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RE: BROADWAY & COMMERCIAL, VANCOUVER ENVIRONMENTAL IMPACT ASSESSMENT UPDATE

Westbank Corp. (Westbank) proposes redevelopment of the existing Safeway site at 1780 East Broadway, Vancouver, British Columbia (BC) (the Property) as mixed commercial and residential space (the Project). The proposed development will include construction of two ramps (one for Safeway loading, the second for commercial parking and loading) connecting the northeast corner of the Property to the Broadway bridge, crossing over a portion of the Grandview Cut.

This correspondence comprises an updated version of the Environmental Impact Assessment[1] previously completed by Envirowest Consultants Inc. (Envirowest) for construction and long-term operation of the proposed ramps, in accordance with the information requirements of the City of Vancouver (City). The updated Environmental Impact Assessment comprises a biophysical inventory of the proposed ramp location (assessment area) as well as discussion of the larger-scale environmental and City planning context, anticipated environmental impacts of ramp construction and operation, and proposed options for mitigation of these impacts.

The location of the proposed ramps (biophysical inventory assessment area) is presented in Attachment A. Details of the proposed ramp footprint are presented in Attachment B. Representative site photographs are presented in Attachment C. A drawing from the solar study for the Project is included as Attachment D.

SITE DESCRIPTION

The Property is legally described as Lot 1 Block 162 Plan VAP20377 District Lot 264A NWD Except Plan EPP35255; its PID is 006-634-851. It is bounded to the north by East Broadway, to the south by East 10th Avenue, to the west by the Commercial-Broadway SkyTrain Station, to the east by a multi-unit residential property, and to the northeast by the Grandview Cut (the Cut), a historically excavated artificial ravine comprising City-owned land that traverses approximately 1.9 kilometres of East Vancouver on a northwest-to-southeast alignment between the False Creek Flats and west of Slocan Street. Land uses surrounding the Property are residential and commercial. An active rail line is located within the rail right-of-way along the bottom of the Cut adjacent to the Property, and a portion of the Millennium Line SkyTrain route is aligned north of the rail tracks.

[1] **Fairhurst, E., and I. Whyte. 2019.** East Broadway and Commercial Drive, Vancouver – Environmental Impact Assessment. January 23, 2019 letter report. *Prepared by:* Envirowest Consultants Inc., Port Coquitlam, BC. *Prepared for:* Westbank Projects Corp., Vancouver, BC. 7 pp. + attachments.

The proposed ramp location extends from the northeast edge of the Property, north across the Grandview Cut to the Broadway bridge, which crosses the Cut in an east-west direction. The assessment area for the biophysical inventory (Attachment A) comprises the triangular portion of the Cut (measuring approximately 50 metres (m) east to west, and approximately 30 m north to south) within and around the proposed ramp footprint. It is bounded to the north by the Broadway bridge, to the southwest by the Property and a portion of the adjacent lot to the east, and to the east by other vegetated areas of the Grandview Cut.

The assessment area is characterized by a steep, vegetated, northeast-facing slope over most of its extent, with a vertical embankment of bare earth at the top of the slope adjacent the existing Safeway parking lot. The horizontal width of the vegetated slope, measured from the edge of the rail right-of-way to the edge of the Property, is approximately 23 m, and the vertical gain within this area at the proposed ramp location is approximately 16-17 m (Attachment B).

The slope continues down into the rail right-of-way before flattening out surrounding the tracks. The columns and deflection wall of Pier 1 of the Broadway bridge are aligned immediately upslope of and parallel to the rail right-of-way, under the bridge immediately north of the proposed ramp location (Attachment B).

BASELINE ENVIRONMENTAL CONDITIONS AND CITYWIDE CONTEXT

Assessment Methods

Envirowest conducted a biophysical inventory of existing environmental conditions within the assessment area on December 19, 2018 between 1145 hours and 1430 hours. The assessment was conducted on foot in the presence of safety personnel designated by the rail operator. Weather conditions at the time of the assessment were 9 degrees Celsius with a light breeze, alternating between overcast and light rain.

Vegetation, wildlife use, and hydrological conditions were described in the field. As deciduous trees and shrubs had shed their leaves prior to the assessment, description of the plant community was supplemented using preliminary photographs of the assessment area taken by Envirowest from street level on September 12, 2018 between 0900 hours and 0930 hours. Areas within approximately 30 m of the designated assessment area were also assessed during the site visit.

Due to prevailing conditions encountered during the assessment (i.e. time of year, precipitation, and frequent disruption by train activity), characterization of anticipated wildlife use of the assessment area is based primarily upon the author's observations of general wildlife activity within the surrounding neighbourhood and SkyTrain corridor within recent years, outside the time of the site visit. This is supplemented by wildlife observations made during the assessment itself.

The regional context of the Project location was also considered. Environmental values extending beyond the immediate assessment area were identified through review of green spaces and potential wildlife habitat in the surrounding landscape using air photos and the City's mapping application.[2] Existing and emerging City plans and strategies (including those produced by the Vancouver Park Board) were also

[2] **City of Vancouver. 2021.** VanMap Viewer. https://maps.vancouver.ca/vanmap-viewer/ (09/13/2021)

reviewed to determine City-identified environmental values associated with the project location and surrounding region, and potential for larger-scale impacts beyond the immediate assessment area.

The findings of the above processes were cross-referenced against existing and emerging City documents to determine points of intersection between the ramp design and the City's environmental goals. Relevant provincial and federal best management practices (BMPs) were also identified for application to ramp design and construction. Design and mitigation actions to comply with City and other BMPs are described in this report.

City and Park Board materials reviewed during the assessment process include:

- Vancouver Greenways Plan (1995[3]);
- Greenest City 2020 Action Plan (2012,[4] 2015[5]);
- Transportation 2040 (2012[6]);
- Urban Forest Strategy (2014[7]) and 2018 Update (2018[8]);
- Vancouver Bird Strategy (2015[9]);
- Biodiversity Strategy (2016[10]);
- Grandview-Woodland Community Plan (2016[11]);
- Citywide Integrated Rainwater Management Plan (2016[12]);
- VanPlay (Vancouver's Parks and Recreation Services Master Plan) Reports 1 (2018a[13]), 2 (2018b[14]), 3 (2019a[15]), and 4 (2019b[16]);
- Climate Change Adaptation Strategy 2018 Update and Action Plan (2019[17]);
- Rain City Strategy (2019[18]);
- Climate Emergency Action Plan (2020[19]);

[3] **City of Vancouver. 1995.** Vancouver Greenways Plan. Vancouver, BC. 59 pp.
[4] **City of Vancouver. 2012.** Greenest City 2020 Action Plan. Vancouver, BC. 77 pp.
[5] **City of Vancouver. 2012.** Greenest City 2020 Action Plan. Part Two: 2015-2020. Vancouver, BC. 89 pp.
[6] **City of Vancouver. 2012.** Transportation 2040. Vancouver, BC. 84 pp. + appendix.
[7] **City of Vancouver. 2014.** Urban Forest Strategy presentation to Council (April 16, 2014). Vancouver, BC. 59 pp.
[8] **City of Vancouver and Vancouver Park Board. 2018.** Urban Forest Strategy: 2018 Update. Vancouver, BC. 60 pp.
[9] **Vancouver Bird Advisory Committee. 2015.** Vancouver Bird Strategy. City of Vancouver. Vancouver, BC. iv + 33 pp.
[10] **Vancouver Board of Parks and Recreation. 2016.** Biodiversity Strategy. Vancouver, BC. 53 pp.
[11] **City of Vancouver. 2016.** Grandview-Woodland Community Plan. Vancouver, BC. 266 pp.
[12] **City of Vancouver. 2016.** Citywide Integrated Rainwater Management Plan. Vancouver, BC. 2 volumes, v + 69 pp. and iii + 43 pp.
[13] **Vancouver Board of Parks and Recreation. 2018a.** VanPlay. Report 1. Inventory and Analysis. Vancouver, BC. xiii + 175 pp.
[14] **Vancouver Board of Parks and Recreation. 2018b.** VanPlay. Report 2. 10 Goals to Shape the Next 25 Years. Vancouver, BC. v + 24 pp.
[15] **Vancouver Board of Parks and Recreation. 2019a.** VanPlay. Report 3. Strategic Bold Moves. Vancouver, BC. xv + 113 pp.
[16] **Vancouver Board of Parks and Recreation. 2019b.** VanPlay. Report 4. The Playbook. Vancouver, BC. 48 pp.
[17] **City of Vancouver. 2019.** Climate Change Adaptation Strategy: 2018 Update and Action Plan. Vancouver, BC. 60 pp.
[18] **City of Vancouver. 2019.** Rain City Strategy: A green rainwater infrastructure and rainwater management initiative. Vancouver, BC. 150 pp.
[19] **City of Vancouver. 2020.** Climate Emergency Action Plan. Vancouver, BC. 72 pp. + appendices.

- Vancouver Plan Phase 1 (2020[20]) and 2 (2021[21]) reports; and
- Green Operations Plan (2020) presentation to Vancouver Park Board (January 18, 2021).[22]

Assessment Results

Vegetation Community

Citywide Context

This section addresses the vegetation community in the assessment area and Grandview Cut, and discusses it in the context of green spaces and the urban canopy generally. Discussion of the function of green spaces as wildlife habitat specifically can be found in the 'Wildlife and Habitat' section of the assessment results, below.

