Interview of Former Gannett-Fleming Employees

Pittsburgh, PA

HWY22MH003

(10 pages)

Interviewee: Gannett Fleming

Represented by: Scott Pearson and Caitlin Caldwell

Date: Thursday, July 21, 2022 – 1300 EDT

For the NTSB: Steve Prouty, Dan Walsh, Dennis Collins

For the FHWA: Justin Ocel, Dennis O'Shea, Jon Buck

Investigator notes were reviewed by Gannett Fleming for factual accuracy and typographical errors. The notes in this document have been revised based on that review.

Questions are in a BLACK font
Notes on the responses are in a BLUE font
Comments are in a RED font
Additional information provided by Gannett Fleming is in a GREEN font

- Can you give us a general description of your duties and responsibilities?

  As Team Leader (TL) is responsible for managing the bridge inspection, arranging for access and associated equipment, reviewing previous inspection reports, the hands-on inspection of Fracture Critical Members (FCMs), visual inspection of all areas, assess the condition of elements/components, and compiling and review the reports. Overall, he spends about 50% of his time performing inspections and 50% of his time in design.

  Caitlin worked under Scott during the 2021 inspection of the Fern Hollow Bridge. She took notes and photographs. She was in the Under Bridge Inspection Truck (UBIT) with Scott during the inspection. She wrote the initial draft of the report. Overall, she also spends about 50% of her time performing inspections and 50% of her time in design.

- Have you successfully completed NHI 130078, "Fracture Critical Inspection Techniques for Steel Bridges?"

  Scott completed that course in December of 2019. He has been a Certified Bridge Safety Inspector (CBSI, a PennDOT certification) for a number of years.

  Caitlin is also a CBSI but has not taken the NHI 130078 course.

- How many years of experience do you have inspecting bridges?
  - How many years of experience inspecting bridges with fracture critical members?

    Scott has approximately 12 years' experience, beginning in 2010 and estimates 15%-25% of the inspections he conducts are FCM inspections.

Caitlin has approximately 2 years' experience and also estimates 15%-25% of the inspections she conducts are FCM inspections.

- What were the dates of the inspection and when was inspection work fully complete?

  The 2021 inspection of the Fern Hollow Bridge occurred on 9/29/2021, 10/4/2021, and 10/5/2021. The break was due to the unavailability of the UBIT.

- What inspection work was completed in September 2021 at the time of initiation of the inspection, and what work was completed in October 2021 or later?

  On 9/29, the signage, the deck (no lane closure performed), the barrier, and the sidewalk were inspected.

  On 10/4 and 10/5, the FCM inspection and the remainder of the routine inspection work were performed.

- Approximately how many field hours were spent on the inspection?

  Approximately 3 hours were spent on 9/29 and approximately 8 hours were spent on each of 10/4 and 10/5, for a total of approximately 19 hours of field work in total.

  It took approximately 16 hours to write the report, approximately 3 hours to review the report, and some time to respond to comments from the Prime contractor (Larson Design Group). The total time spent on the report was estimated as 24-28 hours.

- Scott, were you on the 2020 interim inspection?

  Yes, Matthew Paroda was Team Lead, Jenna Babinski was the primary inspector assisting. Scott inspected the Fern Hollow Bridge from the ground underneath the bridge (the substructure and accessible portions under the bridge). He was on site for one day. The inspection was performed in this manner due to the COVID-19 pandemic.

- The company that performed inspections of this bridge prior to yours characterized the frame legs as "poor to critical" condition in the inspection notes. You characterized the legs as being in "poor" condition, what led you to this characterization?

  Scott felt he agreed with the superstructure condition rating of 4 due to the areas of 100% section loss in the legs. He did not feel it was critical, and that if using the term "critical" in the notes, that the superstructure condition should be a 2 or 3 (i.e., critical). He felt use of the term "critical" in the narrative would therefore be contradictory if rating the superstructure as 4 (poor). Pub 100A defines Rating Code 4 as "advanced section loss, deterioration".

