CITY OF VANCOUVER

CITY CLERK'S DEPARTMENT
Access to Information & Privacy Division

File No.: 04-1000-20-2023-228

August 14, 2023

s.22(1)

Dear s.22(1)

Re: **Request for Access to Records under the Freedom of Information and Protection of Privacy Act (the "Act")**

I am responding to your request of April 18, 2023 under the ***Freedom of Information and Protection of Privacy Act*** for:

> **The seven reports listed on page 14 of the Hastings Park – PNE Master Plan Program: Amphitheatre Renewal Report dated June 9, 2021 (https://council.vancouver.ca/20210623/documents/pspc4.pdf), specifically:**
>
> 1. **Demand Analysis and Business Case (April 2019);**
> 2. **Renewable Energy Strategy (December 2020);**
> 3. **Infrastructure Assessment (November 2019);**
> 4. **Archeological Overview Assessment (October 2019);**
> 5. **Environmental Assessment: Stage 1 and 2 Preliminary Site Investigation (April 2019);**
> 6. **Arborist Study (January 2019); and**
> 7. **Traffic, Parking and Access Study (January 2019).**

All responsive records are attached. Some information in the records has been severed (blacked out) under s.18 and s.18.1 of the Act. You can read or download these sections here: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/96165_00.

Under section 52 of the Act, and within 30 business days of receipt of this letter, you may ask the Information & Privacy Commissioner to review any matter related to the City's response to your FOI request by writing to: Office of the Information & Privacy Commissioner, info@oipc.bc.ca or by phoning 250-387-5629.

If you request a review, please provide the Commissioner's office with: 1) the request number (#04-1000-20-2023-228); 2) a copy of this letter; 3) a copy of your original request; and 4) detailed reasons why you are seeking the review.

Yours truly,

[Signed by Cobi Falconer]

Cobi Falconer, MAS, MLIS, CIPP/C
Director, Access to Information & Privacy
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If you have any questions, please email us at foi@vancouver.ca and we will respond to you as soon as possible. Alternatively, you can call the FOI Case Manager at 604-871-6584.

Encl. (Response Package)

:dl

PNE AMPHITHEATRE RENEWAL

BUSINESS CASE AND PRELIMINARY DESIGN SCENARIOS

BUSINESS CASE REPORT APRIL 2019

Prepared for City of Vancouver and
Hastings Park-PNE

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PART 1: OVERVIEW AND BACKGROUND

1.1 EXECUTIVE SUMMARY

This report summarizes the updated Market Analysis, Business Model and Business Case Analysis for the PNE Amphitheatre Renewal at Hastings Park, which is being developed as part of the City of Vancouver's Hastings Park – PNE Master Plan. This report includes updates to the Demand Analysis Study conducted for the City of Vancouver by John Donnelly & Associates, plus an inventory of existing outdoor and competitive venues in the Greater Vancouver Regional District, a demonstration of the demand for the new PNE Amphitheatre, as well as an analysis of the current capacity gaps in venues found within the Greater Vancouver Regional District, and an overview of comparable Amphitheatres found in other regions.

To build and operate the PNE Amphitheatre, this report addresses fundamental questions including:

- What is the most appropriate size and capacity for the re-developed Amphitheatre?
- What is the nature and revenue potential for anticipated uses?
- What is the market need for accessible venues in the local Vancouver area?
- Will this venue address the current and future growth requirements to influence cultural tourism and support the sustainability of the PNE?

The report also presents an overview of infrastructure requirements, four preliminary design scenarios for the new PNE Amphitheatre, plus a forecast of revenues and expenses with operating model options.

In considering the requirements for the new PNE Amphitheatre, John Donnelly & Associates has:

- Inventoried and assessed existing large capacity and outdoor venues in the Greater Vancouver Regional District;
- Reviewed and summarized relevant material related to growth and trends within the local concert industry;
- Interviewed organizers and producers currently utilizing outdoor event spaces in Vancouver;
- Researched comparable Amphitheatres in other cities;
- Analyzed current PNE events including revenues from rental fees, parking, and food and beverage for shows and events staged in the existing Amphitheatre location at the PNE;
- Identified a list of potential public cultural and commercial events that may be staged at the venue upon completion of construction;
- Established a forecast of projected revenues and expenses to outline an operating business plan;
- Outlined four potential scenarios for the renewal of the PNE Amphitheatre with capacity calculations and preliminary construction cost estimates.

This report concludes that there is significant demand from diverse market segments for a new Amphitheatre with a capacity range from 2,000 to 10,000 people. National promoters and cultural organizations have expressed interest in this venue development and are willing to bring their shows to this new venue if it is built and priced affordably for use by both commercial event producers and community groups.

1.2 BACKGROUND

The City of Vancouver ("COV") and the Pacific National Exhibition ("PNE") have commissioned this report from John Donnelly & Associates ("Donnelly") to provide a preliminary business case for the renewal of the PNE Amphitheatre, which is part of the City's Hastings Park – PNE ("HP-PNE") Master Plan that was adopted by Vancouver City Council in 2010 as a result of many years of public consultation and planning.

The HP-PNE Master Plan touches on virtually every aspect of Hastings Park by transforming it into an environmentally sustainable, increasingly active, year-round destination – one that will see the renewal of the annual Fair and Playland, with improved connections to the waterfront and the surrounding community. The HP-PNE Master Plan envisions Hastings Park as a cultural hub with year-round festivals, events and performances.

A key component of the HP-PNE Master Plan is the creation of a celebratory "Heart of the Park" area within Hastings Park that can provide flexible, programmable spaces suitable for festivals, events and day-to-day usage as a new active, urban destination.

This report is part of the first phase of work for developing the Heart of the Park. It focuses on developing the Business Case Analysis for the **PNE Amphitheatre Renewal**, including design scenarios and operational models.

1.3 PURPOSE

The purpose and goal of this HP-PNE Amphitheatre Renewal Report is to:

- Update the Demand Analysis Study completed by Donnelly in 2010 with current market conditions, data and projections. This includes providing a refreshed market analysis with benchmark venue comparisons and a review of the PNE operations in the current Amphitheatre location;
- Identify venue design considerations and technical requirements in order to provide recommendations for the redesign that aligns with the HP-PNE Master Plan vision;
- Provide flexible, programmable space that maximizes public, cultural and commercial considerations;
- Identify technical requirements that will allow for the production of a variety of cultural events, concerts, media, sporting, leisure and community celebrations;
- Consider the requirements for a stage, either as a permanent fixed installation or as a portable stage that can offer flexibility to the event producers, such as stage height, size, location and design;
- Consider the requirements for a roof to cover either the entire audience or to provide cover for the stage and partial cover for select seating areas only;

- Provide four preliminary redevelopment scenarios, to be used for preliminary cost estimates and revenue projections for the Business Case Analysis for review by the COV / PNE Project Team and Steering Committee;
- Present a Business Case which outlines the potential costs of construction for the renewal of the PNE Amphitheatre, in addition to outlining the annual operating expenses and potential revenues.

1.4 DEMAND ANALYSIS REPORT UPDATED

The 2010 Demand Analysis Report for outdoor performance and event space in Vancouver was updated by reviewing demographic data and trends, analyzing the existing supply of venues together with their published capacity and usage, and by interviewing key stakeholders and producers who will use the new Amphitheatre.

The demand summary was primarily characterized as:

- A growing population in the Greater Vancouver Regional District combined with consistent or increasing quantities of events and increased attendance at performing arts activities, festivals, religious and sport or leisure activities;
- The combination of these factors leads to increased absolute numbers of attendees and a strong market for outdoor performances and events;
- No new venues have been added into the local market, while the number of events has increased. This coupled with the City of Vancouver's increased residential development and population density, thereby creates a universal challenge of limited venue availability for public outdoor events in Vancouver.

1.5 GAP ANALYSIS

Combining demand research with the inventory of existing outdoor venues in the City of Vancouver, the following gaps are demonstrated:

a) The capacity need for new venues is strong in the range of 1,000 to 5,000.

- A venue built to satisfy a capacity range of 1,000 to 5,000 will be usable by events or performances with smaller attendances (1,000 to 3,000 people) if it is designed for scalability;
- The existing venues which serve capacities ranging from 1,000 to 5,000 are either fully booked or are limited in availability due to site management policies which seek to mitigate impacts on residential neighborhoods, wildlife, overuse and availability for community and sports use;
- Event producers who require space for audience capacities in this range find that the existing venues (Queen Elizabeth Theatre, Orpheum, Vogue Theatre, Vancouver Convention Centre) are often booked and unavailable for new events;
- Events in this capacity range that are not suitable for tiered-floor seating, such as a theatre, have extremely limited suitable venue options.

b) There is a demonstrated demand for new venues in the range of 5,001 to 10,000.

- Outdoor venues that serve capacities ranging from 5,001 to 10,000 have a high rate of usage, yet there are only seven existing venues currently supplying this capacity, therefore, this category has the lowest supply of available venues;
- Given the growing population in Vancouver and the projected rate of growth for the majority of events in the next ten years, leading to an increased number of attendees, it is expected that many of the over 3,000 annual events currently being staged in venues in the 1,000 – 5,000 range will outgrow their current venue size in coming years;
- Responses during the interviews strongly indicated demand for venues with capacities in the range of 1,000 to 5,000 capacity and 5,001 to 10,000 overlaps considerably with the demand stated in the original 2010 survey for 1,000 to 3,999 and 4,000 to 6,999 categories.

c) A new venue would best serve the local industry if infrastructure common to all events in the venue are installed.

- The most desired infrastructures include cover, accessibility, wi-fi, power, water, public washrooms, and easy site access (parking and/or proximity to local public transportation);
- An outdoor venue that has cover, or partial cover, for the audience and has the ability for flexible floor plans and scalable ticketing will be most regularly used by cultural event and concert producers;
- A venue that provides a portable stage with varying stage height, size, location and design will offer more flexibility to the event producers;
- Outdoor venues that permit amplified sound, which address neighborhood concerns or noise issues, are not readily available therefore they are in high demand.

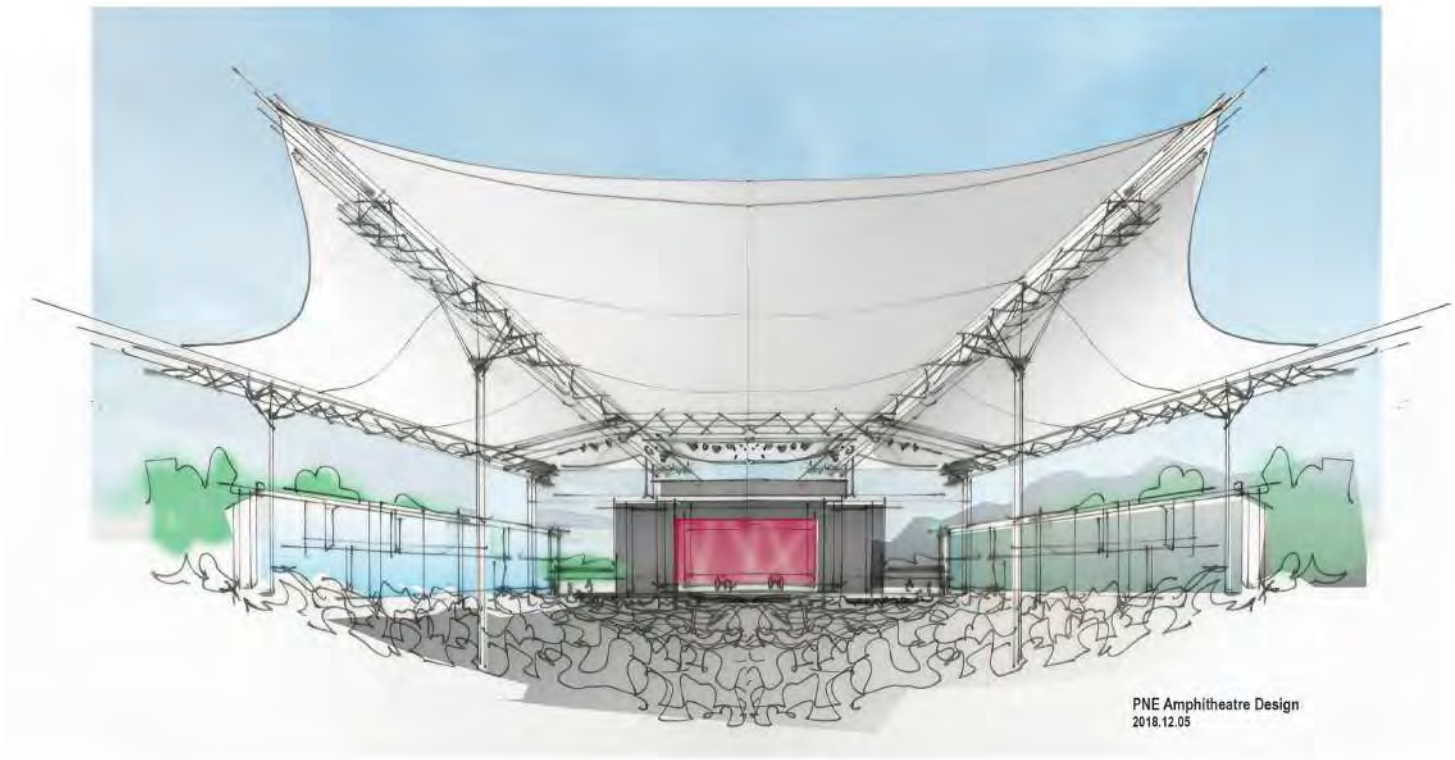
The development of the PNE Amphitheatre at Hastings Park will serve to fill much of the above demand. Furthermore, all of the respondents listed herein have stated they would consider staging some of their events at the PNE Amphitheatre in Hastings Park. As such, a working calendar of potential public, cultural and commercial events has been created to form the basis of the forecasted revenues and expenses for the Business Case section of this report.

Comparable outdoor amphitheatres in other cities were reviewed in order to evaluate venues that are similar to the requirements outlined herein. Amphitheatre style venues with covered stages that provide a mix of fixed and/or covered seating with expanded lawn seating options, parks and festival plazas, along with other municipally owned facilities were the primary venues reviewed.

In completing our review for this current phase of the PNE Amphitheatre development project, we have identified four primary design scenarios to be considered by the COV/PNE Project Team, Steering Committee and the HP-PNE Board.

These four scenarios outline a plan for the roof, stage, concessions locations, VIP suites, washrooms, power requirements, sound mitigation/noise control, front-of-house and back-of-house amenities and a potential operating model.

ARTISTIC RENDERING OF DESIGN SCENARIOS



1.6 PNE AMPHITHEATRE PRELIMINARY DESIGN SCENARIOS

SUMMARY OF FOUR DESIGN SCENARIOS

SCENARIO	ROOF SIZE	BUILDINGS & AMENITIES	CAPACITY	ESTIMATED EVENT CALENDAR
SCENARIO A: Roof covers stage and BOH only	590 m²	2 x one-story support buildings with washrooms, concessions, office	Bleachers = 4,500 Floor = 4,250 Total = 8,750	Commercial Shows = 7 Community Shows = 9 Total = 16 Shows plus PNE Fair
SCENARIO B: Roof covers full plaza. Two support buildings	6,300 m²	2 x one-story support buildings with washrooms, concessions, office	Bleachers = 4,500 Floor = 4,250 Total = 8,750	Commercial Shows = 11 Community Shows = 19 Corporate Shows = 4 Total = 34 Shows plus PNE Fair
SCENARIO C Roof covers full plaza. Two x 2-story support buildings with VIP	6,300 m²	2 x two-story support buildings with washrooms, concessions, office, plus 2nd floor Executive Lounge, rooftop patio and VIP suites	Bleachers = 4,500 Floor = 4,250 Executive Lounge = 290 VIP Suites = 300 Total = 9,340	Commercial Shows = 19 Community Shows = 22 Corporate Shows = 8 Total = 49 Shows plus PNE Fair
SCENARIO D Roof covers full plaza. Three support buildings with VIP.	6,300 m²	1 x one-story 1 x two-story 1 x three-story support buildings with washrooms, concessions, office, plus 2nd floor Executive Lounge, rooftop patio, VIP suites and flex meeting space	Bleachers = 4,500 Floor = 4,250 Executive Lounge = 290 10x VIP Suites = 400 Flex Space = 380 Total = 9,820	Commercial Shows = 24 Community Shows = 22 Corporate Shows = 16 Total = 60 Shows plus PNE Fair

SCENARIO A

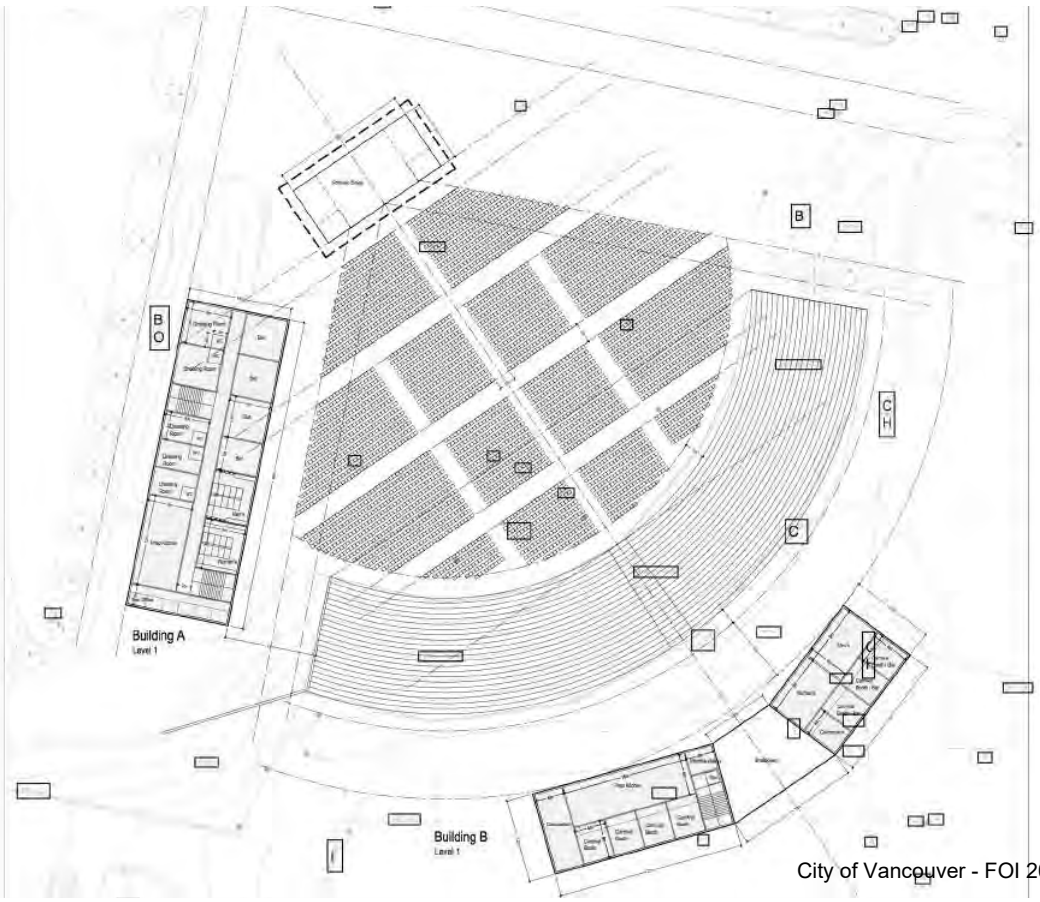
Roof: Provides a steel roof structure which is designed to cover the primary stage and work areas only at a height of 40'. The roof will utilize steel beams to provide rigging points for audio and lighting.

Buildings: There will be 2 x one-story buildings installed to provide concessions, washrooms, dressing rooms, production offices and box office. The stage will utilize portable risers to provide the main stage for concerts up to 8,750 capacity. The stage can also be moved to secondary locations closer to the bleachers, erected in smaller size configurations or is removable when not in use. The roof over the stage will be in a permanent fixed location. Building A on the lower west side will house the main concessions services with four bar and food concession stands, box offices, public washrooms, artist dressing rooms. Building B will house concessions, public washrooms, with a prep kitchen, security, first aid stations and office. The centre of Building B provides a gateway to Playland and includes shared washrooms, concessions and a bar facing east into Playland.

Capacity: With a removable stage and seating, the facility can accommodate flat floor flexibility for audiences up to 4,250 on the main floor, with bleacher seating for 4,500. This provides a total capacity for concerts at 8,750. Including the adjacent festival plaza will potentially allow for a capacity increase of 2,600 guests for a total of 11,350.

A sound barrier backwall will be installed behind the primary stage position and a freestanding noise wall will be installed along the northeast perimeter of the amphitheatre to mitigate existing neighbourhood noise concerns. Ceiling sound baffles suspended from the roof will reduce reverberation and absorb sound.

(Please note: capacity calculations used herein use Fire Marshall ratio of 1.2 m2/person for licensed events with ratios of 0.6 m2/person for seating in bleachers. The venue capacities stated must be considered as directional only for the purpose of this report, as no occupancy loads have been submitted for COV or VFD review.)



SCENARIO A

Capacity:

Bleachers 4,500
Floor 4,250

Total: 8,750

2 One Storey Support Buildings

Only Stage Covered

Number of Bleacher Rows: 24
(same as existing)

Stage Roof Area: ~280 m^2

Building A: 1 Level
~670 m^2

Building B: 1 Level
~520 m^2

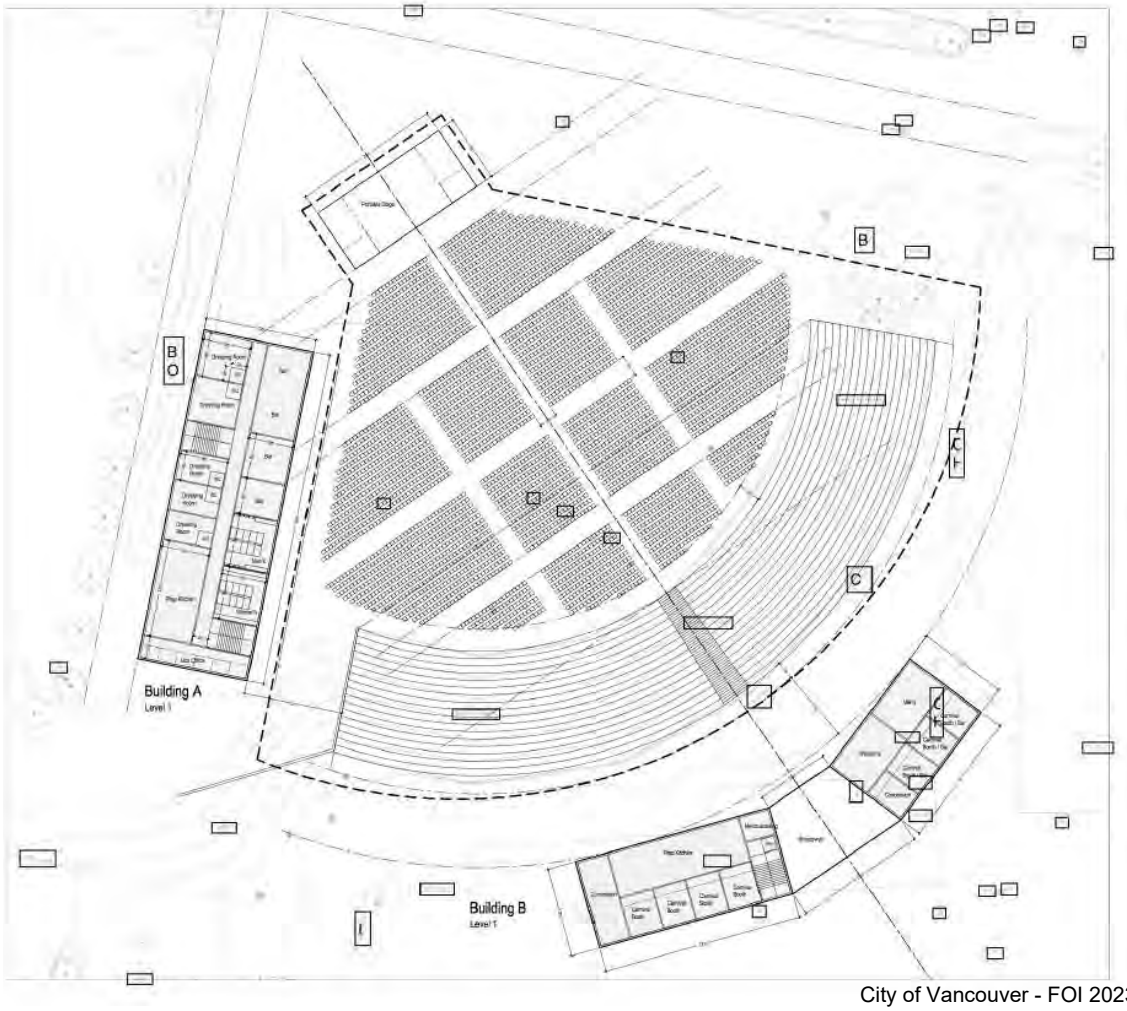
SCENARIO B

Roof: Provides a tensile roof which extends from the primary stage area at a height of 40' and extends upward to cover the plaza and bleachers to a height of 50'. The roof will cover the stage and the entire audience with a span of 6300 m2 extending to cover the floor area and bleachers.

Buildings: There will be 2 x one-story buildings installed to provide concessions, washrooms, dressing rooms, production offices, security, first aid and box office. The stage will utilize portable risers to provide the main stage for concerts up to 8,750 capacity. The stage can also be moved to secondary locations closer to the bleachers, erected in smaller size configurations or is removable when not in use. Building A on the lower west side will house the main concessions services with four bar and food concession stands, box offices, public washrooms, artist dressing rooms. Building B will house concessions, public washrooms, with a prep kitchen, security, first aid stations and office. The centre of Building B provides a gateway to Playland and includes shared washrooms, concessions and a bar facing east into Playland.

Capacity: With a removable stage, the facility can accommodate flat floor flexibility for audiences up to 4,250 on the main floor, with bleacher seating for 4,500, delivering a total capacity at concerts of 8,750. Including the adjacent festival plaza will potentially allow for a capacity increase of 2,600 guests for a total of 11,350.

Sound barriers and noise mitigation efforts will be implemented as per Scenario A.



SCENARIO B

Capacity:

Bleachers 4,500
Floor 4,250

Total: 8,750

2 One Storey Support Buildings

Stage, floor and Bleachers Covered

Number of Bleacher Rows: 24
(same as existing)

Stage Roof Area: ~6,300 m^2

Building A: 1 Level
~670 m^2

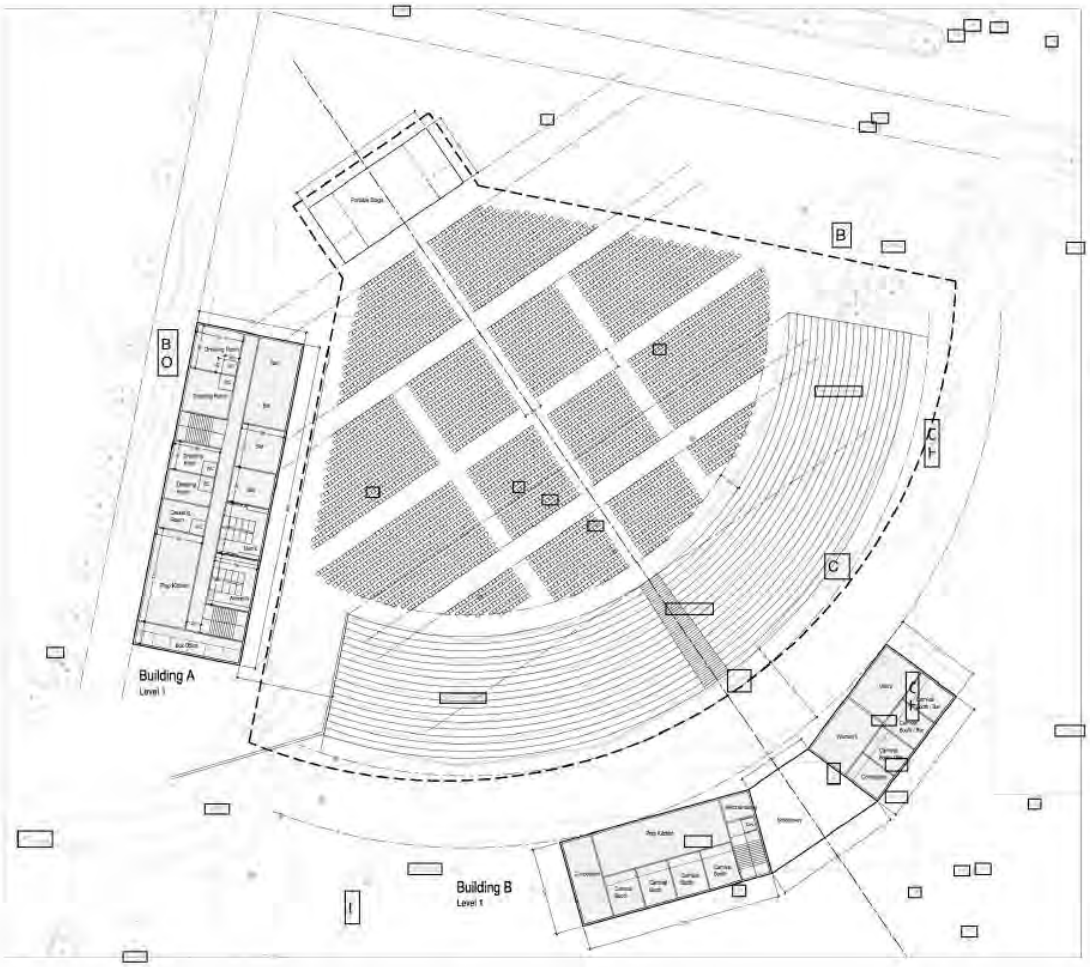
Building B: 1 Level
~520 m^2

SCENARIO C

Roof: Provides a tensile roof which extends from the primary stage area at a height of 40' and extends upward to cover the plaza and bleachers to a height of 50'. The roof will cover the stage and the entire audience with a span of 6300 m2 extending to cover the floor area and bleachers.

Buildings: There will be 2 x two-story buildings installed to provide concessions, washrooms, dressing rooms, production offices, security, first aid and box office. The stage will utilize portable risers to provide the main stage for concerts up to 8,750 capacity. The stage can also be moved to secondary locations closer to the bleachers, erected in smaller size configurations or is removable when not in use. Building A on the lower west side will house the main concessions services with four bar and food concession stands, box offices, public washrooms, artist dressing rooms. The second floor on Building A will house the Executive Lounge with a capacity of 290 plus a rooftop deck overlooking the stage. Building B will house concessions, public washrooms, with a prep kitchen, security, first aid stations and office. The second floor of Building B will house 10 x VIP suites with capacities for each suite ranging from 25 – 40 for a combined total capacity of 300. The centre of Building B provides a gateway to Playland and includes shared washrooms, concessions and a bar facing east into Playland.

Capacity: With a removable stage, the facility can accommodate flat floor flexibility for audiences up to 4,250 on the main floor, with bleacher seating for 4,500, delivering a total capacity at concerts of 8,750, plus VIP areas to serve 590 guests. Including the adjacent festival plaza will potentially allow for a capacity increase of 2,600 guests for a total of 11,940.



SCENARIO C

Capacity:

Bleachers	4,500
Floor	4250
VIP	590
Total:	9,340

2 Two Storey Support Buildings

Stage, floor and Bleachers Covered

Number of Bleacher Rows: 24
(same as existing)

Stage Roof Area: ~6,300 m^2

Building A: 1.5 Levels
~1,110 m^2

Building B: 2 Levels
~1,255 m^2

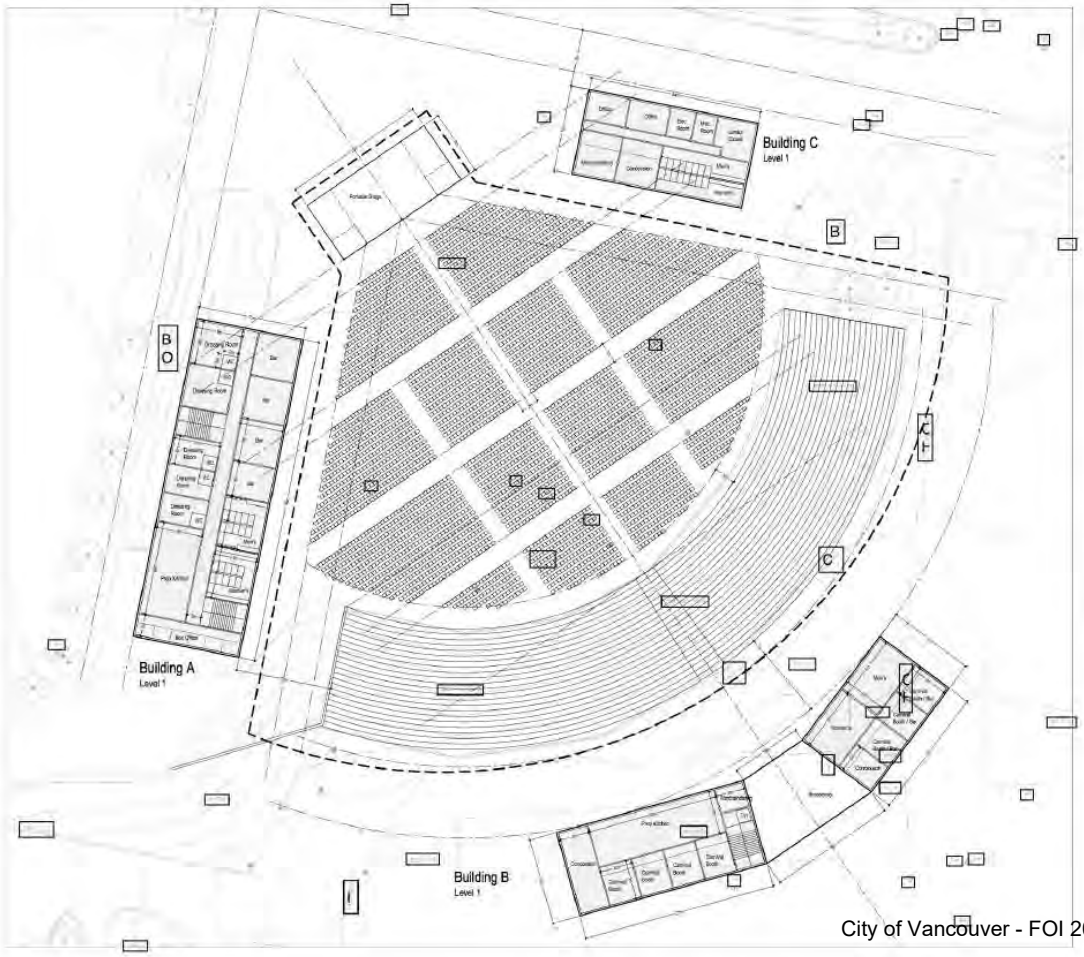
SCENARIO D

Roof: Provides a tensile roof which extends from the primary stage area at a height of 40' and extends upward to cover the plaza and bleachers to a height of 50'. The roof will cover the stage and the entire audience with a span of 6300 m2 extending to cover the floor area and bleachers.

Buildings: There will be 3 support buildings installed to provide concessions, washrooms, dressing rooms, production offices, security, first aid and box office. The stage will utilize portable risers to provide the main stage for concerts up to 8,750 capacity. The stage can also be moved to secondary locations closer to the bleachers, erected in smaller size configurations or is removable when not in use.

Building A will be two-stories to house the main concessions services with four bar and food concession stands, box offices, public washrooms, artist dressing rooms. The second floor on Building A will house the Executive Lounge with a capacity of 290 plus a rooftop deck overlooking the stage. Building B have three stories to house concessions, public washrooms, with a prep kitchen, security, first aid stations and office. The second floor of Building B will house 10 x VIP suites with capacities for each suite ranging from 25 – 40 for a combined total capacity of 300. The third floor of Building B will have additional VIP suites and will include flex space for meeting rooms, rehearsals, catering and flexible work spaces. The centre of Building B provides a gateway to Playland and includes shared washrooms, concessions and a bar facing east into Playland. Building C (one-story) will house the concessions and washrooms for the north side audience, plus two production offices and electrical utility rooms.

Capacity: With a removable stage, the facility can accommodate flat floor flexibility for audiences up to 4,250 on the main floor, with bleacher seating for 4,500, delivering a total capacity at concerts of 8,750, plus VIP areas to serve 590 guests, plus flex meeting space for 400 provides a total area for 9,820. Including the adjacent festival plaza will potentially allow for a capacity increase of 2,600 guests for a total of 12,420 people.



SCENARIO D

Capacity:

Bleachers	4,500
Floor	4,250
VIP/Flex	990
Total:	9,820

3 Support Buildings
Full Program

All Seats, Bleachers and Stage Covered

Number of Bleacher Rows: 24
(same as existing)

Amphitheatre Roof Area: ~6,300 m^2

Building A: 1.5 Levels
~1,110 m^2

Building B: 3 Levels
~1,990 m^2

Building C: 1 Level
~290 m^2

1.7 METHODOLOGY

The PNE Amphitheatre Demand Analysis and Business Case Report was accomplished by undertaking:

- An evaluation of the current venue site and operations;
- An update to the 2010 Demand Analysis Report conducted by John Donnelly & Associates, that includes: demographic and local market trend research, a survey of venue user organizations, and in-person interviews with key venue users;
- A comparison of existing venue supply to projected demand to aid with identifying gaps that may exist in the current venue market;
- A review of comparable Amphitheatres in other communities in order to identify assets and business models that may be used as examples for the PNE Amphitheatre in Vancouver.

An inventory and evaluation of existing venue assets provides an understanding of what events are currently taking place, the types of users, the amenities available, and the quality of the facilities. The inventory and evaluation were accomplished through a review of the City of Vancouver's background information, discussions with venue operators, visits to venues, and feedback received from venue users during the in-person interviews.

In our effort to ensure a fair and balanced report, Donnelly set out to hear from an equal mix of cultural organizers and event producers representing small, medium and large-scale companies and organizations.

John Donnelly & Associates conducted in-person and telephone interviews with 30 key organizations, as well as conducted an online survey, during October and November 2018. Interviews were held with leading producers, executive directors, and artistic directors representing a mix of Vancouver's largest cultural events, as well as independent producers and event organizers representing a mix of small, medium and large-scale companies and organizations. These conversations and interviews provided direct insight into the needs of the industry for a new outdoor performance venue in Vancouver. The goal of these interviews was to assess existing demand from the perspective of the producers, as well as anticipated future market demand, and to comment on the kinds of infrastructure needed to most effectively stage events at a new venue.

The full list of survey respondents is attached as Appendix A. The range of events staged by the survey respondents was used to formulate a potential venue calendar, listed in Appendix B.

The goal in selecting the interview candidates was to achieve a balance, which represented both cultural organizations and event producers who create small, medium and large-scale events. Interview candidates were selected in consultation with the City of Vancouver Cultural Services staff, as well as the PNE staff. The summary of survey questions and comments are attached as Appendix C and D, together with interview notes.

The venue capacity analysis was completed by comparing the inventory and evaluation of the existing supply of outdoor spaces within Vancouver and region to the findings of the demand study.

Research on comparable Amphitheatres in other communities was further conducted in order to identify and evaluate models of governance, operations and amenities that may be applicable for this new outdoor venue in the City of Vancouver.

1.8 ANTICIPATED USE OF THE PNE AMPHITHEATRE

The **anticipated uses** for the proposed PNE Amphitheatre at Hastings Park include, but are not limited to:

- Commercial concerts, events and festivals;
- Community and cultural performances (festivals, music, theatre, dance and cultural events);
- Corporate events (dinners, sports events, private company functions, environmental, weddings, and other events);
- Summer Nights Concert Series (annual premiere shows staged during the PNE Fair);
- Civic gatherings and celebrations;
- Races, walks, cycling and other events;
- Playland events such as school groups, graduation parties and convocations;
- Day-to-day reoccurring passive or un-programmed use when the venue is not in use, such as casual walking, sitting, socializing and recreation.

The **vision** for the PNE Amphitheatre at Hastings Park:

- Provides flexible, programmable space that maximizes its commercial potential;
- Offers sociable, inviting, accessible space that can become a year-round destination venue;
- Establishes a venue that enables dynamic programming and uses;
- Allows multi-use options (i.e. works well for a variety and scale of activities; passive, active and programmed) and is multi-disciplinary (i.e. used by an extensive range of community groups from cultural to commercial, sports, environmental and other);
- Supports community and professional events and activities, including free as well as scalable-ticketed access;
- Utilizes sustainable operations, environmentally and organizationally, with key support infrastructure such as power, water, sewer/washrooms, storage and other appropriate back-of-house systems;
- Becomes a venue that positively impacts surrounding areas, neighborhoods and communities;
- Embraces and commemorates Indigenous/aboriginal culture and heritage community opportunities by offering celebratory events, art and programs;
- Is accessible to all citizens.

In its fulfillment of the facility's mandate, the venue will be used by the PNE to present its own shows and events, as well as being offered for rent to individuals, associations and corporations who will, in turn, promote, organize and deliver public events. These individuals, associations and corporations are the facility's primary market and are identified hereinafter as venue users.

See (Section 5.6 – Potential Venue Calendar) for a listing of current and potential events at PNE Amphitheatre.

PART 2: DEMAND ANALYSIS

2.1 CITY OF VANCOUVER DEMOGRAPHIC OVERVIEW AND ATTENDANCE TRENDS

The population size and potential growth of Vancouver and area, along with trends in performing arts, sport and leisure events were examined in order to support the demand and need for a new outdoor venue in Vancouver and confirm its ability to become self-sustaining.

As stated in Vancouver's Music Strategy Interim Report (2018), "British Columbia is the third largest center for music production and live music in Canada, placing Vancouver in a position to sustain a thriving local music industry. BC boasts over 160 recording studios, over 285 music companies, and more than 400 festivals that take place across the province each year."[1]

Furthermore, Vancouver's Music Strategy Interim Report also stated, "research shows that music is an economic driver and a tool for urban development and social transformation." Governments, policymakers, academics, music industry professionals, and urban planners have identified the role of the music industry as a tool for:

- Creating jobs;
- Increasing local revenue without raising taxes;
- Streamlining and promoting public transport;
- Stimulating tourism;
- Regenerating urban areas;
- Retaining and attracting talent and investments;
- Social integration and the rationalization of urban infrastructure.

Music Canada Live commissioned an additional study which outlined the increased number of music-based events in BC, and the growth of the creative industries. According to the report: "Here, The Beat: The Economic Impact of Live Music in BC. Final Report (2018)", sector-wide optimism is due, in part, to the recent establishment of Amplify BC (BC's music fund administered by Creative BC). The survey found that 80% of the province's live music companies, for example, expect growth in revenues and attendance in the coming year. On the rise is a desire to nurture diverse audiences, promote what is a vibrant festival economy, and forge new connections with BC's tourism sector. The live music sector in BC is poised to meet these developments. In 2017, BC's live music companies supported 12,010 FTE's, $619.3 million in BC-based labour income, and $815.8 million in GDP to the provincial economy. Tourists visiting BC for music-related events contributed a further 2,900 FTEs, $99.1 million in BC-based labour income, and $168.7 million in GDP.[2]

The combination of population growth and absolute growth in the numbers of events leads to the conclusion of increased numbers of attendees and a strong market for outdoor performances and events.

1 Vancouver Music Strategy. Interim Report (2018) p.3-4

2 Full-time equivalent (FTE) is a unit that indicates the workload of an employed person or student in a way that makes workloads or class loads comparable across various contexts.

POPULATION GROWTH

In order to understand the demographic characteristics of Vancouver's local neighborhoods, the City of Vancouver and the surrounding Metro Vancouver regions were examined to project space needs. Populations are not static entities and their evolution over time has changing implications for performance and event space demand. Population projections to 2041 are presented in Figure 1: Projected Population Growth.

Population projections have been provided by Metro Vancouver's Regional Growth Strategy; revised in 2015 to incorporate projection figures contained in accepted Regional Context Statements.

FIGURE 1: PROJECTED POPULATION GROWTH

	2016	2021 (PROJECTED)	2031 (PROJECTED	2041 (PROJECTED)	% GROWTH (2016 TO 2041)
DOWNTOWN PENINSULA	97,975	105,000	120,000	130,000	32.69%
HASTINGS-SUNRISE	34,575	35,162	36,357	37,593	8.73%
CITY OF VANCOUVER	601,200	673,000	725,000	740,000	23.09%
METRO VANCOUVER	2,463,000	2,780,200	3,152,000	3,400,400	38.06%

HASTINGS PARK POPULATION

The population within the Hastings-Sunrise neighbourhood, which is the area surrounding Hastings Park, is projected to judiciously grow. According to Vancouver Magazine (2018), "over the last five to ten years, the Hastings-Sunrise area has transformed into one of the city's hippest areas."[3]

Moderate growth may occur through increased densification such as laneway houses, but unless there is a dramatic change to zoning there is unlikely to be a large increase in population. According to the City of Vancouver Planning, Urban Design and Sustainability Department, it is realistic to estimate slightly higher growth in the upcoming decades. It is estimated that the population in Hastings-Sunrise neighborhood will increase from 34,575 in 2016 to 35,162 in 2021 and to 37,593 by 2041.

While Hastings Park has a local function in serving residents of the Hastings-Sunrise neighborhood, Hastings Park should be considered a destination park. The PNE Fair, as well as additional events hosted on the site, attracts visitors from other areas of Vancouver, throughout Metro Vancouver and from other regions. Approximately 85% of the Fair's visitors originate within Metro Vancouver. The other 15% are from a radius further than 100 km. Overall attendance at the Fair in 2018 was 705,381 compared to 2017's total of 722,466 and 2016's total of 712,367.

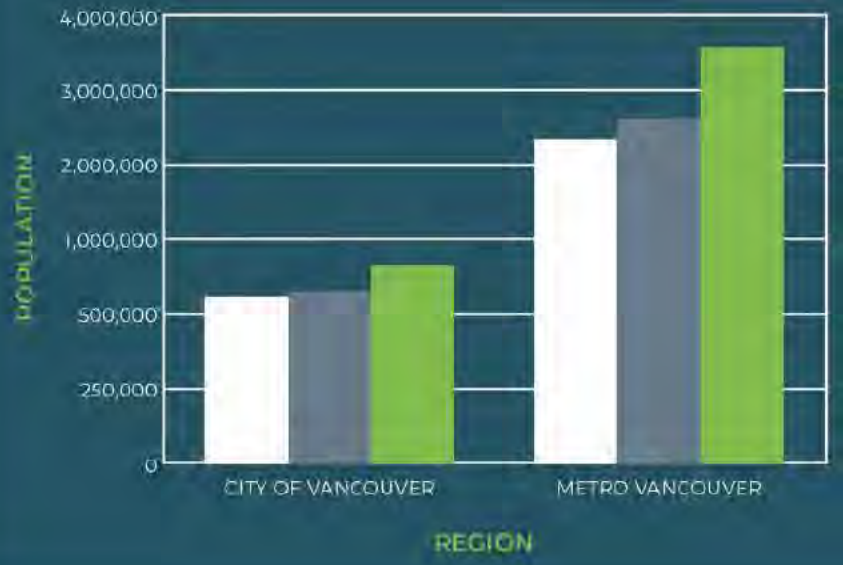
According to the Hastings Park/PNE Master Plan Phase I Inventory and Analysis report, the average number of non-community events held per year, over five operating years, is 220 over 1,216 days. Of these events, 123 utilize indoor building facilities while the balance occurs outdoors on grounds, lots and other areas. There is a further estimate of 680 activities taking place annually at the park, including community uses for which the PNE does not generate revenue.[4]

3 Neighbourhoods Hastings-Sunrise, Vancouver Magazine (nd 2018)
4 Hastings Park/PNE Master Plan – Phase I (2009)

CITY OF VANCOUVER AND METRO VANCOUVER

Any events held within the City of Vancouver are likely to draw participants from the surrounding regions, both from other areas of the city and from the Metro Vancouver region. The Metro Vancouver region is expected to grow from a population of 2.4 million people in 2016 to 2.6 million in 2021 and to 3.6 million people by 2041. The City of Vancouver is projected to take 24% of this growth, growing from a population of 631,490 in 2016 to 765,000 by 2041 (see Figure 2: Projected Regional Population Growth).

