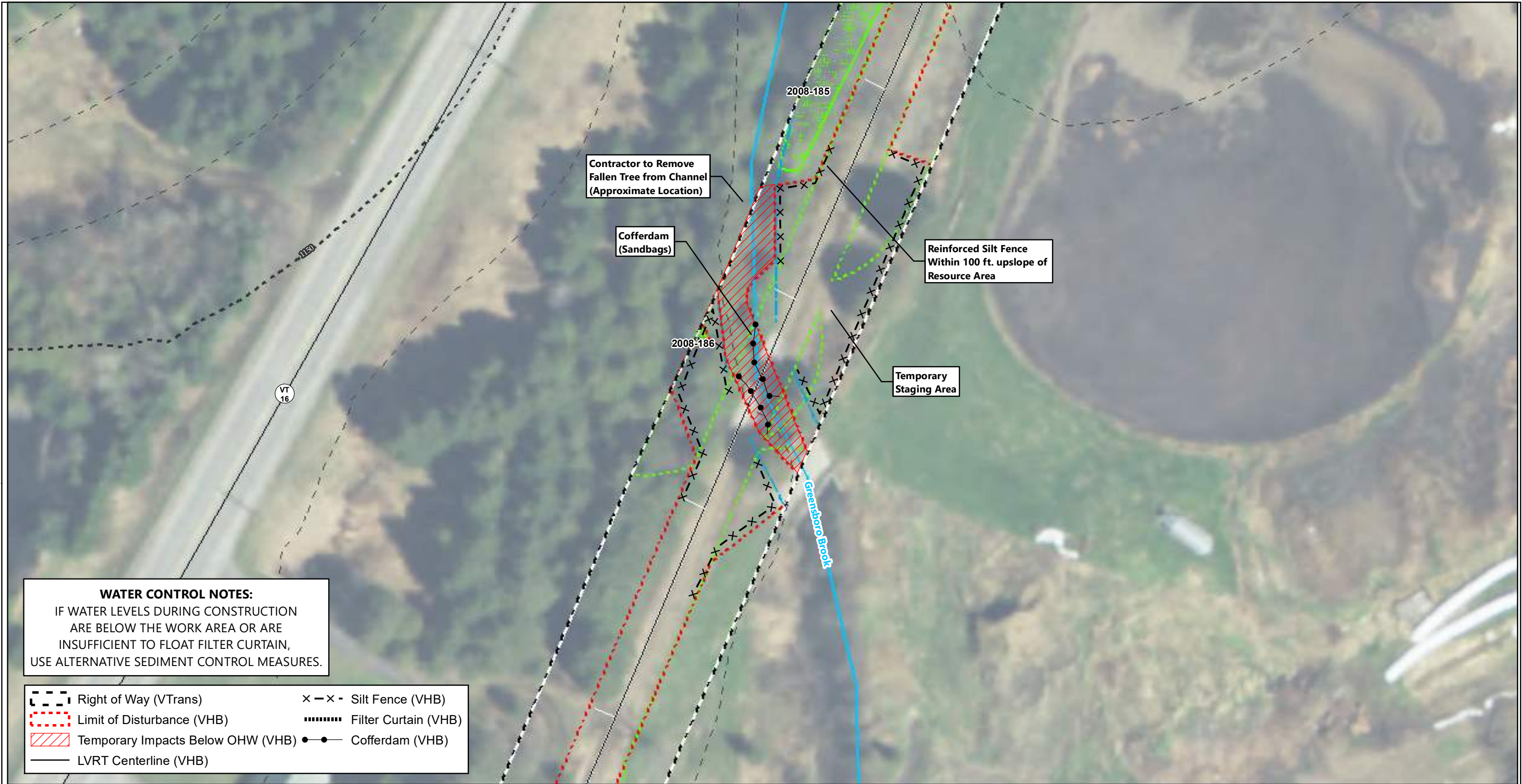


PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 22, 2021

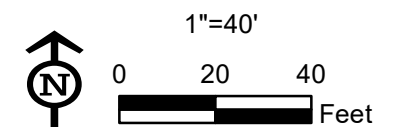
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LAMOILLE VALLEY RAIL TRAIL HARDWICK  
BRIDGE 36 SITE PLAN

APPLICATION BY:  
VTrans



PURPOSE:  
PROPOSED TRAIL IMPROVEMENTS FOR YEAR-ROUND RECREATIONAL USE

DATE:  
March 22, 2021

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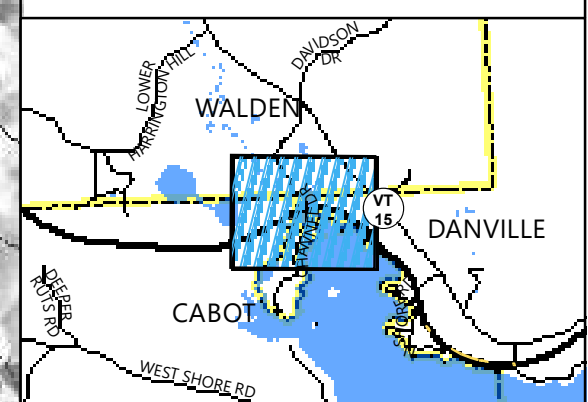


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

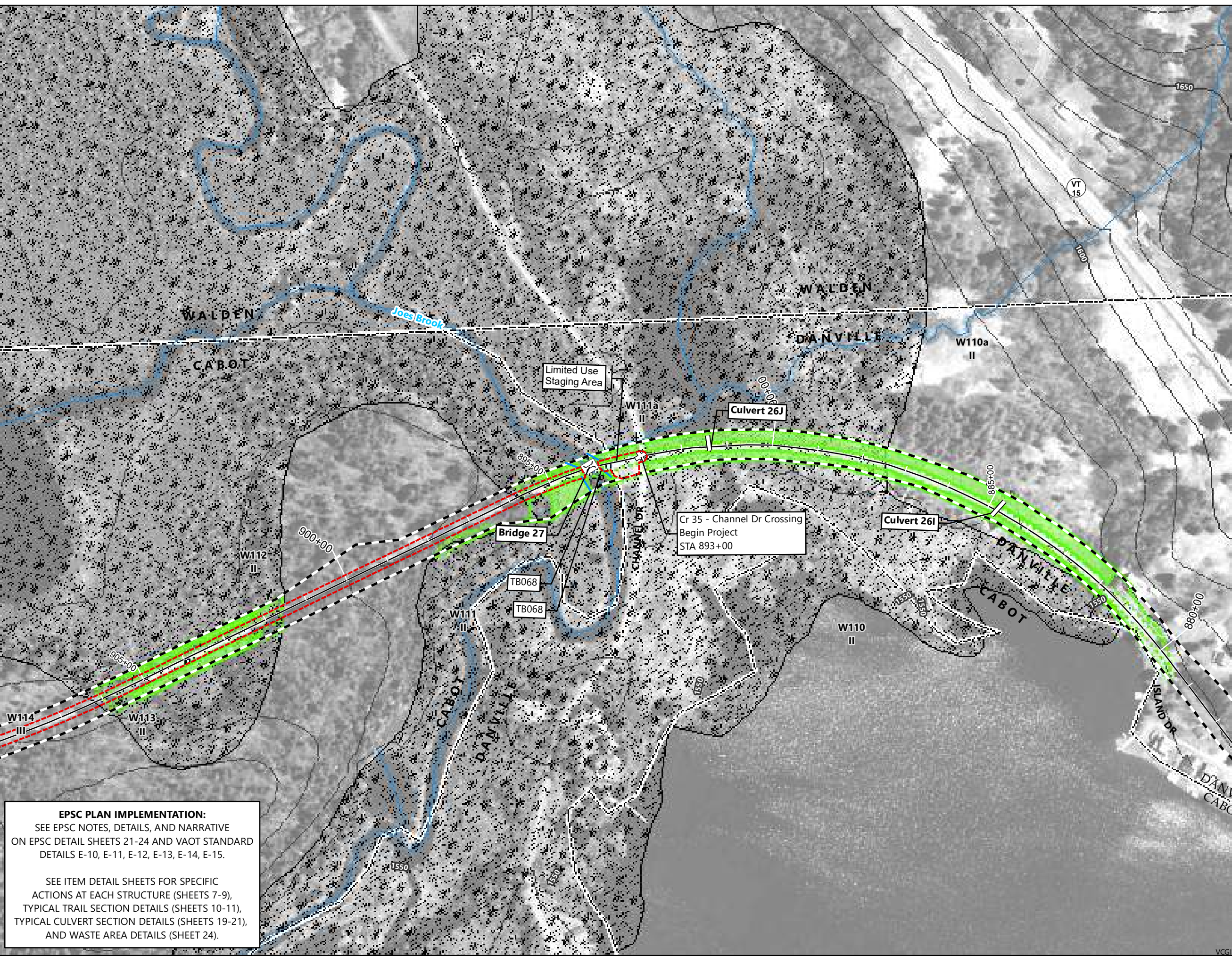
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- |                         |                                |
|-------------------------|--------------------------------|
| — LVRT Centerline       | Proposed Pause Place           |
| Right of Way            | Washouts                       |
| Limit of Disturbance    | RTE Site                       |
| Temp. Impacts Below OHW | RTE Area (2008)                |
| Culvert                 | Class II Wetland Buffer (50ft) |
| Cattlepass              | Delineated Wetland (2017)      |
| +                       | Delineated Stream (2017)       |
| Crossing                | Delineated Stream (2008)       |
| * Renegade Crossing     | VSWI Wetland                   |
| Trailhead               | VHD Stream                     |
| Bridges                 | Other Existing Trail           |
| W001: Wetlands          | Electric Transmission Lines    |
| TB001: Top of Bank      | Parcel Boundary                |
| SC001: Stream Center    | Historic Site                  |



Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).



**EPSC PLAN IMPLEMENTATION:**  
SEE EPSC NOTES, DETAILS, AND NARRATIVE  
ON EPSC DETAIL SHEETS 21-24 AND VAOT STANDARD  
DETAILS E-10, E-11, E-12, E-13, E-14, E-15.  
  
SEE ITEM DETAIL SHEETS FOR SPECIFIC  
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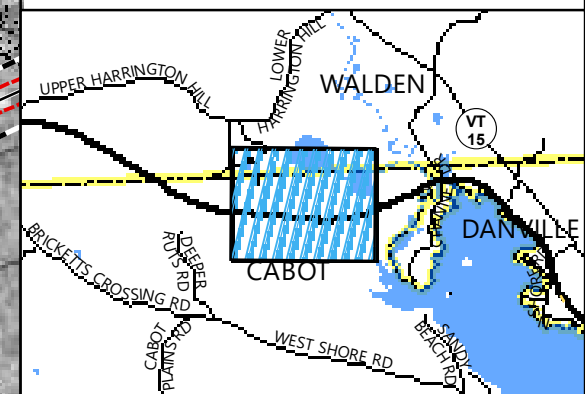


St. Johnsbury - Swanton  
STP-LVRT(13)  
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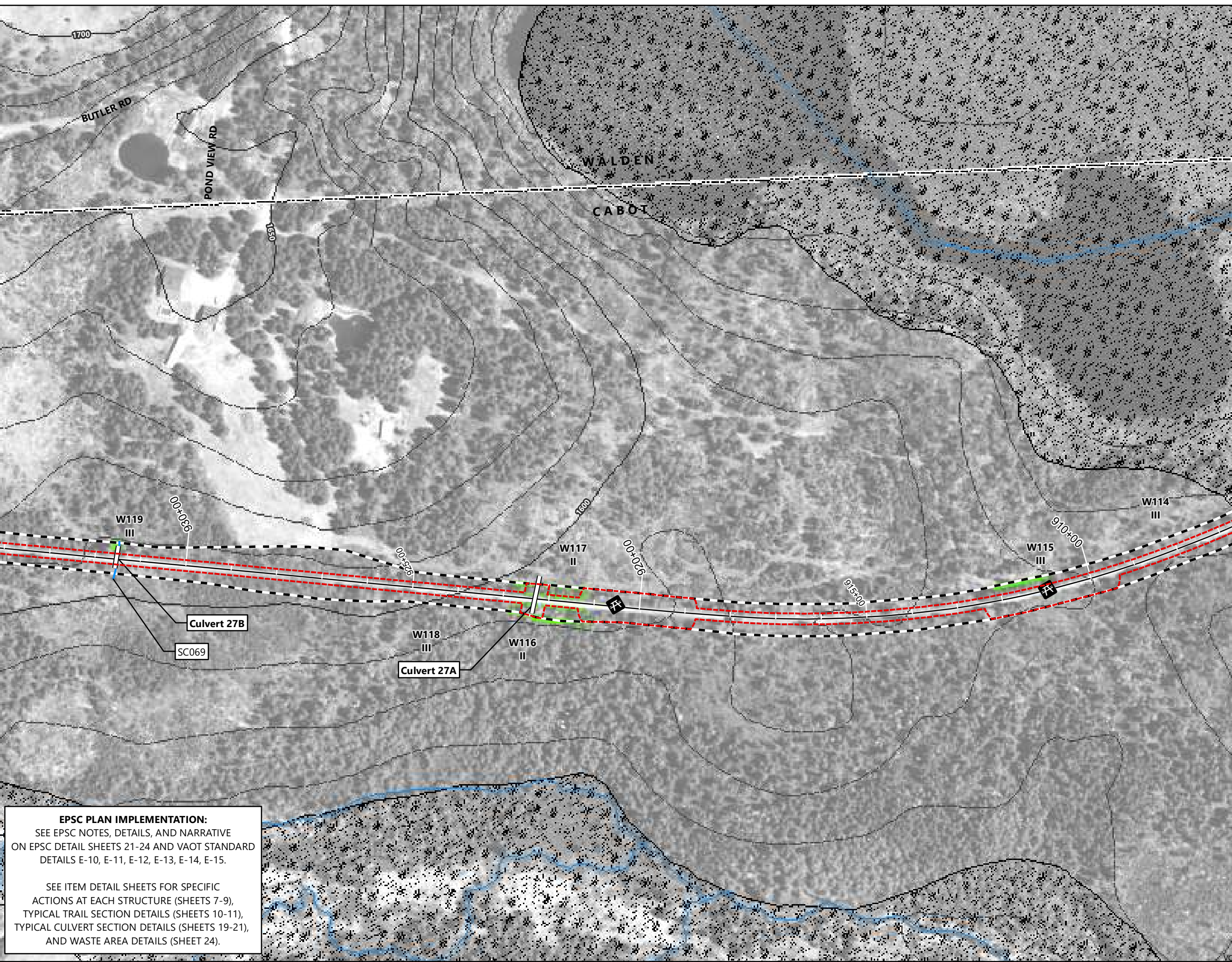
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March 22, 2021

- |                         |                                |
|-------------------------|--------------------------------|
| — LVRT Centerline       | Proposed Pause Place           |
| Right of Way            | Washouts                       |
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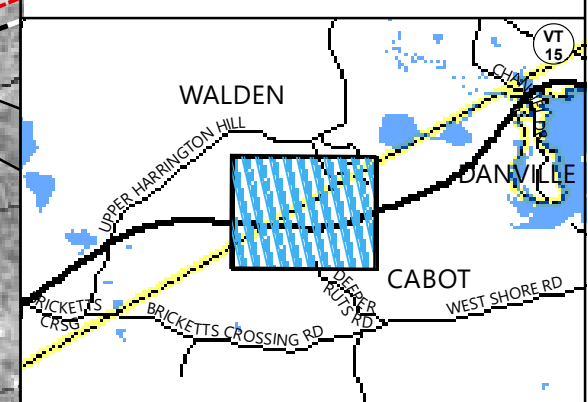


St. Johnsbury - Swanton  
STP-LVRT(13)  
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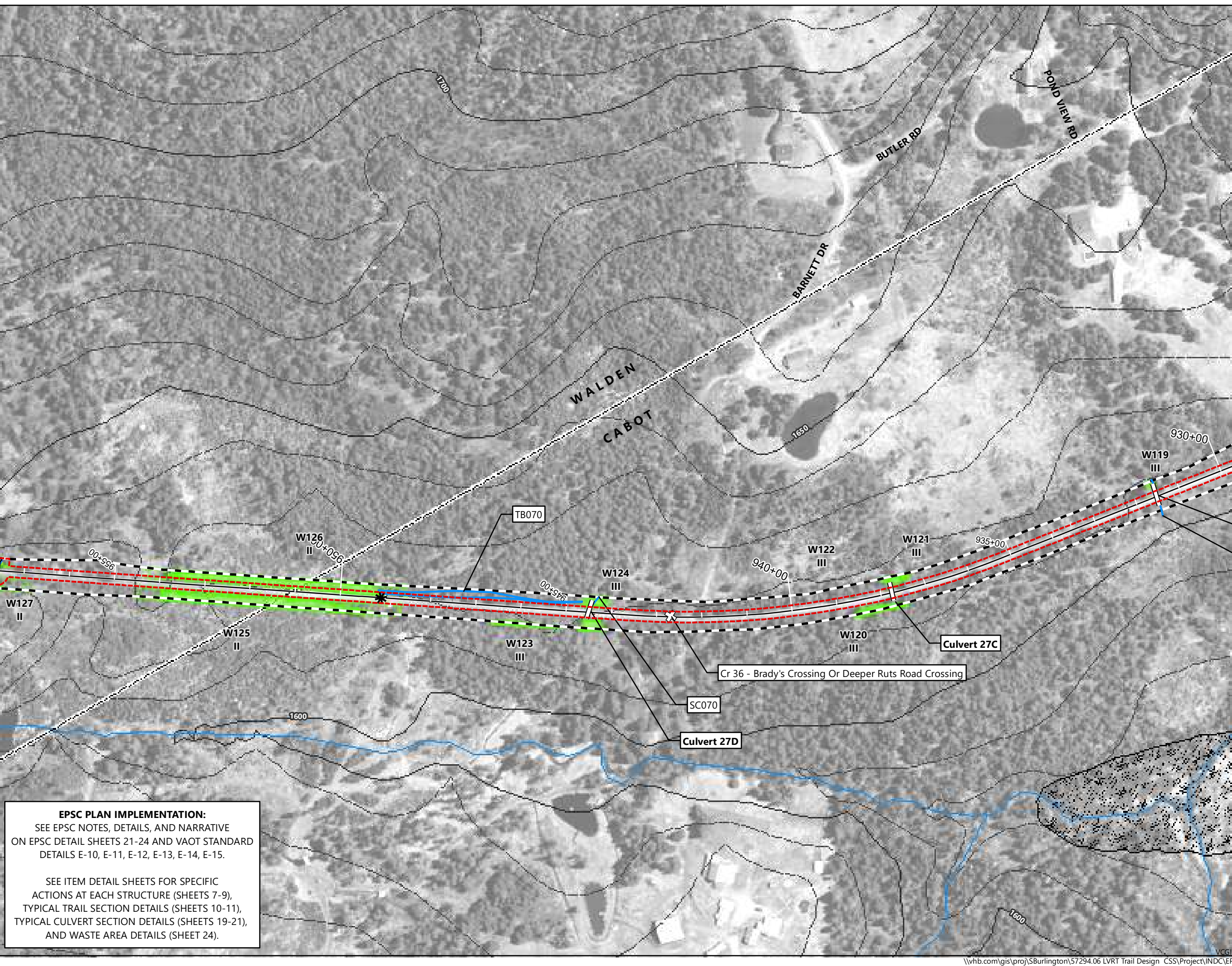
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- LVRT Centerline
  - ▬ Right of Way
  - ▬ Limit of Disturbance
  - ▬ Temp. Impacts Below OHW
  - Culvert
  - ▬ Cattlepass
  - ⊕ Crossing
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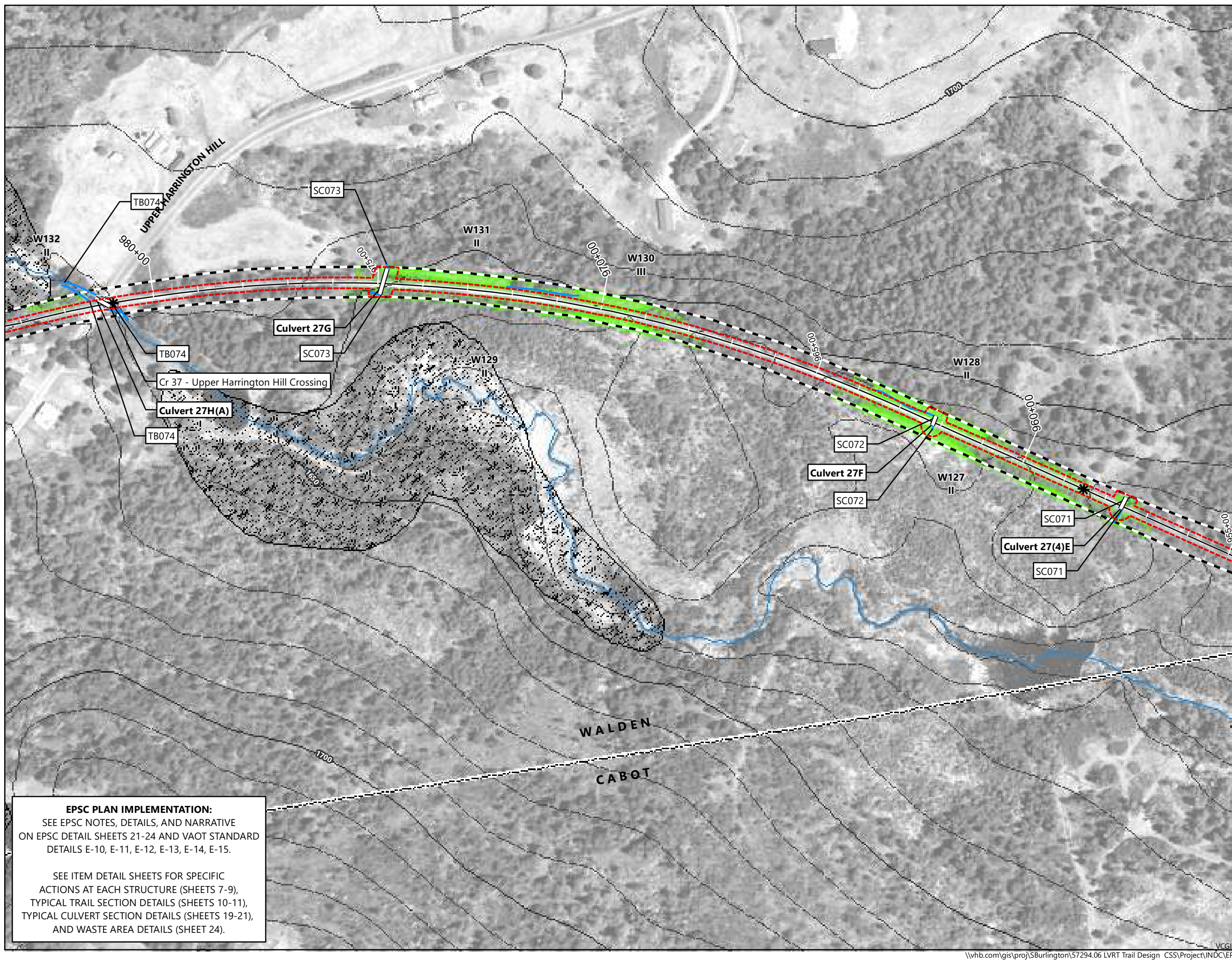
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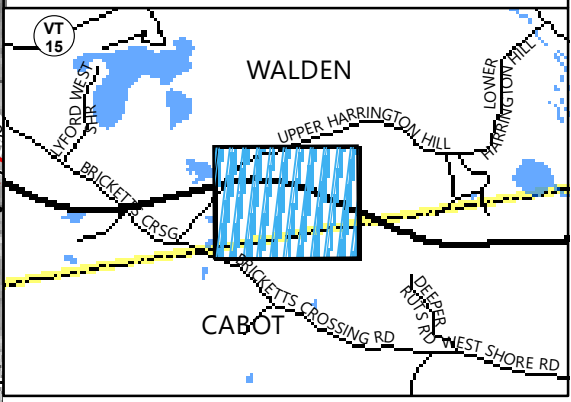
St. Johnsbury - Swanton  
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Lamoille Valley Rail Trail  
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- LVRT Centerline
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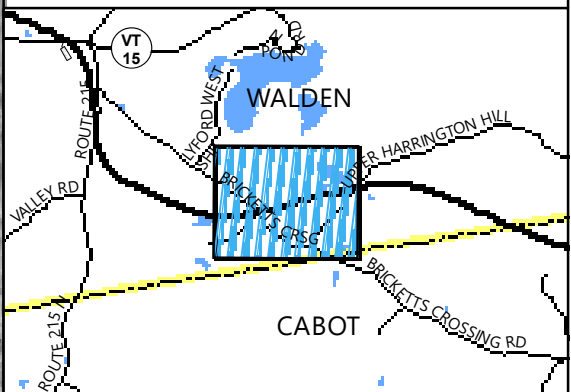


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

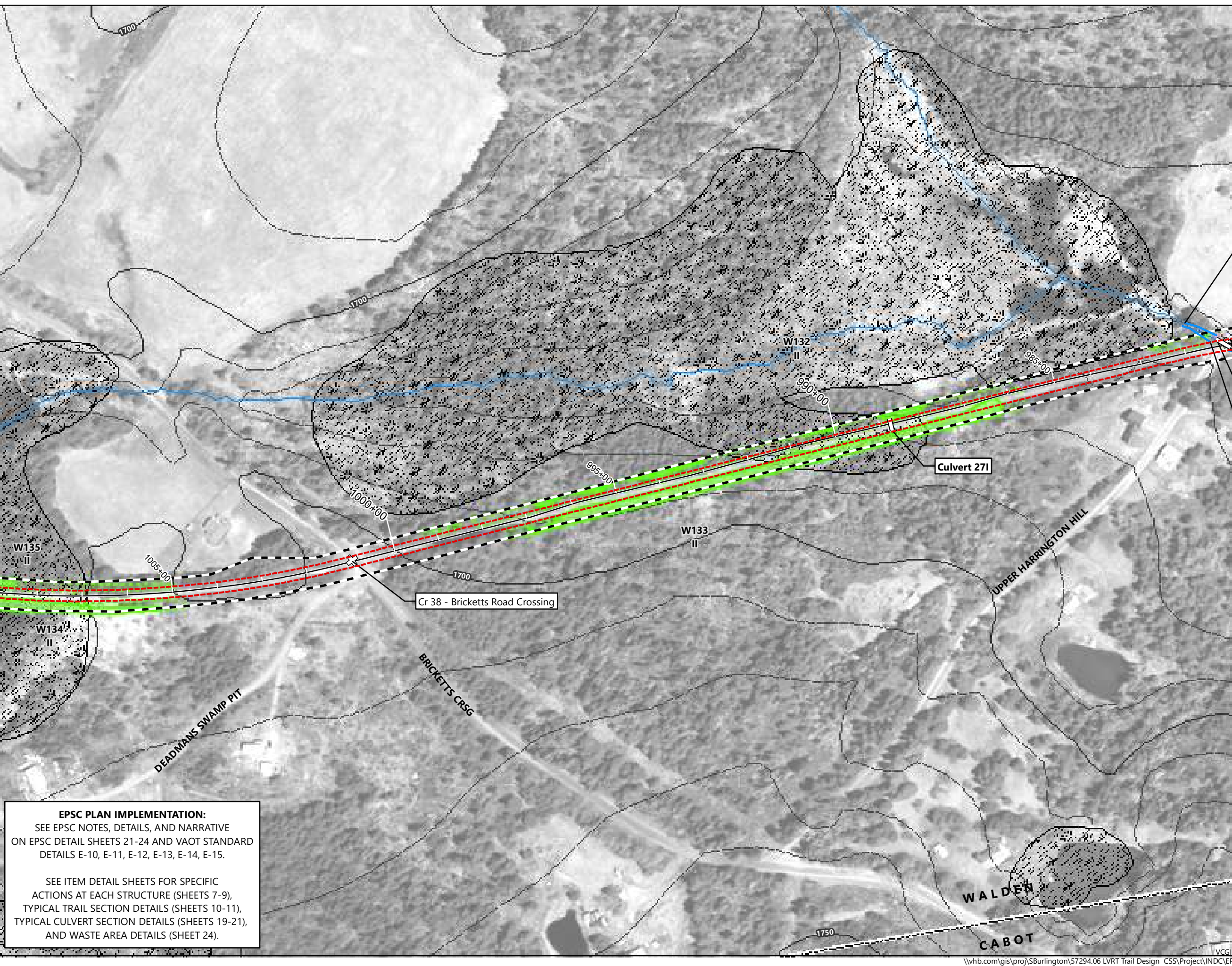
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- |                         |                                |
|-------------------------|--------------------------------|
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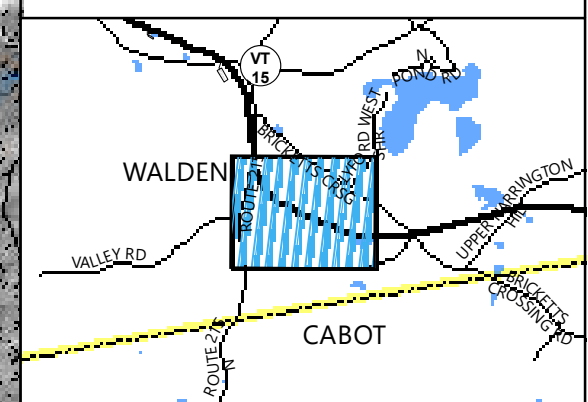


St. Johnsbury - Swanton  
STP-LVRT(13)  
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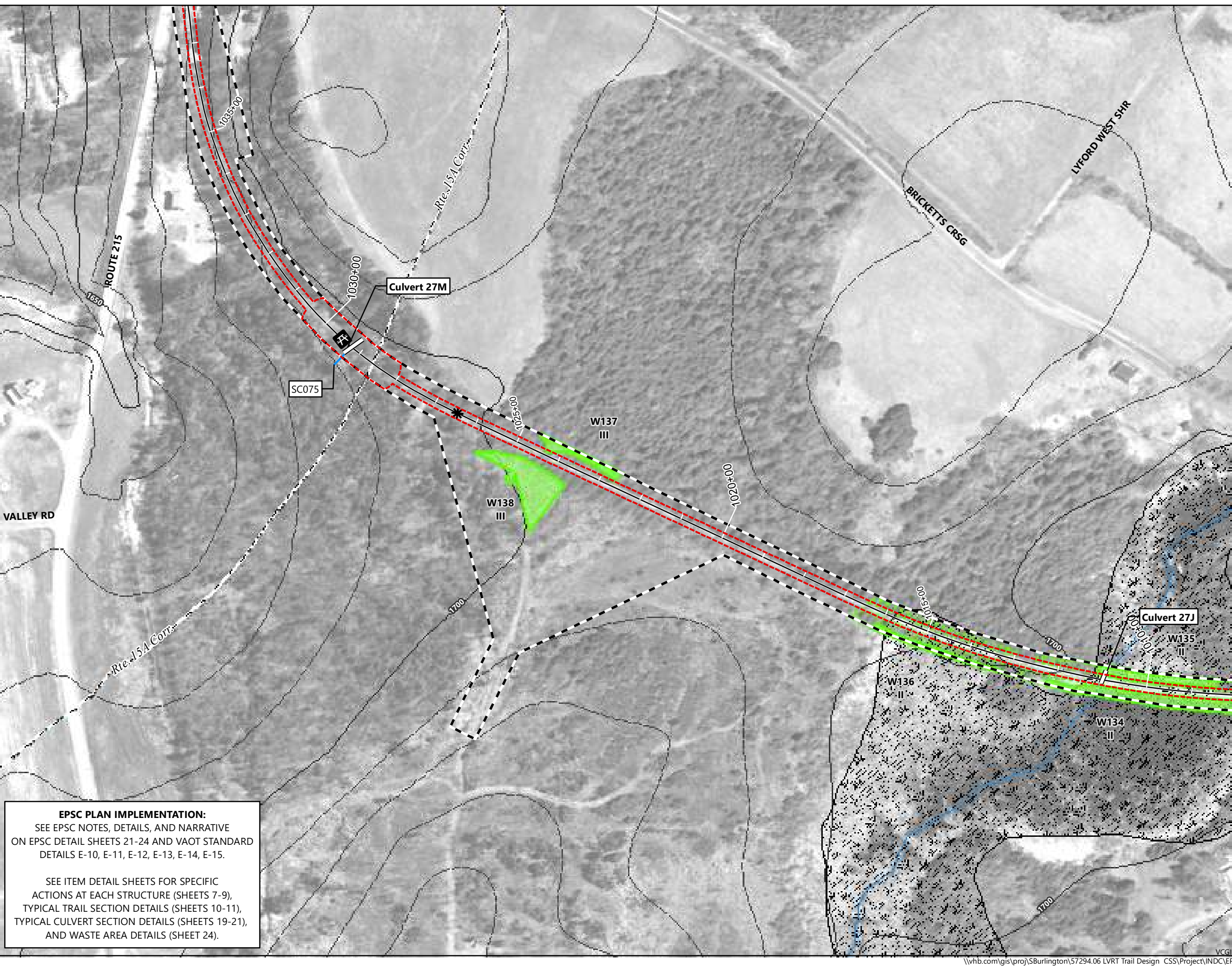
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- LVRT Centerline
  - ▣ Right of Way
  - ▣ Limit of Disturbance
  - ▨ Temp. Impacts Below OHW
  - Culvert
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  - ⊕ Crossing
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  - ◊ Trailhead
  - ≡ Bridges
  - ▣ Proposed Pause Place
  - ▣ Washouts
  - ⊙ RTE Site
  - ▨ RTE Area (2008)
  - ▨ Class II Wetland Buffer (50ft)
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SC001: Stream Center



Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).



**EPSC PLAN IMPLEMENTATION:**  
SEE EPSC NOTES, DETAILS, AND NARRATIVE  
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DETAILS E-10, E-11, E-12, E-13, E-14, E-15.  
  
SEE ITEM DETAIL SHEETS FOR SPECIFIC  
ACTIONS AT EACH STRUCTURE (SHEETS 7-9),  
TYPICAL TRAIL SECTION DETAILS (SHEETS 10-11),  
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AND WASTE AREA DETAILS (SHEET 24).



