

APPENDIX 4I

DETAILED VENUE ANALYSIS: STAMPEDE PARK GRANDSTAND

CALGARY BID EXPLORATION COMMITTEE

VENUE BRIEF:

Stampede Park: Grandstand

**PROPOSED Opening and Closing
Ceremonies & Daily Medal Presentations
CALGARY, ALBERTA, CANADA**

PREPARED FOR

CALGARY BID EXPLORATION COMMITTEE, Master Facilities Plan

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DATE

February 27, 2017

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INTRODUCTION

As part of an exploratory exercise to determine the feasibility of Calgary presenting a bid to host another Olympic and Paralympic Winter Games, a high level survey and study was conducted to review potential major competition and non-competition sites. One of the primary components of the exercise was to look at where there were synergies between venues and maximize existing infrastructure and transportation links/corridors.

The Stampede Park--Grandstand has been identified as the potential site for Opening and Closing Ceremonies for both the Olympic and Paralympic Games.

The information contained in this document is to provide the Calgary Bid Exploration Committee (CBEC), Facility Owners, and Planning Teams further information on venue use, spatial requirements, and any challenges that need to be explored regarding this venue.

PROPOSED SCOPE & WORKING ASSUMPTIONS

Stampede Park--Grandstand has been proposed as a non-competition venue, hosting the following events:

Events: Opening Ceremonies (Olympic and Paralympic)
 Closing Ceremonies (Olympic and Paralympic)
 Daily Live Site—Medal Presentations (Olympic and Paralympic)

Throughout the exploratory discussions the following working assumptions have been applied:

- Venue gross seating capacity meets a minimum of 40,000 to 55,000 seats;
- Seating bowl is code compliant and meets best practice for accessible and amenity seating. Any additional seating required to meet venue capacity to be provided for through temporary infrastructure;
- Full use of venue is available for Olympic and Paralympic use including external compounds, parking, and all ancillary spaces. Shared or exclusive use periods to be determined during venue use agreement planning phase;
- Parking lot surfaces are flat and proper drainage for surface water, and are free from holes, cracks and large uneven surfaces;
- Lighting levels meet Olympic Games Broadcast requirements, see Appendix A;
- Audio systems do not meet Ceremonies requirements, modifications may be required;
- Roof structure has the capacity to hold additional loads for additional lighting and audio, cameras, flags, look banners and/or dimensional rings, video boards, control booths, and aerial systems and platforms;
- Toilets are code compliant and meet all accessible guidelines and best practice;
- Concessions are in good working condition with all services operational, code compliant, and accessible;
- Interior HVAC systems are fully operational and able to meet games requirements for temperature or is feasible for modification;

The material below is a non-exhaustive listing of the major areas and will act as a preliminary benchmarking tool when assessing the overall venues ability to operate as the Opening and

Closing Ceremonies venue. Using this material will provide the information needed to complete the next series of space studies to confirm flows, functional area space allocation, and develop further confirmation of required permanent works necessary.

As part of the sports complex, there needs to be further dialogue around the overall site access, egress, vehicular flows and Security Footprint, but as an initial phase of work the brief below will advise as to baseline requirements. There is minimal reference to the interior spatial requirements for the ceremonies venues as most of the facilities have the primary requisites within their standard operating design, any gaps observed are noted at the end of the document for consideration. Further information on the Ceremonies and Media requirements will come later in the process.

CEREMONIES BASELINE REQUIREMENTS

1 | General Venue Use

The Organizing Committee Olympic Games (OCOG) will need to take possession of the venue and its surrounding site areas to allow sufficient time for build out and overlay works. Build out requirements are based on the number of compounds, cabling requirements, and overall build scale and complexity.

A typical build out duration for a Ceremonies venue is approximately 12 weeks prior to athlete training start, this includes venue lock down, ceremonies and technical rehearsals, and hand over to the games time operations team. Some non-exclusive access for base structures and connections may require isolated works to commence 9 months prior to Opening Ceremonies.

Coordination between venue owner and the OCOG is required to confirm non-exclusive use and exclusive use periods to allow for games build out, games operations, and remediation of the venue and site post games. Opening and Closing Ceremonies are part of both the Olympic and Paralympic program, which requires transition works between all ceremonies. This transition includes works to the FOP or Stage areas, along with other minor venue

elements. Remediation works to commence at the end of Closing Ceremonies of the Paralympic Games.

Full use of the venue is required, including all exterior compounds, parking, facility and maintenance areas, suites, food service areas, retail outlets, storage areas, locker rooms, offices, and all operational spaces necessary to operate during the games.

2 | Front of House (FOH) Program Requirements

Front of House (FOH) areas are where spectator access, circulation, accommodations, and event viewing spaces are provided. FOH operations include spectator entry points, ticket scan, circulation concourses, concessions, ticket resolution, spectator services and information, retail outlets, toilets, water stations, spectator medical, and access to spectator seating and competition viewing areas.

The main entry and exit at the venue happens in the FOH through a secure venue perimeter fence line, spectator security screening, and ticket rip operations. Venue entry and exit points will be determined through crowd modeling exercises with the city transportation teams and surrounding sports complex to established through put rates to ensure optimal spectator flows around the venue and load-in of spectators to the stadium for Ceremonies. Parking that is currently provided for spectators will be used for Games operations and compounds and will not be available, all spectators will arrive through other means of transportation or parking options, these transportation plans will be established by the city and OCOG transportation teams.

General considerations for the front of house include providing spectator toilets and seating to meet best practices in accessibility, amenity seating, toilets, and concessions to ensure all spectators are able to enjoy the games without limitations. A thorough review of the venue's accommodations needs to be completed to determine where improvement works may be necessary to accommodate best practice and code compliance for an international sporting event.

FOH areas optimally occur in existing spaces, however, there may be a requirement for additional spectator spaces to be provided to meet operations and games planning

requirements. These spaces would be provided through temporary infrastructure in the spectator plaza's, entry spaces, and concourses. Internal space allocation and the requirements for external temporary spaces will be confirmed in the next phase of the venue confirmation and detailed planning.

a. FOH External Program Requirements**i. Venue Perimeter**

A secure venue perimeter fence line is required around the full perimeter of the venue, including compounds and entry plaza's. Depending on the security threat level at the time of the Games, this perimeter fence line may be a double fence system with a footprint of approximately 3m in depth. The fencing would be ballasted to ensure stability in the event of heavy winds, and may be engineered as part of a vehicle mitigation system. The fence will be covered in fence fabric with the look of the games applied, and entry and egress points.

ii. Ticket Box Office (TBO)

A ticket box office is required outside the venue secure perimeter, next to the spectator entry point for ticket sales, will-call, or ticket related services. This is a cabin structure with ticket portals, approximately 90m² or multiple 30m² offices at different spectator entry points to the venue.

iii. Pedestrian Security Screening (PSA)

Entry into a venue, whether by spectators or accredited persons, happens through a PSA. The Pedestrian security screening (PSA)s process occurs in tent portals where each individual is scanned and checked prior to entry into the venue. The area and number of PSA's will be determined in the crowd modeling exercise, which will determine the spectator through put rates into the venue, establishing the number of PSA's required. One dedicated lane for accredited persons to be provided at the Spectator/FOH PSA's.

iv. Ticket Scan

Ticket scan will occur just after security screening operations at the venue perimeter, prior to access into the spectator plaza, as an extension to the entry process. The area and number

of ticket scan portals will be determined once the PSA through put rates have been established.

v. Spectator Plaza

The spectator plaza occurs between the PSA's and the venue, with direct access to the spectator concourses, where spectator amenities and services are provided, as well as access to seating and competition areas. The size of the spectator plaza will be determined through the crowd modeling exercise and spectator load-in/egress rates. Based on the existing conditions of the venue, the spectator plaza, concourses, and amenities may be provided with temporary infrastructure including toilets, concessions, retail outlets, spectator medical, ticket resolution, and information, prior to entry into the seating bowl and competition areas.

vi. Spectator Services – Plaza

Spectator services storage and staging areas are required for golf carts, wheel chairs, and stroller storage – this area should be no larger than 25m². In addition, an animal relief area, with direct access to potable water and drainage, is required. This area should be no larger than 10m².

vii. Exit or Blow Out Gates

Exit gates or blow out gates are located adjacent to the entry ticket scan portals. The number of gates is determined based on the venue capacity and crowd modeling, to accept the exiting spectators from the Stadium into the transportation points and sports complex general population and circulation.

b. FOH Internal Program Requirements**i. Spectator Services – Information and Storage**

An area, existing or temporary, to be provided for spectator information, lost and found, and additional wheel chair and stroller storage. This space should be located centrally in the main spectator concourse area, and should be approximately 50m² (multiple locations may be provided each 25m²) in area with provisions for a counter to provide separation between

event services staff and spectators. Use of the existing venues information office is preferred.

ii. Ticket Resolution

Multiple ticket resolution offices or areas, existing or temporary, to be provided centrally in the main spectator concourse area. A minimum of (4) offices to be provided with an area approximately 10m² each, with provisions for a counter to provide separation between ticketing staff and spectators. Use of the existing venues TBO is preferred, if located within the venue perimeter, as one location.

iii. Concessions

Use of the existing concession areas to be provided, and depending on the number of existing concession areas, additional temporary areas for concession sales may be required. A thorough review of the existing concessions conditions, operations, and services to be completed to determine if upgrades are required to ensure code compliance along with spectator accessibility best practice and compliance.

iv. Retail Outlets

Use of the existing retail store outlet to be provided, and depending on the size, additional temporary retail outlets may be required throughout the spectator areas. A minimum of (4) retail outlets to be provided in addition to the main store with approximately 6m of counter space.

v. Spectator Toilets

Use of all existing spectator toilets to be provided, and additional temporary toilets may be required to accommodate the venue use. A thorough review of the existing toilets to be completed to determine if upgrades are required to ensure all toilets provide the required accessibility provisions to meet best practice and code compliance per the venue capacity.

vi. Spectator Medical

Use of the existing spectator medical area to be provided. If the existing spectator medical does not exist, a space of approximately (2) 50m² stations are required. The space needs to

have water and drainage, along with direct access to an accessible toilet.

vii. Water Stations

Water areas to be provided in the venue through existing drinking fountains or water fill stations. Water to be tested for drinking water use. Number of stations to be compliant with venue capacity and located throughout the spectator concourse areas.

c. Other Major FOH Program Requirements

i. Seating

The venues existing spectator seating gross capacity will net 15-20% less to accommodate for accredited seating and seat kills due to ceremonies build out, camera platforms, broadcast and press tribunes, and photo positions. Spectator services requirements and compliance to be aligned with this net capacity number.

3 | Back of House (BOH) Program Requirements

Back of House (BOH) areas are where ceremonies and all venue operational spaces are located. Several spaces are required to be internal to the venue, with others in compounds outside the venue, with access to the venue for servicing and operations.

BOH operational areas include ceremonies operations and compounds, performers and talent areas and staging, ceremonies and performer medical, Heads of State, Dignitaries, and Olympic Family areas, technology, food and beverage compound, cleaning and waste compound, workforce check-in and break areas, logistics compound, site compound, security, venue operations and management, broadcast compound, and venue accreditation. In addition, there are services compounds, parking, venue access points, and emergency services vehicle staging required in the BOH.

General considerations for the external BOH compound spaces include paved surfaces for high traffic use – vehicle and pedestrian, along with structures – tents, cabins, containers, and equipment. Connections to water and waste, along with fibre is a plus to minimize additional works that would be required for necessary service connections. Overall drainage of the BOH compounds is critical for proper surface water drainage. Considerations for internal

BOH spaces include direct connections to the external BOH spaces for cabling and venue servicing.

a. BOH Internal Program Requirements

i. Ceremony Operations

Ceremonies operations requires site compounds, staging, storage, workshop and fabrication shop, control rooms, offices, conference rooms, work spaces, food services and dining, and technical rooms. These areas will be located inside the stadium and in external compounds with easy access to the tunnels and field. An area approximately 5000m² is required.

ii. Performers and Talent Areas

Check-in, holding, prep, dressing, costume management and repair, and staging for performers and Athlete's, along with green rooms for talent, with direct or easy access to the field level or entry tunnels to be provided. These spaces can be in compounds or in the venue itself, with a space approximately 10,000m².

iii. Ceremonies and Performer Medical

Ceremonies and performer medical to be located with direct access to the field level, requiring a space allocation of approximately 300m², with connections to water and waste.

iv. Heads of State and Foreign Dignitaries

Heads of State and foreign dignitaries will be in attendance to both the Olympic and Paralympic Opening and Closing Ceremonies. Entry to the venue will be determined through a security exercise that will require dedicated entry, safe rooms, and Five Rings VVIP lounge. Entry and safe room area is approximately 1000m² and the Five Rings VVIP lounge approximately 500m².

v. Olympic Family

The Olympic Family (OF) lounge and protocol offices to be located in existing lounge or club spaces or areas directly adjacent to the Olympic Family seating areas, with dedicated toilets. This space needs to be a minimum 1000m².

vi. President's Box

The President's box is the seating and podium area for the President of the International Olympic Committee and the President of the International Paralympic Committee to officially open and close the Olympic and Paralympic Games. In addition, there is seating for Heads of State and foreign dignitaries.

The President's box, requires direct access from the VVIP and Olympic Family lounges, with custom seating and layout, with an area approximately 200-250m².

vii. Technology Operations

Dependent on readily available connections to fibre, there may be a requirement for compound spaces for technology and cellular structures, staging, along with containers for equipment and storage. This storage can be in the form of a tent or several containers. The compound space required is roughly 200m². Operational spaces, work areas, and offices to be located on arena level with direct access to the tribunals and ceremonies control rooms, this area is approximately 300m².

b. BOH External Program Requirements

i. Food and Beverage (FAB) Compound

The food and beverage compound is the space for storage of both food and beverages, along with kitchen and food prep areas. Dependent on the venue, a temporary kitchen and additional storage is necessary to service all the additional lounges and food services outside concessions and standard venue operations. FAB sponsors, i.e. Coke, will also provide their own containers for storage on site and require a minimum of 1.5 days storage of products. This compound also requires offices, workforce areas, toilets, connections to water, waste, power, and easy truck access for daily off-hours food delivery. The compound space required is approximately 1000 – 1500m², depending on existing venue kitchen facilities.

ii. Cleaning and Waste (CNW) Compound

The cleaning and waste compound is an area for the staging of the large mobile collection bins, bin wash down area, compactors for the required waste streams, storage of CAW

cleaning and paper products, along with offices. The compound space required is approximately 800m² with an additional area of 1000-2000m² for snow removal equipment and snow storage.

iii. Workforce (WKF) Check-In and Break

An area to be provided for workforce check-in and break areas adjacent to the venue and workforce accredited entry to the venue. These spaces can be in a tent structure, with workforce check-in space allocation at approximately 400m² and workforce break at approximately 1500m².

iv. Logistics (LOG) Compound

The logistics compound requires space for an office cabin, toilets, staging, and storage space. Additionally, this compound will provide containers for storage for other functional teams, dependent on in-venue storage, as well as parking for large equipment and vehicles. This compound is approximately 1000m², and must be secured due to the equipment and goods stored.

v. Site (VED) Management Compound

The site compound requires space for offices, toilets, staging, and storage areas for Site Management along with Energy, Look of the Games, and Signage and Wayfinding. Additionally, this compound requires parking for large equipment, vehicles, and spares with an overall compound space requirement of approximately 1000m², and must be secured due to the equipment and goods stored.

vi. Security (SEC) Operations

As a venue within the sport complex, a full secure perimeter is required with control points and accredited PSA entry/exit access points. Accreditation access points are located BOH, with exception to one FOH accredited entry. Accredited entry points are provided for Staff, Dignitaries, Olympic Family, Athlete's, and Media.

In addition, security operations require offices, control centre, briefing, and storage spaces – these can be in the venue or in an external compound tent or cabin structure, with a

compound size of approximately 400m². Dedicated power and direct fibre connections are required to support their secure independent servers and operations.

In addition to the security compound, there will be required space for Dignitary and Heads of State stage, entry, and safe room. This area will be developed as part of the security planning and protocols, an area of approximately 1000m² should be allocated for these operations.

vii. Venue Management Operations

If space is not available in the venue, a venue operations centre (VOC) is required. This space will house the offices for venue management and miscellaneous functional areas, event services offices and storage, venue briefing area, venue communications centre, and storage as required. If located externally, these spaces can be in a tent or cabin structure, and is approximately 400m².

viii. Broadcast Compound

The Ceremonies broadcast compound for the Olympic Broadcast Service (OBS) at the Winter Games, requires approximately 6000m² of clear open space immediately adjacent to the venue. The compound provides Rights Holder Broadcast (RHB) spaces and OBS technical operations, offices, and connections to the International Broadcast Centre (IBC) and in venue operations.

The compound will also require its own dedicated generator compound, dedicated to OBS operations in the compound and at the venue. This space is roughly an additional 500m² of required space, directly adjacent to the BRD compound.

In venue operations include camera positions and platforms, commentator positions, mixed zone, broadcast studio, commentator control room (CCR), and Broadcast Information Office (BIO). The studio space is approximately 30m², the CCR space is approximately 50m², with the BIO approximately 25m².

ix. Press Operations

As the ceremonies venue is not combined with a competition venue, there is no requirement

for a Venue Media Center (VMC) at venue. Press will be located in the press tribunes located in the seating bowl, with an additional space required for photo filing and press offices of approximately 300m² directly adjacent to the tribune area. Access is required from photo positions to the tribunes and tribunes to the media PSA and load zones located BOH.

x. Transport

A transport office, storage, and drivers lounge is required outside the venue secure perimeter to manage vehicle access, traffic, and venue load zones. This area is next to the VSA and parking areas. These structures can be tents or cabins and require space approximately 100m² for the Driver's lounge and 100m² for offices and storage.

xi. Venue Accreditation

A venue accreditation office is required outside the venue secure perimeter, next to the Olympic Family and Media entry points. This is a cabin structure approximately 30m².

c. Other Major BOH Program Requirements**i. Services and Access**

Access to water and waste, along with access to fibre connections is required for BOH compound spaces. In addition, there will be Ceremonies and BOH energy requirement for prime generated power, along with redundancy generated power requirements. Energy compounds are broken into specific areas adjacent to the compounds and the venue with the most direct routes to reduce cable lengths. Roughly 8 compounds should be considered, outside the broadcast (BRD) compound, of approximately 500m² each.

ii. Parking and Vehicular Access

Each BOH compound will require parking within its compound for various operations. Additionally, Dignitaries, Olympic Family, OBS and operational staff require parking – this can be as high as 200 parking stalls, with an area of approximately 5000m², to allow for parking and bus systems of accredited groups.

Further transportation planning with new and existing public and games transportation

systems can reduce this number, but should not be less than 100 stalls for this venue.

BOH venue vehicle access is through a security vehicle screening area (VSA). A loop in and out of a venue is preferred, allowing for easy access of large trucks without backing up at any point of its entry into a venue. There is only one point of entry and exit for vehicles at a venue.

iii. Ambulance Staging

Emergency services vehicles will also require space within the venue BOH, dependent on the safety plans – fire trucks would be centrally located within the park, however, two ambulances would be required for the venue – one dedicated to Athlete's and the other for Spectators. These ambulances are located adjacent to the building, with direct access to both the field and spectator areas, and require connections to power.

d. Ceremonies Stage (FOP) Space Requirements

The Ceremonies stage (the field) is the area where Ceremonies takes place, whether on the field, the roof, or in areas of the seating bowl. In addition, to the field area, there are several areas that are directly adjacent to the field which are also considered as part of the stage. These areas include tunnels, off field staging, ceremonies control booths (located throughout the venue), roof systems and platforms, lighting positions, audio positions, and video boards, broadcast camera platforms and positions, photographer risers and positions, and the President's Box.

Development of the Ceremonies show will require potential modifications to the field, areas of the seating bowl, and areas around the field. Any modifications would be part of the Ceremonies team scope of works and coordinated into the temporary build of the venue for Games. Additional lighting, audio, video and aerial systems to be added to the venue as part of the temporary build.

Access to the field through existing tunnels will be required and dedicated to the ceremonies production as well as the compounds located nearest the venue that allow for the best flow onto the field or stage areas.