FIGURE 2: PROJECTED REGIONAL POPULATION GROWTH (2016-2041)



The Metro Vancouver region is expected to grow from a population of 2.4 million people in 2016 to 2.6 million in 2021 and to 3.6 million people by 2041. The City of Vancouver is projected to grow from a population of 631,490 in 2016 to 685,000 in 2021 and to 765,000 by 2041.

2.2 HOSPITALITY TRENDS

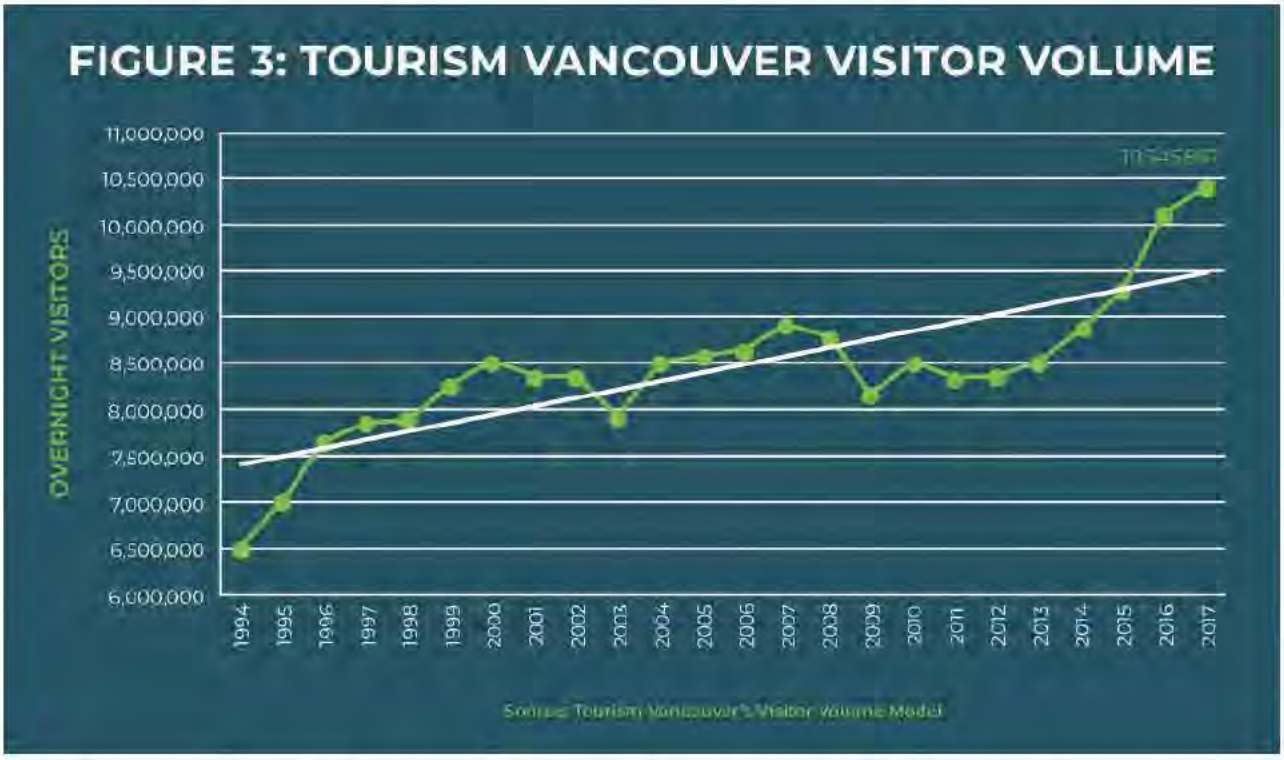
British Columbia is building a reputation for great tourism attractions and destinations; thus, Vancouver is a flourishing metropolis for the hospitality industry. Whether someone is seeking adventure, sightseeing or business, Greater Vancouver and the Lower Mainland is home to hundreds of hotels. In fact, the Greater Vancouver region has more than 22,350 guest rooms, with about 12,000 downtown.[5] According to BC Business (2018), "In the 12 months ending in June 2018, Vancouver's 79.1% hotel occupancy rate was the highest of any Canadian major market" . Vancouver's average daily rate climbed 10.6%, to $194.47, and revenue per available room grew 12.7%, to $157.29, over the same period (RevPAR)."

According to the Playland Market Analysis Report (2018):

- Despite the most recent decreases in 2008, 2009, and 2011, overnight tourism has been trending upward at a statistical rate of 2% since 1994;
- In 2017 there were over 10.3 million overnight visitors, up 300,000 visitors from 2016;
- Overnight tourism has increased by over 1.9 million visitors or a statistical compound annual growth rate of 3% per year since the last report (2010).

5 BC Business - Vancouver Hotel Occupancy (Sept 2018)

FIGURE 3: TOURISM VANCOUVER VISITOR VOLUME



Regarding hospitality trends in the venue and special event industries, the interview respondents noted a huge increase in the amount of VIP services being made available at festivals and major events. As noted in the interview responses, the festival market is maturing and there is a growing audience with disposable income who are prepared to pay more for VIP seating, better food, premium beverages and enhanced customer experiences.

John Donnelly & Associates noted that numerous existing major Canadian venues and arenas have undergone renovations to increase the size and quantity of their offerings for corporate suites, including Budweiser Stage Amphitheatre in Toronto.

Therefore, Donnelly is recommending that corporate suites be included in all venue design scenarios.

2.3 FOOD AND BEVERAGE TRENDS

According to Restaurants Canada, British Columbia led the country with a 7.7% jolt in food-service sales in 2017, and hospitality is forecasted to drive growth again in 2018, with sales expected to increase by 4.3% countrywide. To exceed customer needs, Vancouver is seeing innovative services emerge in the hospitality space, such as the increase of food trucks, and the increased selection of available food services at events.

Recent changes to the BC Liquor laws now allow for site-wide licensing at applicable outdoor events. The PNE Fair has enjoyed site-wide licensing for the annual fair and for other commercial events staged in the current Amphitheatre location.

It is assumed in this report that appropriate stadium or site-wide licensing will be obtained for the venue, thereby allowing food and beverage revenue forecasts to include net revenues generated from licensed beverage sales at Amphitheatre events.

2.4 EVENT AND PERFORMANCE TRENDS IN DEMAND BY RESIDENTS

It is important to understand national and provincial cultural performance, as well as event attendance and participation trends in order to compare that information to the local market. The following key findings summarize data from our event and performance attendance trend analysis.

Key points noted below highlight the qualitative and quantitative research on the impacts of the music industry in Vancouver, as noted in a report commissioned by Music BC and conducted by Sound Diplomacy: Vancouver Music EcoSystem Study (June 2018). Sound Diplomacy facilitated public engagement with music industry stakeholders via interviews and roundtable discussions.[6]

- British Columbia is the third largest centre for music production and live music in Canada, placing Vancouver in a position to sustain a thriving local music industry. BC boasts over 160 recording studios, over 285 music companies, and more than 400 festivals that take place across the province each year;
- There exists a growing sense of community and momentum within BC's live music sector;
- Stakeholders are increasingly seeing themselves as an important and inclusive whole;
- In the next year, 78% of festivals expect to see an increase in attendance, 59% of venues expect an increase in fill rates, and more than half of BC promoters expect to book more shows;
- The economic impact of the music ecology in Vancouver is estimated at over $690M annually;
- The live music sector generated a total of more than $740 million in overall revenues in 2017, of which more than $584 million (79%) was live music-generated revenue.

2.5 ATTENDANCE INDICATORS - CULTURAL AND PERFORMANCE ACTIVITIES

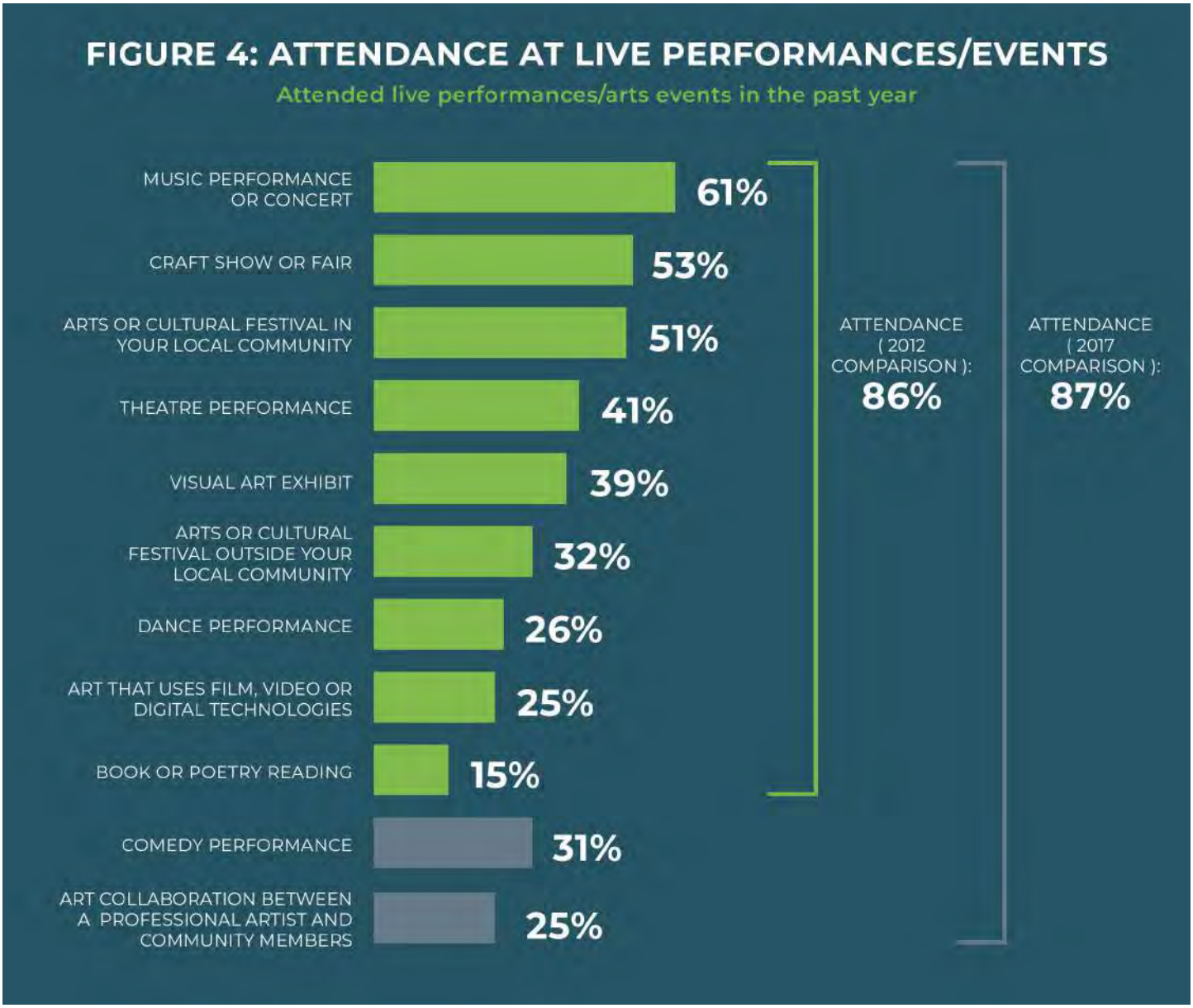
One method to assess demand is to measure attendance and participation. With respect to cultural activities according to the Arts and Heritage Access and Availability Survey,[7] "Attendance of performances and arts events is as strong as ever. In 2016-2017, 87% of Canadians attended at least one performance or arts event (including craft shows and visual arts exhibits). Overall attendance is also high (80%+) across all regions and most segments of the Canadian population."

More than eight in ten Canadians attended at least one performance or arts event in the past year. According to Hill Strategies,[8] participation rates for many arts, culture, and heritage activities have increased over 25 years. In fact, arts attendance levels were very high in 2016, with nearly nine in ten Canadians (86%) attending an art gallery, an arts performance, an artistic or cultural or festival, or a movie theatre.

The most popular types of events were music performances (61%), craft shows or fairs (53%), and local arts or cultural festivals (51%).

In British Columbia, the absolute number of patrons attending events, along with the number of events continues to increase.

6 Sound Diplomacy and Secret Study – Vancouver Music Ecosystem Study (2018)
7 Hill Strategies - Arts and Heritage Access and Availability Survey (2016-2017)
8 Hill Strategies - Canadians' Arts, Culture, and Heritage Participation in 2016 (2018)



2.6 ATTENDANCE INDICATORS - SPORTING EVENTS AND LEISURE ACTIVITIES

Recent participation and attendance rates indicate a growth in popularity for a number of sporting events and leisure activities. Certain sport organizers are direct users of performance and event spaces in the City of Vancouver, requiring similar venues and infrastructure for the festival components of their start/finish lines. These events include runs, walks, cycling races, triathlons, dragon boat festivals, and rowing events. Other sport and recreational activities, such as soccer, baseball, volleyball, tennis, rugby and football do not generally require the same infrastructure necessary for performances and events. Nevertheless, these groups are users of many of the same outdoor spaces, increasing demand pressure on venues, primarily in the case of parks.

The listing of events currently being staged in outdoor venues controlled by the Parks Board demonstrates that sport and recreational activities particularly dominate the list of current users of Vancouver's outdoor parks.

2.7 ECONOMIC INDICATORS – CULTURAL PERFORMANCES

Another method of assessing demand is to monitor economic behaviour, such as the amount of money spent on attending cultural events or the amount earned by organizers and promoters of events.

According to Hill Strategies research on Performing Arts & Theatres in British Columbia (2015), the average household expenditure on admissions to live performing arts events, for example, plays, concerts and/or dance performances, increased from $68 per household in 1997 to $126 per household in 2013.[9]

On average visitors spend approximately $40 per trip on recreation and entertainment (overnight visitor behavior from Playland Market Analysis Report 2018).

Over 10.3 million people visited Vancouver in 2017 – the highest overnight visitation in the city's history.

Some of the increases in household expenditures and operating revenue can be explained by increases to ticket prices and admissions rather than completely attributed to an increase in demand. For the purposes of our study, the above figures are also limited in that they do not indicate whether performances were indoors or outdoors, nor do they account for attendance at free events and performances. Notwithstanding these limitations, the figures do indicate an increase in demand in British Columbia for performing arts products.

9 Canada Council for the Arts Funding for Arts Organizations (2012-2013)

2.8 EVENT AND PERFORMANCE TRENDS IN DEMAND BY NON-RESIDENTS

The tourism sector in Vancouver has grown consistently over the past decade, and the new Vancouver Tourism Master Plan (2013) outlined its mandate to drive continued tourism growth, which included its own recommendations supporting the Hastings Park – PNE Master Plan. Tourism Vancouver recognizes that growth in events leads to growth in all sectors of tourism and concludes that the Vancouver tourism industry is an integral part of the Vancouver economy.[10] The city is highly regarded as one of the world's best places to live in terms of its environment, cultural diversity and quality of life, which makes it attractive to visitors. Vancouver has tremendous strengths in terms of its infrastructure and natural assets that support tourism, including one of the world's most highly regarded airports, the Canada Line transit system, the Vancouver Convention Centre, BC Place stadium, and other tourism assets. It further recommends that the tourism industry supports and will work diligently to enhance and leverage the promotion of more events, festivals and cultural tourism in the immediate future.

NUMBER OF VISITORS

The number of overnight visitors to Vancouver has grown exponentially in the past 20 years, and this is further evidenced by the increased cost in hotel rooms. In 2016, the Greater Vancouver region had an average room rate of $138 and average occupancy rate of 79%, which has climbed to $194.47, and average revenue per available room grew 12.7 percent, to $157.29, over the same period (RevPAR).

- Despite slight decreases in 2008, 2009, and 2011, overnight tourism has been trending upward at a statistical rate of 2.0% since 1994;
- In 2017 there were over 10.3 million overnight visitors, up 300,000 visitors from 2016;
- Overnight tourism has increased by over 1.9 million visitors or a statistical compound annual growth rate of 3.0% per year since the last report (2010);
- The growth in the overnight visitor market and decrease in potential supply has placed upward pressure on average daily rates and occupancy since the previous report.

FIGURE 5: VISITORS TO METRO VANCOUVER

Metro Vancouver visits are UP: The number of total overnight visitors to Metro Vancouver for year-to-date 2015 volumes

VISITORS	FEBRUARY	YTD 2016	YTD 2015	% CHANGE
TOTAL VISITORS	558,997	1,114,729	1,019,157	9.4%
CANADA	314,212	636,138	600,880	5.9%
U.S.	159,287	307,047	266,290	15.3%
EUROPE	18,384	36,167	32,772	10.4%
MEXICO	6,142	12,768	9,801	30.3%
ASIA/PACIFIC	57,142	113,062	101,115	11.8%

Source: Tourism Vancouver's Visitor Volume Model, MNP (Date to February year-to-date 2016)

10 Tourism Vancouver Master Plan (2013)

FIGURE 6: OVERNIGHT VISITORS TO METRO VANCOUVER

PLACE OF ORIGIN	2010	2017	GROWTH	
			NUMERIC CHANGE	% OF GROWTH
BRITISH COLUMBIA	2,667,493	2,966,665	299,172	15.5%
OTHER CANADA	2,538,731	3,104,218	565,487	29.3%
U.S.	1,924,836	2,405,287	480,451	24.9%
ASIA/PACIFIC	723,087	1,145,151	422,064	21.9%
EUROPE	443,492	495,963	52,471	2.7%
OTHER INTERNATIONALS	117,727	228,583	110,856	5.7%
TOTAL:	8,415,366	10,345,867	1,930,501	100%

VISITOR ACTIVITIES

The study conducted by the BC Council for the Arts (2012)[11] which provides funding to artists and arts organizations in British Columbia noted that 71% of surveyed British Columbians attended at least one live art performance—such as a play, musical, concert, dance performance, opera or storytelling—in the past year (2012), and 48% attended at least one arts or cultural festival in that same period. Overall, 58% of surveyed British Columbians rated the quality of arts and culture events in their community as good or very good.

11 BC Council for the Arts Funding Report (2012)

2.9 DEMAND SUMMARY

In order to reach conclusions about the demand for the new PNE Amphitheatre, the population size and potential growth of Vancouver and area, along with trends in performing arts and sport and leisure events were examined. It was discovered that:

- Nordicity's report Here, The Beat: The Economic Impact of Live Music in BC (2018), noted "In the coming year, 78% of festivals expect to see an increase in attendance, 59% of venues expect an increase in fill rates, and more than half of BC promoters expect to book more shows;
- Operating revenue earned by Performing Arts companies in British Columbia continues to increase with Statistics Canada reporting, "Performing arts generated $2.2 billion in operating revenue in 2016, up 5.8% from 2014... with BC companies accounting for 12.2%", which demonstrates continued growth (See Appendix G: References);
- In British Columbia, the average household expenditure on admissions to live performing arts events increased from $68 per household in 1997 to $126 per household in 2013;
- In the twelve months ending June 2018, Vancouver's hotel room occupancy rate was the highest of any Canadian major market;
- An overwhelming 98% of respondents to the survey and interviews conducted for this report noted that there are capacity gaps in available outdoor performance and event spaces in Vancouver.

These general statistics are further supported by confirmation from City staff that there was a 10% increase in the total number of approved special event applications in Vancouver from 2017 over 2016.

DIRECT INTERVIEWS WITH CULTURAL PERFORMANCE AND EVENT PRODUCERS

As a source of demand information, the authors contacted key individuals from event and cultural organizations and companies and arranged for a series of in-person interviews and discussions during October, November and December 2018. The goal was to have a direct conversation with these producers to solicit their comments and opinions, and thus determine their specific needs for the PNE Amphitheatre.

From an initial list of over 150 event producers, cultural groups, service organizations, and private businesses considered to participate in this study, 40 key producers / cultural organization leaders were selected and invited to participate in an in-depth personal interview and discussion with the author, John Donnelly and/or PNE Consultant, Peter Male. The groups selected represented a wide range of cultural interests and diversity, encompassing both not-for-profit and commercial industries, with company sizes ranging from small to large. These interviews provided direct insight into the needs of the event industry for the new PNE Amphitheatre at Hastings Park.

Consideration was given to meet with organizations and companies who had staged events in the past at the PNE / Hastings Park, as well as cultural and event groups of all sizes and Vancouver commercial event producers. Of the 30 interview participants, 45% represented cultural performance organizers, while 55% were commercial event producers.

The complete list of interview participants is attached as Appendix A: List of Survey Respondents.

KEY THEMES AND OBSERVATIONS

One focus of the conversations with the event producers was to benefit from their experience and obtain their insight from the user's perspective on infrastructure and functionality requirements for this venue. Following are key themes and observations that emerged during the conversations.

a) Venue Infrastructure: A universal theme among producers was that the venue should have complete installations of power, internet, water, cover, washrooms, concessions, VIP suites, ticket booths etc., with flexible stage sizes and locations.

b) Venue Size and Supply: It became clear in these conversations, that producers perceive a lack of available outdoor performance space in Vancouver for events that attract audiences in the range of 2,000 to 10,000 people. This is supported by the fact that Vancouver's current venues that range from 1,000 - 5,000 and 5,001 to 10,000 capacity are heavily booked and/or not suitable for events or performances.

c) Venue Capacity: Gap commentary as stated during interviews saw ranges as outlined in Figure 7 below.

FIGURE 7: INTERVIEW COMMENTARY - VENUE CAPACITY

ORGANIZATION	CAPACITY GAP
AEG LIVE	3,000 to 8,000
Asian-Canadian Special Events Association	3,000 to 5,000
African Heritage Festival of Music and Dance Society	3,000 to 5,000 flat floor, multipurpose, covered
Blueprint Inc.	2,500 to 15,000
brandLIVE	2,000 to 6,000 including flat floor flexible space
Canadian International Dragon Boat Festival Society	3,500 to 6,000 venue with audience cover
Coastal Blues and Jazz	3,000 to 7,500
Filipino Canadian Cultural Society	2,500 to 4,000
Ismaili Council for BC	2,000 to 8,000
Live Nation	2,000 to 9,000 with seating, scalability for ticketing, and a permanent stage and roof.
Patrick Roberge Productions	2,000 to 8,000 with removable seats, back wall, roof, noise mitigation
PuSH International Performing Arts Festival	2,000 +
Sakamoto Promotions	3,000 to 10,000
Solid Productions	3,000 to 8,000
Secret Study	2,000 to 6,000
Timbre Productions	2,000 to 10,000... must work for smaller shows at 3,000 and host 10,000 for festival success
Vancouver Chinese Cultural Festival	4,000
Vancouver Farmers Market	2,000
Vancouver International Bhangra Celebration Society	5,000
Vancouver Pride Society	2,000

d) Lack of Mid-Size and Large Venues: A general consensus from a working industry group identified as the "Vancouver Event Collective" was that there is a lack of mid-size and large venues available for general event use.

There is no outdoor venue supply in Vancouver to accommodate mid-size events and performances. From 1986 to 2007, Plaza of Nations served events with capacities ranging from 2,000 to 5,000, and since the removal of the roof at that venue, no venue has been made available to replace the functioning event space previously provided at Plaza of Nations.

e) Loss of Existing Venues: The Plaza of Nations venue and stage hosted an average of 30 to 50 major events or performances each year. The expansive roof structure that covered the audience and stage areas, allowed shows to be produced over an extended summer season, which lasted six months each year, from May to October. This venue is expected to be demolished in 2019. The producers of large-scale events also claimed the loss of UBC Thunderbird Stadium as a venue for outdoor concerts and festivals has left a gap, and there is no suitable outdoor venue in Vancouver for commercial events, which attract 10,000 people or more.

f**) Venues with Exclusive Use Agreements:** Events up to 2,100 people could be staged at Malkin Bowl but this venue has a seasonal tenant which runs from June through to the end of August, and an exclusive use agreement with Live Nation which enables them to book dates at this venue. Live Nation's bookings are done early in the season for shows in May, June and September leaving limited availability for other use and no access for competitive promoters.

g) Anticipated Growth: Looking forward, all producers are generally planning for an increased number of performances and events. What is more, all producers are working to achieve increased attendances. While the available space has declined, attendance at concert events have generally increased in terms of total numbers of concerts and attendance.

h) Noise Concerns: Another recurring theme for producers arranging outdoor events was noise concerns. Most organizations producing festivals or performance events require amplified sound and the perception is that the City of Vancouver is unwilling to allow amplified sound near any city parks. The reality is that amplified sound is allowed, however, in fulfilling the Park Board mandate, staff endeavors to be sensitive to neighbour and wildlife issues and therefore, will limit total usage in secluded parks.

i) Requirement for Cover: The interview respondents strongly indicated a need for a covered outdoor venue. Primarily, the cost to install a professional stage with a steel structure roof or any roof capable of handling the elements and withstanding sizeable winds, or a covered stage of any size (for smaller organizations) was a major factor in determining if an event will be affordable. Given that Vancouver's annual precipitation averages 166 rainy days each year, the need for cover from the elements is further exemplified. There was consensus that if an outdoor venue with a stage and cover was available across the summer season, then producers would be more likely to stage large outdoor events or performances.

Other attributes identified in the interviews with venue users include:

a) Top Front-of-House Attributes identified are: located close to public transport, permanent public washrooms, green space and indoor/outdoor functional space, covered stage, main stage, bike racks, cover for audience, VIP suites, food concessions and hard covered surface;

b) Top Back-of-House Attributes identified are: site electricity, truck loading, internet, running water, amplified sound, site lighting, storage, green rooms, dressing rooms and grey water removal.

As a facility owner, the City of Vancouver and the PNE's interests will be best served when facility utilization is high. The market survey therefore looked to the average of the greatest number of collective uses rather than to the biggest single uses as a determinant of appropriate capacity.

The market sounding research indicated the majority of community uses will be in the 1,000 to 5,000 seat range. This information suggests the design of the Amphitheatre must provide a comfortable experience for smaller audiences and the seating capacity must, therefore, be matched with the market's ability to deliver audiences on a regular and consistent basis.

The venue needs to service the commercial concert promotion market and these users will book events that draw larger audiences of 5,000 to 10,000 people. Festival producers with multiple stage events will require event capacities up to 12,500 across an extended site.

The forecasted calendar included in the financial projections, (Section 6.2: Potential Event Calendar) of this report, demonstrates that there will be a demand for smaller scale and community events. The seat count and the seating design, therefore, needs to be flexible enough to accommodate smaller events (the greater demand by number of anticipated uses in this market) as well as larger events (which show lesser demand but forecast more lucrative revenues per show).

PART 3: AMPHITHEATRE AND OUTDOOR VENUE MARKETPLACE

3.1 EXISTING SUPPLY OF OUTDOOR PERFORMANCE SPACES IN VANCOUVER

INVENTORY OF OUTDOOR VENUES

The 2010 Demand Analysis study included a review and assessment of existing outdoor performance and event spaces available to users. Sites were assessed to identify what infrastructure or amenities are in place and available for use by event organizers, who are currently using the sites, how many people are attending events at the sites, overall site availability and capacity.

Eleven venues were evaluated to provide basic information about their use and functionality for performance and event operations. These locations were selected from an overall list of 54 sites and they were determined to be of the greatest relevance to the study:

- Ambleside Park – capacity 9,000
- Bill Reid Millennium Amphitheatre – capacity 25,000
- Brockton Oval – capacity 10,000
- Creekside Park – capacity 7,500
- Deer Lake Park – capacity 9,000
- Holland Park – capacity 24,000 (pictured below)
- Jack Poole Plaza – capacity 5,700
- Jericho Beach Plaza – capacity 20,000
- Malkin Bowl – capacity 2,100
- Queen Elizabeth Theatre Plaza (šxʷƛexən Xwtl'a7shn) – 2,700
- Vancouver Art Gallery (šxʷƛənəq Xwtl'e7énḵ) – capacity 3,000

From this list of venues, it is important to note that all are still operating, however, the majority of these outdoor parks should be considered "less available" than they were in 2010.

Use of Lumberman's Arch or Ceperley Meadow in Stanley Park for any outdoor licensed music or cultural event requires an application to Vancouver Park's Board. The application for events with music or liquor service must be submitted up to one year in advance as it must be reviewed by the Parks Board, who require written approval from all First Nations bands before considering any application for use of Stanley Park. This makes it very difficult to host events in these locations.

New residential development and noise restrictions have fully limited use of Jack Poole Plaza for any concert or high-volume outdoor event beyond Canada Day, New Year's Eve and other civic events. The venue is booked and managed by the Vancouver Convention Centre, which charges premium rates for rentals and services. Due to structural concerns the maximum capacity for Jack Poole Plaza has been reduced to 5,700 people.

New residential development and noise restrictions have also severely restricted any cultural or commercial event use for Vanier Park, Plaza of Nations, David Lam Park, Jericho Beach Park, Creekside Park and Trout Lake.

Two comparative venues within the Lower Mainland, Deer Lake Park in Burnaby and Holland Park in Surrey were included in the assessment, although these parks are outside the geographic parameters of City of Vancouver. Considering the accessibility and the amenities offered, these two regional sites are feasible venue options for local performance and event organizers to consider.

Deer Lake Park now has a venue capacity of 9,000 and hosts approximately five concerts per year under an exclusive contract between the City of Burnaby and Live Nation Canada. Other operators are not allowed to access the park unless arrangements are negotiated with Live Nation or the City of Burnaby.

Holland Park in Surrey has become a viable large-scale venue, with a capacity for concerts and festivals extending to 24,000 for concerts and 40,000 for festivals. This park has many amenities including power, internet, water and grey water disposal, paved staging areas and paved pathways so it hosts approximately 10 festivals and large-scale events each year.

Eleven venues were evaluated to provide basic information about their use and functionality for event operations. A summary of the assessment is included on the following pages (Figure 8). Detailed descriptions of the venues are provided in Appendix F: Comparative Venue Summary.

FIGURE 8: SUMMARY OF EXISTING OUTDOOR VENUE SUPPLY

FACILITY	LOCATION	CAPACITY	BRIEF DESCRIPTION	SERVICES INCLUDE
Ambleside Park	West Vancouver	9,000	• Located in West Vancouver, Ambleside Park is fully accessible and well used by both west Vancouver residents and visitors. • The park is adjacent to a beach with a view of Stanley Park. • The park is also equipped with a dog park, water park, sports fields & picnic areas. • The park plays host to a a number of concerts, events & festivals predominantly in the summer.	• Public pay parking is limited. • No parking inside the park. • General Admission • Concession stand on site.
Bill Reid Millennium Amphitheatre	Surrey	25,000	• In Cloverdale, this large park has open grass & walking paths. • The park hosts a variety of events such as Canada Day & The Sounds of Summer Music Series.	• Pubic pay parking is limited. • Accessible, with paths running throughout the park. • Food & beverage is brought in. • Power & water onsite.
Brockton Oval	Vancouver	3,000	• Located at Brockton Point on the north side of Coal Harbour. • Open space, next to the Brockton Pavilion & the Brockton Playing Fields. • Stands for spectators which include changerooms & washrooms. • Field is primarily used on weekends for Rugby games. • It is frequently empty. • Running track rarely used.	• Public pay parking at various locations around the park.
Creekside Park	Vancouver	7,500	• Gateway to Science World & a popular venue for summer events & festivals. • Creekside Park has many benches & grass berms for relaxing in the sun or enjoying views of False Creek & the downtown core.	• Public pay parking is limited.
Deer Lake Park	Burnaby	9,000	• Situated in The City of Burnaby's arts and heritage precinct. • Host to year round outdoor festivals & events. • Performance venue overlooking Deer Lake.	• Public parking is limited. • Picnic style seating.
Holland Park	Surrey	24,000	• Holland Park offers a variety of park amenities, including large sports fields, basketball courts, & playground. • Holland Park hosts large community & city events including Fusion Festival, Movies under the Stars & Live Nation Concerts. • Park is also home to the Holland Gardens, which include a large central amphitheatre & water fountain.	• Public pay parking & washrooms are available, with access off King George Boulevard. • Power & water onsite.
Jack Poole Plaza	Vancouver	5,700	• Urban outdoor space used for festivals, community gatherings & special events. • Plaza offers great views of the mountain-backed Burrard Inlet.	• Public pay parking at the Vancouver Convention Centre. • Power available.
Jericho Beach Plaza	Vancouver	20,000	• Jericho's beaches & sailing club attracts people from all over Vancouver who want to experience the waters of English Bay.	• Public pay parking is limited. • Concessions onsite. • Picnic tables for sitting.
Malkin Bowl	Vancouver	2,100	• Outdoor performance stage that hosts concerts & cultural events in Stanley Park. • Malkin Bowl is now available for year-round rentals. • The outdoor theatre was recently renovated to add new heating & cooling systems, a new floor & a retractable stage door.	• Public pay parking. • GM & reserved seating. • Free water stations. • Cash only food & beverage.
Queen Elizabeth Theatre Plaza	Vancouver	2,500	• Performing arts venue in downtown Vancouver. • Outdoor plaza area infront of theatre.	• Public pay parking.
Vancouver Art Gallery	Vancouver	3,000	• The fifth-largest art gallery in Canada & the largest in Western Canada.	• Public pay parking.

INVENTORY OF LARGE CAPACITY INDOOR VENUES

For the purposes of the PNE Amphitheatre review, and in consideration of the potential capacity for the Amphitheatre being in the range of 1,000 to 10,000 capacity, this study was expanded to include reviews of existing, large-capacity indoor performance venues available to users. These venues were assessed to identify what infrastructure is currently available for use by event organizers, who are currently using the sites, how many people are attending events at the sites, overall site availability, rental rates, labour costs and capacity.

Ten indoor venues were evaluated to provide basic information about their use and functionality for performance and event operations:

- BC Place Stadium – capacity 54,500
- Roger's Arena – capacity 18,910
- Pacific Coliseum – capacity 17,713
- UBC Doug Mitchell Thunderbird Sports Area – capacity 6,500
- Langley Event Centre – capacity 5,276
- Abbotsford Event Centre – capacity 7,888
- Queen Elizabeth Theatre – capacity 2,781
- Orpheum Theatre – capacity 2,688
- Chan Centre for the Performing Arts – capacity 1,185
- Vogue Theatre – capacity 1,250

EVALUATION OF EXISTING VENUE SUPPLY

The existing supply of outdoor and large capacity indoor venues within the City of Vancouver can be evaluated in terms of capacity, availability, governance, location, and amenities.

Many of the outdoor venues commonly used in Vancouver for performances and events include sports fields or courts as part of their infrastructure. These fields are used on a frequent basis throughout the year for recurring or programmed recreational sports, limiting availability for other performance or event usage. Of the 54 venues previously identified in the City of Vancouver 2010 Demand Analysis Report, 19 (35%) have more than 100 permitted sport or recreational activities taking place annually. In some cases more than one sport activity may occur on the same day, therefore heavy usage and limited availability is indicated for these venues.

BC Place is booked for 200 event days per year. Roger's Arena is a top grossing arena in North America based on ticket sales, ranked at 31st in the 2017 Top Grossing Arenas by Pollstar Magazine. The high cost of staging cultural or community events in Rogers Arena and BC Place, plus their lack of open dates, are factors which limit the overall venue availability of Vancouver's arenas and large-scale venues for community and commercial use.

Venues with a capacity of 1,000 – 3,999 have the second highest average rate of use, demonstrating a venue supply gap.

With 90% of survey respondents projecting an increase in attendance at their events in the next 10 years, it is expected that many of the 3,232 events currently being held at the 20 outdoor venues in the 1,000 – 3,999 capacity range will outgrow their current venue size in coming years, thereby requiring venues in the 4,000 – 6,999 range to accommodate this group. Currently, there are only seven venue options with 4,000 – 6,999 capacity. This capacity category has the least supply of venues. This demonstrates that there is a projected supply gap to support future demand for outdoor venues that can accommodate 4,000 – 6,999 people. Therefore, a new venue must be built to accommodate events with a capacity range of 4,000 – 6,999 as a critical demand state has become apparent.

Currently, there are only four venues (Jack Poole Plaza, Langley Events Centre, PNE Forum, UBC Doug Mitchell Thunderbird Sports Arena), including outdoor parks, with capacity range of 4,000 – 6,999 that are suitable for public events. This capacity category has the least supply of venues. This demonstrates that there is a supply gap to support the demand for outdoor venues that can accommodate 3,000 – 7,000 people, and that a critical demand state has been reached.

A consortium of Vancouver-based event producers approached the City of Vancouver on March 12, 2018, working under the moniker of the "Vancouver Event Collective", to address the need for more venues in Vancouver suitable for public gatherings with larger capacity ranges.

The executives from this working group were invited to respond to our questionnaire which outlined the plans for the PNE Amphitheatre Renewal Project and requested input from these event producers as to the infrastructure and amenities they would require at their event venues.

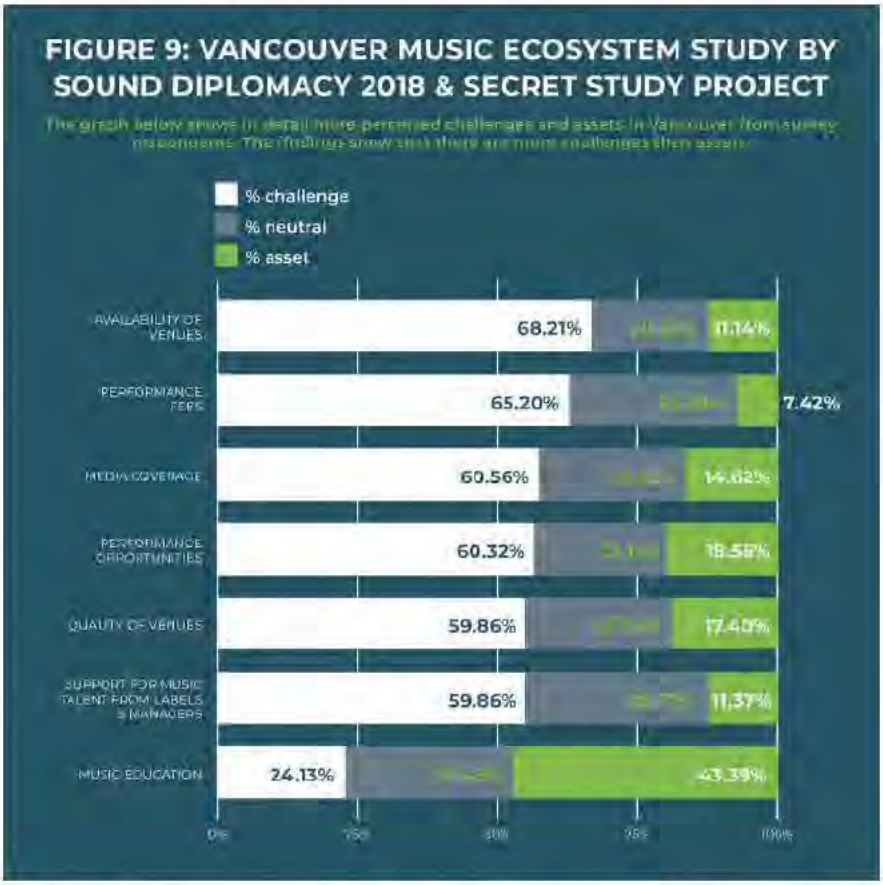
A summary of the responses from these producers is available in the following sections of this report. Detailed summations of the interviews are listed in Appendix D: Survey Response Summaries.

Vancouver Music Ecosystem Study by Sound Diplomacy and Secret Study Projects (2018) noted that over 68% of industry professionals found that Availability of Venues is a challenge (p. 13).

The general consensus is that affordable venues with a capacity range from 2,000 to 5,000 and from 5,001 to 7,500 are in short supply and high demand.

FIGURE 9: VANCOUVER MUSIC ECOSYSTEM STUDY BY SOUND DIPLOMACY 2018 & SECRET STUDY PROJECT

The graph below shows in detail more perceived challenges and assets in Vancouver from survey respondents. The findings show that there are more challenges than assets.



3.2 ANCILLARY REVENUES AT AMPHITHEATRE VENUES

One of the key factors in considering the viability and business case for any Amphitheatre is the potential for ancillary revenues generated from attendees at events. Patrons who attend events at any facility will spend money on parking, food, beverage, merchandise and novelty items. They will also pay facility fees and service charges which can contribute to the financial success and operation of the venue.

This ancillary revenue is tracked on an event-by-event basis, and then it is averaged against the total attendance to derive the average total amount spent per person at any event, known as the "per caps". With food, beverage and merchandise sales figures provided by the PNE Food and Beverage staff, events during 2018 (outside of the PNE Fair), garnered an average per cap of $15/head.

A new standard within the concert industry is that venue operators will often discount the rental charges if they know that the attendance will be large enough to generate ancillary revenues and deliver a strong per cap total.

Therefore, being able to service larger capacities will greatly increase the viability of the new PNE Amphitheatre.

3.3 COMPETITIVE ANALYSIS

COMPETITIVE OVERVIEW

Through strategic electronic and field research, we have considered an analysis of potentially competitive venues for the PNE Amphitheatre. We identified a primary list of direct competition. To better understand the market landscape, we have briefly outlined our competitor's offerings. We also took into consideration their overall usage, which helped isolate what the competitive venues are doing well, and where opportunities lie for PNE Amphitheatre.

FIGURE 10: DIRECT LOCAL COMPETITORS

FACILITY	LOCATION	CAPACITY	BRIEF DESCRIPTION	SERVICES INCLUDE
Abbotsford Centre	Abbotsford	7,888	• Abbotsford Centre finished the 2017 calendar year as one of the hot spots in the touring marketplace & was listed as the 148th top venue in the world based on ticket sales as reported by Pollstar Magazine, #1 in the Pacific Northwest (5,001 - 10,000 capacity).	• Public pay parking is available around the Abbotsford Centre. • Free parking lot located next to the King Connector.
BC Place	Vancouver	54,500	• Multi-purpose stadium located at the north side of False Creek. • Possesses a retractable roof - the largest in the world - revealing over 7,500 square metres of sky, which has created a year-round facility for world class events. • Suspended above the field is the world's second-largest 4-sided centre hung HD video board.	• Street & lot public pay parking. • over 40 concessions & an extensive menu. • 50 suites and hospitality lounges.
Chan Centre for the Performing Arts	Vancouver	1,185	• Located at the University of British Columbia, the Chan Centre is part of UBC's Arts & Culture District. • Centre hosts rehearsals & performances by the UBC School of Music and the UBC Department of Theatre & Film throughout the year.	• Concession services available for pre show, conferences & post reception. • Stand-alone receptions or special event.
Langley Events Centre	Langley	5,276	• Multipurpose facility in the Township of Langley. • Centre includes an arena bowl, field house, banquet hall, a double gymnasium, fitness & community centre as well as meeting rooms.	• Free parking stalls. • Concessions on site.
Malkin Bowl	Vancouver	2,100	• Outdoor performance stage for concerts & cultural events in Stanley Park. • Malkin Bowl is now available for year-round rentals. • The outdoor theatre was recently renovated to add new heating & cooling systems, a new floor & a retractable stage door.	• Limited public pay parking. • Free water stations. • Food & beverage vender on site.
Rogers Arena	Vancouver	18,910	• Indoor sports arena. • Completed in 1995 at a cost of $160 million in private financing. • Home to the Vancouver Canucks, the National Hockey League & the Vancouver Warriors National Lacrosse League.	• Underground, street & lot public pay parking. • Premium seating & suites available. • concessions available. • Fine dining restaurant available.
UBC Doug Mitchell Thunderbird Sports Arena	Vancouver	3,000	• Doug Mitchell Thunderbird Sports Centre is a LEED Silver certified indoor arena, on the campus of the University of British Columbia. • Part of UBC Sport Facilities, a collection of Vancouver's finest multi-sport venues. • UBC Thunderbird Arena is a state-of-the-art, world renown sport & special event facility with 5,033 permanent seats with the ability to house up to 7,000 people for special events including: concerts, sporting events, conventions, speakers, film shoots & hockey related programs.	• 1,600 space parkade parking. • 1,000 space parkade a few minutes walking distance north of the venue. • Floor level & mobile concessions.

The following table outlines a summary of competitive advantages, strengths and weaknesses that the PNE Amphitheatre must consider:

FIGURE 11: COMPETITIVE ADVANTAGES SWOT

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
• Established space • Favorable to the development of tourism • Nostalgic/popularity of the PNE grounds • Generous parking available • Experienced Project Team • Experienced Management Team • Spectacular view of the North Shore mountains • Increased focus on design, stakeholders experiences as well as entertainment options • Social media awareness (opportunity to document the build, creating anticipation and/or teasers for talent)	• Outdated • Seating & bleachers are not covered, which is a deterrent due to Vancouver's annual rainfall (166 days a year) • Competitive market • Future competition • High infrastructure costs associated with renewal project • Noise complaints • Accessibility complaints. • Lack of washrooms • Preserved high union and labor costs • Current transit availability • PNE location (compared to downtown) • Seasonal use (May-October)	• Fresh & modern • Increased ticket sales • Increased cultural awareness • Partnership/sponsorship/ naming rights opportunities • Customer loyalty/season ticket holder • Increased revenue for corporate events • Promotions & initiatives to support Indigenous Peoples • Freedom to listen/engage with the industry • Increase in annual traffic to the park (VGA's steady population growth) • Competitive ticket prices • Amplifies ticket sales through additional events and concerts	• Traditional competition such as Malkin Bowl • Competition could develop expensive new marketing campaigns • Unexpected problems, or delays • Marketplace uncertainty

There are numerous competitive advantages that the new PNE Amphitheatre can present to the current Vancouver market:

- Venue location at PNE is well known, and is in close proximity to transit;
- Parking is available on-site with a vehicle capacity of 2,500 vehicle stalls outside of the Fair period;
- Building a roof to cover the audience will provide tremendous advantage to PNE Amphitheatre in comparison to other outdoor venues within the local marketplace;
- Installing infrastructure common to all events will make the venue more cost-effective than other outdoor venues;
- PNE will have a year-round site-wide liquor license providing flexibility to venue users and delivering a positive customer experience;
- Road closures or traffic management plans common to all events can be provided to event organizers;
- Playland delivers added value to promoters as their guests who are travelling to the PNE for Amphitheatre shows will also have access to enjoy Playland;
- Services available via PNE include concessions, security, ticketing, parking;
- Flexibility in stage position, seating and floor plans will allow event organizers the options for stage design and venue layout;
- Capacity can range from 1,000 to 10,000;
- Proximity to residential is being closely monitored.

3.4 VENUE CAPACITY ANALYSIS

CAPACITY OPTIONS FOR PNE AMPHITHEATRE

Utilizing Fire Marshall capacity calculations based on 1.2 m2 per person in a licensed venue, and 0.6 m2 per person in the bleachers, with assumptions that venue exits will meet standard building codes for exiting, we have arrived at the following capacity projections.

In each scenario, there are variables which will determine the audience capacity for any given event: stage location and size, seated or general admission floor, non-usable work areas, and licensed or non-licensed.

Building code capacities for arenas and stadiums utilize separate calculation formulas for seating in stands and bleachers, so we have itemized each of the distinct areas to outline the potential capacity within each are, for each of the four scenarios.

In Scenarios B, C & D, the stage can be moved forward to a position closer to the bleachers, which provides a more intimate performance area for shows with lower capacities.

With the bleacher seating allowing for 4,500 capacity, any show which is expecting audiences ranging from 2,000 to 5,000 will have an opportunity to move the stage forward allowing the smaller venue footprint to deliver a close-up performance.

In Scenario A, the covered area over the stage will be approx. 80' x 80' (640 m2) which provides cover for the stage and work areas. This fixed roof position means the stage can only move forward to the edge of the roofline, leaving a span of 150' to the bleachers.

