



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

ERIC BOYETTE
SECRETARY

November 11, 2020

MEMORANDUM TO: Wanda Austin, PE
Division 14 Project Development Engineer

ATTENTION: Amy Sackaroff, AICP
Senior Transportation Planner, Stantec

FROM: Jody Kuhne, LG, PE
Regional Geological Engineer, NCDOT GEU

STATE PROJECT: 32572, A-0009
COUNTY: SWAIN/GRAHAM
DESCRIPTION: US 74 Corridor from US 129 at Robbinsville to 2 miles East of
NC 143/NC 28 intersection at Stecoah

SUBJECT: Acidic Rock Testing Results, Improve Existing Alternate

The Geotechnical subsurface investigation for the Improve Existing Alternate has been ongoing through summer and fall, 2020. In the process, fresh testing samples were taken along the alignment in the proximity of the Anakeesta/Weyhuty formation. This formation is noted for having rock mineralization that generates acidic runoff, particularly when excavated and exposed to air and water.

The NCDOT Geotechnical Engineering Unit has recommended A-0009 alignments that avoid the acidic rock issue since 1981. This is mostly because the values, volumes and treatment are highly customized and potentially extremely expensive. Also, the Special Provision and Recommendations for dealing with the issue are not possible until a specific route is thoroughly investigated, which is generally difficult to estimate for the EIS process on a long roadway.

To that end, the attached results and locations indicate that the Improve Existing Alternate does avoid this particular problem. There will be more sampling from rock coring, but these results are from all exposed rock cut areas that were most likely to have the issue.

Sample Interpretation

The attached table shows the indicator we are looking for in the "CaCO₃" column, which has

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Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

been referenced in other project literature as the Net Neutralization Value, NNP. The more negative this number, the more acid producing potential exists. Depending on the general neutralization capacity NCDOT projects typically haven't had an issue requiring treatment with bulk averages of -10.

Since this alignment met a general recommendation to avoid acid producing rock formations, the low level of this measure confirms this as a reasonable choice.

Recommendations

- 1) No specific treatment or material handling will be required for excavation on this project.
- 2) No specific water chemistry testing or monitoring is recommended with respect to this issue, outside of other erosion control and water quality preservation items required for the project.
- 3) Durable excavated rock material, if approximating Class I or II rip rap, or Class VII in the NCDOT Standard Specifications may be used to construct 1.5:1 rock embankments parallel to streams, if this is desirable to reduce the project footprint.

Please contact Jody Kuhne, NCDOT GEU at 828-779-9482 or jkuhne@ncdot.gov with questions regarding this report.

Date: 11/6/2020

Galbraith Laboratories, Inc. Test Report

Prepared for:
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Carolinas Geotechnical Group, PLLC/AA-0001C 2400-20-068
 Robbinsville, NC