VENUE TRANSPORT SUMMARY

Refer to Appendix 4AA

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VENUE PROFILE SUMMARY

Venue: Grandstand

Location: Stampede Park

Key Contact: Doug Rosenberg

Owner/operator: Stampede

Current use: Calgary Stampede

	Yes/No	Comments:
FOP standards/IF approval:	yes	Elevated stage is slightly smaller than a football field
Operational space	yes	Existing concession, vendors etc – needs upgrade
External space – FOH	yes	
External space – BOH	yes	
Parking	no	Parking is limited within cluster due to lay down requirement.
Utilities services (gas/water):	yes	May require future upgrade
Mechanical/electrical:	yes	May require future upgrade, lighting needs complete lighting system rebuild.
Technology/BMS:	yes	Indoor areas
Fiber connectivity:	Yes	Has redundant fiber
Access & Egress Transit:	yes	2 LRT lines, Red (existing) and Green (proposed)
Access & Egress Pedestrian:	yes	Many entry and exit points to park

Long term use contracts:	yes	likely
Capital improvement plan:	no	None for grandstand
Adjacent land (plans in use):	yes	Flat parking, track and barn area.
Lighting levels for broadcast use:	no	Added in lay-over
Sponsorship rights and agreements:	unknown	

VENUE GAPS, CHALLENGES, AND CAPITAL WORKS PROJECTS

The Stampede Park--Grandstand, is an ideal location for consideration for the Olympic Games, with operations and use of the facility fitting the program requirements for Opening and Closing Ceremonies. The venue is able to convert to Ceremonies, ensuring as a baseline, that this venue can be developed, using existing and temporary infrastructure to build out the venue to meet current Olympic Games requirements for ceremonies, space, and operations.

The Olympic games brings a different number of users and accredited groups, protocols, security, and overall operations that are not seen in daily operations at McMahon or past Olympic Games. With this in mind, along with the age of the facility, there are several areas to be reviewed and considered for upgrades.

The following gaps, challenges, and capital works projects are discussed to give a complete view to the feasibility and potential requirements for additional works at this venue.

1 | Venue Challenges

a. Topography to Compounds

The compound spaces will require increased containment systems to connect services to the venue.

b. Spectator Concourse

Crowd modeling study to be conducted to confirm the spectator concourses space for load in of spectator seating, potential for adjusting of compound spaces may be required.

2 | Capital Works Projects

As an existing venue, specific areas need to be reviewed to determine if upgrades will be necessary to meet Games requirements. The following items have been reviewed by Dialog Design, to confirm current conditions and provide recommendations for upgrades to meet

Olympic requirements.

a. Spectator Areas and Amenities

- i. Seating**
- ii. Toilet Facilities Capacity**
- iii. Toilet Facilities Conditions including Code Compliance, Family, and Accessible Requirements**
- iv. Concessions Capacity and Conditions**
- v. Accessible and Amenity Seating Conditions**

b. BOH Support Spaces

- i. Operational Spaces**
- ii. Lighting**

Current Lighting Conditions and Capacities

iii. Mechanical Systems

Current Conditions and Capacities of the Mechanical System

APPENDIX A: BROADCAST LIGHTING TECHNICAL SPECIFICATIONS

BROADCAST LIGHTING TECHNICAL SPECIFICATIONS



Esteem Projects & Consultancy

Date: 8th February 2017

Re: Olympic Broadcasting Service (OBS) summary of current Broadcast Lighting Technical Specifications.

Following is a summary of the OBS technical specification for broadcast lighting. The IOC and OBS would provide a comprehensive specification on confirmation of the Olympics Host City.

Below sets out the key areas for consideration when planning and design for games time lighting.

In addition to the completion area that require quality lighting are the non field of play areas such as

- Mix zones
- Press conference rooms
- Announcer positions
- Athlete holding areas
- Athlete pathways to FOP
- Spectator areas
- Warm up areas and Fields of play
- Medal and Flower Ceremony's
- Flags of Nations and Ceremony Flags

The technical specifications provide the detailed requirement for all venues. Sport specific requirements can vary between sports and venues. Consideration should be given to these specific requirements when formulating designs and equipment.

OBS Technical Specifications Summary **Version February 2017**

Light source (lamp)

The specified requirements apply to all light source (lamp) technologies e.g. HID (MHN, HQI, HSI, HIT, MSR, MSD etc.), LED, fluorescent etc.

Flicker

To support HFR production requirements and irrespective of the lamp technology e.g. HID, LED etc., the lighting shall be flicker free; the lamp driver/control gear shall be of the electronic type with an output frequency $\geq 1,000\text{Hz}$.

Low wattage lamps are preferred. The lamps shall be from the same manufacturer and from the same production batch.

Colour temperature:

The colour temperature, Tk, shall be 5600K (standard TV camera preset).

All lamps shall have the same colour temperature. That is, the colour temperature shall be nominally one value e.g. 5600K. Differences in colour temperature between different wattage lamps (at the FOP in question) are not acceptable.

It follows that if the competition of a sport is held at two (or more) venues, the FOP broadcast lighting of each shall have the same colour temperature.

Colour rendering10:

The CIE CRI Ra shall be ≥ 85 ;

and if no proven international standard installations of the lamp/luminaire system exist, a live field test with the intended light source/luminaire and a broadcast quality camera in cooperation with a national sports broadcaster shall be conducted and the results made available for review;

or

- Alternatively, TLCI11 Qa ≥ 85 ; or
- Alternatively, CRI Ra ≥ 85 and a R9 ≥ 45 ; or
- Alternatively, CRI Re(R1-R15) ≥ 85 .

If, for practical reasons (legacy, economics etc.), the lighting over the spectators has different lamp technology luminaires to the FOP, the colour temperature of these (spectators) luminaires shall not be higher than the FOP lamps.

Lighting equipment and operating conditions

The lighting equipment shall be suitable for the operating environmental conditions of the venue in question; and ensure that the lamps operate at the correct colour temperature and light output characteristics. The lighting equipment shall comply with the relevant host country's electrical safety standards. Luminaires shall comply with IEC 60598. The lamps shall comply with the relevant IEC lamp standards.

Winter Games outdoor venues, cold weather and lamp performance.

Extreme cold weather affects the proper functioning of all lamps (HID, HMI, fluorescent, LED). Apart from a lower light output, in particular the colour temperature may change significantly even between individual lamps and become unacceptable.

Lamps shall be operated on control equipment designed for very low temperatures so that the lamp operates to the stated nominal performance characteristics and meets the above requirements; and be utilised in luminaires designed for cold temperatures.

Anticipated light output losses due to low temperatures shall be factored into the lighting design.

The projected Games time temperatures shall be established well in advance.

Secondary warming (heating) the localised ambient temperature and air space control to ensure compliance should be considered. If necessary tests should be carried out to ensure the equipment would operate at the Games time predicted operating temperatures.

Calculation and measurement grids

Calculation grid intervals shall nominally be 2m (varies per sport – see specific sport requirements).

Illuminance towards a camera - known as camera illuminance, E_c , shall be on a plane nominally at 1.5m above the FOP surface.

Vertical illuminance, E_v , towards a nominated side of the FOP shall be on a plane nominally at 1.5m above the FOP surface.

Horizontal illuminance, E_h , shall be calculated/measured on the FOP surface.

Compliance illuminance measurement grid intervals shall nominally be 4m.

Note: the calculation plane shall match the gradient/slope of the FOP; e.g. cycling track, alpine skiing slalom; and/or the athlete's principal competition 'line' through the space above the FOP which may be a vertical plane e.g. skiing freestyle aerials, diving and ski jumping.

Camera locations

The camera positions modelled in a lighting design shall be as specified by OBS. Nominal camera plans are provided as production teams can survey the venues and formulate related plans.

HD, 4k and HDR

The on-going evolution from standard definition to high definition and beyond raises the question of

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illuminance levels. The reality is that with most professional broadcast camera system cameras, the sensitivity remains the same. In other words, the illuminance criteria herein remain the same for HD and 4K.

Similarly, high dynamic range (HDR) provides no additional restriction. At the time of publication 8K is in the early stages but it likely that the same requirement will prevail. The reader should check with OBS for currency.

Minimum illuminance

The minimum vertical illuminance at any point of the FOP shall be $E_c \geq 1,600$ lux towards the main cameras.

Note: the minimum average illuminance and the average horizontal illuminance are determined by the uniformity ratios. For HDTV/4K it is imperative the uniformities are met or exceeded.

The minimum vertical illuminance at any point of the FOP towards the orthogonal directions of the FOP, where camera #1 is central to a side, or 45° to the 4 sides of the FOP where camera #1 is not central to a side shall not be less than 70% of the minimum illuminance towards any main camera.

Uniformities for FOP

Vertical illuminance uniformity for each relevant main camera.

The minimum to maximum camera illuminance ratio, $E_{c \min}/E_{c \max}$, shall be ≥ 0.7 for the FOP; and ≥ 0.4 for the FOP-surround.

The minimum to average ratio, $E_{c \min}/E_{c \text{ ave}}$, shall be ≥ 0.8 for the FOP; and ≥ 0.6 for the FOP-surround.

Horizontal illuminance uniformity

The minimum to maximum ratio $E_{h \min}/E_{h \max}$, shall be ≥ 0.7 for the FOP; and ≥ 0.4 for the FOP-surround and/or run-off

The minimum to average ratio, $E_{h \min}/E_{h \text{ ave}}$, shall be ≥ 0.8 for the FOP; and ≥ 0.6 for the FOP-surround and/or run-off

The ratio of vertical illuminances at any point on the FOP between the orthogonal planes (at either 90° or 45°; i.e. four calculation planes only) facing the four sides of the FOP shall be ≥ 0.75 and ≤ 0.9 .

The average vertical illuminance on the FOP towards camera #1, or the designated principal camera, shall be greater than the average vertical illuminance towards the other 3 orthogonal directions.

The uniformity gradient $12, U_G$, for both horizontal (U_{Gh}) and vertical illuminance to main cameras (U_{Gc}) shall nominally be $\leq 10\%$ on a 2m calculation grid (varies per sport by interpolating the appropriate calculation grid).

The U_{Gv} of the vertical illuminance towards the backlight side or sides where there are no fixed cameras shall nominally be $\leq 20\%$ at 4m grid intervals (varies per sport and interpolation).

The ratio of the average horizontal illuminance of the FOP surround to the average horizontal illuminance of the FOP shall be ≥ 0.6 and ≤ 0.8 , target 0.7.

Slow motion replay zone (SRZ): some sports will have a defined SRZ. In the absence of a specific SRZ requirement, the $E_{c \max}$ towards the main camera, shall be at the FOP centre.

Coefficient of variation (CV): the CV shall be ≤ 0.13 .

Maximum illuminance

Whilst firstly complying with the six basic specified uniformity criteria i.e. $E_{c \min}/E_{c \max}$, $E_{c \min}/E_{c \text{ ave}}$, $E_{h \min}/E_{h \max}$, $E_{h \min}/E_{h \text{ ave}}$, U_{Gc} and U_{Gh} , the maximum illuminance towards the main cameras, $E_{c \max}$, $\geq 2,000$ lux.

Luminaires and aiming logic

The luminaire-aiming angle shall be $\leq 65^\circ$. Light should reach any point within the total FOP from at least three directions where the third directional component should form a 'backlight' to one or both of the other two directions, with respect to the main cameras.

No luminaire shall be aimed directly at a camera, and not within a 50° cone centred on the camera lens. If the aiming point potentially coincides with a (hard/main) camera, the azimuth aiming angle shall be outside a cone of 50°.

A luminaire within the field-of-view (FOV) of the main cameras and aimed generally in a direction towards the cameras shall be constructed, or fitted with a glare-controlling device. The control shall be such that the light emitting area of the lamp is shielded from the camera's FOV or fitted with barn-doors, louvres or similarly acceptable devices.

Fit-for-purpose louvres, shields, hoods, barn-doors etc. may also be required to minimise the effects of glare, spill light and reflected (skip) light.

Equipment type and position shall be chosen to meet the specified glare limits.

Where the sport includes athlete action above the FOP surface (e.g. gymnastics, ski-jumping, diving etc.), there shall be light projected through the space above the FOP. The athlete's performance space in effect becomes the 'field of play' with respect to broadcast.

The total amount of light (luminous flux) projected from the camera #1 side shall not be less than the total luminous flux from the opposite side. Lighting equipment (luminaires, truss, cable looms, and chain motors etc.) located between the main cameras and the far side of the FOP shall be outside the cameras' field of view (FOV) when shooting the competition.

Noise – lamp control gear or drivers shall be silent (no ballast "hum"). Apart from aerial sports, in principle the luminaires should be designed, installed and aimed such that there is no light projected above the horizontal.

Multiple venues for one sport

Some sports take place at two or more venues accommodating preliminary rounds and the finals. The BRD LX quality of the two (or more) venues shall be the same, or as close as possible – a difference of not more than 5% of both the average horizontal and the average vertical illuminance (to camera 1). The colour temperature shall be the same or not more than a 5% differential.

The baseline lighting quality shall be set by the venue that stages the finals.

End of Technical Specifications

Report Author:

Steven Allen

Esteem Projects & Consultancy LTD. London UK

Broadcast Lighting Consultants to PyeongChang 2018 & Tokyo 2020

Previous Olympics: - Rio 2016, Sochi 2014, London 2012, Vancouver 2010

End of Report

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APPENDIX C: STAMPEDE PARK GRANSTAND—SCOPE OF WORK

Stampede Park--Grandstand is being proposed as a potential location for opening and closing ceremonies for the Olympics. The goal of this exercise is to explore the feasibility of the Stampede Park Grandstand acting as the venue for the opening and closing ceremonies. The main focus being on determining if the area is large enough to have a CFL sized field as the central area with spectator seating around.

As an alternate - the site may alternately be used as an event location for big air. This would be a nightly event.

Deliverables:

- 11x17 document that outlines all findings, sketches, text and supporting documents.
- Text document describing the anticipated capital improvements (including square footages). Also include text on the building engineering including roof load capacity, mechanical HVAC description, plumbing and electrical capacities.
- Text document outlining temporary works that will need to be completed on the site (that would be considered capital costs) as well as remediation measures that will need to be undertaken post games.
- Simple sketches showing:
 - Proposed plan/seating arrangement with stage and temporary seats
 - Proposed plan/seating arrangement without temporary - legacy condition.
 - Sections in two directions showing the seating and stage
 - Plan showing additional permanent seating with big air.

Deliverables as required to complete a Level 5 costing exercise.

Format of Deliverables:

- The CBEC team will ensure that credit is given to all work completed by architectural and engineering professionals; however, information needs to be provided to CBEC in a 'raw' form as it will be included within an overall report that will require a consistent

look.

- Text documents should be provided in WORD.
- Drawings - provide pdf drawings, as well as AutoCAD plans. AutoCAD plans are required by CBEC to complete an overlay analysis. Also provide your logo for inclusion in the CBEC title block for the overlay drawings.

Below is a summary of the key requirements and areas to be assessed:

- As the centre stage area aim for a CFL field with a 3 meter perimeter around. Spectator Area:
- Opening / Closing Ceremony stage will likely need to span over the existing stage.

Spectator Area:

- Overall 40-55,000 seats.
- Additional seating of 15,000 to 30,000, located around the current race track may be possible. This seating is contemplated for low cost (ticket price) seating to create greater accessibility for lower incomes for the opening and closing ceremonies. The parade of athletes would circle the track and this seating would provide up close seating for this.
- Currently Stampede Park--Grandstand has a capacity of approximately 20,000 seats. The remainder of the seats would be temporary.
- Ideally looking for 25-28,000 permanent seats to be left as a legacy. The remainder of the seats would be temporary.
- Modify the existing grandstand and infield seating slightly to allow for the beginning of a creation of a bowl.
- Accessibility - accessible and amenity seating in multiple locations to serve 1% + 1% of the seating (1% accessible, 1% amenity).

Spectator Amenities:

- As the current grandstand holds approximately 17-20,000 people (CBEC to confirm with Stampede) additional washrooms will likely be required to meet the 25-28,000 permanent seats. Identify the additional number of water-closets that will be required. Temporary washrooms will be allowed for to serve the additional 15-25,000 temporary

seats.

- Assess the current washroom amenities and determine the required capital improvement required to add/improve existing washrooms. Temporary washrooms will be allowed for to serve the additional 17-20,000 temporary seats.
- Concessions will be approached in a similar manner as washrooms. Identify the anticipated linear footage of concession counter, and square footage of area that would be required for the permanent legacy piece.
- Provide a list of lounge spaces that will be available for groups, dignitaries, etc. Complete with square footages.

Back of House Requirements:

- Provide a list of back of house spaces that are currently available that could be used as change rooms, green rooms, staging areas, etc. complete with square footages.
- List of operations spaces including workshops, staging, storage, control rooms, etc.

Roof:

- Look at the existing roof of the grandstand and determine the amount of seating that will have limited / cut off views.
- Identify loads that can be supported from roof - spanning over the stage similar to grandstand shows.

Electrical, Lighting & A/V:

- Lighting levels to meet Olympic Games Broadcast requirements of 2000 lux with zero flicker tolerances. What would the anticipated permanent build lighting be? How much will we need to supplement?
- Identify if there is a readily available connection to fibre.
- Energy requirements will include prime generated power along with redundancy generated power requirements.
- Allow for a design load of 10 MW with a demand of 6 MW.

Mechanical/Civil:

- Will the existing services (water and sanitary) be able to handle the increased loads?
- Storm water management...

Temporary Works:

- Removal of existing fences along the track will need to be removed and replaced.
- Any other works that may need to be completed that would alter the existing conditions that would need to be put back (such as removing goal posts, etc) should be identified and outlined now.

DRAFT

FULL VENUE REPORT:

Grandstand

Architectural (Lead): Dialog Design

Structural: Entuitive

Mechanical: MCW Engineering

Electrical: Designcore Engineering Ltd.

Cost Consultants: Altus Group

STAMPEDE GRANDSTAND

CBEC Opening and Closing Ceremonies Venue

1. Introduction

This intent of this document is to summarize the study and design options with their preliminary associated costs (Class 5 cost estimate) completed by DIALOG. The scope includes exploring different permanent and temporary seating configurations to meet both 40,000 and 55,000 seats at the Stampede Grandstand site for 2026 Winter Olympic Games. Package indicating seating arrangement options is attached to this report.

The report includes

- Seating layout options with existing arrangement hosting Big Air event.
- Recommendations for upgrades and renovations to the existing in response to Calgary Stampede ongoing consideration to ensure the long-term future of the facilities after the Games. The report does not offer the complex renovation details as this was deemed beyond the scope of this deliverable.
- Estimated area of existing spaces could be used for Back-of-house/ operations. Full facility assessment is required to confirm the availability.
- Estimated number of seats with limited view to Big Air (option 5).
- Partial building code review looking specifically at washroom and accessibility requirements.
- New universal, barrier-free access washrooms are also recommended to meet the current best practice standards for accessibility. The study does not constitute a full Building Code compliance review.

2. Description of Seating Lay-out Options

Option 1 - 40,000 seats / (No legacy seats)

Option 1 proposed an estimated capacity of 40,000 seats which consists of 14420 exiting permanent seats and 25300 temporary seats during the games.

New seating includes temporary bleachers located north and south of the CFL field-sized raised center stage required by CBEC and additional bleacher located west of the stage behind the existing infield stand. It is our understanding that the existing infield roof may block spectator's view to the field and would need to be removed. No further modifications to the existing are proposed.

Temporary bleacher will be designed to meet the required capacity, sight-lines, access, and facilities for disabled people. All temporary structures will be dismantled and removed after the events. This approach would make sense, particularly when there is no long-term demand for new seats and expenditure of new facility can be difficult to justify.

Unobstructed areas underneath the bleachers could also be available for required lay-down area, BOH and operations.

Summary of Option 1

- **40,000** estimate total seats.
- Minimal impact on the existing.
- **No legacy seats** left behind.
- Estimated 11,105 sq.m. available for BOH and operations.
- Possible 1050 sq.m. combined new lounge space.
- Anticipated minimum area of 1,615 s.q.m. required for concession stands (865 sq.m. of permanent stands/ 750 sq.m. of portable stands).

Option 2 - 40,015 seats / (25,015 legacy seats)

The permanent and temporary stands are designed with an inherent flexibility to accommodate approximately 40,015 spectators in "Olympic" mode while also providing the optimum spectator capacity of 25,015 legacy seats after the Games. The total 40,015 seats consist of 12715 existing Grandstand permanent seats, estimated new 12300 permanent seats plus at least 15000 temporary seats.

As required by CBEC all proposed seating to be located around a CFL field-sized raised center stage. The new seating includes Infield seating located over the infield suites west of the center stage with additional seating located at the stage's north and south ends.

Existing animal gates/ entry could be serve as machine/ field-of-play access or ceremonial entry. Spaces underneath the bleachers could also be available for required lay-down area, BOH and operations.

Summary of Option 2

- **40,015** total seats.
- **25,015** seats to remain as legacy seats.
- Estimated 12,456 sq.m. available for BOH and operations.
- Approximately 2248 sq.m. new lounge spaces.
- Anticipated minimum area of 1,638 required for concession stands (738 sq.m. of permanent stands/ 900 sq.m. of portable stands).