FIGURE 12: SCENARIO A
ROOF COVERS STAGE ONLY, TWO SUPPORT BUILDINGS

AREA	DIMENSIONS	CALCULATION	CAPACITY
CONCERT FLOOR AREA	50m x 51m	2,550 m^2	4,250 (@ 0.6m2 / Person)
BLEACHER SEATING AREA	24 rows @ 100 m	1,720 m^2	4,500 (@ 0.6m / Person)
PEDESTRIAN WALKWAY	360m (min. 3m w – 10m)	2,950 m^2	2,458 (@ 1.2m^2 / Person)
BUILDING A CONCESSIONS	15m x 46m x 1 story	670 m^2	558 (1.2 m2 / Person)
BUILDING B CONCESSIONS	12m x 60m	520 m^2	433 (1.2 m2 / Person)
TOTAL TICKETED CAPACITY:		8,630 m^2	8,750

FIGURE 13: SCENARIO B
ROOF COVERS FULL PLAZA, TWO SUPPORT BUILDINGS

AREA	DIMENSIONS	CALCULATION	CAPACITY
CONCERT FLOOR AREA	50m x 51m	2,550 m^2	4,250 (@ 0.6m^2 / Person)
BLEACHER SEATING AREA	24 rows @ 100 m	1,720 m^2	4,500 (@ 0.6m / Person)
PEDESTRIAN WALKWAY	340m (min. 3m w – 10m)	2,950 m^2	2,458 (@ 1.2 m^2 / Person)
BUILDING A CONCESSIONS	15m x 46m x 1 levels	670 m^2	558 (1.2 m2 / Person)
BUILDING B VIP SUITES	12m x 60m	520 m^2	433 (1.2 m2 / Person)
TOTAL TICKETED CAPACITY:		8,630 m^2	8,750

FIGURE 14: SCENARIO C
ROOF COVERS FULL PLAZA, TWO SUPPORT BUILDINGS WITH VIP AND EXECUTIVE LOUNGE

AREA	DIMENSIONS	CALCULATION	CAPACITY
CONCERT FLOOR AREA	50m x 51m	2,550 m^2	4,250 (@ 0.6m^2 / Person)
BLEACHER SEATING AREA	24 rows @ 100 m	1,720 m^2	4,500 (@ 0.6m / Person)
PEDESTRIAN WALKWAY	360m (min. 3m w – 10m)	2,950 m^2	2,458 (@ 1m^2 / Person)
BUILDING A CONCESSIONS AND EXECUTIVE LOUNGE	15m x 46m x 1.5 levels	1,110 m^2	925 (@ 1.2 m2 (290 ticketed area)
BUILDING B CONCESSIONS	12m x 24m x 2 levels	1,255 m^2	1045 (@ 1.2 m2 (300 ticketed area)
TOTAL TICKETED CAPACITY:		9,585 m^2	9,340

FIGURE 15: SCENARIO D
ROOF COVERS FULL PLAZA, THREE SUPPORT BUILDINGS WITH VIP, EXECUTIVE LOUNGE AND MEETING

AREA	DIMENSIONS	CALCULATION	CAPACITY
CONCERT FLOOR AREA	50m x 51m	2,550 m^2	4,250 (@ 0.6m^2 / Person)
BLEACHER SEATING AREA	24 rows @ 100 m	1,720 m^2	4,500 (@ 0.6m / Person)
PEDESTRIAN WALKWAY	360m (min. 3m w – 10m)	2,950 m^2	2,458 @ 1.2 m2 / Person
BUILDING A CONCESSIONS AND EXECUTIVE LOUNGE	15m x 46m x 1.5 levels	1,110 m^2	925 @ 1.2 m2 / person (290 ticketed area)
BUILDING B CONCESSIONS, VIP SUITES, AND MEETING SPACE	12m x 60m x 3 levels	1,990 m^2	1658 @ 1.2 m2 / person (780 ticketed area)
BUILDING C CONCESSIONS	12m x 24m	290 m^2	240 @ 1.2 m2 / person
TOTAL TICKETED CAPACITY:		10,850 m^2	9,820

3.5 ADJACENT FESTIVAL PLAZA CAPACITY

The PNE's "Heart of the Park" includes an adjacent plaza which can host areas connected to the Amphitheatre events with elements such as second stage, food trucks, bar tents, corporate sponsor activations, games, merchandise sales and promotional areas.

This uncovered area can be added to the event site using temporary fencing to define the licensed event areas. The Festival Plaza dimensions at approximately 6250 m2, which adds 5,208 in additional potential capacity. However, given the density of the concert viewing space in front of the stage, and the desire for festival audiences to see the main stage, it is unlikely that the venue could accommodate an additional 5,208 fans safely for a festival setting. Therefore, a reduced number should be considered and discussed with the Fire Marshall prior to any festival event. For the purpose of this report, we are recommending 50% or 2,604 people to be accommodated if there was a second stage as well as other attractions in the Festival Plaza area.

ADJACENT FESTIVAL PLAZA MAP

MEASUREMENT CALCULATION MAP

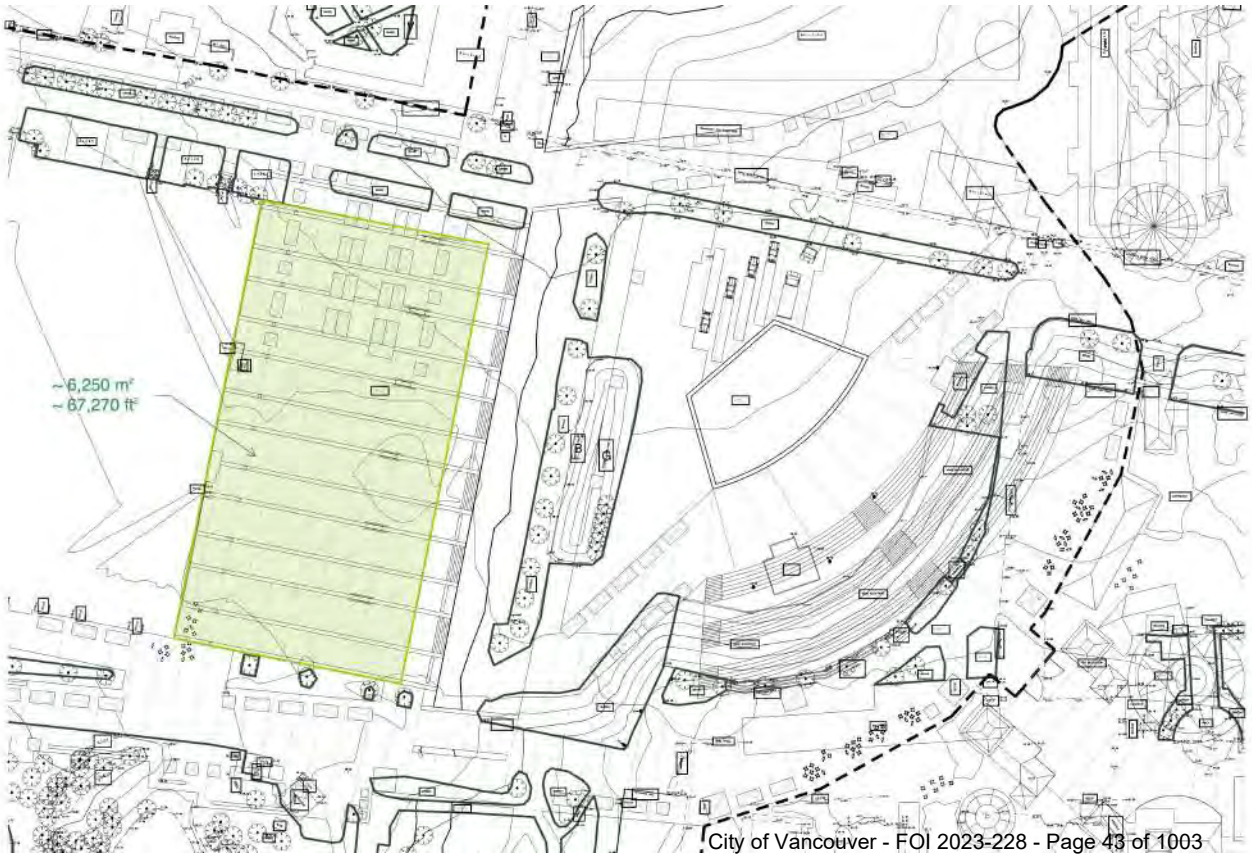


FIGURE 16: CAPACITY CALCULATION FOR EVENTS WHICH UTILIZE FESTIVAL PLAZA

AREA	AMPHITHEATRE	TICKETED CAPACITY	FESTIVAL PLAZA	TOTAL
SCENARIO A – ROOF COVERS STAGE AND BOH ONLY	8900 m²	8,750	6250 m² Net additional capacity of 2,600	11,350
SCENARIO B – ROOF COVERS FULL PLAZA WITH TWO SUPPORT BUILDINGS	8900 m²	8,750	6250 m² Net additional capacity of 2,600	11,350
SCENARIO C – ROOF COVERS FULL PLAZA WITH TWO X TWO-STOREY SUPPORT BUILDINGS	8900 m²	9,340 Including VIP	6250 m² Net additional capacity of 2,600	11,940
SCENARIO D – ROOF COVERS FULL PLAZA WITH THREE SUPPORT BUILDINGS AND FULL VIP	8900 m²	9,820 Including VIP	6250 m² Net additional capacity of 2,600	12,420

Following consultations with PNE Staff, and 36 potential venue users, this report has established the baseline capacity for the proposed facility (effectively, 8750 seats plus VIP) and asked the following questions related to existing and potential users:

- How many venue users require more than 5,000 capacity, and how often?
- How many venue users require less than 5,000 capacity, and how often?
- How many venue users require the additional plaza area, and how often?

Of the known existing and potential community and commercial events that could take place in the Amphitheatre, the largest portion (60%) require fewer than 5,000 seats with most of these in the range of 1,000 to 4,000 people. Current events in the 5,000 to 10,000 range were expected to account for approximately 30% of event-days.

One event, the BreakOut Festival, has requested use of the Festival Plaza in addition to the Amphitheatre forecasting larger crowds (in the range of 12,000) for their two-day event.

During the Fair, the PNE Summer Nights Concert series hosts 15 premiere concerts at the Amphitheatre with a current capacity of 7,000 per show.

3.6 COMPARATIVE VENUES

AMPHITHEATRE INDUSTRY OVERVIEW

Since the Amphitheatre business is primarily a seasonal market, the size of the consumer market is evident in the resident population base and in the summertime visitation, taking into account average participation rates in outdoor festivals and events. This report estimates the size of the total seasonal consumer market to be at least 3 million people.

Given that rainfall in Vancouver is expected to reach 166 days per year, our recommendation is to construct a venue that provides roof coverage for all paid tickets / seats. This will allow the Amphitheatre operating season to be year-round with a peak season from May through October for venue rentals.

John Donnelly & Associates' event estimates and venue research suggests that the Vancouver market currently has a gap in the range of 2,000 to 10,000 which the PNE Amphitheatre can serve. Our prior research noted the demand was high for venues with capacities from 4,000 to 7,000 and we recognized the PNE's need to increase their existing capacity of 7,000, therefore, our evaluation of comparative venues has focused on venues that have a capacity range from 4,000 to 10,000 people.

Respondents felt the Amphitheatre should operate with the key principle of being accessible to the community in all aspects of its management and design. Respondents stated that with scalable rental rates it could also become a venue of choice for events in the 1,000 to 4,000 range.

In summary, offering flexibility in the Amphitheatre set-up should allow promoters to present smaller acts in the venue. In this sense, a smaller seat count at the Amphitheatre could act to fill out the range of venue offerings available in Vancouver and in so doing stimulate new interests.

AMPHITHEATRE EVENT CALENDAR IN COMPARABLE VENUES

Looking at calendars for similar-sized venues along the West Coast reveals there is a strong circuit of artists and events working successfully in "Boutique Amphitheatres" covering 4,000 to 8,000 capacities. The range of artists performing at these amphitheatres is briefly outlined below:

- **Marymoor Park, Seattle - Capacity 5000 -** Hosted 24 commercial concerts, 10 movie nights, 5 runs or sporting events, 2 food events and a six-weekend run of Cirque du Soleil's Volta. Their 2018 line-up included artists such as Robert Plant, Willie Nelson & Family, Vance Joy, Barenaked Ladies, Jason Mraz, Janelle Monae, Slightly Stoopid, Primus and many more.

- **Edgefield Amphitheatre, Portland - Capacity 5000** - Hosted over 25 commercial concerts each year since 2008, featuring many of the Marymoor artists listed above, such as Steve Miller, Jethro Tull, Ween, The Decemberists, Portugal the Man and many more.

- **The Mountain Winery Amphitheatre, Saratoga, CA - Capacity 2,500** - Hosted a legendary summer Amphitheatre concert series for 60 years, with the 2018 edition featuring returning icons Willie Nelson with Alison Krauss, Tony Bennett, Pretenders, Alanis Morissette, The Original Wailers, Los Lobos, Norah Jones, Lyle Lovett and The Roots plus new performers include Roger Daltrey, O.A.R., Boy George, Melissa Etheridge and many others.

- **Red Rocks Amphitheatre, Denver – Capacity 9,525** - Considered one of the most iconic Amphitheatres in all of North America, as it is situated in a canyon with natural acoustic qualities and attracts a who's-who of international recording artists. In 2018, Red Rocks hosted over 150 concerts, with bookings on literally every calendar day throughout the summer. Highlight artists included Jackson Browne, Imagine Dragons, Sarah McLachlan, Michael Franti, Bryan Adams, Avett Bros., Lady Antebellum and many more.

The primary concert season extends from May through September for most Amphitheatre venues.

COMPARISON NOTES FROM OTHER VENUES

Research on comparable venues in other communities was conducted in order to identify and evaluate models of governance, rental rates, operations and amenities that may be applicable to the PNE Amphitheatre.

Venues that were considered most relevant to this study were researched further and are included in Appendix F: Comparative Venue Summary, along with information on site features. As noted, it is difficult to locate existing Amphitheatres that share all the unique characteristics of this proposed venue in Vancouver. However, we looked at the capacities being planned for PNE Amphitheatre and found similar size venues to see what shows they host each year.
These venues were selected based on recommendations from survey respondents and interviewees.

3.7 OFF-SEASON AMPHITHEATRE USE

While this report recognizes that the PNE Amphitheatre will likely be used at other times of the year (e.g., New Year's Eve, Lantern Festival, Winter Carnival, etc.), the present focus is on the conventional season for outdoor public events as the main determinant to establish the appropriate venue capacity.

Given the location at Hastings Park, it is currently intended that the park will remain open during the off-season and during non-event days for passive use.

The indoor spaces, such as the VIP Lounge, and flex spaces will be rentable year-round for events, meeting space, dinners, corporate and private functions.

FORECASTED ATTENDANCE

In order to roughly calculate the forecasted annual use and capacity of the Amphitheatre during its high season, this report assumes:

- An average high season during July and August when the most shows suitable for outdoor venues are touring and available;
- An average usage of about 75% or 50 days;
- Varying venue capacities ranging from 2,000 to 9,000;
- A seat occupancy rate of about 65% across all shows.

This calculation produces a capacity for the high season of about 265,000 potential attendance in Year 1.

PART 4: VENUE DESIGN SCENARIOS


PNE AMPHITHEATRE
Pacific National Exhibition
BAR

4.1 ANALYSIS OF VENUE INFRASTRUCTURE REQUIREMENTS

Questions about what infrastructure should be installed at the venue were raised during interviews with PNE staff, industry experts and within our online survey. The results are summarized below:

WEATHER PROTECTION AND ROOF

The stage must have a roof to offer protection from rain. The roof should provide multiple heavy-load rigging points for sound, lighting and video installations. Factors to consider include:

- Weather protection over the stage is a safety and liability issue and is mandatory for risk management;
- Weather protection over the spectators - in whole or in part - is optional. The generally accepted belief, however, is that a roof on an outdoor venue is good for business. A roof assures ticket buyers that they can purchase tickets in advance knowing that the show will go on. When there is no roof, ticket purchasing is often done at the last minute. This pattern generally produces low ticket sales;
- The roof has the opportunity to become an iconic element of the venue design, so appropriate budget considerations should be given to this piece of the design;
- It is critically important that the roof includes rigging point installations that allow the stage and event infrastructure such as lighting trusses, video screens and sound equipment the flexibility to be installed in a variety of locations;
- The venue roof also presents an opportunity for public art, such as an Indigenous art work or a modern art centrepiece.

Given the prevalence of Vancouver rainfall, the recommendation of this report is to install a roof which covers the stage and the audience.

RECOMMENDATIONS REGARDING STAGE SIZE AND CONSTRUCTION

The stage size needs to be able to service the largest possible shows, which in the case of major recording artists can vary from 60' wide by 40' deep, with heights ranging from 5' high to 6' high.

As noted above, the stage design and floor plan must also respond to the need for smaller formats with community shows, trade shows, sporting and family events to ensure that the Amphitheatre will be able to accommodate differing scales of audiences and attractions and, thereby, address the broadest market.

The location of the stage should also be flexible with some larger events requiring full-floor stage positions, whereas other events may want the stage positioned closer to the bleachers, in the centre or on one side of the venue.

Therefore, our recommendation is to use portable risers for the stage construction which will allow the stage to be flexible in size and location. The stage, when not in use, can be stored under the bleachers.

Rigging points must be installed in the roof above to facilitate multiple stage locations, including a primary location for full-floor events, plus secondary locations for smaller shows.

RECOMMENDATIONS REGARDING SEATING FORMATS

The maximum capacity of seating on the floor and in the bleachers will be an important piece of information for the design team.

The number of seats needed for smaller formats must ensure that the Amphitheatre will be able to accommodate differing scales of audiences and attractions and, thereby, address the broadest market.

This report, therefore, recommends that seating for the Amphitheatre be designed as follows:

- Permanent bleacher seating around the back of the venue to serve 4,500 people;
- Removable chairs on the floor to accommodate approximately 4,250 people seated;
- These chairs can also be stored under the bleachers and in the utility area and can be used for multiple events throughout the PNE.

The cost for installing and removing the chairs will be included in the House Rental packages, determined by the PNE Sales Department on a case-by-case basis.

INFRASTRUCTURE REQUIREMENTS BASED ON SURVEY RESPONDENTS

Each of the interview and online survey respondents was asked to provide their analysis of venue infrastructure requirements as to what items or venue features are required for outdoor performance and/or events, and which amenities are common to all event types.

An initial review of the responses identified that a covered venue with a roof over the stage and audience, site electricity, robust internet access, potable water and grey water disposal, hard ground space for concessions, and storage were all common requests.

Given the high cost of transforming an outdoor site into a functioning event space, it would be beneficial to all producers and cultural organizations if certain infrastructure items could be provided as part of the capital construction of the site. Provision of permanent infrastructure would help make most events affordable for non-profit organizations and more viable for commercial event producers, thus allowing the sites to be used more frequently.

Our respondents rated their infrastructure requirements and preferences as follows*:

FIGURE 17: FRONT-OF HOUSE INFRASTRUCTURE

FEATURES & AMENITIES	RESPONSES
Accessibility	70%
Alcohol service	76%
Back-of-house dressing rooms	70%
Back-of-house production office	70%
Corporate suites	29%
Covered seating	70%
Covered stage	64%
Close to transit	52%
Experiential activations	47%
Food trucks	76%
Gender neutral washrooms	41%
Parking	76%
Permanent box office	47%
Permanent washrooms	68%
Phone charging station	41%
Removable stage	35%
Ride share drop off & pick up area	58%
Storage facility	70%
Variety of food options	52%
Vehicle charging station	17%
VIP area	47%

**As the total number of responses for this question in our survey was less than 100 respondents, this section should be considered as directional information versus statistical data.*

4.2 PNE RECOMMENDATIONS FOR INFRASTRUCTURE INSTALLATIONS

Discussions with PNE Staff were facilitated to determine the PNE's needs for infrastructure, food and beverage operations, prep kitchens, bar service, sales and facilities management in order to ensure our revenue and expense forecasting was based on reliable data.

Given the PNE's operation of the venue with their successful PNE Summer Nights Concert Series and other events, this report solicited comments from the PNE Operations, Programming and Catering staff to determine actual needs for food preparation, bar sales, staging, site operations, security and janitorial.

Feedback from the industry has highlighted the growth in VIP tickets and packages offered at other venues, Amphitheatres and festivals around the world, noting the revenue potential available from hosting VIP suites and installing areas for private rentals. PNE's Corporate Partnership Team noted the potential for naming rights and other strategic partnerships which are outlined in Section 5 of this report.

Further discussion regarding the outbuilding construction, materials and dimensions will be required following in-depth review by PNE Operations.

PNE SUMMER NIGHTS CONCERT SERIES INFRASTRUCTURE

PNE Summer Nights Concert Series is one of the main drivers for the PNE Fair. This event hosted 15 major recording artists during the 2018 Series including Chicago, Kool & the Gang, Cyndi Lauper, Village People, Jann Arden, Boyz II Men, Dean Brody and many more.

The infrastructure and back-of-house requirements for this series included two 40' x 60' tents, production trailers, dressing rooms, offices and hospitality areas. These elements have been taken into consideration with the design and layout of Buildings A, B & C, which will provide the dressing rooms, offices and work areas at the new Amphitheatre.

The PNE Summer Nights Concert Series is expected to remain a key attraction for the PNE Fair, and as such, will likely provide the largest annual use of the new venue.

To service the PNE Summer Nights Concert Series, allowing for future growth, it is suggested that the infrastructure requirements should include:

- Dressing rooms – 6
- Production offices – 3
- Crew catering area - 1
- Video production office - 1
- Box offices – 6 kiosks
- Security office - 1
- Seated and standing capacity to achieve a total attendance of 10,000 people.

PNE FOOD & BEVERAGE SERVICES INFRASTRUCTURE

The PNE operates a variety of facilities, many of which offer food and beverage services. Primarily, these venues are the Pacific Coliseum, The Forum, Agrodome, Hastings Park Racecourse and Playland, where the food services are managed by PNE Food Services Department.

Food and beverage policies standard within the commercial event industry are such that the venue controls all food and beverage services and revenues. Therefore, food and beverage sales will be a key revenue driver for the new PNE Amphitheatre.

Food services at the new PNE Amphitheatre will be managed by the PNE Food Services Department under policies similar to other PNE venues. Food services may also be contracted to third-party caterers or food trucks, depending upon the nature of the event, and subject to terms determined by the PNE or as required by the event.

John Donnelly & Associates has prepared a forecast of food and beverage revenues in this report, with respect to the various food and beverage sales opportunities contemplated at the concession stands, VIP suites, bar areas and meeting spaces.

Alcohol service is to be managed under the PNE's site-wide liquor license, which will be applied for, to allow a site-wide facility license. This will ensure that the best customer experience is provided, whereby guests are allowed to walk through the venue holding an alcoholic beverage.

FIGURE 18: FOOD AND BEVERAGE SERVICE AND PREPARATION AREAS

AREA	DESCRIPTION	SIZE	PURPOSE	POTENTIAL
Building A	Concessions	Four stands each at approx. 6 m² = 60 sq ft	Menu includes both bar and food items	Four booths on west side will serve est. 1600 customers per hour @16 stations
Building A	Executive Lounge	15m x 21m – 315 m²	Flex space for meetings, receptions, dinners	Licensed capacity of 290 persons indoors plus a rooftop deck
Building A	Prep Kitchen	13m x 6m = 78 m²	Provides food service and catering area for Executive Lounge & concessions	Catering service kitchen for on-site and off-site events
Building B	Concessions	Two stands in B at 4m x 12m – 48 m² & 4m x 6m – 24 m²	One serves amphitheatre crowd from south side and one serves Playland and cross-over guest	Main stand can host 8 stations, second stand can host 4 stations – Est 1200 customers per hour
Building B	VIP Suites	16 units ranging in size from 24 m² to 36 m²	Suites can host 25 - 40 guests. Flex spaces can host up to 300 people for meetings, receptions and conferences	Potential for VIP suite sales during Fair and Summer concert season. Meeting rooms and flex space can be rented year-round
Building B	Prep Kitchen	18m x 6m = 108 m²	Provides food service and catering area for VIP Suites, concessions and meeting rooms	Catering service kitchen for on-site and off-site events
Building C	Concession	One stand at 6m x 6m = 36 m²	Serves amphitheatre crowd in north plaza area	Has 4 stations – Est 400 customers per hour

4.3 HASTINGS PARK SOUND MITIGATION INSTALLATIONS

One of the common concerns for event users and PNE staff is noise control. The majority of survey respondents requested that appropriate measures be taken to help alleviate concerns regarding noise complaints from neighbours and area residents.

When the topic of noise comes up, the adage that "one man's floor is another man's ceiling" becomes palpably relevant, especially if you're the one in the downstairs apartment. With a growing number of events planned for the venue including amplified music concerts being booked at the PNE Amphitheatre, it is important to take steps during the design phase for the venue to identify ways to direct and mitigate noise from events.

Elements to be considered for noise mitigation can include:

a) Backstage Wall: The backstage wall will serve to define the backstage area. It will block the audience view of the trucks backstage, etc. With the roof established at 40' high behind the stage, a wall with steel posts, wood and acoustic baffling material will act as a back-stop for the sound and serve as a wind-block to stop wind from blowing onto the stage. Concrete and other weather-resistant sound baffling materials should be considered for this wall.

b) Noise Wall: A noise wall can be constructed along the venue's northeast perimeter behind the bleachers and south of the path leading to/from Building B. It will sit beside the roller coaster on the Playland side and will serve as a fence delineating the two areas. This pedestrian corridor slopes down a slight hill on the northeast side and may be bordered with a noise attenuation wall that can be fabricated from steel posts, concrete or wood materials to soak up the sound.

c) Suspended Noise Reduction Panels: Ceiling sound baffles are an effective, economical acoustic treatment that suspends a panel from the ceiling to increase sound clarity by reducing reverberation and absorbing sound. Acoustic baffles are used in theatres and performance spaces that are large, have limited wall space and amplified sound exposure. Suspended roof sound baffles could be made using fiberglass, acoustic foam and recycled cotton core materials to achieve the best sound absorption while suspended from the roof truss system.

d) Directional Speakers Installed as House System: The PNE may consider the purchase of a house sound system which utilizes three-dimensionally controlled speakers that are configured remotely and capable of focusing sound exactly where it is intended. Installing a robotic line array speaker system as a permanent house system that can be used for any concert or event provides a new set of tools for the audio technicians to control the direction of the sound during concerts. Canadian audio supplier, PK Systems provided a quote for the PNE Summer Nights Concert Series which would equip the users with control over the vertical and horizontal polar directivity of the speaker system, which can be adjusted on a show-by-show basis depending upon the size of audience. The audio engineers are able to make adjustments to the line array remotely and instantly with the touch of a button. It should be noted that many arena-level recording artists travel with their own complete audio, lighting and video systems and may not use the house system regardless of cost or availability. However, there is a precedent at the Orpheum Theatre in Vancouver, where the house system currently installed is often used by the touring artists. A review of the potential rental calendar suggests that approximately 66% of the events would use the house speaker system if it was installed.

e) Guidelines for Venue Users: Guidelines will need to be established for venue users that outline any proposed time limits or restrictions for sound checks and other high-volume sound testing. For example, sound checks may start at or after 3 p.m., concerts should not begin before 9 a.m. or end past 11 p.m., with certain delays permitted and no sound past midnight. The decibel level should not exceed 105 at the sound mixer, 102 at the noise wall and 98 at the furthest property line of the park.

f) Decibel Monitoring System: The venue may install a meter or system at the sound board to constantly monitor the decibel levels. While many artists bring their own sound equipment and sound mixer, the maximum sound decibel levels can be included in the contracts with performing artists.

4.4 SIGNAGE AND VENUE MARKETING

The PNE's Hastings Park Wayfinding & Signage Program outlines the regulations and guidelines for signage installations at PNE and Hastings Park.

The Business Case sections of this report include financial forecasts to outline the potential for Sponsorship and Naming Rights agreements associated with the PNE Amphitheatre. As such, plans for signage and venue marketing must be put in place from the outset to allow the PNE Sales Team an opportunity to define the marketing opportunities and determine the benefits of venue sponsorship.

Given that the physical location of the Amphitheatre is at the centre of Hastings Park, and therefore, not visible from any street or thoroughfare, it is recommended that the plan for venue naming rights and signage should extend beyond the venue perimeter to have a presence on all featured wayfinding and primary park identification aspects.

The PNE will alter the park wayfinding signage to include relevant directional signage to the Amphitheatre.

The PNE Amphitheatre needs to maintain autonomy over its own logo and colours, in the event that a naming rights partner requires an alternate primary logo colour or mark. This is in lie with site branding guidelines as all venues fall under the PNE's branding standards.

4.5 VENUE DESIGN SCENARIOS

The re-development of the PNE Amphitheatre has been identified as a primary element within the "Heart of the Park" portion of Hastings Park outlined in the City of Vancouver's Hastings Park – PNE Master Plan.

The following strategic initiatives were referenced in planning the venue design scenarios outlined herein (linked below):

- Vancouver Music Strategy Interim Report (City of Vancouver)
- Making Space for Arts & Culture: 2018 Cultural Infrastructure Plan (City of Vancouver)
- Here, The Beat: The Economic Impact of Live Music in BC (Music Canada Live)
- Tourism Vancouver Master Plan
- Hastings Park Infrastructure Master Plan

OVERVIEW OF CONSTRUCTION COSTS

It is important to note that the construction cost estimates noted here are intended to be used as preliminary budgeting figures only and do not reflect a guaranteed construction cost, as the elements are not yet fully designed to ensure that level of accuracy.

This Probable Cost of Construction (PCC) includes estimates intended to provide enough detail to allow general cost information to be extracted in order to define project scope and set budget ranges for four distinct Amphitheatre design scenarios.

These estimates have been prepared on the assumption that a feasibility study will be completed in the next phase of the PNE Amphitheatre Renewal, and that an architect and general contractor will complete the work.

Therefore, this PCC is presented to outline the high-level design scenarios and related cost estimates, which provides the PNE and City of Vancouver an opportunity to evaluate an adequate level of detail to identify the varying elements between the proposed scenarios to assign costs and priorities.

The next stages of the design (after this business plan review) will be more refined and will speak to the specific design and engineering developed for each scenario, as they are prepared through a typical process of design development and construction documents.

In reviewing these PCC's, please be aware that significant design work remains, during which actual cost details can be generated. It is important to note that measurements for these proposed scenarios are based on the site surveys prepared by PFS Studio in Vancouver during their prior work on the HP-PNE Master Plan and they will be further modified after the actual construction needs of the Amphitheatre are identified.

ASSUMPTIONS

A list of assumptions related to these scenarios has been included. Given that the project is at an early level of development, much of the cost work is based on assumptions of construction type, project scope, and allowances used to estimate general quantities.

Area square footages used to calculate some of the costs are based on Google Maps data, leading to a reasonable but not exact level of accuracy. An awareness of these assumptions is critical in using this cost estimate as an effective tool.

A list of assumptions made with respect to the Financial Forecasts in Section 5 – Business Case and have been noted on the detailed worksheets attached as Appendix H: Financial Worksheets.

PROBABLE COST OF CONSTRUCTION

There are numerous mark-ups that are generally applied to the direct construction costs, and the range of these mark-ups can vary greatly. Included in these mark-ups are contingencies for both design and construction. As portions of the Hastings Park – PNE Master Plan are pursued for further design development, the evolution of design allows greater certainty over costs and as a result, diminishes the amount of design and construction contingency necessary as more certainty is realized.

Retaining contingencies is prudent for projects of this nature. Design contingency reflects the level of design on which the PCC is based. This contingency is an allowance to reflect unforeseen or non-quantifiable elements of the project that will be incorporated during subsequent design development work. This contingency is higher in the early phases of design and gets lower as the design approaches completion. For this project, we would recommend a design contingency of 20%; however, 30% contingency has been used in the attached Appendix H high-level cost estimate, which was developed by the COV Facilities Planning cost estimator.

Design costs include the overall expense for the consultant team to develop the design, apply for permits and produce construction estimates to inform the Project Team and move the project towards a decision on the design.

These estimates regarding the Probable Cost of Construction were based on preliminary high-level design concepts as a guide to direct the discussion as to which scenario is best to proceed.

PNE AMPHITHEATRE DESIGN SCENARIO A

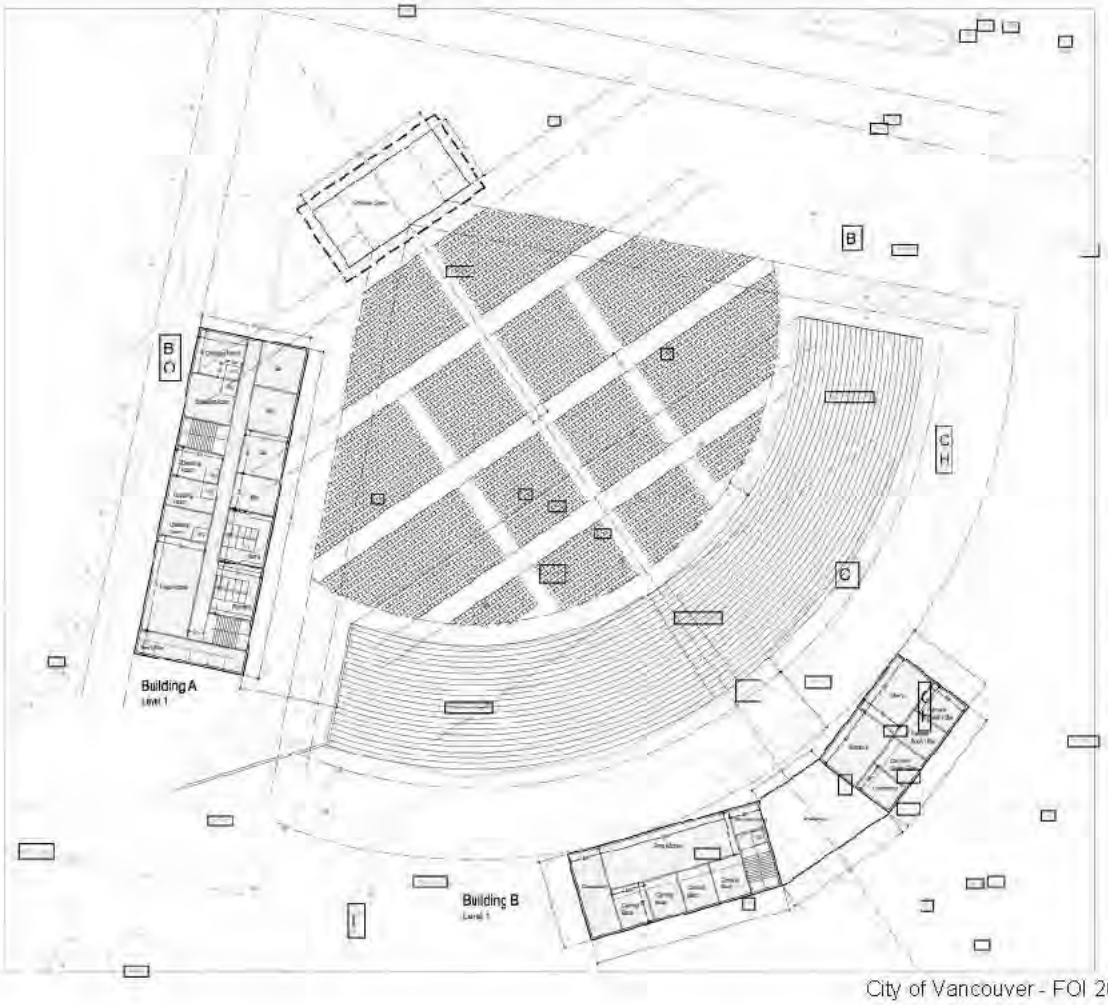
Roof: Provides a steel roof structure which is designed to cover the primary stage and work areas only at a height of 40'. The roof will utilize steel beams to provide rigging points for audio and lighting.

Buildings: There will be 2 x one-story buildings installed to provide concessions, washrooms, dressing rooms, production offices and box office. The stage will utilize portable risers to provide the main stage for concerts up to 8,750 capacity. The stage can also be moved to secondary locations closer to the bleachers, erected in smaller size configurations or is removable when not in use. Building A on the lower west side will house the main concessions services with four bar and food concession stands, box offices, public washrooms, artist dressing rooms. Building B will house concessions, public washrooms, with a prep kitchen, security, first aid stations and office. The centre of Building B provides a gateway to Playland and includes shared washrooms, concessions and a bar facing east into Playland.

Capacity: With a removable stage and seating, the facility can accommodate flat floor flexibility for audiences up to 4,250 on the main floor, with bleacher seating for 4,500. This provides a total capacity for concerts at 8,750. If all included, the adjacent festival plaza will potentially allow for additional capacity increase of 2,600 guests, providing a total for festivals with both areas at 11,350.

A sound barrier backwall will be installed behind the primary stage position and a freestanding noise wall will be installed along the northeast perimeter of the amphitheatre to mitigate existing neighbourhood noise concerns. Ceiling sound baffles suspended from the roof will reduce reverberation and absorb sound.

(Please note: capacity calculations used herein use Fire Marshall ratio of 1.2 m2/person for licensed events with ratios of 0.6 m2/person for seating in bleachers. The venue capacities stated must be considered as directional only for the purpose of this report, as no occupancy loads have been submitted for COV or VFD review.)



SCENARIO A

Capacity:

Bleachers 4,500
Floor 4,250

Total: 8,750

2 One Storey Support Buildings

Only Stage Covered

Number of Bleacher Rows: 24
(same as existing)

Stage Roof Area: ~280 m^2

Building A: 1 Level
~670 m^2

Building B: 1 Level
~520 m^2

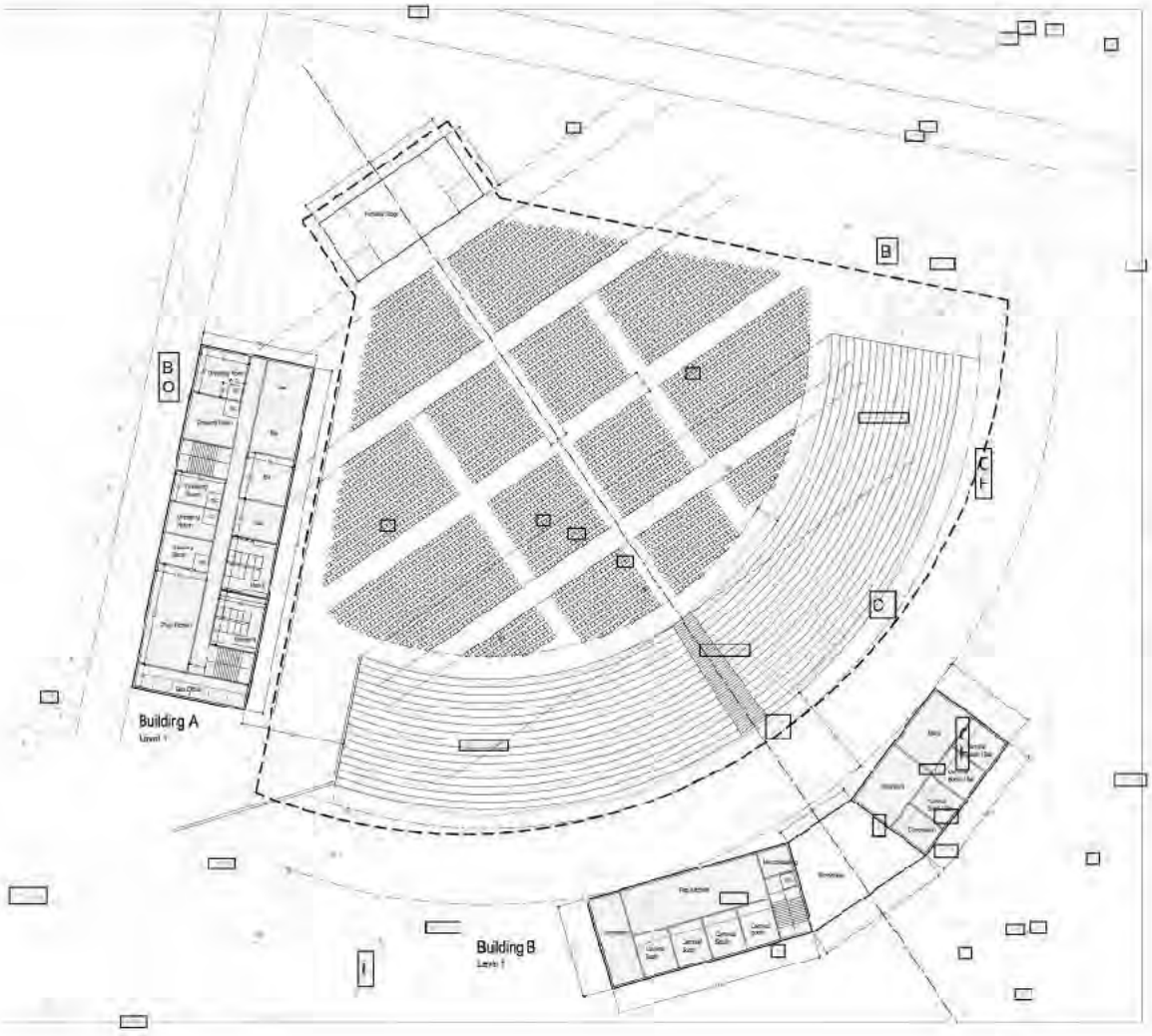
PNE AMPHITHEATRE DESIGN SCENARIO B

Roof: Provides a tensile roof which extends from the primary stage area at a height of 40' and extends upward to cover the plaza and bleachers to a height of 50'. The roof will cover the stage and the entire audience with a span of 6300 m2 extending to cover the floor area and bleachers.

Buildings: There will be 2 x one-story buildings installed to provide concessions, washrooms, dressing rooms, production offices, security, first aid and box office. The stage will utilize portable risers to provide the main stage for concerts up to 8,750 capacity. The stage can also be moved to secondary locations closer to the bleachers, erected in smaller size configurations or is removable when not in use. Building A on the lower west side will house the main concessions services with four bar and food concession stands, box offices, public washrooms, artist dressing rooms. Building B will house concessions, public washrooms, with a prep kitchen, security, first aid stations and office. The centre of Building B provides a gateway to Playland and includes shared washrooms, concessions and a bar facing east into Playland.

Capacity: With a removable stage, the facility can accommodate flat floor flexibility for audiences up to 4,250 on the main floor, with bleacher seating for 4,500, delivering a total capacity at concerts of 8,750. Including the adjacent festival plaza will potentially allow for a capacity increase of 2600 guests for a total of 11,350.

Sound barriers and noise mitigation efforts will be implemented as per Scenario A.



SCENARIO B

Capacity:

Bleachers	4,500
Floor	4,250
Total:	8,750

2 One Storey Support Buildings

Stage, floor and Bleachers Covered

Number of Bleacher Rows: 24 (same as existing)

Stage Roof Area: ~6,300 m^2

Building A: 1 Level ~670 m^2

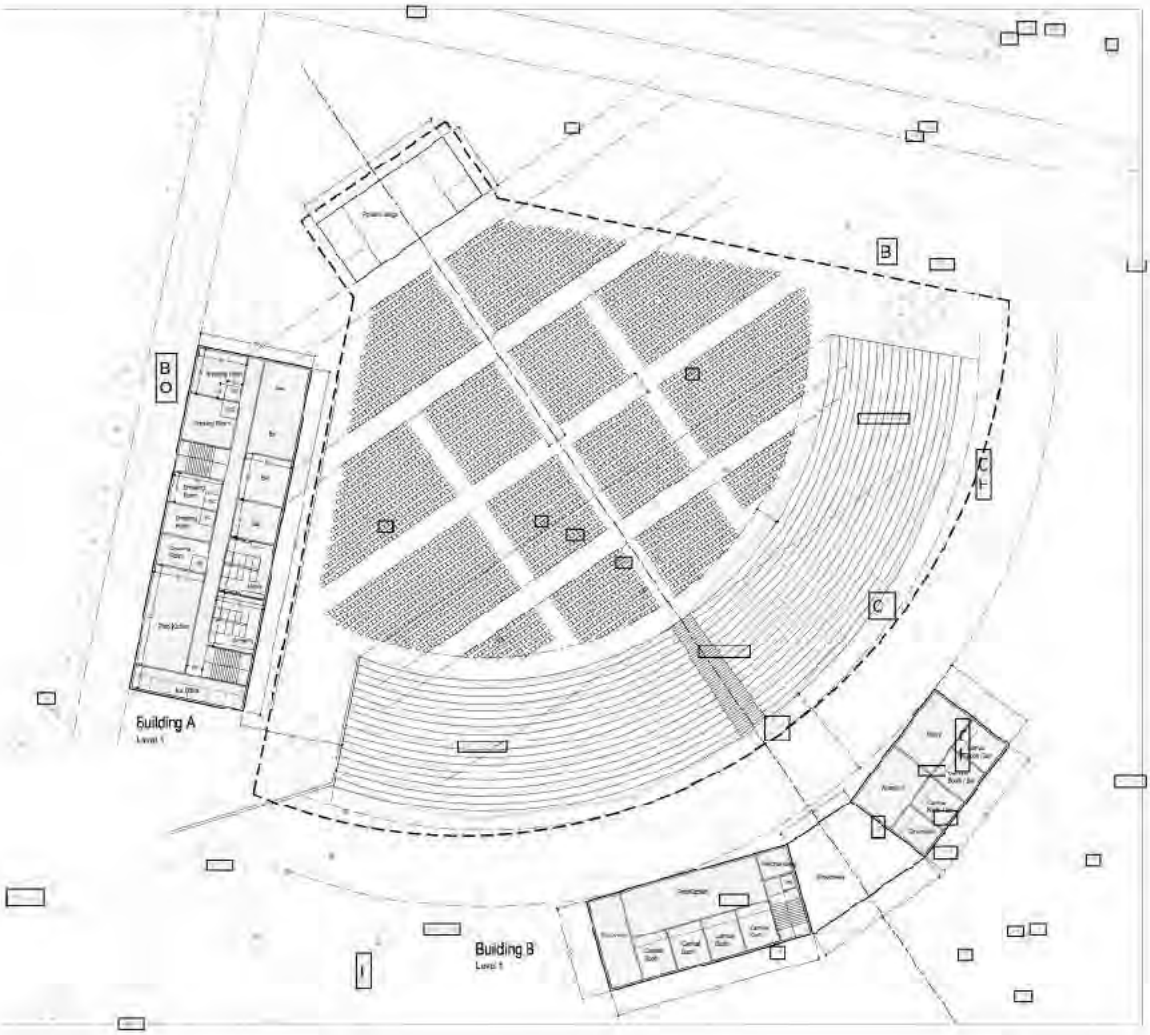
Building B: 1 Level ~520 m^2

PNE AMPHITHEATRE DESIGN SCENARIO C

Roof: Provides a tensile roof which extends from the primary stage area at a height of 40' and extends upward to cover the plaza and bleachers to a height of 50'. The roof will cover the stage and the entire audience with a span of 6300 m2 extending to cover the floor area and bleachers.

Buildings: There will be 2 x two-story buildings installed to provide concessions, washrooms, dressing rooms, production offices, security, first aid and box office. The stage will utilize portable risers to provide the main stage for concerts up to 8,750 capacity. The stage can also be moved to secondary locations closer to the bleachers, erected in smaller size configurations or is removable when not in use. Building A on the lower west side will house the main concessions services with four bar and food concession stands, box offices, public washrooms, artist dressing rooms. The second floor on Building A will house the Executive Lounge with a capacity of 290 plus a rooftop deck overlooking the stage. Building B will house concessions, public washrooms, with a prep kitchen, security, first aid stations and office. The second floor of Building B will house 10 x VIP suites with capacities for each suite ranging from 25 - 40 for a combined total capacity of 300. The centre of Building B provides a gateway to Playland and includes shared washrooms, concessions and a bar facing east into Playland.

Capacity: With a removable stage, the facility can accommodate flat floor flexibility for audiences up to 4,250 on the main floor, with bleacher seating for 4,500, delivering a total capacity at concerts of 8,750, plus VIP areas to serve 590 guests. Including the adjacent festival plaza will potentially allow for a capacity increase of 2600 guests for a total of 11,940.