- There were increasing levels of corrosion documented in the frame legs since the last load rating. In the 2021 inspection report it was stated: "Because the condition of the main load carrying members has not changed significantly, the 2014 Load Rating Analysis is still valid". How did you determine the 2014 Load Rating was still valid?

  Scott reviewed the 2014 load rating calculations after the inspection. That load rating was based on uniform section loss across the leg cross-section that was greater than uniform section loss that considered the current size of the holes in the legs. Therefore, he felt the 2014 load rating was still conservative relative to the 2021 inspected condition of the legs. He only reviewed assumptions related to field measurements and not all assumptions made in the rating.

The weight of the under-bridge inspection truck was higher than the posted load limit on the bridge.

- Did you obtain a posted bridge permit, or did anyone perform a rating analysis for the UBIT?

  Scott indicated they did calculations, removing the impact load, and by his recollection, the weight of the UBIT was not an issue.

  Gannett Fleming indicated they would check to see if they have any documentation of these calculations or if other GF staff had a better recollection of this review. The following information was provided for clarification:

  Upon further review of the documentation, Gannett Fleming confirmed that a Safe Load Capacity (SLC) factor was applied to each operating rating in accordance with Pub 238, Section 4.3.2. based on the condition of the bridge. The bridge is conservatively posted with this factor. Without the factor applied, the operating rating for the bridge was 33 ton. The UB used that day weighs less than 33 tons and it was deemed safe at that time. After having the opportunity to review, Scott confirmed that removal of the impact load was not part of this calculation.

  - If you removed impact factor, was crane operator instructed to use crawl speed at all times on the bridge?

    Not to Scott's recollection. Obviously when crews are in the bucket under the bridge the crane will be at crawl speed, but not if they drove over the bridge entering or leaving the site. Scott felt it is ultimately the responsibility of crane operator not to drive their vehicle over a posted bridge if it exceeds posting.

  - Did your contract specify a specific vehicle?

    No, they specify by reach (60' horizontal reach in this case).

- How do you verify wearing surface thickness on a bridge?

  Scott indicated primary means of this is to look at curb reveal/barrier reveal and compare to plans. To his recollection, it was not verified on this inspection.

- When do you verify wearing surface thickness?

  Typically, if they show up and the wearing surface looks new compared to previous report, they will try to verify.

- What duties does Larson perform under this contract relative to the Fern Hollow Bridge?
  Larson establishes and monitors the schedule, reviews reports, and handles all communication with the owner (the City). They provide comments typically, covering all aspects of the inspection, including, at times, condition ratings.

- What is your internal QC/QA process for inspections?

  Caitlin wrote the report. A Level 1 detailed review was performed by Scott. This would include everything in the report. A Level 2 review (internal independent engineer not involved in the inspection) was performed by Matthew Paroda. A Level 2 review is less detailed, not looking at every word in the report but does look at the condition assessment. Level 1 and Level 2 refer to internal GF processes. They liken Level 1 to a QC and Level 2 to more of a QA review as it does not look at every aspect of the report in detail. After completion of Level 2 review, the report is submitted to Larson. Once Larson comments are addressed, Larson provides the report to PennDOT for review.

  In addition to providing copies to Larsen for distribution, Scott mentioned that, under the direction of Larson, he sent a signed and sealed hard copy of the final inspection report to the City of Pittsburgh.

- Did you receive any comments from PennDOT or the City on this report?

  No, but they do get comments from time to time, typically on inventory items. Priority 0 and 1 maintenance items get a higher level of review from the owner and the PennDOT District. P0 and P1 would be an immediate notification and GF would work with both PennDOT and the owner on a plan of action to address the items. Scott could not recall any cases of PennDOT or the City returning comments related to the condition ratings.

- How do you determine the priority of your maintenance recommendations?

  PennDOT Publication 100A has guidelines for maintenance item prioritization which they follow as best they can. The 100A guidelines are not set in stone and it is necessary to utilize judgement.

