

High Country Civil Engineering, PLLC

P.O. Box 854

Banner Elk, NC 28604 (828)260-2262

19 August 2019

Mr. Shane Garland

Linville Volunteer Fire Department

PO Box 274

Linville, NC 28646

RE: Site inspection LVFD

Dear Mr. Garland,

In accordance with your request and authorization the undersigned Civil Engineer from High Country Civil Engineering, PLLC provides construction inspection and recommendations for foundation/concrete slab repairs at the referenced location. Recommendations are based on information presented during a site visit 2 July 2019. The inspection is requested relative to a site inspection requesting additional professional evaluation of the foundation/concrete slabs and foundation material.

Existing Conditions

The concrete slab referenced in previous report (8 May 2019) has been saw-cut and removed. Material has been excavated to inspect subgrade conditions. The concrete slab is reinforced concrete with steel reinforcing bars and steel mesh.

Inspection and Recommendations

The scope of the inspection was limited to assess the portions of the foundation that have been excavated. No tests, calculations or structural analysis were performed.

Inspection was conducted with Mr. Shane Garland and Mr. Mark Taylor 2 July 2019. Visual inspection of the excavation did not indicate any sloughing of material. It was observed that water has infiltrated the base and subgrade. A steel probe rod (#4 rebar) was used to test subgrade resistance. The probe rod was inserted 8-10 inches with minimal resistance. In

addition to subgrade inspection, the drainage pipe has been inspected and found to be competent without defects. Upon additional excavation, it was observed that construction materials (organics) were located within the fill of the structure. It is presumed that leftover building materials were filled over during construction of the structure. Over time these organics deteriorate and can potentially cause settlement/foundation issues.

It is recommended to repair the excavated concrete slab(s) by re-constructing a slab similar to a bridge approach slab. Replacement of the concrete in front of the Fire Department Bays shall be in accordance with NCDOT 2018 Standard Specifications for Roadways and Structures. NCDOT 2018 Standard Specifications for Roads and Structures is available on the NCDOT website for reference.

<https://connect.ncdot.gov/resources/Specifications/StandSpecLibrary/2018%20Standard%20Specifications%20for%20Roads%20and%20Structures.pdf>

It is recommended to repair the reinforced concrete slabs by the following:

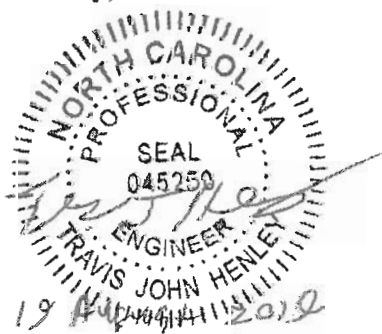
- Excavate additional material/depth until competent material is reached or depth becomes unsafe/unstable. Excavations shall conform with applicable OSHA regulations, specifically Subpart P 1926.650. Allow for a concrete joint between each bay if project spans multiple bays. Concrete Contraction Joints are typically 24-30 times the slab thickness and no greater than 15 ft.
- Subgrade shall be compacted with a vibratory rammer prior to backfilling the excavation
- Type II filter cloth shall be placed at the bottom of the excavation, Aggregate Base Course (ABC) placed in 6-inch lifts and compacted with a vibratory compactor. Repeat until material is within 3 inches of steel reinforcing bars.
- Install steel reinforcing bars as scheduled with 3-inch galvanized slab bolsters and 5.25 inch continuous highchair uppers separating the steel mats.
- Between bays, install steel reinforcing bars as scheduled with steel reinforcing mesh 5.25 inches separating the steel mats.
- Replace Safety Bollards and cast in place during concrete pour. Allow minimum 18inch embedment/foundation depth for bollard.
- Install Fibre Expansion Joint between concrete faces and manufacturer's recommended sealant
- Place AA concrete with a MacroFiber (structural fiber matrix) reinforcement. Apply a broomed texture to the slab(s) before the concrete becomes non-plastic. Ensure concrete consolidation and finishing are conducted with Best Management Practices. Consolidate concrete with vibration and freshly placed concrete can be cured using an acrylic concrete cure & seal immediately after finishing concrete.
- Repair drainage pipe from roof/guttering system to connect with the existing subsurface cross-drain
- Allow 28-day cure time. Concrete typically achieves its maximum compressive strength after 28 days.

