Francis Hveem: Testing the Limits of His Abilities

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Posted: April 2014

Many of you may not know the name Hveem because you have never turned the handle on a stabilometer or watched the steel pellets fall into the bucket of a cohesiometer. If you are not familiar, let's get one thing out the way so you can read this correctly – the name is Hveem, and it's pronounced like "veem" and not like "huh-veem", "H-Veem", or the guttural-sounding "chuh-veem."

The story of Francis Hveem first piqued my interest during a visit with Phil Stolarski, the State Materials Engineer and Deputy Division Chief of Materials Engineering and Testing Services & Geotechnical Services, at Caltrans' Translab. Phil sits in the former office of Francis Hveem, and he often reflects on what he has learned from Francis Hveem in his time with Caltrans.

Phil said that when he gets into a jam and needs to really think through a problem, he looks at a photo of Mr. Hveem and asks himself, "What would Francis do?" To me that meant Francis was more than someone who worked at the DOT – he was a creative problem solver and an inspiration to those who worked with him.

When I asked Phil about this story, he wanted to prepare me by having me read "Highway Recollections of F.N. Hveem," which is a historical transcript of an interview that W. R. Lovering (a former colleague of his) conducted with Francis. In this document, I learned how Francis came into this industry. I imagine it's not all too different from many of our own stories. What is remarkable about this story is how Francis was able to start at the bottom and take on every opportunity that was presented to him to succeed in this industry.

From Rags to Better Quality Rags
Francis started out earning $15 per month as a telephone operator before skyrocketing to a salary of $50 per month as a draftsman with the California Department of Public Works, Division of Highways. The Division of Highways proved to be a goldmine right away by providing him the opportunity to earn $75 per month, plus board, to work in a field office (labor camp) in the Shasta River Canyon. That is NOT a typo – those values are per MONTH! Remember, that was in 1918. The country was at war, and times were tough.

Francis worked his way up through the ranks learning whatever he could along the way. That included mastering the art of driving on the job. He claimed that he could drive even though he had little experience behind the wheel of a car, because he knew he'd figure it out. Unfortunately, Francis moved through the ranks so quickly that he ended up as a young Maintenance Superintendent. In this position, he did not garner the respect that was needed to continue supervising the work in an effective manner. Francis ended up being laid off by the Division of Highways at that time and moved to San Francisco, where he tried at a few different careers that didn't quite fit. He then ended up back at the Division of Highways where he continued his life's work.

The Pioneer
Luck would have it that just as Francis's career was kicking back in gear, a new way of paving roads was being developed. The material they called an "oil-mix" was gaining some traction, and the Division of Highways needed someone they could trust to learn all about the material. Unfortunately, they didn't pick Francis, but that inspired him to work even harder to be the right choice the next time an opportunity was presented.

During this time in the materials industry, people were just figuring out what was going on. Engineers had ideas about what materials worked well, but they were largely relying on local sources near the construction site – so sometimes engineers would be forced to make it work even when it didn't. For example, Francis recalled a time when the aggregate used in the road surface was so poor that it resulted in such an extreme case of washboarding that it forced drivers to keep their cars in the brush where they might have a better driving surface.

Like many other pioneers of his day, Francis wanted to solve these problems his own way. He knew that if one could run reliable tests on the materials before they are used, some of these problems could be eliminated. Francis started to document as much information about the materials and conditions as he could so he could

develop some theories. He figured out through his observation that angularity, gradations, asphalt content, thickness of coating on the aggregates, and moisture content all had a great influence on the mixture.

Francis was trying to figure out a particular field test one day and wanted confirmation from the lab in Sacramento that his conclusions were correct. So, as people did in the early 1900's, he sent them a letter. They liked his letter so much (or were so confounded by it) that they invited him to come to the lab and, eventually, to remain there. He did just that. In fact, Francis liked the lab work so much that although he briefly rose to a level outside the lab, he found the work to be less stimulating, and he quickly returned to the job he loved.

There he solved a lot of problems for many paving operations in the state of California and even developed a few test methods of note:

- The Stabilometer
- The Cohesiometer
- The Sand Equivalent Test
- The Sand Abrasion Test
- The Stripping Test
- The Moisture Susceptibility Test

He even forced the creation of the District Materials Engineer position – so if you hold one of those positions, thank Francis Hveem.

Francis retired from Caltrans in 1963 after 46 years of work. He spent his retirement, like many other retired engineers, working. Because California was such a vanguard in the highway construction industry, Francis' opinion was in high demand. The United Nations latched onto him, flew him to many different countries where he continued to observe, test, and solve problems like he did at Translab.

In 2011, Caltrans announced that it was going to adopt the Superpave mix design method effective July 1, 2014 replacing the current "Hveem" mix design method. Phil Stolarski did comment that Francis would be proud that the former California Department of Public Works, Division of Highways now Caltrans embraced Superpave because Superpave takes into account modern-day traffic loading, environmental conditions and the quality of the materials. With the transition to Superpave, we will get, from a materials standpoint, a higher quality product and Francis would be proud of that.

The Scholarship Fund

To continue the great work that Francis Hveem had completed in his time, Caltrans has been helping to manage the Francis N. Hveem Fundraiser and Scholarship. Every year, Caltrans offers scholarships to assist and encourage those who are current or former Translab employees, their dependents, and volunteers or student assistants and are preparing for careers in technical fields that could lead to employment at Translab. The funding has come through a generous bequest from the Hveem family and contributions by Translab employees, but we wanted to let you know about it in case you also feel that you want to contribute to the scholarship fund. Here is a link if you are interested:

CTF Endowed Hveem Memorial Scholarship | California Transportation Foundation (Powered by Donorbox)

Special thanks to Phil Stolarski, State Materials Engineer and Deputy Division Chief of Materials Engineering and Testing Services & Geotechnical Services, at Caltrans' Translab

References

- Hveem, Francis N., and W. R. Lovering. *Highway Recollections of F.N. Hveem: Oral History Interview*. Sacramento, CA: California Dept. of Transportation, Committee on Preservation of Historical Heritage, 1983. Print.

NOTE: *This article was updated in October 2022 to include the current link to the scholarship fund. At the original date of publishing (April 2014), Phil Stolarski was the State Materials Engineer and Deputy Division Chief of Materials Engineering and Testing Services & Geotechnical Services, at Caltrans' Translab. Please visit their website details on who currently holds that position.*