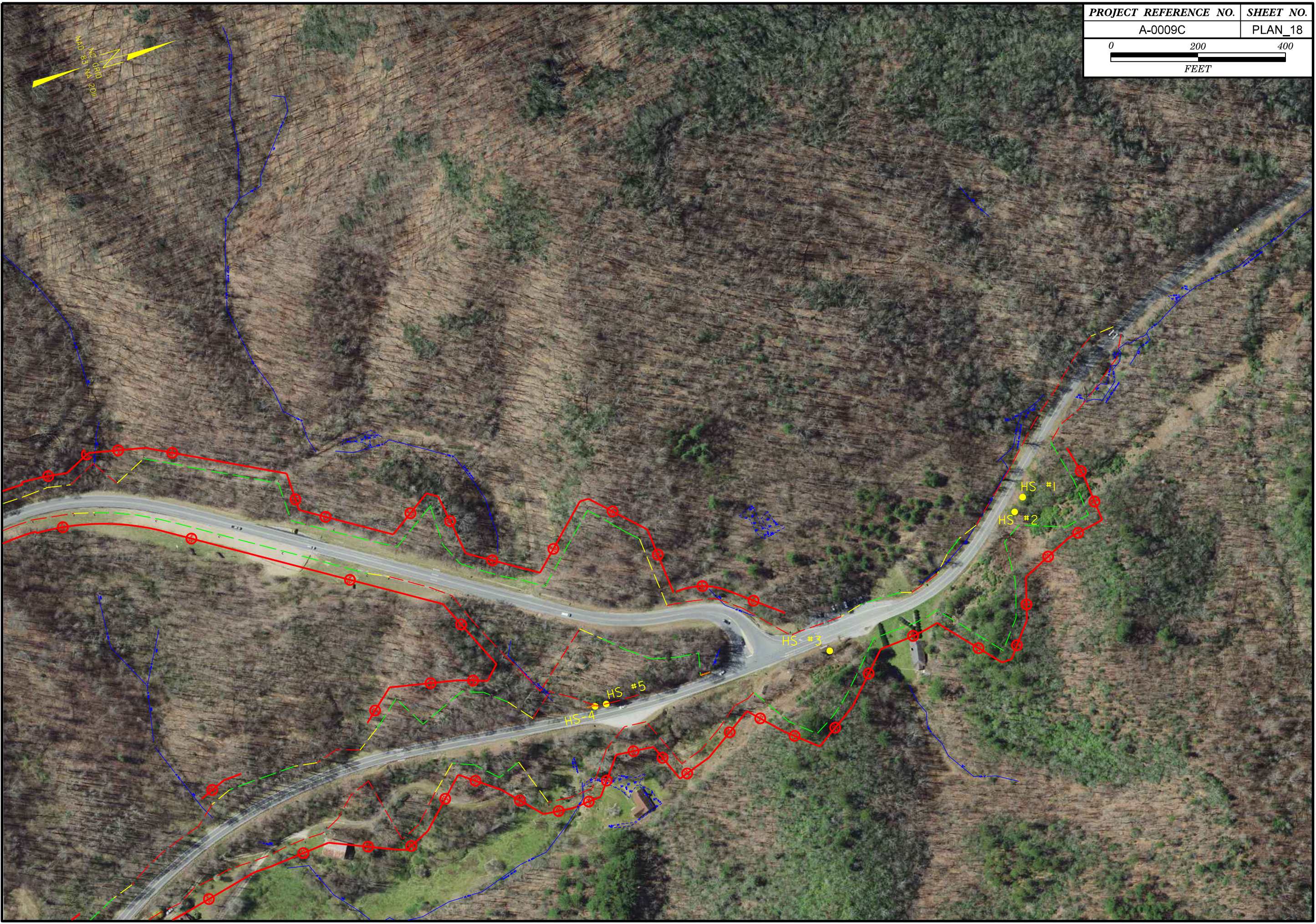
		Paste pH	Neutralization Potential I	Potential Acidity	CaCO3 (Def)/Sur	Fizz	Total Sulfur*	Pyritic Sulfur
		**	**	**	**		%	%
Lab ID	Sample ID	----- EPA 600/2-78-054 -----					ASTM D4239	ASTM D2492-77
M-1018	Hand Sample 1, Date 10/6, Container-Plastic bag, Spl. Type- Rock	5.52	0.50	1.25	-0.8	None	0.040	0.030
M-1019	Hand Sample 2, Date 10/6, Container-Plastic bag, Spl. Type- Rock	6.18	0.72	0.15	0.57	None	0.005	0.024
M-1020	Hand Sample 3, Date 10/6, Container-Plastic bag, Spl. Type- Rock	6.15	2.47	0.08	2.4	None	0.003	0.018
M-1021	Hand Sample 4, Date 10/6, Container-Plastic bag, Spl. Type- Rock	6.54	2.07	0.25	1.82	None	0.008	0.036
M-1022	Hand Sample 5, Date 10/6, Container-Plastic bag, Spl. Type- Rock	6.07	1.70	0.07	1.6	None	0.002	0.019
M-1023	Hand Sample 6, Date 10/6, Container-Bag, Spl. Type- Rock	5.92	0.18	0.34	-0.16	None	0.011	0.012
M1024	Hand Sample 7, Date 10/6, Container-Bag, Spl. Type- Rock	5.85	0.48	0.00	0.5	None	0.000	0.011
M-1025	Hand Sample 8, Date 10/6, Container-Bag, Spl. Type- Rock	8.42	5.63	0.17	5.46	None	0.006	0.037
M-1026	Hand Sample 9, Date 10/6, Container-Bag, Spl. Type- Rock	6.39	0.78	0.16	0.6	None	0.005	0.018
M-1027	Hand Sample 10, Date 10/6, Container-Bag, Spl. Type- Rock	6.99	2.32	0.31	2.01	None	0.010	0.021
M-1028	Hand Sample 11, Date 10/6, Container-Bag, Spl. Type- Rock	5.87	1.73	0.69	1.0	None	0.022	0.011
M-1029	Hand Sample 12, Date 10/6, Container-Bag, Spl. Type- Rock	9.44	4.70	0.00	4.70	None	0.000	0.067
M-1030	Hand Sample 13, Date 10/6, Container-Bag, Spl. Type- Rock	6.93	0.83	0.05	0.8	None	0.002	0.070
M-1031	Hand Sample 14, Date 10/6, Container-Bag, Spl. Type- Rock	6.48	0.74	0.19	0.55	None	0.006	0.021
M-1032	Hand Sample 15, Date 10/6, Container-Bag, Spl. Type- Rock	9.44	4.72	0.00	4.7	None	0.000	0.081
M-1033	Hand Sample 16, Date 10/6, Container-Bag, Spl. Type- Rock	9.33	4.25	0.10	4.15	None	0.003	0.057
M-1034	Hand Sample 17, Date 10/6, Container-Bag, Spl. Type- Rock	8.63	4.14	0.21	3.93	None	0.007	0.056