The Project location is located within the Commercial-Broadway Station Precinct of the Grandview-Woodland neighbourhood.[11] Per VanPlay, Grandview-Woodland (along with Fairview) had the lowest areal cover of neighbourhood parkland per capita of any neighbourhood in Vancouver as of 2011.[13] Per the Park Board's Urban Forest Strategy, Grandview-Woodland also had 13.6% tree canopy cover by area in 2013, compared to 18% for Vancouver overall.[7] Citywide canopy cover has fluctuated from 20% in 1995 to 18% in 2013 to 19% in 2015.[8]

The Grandview Cut has been identified as a priority green space for Vancouver for over 25 years. The Central Valley Trail (now the Central Valley Greenway) running alongside the north side of the Cut was identified in 1995 as a potential greenway by the Vancouver Greenways Plan.[3] The Greenways Plan defined greenways as linear public corridors for pedestrians and cyclists, connecting urban features such as parks and nature reserves (among others), often along natural corridors or rail rights-of-way. Public consultations on citywide greenway development at that time identified nature restoration and habitat creation as priorities for greenway functions.[3]

Prior to publication of the Greenways Plan, the municipal property making up the sides of the Cut was designated by Council as a Greater Vancouver Regional District (GVRD) Green Zone,[3] which was then included in the GVRD's Livable Region Strategic Plan.[23] Two of the four land types making up the Green Zone could be considered to apply to the Cut: ecologically important lands (including forests and wildlife habitat, among others), and outdoor recreation and scenic lands (including major parks and recreation areas).[23]

More recently, wooded parts of the Grandview Cut, including the proposed ramp location, were identified by the Park Board's Biodiversity Strategy[10] as priority habitat (forest) for protection and restoration as part of the city's overall ecological network. Specific locations of priority forest habitat in the Cut are located on its northeast- to north-facing slope (south of the rail tracks) from Clark Drive to west of Slocan

[20] **City of Vancouver. 2020.** Vancouver Plan Phase 1 Report: Public Engagement Summary, Provisional Goals and Update on COVID-19 Community Recovery Actions. September 24, 2020 report to Vancouver City Council. 29 pp. + appendices.
[21] **City of Vancouver. 2021.** Vancouver Plan Update and Quick Start Actions. July 21, 2021 report to Standing Committee on City Finance and Services. 16 pp. + appendices.
[22] **City of Vancouver. 2021.** Green Operations Plan: Leading by example in the climate emergency. January 18, 2021 presentation to Vancouver Park Board. https://parkboardmeetings.vancouver.ca/2021/20210118/ (09/10/2021)
[23] **Greater Vancouver Regional District. 1996.** Livable Region Strategic Plan. 32 pp.

Street (interrupted by the Woodland Drive crossing), and on its southwest- to south-facing slope (north of the rail tracks) from Vernon Drive to Commercial Drive (interrupted by the Woodland Drive crossing). Meadow, another priority habitat in the Biodiversity Strategy, is identified contiguous with and adjacent to the forest at either end of the Cut.[10]

The Grandview Cut is located within 500 m of several other parks and areas containing priority habitats identified by the Biodiversity Strategy, including: John Hendry Park (Trout Lake, containing forest and wetland priority habitats), Beaconsfield Park (forest), Still Creek (stream), Cedar Cottage Park (forest), China Creek South Park (forest), China Creek North Park (forest), Alice Townley Park (forest), McSpadden Park (forest), an unnamed park (meadow), two unnamed fragments (each containing meadow and forest), and an unnamed fragment (meadow).[10]

Wooded parts of the Cut are not specifically identified by the Biodiversity Strategy as biodiversity hotspots (i.e., natural areas supporting noteworthy components of biodiversity in Vancouver, such as regionally rare ecosystems, or species or ecological communities at risk). Biodiversity hotspots identified by the Biodiversity Strategy within 500 m of the Grandview Cut include Trout Lake and the western reaches of Still Creek.[10]

Increasing the quantity, quality, and resilience of green spaces in Vancouver is a goal of the Greenest City Action Plan,[4,5] Transportation 2040,[6] Urban Forest Strategy,[7,8] Biodiversity Strategy,[10] Grandview-Woodland Community Plan,[11] VanPlay,[14,15,16] Climate Change Adaptation Strategy,[17] Green Operations Plan,[22] and preliminary materials on the Vancouver Plan,[20,21] among others. This includes:

- increasing residents' access to green spaces;[4,5,11,15,16]
- preserving and restoring native vegetation and natural areas;[6,7,8, 10,11,15,16]
- increasing the number of street and other trees,[6,7,8,11,14,17] with an emphasis on areas with below-average urban forest cover or where vulnerable populations are at risk from urban heat;[8]
- protecting the urban forest during development;[7,8,10]
- increasing connectivity between green areas (i.e. corridors), thereby fostering biodiversity at a larger scale;[10,11,15,16, 20,21]
- making parks flexible enough for future changes in community needs;[14]
- protecting solar access to green spaces;[14]
- increasing resiliency to climate change,[6] including replacing park and green-area vegetation and street trees with more drought- and heat-tolerant species;[8,14]
- managing invasive species in parks[8,16,22] due to the negative impact of invasive species on biodiversity;[10] and
- increasing the proportion of naturalized areas and variety of ecosystems in parks,[15] including a Green Operations Plan target of having 40% of City-owned land provide "healthy habitat," i.e. naturally managed areas in an urban context, by 2030, and establishing limited-access park areas for natural vegetation restoration or urban wildlife habitat without human impact or disturbance.[22]

Further, Big Move 6 of the Climate Emergency Action Plan[19] identifies restoration of forests in Vancouver as a priority action for removal of carbon pollution from the atmosphere. Reforestation, improved forest management, and forest protection are all identified as activities promoting carbon sequestration.[19]

On a site-specific level, the Grandview-Woodland Community Plan[11] includes two habitat and biodiversity policies relevant to the proposed ramp location:

- Policy 9.6.1: "Preserve significant greenspace corridors and other habitat assets in the neighbourhood including Grandview Cut, neighbourhood parks, and urban forest assets (e.g. street trees)."
- Policy 9.6.2: "Seek opportunities to enhance or restore natural habitat and biodiversity, as part of future open space acquisition, expansion, or upgrade activities," including (among others) enhancing the urban forest canopy.

Plant Community Description

Canopy cover within the assessment area is predominated by native tree species, whereas shrubs and ground cover are predominated by invasive or non-invasive introduced species (Attachment C). The underlying soil is hard-packed mineral soil, with a shallow layer of leaf litter. Downed wood is limited to twigs, branches, and occasional trunks of red alder. Patches of exposed soil and large quantities of garbage occur throughout the area. Vegetation growth and vigour is likely limited by the relatively short duration of sun exposure experienced by the site due to topography, aspect, and (for areas immediately north of the assessment area) shading by the Broadway bridge.

The assessment area is characterized by a canopy of deciduous trees, averaging between 10 and 20 centimetres in diameter at breast height. Trees on the slope within and immediately surrounding area are predominantly red alder (*Alnus rubra*), with minor amounts of black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), bigleaf maple (*Acer macrophyllum*), black locust (*Robinia pseudoacacia*), Norway maple (*Acer platanoides*), and flowering cherry (*Prunus* sp.). Trees located at the top of the slope include Douglas maple (*Acer glabrum*) and horse chestnut (*Aesculus hippocastanum*). Of these species, all are native to British Columbia except black locust, Norway maple, flowering cherry and horse chestnut.

The shrub layer within the assessment area is established but not vigorous, and is predominated by invasive Himalayan blackberry (*Rubus armeniacus*) with a moderate amount of salmonberry (*Rubus spectabilis*). Species comprising a small proportion of the shrub assemblage include native hardhack (*Spiraea douglasii* var. *douglasii*), red elderberry (*Sambucus racemosa*), and red-osier dogwood (*Cornus stolonifera*), and invasive spurge-laurel (*Daphne laureola*). Other native shrub species identified in nearby areas, which may also occur within the assessment area, include vine maple (*Acer circinatum*; identified on the slope east of the assessment area) and trailing blackberry (*Rubus ursinus*; identified under the Broadway bridge). Additional introduced shrub species identified nearby on the slope include European mountain-ash (*Sorbus aucuparia*) and butterfly-bush (*Buddleja davidii*).

Low-lying ground cover identifiable during the December 2018 assessment is predominated by vines, including invasive English ivy (*Hedera helix*) and other introduced vines including bindweed (family Convolvulaceae; likely hedge false bindweed, *Calystegia sepium* ssp. *sepium*) and European bittersweet (*Solanum dulcamara* var. *dulcamara*), the latter of which occurs in comparatively minor amounts. Native ground cover species include sword fern (*Polystichum munitum*) on the slope, common horsetail (*Equisetum arvense*) at the base of the slope, and patches of mosses (families Polytrichaceae and Brachytheciaceae) on soil and the bases of some trees throughout. A small patch of invasive knotweed, either Japanese knotweed (*Reynoutria japonica* var. *japonica*) or Bohemian knotweed (*Reynoutria* x *bohemica*), was identified on the slope during examination of site photographs taken in September 2018.