SCENARIO C

Capacity:

Bleachers	4,500
Floor	4250
VIP	590
Total:	9,340

2 Two Storey Support Buildings

Stage, floor and Bleachers Covered

Number of Bleacher Rows: 24 (same as existing)

Stage Roof Area: ~6,300 m^2

Building A: 1.5 Levels ~1,110 m^2

Building B: 2 Levels ~1,255 m^2

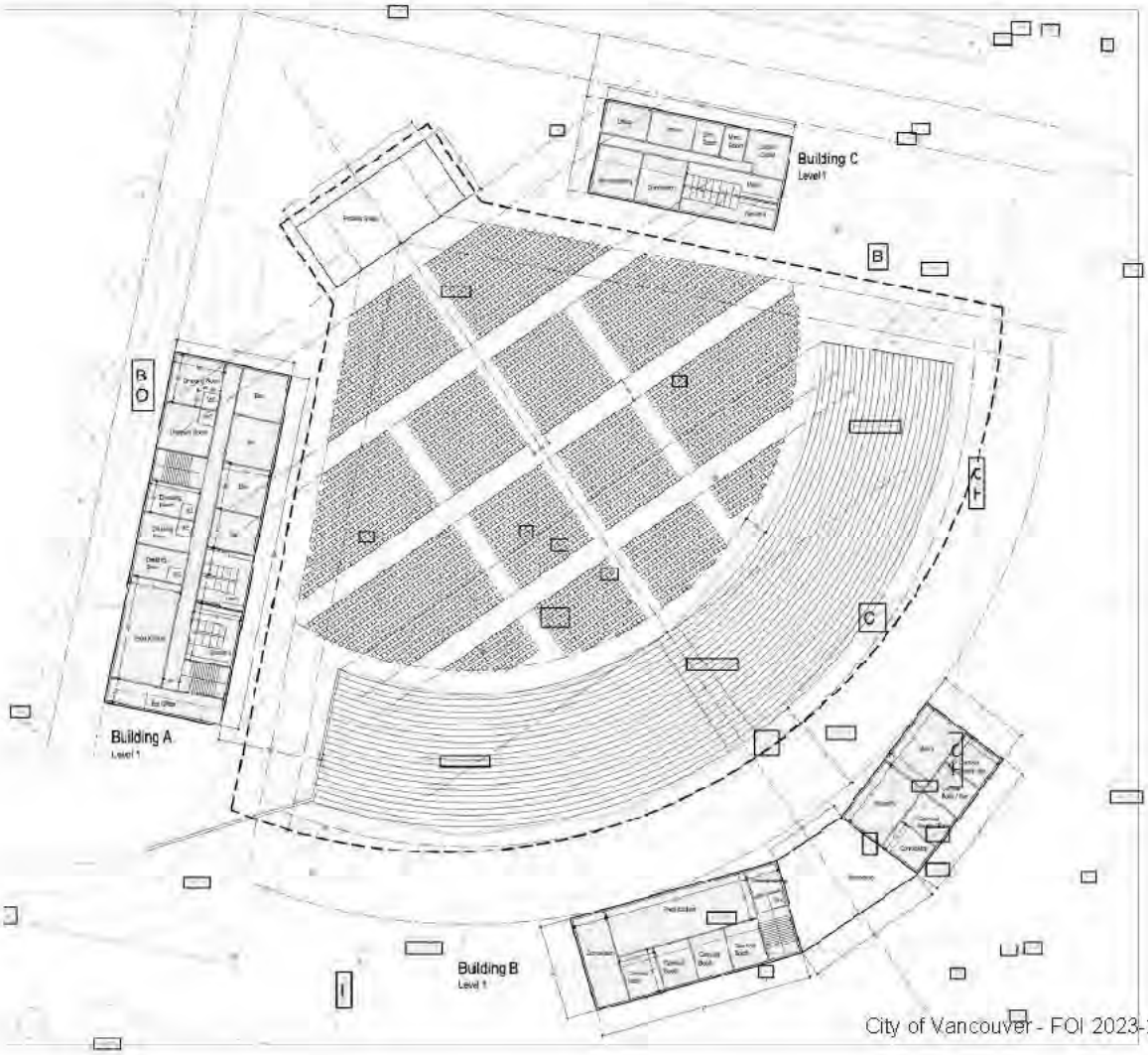
PNE AMPHITHEATRE DESIGN SCENARIO D

Roof: Provides a tensile roof which extends from the primary stage area at a height of 40' and extends upward to cover the plaza and bleachers to a height of 50'. The roof will cover the stage and the entire audience with a span of 6300 m2 extending to cover the floor area and bleachers.

Buildings: There will be 3 support buildings installed to provide concessions, washrooms, dressing rooms, production offices, security, first aid and box office. The stage will utilize portable risers to provide the main stage for concerts up to 8,750 capacity. The stage can also be moved to secondary locations closer to the bleachers, erected in smaller size configurations or is removable when not in use.

Building A will be two-stories to house the main concessions services with four bar and food concession stands, box offices, public washrooms, artist dressing rooms. The second floor on Building A will house the Executive Lounge with a capacity of 290 plus a rooftop deck overlooking the stage. Building B have three stories to house concessions, public washrooms, with a prep kitchen, security, first aid stations and office. The second floor of Building B will house 10 x VIP suites with capacities for each suite ranging from 25 – 40 for a combined total capacity of 300. The third floor of Building B will have additional VIP suites and will include flex space for meeting rooms, rehearsals, catering and flexible work spaces. The centre of Building B provides a gateway to Playland and includes shared washrooms, concessions and a bar facing east into Playland. Building C (one-story) will house the concessions and washrooms for the north side audience, plus two production offices and electrical utility rooms.

Capacity: With a removable stage, the facility can accommodate flat floor flexibility for audiences up to 4,250 on the main floor, with bleacher seating for 4,500, delivering a total capacity at concerts of 8,750, plus VIP areas to serve 590 guests, plus flex meeting space for 400 provides a total area for 9,820. Including the adjacent festival plaza will potentially allow for a capacity increase of 2600 guests for a total of 12,420 people.



SCENARIO D

Capacity:

Bleachers	4,500
Floor	4,250
VIP/Flex	990
Total:	9,820

3 Support Buildings
Full Program

All Seats, Bleachers and Stage Covered

Number of Bleacher Rows: 24 (same as existing)

Amphitheatre Roof Area: ~6,300

Building A: 1.5 Levels
~1,110 m^2

Building B: 3 Levels
~1,990 m^2

Building C: 1 Level
~290 m^2

PUBLIC ART INSTALLATION

This new venue presents an opportunity to feature a public art piece within the centre of the venue (such as back wall or roof), which could showcase and celebrate our Indigenous heritage or other designs.

This art piece could be selected via public competition and displayed year-round on the back wall of the stage.

4.6 SUMMARY OF CONSTRUCTION COST ESTIMATES

A brief summary outlining the top-line estimates for construction costs across all four scenarios, as prepared by COV Facilities Planning cost estimators, is attached below. These numbers are rough order of magnitude estimates and should only be considered as directional as opposed to fully costed estimates, which can be prepared for the next phase of the PNE Amphitheatre Renewal.

PNE AMPHITHEATRE RENEWAL
High Level Cost Estimate

Date 07 Apr 19

Item	Description of Work	Scenario A - BOH, seats, roof over stage only Qty	Unit	Unit Price	COV ADJUST	Scenario B - BOH, seats, roof Qty	Unit	Unit Price	COV ADJUST
1.0	**Site Preparation**								
1.1	Demolition and Removal of Existing	1	l.s.	$250,000.00	$250,000.00	1	l.s.	$250,000.00	$250,000.00
1.2	Cut & Off-site Disposal	1	l.s.	$150,000.00	$150,000.00	1	l.s.	$150,000.00	$150,000.00
1.4	Subgrade Preparation	9650	m2	$6.00	$57,900.00	9650	m2	$6.00	$57,900.00
1.5	Finish Grading	9650	m2	$3.00	$28,950.00	9650	m2	$3.00	$28,950.00
1.6	Existing Tree Retention	12	ea	$150.00	$1,800.00	12	ea	$150.00	$1,800.00
1.7	Allowance for Infrastructure Utilities	1	l.s.	$2,500,000.00	$2,500,000.00	1	l.s.	$2,500,000.00	$2,500,000.00
1.7	Allowance for Electrical and IMIT	1	l.s.	$0.00	$0.00	1	l.s.	$0.00	$0.00
	SubSection Total				**$2,988,650.00**				**$2,988,650.00**
2.0	**Hardscape**								
2.2	C.I.P Concrete	4500	m2	$100.00	$450,000.00	4500	m2	$100.00	$450,000.00
2.5	Asphalt	4500	m2	$80.00	$360,000.00	4500	m2	$80.00	$360,000.00
2.11	Seating Wall / Bleachers	1	l.s.	$3,000,000.00	$3,000,000.00	1	l.s.	$3,000,000.00	$3,000,000.00
2.12	Retaining Wall	40	m	$1,500.00	$60,000.00	40	m	$1,500.00	$60,000.00
2.7	Building A (2 Levels)	670	m2	$4,300.00	$2,881,000.00	670	m2	$4,300.00	$2,881,000.00
2.13	Building B (3 Levels)	520	m2	$4,300.00	$2,236,000.00	520	m2	$4,300.00	$2,236,000.00
2.14	Building C (1 Level)	0	m2	$6,500.00	$0.00	0	m2	$6,500.00	$0.00
	SubSection Total				**$8,987,000.00**				**$8,987,000.00**
3.0	**Site Improvements**								
3.1	Amphitheatre Roof - Scenario A	0	m2	$500.00	$0.00	6300	m2	$500.00	$3,150,000.00
3.1	Steel, cables, other materials	1	l.s.	$1,000,000.00	$1,000,000.00	1	l.s.	$1,000,000.00	$1,000,000.00
3.2	Stage - 4'x8" risers x 75 units	2400	sf	$60.00	$144,000.00	2400	sf	$60.00	$144,000.00
3.3	Chairs - purchase folding chairs	4250	ea	$120.00	$510,000.00	4250	ea	$120.00	$510,000.00
3.4	Storage Carts for Chairs and Risers	80	ea	$150.00	$12,000.00	80	ea	$150.00	$12,000.00
3.5	Sound wall	1	sum	$40,000.00	$40,000.00	1	sum	$40,000.00	$40,000.00
3.11	Handrail / Guardrails	30	m	$250.00	$7,500.00	30	m	$250.00	$7,500.00
3.13	Chain link Fence, Gal Steel estimates	60	m	$280.00	$16,800.00	60	m	$280.00	$16,800.00
	SubSection Total				**$1,730,300.00**				**$4,880,300.00**
4.0	**Softscape**								
4.1	Tree	10	ea	$1,000.00	$10,000.00	10	ea	$1,000.00	$10,000.00
4.2	Shrub/Groundcover/Ornamental Grasses	250	m2	$100.00	$25,000.00	250	m2	$100.00	$25,000.00
4.3	Lawn - sodded	400	m2	$20.00	$8,000.00	400	m2	$20.00	$8,000.00
4.6	Growing Medium (for shrub/ground cover/la	232.5	m3	$65.00	$15,112.50	232.5	m3	$65.00	$15,112.50
4.7	Mulch	250	m2	$10.00	$2,500.00	250	m2	$10.00	$2,500.00
4.8	Irrigation	650	m2	$20.00	$13,000.00	650	m2	$20.00	$13,000.00
	SubSection Total				**$73,612.50**				**$73,612.50**
	SUBTOTAL CONSTRUCTION COST				**$13,780,000.00**				**$16,930,000.00**
	Hazmat Allowance				$0.00				$0.00
	General Requirements & Fees			11%	$1,516,000.00			11%	$1,862,000.00
	Contractors OH/P			20%	$3,059,000.00			20%	$3,758,000.00
	TOTAL CONSTRUCTION COST				**$18,355,000.00**				**$22,550,000.00**
	Architectural Design & Structural			10.00%	$1,836,000.00			10.00%	$2,255,000.00
	Permit Fees			2.50%	$459,000.00			2.50%	$564,000.00
	Design Contingency			30.00%	$6,195,000.00			30.00%	$7,611,000.00
	Construction Contingency			5.00%	$1,342,000.00			5.00%	$1,649,000.00
	Project Management Fees			2.00%	$564,000.00			2.00%	$693,000.00
	Escalation			5.00%	$1,438,000.00			5.00%	$1,766,000.00
	Goods & Service Tax				$0.00				$0.00
	TOTAL PROJECT COST (2019$)				**$30,189,000.00**				**$37,088,000.00**

Item	Description of Work	Scenario C - BOH, seats, roof, some VIP Qty	Unit	Unit Price	COV ADJUST	Scenario D - BOH, seats, roof, full VIP Qty	Unit	Unit Price	COV ADJUST
1.0	**Site Preparation**								
1.1	Demolition and Removal of Existing	1	l.s.	$250,000.00	$250,000.00	1	l.s.	$250,000.00	$250,000.00
1.2	Cut & Off-site Disposed	1	l.s.	$150,000.00	$150,000.00	1	l.s.	$150,000.00	$150,000.00
1.4	Subgrade Preparation	9650	m2	$6.00	$57,900.00	9650	m2	$6.00	$57,900.00
1.5	Finish Grading	9650	m2	$3.00	$28,950.00	9650	m2	$3.00	$28,950.00
1.6	Existing Tree Retention	12	ea	$150.00	$1,800.00	12	ea	$150.00	$1,800.00
1.7	Allowance for Infrastructure Utilities	1	l.s.	$2,500,000.00	$2,500,000.00	1	l.s.	$2,500,000.00	$2,500,000.00
1.7	Allowance for Electrical and IMIT	1	l.s.	$0.00	$0.00	1	l.s.	$0.00	$0.00
	SubSection Total				**$2,938,650.00**				**$2,988,650.00**
2.0	**Hardscape**								
2.2	C.I.P Concrete	4500	m2	$100.00	$450,000.00	4500	m2	$100.00	$450,000.00
2.5	Asphalt	4500	m2	$80.00	$360,000.00	4500	m2	$80.00	$360,000.00
2.11	Seating Wall / Bleachers	1	l.s.	$3,000,000.00	$3,000,000.00	1	l.s.	$3,000,000.00	$3,000,000.00
2.12	Retaining Wall	40	m	$1,500.00	$60,000.00	40	m	$1,500.00	$60,000.00
2.7	Building A (2 Levels)	1110	m2	$4,300.00	$4,773,000.00	1110	m2	$4,300.00	$4,773,000.00
2.13	Building B (3 Levels)	1255	m2	$4,300.00	$5,396,500.00	1990	m2	$4,300.00	$8,557,000.00
2.14	Building C (1 Level)	0	m2	$6,500.00	$0.00	290	m2	$6,500.00	$1,885,000.00
	SubSection Total				**$14,039,500.00**				**$19,085,000.00**
3.0	**Site Improvements**								
3.1	Amphitheatre Roof - Scenario A	6300	m2	$500.00	$3,150,000.00	6300	m2	$500.00	$3,150,000.00
3.1	Steel, cables, other materials	1	l.s.	$1,000,000.00	$1,000,000.00	1	l.s.	$1,000,000.00	$1,000,000.00
3.2	Stage - 4'x8" risers x 75 units	2400	sf	$60.00	$144,000.00	2400	sf	$60.00	$144,000.00
3.3	Chairs - purchase folding chairs	4250	ea	$120.00	$510,000.00	4250	ea	$120.00	$510,000.00
3.4	Storage Carts for Chairs and Risers	80	ea	$150.00	$12,000.00	80	ea	$150.00	$12,000.00
3.5	Sound wall	1	sum	$40,000.00	$40,000.00	1	sum	$40,000.00	$40,000.00
3.11	Handrail / Guardrails	30	m	$250.00	$7,500.00	30	m	$250.00	$7,500.00
3.13	Chain link Fence, Gal Steel estimates	60	m	$280.00	$16,800.00	60	m	$280.00	$16,800.00
	SubSection Total				**$4,880,300.00**				**$4,880,300.00**
4.0	**Softscape**								
4.1	Tree	10	ea	$1,000.00	$10,000.00	10	ea	$1,000.00	$10,000.00
4.2	Shrub/Groundcover/Ornamental Grasses	250	m2	$100.00	$25,000.00	250	m2	$100.00	$25,000.00
4.3	Lawn - sodded	400	m2	$20.00	$8,000.00	400	m2	$20.00	$8,000.00
4.6	Growing Medium (for shrub/ground cover/la	232.5	m3	$65.00	$15,112.50	232.5	m3	$65.00	$15,112.50
4.7	Mulch	250	m2	$10.00	$2,500.00	250	m2	$10.00	$2,500.00
4.8	Irrigation	650	m2	$20.00	$13,000.00	650	m2	$20.00	$13,000.00
	SubSection Total				**$73,612.50**				**$73,612.50**
	SUBTOTAL CONSTRUCTION COST				**$21,932,000.00**				**$27,028,000.00**
	Hazmat Allowance				$0.00				$0.00
	General Requirements & Fees			11%	$2,412,000.00			11%	$2,973,000.00
	Contractor's OH/P			20%	$4,880,000.00			20%	$6,000,000.00
	TOTAL CONSTRUCTION COST				**$29,230,000.00**				**$36,001,000.00**
	Architectural Design & Structural			10.00%	$2,928,000.00			10.00%	$3,600,000.00
	Permit Fees			2.50%	$732,000.00			2.50%	$900,000.00
	Design Contingency			30.00%	$8,882,000.00			30.00%	$12,150,000.00
	Construction Contingency			5.00%	$2,141,000.00			5.00%	$2,633,000.00
	Project Management Fees			2.00%	$899,000.00			2.00%	$1,106,000.00
	Escalation			5.00%	$2,293,000.00			5.00%	$2,820,000.00
	Goods & Service Tax				$0.00				$0.00
	TOTAL PROJECT COST (2019$)				**$48,156,000.00**				**$59,210,000.00**

PART 5: BUSINESS CASE

5.1 VENUE MANAGEMENT

This **Business Case contemplates a primary venue management scenario whereby the PNE provides direct management of the facilities as part of the overall service it provides encompassing all buildings and venues on the PNE grounds:**

- **Sales and Marketing**
- **Food and Beverage Management**
- **Cleaning and Maintenance**
- **Grounds Keeping and Landscape Maintenance**
- **Security**
- **Ushering/Ticket Taking**
- **Parking Services**
- **Operations and Financial Systems**

The PNE's plan is to manage the PNE Amphitheatre as a new signature venue, which celebrates the heritage of the park and will become a true source of revitalization for Hastings Park and all other events onsite including the PNE Fair.

5.2 SALES AND MARKETING

In the primary scenario, the PNE Sales Department will manage the facility sales and venue calendar.

The PNE currently manages a variety of indoor and outdoor venue rental options for concerts, events, conferences, meetings and weddings. These venues include:

- Pacific Coliseum – 56,000 ft2 arena floor
- Pacific Room – 6,300 ft2 banquet room
- Forum – 45,000 ft2 flex space for meetings or events
- The Hastings Room – 3,600 ft2 meeting room
- Momiji Gardens – outdoor reception space for 300 guests
- Italian Gardens – outdoor reception space for 300+ guests
- Agrodome – capacity of 3,500
- Garden Auditorium – capacity of 1,000
- Centre Grounds – Outdoor public space
- PNE Amphitheatre (in its current form)

The existing PNE Amphitheatre is rented by the PNE Sales Department to third party concert promoters using base rates of a $10,000 flat rental fee/day plus a house costs package set at $20,000 to $40,000 depending upon the show size. These current rates reflect the high cost structure related to the need for portable infrastructure. The venue was used for five commercial shows in 2018 in addition to the 15 shows self-promoted by the PNE during the Fair.

- **Commercial Events:** concerts, festivals, special events organized by concert promoters and for-profit companies that are primarily ticketed events;
- **Community Events:** concerts, festivals, special events organized by community groups and non-for-profit organizations that are low-cost ticketed events or free admission;
- **Corporate Events:** meetings, weddings, corporate dinners and functions which are booked through PNE sales and generally non-ticketed and are not open-to-the-public events.

5.3 TICKETING AND FACILITY FEES

The PNE's ticketing system, Ticket Leader, will be the sole and exclusive ticket agent for all events held at the venue as is standard industry venue practise. All commercial events are ticketed using PNE barcoded tickets for venue access control. Exceptions can be made for certain events, and in some cases require a ticketing buyout negotiated with the PNE Sales Manager.

Following are ticketing fees that are generally charged by Ticketing Service Providers:

SERVICE FEE

This is a per-order fee (sometimes called a convenience fee/web charge) that is charged to each ticket purchaser and is kept by the ticketing company and venue. These revenues cover costs associated with ticketing software royalties, access control hardware, ticketing website development, SEO, technology, infrastructure, fraud prevention tools, call centre infrastructure, staffing and management support. These are costs involved in running the ticketing business and offering customers the ability to purchase tickets online through box offices or via phone services.

ORDER PROCESSING FEE

This is a per order fee charged by the ticketing agency to cover costs associated with receiving and confirming ticket orders.

DELIVERY FEE

This is a per-order fee that is based on the selected delivery method (UPS, Canada Post, Will Call, etc.) and it covers the cost of shipping and handling orders.

FACILITY FEE

In alignment with industry and venue best practises, the PNE Amphitheatre may establish a policy to assess a Facility Fee to be added to each ticket sold. The ticketing agency will collect and submit this fee to the PNE upon completion of each event.

Facility fees range from $2 - $6 per venue in the Lower Mainland and may range depending on the event such as:

- **Community Events:** $2.00 per ticket
- **Private Commercial Events:** $3.00 per ticket
- **Public Commercial Events:** $3.00 per ticket
- **Festivals / Full-Day Events:** $4.00 per ticket

5.4 SPONSORSHIP AND NAMING RIGHTS

Based on selling venue sponsorships and naming rights for the venue or areas of the venue, such as entitlement of the venue, entitle of the VIP Lounge, exclusive beer supplier, exclusive soft drink supplier, satellite radio supplier, automotive, and exclusive Telco and internet sponsors for the venue, the financial forecasts enclosed herein include a projection of sponsorship revenues

The PNE Amphitheatre could potentially generate $500,000+ annually for venue naming rights.
The PNE Amphitheatre could also generate $50,000 - $150,000 in sponsorship category revenues in addition to intangibles such as goodwill considerations for the venue, however these category sponsorship rights must be aligned with sponsorship agreements and benefits offered site wide or in other PNE venues or areas of the site.
Based on discussions with PNE Partnerships, we have estimated total revenues for naming rights and supplier sponsorships at $600,000 per year.

5.5 FUNDING / OPERATOR MODELS

A primary goal of this report is to create a Business Model for the PNE Amphitheatre in Hastings Park.
This report takes in account the close relationship which the Amphitheatre has to the rest of the PNE in terms of management, sales and operations.

The report also considers models for a Private / Public Partnership in which a private company, ideally in the concert promotion business, invests cash to cover some of the capital construction costs in exchange for rights to book and/or manage or co-manage the venue.

The fundamental principle for operation of the PNE Amphitheatre includes goals for high utilization, diversity of use and ease of access with a business model that is self-sustaining.

The City of Vancouver's mandate includes having a venue that is open and accessible for community use in addition to commercial event use.

The PNE Amphitheatre will, upon completion, become integral to the overall Hastings Park landscape, and be a key driver of attendance at Hastings Park throughout the year. Therefore, any Third-Party Operation Model must take into account the needs of the PNE and how events and site wide operations are tightly integrated.

PNE OPERATES

In this model, funding provided by City of Vancouver or raised by the PNE will cover the entire cost of the construction and all components of the PNE Amphitheatre would be managed as a PNE entity. Following are considerations for this model:

- The PNE is responsible for all aspects of venue operations;
- This includes day-to-day physical maintenance of the venue, plus administrative functions and programming;
- A PNE Amphitheatre manager could be appointed as the director of programming and the person responsible for venue administration;
- Provides a secure administrative model for public funding sources;
- Will ensure efficiencies with other PNE venues, events, assets and departments;
- Ensures understanding of surrounding community issues is maintained;
- Decreases the risk of commercial interests dominating the space and aligns well with the vision laid out in the Hastings Park-PNE Master Plan;
- Creates synergies for Playland promotions and cross-promotions with other events taking place at the PNE;
- Must abide by pre-existing union and labour agreements;
- Amphitheatre staff positions may be funded or provided through existing staff and channels;
- Maximizes use of event management and programming skills held by PNE team;
- Rate card can include a sliding scale for not-for-profit and community groups;
- Limits what external promoters are willing to invest in capital in return for venue control if venue control is not available

PRIVATE COMMERCIAL OPERATOR

In this scenario, a major concert promoter, such as Live Nation Canada, AEG Live or MRG Concerts may enter into an agreement with the PNE to provide funding towards the capital cost of constructing the Amphitheatre in exchange for a fixed term to manage the venue:

- **Live Nation** is well established in Vancouver and successfully operates the Budweiser Stage Amphitheatre in Toronto, as well as other large amphitheatres in North America. While being well known as industry experts in the concert industry, their operating model typically excludes access by other event and community promoters.
- **AEG Live** owns and operates a network of "Boutique Amphitheatres" along the West Coast, which are similar in size and programming needs to the PNE Amphitheatre. Again, private operator models generally exclude access by a wide range of other event and community promoters.
- **MRG Concert**s owns the Vogue Theatre, Yale Hotel, The Biltmore, Imperial and other venues across Canada and has MRG Concerts offices in four cities. (MRG is the parent company of John Donnelly & Associates, the author of this report).

In this scenario, the private operator would likely want to help design the venue and would want access to naming rights, partnership and ticketing agreements to help maximize the revenue potential. They would sign an annual lease agreement with the PNE to operate and book the venue, paying a monthly base rent for the venue with a percentage of the year-end upside offered to help the PNE recover the renovation costs.

Following are considerations for this model:

- Private operator is responsible for all aspects of venue operations;
- This includes physical maintenance of the venue, plus administrative functions and programming;
- Private operator is responsible for programming and venue administration;
- Commercial operators are primarily concerned with earning a profit, so community users are not their first priority;
- Commercial interests and contemporary shows will dominate the space;
- Benefits include different expertise in operations, maintenance and promotion of commercial and cultural performance venues;
- Less capital funding will be required from COV;
- As an operator of other site venues, PNE loses control of guest experience at Amphitheatre;
- Private operator will limit PNE's ability to generate revenue through naming rights and partnerships;
- Private operator will limit PNE's ability to self-produce shows outside of Fair which is a significant component of PNE business development plans;
- Community Use Agreements could be negotiated and built into the annual lease agreement;
- The PNE is responsible to maintain all aspects of Hastings Park Master Plan, a standard lease agreement does not provide dynamic revenue upside for the PNE in order to adjust to increasing costs.
- Private operator may not promote events or maintain the venue if these operations or events are in conflict with other company goals;
- A single private operator would also limit the range of promoters who can access the venue and there is wide interest across operators. Commercial operators generally look for exclusive mandates.

PRIVATE / PUBLIC PARTNERSHIP FUNDING – CO-MANAGEMENT OR JOINT VENTURE MODEL

In this scenario, the partner will be required to invest in the capital cost of constructing the Amphitheatre in exchange for a fixed term to co-manage the venue with the PNE.

Private concert companies, such as Live Nation, AEG Live, MRG Concerts and BluePrint may be interested in entering into a joint venture to manage the venue.

This joint venture may take different forms including a co-management scenario whereby PNE manages the physical aspects of the venue, while one or more private companies cooperate to provide international talent buying and local promotion services, Canadian shows and community use events at the venue.
Following are considerations for this model:

- The PNE is responsible for all aspects of venue operations and maintenance;
- Private operator or Joint Venture is responsible for programming and venue administration;
- The venue may benefit from the resources of multiple organizations;
- This may lead to a lively programming schedule and very active venue but also creates opportunity for conflicting interests;

- The PNE provides its expertise in operations, maintenance and security at the venue;
- Joint Venture brings commercial shows to the venue;
- The local operator manages the community user groups and fulfills community use agreement;
- There may be conflicts on dates the venue is available;
- Partnerships can have tensions or friction between the needs of the venue and the promoter;
- Most groups spoken to through the market sounding prefer an exclusive arrangement.

MARKET SOUNDING RESULTS

Representatives from Live Nation Canada, AEG Live, MRG Concerts, BluePrint, Jeff Parry Promotions, Timbre Productions, Solid Productions and others were interviewed for the purposes of this report to determine market interest in potential partnership opportunities.

Live Nation did not respond to the on-line survey; however, their technical director was interviewed to provide commentary on the infrastructure needs and facilities development. Live Nation executives have had some dialogue with the PNE senior management directly.

AEG Live expressed their interest in contributing to this project and have been looking at expanding to Vancouver by opening a venue in this market. AEG's Senior Vice-President, Mark Norman, was formerly a Vancouver resident and was General Manager of Perryscope Concerts Vancouver throughout 1983 to 1998. Mark has continued to promote shows in Vancouver from his office in Los Angeles.

MRG Concerts has reviewed this opportunity in detail and is expressly interested in contributing to the capital costs for renovations in exchange for an operating position within the new venue.

PART 6: FINANCIAL FORECASTS

6.1 FINANCIAL FORECAST OVERVIEWS

Following an analysis of the current PNE Amphitheatre revenues and expenses, plus an exploration of the design scenarios and creation of a potential venue calendar of events, it is our opinion that a 2,000 to 10,000 capacity Amphitheatre built at the PNE in Vancouver will generate gross revenues in its first year of operation ranging from $3M for Scenario A (16 events) up to $9M for Scenario D (60 events).

We base this assessment on the following:

- The Amphitheatre would comprise a new, state-of-the-art entertainment facility, which would increase the attractiveness and marketing value of the PNE Amphitheatre and, therefore, the marketing appeal of the building would be highlighted for its naming sponsor;
- The Amphitheatre would attract some 50 events annually, a level of activity consistent with other major arenas in Canada;
- There are opportunities for the Amphitheatre to secure a naming sponsorship from a company wanting to establish a presence in Vancouver similar to Rogers Communications sponsorship of the Vancouver Canucks Arena.

6.2 POTENTIAL EVENT CALENDAR

To arrive at a detailed financial forecast, we had to estimate what the calendar of events would look like in the first year. Our working calendar, attached as Appendix B – Potential Event Calendar identified the potential events under three main categories:

- **Commercial Events - booked by third-party operators**
- **Community Events - booked by qualified not-for-profit groups**
- **Corporate Events - non-ticketed booked by PNE Sales staff**

The Potential Event Calendar was then assessed against the four potential design scenarios, plus a fifth "status quo" scenario in which the facility utilities and bleachers only are upgraded and there is no new roof or buildings. This additional scenario was considered and included in the financial analysis of the report and is listed below as Scenario 0. Conclusions were reached that the following assumptions for Growth in Total Number of Events could be utilized in making the financial forecasts:

Scenario 0 (Status Quo)	
Growth Factor	# of Events
	5
2%	5
2%	5
2%	5
2%	5
2%	6
2%	6
2%	6
2%	6
2%	6

Scenario A (BOH and Seats, No	
Growth Factor	# of Events
	16
10%	18
10%	19
10%	21
5%	22
2%	23
2%	23
2%	24
2%	24
2%	25

Scenario B (BOH and Seats, Roof)	
Growth Factor	# of Events
	34
15%	39
15%	45
10%	49
5%	52
2%	53
2%	54
2%	55
2%	56
2%	57

Scenario C (BOH, Seats, Roof, Light	
Growth Factor	# of Events
	49
20%	59
15%	68
10%	74
5%	78
2%	80
2%	81
2%	83
2%	85
2%	86

Scenario D (BOH, Seats, Roof, Full	
Growth Factor	# of Events
	60
20%	72
15%	83
10%	91
5%	96
2%	98
2%	99
2%	101
2%	104
2%	106

6.3 VENUE RENTAL RATES AND GUIDELINES

Venue Rental Rates and Guidelines will be established based on general industry standard policies and requirements that specifically address events taking place at PNE facilities.

POTENTIAL PNE AMPHITHEATRE RENTAL RATES MAY BE ESTABLISHED AS FOLLOWS:

Commercial Events such as concerts, festivals, and ticketed events promoted by for-profit companies.

- **Room Rental:** $15,000
- **Move In/out Days:** $7,500
- **Multi-day Room Rental:** $10,000
- **Multi-day Move-In / out:** $5,000
- **House Package Costs*:** $20,000 to $30,000

*House Package depending on show size includes staffing (ushers, ticket takers, security, cleaners), event prep, staging set-up, electrical, water consumption, forklift and PNE equipment.

Community Events, such as charity concerts, family festivals, cultural celebrations, graduations – both ticketed or free admission that are promoted by not-for-profit or community associations.

- **Room Rental*:** $5,000
- **Move In/out Days:** $2,500
- **Multi-day Room Rental:** $10,000
- **Multi-day Move-In / out:** $2,500
- **House Package Costs**:** $10,000 to $15,000

*Room Rental rates can be based upon the size of the event, for example events with 1,000 to 2,500 people may be set at $5,000, but community events with more than 2500 people could be calculated at a rate such as $2/person, so a 5,000 person community event would pay $10,000 in rent.

**House Package depending on show size includes staffing (ushers, ticket takers, security, cleaners), event prep, staging set-up, electrical, water consumption, forklift and PNE equipment.

Corporate Events, such as gala dinners, conference events, motivational speakers or corporate celebrations where there are no public ticket sales, therefore no facility fee revenue is generated through the ticketing agency.

- **Room Rental:** $20,000
- **Move In/out Days:** $10,000
- **Multi-day Room Rental:** $15,000 per day
- **Multi-day Move-In / out:** $7,500
- **House Package Costs*:** $15,000 to $20,000

*House Package depending on show size includes staffing (ushers, ticket takers, security, cleaners), event prep, staging set-up, electrical, water consumption, forklift and PNE equipment.

These rates have been applied to the forecasted financial statements to arrive at potential revenues for the PNE Amphitheatre, using the following assumptions:

Rental Rates with House Package expenses charged to the promoter as a "House Nut" which includes: security, policing, stage rental, wings, barricade, FOH tenting, perimeter fencing, potties, forklift, electrician, plumber, dressing rooms and furniture, VIP area, event staff including ushers, ticket takers, janitors, security guards, first aid, searchers, sweepers and attendants.

Event Type	Revenue		Expense
	Rental Rate	House Nut	House Nut (80%)
Community	$5,000	$15,000	$12,000
Commercial	$15,000	$30,000	$24,000
Corporate	$20,000	$40,000	$32,000

Food and Beverage net revenue assumptions were based on the following:

Event	Ancillary - Food & Beverage (per Cap Sales)	
	Revenue	Expense (65%)
Show	$6.00	$3.90
Concert	$15.00	$9.75
Festival	$18.00	$11.70

Net parking revenues were based on:

Event	Parking Rates
	Revenue*
Community	$17.50
Concert	$22.50

** excludes TransLink charge and GST*

Assumptions for ticketing revenues are based on:

Ticketing Fees	Ticketing
	Revenue
Service Fee	$3 - $7
Facility Fee	$2 - $4
Order Processing Fee	$0.80

** some events exempt*

Other rentable areas include the VIP Lounge in Building A, with capacity of 260 people and Flex Meeting Spaces in Building B with capacity ranges up to 500 people can be rented with rates similar to the Pacific Room:

Event	VIP Rental Rates - Revenue		
	Suite	Large Suite	Flex Area / Lounge
Commercial	$1,500	$2,500	$5,000

Catering Services will form a large portion of the revenue base in operating profitable meeting spaces for dinners, receptions and celebrations. Occasionally room rental rates can be discounted or waived when the customer places a substantial catering order.

6.4 PROJECTED PROFIT AND LOSS - YEAR ONE

The PNE Amphitheatre Projected Profit and Loss is outlined in the tables below with detail and back-up calculations noted in Appendix I.

The operating budget for the re-developed PNE Amphitheatre is based on the calendar year, beginning on January 1, 2020, with the prime operating season beginning in May 2020. which is subject to change This report recognizes that the budget and staffing requirements for the operation of the Amphitheatre will be drawn from PNE:

- The PNE may draw staff and resources from several departments;
- The costs may be shared as part of the general operation of the PNE grounds while its revenues are attributed to the Amphitheatre only;
- This is a "seasonal" operation (i.e., part-time throughout the year and full-time during summer);
- The shows and revenues associated with the PNE Fair are not included in this budget.

SCOPE OF BUDGET EXPENDITURES

The costs for the operation of the Amphitheatre will take into account the PNE's responsibility for grounds, buildings, systems and equipment, customer relations and compliance including:

- Maintaining the Amphitheatre buildings and roof fabric;
- Maintaining installed systems and equipment;
- Cleaning the venue before, during and after each event;
- Maintaining general infrastructure (water, sewer, power, etc);
- Coordinating customer relations and permitting;
- Supervising permitted activities;
- Ensuring safety and security.

Annual facility overhead costs are estimated as follows:

Annual Facility Overhead Costs	
Wages/Salary Allocations	$75,600
Building Maintenance	$189,480
Energy Costs & Utilities Share	$55,400
Administration, Legal & Accounting	$158,700
Advertising & Marketing	$226,500
In-House Production Costs	$78,475
Total Annual Facility Overhead Costs	$784,155

** Capital Maintenance costs not required in first 10 years*

* 2% inflationary factor applied annually beyond year 1

Based on this calendar and the rates, the following table outlines the potential revenues and expenses for the PNE Amphitheatre over 10 years, based on the four design scenarios.

		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Scenario 0	Revenues	-	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M
	Expenses	$14M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M
	Net Cash Flows	$(14M)	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M
	Cumulative Cash Flows	$(14M)	$(14M)	$(13M)	$(12M)	$(12M)	$(11M)	$(10M)	$(10M)	$(9M)	$(8M)	$(8M)
Scenario A	Revenues	-	$3M	$3M	$3M	$3M	$3M	$4M	$4M	$4M	$4M	$4M
	Expenses	$30M	$2M	$2M	$2M	$2M	$2M	$2M	$2M	$2M	$2M	$2M
	Net Cash Flows	$(30M)	$1M	$1M	$1M	$1M	$1M	$2M	$2M	$2M	$2M	$2M
	Cumulative Cash Flows	$(30M)	$(29M)	$(28M)	$(27M)	$(26M)	$(24M)	$(23M)	$(21M)	$(20M)	$(18M)	$(16M)
Scenario B	Revenues	-	$4M	$4M	$5M	$5M	$5M	$6M	$6M	$6M	$6M	$6M
	Expenses	$37M	$2M	$2M	$3M	$3M	$3M	$3M	$3M	$3M	$3M	$3M
	Net Cash Flows	$(37M)	$2M	$2M	$2M	$2M	$3M	$3M	$3M	$3M	$3M	$3M
	Cumulative Cash Flows	$(37M)	$(36M)	$(34M)	$(31M)	$(29M)	$(26M)	$(24M)	$(21M)	$(18M)	$(15M)	$(13M)
Scenario C	Revenues	-	$6M	$8M	$9M	$10M	$10M	$10M	$10M	$11M	$11M	$11M
	Expenses	$48M	$3M	$4M	$4M	$4M	$4M	$5M	$5M	$5M	$5M	$5M
	Net Cash Flows	$(48M)	$3M	$4M	$5M	$5M	$6M	$6M	$6M	$6M	$6M	$6M
	Cumulative Cash Flows	$(48M)	$(45M)	$(41M)	$(36M)	$(31M)	$(25M)	$(20M)	$(14M)	$(8M)	$(2M)	$4M
Scenario D	Revenues	-	$9M	$11M	$13M	$14M	$14M	$15M	$15M	$15M	$16M	$16M
	Expenses	$59M	$4M	$5M	$5M	$6M	$6M	$6M	$6M	$6M	$6M	$7M
	Net Cash Flows	$(59M)	$5M	$6M	$7M	$8M	$8M	$9M	$9M	$9M	$9M	$9M
	Cumulative Cash Flows	$(59M)	$(54M)	$(48M)	$(41M)	$(33M)	$(24M)	$(16M)	$(7M)	$2M	$11M	$21M

Based on this forecast, the Net Present Value (NPV) calculations and Internal Rate of Return (IRR) are:

	Net Present Value		Internal Rate of Return	
	10-Yr NPV	40-Yr NPV	10-Yr IRR	40-Yr IRR
Scenario 0	$(25M)	$(16M)	(12%)	3%
Scenario A	$(19M)	$3M	(11%)	3%
Scenario B	$(17M)	$27M	(6%)	6%
Scenario C	$(4M)	$98M	1%	11%
Scenario D	$8M	$169M	5%	14%

6.5 SUMMARY

This report concludes there is significant demand for a new 2,000 to 10,000 capacity amphitheatre venue from diverse market segments. National promoters and cultural organizations have expressed interest in this venue development and are willing to bring their shows to this new venue if it is built and priced affordably.

The financial analysis concludes that Scenario D with a roof covering the entire plaza and the full scale of support buildings to deliver VIP services and work areas with forethought for future growth is the optimal choice based on the cost model and revenue assumptions, although the upfront financing remains a separate issue.

With an approval to proceed, the PNE Amphitheatre will:

- Be a place of gathering and celebration for the community;
- Be the premier place for outdoor festivals and events in Vancouver;
- Become a part of Vancouver's brand and destination appeal;
- Support Vancouver's diversity and showcase its talent;
- Be complementary to and compatible with PNE;
- Be an architectural icon;
- Be host to a wide range of users and a balance of programming;
- Be accessible and easy to use;
- Be self-sustaining with its own management and budget;
- Become a key driver for the continued success of the PNE;
- Complement the existing venue supply at PNE and within Greater Vancouver market;
- Incorporate design and modern construction technology to create a unique property;
- Provide a viable roof option to offer year-round use;
- Produce an estimated $3-5 Million in net operating income annually upon stabilized operations;
- Generate significant economic/fiscal impacts upon completion.

THANK YOU

This report was prepared with the generous support and assistance from the City of Vancouver / PNE Project Team. Special thanks in particular are extended to John Brodie, Program Manager, Hastings Park / PNE Master Plan for his dedication and thoughtful reviews as the research was developed.

Many thanks also to David Uyesugi, City of Vancouver Finance Department for his thorough analysis and detailed financial forecasts.

From the PNE, we received tremendous access and support in identifying the potential scenarios and requirements for the new amphitheatre. Our sincere thanks to Shelley Frost, Susan Steffens, Donald Lee, Karen Massicotte, Steve Bain, Sandra Ruff, Jeff Strickland, Rob Crema, Paul Bussanich and Peter Male (from Peter Male & Associates).

From the City of Vancouver, our thanks for their commitment to culture and community! Many thanks to Lynn Ross, Alix Sales, Kristen Lambertson, Venus Vane, Raghav Grover, Rob Evans and David Uyesugi.

ABOUT THE AUTHOR

John Donnelly is an award-winning producer of special events and has been producing festivals and entertainment properties in Vancouver and across Canada for over 30 years. John was honoured with the Province of British Columbia's Nesika Award for Excellence in Promoting Cultural Diversity. John Donnelly & Associates / MRG Group were awarded the 2019 International GALA Award for Best Festival in a world-wide competition and have been recognized with over 20 national and regional awards.

APPENDICES

APPENDIX A: LIST OF SURVEY RESPONDENTS

1. Paul Runnals, BrandLive
2. Mark Norman, AEG Live
3. Patrick Roberge, PRP Connect
4. Tarun Nayar, Vancouver International Bhangra Society
5. Dave Osborne, Live Nation Canada
6. Robert Calder, Secret Study
7. David McCulloch, Timbre Concerts Ltd
8. Patrick Onukwulu, Festival African Heritage Music and Dance Society
9. Paola Murillo, Latincouver
10. Tania Richards, Collective X
11. Charlie Wu, Asian-Canadian Special Events Association
12. Eduardo Ottoni, Coastal Jazz and Blues
13. Sarah Shandl, Donnelly Events
14. Darren Dreger, BC Event Management
15. Gemma Scott, Go2 Productions
16. Azim Virani, Twisted Promotions
17. Andrea Arnott, Vancouver Pride
18. Andrea Curtis, MuralFest Vancouver
19. Elia Kirby, Great Northern Way Scene Shop
20. Justin Kwan, MRG Concerts
21. Claire Duncan, Cantrav
22. Alvaro Prol, BluePrint
23. Tom Landa, Vancouver World Music Festival
24. Jeff Thorn, AV Industries
25. Chris Monlux, Monqui Presents
26. Brock Lumsden, Bold Event Creative
27. Ricky Li, Vancouver Chinese Cultural Festival
28. Scott Emslie, Wet Ape Productions / Aurora Winter Festival
29. David Chinn, Dragon Boat BC
30. Joanne Burns Millar, Pacific Destinations
31. Mike Shir, Solid Productions
32. Crispin Giles, Promoter
33. Ron Chiu, AEG Live
34. Tony Talirico, e=mc2
35. Leah Heneghan, Vancouver Craft Beer Week
36. Nik Von Schulmann, PRP Connect
37. Marilen Dela Cruz, Philippine Family Festival Association
38. Geoff Tanizawa, Sakamoto Entertainment

APPENDIX B: POTENTIAL EVENT CALENDAR

2020 PNE AMPHITHEATRE - POTENTIAL CALENDAR OF EVENTS					
# DAYS	EVENT DATE	NAME	ACTIVITY	EST. #	CATEGORY
10	January 20-30, 2020	Chinese Lunar New Year Festival	Exhibit of lanterns, food & music	10,000	Community Festival
1	March 28, 2020	Vancouver Famers Spring Market	Market	500	Community Market
1	April 4, 2020	Vancouver Famers Spring Market	Market	500	Community Market
1	April 11, 2020	Vancouver Famers Spring Market	Market	500	Community Market
1	April 15, 2020	Vancouver Famers Spring Market	Market	500	Community Market
1	April 24, 2020	Desi Doordarshan	Cultural concert	4000	Community Festival
1	April 25, 2020	Vancouver Famers Spring Market	Market	500	Community Market
1	April 28, 2020	Vancouver Famers Spring Market	Market	500	Community Market
1	May 1, 2020	Vancouver Famers Spring Market	Market	500	Community Market
1	May 5, 2020	Cinqo de Mayo	Family event and Mexican concert	2000	Community Festival
1	May 23, 2020	Timbre Productions	Concert	5000	Commercial - Concert
1	May 25, 2020	Unite Productions	Christian Concert	3000	Commercial - Concert
2	May 29-30, 2020	BluePrint	EDM Festival	10,000	Commercial - Concert
2	June 5-6, 2020	Vancouver Craft Beer Week	Craft beer festival	5,000	Commercial - Food event
1	June 7, 2020	Yogathon	Yoga event	1500	Community Festival
1	June 12-13, 2020	Break-Out Festival	Timbre Productions festival	7500	Commercial - Festival
1	June 16, 2020	DMC - Corporate Dinner	Off-site Corporate event for conference	2000	Corporate
1	June 19, 2020	Live Nation Canada	Concert	4000	Commercial - Concert
1	June 20, 2020	Philippine Festival Assoc	Cultural festival	4000	Community Festival
1	June 21, 2020	National Indigenous People's Day	Cultural Festival	2000	
1	June 23, 2020	MacGillivray & Associates	Dinner Event	700	Corporate
1	June 26, 2020	Graduation Event	School Graduation ceremony and dinner	1300	Community Event
1	June 27, 2020	Live Nation Canada	Concert	4000	Commercial - Concert
1	June 28, 2020	MRG Concerts	Concert	4000	Commercial - Concert
1	July 1, 2020	Canada Day / Playland Promotion	Festival	5000	In-house production
2	July 4-5, 2020	BC Cancer Foundation	The Underwear Affair	3000	Community Festival
2	July 18, 2020	Taste of the City - food truck festival	Food sampling event	5000	Commercial - food event
1	July 25, 2020	MRG Concerts	Concert	4000	Commercial - Concert
1	August 1, 2020	Live Nation Canada	Concert	4000	Commercial - Concert
1	August 2, 2020	JanSport Bonfire Sessions	Concert / Corporate Event	5000	Corporate
1	August 4, 2020	Vancouver Pride Society	Pride Concert and Playland Promotion	3000	Community Festival
1	August 6, 2020	MRG Concerts	Concert	4000	Commercial - Concert
1	August 7, 2020	MRG Concerts	Concert	4000	Commercial - Concert
1	August 9, 2020	Timbre Productions	Concert	5000	Commercial - Concert
1	August 10, 2020	BluePrint	EDM Concert	7,000	Commercial - Concert
15	August 13 - 31, 2020	PNE Summer Concerts Series	15 show concert series during PNE Fair	7500	In-House Production
1	September 3, 2020	Taiwanese Cultural Festival	Cultural Concert	5,000	Community Festival
2	September 11-12, 2020	Westward Music Festival	Multi artist festival	10,000	Commercial - Festival
1	September 15, 2020	Vancouver Mexican Festival	Family event	2000	Community Festival
1	September 19, 2020	Boys & Girls Club	Autumn Brewmasters Festival	3000	Commercial - Food & Beverage event
1	September 22, 2020	DMC - Corporate Dinner	Off-site Corporate event for conference	2000	Corporate
1	September 25, 2020	Live Nation Canada	Concert	7000	Commercial - Concert
1	October 7, 2020	Motorcycle Toy Drive	Fundraiser - BBQ event	1500	Community Festival
1	October 17, 2020	Rocktoberfest 2020	Beer Festival	2500	Commercial Festival
2	October 24-25, 2020	MIB Roadshow	Diwali Festival of Light	3000	Community Festival
1	October 31, 2020	Solid Promotions	Halloween Doomsday	7500	Commercial - Concert
1	December 31, 2020	Solid Promotions	New Year's Eve Concert	4000	Commercial - Concert

APPENDIX C: SURVEY QUESTIONS

1. Which of the following best describes your organization?
2. Which of the following best describes your legal structure?
3. What type of performance and events does your organization produce?
4. How many outdoor performances and events did your organization produce in the past 12 months?
5. Please indicate how many outdoor performance and events your organization produces per time of year?
6. What is the average admission that you charge for outdoor performances or events?
7. On average, how many people attend your outdoor performances and events?
8. Please describe the typical demographic makeup of your audience (if your audience is broad, please estimate the approximate makeup of the most significant groups within your audience):
9. Has there been a demographic shift in your audience attendance at your event?
10. On average, what is the age of your event attendees?
11. How has your attendance at your outdoor performances and events changed over the past 5 years? By what percentage would you say attendance has changes.
12. Do you expect that the attendance will increase in the next 10 years?
13. Please describe the ideal outdoor venue for your outdoor performances and events.
14. What do you typically require?
15. Are there any production requirements that are unique to your performances and events?
16. What are the top 5 venue features or amenities that influence your venue selection?
17. What do you see as the top 3 challenges facing your organization in terms of addressing the venue needs for your performance and events?
18. What specific infrastructure do desirable venues have that make them ideal?
19. Do you use outdoor facilities located in Vancouver for your performances and events?
20. Which outdoor facilities in Vancouver do you use for your events?
21. What are the top 3 reasons you use these facilities?
22. Has your organization been unable to book an outdoor performance and/or event at your preferred facility in Vancouver in the past 5 years?
23. Why were you unable to book your outdoor performance or event at your preferred venue?
24. What are the advantages of the outdoor performance and event spaces un Vancouver that you currently use?
25. What are the disadvantages of the outdoor performance and event space in Vancouver that you currently use?
26. Do you feel that there are gaps in available outdoor performance and events spaces in Vancouver?
27. The City of Vancouver is considering building a new PNE Amphitheatre. If this happens, would you be interested in renting the space?
28. If the City of Vancouver builds a new Amphitheatre, what are the top 5 features/amenities that the City of Vancouver and the PNE should include?
29. Is there anything else that you would want to see included in the planning?

