

THE ELLIOT LAKE COMMISSION OF INQUIRY

**WRITTEN SUBMISSION OF JAMES CRANFORD AND
STEPHENSON ENGINEERING LTD.**

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TO: The Honourable Paul R. Belanger, Commissioner

AND TO: Commission Counsel

AND TO: All Participants

OVERVIEW

1. The failure of the Algo Centre Mall happened on Saturday, June 23, 2012 at approximately 2:18PM. Prior to this time, Stephenson Engineering Ltd. had never had reason to review the mall and therefore had no knowledge of the mall or its construction.
2. On the evening of Saturday, June 23, 2012 a message was received by Stephenson Engineering Ltd. from the Toronto HUSAR team requesting the presence of a structural engineer to aide in the response to the Algo Centre Mall collapse. Mr. James Cranford was contacted by Mr. Aron McCallum at 7:33PM and agreed to mobilize to the HUSAR rally point in Toronto. Given the urgency of the call, there was no time to prepare equipment as the team was mustering to deploy as soon as possible.
3. The responsibility of Mr. Cranford was to be the engineer embedded within the HUSAR team, and to provide to the members of HUSAR any advice or assistance as could be provided based on his qualification as a structural engineer.
4. Throughout the course of the deployment, Mr. Cranford consulted with engineers in Toronto from Stephenson Engineering and with several other engineers and rescue personnel on site in Elliot Lake as was required to carry out his responsibilities as understood at that time.
5. During the deployment Mr. Cranford was tasked to attend to various areas of the site to review conditions and provide advice to members of the HUSAR team. He was also present on many walk-throughs and on-site discussions as to ways to shore and support the structure to facilitate access of the search and rescue crews.

6. For the deployment, no specific engineering tools were available as a part of the standard HUSAR cache. The only items available were those that were brought personally or were later sourced from locations nearby to the mall.
7. Calculations were performed after discussion with the team members to provide further insight into areas of particular interest to the rescue leaders. These calculations were done to provide additional data upon which the team could base its decision making, but were not in and of themselves a determination of safety. The building had already collapsed and it was understood to be unsafe.
8. The results of any such calculations were presented to the team command in a timely manner upon completion when possible. Dissemination of information provided by Mr. Cranford to individuals not present in briefings described in the evidence was done without his knowledge and without his input.

Transcript – Day 99 – P.24966 to P.24967

9. As a member of the team in a non-command role, it was not unexpected that after providing information to the team commanders, those commanders would then discuss privately amongst themselves the best course of action to take given all of the information available to them including, but not limited to, the information provided by Mr. Cranford. If additional information or clarification was required, he was available on site and willing to assist in any way possible.
10. As of the evening of Monday, June 25, 2012, Mr. Cranford was instructed by Mr. Tony Comella that his presence was no longer required on site, and as such he was sent home to Toronto. Upon leaving Elliot Lake, several phone calls were placed between him and the site to discuss his possible return. At every opportunity, he was informed that he was still no longer required and to continue on his way home. This information was passed on to him through several channels, including independently from the OPP in Parry Sound. During this

time, Mr. Cranford indicated that should his presence have been required back at site, he was willing and able to return.

Transcript – Day 99 – P.24850 L.19 to P.24852 L.24
Transcript – Day 99 – P.24938 L.7-L.9

11. Throughout the deployment in Elliot Lake, Mr. Cranford worked diligently and in good faith to aid the rescue mission being undertaken by the HUSAR team. All recommendations given and calculations produced were based upon the best available information at the time of their completion.

NO MISCONDUCT

Request/Review Drawings

12. Any assertion that structural drawings were not requested is untrue. There were several instances where the drawings were requested, but were not provided. The first such instance occurred on the bus ride on the way up, as evidenced in Exhibit 9463. These drawings, while apparently prepared, were never received by Mr. Neadles and as such were not available for review by Mr. Cranford. Mr. Cranford also requested drawings upon arriving at site and was subsequently informed that the only drawings available were the steel erection drawings, which were used thereafter.

