



Phase 4 Feasibility Study for a
NEW REGIONAL EVENT CENTRE
for the City of Medicine Hat

NOVEMBER 2009



Medicine Hat
The Gas City

GEC
architecture
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ACKNOWLEDGEMENTS



The Consulting Team wishes to thank the contributions of many individuals and groups who provided input into this report.

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The existing Medicine Hat Arena was built in 1970 and for the past 39 years has served the City of Medicine Hat well. As the current facility is nearing the end of its lifespan there have been ongoing discussions and studies around a new arena and event centre. With the usable life expectancy of the existing arena at 10 years or less City of Medicine Hat has been exploring the option of a new event centre.

Following the decision by the Medicine Hat City Council in July 2008 to locate the proposed new multi purpose Event Center at the Box Springs Business Park GEC Architecture was retained to further develop the Feasibility Study originally completed in January 2007 specific to the Box Springs site. The issues addressed in the report include:

- Confirmation of the original assumptions and guiding design principles for the project through a stakeholder engagement process
- Development of an optimum site planning concept and strategy for the creation of an “Arena District” within the Box Springs Business Park
- Confirmation of the functional and programmatic requirements for the facility now located in the Box Springs Business Park
- Development of a conceptual building design for the project
- Development of a Capital Cost Plan for the project including the probable construction costs and associated Owner costs
- Development of the probable operating costs and expected revenues for the facility
- Recommendations for development strategies and schedule
- Risk Assessment

Key Assumptions by the Consulting Team

The following key assumptions have been used to develop the information contained within this report:

- The facility will serve the Medicine Hat community for at least the next 25 years
- The facility will be the largest spectator facility in Medicine Hat and region and should be multi purpose in nature to accommodate a variety of events including concerts and touring shows, ice events such as hockey games, dry floor events and community functions
- The prime tenant for the facility will be the Medicine Hat Tigers Hockey Club
- The operation of the facility will require no greater operating subsidy than exists today with the objective of reaching a break even point over time
- The facility should contribute to the quality of life in Medicine Hat and its economic development

- The project should be a “made in Medicine Hat” solution representative of the unique geography, civic spirit and the interests of the Citizens of Medicine Hat
- The capital cost estimates are based on the current construction market conditions for Southern Alberta. The operating / expense plans are based on comparable facilities with similar market conditions
- The Capital Cost Plan does not include for any financing costs associated with the project

Method

The Consulting Team made use of the information developed for the previous report, tours of recently completed projects in the pacific north west of Canada and the United States, in depth discussions with representatives of the Box Springs Business Park, the New Event Center Steering Committee and City of Medicine Hat Administration and other civic agencies. The development of the site planning strategies has been based on the approved Area Structure Plan and Functional Servicing Report for the Box Springs Business Park. The design team made use of the knowledge and experience of Global Spectrum, a facility operating firm, to review and critique the design solution and generate the operating pro forma. Graham Construction and Engineering provided the capital construction costs estimates.

The Box Springs Business Park

Based on the decision by City Council to locate the new Events Center in the Box Springs Business Park the Consulting Team has focused on developing a design solution that will meet the needs and interests of both the Developer (BSBP) and the City of Medicine Hat. It is the intent of the BSBP to make available to the City (at no cost) a 20 acre fully serviced site for development of the new Event Center within Phase 1-C of their development. There is an approved Area Structure Plan and associated Functional Servicing Report for the Box Springs Business Park in place.

Two site concepts have been created in order to strengthen the overall development concept for the Park. The initial concept has been based on the original land parcel proposed by the Developer. The second alternative concept has been developed with the intent of establishing an “Arena District” of uses surrounding the new Event Center.

The both alternatives site are suitable to accommodate the new Event Center in terms of size, utilities and services, transportation network and development framework. Certain amendments will be required to the approved Area Structure Plan (ASP) and Functional Servicing Plan (FSR) to address subdivision, zoning and land use policy if the alternative site is selected.

Subject to the approval processes and time required to complete



the revisions to the ASP and the FSR it is recommended that the alternative site planning strategy be adopted. By implementing this approach it is felt that:

- The new Event Center will directly benefit from the likely surrounding commercial developments such as hotels, supporting retail outlets /services and restaurants
- The Box Spring Business Park as a commercial development will be strengthened through a stronger and more strategic mix of uses

Functional Analysis

As previously stated, this report recommends that the facility have a total capacity of 7,164 people in a hockey mode and be able to accommodate between 7,000 and 8,000 for concerts and touring shows depending on the show's configuration consisting of:

- 6,500 fixed seats within the bowl
- 200 standing Room positions
- 160 restaurant seats
- 224 seats in 22 suites / boxes
- 40 seats in 8 loge boxes
- 40 seats in community boxes

The functional requirements and associated Schedule of Accommodation have been updated and adjusted to meet the most recent standards for the Western Hockey League, the expected range of events and current technologies likely to be used within

the facility. These updated requirements and criteria predict a building size of 178,500 gross square feet that is consistent with the previous report.

The seating capacities have been confirmed and will meet the expected growth patterns for the Medicine Hat Trading Region for the next 25 years. The final conceptual design solution presented within this report meets or exceeds these parameters with the ability for fewer seats within the bowl to be installed initially. It is recommended the facility open with a seating capacity of 5,500 seats in the main seating bowl and the number of private suites and lore boxes be determined based on the actual demand at opening.

The previous report presented arguments for the inclusion of a second sheet of community ice. It has subsequently been determined that a second sheet of ice is not required at this time at this specific location. No prevision has been made to add this component in the future to the new Event Center.

Conceptual Design

The conceptual design directly responds to the Guiding Design Principals and accommodates the functional requirements within 178,500 gross square feet. The site planning concept orients the main building entry towards a pedestrian friendly plaza that can be used for public functions and gathering before and after events. This plaza is proposed to be an extension of the broader urban framework extending beyond the actual Event Center site and will also serve as a transit and vehicle drop off point. The facility

has been situated in such a way for it to have as great a visible presence as possible both within the BSBP and from the Trans Canada Highway. Public parking and facility servicing has been accommodated at the rear of the building.

The Building has been organized to maximize efficiency and separate functions to optimize its operation. The main entry and associated services has been located at the mid concourse level immediately adjacent to the public plaza. This level also contains administrative spaces, the main kitchen and the restaurant. Spectators and patrons will either move up to the main concourse or down to the event level depending on the type of event and their seat location. The upper level or main concourse level contains access to the seating bowl, concessions, washrooms, access to the private suites / loge boxes and standing room areas. It has been organized in such a way to maximize both the private suite and seating bowl usage and associated revenue during a variety of events. The press box has been located above the seating bowl in a gondola style configuration.

The event or service level of the facility contains all supporting components such as dressing rooms, central commissary, mechanical and electrical spaces shipping / receiving and storage. It has been organized to separate the public and service functions during such events where there is public access to the event floor for seating.

The building imagery and massing has been created as a direct response to the local influences and geography found in the Medicine Hat region. We have drawn on the rich history of the brick industry and the kilns that were used to produce the bricks that are seen throughout the community as a building form and exterior material.

Capital Cost Plan and Operational Feasibility

Based on the facility being located at the Box Springs Business Park with a total hockey capacity of 7,164 within 178,500 gross square feet it is estimated that:

- The new Event Center has an expected total project cost of \$94,316,105.00 including direct construction costs, Owners soft costs and contingencies assuming a construction start in the 4th quarter of 2010 expressed in current dollar values. Financing charges are excluded.
- The total project value is made up of the following components:

Total Direct Construction Costs (including contingencies)	\$76,022,100.00
Total Indirect / Owner Costs.....	\$13,802,762.00
Expected Total Project Cost	\$89,824,862
Project Contingency.....	\$4,491,243.00
Total Project Value:	\$94,316,105.00

- The new Event Center has a projected operating expense of \$2.136 m in the first year of operation
- The new Event Center has a projected operating revenues of \$1,983 m in the first year of operation

Implementation Strategies and Schedule

The previous report evaluated three development strategies to complete the project – namely:

- A Municipal Public Works project
- A Public Private Partnership – 3 P
- Private sector Design Build Finance project

The original recommendation was to develop the new Event Center as Municipal Public Works project using Construction Management as the preferred method to contract the construction services. We are still of the opinion that this is the most prudent course of action for the City to follow given the current market conditions. As an alternative, consideration should be given to a stipulated sum construction model depending on the schedule and desired opening date for the facility. A construction management model will offer the City a more aggressive schedule for construction as it allows for progressive contracting. The stipulated price model will likely add four to six months to the over all project schedule.

Depending on the construction services procurement model chosen the overall project schedule is expected to take approximately three years. Two schedules have been created for the project; one utilizing the existing Area Structure Plan and Functional Servicing report for BOBP, the other modifying these reports. Both schedules are based on beginning the design process in January 2010. Utilizing the existing ASP & FSR could allow for site works to begin in September 2010; modifications to the existing reports would add approximately three months to the schedule.

Operating Model

The consulting team strongly supports the recommendation of the Steering Committee and the subsequent decision by City Council to engage a private sector facility operator once a decision is taken to proceed with the project. We also concur with the notion that this firm be engaged early on in the design process to assist the City through the planning and design stages of the work. As experts in the operation of buildings of this nature the successful operator will be in a position to provide valuable insights and lessons learned from other facilities at a point during the development of the design to insure that the most current and up to date knowledge is applied to the project.

Risk Assessment & Assignment

The development of this project is a significant undertaking for the City of Medicine Hat and will represent one of the most major capital commitments made to a single building project. As the project has evolved over time different risks have been identified and quantified and have involved a variety of stakeholders. At this juncture the major risks facing the various stakeholders are:

- Capital costs
- Operating costs & revenues
- Associates Agreements & Negotiations

Final Conclusions and Recommendations

Subject to the City being able to find suitable funding sources that meet with the principles and objectives established by City Council it is recommended that the project proceed as follows:

- The facility be located within the Box Springs Business Park on a mutually agreeable and fully serviced site provided to the City at no cost.
- The facility to be capable of an ultimate capacity of 7,164 for hockey and between 7,000 and 8,000 for concerts and touring shows. Further the design should allow for an initial seating capacity of 5,500 fixed seats expandable to 6,500 fixed seats.
- The total building area be approximately 178,500 gross square feet
- The existing arena be decommissioned as a spectator venue with the possibility of use as a community ice facility
- The project be completed as a municipal public works project using either a stipulated price or construction management contracting model depending on schedule implications
- The project value be established as \$94.3 million in current dollars including contingencies.

BACKGROUND

The existing Medicine Hat Arena was completed in 1970 and has been home to the Medicine Hat Tigers ever since. The facility is a single bowl arena with approximately 4000 seats; it is a very intimate venue where all seats are created equal. The Arena has served the City of Medicine Hat well over the last 39 years and still maintains a full house for Hockey games; however, the existing facility is reaching the end of its lifespan. The arena is lacking the modern amenities that are now standard in most venues. Without significant infrastructure upgrades the existing facility will need to be replaced in less than ten years.

In June 2006 the City of Medicine Hat commissioned GEC Architecture to complete the second stage Feasibility Study for a new multi purpose Event Center for their community. This report was presented to the New Arena Steering Committee and subsequently presented to City Council who accepted all of the recommendations with the exception of the recommended site. In the summer of 2008 City Council approved locating the new Event Center within the Box Springs Business Park on the western edge of Medicine Hat. In early 2009 GEC Architecture was requested to update the previous report to reflect the decision to locate the new facility in this location. This report builds on the studies previously completed and the decisions and recommendations that have been accepted to date for the project.