APPENDIX D: SURVEY RESPONSE SUMMARIES

PAUL RUNNALS,
Partner & Senior Vice-President; Creative & Production
BRANDLIVE Management Group Inc.
120 West 3rd, Suite 201, Vancouver BC V5Y 1E9
Tel: 604-733-7171 Email: prunnals@brandlivegroup.com

BRANDLIVE is a large-scale event production and sponsorship agency based in Vancouver.

BRANDLIVE is the producer of the Honda Celebration of Light, Vancouver's spectacular fireworks competition, the annual Canada Day at Canada Place celebrations, and the new SKOOKUM festival, a three-day outdoor music festival staged at Stanley Park which attracted paid attendance of 54,000+ in its first year.

BRANDLIVE produces 30 to 40 events each year, including concerts, festivals, charity gala dinners, bespoke conferences and corporate events.

There is a critical gap in the Vancouver venue marketplace to find venues that range from 2,000 to 6,000 people. BRANDLIVE often looks for flat-floor venues to host off-site events for major corporations who are hosting conferences at the Vancouver Convention Centre, and there is nothing available.

They are seeing growth in their corporate business and look for venues to host large-scale dinners with entertainment. There are many limitations with venues such as Rocky Mountaineer and Jack Poole Plaza, such as hours, noise and access.

An ideal venue at the PNE will need infrastructure support including: flat floor or hard event surface space, trenched conduit to bury cables, stage with cover, power, permanent toilets, dressing rooms, fencing, robust internet, running water and back-of-house dressing rooms and production offices. Roof height would be minimum 30'-35' and should be able to support 1000 lb. rigging points in multiple locations.

Flexibility is very important in terms of stage size and location. Should also have multiple rigging locations throughout the house for lighting and other installations. There should be catwalks and ability to service the roof lighting and rigging points.

Outdoor venues that have been used in the past include Larwill Park - which now has significant limitations; David Lam Park and Stanley Park – both of which have many restrictions regarding use; and the Concord Pacific Lands at False creek - which os now being divided into smaller spaces with gardens and walkways and is slated for extensive redevelopment in the next few years.

VIP services and areas are becoming increasingly important because VIP tickets generate significant revenues for premium experiences and there is a fast-growing market for VIP's.

The lighting in the venue needs to be fully controllable, and there is tremendous progress in LED lighting technology. BC Place is a great example of using LED lighting and colour to create ambience and excitement for the events.

The gap that is missing in the Vancouver marketplace for venues, indoor or outdoor, is 2000 to 6000 capacity. There are currently venues such as QE Theatre and Orpheum or Malkin Bowl which seat 2500 people, and then after that there is only the arenas.

Vancouver definitely needs a new, mid-size multi-purpose venue.

APPENDIX D: SURVEY RESPONSE SUMMARIES

ALVARO PROL, President
BluePrint
415 West Cordova Street
Vancouver BC

BluePrint is one of Vancouver's most successful entertainment companies, which owns bars and nightclubs in Vancouver and Calgary, and produces over 700 shows per year, including major music festivals: Contact, FVDED in the Park, Seasons and Get Together.

BluePrint specializes in EDM, dance and contemporary live music genres, with ticket prices that range from $15 to $100, with an estimated average of $38. Approximately 300,000 people attend BluePrint events annually, which are predominantly in the 18-29 age range.

The primary gap in capacities for Vancouver venues ranges from 2,500 to 15,000 people. There are venues such as Commodore and Vogue which can hold 1000 people, and then aside from soft-seat theatres which don't work well for EDM artists, there are very few available venues until the artist reaches the arena level. Talent-wise there is a huge gap in the market for artists who can draw 5,000 to 10,000 people.

An important consideration in venue amenities is proximity to transit. They have had proven success with events that are close to transit, such as Holland Park in Surrey with skytrain across the street.

In setting up outdoor venues, they look to ensure there are no pinch points in the venue layout, and that exits and entrances are large. They also watch for issues such as long line-ups due to security checks and pat-downs.

It would be nice to have a fixed permanent stage at a new amphitheatre but having options is nicer. Most amphitheatres have fixed seating and tiered floor layouts… so having flexibility for a flat floor GA set-up would be beneficial for their shows.
They tried to host a dance music event at Deer Lake Park and were turned down due to perceptions of the EDM genre.

There are many shows that BluePrint can't do because they are too big for the Commodore and too small for an arena. Red Rock Amphitheatre has a 9,525 capacity and hosts many artists that BluePrint could book.

VIP services is a huge and growing part of BluePrint's business, estimating almost 30% of their revenue comes from VIP premium services and sales. There are many Vancouver customers who have the disposable income and want the VIP experience.

If there was a large VIP room at the new Amphitheatre, he would suggest 250 capacity.

Having a flat floor area and flexibility for stage size, stage location and GA floor is ideal.

If the venue had pre-installed speakers, his artists would likely use them if it reduced the impact on the neighborhood.

Having an assortment of food options, including food trucks, is preferred.

APPENDIX D: SURVEY RESPONSE SUMMARIES

EDUARDO OTTONI
Director of Operations
COASTAL JAZZ
2nd Floor, 295 West 7th Avenue
Vancouver, BC V5Y 1L9

Coastal Jazz and Blues Society is a community-based, non-profit, charitable arts organization located in Vancouver, British Columbia. Since 1986 Coastal Jazz and Blues Society has contributed vigorously to the local, national and international jazz scene as producers of the TD Vancouver International Jazz Festival, generating over $43 million in economic activity each year.

Now in its 32nd year, Coastal Jazz is committed to actively supporting year-round programming initiatives that strengthen links with a diverse range of arts presenters in Vancouver.

The 2018 Jazz Festival featured almost 400 shows, with 80 shows taking place at outdoor venues including marquis events at David Lam Park, Gastown, Canada Place, Capilano and Granville Island.

The festival location at David Lam Park attracts almost 10,000 people daily, as the audience sizes have grown steadily over the past 15 years. These performances are tied to workshops and smaller events happening simultaneously at the Roundhouse Community Centre.

The event infrastructure all has to be brought into the park, including generators, staging, and water is arranged for food vendors by running hoses from a local business on Drake Street.

The Jazz Festival is one of the largest cultural events in Vancouver, attracting 500,000 people and the producers do anticipate continued growth over the next 10 years.

Their goal is to keep the event in the downtown core, vs splitting the audience by having sites located in other districts. Hastings Park is not really a viable option for them given their main core of downtown venues, however they would consider doing a premiere show there.

They are continually looking for new sites as their growth depends on how viable their sites area. They would love to have one large coherent space to create a singular experience for people to enjoy all day long. There are numerous hurdles in working to secure outdoor sites, such as liquor licensing and various rules or conditions imposed at various park locations.

The gap that is missing for Vancouver International Jazz Festival is in the 5,000 to 15,000 range and up. It would make more sense to them to have one large space vs going onto more city streets, as they have reduced level of control on the streets.

The ideal outdoor venues for Coastal Jazz will have easy accessibility, truck and loading access, close to transit, power, stage, permanent washrooms, green space, running water and is mainly a flat or level surface.

APPENDIX D: SURVEY RESPONSE SUMMARIES

DAVE OSBORNE, Senior Production Manager
Live Nation Concerts Canada
56 East 2nd Avenue, Vancouver, BC V5T 1B1

Live Nation Entertainment is the largest live entertainment company in the world, consisting of five businesses: concert promotion and venue operations, sponsorship, ticketing solutions, e-commerce and artist management. Live Nation seeks to innovate and enhance the live entertainment experience for artists and fans: before, during and after the show.

In 2018, Live Nation sold 140 million tickets, promoted 21,000 concerts, partnered with 850 sponsors and averaged 25 million unique monthly users of its e-commerce sites.

Live Nation's Vancouver office annually promotes over 300 major concerts in Western Canada.

Live Nation produces outdoor concerts and festivals in the Lower Mainland at Malkin Bowl at Stanley Park, Deer Lake Park in Burnaby and Holland Park in Surrey.

Although Malkin Bowl has certain production limitations due to its age and location, our audiences tend to like this venue aesthetically and ticket sales for this venue have been consistent. The concerts being staged at Malkin Bowl this year are skewing to a younger demographic, with shows like which may account for the increase in attendance.

The gap that is missing in the Vancouver marketplace for venues, indoor or outdoor, is 2,000 to 9,000 capacity, although Live Nation does shows at Deer Lake Park that range from 5,000 to 9,000.

The venue must be cost-effective… if you have to bring in sound, lights, stage, fencing, potties, power… the production costs become too high and you can't afford to pay the artists or you must raise the ticket price to unaffordable levels.

Having permanent infrastructure such as stage with cover, power, toilets, dressing rooms, seating, fencing, internet access and back-of-house dressing rooms and production offices. There should be a grid system installed above the stage which has 1000 lbs per point, and which can support loads up to 50,000 lbs for a 4-truck show. The video wall generally has the heaviest loads so there should be corner beams on the upstage edge for video installations. If there is no back wall, then a wind wall should be installed and flown from the truss. They would need to have a minimum of four dressing rooms, with two being larger size, plus two production offices. Power should have 400 amps for lighting, 200 amps for sound and 200 amps for video.

The stage should be 60' wide x 40' deep x 5' high with docking ability for truck unloading.

The consumer experience must be pleasant… parking nearby or easy access to public transit, sufficient entryways to reduce line-ups, reserved seating, quality food and beverage.

There are many production limitations at Malkin Bowl – no truck access, no rigging points, old stage … The biggest concerns in arranging outdoor venues are generally neighbourhood issues, problems arising with local neighbours.

This city needs an outdoor venue with 4000 to 7500 capacity with seating, great aesthetics, scalability, partial infrastructure and a permanent stage and roof.

Live Nation would like to see the resources focused on a roof with proper rigging, power, entry gates, back-of-house support areas and ideally a cover for the audience.

APPENDIX D: SURVEY RESPONSE SUMMARIES

CHARLIE WU
Asian Canadian Special Events Association
103 - 334 East Kent Avenue South
Vancouver BC V5X 4N6

Asian Canadian Special Events Association is the producer of TaiwanFest, Vancouver Taiwanese Cultural Festival which is now in its 28th year and had taken place at Plaza of Nations for 9 consecutive years until 2010, when it relocated to the Art Gallery Plaza and Granville Street. They also produce LunarFest and hosted a cultural festival as part of the Cultural Olympiad during the Vancouver 2010 Winter Olympic Games.

TaiwanFest consistently attracts 60,000 to 100,000 people. Their new goal was to share their culture and provide the people of Vancouver to experience and appreciate the culture and diversity of Taiwanfest.

They would like to see Vancouver install a new venue with a cover for the audience similar to Freemont Street in Las Vegas, where the complete street and sidewalks are covered for pedestrian use. Their event needs a combination of indoor space for exhibits and art, as well as outdoor space for music and festival performances and vendors.

They would love to see a new venue which is covered to protect the event from the elements, as their patrons who are mainly Asian do not like direct sunlight or rain. Their event takes place from September 1 – 3, which is generally when the PNE is on, so they cannot go to Hastings Park for this reason but they would consider other presentations when the venue is available.

CHRIS MONLUX, Promoter
Monqui Presents
P.O.Box 5908
Portland, Oregon, 97228

Chris and Monqui book several venues in the Portland Oregon area including two major Amphitheatres. They have a long relationship with the Les Schwab Amphitheatre in Bend where they have an exclusivity agreement and produce 13-16 shows annually. Les Schwab has a maximum capacity of 7,000 people. Monqui also has a long standing agreement with the Edgefield Amphitheatre in Troutdale Oregon where they are averaging 30 shows per year at an average ticketprice of $45.00. Edgefield has a capacity of 2,500 and plays host to a wide range of Genres from Steve Miller to Rodrigo & Gabriela, Jack Johnson, Phish and Jack White. They also book shows in several Portland venues from the clubs to theatres.

On average their Amphitheatre shows range from 2,500 to 5,000 people with a couple of the Bend shows this year hitting 7,000. Their biggest priority besides the roof and weather protection is the flexibility of layout inside the Amphitheatre footprint. With a large portion of their shows running 2,500 to 3,000 they do require the ability to move the stage and are not fans of a fixed bandshell.

With the work being done to upgrade the PNE's Amphitheatre, Chris expressed the desire to start bringing shows again into the Vancouver area. Monqui worked with Dave Fortune a few years back and put two shows in the PNE Amphitheatre using its temporary set up with one doing well and one not so strong. Chris feels the proposed upgrades would give them a better chance at success and believes the stop would highly appeal to most agents routing their tours, bands that play both Edgefield and Bend would be a natural.

APPENDIX D: SURVEY RESPONSE SUMMARIES

MARK NORMAN
Senior Vice President of Global Touring
Concerts West / AEG Presents

AEG Presents LLC produces music festivals and owns and operates arenas and amphitheatres in the United States. AEG Presents was formerly known as AEG Live, LLC. The company was founded in 2001 and is based in Los Angeles, California with venues in the United States. AEG Presents LLC operates as a subsidiary of Anschutz Entertainment Group,

An amphitheatre in Vancouver will have an extended season if it has a roof. Perhaps consider a cable system with a retractable canopy roof.

A similar size Amphitheatre is Red Rocks in Denver which has a capacity of 9,200 people, and it an exceptional venue because it is iconic and all artists want to play there. Red Rocks hosted over 150 shows in 2018 and the quality of the venue experience helps to sell tickets. It is situated where there are no noise issues.

The top venue features that he looks for in booking a venue are: ambience, pricing, fit with the artist, is there easy parking or access, and is it cost effective.

The top Vancouver outdoor venues that come to mind are Malkin Bowl, Brockton Oval, UBC Thunderbird Stadium and Deer Lake Park.

Most amphitheatres have permanent stages and pre-set seating. If the venue has a flat floor with removable seats, and a portable stage, then it has to be cost-effective for setting up the stage and seating. Flexibility is good for some shows, but it gets expensive if you have to bring in the stage and chairs, so that could limit the number of shows that come in.

The venue has to have a good artist experience… nice dressing rooms, a BBQ pit or high end lounge areas are helpful in creating an excellent experience for the headliners.

Most artists will travel with their own PA system.

APPENDIX D: SURVEY RESPONSE SUMMARIES

MIKE SHIR, President
Solid Corporation
501 St Andrews
West Vancouver BC, V7S 1V1

Solid is one of Vancouver's largest EDM promoters, having done shows at the PNE Coliseum for over 15 years they have achieved great success with their two strongest branded events, Halloween Doom's Night and New Year's Eve. Solid now runs the Harbour Event Centre and the Harbour Convention Centre on the old Plaza of Nations site in NE False Creek. As such they are an incorporated company specializing in venue management and concert promoting.

Solid now produces around 120 shows per year in the Vancouver market ranging from club to arena level. Their client base holds a culturally diverse mix, concentrating on 19+ age group ranging primarily 19 to 29 but seeing a growing crowd also in the 30-42 range. Most shows are in the EDM and Hip-Hop Genres. On average they are playing to crowds between 2,500-7,000.

They have been aware of increased attendance over the last 10 years with one of the most advanced areas of growth in the VIP experience. At this point this demographic on average is running at about 30% of their business.

In looking at the proposed Amphitheatre at the PNE grounds there are three main priorities for their group. The most important being the roof over the floor and stands, one of the factors that has held them back in the development of outside performances has been the risk associated with weather. They are being asked by artists that they have worked with for a long time to try and find outdoor space as the artists want to play outdoors to offer something different. Besides the roof they are looking for capacities of 7-12,000 and more important than the seating is the GA Floor of up to 6000. A large GA configuration is a key requirement for their crowd and with this they feel that they could bring increased business to the PNE grounds.

As far as back of house goes they require at least 3 dressing rooms and a promoter office. Moving forward they also see the growth of the internet as a key factor and are looking for the ability to live stream during shows. All improvements in service in this area are of great value as more and more we are seeing this aspect added to live performance.

In Mike's mind the roof is far more important than the stage itself, he does not like the idea of a permanent bandshell as it limits the flexibility of what he can do. He would however look to use a permanent speaker system if it was installed especially liking the effect of minimizing sound bleed into the neighbourhood.

APPENDIX D: SURVEY RESPONSE SUMMARIES

GEOFF TANIZAWA
Gold & Gold
63 Chinook Hts S
Lethbridge, Alberta\T1K 6T6

Geoff works as Ron Sakamoto's right-hand promoting shows across Canada. Ron and his company have a 50-year concert portfolio with tours and shows in Canada with most of the top country artists in the U.S. In 2014 he was inducted into the Canadian Country Music Hall of Fame and has received several other awards from the Canadian Industry. Ron and Geoff have just finished an 8-city tour with Keith Urban across western Canada to sellout crowds and are already setting up major tours for 2019 including a 20 city run with Johnny Reid.

Geoff feels that the roof is the key to a market facing the weather conditions we have in the Lower Mainland. One of his concerns with the roof will be the hang capacity for larger shows for example the Keith Urban show had 74 points holding approx. 125,000 pounds. Its not just the speakers that have driven this but the growing use of moving lights which can also add considerable weight. From a size perspective he feels it will need to be able to accommodate 8-12,000 people but will need the ability to scale back to 3,000 when required. He stresses the need for flexibility and as such is not a supporter of a fixed bandshell and prefers the option of a portable stage that can have its position adjusted. He also mentioned that if a canvas roof was used he would be in favour of having the ability to pull it back on sunny days to expose the crowd to more direct sunlight.

He is a huge supporter of the PNE as a venue site and emphasizes the advantages of onsite parking, power resources, Playland and the mountain view. Drawing large parts of a country audience from the valley the direct access to Hwy 1 is also a huge value. Although the VIP section of his business does not run as high as the EDM genre he is seeing growth in this section of the market and encourages the use of suites and second floors on concessions buildings. On the floor he is looking for VIP sections that could accommodate 150-300 people and sees the idea of a rooftop area of approx. 250 on the concessions stands as a great opportunity. The suites would also give the chance to grow his corporate sales.

Requests for dressing rooms and production offices run similar to other promoters, looking for at least 4 dressing rooms, a production office for the tour and one for the local promoter. Merch and meet and greet areas are also a must with a heavy emphasis in the country music scene.

APPENDIX D: SURVEY RESPONSE SUMMARIES

PATRICK ONUKWULU
Artistic & Managing Director
Festival African Heritage Music & Dance Society

Patrick is an African musician, songwriter, storyteller and producer who annually producers the African Heritage Music Festival and many other events in Vancouver, Richmond and Surrey. Patrick agrees that Vancouver has a gap in venues for concerts and events that will draw more than 1,000 people. He would like to see infrastructure installed similar to Swangard Stadium where they provide dressing rooms and permanent public washrooms that can serve the artists and audience. He would like to see the venue be self-contained, where community shows can access these resources and bring in their own specialized food vendors and booths.

He feels that if the stage is able to move forward, this will be a great idea for events that have smaller attendances.

He would prefer to see the chairs be removable so the venue can host a large open floor for dancing or dinners in addition to seated concerts.

SCOTT EMSLIE
President
Wet Ape Productions

Vancouver needs a venue to serve the 3,000 to 5,000 event range. There is no suitable venue for EDM shows in this market as the local theatres do not suit all shows. Many artists can play the Commodore, but the next venue available to them after that (if they don't suit a theatre) is Rogers Arena, which isn't financially viable for less than 5,000 capacity shows.

As a producer, he prefers to have creative control over the layout of their venues, so having removable seating and flexible stage position is preferred. It is critical to have suitable power, green rooms, production offices.

His company does a range of different events, less music shows and more experiential events so he could envision other uses for the amphitheatre besides concerts. He has many other shows that could work at the PNE, so he is always looking to do creative projects that don't rely on a headline artist for the draw.

If the venue can offer a layout which works for 3,000 as well as it works for 7,500, then it will be more viable for the Vancouver market.

Having flexible seating locations or removable seats altogether is good. Having tiers on one side, or corporate boxes is also good for his company.

In the past five years, his company has seen a huge increase in VIP spending at events, in particular the sponsors are paying more for corporate hosting and less on straight sponsorships.

He finds it a real challenge to book events in City Parks and to go through the Parks Board as their approval process is not easy to manuouvre,

If the PNE Amphitheatre can have a streamlined process, with flexibility for event sizes and scalable costs based on attendance, that would be best. His concern is the high cost of union labour at the PNE.

APPENDIX D: SURVEY RESPONSE SUMMARIES

DAVID MCCULLOCH
President
Timbre Productions

Timbre Productions has been a respected alternative promoter in the Vancouver market for over 40 years. David McCulloch promotes the BreakOut Festival the current PNE Amphitheatre location and many events at the PNE Coliseum, Forum and other local venues.

When he stages shows at the current PNE Amphitheatre and they are restricted to 7000 capacity, the venue still looks empty and there are very few people using the bleachers. He needs to be able to add the second stage location on the adjacent PNE Plaza, where he will install a second stage for the BreakOut Festival.

Covering the whole audience is a great idea, but at the minimum you have to cover the stage. He would prefer to go with a permanent stage so you don't have to pay installation costs for the stage.

It would be better if the business arrangement included scaling rental cost rates for smaller shows. Ideally scalable rent on all shows.

The main gap that they see is in the 2,000 to 3,000 capacity for shows that require an open floor.

The Orpheum is not ideal to work in, and the rent keeps going up although they offer no extra services for the additional rent monies.

The neighbourhood issues are a big concern, as they have to keep the dB level down so low that it doesn't work for the artists and crowd. This is a huge thing as the audience notices the sound isn't as loud as it should be.

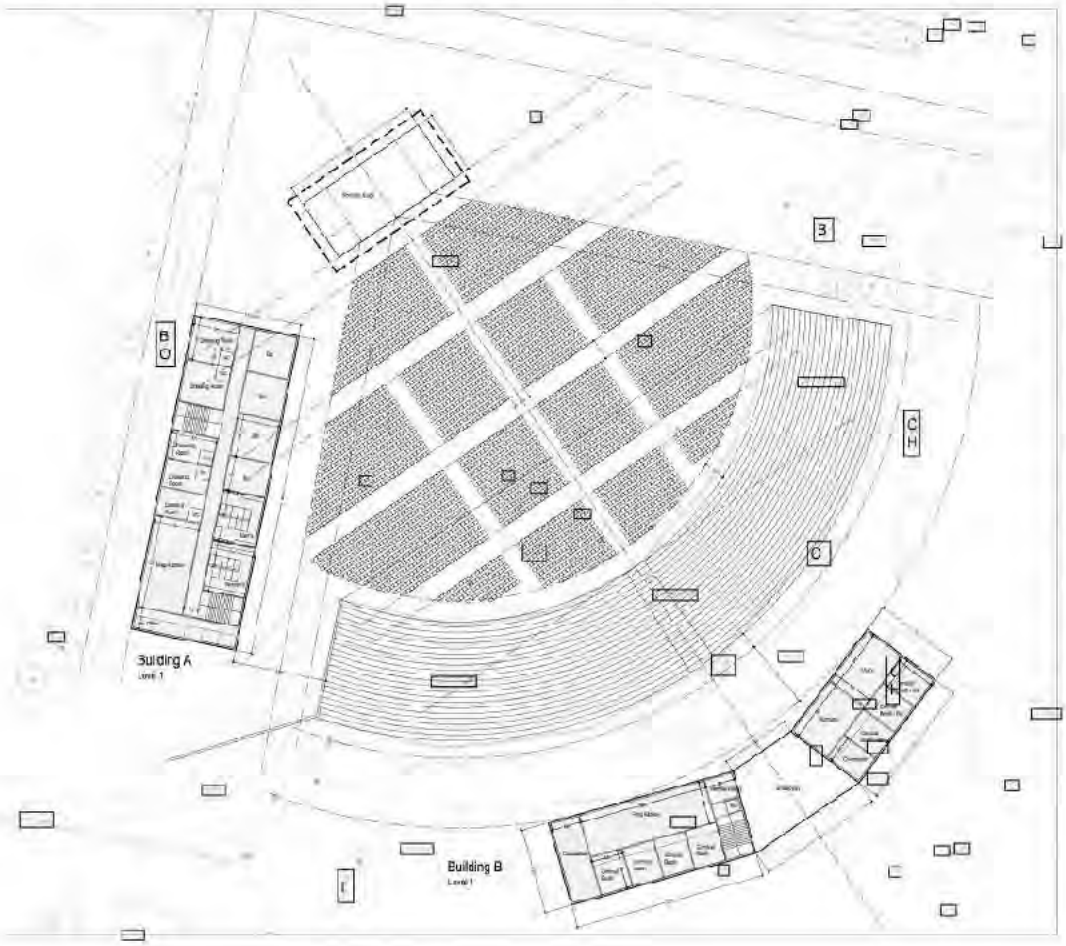
Installing a back wall is very important to make a proper backstage area and backstop the sound.

He would need to see two large dressing rooms, four smaller dressing rooms, and at least two production offices.

He prefers the option of food trucks vs standard PNE food booths with hamburgers and wants to ensure there is enough food stands that there are no lineup issues.

It would be a great option to have VIP booths that he can sell and not just have the venue sell the VIP suites.

APPENDIX E: VENUE DESIGN EXAMPLES AND RENDERINGS



SCENARIO A

Capacity:

Bleachers 4,500
Floor 4,250

Total: 8,750

2 One Storey Support Buildings

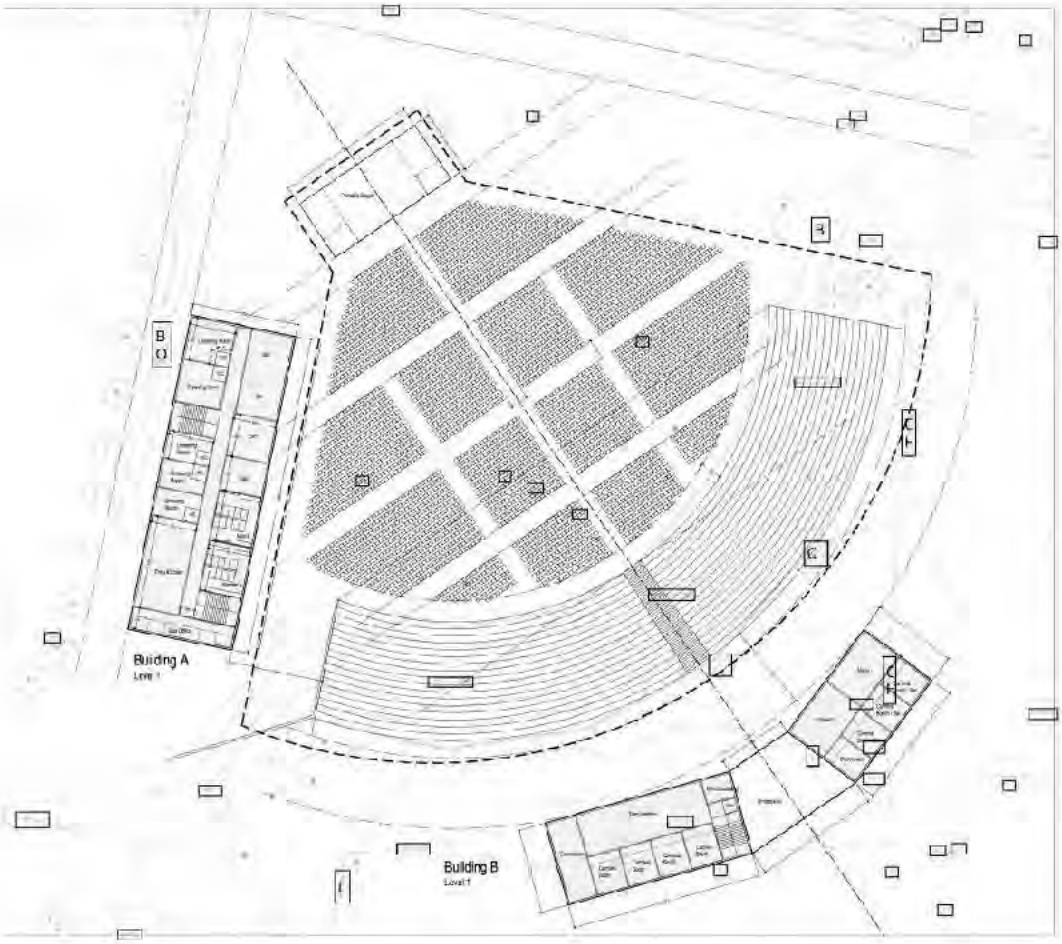
Only Stage Covered

Number of Bleacher Rows: 24
(same as existing)

Stage Roof Area: ~280 m^2

Building A: 1 Level
~670 m^2

Building B: 1 Level
~520 m^2



SCENARIO B

Capacity:

Bleachers 4,500
Floor 4,250

Total: 8,750

2 One Storey Support Buildings

Stage, floor and Bleachers Covered

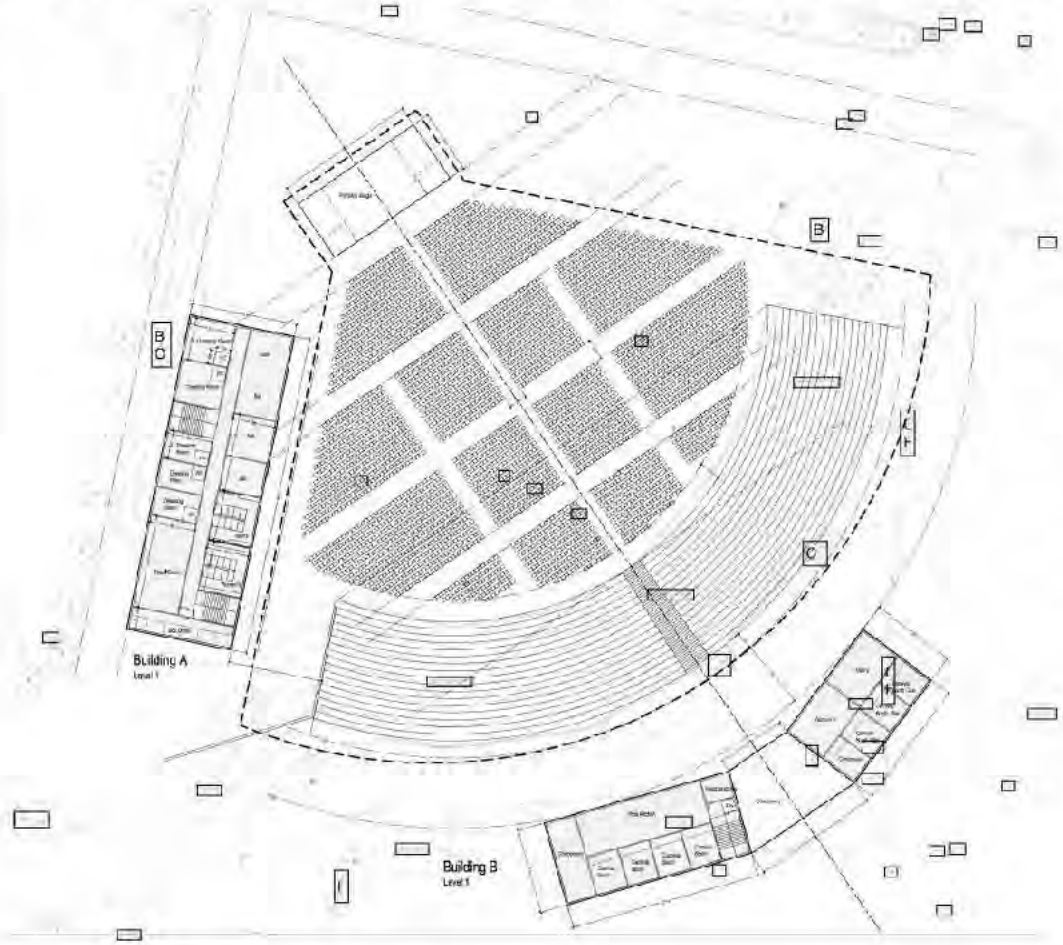
Number of Bleacher Rows: 24
(same as existing)

Stage Roof Area: ~6,300 m^2

Building A: 1 Level
~670 m^2

Building B: 1 Level
~520 m^2

APPENDIX E: VENUE DESIGN EXAMPLES AND RENDERINGS



SCENARIO C

Capacity:

Bleachers	4,500
Floor	4250
VIP	590
Total:	9,340

2 Two Storey Support Buildings

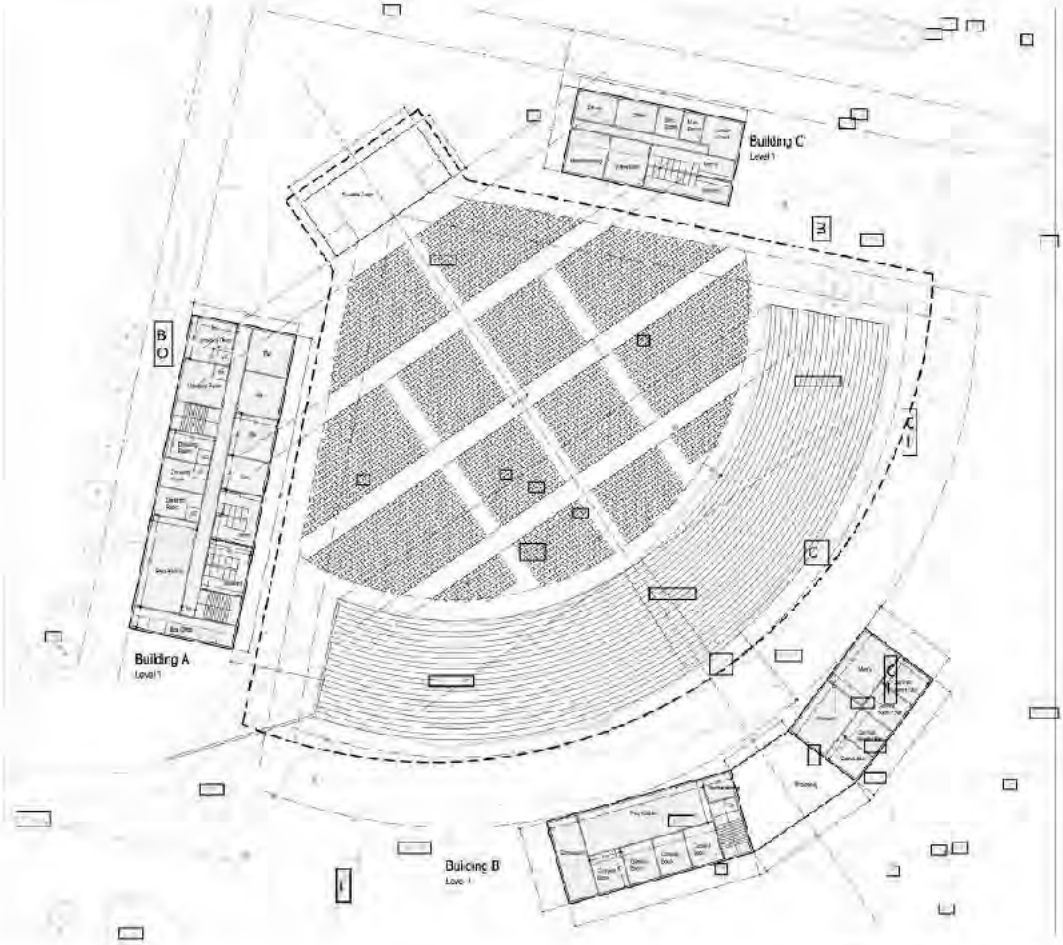
Stage, floor and Bleachers Covered

Number of Bleacher Rows: 24
(same as existing)

Stage Roof Area: ~6,300 m^2

Building A: 1.5 Levels
~1,110 m^2

Building B: 2 Levels
~1,255 m^2



SCENARIO D

Capacity:

Bleachers	4,500
Floor	4,250
VIP/Flex	990
Total:	9,820

3 Support Buildings
Full Program

All Seats, Bleachers and Stage Covered

Number of Bleacher Rows: 24
(same as existing)

Amphitheatre Roof Area: ~6,300 m^2

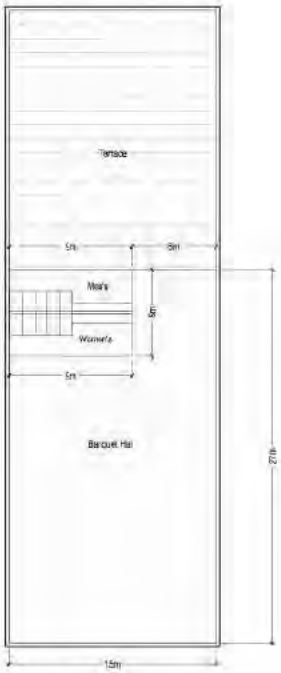
Building A: 1.5 Levels
~1,110 m^2

Building B: 3 Levels
~1,990 m^2

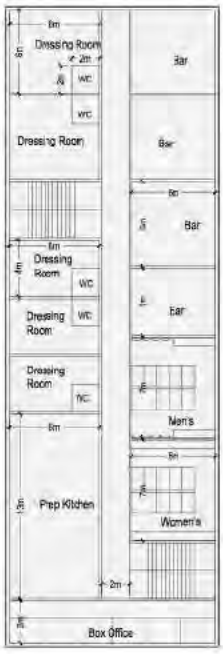
Building C: 1 Level
~290 m^2

APPENDIX E: VENUE DESIGN EXAMPLES AND RENDERINGS

BUILDING A



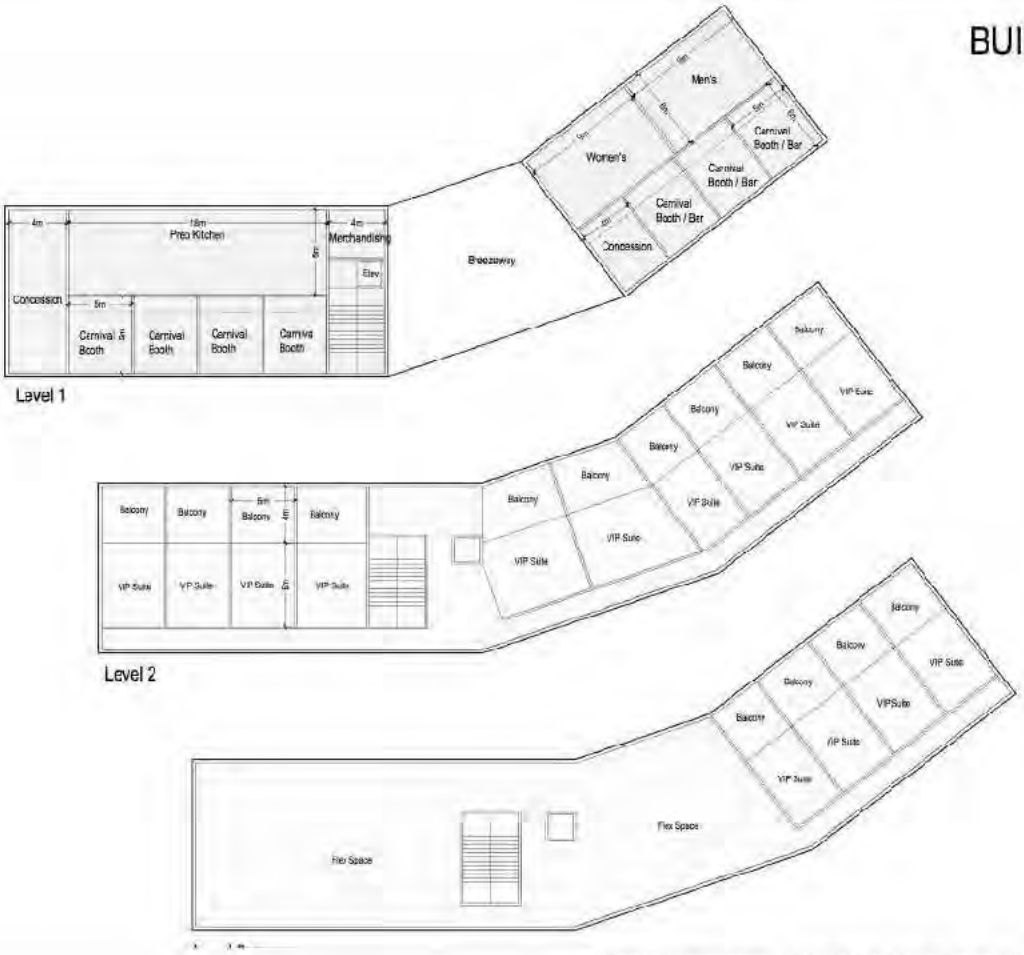
Level 2



Level 1

Building A

BUILDING B



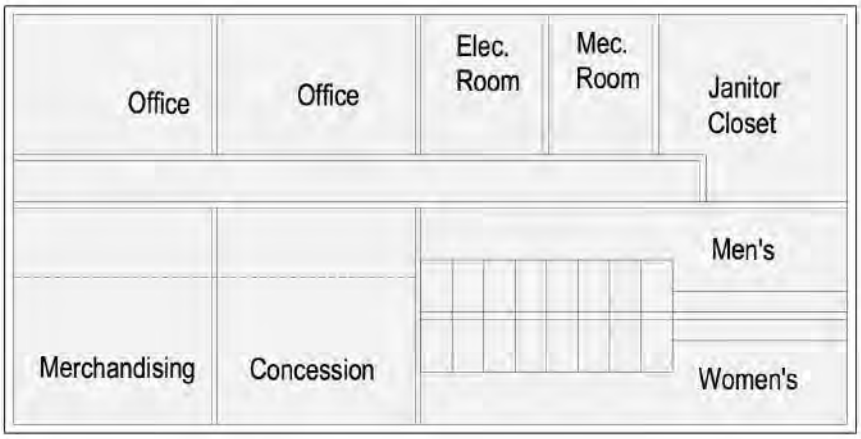
Building B

Level 1

Level 2

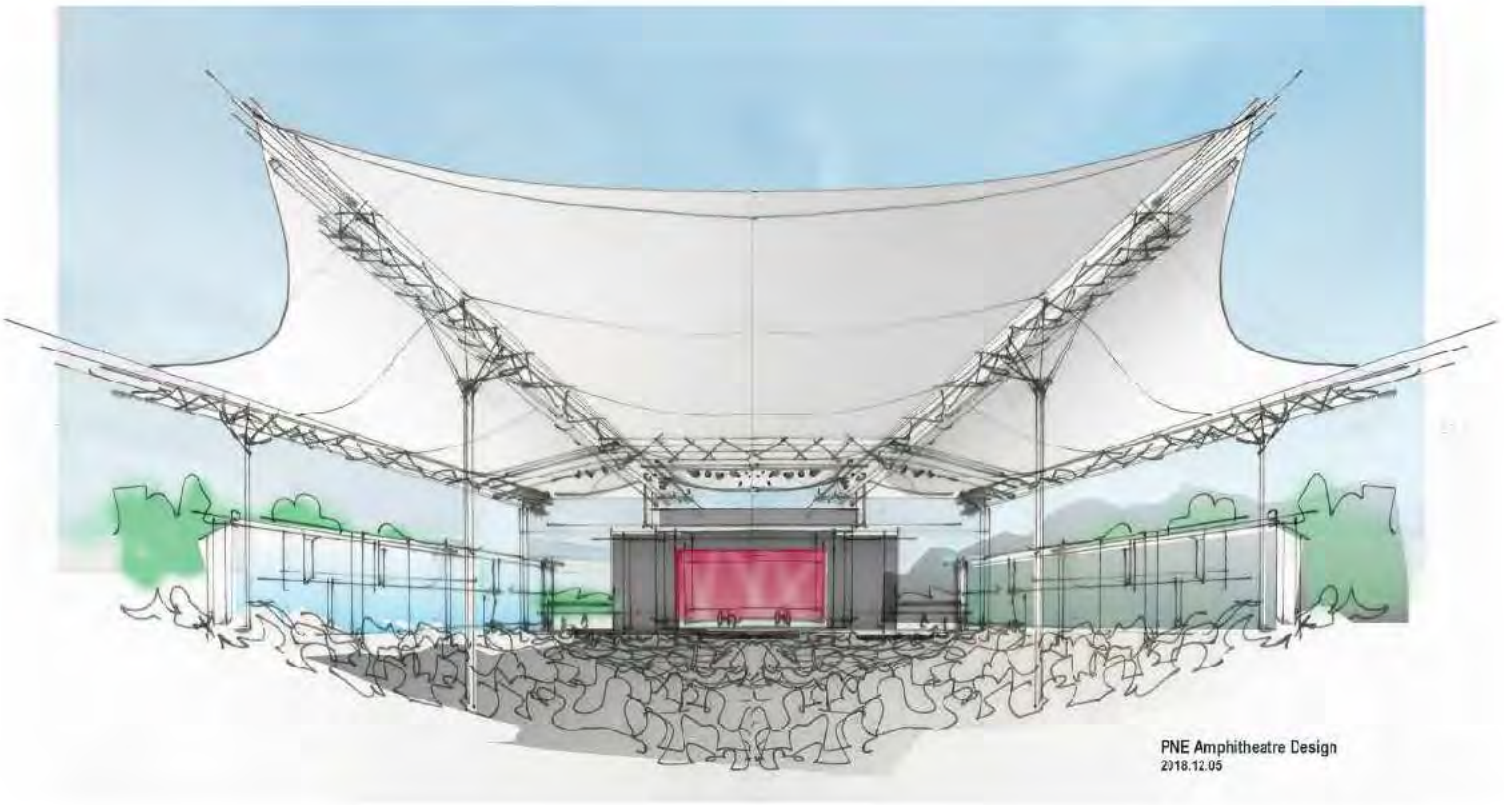
APPENDIX E: VENUE DESIGN EXAMPLES AND RENDERINGS

BUILDING C



Building C
Level 1

APPENDIX E: VENUE DESIGN EXAMPLES AND RENDERINGS



APPENDIX E: VENUE DESIGN EXAMPLES AND RENDERINGS

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APPENDIX F: COMPARATIVE VENUE SUMMARY