St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Renegade Crossing

Trailhead

Bridges
- Proposed Pause Place

Washouts

RTE Site

RTE Area (2008)

Class II Wetland Buffer (50ft)

Delineated Wetland (2017)

Delineated Stream (2017)

Delineated Stream (2008)

VSWI Wetland

VHD Stream

Other Existing Trail

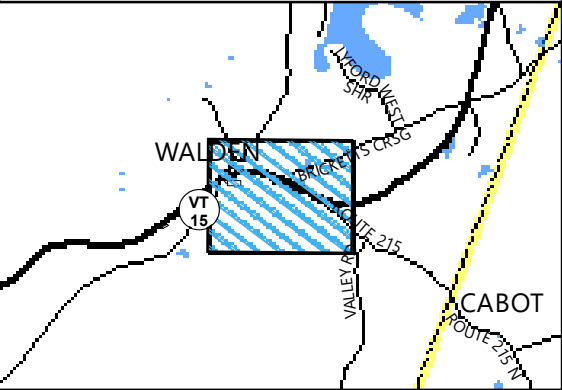
Electric Transmission Lines

Parcel Boundary

Historic Site
- W001: Wetlands

TB001: Top of Bank

SC001: Stream Center



Sources:  
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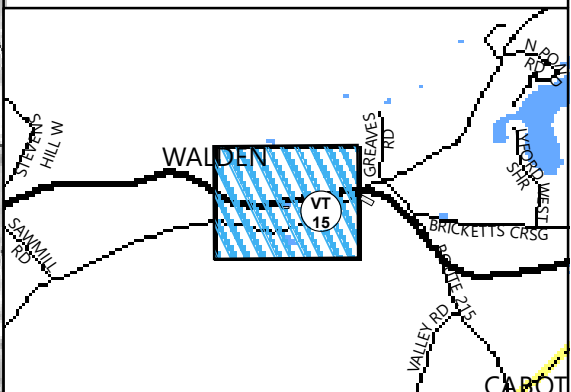


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬜ Right of Way            | ⬜ Washouts                       |
| ⬜ Limit of Disturbance    | ⬜ RTE Site                       |
| ⬜ Temp. Impacts Below OHW | ⬜ RTE Area (2008)                |
| — Culvert                 | ⬜ Class II Wetland Buffer (50ft) |
| ⬜ Cattlepass              | ⬜ Delineated Wetland (2017)      |
| ⬜ Crossing                | — Delineated Stream (2017)       |
| ⬜ Renegade Crossing       | — Delineated Stream (2008)       |
| ⬜ Trailhead               | ⬜ VSWI Wetland                   |
| ⬜ Bridges                 | — VHD Stream                     |
| W001: Wetlands            | ⬜ Other Existing Trail           |
| TB001: Top of Bank        | ⬜ Electric Transmission Lines    |
| SC001: Stream Center      | ⬜ Parcel Boundary                |
|                           | ⬜ Historic Site                  |



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St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Renegade Crossing

Trailhead

Bridges

W001: Wetlands

TB001: Top of Bank

SC001: Stream Center
- Proposed Pause Place

Washouts

RTE Site

RTE Area (2008)

Class II Wetland Buffer (50ft)

Delineated Wetland (2017)

Delineated Stream (2017)

Delineated Stream (2008)

VSWI Wetland

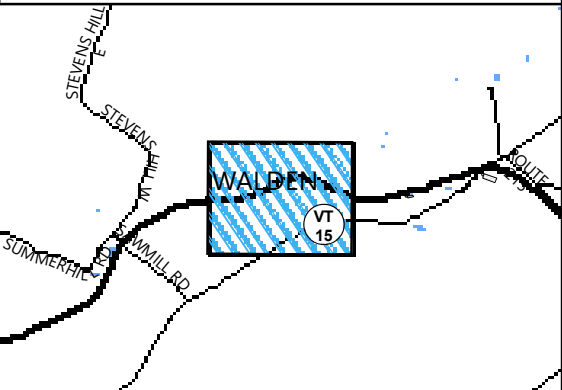
VHD Stream

Other Existing Trail

Electric Transmission Lines

Parcel Boundary

Historic Site



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St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Renegade Crossing

Trailhead

Bridges

W001: Wetlands

TB001: Top of Bank

SC001: Stream Center
- Proposed Pause Place

Washouts

RTE Site

RTE Area (2008)

Class II Wetland Buffer (50ft)

Delineated Wetland (2017)

Delineated Stream (2017)

Delineated Stream (2008)

VSWI Wetland

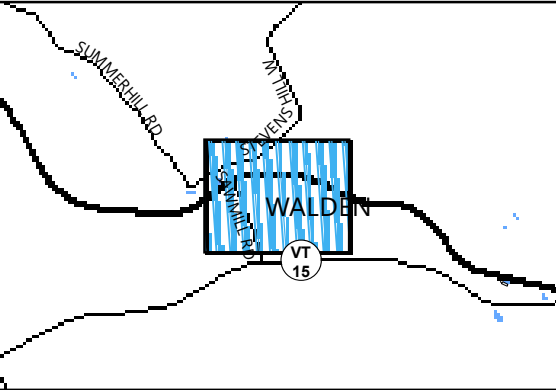
VHD Stream

Other Existing Trail

Electric Transmission Lines

Parcel Boundary

Historic Site



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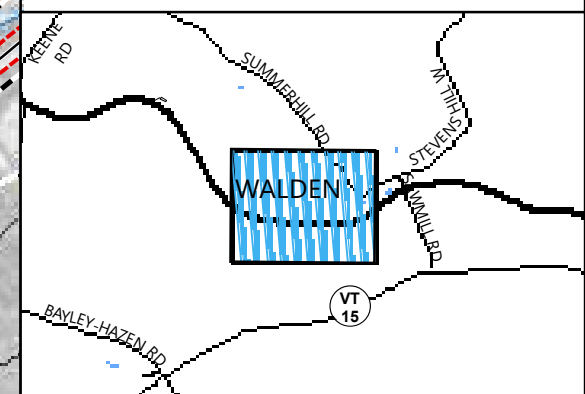
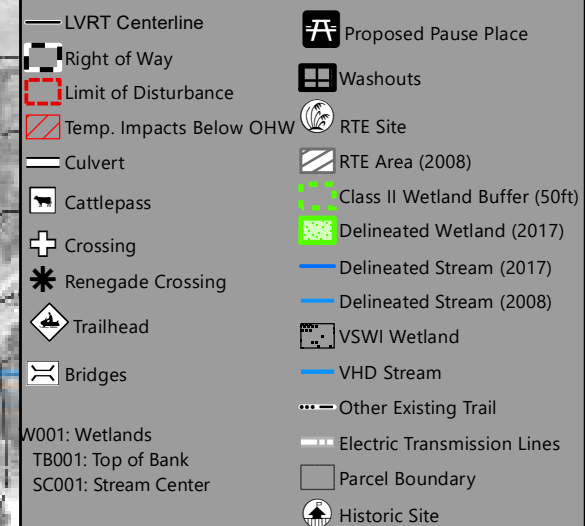


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March 22, 2021



**Sources:** Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundaries, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).

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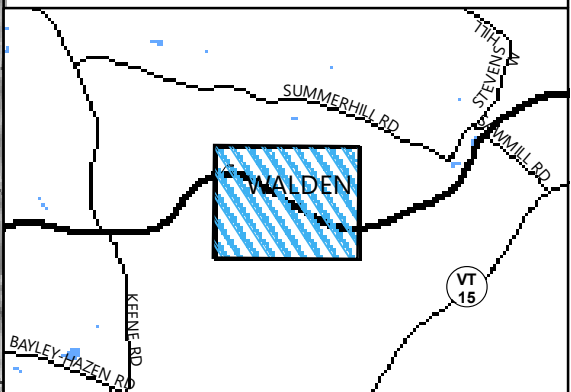


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

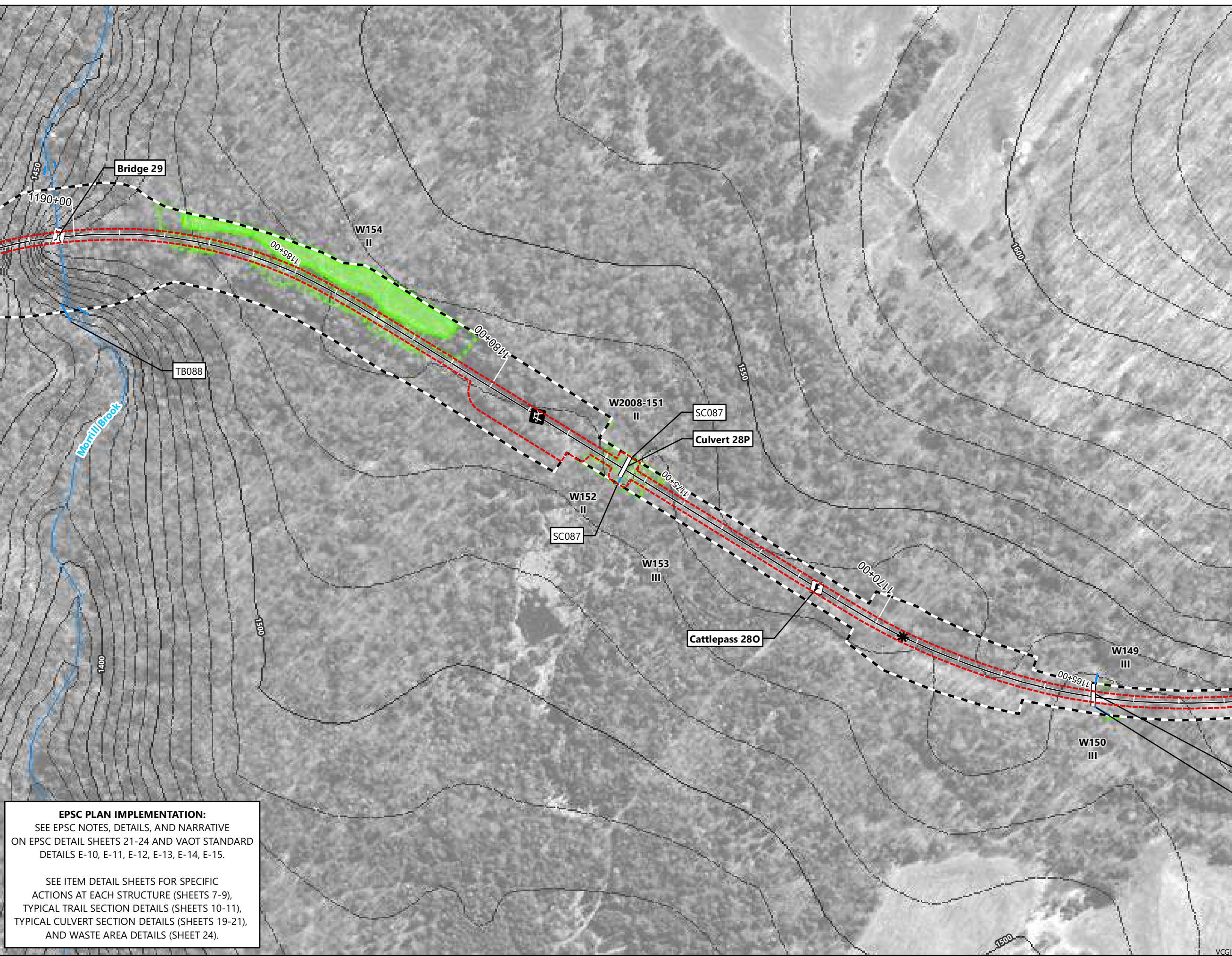
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March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⚡ Right of Way            | ⚡ Washouts                       |
| ⚡ Limit of Disturbance    | ⚡ RTE Site                       |
| ⚡ Temp. Impacts Below OHW | ⚡ RTE Area (2008)                |
| — Culvert                 | ⚡ Class II Wetland Buffer (50ft) |
| ⚡ Cattlepass              | ⚡ Delineated Wetland (2017)      |
| ⚡ Crossing                | ⚡ Delineated Stream (2017)       |
| ⚡ Renegade Crossing       | ⚡ Delineated Stream (2008)       |
| ⚡ Trailhead               | ⚡ VSWI Wetland                   |
| ⚡ Bridges                 | ⚡ VHD Stream                     |
| W001: Wetlands            | ⚡ Other Existing Trail           |
| TB001: Top of Bank        | ⚡ Electric Transmission Lines    |
| SC001: Stream Center      | ⚡ Parcel Boundary                |
|                           | ⚡ Historic Site                  |



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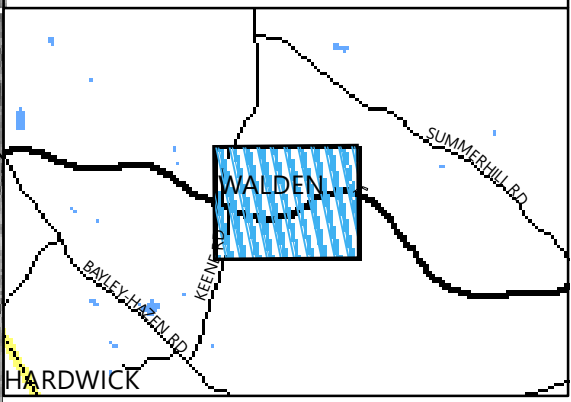


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

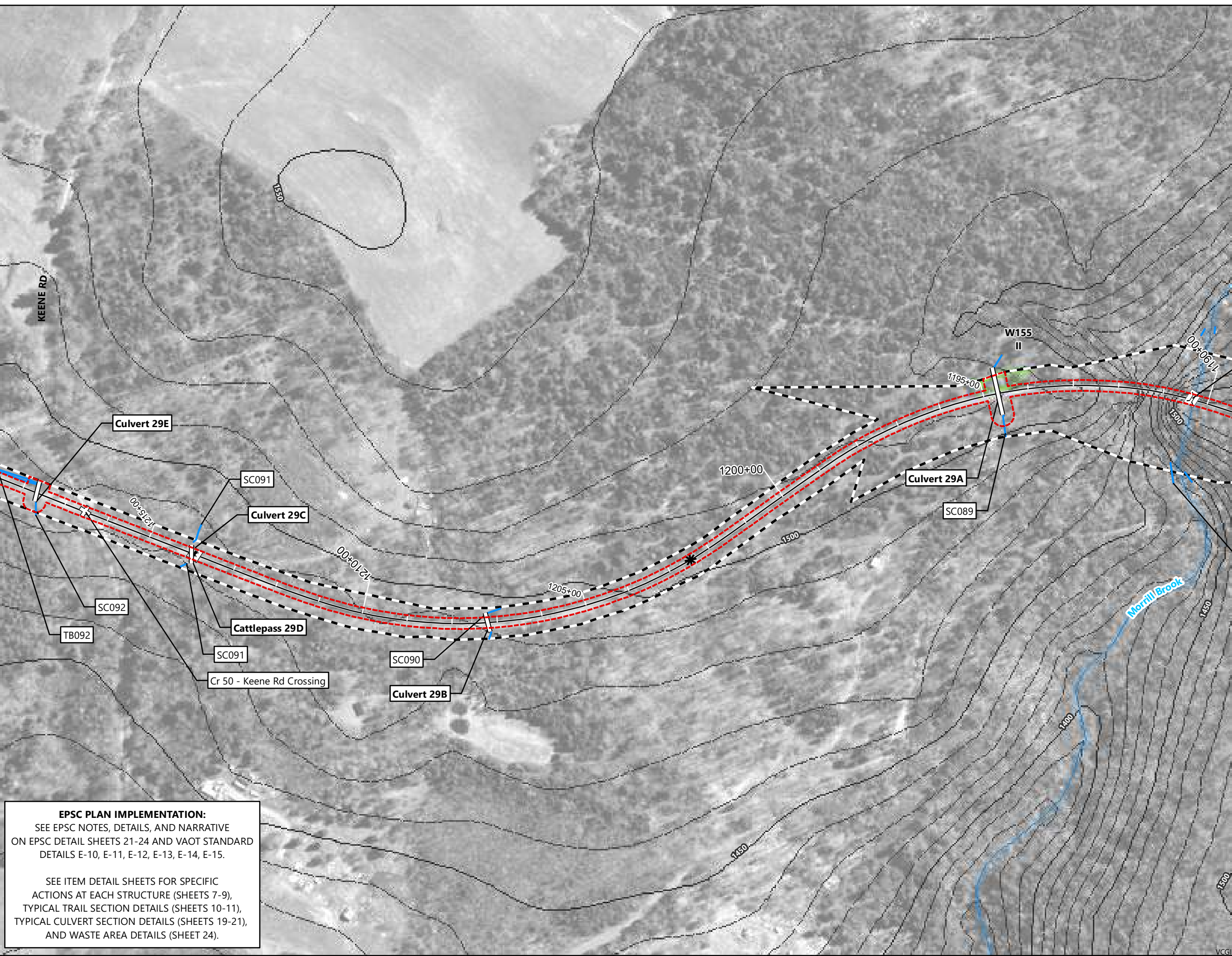
Sheet 45 of 70

March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬜ Right of Way            | ⬜ Washouts                       |
| ⬜ Limit of Disturbance    | ⬜ RTE Site                       |
| ⬜ Temp. Impacts Below OHW | ⬜ RTE Area (2008)                |
| — Culvert                 | ⬜ Class II Wetland Buffer (50ft) |
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St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Renegade Crossing

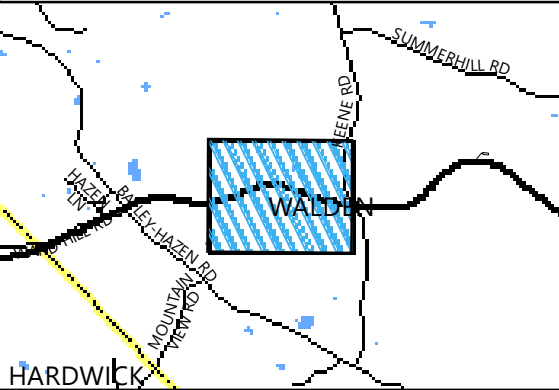
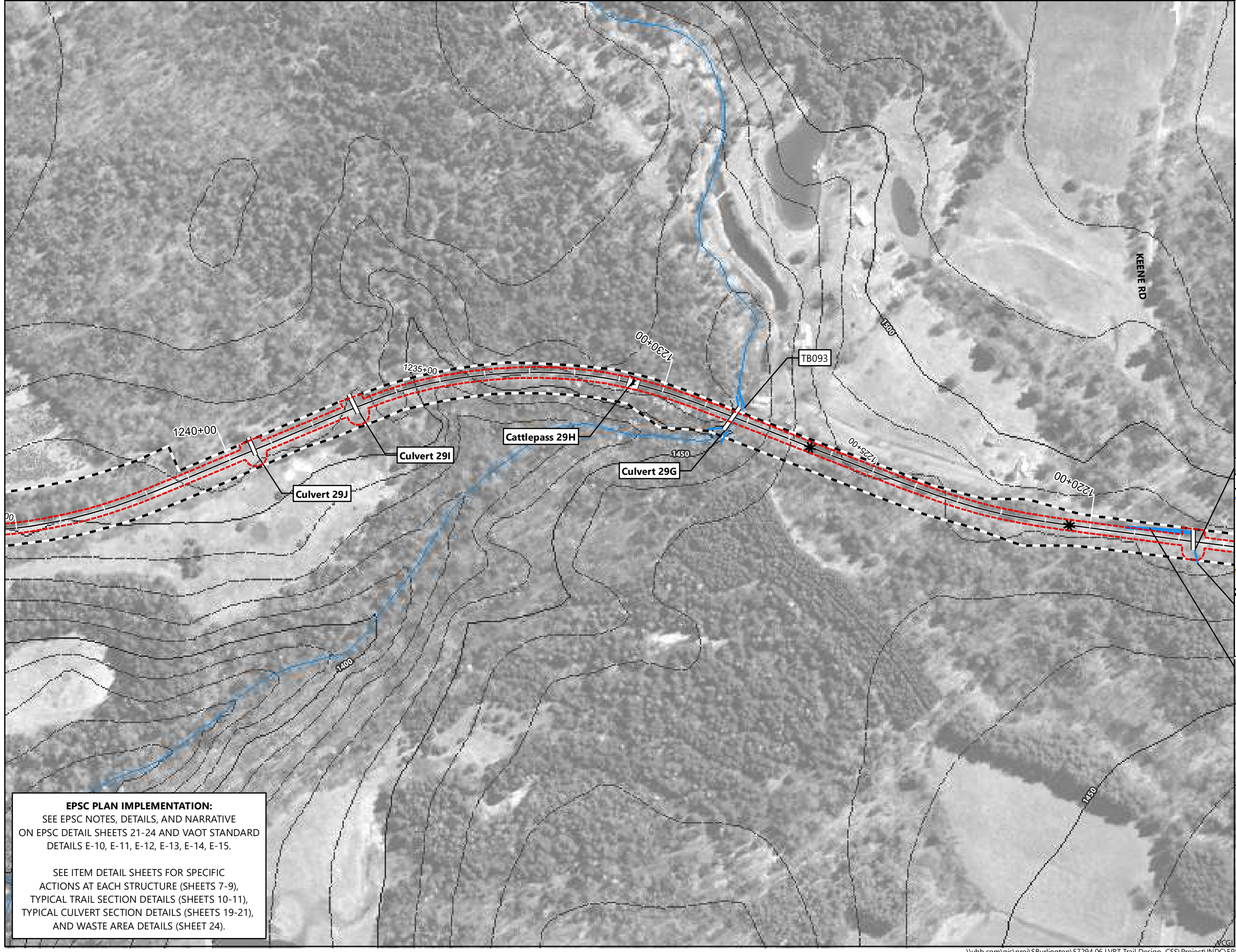
Trailhead

Bridges
- Proposed Pause Place
- Washouts
- RTE Site
- RTE Area (2008)
- Class II Wetland Buffer (50ft)
- Delineated Wetland (2017)
- Delineated Stream (2017)
- Delineated Stream (2008)
- VSWI Wetland
- VHD Stream
- Other Existing Trail
- Electric Transmission Lines
- Parcel Boundary
- Historic Site

W001: Wetlands

TB001: Top of Bank

SC001: Stream Center



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St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

Sheet 47 of 70

March 22, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Renegade Crossing

Trailhead

Bridges
- Proposed Pause Place

Washouts

RTE Site

RTE Area (2008)

Class II Wetland Buffer (50ft)

Delineated Wetland (2017)

Delineated Stream (2017)

Delineated Stream (2008)

VSWI Wetland

VHD Stream

Other Existing Trail

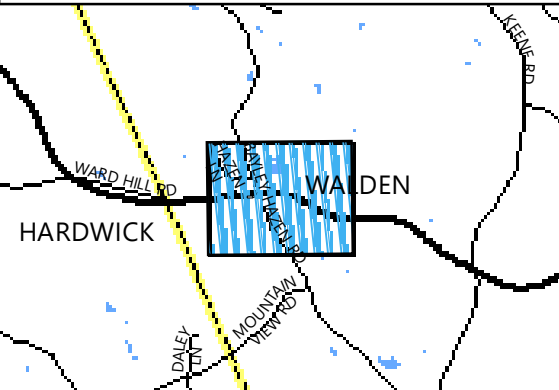
Electric Transmission Lines

Parcel Boundary

Historic Site
- W001: Wetlands

TB001: Top of Bank

SC001: Stream Center



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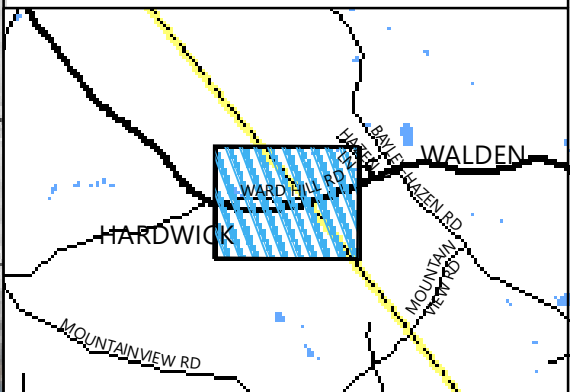


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

Sheet 48 of 70

March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬜ Right of Way            | ⬜ Washouts                       |
| ⬜ Limit of Disturbance    | ⬜ RTE Site                       |
| ⬜ Temp. Impacts Below OHW | ⬜ RTE Area (2008)                |
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| ⬜ Trailhead               | ⬜ VSWI Wetland                   |
| ⬜ Bridges                 | — VHD Stream                     |
|                           | ⬜ Other Existing Trail           |
| W001: Wetlands            | ⬜ Electric Transmission Lines    |
| TB001: Top of Bank        | ⬜ Parcel Boundary                |
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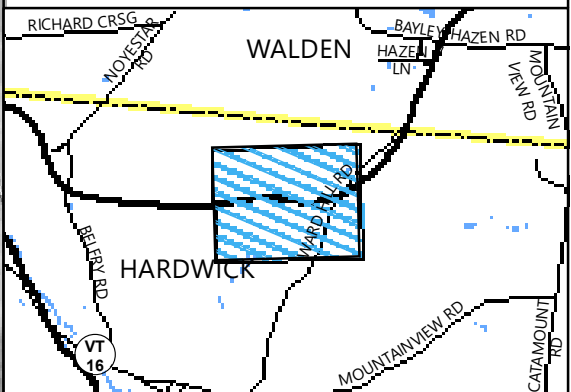


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline
  - ▣ Right of Way
  - ▣ Limit of Disturbance
  - ▣ Temp. Impacts Below OHW
  - Culvert
  - ▣ Cattlepass
  - ⊕ Crossing
  - ✱ Renegade Crossing
  - ◊ Trailhead
  - ▢ Bridges
  - ▣ Proposed Pause Place
  - ▣ Washouts
  - ⊙ RTE Site
  - ▣ RTE Area (2008)
  - ▣ Class II Wetland Buffer (50ft)
  - ▣ Delineated Wetland (2017)
  - Delineated Stream (2017)
  - Delineated Stream (2008)
  - ▣ VSWI Wetland
  - VHD Stream
  - ⋯ Other Existing Trail
  - Electric Transmission Lines
  - ▣ Parcel Boundary
  - ⊙ Historic Site
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



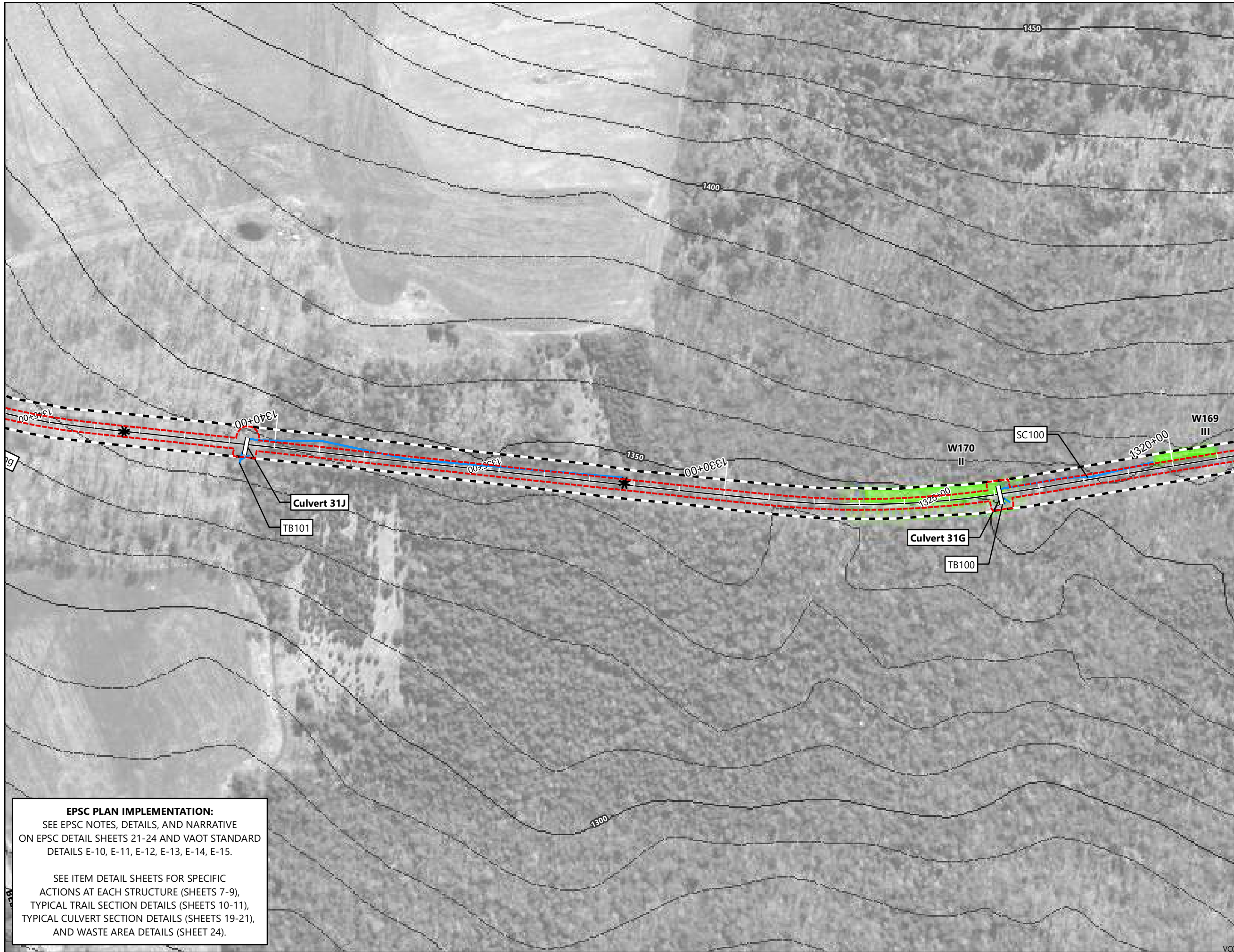
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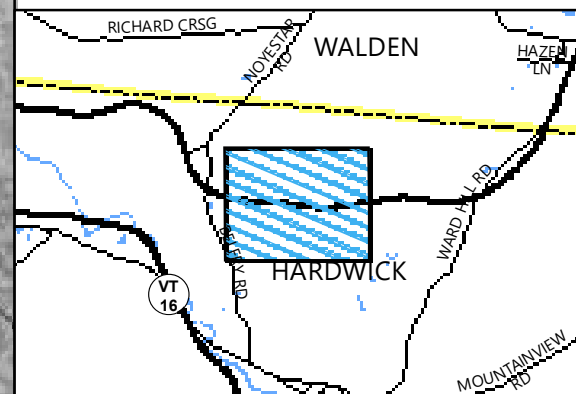
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March 22, 2021



- |                      |                         |  |                                |
|----------------------|-------------------------|--|--------------------------------|
|                      | LVRT Centerline         |  | Proposed Pause Place           |
|                      | Right of Way            |  | Washouts                       |
|                      | Limit of Disturbance    |  | RTE Site                       |
|                      | Temp. Impacts Below OHW |  | RTE Area (2008)                |
|                      | Culvert                 |  | Class II Wetland Buffer (50ft) |
|                      | Cattlepass              |  | Delineated Wetland (2017)      |
|                      | Crossing                |  | Delineated Stream (2017)       |
|                      | Renegade Crossing       |  | Delineated Stream (2008)       |
|                      | Trailhead               |  | VSWI Wetland                   |
|                      | Bridges                 |  | VHD Stream                     |
|                      |                         |  | Other Existing Trail           |
| W001: Wetlands       |                         |  | Electric Transmission Lines    |
| TB001: Top of Bank   |                         |  | Parcel Boundary                |
| SC001: Stream Center |                         |  | Historic Site                  |



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TYPICAL CULVERT SECTION DETAILS (SHEETS 19-21),  
AND WASTE AREA DETAILS (SHEET 24).



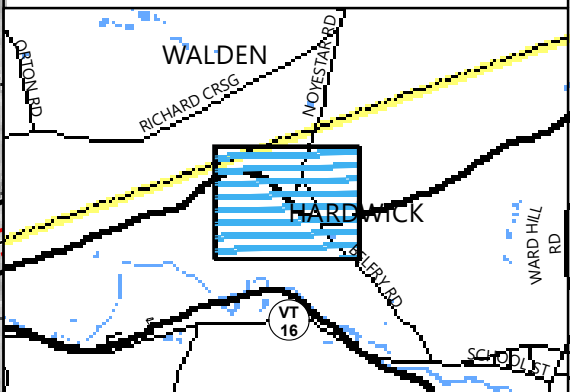


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

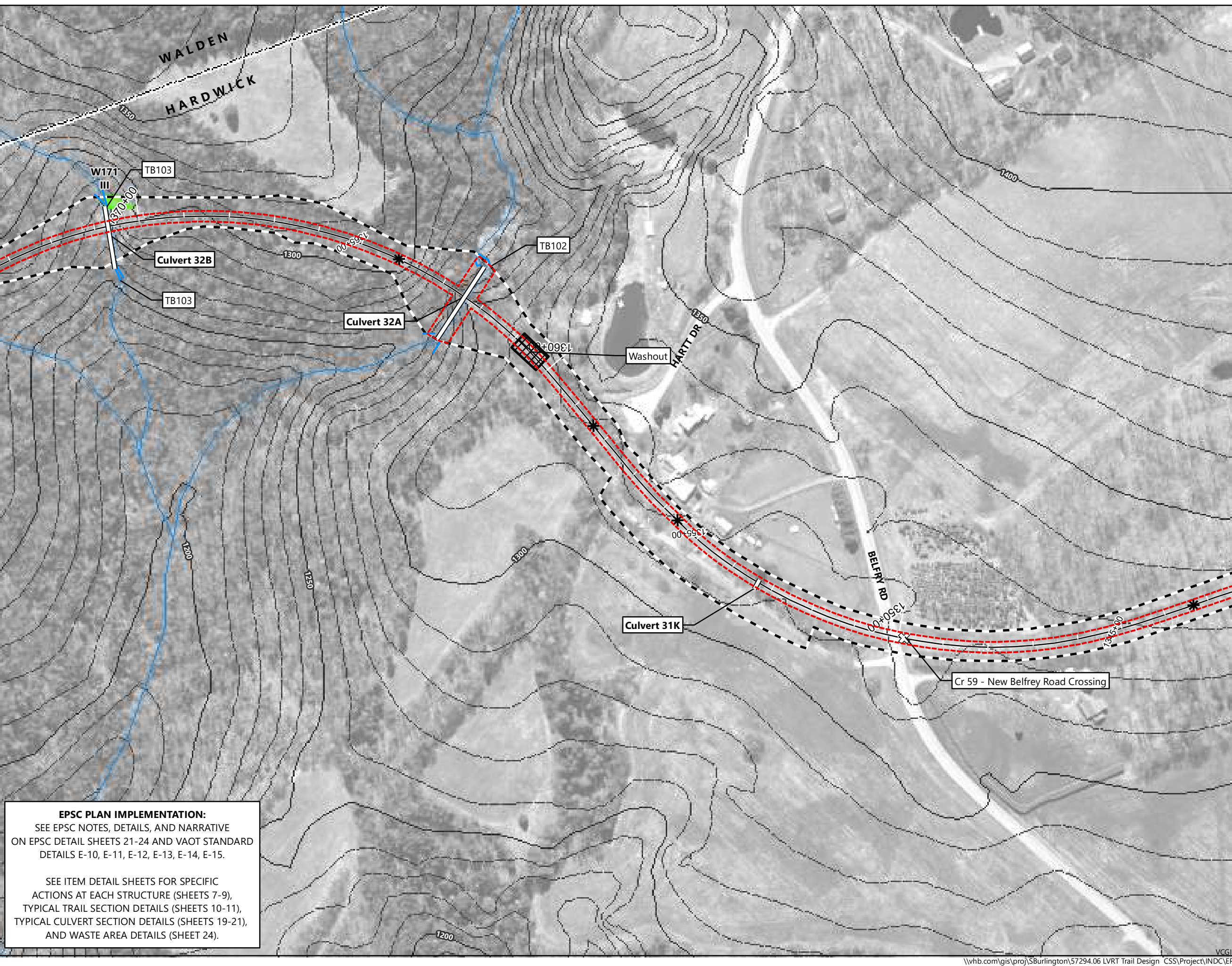
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March 22, 2021

- |                         |                                |
|-------------------------|--------------------------------|
| — LVRT Centerline       | Proposed Pause Place           |
| Right of Way            | Washouts                       |
| Limit of Disturbance    | RTE Site                       |
| Temp. Impacts Below OHW | RTE Area (2008)                |
| Culvert                 | Class II Wetland Buffer (50ft) |
| Cattlepass              | Delineated Wetland (2017)      |
| Crossing                | Delineated Stream (2017)       |
| Renegade Crossing       | Delineated Stream (2008)       |
| Trailhead               | VSWI Wetland                   |
| Bridges                 | VHD Stream                     |
|                         | Other Existing Trail           |
|                         | Electric Transmission Lines    |
|                         | Parcel Boundary                |
|                         | Historic Site                  |
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).