Exhibit 9463 – Email – Elliot Lake Roof Collapse
Transcript – Day 100 – P.25273 L.13 to L16
Transcript – Day 99 – P.24744 L.2 to L4

13. The evidence to support the presence of structural drawings on site from Chief Officer indicates he had seen on site the “York Steel Shop Drawings” which are the same drawings that were available to Mr. Cranford while he was on site. There is no reference in his testimony to the base building structural drawings. Furthermore, evidence provided by Mr. Roger Jeffreys indicates that the structural drawings were not available on site, and that he only had access to them ‘later on’. The drawings referenced by Mr. Jeffreys as available on the 24th of June, 2012 were Exhibit 9279, Page 70, which is a photograph of the steel erection drawings which were used by Mr. Cranford.

Transcript – Day 89 – P.21696 to P.21699
Transcript – Day 113 – P.28079 – P.28080

Assert Self in Presence of Other Engineers

14. The role the structural engineer was agreed to be to provide guidance to the HUSAR team command structure with respect to shoring and stabilization of the building, and to assist with any other tasks the commanders required on an as-needed basis. There is no provision within this understanding which would imply the HUSAR embedded engineer has either the duty or the responsibility to assert their authority over any other engineer or regulatory official who would also happen to be present on site. The mandate of any engineer from the Ministry of Labour would therefore be assumed to be similar to that on any other job site in the Province, where they have the power to issue orders as they see fit. It is therefore reasonable to assume that it would not be the place of the HUSAR embedded engineer to overrule the Ministry of Labour should their engineers and/or inspectors issue Orders during the deployment. Furthermore, Mr. Cranford was unaware of any Orders being placed on the building by the engineers or inspectors from the Ministry of Labour at any time throughout his deployment to Elliot Lake.

Transcript – Day 99 – P.24729- P.24732

Transcript – Day 99 – P.24944

Exhibit 7801 – Canada Task Force 3 – Toronto Heavy Urban Search and Rescue (HUSAR) – Team Position Description

Proactively Provide Advice to Team

15. Mr. Cranford was directly involved in developing many strategies for shoring and/or stabilizing the structure of the Algo Centre Mall during the course of his deployment with the HUSAR team. A summary of these strategies, as well as detailed descriptions of how each would have been carried out can be found in Exhibit 9582. Furthermore, there are many instances outlined in the transcript describing meetings between Mr. Cranford and Mr. Comella where advice was offered. An example of such an exchange can be found on page 24770.

Transcript – Day 99 – P.24770
Exhibit 9582 – Project Name: HUSAR – Elliot Lake Deployment

16. Advice was given to the HUSAR command structure, and the extent to which that advice was considered was never disclosed to Mr. Cranford. Mr. Cranford fulfilled his requirements to advise the team on the structural matters at hand and once that advice had been rendered, it was the responsibility of the HUSAR command team to use that information as they saw fit. Mr. Cranford was available to offer clarification if requested.

Transcript – Day 99 – P.24921 L.18-L.20

17. Furthermore, Mr. Cranford offered his opinion with respect to the seriousness of any movements of the escalator frame and what that would have implications on the stability of the building. He advised that a continued separation or movement of the frame would indicate a much more serious situation than a small movement followed by no additional movement. Also, prior to this discussion Mr. Cranford indicated that any movement of the escalator would be something that should be tracked.

Transcript – Day 99 – P.24954 to P.24955

Transcript – Day 99 – P.24802 L.23-L.25

Transcript – Day 99 – P.24806- P.24807

Reasonableness of the Measuring Device

18. Mr. Cranford did not offer any advice to the rescue team as to the reasonableness of the measuring device because it was installed without his knowledge and upon learning of the setup, it was determined that there was no specific problem with the method used to measure the deflections. While minor improvements could have been made, the underlying principle of the measuring device was solid, and there was no reason to doubt that it was measuring movements accurately. Additionally, this opinion was shared by Mr. Jeffreys as evidenced in his testimony.

Transcript – Day 113 – P.28218 L.13-L.25

Transcript – Day 99 – P.24802-P.24805

19. It was also not required that the device be able to measure exact deflections to the millimeter, the more critical information was whether or not the staircase continued to move. As this device was capable of measuring this condition, there were no concerns to be raised.