Name	Location	Capacity	Coverage	Seating
Amphitheater at Lone Star & Event Center	Lubbock, Texas	7,500	Roof covers stage	Removable folding chairs & general admission
Ascend Amphitheater	Nashville, Tennessee	6,800	Roof covers stage	Removable folding chairs & general admission
Big Sky Brewing Company Amphitheater	Missoula, Montana	6,000	Roof covers stage	No permanent seating
Brandon Amphitheater	Brandon, Mississippi	8,500	Roof covers stage	General admission in the front & permanent flip chairs in the back
Budweiser Stage	Toronto, Ontario	16,000	Roof covers stage & covers partial seating	Permanent seating in the front & general admission in the back
Chene Park Amphitheatre	Detroit, Michigan	6,000	Roof covers stage & covers all of the seating	Permanent seating in the front & general admission in the back
Cogeco Amphitheatre	Trois-Rivères, Quebec	9,000	Roof covers stage & covers all of the seating	Permanent seating in the front & general admission in the back
Dalhalla	Rättvik, Sweden	5,900	Roof covers stage	Permanent seating
First Security Amphitheatre	Little Rock, Arizona	8,375	Roof covers stage	General admission in the front of the stage & permanent seating in the middle & general admission in the back
Ford Amphitheater at Coney Island Boardwalk	Brooklyn, New York	5,000	Roof covers stage & covers all seating	Permanent seating
Koka Booth Amphitheatre	Cary, North Carolina	7,000	Roof covers stage	No permanent seating & lawn chairs permitted
Lavis Italy Amphitheatre	Lavis, Italy	800	Retractable roof	Permanent bleacher seating
LB Day Amphitheatre	Salem, Oregon	8,700	Roof covers stage	Permanent bleacher seating
Leach Amphitheater	Oshkosh, Wisconsin	7,500	Roof covers stage	Removable folding chairs, general admission & lawn chairs permitted
Marymoor Park	Redmond, Washington	5,000	Roof covers stage	Removable folding chairs & general admission
Meadow Brook Amphitheatre	Rochester, Michigan	7,700	Roof covers stage & partial seating	Permanent seating & general admission in the back
Michigan Lottery Theater at Freedom Hill	Sterling Heights, Michigan	7,200	Roof covers stage & partial seating	Covered permanent seating & general admission

APPENDIX F: COMPARATIVE VENUE SUMMARY

Miller Outdoor Theatre	Houston, Texas	6,500	Roof covers stage & all seating	Covered permanent seating & general admission
Opera Leśna	Sopot, Poland	6,000	Roof covers all seating & covers the balcony	Permanent seating
Pacific Amphitheatre	Costa Mesa, California	8,200	Roof covers stage	Permanent bleacher seating
Parc Jean-Drapeau	Montreal, Quebec	55,000	Roof covers removable stage at parc festivals	General admission
Red Rocks Amphitheatre	Morrison, Colorado	9,525	Roof covers stage	Permanent wooden bench seating
Saint Augustine Amphitheatre	St. Augustine, Florida	4,060	Roof covers stage & partial seating	Permanent seating
Shoreline Amphitheatre	Mountain View, California	22,000	Roof overs stage & partial seating	Permanent seating in the front & general admission in the back
Union Bank & Trust Pavilion	Portsmouth, Virginia	6,500	Roof covers stage as well as partial seating	General admission in the front, permanent seating in the middle & general admission in the back
Verizon Amphitheatre	Alpharetta, Georgia	13,196	Roof covers stage & partial seating	Covered permanent seating & general admission in the back
Virginia Credit Union Live!	Richmond, Virginia	6,000	Roof covers stage & covers all seating	Permanent seating in the front & general admission in the back
The Walmart AMP	Rogers, Arkansas	10,000	Roof covers stage & partial seating	General admission in the front, permanent seating in the middle & general admission in the back
White River Amphitheatre	Auburn, Washington	16,500	Roof covers stage & partial seating	Covered permanent seating & general admission in the back

APPENDIX F: COMPARATIVE VENUE SUMMARY

Vancouver Venues & Capacities

Venue	Location	Capacity
Abbotsford Centre	Abbotsford	7,888
Ambleside Park	West Vancouver	9,000
Arts Club Theatre (Stanley, Granville, Revenue)	Vancouver	1,298
BC Place	Vancouver	54,500
Bell Performance Art Centre	Surrey	1,052
Bill Reid Millennium Amphitheatre	Surrey	25,000
BlueShore Financial Centre for the Performing Arts	Capilano University	372
Brockton Oval, Stanley park	Vancouver	10,000
Centennial Theatre	North Vancouver	660
Chan Centre for the Performing Arts	Vancouver	1,185
Commodore Ballroom	Vancouver	990
Creekside Park	Vancouver	7,500
Deer Lake Park (outdoor)	Burnaby	9,000
Holland Park (outdoor)	Surrey	24,000
Jack Poole Plaza	Vancouver	5,700
Jericho Beach Park	Vancouver	20,000
Langley Events Centre	Langley	5,276
Malkin Bowl, Stanley Park	Vancouver	2,100
Orpheum	Vancouver	2,688
PNE Amphitheatre	Vancouver	7,000
PNE Pacific Coliseum	Vancouver	5,050
Queen Elizabeth Theatre	Vancouver	2,781
Queen Elizabeth Theatre Plaza	Vancouver	2,500
Richmond Olympic Oval	Richmond	8,000
Rickshaw Theatre	Vancouver	600
Rio Theatre	Vancouver	420
Rogers Arena	Vancouver	18,910
Roundhouse Community Centre	Vancouver	600
UBC Mitchell Thunderbird Sports Arena	Vancouver	6,500
Vancouver Art Gallery Plaza	Vancouver	3,000
Vancouver East Cultural Centre "The Clutch"	Vancouver	260
Vancouver Convention Centre	Vancouver	12,000
Vancouver Playhouse	Vancouver	668
The Vogue Theatre	Vancouver	1,250
The wise Hall	Vancouver	250

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APPENDIX H: FINANCIAL WORKSHEETS

		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Scenario 0	Revenues	-	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M
	Expenses	$14M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M
	Net Cash Flows	$(14M)	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M	$1M
	Cumulative Cash Flows	$(14M)	$(14M)	$(13M)	$(12M)	$(12M)	$(11M)	$(10M)	$(10M)	$(9M)	$(8M)	$(8M)
Scenario A	Revenues	-	$3M	$3M	$3M	$3M	$3M	$4M	$4M	$4M	$4M	$4M
	Expenses	$30M	$2M	$2M	$2M	$2M	$2M	$2M	$2M	$2M	$2M	$2M
	Net Cash Flows	$(30M)	$1M	$1M	$1M	$1M	$1M	$2M	$2M	$2M	$2M	$2M
	Cumulative Cash Flows	$(30M)	$(29M)	$(28M)	$(27M)	$(26M)	$(24M)	$(23M)	$(21M)	$(20M)	$(18M)	$(16M)
Scenario B	Revenues	-	$4M	$4M	$5M	$5M	$5M	$6M	$6M	$6M	$6M	$6M
	Expenses	$37M	$2M	$2M	$3M	$3M	$3M	$3M	$3M	$3M	$3M	$3M
	Net Cash Flows	$(37M)	$2M	$2M	$2M	$2M	$3M	$3M	$3M	$3M	$3M	$3M
	Cumulative Cash Flows	$(37M)	$(36M)	$(34M)	$(31M)	$(29M)	$(26M)	$(24M)	$(21M)	$(18M)	$(15M)	$(13M)
Scenario C	Revenues	-	$6M	$8M	$9M	$10M	$10M	$10M	$10M	$11M	$11M	$11M
	Expenses	$48M	$3M	$4M	$4M	$4M	$4M	$5M	$5M	$5M	$5M	$5M
	Net Cash Flows	$(48M)	$3M	$4M	$5M	$5M	$6M	$6M	$6M	$6M	$6M	$6M
	Cumulative Cash Flows	$(48M)	$(45M)	$(41M)	$(36M)	$(31M)	$(25M)	$(20M)	$(14M)	$(8M)	$(2M)	$4M
Scenario D	Revenues	-	$9M	$11M	$13M	$14M	$14M	$15M	$15M	$15M	$16M	$16M
	Expenses	$59M	$4M	$5M	$5M	$6M	$6M	$6M	$6M	$6M	$6M	$7M
	Net Cash Flows	$(59M)	$5M	$6M	$7M	$8M	$8M	$9M	$9M	$9M	$9M	$9M
	Cumulative Cash Flows	$(59M)	$(54M)	$(48M)	$(41M)	$(33M)	$(24M)	$(16M)	$(7M)	$2M	$11M	$21M

	Net Present Value		Internal Rate of Return	
	10-Yr NPV	40-Yr NPV	10-Yr IRR	40-Yr IRR
Scenario 0	$(25M)	$(16M)	(12%)	3%
Scenario A	$(19M)	$3M	(11%)	3%
Scenario B	$(17M)	$27M	(6%)	6%
Scenario C	$(4M)	$98M	1%	11%
Scenario D	$8M	$169M	5%	14%

APPENDIX H: FINANCIAL WORKSHEETS

PNE AMPHITHEATRE RENEWAL
High Level Cost Estimate

Date: 07-Apr-19

Item	Description of Work	Scenario A - BOH, seats, roof over stage only				Scenario B - BOH, seats, roof			
		Qty	Unit	Unit Price	COV ADJUST	Qty	Unit	Unit Price	COV ADJUST
1.0	**Site Preparation**								
1.1	Demolition and Removal of Existing	1	l.s.	$250,000.00	$250,000.00	1	l.s.	$250,000.00	$250,000.00
1.2	Cut & Off-site Disposed	1	l.s.	$150,000.00	$150,000.00	1	l.s.	$150,000.00	$150,000.00
1.4	Subgrade Preparation	9650	m2	$6.00	$57,900.00	9650	m2	$6.00	$57,900.00
1.5	Finish Grading	9650	m2	$3.00	$28,950.00	9650	m2	$3.00	$28,950.00
1.6	Existing Tree Retention	12	ea	$150.00	$1,800.00	12	ea	$150.00	$1,800.00
1.7	Allowance for Infrastructure Utilities	1	l.s.	$2,500,000.00	$2,500,000.00	1	l.s.	$2,500,000.00	$2,500,000.00
1.7	Allowance for Electrical and IMIT	1	l.s.	$0.00	$0.00	1	l.s.	$0.00	$0.00
	SubSection Total				**$2,988,650.00**				**$2,988,650.00**
2.0	**Hardscape**								
2.2	C.I.P Concrete	4500	m2	$100.00	$450,000.00	4500	m2	$100.00	$450,000.00
2.5	Asphalt	4500	m2	$80.00	$360,000.00	4500	m2	$80.00	$360,000.00
2.11	Seating Wall / Bleachers	1	l.s.	$3,000,000.00	$3,000,000.00	1	l.s.	$3,000,000.00	$3,000,000.00
2.12	Retaining Wall	40	m	$1,500.00	$60,000.00	40	m	$1,500.00	$60,000.00
2.7	Building A (2 Levels)	670	m2	$4,300.00	$2,881,000.00	670	m2	$4,300.00	$2,881,000.00
2.13	Buildng B (3 Levels)	520	m2	$4,300.00	$2,236,000.00	520	m2	$4,300.00	$2,236,000.00
2.14	Building C (1 Level)	0	m2	$6,500.00	$0.00	0	m2	$6,500.00	$0.00
	SubSection Total				**$8,987,000.00**				**$8,987,000.00**
3.0	**Site Improvements**								
3.1	Amphitheatre Roof - Scenario A	0	m2	$500.00	$0.00	6300	m2	$500.00	$3,150,000.00
3.1	Steel, cables, other materials	1	l.s.	$1,000,000.00	$1,000,000.00	1	l.s.	$1,000,000.00	$1,000,000.00
3.2	Stage - 4'x8' risers x 75 units	2400	sf	$60.00	$144,000.00	2400	sf	$60.00	$144,000.00
3.3	Chairs - purchase folding chairs	4250	ea	$120.00	$510,000.00	4250	ea	$120.00	$510,000.00
3.4	Storage Carts for Chairs and Risers	80	ea	$150.00	$12,000.00	80	ea	$150.00	$12,000.00
3.5	Sound wall	1	sum	$40,000.00	$40,000.00	1	sum	$40,000.00	$40,000.00
3.11	Handrail / Guardrails	30	m	$250.00	$7,500.00	30	m	$250.00	$7,500.00
3.13	Chainlink Fence, Gal Steel estimates	60	m	$280.00	$16,800.00	60	m	$280.00	$16,800.00
	SubSection Total				**$1,730,300.00**				**$4,880,300.00**
4.0	**Softscape**								
4.1	Tree	10	ea	$1,000.00	$10,000.00	10	ea	$1,000.00	$10,000.00
4.2	Shrub/Groundcover/Ornamental Grasses	250	m2	$100.00	$25,000.00	250	m2	$100.00	$25,000.00
4.3	Lawn - sodded	400	m2	$20.00	$8,000.00	400	m2	$20.00	$8,000.00
4.6	Growing Medium (for shrub/ground cover/la	232.5	m3	$65.00	$15,112.50	232.5	m3	$65.00	$15,112.50
4.7	Mulch	250	m2	$10.00	$2,500.00	250	m2	$10.00	$2,500.00
4.8	Irrigation	650	m2	$20.00	$13,000.00	650	m2	$20.00	$13,000.00
	SubSection Total				**$73,612.50**				**$73,612.50**
	SUBTOTAL CONSTRUCTION COST				**$13,780,000.00**				**$16,930,000.00**
	Hazmat Allowance				$0.00				$0.00
	General Requirements & Fees			11%	$1,516,000.00			11%	$1,862,000.00
	Contractor's OH/P			20%	$3,059,000.00			20%	$3,758,000.00
	TOTAL CONSTRUCTION COST				**$18,355,000.00**				**$22,550,000.00**
	Architectural Design & Structural			10.00%	$1,836,000.00			10.00%	$2,255,000.00
	Permit Fees			2.50%	$459,000.00			2.50%	$564,000.00
	Design Contingency			30.00%	$6,195,000.00			30.00%	$7,611,000.00
	Construction Contingency			5.00%	$1,342,000.00			5.00%	$1,649,000.00
	Project Management Fees			2.00%	$564,000.00			2.00%	$693,000.00
	Escalation			5.00%	$1,438,000.00			5.00%	$1,766,000.00
	Goods & Service Tax				$0.00				$0.00
	TOTAL PROJECT COST (2019$)				**$30,189,000.00**				**$37,088,000.00**

APPENDIX H: FINANCIAL WORKSHEETS

		Scenario C - BOH, seats, roof, some VIP				Scenario D - BOH, seats, roof, full VIP			
Item	Description of Work	Qty	Unit	Unit Price	COV ADJUST	Qty	Unit	Unit Price	COV ADJUST
1.0	**Site Preparation**								
1.1	Demolition and Removal of Existing	1	l.s.	$250,000.00	$250,000.00	1	l.s.	$250,000.00	$250,000.00
1.2	Cut & Off-site Disposed	1	l.s.	$150,000.00	$150,000.00	1	l.s.	$150,000.00	$150,000.00
1.4	Subgrade Preparation	9650	m2	$6.00	$57,900.00	9650	m2	$6.00	$57,900.00
1.5	Finish Grading	9650	m2	$3.00	$28,950.00	9650	m2	$3.00	$28,950.00
1.6	Existing Tree Retention	12	ea	$150.00	$1,800.00	12	ea	$150.00	$1,800.00
1.7	Allowance for Infrastructure Utilities	1	l.s.	$2,500,000.00	$2,500,000.00	1	l.s.	$2,500,000.00	$2,500,000.00
1.7	Allowance for Electrical and IMIT	1	l.s.	$0.00	$0.00	1	l.s.	$0.00	$0.00
	SubSection Total				**$2,988,650.00**				**$2,988,650.00**
2.0	**Hardscape**								
2.2	C.I.P Concrete	4500	m2	$100.00	$450,000.00	4500	m2	$100.00	$450,000.00
2.5	Asphalt	4500	m2	$80.00	$360,000.00	4500	m2	$80.00	$360,000.00
2.11	Seating Wall / Bleachers	1	l.s.	$3,000,000.00	$3,000,000.00	1	l.s.	$3,000,000.00	$3,000,000.00
2.12	Retaining Wall	40	m	$1,500.00	$60,000.00	40	m	$1,500.00	$60,000.00
2.7	Building A (2 Levels)	1110	m2	$4,300.00	$4,773,000.00	1110	m2	$4,300.00	$4,773,000.00
2.13	Buildng B (3 Levels)	1255	m2	$4,300.00	$5,396,500.00	1990	m2	$4,300.00	$8,557,000.00
2.14	Building C (1 Level)	0	m2	$6,500.00	$0.00	290	m2	$6,500.00	$1,885,000.00
	SubSection Total				**$14,039,500.00**				**$19,085,000.00**
3.0	**Site Improvements**								
3.1	Amphitheatre Roof - Scenario A	6300	m2	$500.00	$3,150,000.00	6300	m2	$500.00	$3,150,000.00
3.1	Steel, cables, other materials	1	l.s.	$1,000,000.00	$1,000,000.00	1	l.s.	$1,000,000.00	$1,000,000.00
3.2	Stage - 4'x8' risers x 75 units	2400	sf	$60.00	$144,000.00	2400	sf	$60.00	$144,000.00
3.3	Chairs - purchase folding chairs	4250	ea	$120.00	$510,000.00	4250	ea	$120.00	$510,000.00
3.4	Storage Carts for Chairs and Risers	80	ea	$150.00	$12,000.00	80	ea	$150.00	$12,000.00
3.5	Sound wall	1	sum	$40,000.00	$40,000.00	1	sum	$40,000.00	$40,000.00
3.11	Handrail / Guardrails	30	m	$250.00	$7,500.00	30	m	$250.00	$7,500.00
3.13	Chainlink Fence, Gal Steel estimates	60	m	$280.00	$16,800.00	60	m	$280.00	$16,800.00
	SubSection Total				**$4,880,300.00**				**$4,880,300.00**
4.0	**Softscape**								
4.1	Tree	10	ea	$1,000.00	$10,000.00	10	ea	$1,000.00	$10,000.00
4.2	Shrub/Groundcover/Ornamental Grasses	250	m2	$100.00	$25,000.00	250	m2	$100.00	$25,000.00
4.3	Lawn - sodded	400	m2	$20.00	$8,000.00	400	m2	$20.00	$8,000.00
4.6	Growing Medium (for shrub/ground cover/la	232.5	m3	$65.00	$15,112.50	232.5	m3	$65.00	$15,112.50
4.7	Mulch	250	m2	$10.00	$2,500.00	250	m2	$10.00	$2,500.00
4.8	Irrigation	650	m2	$20.00	$13,000.00	650	m2	$20.00	$13,000.00
	SubSection Total				**$73,612.50**				**$73,612.50**
	SUBTOTAL CONSTRUCTION COST				**$21,982,000.00**				**$27,028,000.00**
	Hazmat Allowance				$0.00				$0.00
	General Requirements & Fees			11%	$2,418,000.00			11%	$2,973,000.00
	Contractor's OH/P			20%	$4,880,000.00			20%	$6,000,000.00
	TOTAL CONSTRUCTION COST				**$29,280,000.00**				**$36,001,000.00**
	Architectural Design & Structural			10.00%	$2,928,000.00			10.00%	$3,600,000.00
	Permit Fees			2.50%	$732,000.00			2.50%	$900,000.00
	Design Contingency			30.00%	$9,882,000.00			30.00%	$12,150,000.00
	Construction Contingency			5.00%	$2,141,000.00			5.00%	$2,633,000.00
	Project Management Fees			2.00%	$899,000.00			2.00%	$1,106,000.00
	Escalation			5.00%	$2,293,000.00			5.00%	$2,820,000.00
	Goods & Service Tax				$0.00				$0.00
	TOTAL PROJECT COST (2019$)				**$48,155,000.00**				**$59,210,000.00**

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HASTINGS PARK INFRASTRUCTURE MASTER PLAN – RENEWABLE ENERGY STRATEGY

PHASES 1A AND 2

December 1, 2020

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1.0 INTRODUCTION

The Hastings Park-PNE Master Plan ('HP-PNE Master Plan') was completed in 2010 and outlined a redevelopment vision for Hastings Park. In 2016, Urban Systems completed a comprehensive 'Infrastructure Master Plan' (IMP) identifying and assessing the condition of existing infrastructure, and outlining the infrastructure, capital and implementation requirements required to support the HP-PNE Master Plan vision.

The IMP was updated in early 2019 to include capacity, design and cost estimate revisions related to the Playland Redevelopment project. A subsequent update was completed in November 2019 to identify capacity, design, and cost estimate revisions related to the Amphitheatre Renewal project.
In November 2019, a preliminary renewable energy strategy was incorporated within Phases 1A and 2 of the IMP with a recommendation that a broader assessment of renewable energy options should be considered. Refining infrastructure cost estimates for renewable energy was subsequently identified as a key component of work to be completed before other phases of work commence.

In 2020, Urban Systems was retained by the Pacific National Exhibition (PNE) to prepare the Renewable Energy Strategy (RES) for Phases 1A and 2. The objectives of the RES are to:

- Demonstrate innovation and climate leadership;
- Reduce greenhouse gas (GHG) emissions;
- Develop a cost-effective strategy that considers life cycle costs; and
- Show alignment with PNE and City of Vancouver plans and policies

A key deliverable of the RES was the development of an evaluation framework that establishes a clear set of objectives and corresponding evaluation criteria (qualitative and quantitative) to compare renewable energy options. The evaluation framework was used to short-list renewable energy options for further consideration and, ultimately, select a preferred strategy.

The RES was co-developed by stakeholders of the PNE and City of Vancouver (City) through a series of workshops and meetings, as described in Table 1.

Table 1: Meetings and Workshops During Development of the Renewable Energy Strategy

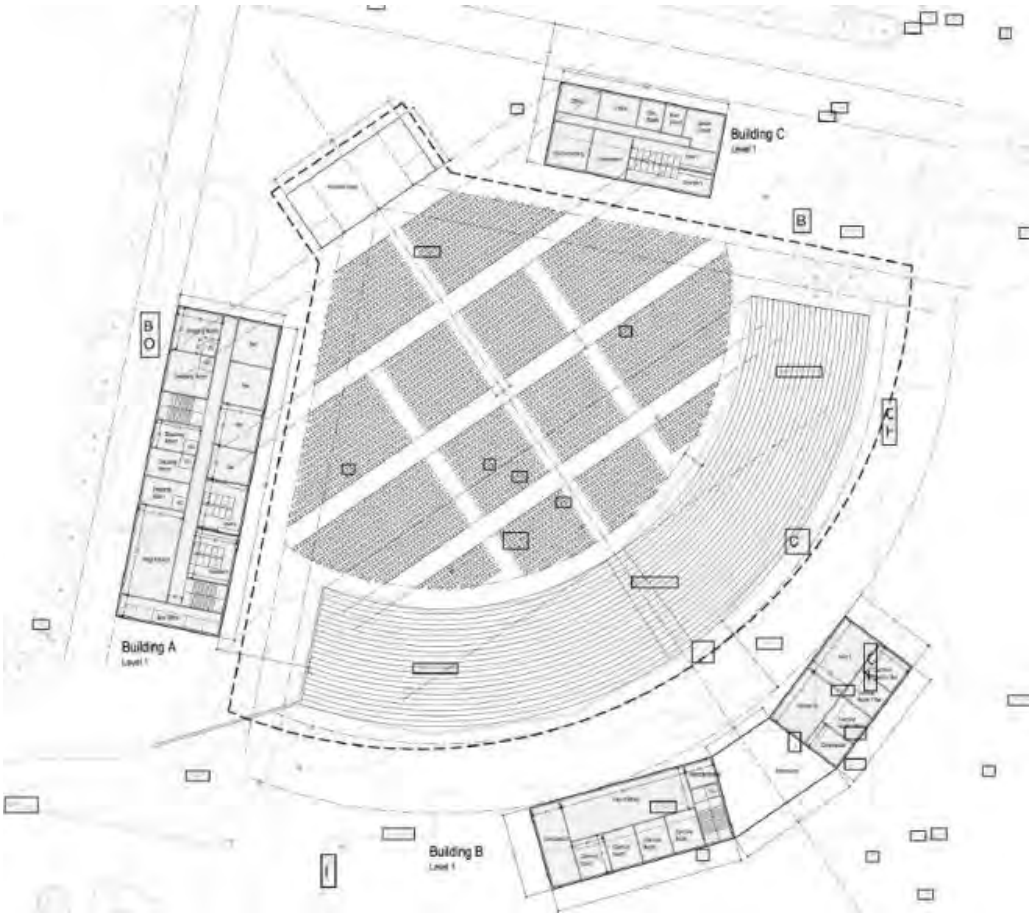
DATE	DESCRIPTION	PRIMARY OBJECTIVE
July 9, 2020	Kick-off Meeting	To confirm project scope and deliverables
August 5, 2020	Workshop #1	To solicit input, and review preliminary considerations, for the RES evaluation framework
August 28, 2020	Workshop #2	To discuss draft evaluation framework and qualitative scoring
September 28, 2020	Workshop #3	To discuss final evaluation framework, including both qualitative and quantitative scoring

The HP-PNE Master Plan includes various phases of development with Phase 1A (Playland Redevelopment) and Phase 2 (Amphitheatre Renewal) preceding other phases. The scope of this project is to focus on Phases 1A and 2 as shown in Figure 1. Specifically, the scope of the project is to consider heating and cooking loads for Phases 1A and 2 that would have otherwise been supplied by conventional means (e.g. natural gas). Details of the heating and cooking loads can be found in Section 2.2.

Figure 1: PNE Phases and Scope of this Project (Phases 1A & 2)

Phase 1A (Playland) consists primarily of existing buildings and loads. Phase 2 (Amphitheatre), however, consists of new construction. Figure 2 shows a concept plan for the Amphitheatre Renewal. This concept plan is subject to change.

Figure 2: Concept Plan for Phase 2 (Amphitheatre Renewal)



The 2019 IMP update already contemplated significant electrical infrastructure for Phase 2 (Amphitheatre) to supply power for events, lighting, ancillary building loads etc., and similarly for Phase 1A (Playland) to replace aging electrical infrastructure. Electrification in the context of this report is describing electrical loads over an above those originally anticipated in the IMP, specifically to replace heating and cooking loads that would otherwise by supplied by natural gas.

Hastings Park is currently serviced by an extensive natural gas supply network. The original IMP contemplated upsizing the feeder main to Playland to address reported supply capacity constraints, and further contemplated long term renewal (replacement) of all existing gas infrastructure in the Playland footprint as it reaches the end of its service life. This strategy explores renewable options to either validate or propose alternative energy options for these areas.

Details of the existing electrical network and natural gas network can be found in the original IMP.

2.0 INITIAL ASSESSMENTS

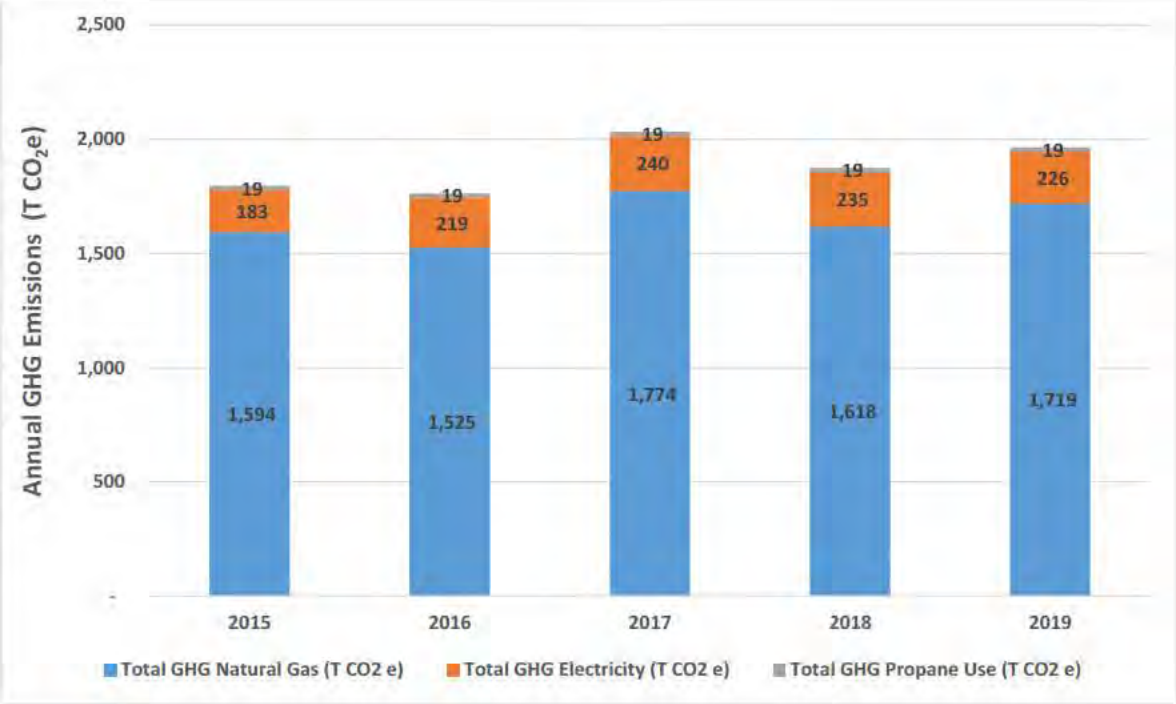
This section summarizes initial assessments that were conducted to help with development of the Renewable Energy Strategy. Section 2.1 describes a baseline greenhouse gas assessment and Section 2.2 describes an assessment of energy loads.

2.1 BASELINE GREENHOUSE GAS (GHG) EMISSIONS

Greenhouse gas (GHG) emissions for the complete PNE site were examined for 2015 – 2019. Sub-metering was not available to allow for an examination of Phases 1A and 2 only so the data presented below is for the entirety of Hastings Park. As shown in Figure 3, GHG emissions are primarily attributable to natural gas consumption followed by electricity and propane consumption. Data for propane consumption was only available for 2018 but it was assumed that there would be similar consumption year-to-year.

On average, the PNE emits 1,900 tonnes of CO_2e (carbon dioxide equivalent) per year. This only includes building energy use and excludes GHG emissions associated with vehicle fuel use. This does, however, point to the need to reduce natural gas consumption in buildings if significant GHG reductions are to be achieved. Subsequent sections of this report will examine potential GHG savings related to various renewable energy options. Those potential GHG savings can be compared to this GHG baseline. Further details of building energy use, and associated GHG emissions, can be found in **Appendix B**. Emission factors in **Appendix B** were sourced from the Government of British Columbia (2017).

Figure 3: Greenhouse Gas (GHG) Emissions for Complete PNE site



2.2 ENERGY LOADS

Preliminary energy loads were calculated during the 2019 IMP update for the purposes of developing a high-level cost for electrification which were believed to be conservative. As part of this strategy updated energy loads were calculated by our electrical sub-consultant, DMD & Associates Ltd., based on information provided by the PNE. Figures 4 & 5 show the previous and updated energy loads for Phase 1A (Playland) and Phase 2 (Amphitheatre), respectively. As shown, the updated energy loads are significantly lower than the previously calculated loads. The updated energy loads were used as an input to the quantitative analyses presented below. Details of DMD's assessment can be found in **Appendix A**.

Figure 4: Previous and Updated Energy Loads for Phase 1A (Playland)

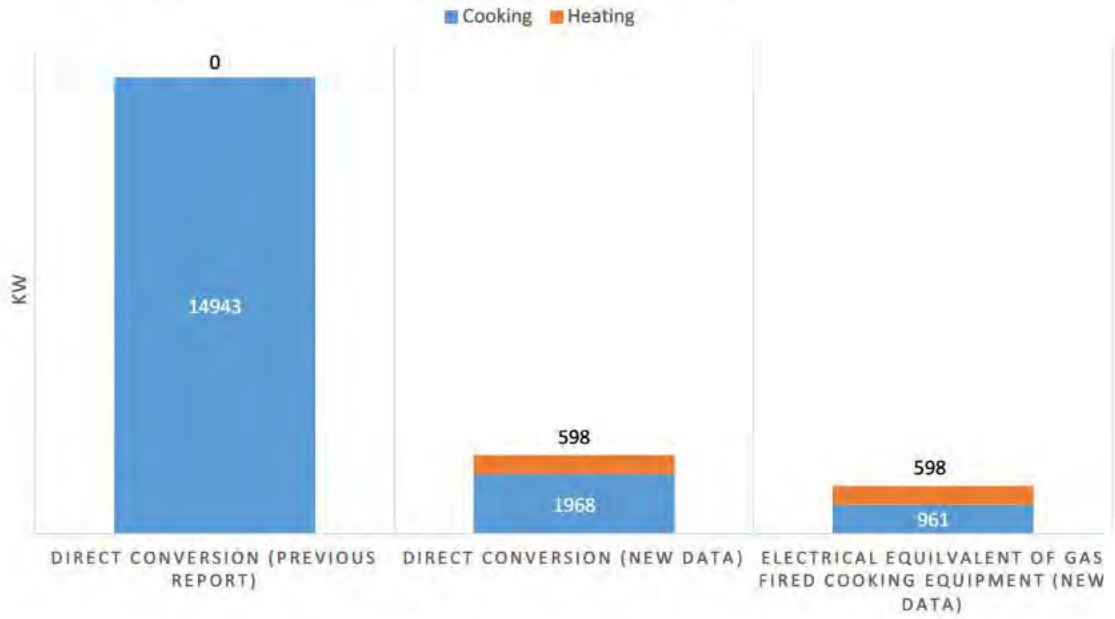
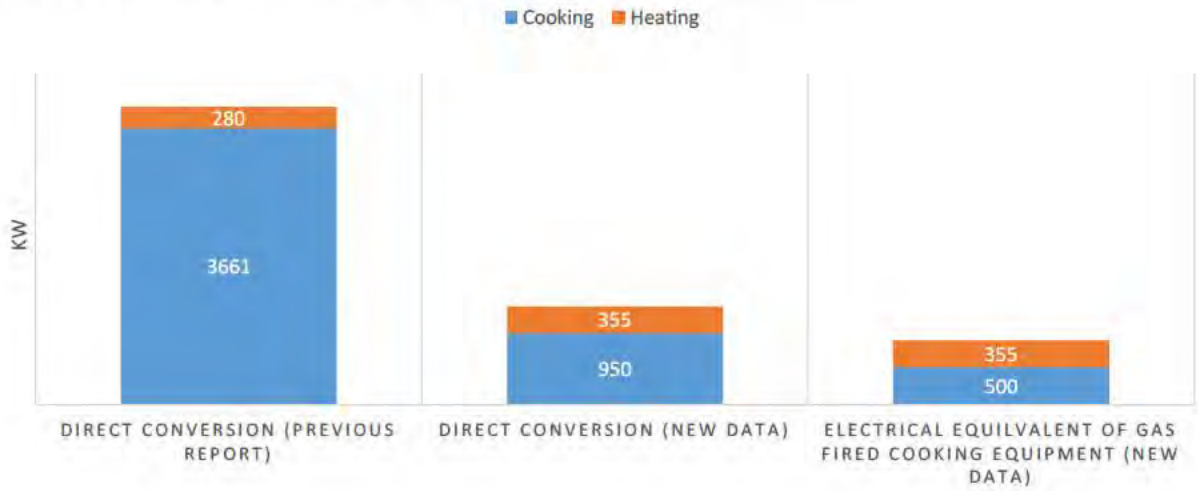


Figure 5: Previous and Updated Energy Loads for Phase 2 (Amphitheatre)



3.0 RENEWABLE ENERGY OPTIONS

At the August 5, 2020 workshop with PNE and City stakeholders, numerous renewable energy options were explored and discussed. Table 2 outlines various renewable energy options that were explored and provides rationale for those options that were not considered further as part of this project.

Table 2: Initial Scan of Renewable Energy Options

	RENEWABLE ENERGY OPTION	DESCRIPTION	COMMENTS
	**BC Hydro Supplied Electricity**	• Purchase Grid-Supplied Electricity from BC Hydro. • Close to carbon (GHG) neutral.	• Would need to electrify current gas loads (cooking & heating). • Could include heat pumps.
	**Renewable Gases: Renewable Natural Gas (RNG) and/or Hydrogen**	• RNG is produced from decomposing organic materials from landfills, agricultural waste and wastewater treatment bi-products. • Close to carbon neutral. • RNG can be purchased from Fortis at a premium relative to conventional natural gas.	• Could keep relying on existing gas infrastructure, but need to confirm that there is adequate availability of RNG on the market. • Hydrogen is still in early development and will not be considered further as part of this project.
	**Solar**	• Solar photovoltaic (PV) panels convert sunlight into electricity. • Could be roof-mount or ground-mount	• The Livestock roof could potentially host solar PV panels.
	**Wind**	• Wind turbine(s) convert wind energy into electricity. • Large and small-scale wind turbines.	• There isn't an adequate wind resource in this area. This option will not be considered further for this project.

	RENEWABLE ENERGY OPTION	DESCRIPTION	COMMENTS
	**Biomass**	• Typically utilizes wood waste in this region • Can be converted into thermal energy (heat) or into heat & electricity (cogeneration or combined heat & power, CHP).	• There are concerns about air emissions and there is also debate about the carbon neutrality of this option. This option will not be considered further for this project.
	**Geoexchange (GHX)**	• Exchanging thermal energy with the ground. • Open loop and closed loop options. • Heat pumps required.	• This option could be considered further on a case-by-case basis at the conceptual design phase for each building.
	**District Energy**	• Providing thermal energy to multiple buildings from a centralized energy source. • Potential energy source(s): Biomass; Geoexchange; RNG; Solar (Hot Water); Heat recovery.	• There likely is not adequate thermal energy load for such a capital investment (would need to look beyond Phases 1A & 2). • This option will not be considered further for this project.
	**Air Source Heat Pumps (ASHPs)**	• ASHPs can provide heating and/or cooling. • ASHPs draw heat from the outside air in heating mode and reject heat outside in cooling mode	• ASHPs can operate at a relatively high efficiency or coefficient of performance (COP). A COP of 3.0 means that one unit of electricity can provide 3 units of thermal energy.

Following the August 5, 2020 workshop, a list of renewable energy strategy options was assembled for further exploration and evaluation.

Given that the Amphitheatre renewal is new construction that will be serviced with all new electrical infrastructure, and that there is no existing gas infrastructure within the Amphitheatre footprint, electrification was chosen as the most appropriate strategy for that area with various sub options (i.e. solar panels and heat pumps).

Renewable natural gas (RNG) was reviewed as a viable option for Playland given the extensive existing natural gas infrastructure across the site and existing facilities serviced by gas. Electrification of all the Playland facilities was also reviewed.

It is recognized that the list of strategies developed below is not exhaustive but serve as a framework for selecting a guiding strategy and allocating associated infrastructure costs for planning. Combinations of these options and technologies can and should be reviewed as design advances for each area on a facility by facility basis to optimize the renewable energy strategy.

The renewable energy options shown in Table 3 were assessed using the evaluation framework discussed below.

Table 3: Renewable Energy Options Assessed using Evaluation Framework

OPTION	DESCRIPTION	PHASE 1A (PLAYLAND)		PHASE 2 (AMPHITHEATRE)		
		Electrification	Renewable Natural Gas	Electrification	Solar PV Panels	Air Source Heat Pumps
A: Full Electrification*, excluding Air Source Heat Pumps	Electrification of all heating and cooking loads with electricity supply coming from BC Hydro, upgrading electrical distribution infrastructure as required.					
B: Electrification of Amphitheatre, Renewable Natural Gas (RNG) in Playland	Electrification of Amphitheatre, continue using existing gas-fired equipment in Playland and purchase renewable natural gas (RNG) from Fortis.					
C: Full Electrification*, including Solar Photovoltaic (PV) Panels	Solar PV panels (100 kW) to be installed on Livestock Roof Area. Remaining energy to be provided by BC Hydro, upgrading electrical infrastructure as required.					
D: Full Electrification*, including Air Source Heat Pumps	Electrification of all heating and cooking loads with electricity supply coming from BC Hydro, upgrading electrical distribution infrastructure as required. Use air source heat pumps in Amphitheatre.					
E: Electrification of Amphitheatre, Solar PV Panels, Renewable Natural Gas (RNG) in Playland	Electrification of Amphitheatre, continue using existing gas-fired equipment in Playland and purchase renewable natural gas (RNG) from Fortis. Solar PV panels (100 kW) to be installed on Livestock Roof Area.					
F: Electrification of Amphitheatre (w/ Air Source Heat Pumps), Renewable Natural Gas (RNG) in Playland	Electrification of Amphitheatre, continue using existing gas-fired equipment in Playland and purchase renewable natural gas (RNG) from Fortis. Use air source heat pumps in Amphitheatre.					

* *Full electrification of Phases 1A (Playland) & 2 (Amphitheatre), including cooking and heating loads presented above.*

4.0 RENEWABLE ENERGY STRATEGY EVALUATION FRAMEWORK

As mentioned above, a key deliverable of the Renewable Energy Strategy was the development of an evaluation framework. The evaluation framework establishes a clear set of objectives and corresponding evaluation criteria (qualitative and quantitative) to compare renewable energy options. The evaluation framework was used to short-list renewable energy options for further consideration and, ultimately, select a preferred option.

Section 4.1 describes prerequisites in order for an option to be considered in the evaluation framework. Section 4.2 and 4.3 describe the qualitative and quantitative assessments, respectively, that formed part of the overall evaluation framework. Finally, Section 4.4 describes the overall results of the evaluation process.

4.1 PREREQUISITES

For an option to warrant further evaluation, it was agreed that the following prerequisites must be met:

- Alignment with Provincial, City and PNE policies, plans & strategies
- Certainty of ongoing energy supply
- Potential to satisfy both heating and cooking loads

Options A – F, presented in Table 3, met these prerequisites. As a result, these options were assessed using the qualitative and quantitative criteria discussed below.

Initial concerns regarding the certainty of renewable natural gas (RNG) supply were reviewed. Based on discussions with Fortis, it is understood that significant RNG supply will be coming online in the next couple years. This additional RNG supply is orders of magnitude greater than the needs of the complete Hasting Park-PNE site. For this reason, RNG supply is deemed to be adequate for the future needs of the PNE. It is recommended, however, that PNE staff remain in close contact with Fortis for any updates regarding RNG supply.

4.2 QUALITATIVE ASSESSMENT

The renewable energy options were assessed using the qualitative criteria presented in Table 4. Each criterion was assigned a weighting and associated number of maximum points. The qualitative criteria represent 30% of the overall score. The evaluation results are shown in Section 4.4.

Table 4: Evaluation Framework – Qualitative Criteria

CRITERIA	WEIGHTING	MAXIMUM POINTS
a. Impact to PNE operators and users (including aesthetic impacts)	10%	20
b. Demonstrating climate leadership, innovation and other environmental co-benefits *	10%	20
c. Public education opportunities **	4%	8
d. Resiliency of Infrastructure ***	4%	8
e. Construction impacts / Footprint constraints	2%	4
Total	**30%**	**60**

* *Environmental co-benefits include other City of Vancouver climate emergency targets (e.g. uptake of EV charging stations, carbon sequestration via green roofs) - see https://vancouver.ca/green-vancouver/climate-emergency-response.aspx for more information*

** *Due to the public nature of Hasting Park-PNE, there is a significant opportunity for public education. City staff have expressed an interest in collaborating with PNE staff on public education.*

*** *Ability of infrastructure systems to absorb disturbance and still retain their basic function and structural capacity (e.g. gas-fired equipment requires both gas service and electrical service to be maintained, making it less resilient to system outages)*

4.3 QUANTITATIVE ASSESSMENT

The renewable energy options were assessed using the quantitative criteria presented in Table 5. Each criterion was assigned a weighting and associated number of maximum points. The quantitative criteria represent 70% of the overall score.

Table 5: Evaluation Framework – Quantitative Criteria

CRITERIA	WEIGHTING	MAXIMUM POINTS
a. Life Cycle Cost ($), expressed as Net Present Value (NPV)	20%	40
b. Capital Cost ($)	20%	40
c. Reduction of GHG Emissions (tonne CO_2e)	20%	40
d. GHG abatement cost ($/tonne CO_2e)	10%	20
Total	**70%**	**140**

Table 6 outlines the quantitative assessment results for each option based on the four criteria presented above. The associated scoring results are shown in Section 4.4. It should be noted that the Life Cycle Cost calculations, expressed as NPV, include the City's Internal Corporate Carbon Pricing Policy (City of

Vancouver, 2018). The cost of carbon in dollars-per-tonne ($/tCO2e) stipulated in the policy was multiplied by the estimated annual GHG savings (tCO2e) for each option. This resulted in additional "revenue" in the NPV calculations that partially offsets the annual operating and debt servicing costs of each option. In other words, each option that reduces GHG emissions over the baseline receives a credit to represent the reduction in annual carbon emissions which have a policy cost. Details can be found in **Appendix C**.

While capital cost is part of the life cycle cost, both financial criteria were assessed as unique categories to recognize the upfront capital investment and associated financing requirements to realize these projects.

Table 7 provides further detail of the capital cost estimates. Note that the capital costs presented in Tables 6 & 7 are based on preliminary electrification costs initially conducted by DMD using a cost scaling approach. The electrification costs for the preferred strategy were subsequently refined using a conceptual layout and updated quantity takeoff, which is described in subsequent sections.

Further details of the quantitative assessment, including assumptions, can be found in **Appendix C**.

Table 6: Quantitative Assessment of Renewable Energy Options

OPTION	DESCRIPTION	CAPITAL COST ($)*	LIFE CYCLE COST EXPRESSED AS NPV	CUMULATIVE 25-YEAR GHG SAVINGS (TONNE CO_2E)	GHG ABATEMENT COST ($/TONNE CO_2E)
A: Full Electrification, excluding Air Source Heat Pumps	Electrification of all heating and cooking loads with electricity supply coming from BC Hydro, upgrading electrical distribution infrastructure as required.	$5,000,000	-$8,034,421	12,672	$395
B: Electrification of Amphitheatre, Renewable Natural Gas (RNG) in Playland	Electrification of Amphitheatre, continue using existing gas-fired equipment in Playland and purchase renewable natural gas (RNG) from Fortis.	$1,600,000	-$4,128,677	12,984	$123
C: Full Electrification, including Solar Photovoltaic (PV) Panels	Solar PV panels (100 kW) to be installed on Livestock Roof Area. Remaining energy to be provided by BC Hydro, upgrading electrical infrastructure as required.	$5,300,000	-$8,253,925	12,704	$417
D: Full Electrification, including Air Source Heat Pumps	Electrification of all heating and cooking loads with electricity supply coming from BC Hydro, upgrading electrical distribution infrastructure as required. Use air source heat pumps in Amphitheatre.	$5,900,000	-$9,058,160	12,713	$464
E: Electrification of Amphitheatre, Solar PV Panels, Renewable Natural Gas (RNG) in Playland	Electrification of Amphitheatre, continue using existing gas-fired equipment in Playland and purchase renewable natural gas (RNG) from Fortis. Solar PV panels (100 kW) to be installed on Livestock Roof Area.	$1,900,000	-$4,348,181	13,016	$146
F: Electrification of Amphitheatre (w/ Air Source Heat Pumps), Renewable Natural Gas (RNG) in Playland	Electrification of Amphitheatre, continue using existing gas-fired equipment in Playland and purchase renewable natural gas (RNG) from Fortis. Use air source heat pumps in Amphitheatre.	$2,500,000	-$5,152,416	13,025	$192

* *Capital required to realize renewable energy strategy relative to current site conditions, assuming all other electrical infrastructure from the IMP for each phase proceeds in parallel. Refer to Table 7 for further breakdown of the capital cost estimates. All capital costs are in 2020 dollars and include a 20% engineering and 30% contingency allowance.*

Table 7: Quantitative Assessment – Preliminary Capital Cost Breakdown

PHASE	ITEM	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E	OPTION F
Phase 1A (Playland)	Electrification Costs[1]	$3,700,000	0	$3,700,000	$3,700,000	0	0
	Gas Infrastructure[2]	0	$300,000	0	0	$300,000	$300,000
Phase 2 (Amphitheatre)	Electrification Costs[1]	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000
	Heat Pumps	0	0	0	$900,000	0	$900,000
	Solar Panels	0	0	$300,000	0	$300,000	0
Total Capital Cost Estimate (rounded)		**$5,000,000**	**$1,600,000**	**$5,300,000**	**$5,900,000**	**$1,900,000**	**$2,500,000**

1 *Refer to DMD report (Appendix A), which presents preliminary electrification costs for each phase in 2015 dollars. An escalation factor of 23.6% has been applied to inflate costs to 2020 dollars.*

2 *Gas costs included in the estimate include "new" and "removal" costs originally identified in the IMP for Phase 1A to represent the initial capital cost required to upgrade gas infrastructure to continue serving Playland in the near term for options that consider renewable natural gas. "Renewal" costs which are long term replacement costs for existing gas assets are not included in the comparative analysis, but are included in the overall IMP cost estimates as described in subsequent sections.*

4.4 EVALUATION RESULTS

The overall evaluation results are summarized in Table 8. For each criterion, a score of 1 to 4 was given. The qualitative criteria each have a score of 1, 2, 3 or 4. The quantitative criteria, however, were evaluated such that any score from 1 to 4 was possible. For each quantitative criterion, the option with the most favourable quantitative value was given a score of 4 while the option with the least favourable value was given a score of 1. Quantitative scores for the other options were linearly interpolated based on their respective quantitative values (see Table 6). With respect to GHG emissions, a score of 1 was assumed to be a fictitious option with no GHG reduction.