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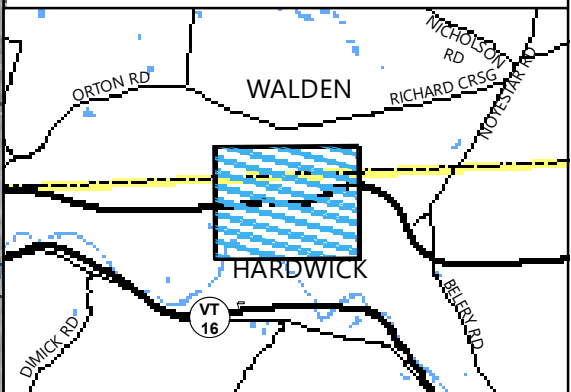


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline
- ▬ Right of Way
- ▬ Limit of Disturbance
- ▬ Temp. Impacts Below OHW
- Culvert
- ▬ Cattlepass
- ⊕ Crossing
- ✱ Renegade Crossing
- ◀ Trailhead
- ≡ Bridges
- W001: Wetlands
- TB001: Top of Bank
- SC001: Stream Center
- ▬ Proposed Pause Place
- ▬ Washouts
- ⊙ RTE Site
- ▨ RTE Area (2008)
- ▨ Class II Wetland Buffer (50ft)
- ▨ Delineated Wetland (2017)
- Delineated Stream (2017)
- Delineated Stream (2008)
- ▨ VSWI Wetland
- VHD Stream
- ⋯ Other Existing Trail
- Electric Transmission Lines
- ▭ Parcel Boundary
- ⊙ Historic Site



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St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline

Right of Way

Limit of Disturbance

Temp. Impacts Below OHW

Culvert

Cattlepass

Crossing

Renegade Crossing

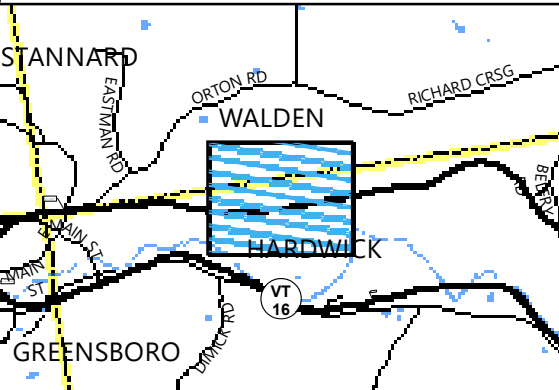
Trailhead

Bridges
- Proposed Pause Place
- Washouts
- RTE Site
- RTE Area (2008)
- Class II Wetland Buffer (50ft)
- Delineated Wetland (2017)
- Delineated Stream (2017)
- Delineated Stream (2008)
- VSWI Wetland
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- Other Existing Trail
- Electric Transmission Lines
- Parcel Boundary
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W001: Wetlands

TB001: Top of Bank

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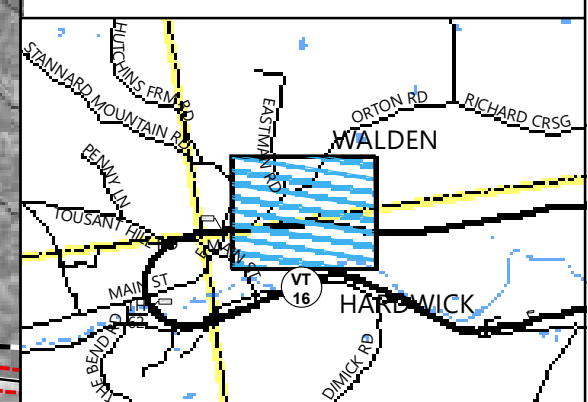


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

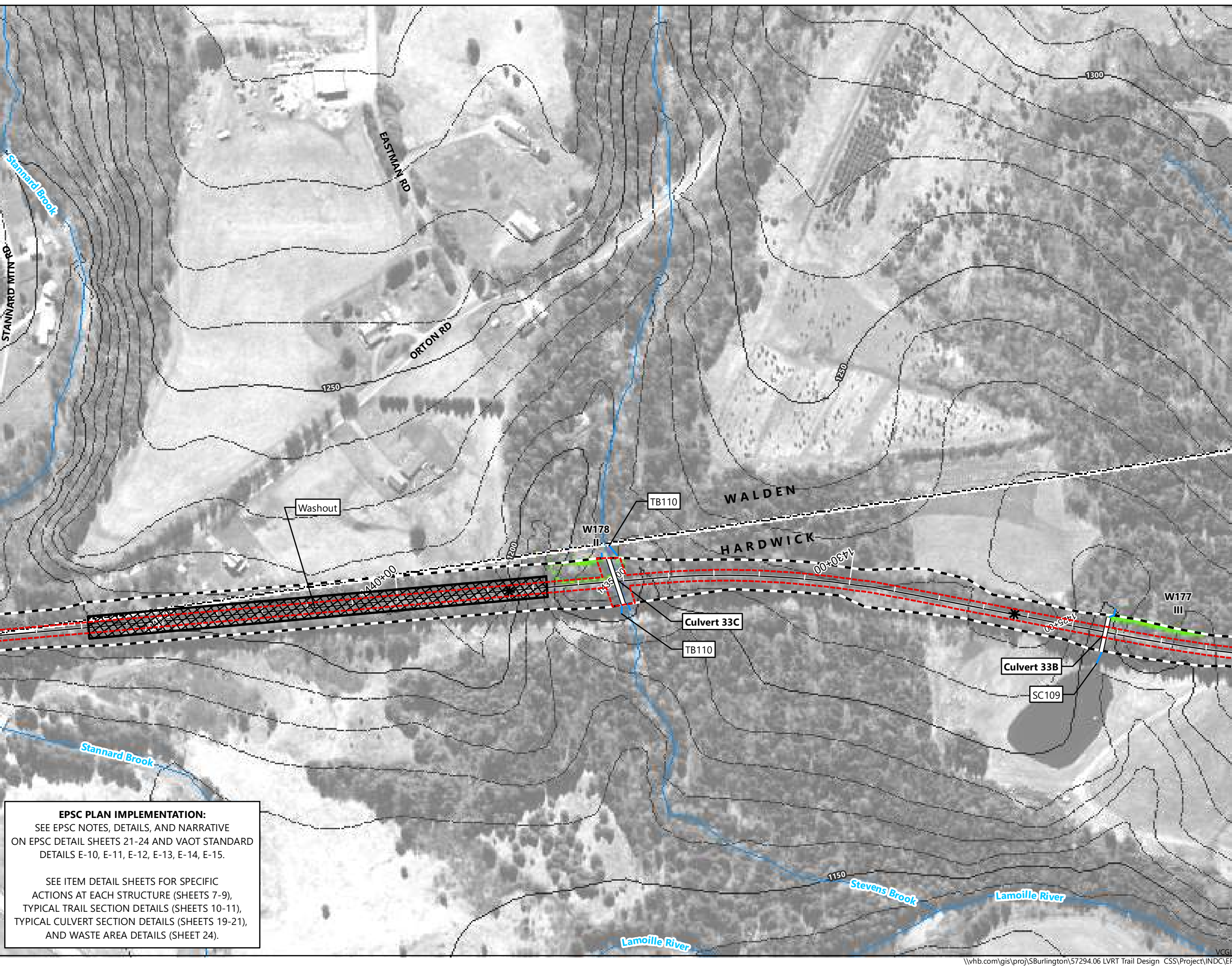
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March 22, 2021

- |                         |                                |
|-------------------------|--------------------------------|
| — LVRT Centerline       | Proposed Pause Place           |
| Right of Way            | Washouts                       |
| Limit of Disturbance    | RTE Site                       |
| Temp. Impacts Below OHW | RTE Area (2008)                |
| Culvert                 | Class II Wetland Buffer (50ft) |
| Cattlepass              | Delineated Wetland (2017)      |
| Crossing                | Delineated Stream (2017)       |
| Renegade Crossing       | Delineated Stream (2008)       |
| Trailhead               | VSWI Wetland                   |
| Bridges                 | VHD Stream                     |
| W001: Wetlands          | Other Existing Trail           |
| TB001: Top of Bank      | Electric Transmission Lines    |
| SC001: Stream Center    | Parcel Boundary                |
|                         | Historic Site                  |



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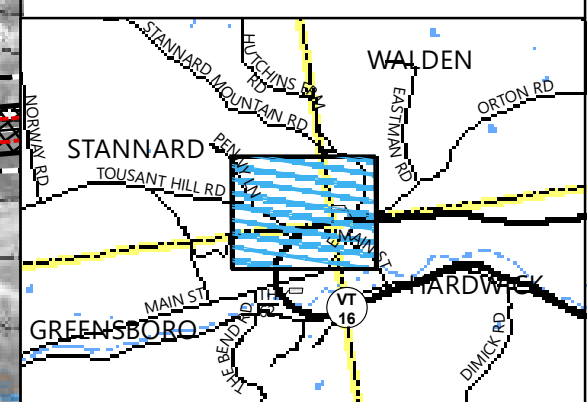


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

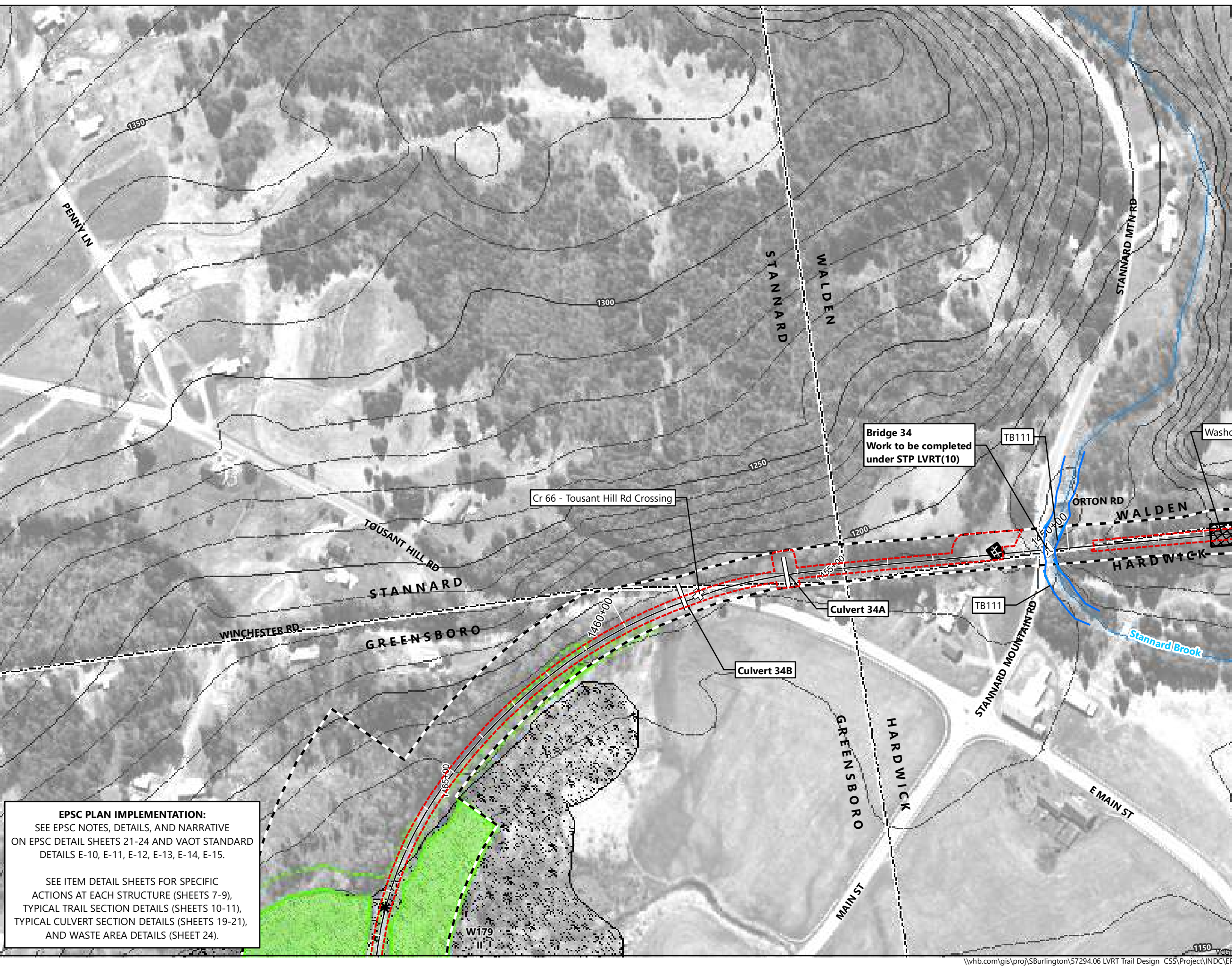
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March 22, 2021

- LVRT Centerline
  - ▬ Right of Way
  - ▬ Limit of Disturbance
  - ▬ Temp. Impacts Below OHW
  - Culvert
  - ▬ Cattlepass
  - Crossing
  - ✱ Renegade Crossing
  - ◆ Trailhead
  - ▬ Bridges
  - ▬ Proposed Pause Place
  - ▬ Washouts
  - ⊙ RTE Site
  - ▨ RTE Area (2008)
  - ▨ Class II Wetland Buffer (50ft)
  - ▨ Delineated Wetland (2017)
  - Delineated Stream (2017)
  - Delineated Stream (2008)
  - ▨ VSWI Wetland
  - VHD Stream
  - Other Existing Trail
  - Electric Transmission Lines
  - ▬ Parcel Boundary
  - ⊙ Historic Site
- W001: Wetlands  
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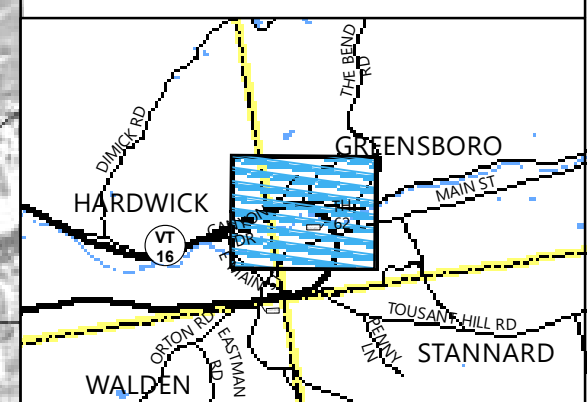


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

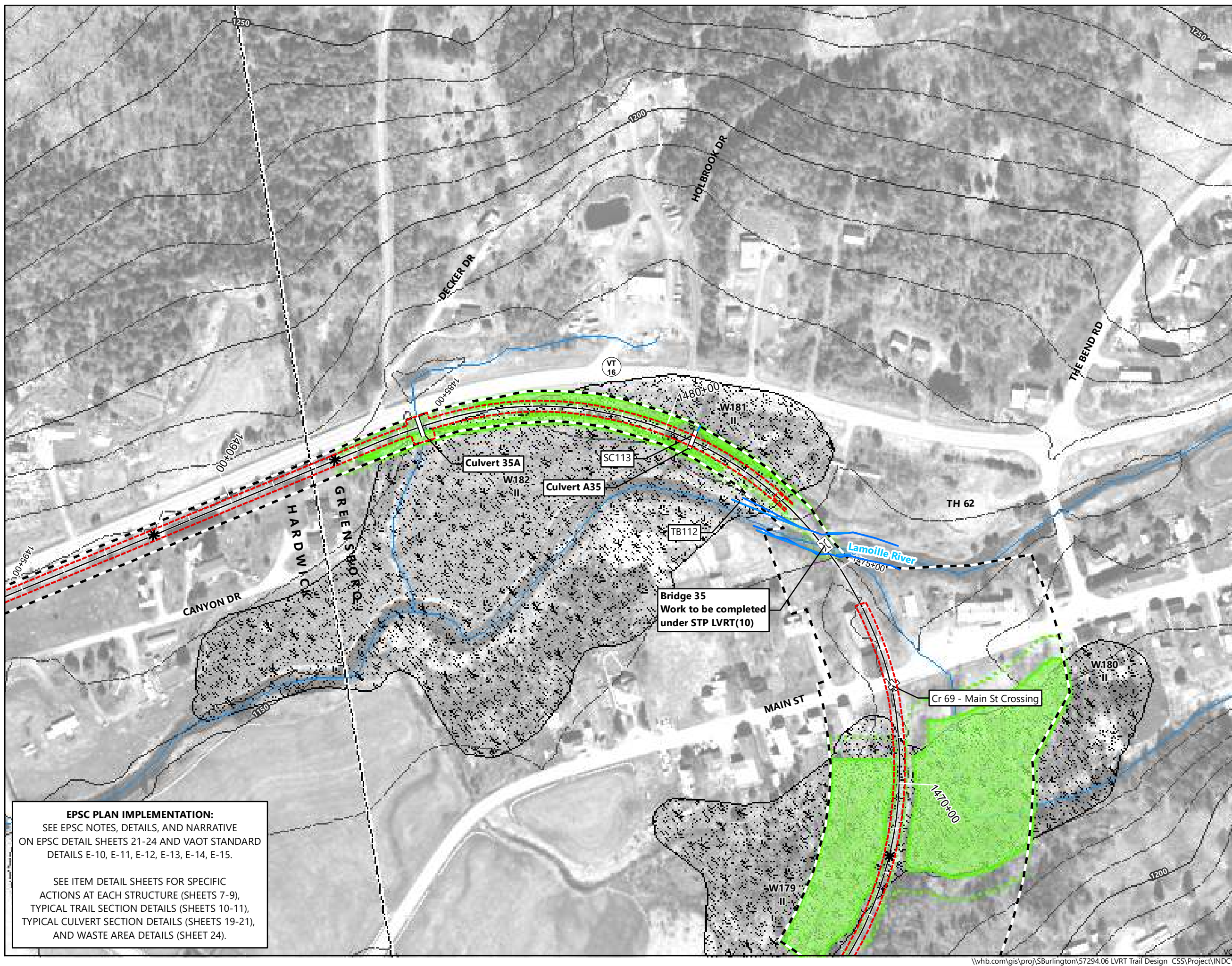
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March 22, 2021

- LVRT Centerline
  - Right of Way
  - Limit of Disturbance
  - Temp. Impacts Below OHW
  - Culvert
  - Cattlepass
  - Crossing
  - Renegade Crossing
  - Trailhead
  - Bridges
  - Proposed Pause Place
  - Washouts
  - RTE Site
  - RTE Area (2008)
  - Class II Wetland Buffer (50ft)
  - Delineated Wetland (2017)
  - Delineated Stream (2017)
  - Delineated Stream (2008)
  - VSWI Wetland
  - VHD Stream
  - Other Existing Trail
  - Electric Transmission Lines
  - Parcel Boundary
  - Historic Site
- W001: Wetlands  
TB001: Top of Bank  
SC001: Stream Center



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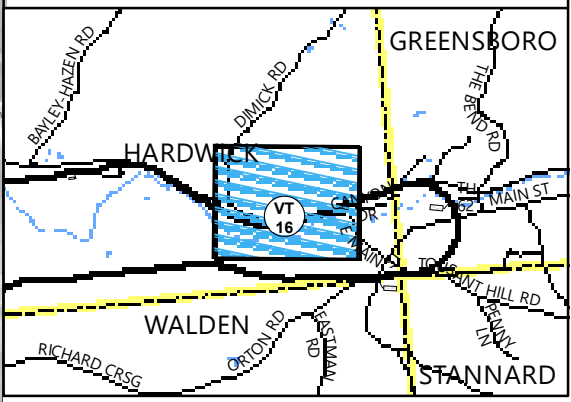


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

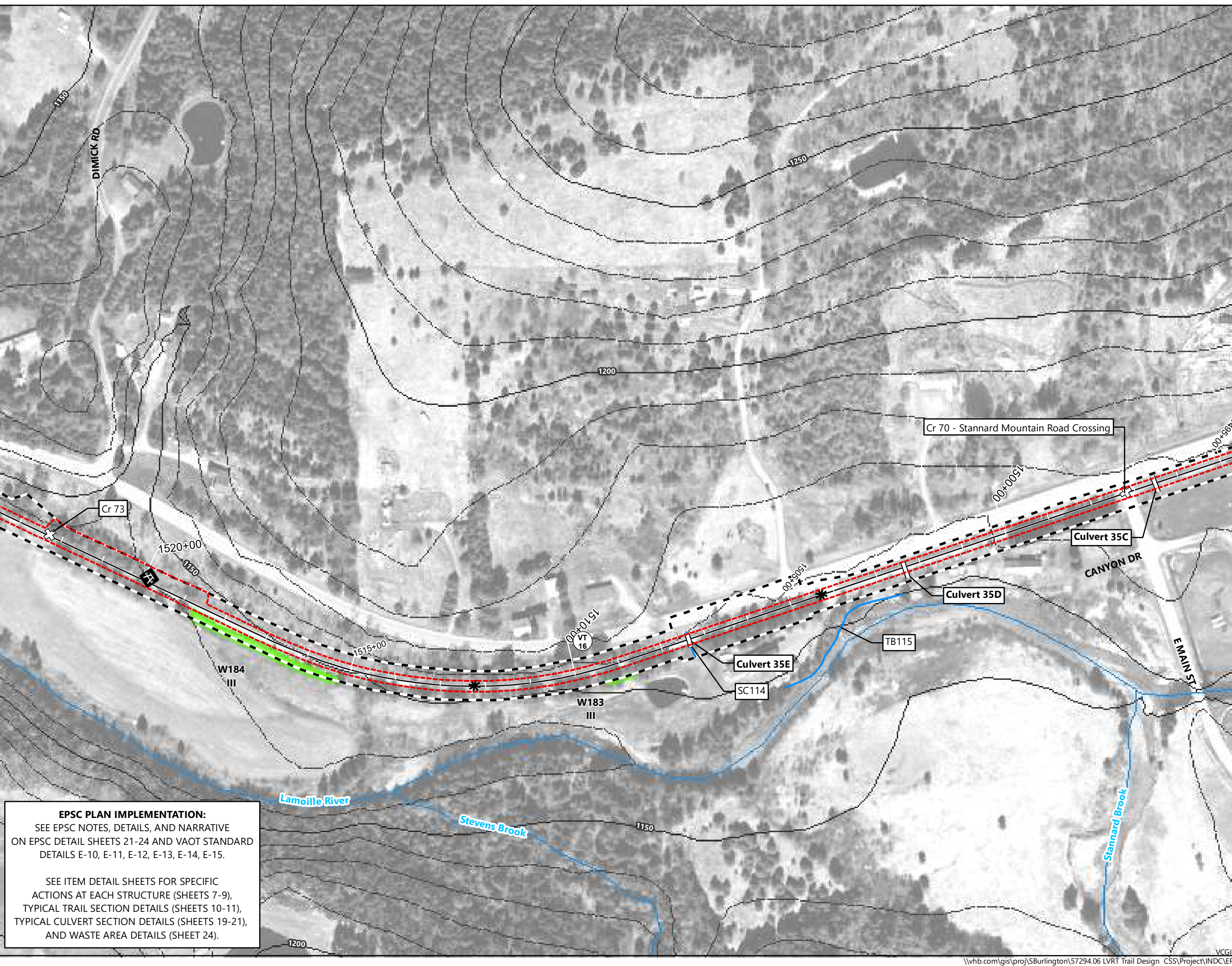
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March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ▬ Right of Way            | ⚡ Washouts                       |
| ▬ Limit of Disturbance    | ⚡ RTE Site                       |
| ▬ Temp. Impacts Below OHW | ▨ RTE Area (2008)                |
| — Culvert                 | ▨ Class II Wetland Buffer (50ft) |
| ⚡ Cattlepass              | ▨ Delineated Wetland (2017)      |
| + Crossing                | — Delineated Stream (2017)       |
| * Renegade Crossing       | — Delineated Stream (2008)       |
| ⬆ Trailhead               | ▨ VSWI Wetland                   |
| ⚡ Bridges                 | — VHD Stream                     |
| W001: Wetlands            | ⋯ Other Existing Trail           |
| TB001: Top of Bank        | — Electric Transmission Lines    |
| SC001: Stream Center      | ▭ Parcel Boundary                |
|                           | ⚡ Historic Site                  |



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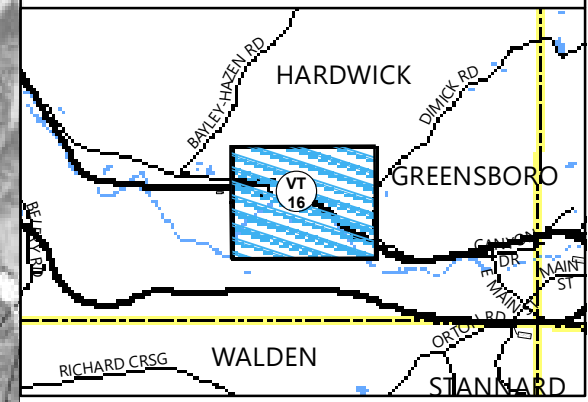


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

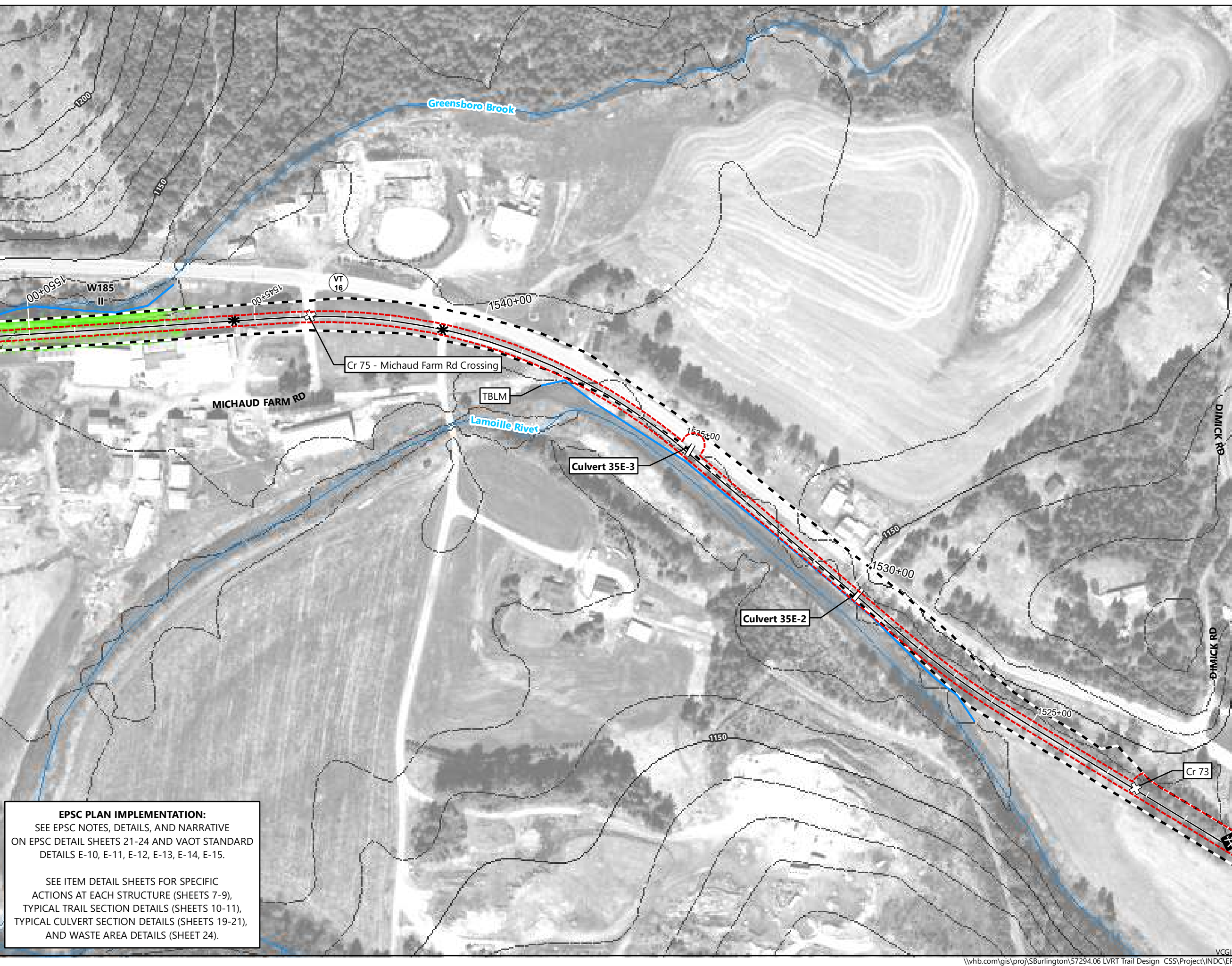
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March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬜ Right of Way            | ⬜ Washouts                       |
| ⬜ Limit of Disturbance    | ⬜ RTE Site                       |
| ⬜ Temp. Impacts Below OHW | ⬜ RTE Area (2008)                |
| — Culvert                 | ⬜ Class II Wetland Buffer (50ft) |
| ⬜ Cattlepass              | ⬜ Delineated Wetland (2017)      |
| ⬜ Crossing                | — Delineated Stream (2017)       |
| ⬜ Renegade Crossing       | — Delineated Stream (2008)       |
| ⬜ Trailhead               | ⬜ VSWI Wetland                   |
| ⬜ Bridges                 | — VHD Stream                     |
|                           | ⬜ Other Existing Trail           |
| W001: Wetlands            | ⬜ Electric Transmission Lines    |
| TB001: Top of Bank        | ⬜ Parcel Boundary                |
| SC001: Stream Center      | ⬜ Historic Site                  |



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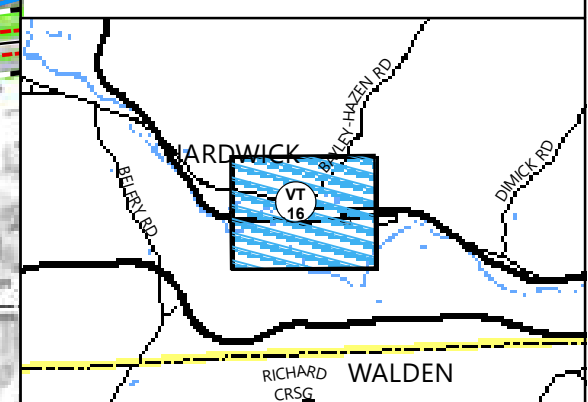


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline
  - ▣ Right of Way
  - ▣ Limit of Disturbance
  - ▣ Temp. Impacts Below OHW
  - Culvert
  - ▣ Cattlepass
  - ⊕ Crossing
  - ✱ Renegade Crossing
  - ◆ Trailhead
  - ▢ Bridges
  - ▣ Proposed Pause Place
  - ▣ Washouts
  - ⊙ RTE Site
  - ▣ RTE Area (2008)
  - ▣ Class II Wetland Buffer (50ft)
  - ▣ Delineated Wetland (2017)
  - Delineated Stream (2017)
  - Delineated Stream (2008)
  - ▣ VSWI Wetland
  - VHD Stream
  - ⋯ Other Existing Trail
  - Electric Transmission Lines
  - ▣ Parcel Boundary
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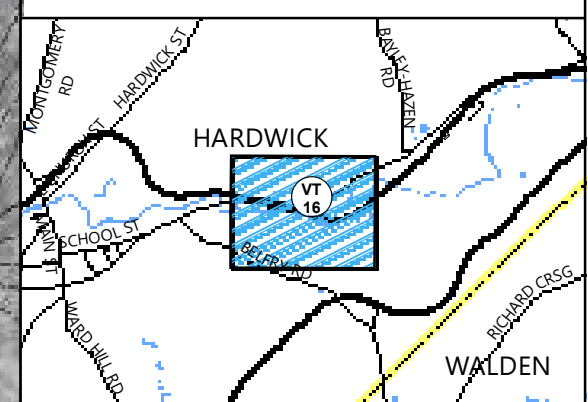


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline
  - ▬ Right of Way
  - ▬ Limit of Disturbance
  - ▬ Temp. Impacts Below OHW
  - Culvert
  - ▬ Cattlepass
  - ⊕ Crossing
  - ✱ Renegade Crossing
  - ◀ Trailhead
  - ▬ Bridges
  - ▬ Proposed Pause Place
  - ▬ Washouts
  - ⊙ RTE Site
  - ▨ RTE Area (2008)
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  - Delineated Stream (2017)
  - Delineated Stream (2008)
  - ▨ VSWI Wetland
  - VHD Stream
  - ⋯ Other Existing Trail
  - Electric Transmission Lines
  - ▬ Parcel Boundary
  - ⊙ Historic Site
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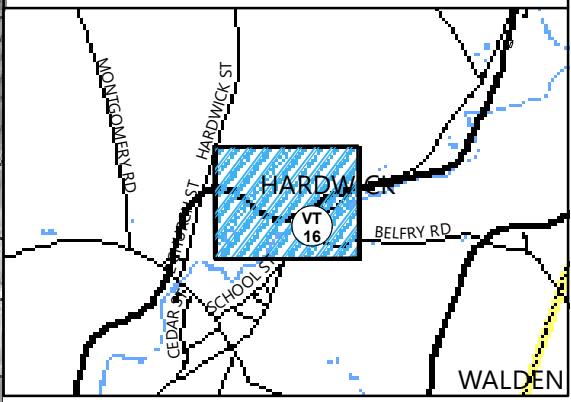


St. Johnsbury - Swanton  
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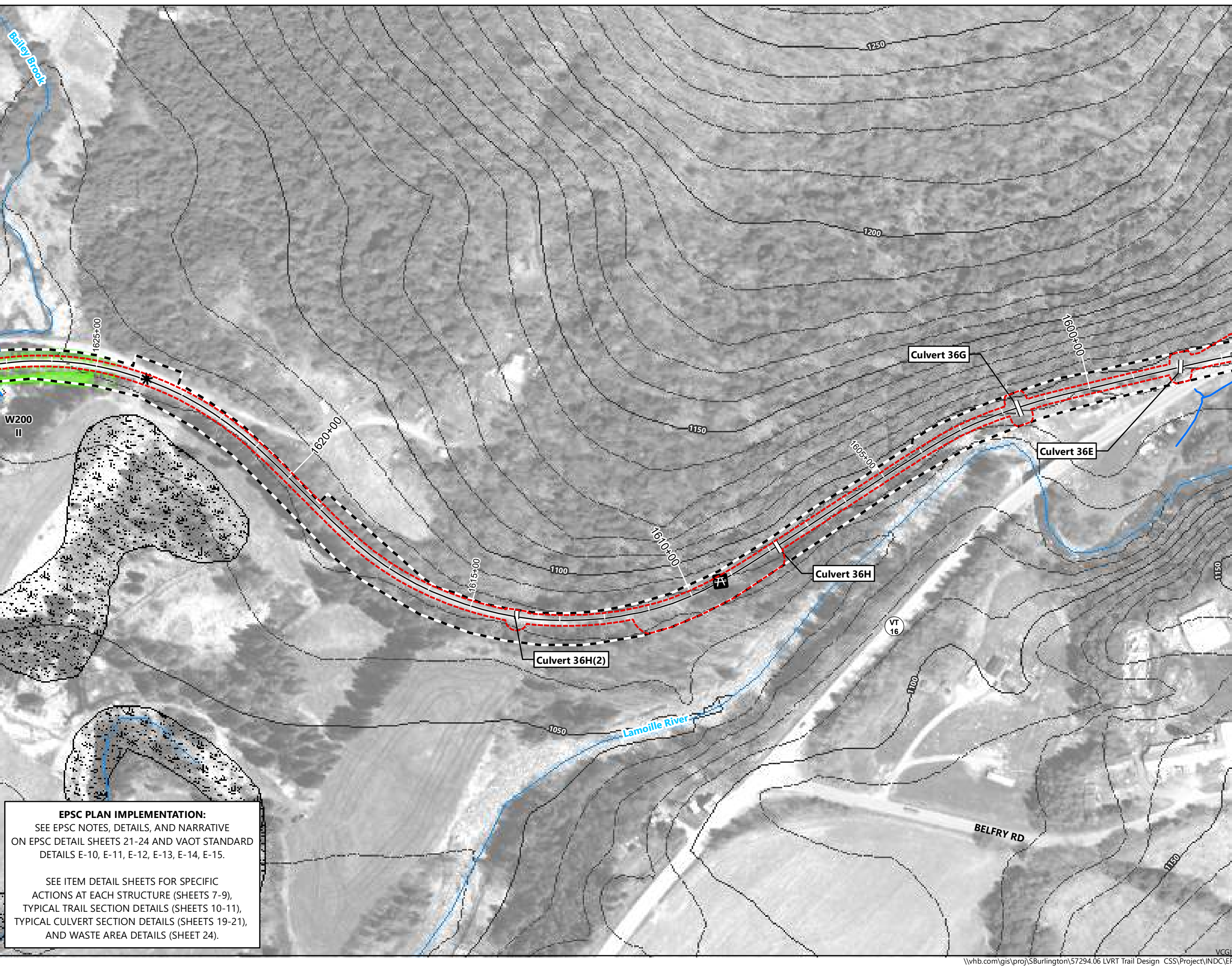
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March 22, 2021

