

January 5, 2016

Town of Plainfield
PO Box 380
Meriden, NH 03770-0380
Attn.: Steve Halleran

re: Concrete samples from the Plainfield Town Garage

Dear Mr. Halleran,

On December 27, 2015 we were delivered four concrete core samples that Brad Atwater had obtained from the Town Garage. Samples were labeled as numbers 1 through 4, with the locations correlating to a location sketch that Brad retained. We were asked to inspect and comment on the cylinders, and subject them to a compressive strength test.

Cores 1-3 were 2 3/4" diameter, taken from the slab, and Core 4 was a 3 3/4" diameter core taken from the wall. I took initial measurements and photos of the cores before we disturbed them. A visual inspection of the cores showed what appears to be a 3/4" aggregated concrete mix, in all samples, that had been air entrained. Also visible was #4 bar reinforcing in the side of Core #1, at 1" down from the top of the core, and welded wire mesh in Core #3 at 3 1/4" down from the top.

The core ends were cut to a flat, clean surface before adding a sulfur cap to each end. I was able to trim the ends of cylinder #4 and preserve a minimum length to diameter ratio of 2. Sample 1-3, however, were cored with an average L/D ratio of 1.6, so a correction factor was applied to the compressive strength value of each.

The cores were broken at normal power in our compression break machine and the measurements and results are as follows:

Core #	Initial Length (in.)	Cut Length (in.)	Core Weight (grams)	Unit Weight (pcf)	Corrected Compressive Strength
1	4-1/2	4-3/8	1026.3	150.7	6690
2	4-1/2	4-3/8	991.1	145.6	4250
3	4-7/8	4-1/2	1063.3	151.9	5710
4	8	7-1/2	3129.7	144.0	2940

The results from Cores 1 and 3, both the unit weight and the corrected strengths, were likely increased somewhat by the presence of rebar or reinforcing wire. Core 2, therefore, is probably the most representative sample from the slab. The given strength of 4,250 is more than adequate for even a heavily travelled floor slab. Concrete for slabs is typically specified between 3,500 and 4,000 psi. Modern slabs are placed without air entrainment, it appears from visual inspection that this mix did have air in it. This shouldn't have any long term negative effects.

The single core taken from the foundation wall was the best looking core of the lot, but was found to have the lowest compressive strength. A strength of 2,940 is less than a typical commercial mix, a minimum of 3,000 psi is generally specified. The structural engineer may determine that the strength is adequate for the current or expected loading.

A photo of the cores as delivered follows below.



Sincerely,

Randall Rhoades

Randall Rhoades, PE
ACI Concrete Strength Testing Technician