



May 3, 2017

Dear Parents/Guardians,

The TDSB has now had an opportunity to review and consider ECOH's *Phase II Risk Assessment Report* dated April 21, 2017 and the *Peer Review Report* of Walters Forensic Engineering Inc. dated May 3, 2017 (copy attached as Appendix "A"). Based on the contents of these documents, the TDSB can now confirm that:

- (i) It will comply with all mitigation measures that are within its control, as outlined in the chart attached as Appendix "B"; and
- (ii) It will work with the Developer and the City to best ensure a commitment to, and compliance with, the mitigation measures that are outside its control.

The chart that is attached as Appendix "B" was prepared by the TDSB confirming its role in mitigation as well as timing for completion of the various mitigation measures that it will be undertaking. The TDSB confirms its commitment to act in good faith to address the legitimate concerns related to the development. The TDSB's primary concerns are the safety of students and staff and safety and integrity of the John Fisher school building.

By May 5, 2017, once the TDSB has had an opportunity to hear from the various stakeholders at the public meeting to be held this evening, it will confirm whether the John Fisher Junior Public School can remain operational during construction. A final decision on the location of the John Fisher French Immersion program will be made following the review of the parents' survey results.

Sincerely,

A handwritten signature in black ink that reads "Bacopoulos".

Angelos Bacopoulos
Associate Director, Facilities, Sustainability and Employee Services



PROJECT REPORT:

Preliminary Review
ECOH Risk Assessment
Hazards from Construction Project Near
John Fisher Public School, Phase II
Our File No.: 0317107

PREPARED FOR:

Angelos Bacopoulos
Associate Director
TORONTO DISTRICT SCHOOL BOARD
5050 Yonge Street
North York, Ontario
M2N 5N8

PARTICIPATING CONSULTANTS:

Fred G. Stanley, P.Eng.

Khalid S. Dinno, PhD., P.Eng.

May 3, 2017





WALTERS FORENSIC ENGINEERING INC.

May 3, 2017

Angelos Bacopoulos
Associate Director
TORONTO DISTRICT SCHOOL BOARD
5050 Yonge Street
North York, Ontario
M2N 5N8

Dear Mr. Bacopoulos:

RE: Preliminary Review
ECOH Risk Assessment
Hazards from Construction Project Near
John Fisher Public School, Phase II
Our File No.: 0317107

Walters Forensic Engineering Inc. has been retained by the TDSB to provide a peer review of the above noted ECOH report dated April 21, 2017. We have been asked to review:

1. the process followed by ECOH in developing their report,
2. whether the mitigation recommendations in the report reduce risks from the construction

This report has been developed for the public meeting of today's date. Given the short timeframe between our retainer and the meeting this report is preliminary in nature and includes a review of items 1 and 2 above.

This report has been prepared by Fred Stanley, P.Eng. and reviewed by Khalid S. Dinno, PhD., P.Eng. The report is based on a review of the following documentation:

- ECOH Phase II Risk Assessment
- KG Group Construction Management Plan (CMP) including Appendices 1-16 dated April 6, 2017
- KG Responses to ECOH Questions





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ECOH has carried out a risk assessment that generally follows methods set out in the standard CAN/CSA-Z1002-12 *Occupational health and safety-Hazard identification and elimination and risk assessment and control*. Specifically ECOH's report follows the principles that:

- Hazard and risk are not the same
- Where hazard exists there is risk
- The risk is a function of the severity of harm and the likelihood of occurrence
- Eliminating a hazard eliminates the risk
- Where there is a hazard, there should be risk controls

ECOH's hazard assessment describes the source of the hazard and how it can cause harm. Discussion of the frequency and duration of the hazards in the report is qualitative which is allowed under the standard. The next step of an analysis is normally hazard elimination. As the hazards arise from the construction process they generally cannot be eliminated and the report reflects this by concentrating on mitigating measures.

Following the hazard assessment ECOH has provided a risk assessment analysis that rates the severity of harm as required in the standard. In the report the scale is minor through catastrophic (S1-S4). The standard requires that the likelihood of occurrence of the harm be assessed. ECOH has provided a discussion for each harm they identified and an associated probability rating from very remote to likely (P0-P4). ECOH considered the mitigation measures in the constructor's CMP and the mitigation measures it recommended the TDSB carry out in its assessment of the probability of harm. This the appropriate approach.

The level of risk in the report is arrived at using a risk assessment matrix which is a common approach. A total of 21 health hazards were assessed, each for three stages of construction (demolition, excavation and above grade construction) and the finished building construction. The predominate risk condition arrived at by ECOH is low. The hazards rated medium are diesel exhaust, noise (windows open), pests, traffic, cranes, fire and explosion. As discussed below





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mitigation measures to be carried out by the TDSB include the installation of air conditioners which will eliminate the need for open windows.