Transcript – Day 99 – P.24954 L.22-L.24

Miscalculation of Loads

20. As set out in paragraphs 14 and 15 herein, the base building structural drawings were not available to the team during the deployment, therefore in the absence of all relevant structural information it was required that some assumptions be made in order to complete the calculations. Furthermore, it was not possible to physically measure all of the elements in place due to the risks posed by the instability of the exact structures in question.
21. An approach to the calculations was undertaken using scenarios developed to reflect as accurately as possible standard construction methods. While it was subsequently discovered that the assumption of a topping material on the upper mall level floor was not present, it was not unreasonable to expect that this may have been present as assumed. This was a decision made after reasonable consideration had been given to the type of construction noted, and information being relayed from the search and rescue crews who had indicated that significant amounts of concrete topping were present on the hollow core precast slab elements they had encountered. It was also made in consultation with structural engineers from Stephenson Engineering Ltd. based in Toronto who are experienced in the design of buildings with such floor systems.

Transcript – Day 99 – P.24854 L.14-L.22
Exhibit 7675– SMS Messages

22. Loads were determined as accurately as possible as described above, and wherever actual dimensions were known, they were used. Where they were not

known, they were scaled from known quantities. In this manner a reasonably accurate picture was able to be produced of the length of all members under consideration, as well as the areas of loading. It was not reasonable to physically measure the exact extents of the additional loading on the floor because to do so would have involved climbing onto the unstable structures to gather the information.

Transcript – Day 99 – P.24820 L.1-L.7

Relay Advise to Single Source

23. Prior to the deployment to Elliot Lake, Mr. Cranford had attended only one training session as a part of the HUSAR team, and that was a skills training exercise and not a course in the command structure of the team.

Transcript – Day 99 – P.24722 L.9-L.19

24. Any specific information provided to a team member not in the command structure was subsequently relayed back to the command team. At no point was advice given or work completed without the knowledge of the command team.

Transcript – Day 99 – P.24775 to P.24776

25. Results of all calculations were provided to the HUSAR team leaders only, with the exception of the Ministry of Labour engineers, who requested the results of the calculations for their records and report. Any confusion of that information after it was communicated to the team leaders, and any misunderstandings that arose as to the exact figures determined as those numbers were repeated in discussions where Mr. Cranford was not present, were entirely beyond his control.

Transcript – Day 99 – P.24967 L.1-L.3

SUMMARY

26. Based on the evidence provided in the aforesaid paragraphs, there is no basis for any finding of misconduct against Mr. Cranford.

RECOMMENDATIONS

27. The HUSAR team include in its cache copies of codes/design aids to assist an engineer operating in the field. This would ensure that any engineer who deploys with the team will have access to these materials on site, regardless of the circumstances of the call out. Suggested documents would include, but not be limited to:
- Concrete Design Handbook including CSA A23.3-04 (updated as required)
 - Handbook of Steel Construction including CSA S16-09 (updated as required)
 - Wood Design Manual including CSA 086 (updated as required)
28. Training standards for the team engineer should be on par with those of the rest of the team members in that the engineer should be required to attend training yearly in a similar manner to the rest of the team members. This training should be specific to responding to a structural collapse and any and all methods available in North America to support, shore and lift compromised structures. This will ensure that the engineer is familiar with not only the basics of building design and construction, but is also familiar with the methods of the HUSAR team. In this way, the role of team engineer could be significantly enhanced by providing a much greater understanding of all of how to work within collapsed structures. Currently an engineer unfamiliar with these techniques may be unaware of tools and/or methods that may be of assistance to the team and would be relying solely on techniques used in standard construction practice.

29. During an emergency response involving a structural failure, it should be required that the municipality in which the structure is located be required by law to provide to the emergency responders any and all drawings and specifications on file. These documents should be delivered to the incident command as quickly as is possible.
30. In any situation where a structural failure has occurred and there is a request made for structural engineers to attend, all efforts should be made to include multiple team engineers. This will be beneficial especially in cases where the response will last more than 24 hours, or there are multiple areas of work. If there are not enough engineers present, requests on their time may require them to forgo sleep and perform work on different problems simultaneously. In order to reduce the possibility of errors and/or misjudgements, having multiple engineers may allow more recovery time and allow each engineer to focus on one set of information at a time.

ALL OF WHICH IS RESPECTFULLY SUBMITTED this 8th day of November, 2013.



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