- |                         |                                |
|-------------------------|--------------------------------|
| — LVRT Centerline       | Proposed Pause Place           |
| Right of Way            | Washouts                       |
| Limit of Disturbance    | RTE Site                       |
| Temp. Impacts Below OHW | RTE Area (2008)                |
| Culvert                 | Class II Wetland Buffer (50ft) |
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| Bridges                 | VHD Stream                     |
|                         | Other Existing Trail           |
| W001: Wetlands          | Electric Transmission Lines    |
| TB001: Top of Bank      | Parcel Boundary                |
| SC001: Stream Center    | Historic Site                  |



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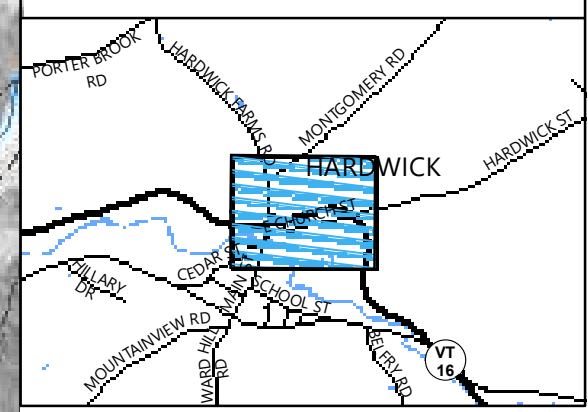


St. Johnsbury - Swanton  
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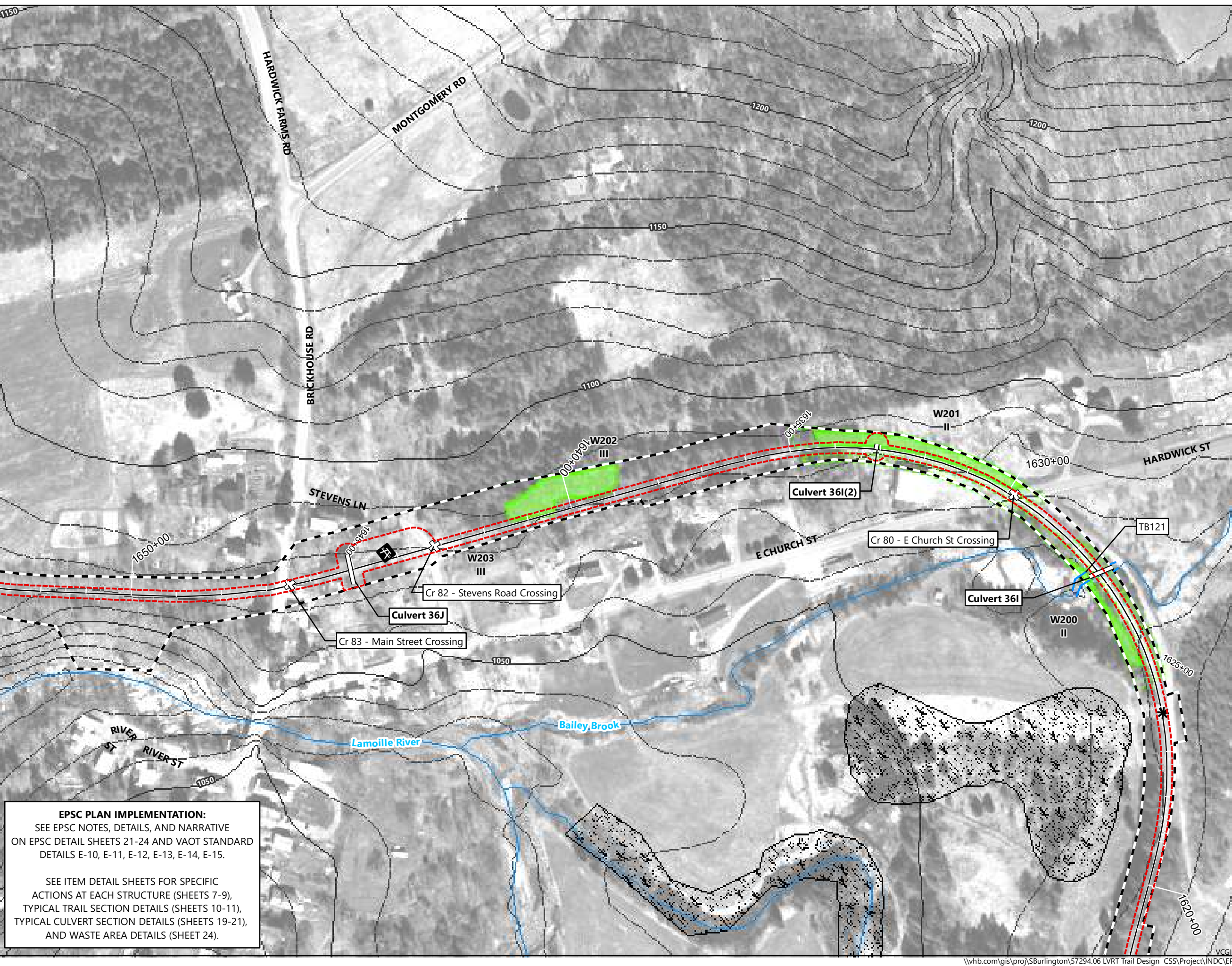
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March 22, 2021

- LVRT Centerline
- ▣ Right of Way
- ▣ Limit of Disturbance
- ▣ Temp. Impacts Below OHW
- Culvert
- ▣ Cattlepass
- ⊕ Crossing
- ✱ Renegade Crossing
- ◆ Trailhead
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- SC001: Stream Center
- ▣ Proposed Pause Place
- ▣ Washouts
- ⊙ RTE Site
- ▣ RTE Area (2008)
- ▣ Class II Wetland Buffer (50ft)
- ▣ Delineated Wetland (2017)
- Delineated Stream (2017)
- Delineated Stream (2008)
- ▣ VSWI Wetland
- VHD Stream
- ⋯ Other Existing Trail
- Electric Transmission Lines
- ▣ Parcel Boundary
- ⊙ Historic Site



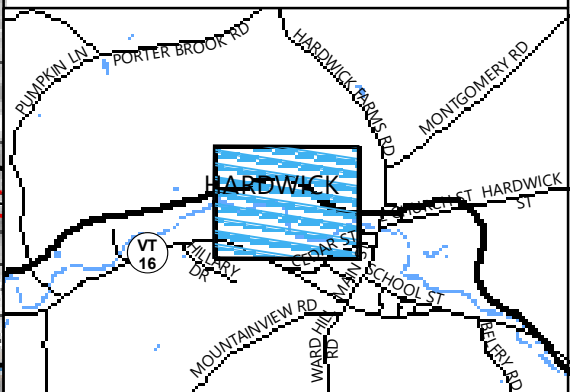
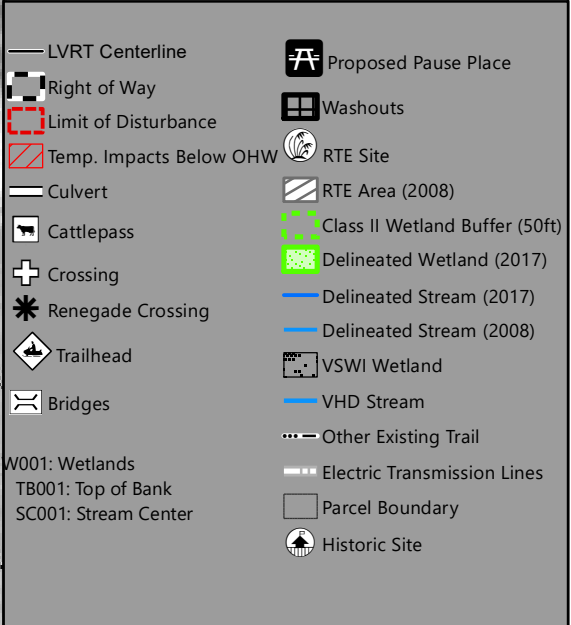
Sources:  
Background imagery by VCGI (2018); Trail Centerline Route by VHB (2008); Trail Infrastructure Data provided by VAST (2008) and updated by VHB (2017); Roads, Town Boundary, Elevation, Stream, VSWI, and Waterbody data from VCGI (various dates); Wetlands, Streams, and RTEs delineated using Trimble GPS Equipment by VHB (2008-2017); Historic Sites identified and mapped by VHB (2008).



**EPSC PLAN IMPLEMENTATION:**  
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ON EPSC DETAIL SHEETS 21-24 AND VAOT STANDARD  
DETAILS E-10, E-11, E-12, E-13, E-14, E-15.  
  
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TYPICAL CULVERT SECTION DETAILS (SHEETS 19-21),  
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March 22, 2021



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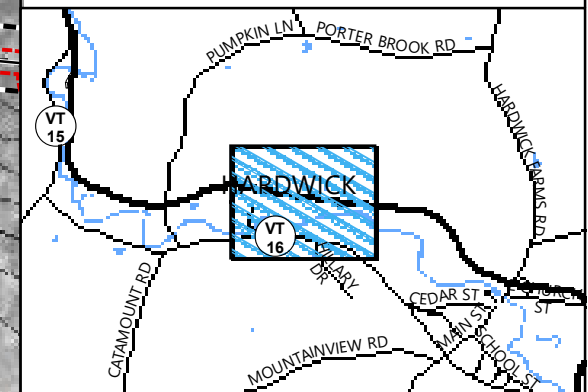


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

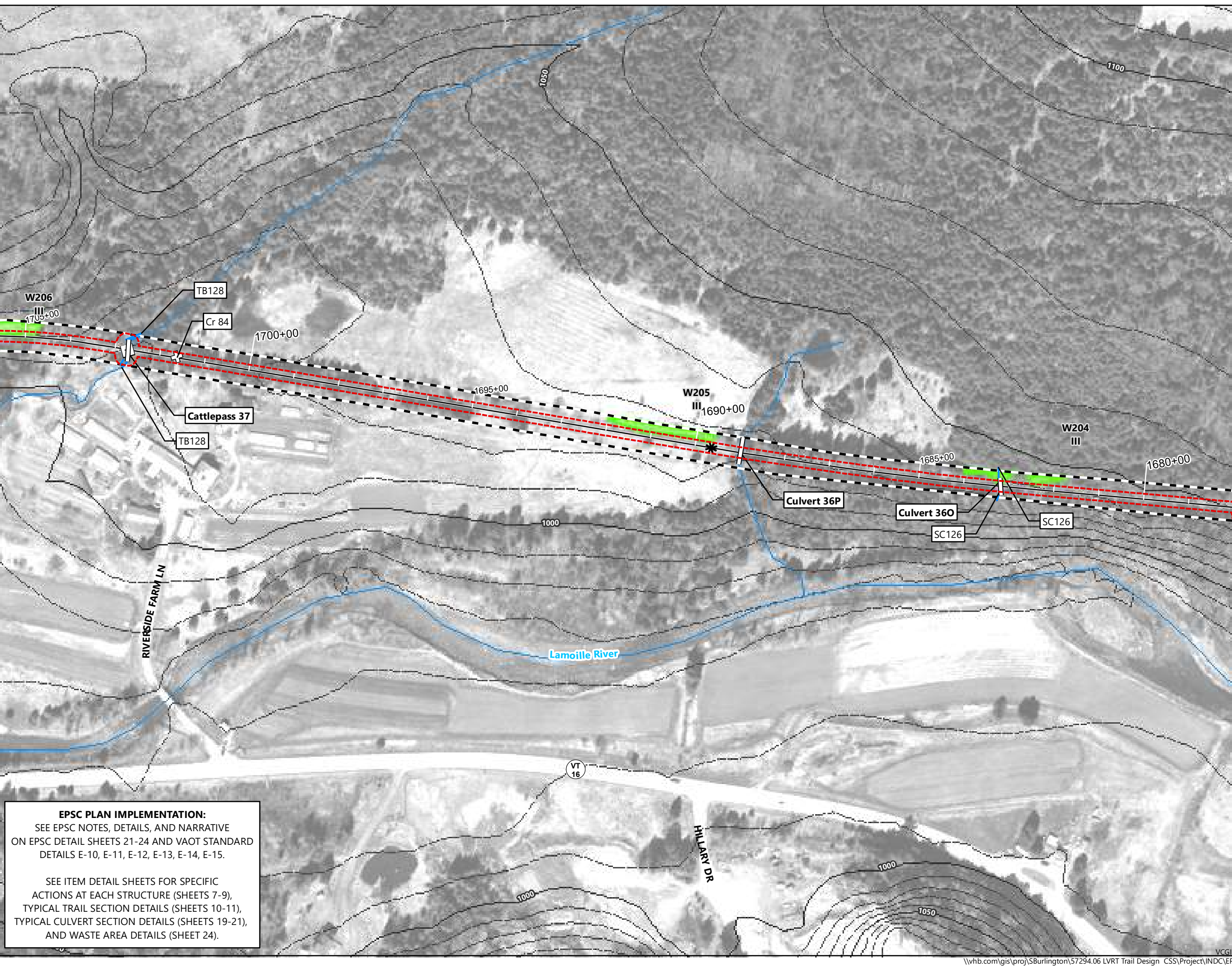
Sheet 64 of 70

March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⚡ Right of Way            | ⚡ Washouts                       |
| ⚡ Limit of Disturbance    | ⚡ RTE Site                       |
| ⚡ Temp. Impacts Below OHW | ⚡ RTE Area (2008)                |
| — Culvert                 | ⚡ Class II Wetland Buffer (50ft) |
| ⚡ Cattlepass              | ⚡ Delineated Wetland (2017)      |
| ⚡ Crossing                | ⚡ Delineated Stream (2017)       |
| ⚡ Renegade Crossing       | ⚡ Delineated Stream (2008)       |
| ⚡ Trailhead               | ⚡ VSWI Wetland                   |
| ⚡ Bridges                 | ⚡ VHD Stream                     |
|                           | ⚡ Other Existing Trail           |
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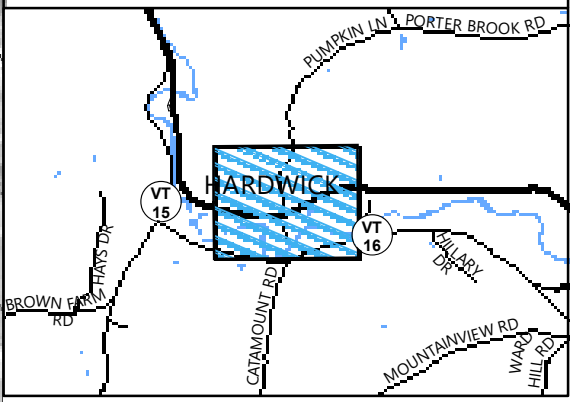
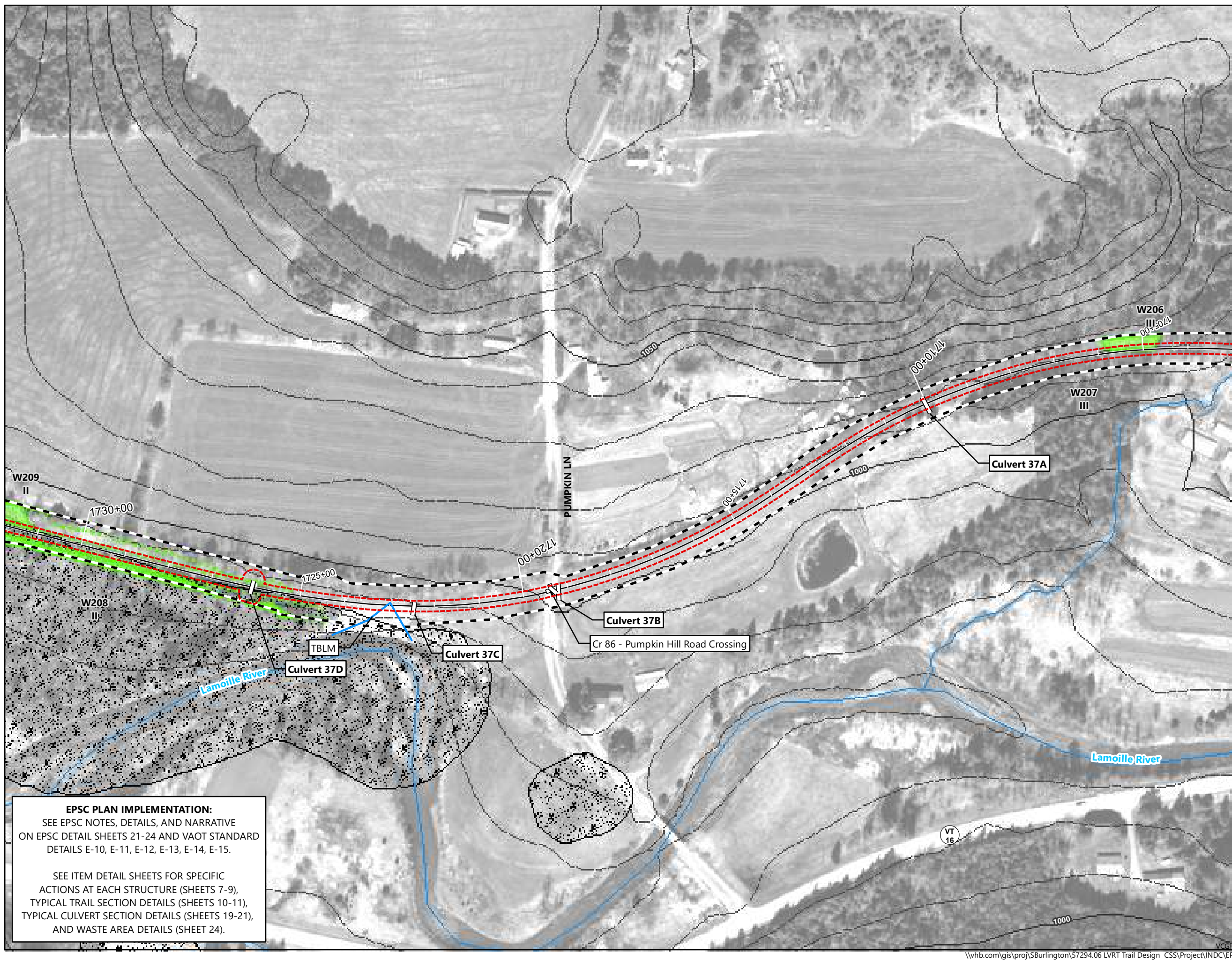


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline
  - ▬ Right of Way
  - ▬ Limit of Disturbance
  - ▬ Temp. Impacts Below OHW
  - Culvert
  - ▬ Cattlepass
  - ⊕ Crossing
  - ✱ Renegade Crossing
  - ◀ Trailhead
  - ▬ Bridges
  - ▬ Proposed Pause Place
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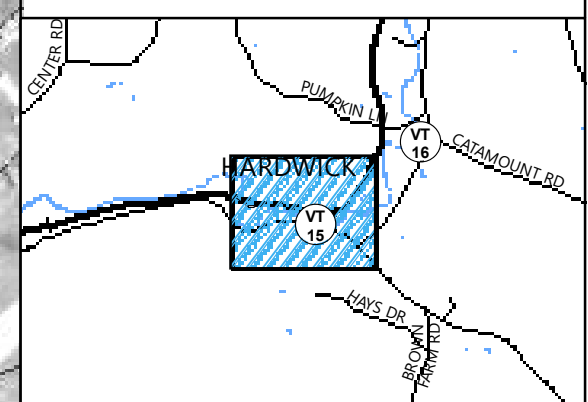


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

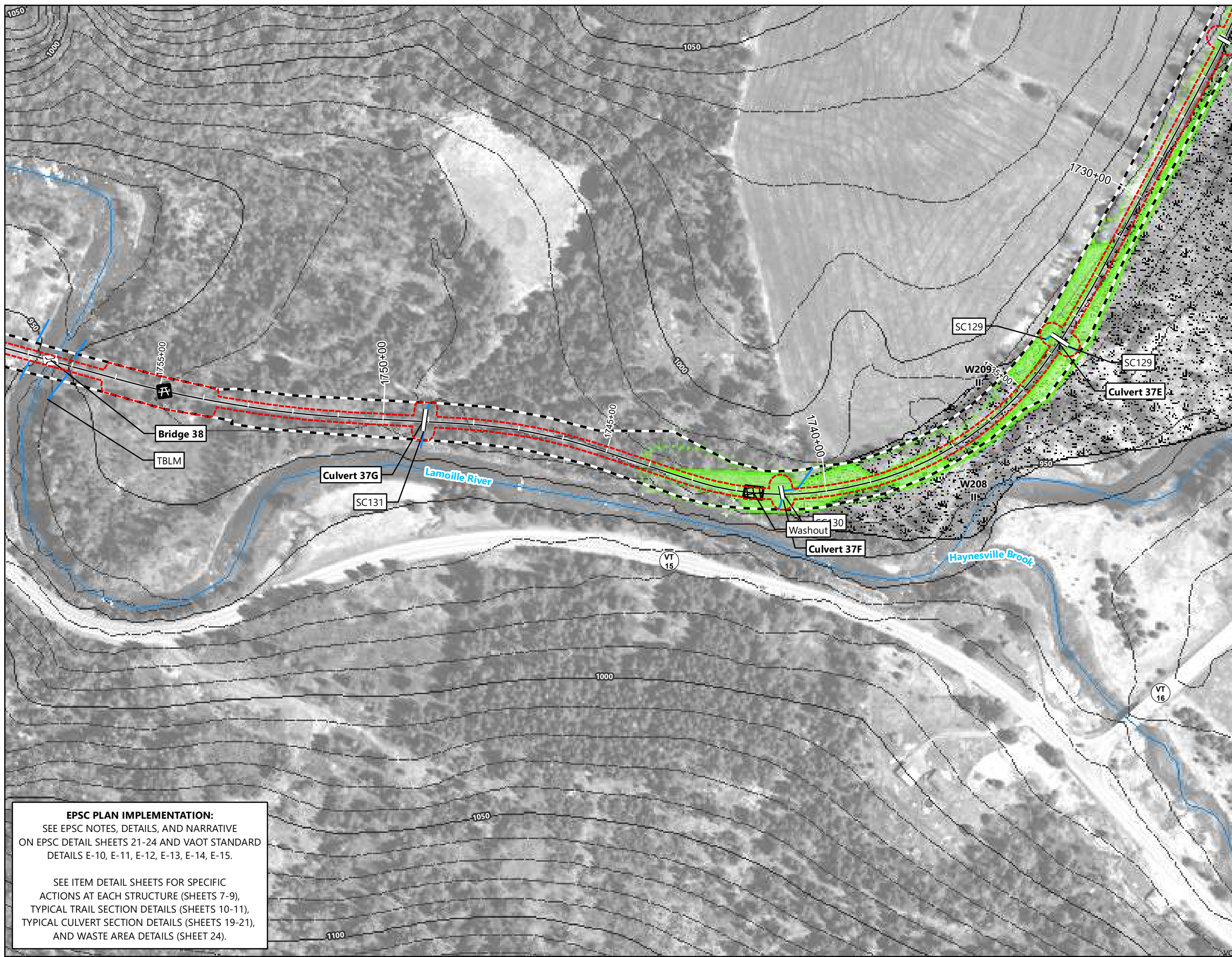
Sheet 66 of 70

March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ▬ Right of Way            | ⚡ Washouts                       |
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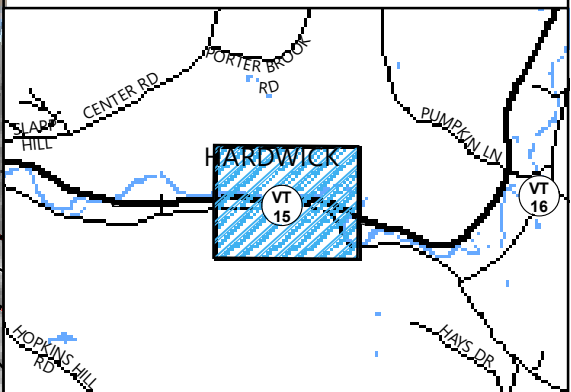


St. Johnsbury - Swanton  
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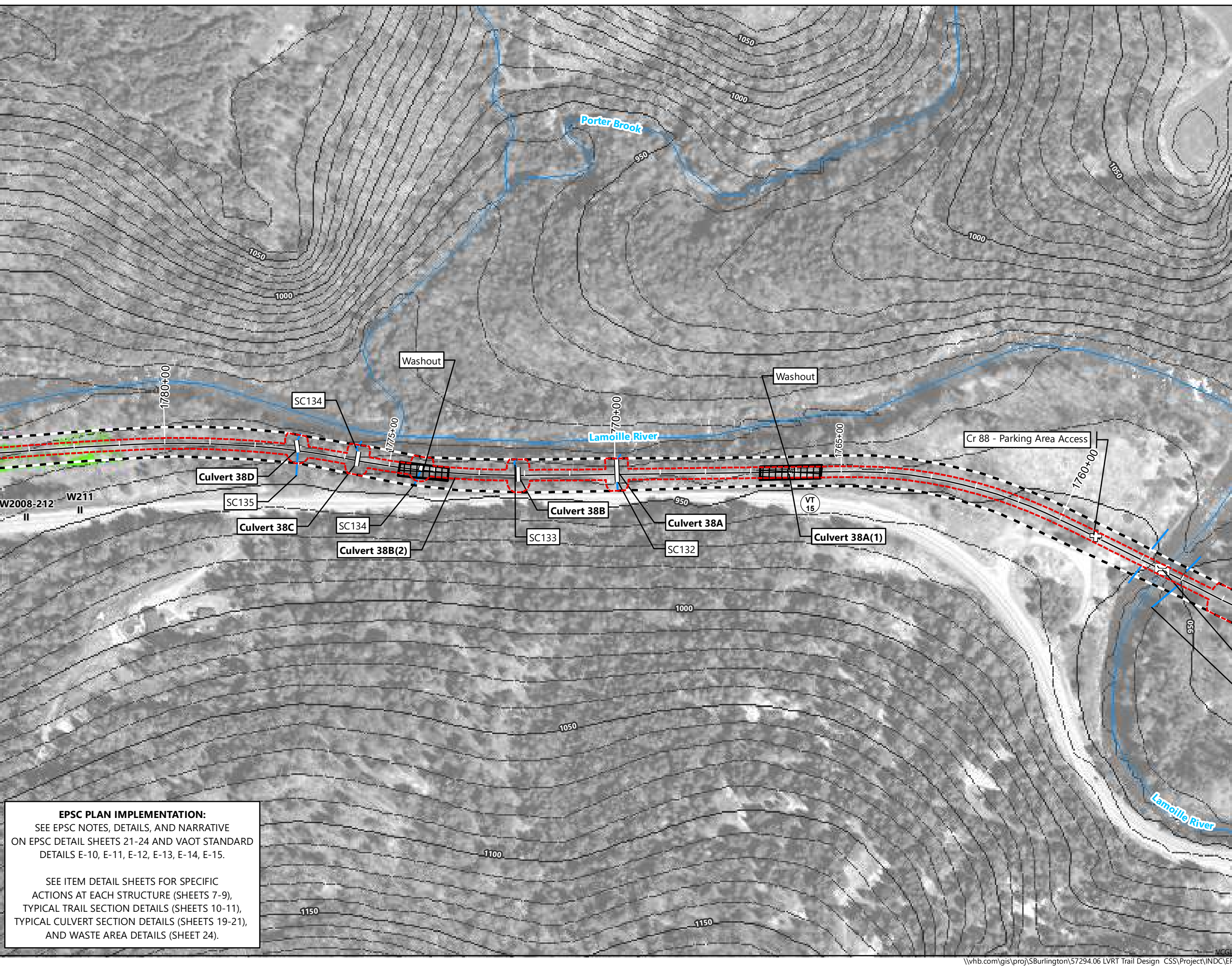
Sheet 67 of 70

March 22, 2021

- LVRT Centerline
  - ▣ Right of Way
  - ▤ Limit of Disturbance
  - ▨ Temp. Impacts Below OHW
  - Culvert
  - ▣ Cattlepass
  - ⊕ Crossing
  - ✱ Renegade Crossing
  - ◆ Trailhead
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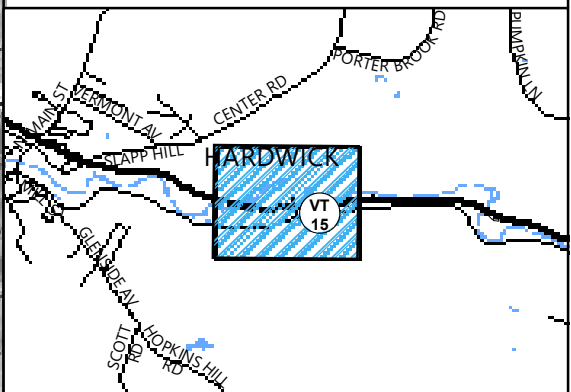


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

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March 22, 2021

- LVRT Centerline
  - ▣ Right of Way
  - ▣ Limit of Disturbance
  - ▣ Temp. Impacts Below OHW
  - Culvert
  - ▣ Cattlepass
  - ⊕ Crossing
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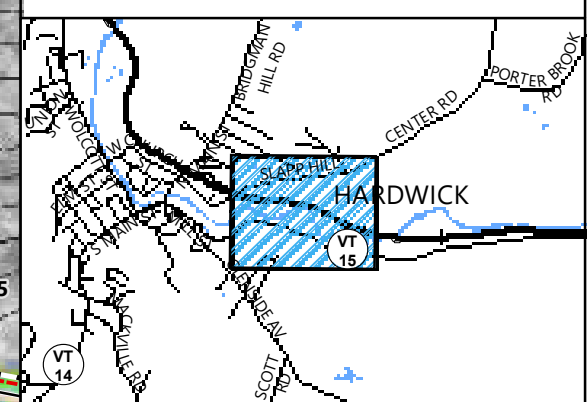


St. Johnsbury - Swanton  
STP-LVRT(13)  
Lamoille Valley Rail Trail  
Layout Plan

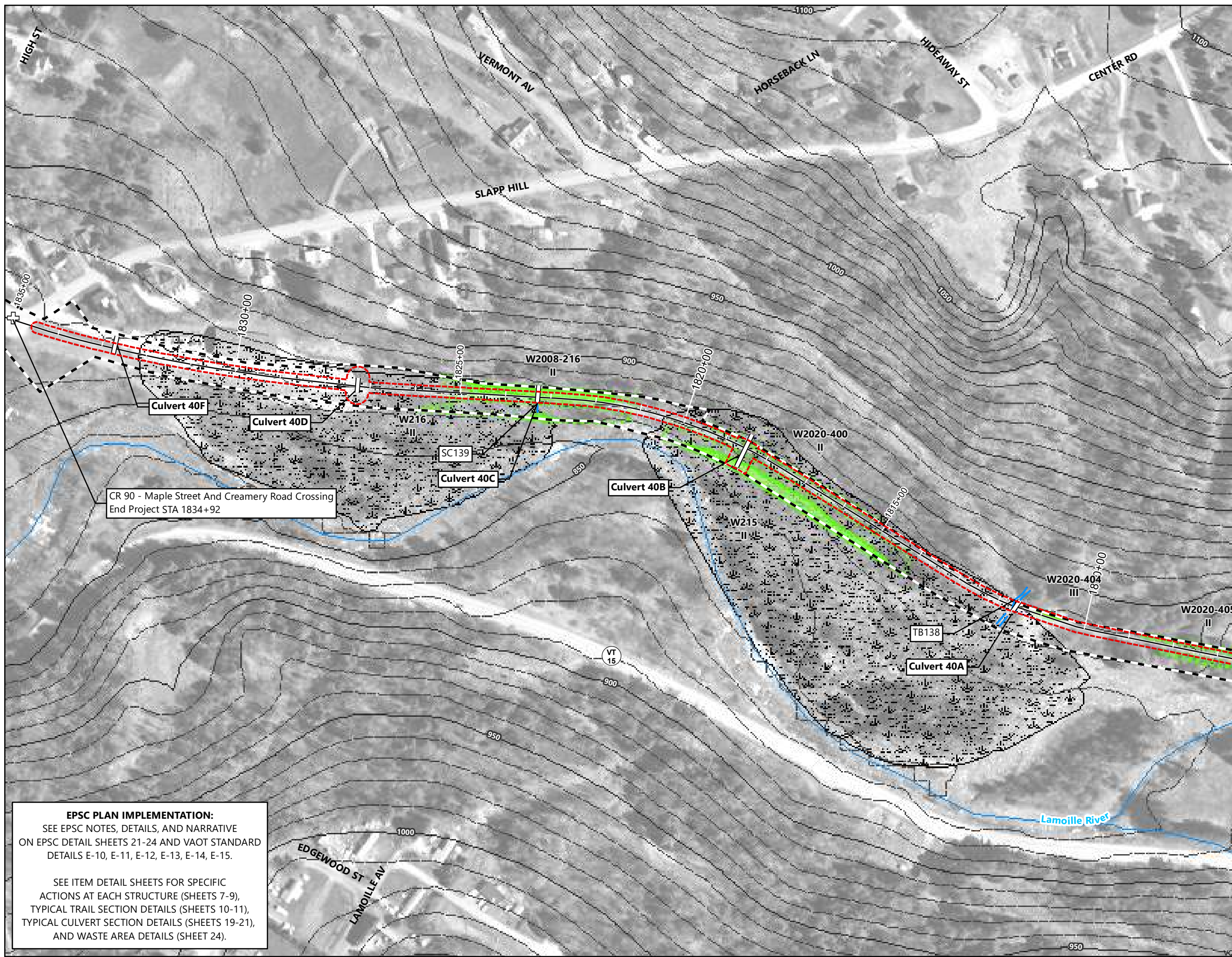
Sheet 69 of 70

March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⚠ Proposed Pause Place           |
| ⬜ Right of Way            | ⬜ Washouts                       |
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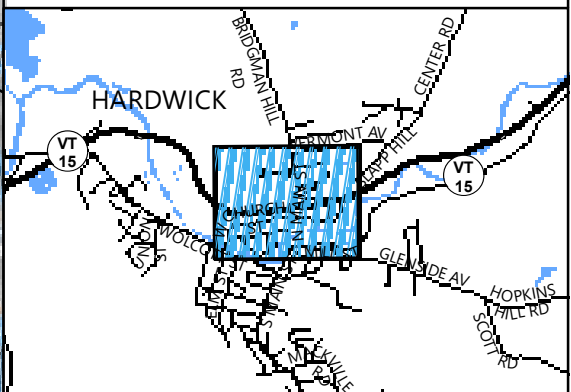