- Who reviews maintenance prioritization?

  Larson Design Group (prime contractor) reviews everything. Larson handles all communication with the client (PennDOT).

- There were Priority 2 maintenance recommendations listed in the 2021 inspection report for structural steel repair to the legs. How was this maintenance prioritization determined?

  They felt a priority 2 was appropriate for the structural steel repairs to the legs because they felt the load posting adequately accounted for the leg condition. A priority 2 should be completed within 2 years. They did not feel repair was needed within 6 months (priority 1).

- You determined the leg frame elements were in CS4, which require a structural review. Who is responsible for conducting the structural review? Do you know if one was completed and if it was documented?

  No additional structural review was performed, aside from review of the load rating analysis. They felt the load rating adequately considered the section loss in the legs.

  Scott indicated that if a structural review/load rating were determined to be necessary, Gannett Fleming would communicate this to the prime (Larson) and Larson would coordinate with the owner to begin re-rating. If directed, Gannett Fleming would provide this review under an amendment or supplement to its contract.

  From Scott's perspective, the AASHTO MBEI structural review would be the same as the load rating analysis for this situation of the frame legs.

- During your last inspection, do you recall how the legs were accessed?

  They utilized the UBIT along the leg from the top as far as they could reach. Scott's recollection was that this was 4-5 stiffener lines from the thrust block. They accessed the thrust block from the ground. There was ~10' between what they could access in the UBIT and what they could access from the ground that were only visually inspected beyond arm's length. The legs were not FCMs per the FCM procedures and therefore did not require hands-on inspection.

- Did you have a copy of the fracture Critical Member procedures prior to this inspection? Do you feel the procedures were adequate? Did you supplement the procedures in any way?

  Yes, they had a copy. They reviewed the procedures and felt they were adequate. The procedures were not modified for this inspection.

  Scott said he was a little surprised that the legs were not FCMs. He did not feel this required escalation to have the FCM procedures revised.

Following the interview, the following additional information was provided for clarification:

Since Scott had limited experience inspecting K-Frame structures, he relied upon the FCM Identification Plan developed by CDM Smith, as permitted under Pub. 238. Additionally, Scott performed a hands-on inspection of all but 10 feet of the legs, even though they were not designated fracture critical on the FCM Identification Plan, because they were accessible through the equipment available on site.

He had not inspected other K-frames prior to this inspection. However, he had inspected numerous two girder systems and rigid frames with similar configurations.

- What cleaning methods, if any, were utilized on steel members?

  Both a wire brush and hammer were utilized. They hammered areas around thru holes, knocked off laminar corrosion, and utilized sounding to determine extent of sound section around the thru hole. A wire brush was used to clean the steel as best as possible down to base metal.

- What NDT methods, if any, were utilized on the most recent inspection?

  No NDT was utilized. They examined FB connection plate cracks visually and determined there was no propagation, so they felt NDT was not necessary. They did not utilize a d-meter because it can be difficult to get proper surface prep on uncoated weathering steel.

- Describe the procedure you used to take web section loss measurements during the most recent inspection?
  - How were these results compared to past inspections?

  Thru hole measurements were taken but their calipers were not large enough to fit around the flanges and measure the remaining web section. They focused on measuring the web thru holes (areas of 100% section loss). Scott's primary experience is with BAR7. This program does not assess 100% section loss; therefore, the average web thickness is typically used when evaluating web loss.

- The inspection report notes indicate the retrofit cables were tight and in good condition. What were the procedures utilized to inspect the cables and verify the tension?

  They went to each cable anchorage location and ensured attachment was sound. If they checked tension, it was just thru touch/hammer sounding.

- What is a Fracture Critical (FC) member?

  Scott - A member whose fracture or failure could cause collapse of the structure.

- Are you only looking for cracking on FCMs (cracking would lead to fracture)?

  Scott - No, you would be measuring section loss, reporting corrosion, reporting impact damage, as well as other distress.