New Infield Suites

In response to Stampede ongoing consideration for infield suites upgrade, option 1,2,3,4 propose a new two-story structure to house future infield suites. If construction takes place prior to the Games, structure directly under the bleachers will be required to accommodate temporary bleachers and potential Big Air structure afterwards. During the events the stacked suites could provide private spaces with premium seating for dignitary, official and press. The structure will be refigured to infield suites with more premium seating options and possible roof top patio after the Games. This upgrade will double the size of the existing, improve the sightline while retaining comfortable, intimate and amplified experience. Only Infield permanent Bleacher (12300 seats) will remain and be reconfigured with new amenities and possibly extended roof to protect spectators from the weather.

Option 3 - 54,615 seats / (22,215 legacy seats)

This scheme will provide approximately 54,615 seats which includes existing 12,715 permanent seats at Grandstand, estimated new 9500 permanent seats and at least 32,400 temporary seats around the center stage.

After the events, there will be approximately 9,500 seats to remain as legacy seats at the infield (2800 seats less than option 1).

Summary of Option 3

- **54,615** total seats
- **22,215** seats to remain as legacy seats.
- Estimated 10,475 sq.m. available for BOH and operations.
- Approximately 2248 sq.m. new lounge spaces.
- Anticipated minimum area of 2,514 required for concession stands (570 sq.m. of permanent stands/ 1,944 sq.m. of portable stands).

Option 4 - 40,715 seats / Third Level Tier & Upgrades/ (25,715 legacy seats)

This option proposed upgrades to the existing Grandstand by removing the existing roof structure and adding a new third level tier. The facility will receive approximately 70,000 new permanent seats, in addition to 12,715 existing seats. This addition will bring the total capacity to 40,715 seats during the Games. Approximately 25,715 seats to remain as legacy seats.

Summary of Option 4

- New Third Level Tier at the Grandstand.
- 40,715 total seats.
- 25,715 legacy seats.
- Estimated 9,643 sq.m. available for BOH and operations.
- Approximately 3,748sq.m. new lounge spaces. (2,248 sq.m. at Infield stand and 1,500sq.m. at Grandstand).
- Anticipated minimum area of 1,680 required for concession stands (780 sq.m. of permanent stands/ 900 sq.m. of portable stands).

Proposed Third Level Tier with new roof

The third level tier proposed for option 4 & 5 will allow an estimate of 7000 permanent seats to be added to the existing along with new amenities, washroom, concession facilities and premium suites at the Club level. The new club rooms at the Club level will be designed to create additional social spaces within view of the action plus a variety of premium seating options. Optional new roof is also proposed to provide shade and protect fans from the weather.

Optional Grandstand Expansion

Located on the west side of the Grandstand, the concourse expansion is also proposed in addition the new tier. This addition will contain roughly 11210 square meters of new functional space, washrooms and concession facilities and several possibilities such as possible future lounge/ restaurant, offices, gift shop and Calgary Stampede museum. The addition will feature open and transparent concourses with panoramic views of Stampede ground and downtown skyline. Proposed enhancements to the existing includes improvements of washrooms, concession stands, lighting and signage in order to make the experience memorable.

When complete, Grandstand will be offer further quality space for special community gatherings/ functions and allow the facility to accommodate a wider variety of concerts and shows throughout the years.

Option 5 - 53,915 seats / Third Level Tier & Upgrades/ (25,715 legacy seats)

This scheme proposed the third level tier similar to Option 4 by further 7,000 seats to provide the maximized number of seat to meet the potential ever-increasing demand for tickets to the opening/ closing ceremony. Nearly 41200 seats to be added to the existing 12715 permanent seats giving a final capacity of **53,915** seats.

Summary of Option 4

- New Third Level Tier at the Grandstand.
- 53,915 total seats.
- 25,715 legacy seats.
- Estimated 8,989 sq.m. available for BOH and operations.
- Approximately 3,748 sq.m. of new lounge spaces. (2,248 sq.m. at Infield stand and 1,500sq.m. at Grandstand).
- Anticipated minimum area of 2472 required for concession stands (780 sq.m. of permanent stands/ 1692 sq.m. of portable stands).

Option 6 - Existing Grandstand Arrangement Hosting Big Air Event

We estimate that existing seating and hospitalities will be capable of supporting the Big Air event. Clearance between Grandstand and the south annex would be sufficient to accommodate Big Air footprint. The arrangement will allow for Big Air to be erected in north-south alignment. North-facing orientation is recommended to avoid direct glare from winter low sun angle.

3. Back-of-house Requirements

We estimate a total of 5,315 sq.m. current space that could serve as Back-of-house/ Operations spaces. Areas by level as follows.

First Level - 550 sq.m.

- Storage spaces located thru-out the main floor **1,173 sq.m.**
- Partial exhibition space **379 sq.m.**
- "30+ lounge" **234 sq.m.**
- Existing lunchroom **171 sq.m.**

Second Level - 843 sq.m.

- Partial concourse space **843 sq.m.**

Third Level - 955 sq.m.

- YC wardrobe **263 sq.m.**
- Sound Studio/ G/S Show Production space **692 sq.m.**

Fourth Level- 278 sq.m.

- Private rooms **278 sq.m.**

Eighth Level - 232 sq.m.

- "Eye in Sky" media box **232 sq.m.**

Existing surface parking lot back of Infield bleachers

This vast parking space could be reconfigured to accommodate staging area and other support spaces. This location provide access to internal roads, overflow lot 2 north of the track and possible additional staging space in barn H southeast of the track.

4. Seats with limited view

A certain number of Grandstand existing seats will have their view of the top of Big Air cut off. We estimated 92 seats at the top 4 rows of Section 711 level 7 Central will have the sightlines to top of Big Air partially blocked by "Eye in Sky" media box. Infield seating row F and K will also experience an obstructed view. Some seats at the first tier top five rows and in the box suites would have their view impacted by the upper balcony. Further investigation will be required to confirm the number. All new proposed seats should have a clear view of the playing field and at least one video wall. Approximately 2585 seats located at the north and south ends of the existing Grandstand have been excluded from the seat counted due to their possible obstructed line-of-sight. We recommend existing seating section 101, 102, 119, 120, 201, 202, 203, 225, 226, 227 to be removed to allow for new lighting towers and sound systems.

5. Temporary works

Existing structure and it related components within and around the extent of proposed site will be removed to allow site access and new construction. Key items such as existing bleachers, gates, fences, animal chutes are outlined in the cost report.

6. Washroom Fixture Counts

OPTION 1

39,721 Seats (No Legacy)

Major Occupancy	A-4 Stadia and Grandstands							ABC Table 3.1.2.1
Proposed New Seats	New Temporary Seats				New Permanent Seats			
	15000				-			
Occupant Load	Men	Women	Universal *		Men	Women	Universal *	ABC Table 3.1.17.1
	12650	12650						
Fixtures required	Urinals	WC	WC	WC	Urinals	WC	WC	
By code	45	23	136					
Recommended*	110	38	159	11				
Barrier-free stall required by code		7	14					ABC 3.8.2.3 (6) ABC 3.8.2.3 (7)
Barrier-free stall recommended*		23	23					
Notes: 3.8.2.3 (3) In a building in which water closets are required in accordance with Subsection 3.7.2., atleastone barrier-free water closet shall be provided in the entrance storey, unless a) a barrier-free path of travel is provided to barrier-free water closets elsewhere in the building, or b) The water closets required by Subsection 3.7.2. are for dwelling units only. 3.8.2.3 (6) If more than one water closet is provided in a washroom, a barrier-free stall shall be provided for every 10 stalls or part thereof. 3.8.2.3 (7) For temporary uses, such as outdoor fairs and festivals, a barrier-free stall hall be provided for every 10 stalls or part thereof. * Recommended washroom count based on washroom ratios per spectator of newer CFL stadiums. (Universal washrooms to be counted as part of the total requirements).								

OPTION 2

40,015 Seats

Major Occupancy	A-4 Stadia and Grandstands							ABC Table 3.1.2.1
Proposed New Seats	New Temporary Seats				New Permanent Seats			
	15000				12300			
Occupant Load	Men	Women	Universal *		Men	Women	Universal *	ABC Table 3.1.17.1
	7500	7500			6150	6150		
Fixtures required	Urinals	WC	WC	WC	Urinals	WC	WC	
By code	28	15	84		24	12	71	
Recommended*	66	23	94	13	54	19	77	11
Barrier-free stall required by code		5	9			4	8	ABC 3.8.2.3 (6) ABC 3.8.2.3 (7)
Barrier-free stall recommended*		14	14			12	12	

OPTION 3										
54,615 Seats										
Major Occupancy		A-4 Stadia and Grandstands						ABC Table 3.1.2.1		
Proposed New Seats		New Temporary Seats				New Permanent Seats				
		32400				9500				
Occupant Load		Men		Women	Universal *	Men		Women	Universal *	ABC Table 3.1.17.1
		16200		16200		4750		4750		
Fixtures required		Urinals	WC	WC	WC	Urinals	WC	WC	WC	
By code		58	28	171		20	9	57		
Recommended*		141	48	203	27	42	14	60	8	
Barrier-free stall required by code			9	18			3	6		ABC 3.8.2.3 (6) ABC 3.8.2.3 (7)
Barrier-free stall recommended*			30	30			9	9		

OPTION 4										
40,715 Seats										
Major Occupancy		A-4 Stadia and Grandstands						ABC Table 3.1.2.1		
Proposed New Seats		New Temporary Seats				New Permanent Seats				
		15000				13000				
Occupant Load		Men		Women	Universal *	Men		Women	Universal *	ABC Table 3.1.17.1
		7500		7500		6500		6500		
Fixtures required		Urinals	WC	WC	WC	Urinals	WC	WC	WC	
By code		28	15	84		26	12	74		
Recommended*		66	23	94	13	57	20	163	11	
Barrier-free stall required by code			5	9			4	8		ABC 3.8.2.3 (6) ABC 3.8.2.3 (7)
Barrier-free stall recommended*			14	14			12	12		

OPTION 5										
53,915 Seats										
Major Occupancy		A-4 Stadia and Grandstands							ABC Table 3.1.2.1	
Proposed New Seats		New Temporary Seats				New Permanent Seats				
		28200				13000				
Occupant Load		Men	Women	Universal *	Men		Women	Universal *	ABC Table 3.1.17.1	
		14100	14100		6500		6500			
Fixtures required		Urinals	WC	WC	WC	Urinals	WC	WC	WC	
By code		51	25	150		26	12	74		
Recommended*		123	42	177	24	57	20	163	11	
Barrier-free stall required by code			8	15			4	8	ABC 3.8.2.3 (6) ABC 3.8.2.3 (7)	
Barrier-free stall recommended*			26	26			12	12		

END OF REPORT

CBEC STUDY

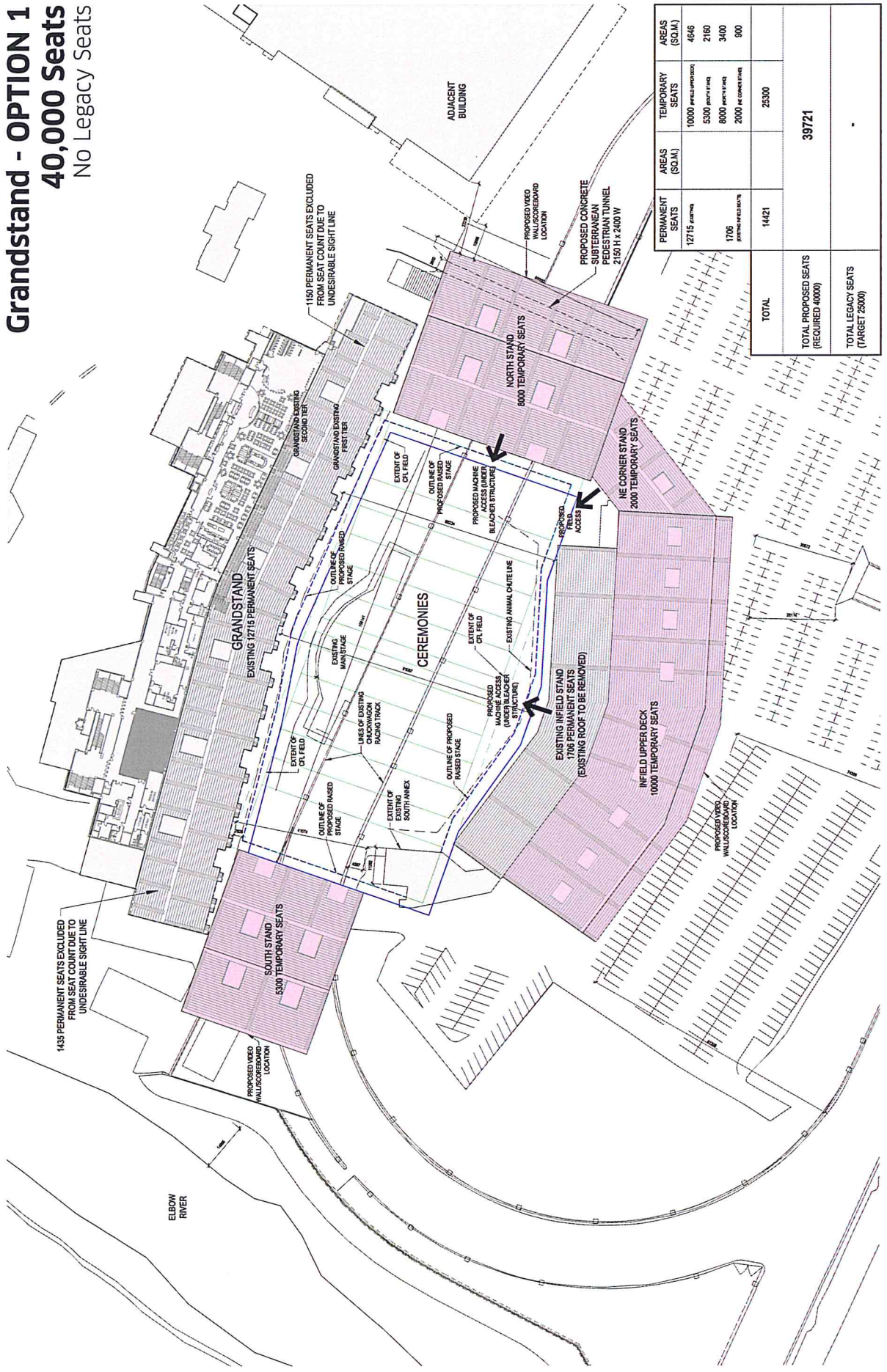
Stampede Grandstand

April 7, 2017

Grandstand - OPTION 1

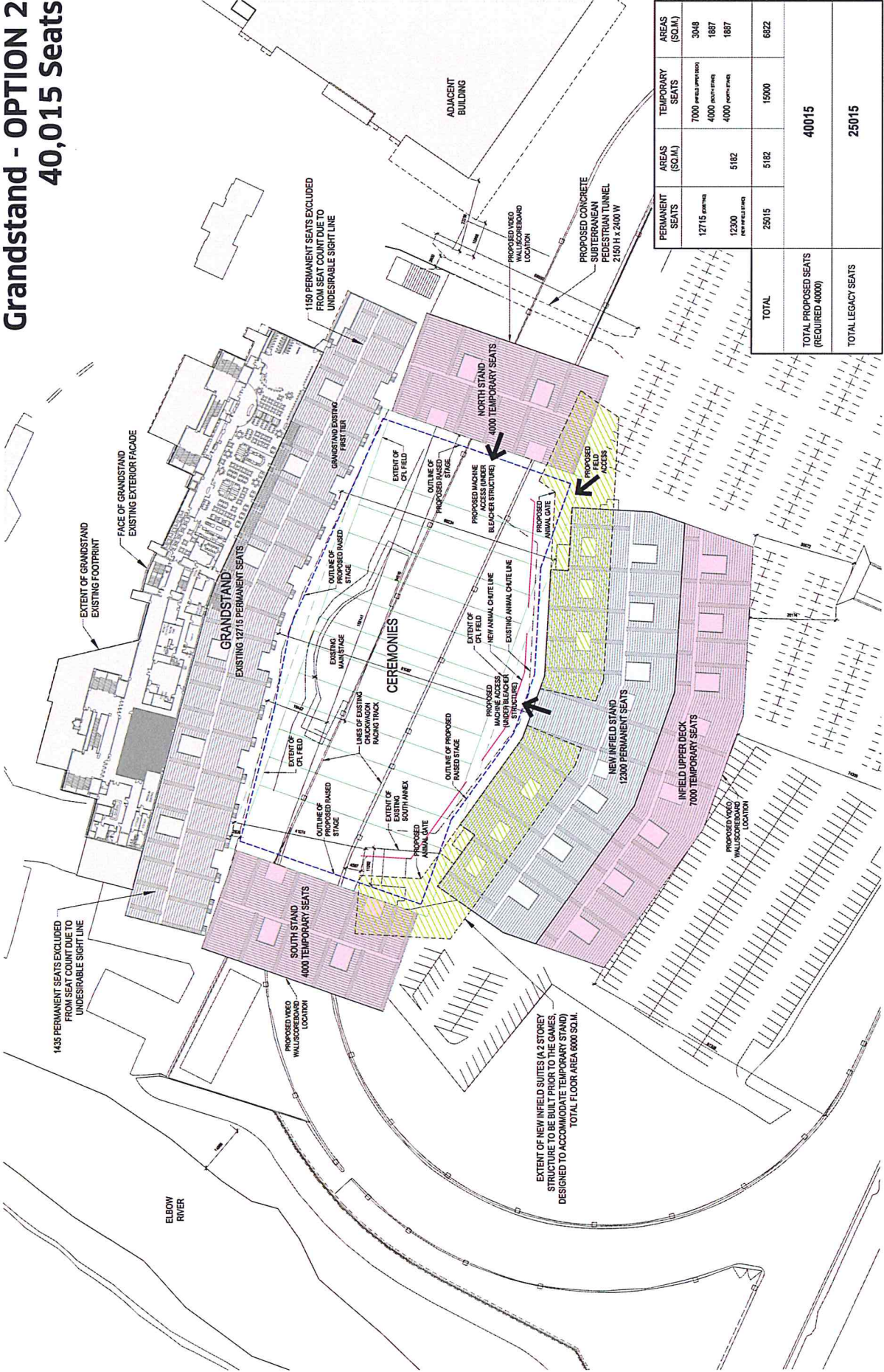
40,000 Seats

No Legacy Seats



PERMANENT SEATS	AREAS (SQ.M.)	TEMPORARY SEATS	AREAS (SQ.M.)
12,715	10,000	25,300	4,646
17,066	5,300	8,000	2,160
	2,000	2,000	3,400
		2,000	900
TOTAL	14,421	25,300	
TOTAL PROPOSED SEATS (REQUIRED 40,000)		39,721	
TOTAL LEGACY SEATS (TARGET 25,000)		-	