St. Johnsbury - Swanton  
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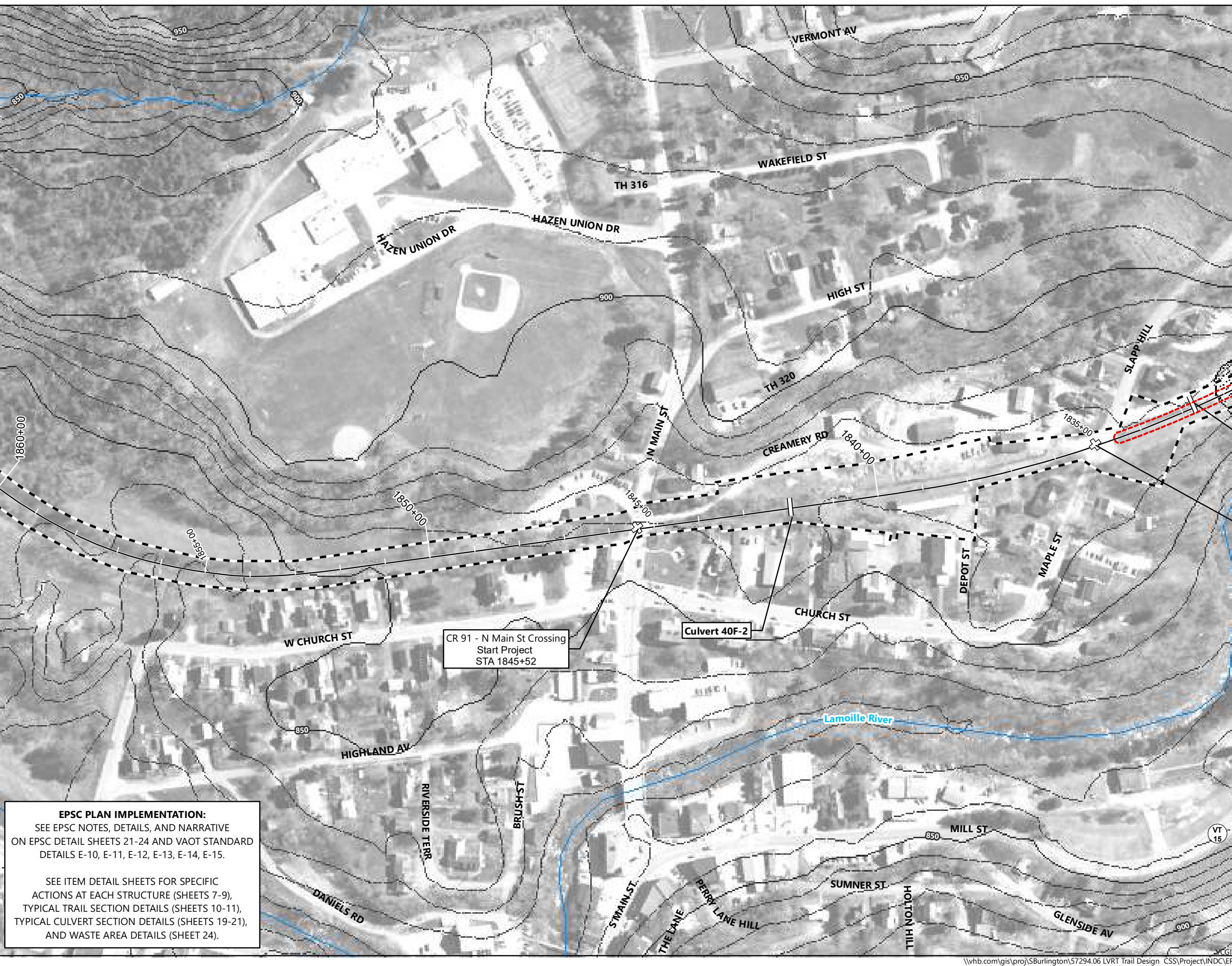
Sheet 70 of 70

March 22, 2021

- |                           |                                  |
|---------------------------|----------------------------------|
| — LVRT Centerline         | ⛔ Proposed Pause Place           |
| ▣ Right of Way            | ▣ Washouts                       |
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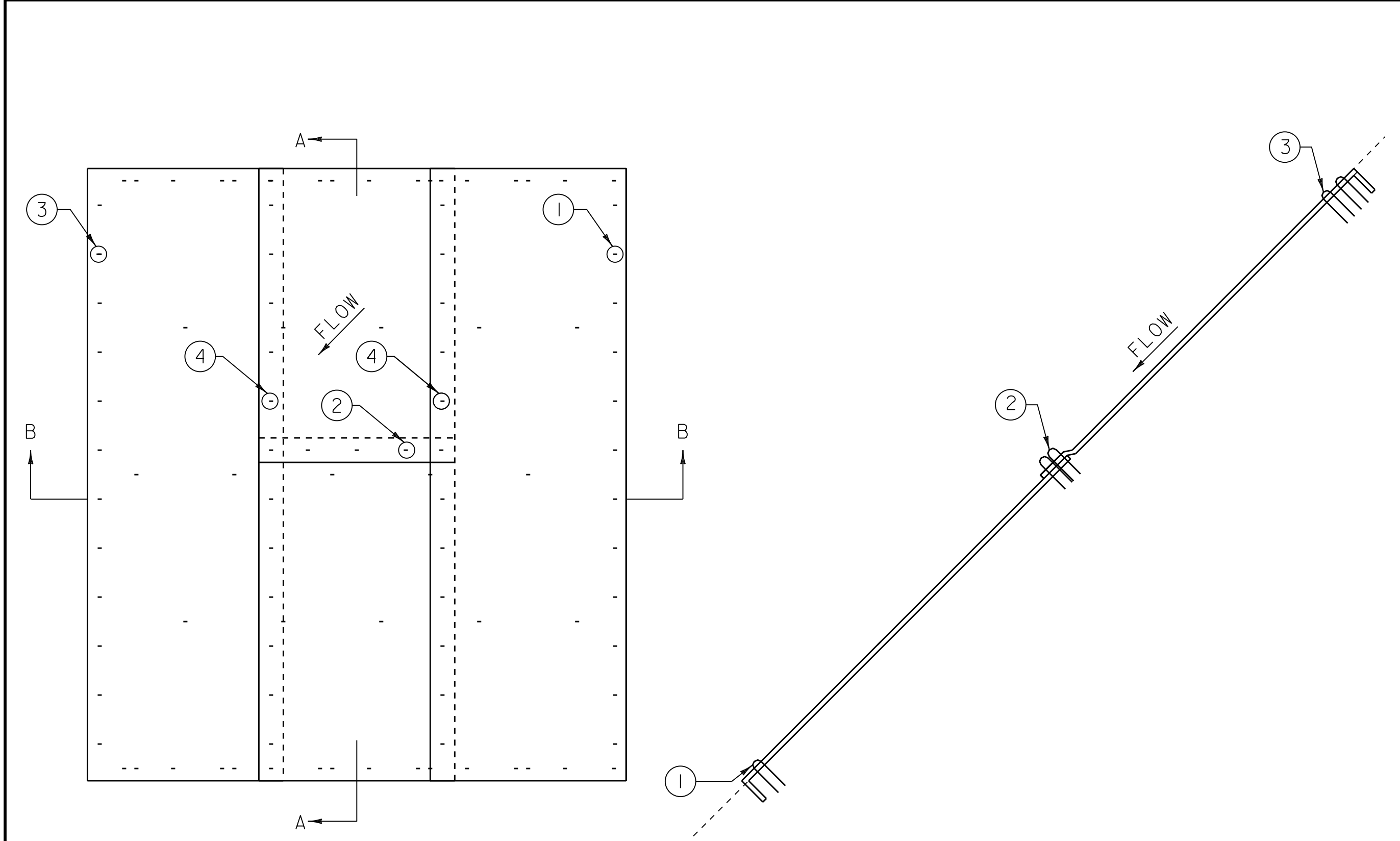


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CR 91 - N Main St Crossing  
Start Project  
STA 1845+52

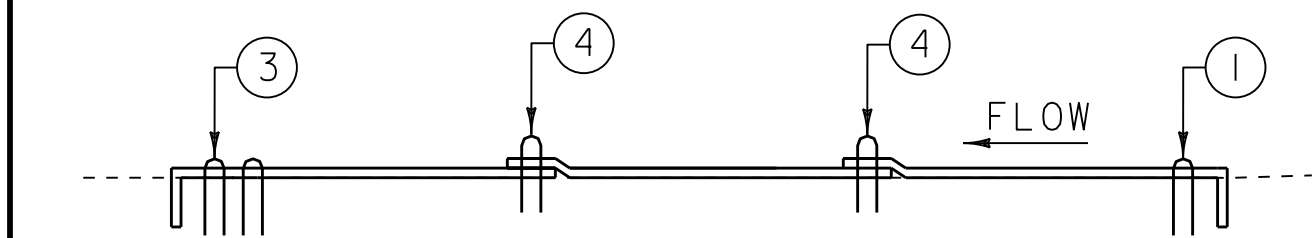
Culvert 40F-2





PLAN

SECTION A-A



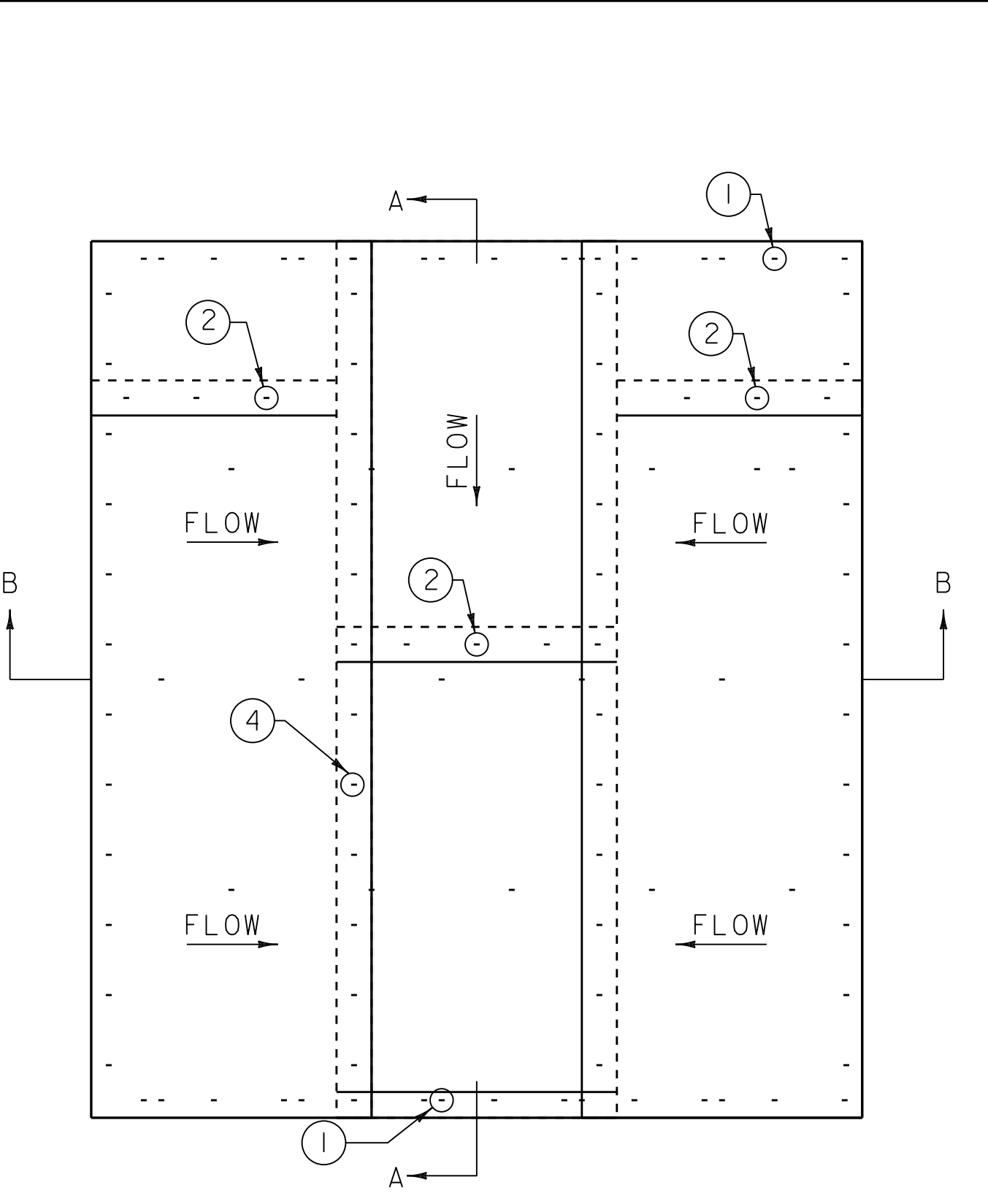
SECTION B-B

ON SLOPE

NOTE:

1. APPLY TO SLOPES GREATER THAN 1V:3H OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

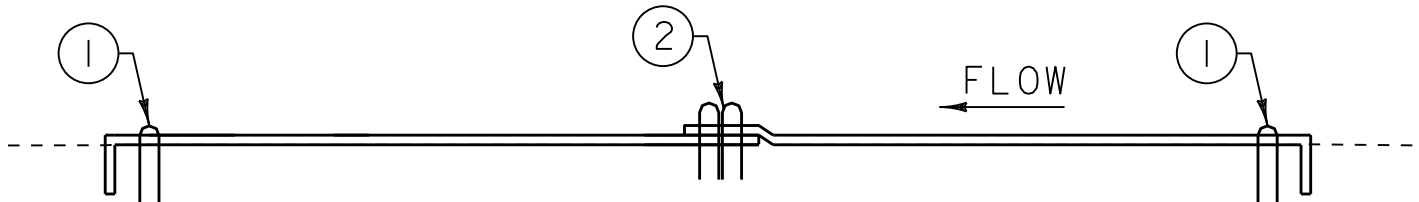
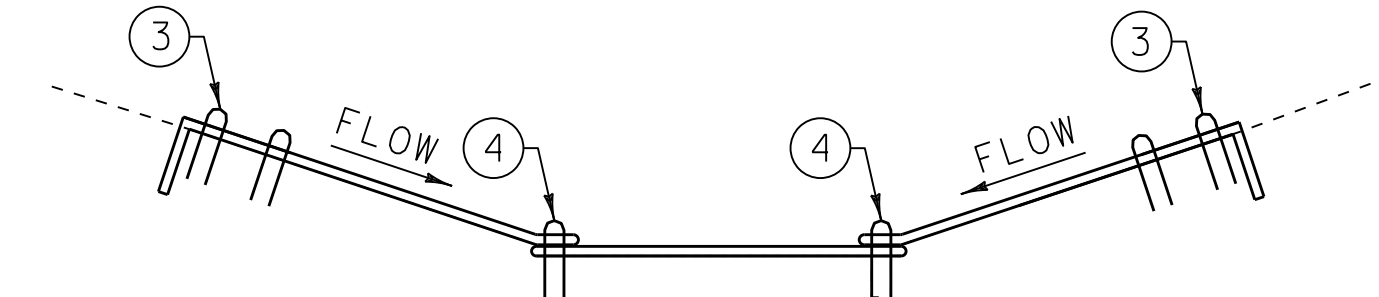


PLAN

SECTION B-B

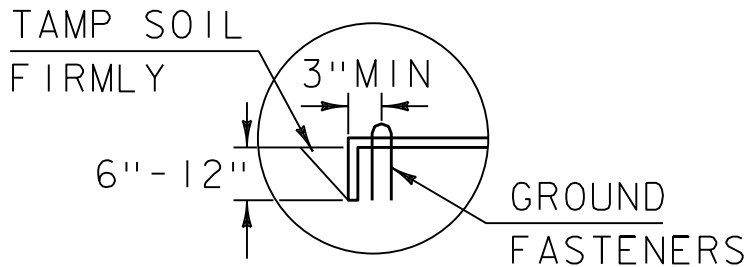
SECTION A-A

IN DITCH

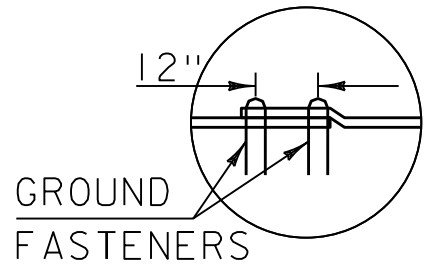


NOTE:

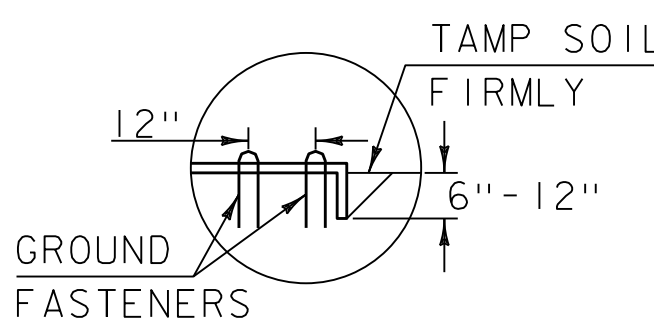
1. PARABOLIC DITCHES MAY REQUIRE ADDITIONAL FASTENERS TO ENSURE SUITABLE CONTACT WITH SOIL.



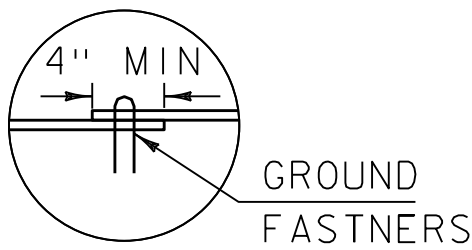
1 TERMINAL FOLD



2 JUNCTION SLOT



3 ANCHOR SLOT



4 LAP JOINT

GROUND FASTNER DETAILS

GENERAL NOTES:

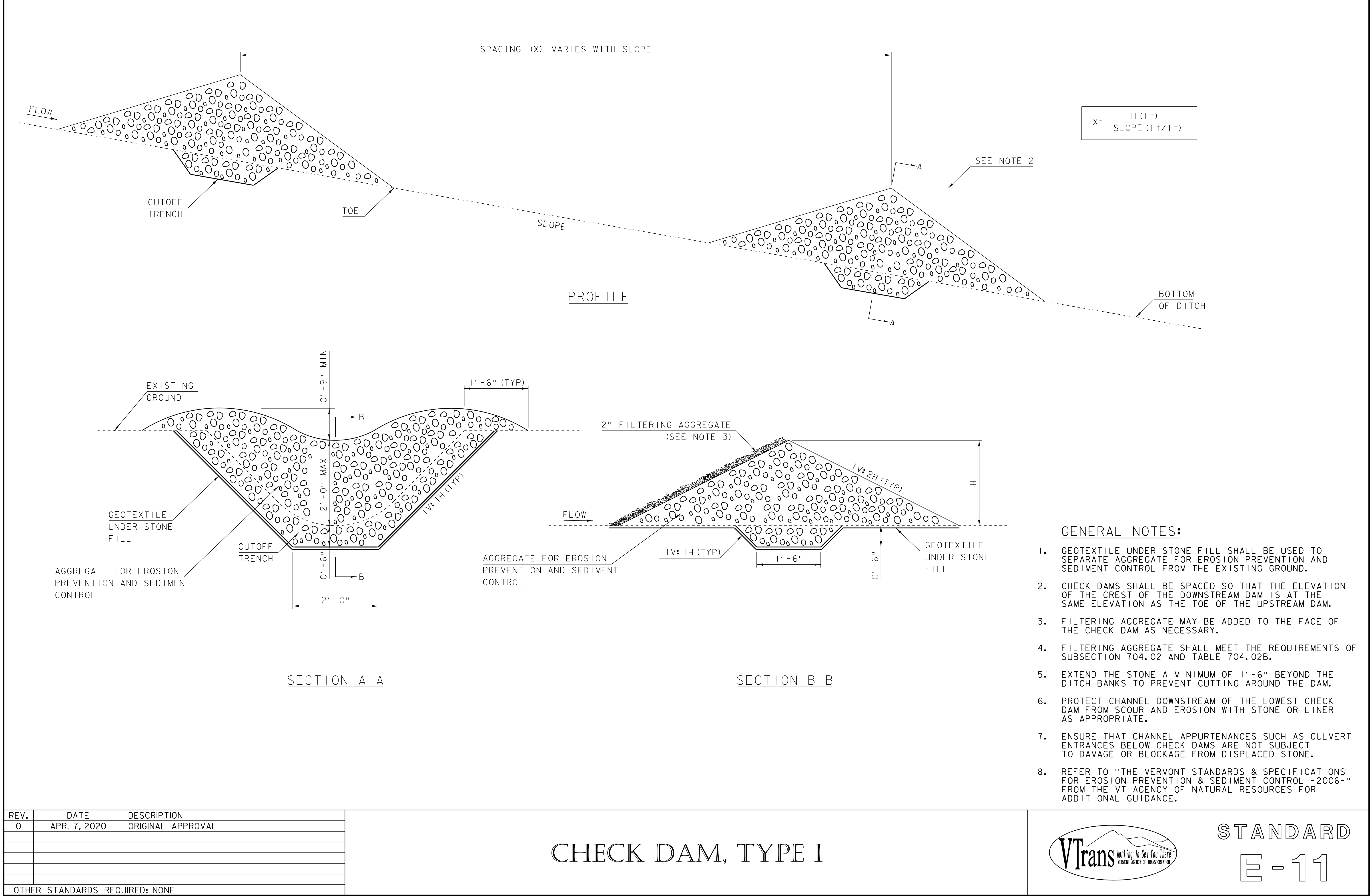
- FASTENERS ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART.
- SHOWN SPACING IS FOR GENERAL GUIDANCE. MANUFACTURER'S SPECIFICATIONS SHOULD BE FOLLOWED TO ENSURE PROPER INSTALLATION.
- DISTURBED AREAS SHALL BE SMOOTHLY GRADED. ROLLED EROSION CONTROL PRODUCT SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
- ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE SECURED AT APPROXIMATELY 12" INTERVALS.
- REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

ROLLED EROSION CONTROL PRODUCT , TYPE I



STANDARD  
E-10



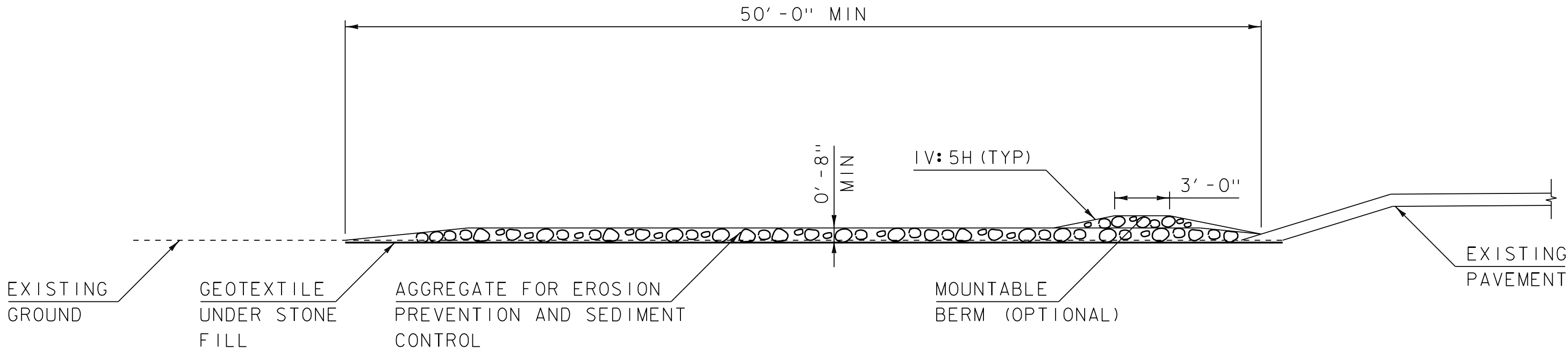


REV.	DATE	DESCRIPTION
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OTHER STANDARDS REQUIRED: NONE		

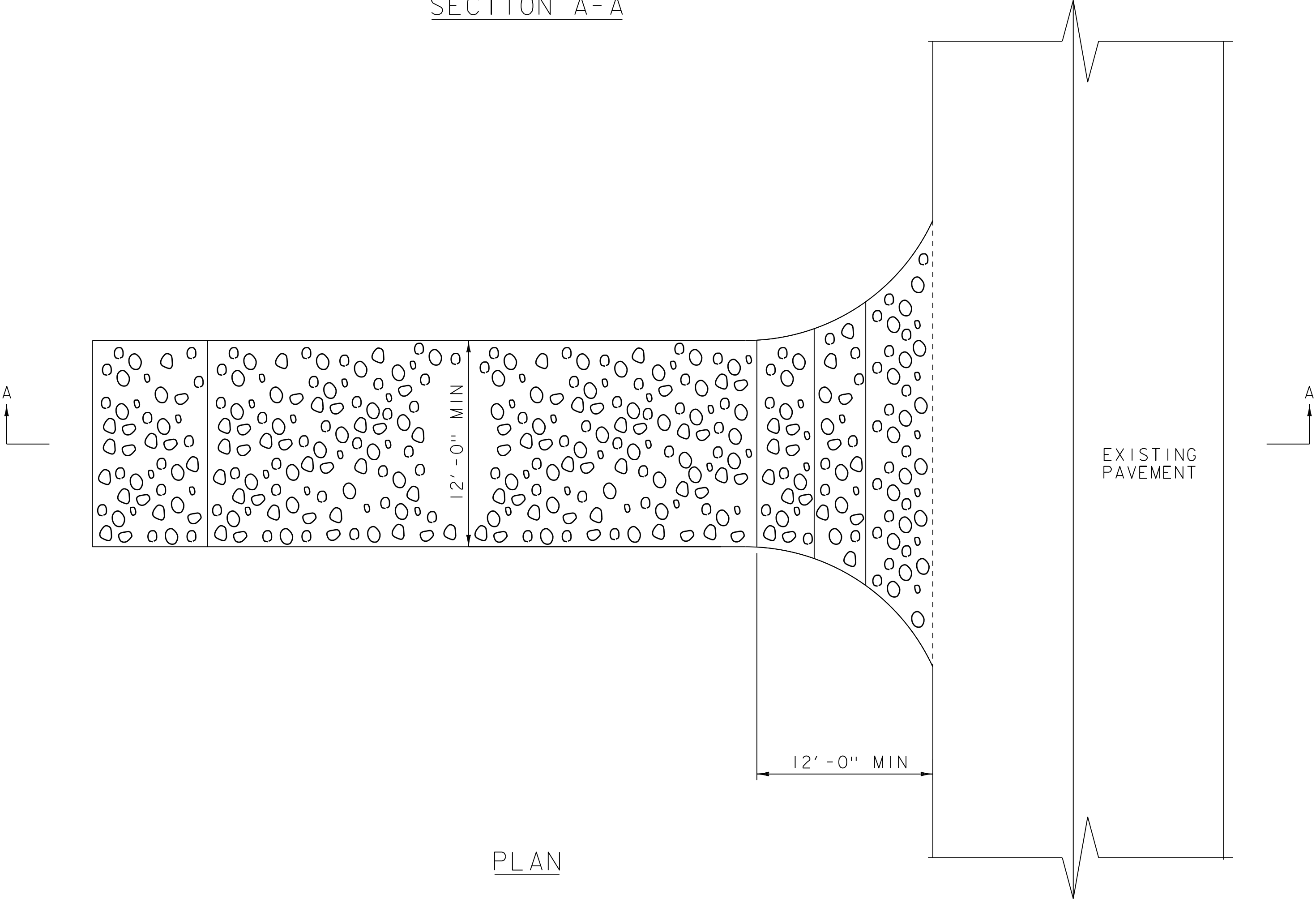
CHECK DAM, TYPE I







SECTION A-A



PLAN

GENERAL NOTES:

1. LENGTH- NOT LESS THAN 50' UNLESS APPROVED BY THE ENGINEER.
2. GEOTEXTILE UNDER STONE FILL SHALL BE USED TO SEPARATE AGGREGATE FOR EROSION PREVENTION AND SEDIMENT CONTROL FROM THE EXISTING GROUND.
3. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 1V:5H SLOPES WILL BE PERMITTED.
4. REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

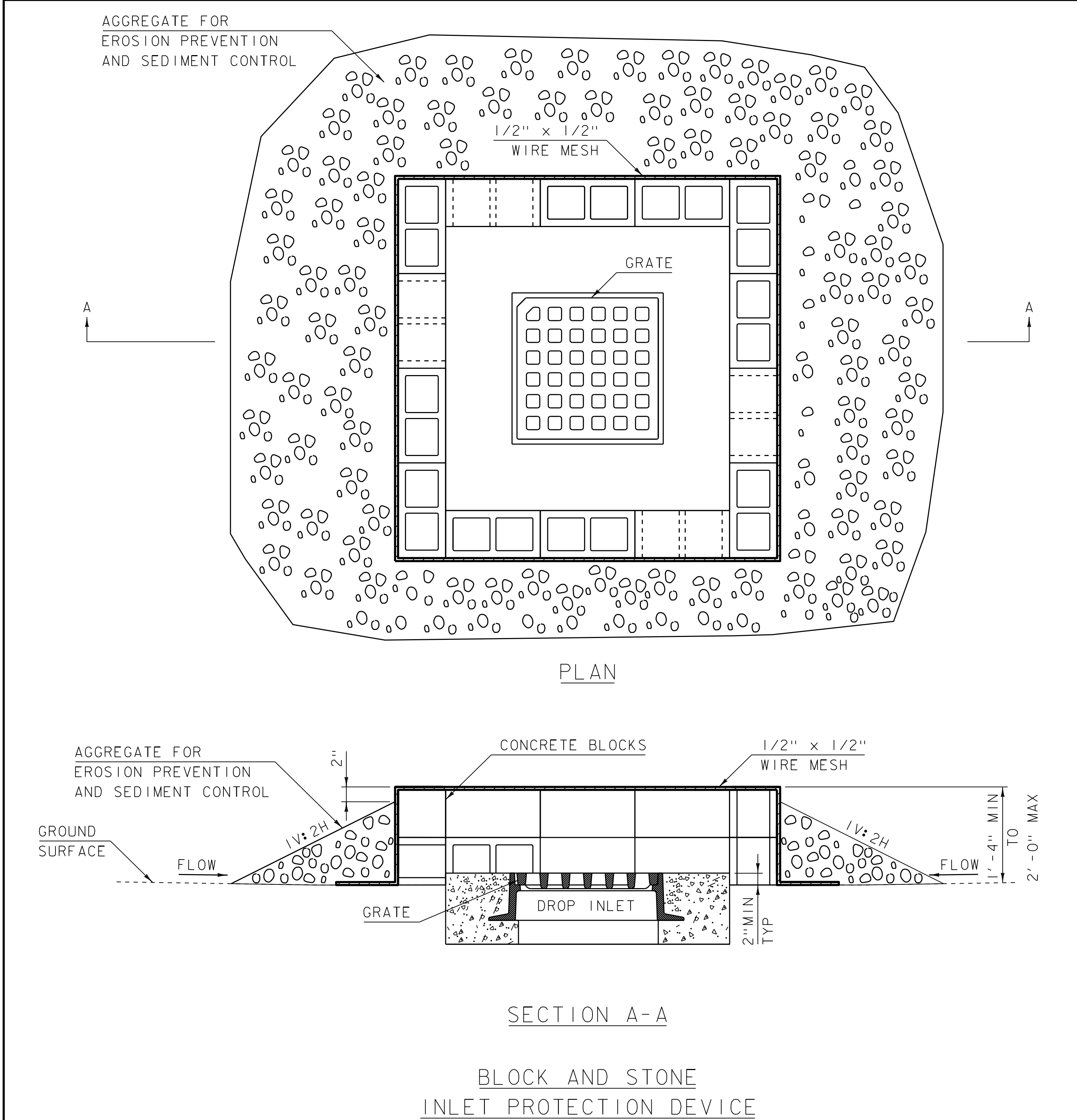
REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

STABILIZED CONSTRUCTION ENTRANCE



STANDARD  
E-12



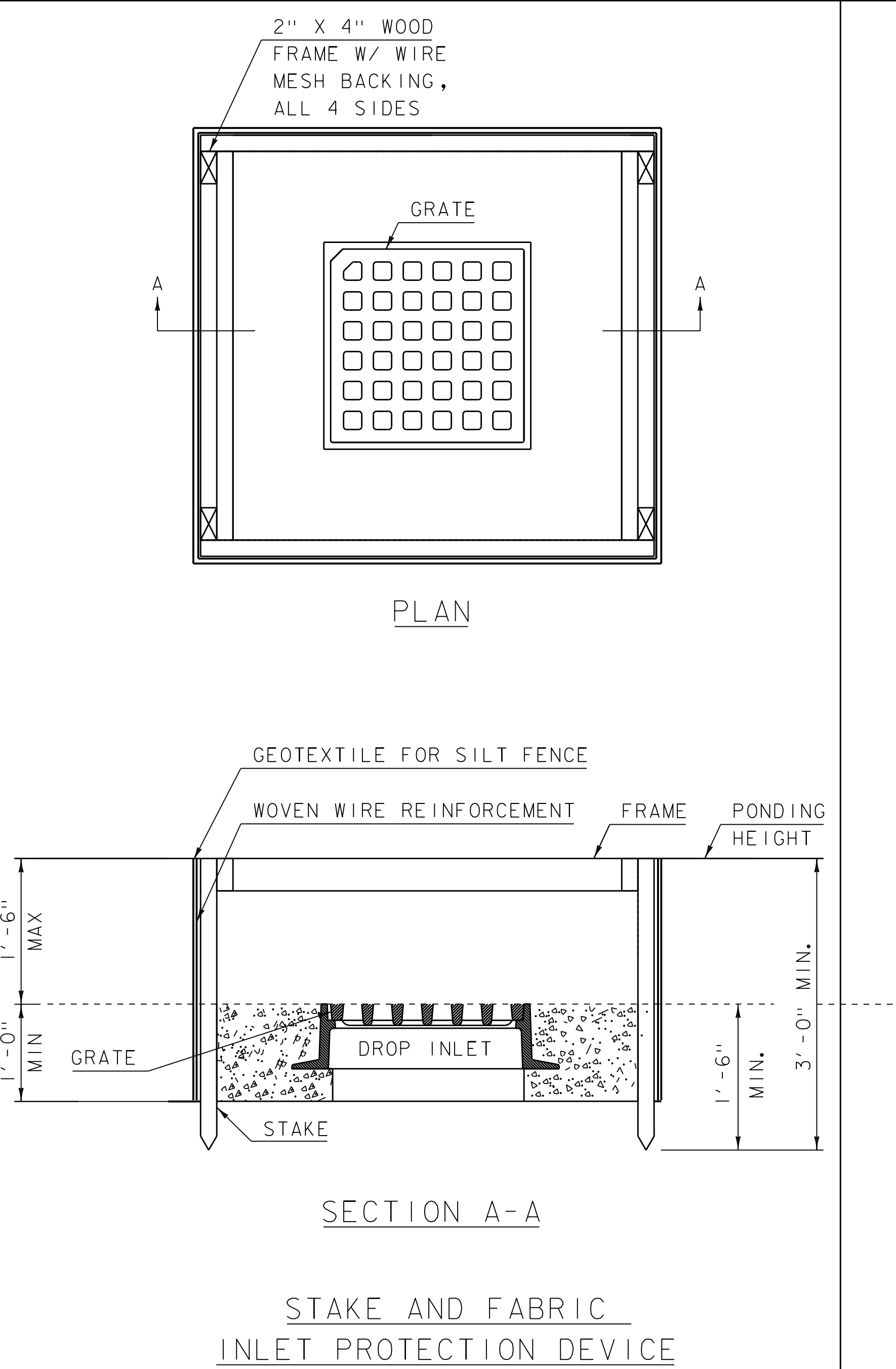


**NOTES:**

- ONE BLOCK ON EACH SIDE SHALL BE PLACED WITH HOLES ORIENTED HORIZONTALLY TO ALLOW WATER TO FLOW INTO THE INLET.
- 1/2" X 1/2" WIRE MESH SHALL BE PLACED OVER THE BLOCK WITH THE HORIZONTALLY ORIENTED HOLES. WIRE MESH SHALL BE OF A GAGE TO WITHSTAND APPLICATION OF THE FILTERING AGGREGATE.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

