

Peer Review Comments

Peer Review subject: Rail Safety and Development Viability Assessment Report (DVA Report), by Hatch, for the Proposed Development at 6 Dawes Rd, Toronto, ON, dated Nov. 22, 2019

Final Peer Review Report: by WSP on behalf of City of Toronto, dated February 26, 2020

\* Actions:  
 1 = Will comply  
 2 = Discuss, clarification required  
 3 = Not applicable because ...

\*\* Status:  
 O = Open, not resolved  
 P = Pending because ...  
 C = Closed, implementation complete

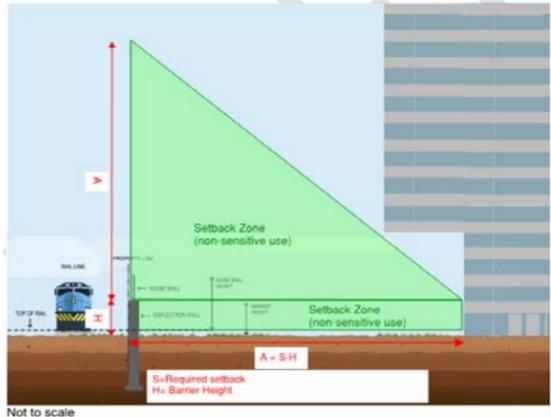
Client: City of Toronto (City)

Property Owner: 6 Dawes Road Incorporated

Peer Reviewer: WSP

Property Owner's Consultant: Hatch (Consultant)

Date of this document: June 19, 2020

Item No.	Topic	Peer Review Comment	Consultant	Response (Consultant / Property Owner)	Action 1 / 2 / 3* (Consultant / Property Owner)	Status O / P / C** (Peer Reviewer)	Status Notes by the Peer Reviewer
1	Setback distance	<p>Since the standard mitigation requirements for development adjacent to a railway corridor (30 m horizontal setback from the railway property line and an earthen berm as safety barrier) cannot be met due to site constraints, the proposed concept of utilizing a crash wall as safety barrier to allow combining horizontal and vertical setback distances is in general compliance with FCM/RAC guidelines. The necessary combined horizontal and vertical setback for residential land use is 30m per Metrolinx Guidelines, Section 5; this 30m combined setback is also noted as recommended setback for new residential developments in proximity to railway operations in FCM/RCA Guidelines, Section 3.3.1. However, the minutes of meeting with Metrolinx on July 25, 2019 provided in the Rail Safety DVA Report, Appendix C states the following:  <i>"Metrolinx confirms that they will accept the following setback requirements specifically for 6 Dawes, and that the total requirement can be achieved through the application of combined vertical and horizontal distances:</i>                      - 20m total setback requirement for community centre and recreational uses                      - 25m total setback requirement for residential units/living areas".                      The acceptance of 25m total setback was confirmed again by Metrolinx during a teleconference on June 11, 2020 and was agreed upon by The City and WSP.</p>	Hatch	<p>Hatch (12.01.2020)</p> <p>Noted. A 25m rail setback has been applied, as discussed during the call on June 11, 2020 and as interpreted by WSP's peer review team.</p> <p>The community centre has been removed and instead been replaced with a non-sensitive self-storage facility.</p>	1		
2	Setback distance	<p>Upon study of FCM/RCA and Metrolinx guidelines and Land Use Study, WSP's interpretation is that when a crash wall is utilized to combine the vertical and horizontal setback distances for achieving the required setback distance (S), the setback zone is in shape of a trapezoid consisting of a rectangular area at the bottom and a triangular area at the top. The rectangular setback zone is immediately behind the crash wall with the width equal to the height of the crash wall (H) and the length equal to the required setback minus the height of the crash wall (A=S-H). The triangular setback zone starts above the crash wall in shape of an isosceles triangle (45°-45°-90° triangle) with the legs equal to 'A'. It should be noted that the height of the vertical component of the setback distance in Figure 3 of the DVA Report (referenced from FCM/RCA Guidelines) and Figures 11 and 12 of the Final Peer Review Report (referenced from FCM/RCA Guidelines and Metrolinx Guidelines, respectively), are equal to the height of the crash wall. The height of the proposed crash wall in the DVA report is about 7 m, which demands a horizontal setback of about 18m (25m-7m=18m) from the property and behind the crash wall in the rectangular portion of the setback. The Horizontal setback for the spaces vertically higher than the crash wall decreases as the vertical setback increases. <b>The Consultant to provide plans clearly indicating the total setback at each floor of the proposed development (for both east and west blocks) specifying the vertical component of the setback and the horizontal setback to sensitive-use/high-occupancy spaces at each floor.</b> The Architectural plans only show a "line of 5m horizontal setback" at each level which is not acceptable.</p>	Hatch	<p>Hatch (07.07.2020)</p> <p>Noted.</p> <p>The architectural plans have been updated to reflect the non-sensitive use setback area recommended by WSP.</p> <p>The community centre has been removed from the development plans.</p> <p>Non-sensitive uses will be planned within the setback, following WSPs review.</p>	1		
3	Setback distance and type of space use	<p>With the current proposed development layout, most of the Community Center building will be in the setback zone. The acceptance of the reduced setback of 20m for the Community Centre (concurrent by Metrolinx per Appendix C of the DVA Report) and categorizing any of the Community Centre as a whole or any of its spaces as low-occupancy/non-sensitive use is up to the City.</p>  <p>Not to scale</p>	Hatch	<p>Hatch (09.30.2020)</p> <p>The community centre has been removed from the development.</p> <p>Typical non-sensitive uses are planned within the setback area, including parking, amenity space and building common areas.</p>	1		