TERMS OF REFERENCE

The mandate and broad terms of reference for this report are to provide the City of Medicine Hat with information and recommendations as to the viability and feasibility of developing a new regional multi purpose Event Center to be located within the Box Springs Business Park that includes:

- Confirmation of the programmatic and functional requirements for the facility
- Site analysis and studies to determine the optimum location for the facility within the Box Springs Business Park
- Development of a conceptual design specific to the BSBP
- Development of a capital cost plan for the project specific to the BSBP location
- Development of an operating pro forma including expected revenues and expenses
- Updated recommendations regarding development models / strategies and project time lines

METHODOLOGY

Background Research, Programmatic & Functional Requirements

The consulting team met with the key project stakeholders to review the original guiding design principles and functional requirements for the new facility to confirm their relevance and suitability for the BSBP site. These meetings included the New Event Center Steering Committee, a variety of civic committees, the Western Hockey League, The Medicine Hat Tigers and the City's Technical Coordinating Committee (TCC). In addition to stakeholder meetings, the consulting team together with City Administration and members of the Steering Committee toured recently completed facilities in Abbotsford BC and Kent Washington. These facilities represent the state of most current facilities of this nature in terms of design, operating models and development models. The consulting team has also made use of the knowledge and experience of Global Spectrum – an independent facility operator – to provide peer reviews of functional components and the conceptual design solution.

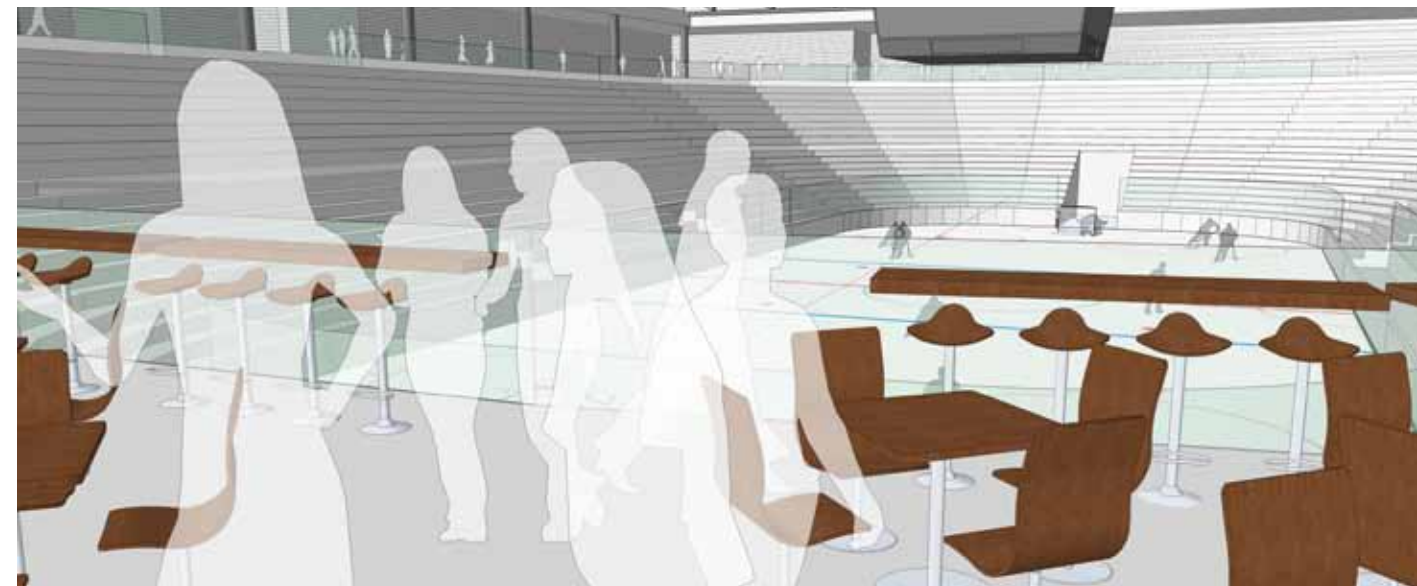
Box Springs Business Park Site Analysis

The consulting team met on numerous occasions with both City of Medicine Hat and representatives of the Box Springs Business Park in order to identify a mutually agreeable site for the facility. This analysis was supported by previously completed reports and studies including the Area Structure Plan and associated Functional Servicing Report for the business park. A geotechnical report and foundation recommendations was completed for the recommended site to assist in the development of the capital cost plan.

Financial Analysis

The financial analysis has been prepared using current market values for projects of a similar nature using current dollar values. The total project value has been developed to predict the total estimated cost for the project based on an approval to proceed by City Council in the fall of 2009 and a construction start in the third quarter of 2010 and include direct construction costs, contingencies, indirect Owner costs, FF&E and a global project contingency but excludes GST. The direct construction costs have been prepared by Graham Construction and Engineering using an elemental cost breakdown.

The operating pro forma was prepared by Global Spectrum based on actual information from facilities of a similar size and nature that they currently operate.



Proposed New Regional Event Centre – View from Lounge

Stakeholder Consultation

The consulting team together with the City Administration met with the City of Medicine Hat Advisory Committee on Disability Issues (ACDI) and the Medicine Hat Arts and Heritage Advisory Board to discuss the key guiding design principles for the facility and to better understand any concerns these civic committees may have. During these discussions the importance of this facility being a multi-purpose venue accessible to all was stressed. It is understood that a new hockey facility is needed to house the Medicine Hat Tigers; however, as the City of Medicine Hat is growing it is necessary that this facility be multi-purpose in nature and be designed to accommodate a multitude of events such as the performing arts; trade shows; figure skating; concerns; and dirt events such as the monster trucks. It is also key that the facility be able to accommodate people of all abilities for these events and that seating options be provided throughout the facility at all levels for people with reduced mobility.

In addition to these functional requirements the ACDI and the Arts and Heritage Advisory Board indicated to the consulting team that it is important that the design for the Medicine Hat New Regional Event Centre be a Medicine Hat solution. The facility needs to be a Medicine Hat building; a quality building, both aesthetically appealing and properly designed to stand the test of time.

In addition to consultation with civic committees the concept and design for the New Regional Event Centre has been reviewed with the WHL. The WHL feels that the new facility could greatly benefit the City of Medicine Hat and take the Tigers' franchise to an even greater level. They are in support of the decision to open with 5500 seats as a full building creates a much better hockey atmosphere.



Existing Medicine Hat Arena



Existing Medicine Hat Arena

In July 2009 GEC and members of the Steering Committee toured the Abbotsford Entertainment and Sports Centre in British Columbia, and the Kent Showare Centre in Washington. Both facilities were completed in 2009, are comparable in size to the proposed Medicine Hat New Regional Event Centre, and are operated by private operators. While both facilities have been extremely successful in their first year the building operators conducting the tours shared their lessons learned with the Medicine Hat Event Centre team.

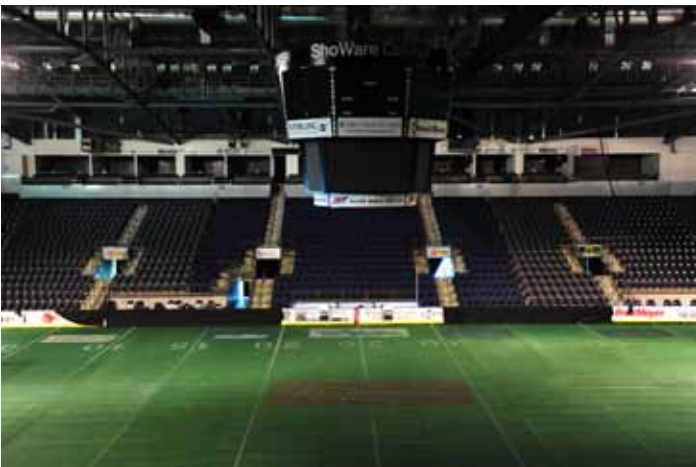
The Abbotsford Entertainment and Sports centre was completed in May 2009 and is operated by Global Spectrum. The main focus during the design and construction of the Abbotsford facility was for the project to be completed on time and on budget. While the team achieved their goal the construction budget did not allow for the provisions for an AHA hockey team; now that the Abbotsford Heat has taken up residence within the facility upgrades have been required to bring the home team dressing rooms up to standards. In addition, spaces were not properly allocated within the building for spot lights and cameras; these elements now take away from possible revenue generating spaces on the upper seating concourse.

Kent Showare Centre was completed in January 2009 and is operated by SMB. Their main goal was to create a destination within Kent; a showcase building that would add to the surrounding community and draw people in. While their capital costs were greater and their overall building is smaller than the Abbotsford facility they definitely achieved their goal and feel the extra expense was well worth it. During the design and construction process the Kent facility is of the opinion that they did not consult an operator early enough in the process; as a result, they are currently without a rigging grid for large events and shows, and they are short on concession space and points of sale.

These tours and words of advice have both influenced the current conceptual design for the Event Centre and confirmed the team’s decisions with respect to the direction of the design. The main overriding messages learned from both facilities are firstly to include the operator as a part of the design team early in the process to ensure that the building will function as best it can once complete; and secondly to ensure that all key functional items are included in the design and not eliminated at the construction phase, as these essential items, such as rigging grids, can be extremely costly to upgrade after the fact.

TOUR BREAKDOWN

Description	Abbotsford Entertainment & Sports Centre	Kent Showare Center
Accessible seating	Available for all events	Seating, parking & ticket window
Architects	PBK Architects	LMN Architects with PBK Architects
Club seating	300	
Concessions	Fixed and portable	4 permanent stands
Construction Cost	\$64.7 million Canadian	\$84.5 million US
Easy access	Ground level entrances	One ground level entrance
Elevator	Yes (2)	Yes
Events per year	35+	110–117 including 40 Thunderbird games
LEED Silver		Yes
Locker rooms	2 small dressing rooms (8’x9’) 2 medium size locker rooms (8’x28’), 2 large locker rooms (14’x20’)	In end zone - teams skate across the ice to get to their benches
Loge boxes	15	
Major tenant	AHA Flames	Seattle Thunderbirds
Opening Date	May 10, 2009	January 3, 2009
Operator	Global Spectrum	SMB
Owner	City of Abbotsford	City of Kent
Parking	2,500 - pay	Free
Party rooms	Yes	
Press box		In the corner, not at centre ice
Restrooms	6 mens, 6 womens, 2 family	All
Scoreboard		“Chandelier” with four 6’ x 12’ video screens
Seating Capacity for concerts	1,000–8,500	2,500–7,500
Seating Capacity for hockey	7,000	6,500
Size	175,474 sq. ft. with NHL hockey size ice	154,400 sq. ft. (14,340 m²)
Suites	22	20



Kent Showare Centre



Kent Showare Centre



Abbotsford Entertainment & Sports Centre

INTRODUCTION

The Box Springs Business Park (BSBP) is a commercial / industrial project located in the northwest sector of the City currently under development. It is bounded by:

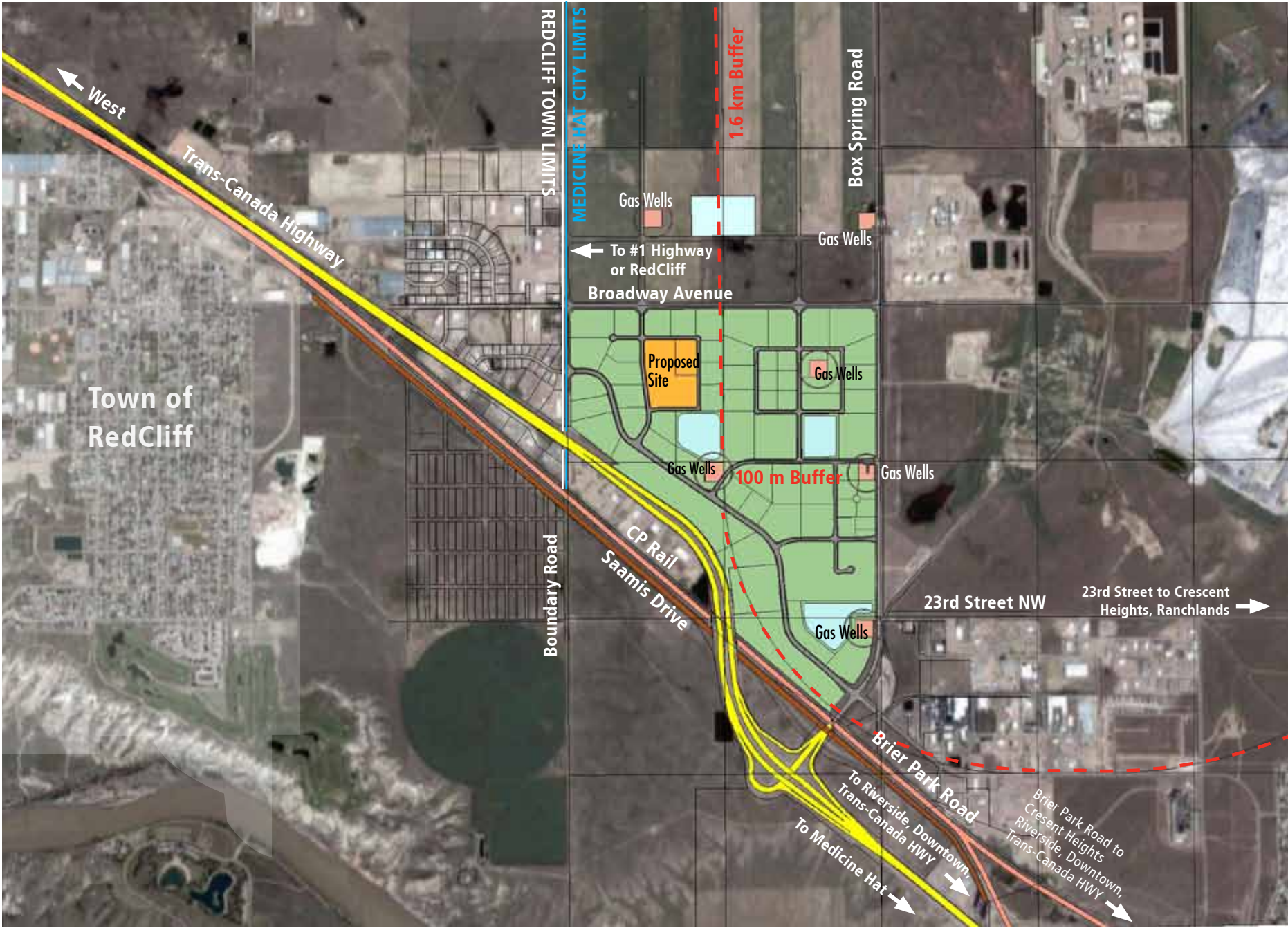
- Agricultural lands to the north
- Boundary Road and the Town of Redcliff to the west
- Box Springs Road to the east
- The Trans Canada Highway and the CPR rail line to the south

An Area Structure Plan (ASP) and associated Functional Servicing Report (FSR) are in place for the Park and were approved by City Council in December, 2006. These documents establish the future land use, utility servicing and transportation framework. The ASP allows for a mix of uses including general commercial that are intended to border the Trans Canada Highway to maximize visibility and light industrial / business park uses in the remaining area. The new Event Center is considered as a discretionary use within this frame work and as such there are likely no land uses impediments to locating it within the BSBP.

A geotechnical investigation and a Phase 1 environmental assessment have been completed for the sites in question for the new Event Center that have not identified any significant issues that would adversely affect the project.

The Functional Servicing Report while not specifically addressing the new Event Center has provided for sufficient capacity in the deep services, shallow utilities and transportation network to accommodate the facility with minor upgrades to some services.

The Developer of the Park has offered to make available to the City of Medicine Hat a fully serviced 20 acre (+/-) parcel of land within Phase 1C of the development at no cost to the City. Negotiations are currently underway between the City and BSPB to establish a Memorandum of Understanding (MOU) as a framework leading to a Development Agreement for the project on this basis.



2.1 SITE PLAN

Two sites have been considered with the intent of developing the optimum location for the new Event Center within the Box Springs Business Park. The initial site proposed by the Developer has been studied together with an alternative site that strengthens and develops the “Arena District” concept together with creating new commercial opportunities not originally considered when the Area Structure Plan was approved.

As previously noted there is an approved Area Structure Plan and associated Functional Servicing Report in place for the Box Springs Business Park that includes the land originally proposed by the Developer for the new Event Center. If this site is ultimately selected for the project the normal approvals including subdivision, development permit and building permit will be required in order

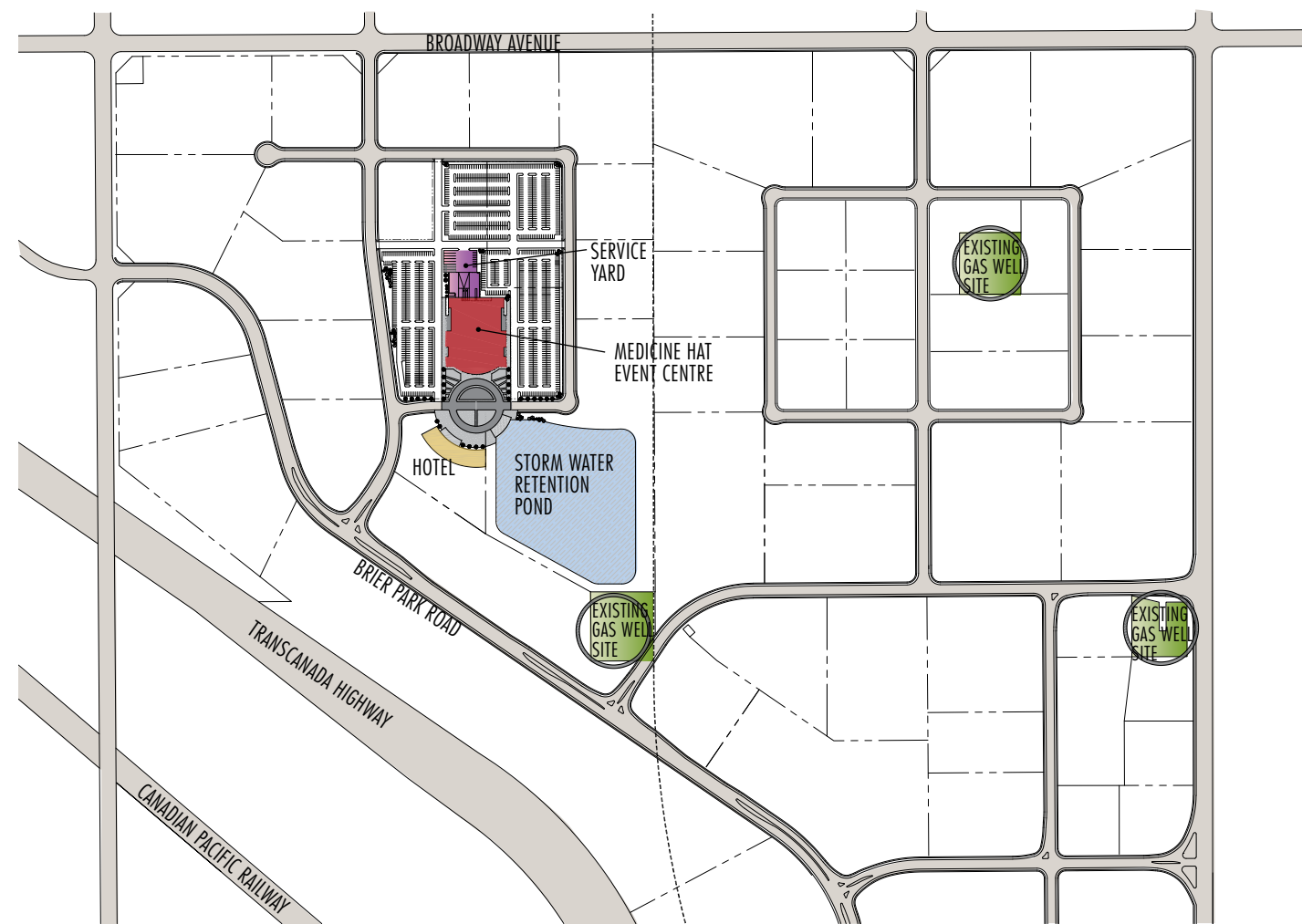
for the project to move to construction stage. If the recommended alternative site is selected, amendments to both the ASP and FSR will also be required. In both scenarios it is expected that the site development work and associated infrastructure being provided by the Developer will happen concurrently with the construction of the actual project.

Subject to the implications on the schedule for the project it is recommended that the modified site be established as the preferred location for the project as it will:

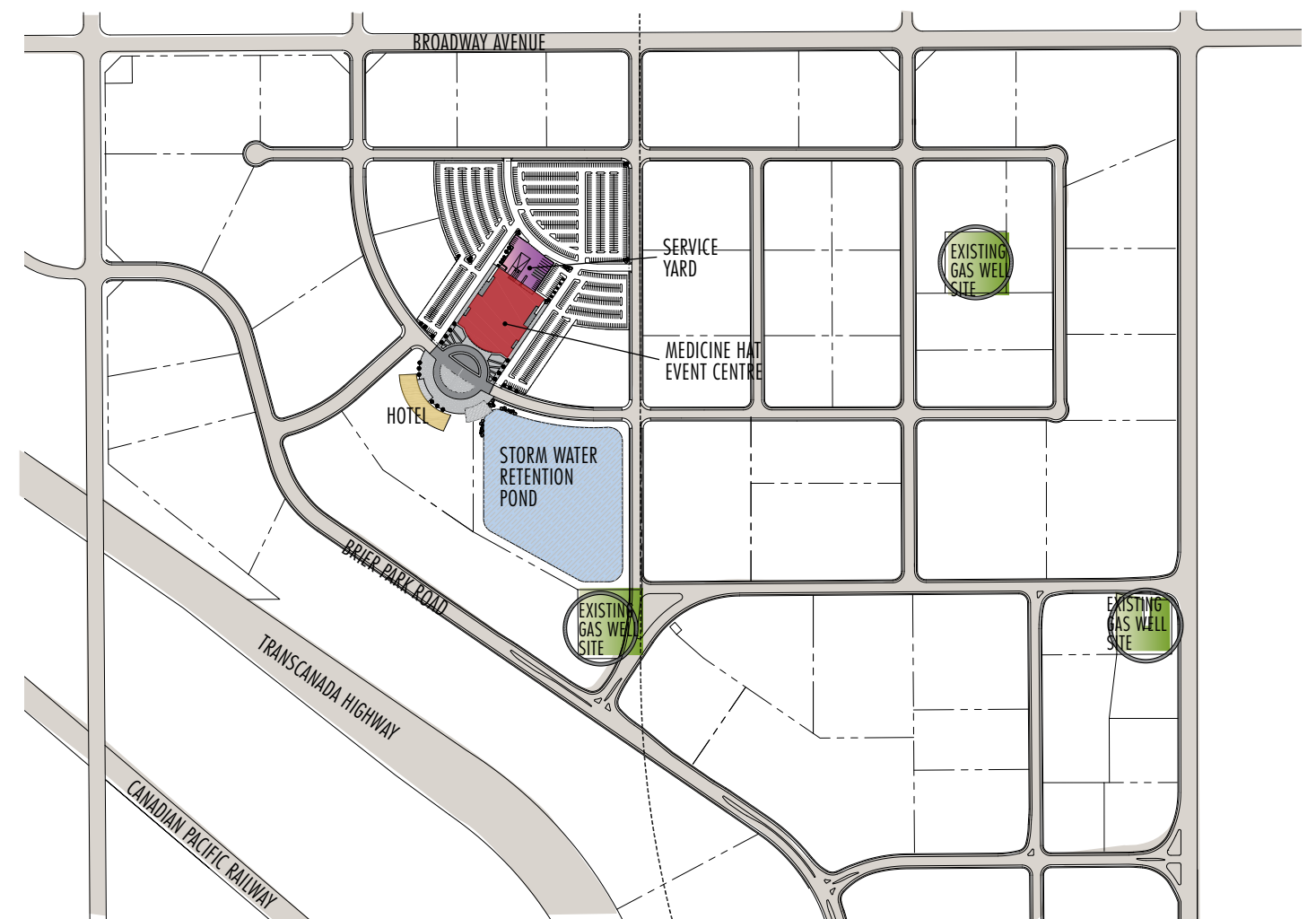
- Strengthen the land use concept of the BSBP in terms of commercial uses
- Provide for the creation of an “Arena District” of complimentary uses within the BSBP