# INLET PROTECTION DEVICE, TYPE I



**NOTES:**

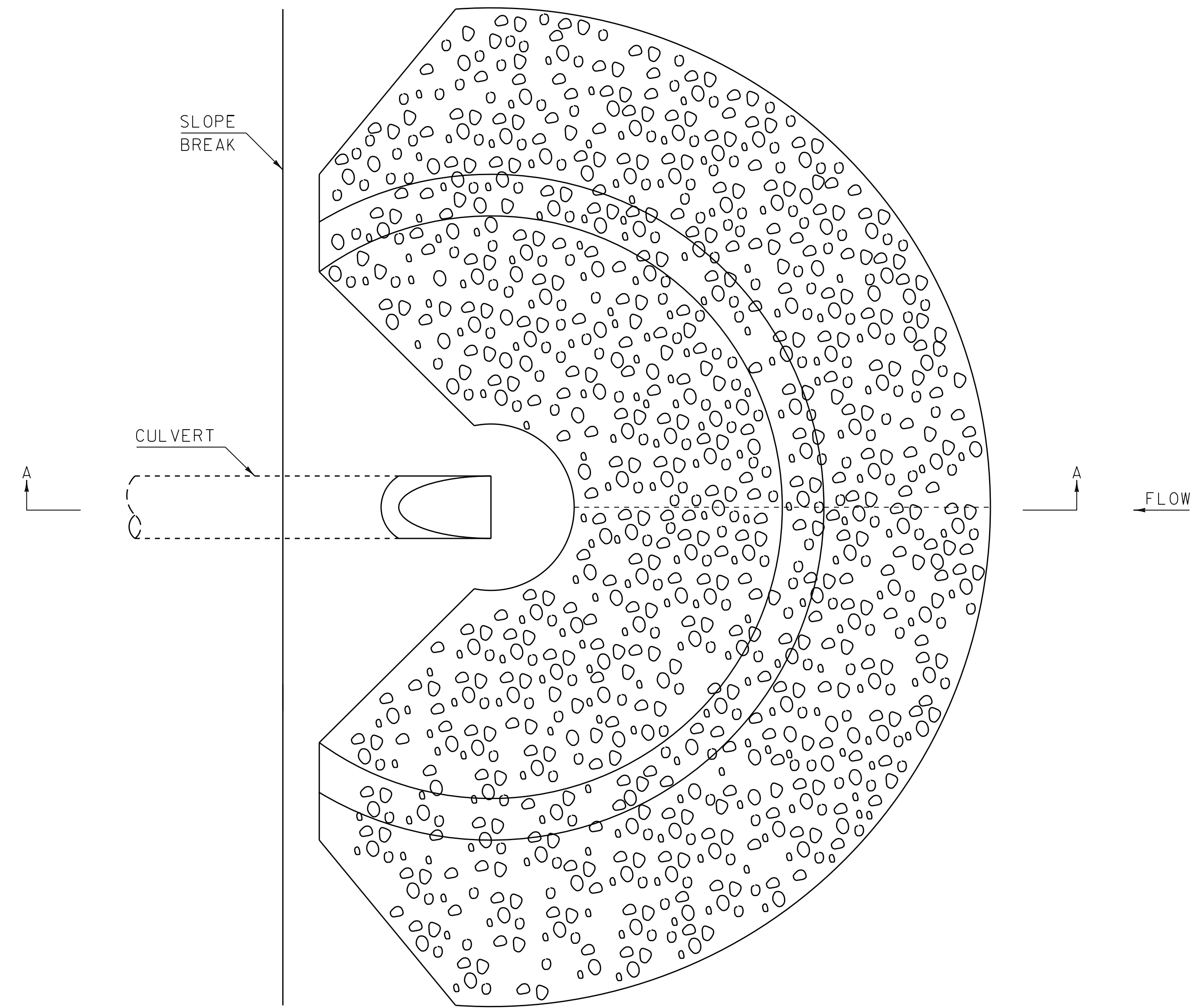
- STAKES AND FRAME SHALL BE STANDARD 2" X 4" LUMBER.
- STAKES SHALL BE SPACED AT A MAXIMUM OF FOUR FEET APART. FOR SIDES GREATER THAN FOUR FEET IN LENGTH, STAKES SHALL BE EQUALLY SPACED.
- BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
- FABRIC SHALL BE ONE CONTINUOUS PIECE AND SHALL BE OVERLAPPED TO THE NEXT STAKE.
- FABRIC SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.

**GENERAL NOTE:**

- REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

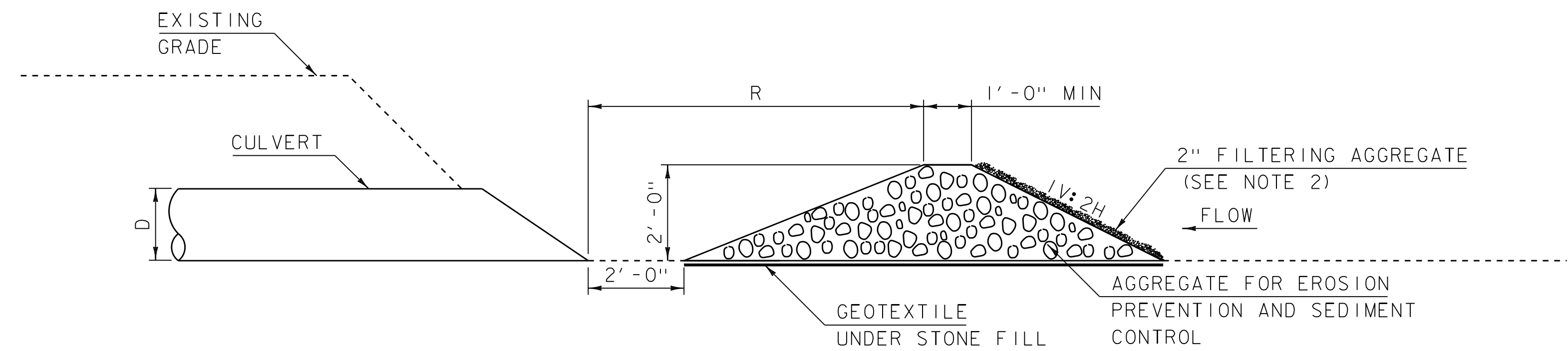






PIPE DIA.	
"D"	"R"
≤ 24"	7'
30"	8'

PLAN



SECTION A-A

GENERAL NOTES:

1. GEOTEXTILE UNDER STONE FILL SHALL BE USED TO SEPARATE AGGREGATE FOR EROSION PREVENTION AND SEDIMENT CONTROL FROM THE EXISTING GROUND.
2. FILTERING AGGREGATE MAY BE ADDED AS NECESSARY.
3. FILTERING AGGREGATE SHALL MEET THE REQUIREMENTS OF SUBSECTION 704.02 AND TABLE 704.02B.
3. INDIVIDUAL CONSIDERATION SHALL BE GIVEN FOR PIPE DIAMETERS GREATER THAN 30".

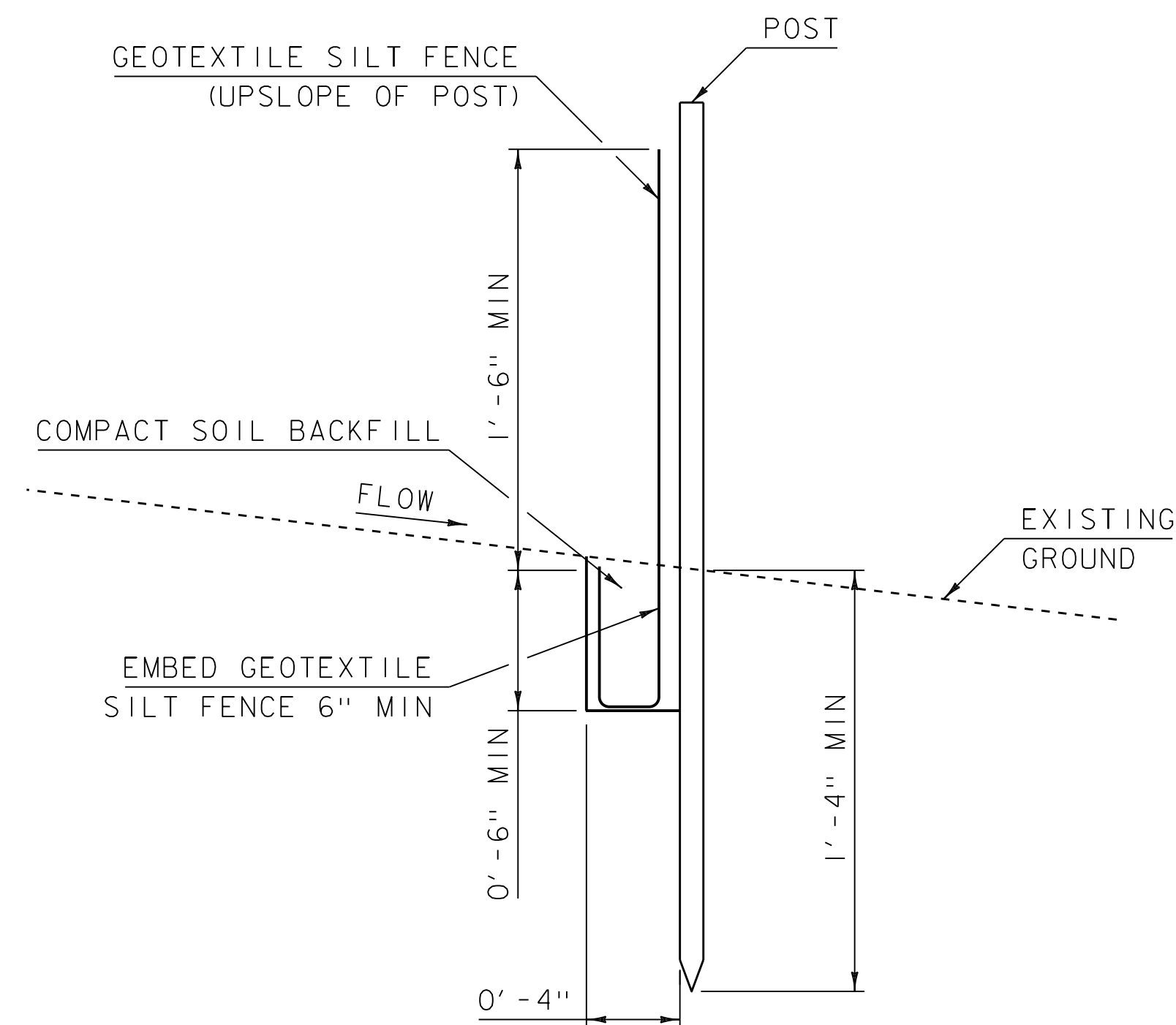
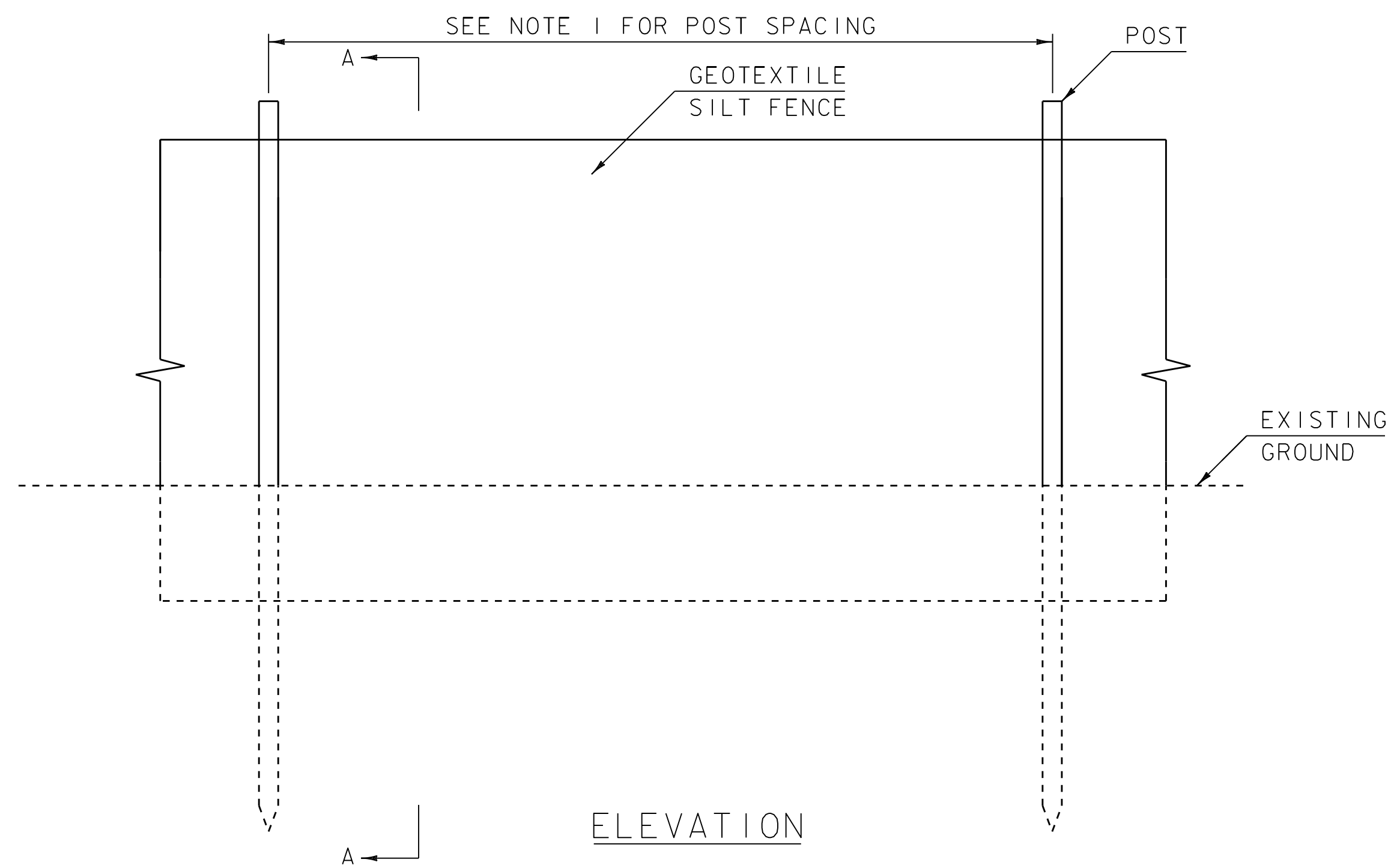
REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

# INLET PROTECTION DEVICE, TYPE III



STANDARD  
E-14



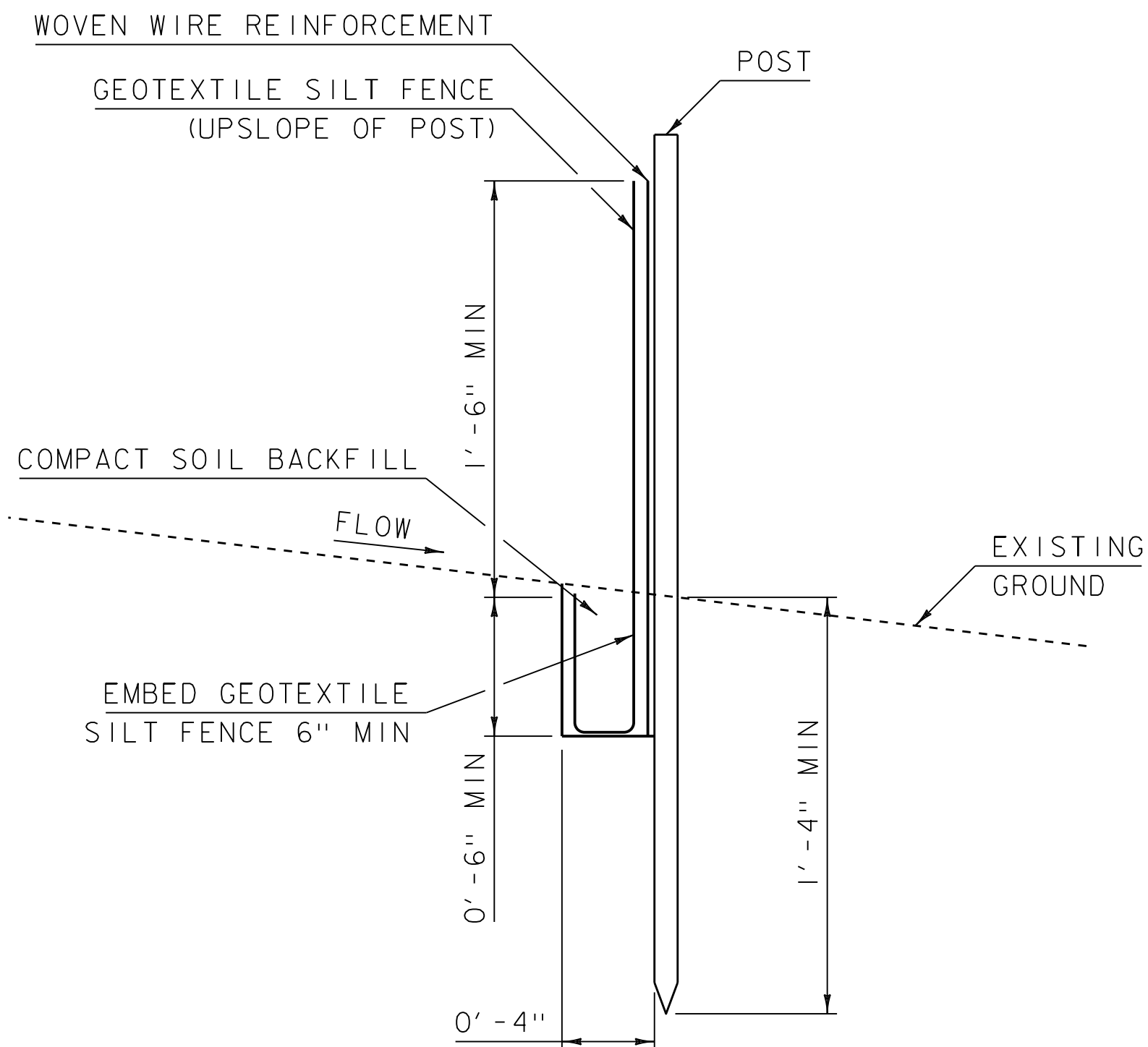
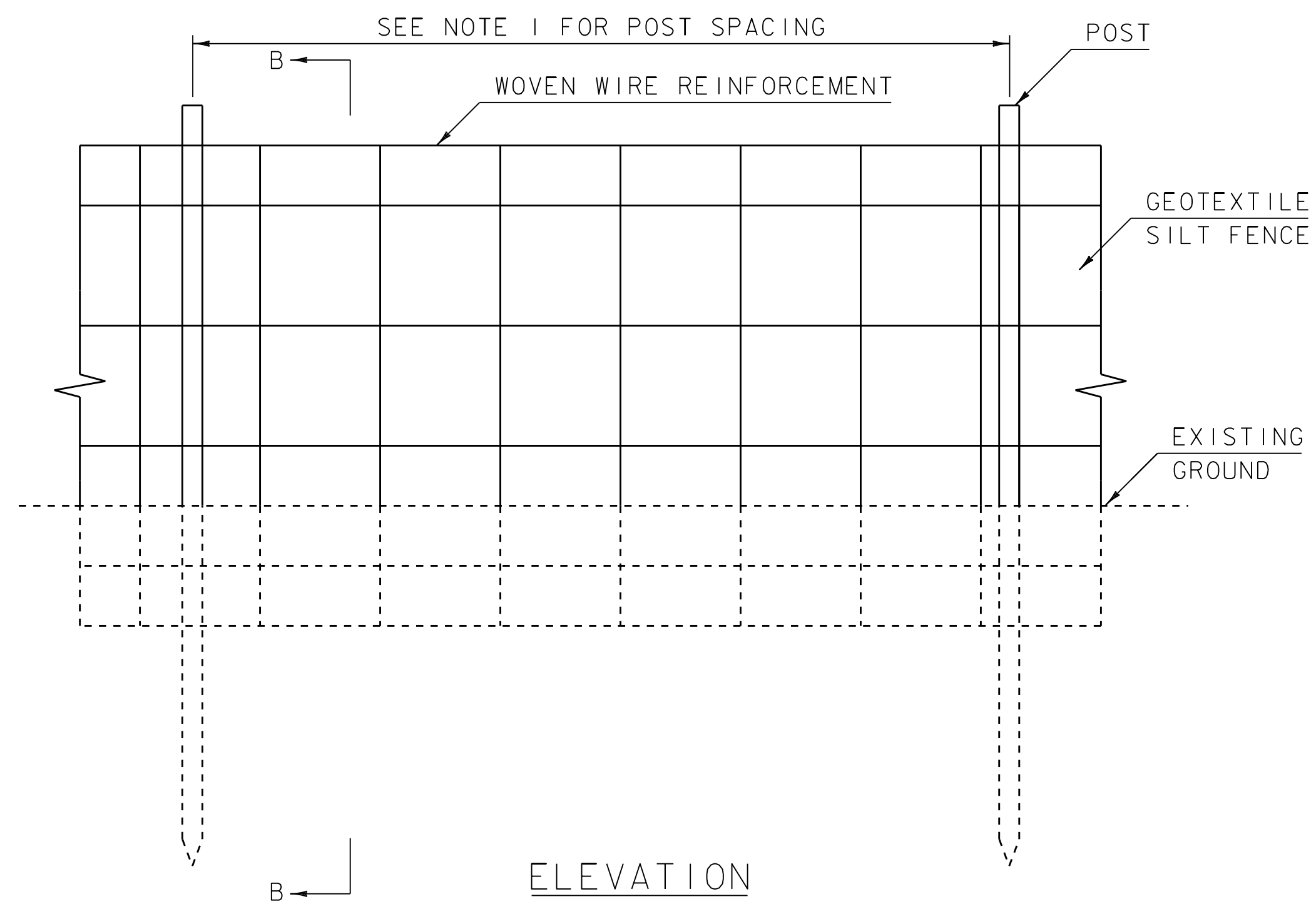


SECTION A-A

SILT FENCE, TYPE I

**NOTE:**

1. POST SPACING FOR SILT FENCE SHALL NOT EXCEED 4' WHEN ELONGATION IS GREATER THAN 50% AND SHALL NOT EXCEED 6' WHEN ELONGATION IS LESS THAN 50%.

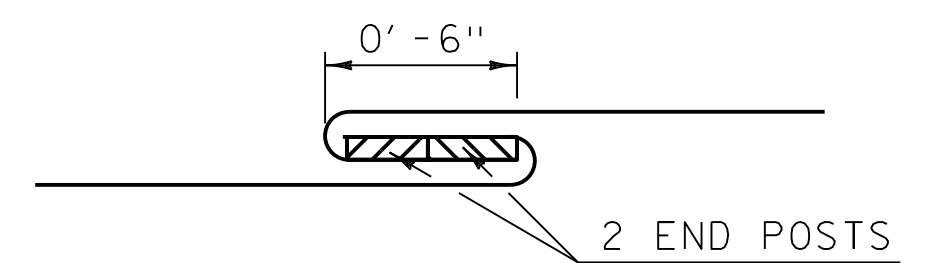


SECTION B-B

SILT FENCE, TYPE II

**NOTES:**

1. POST SPACING FOR SILT FENCE, WOVEN WIRE REINFORCED SHALL NOT EXCEED 10'.
2. WOVEN WIRE REINFORCEMENT IS TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. GEOTEXTILE FOR SILT FENCE IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.



GEOTEXTILE FOR SILT FENCE  
OVER LAP DETAIL

**GENERAL NOTES:**

1. REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.
2. TAMP SOIL BACKFILL FOR SECTION OF EMBEDDED GEOTEXTILE.

REV.	DATE	DESCRIPTION
0	APR. 7, 2020	ORIGINAL APPROVAL
OTHER STANDARDS REQUIRED: NONE		

# SILT FENCE



STANDARD  
E-15





## Lamoille Valley Rail Trail – 401 Water Quality Certification Application

### Appendix IH. Perennial Stream Impact List

April 1, 2021

Structure ID	Type	Stream Name	Latitude	Longitude
<b>LVRT (13)</b>				
<b>27P</b>	Culvert	Perkins Meadow Brook	44.45159	-72.257802
<b>28E</b>	Culvert	Unnamed tributary to Perkins Meadow Brook	44.46658	-72.263717
<b>28P</b>	Culvert	Unnamed tributary to Haynesville Brook	44.48011	-72.275743
<b>31G</b>	Culvert	Unnamed Tributary to Lamoille River	44.51505	-72.290722
<b>32A</b>	Culvert	Unnamed Tributary to Lamoille River	44.5215	-72.281134
<b>32C</b>	Culvert	Unnamed Tributary to Lamoille River	44.52368	-72.277938
<b>32D</b>	Culvert	Unnamed Tributary to Lamoille River	44.52632	-72.277051
<b>33C</b>	Culvert	Stevens Brook	44.53779	-72.266733
<b>36</b>	Bridge	Greensboro Brook	44.5312	-72.282039
<b>36L</b>	Culvert	Unnamed Tributary to Lamoille River	44.51942	-72.31376
<b>36M</b>	Culvert	Unnamed Tributary to Lamoille River	44.51897	-72.31476
<b>37</b>	Culvert	Unnamed Tributary to Lamoille River	44.50985	-72.320484
<b>LVRT (12)</b>				
<b>41D(2)</b>	Culvert	Unnamed tributary to Lamoille River	44.51500	-72.38332
<b>43</b>	Bridge	Unnamed tributary to Lamoille River	44.52062	-72.41627
<b>44</b>	Bridge	Kate Brook	44.52172	-72.41874
<b>48C</b>	Culvert	Unnamed tributary to Lamoille River	44.55225	-72.47548
<b>49</b>	Bridge	Wild Branch	44.56034	-72.490456
<b>52</b>	Bridge	Lamoille River	44.57124	-72.508221
<b>53G</b>	Culvert	Unnamed tributary to Lamoille River	44.56680	-72.536419
<b>53P</b>	Culvert	Unnamed tributary to Lamoille River	44.56584	-72.550031
<b>LVRT (11)</b>				
<b>70</b>	Bridge	Black Creek	44.709724	-72.837086
<b>71</b>	Bridge	Black Creek	44.710944	-72.839333
<b>77A</b>	Culvert	Unnamed Perennial tributary to Black Creek	44.768643	-72.852882
<b>81</b>	Bridge	Unnamed Perennial tributary to Black Creek	44.78201	-72.856356
<b>82</b>	Bridge	Unnamed Perennial tributary to Black Creek	44.788319	-72.864146
<b>83A-2</b>	Culvert	Unnamed Perennial tributary to Black Creek	44.793167	-72.876799
<b>85</b>	Bridge	Elm Brook	44.793521	-72.878569
<b>89F</b>	Culvert	Unnamed Perennial tributary to Black Creek	44.84788	-72.928824
<b>89G</b>	Bridge	Unnamed Perennial tributary to Black Creek	44.850595	-72.929202
<b>90</b>	Bridge	Unnamed Perennial tributary to Black Creek	44.855225	-72.931409
<b>91F</b>	Culvert	Unnamed Perennial tributary to Black Creek	44.8738525	-72.9383149



## **Lamoille Valley Rail Trail – 401 Water Quality Certification Application**

### **Appendix II. Geomorphic Condition**

April 1, 2021

The Lamoille Valley Rail Trail (“LVRT” or “Project”) project involves the repair and replacement of existing culverts and bridges along the trail corridor, as well as the associated instream work required at these locations. Named streams that will be impacted by the Project include Black Creek, Elm Brook, Greensboro Brook, Kate Brook, Lamoille River, Perkins Meadow Brook, Stevens Brook, and Wild Branch. Many smaller, unnamed tributaries to these streams will also be impacted. See Appendix IH for a full list of perennial streams impacted by the Project and locations of the proposed structures. Because the LVRT occupies the existing railroad corridor along the entirety of its length, there are existing structures at each of these locations or there had been in the past.

In most instances, the geomorphic conditions at these sites have adjusted to the presence of these structures, generally with localized impacts such as minor sediment accumulation upstream and scour downstream of undersized culverts. Because the LVRT crosses most of these streams near the downstream end of their watersheds and occupies the valley bottom through the Lamoille River and Black Creek watersheds, the geomorphic sensitivity at most sites is limited due to the low gradient, tailwater conditions that they experience. Certain structures that have previously failed or are nearing failure will be completely replaced with new structures that will accommodate the geomorphic sensitivity of the stream. Overall, all proposed activities will maintain or improve the geomorphic condition at each site.

The Vermont Agency of Transportation and the Vermont Department of Environmental Conservation are reviewing this Project to ensure that it complies with each Agency’s applicable guidance pertaining to the geomorphic condition and sensitivity of the affected streams. For example, proposed construction activities associated with LVRT stream crossing structures will involve the movement, fill, or excavation of 10 cubic yards or more of instream materials within perennial streams and the Project is therefore required to demonstrate compliance with Vermont Stream Alteration Rule (Environmental Protection Rule, Chapter 27). The Project is a state transportation infrastructure project and therefore requires a Title 19 consultation rather than authorization under the Stream Alteration General Permit (“SAGP”) for instream work. Furthermore, these structures occur within River Corridors designated by the Vermont Department of Environmental Conservation (“DEC”) and some span waterways with FEMA-designated floodways or approximate floodplains and are required to demonstrate compliance with the Flood Hazard Area and River Corridor (“FHARC”) Rule (Environmental Protection Rule, Chapter 29). Currently, Title 19 and FHARC applications have been submitted for all phases of the LVRT and the authorizations have been issued or are under review.

Many of the larger stream crossings involve existing railroad bridges that will be rehabilitated for use by the LVRT. Specific repairs required to reuse these structures include repointing, resetting, and/or replacing concrete and stone abutments and wingwalls, replacement of concrete bridge seats and backwalls, repair or replacement of bridge decks, railings, and approaches. Where practicable, collapsing or failed stones from the original box culverts will be removed and reset to improve the waterway





opening and preserve the historic nature of the structures. Previously removed or completely failed structures that will be fully replaced have been designed so that the new structure fully spans the bankfull channel width and provides opportunity for improved sediment transport and flood capacity (e.g., Bridge 49).

Proposed activities at smaller stream crossings include structural repairs to existing culverts constructed from various materials (e.g., stone, concrete, corrugated metal pipe). Additional work needed at these structures may involve clearing, regrading, or stabilizing channel inlets and outlets in the vicinity of such structures and stabilizing the adjacent embankment. Overall, these repairs will improve the integrity and longevity of each structure and restore aquatic organism passage and sediment transport where these connections have been previously disrupted by collapsed or damaged structures. Bank repairs and scour protection proposed at these locations channels will also serve to minimize scour and decrease the risk of future erosion at these structures.

Structures proposed for replacement involve replacing undersized, deteriorating, and/or missing bridges and culverts with appropriately sized structures. Proposed replacement structures will conform with Section C.2.2.4 of the SAGP, which states that the span length of replacement structures shall be equal to 1.0X the bank full width of the stream, the opening height shall be the greater of 4.0X the mean depth of the bank full channel or the height based on the hydraulic capacity required to pass the design flow with a HW/D less than 1.0, and the embeddedness shall be the greater of 30% of the calculated structure opening height, or 1.5 feet. In addition, the slope of the proposed structure will be designed to match the existing channel slope more closely.

The overall effect of the proposed activities will maintain or increase geomorphic stability of the affected stream reaches, will more closely match the dimensions, patterns, and profiles associated with the natural channel, and will provide structure and stream geometries that will decrease the risk of channel adjustments, erosion, deposition, and flooding at the site of each structure. In summary, the geomorphic conditions at each of these locations will be maintained or improved by the Project.