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4	Setback distance	The DVA report, Section 4.3.1 indicates that the 6m Protected Space adds to the horizontal separation, increasing the total setback over 30m standard requirement, however the Protected Space is located within the railway corridor and hence cannot be included in setback calculation. <b>FCM/RAC Guidelines, Section 3.3 clearly notes that the setback distances must be measured from the mutual property line.</b>	Hatch	<b>Hatch (09.30.2020)</b> The Protected Zone identified in the original submission was not included in the setback measurement. It was identified as a long-term space that cannot be developed due to infrastructure constraints. However, reference to the Protected Space will be removed from future resubmissions.	1		
5	Track design speed	Section 2.2 of the DVA states that the allowable track speed is 80mph for passenger trains (due to Permanent Slow Orders). The passenger track design speed of 100 mph shall be used in the design of the crash walls for the proposed development as stated in minutes of the meeting with Metrolinx on July 25, 2019 and confirmed by Land Use Study, Exhibit 2-1.	Hatch / JAP	<b>Hatch (07.07.2020)</b> Noted. The crash wall design will be designed to the maximum operating speed within the rail corridor - 100mph.	1		
6	Rail Corridor Operations	The existing Metrolinx access road is located south of the Property, at the edge of the mutual property line. The developer must coordinate with Metrolinx to ensure that uninterrupted access will be provided to Metrolinx during and after construction of the proposed development.	Hatch	<b>Hatch (07.07.2020)</b> Noted. The developer is coordinating with Metrolinx to ensure the correct agreements are in place.	1		
7	Rail Corridor Operations and crash wall design	Per Appendix C of the DVA, minutes of meeting held on July 25, 2019 between Metrolinx, the Developer and the Consultant, Metrolinx requires full flexibility for future developments to its rail corridor and operations and sign-off from Metrolinx's Sponsor Office on any setback measures taken from within the rail corridor area is required. WSP recommends that the Consultant submits to Metrolinx the plans and sections of the proposed developments for review and approval to ensure that the existing and future rail corridor operations are fully considered. The expected future developments in the rail corridor are described in Section 2.2.3 of the Final Peer Review Report including the addition of a future fifth track ("Track E0" as annotated in Figure 11 of the DVA report) which would impact the crash wall load calculations.	JAP	<b>Hatch (07.07.2020)</b> A 5th track to the north of the existing rail corridor will be considered in the crash wall design - to be submitted by the structural engineer during the Site Plan Application.	1		
8	Easement	According to Architectural Drawings A211.S and A453.S, the proposed private development extends beyond the limits of the privately-owned land in the West Block. As shown in Figure 8, parts of the proposed residential towers, podiums and crash walls are within Metrolinx lands. Consequently, part of the setback area also falls within Metrolinx lands. The Consultant to confirm that the encroachment of private development into Metrolinx property is coordinated with Metrolinx and necessary property easement agreements will be in place prior to any advanced design and construction.	Hatch / Quadrangle	<b>Hatch (07.07.2020)</b> The proposed development is now entirely within the limits of the property at 6 Dawes Road. The Project Owner is working with Metrolinx to ensure the necessary property easements are in place.	1		
9	Crash wall design	It is understood that the current stage of the development is at Application for Zoning By-law Amendment and detail design of the proposed development has not started yet. It is recommended to perform the followings prior or during the design phase of the development:  a. An updated detailed survey of the site and the adjacent roadway shall be performed prior to detail design of the crash wall. It is recommended to extend the survey area to cover the full length of the development land, and the full width of the rail corridor land. This will provide a basis for crash load calculation and wall dimensioning, as well as keeping a record of the track alignments at the time of the crash wall design. This will be helpful for any future vertical or horizontal track re-alignment design and/or rail capacity improvements.  b. The structural calculations and design drawings of the crash wall shall be provided to the municipality for review. All structural drawings and calculations shall be signed and sealed by a registered professional engineer in province of Ontario.	Hatch / JAP	<b>Hatch (07.07.2020)</b> Detailed rail corridor survey provided.  The detailed drawings and all design-related documents for the crash wall will be submitted for review during the detailed design stage.	1		
10	Crash wall design	The load calculation approach presented in Appendix B of the DVA report is in general conformance with the guidelines; however, the followings need to be addressed by the Consultant:  a. The DVA Report, Appendix B, page 30 states that "The Energy Balance contained herein was carried out based on the existing and planned track configuration at Danforth GO Station, and subsequently, 6 Dawes Road."; however, the calculations on page 33 reflect only the current operating environment and not the future operating environment for potential addition of the fifth track on the north side of rail corridor. The potential future fifth track (Track E0) will decrease the distance between the crash wall and the closest track and the crash wall load calculations. It is recommended to prepare the calculations for future operating environment. As discussed during the teleconference on June 11, 2020, Metrolinx will provide directions regarding the consideration of the future fifth track in analysis and design of the crash wall.  b. Appendix B of the DVA concludes that: "the crash wall should be isolated from any primary use load bearing system, or buildings load resisting systems."; however, WSP's interpretation of the architectural layout for the crash wall as shown in Drawing A453.S, is that the proposed crash wall is part of the load bearing system of the development structure and sharing foundation with the adjacent development structure. The Consultant is to clarify this	Hatch / JAP	<b>Hatch (07.07.2020)</b>  A). The possibility of a future fifth track will be accounted for in the crash wall design  B). The crash wall is integrated into the podium but does not act as a load bearing structure. JAP to provide detailed crash wall designs subject to the review and approval of the rail operator.	1		
11	Easement	The Consultant to provide information about foundation of the proposed crash wall and clarify if the necessary steps for obtaining temporary or permanent easement agreements from Metrolinx are considered to address the encroachment of the proposed development foundations to the railway corridor.	JAP	<b>Hatch (07.07.2020)</b>  To be provided by Structural Engineer (JAP) during Site Plan Application	1		
12	Crash wall design	The height of the crash wall is noted to be 7.5 m and 7 m in various sections of the DVA, and it is not clear how the crash wall height is calculated. The Consultant to clarify the height of the proposed crash wall with respect to adjacent ground.	Hatch	<b>Hatch (07.07.2020)</b>  The height of the crash wall is 7m. Future re-submissions of the rail safety report will clarify and correct any reference to 7.5m.	1		