Note that we will not comment on psychosocial hazards and learning hazards which would require review by suitably qualified personnel.

ECOH recommended 14 measures to mitigate risk related to the construction. Of these measures it is our understanding that the TDSB will carry out the following items listed below:

- Relocate the playground
- Replace the school windows starting at the west elevation of the school
- Install air conditioners with priority to those rooms closest to the construction
- Install a solid boundary wall at approximately the location of the wood fence for the playground currently located at the west side of the school property
- Remove friable asbestos
- Remove flaking lead paint
- Carry out air monitoring as ECOH has detailed
- Monitor for pests
- Monitor for radon
- Monitor for vibration (in addition to that work done by the constructor)

All of these measures will reduce risk.

ECOH's recommendations regarding the crane, fire safety plan at the construction site and netting are within the purview of the constructor. A fire safety plan for a project of this size is typically prepared. KG Group has stated that the crane will not travel or lift loads over the school property. They have not provided any information regarding crane operation during adverse weather conditions which would help with the assessment of crane risk.





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With respect to traffic control this is an issue for consideration by the City. The TDSB can communicate safe practice to the school community once the final traffic configuration is settled. Additional vigilance with respect to traffic is appropriate for all parties during construction.

With respect to recommendation 14 “Enforcement” the KG Group is responsible for the safe construction of the proposed high rise and has provided a CMP outlining how it intends to carry out the work safely. Elements of the CMP exceed the obligations all contractors/builders have under the provincial construction health and safety regulations. An example is the commitment to have only 8 storeys of the construction unenclosed at one time, to use safety netting and to install double height guards across the building openings. These measures are visible to the public and as such the school community can independently assess whether or not the constructor is following his CMP commitments.

Many other elements of the CMP that are protective of the school are fully or partially part of the normal construction process and so are supervised under construction site safety regulation (tower crane inspection and installation for example), under building regulation by engineering site review (shoring and building structure) and City building inspection, and under City by-laws (required vibration monitoring for example).

There are items that are part of the CMP that cannot be assessed by the public and are not captured by the usual building regulatory regime. Examples are tying down of materials so that they can't be shifted by the wind and processes and procedures such as the worker site orientation program. It is understandable that the school community would want some assurance these procedures are being followed. KG Group has provided contact information for site personnel which is appropriate for more urgent situations should they arise but some form of regular communication and information exchange is desirable so that the school community understands the measures KG Group is taking. As issues arise, as they will during a multi-year project, they can be discussed and resolved. If there was periodic site review by a third party



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that would go a long way to addressing the concerns of the school community that the CMP is being followed.

In addition I also recommend that the TDSB consider the installation of tiebacks along the east side of the excavation given the positive impact this will have on the mitigation of risks as outlined in the attached memorandum in Appendix A.

Based on our preliminary review we concur with ECOH's opinions that the risks to the John Fisher school arising from the construction cannot be eliminated but the risks can be mitigated to the reduce the hazards to a point that students and staff can attend the school during the period of construction.

This concludes our reporting.

Yours truly,



Fred G. Stanley, P.Eng.



APPENDIX A

Tieback Memorandum





WALTERS FORENSIC ENGINEERING INC.

Memorandum

To: Angelos Bacopoulos, Associate Director, TDSB
From: Fred Stanley P.Eng., Walters Forensic Engineering Inc.
Date: May 3, 2017
RE: Tiebacks on JFPS Property vs Struttred Excavation at 18-30 Erskine Ave.

As you know I spoke with Mark Gallow of KG Group and their shoring engineer, Thomas Fiali, P.Eng. of Isherwood Associates.

Isherwood Associates is a well-known and reputable shoring design firm who have worked on many large projects in the Toronto area over the last two decades.

The major differences between the shoring design and construction using tiebacks versus using struts are outlined below based on Mr. Fiali's description and the plans provided to me. Mr. Gallow provided the schedule information.