**Lamoille Valley Rail Trail – 401 Water Quality Certification Application**

**Appendix IJ LVRT 401 Physical Biological Chemical Conditions**

March 31, 2021



**401 WATER QUALITY CERTIFICATION**
**STP LVRT (11,12,13) Water Quality Measurement Station**

Site Name	River Mile	Location Details	Physical Conditions Monitored	Chemical Conditions Monitored	Biological Conditions Monitored
Joes Brook	14.7	Located above Joes Pond above railroad bridge crossing. Walden, VT (44.42436, -72.22368)	Conductivity	Chloride, Nitrogen, Phosphorus, pH	Macroinvertebrate (Very Good)
Lyford Pond	N/A	STATION LOCATED IN MIDDLE OF WESTERN ARM OF POND Walden, VT (44.43970, -72.25110)	Secchi Transparency, Conductivity	Chloride, Nitrogen, Phosphorus, pH	N/A
Stannard Brook	0.3	Located above Orton Rd, which is just above railroad tressle Stannard, VT (44.54075, -72.26313)	Turbidity, Conductivity	Chloride, Nitrogen, Phosphorus, pH	Macroinvertebrate (Good-Fair), Habitat Observations
Lamoille River	76.8	Located just north of Route 16 crossing north of East Hardwick. Sampled adjacent to railroad bed. Hardwick, VT (44.52433, -72.29248)	Turbidity, Conductivity	Chloride, Nitrogen, Phosphorus, pH	Macroinvertebrate (Very Good), Habitat Observations, Fish assessment (Good)
Bailey Brook	0.5	Located above railroad tracks in East Hardwick. Hardwick, VT (44.52667, -72.30472)	Conductivity	pH	Fish Assessment (Excellent), habitat observations
Porter Brook	0.1	Park at pull off on Rte 15 directly across from Porter Brook. Descend steep bank and cross old rail bed and cross Lamoille River to confluence with Porter Brook. Go 100 meters upstream to bend in brook. Hardwick, VT (44.50399, -72.33881).	Turbidity, Conductivity	Chloride, Nitrogen, Phosphorus, pH	Macroinvertebrate (Excellent-Very Good), Habitat Observations
Lamoille River	70.5	Located below Hardwick WWTF outfall about 200m and downstream of dam on Route 15. Hardwick, VT (44.51694, -72.38111)	Turbidity, Conductivity	Chloride, Nitrogen, Phosphorus, pH	Macroinvertebrate (Excellent-Very Good), Habitat Observations
Bunker Brook	0.1	Next to Bunker Hill Rd, immediately upstream of Rte 15. Hardwick, VT (44.51598, -72.39955)	Turbidity	Chloride, Nitrogen, Phosphorus	N/A
Kate Brook	0.1	At rail trail crossing off of Kate Brook Rd. Hardwick, VT (44.52173, -72.41869)	Turbidity	Chloride, Nitrogen, Phosphorus	N/A
Elmore Branch	0.2	At School St bridge. Wolcott, VT (44.53930, -72.45723)	Turbidity, Conductivity	Chloride, Nitrogen, Phosphorus, pH	Macroinvertebrate (Very Good- Good), Habitat Observations
Lamoille River	58	Upstream of Rt. 15A bridge, adjacent to Darling Rd and rail trail. NRSA/Probability site. Morristown, VT (44.56326, -72.56487)	Turbidity, Conductivity	Chloride, Nitrogen, Phosphorus, pH	Macroinvertebrate (Very Good), Habitat Observations
Black Creek	N/A	Bouchard Rd crossing Sheldon, VT (44.89459, -72.94369)	Turbidity	Nitrogen, Phosphorus	N/A
Black Creek	N/A	Beneath Pumpkin Village Road. Fairfield, VT (44.85090, -72.93231)	Turbidity (NTU)	Nitrogen (mg/L), Phosphorus (ug/L)	N/A
Black Creek	N/A	Main stem of Black Creek, beneath Paradee Road. Fairfield, VT (44.83200, -72.92860)	Turbidity (NTU)	Nitrogen (mg/L), Phosphorus (ug/L)	N/A
Black Creek	N/A	Main stem of Black Creek, beneath Chester A. Arthur Road. Fairfield, VT (44.81900, -72.92221)	Turbidity (NTU)	Nitrogen (mg/L), Phosphorus (ug/L)	N/A
Fairfield River	0.2	Located south of Fairfield station 0.4 mi, just above RR crossing. Fairfield, VT (44.81347, -72.92161)	Turbidity, Conductivity	Nitrogen, Phosphorus, Chloride, pH	Macroinvertebrate Assessment (Good), Fish assessment(very good), Habitat observations
Black Creek	N/A	East Fairfield, Ryan Rd crossing Fairfield, VT (44.81135, -72.90862)	Turbidity (NTU)	Nitrogen (mg/L), Phosphorus (ug/L)	N/A
Black Creek	14.5	Access off Route 36 (or Austin Rd) through pasture/crops. rotational probabilistic site. □ Fairfield, VT (44.78923, -72.87001)	Turbidity, Conductivity	Nitrogen, Phosphorus, pH	Macroinvertebrate Assessment (Very Good), Fish assessment(Good), Habitat observations





**Lamoille Valley Rail Trail – 401 Water Quality Certification Application**

**Appendix IK. Act 250 Application #7C1321 FINDINGS OF FACT**

October 25, 2012



155. The prehistoric sites are located on floodplains, first terraces, or second terraces. Deeply buried sites are present in all three settings but, not unexpectedly, most common in the floodplain. There are prehistoric sites with features and most of the latter were hearths. The results of various archaeological studies suggest that both prehistoric and historic archaeological sites will likely be present if: 1) the associated soils are well to moderately well drained; 2) there is proximity to potable water (prehistoric); and 3) there is an established access road in proximity (historic). [Exhibit 2]
156. The results of the background and literature review, the site-visits and archaeological sensitivity assessment are presented in the Phase IA report. The sensitivity assessments rely heavily on environmental variables as the number of previously recorded archaeological sites in the study area is very low. It appears that archaeological sites are present buried in the floodplains and on the first terraces and occasionally present on kame knolls on the terraces. The few upland sites in the sample that are noted are specialized sites like petroglyphs (both historic and prehistoric). [Exhibit 2]
157. VTrans and others have evaluated the potential impact to archaeological sites from the floodplain restoration Projects. These Projects are designed to remove floodplain barriers, including the LVRR ballast, that inhibit the dispersion of flood waters over the active floodplain. It is the opinion of VTrans that these Projects did not require archaeological investigation because there would be no disturbance below the bottom of the embankment. In light of this opinion, further archaeological consideration of VAST's proposed action on the LVRR ballast is not warranted. [Exhibit 2]
158. Wetlands have been identified on or near the LVRT Project site. [Exhibit 30 and Criterion 1(G) above]
159. There are no active necessary wildlife habitat areas within the LVRT Project site. [Exhibit 2]
160. There are no designated rare or irreplaceable natural or fragile areas on or near the Project site. [Exhibits 2, 19]
161. Repair and rehabilitation of Bridge #68 is included in the LVRT Phase 1 Project. This bridge work will require disturbance of the stream bed, resulting in potential impacts to freshwater mussel habitat. A plan has been developed in consultation with ANR to establish the presence or absence of these mussels and to determine recommendations for relocation if applicable. [Exhibit 2, 45, 76; Testimony of J. Nelson]

### **Discussion and Conclusion, Criterion 8**

In evaluating the potential aesthetic impacts of projects under Criterion 8, the Environmental



effect on aesthetics and scenic beauty, or may not have an undue adverse effect on aesthetics and scenic beauty. The Commission is not yet able to reach a conclusion regarding impact on aesthetics and scenic beauty, for the Phase 2 and Phase 3 components of the LVRT Project. Additional information is required in order for the Commission to reach a conclusion, as outlined above.

### **Conclusion of Law, Criterion 8**

#### **Phase 1**

**The Commission hereby issues a final affirmative conclusion of law under Criterion 8 for the Phase 1 Project. For the reasons set forth above, the Commission concludes that the Phase 1 Project, with the inclusion of monitoring and reporting related to noise emissions, as outlined above, will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, or rare and irreplaceable natural areas under Criterion 8. This constitutes a final conclusion of law under Criterion 8 for the Phase 1 Project.**

#### **Master Plan (Phase 2 & 3)**

**The Commission is unable to reach a positive conclusion of law under the entirety of Criterion 8 for the Master Plan (Phase 2 & 3) because there is not yet sufficient evidence to support such a conclusion. Specifically, for the reasons set forth above, the Commission is unable to make affirmative findings under Criterion 8 because it lacks information relevant to the Queechee analysis as outlined above, notably snowmobile noise emissions at three specific locations (i.e. the homes owned and occupied by Kate Scarlott and Rob MacLeod, Bruce and Molly Markwell, and Charles Emers and Anne McPherson). The Commission will require that future application(s) for construction of the Phase 2 and Phase 3 components of the LVRT Project include this additional information for these three locations, so that the Criterion 8 analysis can be concluded; this additional information may be presented in the form of the preliminary plans. The Commission's findings of fact and conclusion under criterion 8 for the Master Plan (Phase 2 and Phase 3 components of the LVRT Project) is valid for a five year period.**

### **SECTION 6086 (a)(8)(A) NECESSARY WILDLIFE HABITAT:**

162. No active necessary wildlife habitat areas are located within the LVRT right-of-way.  
[Exhibit 2]
163. State-threatened endangered plants are found in select locations in the LVRT right-of-way. These plants will be relocated to an alternate suitable location outside of the LVRT right-of-way, pursuant to a Takings Permit #EH-2012-21 issued by the Agency of Natural Resources Natural Heritage Information Program (NHIP). This Permit requires that the transplanted plant specimens be relocated to preserved portions of the





**Lamoille Valley Rail Trail – 401 Water Quality Certification Application**

**Appendix IL. 2020 Natural Resources Summary Memorandums**

2020/2021





To: Swanton – St. Johnsbury STP LVRT  
(11) Project File

Date: March 9, 2021

## Memorandum

Project #: 57294.13

From: Levi Keszey, Ecologist

Re: 2020 Natural Resource Summary

In 2008, VHB was engaged by the Vermont Association of Snow Travelers ("VAST") to complete preliminary engineering and Conceptual Plans for the 93-mile Lamoille Valley Rail Trail ("LVRT") Project and VHB conducted natural resource assessments to support that work. Since that time and through 2020, three segments of the LVRT have been constructed, totaling roughly 45 miles.

In 2020, the Vermont Agency of Transportation ("VTrans") assumed primary responsibility for managing the design, permitting, and construction of the unbuilt segments of the LVRT, totaling over 40 miles ("Project"), though VTrans continues to collaborate with VAST on all aspects of the Project. Given the original 2008 resource assessments are antiquated, VHB and Gilman and Briggs Environmental ("GBE") – at the request of VTrans – completed natural resource field inventories over the remainder of the unbuilt portion of the LVRT corridor during the 2020 growing season. These inventories consisted primarily of re-evaluating prior mapped resources, updating mapping and necessary, and regulatory coordination.

This memorandum describes the results of the natural resource assessments for Segment 11 of the LVRT [VTrans Project Swanton – St. Johnsbury STP LVRT (11)] between Cambridge and Sheldon, Vermont. The assessments were completed between STA 3422+55 (VT Route 109, Cambridge) and approximately STN 4392+15 (Bridge Street, Sheldon). VHB field-reviewed previously identified natural resources under current guidance and regulatory standards. The work occurred over several days in July, August, and September 2020.

### **Wetlands and Watercourses**

#### Background and Methodology

Previously identified wetlands were delineated in 2008 under 2002 Vermont Wetland Rules ("VWR"), and the 1987 Corps of Engineers Wetlands Delineation Manual. The 2020 field review relied on the current (2020) Vermont Wetland Rules ("VWRs") and the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region ("the Supplement"). These updates, particularly the 2020 VWRs, resulted in the re-classification of a number of features from Class III wetlands to Class II wetlands. Accordingly, the presumed Class II wetlands fall under the jurisdiction of the Agency of Natural Resources ("ANR") Vermont Department of Environmental Conservation ("DEC") Wetlands Program. In response to changes in state regulations, VHB modified field investigation protocols to expand the limits of the Study Area to include areas within fifty (50) feet of the limits of disturbance to

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P 802.497.6100





## Memorandum

identify and wetland and waters features that could have associated buffers that extend in the work area. This resulted in the delineation of several new, previously unidentified resources.

VHB reviewed delineated wetland features within the LVRT (11) Study Area with the assigned DEC District Ecologist on October 6 and October 20, 2020. The purpose of this site visit was to confirm the presence/absence of wetland resources and to assign presumptive classifications. This effort also provided confirmation on delineated wetland boundaries from DEC.

### Findings

Watercourses were generally found to be unchanged from the 2008 inventories, though minor modifications were observed and mapped to reflect current conditions. VHB delineated new wetland resources and modified the boundaries of previously identified wetland resources based on the 2020 field assessment and site visits with the DEC District Ecologist, generally increasing their size, though not significantly. The original 2008 assessment mapped 50.92 acres of total wetland and 38.52 acres of wetland buffer within the Project's approximately 18.4-mile long Study Area. The 2020 re-delineation resulted in the addition of approximately 7.61 acres of wetland as well as 13.37 acres of wetland buffer within the Study Area.

As previously noted, this increase is partially attributable to changes in state regulations and federal guidelines for wetland delineation. However, this increase is also attributable to the evolution of the Project corridor since the original 2008 delineation. Specifically, wetlands, wetland buffers, and/or streams have encroached on the rail corridor as a result of the natural degradation and erosion of the rail embankment, particularly during severe storm events. Additionally, the extent of regulated wetlands and their buffers may have been affected by anthropogenic changes such as ATV and snowmobile use.

The increase in the area of regulated wetland and wetland buffer within the Study Area could result in an associated increase in impacts to these features. Additionally, ongoing degradation of culverts and/or bridges since the original preliminary engineering analysis may dictate additional maintenance activities (and associated impacts) not contemplated previously.

That being said, the vast majority of Project improvements will occur within the existing footprint of the abandoned railroad ballast and culvert or bridge replacements will predominantly reestablish the existing limits of disturbance for the rail bed. Given that nature of the proposed work as maintenance and/or replacement of prior fill and pre-existing drainage structures, VHB assumes that the Project will not result in an undue adverse effect on regulated wetlands and buffers per the VWRs. This assumption is made in part via the outcome of proactive and pre-application coordination with the DEC District Ecologist, who has not indicated that the Project cannot be permitted provided that standard

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From: Levi Keszezy, Ecologist  
Ref: 57294.13  
March 9, 2021  
Page 3



## Memorandum

impact avoidance and minimization measures and Best Management Practices ("BMPs") developed by the DEC are implemented. The USACE has similarly expressed no concerns regarding the permissibility of the Project. VTrans and VAST will obtain the necessary approvals for unavoidable Project-related from the DEC Wetlands Program, DEC Rivers Program, and the U.S. Army Corps of Engineers and will adhere to conditions contained therein.

### **Rare, Threatened, and Endangered Plants**

In Fall, 2020 GBE conducted a survey of RTE plant populations within LVRT(11), flagging any RTE individuals within the Study Area. Following this survey, VHB Ecologists GPS-located the flagged populations. This assessment documented seven populations of the State S2, Threatened great St. John's-wort (*Hypericum ascyron*), of which four populations fall within the Limit of Disturbance ("LOD"). No other RTE plant species were documented by GBE within LVRT(11) and as documented in the Attachments, VT Fish and Wildlife did not cite any additional RTE plant species concerns within the Project vicinity.

The original Threatened and Endangered Species Takings Permit for the overall LVRT project was amended on September 11, 2020 to authorize construction activities proposed within LVRT(11). This Takings Permit, included in Attachments, authorizes the Permittee's botanist "to transplant any additional stems of Low Bindweed and other listed plants found in the disturbance/construction areas to an approved receiving site in advance of construction." As such, prior to Project construction, VTrans and/or VAST will arrange for the transplantation of the four great St. John's-wort populations from the LOD to an approved receiving site. Construction plans will identify these locations and include protection for those plants not within the LOD as appropriate. VTrans or its agents will coordinate with Bob Popp or his designee as appropriate in advance of construction activities.

### **Freshwater Mussels**

In Segment LVRT(11), work at bridge locations involves primarily deck replacement, installation of curbing and bridge and approach rails or guardrails. In some instances, masonry repairs are required such as resetting stones and repointing abutments and wingwalls. These activities are not anticipated to require in-stream disturbance, though the Clean Water Act Section 404 Individual Permit application for the LVRT(11) will account for incidental occupancy of the stream bed via a conservative temporary impact area. Bridges within LVRT(11) that may involve such incidental work in streams include:

40 IDX Drive

Building 100, Suite 200

South Burlington, VT 05403-7771

P 802.497.6100



From: Levi Keszey, Ecologist  
Ref: 57294.13  
March 9, 2021  
Page 4



## Memorandum

- Bridge 70 over the Black Creek in Fletcher;
- Bridge 71 over the Black Creek in Fletcher;
- Bridge 81 over an unnamed tributary to Black Creek in Fairfield;
- Bridge 82 over an unnamed tributary to Black Creek in Fairfield; and
- Bridge 90 over an unnamed tributary to Black Creek in Fairfield.

In each of these locations, there are no concerns for potential impacts to state or federally listed freshwater mussels. Bridges 70 and 71 over the Black Creek are located upstream of Bridges 77, 80, and 83, locations which were previously noted by Mark Ferguson, FWD Natural Heritage Zoologist, as not requiring a freshwater mussel survey for work there (see attached email string dated September 11, 2020). Each of the unnamed tributaries are of insufficient size to support mussel populations.

In-stream disturbance is proposed to occur at just one location in Segment LVRT(11): at Bridge 85 over Elm Brook. Based on email correspondence with Mr. Ferguson, dated January 13, 2021, no freshwater mussel survey is required at this location. Accordingly, no Endangered and Threatened Species Takings Permit for freshwater mussels is required in advance of the construction of LVRT (11).

### Attachments

- Email from Bob Popp of FWD Department Biologist, to Art Gilman of GBE, dated September 18, 2020, as forwarded from GBE to VHB.
- Threatened and Endangered Species Takings Permit, Amended 9/11/2020, expires 12/31/22.
- Emails from Mark Ferguson, FWD Natural Heritage Zoologist, to Brad Ketterling of VHB, dated September 11, 2020 and January 13, 2021.



**ATTACHMENT**



**From:** Art Gilman <avgilman@together.net>  
**Sent:** Monday, September 21, 2020 6:58 AM  
**To:** Ketterling, Brad  
**Subject:** [External] Fw: RE: LVRT

HI - See Bob's response below. I don't believe anything has been found, but I'll look through - nothing strikes me as much of a potential. Art

-----Forwarded Message-----

>From: "Popp, Bob" <[Bob.Popp@vermont.gov](mailto:Bob.Popp@vermont.gov)>  
>Sent: Sep 18, 2020 9:36 AM  
>To: Art Gilman <[avgilman@together.net](mailto:avgilman@together.net)>  
>Subject: RE: LVRT

>

>Hi Art, thanks for checking. Nothing else comes to mind, but you have access to our data so you can check where other RTE plants had previously been observed. Otherwise, it would be good to check exposed sandy areas, floodplains, and other potential habitats that may be impacted. It is getting late to find some of the earlier things.

>Bob

>

>Bob Popp  
>Department Botanist  
>VT. Dept of Fish & Wildlife  
>5 Perry St. Suite 40  
>Barre, VT. 05641

>

>(802) 476-0127  
>[bob.popp@vermont.gov](mailto:bob.popp@vermont.gov)

>

>-----Original Message-----

>From: Art Gilman <[avgilman@together.net](mailto:avgilman@together.net)>  
>Sent: Tuesday, September 15, 2020 8:42 AM  
>To: Popp, Bob <[Bob.Popp@vermont.gov](mailto:Bob.Popp@vermont.gov)>  
>Subject: Fw: LVRT

>

>EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.

>

>Good morning Bob.

>

>The Lamoille Valley Rail Trail work will be proceeding, as we discussed with Ken Brown of VAST earlier this summer. As you know in 2009, Gilman & Briggs searched the corridor from Swanton easterly to Fairfield, where it crosses Vermont Rte. 36, and several other locations in central and eastern Vermont for rare, threatened, or endangered plants. No rare plants were found east of the Swanton-Fairfield segment, and over time, we have monitored some of the populations of rare species there, i.e., *Monarda punctata* and *Calystegia spithamea*, and have re-searched, north of the Missisquoi River for others (*Carex fernaldii*, *Hypericum ascyron*) without finding them.

>

>The one segment where rare species were originally found but where we have not been back since 2009 is the segment from Pumpkin Village Road east (south) to Vt. Rte. 36, where *Hypericum ascyron* (Tall St. John's-wort) was found in several areas. We are proposing to re-search those locations in the



near future (i.e. before 10 October) so that it can be determined if an Endangered Species Permit will be necessary going forward.

>

>I am writing to see if your Program has any other concerns, i.e., if you will want additional areas or segments of the LVRT searched again, or newly searched? I will be in my office on Thursday of this week if you would like to discuss (am teaching a wetland class today and tomorrow).

>

>Thanks,

>

>Art

>

>





## Agency of Natural Resources

1 National Life Dr, Davis 2, Montpelier, VT 05620-3702 • 802-828-1294

### Threatened & Endangered Species Takings Permit

Statutory Authority: 10 VSA § 5408

**1. Permittee**

**Cindy Locke**

**Vermont Association of Snow Travelers** 26 VAST

Lane, Barre, VT 05641

802-229-0005, cindy@vtvast.org; ken@vtvast.org; team@gbvt.com

**2. Permit Period**

**Effective Date:** 8/17/2012 amended 9/11/2020

**Expiration Date:** 12/31/2022

**Authorization #** EH-2012-21(a1)

**Amendment #** 01

**2. Principal Officer:** Cindy Locke

**4. Subpermittee(s):** Art Gilman and Errol Briggs of Gilman & Briggs Environmental;  
Adam Crary of Vanasse Hangen Brustlin, Inc.

**5. Authorized Species:** Great St. Johnswort (*Hypericum ascyron*)—Threatened,  
Low bindweed (*Calystegia spithamea*)—Threatened.

**6. Authorized Activity:** Rehabilitating a former railway railbed for use as a multi-use trail known as the Lamoille Valley Rail Trail (LVRT).

**7. Location Where Authorized Activity May Be Conducted:** Highgate Center, Sheldon & Swanton, VT.

**8. Findings**

**The Project**

- A. The Permittee seeks an Endangered and Threatened Species Takings Permit under 10 V.S.A. § 5408 to lessen economic hardship related to the development of the Lamoille Valley Rail Trail (LVRT).
- B. The Permittee reports that the proposed LVRT will be a year-round, shared-use recreation trail, which when complete, will stretch 93-miles from St. Johnsbury to Swanton.
- C. Trail development will be managed by the Permittee under the terms of a long-term lease of the Lamoille Valley Railroad corridor between the landowner, the State of Vermont Agency of Transportation (VTrans) and the Vermont Association of Snow Travelers (VAST).
- D. The trail development activities include: refurbishing the existing rail bed with a layer of gravel/stone dust material to provide a durable surface consistent with VTrans specifications for bicyclists, hikers, equestrians, snowmobiles and other approved multi-use trail users; clearing the rail bed of encroaching vegetation; re-establishment of shallow lateral or side railroad drainage ditches; installation of appropriate signage and guardrails; replacement of missing or unsafe bridges; reconstruction of trail washouts; and, repair or replacement of degraded culverts.
- E. Said activity is expected to have the following benefits: increased public recreation for bicyclists, hikers, equestrians, snowmobilers and other approved multi-use trail users, reduced burden on other public recreational facilities in the area. Economic benefits stemming from additional visitorship to the communities where the LVRT runs is also anticipated.
- F. The proposed trail is mandated by funding requirements to be situated within the existing 66-foot wide railway right of way.
- G. The proposed trail will be 8-feet wide with a 2-foot wide grassed shoulder and drainage ditches on each side. There is, therefore, potential to adjust the location of the trail in the vicinity of the species listed in section 5 to avoid or reduce take. The Permittee wishes to situate the proposed trail on the existing railbed—not simply within the right of way in order to minimize development costs.

**The Impact**

- H. The proposed activity, rehabilitation of a railway to a multi-use trail, includes supplementing the existing ballast (crushed rock) with a layer of gravel/stone dust material to provide a durable surface consistent to meet state transportation specifications. These materials will cover the soils where the species listed in Section 5 are



found resulting in the take of those species.

- I. The Permittee's consultant conducted field searches for rare, threatened or endangered species in summer 2009 on pre-determined sections of the LVRT. Target populations were mapped and a summary report was submitted to the Department of Fish and Wildlife on January 29, 2010.
- J. Three listed species within the planned Phase I construction area were located: Great St. John's-wort (*Hypericum ascyron*), Low Bindweed (*Calystegia spithamea*), and Harsh sunflower (*Helianthus strumosus*).
- K. Low Bindweed (*Calystegia spithamea*): Low bindweed is a low-growing plant found mostly on sandplains and occasionally limestone ledges in Chittenden County, Vermont. It is rare throughout New England and is on the Endangered Species list in all four New England states in which it occurs. Four plants of low bindweed were located at a site just east of the village of Highgate Center during the July 2012 visit. Each plant consisted of only a single stem.
- L. Great St. John's-wort (*Hypericum ascyron*): Great St. John's-wort is a perennial herb displaying five-petaled, yellow flowers, and opposite, punctate leaves found in moist rich soils along riverbanks. It is rare throughout New England and is on the Endangered Species list in CT, MA, ME and NH. Approximately 12 individuals of Great St. John's-wort were observed in 2009 within the refurbishment area at this site, which is on the north side of the Missisquoi River in Sheldon.
- M. Harsh sunflower (*Helianthus strumosus*): What was thought to be Harsh sunflower, also known as paleleaf woodland sunflower was observed adjacent to the railbed in Swanton in 2009. It occurred in a 10ft x 10ft patch with approximately 100 stems. The stems may be a single clone.
- N. A July, 2, 2012 follow-up survey conducted by the Permittee's plant specialist and Vermont Fish & Wildlife Department Botanist Bob Popp determined that the population of harsh sunflower (*Helianthus strumosus*) as originally identified in 2009 was observed to include at least a major portion of tall sunflower (*Helianthus tuberosus*, aka Jerusalem artichoke) and some potential hybrids with that species raising doubts about the identification of all the plants. In addition, no specimens of Great St. John's-wort were located at the site where 12 plants were found in 2009.
- O. Three rare (but not protected) plant species were observed in the Phase I construction area: Dotted horsemint (*Monarda punctata*), Fernald's sedge (*Carex fernaldii*), and shorter sedge (*Carex brevior*).

#### Mitigation

- P. The species listed in section 5 most likely colonized the railbed since it ceased being used and maintained by the railroad
- Q. The Permittee has agreed to transplant all specimens of plants listed in Section 5 to preserved portions of the site that have similar site conditions and in most cases support other occurrences of the same plant species.
- R. The Permittee has agreed to transplant to approved locations specimens of the rare species Dotted Horsemint (*Monarda punctata*), Fernald's Sedge (*Carex merriamii*) or Short-headed Sedge (*Carex brevior*) that might otherwise be taken during project activities.

#### Advice of the Endangered Species Committee

- S. Endangered Species Committee Advice: The ESC advises granting the permit with the following recommendations:
  - a. That the Permittee create some favorable habitat for the rare species by cutting adjacent trees and clearing competing vegetation;
  - b. That Low Bindweed (*Calystegia spithamea*) populations not be fenced-off until trampling appears to be an issue and that competing vegetation be removed during yearly follow-up monitoring to maintain the habitat;

#### 9. Statutory Determination

- A. 10 V.S.A. § 5408(a) provides: "[A]fter obtaining the advice of the Endangered Species Committee, the Secretary may permit, under such terms and conditions as the Secretary may prescribe by rule any act otherwise prohibited by this chapter done for any of the following purposes: scientific purposes; to enhance the



propagation or survival of a species; economic hardship; zoological exhibition, educational purposes; or special purposes consistent with the purposes of the federal Endangered Species Act."

- B. The Permittee has requested an Endangered and Threatened Species Taking Permit for the following purpose: Economic hardship.
- C. The state of Vermont recognizes the value which plants, fish and wildlife in their natural environment have for public enjoyment, ecological balance, and scientific study.
- D. The state of Vermont recognizes the need for protection and preservation of these plants, fish and wildlife in their natural environment.
- E. The General Assembly of Vermont intends that the species of wildlife and wild plants normally occurring within this state which may be found to be threatened or endangered within the state should be accorded protection as necessary to maintain and enhance their numbers.
- F. The General Assembly of Vermont intends that the state should assist in the protection of species of wildlife and wild plants which are determined to be threatened or endangered elsewhere pursuant to the federal Endangered Species Act.
- G. Pursuant to 10 V.S.A. § 5408(a), the ANR Secretary hereby determines, based upon the findings detailed above and after recommendations from the Endangered Species Committee, that the proposed activity is consistent the purposes of the 10 V.S.A. ch. 123. A Threatened & Endangered Species Takings Permit is authorized, as conditioned below.
- H. The General Assembly of Vermont intends to allow for the orderly development of Vermont without undue hardship being caused by the protections provided by the Threatened and Endangered Species Act by providing for the issuance of permits.

#### 10. General Conditions & Authorizations

- A. General conditions set out in 10 V.S.A. ch. 123 are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.
- B. The validity of this permit is expressly conditioned upon compliance with all applicable federal and state laws, regulations and permits.
- C. This permit does not confer upon the permittee the authority to conduct research without the acquiring necessary landowner permission including, but not limited to, state lands.
- D. By acceptance of this permit, the Permittee and its heirs, successors and assigns agree to provide the Agency of Natural Resources with unrestricted access, at reasonable times to the animal or plant specimens and/or animal or plant parts collected under this permit, and otherwise ensuring compliance with this permit.
- E. The Agency maintains continuing jurisdiction over this activity, and may, at any time, order the permittee to undertake remedial measures if necessary to ensure the protection and conservation of listed species.
- F. This permit is not valid for Federal and/or State endangered and threatened species not identified in section 5.
- G. The permit is valid for use by the named Permittee and subpermittees(s) only and may be revoked by the Secretary at any time for cause, or violations of any terms or conditions of this permit or state wildlife law.
- H. The Permittee and subpermittee(s) shall carry this permit whenever performing authorized activities.
- I. The locations of listed species shall be confidential and the sharing of such information is a violation of 10 V.S.A. § 5410 and this permit.



**11. Specific Conditions & Authorizations**

- A. Searches, flagging, transplantation, monitoring, management and other activities directly impacting the species listed in Section 5 shall be conducted by an experienced botanist and/or plant restoration specialist approved by the Vermont Fish & Wildlife Department (VFWD) prior to project commencement. Permittee and subpermittees shall consult with the VFWD botanist as needed.
- B. Locations of specimens of all species listed in Section 5 shall be located prior to the commencement of construction. If there is any potential for impact, then these individuals shall be clearly flagged.
- C. An additional search for Great St. Johnswort (*Hypericum ascyron*) shall be conducted again during the 2012 growing season but prior to any construction activity.
- D. Impacted individuals shall be transplanted to nearby appropriate habitat within the LVRT right-of-way with the following caveats:
  - a. Low Bindweed (*Calystegia spithamea*): Shall be transplanted to the edge of the transmission right-of-way in an area kept open for the transmission line. Plants shall not be fenced unless subsequent visits identify trampling as a threat.
  - b. If plants of Great St. Johnswort are observed, these shall be transplanted to appropriate habitat on the shores of the Missisquoi River within the ROW.
- E. Searches and transplantation shall be conducted by an individual that has professional experience and training in the excavation, moving, and planting of the species listed in Section 5. Transplantation shall occur at a time when the plants are recognizable in the field. All transplanted specimens shall be watered throughout the first year following transplantation a minimum of once per week until such time as a killing frost occurs. Watering need not occur during any week in which natural rainfall exceeds 1.5 inches.
- F. Monitoring to map and document survival, recruitment and management shall occur yearly for the 10-years following completion of transplantation. Management shall entail cutting back trees and other vegetation infringing on the species listed in Section 5; and, scarifying the soil nearby to facilitate seed germination and establishment of new plants. After five-years of monitoring, the Permittee may petition the Secretary to amend this monitoring condition for the remainder of the permit period.
- G. The Agency of Natural Resources recommends the following procedures for the transplantation and management of the rare, but not listed, species identified in Section 8.S:
  - a. Clearly flag all specimens Dotted Horsemint (*Monarda punctata*), Fernald's Sedge (*Carex merriitt-feraldii*) and Short-headed Sedge (*Carex brevior*) to the commencement of construction.
  - b. Transplant Dotted horsemint (*Monarda punctata*) to appropriate open, sandy areas within the LVRT right-of-way.
  - c. Cut trees adjacent to both existing and transplanted populations in order to provide longer term, open habitat.
  - d. Collect seeds and disseminate in appropriate habitat. In years where at least 20 specimens of a species produces seeds up to 10% of those seeds can be collected and provided to the New England Wildflower Society for storage.
  - e. If any plants of Fernald's Sedge (*Carex merriitt-feraldii*) or Short-headed Sedge (*Carex brevior*) are found in areas to be impacted, transplant these individuals to open, sandy habitat within the LVRT right-of-way.
- H. **Amended 9/12/2020:** The Permittee's botanist is authorized to transplant any additional stems of Low Bindweed and other listed plants found in the disturbance/construction areas to an approved receiving site in advance of construction.



**12. Reporting Requirements**

- A. Any mortality of the species listed in Section 5 related to the activities authorized under this permit that was/were not specifically requested, anticipated and/or authorized shall be reported in writing to the Secretary of the Agency of Natural Resources (with a copy to the VFWD Permits Specialist) within 72 hours of each occurrence. Reports shall include the preserved specimens and a plan for reducing the likelihood of future occurrences.
- B. Annual reports, due by January 30th following each year of permit term unless an extension is specifically requested and granted shall be submitted to the Permit Specialist (electronic format preferred). At a minimum, the report shall summarize project activities and species handled; where each specimen was collected and where it was transplanted, the number that survived/died from year-to-year, other species encounters, management activities performed during the reporting period, the dates of all activities and the names of the person(s) performing each activity. All reports shall include a map of sufficient detail to enable ANR to find each location.
- C. The Permittee shall accommodate requests by Department staff for additional information from collection activities (e.g., copies of original field sheets, computerized data in usable format). Reports of results of any subsequent analyses and copies of subsequent publications resulting from the collections made under this permit shall be forwarded to the Vermont Fish & Wildlife Department.

Issued by: _____



Louis Porter, Commissioner  
Fish & Wildlife Department,  
Agency of Natural Resources

Date: 9/18/2020**Right to Appeal to Environmental Court**

Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Division of the Superior Court within 30 days of the date of the decision. The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Court; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and description of the property, project or facility with which the appeal is concerned and the name of the applicant or any permit involved in the appeal. The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings. For further information, see the Vermont Rules for Environmental Court Proceedings, available online at [www.vermontjudiciary.org](http://www.vermontjudiciary.org). The address for the Environmental Court is 2418 Airport Road, Suite 1, Barre, VT 05641 (Tel. # 802-828-1660).



**From:** Ferguson, Mark <Mark.Ferguson@vermont.gov>  
**Sent:** Friday, September 11, 2020 3:39 PM  
**To:** Ketterling, Brad  
**Cc:** Ethan Nedeau (nedeau.ethan@gmail.com)  
**Subject:** [External] RE: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction  
**Attachments:** Wood turtles: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

Brad,

Based on the reports and information that Ethan provided for the two sites he surveyed, no additional mussel surveys will be required.

I've attached an email from Steve Parren, coordinator for our program and who has turtle expertise, which has recommendations for avoiding impacts to wood turtles that could occur at the 80, 77, and 83 crossings. The main points:

- *Best to limit on-site construction and prep to July - August if possible. June – mid-September is ok if necessary, but turtles may be encountered in those additional times.
- Wood turtles are hibernating in the stream November through April. They may be in the river at times throughout the year.
- Turtles also stay near the stream (potentially within project area) in mid-September to mid-October and late April through May.
- *Before placing fill or impacting the river bottom, search the river bottom for turtles.
- *Avoid bare, sandy areas that get direct sun and could support turtle nesting.
- A wood turtle fact sheet is included.

Mark Ferguson  
Natural Heritage Zoologist  
Vermont Department of Fish & Wildlife  
802-279-3422

---

**From:** Ferguson, Mark  
**Sent:** Tuesday, September 1, 2020 11:29 AM  
**To:** Ketterling, Brad <[BKetterling@VHB.com](mailto:BKetterling@VHB.com)>  
**Cc:** Ethan Nedeau ([nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)) <[nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)>  
**Subject:** RE: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

Hi Brad,

Thanks for the kmz file. That was easy and useful. I agree about the Black River sites, likely to be too far upstream for T&E mussels. There will be no mussel surveys needed for the following bridges: 80, 77, and 83. Also, since they were included in the file, no mussel surveys are needed for bridges 69G and 51.

I would like to wait on determining whether additional mussel surveys are needed at bridges 49, 35, and 34 until after I've received and reviewed the report for #48 and 41.



We have records of wood turtles in Black Creek near bridges 80, 77, and 83. I will contact our turtle biologist to see if he has any recommendations for avoiding impacts to that species. I'll get back to you with his response.

Thanks.

Mark Ferguson  
Natural Heritage Zoologist  
Vermont Department of Fish & Wildlife  
802-279-3422

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**From:** Ketterling, Brad <[BKetterling@VHB.com](mailto:BKetterling@VHB.com)>  
**Sent:** Monday, August 31, 2020 10:42 AM  
**To:** Ferguson, Mark <[Mark.Ferguson@vermont.gov](mailto:Mark.Ferguson@vermont.gov)>  
**Cc:** Ethan Nedeau ([nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)) <[nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)>  
**Subject:** Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Good morning, Mark –

VHB is working with VTrans and VAST on trail design for the remaining portions of the Lamoille Valley Rail Trail (LVRT) project, which include some bridge repairs and replacements. As you may recall, Ethan Nedeau (copied here) submitted a couple of Takings Permit applications for related freshwater mussel surveys at Bridges 41 and 48 over the Lamoille River in Hardwick and Wolcott, respectively. Ethan completed the survey work in July and is working on those reports, but no mussels were observed at either location.