BILL OF MATERIALS				
APPROACH SLAB FD BAY				
Size	No.	Length	Weight (lbs)	Type
#4	24	3' 6"	56	Epoxy
#4	24	3' 6"	56	STR
#5	8	11' 6"	96	Epoxy
#6	8	11' 6"	138	STR
FD BAY Pour			Cubic Yards	1.8

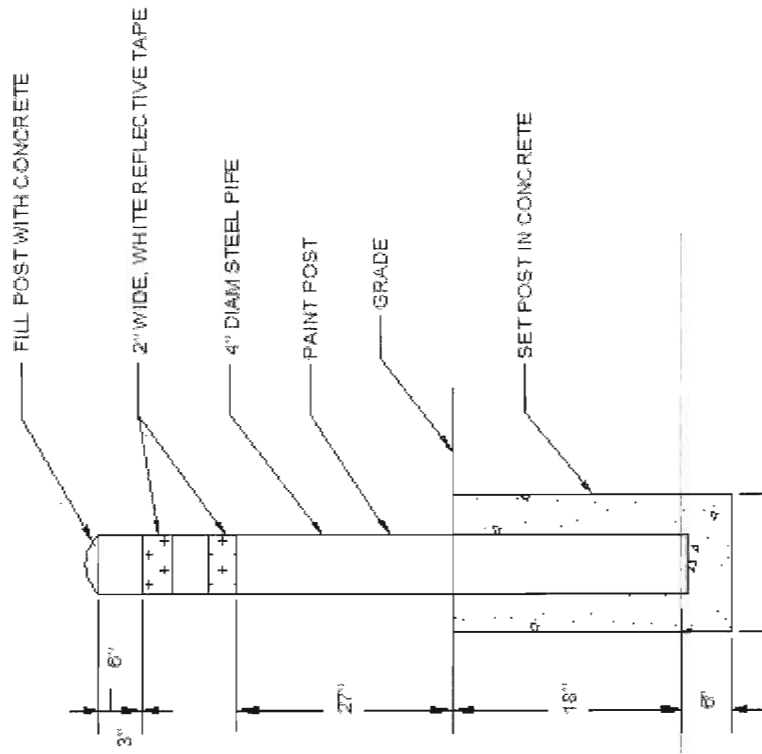
BILL OF MATERIALS				
APPROACH SLAB BETWEEN BAYS				
Size	No.	Length	Weight (lbs)	Type
#4	8	1' 6"	8	STR
#5	3	3' 6"	11	STR
BAY Pour			Cubic Yards	0.3

If you have any questions or comments regarding this report, or require any additional engineering services, it is recommended that you contact me at your earliest opportunity.

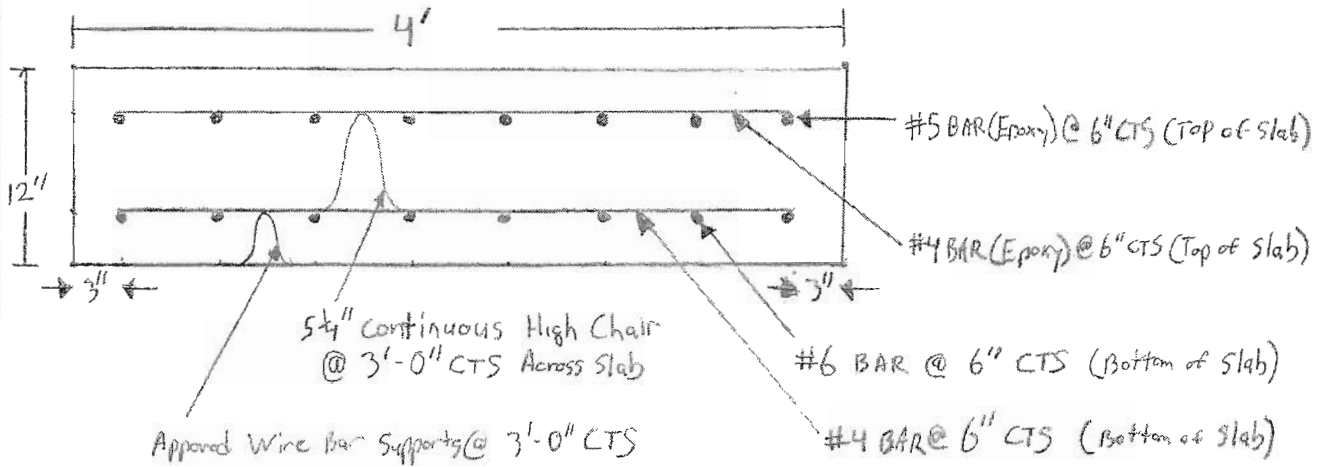
Sincerely,



Travis J. Henley, P.E.



SECTION THRU SLAB



SECTION BETWEEN BAYS