1. The struttred design requires a stiffer wall construction which requires many more, although smaller diameter piles (approx. 300 mm) along the east wall of the excavation. The struttred design shows 44 round HSS piles filled with grout along the longest stretch of the east elevation vs 15 - 1m diameter sturdier soldier piles with the tiebacks plan. Similar changes would occur at the remaining northerly portion of the east elevation and at the north elevation.
2. The struttred design requires shotcrete application to the east excavation wall face whereas the tieback design uses wood lagging. The shotcrete will require a large air compressor, a noise source, to apply the mixture. In addition, cement and aggregate will have to be stored and mixed on site for the application. These are potential sources of dust. Use of wood lagging would eliminate those issues.
3. The struttred design involves a continuous caisson wall along Erskine Ave and much of the west elevation of the excavation. Along Erskine this involves 38 overlapping





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caissons. Struts are no longer needed with the tiebacks on the east elevation and so this wall does not have to be as stiff and the design becomes wood lagging with soldier piles at 3 m o.c. over the easterly 80% of the elevation. As a result there are 24 fewer drilled shafts. This speeds up the work. In addition the face of many the caissons or soldier piles will need to be trimmed. This is usually done with a backhoe and is a source of vibration and noise. Fewer drilled shafts means less trimming and so less vibration and noise.

4. Note that a continuous caisson wall remains at the southwest corner of the excavation where the access ramp will be located.
5. Along the west elevation 21 fewer drilled shafts would be needed if struts are not required. That means the elimination of some noise and dust generating work and less spoil that has to be trucked from the site.
6. The installation of the struts requires a great deal of welding, whether the welding is done in the excavation vs at grade and in what proportion depends on the sub contractor's methods. The amount of welding is greatly reduced with the tie backs. This removes a hazard (welding radiation) and removal is preferable to the mitigation (welding screens) that KG Group has said will be used.
7. KG Group indicated that the use of tiebacks will shorten the construction period considerably. they indicated that the saving would be 2 months going down and 2-3 months building up out of the excavation. These savings are understandable given the reduced amount of drilling and the absence of the shotcrete and struts. The struts are time consuming to install and they interfere with machine access during excavation. The contractor must form and pour his structure around the struts, then eventually remove the struts. A 5 month shorter construction period is 5 months less noise, vibration, dust and construction traffic compared to the strutted plan.
8. The soldier piles along the east elevation will need to be trimmed in the tie back plan whereas no trimming of the smaller piles associated with the strutted plan would be required. As the trimming would occur during the summer according to KG's plan this is not a significant factor.



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9. The time savings would allow KG group to complete the east side of the excavation over the summer, thus reducing noise, vibration dust and other effects on the school during instructional time as compared to the strutted plan (assumes a timely start to construction).
10. In terms of the work to install tiebacks this is done with tracked diesel or gas powered drill rigs. There is some noise and dust associated with the operation but less than with additional piling required by the strutted design. The work is typically not a significant source of vibration.
11. As designed, the east elevation tiebacks will extend to within 3 m of the most westerly part of the school and it is noted that only 6 of the 14 tie backs at the longer east wall section will be opposite the west wing of the school. The upper row of tiebacks will be located more than 5 m below the school footings. As none of the tiebacks extend below the school no adverse structural impact is expected. Very minor vibration is possible. KG will carry out attended vibration monitoring at the start of tieback construction. As the tie backs would occur during the summer according to KG's plan this vibration is not a significant factor.



<i>Mitigation Recommendations</i>	<i>Property</i>	<i>Commitment Developer</i>	<i>Commitment TDSB</i>	<i>Commitment City</i>	<i>Comp. Date</i>	<i>Proposed Result</i>
<p>1. Noise mitigation measures:</p> <p>a. Plans should proceed to move the playground to the east end of the school to reduce noise exposure while staff and students are outdoors;</p> <p>b. Install double-paned windows that provide good seals and meet the expected Sound Transmission Class (STC) ratings;</p> <p>c. A boundary wall, at least 12 feet high, should be erected at the west boundary of the school. This will further reduce the noise in the classrooms, offices and play areas. In addition, it will reduce school occupants', especially children's, access to the construction site and the completed building, reduce construction workers' access to the school and help control pests</p>	School	N/A	YES	N/A	Sep/17	Compliance
	School	N/A	YES	N/A	Sep/17 (west side)	Compliance (west side)
	Either	Developer has agreed to an 8 foot hoarding wall	N/A	N/A	Sep/17	Compliance (at 8 feet)

<p>*In addition, the Peer Reviewer, Walters Forensic Engineering Inc. has recommended a further hoarding wall on the School property to provide greater set-back from the Development</p>	School	N/A	YES	N/A	Sep/17	Compliance
<p>2. Indoor Air Quality: Provide air conditioning to eliminate the need to open windows during hot weather. Opening windows will subject occupants to potentially high noise and increased dust. While unit air conditioning will help to relieve this problem, central air conditioning is a more effective solution;</p>	School	N/A	YES (window units for west side of School)	N/A	Sep/17	Compliance (west side window units)
<p>3. Asbestos: Remove all friable asbestos containing materials (ACM), preferably prior to the start of the project but certainly before the start of excavation, to eliminate the hazard of release of asbestos fibres due to vibration;</p>	School	N/A	YES	N/A	Prior to Excavation	Compliance