- Enhance the visibility of new Event Center from the surrounding road network
- Provide a stronger and more sustainable framework for future phases of the Park

PROPOSED SITE BY BSBP



MODIFIED SITE



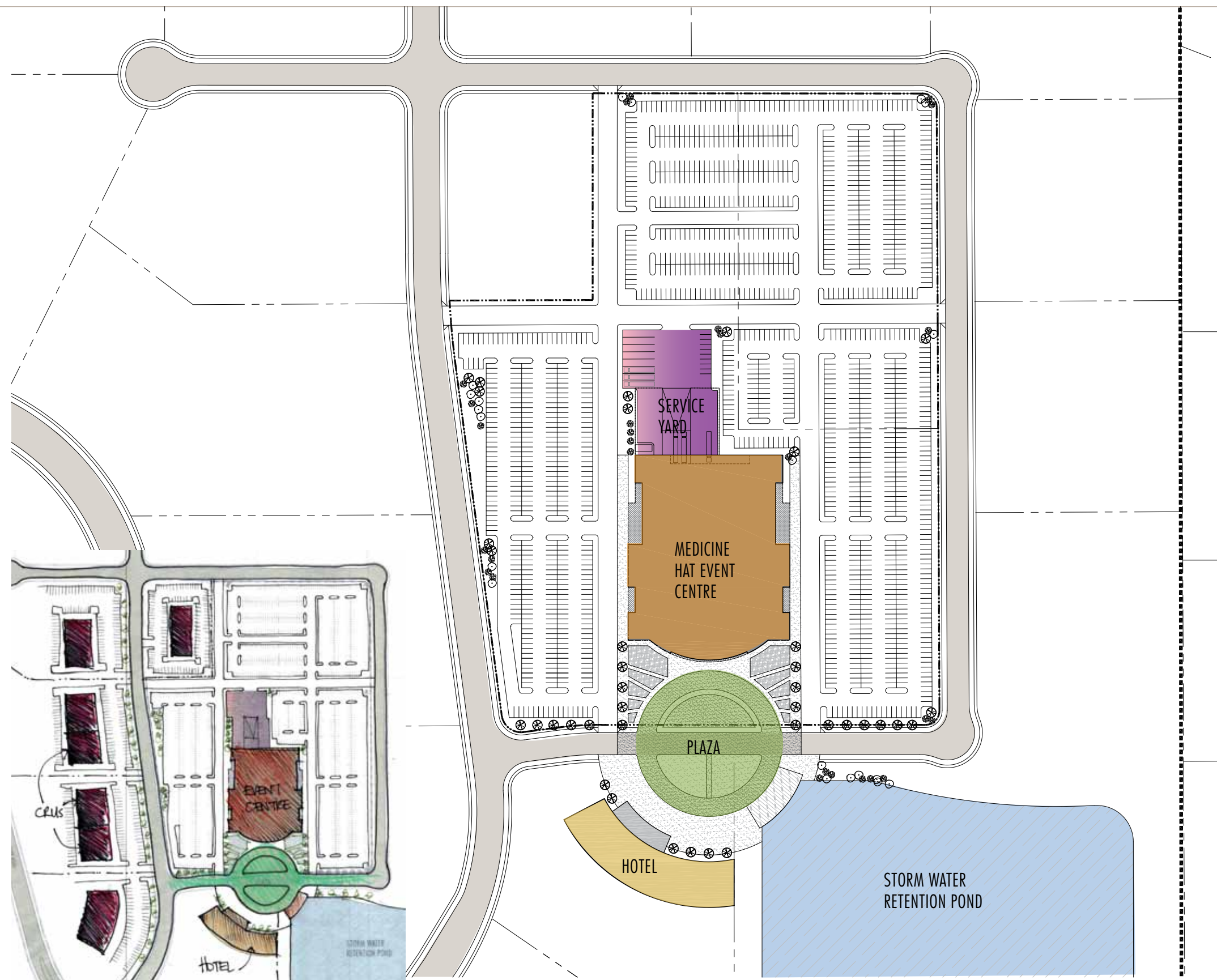
PROPOSED SITE BY BSBP

The conceptual site plan utilizing the existing ASP, FSR, and proposed site by BSBP locates the Event Centre on the southern end of the site just west of the storm water retention pond. This site situates the facility within a sea of parking surrounded by roadways on all sides; while functional, limiting direct adjacencies to the facility does not encourage complementary commercial and retail spaces to be developed around the Event Centre. With the exception of the direct commercial / retail units this site plan incorporates the majority of the same design strategies as the modified site.

The front entry of the Event Centre is located on a raised pedestrian plaza that connects the facility with a possible hotel and the existing storm water retention pond. This plaza not only serves as an outdoor public event area, but acts as a drop off area for transit and taxis. From this front entry point the grade slopes down toward the north of the building allowing direct access to the event level from a fenced-in loading dock and service yard.

Site Plan Highlights:

- 20 Acre site (+/-)
- Plaza connecting the Event Centre; possible hotel; and storm water retention pond.
- Possibility of upgrading the storm water retention pond into more of a water feature.
- Fenced in loading area and service yard to the north.
- The site can accommodate nominally more than 1500 parking stalls incorporated on the site with ample parking located on adjacent parcels around the facility.



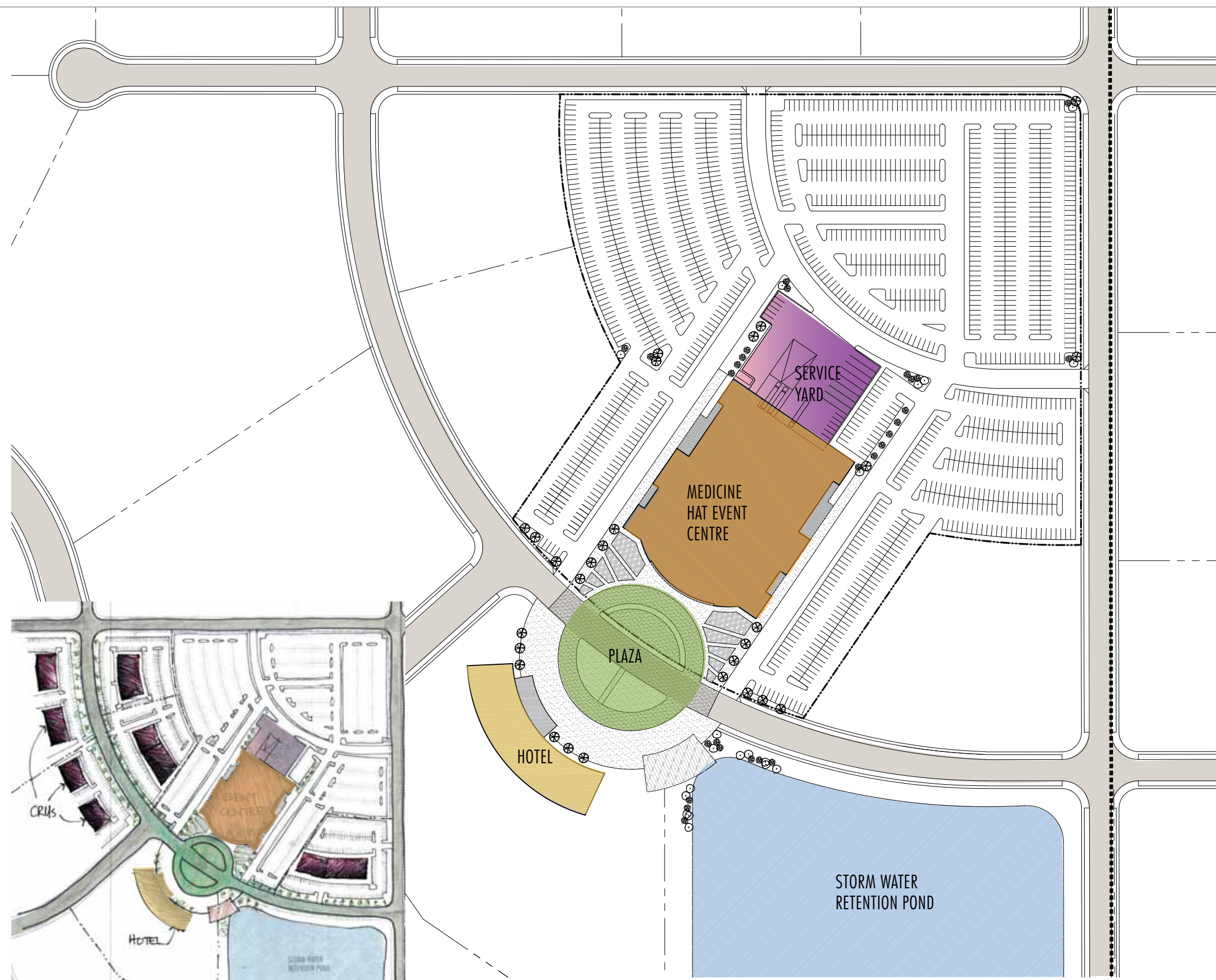
MODIFIED SITE

The conceptual site plan that modifies the ASP and FSR alters the roadways surrounding the proposed site and rotates the Event Centre aligning it to the south west. Altering the roadways allows for the inclusion of complementary uses within the roadway boundaries surrounding the facility allowing for the creation of an 'Arena District.' The idea behind this design is to create a plaza at the entry to the Event Centre linking it to a possible hotel across the way and the existing storm water retention pond. This concept would then extend out to the adjacent commercial and retail units and include the road as an extension of the plaza creating a pedestrian friendly street that would have the ability to be closed off at times and house outdoor events and activities. As an added feature, including the storm water retention pond as an extension of the public plaza allows for it to be upgraded to more of an urban water feature for the development.