Grandstand - OPTION 2
40,015 Seats

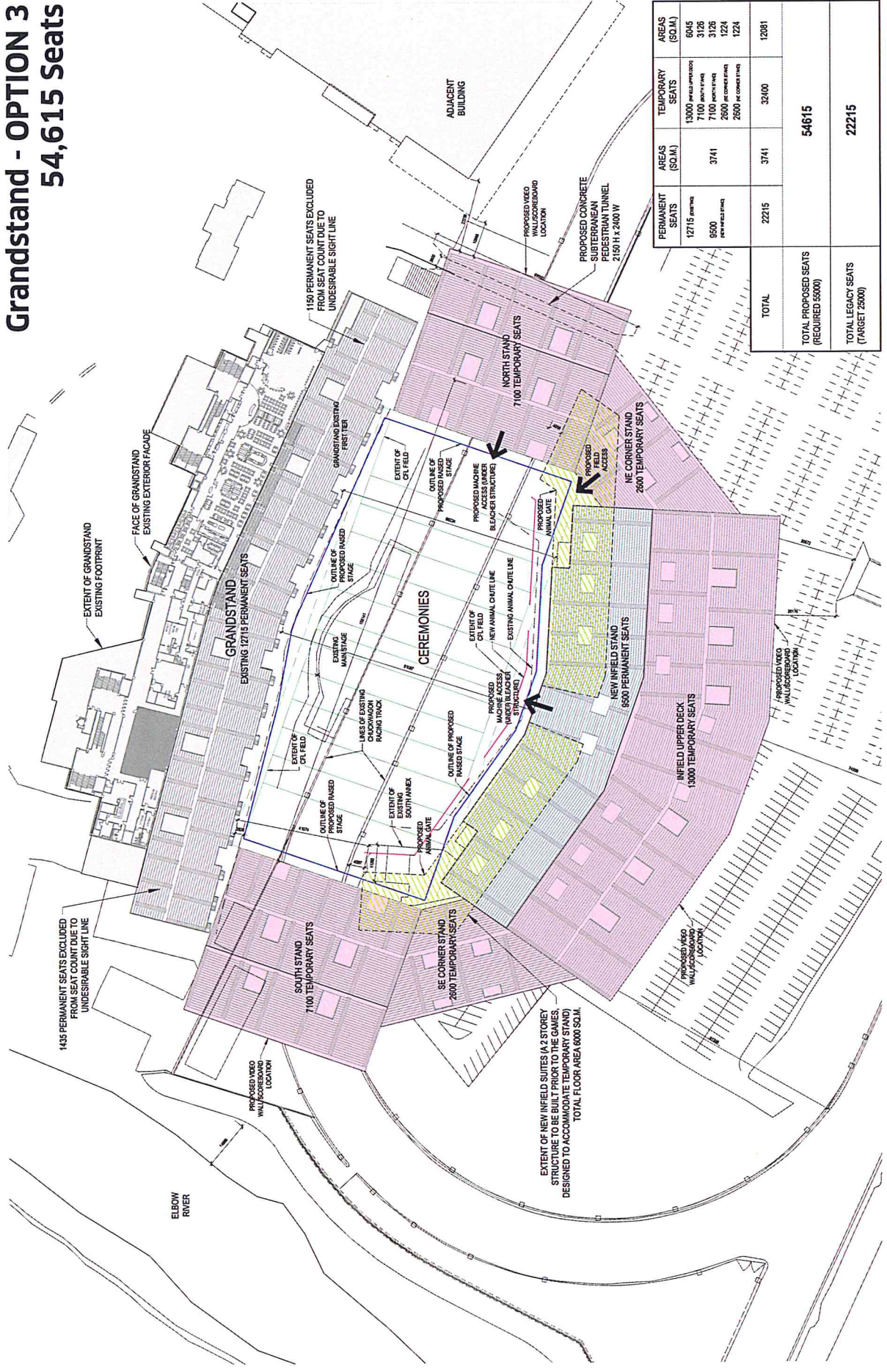


PERMANENT SEATS	AREAS (SQ.M.)	TEMPORARY SEATS	AREAS (SQ.M.)
12715	3048	7000	1887
12300	5182	4000	1887
25015	5182	15000	6822
TOTAL		40015	
TOTAL PROPOSED SEATS (REQUIRED 40000)		25015	
TOTAL LEGACY SEATS			

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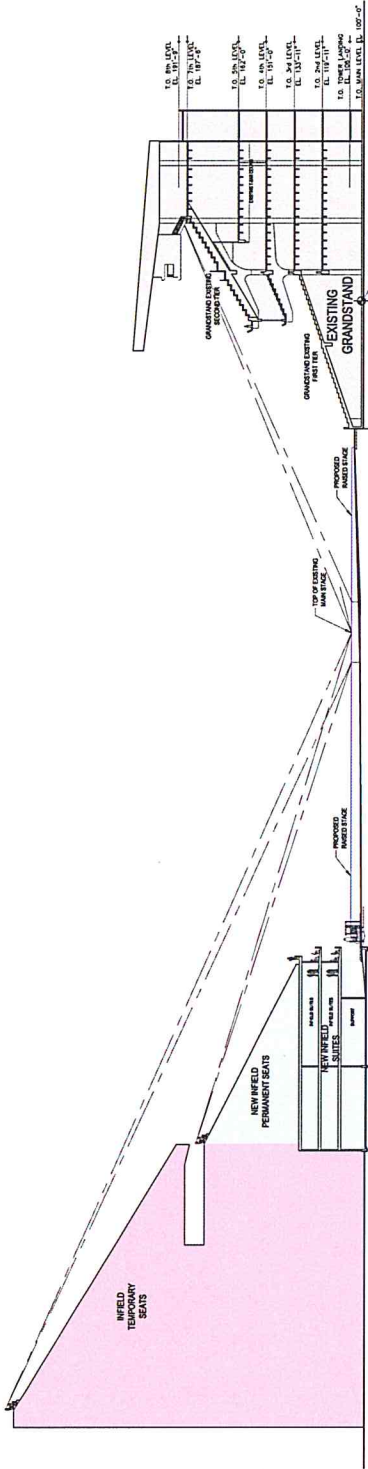
Stampede Grandstand R1 Updated 2017/04/07

Grandstand - OPTION 3 54,615 Seats



PERMANENT SEATS	AREAS (SQ.M.)	TEMPORARY SEATS	AREAS (SQ.M.)
12715	3741	13000	6045
9500	3126	7100	3126
		7100	3126
		2500	1224
		2500	1224
TOTAL	22215	32400	12081
TOTAL PROPOSED SEATS (REQUIRED 55000)		54615	
TOTAL LEGACY SEATS (TARGET 25000)		22215	

Grandstand - OPTION 3 Section



Section Option 3

SUMMARY

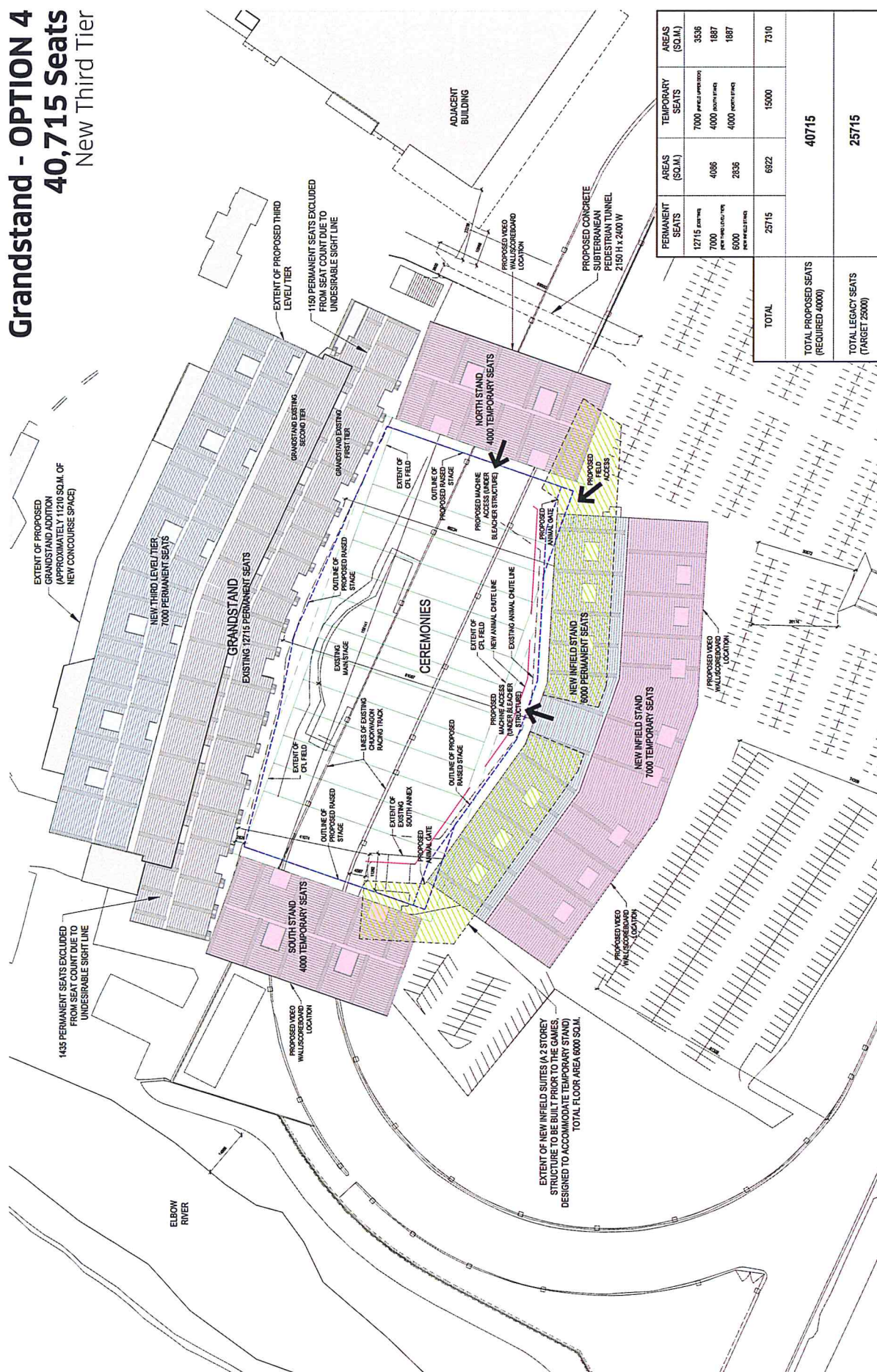
- 54,615 total seats
- 22,215 seats to remain as legacy seats.
- Estimated 10,475 sq.m. available for BOH and operations.
- Approximately 2248 sq.m. new lounge spaces.
- Anticipated minimum area of 2,514 required for concession stands (570 sq.m. of permanent stands and 1,944 sq.m. of portable stands).

DESCRIPTION

Option 3 will provide approximately 54,615 seats which includes existing 12715 permanent seats at Grandstand, estimated new 9500 permanent seats and at least 32,400 temporary seats around the center stage. After the events, approximately 9,500 seats will remain as legacy seats at the infield (2800 seats less than option 2).

WASHROOMS

Occupant Load	Men		Women		Universal*		Men		Women		Universal*	
	16200		16200				4750		4750			
Fixtures required												
By code	58	28	171	WC	WC	WC	20	9	57	WC	WC	WC
Recommended*	141	48	203	27	42	14	60	8				
Barrier-free stall required by code			9	18			3	6				
Barrier-free stall recommended*			30	30			9	9				



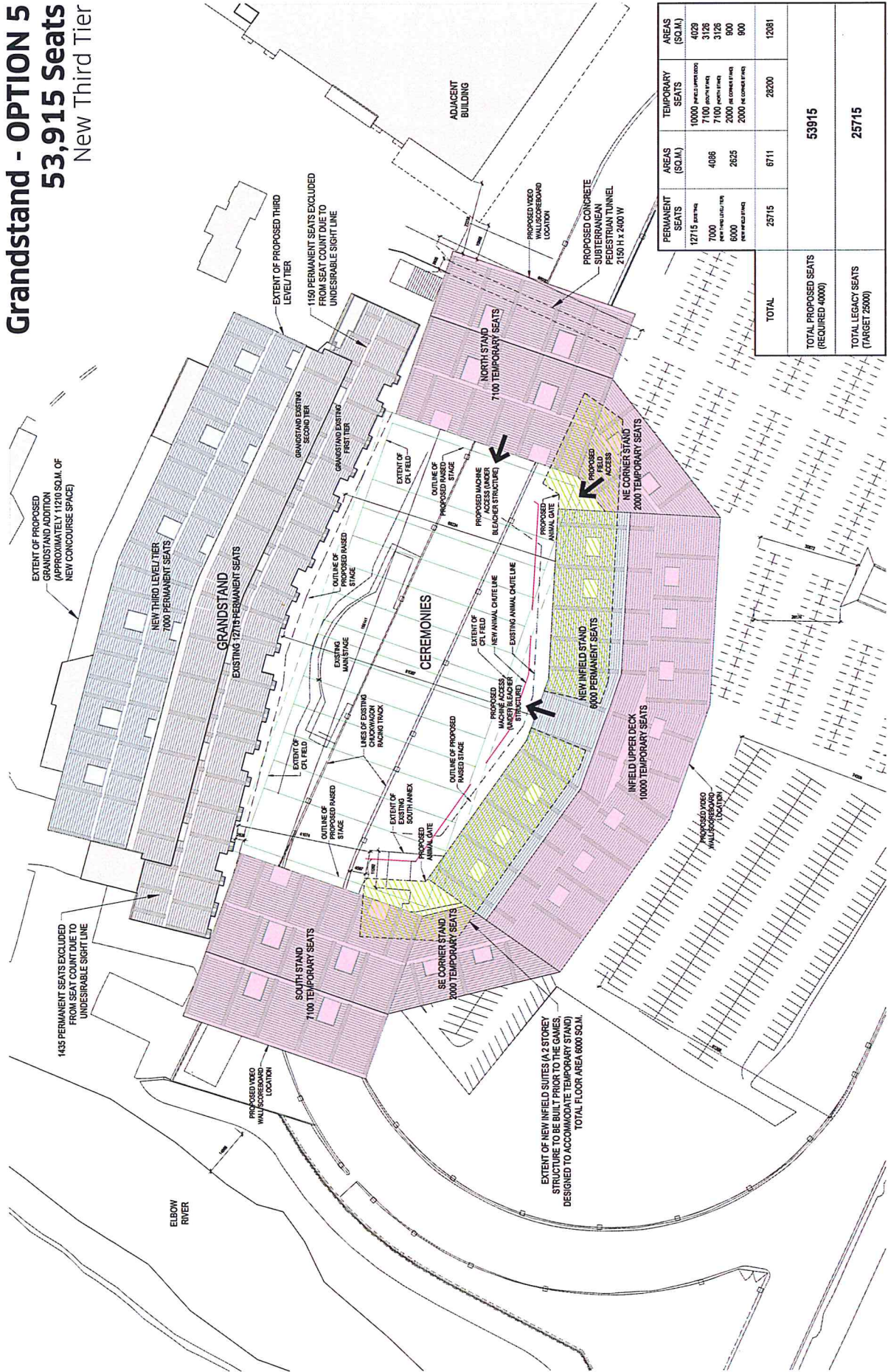
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Stampede Grandstand R1 Updated 2017/04/07

Grandstand - OPTION 5

53,915 Seats

New Third Tier



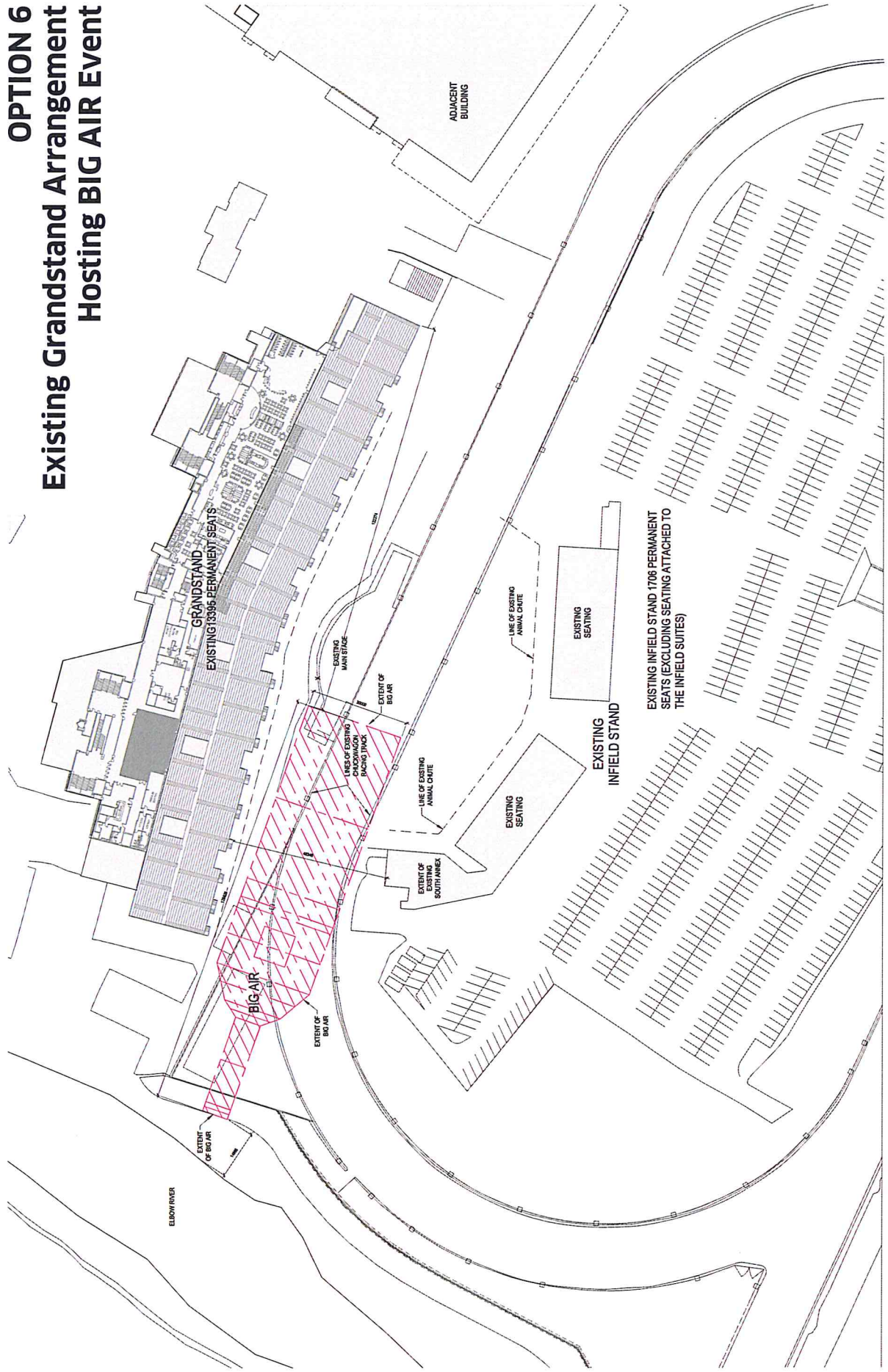
	PERMANENT SEATS	AREAS (SQ.M.)	TEMPORARY SEATS	AREAS (SQ.M.)
	12719	4086	10000	4029
	7000	4086	7100	3128
	6000	2625	7100	3128
	2000	2625	2000	900
	10000	2625	2000	900
	12719	6711	28200	12081
TOTAL	25715	6711	28200	12081
TOTAL PROPOSED SEATS (REQUIRED 40000)	53915			
TOTAL LEGACY SEATS (TARGET 25000)	25715			

[illegible]

- New Third Level Tier at the Grandstand.
- **53,915** total seats.
- **25,715** legacy seats.
- Estimated 9,989 sq.m. available for BOH and operations.
- Approximately 3,748 sq.m. of new lounge spaces, (2,248 sq.m. at Infield stand and 1,500sq.m. at Grandstand).
- Anticipated minimum area of 2472 required for concession stands (780 sq.m. of permanent stands/ 1692 sq.m. of portable stands).

Occupant load	Men 14100	Women 14100	Universal ^a	Men 6500	Women 6500	Universal ^a
Fixtures required	WC	WC	WC	WC	WC	WC
By code	51	25	150	26	12	74
Recommended*	123	42	177	24	57	20
Barriers free stall required by code	8	15		4	8	
Barriers-free stall recommended*	26	26		12	12	

OPTION 6 **Existing Grandstand Arrangement** **Hosting BIG AIR Event**



ENTUITIVE

CBEC Opening and Closing Ceremonies Venue Stampede Grandstand

Project Description

The Stampede Grandstand has been identified as a main venue for the 2026 Winter Games and may host the opening/closing ceremonies, the medal ceremonies, and/or Big Air. The legacy use of the facility may include an enhanced facility for the Calgary Stampede Rodeo and Rangeland Derby Events.

The existing facility includes a main grandstand with two open levels of seating, premium seating areas, concourses and a small suspended media level. The upper levels are covered by a roof canopy which is cantilevered off of two lines of columns. A number of other buildings also exist opposite the seating stands which are proposed to be demolished to allow for the addition of seating.

The current proposal is to consider the modernization of the facility with (1) an expansion to approximately 25,000 permanent seats with 15,000 temporary seats to accommodate a total of 40,000 seats; or (2) an expansion to approximately 25,000 permanent seats with 30,000 temporary seats to accommodate a total of 55,000 seats. These seating areas would require a variety of support spaces including concessions, washrooms, and administration facilities.

Infield Seating

The addition of permanent seating will be required in the location of the current infield seating. We are proposing the use of precast seating tiers supported by a precast concrete, cast in place concrete framing, or structural steel on conventional cast in place concrete spread footings or pile foundations. The lateral load resisting system would include the seating rakers perpendicular to the field and walls or cross bracing parallel to the field. The length of the seating structure will require the addition of an expansion joint at mid field to control the movements expected in a structure that will be exposed to external temperatures. All the enclosed spaces below the seats will require roof structures to protect the finishes from damage and allow for temperature control of the interior environments.

We understand that the existing seating foundations were designed to accommodate permanent seating structures and so there may be an option to re-use and expand some of these foundations for the use of the expanded facility. This will need to be further investigated.

North and South Temporary Seating

The Olympic Games will require a larger number of seats than the legacy uses. This will require the addition of temporary seating at the north and south ends of the facility. This is commonly achieved through the use of scaffold framing supporting aluminium seating tiers which can be arranged in a number of configurations. These systems are designed and supplied by a number of specialty contractors who can be selected on a competitive basis when an event is hosted. The main consideration for the permanent construction would be to provide an adequate base to support the framing system, because much of this seating will be located over the Rangeland Derby track, temporary foundations such as screw piles or micropiles will be required to support the temporary seating. It is our understanding that the existing North and South Annex buildings may be replaced prior to the Olympic venue. If this were to take place, the replacement structures would need to be designed to accommodate temporary seating loads bearing on the roof of these new permanent structures.

