
RAIL CONSTRUCTION PROGRAM - MEMO

TO: QUEENSVIEW TERRACE NORTH COMMUNITY ASSOCIATION

FROM: MICHAEL MORGAN, RCP DIRECTOR

SUBJECT: CONNAUGHT NOISE ATTENUATION

DATE: OCTOBER 22, 2021

CC: COUNCILLOR KAVANAGH

INTRODUCTION

The operation of the LRT through the Pinecrest Creek corridor will affect the level of noise the community will experience. From the initial stages of the Environmental Assessment, through to the current detailed design development, noise studies have been undertaken to understand the potential impacts and mitigation requirements. Further to the recent Public Advisory Committee (PAC), discussion, this memo reviews the work previously undertaken and provides recommendations for attenuation for the neighbourhood surrounding Connaught Park.

CONFEDERATION WEST ENVIRONMENTAL ASSESSMENT

Noise impacts were assessed in the 2015 Air Quality, Noise and Vibration Impact Assessment report prepared for the project Environmental Assessment. Noise impacts were assessed according to the City of Ottawa's Environmental Noise Control Guidelines, where mitigation is investigated when future daytime noise levels exceed 60 dBA, or change more than 5 dB and exceed 55 dBA. In the Connaught Park area, the closest receptors to the rail corridor were predicted to have noise level changes greater than 5 dB, but since overall noise levels were predicted to be below the 55 dBA threshold, noise mitigation was not required.

STAGE 2 – PRELIMINARY DESIGN

Building on the EA, the City's project team developed the preliminary design for Confederation West. As part of the design development, mitigation measures were reviewed for Connaught Park. The following elements were considered during this work:

1. Pinecrest Creek and the floodplain to the east of Connaught Park was to be protected to meet federal, provincial and municipal requirements.
2. There are two existing pathway connections from Connaught Avenue to NCC's Pinecrest Creek Pathway. All community pathways are to be built to meet accessibility guidelines with a maximum of 5% slope.
3. The NCC required a maximum of 3:1 slopes for the berm to maintain the natural park setting of the corridor. 3 metres horizontal distance for every 1 metre in height. In addition, the slopes should vary, to further enhance the natural environment.
4. There are proposed and existing underground utilities, with limits to the depth of soil allowed over them.
5. Protection of the drainage improvements had previously been completed along the rear yards of the homeowners along Connaught.
6. Specific trees that were identified to be protected, either for age or as Species at Risk.
7. There were pinch points, specifically at the north side of the alignment, where the offset from the homeowners was insufficient for a berm of any height.
8. The existing sports field on the south side of the alignment.
9. The provincial requirement to provide emergency vehicle access to the alignment. This is proposed for the south side of the alignment, with access from Connaught Avenue.

Result: It was determined that berms would not be of sufficient size and height to provide effective noise mitigation of the alignment. A combination of landforms and trees were proposed to provide visual screening of the alignment and was identified as a requirement within the contract for EWC/KEV. Refer to Appendix A for Plan View.

KEV LARGE BERMS OPTION

After the award of the contract, the contractor, KEV, did explore an alternative to increase the size of the berms to accommodate fill generated from the excavation for the alignment. Due to the above constraints, the proposed berms were not continuous, could not be built to the heights needed for attenuation, and therefore did not provide meaningful noise reductions. Further, the level of impact on the parklands would be increased, causing more disturbance, closer to the residences, with increased removal of trees, and loss of the well-established open meadow.

Result: Large berms were not carried forward due to impact and lack of noise attenuation.

CURRENT STATUS

There was a commitment to both the community and through the Project Agreement, for a more detailed noise analysis. Analytical information, from the Stage 1 operations, as well as Stage 2 design, was provided for the noise analysis completed in 2021 to predict the noise levels more accurately in Connaught Park. Refer to Appendix B for details.

EWC prepared a detailed noise analysis using the US Federal Highway Association Traffic Noise Model version 2.5 to predict road traffic noise and the US Federal Transit Administration (FTA) detailed noise analysis method to predict rail noise, both implemented in CadnaA environmental noise modelling software. The updated assessment

considers the selected vehicle noise specification and includes contributions of noise from wheel squeal at curves and elevated noise levels at special trackwork (i.e. switches and crossovers) in accordance with the FTA Noise and Vibration Impact Assessment Manual. The contribution of noise from wheel squeal at curves applies to track segments with turn radii less than 1000 ft (305 m). Noise impacts in the Connaught Park area were identified to be above 5 dB at levels over 55 dBA, so noise mitigation was investigated in accordance with the City's Environmental Noise Control Guidelines. Although EWC initially deemed noise barrier walls not technically feasible in this area, the City has committed to funding and implementing discretionary noise attenuation measures to reduce impacts to the community.