In addition to creating a pedestrian friendly outdoor event area the plaza also serves as a functional drop off area for public transit and taxis. The plaza and ground surrounding the entry of the Event Centre would be raised slightly to allow for direct access into the Entry Level of the facility; the ground then slopes down to the north east allowing for the fenced-in service yard and loading dock in the rear of the building to have direct access to the Event Level of the facility. The majority of the on-site parking is also located to the rear of the facility.

Site Plan Highlights:

- 20 Acre site (+/-)
- Modifications to existing ASP roadways.
- Possible location of complementary retail spaces and restaurants adjacent to the Event Centre.
- Plaza connecting the Event Centre; possible hotel; and storm water retention pond.
- Possibility of upgrading the storm water retention pond into more of a water feature.
- Fenced in loading area and service yard to the north.
- The site can accommodate nominally more than 1500 parking stalls incorporated on the site with ample parking located on adjacent parcels around the facility.



The functional requirements of the New Regional Event Centre are largely based on the recommendations put forth in the Feasibility Study that was completed in January 2007. During the creation of the functional requirements a series of studies were completed with respect to population growth within and around the City of Medicine Hat and comparing similar facilities throughout North America to determine the appropriate size and program for the New Regional Event Centre. The final recommendation was for a single top loaded seating bowl with a total hockey capacity of 7,136 that would be designed to accommodate multiple uses including hockey; touring concerts; plays; exhibitions; etc.

The functional requirements and associated Schedule of Accommodation have be updated and adjusted to meet the needs of the most recent standards for the Western Hockey League; in addition to allowing for the expected range of events and current technologies likely to be used within the facility. These updated requirements and criteria predict a building size of approximately 178,500 sq.ft. which is consistent with that of the previous report (175,000 sq.ft.).

Guiding Design Principals and Assumptions

The following are the key Guiding Principles that form the basis for the design of the New Regional Event Centre for the City of Medicine Hat. These principles are both specific to Medicine Hat and the Box Springs site; as well as, overall principles that apply to all facilities of this nature:

- Top down access to the seating bowl – limited or no vomitories reduce distraction and enhance the spectator experience.
- Public Concourse open to the seating bowl with concert black-out provisions.
- Every seat is a premium seat.
- Access to the private suites is directly off the public concourse creating a better sense of inclusion.
- This is a multi-purpose facility designed to accommodate a variety of events in order to maximize event days and hence maximize community use and facility revenues.
- Incorporation of leading edge technologies and sustainable building measures.
- Incorporate best practices to achieve both financial and operating sustainability.
- Serviced by a sensible and sustainable transportation and parking strategy.
- Creation of accessible seating throughout all types of seating options.
- Incorporation of a restaurant/lounge with access to the seating bowl.

- **Key Operational Objective:** Efficient to Operate and Use
- **Functional Design Objective:** Efficient and Coherent while Maximizing Revenue
- **Key Design Objective:** Effective, Efficient, and Cost Effective

In addition to the above Guiding Principals the overall design of the facility makes the following two assumptions:

- The facility will be home to the local WHL team as a major tenant – namely the Medicine Hat Tigers – and will accommodate their operations in terms of both hockey and business components.
- There will be a single sheet of ice within the facility – there is no provision for a second ice surface for community use or other purposes.

Seating Bowl — Capacity

It is recommended that the overall capacity for the facility remain consistent with the January 2007 Feasibility Study. The number of seats fundamentally defines the shape and geometry of the bowl and is the design basis for the supporting areas and services such as the public concourses, concessions and washrooms. The previous report recommended that the facility have a total seating capacity of 7,136 people in a hockey mode and be able to accommodate between 7,000 and 8,000 people for concerts and touring shows. This number was developed based on likely demand, the growth of the population base of the Medicine Hat region and the size of comparable facilities. None of these parameters has changed materially and as such it is recommended that this umber be maintained.

In terms of seating options and premium seating products there are seven basic types available for consideration:

- Private Suites/Boxes
- Community Suites/Boxes
- In Bowl Boxes “Loge Boxes”
- Club Seating
- Regular Seating
- Standing Room
- Restaurant/Club Terrace Tables

It is recommended that all of these options and products be included in the New Regional Event Centre for the City of Medicine Hat in order to offer the spectator and building operator a wide variety of price points and spectator experiences for the various events likely to be held in the facility.

Each of the seating options has its own unique features and benefits. With regards to private suites it is recommended that each suite be designed to accommodate 8 to 12 seats within the bowl with an additional 4 seats within the suite itself together with a hospitality area. The current practice is not to have washrooms within each suite but to provide centralized facilities. Community suites are basically oversized private suites that can accommodate up to 24 people and be used and marketed on a per event basis. The third type of private box is the ‘in-bowl’ or Loge Box. Loge boxes are a relatively new product located at the top of the bowl within the last two rows of seating; these typically hold 4 to 6 people with loose seating behind a drink rail and are often equipped with a lockable bar refrigerator and receive table service. ‘Club Seating’ for facilities of this nature is a generic product usually located within the fixed seating bowl and consists of an enhanced seat in a premium location with specific value added

features such as preferred access to restaurants and bars, dedicated parking, and private building access. It is recommended that a portion of the seating bowl be designed to accommodate club seating.

The following chart outlines the seating breakdown from the previous report and recommendations being made in the current report. Through further design development for the Box Springs site and adjustments to the functional requirements the types of seating has been altered; however, the overall capacity of the facility has remained fairly consistent.

In addition to the outlined seating capacities it was recommended that the facility be designed in such a way that would allow for it to open with a capacity of 5,500 with the ability to increase capacity to 6,500 seats as demand increases.



Nationwide Arena, Columbus, OH: Loge Box

January 2007 Seating Capacities	October 2009 Seating Capacities	October 2009 Seating Capacity (Full)
6,500 fixed seats within the bowl	5,500 fixed seats within the bowl	6,500 fixed seats within the bowl
440 standing room positions	200 standing room positions	200 standing room positions
60 restaurant seats	160 restaurant seats	160 restaurant seats
136 seats in 17 suites/boxes	224 seats in 22 suites/boxes	224 seats in 22 suites/boxes
	40 seats in 8 loge boxes	40 seats in 8 loge boxes
	40 seats in community boxes	40 seats in community boxes
Standing/Seating on event level for concerts	Standing/Seating on event level for concerts	Standing/Seating on event level for concerts
7,136 total capacity + ice level seating (on ice)	6,164 total capacity + ice level seating (on ice)	7,164 total capacity + ice level seating (on ice)



Associated Functional Requirements

The functional components have been organized into three basic categories: seating bowl; public concourse(s); and event level services. Discretionary and complimentary components have not been included in the functional components for the basis of the facility.

The main seating bowl will be constructed around a multi-purpose event floor/surface that while in hockey mode measures 200' long by 85' wide; NHL Arena ice size. The seating bowl will be designed to accommodate not only hockey, but also full end-stage shows, and half-house or centre-stage shows. The first 12 rows of seating at the stage-end of the bowl are to be fully retractable to allow space for the stage and backstage areas. At the bottom cords of the trusses over the event floor a rigging grid is required over the end and centre stage areas to accommodate larger shows and productions. In addition to the rigging grid, a retractable centre-hung multipurpose display board will be accommodated.

The public concourse spaces house all spectator amenities associated with events. Ticketing and guest services should be located near the main entry. Arena management and administrative offices, as well as the home team administrative offices are to be located where they have access from both inside and outside the facility. Concessions, public washrooms, retail outlets and kiosks, associated support spaces such as janitor rooms and storage, and a restaurant are to be located directly on the concourse adjacent to the seating bowl. This last group of spaces should be next to the action and easy to access and navigate for all patrons.

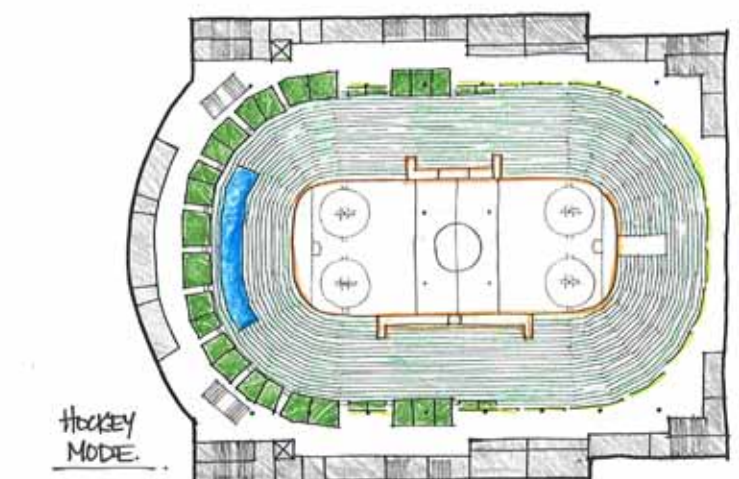
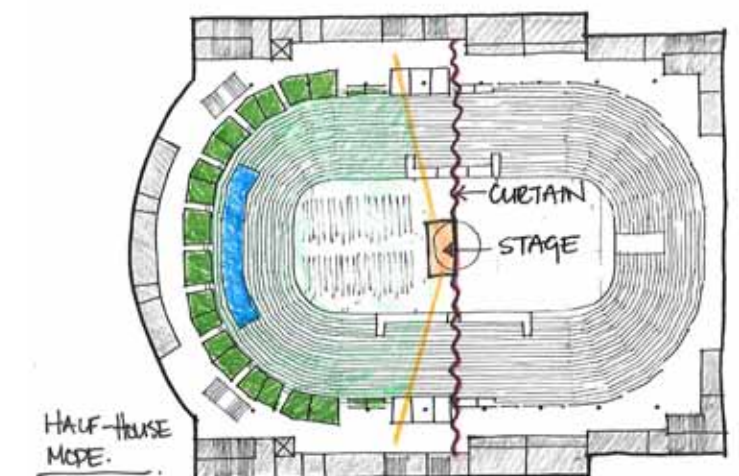
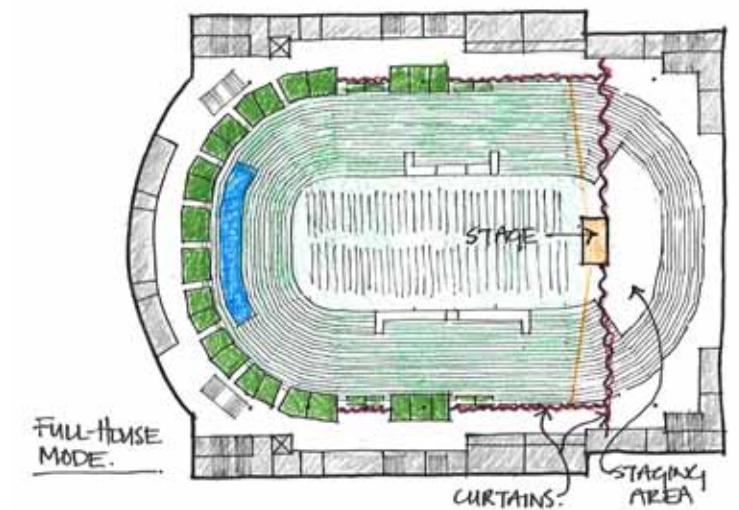
The major revenue generator within the public concourse spaces is food services. The nature of food services within the facility is dependent on several factors including its geographic location within the city, size of the facility, the nature and number of the surrounding amenities and the supporting business case pro forma. Facilities of a similar nature that are located in a more urban area have the ability to rely on the surrounding community context to provide secondary food and beverage services. Facilities located in more remote or developing areas such as the Box Springs Business Park need to offer spectators, users, and staff with a sufficient level of service from within the facility itself. In time, as development occurs, complimentary uses will emerge such as hotels, conference centers and stand alone restaurants. It is recommended that the Medicine Hat New Regional Event Centre not be dependent on speculative development specifically related to food and beverage. A balanced and financially sustainable mix of services should be provided.