With the addition of an additional level at the grandstand, temporary seating on either the South or North end of the ceremony surface may be either minimized or avoided which will create better opportunities to accommodate the Big Air event.

Grandstand Renovations Option

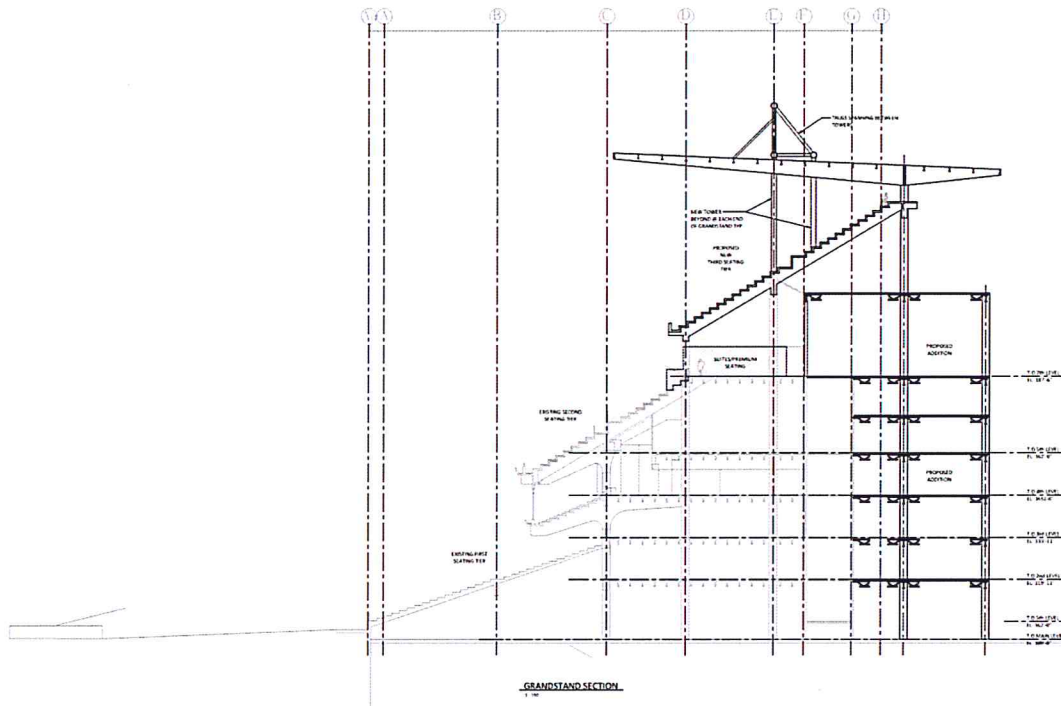
For both the 40,000 seat and 55,000 seat options, to improve site lines and also to allow for new lighting towers and sound systems (either permanent or temporary) the north and south ends of the existing grandstand will likely need to be removed and in some areas modified. These are the portions of existing seating that are outside the footprint of the roof structure. Depending on the extent of the demolition, removal should be fairly straight forward.

Any new lighting and sound system elements fastened to the existing grandstand structure will need to be reviewed from a loading standpoint and localized strengthening of the structure may be necessary.

Grandstand Expansion Option

We are proposing an option to expand the existing grandstand as an economical alternative for expanding stadium seating. By removing the existing roof and adding a third level of seating with a new roof structure, the concourse spaces can be increased and enhanced while updating the building facade. We estimate the ability to add approximately 7000 seats in this manner. This approach has precedence in the recent expansion of BMO Field in Toronto where 7500 seats were added. The capacity of the existing columns, foundations, and soil bearing capacity would need to be checked along with the lateral resisting system of the existing grandstand. Additional bracing or shear walls will likely be required to be added to the existing structure given that the structure's mass (for seismic loads) and projected area (for wind loads) increases and the existing and new structures would need to comply with current building code. Site lines would need to be verified.

There are a number of options for replacing the roof in this concept including a full canopy as was incorporated in the BMO expansion. A smaller canopy could also be introduced with a simple cantilevered truss option from the new exterior columns.



Ceremony Surface Support

The Olympic venue stage has a footprint that will extend over both asphalt and soil surfaces. Depending on elevations, the temporary stage could be constructed around or slightly above the existing stage. The structure supporting the stage along with the tunnel to the stage likely both have capacity to accept the self-weight of a temporary stage and live load however this will need to be further investigated.

To minimize potential differential settlement and differential heave from frost, consideration should be made for either micropiles or screw piles to support the temporary stage framing. After the Olympic venue, the piles could be either removed or cut off at the underside of the soil layer that exists within the arena. Alternatively there may be means of providing temporary heat within the footprint of the stage that could prevent the soil from freezing. This would be dependent on the temporary stage installation schedule.

Grandstand Feasibility Study

Mechanical

Prepared For:
Calgary Bid Exploration Committee via Dialog

Prepared by:



Consulting Engineers
Calgary, AB

Reference No. C17019-01
Date: March 3, 2017

1. Introduction

The use of the Stampede Grandstand as a host venue for the opening and closing ceremonies for the 2026 Winter Olympic Games is being explored. Two (2) scenarios are being vetted, one for 40,000 spectators and one for 55,000 spectators; the current capacity of the Grandstand is 17,000 permanent seats and 8,000 standing room for a total of 25,000 spectators. Each of the options being explored would involve the addition of temporary seating for the additional spectators beyond the current seating capacity.

The existing sanitary and storm water sewer capacity has been analyzed in order to determine the implications of each of the potential seating expansion options being explored. The intent is to provide a high-level summary of the mechanical system implications with sufficient detail for a preliminary cost estimate to be prepared.

For the purposes of this analysis the Grandstand will be separated into three (3) areas, the main grandstand, the north infield and the south infield.

The information provided in this study is based on the existing CAD file received.

2. Background

1. Existing Sanitary Infrastructure

Sanitary drainage for the Main Grandstand is provided by the followings drainage mains:

- 200Ø steel main located in the southeast corner (1.5% slope) – Maximum 1,400 FU* capacity
- 150Ø PVC main located in the northeast corner (2% slope) – Maximum 770 FU capacity
- 100Ø main located in the southwest corner (slope unknown, assume 1% min. slope) – Maximum 180 FU capacity
- Total Grandstand Sanitary Capacity – 2,350 FU

* FU: A Fixture Unit is a unit of measure that defines the hydraulic load on the drainage system.

Sanitary drainage for the North Infield is provided by the following drainage mains:

- 200Ø PVC main located in the northeast corner (3% slope) – Maximum 2,810 FU capacity
- 200Ø PVC main located in the southeast corner (1% slope) – Maximum 1,600 FU capacity
- Total North Infield Sanitary Capacity – 4,410 FU

Sanitary drainage for the South Infield is provided by the following drainage mains:

- 200Ø PVC main located in the northeast corner (1.5%) – Maximum 1,925 FU capacity
- Total South Infield Sanitary Capacity – 1,925 FU

2. Existing Washroom Fixtures

The existing washroom groups are generally distributed between the Grandstand and Infield seating areas based on seating. The existing washroom fixtures impose a total load of 2,490 FU's on the existing sanitary system. Based on the existing plumbing fixture concentrations, the distribution of the sanitary loads for each of the areas is summarized as follows:

- Grandstand: 2,220 Fixture Units (FU's)

- North Infield: 135 Fixture Units (FU's)
- South Infield: 135 Fixture Units (FU's)

Please note that these loads are estimated based on good engineering judgement, as detailed plumbing drawings were not available for analysis. The general "split" between the Grandstand and Infield areas is 89% and 11%.

3. Existing Domestic Water Supply

The Grandstand portion of the facility is supplied with domestic water by a 150Ø diameter line entering the building on the southwest corner. The Infield portion (north and south) of the facility is supplied with domestic water by a single 150Ø diameter line entering the South Infield on the east side. A pressure and flow test of the incoming water supply must be performed in order to confirm the capacity of the existing water service. However, good design practice would suggest that the capacity of the existing water service is approximately 600 GPM for each 150Ø line.

4. Existing Storm Water Infrastructure

Storm water for the Grandstand area is generally collected at the north and south ends of the facility. The sizes of the north and south storm water mains are unclear, but they connect to a 675Ø gravity main on the north side, and a 600Ø main on the south side.

Storm water from the Infield areas appears to splash to grade and is drained by several adjacent storm water catch basins located throughout the infield and parking lot areas.

3. Expansion Scenarios & Analysis

An analysis of the existing washroom fixture count has determined that the existing facility is equipped with a sufficient number of washroom fixtures based on the current building code requirements. Newer stadiums typically exceed the number of code-required washroom fixtures based on the nature of the occupancy for sports / assembly facilities. The following scenarios will be analyzed in terms of the impact on the sanitary drainage systems:

1. Increased washroom fixtures based on "best practices" for similar new facilities
2. Increased washroom fixtures based on 40,000 spectators (15,000 new temporary and 8,000 new permanent seats) based on current code requirements
3. Increased washroom fixtures based on 40,000 spectators (15,000 new temporary and 8,000 new permanent seats) based on current "best practices"
4. Increased washroom fixtures based on 55,000 spectators (30,000 new temporary and 8,000 new permanent seats) based on current code requirements
5. Increased washroom fixtures based on 55,000 spectators (30,000 new temporary and 8,000 new permanent seats) based on current "best practices"

For each of the scenarios summarized above, it will be assumed that the potential additional washroom fixtures will be added proportionally to each of the Grandstand and Infield areas; this is to say 89% of the new sanitary load will be applied to the existing Grandstand sanitary system, and 5.5% will be added to the North and South Infield sanitary systems each (11% total). A table summarizing the results of each of the above described scenarios is provided as in Appendix A.

An analysis of the results indicates that though the overall existing sanitary system has sufficient capacity, specific areas of the existing drainage system are not capable of supporting the additional imposed loads. Put simply, the areas of the sanitary drainage system with excess capacity are not located in an area where this capacity is capable of being used.

It is also important to note that this analysis excludes the drainage load imposed by other sanitary load sources such as kitchen or service areas.

4. Summary & Conclusions

1. Sanitary System

There is insufficient sanitary drainage capacity to support the increase in washroom fixtures beyond their current amount in the Grandstand area of the facility. The addition of washroom fixtures beyond the current amount would require substantial sanitary system upgrades including potential upsizing of sanitary mains or additional mains for the Grandstand area. There is residual sanitary drainage capacity for both the North and South Infield areas, but this is not located where the majority of the new capacity will be required.

Recognizing that the majority of the additional seating that would be added for the Olympics would be temporary, it is suggested that the most cost-effective solution is to provide temporary washroom facilities such as portable washroom trailers or portable toilets. The temporary washroom facilities would be equipped with on-board sanitary storage tanks such that no additional sanitary load would be imposed on the existing sanitary sewer system.

2. Domestic Water System

A pressure and flow test of the existing water supply must be performed in order to verify the exact capacity of the existing water service to the stadium. Based on the existing fixtures and the capacity estimate of 1,200 GPM, it is likely that the existing water service is sufficient for the additional demands in any expansion scenario. Temporary washroom facilities brought in for the Olympics would need to be complete with domestic water storage for hand washing and flushing purposes.

3. Storm Water System

The majority of the existing site is impervious in nature including the stadium and surrounding parking areas. The temporary seating brought in for the Olympics would be arranged on the already impervious areas, meaning that the existing rate of storm water run-off would not change substantially from its current amount; as such, the existing storm water system is deemed to be sufficient for the potential temporary seating expansion scenarios.

Appendix A: Expansion Scenario Sanitary Drainage Analysis

Scenario	Sanitary Load (FU)	Total Sanitary Load (FU)	Existing Facility Sanitary Capacity (FU)	Facility Residual Capacity (FU)	Grandstand Portion of Total Sanitary Load (FU)	Grandstand Sanitary Capacity (FU)	Grandstand Residual Capacity (FU)	North Infield Portion of Total Sanitary Load (FU)	North Infield Sanitary Capacity (FU)	North Infield Residual Capacity (FU)	South Infield Portion of Total Sanitary Load (FU)	South Infield Sanitary Capacity (FU)	South Infield Residual Capacity (FU)
Current	2,490	2,490	8,685	6,195	2,216	2,350	134	137	4,410	4,273	137	1,925	1,788
1	1,565	4,055	8,685	4,630	3,609	2,350	-1,259	223	4,410	4,187	223	1,925	1,702
2	2,010	4,500	8,685	4,185	4,005	2,350	-1,655	248	4,410	4,163	248	1,925	1,678
3	2,935	5,425	8,685	3,260	4,828	2,350	-2,478	298	4,410	4,112	298	1,925	1,627
4	3,105	5,595	8,685	3,090	4,980	2,350	-2,630	308	4,410	4,102	308	1,925	1,617
5	4,820	7,310	8,685	1,375	6,506	2,350	-4,156	402	4,410	4,008	402	1,925	1,523

A negative number indicates that the capacity of the existing sanitary drainage system is exceeded

March 13, 2017

**DIALOG Design
300, 134 – 11 Avenue SE
Calgary, AB T2G 0X5**

Attention: Rob Adamson and Doug Cinnamon

**Re: CBEC – Stampede Grandstand Potential Opening and Closing Ceremony Venue (R1.0)
Designcore Project # 17038**

Please find attached our report outlining the electrical and telecommunications capacity for the Stampede Grandstand Facility located on Stampede Park. Our report will outline the current electrical capacity as well as outline some of the upgrades that will be required to utilize the facility for the potential Opening and Closing Ceremony Venue.

If you have any questions, please do not hesitate to contact me directly at (403) 269-2125.

Sincerely,



Rick Robertson, P.Eng. LEED®AP
Principal
Designcore Engineering Ltd.

TABLE OF CONTENTS

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2.2.	Power Capacity Upgrades	4
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2.5.	Lighting System Upgrades.....	5
2.6.	Existing Communications Infrastructure	5
2.7.	Communication Infrastructure Upgrades	5

ATTACHMENTS:

E1.1	EXISTING SITE POWER – GRANDSTAND (NORTH)
E1.2	EXISTING SITE POWER – GRANDSTAND (SOUTH)
E1.3	EXISTING SITE POWER – GRANDSTAND (NORTH)
E1.4	EXISTING SITE POWER – GRANDSTAND (SOUTH)
E2.1	EXISTING SITE COMMUNICATIONS (NORTH)
E2.2	EXISTING SITE COMMUNICATIONS (SOUTH)
E3.1	GRANDSTAND FEEDER SINGLE LINE
E3.2	GRANDSTAND EXISTING SINGLE LINE
E3.3	STAMPEDE PARK 25 kV & 5kV SUBSTATION
E4.1	STAMPEDE PARK EXISTING COMMUNICATIONS RISER

1.0 Introduction

Designcore Engineering Ltd. has been retained to review the existing electrical, lighting and telecommunications systems and to evaluate the ability to upgrade with respect to hosting the Opening and Closing Ceremonies for the Winter Olympics at the Stampede Grandstand. Designcore has performed an on-site review of the existing systems and upgrade potential of the following: power capacity, power redundancy, lighting systems and communications infrastructure including fibre services to the building. Attached to this report are a series of sketches indicating existing power and communications infrastructure.

2.0 Stampede Grandstand

2.1. Existing Power Capacities

Substation

The Calgary Exhibition & Stampede (CE&S) substation is supplied by two (2) 25kV feeders from Enmax Substations which operate in a Preferred-Alternate arrangement with CE&S fail-over auto-transfer capability. The two feeders have the capability of being fed from two different substations

Each feeder, Preferred and Alternate, support other utility customers. The utility, Enmax, has been contacted for further information, however when asked what the capacity for the Stampede feeder is, both Preferred and Alternate, they replied with "This information is not available to customers".

We would like to recommend a meeting between the committee co-chairs and senior personnel at Enmax take place and see if this information could be made available.

Three (3) 25 kV–4.16 kV 14 MVA rated power CE&S transformers are installed which feed sections of a 5 kV switchgear line-up. Each section of 5 kV switchgear is rated for 2,000 amps at 4,160 Volts 3-phase. Each section of switchgear has a tie breaker connecting it to the section adjacent to it. These tie breakers are automatic and will close as soon as the main feeder breaker opens in the event of a failure. The entire system is designed for an N+1 configuration with a total of 28 MVA available with one redundant 14 MVA transformer.

Grandstand

The existing electrical service for the Grandstand is sourced at the Stampede Substation. The Grandstand is fed in a ring configuration from two separate sections of 5 kV switchgear which provides a fully redundant electrical supply.

The existing electrical service for the Grandstand is comprised of two (2) redundant 480 volt 3-phase services fed from individual 1,000 kVA transformers. The service size to the building is 1,600 amps at 277/480 Volt 3-phase. The main board is a double ended 1,600A switchboard utilizing a manual tie breaker. The primary of the transformers is fed from two (2) redundant 5 kV, 400 amp feeders from the substation. These services also support the infield structure with a 750 kVA transformer.

This system allows for 3.0 MVA of redundant power or 6.0 MVA of total non-redundant power.

2.2. Power Capacity Upgrades

Substation

The CE&S substation has the capacity to accommodate the additional requirements for the Opening / Closing Ceremonies however the available power capacity may limit Stampede Park from hosting multiple events simultaneously (i.e. the International Broadcasting Centre and the Opening or Closing Ceremonies) while providing the 100% redundancy.

There will be a requirement to take a holistic view of the type and timing of the activities that will occur on Stampede Park. This report focuses on the Grandstand Building and the requirements for these facilities only.

Grandstand

The 5 kV distribution system has the capacity to be upgraded to allow for the projected 10 MVA of power required at the Grandstand.

Stampede Park Infrastructure

One area of concern is the existing underground duct bank system which run from the substation at the north end of the park to the Grandstand located at the south end of the park. There would be additional underground ducts required to accommodate the new feeders to increase the capacity to the Grandstand. Along with the additional underground ducts there would be a requirement for alterations to existing underground vaults or the installation of new underground vaults that would tie into the existing underground duct bank network.

2.3. Necessary Upgrades to Accommodate Backup Power Requirements

The requirements for a redundant on-site generation system can be accommodated at the Grandstand. There is sufficient space in the infield to locate any generators that are required.

To accomplish this, there will need to be temporary power cables installed to tie in the backup system to the main systems.

The most effective way to accomplish this interconnect will be to have the generators at 5 kV and connect to the 5 kV infrastructure. The connection from the generators located in the Infield to the Grandstand would be through the underground duct bank system. All synchronizing equipment, etc. will be part of the temporary generation system.

2.4. Existing Lighting System

The existing lighting system for the area being considered for the actual ceremonies is currently designed and installed for horse racing. This includes lighting from the Grandstand 5th level onto the track area. The lighting is accomplished with metal halide sports floodlighting. The light levels are approximately 200 – 300 lux. This lighting is however from one side only. There is no lighting from the east side (the infield side) to the track.

The outline of requirements lists a lighting level of 2000 lux and to be from a minimum of 3 sides.

2.5. Lighting System Upgrades

A new lighting system will be required to accommodate the lighting requirements for broadcasting. The new system would be an LED source. This would include lighting from the Grandstand and the infield bleachers roof as well as from both the south and north ends of the area. The infield luminaires as well as the north and south luminaires would be temporary in nature.

It would be recommended to upgrade the existing lighting systems from metal halide to LED to ensure that lighting would immediately be available should the unlikely event a momentary interruption in power occurs. Metal halide luminaires require 5 to 10 minutes to cool down and re-strike following a power interruption while LED luminaires are instant on (reference Super Bowl XLVII in New Orleans where game play was interrupted due to metal halide lights re-strike time following a power interruption at the stadium).

2.6. Existing Communications Infrastructure

The Grandstand is currently supported with 216 single mode and 24 multimode strand fibre from the main Park demarcation room in the existing BMO Centre. Currently, during the Stampede Rodeo and Chuckwagon races, some of the TV feeds are supported by this infrastructure. Some of the TV feeds are satellite feeds.