Comprehensive identification of herbaceous and/or annual species in the assessment area was not possible due to the time of year during which the assessment occurred, however several introduced species were identified around the periphery of the assessment area. Creeping buttercup (*Ranunculus repens*) and Robert's geranium (*Geranium robertianum*) occur at the base of the slope adjacent the nearest railway ditch. Wall-lettuce (*Mycelis muralis*) and nipplewort (*Lapsana communis*) occur beneath the Broadway bridge.

Aquatic plant species within the adjacent railway ditches, outside the defined assessment area, were identified as well. Aquatic species detectable during the December assessment included native Pacific water-parsley (*Oenanthe sarmentosa*) and introduced pond water-starwort (*Callitriche stagnalis*) and common watercress (*Nasturtium officinale*), all of which were detected only within the north ditch, across the railway tracks from the assessment area. Sedges (family Cyperaceae), rushes (*Juncus* sp.), and grasses (family Poaceae) occur in areas surrounding the train tracks and ditches.

Tree Survey

Twenty-one trees with diameters at breast height of 20 centimetres (cm) or greater are identified by the arborist's report[24] for removal from the Cut in association with ramp construction; these are to be removed along with shrubs and herbaceous vegetation during construction (see 'Proposed Works' below). All 21 trees are described by the arborist's report as young relative to their normal urban lifespan, and of low value as determined by "contribution, location and purpose in the landscape and other factors."[24] Trees are described by the arborist's report as follows.

Sixteen red alders are identified for removal within the Cut. Mean diameter at breast height is 22 cm (range 20 to 35 cm). Condition of these trees is summarized as very poor (9 trees), poor (3 trees), or fair (4 trees). Of the 16 alders, four are described as fully dead, with two of these four having decayed stems and one having a decaying stem; a fifth alder with multiple stems is described as having one dead and decaying stem, and three other alders are described as showing cankering.[24]

Two black cottonwoods are identified for removal within the Cut. The diameter at breast height for both trees is 30 cm. Condition of these trees is summarized as fair.[24]

Two black locusts are identified for removal within the Cut. Diameter at breast height is 20 and 30 cm, respectively. Condition of these trees is summarized as fair. One of these is described as showing cankering.[24]

One flowering cherry is identified for removal within the Cut. Diameter at breast height is 32 cm. Condition is summarized as fair.[24]

Invasive Species

As described under 'Plant Community Description,' above, invasive and other introduced species predominate the shrub and herbaceous plant layers within the assessment area and form a portion of the tree canopy.

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[24] **McMahon, N. 2019.** Proposed Re-Development – 1780 East Broadway, Vancouver – Tree Management Report for Development Application Purposes. Revision 1. July 25, 2019 letter report. *Prepared by:* Arbortech Consulting, Richmond, BC. *Prepared for:* Westbank Projects Corp., Vancouver, BC.

Knotweed (*Reynoutria* sp.), detected in the assessment area, is an invasive species identified in the Weed Control Regulation of the provincial *Weed Control Act*.

Species identified in or adjacent to the assessment area, that are identified as invasive by the Invasive Species Council of BC[25] but are not listed by the provincial *Weed Control Act*, include: Himalayan blackberry, butterfly-bush, spurge-laurel, and English ivy. Himalayan blackberry is the predominant shrub species in the assessment area and surrounding slope of the Grandview Cut.

Plant Species and Communities at Risk

Plant species or communities listed on the British Columbia Conservation Data Centre's Blue or Red lists, or species designated Endangered, Threatened, or Special Concern by Schedule 1 of the Canada *Species at Risk Act*, were not detected during the assessment, however protected plant species would not be expected to be detectable in December. Plant species and communities-at-risk are expected to have a very low probability of occurrence within the Grandview Cut due to its poor soil conditions, high degree of shading, prevalence of invasive species, and setting within a heavily urban context.

Wildlife and Habitat

Citywide Context

City goals relating to green spaces generally, which comprise the habitat of urban wildlife, are discussed in the 'Vegetation Community' section, above. Wildlife-specific goals, initiatives and issues are discussed in this section.

Report 1 of VanPlay,[13] citing the Biodiversity Strategy,[10] identifies the Grandview Cut as part of a potential wildlife corridor. This corridor begins at Burnaby's Montrose Park on Burrard Inlet, passes south beside the Trans-Canada Highway and through Rupert Park to Still Creek, then continues west along the Central Valley Greenway and Grandview Cut, through the north portion of the False Creek Flats, into and along the north side of False Creek, and onwards to Stanley Park. It connects directly to other identified potential wildlife corridors connecting Still Creek to Killarney via Renfrew Ravine; John Hendry Park to Queen Elizabeth Park; the Burrard Street Bridge to the University Endowment Lands via the English Bay shoreline; and the Burrard Street Bridge to Queen Elizabeth Park via the Arbutus Greenway. Additional network connections link these locations to the Southlands, the Langara Golf Course, and Burnaby's Central Park.[13]

Report 2 of VanPlay[14] provides further description of the anticipated function of potential wildlife corridors. Goal 6 of this report indicates that "pathways for the movement of urban wildlife" are one of the anticipated functions of a proposed green network of pedestrian paths, bike routes and green corridors to connect Vancouver's parks, waterfronts and recreation areas.

Initiative N.3.5 in Report 4 of VanPlay (2019b)[16] indicates the Park Board's goal to "[i]dentify locations for habitat corridors based on urban wildlife movement, bird flyways, biodiversity hotspots, hidden streams and green infrastructure gaps."

[25] **Invasive Species Council of BC. 2021.** https://bcinvasives.ca/ (09/13/2021)

Birds

Five bird species were observed directly in the assessment area or surrounding parts of the Grandview Cut during the December assessment: northwestern crow (*Corvus caurinus*), Anna's hummingbird (*Calypte anna*), black-capped chickadee (*Poecile atricapillus*), house sparrow (*Passer domesticus*), and rock pigeon (*Columba livia*). Glaucous-winged gull (*Larus glaucescens*) was observed flying overhead but was not observed in the assessment area. Of these species, all are native to British Columbia except house sparrow and rock pigeon.

In addition to those observed in December, bird species considered most likely to occur within the assessment area include urban generalists such as the invasive European starling (*Sturnus vulgaris*) and the native northern flicker (*Colaptes auratus*), downy woodpecker (*Dryobates pubescens*), American robin (*Turdus migratorius*), white-crowned sparrow (*Zonotrichia leucophrys*), song sparrow (*Melospiza melodia*), spotted towhee (*Pipilo maculatus*), dark-eyed junco (*Junco hyemalis*), bushtit (*Psaltriparus minimus*), and house finch (*Haemorhous mexicanus*).

Old bird nests were not detected in shrubs or trees within the assessment area. Should nesting occur in the area, it is most likely to be by species nesting low to the ground (e.g. song sparrow, white-crowned sparrow, spotted towhee, or dark-eyed junco); by those nesting in, on or under pieces of urban infrastructure such as light standards or overpasses (e.g. European starling, house finch, or rock pigeon); by urban-tolerant tree nesters (e.g. American robin); or by tree cavity nesters (e.g. northern flicker, downy woodpecker, or black-capped chickadee). Bird nesting within the assessment area is, however, considered likely to be minimal due to: low density, age, structural complexity and biodiversity of trees and other vegetation; shading by the side of the Grandview Cut; the steep slope; and frequent disturbance by passing trains and SkyTrains. Superior quality habitat for bird nesting occurs within the surrounding neighbourhood, including in vegetation along the Central Valley Greenway directly north of the Cut, and in backyards, street trees, and parks such as John Hendry Park.

Bird use of the assessment area and surrounding areas of the Grandview Cut is expected to be limited primarily to foraging and roosting, and as a movement corridor. Use of the Grandview Cut as a movement corridor for birds, particularly while foraging, is considered likely, as the Cut provides green space undisturbed by pedestrians for movement from the False Creek Flats to Slocan Street, and a close connection via street trees and private property gardens to parks and other green spaces in the surrounding area and beyond, including Still Creek.

Mammals

Mammals were not observed directly during the assessment, but evidence of raccoon (*Procyon lotor*) activity was detected in the form of a print in the dirt bank adjacent the southern railway ditch, beneath the Broadway bridge.

Terrestrial, non-flying mammals previously observed by the author in the surrounding neighbourhood and considered likely to access the Grandview Cut given adequate access points include native urban generalists such as raccoon, coyote (*Canis latrans*), and striped skunk (*Mephitis mephitis*), and introduced urban generalists such as brown rat (*Rattus norvegicus*), the invasive eastern grey squirrel (*Sciurus carolinensis*), and domestic cat (*Felis catus*). Use of the assessment area by terrestrial, non-flying mammals is expected to be limited to use of the Grandview Cut as a movement corridor, a source of water (via the ditches), a source of opportunistic foraging on refuse dumped from the Broadway bridge, and a

hunting location. Native bat species (order Chiroptera) may also forage in the vicinity of the assessment area, but are not anticipated to use the site for roosting or breeding.