The City also commissioned SLR Consulting to undertake an independent noise analysis, which was prepared using the Nord2000 train noise prediction algorithm implemented using SoundPLAN version 8.2 environmental noise modelling software. The predicted LRT noise levels at the detailed design representative receptor locations in the Connaught Park area were similar, but slightly lower than EWC's predicted levels.

Result: The study report identified the requirement for noise mitigation investigation to meet provincial and City standards. As it had been previously determined that the use of berms for attenuation was not adequate, other methods for noise attenuation were reviewed.

ENGINEERED ELEMENTS

Upon confirming the requirement for the additional noise attenuation, engineering alternatives to provide the attenuation were considered, and three elements identified:

1. Noise Barrier Wall

This will be visible from community and the park, replacing the currently proposed 1.8 m high chain link fence. The walls will commence at the limit of the bridge over Pinecrest Creek, and encompass both sides of the alignment, including over the portal. The detailed design for the wall is currently underway, with projected heights anticipated to be up to 5 metres in some locations. After the detailed design is complete, this information on the final wall heights will be provided.

2. Absorptive Panels

These panels will be utilized on the inside of the alignment, as the rail line goes below grade to assist in reducing the build-up of sound reflections within the relatively narrow cut section by absorbing a significant amount of the sound energy upon contact.

3. Rail Dampers

Rail dampers will absorb the energy of the rail, reducing the noise of the interaction between the rail and the wheels. This element will start on the east side of the alignment bridge and extend to the tunnel portal.

CURRENT LANDSCAPE DESIGN

In addition to the noise attenuation walls encircling the alignment, from the limit of the bridge abutment at Pinecrest Creek to the tunnel portal, there will be the initially identified visual screening. The contract development is on-going, and EWC will be meeting the commitments for the visual screening.

1. Landforms

Landforms, with an approximate height of 3 m (10') are located to provide visual screening of the alignment, within the constraints identified above. As per the NCC criteria, the maximum slope will be 3:1, with some variation to create a naturalized landscape.

2. Planting

To compliment the park setting, a blend of conifers and deciduous trees have been selected. There is a diverse range of species, native, wherever possible, or disease hardy cultivars, such as the elm tree. Where the alignment is below grade, the final landscape for the park will be an open meadow, the MUP connections from Connaught Avenue to the Pinecrest Creek Pathway. Trees will not be permitted over the alignment due to the weight restrictions for the tunnel roof, as well as the depth of soil required to for the tree roots.

As discussed in the PAC, additional trees have been requested to assist in the visual screening. There is opportunity to complete this, and the City will work with the community, the NCC and EWC to ensure there is sufficient trees to screen the alignment as much as possible. Additional species, such as fruit trees will be integrated in as well.

ADDITIONAL DISCUSSION

With the implementation of a continuous noise wall from the bridge to the portal, the following community input is requested by November 19, 2021:

1. Noise attenuation Wall Finish

The proposed noise wall is a durable concrete wall. There are different colours for the wall, natural concrete colour, or a light beige, and different textures, from a flat panel, to ones with more natural cut stone finish.

2. Vines

The addition of vines at the base of the wall will allow the vines to climb the wall and provide a softer green appearance to the wall. This will also reduce the appeal of tagging or spraying graffiti on the wall, which would detract from the overall park quality.

3. Wall Murals

Wall murals, or graffiti walls, are growing in popularity within the City. These walls are currently being developed outside of the City's Public Art Program, and therefore the LRT program, rather they are community based and funded. This may require NCC approval, an annual refresh and maintenance during the year to ensure the piece(s) would be in good repair and not vandalized. An installation could be developed, after the completion of the LRT alignment, should there be sufficient community support.

ATTACHMENTS:

1. Draft EWC Noise Report for Connaught Park
2. SLR Noise contour map: 16hr average without mitigation measures
*Noise contour map with mitigation measures will be sent to the PAC in the coming weeks
3. Rail Damper Assessment (2020)