2.7. Communication Infrastructure Upgrades

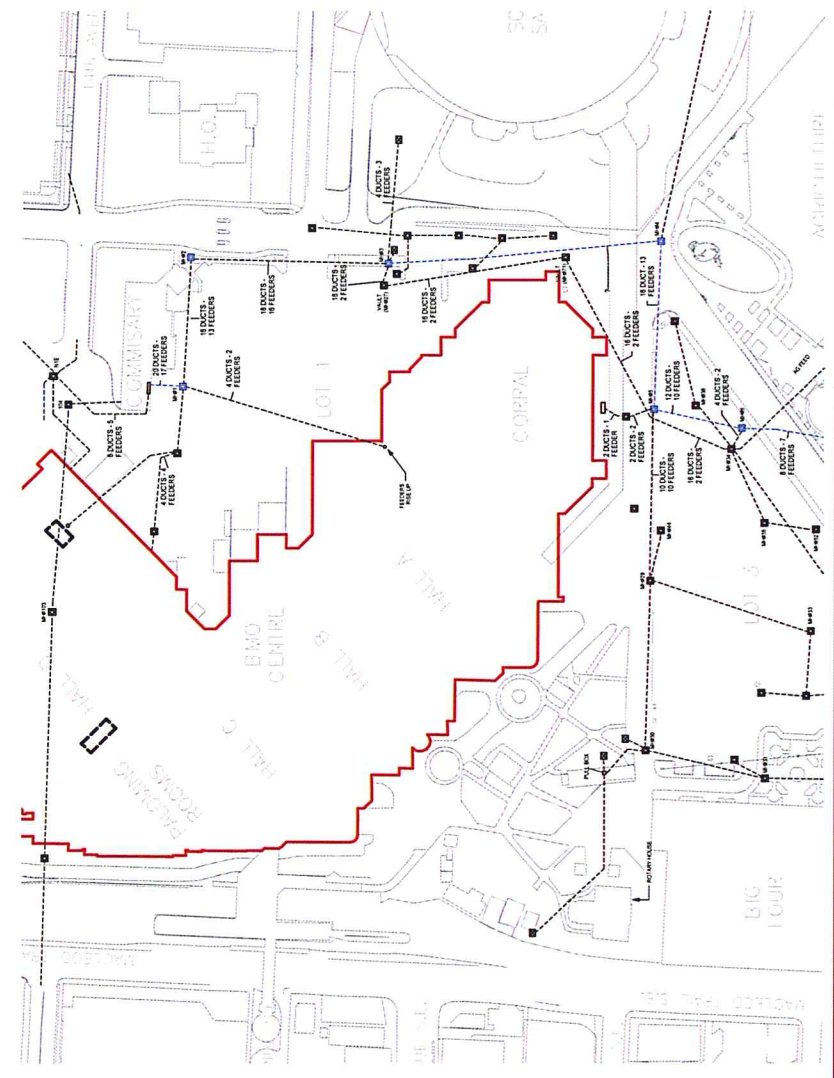
An area of concern is the existing underground duct bank system which run from park demarcation room at the BMO Centre to the Grandstand. There would be additional underground ducts required in certain areas to accommodate the new fibre. Along with the additional underground ducts there would be a requirement for alterations to existing underground vaults or the installation of new underground vaults that would tie into the existing underground duct bank network.

END OF REPORT



GENERAL NOTES:
A) BLUE DEMOTES UNDERGROUND DUCTBANK PATH OF GRANDSTAND FEEDER

DESIGNCORE
CONSULTANTS



REFER TO DRAWING E1.2 FOR CONTINUATION

1 EXISTING SITE POWER - GRANDSTAND FEEDER (NORTH) (COLOUR)
Scale: 1:1000

OLYMPIC BID
EXPLORATION
STAMPEDE
GRANDSTAND

EXISTING SITE POWER
- GRANDSTAND
(NORTH) (COLOUR)

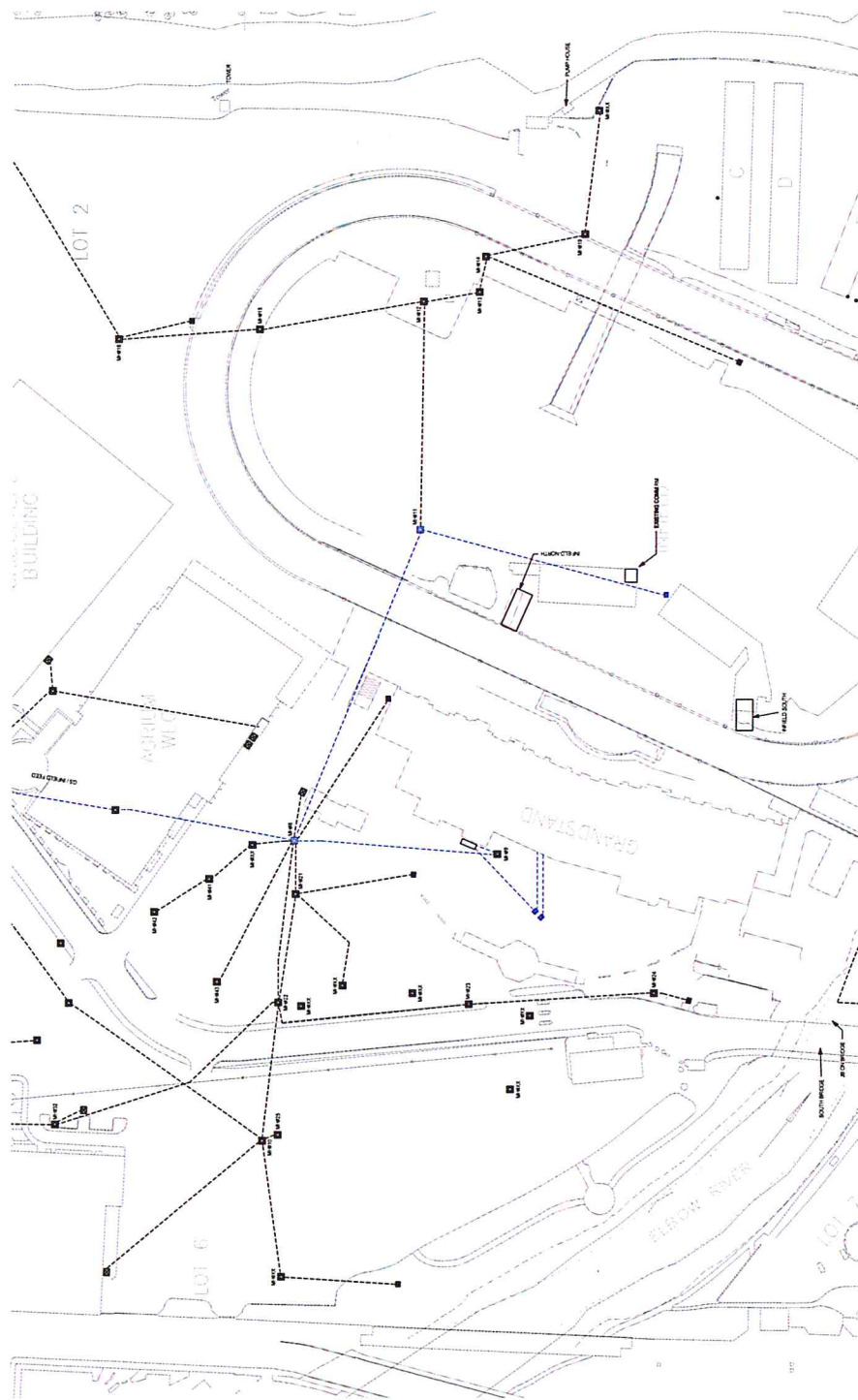
DATE	2017/02/23
SCALE	AS SHOWN
PROJECT	1028
DESIGNER	DESIGNCORE
ENGINEER	DESIGNCORE
DATE	2017/02/23

E1.1

8/11/2017 10:00 AM



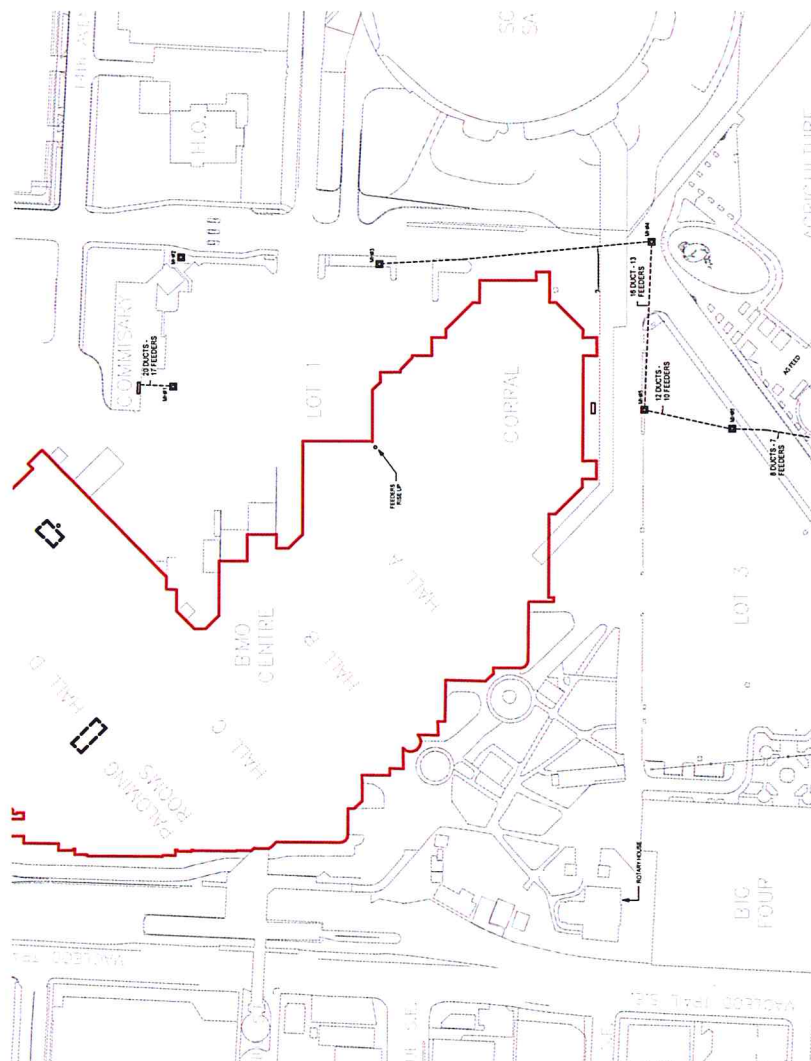
REFER TO DRAWING E1.1 FOR CONTINUATION





GENERAL NOTES:

A) PLAN INDICATES ONLY UNDERGROUND DUCTBANKS WHICH INCLUDES GRANDSTAND FEEDER



REFER TO DRAWING E1.4 FOR CONTINUATION

1 EXISTING SITE POWER - GRANDSTAND FEEDER (NORTH)

STUDIES

809

1

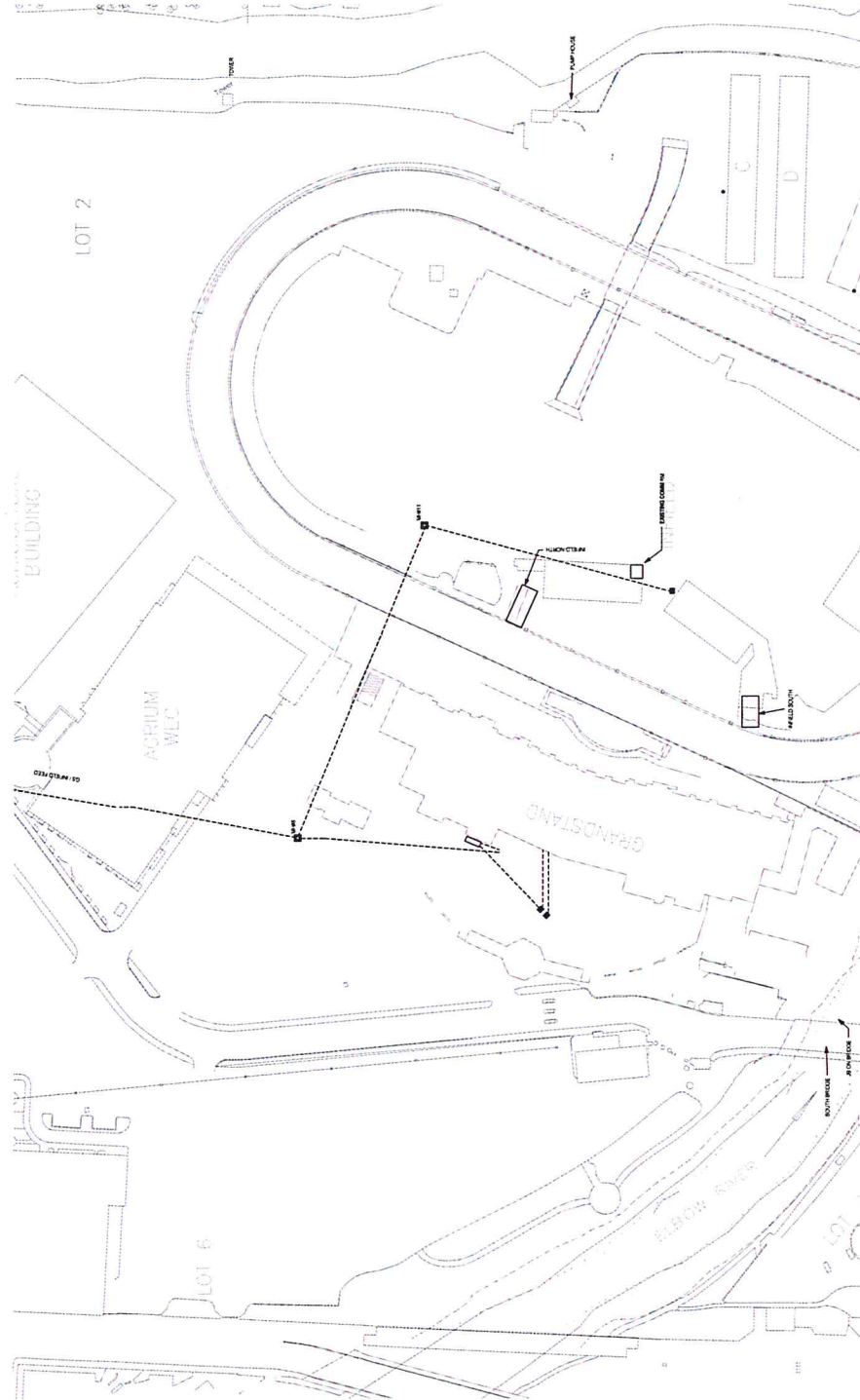
OLYMPIC BID
EXPLORATION
STAMPEDE
GRANDSTAND

STING SITE POWER
- GRANDSTAND
(NORTH)

DESIGNED BY	NR	DATE	2011.02.23
DESIGNED BY	RR	SCALE	AS SHOWN
ENGINEER	RR	PROJECT #	17208
DRAWING NUMBER			

E1.3

DATE OF ENTRY 27/5/1996



[illegible]

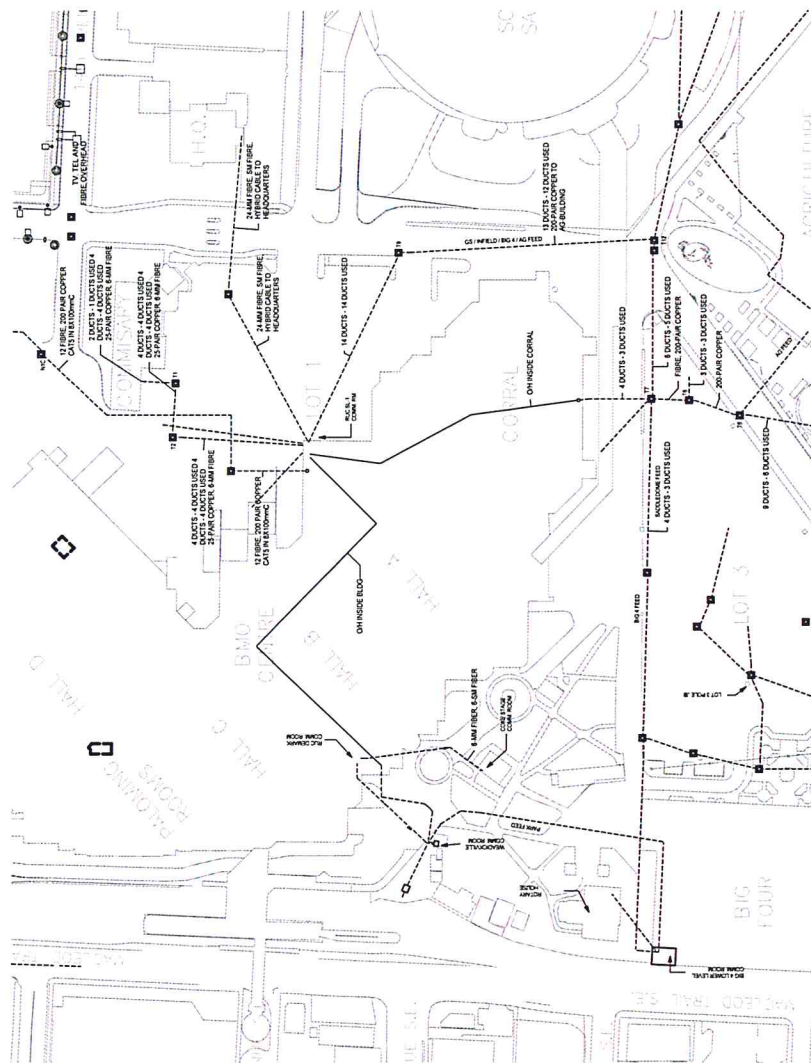
OLYMPIC BID
EXPLORATION
STAMPEDE
GRANDSTAND

EXISTING SITE
COMMUNICATION
(NORTH)

DRAWN BY	NR	DATE	2017.02.23
DESIGNED BY	RR	SCALE	AS SHOWN
ENGINEER	RR	PROJECT #	1728
DRAWING NUMBER			

E2.1

SHEET SIZE: ARCH D (36" x 30")



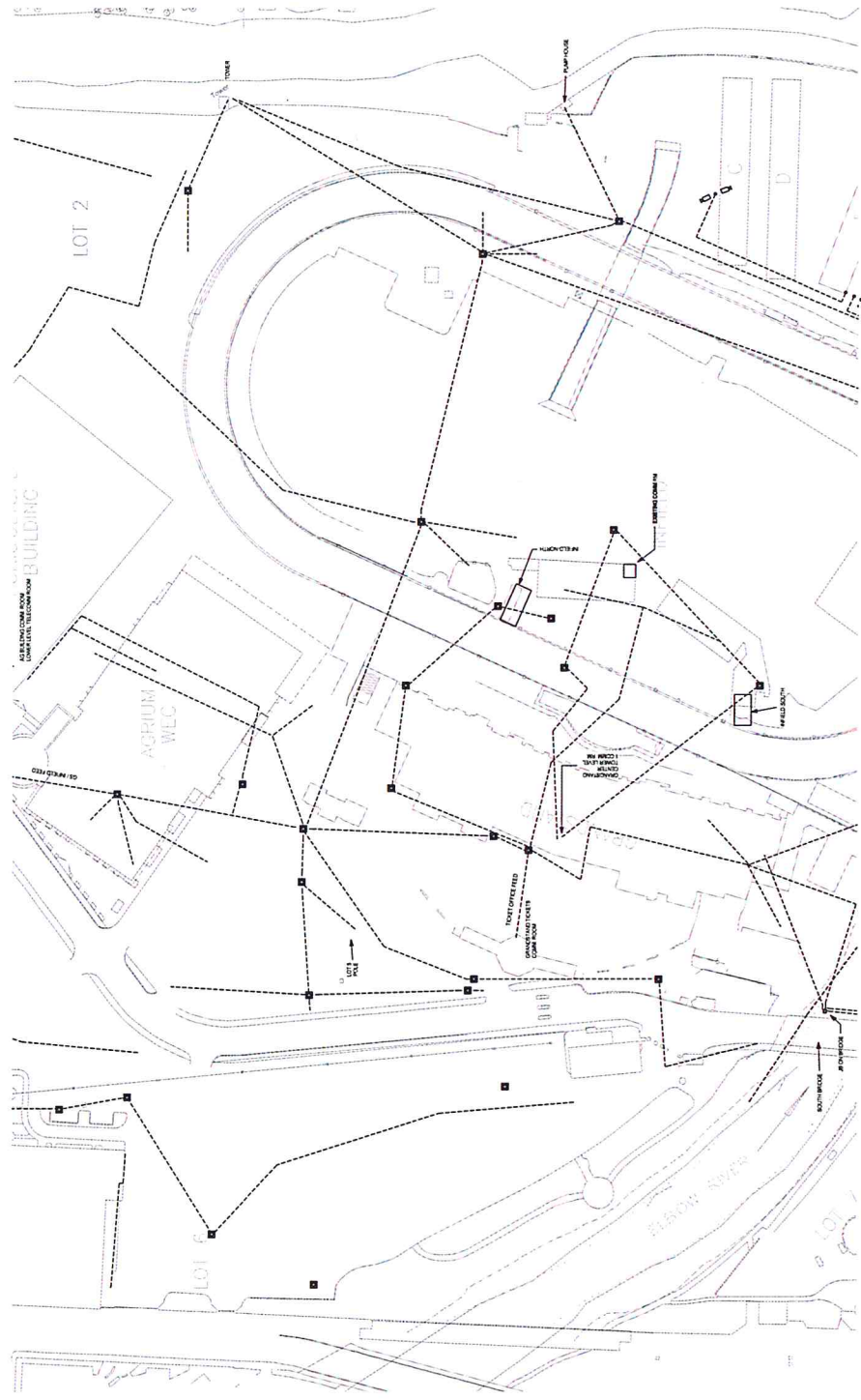
REFER TO DRAWING E2.2 FOR CONTINUATION

1 EXISTING SITE COMMUNICATION (NORTH)

STAINLESS



REFER TO DRAWING E2.1 FOR CONTINUATION



1 EXISTING SITE COMMUNICATIONS (SOUTH)
Scale: 1" = 100'

DESIGNCORE
ARCHITECTURAL & ENGINEERING

Project No.
Date
Revisions
Issued For

Client
Design
Drawn
Checked
Reviewed
Approved

Project Title
Address

Drawing Title
Drawing No.