The event level houses the behind the scenes areas and requirements needed to make the various events happen. This area includes the dressing rooms for the hockey events; including referee dressing rooms, community dressing rooms, visiting team facilities, and home team facilities. The home team facilities are mostly self contained and include: player's change room; player's dressing room; player's lounge; washroom and shower facilities; therapy and training spaces; coach's offices; equipment storage; skate sharpening; and laundry facilities. Supplementary to the

hockey spaces, the event level needs to house multi-purpose spaces for other productions and for the media, including green rooms, production offices, and production support rooms. In addition to the above mentioned event and production spaces the event level contains the following:

- A central food services commissary for material and food service handling, coolers, freezers, dry storage, and staff facilities for food services.
- 'Day-of' event staff facilities including locker rooms and showers.
- Building maintenance and operation spaces.
- Waste management including compactors and recycling.
- Loading docks complete with a security office and control room.
- Ice plant and associated ice resurfacing equipments and ice melt pit.
- Building mechanical, electrical, and data communications space.
- Storage spaces for floor seating, floor protection, replacement glass and boards, nets, etc.

Directly adjacent to the event level loading area on the exterior of the building is the location of the service compound. The service compound is an enclosed space that contains event bus and semi-trailer parking, and connections for broadcast vehicles.



4.0 MEDICINE HAT EVENT CENTRE — CONCEPTUAL DESIGN

The conceptual design and planning for the Medicine Hat New Regional Event Centre is derived directly from the functional analysis and guiding design principals laid out by the City of Medicine Hat. The building has been organized to maximize efficiency and separate functions in order to optimize its operation. The building organization and layout creates a design which accommodates the functional requirements within 178,500 gross square feet.

The Guiding Design Principles that most directly impact the overall layout and organization of the building include but are not limited to the following:

- Top down access to the seating bowl – limited or no vomitories reduce distraction and enhance the spectator experience.
- Public Concourse open to the seating bowl with concert black-out provisions.
- Every seat is a premium seat.
- Access to the private suites is directly off the public concourse creating a better sense of inclusion.
- This is a multi-purpose facility designed to accommodate a variety of events.
- Incorporation of leading edge technologies and sustainable building measures.

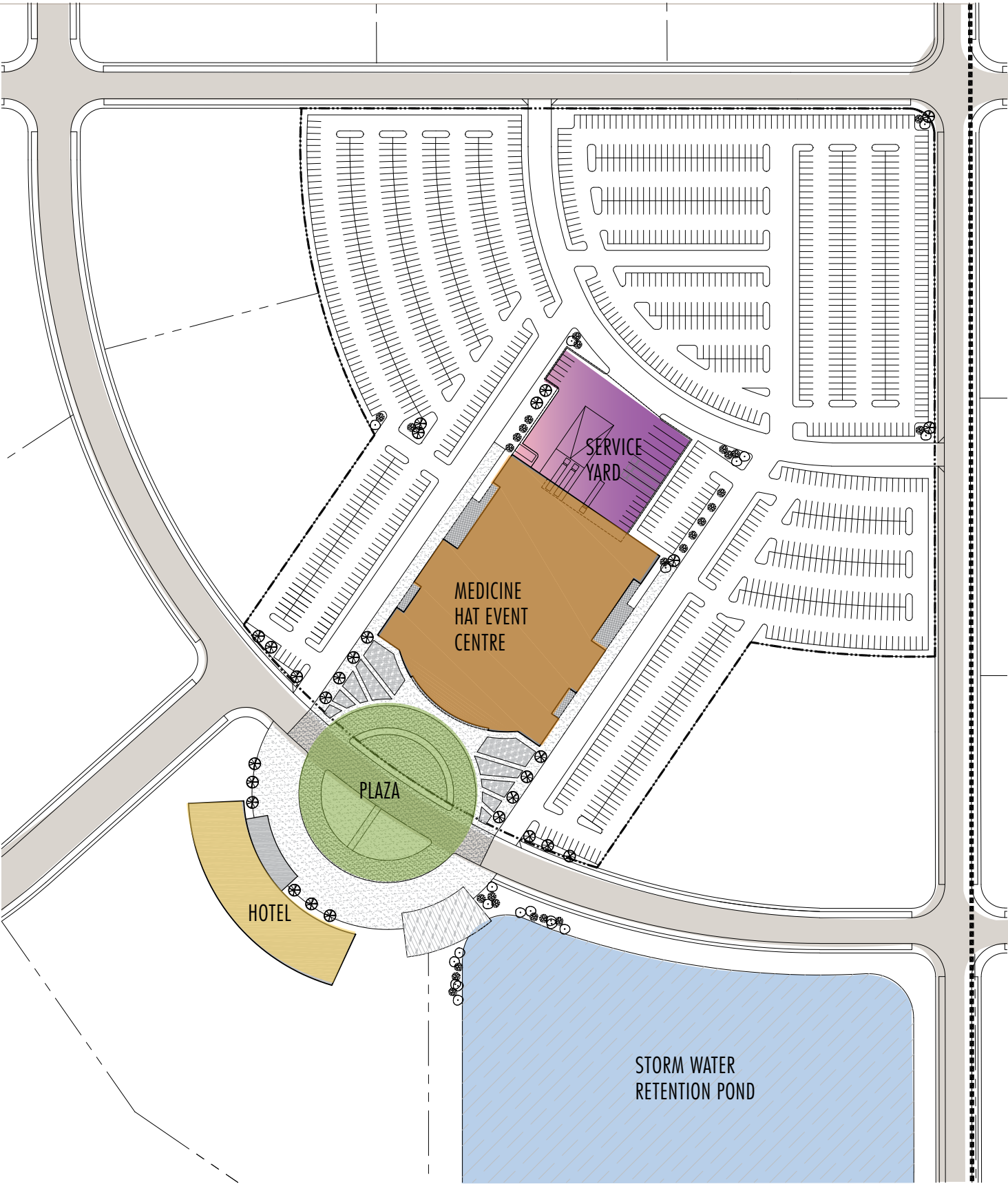
Building Statistics

AREA	SQ.M.	SQ.FT.
Event Level	4,543	48,900
Entry Level	2,738	29,474.1
Concourse Level	9,155	98,543.6
Press Box Level	147	1,582.30
TOTAL AREA:	16,583 sq.m.	178,500 sq.ft.

Site

The site planning concept is based on the idea of the creation of an ‘Arena District,’ a place where people can congregate both before, during, and after events creating a vibrant and active community around the Event Centre. The Arena District plan orients the main building entry towards a pedestrian friendly plaza that can be used for public functions and gathering before and after events. This plaza is proposed to be an extension of the actual Event Centre site and will also serve as a transit and vehicle drop-off point.

The facility has been situated in such a way for it to have as great a visible presence as possible both within the Box Springs Business Park and from the Trans Canada Highway. Locating the facility at an elevated site grade adjacent to the storm water retention pond ensures that a direct view from the Highway will remain; while providing the opportunity to upgrade the appearance and surrounding amenities of the storm pond to create an urban water feature. Site grade around the facility slopes down away from the front entry to additional public parking and facility servicing at the rear of the building.



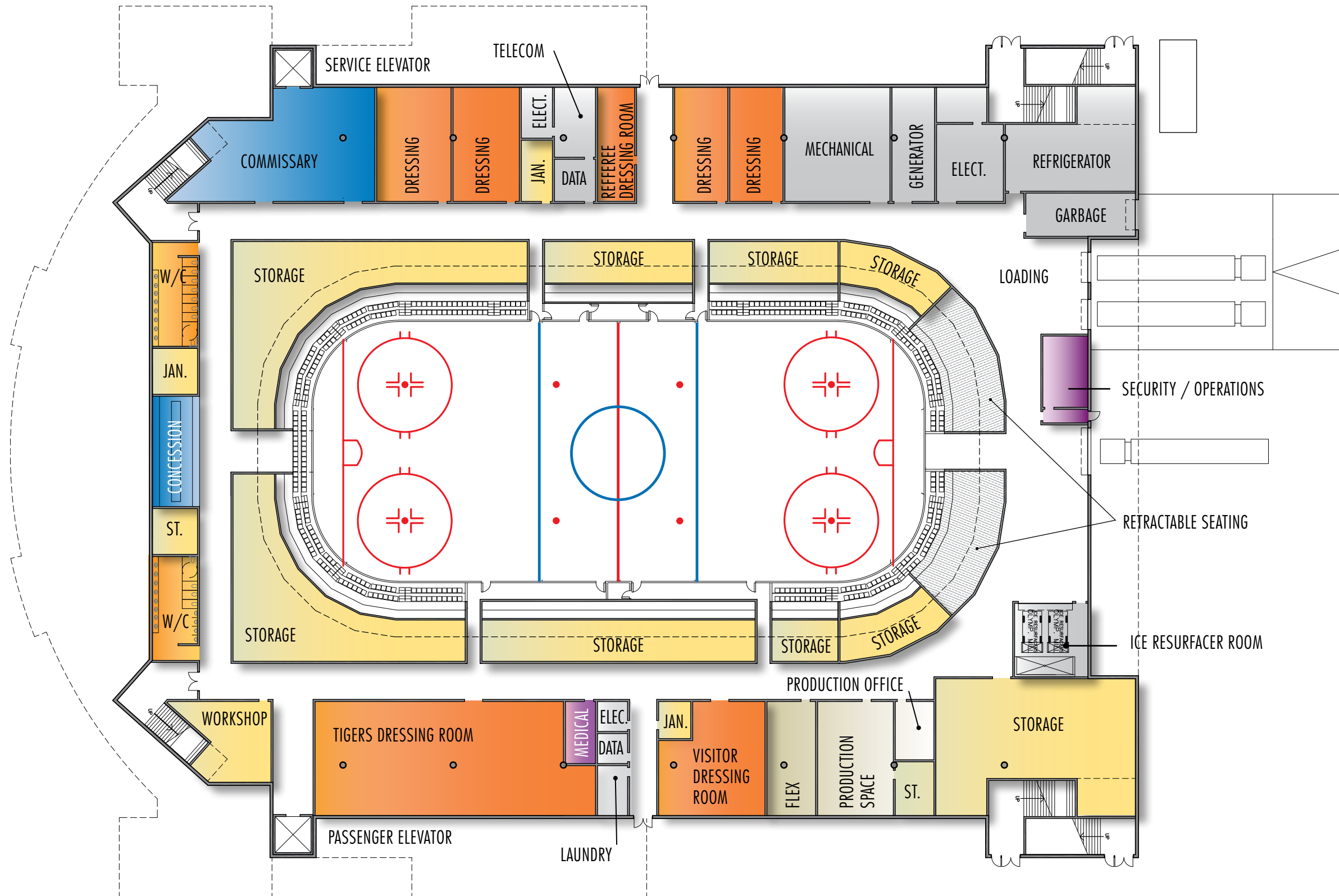
4.1 FLOOR PLANS

EVENT LEVEL

The Event Level of an Event Centre is the most crucial with respect to layout and functionality. This is the level where all of the behind the scenes action happens; where the producers, managers, participants, players, and supporting staff complete the tasks that create the event or show the audience has come to see. It is important to ensure that the proper connections are made between related activities and spaces; and that cross-overs do not occur between functions or people that are better kept separated. While the overall spacial relationships and layout are crucial it is also important that the Event Centre function well as both an Event Venue and a Hockey Arena.