<p>4. Lead:</p> <p>Prior to the start of the project but certainly before the start of excavation, remove all lead-containing paint that may be flaking, otherwise deteriorating or accessible to children, to eliminate the possibility of exposure to lead by inhalation as well as by ingestion;</p>	School	N/A	YES	N/A	Prior to Excavation	Compliance
<p>5. Traffic:</p> <p>(a) Increase vigilance to ensure children are not endangered by increased traffic;</p> <p>(b) hold discussions with city officials on the advisability of designating Erskine Avenue a one-way street.</p>	All	YES	YES	YES	In place by Sep/17 and on-going	Compliance
<p>6. Crane(s):</p> <p>Address specific measures related to luffing jib tower crane safety (as discussed in section 6.2.); specify the number of cranes that might be used at a given time; ensure there is a lift plan that provides protection, especially for lifting heavy loads to great heights;</p>	Devel.	Developer to Address	N/A	City will seek to have Developer agree to include in the Construction Management Plan ("CMP")	In place by Sep/17 and on-going	Pending

<p>7. Fire Safety:</p> <p>Establish a detailed fire safety plan for the construction project (as discussed in section 6.5);</p>	Devel.	Developer to Address	N/A	City will seek to have Developer agree to include in the CMP		Pending
<p>8. Air monitoring for dust and diesel emissions:</p> <p>(a) Regularly monitor for PM2.5 in addition to PM10 during demolition, excavation and construction stages of the development, as discussed in section 3.3;</p> <p>(b) A plan for regularly monitoring for oxides of nitrogen (NOx) should be established;</p> <p>(c) Action levels should be established as discussed in sections 3.3 and 3.4, with detailed corrective measures to be taken (promptly) if action levels are exceeded</p> <p>(d) Air monitoring for PM10, PM2.5 and NOx should be conducted at JFPS as well as at the project property line</p>	Both	Developer to Address	YES	City will seek to have Developer agree to include in the CMP	In place by Sep/17 and on-going	Compliance
	Both	Developer to Address	YES	City will seek to have Developer agree to include in the CMP	In place by Sep/17 and on-going	Compliance
	Devel.	Developer to Address	TDSB will commit to report and share information	City will seek to have Developer agree to include in the CMP		Pending
	Both	Developer to Address	YES	City will seek to have Developer agree to include in the CMP	TDSB: In place by Sep/17 and on-going Develop to confirm	TDSB: Compliance Developer: Pending

<p>10. Structural integrity of the JFPS building:</p> <p>The care-taker at JFPS should be trained to look for visible signs and symptoms of structural damage and to seek professional help as appropriate</p>	School	N/A	YES	N/A	In place by Sep/17 and on-going	Compliance
<p>11. Falling Objects:</p> <p>Provide netting as required by the City of Toronto to ensure that any falling object is adequately captured; ensure that netting and other barriers and measures are adequate (e.g. in terms of strength, mesh and placement) to prevent any potential for objects to land off the construction site.</p> <p>* In addition, the Peer Reviewer, Walters Forensic Engineering Inc. has recommended a further hoarding wall on the School property to provide greater set-back from the Development which will further mitigate risks re: falling objects</p>	Devel.	YES	N/A	N/A	In place by Sep/17 and on-going	Compliance
	School	N/A	YES	N/A	Sep/17	Compliance

<p>12. Radon:</p> <p>Monitor for radon in JFPS to establish the base line radon levels, followed by regular monitoring. If there is any increase, investigate whether the cause is related to cracks in the foundations which are otherwise not discernible</p>	School	N/A	YES	N/A	In place by Sep/17 and on-going	Compliance
<p>13. Vibration:</p> <p>Monitor vibration levels at JFPS, if warranted by perceived vibration, structural damage, or vibration levels measured by the developer/constructor</p>	School	N/A	YES	N/A	In place by Sep/17 and on-going	Compliance
<p>14. Enforcement:</p> <p>The Phase II risk assessment is predicated on mitigation steps proposed by the developer as a part of the Construction Mitigation Plan (CMP) or documents and responses exchanged with ECOH. Establish a co-operative plan with the developer to ensure that risk mitigation measures are implemented as</p>	All	Developer to Address	TDSB to Address	City to Address		Pending

<p>expected, hazards are controlled, and corrective action is taken immediately if expectations are not met. The plan should include third party monitoring and procedures for resolving issues. The third party chosen must have a demonstrated perspective of all the risks identified and the sensitive populations at risk.</p>						
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