Project Name
Project No.

Project Location
Project Date

Project Status
Project Budget

Project Manager
Project Engineer

Project Architect
Project Designer

Project Engineer
Project Designer

Project Engineer
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Project Engineer
Project Designer

Project Engineer
Project Designer

Consultant

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www.designcoreinc.com

Stamp

Client

SINGLE LINE NOMENCLATURE LEGEND

DESIGNATION	DESCRIPTION
LB	LOAD BREAK
FLB	FUSED LOAD BREAK
CB	CIRCUIT BREAKER
TS	TRANSFORMER
MT	MAIN TRANSFORMATION BOARD
SB	SEPARATOR
BR	BREAKER
TC	TRANSITION CELL
CP	CONNECTING PLUG
EL	ELBOW
EP	EXTENSION PLUG
LS	LOCK STRAIGHT PLUG
LP	LOCK PLUG
SP	STRAIGHT PLUG
SR	STRAIGHT RECEPTACLE

SAV FEEDER SCHEDULE

FEEDER TAG	DESCRIPTION	FEEDER SIZE	ALUMINUM
1	MAIN TRANSFORMATION BOARD	1000A	1000A
2	TRANSFORMER	1000A	1000A
3	SEPARATOR	1000A	1000A
4	TRANSITION CELL	1000A	1000A
5	CONNECTING PLUG	1000A	1000A
6	ELBOW	1000A	1000A
7	EXTENSION PLUG	1000A	1000A
8	LOCK STRAIGHT PLUG	1000A	1000A
9	LOCK PLUG	1000A	1000A
10	STRAIGHT PLUG	1000A	1000A
11	STRAIGHT RECEPTACLE	1000A	1000A

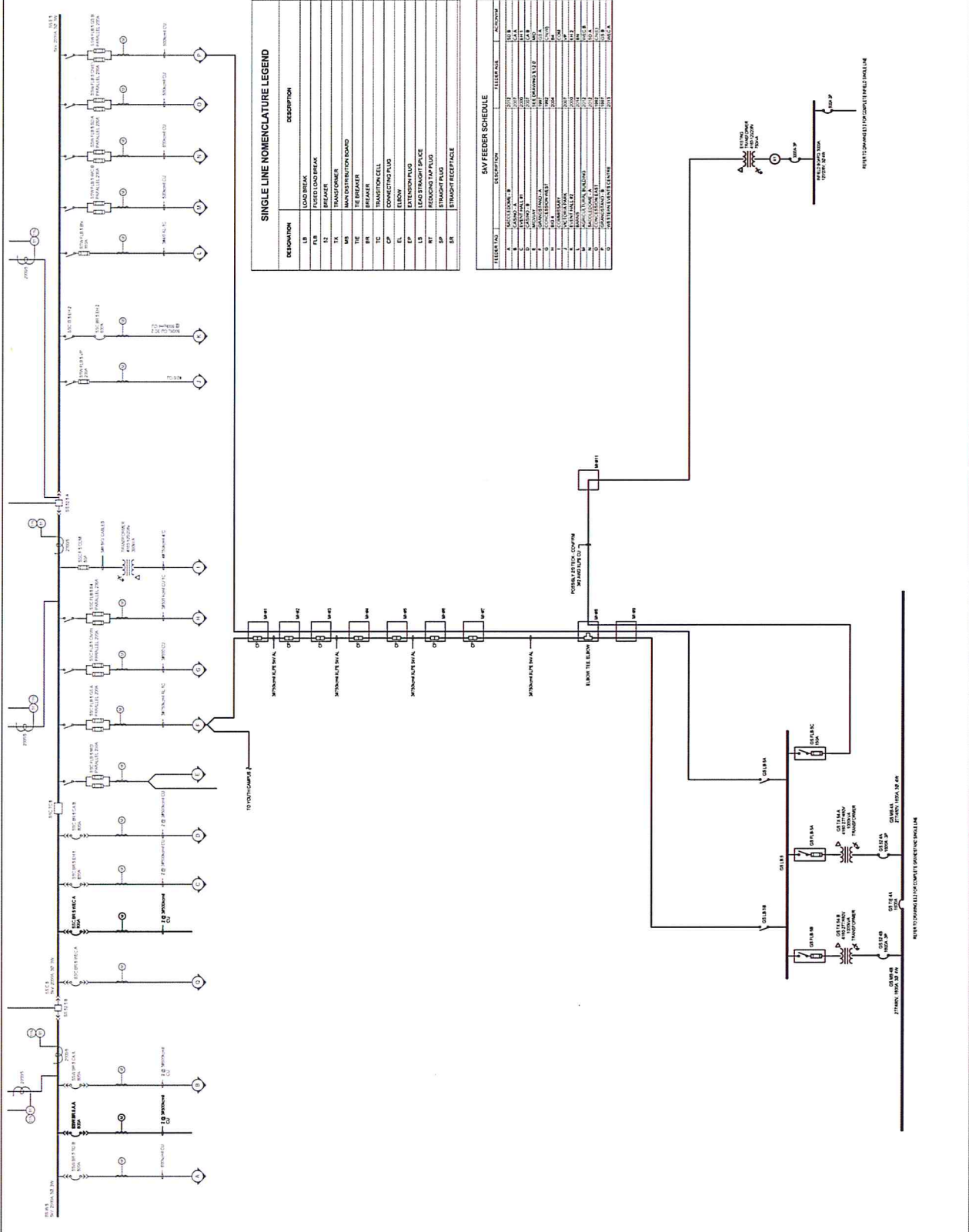
OLYMPIC BID
EXPLORATION
STAMPEDE
GRANDSTAND

GRANDSTAND FEEDER
SINGLE LINE

DRAWN BY	VER	DATE
DESIGNED BY	SCALE	2017-02-23
ENGINEER	PROJECT #	AS BOWH
DATE	ISSUE	1/2018

E3.1

REVISIONS



No	Description	Date
Revisions		

Issued For	Date

Period For	Date
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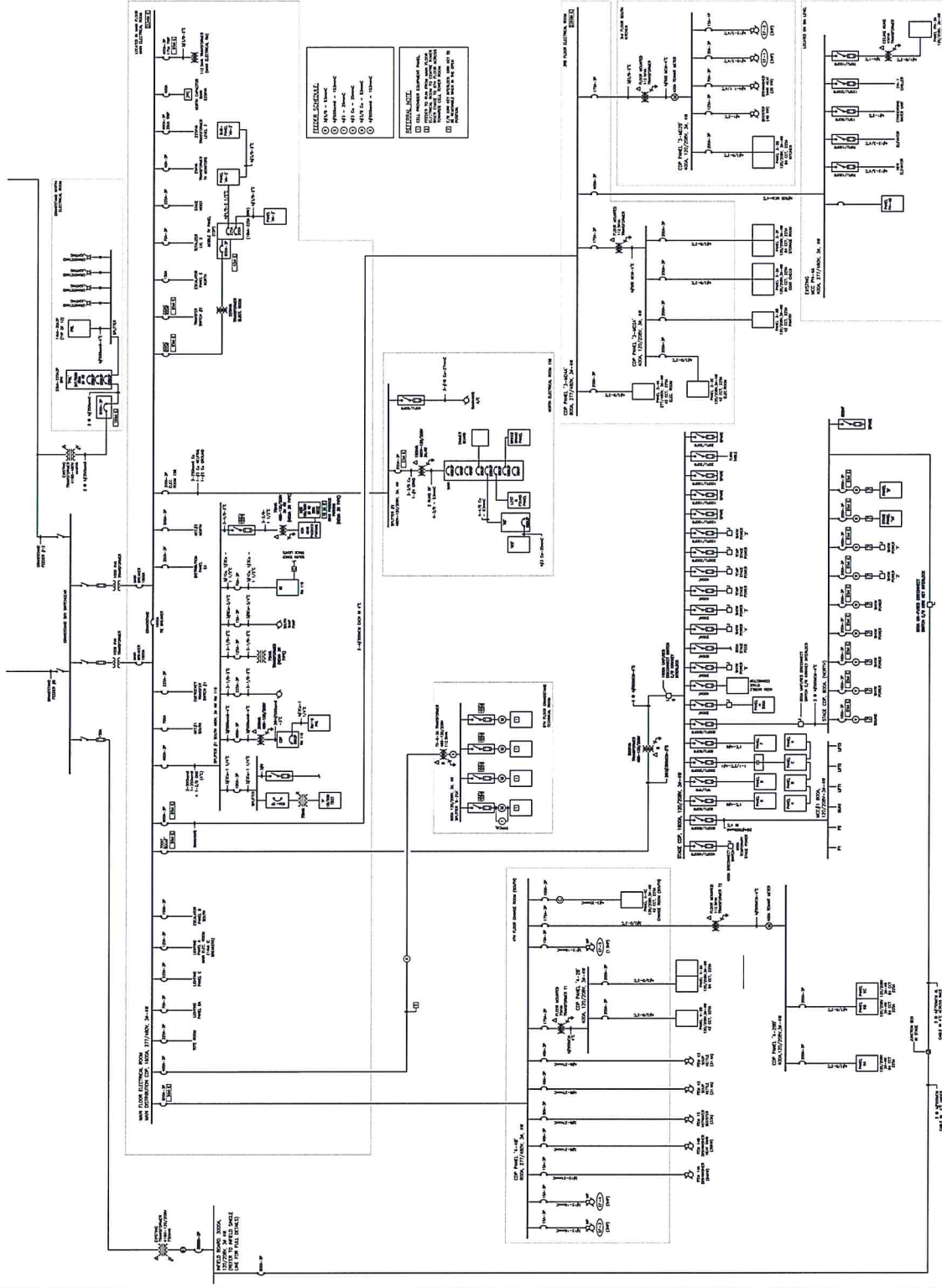
OLYMPIC BID
EXPLORATION
STAMPEDE
GRANDSTAND

Drawing Title

DRAWN BY	NR	DATE	11/03/2017
DESIGNED BY	RR	SCALE	AS SHOWN
ENGINEER	RR	PROJECT #	17038
DRAWING NUMBER			

E3.2

JOHN 1761306



[illegible]

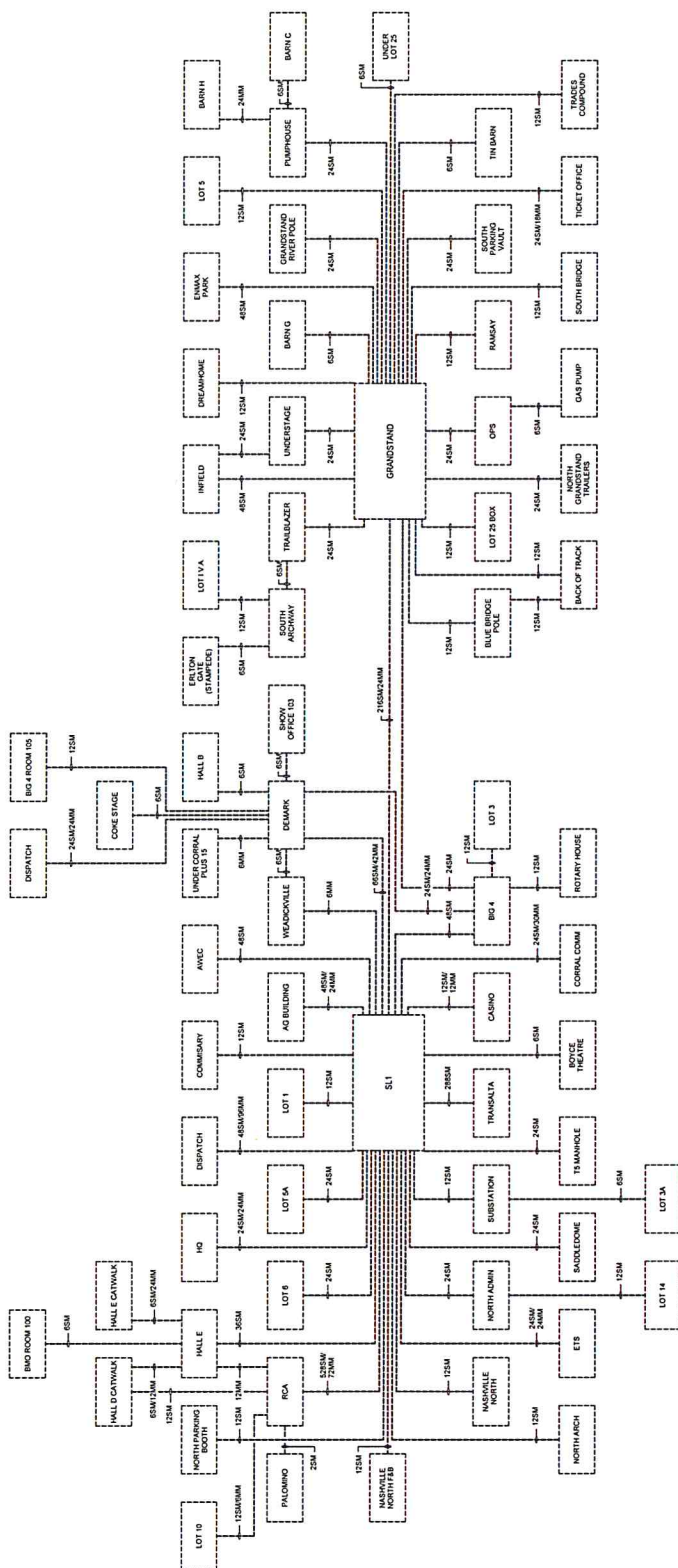
OLYMPIC BID
EXPLORATION
STAMPEDE
GRANDSTAND

STAMPEDE PARK
EXISTING
COMMUNICATIONS
RISER

DRAWN BY	Author	DATE	2011.02.23
DESIGNED BY	Designer	SCALE	AS SHOWN
ENGINEER	Approver	PROJECT #	17208
DRAWING NUMBER			E4.1

E4.1

CALCULATED AS FOLLOWS:





CBEC Study – Stampede Grandstand Calgary, Alberta

Class 5 Cost Estimate (R1)

Prepared for:

DIALOG

300, 134 - 11th Avenue SE

Calgary, AB, T2G 0X5

Phone: 403.245.5501

Prepared by:

ALTUS GROUP LIMITED

Suite 310, 2020-4th Street SW

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Issued: March 17, 2017

Revised: March 24, 2017

Job No.: 13130.100500.008

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March 24, 2017

Job No. 13130.100500.008

Dialog
300, 134 - 11th Avenue SE
Calgary, AB T2G 0X5
Phone: 403.245.5501

Attention: Mr. Douglas Cinnamon, Architect, AAA, AIBC, Principal

Re: CBEC Study – Stampede Grandstand, Calgary, AB - Class 5 Cost Estimate (R1)

Dear Douglas,

We submit for your review our Class 5 Estimate (R1), in accordance with the terms of our engagement.

The estimate includes all direct and indirect construction costs, subject to certain exclusions, and general conditions, as well as, contractor's overheads and profit. The estimate also addresses the following contingencies and allowance values.

- A design and pricing contingency has been **included** in the estimate.
- Escalation allowance of construction has been **excluded** in the estimate.
- Construction (change order) allowance has been **included** in the estimate.
- An allowance for "soft costs" has been **included** in the estimate.

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Should you have any questions related to this report please do not hesitate to contact the undersigned at the address listed below.

Yours truly,

ALTUS GROUP LIMITED



Per: Ven R Guerra, MRICS, PQS
Senior Cost Consultant



Per: David Crane, MRICS, PQS
Senior Director

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Appendices

Appendix A – Budget Allocation Summary

Appendix B – Drawings / Documents List

1 Introduction

1.1 General Information

This Class 5 cost estimate is intended to provide a realistic budget of the expansion and/or renovation of the existing 15,300-seat grandstand in order to accommodate the opening and closing ceremonies for the proposed Calgary bid on the 2026 Winter Olympics. The estimate reflects our opinion as to the fair market value for the construction of this proposed project and is not intended to predict the lowest bid.

The details outlining inclusions and assumptions are described within section 6 of this report. This report includes all direct and indirect construction costs with the following exclusions as noted in section 1.2 below.

1.2 Exclusions

The following items are excluded in this report:

- Land acquisition, survey and associated costs
- Financing cost
- Phased construction
- Soil remediation and/or removal
- Any work associated with asbestos removal and maintained of contaminated asbestos work area, if required
- Upgrade / renovation works of existing areas other than those identified in the design information
- Offsite work outside proposed site area
- Any scope, program and overlay requirements outside of Dialog's identified scope
- Escalation allowance
- Goods & Services Tax (GST)
- Additional elevator(s) or works to existing
- Big Air
- Façade to exposed back of temporary tiered seating
- Temporary washrooms
- New AV & Clock System
- Site services to temporary bus staging area, part of overlay budget
- Emergency generator
- Site services upgrade to Options 1, 2 & 3

1.3 Estimate Accuracy

This Class 5 estimate was prepared based on ongoing studies with an expected accuracy range of -50% to +100%, as per the City of Calgary Corporate Project Management Framework Estimation and Contingency Standard V1.2 document.

2 Project Details

2.1 General Information

From the information provided in appendix A, we have measured quantities where possible and applied unit rates considered competitive for a project of this nature, based on historical and current cost data for this type of project. Where design information was limited, we have had discussions with the relevant design disciplines and/or made assumptions based on our experience with projects of a similar type, size, and standard of quality.

2.2 Location

The location cost base for this estimate is the Calgary, Alberta.

2.3 Measurement and Pricing

The estimate has been prepared using generally accepted principles as to format, method of measurement and pricing. Quantities and project statistics have been calculated in general accordance with the Canadian Institute of Quantity Surveyors' Method of Measurement.

The unit rates within our report are considered competitive and are based on our experience with similar projects, and/or quotes provided by subcontractors as noted. Pricing shown reflects probable construction costs obtainable in Calgary, Alberta, on Q1, 2017. Where applicable, unit rates include labour, material, equipment, and subcontractor's overheads and profit. In instances where design information was limited, we have made reasonable assumptions based on our experience on projects of a similar nature and discussions with the design team when possible.

2.4 Taxes

The estimate excludes the Goods and Services Tax (GST).

2.5 General Requirements and Fees

The General Requirements and Fee included within the estimate for the General Contractor are calculated as a percentage of the hard costs. The General Requirements are based on our assumptions of the anticipated construction approach and construction schedule for the project. The general requirements percentage includes the cost associated with bonding and insurance. Development and building permit fees are included within the soft cost allowance.

2 Project Details (continued)

2.6 Procurement Methodology

We have assumed that the project will be procured with a Stipulated Lump Sum approach under a CCDC 2 standard form of contract. We have assumed a minimum of five General Contractor bids and at least three major subtrade/supplier bids received for all trade categories to establish competitive bidding and tender results. The estimate is a determination of fair market pricing and not a prediction of lowest bid in any trade category. Please note that should the above minimum bidding conditions not occur on this project, construction bids received could vary significantly from the estimated costs included within this report.

2.7 Schedule / Phasing

This report is based on the project being completed and/or bid as one complete project. The rates used in this report are based on current dollars and any allowance for escalation beyond the date of this report will be included as an escalation contingency. The unit rates in our estimate are based on construction activities occurring during standard business working hours and proceeding within a non-accelerated schedule.

3 Contingencies

3.1 General

The effective use of contingencies in construction cost planning requires a clear understanding of estimating risks in both a project specific and general construction market sense. The appropriate level of contingency is dependent on the amount of information available, knowledge of the design teams' methods and philosophy, the timing of the estimate preparation relative to the project design and construction schedule, and the anticipated complexity of the construction work.

3.2 Design and Pricing

A 10% design and pricing contingency has been included in the hard cost estimate. This contingency covers the design & pricing evolution during the remain design stages of the project, please note this contingency is not intended to cover additional scope or additional functional program requirements.