Key layout highlights include:

- Location of loading and maintenance areas to the north with the public amenities (access to floor; washrooms; and concessions) to the south.
- Location of community hockey to the west with WHL hockey situated on the east side of the ice surface.
- Community dressing room pairs will be equipped with connecting doors to allow for the conversion into two large dressing rooms on the west to accommodate the Memorial Cup.
- Flex and production spaces can suit multiple functions during both hockey and other event days as needed.
- Fully contained home team dressing area featuring a main dressing area; street clothes area; players lounge; trainer / therapy space; showers; skate sharpening; and fitness area.

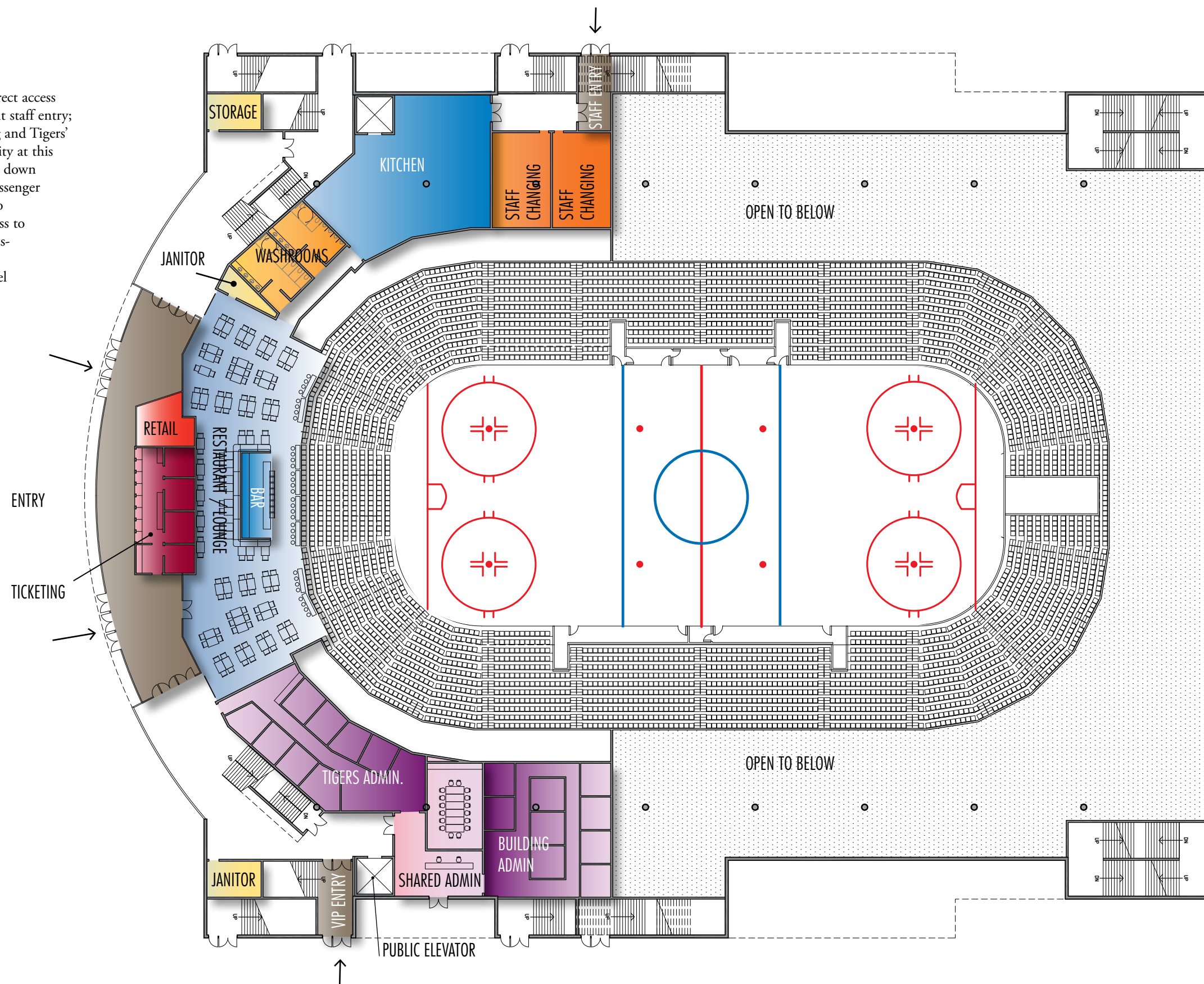


ENTRY LEVEL

The Entry Level is located at grade and allows for direct access into the building via the main south entry; west event staff entry; east suite holder entry; and east entry to the building and Tigers' administration. During events patrons enter the facility at this level and proceed either up to the main concourse or down to the event level via two large feature stairs and a passenger elevator. On non-event days this level allows access to the building administration and hockey team administration via a separate administration entrance to the east. In addition to entry and administration this level houses the Restaurant/Lounge; main kitchen; and staff change rooms and lockers.

Key layout highlights include:

- Shared administration entrance and meeting spaces.
- Restaurant/Lounge overlooking the bowl; allowing for table-services seats along the edge that have full view of the bowl.
- Kitchen is located adjacent to the restaurant; with a freight elevator that gives direct access to the commissary below.
- Staff entry and locker rooms allow for staff to prepare for work before proceeding down to the event level.
- Floor plate extends only as far as needed to accommodate needs while allowing for double height volume above the loading areas.

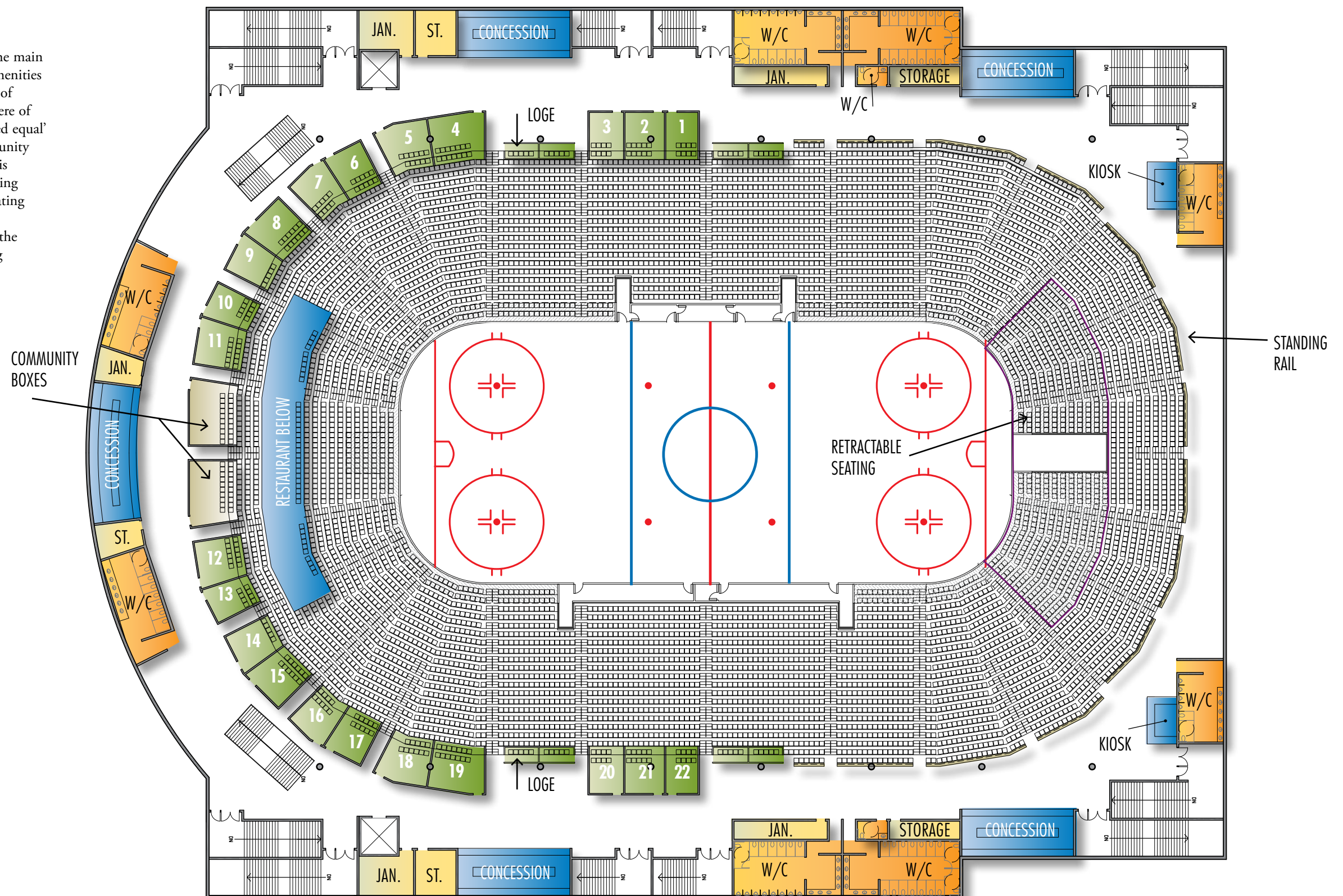


CONCOURSE LEVEL

The upper level or main Concourse level contains the main access to the seating bowl and spectator/audience amenities associated with events. Given the desire by the City of Medicine Hat to maintain the community atmosphere of their existing facility, and have an 'all seats are created equal' feel, the direct access to all premium seating (community boxes; private suites and loge boxes; and club seats) is directly off the main concourse. A continuous standing rail is located along the perimeter of the bowl separating the bowl from the concourse while still leaving the concourse open to the bowl. Around the outside of the concourse is where the spectator amenities including concessions and washrooms are located.

Key layout highlights include:

- Two community boxes and 22 private suites located to allow for use in all types of events (hockey; full house; and half house)
- Four Loge boxes at the top of the bowl.
- Ticketed Standing Rail along the north of the seating bowl; this area will be outfitted with an integrated black-out curtain for non-hockey events.
- Five self-contained concessions allow for cooking within the concession and 31 points of sale.
- Kiosks to the north can be used for Tigers' merchandising or specialty foods; allowing for 6 points of sale.
- Four men's and four women's washrooms contain accessible stalls; in addition two large family washrooms are fully accessible.
- Generous uninterrupted concourse space around the entire bowl.
- Janitorial and Storage spaces are equally spaced out around the concourse.