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13	Crash wall design	In Appendix B of the DVA Report, 0.76m wall thickness is used for Energy Balance calculations, however on page 36, the Consultant estimates that a wall thicker than 0.76 m may be needed to meet the requirement of a 2,700 kN point load applied at a height of 1.8 m. Architectural Drawing No. A201.S shows the crash wall thickness of 1.0m. The DVA does not specify the material of the proposed crash wall. The Consultant to confirm the material and thickness of the proposed crash wall according to engineering analyses and calculations	Hatch / JAP	Hatch (07.07.2020)  Noted. JAP to provide final wall thickness during detailed design stage. Hatch's recommendation was that a crash wall be required at a minimum thickness of 760mm, which corresponds with the upper limit (as it relates to wall thickness) in the AECOM Crash Wall Guidelines.	1		
14	Crash wall design	There are discrepancies between the DVA Report and Architectural drawings regarding crash wall returns; Section 4.3.2 of the DVA states that wall returns are typically 6 m long, but the actual length of the proposed crash wall returns is not noted in the DVA. Architectural Drawings show returns at both ends of both east and west crash walls with various lengths (Refer to drawing A201.S.). Figures 12 and 13 of the DVA Report also show returns at both end of both east and west crash walls. Section 4.3.2 of the DVA proposes a return for each end of each wall, except for the west end of the west wall, as the wall is being buffered by the GO Station building and the Main Street Bridge abutment. After the clarifications provided by the Consultant during teleconference of June 11, 2020 stating that the expansion of GO Station Building will provide a buffer to the development from the western edge of the proposed crash wall, WSP agrees that a return at west end of the west crash wall is not necessary. <b>The consultant to revise the DVA Report and Architectural Drawings with clear and consistent wall returns information.</b>	Hatch	Hatch (07.07.2020)  Noted. The architectural drawings and rail safety report will be updated accordingly.	1		
15	Risk assessment	The following items regarding the risk assessment presented in the DVA Report to be addressed by the Consultant:  a. The DVA Report risk assessment methodology considers two factors in assessing the risk level for each derailment scenario: frequency of risk event, and severity of the risk event, however no explanation or legend is provided about risk level classification which seems to be ranked from 1 to 5 with 5 being the most undesirable score. Also, the risk classification appears to be inconsistent, as items that are identified to have a Residual Risk Level of 5 obtained a Risk Classification of either acceptable or tolerable.  b. It is unclear why the frequency of Hazard #13, "Movement Exceeds Limits of Authority", is reduced from level 2 in Existing Conditions to level 1 in Future Conditions.  c. The DVA Report, Section 4.4, States that "In the future condition, when mitigation measures herein are applied as recommended, the risk levels of twelve (12) identified potential derailment scenarios are lowered to an acceptable level of risk that requires no further mitigation. Two (2) of the scenarios are improved by the implementation of the safety recommendations contained herein thereby reducing the total risk to the development site compared to the risk assessment of the current operating environment."; however, the risk score for three of the identified hazards (hazards No. 1, 8 and 11 of Table 3 of the DVA report), has remained the same in Future Assessed Risk of Table 5 of the DVA Report. The Consultant to clarify and/or revise the above noted statement.  d. The "acceptable level" of risk does not mean that a major event cannot occur, but rather that the likelihood of occurrence is rare. It is recommended that the developer shall seek the final concurrence of the presented acceptable risks from the City.	