3.3 Escalation

Escalation allowance has been excluded from this estimate. We recommend that the client carry a separate allowance for this item in their overall project budget.

3.4 Construction Contingency (Post Contract)

A 5% construction contingency has been included in the hard cost estimate. The intention of this contingency is to cover post contract change orders.

3.5 Soft Cost Allowance

A 23% soft cost allowance has been included in this estimate as a percentage of the hard construction cost. This include design fee (12%), cost consultancy/independent certifier (0.4%), city administration/PM fees (3%), legal fees (0.5%), permits (1.1%), third party material testing (1%), moveable FF&E (2%) and program contingency (3%).

4 General Statement of Liability

4.1 Probable Costs and Ongoing Cost Control

Altus Group Limited does not guarantee that tenders or actual construction costs will not vary from this estimate. Acute market conditions, proprietary specifications, or competition/collaboration among contractors may cause tenders to vary from reasonable estimates based on normal and abnormal competitive conditions.

Altus Group Limited recommends the owner and/or design team review the cost estimate report including line item descriptions, unit prices, allowances, assumptions, exclusions, and contingencies to ensure the appropriate design intent has been accurately captured within the report.

It should be noted that the cost consultants are not qualified to confirm that construction work and design is in accordance with approved plans and specifications.

5 Executive Project Cost Summary

Component		Option 1 40,000 Seats (\$)	Option 2 40,000 Seats (\$)	Option 3 55,000 Seats (\$)	Option 4 40,000 Seats (\$)	Option 5 55,000 Seats (\$)
A. Hard Construction Cost						
Temporary Works						
Temporary Seating & Field Stage		\$14,594,840	\$10,298,120	\$16,020,250	\$10,878,330	\$14,543,130
Permanent Works						
New Infield Suites		N/A	\$21,361,500	\$21,361,500	\$21,361,500	\$21,361,500
New Seats (permanent)		N/A	\$13,476,110	\$10,797,040	\$25,643,330	\$25,615,140
New Pedestrian Tunnel		\$773,960	\$773,960	\$773,960	\$773,960	\$773,960
New Functional Spaces (concourse addition)						
Base Build		N/A	N/A	N/A	\$35,055,160	\$35,055,160
Fitout		N/A	N/A	N/A	\$5,627,420	\$5,627,420
Net Building Cost		\$15,368,800	\$45,909,690	\$48,952,750	\$99,339,700	\$102,976,310
Phasing		Excluded	Excluded	Excluded	Excluded	Excluded
General Requirements	10.0%	\$1,536,880	\$4,591,000	\$4,895,000	\$9,934,000	\$10,298,000
Fees	3.0%	\$507,170	\$1,515,000	\$1,616,000	\$3,279,000	\$3,399,000
Total Construction Cost (Including General Requirements and Fees)		\$17,412,850	\$52,015,690	\$55,463,750	\$112,552,700	\$116,673,310
Design and Pricing Contingency	10.0%	\$1,741,000	\$5,202,000	\$5,546,000	\$11,255,000	\$11,667,000
Escalation Contingency		Excluded	Excluded	Excluded	Excluded	Excluded
Construction (Change Order) Contingency	5.0%	\$958,000	\$2,861,000	\$3,050,000	\$6,190,000	\$6,417,000
TOTAL HARD CONSTRUCTION COST (Including Allowances)		\$20,111,850	\$60,078,690	\$64,059,750	\$129,997,700	\$134,757,310
Hard cost/m2		\$738 /m2	\$1,758 /m2	\$1,698 /m2	\$2,676 /m2	\$2,589 /m2
B. Soft Cost						
Soft Costs including Movable FF&E	23.0%	\$4,626,000	\$13,818,000	\$14,734,000	\$29,899,000	\$30,994,000
TOTAL SOFT COST		\$4,626,000	\$13,818,000	\$14,734,000	\$29,899,000	\$30,994,000
Soft cost/m2		\$170 /m2	\$404 /m2	\$390 /m2	\$615 /m2	\$595 /m2
Goods Services Tax (GST)		Excluded	Excluded	Excluded	Excluded	Excluded
TOTAL PROGRAM COST (HARD & SOFT) (Excluding GST)		\$24,737,850	\$73,896,690	\$78,793,750	\$159,896,700	\$165,751,310
GFA (m2)		27,268 m2	34,166 m2	37,734 m2	48,584 m2	52,058 m2
Rate/m2 (based on Total Project Cost)		\$ 907.21 /m2	\$ 2,162.86 /m2	\$ 2,088.13 /m2	\$ 3,291.13 /m2	\$ 3,183.96 /m2

- 25,300 temporary seats

- 15,000 temporary seats

- 32,400 temporary seats

- 15,000 temporary seats

- 28,200 temporary seats

- 12,300 new permanent seats

- 9,500 new permanent seats

- 13,000 new permanent seats

- 13,000 new permanent seats

- new infield suites

- new infield suites

- new infield suites

- new infield suites

- concourse addition

- concourse addition

- new west stand canopy

- new west stand canopy

Appendix A

Budget Allocation Summary

Class 5 Cost Estimate (R1)



<u>Component</u>	<u>Revitalization</u>	<u>Estimated Cost \$</u> <u>Legacy Upgrades</u>	<u>Olympic Upgrades</u>	<u>TOTAL</u>
1. Temporary Works				
Temporary seating c/w re-instatement	~	~	10,622,690	10,622,690
Temporary stage c/w re-instatement	~	~	3,972,150	3,972,150
Sub-total	~	~	14,594,840	14,594,840
2. Permanent Works				
New Infield Suites - not required	~	~	~	~
New Seats (permanent) - not required	~	~	~	~
New Pedestrian Tunnel	~	773,960	~	773,960
Sub-total	~	773,960	~	773,960
Sub-total All Components	~	773,960	14,594,840	15,368,800
General requirements and Fee	~	102,940	1,941,110	2,044,050
Sub-total	~	876,900	16,535,950	17,412,850

CBEC Stampede Grandstand Venue - Opening / Closing Ceremony
Class 5 Estimate of Construction Cost (R1)



Design and Pricing Contingency (10%)	~	88,000	1,654,000	1,742,000
Post-contract Contingency (5%)	~	48,000	909,000	957,000
Escalation (excluded)	~	~	~	~
Construction Total - Excluding G.S.T.	~	1,012,900	19,098,950	20,111,850
Soft Costs (23% of construction costs)	~	233,000	4,393,000	4,626,000
PROJECT TOTAL	~	1,245,900	23,491,950	24,737,850

Option Differentiators:

North stand temporary seats @ 10,000no.
South stand temporary seats @ 5,300no.
East upper deck stand temporary seats @ 10,000no.

<u>Component</u>	<u>Revitalization</u>	<u>Estimated Cost \$</u>		<u>TOTAL</u>
		<u>Legacy Upgrades</u>	<u>Olympic Upgrades</u>	
1. Temporary Works				
Temporary seating c/w re-instatement	~	~	6,325,970	6,325,970
Temporary stage c/w re-instatement	~	~	3,972,150	3,972,150
Sub-total	~	~	10,298,120	10,298,120
2. Permanent Works				
New Infield Suites	~	21,361,500	~	21,361,500
New Seats (permanent)	~	13,476,110	~	13,476,110
New Pedestrian Tunnel	~	773,960	~	773,960
Sub-total	~	35,611,570	~	35,611,570
Sub-total All Components	~	35,611,570	10,298,120	45,909,690
General requirements and Fee	~	4,736,000	1,370,000	6,106,000
Sub-total	~	40,347,570	11,668,120	52,015,690

CBEC Stampede Grandstand Venue - Opening / Closing Ceremony
Class 5 Estimate of Construction Cost (R1)



Design and Pricing Contingency (10%)	~	4,035,000	1,167,000	5,202,000
Post-contract Contingency (5%)	~	2,219,000	642,000	2,861,000
Escalation (excluded)	~	~	~	~
Construction Total - Excluding G.S.T.	~	46,601,570	13,477,120	60,078,690
Soft Costs (23% of construction costs)	~	10,718,000	3,100,000	13,818,000
PROJECT TOTAL	~	57,319,570	16,577,120	73,896,690

Base Option Differentiators:

- North stand temporary seats @ 4,000no.
- South stand temporary seats @ 4,000no.
- East upper deck stand temporary seats @ 7,000no.
- New permanent seats to lower east stand @ 12,300no.
- New infield suites

<u>Component</u>	<u>Revitalization</u>	<u>Estimated Cost \$</u>		<u>TOTAL</u>
		<u>Legacy Upgrades</u>	<u>Olympic Upgrades</u>	
1. Temporary Works				
Temporary seating c/w re-instatement	~	~	12,048,100	12,048,100
Temporary stage c/w re-instatement	~	~	3,972,150	3,972,150
Sub-total	~	~	16,020,250	16,020,250
2. Permanent Works				
New Infield Suites	~	21,361,500	~	21,361,500
New Seats (permanent)	~	10,797,040	~	10,797,040
New Pedestrian Tunnel	~	773,960	~	773,960
Sub-total	~	32,932,500	~	32,932,500
Sub-total All Components	~	32,932,500	16,020,250	48,952,750
General requirements and Fee	~	4,380,000	2,131,000	6,511,000
Sub-total	~	37,312,500	18,151,250	55,463,750

CBEC Stampede Grandstand Venue - Opening / Closing Ceremony
Class 5 Estimate of Construction Cost (R1)



Design and Pricing Contingency (10%)	~	3,731,000	1,815,000	5,546,000
Post-contract Contingency (5%)	~	2,052,000	998,000	3,050,000
Escalation (excluded)	~	~	~	~
Construction Total - Excluding G.S.T.	~	43,095,500	20,964,250	64,059,750
Soft Costs (23% of construction costs)	~	9,912,000	4,822,000	14,734,000
PROJECT TOTAL	~	53,007,500	25,786,250	78,793,750

Option Differentiators:

- North stand temporary seats @ 9,700no.
- South stand temporary seats @ 9,700no.
- East upper deck stand temporary seats @ 13,000no.
- New permanent seats to lower east stand @ 9,500no.
- New infield suites

<u>Component</u>	<u>Revitalization</u>	<u>Estimated Cost \$</u>		<u>TOTAL</u>
		<u>Legacy Upgrades</u>	<u>Olympic Upgrades</u>	
1. Temporary Works				
Temporary seating c/w re-instatement	~	~	6,906,180	6,906,180
Temporary stage c/w re-instatement	~	~	3,972,150	3,972,150
Sub-total	~	~	10,878,330	10,878,330
2. Permanent Works				
New Infield Suites	~	21,361,500	~	21,361,500
New Seats (permanent c/w new grandstand canopy)	~	25,643,330	~	25,643,330
New Pedestrian Tunnel	~	773,960	~	773,960
New Functional Spaces (concourse addition)	~	40,682,580	~	40,682,580
Sub-total	~	88,461,370	~	88,461,370
Sub-total All Components	~	88,461,370	10,878,330	99,339,700
General requirements and Fee	~	11,765,000	1,447,000	13,212,000
Sub-total	~	100,226,370	12,325,330	112,551,700

CBEC Stampede Grandstand Venue - Opening / Closing Ceremony
Class 5 Estimate of Construction Cost (R1)



Design and Pricing Contingency (10%)	~	10,023,000	1,233,000	11,256,000
Post-contract Contingency (5%)	~	5,512,000	678,000	6,190,000
Escalation (excluded)	~	~	~	~
Construction Total - Excluding G.S.T.	~	115,761,370	14,236,330	129,997,700
Soft Costs (23% of construction costs)	~	26,625,000	3,274,000	29,899,000
PROJECT TOTAL	~	142,386,370	17,510,330	159,896,700

Option Differentiators:

- North stand temporary seats @ 4,000no.
- South stand temporary seats @ 4,000no.
- East upper deck stand temporary seats @ 7,000no.
- New permanent seats to lower east stand @ 6,000no.
- New permanent seats to upper west stand @ 7,000no.
- New grandstand canopy to permanent upper west stand
- New functional spaces below new upper west stand
- New infield suites

<u>Component</u>	<u>Revitalization</u>	<u>Estimated Cost \$</u> <u>Legacy Upgrades</u>	<u>Olympic Upgrades</u>	<u>TOTAL</u>
1. Temporary Works				
Temporary seating c/w re-instatement	~	~	10,570,980	10,570,980
Temporary stage c/w re-instatement	~	~	3,972,150	3,972,150
Sub-total	~	~	14,543,130	14,543,130
2. Permanent Works				
New Infield Suites	~	21,361,500	~	21,361,500
New Seats (permanent c/w new grandstand canopy)	~	25,615,140	~	25,615,140
New Pedestrian Tunnel	~	773,960	~	773,960
New Functional Spaces (concourse addition)	~	40,682,580	~	40,682,580
Sub-total	~	88,433,180	~	88,433,180
Sub-total All Components	~	88,433,180	14,543,130	102,976,310
General requirements and Fee	~	11,762,000	1,934,000	13,696,000
Sub-total	~	100,195,180	16,477,130	116,672,310

CBEC Stampede Grandstand Venue - Opening / Closing Ceremony
Class 5 Estimate of Construction Cost (R1)



Design and Pricing Contingency (10%)	~	10,020,000	1,648,000	11,668,000
Post-contract Contingency (5%)	~	5,511,000	906,000	6,417,000
Escalation (excluded)	~	~	~	~
Construction Total - Excluding G.S.T.	~	115,726,180	19,031,130	134,757,310
Soft Costs (23% of construction costs)	~	26,617,000	4,377,000	30,994,000
PROJECT TOTAL	~	142,343,180	23,408,130	165,751,310

Option Differentiators:

- North stand temporary seats @ 9,100no.
- South stand temporary seats @ 9,100no.
- East upper deck stand temporary seats @ 10,000no.
- New permanent seats to lower east stand @ 6,000no.
- New permanent seats to upper west stand @ 7,000no.
- New grandstand canopy to permanent upper west stand
- New functional spaces below new upper west stand
- New infield suites

Appendix B

Drawings / Documents List

Appendix B - Drawings / Documents List

Architectural			
Provided By: Dialog Design			
Number	Name	Date Issued	Date Received
1.	CBEC Study Stampede Grandstand (for costing purposes)	March 9, 2017	March 9, 2017
2.	Additional Option (40,000 seater with no legacy)	March 23, 2017	March 23, 2017
3.	Various correspondence / emails	March 9 - 14, 2017	

Electrical			
Provided By: Designcore			
Number	Name	Date Issued	Date Received
1.	Electrical & Telecommunication Report	March 13, 2017	March 14, 2017

Structural			
Provided By: Entuitive			
Number	Name	Date Issued	Date Received
1.	Structural Report	March 9, 2017	March 14, 2017

Grandstand Washroom Fixture Counts

<div> <div></div> <div>OPTION 1</div> <div>40,000 Seats</div> </div>									
Major Occupancy	A-4 Stadia and Grandstands								ABC Table 3.1.2.1
Proposed New Seats	New Temporary Seats				New Permanent Seats				
	15000				12300				
Occupant Load	Men	Women	Universal*		Men	Women	Universal*		ABC Table 3.1.17.1
	7500	7500			6150	6150			
Fixtures required	Urinals	WC	WC	WC	Urinals	WC	WC	WC	
By code	28	15	84		24	12	71		
Recommended*	66	23	94	13	54	19	77	11	
Barrier-free stall required by code		5	9			4	8		ABC 3.8.2.3 (6) ABC 3.8.2.3 (7)
Barrier-free stall recommended*		14	14			12	12		
Notes: 3.8.2.3 (3) In a building in which water closets are required in accordance with Subsection 3.7.2., atleastone barrier-free water closet shall be provided in the entrance storey, unless a) a barrier-free path of travel is provided to barrier-free water closets elsewhere in the building, or b) The water closets required by Subsection 3.7.2.arefor dwelling units only. 3.8.2.3 (6) If more than one water closet is provided in a washroom, a barrier-free stall shall be provided for every 10stalls or part thereof. 3.8.2.3 (7) For temporary uses, such as outdoor fairs and festivals, a barrier-free stall hall be provided for every 10 stalls or part thereof. * Recommended washroom count based on washroom ratios per spectator of newer CFL stadiums. (Universal washrooms to be counted as part of the total requirements).									

Grandstand Washroom Fixture Counts

OPTION 2 55,000 Seats

Major Occupancy	A-4 Stadia and Grandstands							ABC Table 3.1.2.1
Proposed New Seats	New Temporary Seats				New Permanent Seats			
	32400				9500			
Occupant Load	Men	Women	Universal*		Men	Women	Universal*	ABC Table 3.1.17.1
	16200	16200			4750	4750		
Fixtures required	Urinals	WC	WC	WC	Urinals	WC	WC	WC
By code	58	28	171		20	9	57	
Recommended*	141	48	203	27	42	14	60	8
Barrier-free stall required by code		9	18			3	6	
Barrier-free stall recommended*		30	30			9	9	

Notes:

3.8.2.3 (3) In a building in which water closets are required in accordance with Subsection 3.7.2., atleastone barrier-free water closet shall be provided in the entrance storey, unless

a) a barrier-free path of travel is provided to barrier-free water closets elsewhere in the building, or

b) The water closets required by Subsection 3.7.2. are for dwelling units only.

3.8.2.3 (6) If more than one water closet is provided in a washroom, a barrier-free stall shall be provided for every 10 stalls or part thereof.

3.8.2.3 (7) For temporary uses, such as outdoor fairs and festivals, a barrier-free stall shall be provided for every 10 stalls or part thereof.

* Recommended washroom count based on washroom ratios per spectator of newer CFL stadiums. (Universal washrooms to be counted as part of the total requirements).

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Grandstand Washroom Fixture Counts

<div> <div></div> <div>OPTION 3</div> <div>40,000 Seats</div> </div>									
Major Occupancy	A-4 Stadia and Grandstands								ABC Table 3.1.2.1
Proposed New Seats	New Temporary Seats				New Permanent Seats				
	15000				13000				
Occupant Load	Men	Women	Universal*		Men	Women	Universal*		ABC Table 3.1.17.1
	7500	7500			6500	6500			
Fixtures required	Urinals	WC	WC	WC	Urinals	WC	WC	WC	
By code	28	15	84		26	12	74		
Recommended*	66	23	94	13	57	20	163	11	
Barrier-free stall required by code		5	9			4	8		ABC 3.8.2.3 (6) ABC 3.8.2.3 (7)
Barrier-free stall recommended*		14	14			12	12		
Notes: 3.8.2.3 (3) In a building in which water closets are required in accordance with Subsection 3.7.2., atleastone barrier-free water closet shall be provided in the entrance storey, unless a) a barrier-free path of travel is provided to barrier-free water closets elsewhere in the building, or b) The water closets required by Subsection 3.7.2.arefor dwelling units only. 3.8.2.3 (6) If more than one water closet is provided in a washroom, a barrier-free stall shall be provided for every 10stalls or part thereof. 3.8.2.3 (7) For temporary uses, such as outdoor fairs and festivals, a barrier-free stall hall be provided for every 10 stalls or part thereof. * Recommended washroom count based on washroom ratios per spectator of newer CFL stadiums. (Universal washrooms to be counted as part of the total requirements).									

Grandstand Washroom Fixture Counts

<div> <div>OPTION 4</div> <div>55,000 Seats</div> </div>									
Major Occupancy	A-4 Stadia and Grandstands								ABC Table 3.1.2.1
Proposed New Seats	New Temporary Seats				New Permanent Seats				
	28200				13000				
Occupant Load	Men	Women	Universal*		Men	Women	Universal*		ABC Table 3.1.17.1
	14100	14100			6500	6500			
Fixtures required	Urinals	WC	WC	WC	Urinals	WC	WC	WC	
By code	51	25	150		26	12	74		
Recommended*	123	42	177	24	57	20	163	11	
Barrier-free stall required by code		8	15			4	8		ABC 3.8.2.3 (6) ABC 3.8.2.3 (7)
Barrier-free stall recommended*		26	26			12	12		
Notes: 3.8.2.3 (3) In a building in which water closets are required in accordance with Subsection 3.7.2., atleastone barrier-free water closet shall be provided in the entrance storey, unless a) a barrier-free path of travel is provided to barrier-free water closets elsewhere in the building, or b) The water closets required by Subsection 3.7.2. arefor dwelling units only. 3.8.2.3 (6) If more than one water closet is provided in a washroom, a barrier-free stall shall be provided for every 10stalls or part thereof. 3.8.2.3 (7) For temporary uses, such as outdoor fairs and festivals, a barrier-free stall hall be provided for every 10 stalls or part thereof. * Recommended washroom count based on washroom ratios per spectator of newer CFL stadiums. (Universal washrooms to be counted as part of the total requirements).									

Revised 09/03/2017

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