M-1035	Hand Sample 18, Date 10/6, Container-Bag, Spl. Type- Rock	9.49	5.95	0.15	5.80	None	0.005	0.169
M-1036	Hand Sample 19, Date 10/6, Container-Bag, Spl. Type- Rock	9.71	37.62	0.17	37.45	Slight	0.005	0.065
M-1037	Hand Sample 20, Date 10/6, Container-Bag, Spl. Type- Rock	9.54	3.67	0.01	3.66	None	0.000	0.733

** Tons of CaCO₃ per 1000 tons of material

* The quantitation limit for sulfur was 0.010%

PROJECT REFERENCE NO.	SHEET NO.
A-0009C	PLAN_18
0 200 400 FEET	

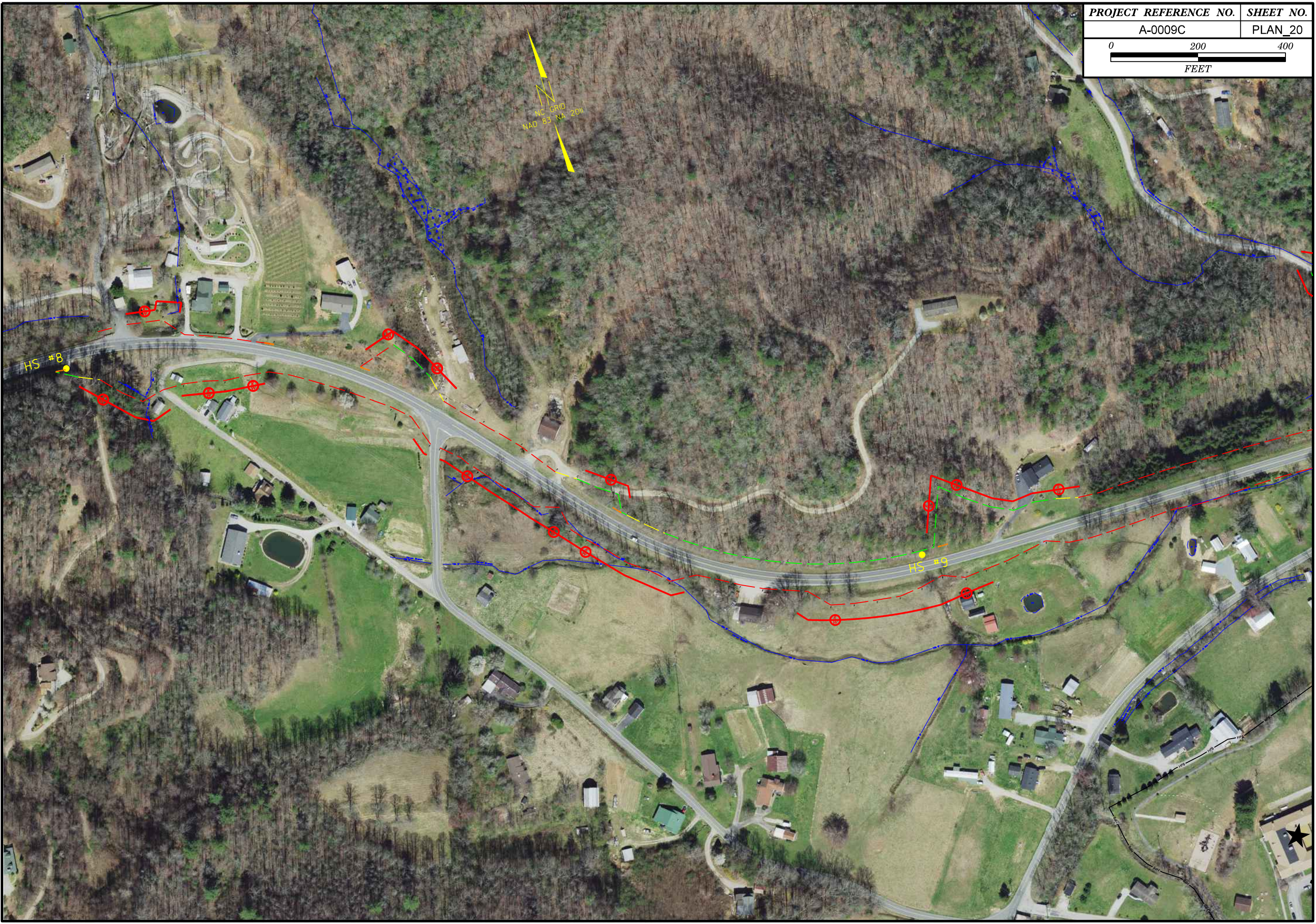


PROJECT REFERENCE NO.	SHEET NO.
A-0009C	PLAN_19
0 200 400 FEET	

NC GRID
NAD 83 NA 2011



NC GRID
MAD 83 NA 201



NC GRID
NAD 83 NA 2011

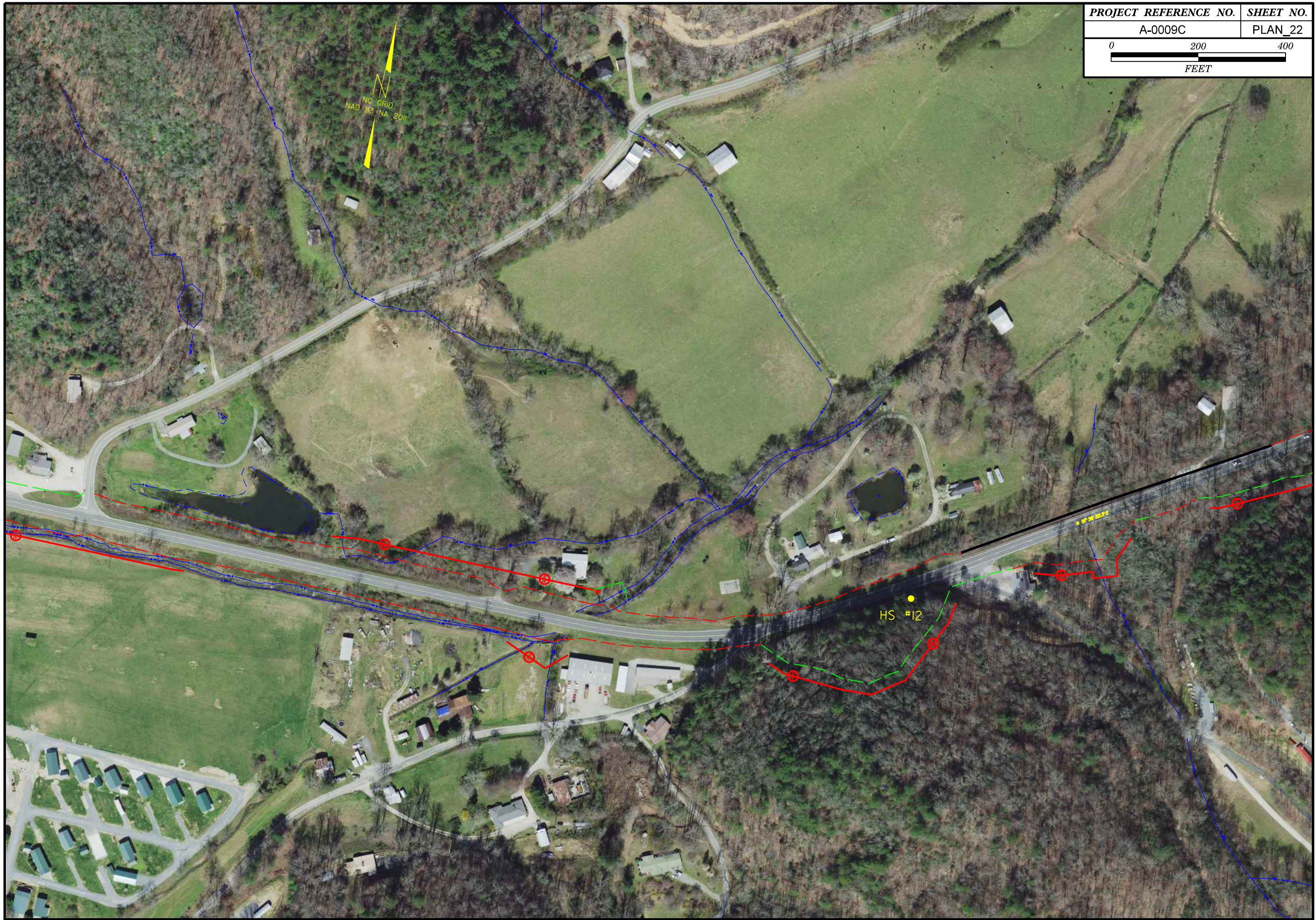


HS #10

HS #11

87
★ GH0026
STECOAH
BAPTIST CHURCH

85
★ GH0025
STECOAH
SCHOOL



PROJECT REFERENCE NO.	SHEET NO.
A-0009C	PLAN_23
0 200 400 FEET	

227
★ GH0349
BOXED HOUSE

NC GRID
NAD 83 NA 2011