Use of the Grandview Cut as a movement corridor by native mammals including coyote, raccoon and skunk is expected to be concentrated at access points from surrounding areas (e.g. gaps in fences and at bridge footings for coyote and skunk, and at these locations and scalable barriers and vegetated borders for raccoon) and along the rail tracks. On a landscape scale, the Cut is expected to serve as a movement corridor between areas along the Cut from its west end at the False Creek Flats to its east end near Slocan Street, at which point it connects to green areas along the rail tracks further east and thereafter to Still Creek. Vegetated areas along the Central Valley Greenway, running directly north of the Cut, provide further cover for nocturnal and crepuscular movements by these species, and are considered likely to also serve as a movement corridor.

Reptiles and Amphibians

Neither reptiles nor amphibians were detected during the assessment and native species of either are not anticipated to occur in the assessment area. Although water is at least seasonally present in the railway ditches, other habitat requirements (e.g. cover such as large woody debris for amphibians; sunning spots for reptiles) are not met on site and habitat conditions are marginal at best for these taxa.

Fish

The Environmental Assessment Report prepared for the Rapid Transit Project 2000 (i.e. SkyTrain Millennium Line)[26] indicates that juvenile threespine stickleback (*Gasterosteus aculeatus*) were detected in the southern railway ditch below the Victoria Drive bridge in November 1998, and that juvenile stickleback were also detected in a small pool below the same overpass. The report speculates that the fish were flushed into the Cut from a connected storm drain outlet during a rainstorm event, and that the ditches are not likely used for spawning by stickleback due to the ephemerality of flows.[26]

Fish were not detected visually during the assessment and are not expected to occur regularly in the railway ditches due to the otherwise lack of surface flows in the historical China Creek drainage.

Invasive Species

Eastern grey squirrel is established throughout Vancouver and is identified as invasive by the Invasive Species Council of BC.[25] This species is considered likely to utilize the Grandview Cut as a movement corridor, and is considered to be a likely nest predator of birds nesting in the Cut.

European starling, also identified as invasive by the Invasive Species Council of BC,[25] is also established throughout Vancouver and competes with native bird species for food. It commonly nests in light standards and other urban features and is likely to utilize the Grandview Cut as a foraging location.

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[26] **Rapid Transit Project 2000 Ltd. 1999.** Environmental Assessment Report – Clark Drive to Lougheed Mall & Lougheed Mall to New Westminster Rapid Transit Project. March 1999 report. *Prepared by:* Rapid Transit Project 2000 Ltd., Vancouver, BC. *Prepared for:* Screening Level Review under the *Canadian Environmental Assessment Act* (CEAA).

Animal Species at Risk

Animal species listed on the British Columbia Conservation Data Centre's Blue or Red lists, or species designated Endangered, Threatened, or Special Concern by Schedule 1 of the Canada *Species at Risk Act*, were not detected during the assessment. They are not expected to occur within the assessment area due to lack of appropriate habitat features and situation within an intensively developed urban matrix with poor connectivity to large patches of natural areas considered likely to harbour viable populations of animal species at risk.

Hydrological Conditions

Citywide Context

The majority of the Grandview Cut, including at the proposed ramp location, is located at the boundary between the China Creek and Grandview Woodlands stormwater catchment areas identified in the Citywide Integrated Rainwater Management Plan (IRMP), and terminates at approximately the historical high water mark of False Creek, now the easternmost extent of the False Creek Flats, which now corresponds approximately to the Terminal stormwater catchment area. All three catchment areas are located in the IRMP's North-East Rainwater Management Area, which as a whole drains to False Creek and Burrard Inlet and receives relatively heavy rainfall (average of 1300-1500 millimetres (mm) per year) compared to parts of Vancouver further west.[12] The Property is located at the edge of the Quadra Sands Aquifer.[18]

Historical watercourses[27] located in proximity to the Grandview Cut include:

- the China Creek drainage (located mainly south of the Cut), which previously drained to False Creek but was historically converted from surface flows to an underground stormwater drainage system that now drains to Burrard Inlet;
- a short (approximately 275 m) stream, unnamed on maps of Vancouver's old streams, which historically flowed to False Creek (now the False Creek Flats) from what is now the west end of the Grandview Cut, near the intersection of Clark Drive and East 6th Avenue; and
- the Still Creek drainage, which begins near the east end of the Cut and conveys waters eastward to the Brunette River including via both sewers and surface-flowing portions.

The area surrounding the proposed ramp location, and the Cut generally, is identified by the IRMP as having predominantly low infiltration potential. Most of the area immediately surrounding the Cut is identified as having between 25% and 79% impervious surface area, with a corridor of 80-100% impervious surface area along Commercial Drive and parcels of the same level of permeability on the north side of East Broadway at Victoria Drive. The proposed ramp location is identified as a small patch of relatively permeable land (< 24% impervious) within a matrix of 60-79% impervious parcels.[12]

While the Cut overall is identified by the IRMP as having higher permeability than the surrounding landscape (with the majority of the Cut identified as having < 24% impervious surfaces), this zone of permeability is interrupted by major road crossings at Clark Drive, Commercial Drive, East Broadway, Victoria Drive, and Nanaimo Street (all of which are characterized by 60-79% impervious surfaces), and

[27] **Lesack, P., and S.J. Proctor. 2011.** Vancouver's Old Streams, 1880-1920. Abacus Data Network, V1. https://hdl.handle.net/11272.1/AB2/D6XCQG. (09/10/2021)

by smaller crossings at Woodland Drive and Lakewood Drive (which are characterized by 25-59% impervious surfaces). Permeability is also reduced (to 25-59% impervious surfaces) in the area surrounding the Commercial Drive crossing due to the Commercial-Broadway SkyTrain Station, which crosses and is partially located within the Cut.[12]

The proposed ramp location specifically is located with the portion of the Cut containing the least permeable surface area due to three major road crossings (Commercial Drive, East Broadway, and Victoria Drive) and a SkyTrain station within a less than 400 m length of ravine. Larger areas of more permeable land (< 24% impervious) in proximity to the proposed ramp location occur within the Cut east of the Project location as well as north of it (north of Broadway).[12]

As per the Urban Forest Strategy (2018 update), impermeability inhibits urban tree canopy cover by limiting space availability for new or replacement trees, soil volume for new and existing trees, and soil infiltration and storage of rainwater. The strategy indicates that protection of and increases to permeable areas will increase the success of efforts to increase the urban tree canopy.[8]

Hydrological Conditions on Site

The nearest surface water features to the assessment area observed during the biophysical inventory are two northwest-flowing drainage ditches, one on either side of the railway tracks. Neither is indicated by the City's public mapping website[28] as being connected to the municipal storm or combined sewer network, but the Rapid Transit Project 2000 Environmental Assessment Report[26] suggests that they likely drain into the City stormwater drainage system. That report also indicates that as of 1998, the ditches did not convey flows year-round.

At the time of the December 2018 assessment, both ditches contained water and were flowing northwest; the southern of the two ditches conveyed more flow than the northern. Between the Broadway and Victoria Drive bridges, the average wetted width of the southern ditch (closest to the assessment area) was 92 centimetres (cm), with an average maximum wetted depth of 10 cm. The average wetted width of the northern ditch was 88 cm, with an average maximum wetted depth of 9 cm.

Water entering the southern ditch from the assessment area and surrounding portions of the Cut (except where rain access is shielded by road crossings and transit infrastructure) is via overland flow of rainwater down the walls of the Cut. No evidence of channelized water flow from street level was observed in or near the assessment area. Infiltration of rainwater into the mineral soils within the assessment area is likely limited, due to the hard-packed nature of the soils.

PROPOSED WORKS

Description of Proposed Ramps

Two, two-lane loading and access ramps are proposed to connect the Property to the Broadway bridge over the Grandview Cut. Their general arrangement is presented in Attachment B. Their proposed location is based on the tenant's commercial requirements for truck access. Proposed widths of the west

[28] **City of Vancouver. 2021.** VanMap Viewer. Infrastructure – Sewer. https://maps.vancouver.ca/vanmap-viewer/ (09/13/2021)

and east ramps are 10.5 m and 11.5 m, respectively, with a 9 m gap between them. Ramp deck surfaces are proposed to be concrete rather than open grate, for reasons of long-lasting durability, structural integrity and expediency in construction methodology and timing.

The ramps are to be supported on their north end by a single, 37 m-long precast concrete box girder spanning east-west along the south edge of the Broadway bridge. The west end of this girder will be supported on an abutment seat supported on piles and/or tied to the development on the Property. The east end will be supported on a single column to be installed in alignment with the adjacent line of columns on Pier 1 of the Broadway bridge. A deflection wall will be included in the design to protect this column from potential impact by a derailed train.

Precast concrete beams supporting the ramps will span north to south, supported at the north end by the aforementioned east-west girder. The south end of these beams will be supported by abutment seats proposed for incorporation into the building on the Property.

The footprint of the proposed ramps and east-west girder encompasses a total of approximately 418 square metres (m^2), of which approximately 106 m^2 is within the footprint of the westernmost ramp deck, and approximately 249 m^2 is within the footprint of the easternmost ramp deck. The footing of the column to support the east-west girder encompasses a footprint of approximately 6 m^2.