- What was the scope of the 2020 interim inspection? How was the scope of interim inspection determined? (Was it via direction from Owner/PennDOT or was the Team Leader to determine appropriate scope based on Publication 238)

  A 12-month interim was required due to load posting and condition of superstructure with FCMs of a 4. The scope of the inspection included steel superstructure (frame, floorbeams, stringers). The legs are part of the superstructure, so they were included.

  The scope of an interim inspection is typically determined based on Publication 238 requirements and what is driving the posting and the condition. For example, if the superstructure is in good condition and sub is driving the low condition, the scope may just be sub. For a posted bridge the scope is typically the superstructure.

  When the bridge has FCMs, the scope will include FCM hands on inspection.

- Based on a previous interview, the rigging crew recalled hearing a loud noise at the west abutment as heavier vehicles (buses, etc.) used the bridge. Do you recall hearing that and were you able to determine the source?

  Yes, they recall that discussion. In their judgement the noise was likely caused by the deck joint.

- Did you recall seeing any overweight vehicles on the bridge during the inspection?

  They were not really able to say with any certainty. Scott did see triaxle and other trucks on the bridge but cannot say whether they were loaded or over the posting.

- In your experience as a bridge inspector in the State of PA, would you say you have seen large trucks that are likely over a bridge's posted weight utilizing a bridge during your inspections? E.g., on a 3 Ton bridge, have you seen trucks of any size using the bridge.

  Scott - Yes, this is not uncommon to see.

- Going back to the FCM inspection procedures, do you know who writes them or is responsible for them?

  CDM Smith created the FCM identification plan in 2015. Scott stated that PennDOT procedures applied to the inspection. It is not in GF's scope of work to write the plan or procedures, unless specifically asked to do so. In the case of Fern Hollow, they used the existing procedures.

- You stated you were a little surprised the legs were not FCMs, did you have a path to raise this a concern that the FCM procedures may have been incomplete or deficient?

  Since they are a subcontractor to Larson, they would have to send the inquiry through them to PennDOT and onto the City. PennDOT would have to revise inspection scope or create new work order to get the procedures revised.

- In your records research, what was the thickness of asphalt wearing surface assumed in the design of the bridge?

  Caitlin: Our latest inspection report did not indicate the thickness of the asphalt wearing surface.

  Scott: Confirmed the latest inspection report did not indicate the thickness of the asphalt wearing surface.

- In your experience, have you ever found the asphalt wearing surface thickness exceeding the thickness assumed in the design?

  Scott: We would check only if the wearing surface looked new compared to the previous inspection report.

Follow-up Questions and Responses

Following the interview, investigators sent follow-up questions to Gannett Fleming. Those questions and Gannett Fleming's responses are below.

- Is Scott still a registered professional engineer (PE) in Pennsylvania, and is Caitlin still an engineer in training (EIT) in Pennsylvania? Or, if either of these statuses have changed, what are they currently?

  Scott is still a registered PE in Pennsylvania and Caitlin is still an EIT in Pennsylvania.

- Scott stated that he had approximately 12 years of bridge inspection experience, and Caitlin stated that she had about 2 years of inspection experience. How many years of total engineering experience did each of them have (either in design and/or inspections) at the time of the 2021 inspection?

  Scott had approximately 16 years' experience as a licensed PE at the time of the inspection. He had additional experience working in the civil engineering field between obtaining his BS in Civil Engineering from Penn State University in 1999 and obtaining his Pennsylvania PE in 2005.

  Caitlin had approximately 2 years' experience as an EIT at the time of the 2021 inspection. She obtained her BS in Civil Engineering from Penn State University in 2019 and obtained her EIT that same year. Prior to that she worked as an engineering intern.

- How many inspection reports, prior to the 2021 Fern Hollow Bridge inspection, had Caitlin written?

  GF estimates that Caitlin had drafted 15 bridge inspection reports prior to the 2021 Fern Hollow Bridge inspection. The relevant inspections and the drafting of the reports were conducted under the supervision of a more experienced engineer who served as Team Lead.