After a score of 1 to 4 was determined, each score was multiplied by the respective multiplier to yield a total number of points. The highest possible number of points is 200. As shown, Option E has the highest number of points (182) while Option D has the lowest number of points (106).

The two options, D & F, that included air source heat pumps did not have favorable results in large part because of the capital cost premium associated with the heat pumps. While these options had a lower operating cost due to increased efficiencies, the overall life cycle cost was still greater than other options due to the increased capital cost. There are currently provincial rebate programs to help mitigate the cost premium of air source heat pumps. This would help improve the business case for the inclusion of air source heat pumps. For this reason, air source heat pumps should still be considered moving forward, especially if rebates can be secured.

Table 8: Evaluation Framework Results

Criteria	Multiplier	% Weighting	Maximum Points	Score Description	Preliminary Scoring of Renewable Energy Options: Option A: Full Electrification, no Heat Pumps	Option B: Electrification of Amphitheatre, Renewable Natural Gas (RNG) for Existing Playland Facilities	Option C: Full Electrification, including Solar Photovoltaic (PV) Panels	Option D: Full Electrification, including Air Source Heat Pumps	Option E: Electrification of Amphitheatre, Solar PV Panels, Renewable Natural Gas (RNG) for Existing Playland Facilities	Option F: Electrification of Amphitheatre, ASHPs, Renewable Natural Gas (RNG) for Existing Playland Facilities
1. Prerequisites										
a. Alignment with Provincial, City and PNE policies, plans & strategies		N/A		N/A	✓	✓	✓	✓	✓	✓
b. Certainty of ongoing energy supply		N/A		N/A	✓	✓	✓	✓	✓	✓
c. Potential to satisfy both heating and cooking loads		N/A		N/A	✓	✓	✓	✓	✓	✓
2. Qualitative Criteria (30%, 60 out of 200 points max)										
a. Impact to PNE operators and users (including aesthetic impacts)	5	10%	20	(1 = negative impact, 4 = positive impact)	3	3	2	2	2	2
b. Demonstrating climate leadership, innovation and other environmental co-benefits*	5	10%	20	(1 = few co-benefits, 4 = many co-benefits)	2	2	3	3	4	4
c. Public education opportunities	2	4%	8	(1 = low potential, 4 = high potential)	2	2	3	3	4	4
d. Resiliency of Infrastructure **	2	4%	8	(1 = low resiliency, 4 = high resiliency)	4	3	4	4	3	3
e. Construction impacts / Footprint constraints	1	2%	4	(1 = high impacts, 4 = low impacts)	3	4	3	3	2	2
Maximum Points			**60**		**60**	**60**	**60**	**60**	**60**	**60**
Subtotal Points					**40**	**39**	**42**	**42**	**46**	**46**
3. Quantitative Criteria (70%, 140 out of 200 points max)										
a. Life Cycle Cost ($), expressed as Net Present Value (NPV)	10	20%	40	(1 = highest cost, 4 = lowest cost)	1.6	4.0	1.5	1.0	3.9	3.4
b. Capital Cost ($)	10	20%	40	(1 = highest cost, 4 = lowest cost)	1.6	4.0	1.4	1.0	3.8	3.4
c. Reduction of GHG Emissions (tonne CO_2e)	10	20%	40	(1 = lowest reduction, 4 = highest reduction)	3.9	4.0	3.9	3.9	4.0	4.0
d. GHG abatement cost ($/tonne CO_2e)	5	10%	20	(1 = highest cost, 4 = lowest cost)	1.6	4.0	1.4	1.0	3.8	3.4
Maximum Points			**140**		**140**	**140**	**140**	**140**	**140**	**140**
Subtotal Points					**80**	**140**	**75**	**64**	**136**	**124**
TOTAL Points					**120**	**179**	**117**	**106**	**182**	**170**

* *Environmental co-benefits include other City of Vancouver climate emergency targets (e.g. uptake of EV charging stations, carbon sequestration via green roofs) - see https://vancouver.ca/green-vancouver/climate-emergency-response.aspx for more information*

** *Ability of infrastructure systems to absorb disturbance and still retain their basic function and structural capacity (e.g. gas-fired equipment requires both gas service and electrical service to be maintained, making it less resilient to system outages)*

5.0 PREFERRED RENEWABLE ENERGY STRATEGY

As shown above, Option E ranked highest among the options that were assessed using the evaluation framework.

Option E is, therefore, the preferred renewable energy strategy for Phase 1A (Playland) and Phase 2 (Amphitheatre). Figure 6 illustrates the preferred renewable energy strategy for Phases 1A and 2. The preferred renewable energy strategy includes the following:

- Electrification of Phase 2 (Amphitheatre);
- Continued use of existing gas-fired equipment in Playland (Phase 1A), including some gas infrastructure upgrades, with the purchase of renewable natural gas (RNG);
- Solar PV panels (100 kW) to be installed on the Livestock Roof.

The BC Hydro net metering program currently allows a maximum of 100 kW of solar photovoltaic (PV) capacity to be installed per account / meter. Preliminary solar PV modelling suggest that the Livestock Roof could host up to 400 kW of solar PV capacity (see **Appendix D**).

Further discussions with BC Hydro are suggested to determine if capacity beyond 100 kW could be accommodated for this project. Discussions and analysis will also be required to ensure that the Livestock Roof can structurally accommodate the solar PV installation. The heritage status of the Livestock building will also need to be reviewed.

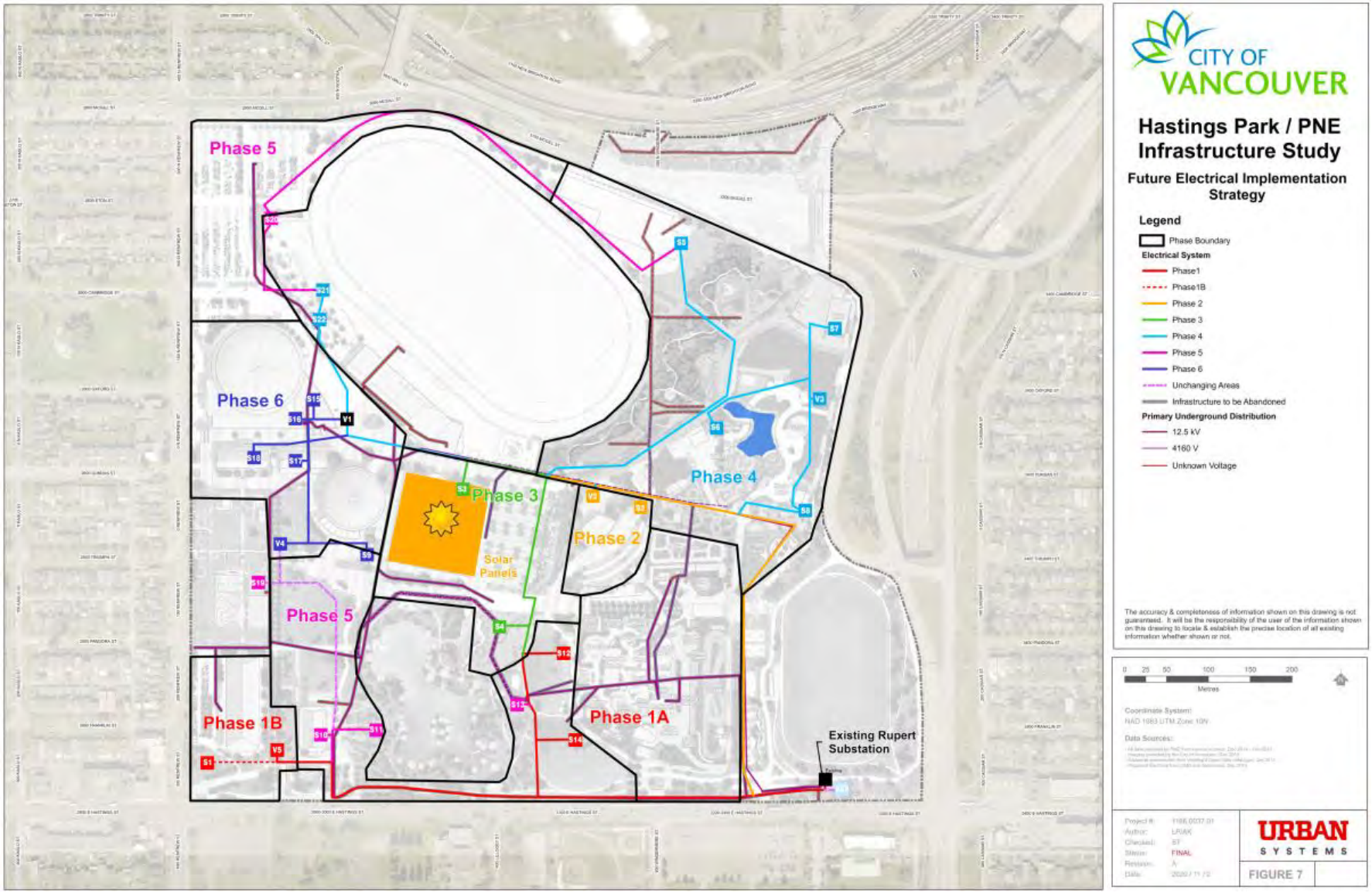
Optional costs for solar panels up to 400 kW (i.e. an additional 300 kW) have been included in the infrastructure costs to allocate funding should this option become viable. The optional cost assumes that the full 400 kW installation is completed as part of a single installation. City staff have expressed an interest in realizing the full 400 kW installation.

During conceptual design of the solar PV installation, some of the roof area could also be used to host solar hot water panels. Solar hot water could be a means to reduce natural gas consumption in the Livestock building. Further analysis would be required to understand the domestic hot water system in the Livestock building and the feasibility of solar hot water.

The primary objectives of this renewable energy strategy were to identify the available options and associated costs for implementing renewable energy alternatives at Hastings Park. The preferred strategy should be reviewed as planning and design advances for each area and optimized on a facility by facility basis. For example, there may be opportunities to electrify cooking and heating loads in existing Playland facilities in addition to utilizing RNG to supply others, or utilize air source heat pumps where they are determined to be cost effective.

Figure 6: Master Plan Implementation Timeframe

Figure 7: Future Electrical Implementation Strategy



Hastings Park Infrastructure Study

Future Gas Servicing Schematic

Legend

- Study Boundary
- Fair Areas
- Proposed New Infrastructure (schematic only)
- Infrastructure to be Removed or Abandoned
- Suggested Isolation Valve Locations
- Meter
- Sub Meter
- Valve
- Surveyed valve
- End Cap
- Existing Main to Remain
- Existing Main with Unknown Diametre

Proposed Gas infrastructure extensions from original IMP in future phases to be revisited as part of park wide renewable energy strategy

Extend gasmain to service expanded Playland

Extend Gas Services to Fair Areas

100mm gas line in Playland to be replaced

Playland gas consumption to utilize Renewable Natural Gas

Primary gas feed to Playland to be upgraded from 100mm to 150mm as proposed in original IMP to improve supply capacity

Add Gas Meters on all Unmetered Facilities

The accuracy & completeness of information shown on this drawing is not guaranteed. It will be the responsibility of the user of the information shown on this drawing to locate & establish the precise location of all existing information whether shown or not.

0 25 50 100 150 200

Metres

Coordinate System:
NAD 1983 UTM Zone 10N

Data Sources:

- All data provided by PNE from various sources, Dec 2014 - Feb 2015
- Imagery provided by the City of Vancouver, Dec 2015
- Cadastral downloaded from VanMap's Open Data catalogue, Jan 2015

Project #:	1166.0037.01
Author:	LP/AK
Checked:	ST
Status:	FINAL
Revision:	A
Date:	2020 / 10 / 30

URBAN SYSTEMS

FIGURE 8

5.1 UPDATED COST ESTIMATE

An updated cost estimate was prepared by DMD for the electrification portion of the preferred renewable energy strategy identified above. This review included a refined layout of electrical infrastructure within the Amphitheatre footprint, as well as high level infrastructure sizing based on the anticipated loads. This updated cost estimate resulted in further reduction of the estimated electrification costs for the Amphitheatre relative to the preliminary costs included during the quantitative analysis. Refer to **Appendix A** for DMD's report with further discussion around the cost estimates and electrical infrastructure.

The following is noted as the basis for all cost estimates presented herein:

- All costs are in 2020 dollars
- All costs include a 20% engineering allowance and a 30% contingency.
- Costs estimates should be considered Class D estimates with an expected accuracy of -20% to +30%

The updated capital cost estimate associated with the preferred renewable energy strategy is shown in Table 9 below.

Table 9: Proposed Renewable Energy Strategy Capital Cost Estimate

PHASE	ITEM	CAPITAL COST ESTIMATE
Phase 1A (Playland)	Electrification Costs	-
	Gas Infrastructure	$300,000
Phase 2 (Amphitheatre)	Electrification Costs	$430,000
	Heat Pumps	-
	Solar Panels (100kW)	$300,000
Total Capital Cost Estimate (rounded)		**$1,030,000**
Optional Item: Additional 300 kW of Solar Panels		*$900,000*[1]
Total Capital Cost Estimate including Optional Item (rounded)		**$1,930,000**

1. *Optional costs for the additional 300 kW of solar panels assume they are implemented at the same time as the initial 100 kW and therefore do not include an allowance for system upgrade costs.*

As discussed above, the PNE and City may explore electrification of some existing facilities within Playland where it is determined to be cost effective in addition to the use of renewable natural gas. The proposed high voltage distribution system should have the electrical capacity to entertain further electrification of existing facilities in Playland. Upgrades would be adding substations and/or vista switches. However, the low voltage distribution allocated in the cost estimates only accounts for the

selected scenario in the current IMP and therefore costs for these future electrification opportunities in Playland are not explicitly accounted for. However, there is a 30% contingency applied to all the infrastructure costs including the baseline electrical upgrades for Playland from the IMP. This contingency allowance may provide capital for additional electrification. It is recommended this be reviewed during subsequent phases of planning and design.

Table 10 summarizes the updated capital cost estimates associated with the renewable energy strategy compared to the initial electrification study completed in late 2019 (Urban Systems, 2019b). Annual GHG savings and estimated annual operating costs are also shown.

Table 10: Revised capital costs associated with the Renewable Energy Strategy

	IMP - AMPHITHEATRE UPDATE (URBAN SYSTEMS, 2019B)	2020 RENEWABLE ENERGY STRATEGY (PHASES 1A AND 2)	
	Full Electrification of Phase 1A + 2	Option E RNG Phase 1A, Electrification of Phase 2, 100 kW Solar[1]	Change from 2019 IMP Update[1]
Capital Cost Premium (Heating + cooking, relative to baseline, 2020 dollars)	$18,530,000	$1,030,000	$(17,500,000)
Annual GHG Savings (tonne CO_2e/year)	507	521	14
Estimated Annual Operating Costs (heating + cooking), (*Rounded*)	$184,000 / year	$234,000 / year	$50,000 / year

[1] *Costs presented exclude the optional cost for additional 300kW of solar panels. This optional cost is included in the cost tables presented in* ***Appendix E****.*

Table 10 reflects a significant reduction in estimated capital costs associated with renewable energy for Phases 1A and 2 when compared to the previous estimates (Urban Systems, 2019b), which is a positive outcome of this study. Reasons for the significant reduction in costs relative to previous estimates include:

1. Refined demand analysis
    a. Total energy demands for heating and cooking (currently fueled with natural gas) were developed in detail, including inventory of existing facilities and estimates of new facilities.
    b. Resulted in reduction in total estimated energy demand by 87% across both phases when compared to previous study, as described above.
    c. The lower demand resulted in reduced capital requirements for energy infrastructure, lowering the estimated capital cost associated with electrification of both phases from $18.5M to approximately $4.2M.

2. Broad engagement and consultation with stakeholder groups, resulting in improved options identification including quantitative and qualitative analyses.

a. Quantitative and qualitative analysis identified preferred Option E which achieves the objectives of the Renewable Energy Strategy at a lower capital cost compared to full electrification of both Phases ($1.03M for Option E compared to $4.2M).

The updated capital costs for the preferred renewable energy strategy have also been integrated into the cost estimates associated with the original Infrastructure Master Plan for the entirety of Hastings Park. These cost tables are included in **Appendix E**.

Appendix E presents the total cost of the IMP, as well as the cost changes relative to the November 2019 IMP Amphitheatre Update, which considered high level electrification costs for Phases 1A and 2. The driving factors for cost changes are the renewable energy strategy and refined pre-requisite costs.

The following is a summary of the IMP costs presented in **Appendix E**:

- The preferred renewable energy strategy represents a significant cost reduction compared to the previous Amphitheatre Update, specifically for Power and Communications infrastructure as a result of the refined electrical loading estimates.

- Optional costs for an additional 300kW of solar panels have been included in Phase 2, which will be explored further during design.

- Gas costs have increased in Phase 1A due to the reintroduction of gas servicing plans to support RNG that were removed in the 2019 Amphitheatre Update in favour of electrification.

- Costs in the Pre-requisite phase have also increased for several infrastructure types due to updated information provided by the PNE regarding end of life infrastructure.
    - Pre-requisite costs have increased by $2.2 million compared to the 2019 Amphitheatre Update, which is outlined in Urban Systems' report Hastings Park IMP – Pre-Requisite Cost Summary (October 2020).

- The total cost of the IMP (All phases) with the renewable energy strategy is $151 million, including the optional 300kW solar panels.

6.0 CONCLUSION

This report summarizes a Renewable Energy Strategy (RES) for Phase 1A (Playland Redevelopment) and Phase 2 (Amphitheatre Renewal) of the Hastings Park Infrastructure Master Plan (IMP). A key deliverable of the RES was the development of an evaluation framework that establishes a clear set of objectives and corresponding evaluation criteria (qualitative and quantitative) to compare renewable energy options. The evaluation framework was used to short-list renewable energy options for further consideration and, ultimately, select a preferred option.

Option E ranked highest among the options that were assessed using the evaluation framework. Option E is, therefore, the preferred renewable energy strategy for Phase 1A (Playland) and Phase 2 (Amphitheatre). The preferred renewable energy strategy includes the following:

- Electrification of Phase 2 (Amphitheatre);

- Continued use of existing gas-fired equipment in Playland (Phase 1A), including some gas infrastructure upgrades, with the purchase of renewable natural gas (RNG);

- Solar PV panels (100 kW) to be installed on the Livestock Roof.

This preferred strategy should be viewed as a guiding document and it is recommended that the strategy be reviewed as planning and design advances for each area and optimized on a facility by facility basis.

The following is a summary of recommendations and potential next steps:

- Further discussions with BC Hydro are suggested to determine if solar PV capacity beyond 100 kW could be accommodated for this project. Discussions and analysis will also be required to ensure that the Livestock Roof can structurally accommodate the solar PV installation. The heritage status of the Livestock building will also need to be reviewed.

- During conceptual design of Phase 2 (Amphitheatre Renewal) and any Playland retrofits, further analysis is suggested to determine if heat pumps (air source or ground source) should be included. This analysis may be contingent on whether the City & PNE can secure heat pump rebates.

- This study focused on renewable energy supply options for Phases 1A and 2. In tandem with energy supply efforts, the PNE and City should also venture to reduce energy loads through demand side management efforts (e.g. building energy retrofits).

- The City and PNE may want to consider electrification of certain facilities in Phase 1A (Playland) where they are determined to be cost effective instead of solely pursuing renewable natural gas for Playland. This should be reviewed on a case-by-case basis through additional analysis.

- The PNE & City may want to consider a Renewable Energy Strategy for Hastings Park beyond Phases 1A and 2. This broader Renewable Energy Strategy could also consider opportunities outside of the Hastings Park-PNE boundaries.

Should you have any questions, please contact the undersigned.

Sincerely,

Waleed Giratalla, P.Eng., RPP

Spencer Thompson, P.Eng

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Urban Systems Ltd., 2020, Hastings Park IMP – Pre-Requisite Cost Summary, Prepared for the Pacific National Exhibition

APPENDIX A

Electrical Report (DMD)

Contents

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List of Figures

List of Tables

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1 Introduction

DMD was retained by Urban systems to provide an update to the original Infrastructure Master Plan report. In October 2019, the PNE Amphitheatre Renewal Business Case and Preliminary Design Scenarios was evaluated and cost estimates were provided. At the time, the City of Vancouver had indicated that for City owned and operated property, the goal was to reach zero emissions. As a result, DMD was tasked to review the electrification of the Amphitheatre (Phase 2) and Playland (Phase 1A). At that time the scope of the electrification review was limited so a direct conversion of units (gas to electric) method was applied.

For the purposes of these series of studies, electrification means to replace gas-fired cooking and heating equipment with its electrical equivalent. At the time of the October 2019 study, the conversion from gas fired equipment to electrical equipment represented a significant increase in demand. This was because the majority of the new load comes from cooking equipment and the numbers produced were very conservative as it was a straight unit conversion as well as the gas unit estimates at the time were also very conservative. As the scope of the study did not allow for a deeper investigation, it was recommended a kitchen designer be retained to layout the equipment of a typical kitchen so that a realistic electrical demand could be determined.

The purpose of this study is to provide a more realistic estimate of electrification of the cooking and heating equipment in the Amphitheatre (new construction) and Playland (convert existing equipment). With this information, we will look at the effects of the increased load to the IMP electrical design and cost estimates.
The items covered under this evaluation are primary power systems, communications and pedestrian lighting and will include:

Capacity Assessments

- Leveraging the assessed capacity of existing infrastructure reported in the IMP, determine their ability to meet future demands
- Update schematic infrastructure designs

Cost Estimates

- Update Class D (-20% to +30%) infrastructure cost estimates and cost allocation for the Amphitheatre project (Phase 2).

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2 Amphitheatre (Phase 2) - Electrification

2.1 Methodology

As mentioned in the introduction, the previous study used a straight unit conversion from MBH (gas units) to kW (electrical units). This resulted in a very large increase in electrical demand. Electrical demand represents the maximum amount of energy that is being consumed at a given time, measured in kilowatts (kW). While it is unlikely that a system would see the maximum demand often or at all, a system has to be designed to handle it. For this study, the PNE provided kitchen equipment lists for each kitchen that would be in the Amphitheatre. Some of the equipment were already electric and had the electrical connection data. To determine the demand, the wattage was calculated from the electrical connection data which was then taken at 80%. This is because it was assumed the electrical connection data provided was the circuit breaker size, and 80% would determine a worst-case demand.

For gas fired equipment, an electrical equivalent was found. The methodology behind this was to look at the BTU to determine the class of equipment, and then look for similar electric equipment in size, features, and heating capacity. We located this data off of kitchen equipment vendors, found at least 3 similar equipment of each type, and averaged the electrical demand.

For heating equipment, the industry standard electrical baseboard calculation of 10 W/sqft was used. The area that was required to be heated was provided by the PNE. It is likely that the more energy efficient heat pumps will be used for heating and cooling. However, heat pumps fail at – 7 degrees Celsius, which Vancouver temperature can reach. For this reason, electric base boards were modelled as it represented the worst-case demand.

Refer to Appendix for equipment list, square footages, kitchen BTU requirements provided by the PNE.

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2.2 Results

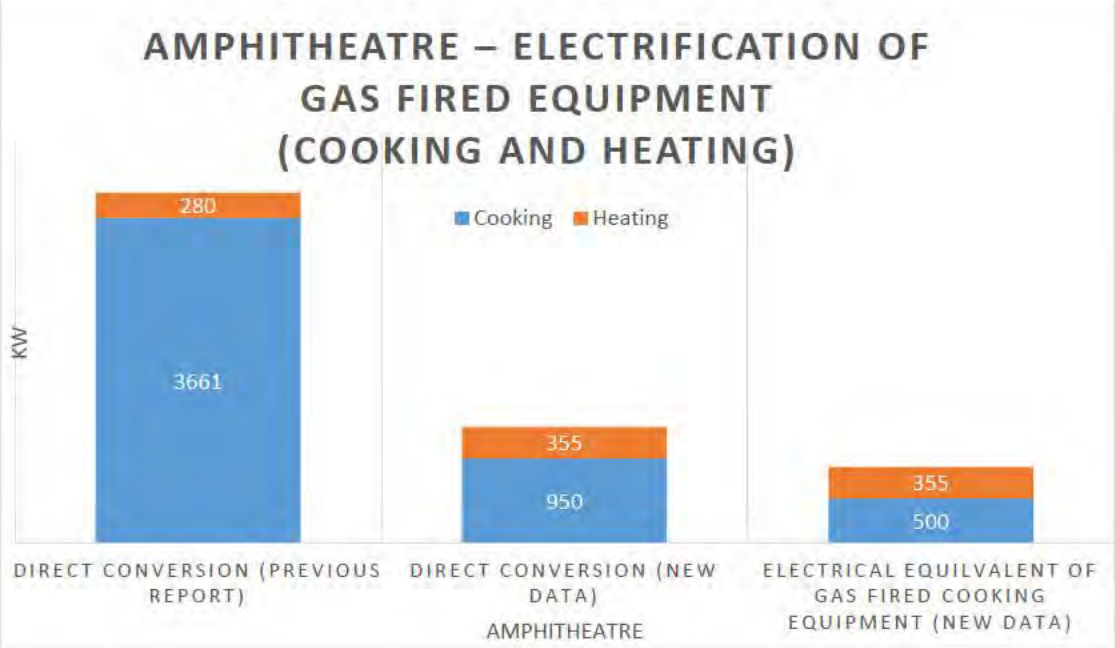

Figure 1: Amphitheatre – Electrification of Gas Fired Equipment (Cooking and Heating)

In Figure 1, we can see a significant decrease in electrical demand once electrical equivalents of gas-fired kitchen equipment were located. The previous mechanical study (by others) also had a conservative approach to estimating MBH of the gas equipment. Once a kitchen list was provided a more realistic gas load was achieved and this can be seen in the direct conversion (new data) column.

3 Playland (Phase 1 A) - Electrification

3.1 Methodology

Information provided by the PNE included restaurant name, square footage, and if natural gas or propane was present at each concession (refer to appendix). However, there were no kitchen loads or equipment lists provided.

To overcome this, some assumptions and calculations derived from the amphitheatre study had to be made. For the amphitheatre, there were kitchens of varying size. These size categories were defined as: small (less than or equal to 432 sqft), medium (greater than 432

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sqft to less than 1200 sqft) and large (greater than 1200 sqft). For each of these categories, the fully electric equipment, electrical equivalent equipment and the direct conversion watts/sqft were derived. The size categories and watts/sqft were then applied to the Playland concessions to determine the electrical demand.

For heating equipment, the same methodology as the Amphitheatre was used.

Additional assumptions include:

- If a concession is fully electric, then it is assumed that it has already converted any gas equipment to electric. Therefore, the electrical demand will be the sum of fully electric plus electrical equivalent applied to the square footage of the restaurant.
- If there is no gas present then it is assumed the concessions are already using electric resistive heat.

3.2 Results

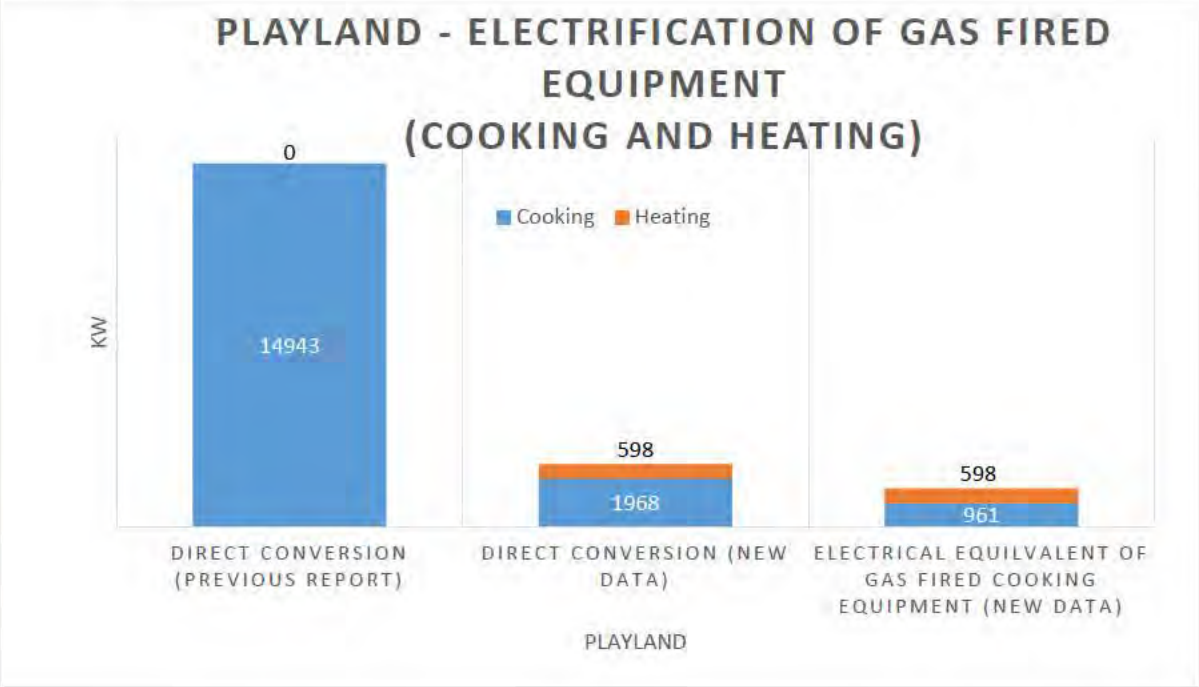

Figure 2: Playland – Electrification of Gas Fired Equipment (Cooking and Heating)

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In Figure 2, we can see a significant decrease in electrical demand with the electrical equivalent as compared to the direct conversion. However, a more drastic change is when the results were compared to the previous report. This is because the previous mechanical study (by others) had a conservative approach to estimating MBH of the gas equipment and also assumed all kitchens were gas. The data provided in this study found that many of the existing concessions were already electric and therefore the not all kitchens had to be converted.

4 Capacity Assessments

4.1 Amphitheatre (Phase 2)

Based on the results of this study, the capacity assessment in the Hastings Park Infrastructure Master Plan Report (2018, Amphitheatre update) is not affected very much. The Amphitheatre substation S2 did have to upgrade from 500KVA to 1500KVA (refer to appendix, attached drawing).

Currently, BC Hydro's Rupert Substation is being fed by 3x 12.5kV feeder circuits from the Horne Payne Substation. A typical 12.5kV circuit has the maximum capacity of 8MVA or 24MVA total. When BC Hydro upgrades the system to 25kV that would be a maximum of 16MVA per circuit or 48MVA total. With the upgrade of Amphitheatre substation S2, the overall capacity from the PNE substations in the current IMP over 20 years is 40.75MVA, and within BC Hydro's proposed capacity.

On the primary voltage side, the increase of 1MVA does not affect upstream vista switches (V2 & V5) and associated feeders as they have the capacity to handle this increase.

On the secondary side, there was a significant increase in panels and switchgear as expected as there are more electrical loads to feed and therefore more distribution is required.

Please refer to the attached drawings for a preliminary primary electrical system of Hastings Park as well as a sketch of a preliminary secondary distribution design of the amphitheatre.

4.2 Playland (Phase 1A)

During the workshops between the consultants, City of Vancouver and the PNE it was decided not to pursue the electrification of gas fired equipment. For the selected options as

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well as the reasons why please refer to Urban System's report. As a result, Phase 1A was not impacted at all.

During the initial stages of this study an option was converting the existing gas fired equipment in Playland. This would result in an additional 2MVA substation required as well as a significant increase in secondary distribution panels and switchgears. Because the gas fired equipment and the buildings they reside were existing, it would be a significant undertaking to retrofit to electrical. This would include but not limited to: removing existing equipment and gas lines, upgrading feeders, panels and sub-panels in the buildings.

4.3 Phase 1B, Phase 3A & 3B

While not part of this study, some clarifications on assumptions made in previous IMP updates as reflected in cost estimates and schematic drawings.

- Phase 3A and 3B duct work could be installed at the same time as phase 2 as part of the "Heart of the Park". The costs for these were listed under Phase 3A and 3B.
- Vista Switch V5 (Phase 1A) and Vista Switch V2 (Phase 2) would be tied together in Phase 1B. This would also provide the primary wiring that will tie in Phase 3A and 3B substations S3 and S4 should 1B occur first.
- Phase 3A and 3B substations S3 and S4 could be independent of Phase 1B, however the primary cabling would need to be installed from Vista Switch V2. This would mean moving approximately 608m of primary cables from Phase 1B into Phase 3A/3B (or about $170,000)

Please refer to attached for preliminary primary electrical system of Hastings Park.

5 Cost Estimate

5.1 Amphitheatre (Phase 2)

Please refer to the attached document for the updated Final Phase 2 Cost Estimate. The changes from the previous pre-electrification study's cost estimate was the size of the substation that is required. Additionally, the number of secondary conductors and secondary panels has increased to accommodate the increase in electrical load.

For comparison, the October 2019 IMP "pre-electrification" cost estimate is included.

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Also, for information, the preliminary cost estimate at the initial stages of the study is included. The reason why the secondary panels and switchgear are so much higher is that they were scaled up by a factor that was extra conservative. However, at the later stages of the study, a high-level secondary design could be done and as a result the cost estimate could be dialed in better.

The cost estimates are based 2015 dollars (original IMP) and doesn't include taxes or inflation factors.

5.2 Playland (Phase 1A)

As mentioned under Capacity Assessments, there is no change to the Playland loads and therefore no change to phase 1A cost estimate when compared to the October 2019 pre-electrification cost estimate.

For information, the preliminary cost estimate to electrify the gas fired equipment in Playland is attached and for comparison, the October 2019 IMP "pre-electrification" cost estimate is also included. Although the secondary panels and switch gears were scaled up much like in the Phase 2 preliminary cost estimate, the additional costs can be somewhat justified by the additional work required to retrofit existing buildings and equipment.

6 Conclusion

There are cost implications to the electrifying of gas fired equipment in the amphitheatre as seen in the cost estimates. On the primary voltage system, the impact is the upgrading of the amphitheatre substation, however the upstream primary system and BC Hydro's connection is not affected.

If future phases are also going through a similar greenhouse gas reduction exercise, and electrification is one of the options, it would be advisable to review the impact to the overall electrical Master Plan. Hastings Park may require another connection to BC Hydro for added capacity and redundancy. It is advisable to consult with the BC Hydro Key Accounts manager to see what options are available for Hastings Park. BC Hydro would need to upgrade their system and some of those costs would be passed on to the City.

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7 Appendix

7.1 PNE Provided Information – Amphitheatre

Kitchen Equipment List	Electrical		Natural Gas
	Amps	*Voltage*	*BTU*
PROPOSED LARGE KITCHEN FACILITY (TYPE 1 - 20' X 60') - 1200 sqft Amphitheatre Building B			
Hood Fan	30	208	
8' x 10' Walk In Cooler	60	208	
8' x 10' Walk In Freezer	60	208	
Deep Fryers (4)			**400,000**
Convection Oven			**100,000**
Combo Oven	20	120	
Dishwasher	30	208	
Burner Oven			**100,000**
Line Fridges (2)	30	120	
Cofee Maker	30	120	
Merry Chef Ovens (2)	60	208	
Stand Up Fridge	15	120	
Stand Up Freezer	15	120	
Steamer	30	208	
Microwave	15	120	
Misc. Small Equipment	100	120/208	
Hot Water Tank			**150000**
Charbroiler			**100000**
Warmer	20	120	

Table 1: Proposed Kitchen Facility Type 1

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Kitchen Equipment List	Electrical		Natural Gas
	Amps	*Voltage*	*BTU*
PROPOSED KITCHEN FACILITY (TYPE 2 - 20' X 40') 800 sqft Amphitheatre Building A			
Hood Fan	30	208	
8' x 10' Walk In Cooler	60	208	
8' x 10' Walk In Freezer	60	208	
Deep Fryers (4)			**400,000**
Convection Oven			**100,000**
Combo Oven	20	120	
Dishwasher	30	208	
Burner Oven			**100,000**
Line Fridges (2)	30	120	
Cofee Maker	30	120	
Merry Chef Ovens (2)	60	208	
Stand Up Fridge	15	120	
Stand Up Freezer	15	120	
Steamer	30	208	
Microwave	15	120	
Misc. Small Equipment	100	120/208	
Hot Water Tank			**150000**
Charbroiler			**100000**
Warmer	20	120	

Table 2: Proposed Kitchen Facility Type 2

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Kitchen Equipment List	Electrical		Natural Gas
	Amps	*Voltage*	*BTU*
PROPOSED CONCESSION FACILITY (TYPE 3 - 36' X 12') 432 sqft Amphitheatre Building B			
Hood Fan	30	208	
8' x 10' Walk In Cooler	60	208	
Stand Up Fridge	15	120	
Stand Up Freezer	15	120	
Line Fridges (2)	30	120	
Fountain Pop (2)	30	120	
Merry Chef Oven	30	208	
Deep Fryers (4)			**400,000**
Broiler			**100,000**
Flat Top Oven			**100,000**
Warming Unit	30	208	
Coke Fridge	20	120	
Beer Purlick	20	120	
Ice Cream Machine	20	120	
Pop Can Fridge	20	120	
Heat Lamp	20	120	
Dishwasher	30	208	
Misc. Small Equipment	60	120/208	
Hot Water Tank			**100,000**

Table 3: Proposed Kitchen Facility Type 3

Note: The information on proposed Kitchen Facility Type 4 (small concession) provided was number of small concessions (2 total) and footprint of each (13'x20')

Note: The amphitheatre proposed kitchens and concessions made up approximately 3000 sqft, while the proposed area to be heated was about 36,000 sqft.

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7.2 PNE Provided Information – Playland

F&B Facility	Square Footage (ea) (sq ft)	Natural Gas (Y/N)	Propane (Y/N)
Triple O's	1800	Y	
Coaster Dogs	320		Y
F1	400		
Pop	188		
Tacos + Totchos	320		Y
F2	144		Y
Lemonade x2	288		
Candy units x4	576		
F3	160		
Candy Shop	200		
What the fudge	2400	Y	
Cheese Please	200		
Lookout Grill	800	Y	
Slucious	270		
Pizza Pizza	1000	Y	
Scoops	600		
Mini Scoops	100		
Ride Side Bar	1200	Y	
Exist. & Proposed Gas Heated Buildings	51780		

Table 4: Playland Food and Beverage Facilities

The existing kitchens and concessions to be converted made up approximately 11,000 sqft, while the existing and proposed gas heated buildings to be converted was about 52,000 sqft

7.3 Diagram – Primary Electrical System Master Plan

See attached. Updated October 2020.

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7.4 Diagram – Secondary Electrical System – Amphitheatre

See attached. Updated October 2020.

7.5 Cost Estimate – Pre-Electrification October 2019

See attached. Updated October 2019.

7.6 Cost Estimate – Preliminary Phase 2 and 1A Electrification August 2020

See attached. Preliminary costs estimate at initial stage of study. Updated August 2020.

7.7 Cost Estimate – Final Amphitheatre Phase 2 electrification October 2020

See attached. Final Cost estimate for Phase 2 only, updated October 2020.

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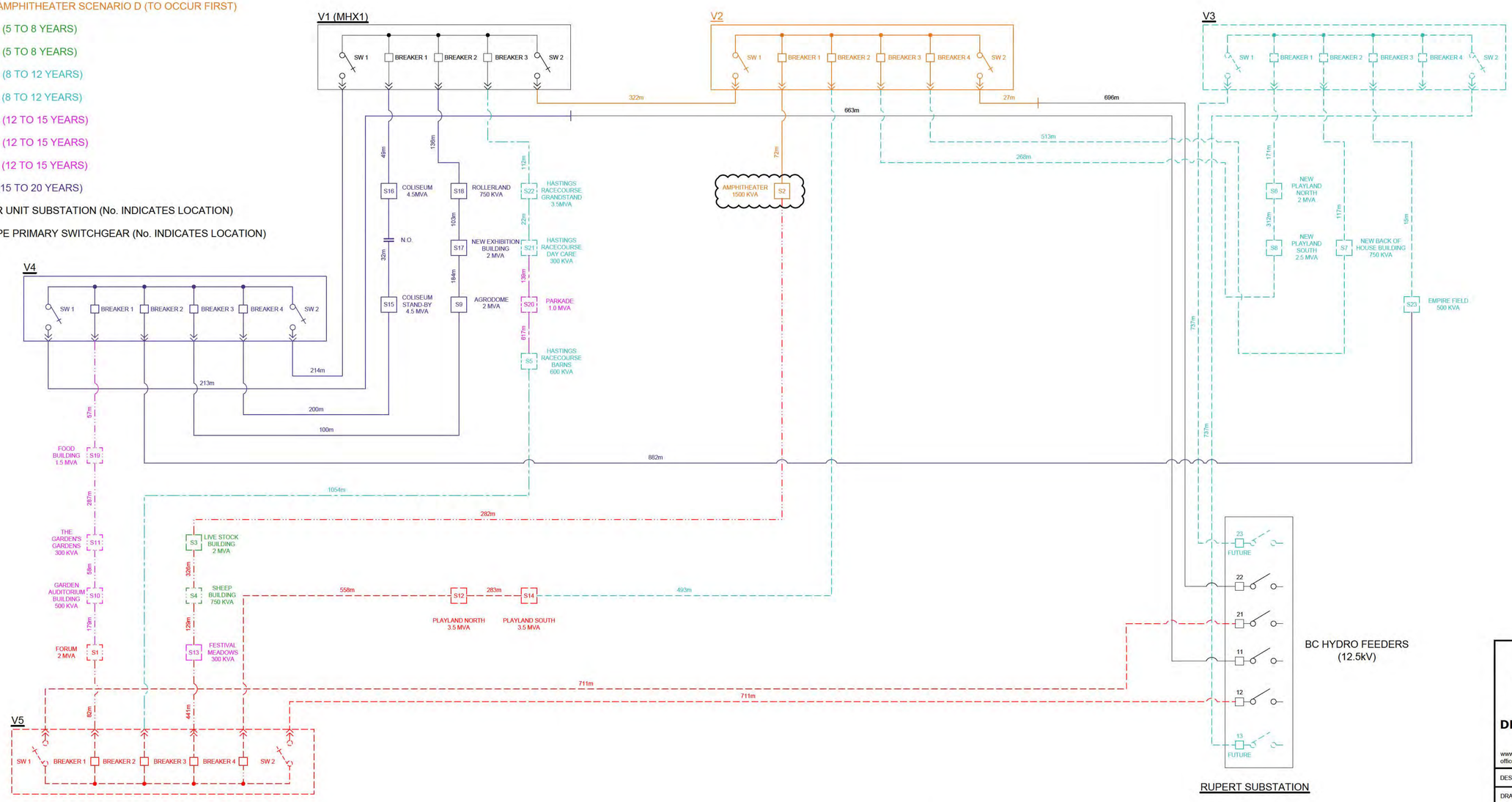
LEGEND:

- EXISTING
- PHASE 1a (1 TO 5 YEARS)
- PHASE 1b (1 TO 5 YEARS)
- PHASE 2 AMPHITHEATER SCENARIO D (TO OCCUR FIRST)
- PHASE 3a (5 TO 8 YEARS)
- PHASE 3b (5 TO 8 YEARS)
- PHASE 4a (8 TO 12 YEARS)
- PHASE 4c (8 TO 12 YEARS)
- PHASE 5a (12 TO 15 YEARS)
- PHASE 5b (12 TO 15 YEARS)
- PHASE 5c (12 TO 15 YEARS)
- PHASE 6 (15 TO 20 YEARS)
- S1 OUTDOOR UNIT SUBSTATION (No. INDICATES LOCATION)
- V1 VISTA TYPE PRIMARY SWITCHGEAR (No. INDICATES LOCATION)



RUPERT SUBSTATION

NOTES:

1. THIS DRAWING IS A SPECIAL SIMPLIFIED SINGLE LINE DIAGRAM DESIGNED TO SHOW THE OVERALL HASTINGS PARKPNE MEDIUM VOLTAGE DISTRIBUTION ON A SINGLE DRAWING.
2. PROPOSED PRIMARY SYSTEM VOLTAGE IS 7.2/12.5kV. ALL PRIMARY SERVICE EQUIPMENT MUST BE RATED AND CERTIFIED FOR FUTURE OPERATION AT 14.4/25kV SUPPLY.

TYPICAL OUTDOOR VISTA TYPE PRIMARY SIWTCHGEAR
N.T.S.

TYPICAL OUTDOOR UNIT SUBSTATION INCLUDING PRIMARY SWITCH GEAR & TRANSFORMER - 1
N.T.S.

TYPICAL OUTDOOR UNIT SUBSTATION INCLUDING PRIMARY SWITCH GEAR & TRANSFORMER - 2
N.T.S.