Vertical clearance under the proposed ramps will be approximately 1.0 m less than under the Broadway bridge. A clear span of approximately 30 m will allow for the possibility of a future rail corridor or other use passing under the west span of the Broadway bridge and proposed ramps.

Stabilization of the wall of the Grandview Cut at the Project location is proposed to be achieved through excavation and shoring of the wall of the Cut, followed by installation of an interlocking concrete block wall with soil and mesh for landscape growth (see next section).

Construction Methodology and Timing

Construction activity within the Grandview Cut itself will include tree removal, rebuilding and stabilization of the adjacent wall of the Cut, and construction of the east column to support the east-west girder, along with its foundation and associated crash wall.

During shoring and excavation of upland areas of the Project site adjacent to the Grandview Cut, soils will fall into the Project site (south of the Cut), and soil and material will be removed from that side of the wall. As the basement of the site is built upwards, the wall of the Cut will be rebuilt using an interlocking concrete block wall with soil and mesh for landscape growth. Areas surrounding the existing wall of the Cut will be shored using a shotcrete wall and tiebacks and/or cross-bracing. Shoring plans will need to be engineered and stamped by a geotechnical consultant.

Trees, including roots, within the ramp footprint (Attachment B) are to be removed by excavator as the Cut wall and material are removed during shoring and excavation of the Project site.

Construction of the east column for the east-west girder will begin with excavation of a hole for the column footing by excavation equipment staged at the bottom of the Cut, in the open area between the rail tracks and the currently treed slope. The column and associated structures will be built by working from the bottom of the Cut, also within the area between the rail tracks and slope. Tying and rebar and

building out the column's form work will be done by hand at this location. Concrete for the column will be poured using a machine pump staged on the Broadway bridge above.

Placement of girders and decks will occur from the top of slope on the Property or from the Broadway bridge.

Duration of works associated with ramp construction is estimated at approximately 6-8 months total, including approximately two months of work to complete the east column and its foundation and deflection wall. Shoring and excavation of the wall of the Cut, including tree removal, is to occur between September and January, outside the nesting window of birds potentially nesting on site.

PROJECT ENVIRONMENTAL EFFECTS AND MITIGATION

Long-term (post-development) operational effects of the proposed ramps are discussed in the following sections, along with proposed mitigation options for these effects.

Solar Access

Goal 2 of Report 2 of VanPlay,[14] namely to "[p]rotect existing parks and recreation spaces from loss, encroachment and densification," includes protection of solar access to green spaces.

As described in 'Proposed Works,' above, open grate decks, which would have provided greater solar access to areas below the ramps, were considered, but concrete decks were chosen for reasons of long-lasting durability, structural integrity and expediency in construction methodology and timing.

As indicated in the updated shadow study submitted as part of the Project's rezoning submission (drawing included as Attachment D), the proposed ramp area will receive no morning (1000 hours) shading by the Project's buildings at the start of spring (March 20), summer (June 2), or fall (September 21), and significant morning shading at the start of winter (December 21). It will receive no midday (1200 hours) shading by the buildings at the start of summer, partial midday shading at the start of spring and fall, and significant midday shading at the start of winter. It will receive partial afternoon (1400 hours) shading at the start of summer, significant afternoon shading at the start of spring and fall, and complete afternoon shading at the start of winter. Situation of tall buildings on the Project site in proximity to the Grandview Cut is as prescribed by the Grandview-Woodland Community Plan[11] to minimize shadowing of the public plaza proposed for the Project site.

The proposed access ramps will further reduce solar access to green areas below and surrounding them, with the direction of shadows cast by the ramps moving generally from northwest to northeast between mid-morning and mid-afternoon in both June and September.

Reduction of vegetation growth potential is expected below and in areas directly surrounding the ramps due to reduction in solar access. Spaces between the two ramps and between the western ramp and the adjacent wall of the Cut will provide some solar access that may render areas below these spaces (which will also receive some rainfall; see 'Rainfall,' below), capable of supporting shade-tolerant native vegetation.

As a result of solar access reductions, any replanting of areas within the vicinity of the proposed ramps should focus on shade-tolerant native shrubs and herbaceous species. Shrub plantings are recommended to be focused on more gently sloped, lower-elevation areas at the bottom of the Cut wall, where native shrubs (particularly salmonberry) are currently concentrated.

Rainfall

The Biodiversity Strategy identifies disruption to ecological processes, as well as environmental contaminants including those from stormwater runoff, as threats to biodiversity.[10] Increasing rainfall interception and infiltration via the urban tree canopy, green spaces, and other green infrastructure is advocated by or consistent with the Greenest City Action Plan,[4,5] Transportation 2040,[6] Urban Forest Strategy,[7,8] VanPlay,[13,14,15,16] Climate Change Adaptation Strategy,[17] Rain City Strategy,[18] and Grandview-Woodland Community Plan,[11] among others. The Citywide Integrated Rainwater Management Plan[12] provides guidance on recommended green infrastructure options for rainwater management.

The proposed access ramps and supporting girder will shield approximately 418 m^2 (as measured from above) of underlying soils in the Grandview Cut from direct rainfall access. As described under 'Solar Access,' above, open grate decks would have provided greater rainfall permeability but were not selected for the ramp deck surfaces.

Runoff from the ramps will either be directed to the Project's overall rainwater management system or will be directed by scuppers from the ramp surface to the nearest ditch at the bottom of the Grandview Cut to facilitate rainwater infiltration into soils, thereby avoiding diversion of runoff from these surfaces to the storm sewer system.

As per the proponent's preliminary rainwater management plan,[29] rainwater management for the Project overall will be achieved using design criteria from the City's Rezoning Policy for Sustainable Large Development and the IRMP. Quantity and water quality of runoff will be controlled by implementing BMPs described in the IRMP. Specific on-site rainwater management features included in the preliminary rainwater management plan for the Project include: absorbent landscaping (planters and soft landscaped surface finishes); extensive green roof areas; rainwater harvesting for irrigation of landscaping and potentially for reuse in commercial washrooms; storage/detention tanks; a water quality treatment system; and catch basins with oil-water separators for runoff not treated by vegetation and soils. Off-site rainwater management features included in the preliminary rainwater management plan include infiltration-based features for water falling on landscaped areas on East 10th Avenue and runoff from the adjacent sidewalks, including absorbent landscaping, rain gardens, infiltration swales and rock pits. Rainwater management design features to be implemented for the Project overall, including the ramps, will be required to adhere to the City's requirements described in the above referenced policies, including (quoting from the project's preliminary rainwater management plan[29]):

[29] **Casey, D. and R. Warren. 2019.** Rainwater Management Plan – Preliminary Design – Commercial + Broadway – 1780 East Broadway. September 26, 2018 letter report, revised March 25, 2019. *Prepared by:* R.F. Binnie & Associates Ltd., Burnaby, BC. *Prepared for:* Westbank Corp. and City of Vancouver, Vancouver, BC.

Quantity Control:

City of Vancouver requirements for Sustainable Large Developments:

- Post-development runoff rate and volume = pre-development runoff rate and volume, for the 2-year 24-hour duration storm.

City of Vancouver Citywide IRMP:

- Capture a minimum of 50% of the 6-month/24-hour post-development volume from effective impervious areas, other than collector/arterial roads in all land uses and either infiltrate to ground, evapotranspiration, or reuse the captured rainfall.
    - Equivalent to capturing the first 24mm per day.
- For developments defined as 'large scale developments', reduce post-development runoff rate and volume to at or below the pre-development runoff rate and volume for the 2-year/24-hour duration storm.

Quality Control:

City of Vancouver requirements for Sustainable Large Developments:

- Treat 90% of the average run-off volume.
- The practices used to treat runoff must be capable of 85% TSS removal.

City of Vancouver Citywide IRMP:

- Treat 90% of the volume of runoff from effective impervious areas, other than roof in low density residential land uses, to the water quality standards – yellow or green – for piped drainage set out in Monitoring and Adaptive Management Framework for Stormwater, Metro Vancouver, 2014.
    - Equivalent to treating an additional 24mm of rainfall per day (48mm total).

Reduction of vegetation growth potential is expected in areas below the ramps due to reduction in direct rainfall access. Spaces between the two ramps and between the western ramp and the adjacent wall of the Cut will receive direct rainfall, and as a result may support native shrubs and herbaceous species (as described in 'Solar Access,' above). Pending design of the shored-up and reconstructed wall of the Cut, along with direction from the City on planned habitat enhancement within City-owned green areas such as the Cut[22] (including information on the potential for supplementation with organic soils), planting of native species tolerant of both shade and dry conditions below the ramps may be a viable option.

Species used for any plantings should be selected with climate resilience in mind, consistent with Goal 5 (adapting parks and recreation amenities to a changing climate)[14] and initiative N.3.1 (including enhancement of natural areas to address threats like climate change)[16] of VanPlay. Hotter, drier summers will mean that native species tolerant of current climate conditions may not be optimal for plantings, and including species with greater heat and drought resistance may be warranted.