There are six additional bridge crossings for this project that are currently under design. The extent of in-water work required is still being determined, but I ran the locations by Ethan for his first impression. These bridges are listed below and can be navigated to using the attached KMZ file. While Ethan does not have any experience on the tributary streams, based on the results of the Bridges 41 and 48 surveys and the size of the tributaries, he believes it's unlikely that mussels are present at any of these crossings. He thinks that the lower Black Creek has potential, but the three proposed crossings are many miles upstream.

That being said, both Ethan and I defer to your judgment and/or any existing records for these streams to make a decision regarding whether or not surveys should be conducted at any of these locations. Could you please let us know what you think and we can react accordingly.

- Bridge 34 (Stannard Mtn. Rd. and Stannard Brook, Hardwick)
- Bridge 35 (Lamoille R., Greensboro)
- Bridge 49 (Wild Branch)
- Bridge 77 (Black Creek, Bakersfield)
- Bridge 80 (Black Creek, Bakersfield)
- Bridge 83 (Black Creek, Fairfield)



Thanks very much,  
Brad

**Brad Ketterling**

Director of Environmental Services - Vermont



40 IDX Drive  
Building 100, Suite 200  
South Burlington, VT 05403-7771  
**P** 802.497.6153 | **M** 802.324.9917 | **F** 802.495.5130  
bketterling@vhb.com

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**From:** Ferguson, Mark <Mark.Ferguson@vermont.gov>  
**Sent:** Wednesday, January 13, 2021 4:49 PM  
**To:** Ketterling, Brad  
**Subject:** [External] RE: VTrans LVRT Segments (11) and (12): request for input on in-stream work

Hi Brad,

Based on the mussel survey work already completed and those findings, these additional stream crossing will not require mussel surveys.

The recommendations I included previously for Black Creek crossings would apply to these additional Black Creek crossings also.

Thanks for checking with us.



---

Mark Ferguson  
Vermont Department of Fish & Wildlife  
Wildlife Division, Wildlife Diversity Program  
1 National Life Drive, Davis 2 | Montpelier, VT 05620-3702  
802-279-3422 cell  
<https://vtfishandwildlife.com/>

---

**From:** Ketterling, Brad <[BKetterling@VHB.com](mailto:BKetterling@VHB.com)>  
**Sent:** Tuesday, January 12, 2021 5:44 PM  
**To:** Ferguson, Mark <[Mark.Ferguson@vermont.gov](mailto:Mark.Ferguson@vermont.gov)>  
**Subject:** VTrans LVRT Segments (11) and (12): request for input on in-stream work

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Good afternoon, Mark –

Happy New Year!

We have some additional in-stream work that may be required for bridge repair and replacement for the Lamoille Valley Rail Trail (LVRT) project. These bridge locations and the associated streams are noted below, with KMZs for their relative location attached. These start from upstream to downstream:

- Bridge 52: Lamoille River
- Bridge 71: Black Creek, OHW = ~22'
- Bridge 85: Elm Brook (near Black Creek confluence), OHW = ~16'

Do you think freshwater mussel surveys should be performed at any of these locations?

Regarding Bridge 52, as some relevant background, you may recall that Ethan Nedeau completed a mussel survey at Bridge 48 on the Lamoille last summer and found no mussels. This bridge is located upstream of Bridge 52. Ethan also completed a mussel survey in 2012 at Bridge 68 (far downstream, KMZ



attached) and found mussels, though none were state or federally listed and no relocation plan was required.

Ethan was wondering if the recent work on the Lamoille at the new VT-15A just east of Morrisville involved any mussel survey that you know of. This location is downstream but much closer to Bridge 52 than is Bridge 68 (KMZ attached). Perhaps a survey there would inform the decision as to whether or not a survey is required at Bridge 52?

Any guidance you can provide would be much appreciated!

Regards,  
Brad

**Brad Ketterling**

Director of Environmental Services – Vermont  
(he/him/his)



40 IDX Drive  
Building 100, Suite 200  
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To: Swanton – St. Johnsbury STP LVRT  
(12) Project File

Date: January 14, 2021

## Memorandum

Project #: 57294.13

From: Ryan Scott, Senior Ecologist

Re: 2020 Natural Resource Summary

In 2008, VHB was engaged by the Vermont Association of Snow Travelers ("VAST") to complete preliminary engineering and Conceptual Plans for the 93-mile Lamoille Valley Rail Trail ("LVRT") Project and VHB conducted natural resource assessments to support that work. Since that time and through 2020, three segments of the LVRT have been constructed, totaling roughly 45 miles.

In 2020, the Vermont Agency of Transportation ("VTrans") assumed primary responsibility for managing the design, permitting, and construction of the unbuilt segments of the LVRT, totaling over 40 miles ("Project"), though VTrans continues to collaborate with VAST on all aspects of the Project. Given the original 2008 resource assessments are antiquated, VHB and Gilman and Briggs Environmental ("GBE") – at the request of VTrans – completed natural resource field inventories over the remainder of the unbuilt portion of the LVRT corridor during the 2020 growing season. These inventories consisted primarily of re-evaluating prior mapped resources, updating mapping and necessary, and regulatory coordination.

This memorandum describes the results of the natural resource assessments for Segment 12 of the LVRT [VTrans Project Swanton – St. Johnsbury STP LVRT(12)] between Hardwick and Morristown, Vermont. The assessments were completed between STA 1845+32 and STA 2502+52 (North Main Street in Hardwick to VT Route 15A in Morristown). VHB field-reviewed previously identified natural resources under current guidance and regulatory standards. The work occurred over several days in July, August, and September 2020.

### **Wetlands and Watercourses**

#### Background and Methodology

Previously identified wetlands were delineated in 2008 under 2002 Vermont Wetland Rules ("VWR"), and the 1987 Corps of Engineers Wetlands Delineation Manual. The 2020 field review relied on the current (2020) Vermont Wetland Rules ("VWRs") and the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region ("the Supplement"). These updates, particularly the 2020 VWRs, resulted in the re-classification of a number of features from Class III wetlands to Class II wetlands. Accordingly, the presumed Class II wetlands fall under the jurisdiction of the Agency of Natural Resources ("ANR") Vermont Department of Environmental Conservation ("DEC") Wetlands Program. In response to changes in state regulations, VHB modified field investigation protocols to expand the limits of the Study Area to include areas within fifty (50) feet of the limits of disturbance to identify and wetland and waters features that could have associated buffers that extend in the work area. This resulted in the delineation of several new, previously unidentified resources.

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From: Ryan Scott, Senior Ecologist  
Ref: 57294.13  
January 14, 2021  
Page 2



## Memorandum

VHB reviewed delineated wetland features within the LVRT(12) Study Area with the assigned DEC District Ecologist on October 20, 2020. The purpose of this site visit was to confirm the presence/absence of wetland resources and to assign presumptive classifications. This effort also provided confirmation on delineated wetland boundaries from DEC.

### Findings

Watercourses were generally found to be unchanged from the 2008 inventories, though minor modifications were observed and mapped to reflect current conditions. VHB delineated new wetland resources and modified the boundaries of previously identified wetland resources based on the 2020 field assessment and site visits with the DEC District Ecologist, generally increasing their size, though not significantly. The original 2008 assessment mapped 3.07 acres of total wetland and 12.87 acres of wetland buffer within the Project's approximately 12.5-mile long Study Area. The 2020 re-delineation resulted in the addition of approximately 5.31 acres of wetland as well as 17.87 acres of wetland buffer within the Study Area.

As previously noted, this increase is partially attributable to changes in state regulations and federal guidelines for wetland delineation. However, this increase is also attributable to the evolution of the Project corridor since the original 2008 delineation. Specifically, wetlands, wetland buffers, and/or streams have encroached on the rail corridor as a result of the natural degradation and erosion of the rail embankment, particularly during severe storm events. Additionally, the extent of regulated wetlands and their buffers may have been affected by anthropogenic changes such as ATV and snowmobile use.

The increase in the area of regulated wetland and wetland buffer within the Study Area could result in an associated increase in impacts to these features. Additionally, ongoing degradation of culverts and/or bridges since the original preliminary engineering analysis may dictate additional maintenance activities (and associated impacts) not contemplated previously.

That being said, the vast majority of Project improvements will occur within the existing footprint of the abandoned railroad ballast and culvert or bridge replacements will predominantly reestablish the existing limits of disturbance for the rail bed. Given that nature of the proposed work as maintenance and/or replacement of prior fill and pre-existing drainage structures, VHB assumes that the Project will not result in an undue adverse effect on regulated wetlands and buffers per the VWRs. This assumption is made in part via the outcome of proactive and pre-application coordination with the DEC District Ecologist, who has not indicated that the Project cannot be permitted provided that standard impact avoidance and minimization measures and Best Management Practices ("BMPs") developed by the DEC are implemented. The USACE has similarly expressed no concerns regarding the permissibility of the Project.

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From: Ryan Scott, Senior Ecologist  
Ref: 57294.13  
January 14, 2021  
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## Memorandum

VTrans and VAST will obtain the necessary approvals for unavoidable Project-related from the DEC Wetlands Program, DEC Rivers Program, and the U.S. Army Corps of Engineers and will adhere to conditions contained therein.

### **Rare, Threatened, and Endangered Plants**

In 2009, GBE searched the LVRT corridor from Swanton easterly to Fairfield, where it crosses Vermont Route 36, and several other locations in central and eastern Vermont for rare, threatened, or endangered ("RTE") plants. No rare plants were found east of the Swanton-Fairfield segment [which includes STP LVRT(11)], and over time, GBE has monitored some of the populations of rare species there (e.g., *Monarda punctata* and *Calystegia spithamea*), and have re-searched, north of the Missisquoi River for others (*Carex fernaldii*, *Hypericum ascyron*) without finding them. Based on these findings and on correspondence with Bob Popp, Department Biologist at the Vermont Fish and Wildlife Department ("FWD") in September 2020 (attached), there are no concerns regarding RTE plants in LVRT(12). The original Threatened and Endangered Species Takings Permit for the overall LVRT project was amended on September 11, 2020 to authorize construction activities are the far western end of the corridor in Highgate Center, Sheldon, Swanton (see attached).

### **Freshwater Mussels**

For the priority bridges Segment LVRT(10), a freshwater mussel survey was conducted by Biodiversity in 2020 at Bridge 48 over the Lamoille River. No mussels were found at this location. As Bridge 48 is roughly located at the midpoint of LVRT(12), the FWD concluded that surveys for freshwater mussels were not required for upstream segments of the Lamoille River, which includes roughly the eastern half of LVRT(12). See attached correspondence with Mark Ferguson, FWD Natural Heritage Zoologist. Mr. Ferguson also noted that a mussel survey would not be required at Bridge 49 over the Black Creek, also located in LVRT(12).

At this time, plans for repair or replacement of Bridge 52 over the Lamoille River in Wolcott are still being finalized. It is possible that in-stream work, including perhaps a temporary causeway, would be required to demolish the existing bridge. Accordingly, VHB reached out to Mr. Ferguson to determine whether a freshwater mussel survey would be required at this location. On January 13, 2021, Mr. Ferguson responded via email to note that a survey would not be required based on the outcome of prior mussel surveys conducted upstream and downstream of Bridge 52 (see attached).

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From: Ryan Scott, Senior Ecologist  
Ref: 57294.13  
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## Memorandum

Other proposed bridge repair or replacement activities in LVRT(12) include Bridge 51 providing cross drainage for an unnamed tributary to the Lamoille River near North Wolcott Road; Bridge 53 over Elmore Pond Brook in Wolcott near the Morristown town line; and Bridge 54 over an unnamed tributary to the Lamoille River in Morristown upstream of the VT-15A bridge. At Bridge 51, the stream is too small to support freshwater mussel populations (the existing 12' steel I-beam bridge will be replaced by a 4'X4' box culvert). The same is true at Bridges 53 and 54, though plans currently call for no in-water work for bridge repairs. Each of the proposed culvert replacements in LVRT(12) occur in streams too small to support freshwater mussel populations. In conclusion, no freshwater mussel surveys nor an associated Endangered and Threatened Species Takings Permit are required in advance of the construction of LVRT(12).

### Attachments

- Email from Bob Popp of FWD Department Biologist, to Art Gilman of GBE, dated September 18, 2020, as forwarded from GBE to VHB.
- Emails from Mark Ferguson, FWD Natural Heritage Zoologist, to Brad Ketterling of VHB, dated September 11, 2020 and January 13, 2021.



**ATTACHMENT**



**From:** Art Gilman <avgilman@together.net>  
**Sent:** Monday, September 21, 2020 6:58 AM  
**To:** Ketterling, Brad  
**Subject:** [External] Fw: RE: LVRT

HI - See Bob's response below. I don't believe anything has been found, but I'll look through - nothing strikes me as much of a potential. Art

-----Forwarded Message-----

>From: "Popp, Bob" <[Bob.Popp@vermont.gov](mailto:Bob.Popp@vermont.gov)>  
>Sent: Sep 18, 2020 9:36 AM  
>To: Art Gilman <[avgilman@together.net](mailto:avgilman@together.net)>  
>Subject: RE: LVRT

>

>Hi Art, thanks for checking. Nothing else comes to mind, but you have access to our data so you can check where other RTE plants had previously been observed. Otherwise, it would be good to check exposed sandy areas, floodplains, and other potential habitats that may be impacted. It is getting late to find some of the earlier things.

>Bob

>

>Bob Popp  
>Department Botanist  
>VT. Dept of Fish & Wildlife  
>5 Perry St. Suite 40  
>Barre, VT. 05641

>

>(802) 476-0127  
>[bob.popp@vermont.gov](mailto:bob.popp@vermont.gov)

>

>-----Original Message-----

>From: Art Gilman <[avgilman@together.net](mailto:avgilman@together.net)>  
>Sent: Tuesday, September 15, 2020 8:42 AM  
>To: Popp, Bob <[Bob.Popp@vermont.gov](mailto:Bob.Popp@vermont.gov)>  
>Subject: Fw: LVRT

>

>EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.

>

>Good morning Bob.

>

>The Lamoille Valley Rail Trail work will be proceeding, as we discussed with Ken Brown of VAST earlier this summer. As you know in 2009, Gilman & Briggs searched the corridor from Swanton easterly to Fairfield, where it crosses Vermont Rte. 36, and several other locations in central and eastern Vermont for rare, threatened, or endangered plants. No rare plants were found east of the Swanton-Fairfield segment, and over time, we have monitored some of the populations of rare species there, i.e., *Monarda punctata* and *Calystegia spithamea*, and have re-searched, north of the Missisquoi River for others (*Carex fernaldii*, *Hypericum ascyron*) without finding them.

>

>The one segment where rare species were originally found but where we have not been back since 2009 is the segment from Pumpkin Village Road east (south) to Vt. Rte. 36, where *Hypericum ascyron* (Tall St. John's-wort) was found in several areas. We are proposing to re-search those locations in the



near future (i.e. before 10 October) so that it can be determined if an Endangered Species Permit will be necessary going forward.

>

>I am writing to see if your Program has any other concerns, i.e., if you will want additional areas or segments of the LVRT searched again, or newly searched? I will be in my office on Thursday of this week if you would like to discuss (am teaching a wetland class today and tomorrow).

>

>Thanks,

>

>Art

>

>



**From:** Ferguson, Mark <Mark.Ferguson@vermont.gov>  
**Sent:** Friday, September 11, 2020 3:39 PM  
**To:** Ketterling, Brad  
**Cc:** Ethan Nedeau (nedeau.ethan@gmail.com)  
**Subject:** [External] RE: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction  
**Attachments:** Wood turtles: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

Brad,

Based on the reports and information that Ethan provided for the two sites he surveyed, no additional mussel surveys will be required.

I've attached an email from Steve Parren, coordinator for our program and who has turtle expertise, which has recommendations for avoiding impacts to wood turtles that could occur at the 80, 77, and 83 crossings. The main points:

- *Best to limit on-site construction and prep to July - August if possible. June – mid-September is ok if necessary, but turtles may be encountered in those additional times.
- Wood turtles are hibernating in the stream November through April. They may be in the river at times throughout the year.
- Turtles also stay near the stream (potentially within project area) in mid-September to mid-October and late April through May.
- *Before placing fill or impacting the river bottom, search the river bottom for turtles.
- *Avoid bare, sandy areas that get direct sun and could support turtle nesting.
- A wood turtle fact sheet is included.

Mark Ferguson  
Natural Heritage Zoologist  
Vermont Department of Fish & Wildlife  
802-279-3422

---

**From:** Ferguson, Mark  
**Sent:** Tuesday, September 1, 2020 11:29 AM  
**To:** Ketterling, Brad <[BKetterling@VHB.com](mailto:BKetterling@VHB.com)>  
**Cc:** Ethan Nedeau ([nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)) <[nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)>  
**Subject:** RE: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

Hi Brad,

Thanks for the kmz file. That was easy and useful. I agree about the Black River sites, likely to be too far upstream for T&E mussels. There will be no mussel surveys needed for the following bridges: 80, 77, and 83. Also, since they were included in the file, no mussel surveys are needed for bridges 69G and 51.

I would like to wait on determining whether additional mussel surveys are needed at bridges 49, 35, and 34 until after I've received and reviewed the report for #48 and 41.



We have records of wood turtles in Black Creek near bridges 80, 77, and 83. I will contact our turtle biologist to see if he has any recommendations for avoiding impacts to that species. I'll get back to you with his response.

Thanks.

Mark Ferguson  
Natural Heritage Zoologist  
Vermont Department of Fish & Wildlife  
802-279-3422

---

**From:** Ketterling, Brad <[BKetterling@VHB.com](mailto:BKetterling@VHB.com)>  
**Sent:** Monday, August 31, 2020 10:42 AM  
**To:** Ferguson, Mark <[Mark.Ferguson@vermont.gov](mailto:Mark.Ferguson@vermont.gov)>  
**Cc:** Ethan Nedeau ([nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)) <[nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)>  
**Subject:** Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Good morning, Mark –

VHB is working with VTrans and VAST on trail design for the remaining portions of the Lamoille Valley Rail Trail (LVRT) project, which include some bridge repairs and replacements. As you may recall, Ethan Nedeau (copied here) submitted a couple of Takings Permit applications for related freshwater mussel surveys at Bridges 41 and 48 over the Lamoille River in Hardwick and Wolcott, respectively. Ethan completed the survey work in July and is working on those reports, but no mussels were observed at either location.

There are six additional bridge crossings for this project that are currently under design. The extent of in-water work required is still being determined, but I ran the locations by Ethan for his first impression. These bridges are listed below and can be navigated to using the attached KMZ file. While Ethan does not have any experience on the tributary streams, based on the results of the Bridges 41 and 48 surveys and the size of the tributaries, he believes it's unlikely that mussels are present at any of these crossings. He thinks that the lower Black Creek has potential, but the three proposed crossings are many miles upstream.

That being said, both Ethan and I defer to your judgment and/or any existing records for these streams to make a decision regarding whether or not surveys should be conducted at any of these locations. Could you please let us know what you think and we can react accordingly.

- Bridge 34 (Stannard Mtn. Rd. and Stannard Brook, Hardwick)
- Bridge 35 (Lamoille R., Greensboro)
- Bridge 49 (Wild Branch)
- Bridge 77 (Black Creek, Bakersfield)
- Bridge 80 (Black Creek, Bakersfield)
- Bridge 83 (Black Creek, Fairfield)



Thanks very much,  
Brad

**Brad Ketterling**

Director of Environmental Services - Vermont



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**From:** Ferguson, Mark <Mark.Ferguson@vermont.gov>  
**Sent:** Wednesday, January 13, 2021 4:49 PM  
**To:** Ketterling, Brad  
**Subject:** [External] RE: VTrans LVRT Segments (11) and (12): request for input on in-stream work

Hi Brad,

Based on the mussel survey work already completed and those findings, these additional stream crossing will not require mussel surveys.

The recommendations I included previously for Black Creek crossings would apply to these additional Black Creek crossings also.

Thanks for checking with us.



---

Mark Ferguson  
Vermont Department of Fish & Wildlife  
Wildlife Division, Wildlife Diversity Program  
1 National Life Drive, Davis 2 | Montpelier, VT 05620-3702  
802-279-3422 cell  
<https://vtfishandwildlife.com/>

---

**From:** Ketterling, Brad <[BKetterling@VHB.com](mailto:BKetterling@VHB.com)>  
**Sent:** Tuesday, January 12, 2021 5:44 PM  
**To:** Ferguson, Mark <[Mark.Ferguson@vermont.gov](mailto:Mark.Ferguson@vermont.gov)>  
**Subject:** VTrans LVRT Segments (11) and (12): request for input on in-stream work

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Good afternoon, Mark –

Happy New Year!

We have some additional in-stream work that may be required for bridge repair and replacement for the Lamoille Valley Rail Trail (LVRT) project. These bridge locations and the associated streams are noted below, with KMZs for their relative location attached. These start from upstream to downstream:

- Bridge 52: Lamoille River
- Bridge 71: Black Creek, OHW = ~22'
- Bridge 85: Elm Brook (near Black Creek confluence), OHW = ~16'

Do you think freshwater mussel surveys should be performed at any of these locations?

Regarding Bridge 52, as some relevant background, you may recall that Ethan Nedeau completed a mussel survey at Bridge 48 on the Lamoille last summer and found no mussels. This bridge is located upstream of Bridge 52. Ethan also completed a mussel survey in 2012 at Bridge 68 (far downstream, KMZ



attached) and found mussels, though none were state or federally listed and no relocation plan was required.

Ethan was wondering if the recent work on the Lamoille at the new VT-15A just east of Morrisville involved any mussel survey that you know of. This location is downstream but much closer to Bridge 52 than is Bridge 68 (KMZ attached). Perhaps a survey there would inform the decision as to whether or not a survey is required at Bridge 52?

Any guidance you can provide would be much appreciated!

Regards,  
Brad

**Brad Ketterling**

Director of Environmental Services – Vermont  
(he/him/his)



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To: Swanton – St. Johnsbury STP LVRT  
(13) Project File

Date: December 23, 2020

## Memorandum

Project #: 57294.13

From: Ryan Scott, Senior Ecologist

Re: 2020 Natural Resource Summary

In 2008, VHB was engaged by the Vermont Association of Snow Travelers ("VAST") to complete preliminary engineering and Conceptual Plans for the 93-mile Lamoille Valley Rail Trail ("LVRT") Project and VHB conducted natural resource assessments to support that work. Since that time and through 2020, three segments of the LVRT have been constructed, totaling roughly 45 miles.

In 2020, the Vermont Agency of Transportation ("VTrans") assumed primary responsibility for managing the design, permitting, and construction of the unbuilt segments of the LVRT, totaling over 40 miles ("Project"), though VTrans continues to collaborate with VAST on all aspects of the Project. Given the original 2008 resource assessments are antiquated, VHB and Gilman and Briggs Environmental ("GBE") – at the request of VTrans – completed natural resource field inventories over the remainder of the unbuilt portion of the LVRT corridor during the 2020 growing season. These inventories consisted primarily of re-evaluating prior mapped resources, updating mapping and necessary, and regulatory coordination.

This memorandum describes the results of the natural resource assessments for Segment 13 of the LVRT [VTrans Project Swanton – St. Johnsbury STP LVRT(13)] between Danville and Hardwick, Vermont. The assessments were completed between STA 893+00 and STA 1834+92 (Channel Drive in Danville to Pumpkin Hill Road in Hardwick). VHB field-reviewed previously identified natural resources under current guidance and regulatory standards. The work occurred over several days in July, August, and September 2020.

### **Wetlands and Watercourses**

#### Background and Methodology

Previously identified wetlands were delineated in 2008 under 2002 Vermont Wetland Rules ("VWR"), and the 1987 Corps of Engineers Wetlands Delineation Manual. The 2020 field review relied on the current (2020) Vermont Wetland Rules ("VWRs") and the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region ("the Supplement"). These updates, particularly the 2020 VWRs, resulted in the re-classification of a number of features from Class III wetlands to Class II wetlands. Accordingly, the presumed Class II wetlands fall under the jurisdiction of the Agency of Natural Resources ("ANR") Vermont Department of Environmental Conservation ("DEC") Wetlands Program. In response to changes in state regulations, VHB modified field investigation protocols to expand the limits of the Study Area to include areas within fifty (50) feet of the limits of disturbance to identify and wetland and waters features that could have associated buffers that extend in the work area. This resulted in the delineation of several new, previously unidentified resources.

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From: Ryan Scott, Senior Ecologist  
Ref: 57294.13  
December 23, 2020  
Page 2



## Memorandum

VHB reviewed delineated wetland features within the LVRT(13) Study Area with the assigned DEC District Ecologist on September 29, 2020. The purpose of this site visit was to confirm the presence/absence of wetland resources and to assign presumptive classifications. This effort also provided confirmation on delineated wetland boundaries from DEC.

### Findings

Watercourses were generally found to be unchanged from the 2008 inventories, though minor modifications were observed and mapped to reflect current conditions. VHB delineated new wetland resources and modified the boundaries of previously identified wetland resources based on the 2020 field assessment and site visits with the DEC District Ecologist, generally increasing their size, though not significantly. The original 2008 assessment mapped 12.85 acres of total wetland and 12.23 acres of wetland buffer within the Project's approximately 17.8-mile long Study Area. The 2020 re-delineation resulted in the relatively minimal addition of approximately 0.83 acres of wetland as well as 10.79 acres of wetland buffer within the Study Area.

As previously noted, this increase is partially attributable to changes in state regulations and federal guidelines for wetland delineation. However, this increase is also attributable to the evolution of the Project corridor since the original 2008 delineation. Specifically, wetlands, wetland buffers, and/or streams have encroached on the rail corridor as a result of the natural degradation and erosion of the rail embankment, particularly during severe storm events. Additionally, the extent of regulated wetlands and their buffers may have been affected by anthropogenic changes such as ATV and snowmobile use.

The increase in the area of regulated wetland and wetland buffer within the Study Area could result in an associated increase in impacts to these features. Additionally, ongoing degradation of culverts and/or bridges since the original preliminary engineering analysis may dictate additional maintenance activities (and associated impacts) not contemplated previously.

That being said, the vast majority of Project improvements will occur within the existing footprint of the abandoned railroad ballast and culvert or bridge replacements will predominantly reestablish the existing limits of disturbance for the rail bed. Given that nature of the proposed work as maintenance and/or replacement of prior fill and pre-existing drainage structures, VHB assumes that the Project will not result in an undue adverse effect on regulated wetlands and buffers per the VWRs. This assumption is made in part via the outcome of proactive and pre-application coordination with the DEC District Ecologist, who has not indicated that the Project cannot be permitted provided that standard impact avoidance and minimization measures and Best Management Practices ("BMPs") developed by the DEC are implemented. The USACE has similarly expressed no concerns regarding the permissibility of the Project.

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From: Ryan Scott, Senior Ecologist  
Ref: 57294.13  
December 23, 2020  
Page 3



## Memorandum

VTrans and VAST will obtain the necessary approvals for unavoidable Project-related from the DEC Wetlands Program, DEC Rivers Program, and the U.S. Army Corps of Engineers and will adhere to conditions contained therein.

### **Rare, Threatened, and Endangered Plants**

In 2009, GBE searched the LVRT corridor from Swanton easterly to Fairfield, where it crosses Vermont Route 36, and several other locations in central and eastern Vermont for rare, threatened, or endangered ("RTE") plants. No rare plants were found east of the Swanton-Fairfield segment [which includes STP LVRT(11)], and over time, GBE has monitored some of the populations of rare species there (e.g., *Monarda punctata* and *Calystegia spithamea*), and have re-searched, north of the Missisquoi River for others (*Carex fernaldii*, *Hypericum ascyron*) without finding them. Based on these findings and on correspondence with Bob Popp, Department Biologist at the Vermont Fish and Wildlife Department ("FWD") in September 2020 (attached), there are no concerns regarding RTE plants in LVRT(13). The original Threatened and Endangered Species Takings Permit for the overall LVRT project was amended on September 11, 2020 to authorize construction activities at the far western end of the corridor in Highgate Center, Sheldon, Swanton (see attached).

### **Freshwater Mussels**

For the priority bridges Segment LVRT(10), freshwater mussel surveys were conducted by Biodiversity in 2020 at Bridges 41 and 48 over the Lamoille River. No mussels were found at either location. As both of these bridges are located downstream of LVRT(13), the FWD concluded that surveys for freshwater mussels were not required for upstream segments of the Lamoille River, including LVRT(13). See attached correspondence with Mark Ferguson, FWD Natural Heritage Zoologist. Moreover, LVRT(13) does not propose any in-water work at any bridge locations, and each of the 31 proposed culvert replacements occur in streams too small to support freshwater mussel populations.

### **Attachments**

- Email from Bob Popp of FWD Department Biologist, to Art Gilman of GBE, dated September 18, 2020, as forwarded from GBE to VHB.
- Email from Mark Ferguson, FWD Natural Heritage Zoologist, to Brad Ketterling of VHB, dated September 11, 2020.



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>Bob

>

>Bob Popp  
>Department Botanist  
>VT. Dept of Fish & Wildlife  
>5 Perry St. Suite 40  
>Barre, VT. 05641

>

>(802) 476-0127  
>[bob.popp@vermont.gov](mailto:bob.popp@vermont.gov)

>

>-----Original Message-----

>From: Art Gilman <[avgilman@together.net](mailto:avgilman@together.net)>  
>Sent: Tuesday, September 15, 2020 8:42 AM  
>To: Popp, Bob <[Bob.Popp@vermont.gov](mailto:Bob.Popp@vermont.gov)>  
>Subject: Fw: LVRT

>

>EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.

>

>Good morning Bob.

>

>The Lamoille Valley Rail Trail work will be proceeding, as we discussed with Ken Brown of VAST earlier this summer. As you know in 2009, Gilman & Briggs searched the corridor from Swanton easterly to Fairfield, where it crosses Vermont Rte. 36, and several other locations in central and eastern Vermont for rare, threatened, or endangered plants. No rare plants were found east of the Swanton-Fairfield segment, and over time, we have monitored some of the populations of rare species there, i.e., *Monarda punctata* and *Calystegia spithamea*, and have re-searched, north of the Missisquoi River for others (*Carex fernaldii*, *Hypericum ascyron*) without finding them.

>

>The one segment where rare species were originally found but where we have not been back since 2009 is the segment from Pumpkin Village Road east (south) to Vt. Rte. 36, where *Hypericum ascyron* (Tall St. John's-wort) was found in several areas. We are proposing to re-search those locations in the



near future (i.e. before 10 October) so that it can be determined if an Endangered Species Permit will be necessary going forward.

>

>I am writing to see if your Program has any other concerns, i.e., if you will want additional areas or segments of the LVRT searched again, or newly searched? I will be in my office on Thursday of this week if you would like to discuss (am teaching a wetland class today and tomorrow).

>

>Thanks,

>

>Art

>

>



**From:** Ferguson, Mark <Mark.Ferguson@vermont.gov>  
**Sent:** Friday, September 11, 2020 3:39 PM  
**To:** Ketterling, Brad  
**Cc:** Ethan Nedeau (nedeau.ethan@gmail.com)  
**Subject:** [External] RE: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction  
**Attachments:** Wood turtles: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

Brad,

Based on the reports and information that Ethan provided for the two sites he surveyed, no additional mussel surveys will be required.

I've attached an email from Steve Parren, coordinator for our program and who has turtle expertise, which has recommendations for avoiding impacts to wood turtles that could occur at the 80, 77, and 83 crossings. The main points:

- *Best to limit on-site construction and prep to July - August if possible. June – mid-September is ok if necessary, but turtles may be encountered in those additional times.
- Wood turtles are hibernating in the stream November through April. They may be in the river at times throughout the year.
- Turtles also stay near the stream (potentially within project area) in mid-September to mid-October and late April through May.
- *Before placing fill or impacting the river bottom, search the river bottom for turtles.
- *Avoid bare, sandy areas that get direct sun and could support turtle nesting.
- A wood turtle fact sheet is included.

Mark Ferguson  
Natural Heritage Zoologist  
Vermont Department of Fish & Wildlife  
802-279-3422

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**From:** Ferguson, Mark  
**Sent:** Tuesday, September 1, 2020 11:29 AM  
**To:** Ketterling, Brad <[BKetterling@VHB.com](mailto:BKetterling@VHB.com)>  
**Cc:** Ethan Nedeau ([nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)) <[nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)>  
**Subject:** RE: Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

Hi Brad,

Thanks for the kmz file. That was easy and useful. I agree about the Black River sites, likely to be too far upstream for T&E mussels. There will be no mussel surveys needed for the following bridges: 80, 77, and 83. Also, since they were included in the file, no mussel surveys are needed for bridges 69G and 51.

I would like to wait on determining whether additional mussel surveys are needed at bridges 49, 35, and 34 until after I've received and reviewed the report for #48 and 41.



We have records of wood turtles in Black Creek near bridges 80, 77, and 83. I will contact our turtle biologist to see if he has any recommendations for avoiding impacts to that species. I'll get back to you with his response.

Thanks.

Mark Ferguson  
Natural Heritage Zoologist  
Vermont Department of Fish & Wildlife  
802-279-3422

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**From:** Ketterling, Brad <[BKetterling@VHB.com](mailto:BKetterling@VHB.com)>  
**Sent:** Monday, August 31, 2020 10:42 AM  
**To:** Ferguson, Mark <[Mark.Ferguson@vermont.gov](mailto:Mark.Ferguson@vermont.gov)>  
**Cc:** Ethan Nedeau ([nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)) <[nedeau.ethan@gmail.com](mailto:nedeau.ethan@gmail.com)>  
**Subject:** Lamoille Valley Rail Trail - potential in-water work for bridge repair / construction

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Good morning, Mark –

VHB is working with VTrans and VAST on trail design for the remaining portions of the Lamoille Valley Rail Trail (LVRT) project, which include some bridge repairs and replacements. As you may recall, Ethan Nedeau (copied here) submitted a couple of Takings Permit applications for related freshwater mussel surveys at Bridges 41 and 48 over the Lamoille River in Hardwick and Wolcott, respectively. Ethan completed the survey work in July and is working on those reports, but no mussels were observed at either location.

There are six additional bridge crossings for this project that are currently under design. The extent of in-water work required is still being determined, but I ran the locations by Ethan for his first impression. These bridges are listed below and can be navigated to using the attached KMZ file. While Ethan does not have any experience on the tributary streams, based on the results of the Bridges 41 and 48 surveys and the size of the tributaries, he believes it's unlikely that mussels are present at any of these crossings. He thinks that the lower Black Creek has potential, but the three proposed crossings are many miles upstream.

That being said, both Ethan and I defer to your judgment and/or any existing records for these streams to make a decision regarding whether or not surveys should be conducted at any of these locations. Could you please let us know what you think and we can react accordingly.

- Bridge 34 (Stannard Mtn. Rd. and Stannard Brook, Hardwick)
- Bridge 35 (Lamoille R., Greensboro)
- Bridge 49 (Wild Branch)
- Bridge 77 (Black Creek, Bakersfield)
- Bridge 80 (Black Creek, Bakersfield)
- Bridge 83 (Black Creek, Fairfield)



Thanks very much,  
Brad

**Brad Ketterling**

Director of Environmental Services - Vermont



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