REFERENCE: HASTINGS PARK INFRASTRUCTURE MASTER PLAN REPORT - 2020-10-15 REVISION

NOT FOR CONSTRUCTION
2020-10-15

No.	DATE	BY	CHK'D	REVISION
A	2019-09-13	MDGS	DC	REVISED TO SHOW AMPHITHEATER SCENARIO D
B	2020-10-15	RF	MDGS	REVISED TO SHOW ELECTRIFICATION OF GAS FIRED EQUIPMENT (AMPHITHEATRE - PHASE 2 ONLY)

DRAWING REFERENCE

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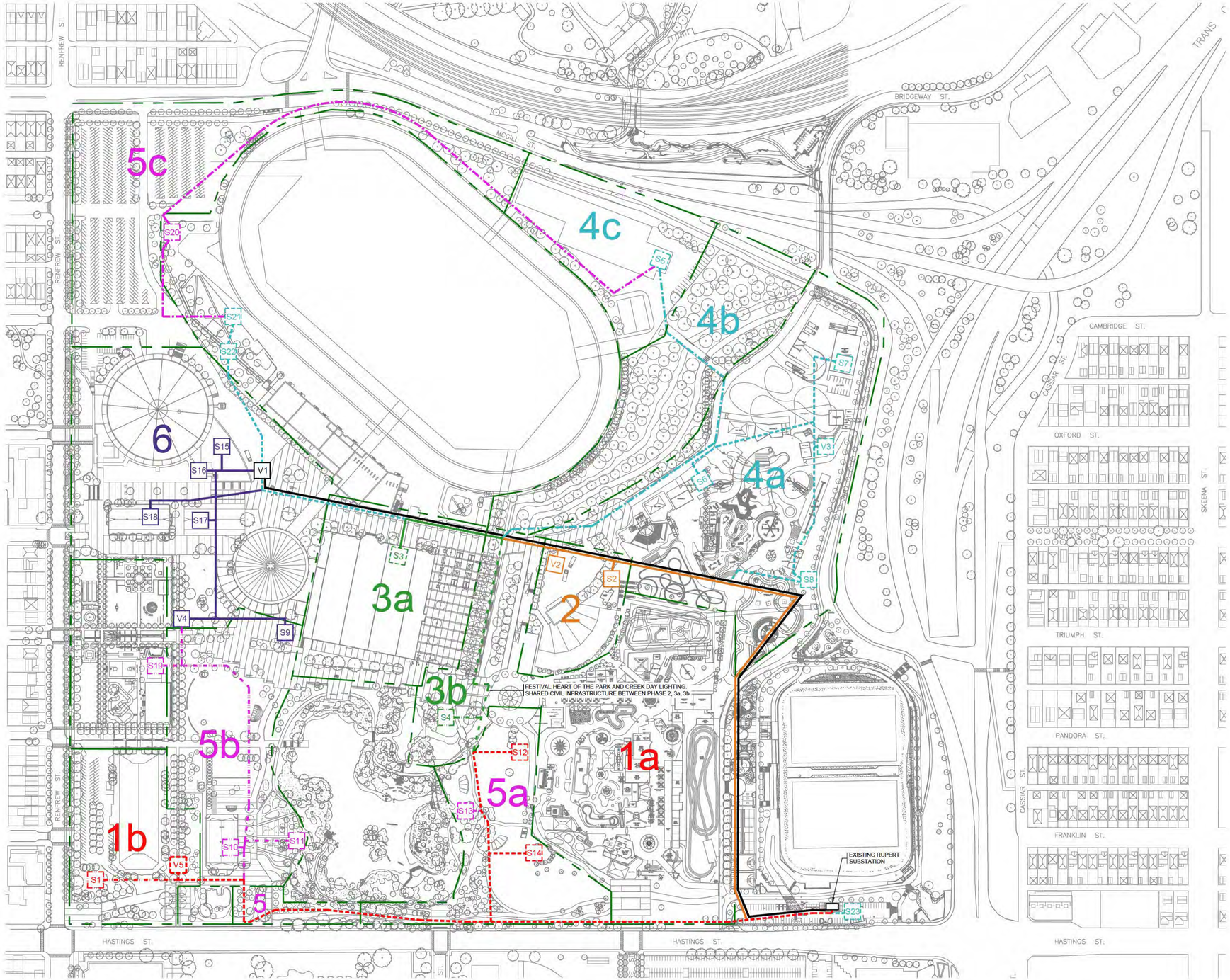
DESIGNED	DAVID SON
DRAWN	GABRIELA VARSANYI
CHECKED	DON CRONAN
DATE	JUNE 08/2015
SCALE:	N.T.S.
SEAL	

Urban Systems Ltd.
550 - 1090 Homer St., Vancouver, B.C., V6B 2W9, Tel: (604) 253-1701

PRIMARY ELECTRICAL SYSTEM
SINGLE LINE DIAGRAM - PROPOSED
MASTER PLAN
HASTINGS PARK, VANCOUVER

PROJECT No.	SHEET No.	REVISION
6299A-18-02 of 02	E2	B



SITE PLAN
0 1:2000 80

LEGEND:

- S1 — OUTDOOR UNIT SUBSTATION (No. INDICATES LOCATION)
- V1 — VISTA TYPE PRIMARY SWITCHGEAR (No. INDICATES LOCATION)
- DUCTBANKS (TRENCH)

IMPLEMENTATION TIMELINE:

- EXISTING
- PHASE 1a (1 TO 5 YEARS)
- PHASE 1b (1 TO 5 YEARS)
- PHASE 2 AMPHITHEATER SCENARIO D (TO OCCUR FIRST)
- PHASE 3a (5 TO 8 YEARS)
- PHASE 3b (5 TO 8 YEARS)
- PHASE 4a (8 TO 12 YEARS)
- PHASE 4c (8 TO 12 YEARS)
- PHASE 5a (12 TO 15 YEARS)
- PHASE 5b (12 TO 15 YEARS)
- PHASE 5c (12 TO 15 YEARS)
- PHASE 6 (15 TO 20 YEARS)

NOT FOR CONSTRUCTION
2020-10-15

REFERENCE: HASTINGS PARK INFRASTRUCTURE MASTER PLAN REPORT - 2020-10-15 REVISION

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DRAWN	ROB FRASER
CHECKED	DON CRONAN
DATE	NOVEMBER 27, 2015
SCALE:	1:2000
SEAL	

No.	DATE	BY	CHK'D	REVISION
A	2019-09-13	MDGS	DC	REVISED TO SHOW AMPHITHEATER SCENARIO D
B	2020-10-15	RF	MDGS	REVISED TO SHOW ELECTRIFICATION OF GAS FIRED EQUIPMENT (AMPHITHEATRE - PHASE 2 ONLY)

DRAWING REFERENCE

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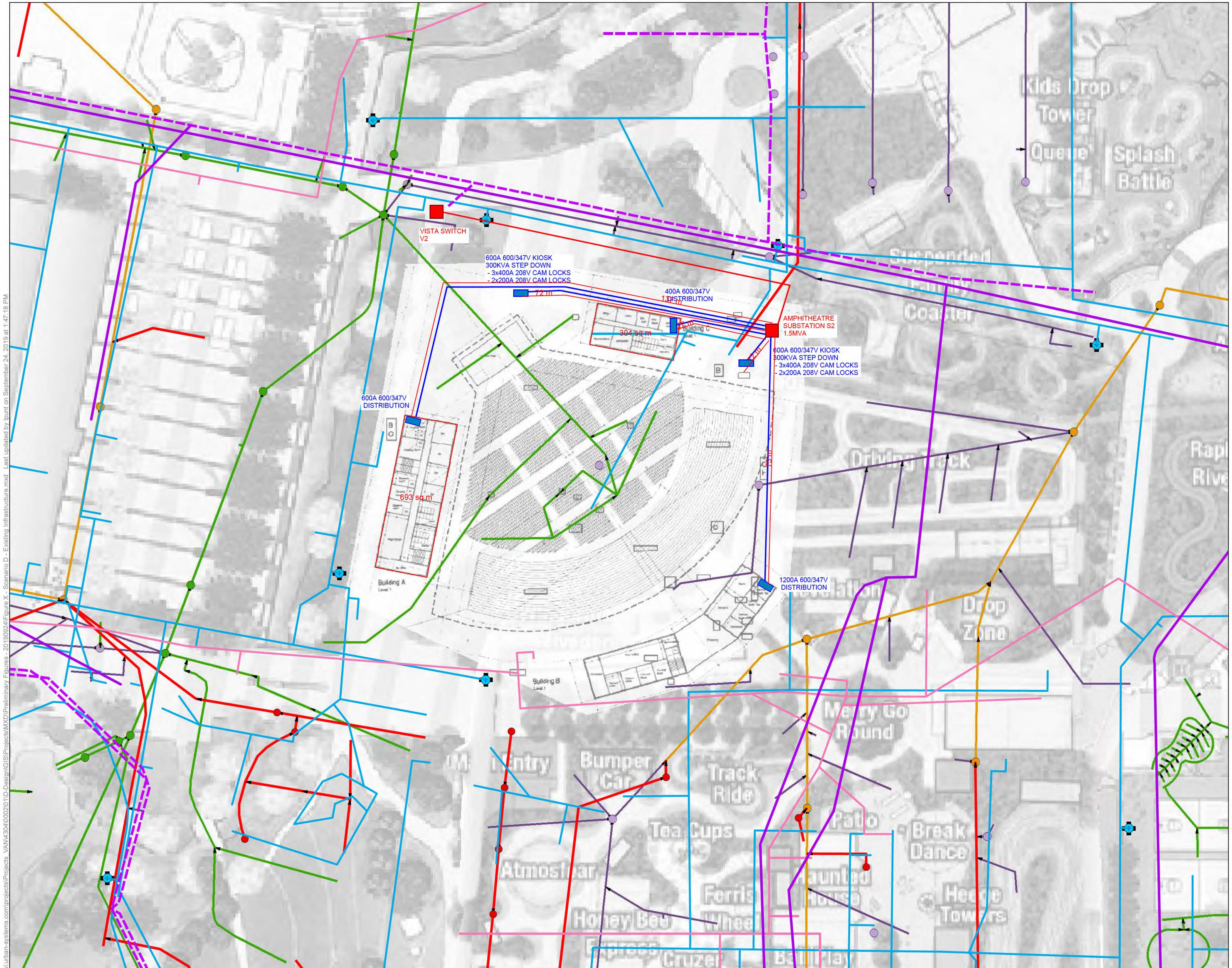
PRIMARY ELECTRICAL SYSTEM
MASTER PLAN
HASTINGS PARK, VANCOUVER

PROJECT No.	SHEET No.	REVISION
6299A-18-01 of 02	E1	B



CITY OF VANCOUVER

IMP Update
Amphitheatre Renewal

PNE Amphitheatre Design
Scenario D - Existing Infrastructure

Legend

Study Boundary

Existing Electrical System
- Primary Overhead Distribution
- Primary Underground Distribution

Existing Gas System
- Gas Main

Existing Water System
- Hydrant
- Main

Existing Sanitary System
- Manhole
- Main

Existing Storm System
- Manhole
- Main

Existing Combined System
- Manhole
- Main

Sewers that are assumed to be combined unless proven otherwise through field testing
- Manhole
- Main

The accuracy & completeness of information shown on this drawing is not guaranteed. It will be the responsibility of the user of the information shown on this drawing to locate & establish the precise location of all existing information whether shown or not.

0 25 50
Metres

Coordinate System:
NAD 1983 UTM Zone 10N

PRELIMINARY

SCHEMATIC SECONDARY ELECTRICAL SYSTEM
AMPHITHEATRE

Project #:	1166.0037.01
Author:	LP
Checked:	ST
Status:	FINAL
Revision:	A
Date:	2019 / 9 / 24

URBAN systems

FIGURE E1

Hastings Park and Playland - Class C Estimate of Probable Costs

Description of Item		Phase 1A Qty	Phase 1B Qty	Phase 2 Qty	Phase 3A Qty	Phase 3B Qty	Phase 4A Qty	Phase 4B Qty	Phase 4C Qty	Phase 5A Qty	Phase 5B Qty	Phase 5C Qty	Phase 6 Qty	Unit Price	Phase 1A Total	Phase 1B Total	Phase 2 Total	Phase 3A Total	Phase 3B Total	Phase 4A Total	Phase 4B Total	Phase 4C Total	Phase 5A Total	Phase 5B Total	Phase 5C Total	Phase 6 Total
Electrical																										
1 MVA Substation	ea	0	0	1	0	1	2	0	2	1	2	1	1	$104,000.00	$0.00	$0.00	$104,000.00	$0.00	$104,000.00	$208,000.00	$0.00	$208,000.00	$104,000.00	$208,000.00	$104,000.00	$104,000.00
1.5 MVA Substation	ea	0	0	0	0	0	0	0	0	0	1	0	0	$140,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$140,000.00	$0.00	$0.00
2 MVA Substation	ea	0	1	0	1	0	1	0	0	0	0	0	2	$162,000.00	$0.00	$162,000.00	$0.00	$162,000.00	$0.00	$162,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$324,000.00
2.5 MVA Substation	ea	0	0	0	0	0	1	0	0	0	0	0	0	$183,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$183,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
3 MVA Substation	ea	0	0	0	0	0	0	0	0	0	0	0	0	$197,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
3.5 MVA Substation	ea	2	0	0	0	0	0	0	1	0	0	0	0	$211,000.00	$422,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$211,000.00	$0.00	$0.00	$0.00	$0.00
4.5 MVA Substation	ea	0	0	0	0	0	0	0	0	0	0	0	2	$242,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$484,000.00
Vista Switching Cabinet and Vault	ea	1	0	1	0	0	1	0	0	0	0	0	1	$320,000.00	$320,000.00	$0.00	$320,000.00	$0.00	$0.00	$320,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$320,000.00
Primary Duct Bank, Vaults and Cables	m	2704	652	421	0	0	3246	0	860	20	1100	756	2500	$830.00	$2,244,320.00	$541,160.00	$349,430.00	$0.00	$0.00	$2,694,180.00	$0.00	$713,800.00	$16,600.00	$913,000.00	$627,480.00	$2,075,000.00
Primary Duct Bank and vaults only	m	0	0	0	282	326	0	0	0	0	0	0	0	$550.00	$0.00	$0.00	$0.00	$155,100.00	$179,300.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Primary Cables only	m	0	608	0	0	0	0	0	0	0	0	0	0	$280.00	$0.00	$170,240.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Secondary Ducts and Cables	m	3230	570	1000	100	100	2200	0	250	240	490	120	850	$150.00	$484,500.00	$85,500.00	$150,000.00	$15,000.00	$15,000.00	$330,000.00	$0.00	$37,500.00	$36,000.00	$73,500.00	$18,000.00	$127,500.00
Secondary Panels and Switchgear	ea	61	11	100	1	1	39	0	4	2	4	2	8	$5,000.00	$305,000.00	$55,000.00	$500,000.00	$5,000.00	$5,000.00	$195,000.00	$0.00	$20,000.00	$10,000.00	$20,000.00	$10,000.00	$40,000.00
Removal and Disposal of Existing	LS	1	1	0	1	0	0	1	1	1	2	0	2	$30,000.00	$30,000.00	$30,000.00	$0.00	$30,000.00	$0.00	$0.00	$30,000.00	$30,000.00	$30,000.00	$60,000.00	$0.00	$60,000.00
Sub-Total															**$3,805,820.00**	**$1,043,900.00**	**$1,423,430.00**	**$367,100.00**	**$303,300.00**	**$4,092,180.00**	**$30,000.00**	**$1,220,300.00**	**$196,600.00**	**$1,414,500.00**	**$759,480.00**	**$3,534,500.00**
Lighting																										
Lighting Pole conduit and conductors	ea	38	10	11	8	8	34	15	49	18	14	23	31	$10,000.00	$380,000.00	$100,000.00	$110,000.00	$80,000.00	$80,000.00	$340,000.00	$150,000.00	$490,000.00	$180,000.00	$140,000.00	$230,000.00	$310,000.00
Adaptive Lighting Controls	ea	38	10	11	8	8	34	15	0	18	14	23	31	$200.00	$7,600.00	$2,000.00	$2,200.00	$1,600.00	$1,600.00	$6,800.00	$3,000.00	$0.00	$3,600.00	$2,800.00	$4,600.00	$6,200.00
Sub-Total															**$387,600.00**	**$102,000.00**	**$112,200.00**	**$81,600.00**	**$81,600.00**	**$346,800.00**	**$153,000.00**	**$490,000.00**	**$183,600.00**	**$142,800.00**	**$234,600.00**	**$316,200.00**
Communications																										
Duct Bank and Vaults	ea	2704	652	421	282	326	3246	0	860	20	1019	756	2113	$150.00	$405,600.00	$97,800.00	$63,150.00	$42,300.00	$48,900.00	$486,900.00	$0.00	$129,000.00	$152,850.00	$152,850.00	$113,400.00	$316,950.00
Fibre Cables	m	2704	1260	421	0	0	3246	0	860	20	1019	756	0	$75.00	$202,800.00	$94,500.00	$31,575.00	$0.00	$0.00	$243,450.00	$0.00	$64,500.00	$76,425.00	$76,425.00	$56,700.00	$0.00
Copper Cables	m	2704	1260	421	0	0	3246	0	860	20	1019	756	0	$75.00	$202,800.00	$94,500.00	$31,575.00	**$0.00**	$0.00	$243,450.00	$0.00	$64,500.00	$76,425.00	$76,425.00	$56,700.00	$0.00
Sub-Total															**$811,200.00**	**$286,800.00**	**$126,300.00**	**$42,300.00**	**$48,900.00**	**$973,800.00**	**$0.00**	**$258,000.00**	**$305,700.00**	**$305,700.00**	**$226,800.00**	**$316,950.00**
Overall Total															**$5,004,620.00**	**$1,432,700.00**	**$1,661,930.00**	**$491,000.00**	**$433,800.00**	**$5,412,780.00**	**$183,000.00**	**$1,968,300.00**	**$685,900.00**	**$1,863,000.00**	**$1,220,880.00**	**$4,167,650.00**
Contingency (30%)															$1,501,386.00	$429,810.00	$498,579.00	$147,300.00	$130,140.00	$1,623,834.00	$54,900.00	$590,490.00	$205,770.00	$558,900.00	$366,264.00	$1,250,295.00
Engineering (20%)															$1,000,924.00	$286,540.00	$332,386.00	$98,200.00	$86,760.00	$1,082,556.00	$36,600.00	$393,660.00	$137,180.00	$372,600.00	$244,176.00	$833,530.00
Total Per Phase															**$7,506,930.00**	**$2,149,050.00**	**$2,492,895.00**	**$736,500.00**	**$650,700.00**	**$8,119,170.00**	**$274,500.00**	**$2,952,450.00**	**$1,028,850.00**	**$2,794,500.00**	**$1,831,320.00**	**$6,251,475.00**
Grand Total																										**$36,788,340.00**

Assumptions:

1. Secondary panels and kiosks for Amphiteatre increased to account for outdoor kiosk. It is really only 2 kiosk feeding some subpanels, but the number shown in phase 2 is to approximate the larger cost of the kiosk
2. Scenario assumes that Daylighting and Heart of the park is being installed at the same time as Phase 2 Amphitheatre. However, only duct/vaults can be installed. Cable will be installed in phase 1B.
3. Dependencies from Phase 1b moved over to 1a. Moved over Vista V5 and portion of ductbank/cables.

COST ESTIMATE
PRE-ELECTRIFICATION OCT 2019

2019-10-16

Hastings Park and Playland - Class C Estimate of Probable Costs

Description of Item		Phase 1A Qty	Phase 1B Qty	Phase 2 Qty	Phase 3A Qty	Phase 3B Qty	Phase 4A Qty	Phase 4B Qty	Phase 4C Qty	Phase 5A Qty	Phase 5B Qty	Phase 5C Qty	Phase 6 Qty	Unit Price	Phase 1A Total	Phase 1B Total	Phase 2 Total	Phase 3A Total	Phase 3B Total	Phase 4A Total	Phase 4B Total	Phase 4C Total	Phase 5A Total	Phase 5B Total	Phase 5C Total	Phase 6 Total
Electrical																										
1 MVA Substation	ea	0	0	0	0	1	2	0	2	1	2	1	1	$104,000.00	$0.00	$0.00	$0.00	$0.00	$104,000.00	$208,000.00	$0.00	$208,000.00	$104,000.00	$208,000.00	$104,000.00	$104,000.00
1.5 MVA Substation	ea	0	0	1	0	0	0	0	0	0	1	0	0	$140,000.00	$0.00	$0.00	$140,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$140,000.00	$0.00	$0.00
2 MVA Substation	ea	1	1	0	1	0	1	0	0	0	0	0	2	$162,000.00	$162,000.00	$162,000.00	$0.00	$162,000.00	$0.00	$162,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$324,000.00
2.5 MVA Substation	ea	0	0	0	0	0	1	0	0	0	0	0	0	$183,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$183,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
3 MVA Substation	ea	0	0	0	0	0	0	0	0	0	0	0	0	$197,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
3.5 MVA Substation	ea	2	0	0	0	0	0	0	1	0	0	0	0	$211,000.00	$422,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$211,000.00	$0.00	$0.00	$0.00	$0.00
4.5 MVA Substation	ea	0	0	0	0	0	0	0	0	0	0	0	2	$242,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$484,000.00
Vista Switching Cabinet and Vault	ea	0	0	1	0	0	1	0	0	0	0	0	1	$320,000.00	$0.00	$0.00	$320,000.00	$0.00	$0.00	$320,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$320,000.00
Primary Duct Bank, Vaults and Cables	m	3500	652	500	0	0	3246	0	860	20	1100	756	2500	$830.00	$2,905,000.00	$541,160.00	$415,000.00	$0.00	$0.00	$2,694,180.00	$0.00	$713,800.00	$16,600.00	$913,000.00	$627,480.00	$2,075,000.00
Primary Duct Bank and vaults only	m	0	0	0	282	326	0	0	0	0	0	0	0	$550.00	$0.00	$0.00	$0.00	$155,100.00	$179,300.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Primary Cables only	m	0	608	0	0	0	0	0	0	0	0	0	0	$280.00	$0.00	$170,240.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Secondary Ducts and Cables	m	2000	570	1250	100	100	2200	0	250	240	490	120	850	$150.00	$300,000.00	$85,500.00	$187,500.00	$15,000.00	$15,000.00	$330,000.00	$0.00	$37,500.00	$36,000.00	$73,500.00	$18,000.00	$127,500.00
Secondary Panels and Switchgear	ea	350	11	200	1	1	39	0	4	2	4	2	8	$5,000.00	$1,750,000.00	$55,000.00	$1,000,000.00	$5,000.00	$5,000.00	$195,000.00	$0.00	$20,000.00	$10,000.00	$20,000.00	$10,000.00	$40,000.00
Removal and Disposal of Existing	LS	1	1	0	1	0	0	1	1	1	2	0	2	$30,000.00	$30,000.00	$30,000.00	$0.00	$30,000.00	$0.00	$0.00	$30,000.00	$30,000.00	$30,000.00	$60,000.00	$0.00	$60,000.00
Sub-Total															**$5,569,000.00**	**$1,043,900.00**	**$2,062,500.00**	**$367,100.00**	**$303,300.00**	**$4,092,180.00**	**$30,000.00**	**$1,220,300.00**	**$196,600.00**	**$1,414,500.00**	**$759,480.00**	**$3,534,500.00**
Lighting																										
Lighting Pole conduit and conductors	ea	38	10	11	8	8	34	15	49	18	14	23	31	$10,000.00	$380,000.00	$100,000.00	$110,000.00	$80,000.00	$80,000.00	$340,000.00	$150,000.00	$490,000.00	$180,000.00	$140,000.00	$230,000.00	$310,000.00
Adaptive Lighting Controls	ea	38	10	11	8	8	34	15	0	18	14	23	31	$200.00	$7,600.00	$2,000.00	$2,200.00	$1,600.00	$1,600.00	$6,800.00	$3,000.00	$0.00	$3,600.00	$2,800.00	$4,600.00	$6,200.00
Sub-Total															**$387,600.00**	**$102,000.00**	**$112,200.00**	**$81,600.00**	**$81,600.00**	**$346,800.00**	**$153,000.00**	**$490,000.00**	**$183,600.00**	**$142,800.00**	**$234,600.00**	**$316,200.00**
Communications																										
Duct Bank and Vaults	ea	3500	652	500	282	326	3246	0	860	20	1019	756	2113	$150.00	$525,000.00	$97,800.00	$75,000.00	$42,300.00	$48,900.00	$486,900.00	$0.00	$129,000.00	$152,850.00	$152,850.00	$113,400.00	$316,950.00
Fibre Cables	m	3500	1260	500	0	0	3246	0	860	20	1019	756	0	$75.00	$262,500.00	$94,500.00	$37,500.00	$0.00	$0.00	$243,450.00	$0.00	$64,500.00	$76,425.00	$76,425.00	$56,700.00	$0.00
Copper Cables	m	3500	1260	500	0	0	3246	0	860	20	1019	756	0	$75.00	$262,500.00	$94,500.00	$37,500.00	**$0.00**	$0.00	$243,450.00	$0.00	$64,500.00	$76,425.00	$76,425.00	$56,700.00	$0.00
Sub-Total															**$1,050,000.00**	**$286,800.00**	**$150,000.00**	**$42,300.00**	**$48,900.00**	**$973,800.00**	**$0.00**	**$258,000.00**	**$305,700.00**	**$305,700.00**	**$226,800.00**	**$316,950.00**
Overall Total															**$7,006,600.00**	**$1,432,700.00**	**$2,324,700.00**	**$491,000.00**	**$433,800.00**	**$5,412,780.00**	**$183,000.00**	**$1,968,300.00**	**$685,900.00**	**$1,863,000.00**	**$1,220,880.00**	**$4,167,650.00**
Contingency (30%)															$2,101,980.00	$429,810.00	$697,410.00	$147,300.00	$130,140.00	$1,623,834.00	$54,900.00	$590,490.00	$205,770.00	$558,900.00	$366,264.00	$1,250,295.00
Engineering (20%)															$1,401,320.00	$286,540.00	$464,940.00	$98,200.00	$86,760.00	$1,082,556.00	$36,600.00	$393,660.00	$137,180.00	$372,600.00	$244,176.00	$833,530.00
Total Per Phase															**$10,509,900.00**	**$2,149,050.00**	**$3,487,050.00**	**$736,500.00**	**$650,700.00**	**$8,119,170.00**	**$274,500.00**	**$2,952,450.00**	**$1,028,850.00**	**$2,794,500.00**	**$1,831,320.00**	**$6,251,475.00**
Grand Total																										**$40,785,465.00**

2019-10-09 Pre-Electrication Cost Est	**$7,506,930.00**	**$2,149,050.00**	**$2,492,895.00**	**$736,500.00**	**$650,700.00**	**$8,119,170.00**	**$274,500.00**	**$2,952,450.00**	**$1,028,850.00**	**$2,794,500.00**	**$1,831,320.00**
Change per phase compared to Pre-Electrification	**$3,002,970.00**	**$0.00**	**$994,155.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Assumptions:

1. Secondary panels and kiosks for Amphiteatre increased to account for outdoor kiosk. It is really only 2 kiosk feeding some subpanels, but the number shown in phase 2 is to approximate the larger cost of the kiosk
2. Scenario assumes that Daylighting and Heart of the park is being installed at the same time as Phase 2 Amphitheatre. However, only duct/vaults can be installed. Cable will be installed in phase 1B.
3. Dependencies from Phase 1b moved over to 1a. Moved over Vista V5 and portion of ductbank/cables.

COST ESTIMATE
PRELIMINARY AUG 2020

2020-08-24

DMD Associates Electrical Consultants Ltd.

Hastings Park and Playland - Class C Estimate of Probable Costs

Description of Item		Phase 1A Qty	Phase 1B Qty	Phase 2 Qty	Phase 3A Qty	Phase 3B Qty	Phase 4A Qty	Phase 4B Qty	Phase 4C Qty	Phase 5A Qty	Phase 5B Qty	Phase 5C Qty	Phase 6 Qty	Unit Price	Phase 1A Total	Phase 1B Total	Phase 2 Total	Phase 3A Total	Phase 3B Total	Phase 4A Total	Phase 4B Total	Phase 4C Total	Phase 5A Total	Phase 5B Total	Phase 5C Total	Phase 6 Total
Electrical																										
1 MVA Substation	ea	0	0	0	0	1	2	0	2	1	2	1	1	$104,000.00	$0.00	$0.00	$0.00	$0.00	$104,000.00	$208,000.00	$0.00	$208,000.00	$104,000.00	$208,000.00	$104,000.00	$104,000.00
1.5 MVA Substation	ea	0	0	1	0	0	0	0	0	0	1	0	0	$140,000.00	$0.00	$0.00	$140,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$140,000.00	$0.00	$0.00
2 MVA Substation	ea	0	1	0	1	0	1	0	0	0	0	0	2	$162,000.00	$0.00	$162,000.00	$0.00	$162,000.00	$0.00	$162,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$324,000.00
2.5 MVA Substation	ea	0	0	0	0	0	1	0	0	0	0	0	0	$183,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$183,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
3 MVA Substation	ea	0	0	0	0	0	0	0	0	0	0	0	0	$197,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
3.5 MVA Substation	ea	2	0	0	0	0	0	0	1	0	0	0	0	$211,000.00	$422,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$211,000.00	$0.00	$0.00	$0.00	$0.00
4.5 MVA Substation	ea	0	0	0	0	0	0	0	0	0	0	0	2	$242,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$484,000.00
Vista Switching Cabinet and Vault	ea	1	0	1	0	0	1	0	0	0	0	0	1	$320,000.00	$320,000.00	$0.00	$320,000.00	$0.00	$0.00	$320,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$320,000.00
Primary Duct Bank, Vaults and Cables	m	2704	652	421	0	0	3246	0	860	20	1100	756	2500	$830.00	$2,244,320.00	$541,160.00	$349,430.00	$0.00	$0.00	$2,694,180.00	$0.00	$713,800.00	$16,600.00	$913,000.00	$627,480.00	$2,075,000.00
Primary Duct Bank and vaults only	m	0	0	0	282	326	0	0	0	0	0	0	0	$550.00	$0.00	$0.00	$0.00	$155,100.00	$179,300.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Primary Cables only	m	0	608	0	0	0	0	0	0	0	0	0	0	$280.00	$0.00	$170,240.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Secondary Ducts and Cables	m	3230	570	1425	100	100	2200	0	250	240	490	120	850	$150.00	$484,500.00	$85,500.00	$213,750.00	$15,000.00	$15,000.00	$330,000.00	$0.00	$37,500.00	$36,000.00	$73,500.00	$18,000.00	$127,500.00
Secondary Panels and Switchgear	ea	61	11	126	1	1	39	0	4	2	4	2	8	$5,000.00	$305,000.00	$55,000.00	$630,000.00	$5,000.00	$5,000.00	$195,000.00	$0.00	$20,000.00	$10,000.00	$20,000.00	$10,000.00	$40,000.00
Removal and Disposal of Existing	LS	1	1	0	1	0	0	1	1	1	2	0	2	$30,000.00	$30,000.00	$30,000.00	$0.00	$30,000.00	$0.00	$0.00	$30,000.00	$30,000.00	$30,000.00	$60,000.00	$0.00	$60,000.00
Sub-Total															**$3,805,820.00**	**$1,043,900.00**	**$1,653,180.00**	**$367,100.00**	**$303,300.00**	**$4,092,180.00**	**$30,000.00**	**$1,220,300.00**	**$196,600.00**	**$1,414,500.00**	**$759,480.00**	**$3,534,500.00**
Lighting																										
Lighting Pole conduit and conductors	ea	38	10	11	8	8	34	15	49	18	14	23	31	$10,000.00	$380,000.00	$100,000.00	$110,000.00	$80,000.00	$80,000.00	$340,000.00	$150,000.00	$490,000.00	$180,000.00	$140,000.00	$230,000.00	$310,000.00
Adaptive Lighting Controls	ea	38	10	11	8	8	34	15	0	18	14	23	31	$200.00	$7,600.00	$2,000.00	$2,200.00	$1,600.00	$1,600.00	$6,800.00	$3,000.00	$0.00	$3,600.00	$2,800.00	$4,600.00	$6,200.00
Sub-Total															**$387,600.00**	**$102,000.00**	**$112,200.00**	**$81,600.00**	**$81,600.00**	**$346,800.00**	**$153,000.00**	**$490,000.00**	**$183,600.00**	**$142,800.00**	**$234,600.00**	**$316,200.00**
Communications																										
Duct Bank and Vaults	ea	2704	652	421	282	326	3246	0	860	20	1019	756	2113	$150.00	$405,600.00	$97,800.00	$63,150.00	$42,300.00	$48,900.00	$486,900.00	$0.00	$129,000.00	$152,850.00	$152,850.00	$113,400.00	$316,950.00
Fibre Cables	m	2704	1260	421	0	0	3246	0	860	20	1019	756	0	$75.00	$202,800.00	$94,500.00	$31,575.00	$0.00	$0.00	$243,450.00	$0.00	$64,500.00	$76,425.00	$76,425.00	$56,700.00	$0.00
Copper Cables	m	2704	1260	421	0	0	3246	0	860	20	1019	756	0	$75.00	$202,800.00	$94,500.00	$31,575.00	**$0.00**	$0.00	$243,450.00	$0.00	$64,500.00	$76,425.00	$76,425.00	$56,700.00	$0.00
Sub-Total															**$811,200.00**	**$286,800.00**	**$126,300.00**	**$42,300.00**	**$48,900.00**	**$973,800.00**	**$0.00**	**$258,000.00**	**$305,700.00**	**$305,700.00**	**$226,800.00**	**$316,950.00**
Overall Total															**$5,004,620.00**	**$1,432,700.00**	**$1,891,680.00**	**$491,000.00**	**$433,800.00**	**$5,412,780.00**	**$183,000.00**	**$1,968,300.00**	**$685,900.00**	**$1,863,000.00**	**$1,220,880.00**	**$4,167,650.00**
Contingency (30%)															$1,501,386.00	$429,810.00	$567,504.00	$147,300.00	$130,140.00	$1,623,834.00	$54,900.00	$590,490.00	$205,770.00	$558,900.00	$366,264.00	$1,250,295.00
Engineering (20%)															$1,000,924.00	$286,540.00	$378,336.00	$98,200.00	$86,760.00	$1,082,556.00	$36,600.00	$393,660.00	$137,180.00	$372,600.00	$244,176.00	$833,530.00
Total Per Phase															**$7,506,930.00**	**$2,149,050.00**	**$2,837,520.00**	**$736,500.00**	**$650,700.00**	**$8,119,170.00**	**$274,500.00**	**$2,952,450.00**	**$1,028,850.00**	**$2,794,500.00**	**$1,831,320.00**	**$6,251,475.00**
Grand Total																										**$37,132,965.00**

2020-10-01 Cost Est	**$7,506,930.00**	**$2,149,050.00**	**$2,492,895.00**	**$736,500.00**	**$650,700.00**	**$8,119,170.00**	**$274,500.00**	**$2,952,450.00**	**$1,028,850.00**	**$2,794,500.00**	**$1,831,320.00**	
	$0.00	**$0.00**	**$344,625.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	

Assumptions:

1. Secondary panels and kiosks for Amphiteatre decreased. Scope ends at mainswitch of each building
2. Scenario assumes that Daylighting and Heart of the park is being installed at the same time as Phase 2 Amphitheatre. However, only duct/vaults can be installed. Cable will be installed in phase 1B.
3. Dependencies from Phase 1b moved over to 1a. Moved over Vista V5 and portion of ductbank/cables.
4. Assumptions for gas to electric. Study results included for gas to electric equipment
5. Added additional primary equipment such as transformers, vista switch, and secondary equipment to accommodate new gas to elec loads.
6. Phase 1 reverted back to 2019-10-16 Phase 1b to 1a_R1 cost estimate

COST ESTIMATE
FINAL OCT 2020

2020-10-02

APPENDIX B

Baseline Energy Use and GHG Emissions

Baseline Energy Use and GHG Emissions - Summary Table

	2015	2016	2017	2018	2019	2020	Average (2015 - 2019)
Natural Gas (GJ)	31,955	30,581	35,577	32,453	34,478	18,112	**33,009**
Electricity (GJ)	59,633	60,290	59,564	58,821	57,093	19,112	**59,080**
Total Propane Use (GJ)	315	315	315	315	315	315	**315**
Total GHG Natural Gas (T CO_2 e)	1,594	1,525	1,774	1,618	1,719	903	**1,646**
Total GHG Electricity (T CO_2 e)	183	219	240	235	226	78	**221**
Total GHG Propane Use (T CO_2 e)	19	19	19	19	19	19	**19**

APPENDIX C

Quantitative Assessment Details

Option A: Electrification, excluding Air Source Heat Pumps

Electrification of all heating and cooking loads with electricity supply coming from BC Hydro, upgrading electrical distribution infrastructure as required.

Inflation rate:	2%				
Discount Rate:	5%				
Electrification cost (2015 dollars):	$4,000,000				
Escalation:	23.6%				
Initial cost:	$4,944,000				
Debt ratio:	100%				
Equity amount:	$0		Incentives:	Year 0:	$0
Loaned amount:	$4,944,000				
Debt interest rate:	5%				
Debt term:	10	years			
Annual debt pmt:	-$640,271				
Maintenance:	2.5%	of capital			
Maintenance cost (Year 0):	$123,600				
Hydro purchased electricity:	2,215,677	kWh/year			
Hydro rate:	0.083	$/kWh			
Annual electricity cost (Year 0):	$183,862				
GHG Savings:	507	tCO_2e/year			
Carbon price (Year 0, 2021):	$160	$/tCO_2e$			
Carbon cost (Year 0, 2021):	$81,099	$/year			
Carbon price multiplier:	1.06				

Year	Equity investment	Loaned amount	Maintenance	Operating	O&M	Debt	Carbon cost	Cash outlays
0	$0.00	-$4,944,000						
1			-$126,072	-$187,539	-$313,611	-$640,271	$85,965	-$953,882
2			-$128,593	-$191,290	-$319,883	-$640,271	$91,123	-$960,154
3			-$131,165	-$195,116	-$326,281	-$640,271	$96,590	-$966,551
4			-$133,789	-$199,018	-$332,806	-$640,271	$102,386	-$973,077
5			-$136,464	-$202,998	-$339,463	-$640,271	$108,529	-$979,733
6			-$139,194	-$207,058	-$346,252	-$640,271	$115,041	-$986,522
7			-$141,978	-$211,199	-$353,177	-$640,271	$121,943	-$993,447
8			-$144,817	-$215,423	-$360,240	-$640,271	$129,260	-$1,000,511
9			-$147,713	-$219,732	-$367,445	-$640,271	$137,015	-$1,007,716
10			-$150,668	-$224,126	-$374,794	-$640,271	$145,236	-$1,015,065
11			-$153,681	-$228,609	-$382,290		$153,950	-$382,290
12			-$156,755	-$233,181	-$389,936		$163,187	-$389,936
13			-$159,890	-$237,845	-$397,734		$172,979	-$397,734
14			-$163,088	-$242,602	-$405,689		$183,357	-$405,689
15			-$166,349	-$247,454	-$413,803		$194,359	-$413,803
16			-$169,676	-$252,403	-$422,079		$206,020	-$422,079
17			-$173,070	-$257,451	-$430,521		$218,381	-$430,521
18			-$176,531	-$262,600	-$439,131		$231,484	-$439,131
19			-$180,062	-$267,852	-$447,914		$245,373	-$447,914
20			-$183,663	-$273,209	-$456,872		$260,096	-$456,872
21			-$187,336	-$278,673	-$466,009		$275,701	-$466,009
22			-$191,083	-$284,246	-$475,330		$292,244	-$475,330
23			-$194,905	-$289,931	-$484,836		$309,778	-$484,836
24			-$198,803	-$295,730	-$494,533		$328,365	-$494,533
25			-$202,779	-$301,645	-$504,424		$348,067	-$504,424

Profitability from different perspectives:

Investor cashflow:	Investor cashflow w/ carbon cost:
$0.00	$0.00
-$953,882	-$867,917
-$960,154	-$869,031
-$966,551	-$869,961
-$973,077	-$870,691
-$979,733	-$871,204
-$986,522	-$871,482
-$993,447	-$871,504
-$1,000,511	-$871,251
-$1,007,716	-$870,701
-$1,015,065	-$869,829
-$382,290	-$228,340
-$389,936	-$226,748
-$397,734	-$224,756
-$405,689	-$222,332
-$413,803	-$219,444
-$422,079	-$216,059
-$430,521	-$212,139
-$439,131	-$207,647
-$447,914	-$202,540
-$456,872	-$196,776
-$466,009	-$190,308
-$475,330	-$183,086
-$484,836	-$175,058
-$494,533	-$166,168
-$504,424	-$156,357
NPV: -$10,333,137	-$8,034,421

Option B: Electrification of Amphitheatre, Renewable Natural Gas (RNG) for Existing Playland Facilities

Electrification of Amphitheatre, continue using existing gas-fired equipment in Playland and purchase renewable natural gas (RNG) from Fortis.

Inflation rate:	2%				
Discount Rate:	5%				
Electrification cost (2015 dollars):	$1,000,000				
Escalation:	23.6%				
Gas infrastructure cost (2020 dollars):	$302,800				
Initial cost:	$1,538,800				
Debt ratio:	100%				
Equity amount:	$0		Incentives:	Year 0:	$0
Loaned amount:	$1,538,800				
Debt interest rate:	5%				
Debt term:	10	years			
Annual debt pmt:	-$199,282				
Maintenance:	2.5%	of capital			
Maintenance cost (Year 0):	$38,470				
Hydro purchased electricity:	794,596	kWh/year			
Hydro rate:	0.083	$/kWh			
Annual electricity cost (Year 0):	$65,937				
Fortis purchased RNG:	9,204	GJ			
Fortis rate:	$12.08	$/GJ			
Fortis fixed charge:	$66,542	/year			
Annual RNG cost (Year 0):	$177,730				
Annual elec + RNG cost (Year 0):	$243,667				
GHG Savings:	519	tCO_2e/year			
Carbon price (Year 0, 2021):	$160	$/tCO_2e$			
Carbon cost (Year 0, 2021):	$83,098	$/year			
Carbon price multiplier:	1.06				

Year	Equity investment	Loaned amount	Maintenance	Operating	O&M	Debt	Carbon cost	Cash outlays
0	$0.00	-$1,538,800						
1			-$39,239	-$248,541	-$287,780	-$199,282	$88,084	-$487,062
2			-$40,024	-$253,511	-$293,536	-$199,282	$93,369	-$492,817
3			-$40,825	-$258,582	-$299,406	-$199,282	$98,971	-$498,688
4			-$41,641	-$263,753	-$305,394	-$199,282	$104,909	-$504,676
5			-$42,474	-$269,028	-$311,502	-$199,282	$111,204	-$510,784
6			-$43,323	-$274,409	-$317,732	-$199,282	$117,876	-$517,014
7			-$44,190	-$279,897	-$324,087	-$199,282	$124,949	-$523,369
8			-$45,074	-$285,495	-$330,569	-$199,282	$132,446	-$529,850
9			-$45,975	-$291,205	-$337,180	-$199,282	$140,392	-$536,462
10			-$46,895	-$297,029	-$343,924	-$199,282	$148,816	-$543,205
11			-$47,833	-$302,970	-$350,802		$157,745	-$350,802
12			-$48,789	-$309,029	-$357,818		$167,210	-$357,818
13			-$49,765	-$315,209	-$364,975		$177,242	-$364,975
14			-$50,760	-$321,514	-$372,274		$187,877	-$372,274
15			-$51,776	-$327,944	-$379,719		$199,149	-$379,719
16			-$52,811	-$334,503	-$387,314		$211,098	-$387,314
17			-$53,867	-$341,193	-$395,060		$223,764	-$395,060
18			-$54,945	-$348,017	-$402,961		$237,190	-$402,961
19			-$56,044	-$354,977	-$411,021		$251,421	-$411,021
20			-$57,164	-$362,077	-$419,241		$266,507	-$419,241
21			-$58,308	-$369,318	-$427,626		$282,497	-$427,626
22			-$59,474	-$376,705	-$436,178		$299,447	-$436,178
23			-$60,663	-$384,239	-$444,902		$317,414	-$444,902
24			-$61,877	-$391,923	-$453,800		$336,459	-$453,800
25			-$63,114	-$399,762	-$462,876		$356,646	-$462,876

Profitability from different perspectives:

Investor cashflow:	Investor cashflow w/ carbon cost:
$0.00	$0
-$487,062	-$398,978
-$492,817	-$399,448
-$498,688	-$399,717
-$504,676	-$399,767
-$510,784	-$399,580
-$517,014	-$399,138
-$523,369	-$398,420
-$529,850	-$397,405
-$536,462	-$396,069
-$543,205	-$394,389
-$350,802	-$193,057
-$357,818	-$190,609
-$364,975	-$187,732
-$372,274	-$184,397
-$379,719	-$180,570
-$387,314	-$176,216
-$395,060	-$171,296
-$402,961	-$165,771
-$411,021	-$159,599
-$419,241	-$152,734
-$427,626	-$145,129
-$436,178	-$136,731
-$444,902	-$127,488
-$453,800	-$117,341
-$462,876	-$106,230
NPV: -$6,484,053	-$4,128,677

Option C: Electrification, including Solar Photovoltaic (PV) Panels

Solar PV panels to be installed on Livestock Roof Area. Remaining energy to be provided by BC Hydro, upgrading electrical infrastructure as required.

Inflation rate:	2%				
Discount Rate:	5%				
Electrification cost (2015 dollars):	$4,000,000				
Escalation:	23.6%				
Solar capacity:	100	kW			
Solar cost:	2,775	$/kW			
Initial cost:	$5,221,500				
Debt ratio:	100%				
Equity amount:	$0		Incentives:	Year 0:	$0
Loaned amount:	$5,221,500				
Debt interest rate:	5%				
Debt term:	10	years			
Annual debt pmt:	-$676,208				
Maintenance:	2.5%	of capital			
Maintenance cost (Year 0):	$130,538				
Solar production:	1,195	kWh/kW			
Solar generated electricity:	119,500	kWh/year			
Hydro purchased electricity:	2,096,177	kWh/year			
Hydro rate:	0.083	$/kWh			
Annual electricity cost (Year 0):	$173,945				
GHG Savings:	508	tCO_2e/year			
Carbon price (Year 0, 2021):	$160	$/tCO_2e$			
Carbon cost (Year 0, 2021):	$81,303	$/year			
Carbon price multiplier:	1.06				

Year	Equity investment	Loaned amount	Maintenance	Operating	O&M	Debt	Carbon cost	Cash outlays
0	$0.00	-$5,221,500						
1			-$133,148	-$177,424	-$310,572	-$676,208	$86,181	-$986,781
2			-$135,811	-$180,973	-$316,784	-$676,208	$91,352	-$992,992
3			-$138,527	-$184,592	-$323,120	-$676,208	$96,833	-$999,328
4			-$141,298	-$188,284	-$329,582	-$676,208	$102,643	-$1,005,790
5			-$144,124	-$192,050	-$336,174	-$676,208	$108,802	-$1,012,382
6			-$147,006	-$195,891	-$342,897	-$676,208	$115,330	-$1,019,105
7			-$149,947	-$199,809	-$349,755	-$676,208	$122,250	-$1,025,963
8			-$152,945	-$203,805	-$356,750	-$676,208	$129,585	-$1,032,958
9			-$156,004	-$207,881	-$363,885	-$676,208	$137,360	-$1,040,093
10			-$159,124	-$212,038	-$371,163	-$676,208	$145,601	-$1,047,371
11			-$162,307	-$216,279	-$378,586		$154,338	-$378,586
12			-$165,553	-$220,605	-$386,158		$163,598	-$386,158
13			-$168,864	-$225,017	-$393,881		$173,414	-$393,881
14			-$172,241	-$229,517	-$401,759		$183,818	-$401,759
15			-$175,686	-$234,108	-$409,794		$194,848	-$409,794
16			-$179,200	-$238,790	-$417,990		$206,538	-$417,990
17			-$182,784	-$243,565	-$426,349		$218,931	-$426,349
18			-$186,440	-$248,437	-$434,876		$232,067	-$434,876
19			-$190,168	-$253,406	-$443,574		$245,991	-$443,574
20			-$193,972	-$258,474	-$452,445		$260,750	-$452,445
21			-$197,851	-$263,643	-$461,494		$276,395	-$461,494
22			-$201,808	-$268,916	-$470,724		$292,979	-$470,724
23			-$205,844	-$274,294	-$480,139		$310,557	-$480,139
24			-$209,961	-$279,780	-$489,742		$329,191	-$489,742
25			-$214,161	-$285,376	-$499,536		$348,942	-$499,536

Profitability from different perspectives:

	Investor cashflow:	Investor cashflow w/ carbon cost:
	$0.00	$0.00
	-$986,781	-$900,599.35
	-$992,992	-$901,639.92
	-$999,328	-$902,494.47
	-$1,005,790	-$903,146.87
	-$1,012,382	-$903,579.91
	-$1,019,105	-$903,775.27
	-$1,025,963	-$903,713.41
	-$1,032,958	-$903,373.53
	-$1,040,093	-$902,733.44
	-$1,047,371	-$901,769.55
	-$378,586	-$224,248.59
	-$386,158	-$222,560.06
	-$393,881	-$220,467.34
	-$401,759	-$217,940.14
	-$409,794	-$214,946.21
	-$417,990	-$211,451.23
	-$426,349	-$207,418.71
	-$434,876	-$202,809.86
	-$443,574	-$197,583.39
	-$452,445	-$191,695.44
	-$461,494	-$185,099.34
	-$470,724	-$177,745.53
	-$480,139	-$169,581.29
	-$489,742	-$160,550.62
	-$499,536	-$150,593.99
NPV:	-$10,558,424	-$8,253,925