<u>Tree Canopy</u>

Removal of forest-character vegetation within the proposed ramp location will reduce the carbon sequestration, rainfall interception, and heat reduction capacity of the local area by, at the time of the arborist's report,[24] 21 trees. Site conditions capable of supporting trees are not expected to persist within the ramp footprint following construction.

Given the lower-than-average tree canopy within Grandview-Woodland and the City's goals of increasing the urban canopy for all these reasons as described in the Urban Forest Strategy,[7,8] among others, it is proposed that Westbank collaborate with the City to ensure that these trees are replaced in the local neighbourhood, including but not limited to on the Project site, at a ratio acceptable to the City.

Light and Noise

The Biodiversity Strategy includes light and noise pollution as factors that are directly detrimental to biodiversity via disruption of nesting, foraging, and other activities in birds and invertebrates.[10] The Grandview-Woodland Community Plan advocates the use of habitat-friendly lighting systems for neighbourhood streets and new developments.[11]

No new light standards are proposed as part of the ramp design; street lights on the Broadway bridge will be reinstalled following ramp construction. Traffic lights for the new ramp access intersection will be installed at street level at the west end of the Broadway bridge. These features will not significantly change the illumination level within the Grandview Cut. Lights associated with the rest of the Project are not addressed in this report.

Intermittent, low-velocity vehicle traffic, including intermittent access by commercial trucks, will occur on the proposed ramps. Noise generated by this traffic is not expected to significantly add to existing background noise at the Project location, which is already heavily impacted by noise from: a busy arterial route (East Broadway) serving commercial and non-commercial vehicle traffic and a busy bus route; a SkyTrain station serving two intersecting SkyTrain lines directly west of the Project location (one of which passes within the Cut and one overtop); and an active rail corridor within the Cut.

Due to lack of significant changes to light or noise impacting the Grandview Cut during long-term ramp operation, mitigation for these factors is not proposed.

Wildlife Movement and the Ecological Network

As described in the 'Assessment Results' sections above, the Grandview Cut is identified as part of the city's ecological network, and as a movement corridor for urban wildlife including coyotes, raccoons, birds, and others. Enhancing ecological connectivity for birds, pollinators, insects and other urban wildlife is identified by as a priority by the Biodiversity Strategy[10] and VanPlay,[15] among others. Due to the lack of human access to the Cut (aside from for rail and SkyTrain purposes), the Cut is a reasonable candidate for inclusion in the City's Green Operations Plan[22] initiative to create limited-access parks for purposes such as wildlife corridors.

Construction of the ramps will interrupt current levels of forest connectivity within the Cut through removal of all vegetation within the proposed work area. Construction will also cause a long-term alteration to the vegetation community capable of existing within the ramp footprint. Re-establishment of a tree-dominated vegetation community within the ramp footprint is not anticipated following ramp construction due to disruptions to solar access and rainfall as described in the 'Solar Access' and 'Rainfall' sections, above. This will result in an incremental increase to the comparatively built-up, less-vegetated part of the Cut that extends eastward from Commercial Drive.

While the area affected by the proposed ramps is not large relative to the overall green area of the Cut, any reduction in green space equates to incremental reduction in the Cut's function as part of Vancouver's ecological network. The impact of the ramps on the ecological network is mitigated somewhat by the location of the ramps directly adjacent to an existing unvegetated area below the Broadway bridge; rather than causing new fragmentation (i.e. creating a gap within intact forest), the ramp design will increase the area of an already unforested space. Edge effects, including but not limited to increased temperature, air movement, and predator access to areas near the forest edge, will also be minimized by the proposed design. A single forest edge will be moved (and reduced in length relative to the current edge at the Broadway bridge) rather than additional edge(s) being created. This, in addition to the softening of the new edge through strategic planting of native shrubs and herbaceous species in the spaces left open between and adjacent to the ramps, will result in a minimization of edge effects to the greatest extent possible. Planting of the areas between and adjacent the ramps will also help reduce the overall reduction in areal extent of green space within the ecological network.

The ramp design is not expected to significantly affect wildlife access to the Cut for non-climbing, ground-based species like coyote. The proposed ramp location connects to a busy arterial road bridge on one end and what is currently a fenced parking lot on the other, so such species are not considered likely to currently access the Cut at this location. These species are considered more likely to use vegetated areas along the top of slope (along the Central Valley Greenway) as movement corridors if the Cut is not accessible along much of its length. Should coyotes pass through the Cut at the location of the proposed ramps, they are likeliest to use the comparatively obstacle-free and flat bottom of the Cut as a movement corridor rather than the sides. Removal of vegetation within the ramp area will remove a local source of cover should they require it during their movements, but will not directly impede their movements.

For climbing species capable of scaling fences, such as raccoon, access to the Cut will be curtailed at the Project location by proposed buildings as opposed to the ramps specifically, but the Cut will remain accessible by these species via trees and fences east of the Project location. Interruption to the forest-type vegetation community is not expected to significantly alter the movements of raccoons up and down the corridor, as their use of the Cut is expected to be primarily for water access at the railway ditches and for scavenging opportunities on garbage under the edges of road bridges.

Bird access to the Cut at this location will also be more impeded by building presence than by the ramps, but bird use of the Project location above the Cut, and hence use of the Cut itself, may increase post-development due to inclusion of green infrastructure features for the Project (see 'Rainfall' section, above). Removal of trees within the ramp footprint is expected to alter the local movement patterns of birds that forage in the treetops; birds are likely to fly from one patch of vegetation to the next as they travel within the Cut, or to exit the Cut to travel along street trees and trees on private property in the surrounding area.

Insect (including pollinating insect) access to the Cut is not expected to be negatively impacted by construction of the ramps or Project, as neither East Broadway nor the existing parking lot are likely to have been significant movement corridors for these species. Following ramp construction, insects may either traverse unvegetated sections or remain in areas meeting their habitat requirements.

Replanting of shrubs (particularly flowering and fruiting shrubs) and herbaceous species within openings between and adjacent to the ramps, and possibly below them, presents an opportunity to partially reestablish vegetation connectivity within the ramp area, providing cover for small animals and perch locations for birds traveling through the area, as well as foraging habitat for mammals, birds and

pollinators. Opportunities also exist, depending on City guidance at the development permit stage, for enhancement of surrounding areas of the Cut in accordance with City goals to remove invasive species, improve soils, add or retain downed wood, and enhance plant biodiversity within City lands.

Bird Habitat

Bird habitat enhancement is a key component of Goal 7 of Report 2 of VanPlay,[14] which is to restore Vancouver's wild spaces and vital biodiversity. The Vancouver Bird Strategy[9] advocates conservation and restoration of plant communities in urban landscapes to support larger numbers of native birds, including removal of invasive plant species (with a note that blackberry can provide food and shelter for some species) and implementation of bird-friendly landscape and building design principles. Protection and enhancement of biodiversity during development, including adding landscaping features for birds (as well as pollinators), is also an objective of the Biodiversity Strategy.[10]

Landscape design guidelines recommended by the Vancouver Bird Strategy[9] include:

- protection and enhancement of large patches of habitat;
- planting native trees and shrubs in the urban landscape;
- inclusion of different types of vegetation communities within the landscape (e.g. different forest types, shrublands, etc.);
- increasing vertical structural complexity of vegetation (trees and shrubs);
- using a diversity of native and non-invasive plants;
- controlling invasive species without disturbing breeding birds;
- minimizing direct human disturbance;
- reducing light pollution;
- minimizing lawn areas;
- including snags and downed wood; and
- provision of drinking and bathing water for birds.

The Vancouver Bird Strategy[9] also identifies features like mature trees and fruiting plants as being important to bird diversity.

Removal of trees within the ramp footprint will reduce nest site availability for urban tree-nesting birds such as American robin. Removal of shrub cover will also reduce nest site availability for urban shrub- and ground-nesting birds such as song sparrow, spotted towhee, and white-crowned sparrow.

The diameters of the trees identified for removal for ramp construction are within the size range utilized by urban cavity-nesting birds, including northern flicker and black-capped chickadee. Removal of dead and decaying trees within the project footprint will have a more immediate impact on potential nesting sites for these species than removal of live and healthier trees.

Removal of vegetation within the project footprint is expected to have temporary impacts on volume of birds moving along the south side of the Grandview Cut. Any birds passing through this area are expected to move along the opposite side of the railroad tracks during construction, and to resume utilizing both sides of the Cut following completion of the ramp and replanting of impacted areas.

Any habitat enhancement activities within the ramp footprint and adjacent areas of the Cut should, where possible and under the direction of the City, include enhancement of soils to foster a healthier plant and invertebrate community, replacement of invasive species with fruiting native shrubs, and retention or placement of downed wood.

CONSTRUCTION IMPACTS AND MITIGATION

Impacts of the construction process itself, as opposed to the long-term operational impacts discussed in the previous sections, are discussed here, along with mitigation and avoidance plans for these impacts.

Vegetation

Vegetation impacts during the construction process include total removal of vegetation within the ramp footprint during shoring and excavation of the wall of the Grandview Cut. Damage to vegetation outside the shoring and excavation area will be avoided by staging equipment used for excavation, shoring and tree removal within the identified tree removal area and at the bottom of the Cut adjacent to the railway tracks. Trees will be removed by excavator and will not be felled onto vegetation outside the tree removal area.