Hatch	Hatch (07.07.2020)  The risk assessment (in table form) has been removed from the report.  The entire report is intended as a site-specific assessment of the potential risks and mitigation measures.  *Note - Trying to predict the frequency and/or severity of train derailment or rail-related incidents is, arguably, very subjective and the results are easily manipulated/skewed. Additionally, the historical frequency of an event is not necessarily a strong indicator that the same event will happen again in the future. For this reason, it felt better to articulate the risks and site-specific conditions through the report rather than assign values to the possible severity of hypothetical events. In reality, the rail corridor is being significantly changed and modern infrastructure will improve level of safety within the rail corridor. The crash wall is designed to account for the maximum possible speed of a derailed train..  ***Hatch would be more than willing to work with the peer review teams to develop a comprehensive risk assessment process that involves both the peer reviewers and the applicants to minimize the subjective nature of the risk assessment.	3		
16	Trespassing	Trespassing mitigation measures shall be provided along the entirety of the property line between the rail corridor and the proposed development. The DVA does not specify any trespassing protection fences between the POPS and the rail corridor. As discussed during the teleconference on June 11, 2020, the Consultant will coordinate with Metrolinx regarding this matter.	Hatch	Hatch (07.07.2020)  Noted. Fencing is provided between the OPEN SPACE and the RAIL CORRIDOR.  Correspondence with Metrolinx is provided in the updated rail safety report which indicates a fence is required. A connection between the station and the OPEN SPACE is not proposed at this time.  Fencing is also planned along the southeast property boundary to limit trespassing opportunities.	1		
17	Easement	It is recommended to provide the extent and treatment of any temporary excavations on the railway property since the south edge of the proposed development structure, and specifically the crash wall, is located right on the railway corridor property line. This is of the utmost importance for the Existing GO Station Building at the west side of the north platform which shall be protected and maintained during the construction of the proposed development. It should be noted that the supplementary documents provided by the Developer to the City in support of their Zoning By-law Amendment application, included a Geotechnical Report which is not reviewed as part of this peer review is it out of WSP's scope of work.	JAP / Hatch	Hatch (07.07.2020)  The existing station will continue to operate during construction.  The structural engineer to provide details regarding the crash wall construction and any excavation and shoring requirements during the Site Plan Application.  No construction, temporary or permanent, is anticipated within the rail corridor property limits and is planned entirely within the property limits of 6 Dawes Road.	1		
18	Rail corridor operations	It is recommended to provide a Constructability Report to City for review and ensure that no adverse impact to the railway corridor infrastructure and operations will occur during and after construction.	To be determined	Hatch (07.07.2020)  Constructability Report to be submitted to City during Site Plan Application.  Any construction outside of the subject property will adhere to any and all requirements of the rail operator	1		

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19	Rail corridor operations	The existing GO Station Building on the north platform must be maintained and protected during and after construction and any plans for decommissioning/demolition of this building must be coordinated and approved by Metrolinx.	All	Hatch (07.07.2020)  The station building is planned to remain operational during the construction of the new facilities. Close coordination between Metrolinx and contractor will be maintained.	1		
20							