Longer-term mitigation of vegetation removal is discussed under 'Project Environmental Effects and Mitigation,' above.

Wildlife

Ramp construction activity is proposed to occur during daylight hours in accordance with City bylaws, and nighttime illumination is not proposed for the ramp construction site. Noise levels during construction will be greatest during shoring of the wall of the Grandview Cut.

Native urban mammals expected to use the proposed work area are crepuscular and/or nocturnal, i.e. they are most active at dawn and dusk and/or at night. As such, neither noise nor light from ramp construction is expected to impact the movement patterns of these species. Presence of construction equipment and an active construction site shuttered for the evening are not anticipated to alter movement of these species along the Grandview Cut, as evidence of off-hours use by raccoon and coyote is regularly observed on active construction sites in Metro Vancouver (E. Fairhurst, personal observation). The primary impact to use of the area by native urban mammals during construction is expected to be reduction of access to the Cut at the Project location by raccoons once excavation of the upland part of the Project, including the Cut wall, begins. This impact will continue following Project completion, but as detailed under 'Project Environmental Effects and Mitigation,' above, raccoon access from adjacent properties will remain possible during and after construction.

Impacts to bird movement through the Grandview Cut during construction are expected to include vegetation removal and other construction activity causing birds to either exit the Cut to move along street trees and trees on private property in the surrounding area, or bypass the construction area as they move to the nearest vegetated area of the Cut. Removal of trees and berry-producing shrubs will reduce foraging opportunities for birds in the local area until replanting occurs.

Impacts to bird nesting will be minimized by limiting activities resulting in the removal of potential nest sites, as well as the loudest construction activities, to outside the songbird nesting season, i.e. limiting these activities to September through January (inclusive). These activities include excavation and shoring of the wall of the Grandview Cut, and associated vegetation removal. Should these activities extend into the nesting season, i.e. February to August (inclusive), likelihood of impacts to bird nesting will be reduced by having a qualified environmental professional perform an active bird nest survey prior to any vegetation removal needing to occur during the songbird nesting season. Vegetation removal will be delayed until no active nests or site-dependent young birds are detected during surveys.

Water Quality

Impacts of construction on water quality entering either the south railway ditch or the City sewer network will be mitigated by adherence to a Construction and Environmental Management Plan for the Project, that prescribes appropriate erosion and sediment control and spill prevention and response measures. An erosion and sediment control plan will be prepared for the Project at a future date. Compliance with the Sewer and Watercourse Bylaw No. 8093 will be achieved by following the requirements set out in City Bulletin 2002-003-EV governing erosion and sediment control for large lot development.[30]

SUMMARY

Proposed redevelopment of the Property at 1780 East Broadway includes construction of two access ramps over the Grandview Cut adjacent the northeast corner of the Property. Construction of the proposed ramps will include excavation and shoring of the wall of the Grandview Cut, removal of trees and other vegetation within the excavated area, addition of a new column (and associated foundation and deflection wall) to the existing line of columns supporting the Broadway bridge, and installation of a support girder and the ramp structures themselves. Construction and operation of the ramps are anticipated to cause temporary and long-term alterations to the vegetation community and animal use of the ramp location, and long-term local reductions in solar access and rainfall permeability. Ramp construction will remove part of the tree canopy from the south side of the Cut, thereby reducing the urban tree canopy in Grandview-Woodland and reducing associated ecological functions as a green corridor within the citywide ecological network, as well as carbon sequestration, rainfall interception, and heat mitigation. Mitigation of long-term environmental effects of the proposed ramps will include planting of native shrubs and herbaceous species within the area surrounding and between the ramps where possible, coordination with the City to determine appropriate offsetting through tree planting and habitat enhancement in the surrounding area according to City and Park Board policies and initiatives, and directing of rainwater runoff to the Project's overall rainwater management system or the south railway ditch. Mitigation of short-term construction impacts will include prevention of impacts to surrounding vegetation, limiting of ramp-related construction activity to daylight hours and times of year outside the bird nesting season, and adherence to an erosion and sediment control plan.

[30] **City of Vancouver. 2017.** Erosion and Sediment Control – Large Lot Development (1,000 m^2 or more). Revised March 01, 2017. Development, Buildings and Licensing. Office of the Chief Building Official and Environmental Services. Environmental Protection. Vancouver, BC. 3 pp. + appendix.

Please contact the undersigned at 604-944-0502 or at fairhurst@envirowest.ca should you have any comments or questions regarding this report.

Sincerely,
ENVIROWEST CONSULTANTS INC.

Written by:	Reviewed by:
Elizabeth Fairhurst, M.Sc., R.P.Bio.	Ian Whyte, P.Ag.
Wildlife Biologist	Director/Senior Project Manager

EF/IWW

Copy Benjamin Hsieh, Westbank

ATTACHMENT A
Assessment Area Location

REFERENCES
1. 2020 Legal Base from City of Vancouver.
2. 2018 Ortho Photograph from Google Earth.

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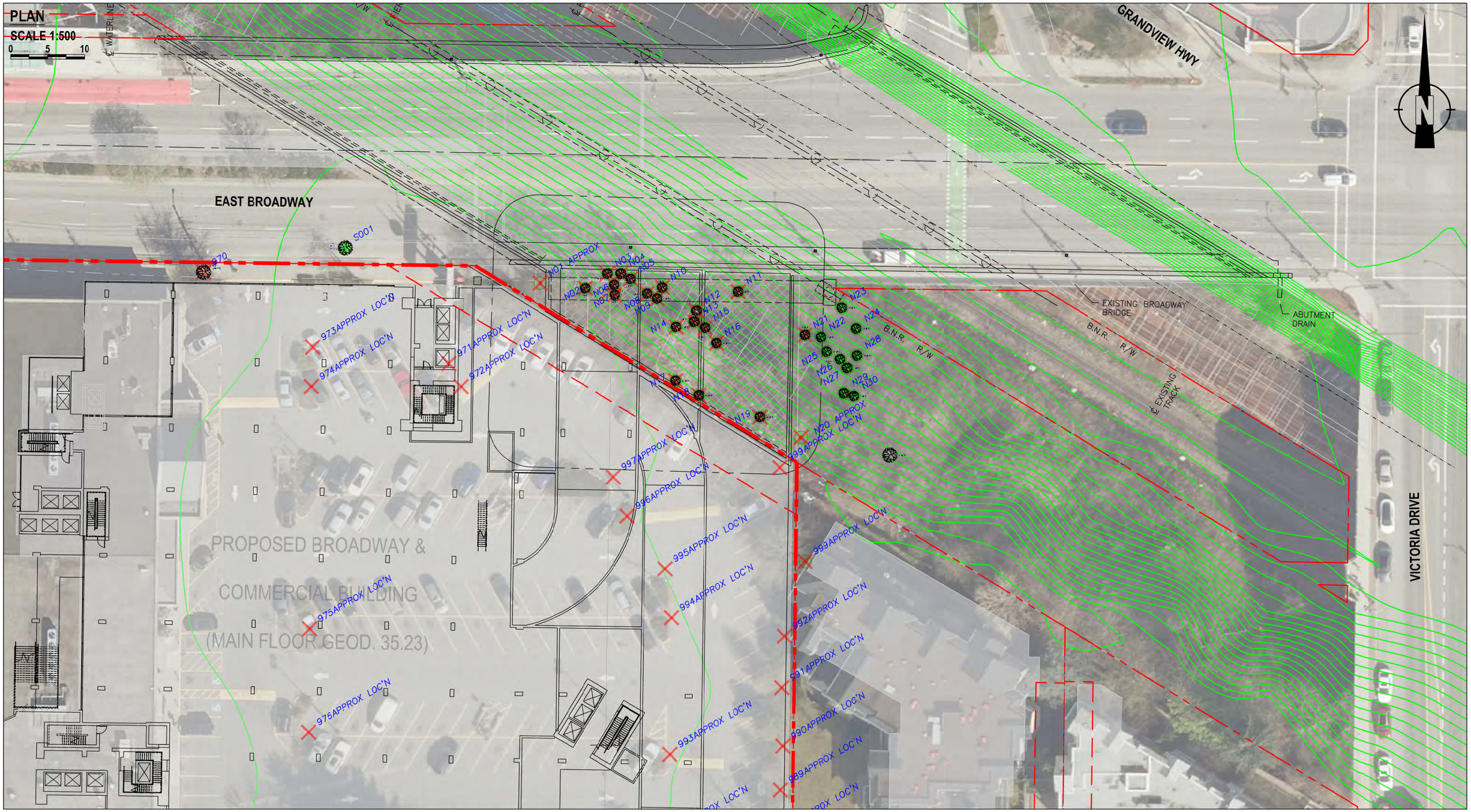
WESTBANK CORP. Vancouver, BC	envirowest www.envirowest.ca envirowest consultants inc. Suite 101 - 1515 Broadway Street Port Coquitlam, British Columbia Canada V3C 6M2 office: 604-944-0502 facsimile: 604-944-0507 saper-vedere@envirowest.ca	ASSESSMENT AREA LOCATION
BROADWAY & COMMERCIAL, VANCOUVER		DESIGN: EF · DRAWN: SDJ · CHECKED: IWW · REVISION: 00 · REVISION DATE: SCALE: As Shown DATE: September 23, 2021 DRAWING NUMBER: FIGURE 1

DATE: 2021-09-23 - 3:47pm
PATH: \\ENV-FS-R\Alpha\Envirowest Files\2021\Vancouver\2669-01\AutoCAD\Final\Figure 1 - Assessment Area Location.dwg
LAYOUT: FIGURE 1

ATTACHMENT B
Envirowest Drawing No. 2669-01-01
Proposed Ramp Location
(September 23, 2021)



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1. Drawing No. A117356-S-SK1. Rev. A. "General Arrangement". October 10, 2018. COWI.
2. File: 17130. Rev. 1. "Appendix D and E: Tree Assessment and Management Drawings". July 25, 2019. Arbortech Consulting.
3. Topographic Contours from City of Vancouver.
4. 2020 Legal Base from City of Vancouver.
5. 2020 Ortho Photograph from City of Vancouver Website (https://maps.vancouver.ca/vanmap-viewer/).

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PROPOSED RAMP LOCATION

DESIGN:	DRAWN:	CHECKED:	REVISION:	REVISION DATE:
EF	SDJ	IWW	00	
SCALE: As Shown			DRAWING NUMBER: 2669-01-01	
DATE: September 23, 2021				

DATE: 2021-09-23 - 3:49pm
PATH: \\ENV-FS-R\Alpha\Envirowest Files\2021\Vancouver\2669-01\AutoCAD\Final\2669-01-01 Proposed Ramp Location.dwg
LAYOUT: 2669-01-01

ATTACHMENT C
Site Photographs

Photograph C1. Grandview Cut surrounding assessment area, looking northwest from Victoria Drive bridge (September 12, 2018). Visible in photograph: train tracks (middle), SkyTrain tracks (right), Broadway bridge (background), and assessment area (left of Broadway bridge).

Photograph C2. Northern boundary of assessment area from street level, looking east-southeast from northwest corner of assessment area (September 12, 2018).

Photograph C3. Upper slope and mid-slope section of assessment area from street level, looking east-southeast and down into Grandview Cut from East Broadway (September 12, 2018).

Photograph C4. Upper slope of assessment area from street level, looking southwest from East Broadway (September 12, 2018).

Photograph C5. Upper slope of assessment area from street level, looking west-southwest from East Broadway (September 12, 2018).

Photograph C6. Lower and middle slope of assessment area, looking southeast from beneath edge of Broadway bridge (December 19, 2018).

Photograph C7. Middle and upper slope of assessment area, looking south from beneath edge of Broadway bridge (December 19, 2018).

Photograph C8. Upper slope of assessment area, looking west from eastern extent of assessment area (December 19, 2018).

Photograph C9. Middle and lower slope of assessment area, looking northwest from eastern extent of assessment area (December 19, 2018).

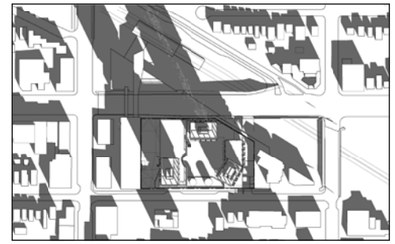
Photograph C10. Pier 1 of Broadway bridge and railway ditch, looking approximately west from northeast corner of assessment area (December 19, 2018).

ATTACHMENT D
Perkins + Will
Shadow Studies
Issued for Rezoning Amendment (September 20, 2021)

DECEMBER 21 SHADOW STUDIES

PROPOSED DEVELOPMENT

10 AM

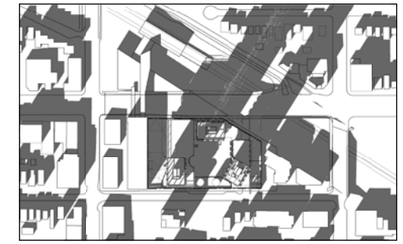


(12) DEC 21 -10AM FUTURE DEVELOPMENT
1 : 2000

12 NOON

(11) DEC 21 -12PM FUTURE DEVELOPMENT
1 : 2000

2 PM

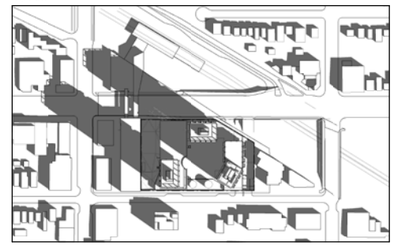


(10) DEC 21 -2PM FUTURE DEVELOPMENT
1 : 2000

MARCH 20 SHADOW STUDIES

PROPOSED DEVELOPMENT

10 AM



(9) MARCH 20 - 10AM FUTURE DEVELOPMENT
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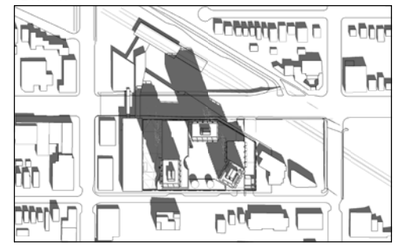
12 NOON



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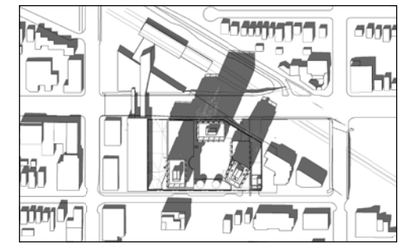
2 PM

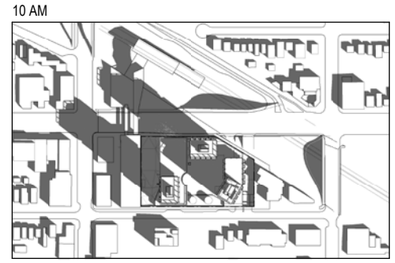


(7) MARCH 20 - 2PM FUTURE DEVELOPMENT
1 : 2000

SEPTEMBER 21 SHADOW STUDIES

PROPOSED DEVELOPMENT

10 AM



(6) SEPT 21 - 10AM FUTURE DEVELOPMENT
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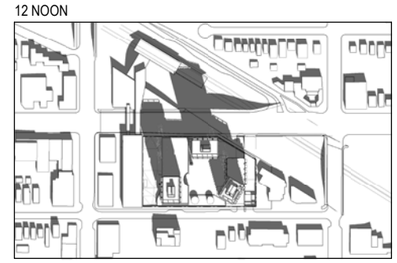
12 NOON



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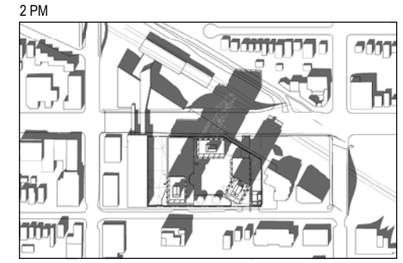
2 PM



(4) SEPT 21 -2PM FUTURE DEVELOPMENT
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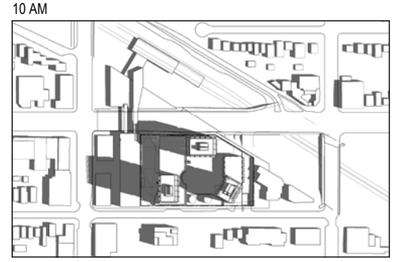
JUNE 20 SHADOW STUDIES

PROPOSED DEVELOPMENT

10 AM



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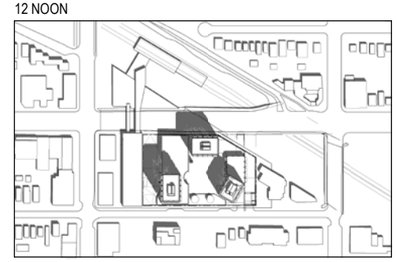
12 NOON



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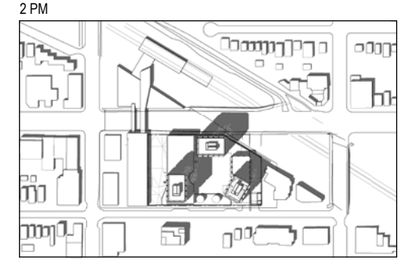
2 PM



(1) JUNE 20 - 2PM FUTURE DEVELOPMENT
1 : 2000

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Crombie

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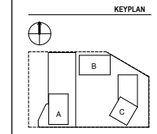
Crombie REIT + Westbank Corp.

KEYPLAN



ISSUE CHART

ISSUED FOR REZONING AMENDMENT	Sept 20, 2021
ISSUED FOR REZONING RE-SUBMISSION	Jul 07, 2020
ISSUED FOR REZONING	May 30, 2019
ISSUE	DATE

Job Number	411812.000
Drawn	Author
Checked	Checker
Approved	Approver

TITLE

SHADOW STUDIES

SHEET NUMBER

G00.04

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9/2/2021 7:54:19 PM BIM 360://Commercial Broadway A-W8BVC-1EZ-r2.rvt