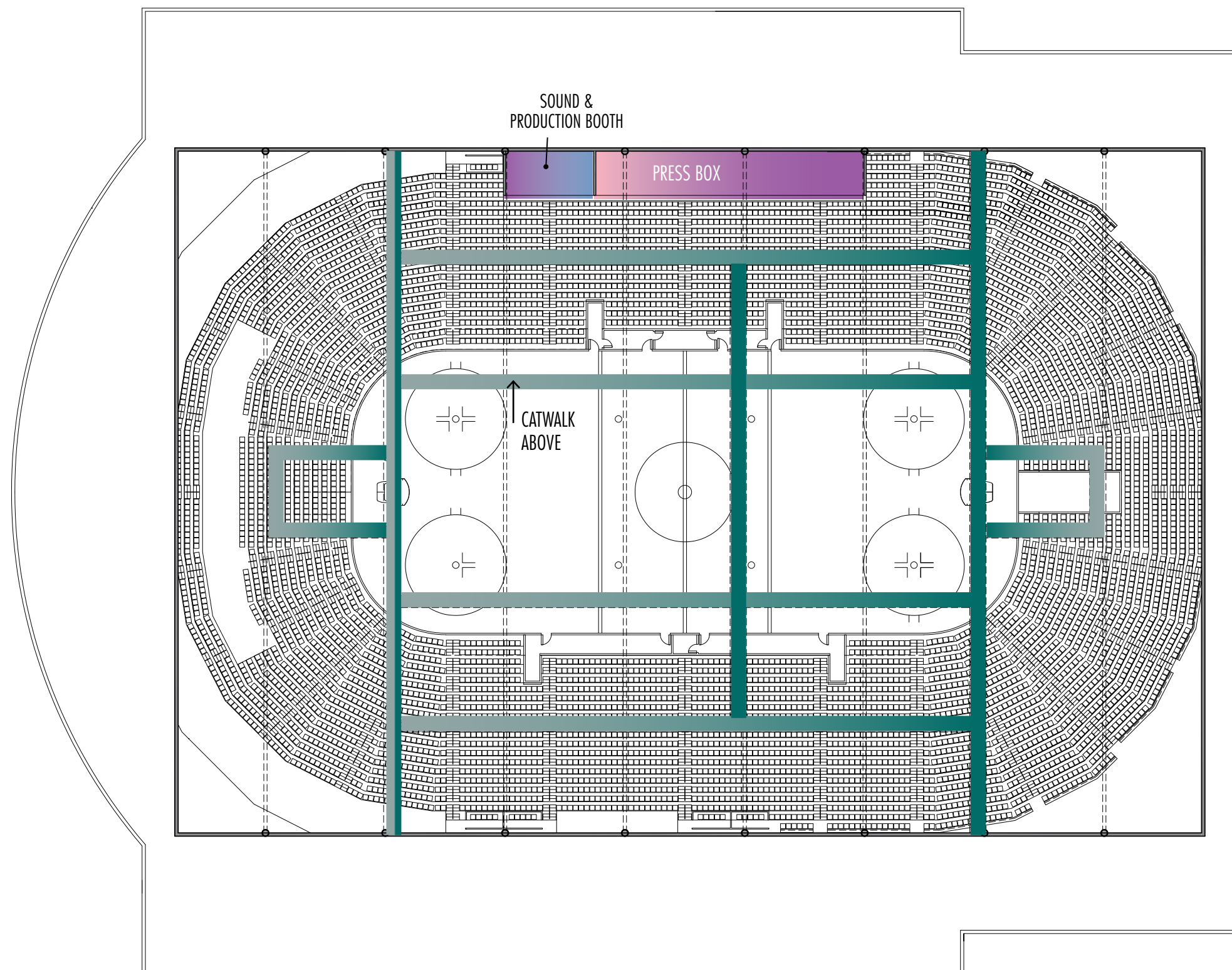


PRESS BOX LEVEL

The press box is located above the concourse level in a gondola style configuration along the west side of the ice surface. The location of the press box allows for unrestricted views of the ice surface and players boxes. In addition to containing the WHL requirements for a press box the Press Box Level will house a production room; sound and light booth for the building; camera locations and access to a catwalk and building spot lights.

Key layout highlights include:

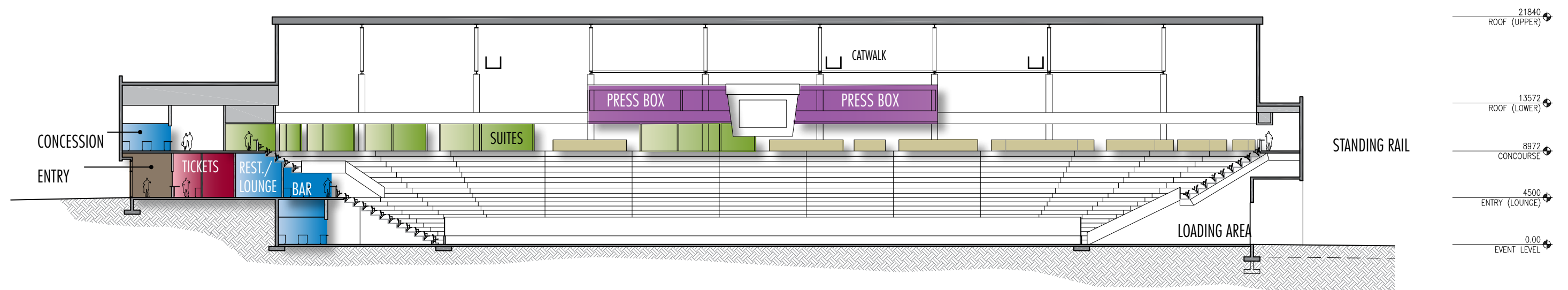
- Areas for WHL functions: Video goal judge room; visitors team radio; home team radio; print press; WHL Supervisors and Stats recorders; etc.
- Extensive Catwalk allowing access to four building owned spotlights located south of the half house curtain line.
- Production Space and Sound and Light booth for building.
- Centre-Hung score clock that can be raised up into the truss space during events.
- Rigging Grid over the end stage and centre stage areas.



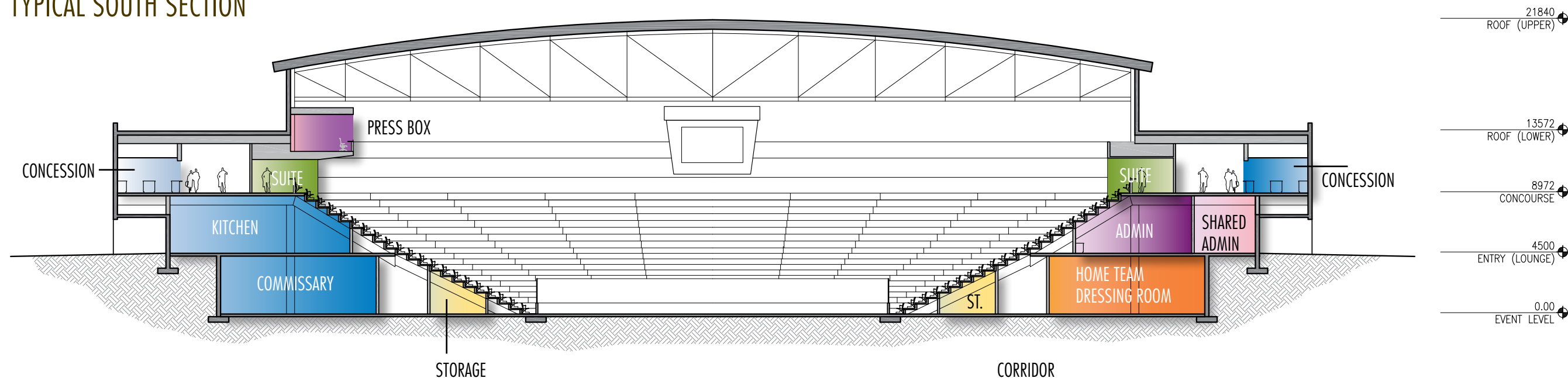
4.2 SECTIONS

The conceptual design has the grade at the front of the Event Centre built up to allow direct entry to the mid-level concourse (or entry level). From this level patrons either move directly into the restaurant / lounge area overlooking the event floor; or up to the concourse level to access the seating bowl and private suites. On event days where seating is provided on the event floor patrons will access the event level via two staircases or the passenger elevator on the entry level. North of the front and side entries of the facility the grade of the site slopes down toward the rear of the building allowing for direct entry to the event level from the enclosed service yard in the rear.

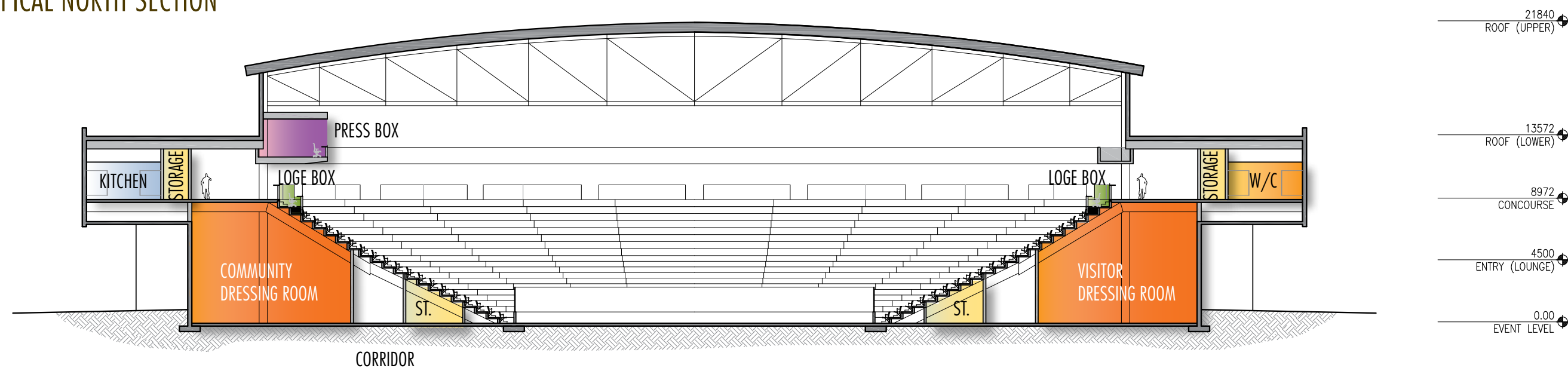
LONGITUDINAL SECTION



TYPICAL SOUTH SECTION



TYPICAL NORTH SECTION



4.3 ELEVATIONS



4.4 ARCHITECTURE

The exterior form of the building has been developed as a direct response to the local influences and geography found in the Medicine Hat region while following the functions of the building within. The overall design draws from the rich history of the brick industry in Medicine Hat and the brick production kilns that can be seen throughout the community. The front entry and south elevation of the Event Centre takes its form and materiality directly from that of the brick production kiln with the entry portion of the main level being carved out of the brick and fully glazed. This transparent entry will be lit up at night drawing people in and allowing the patrons a small glimpse of what is unfolding inside.

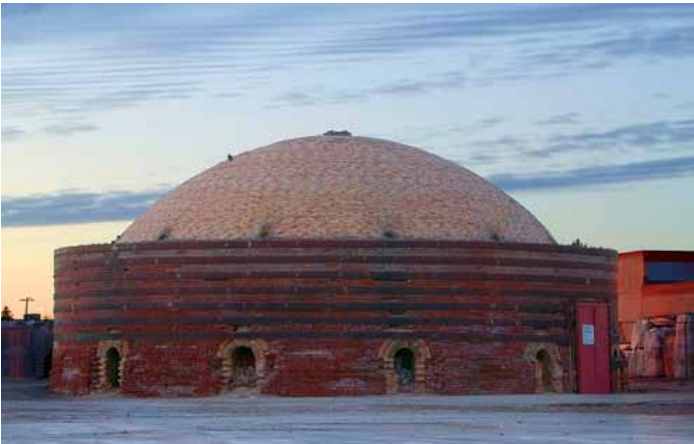
The brick and glass theme continues to the north at the east and west entries with the brick following the line of the ground to the north loading area. The concourse level consists of a metal clad element cantilevering out over the brick and glass below. This upper metal level extends down to the site grade at the exit stairs grounding the building at the ends and in the centre.

Building Materials

Materials have been chosen for their durability, cost point, and aesthetic qualities.

Exterior Materials Include:

- Red Brick
- Prefinished Metal Cladding
- Aluminum Curtain Wall with High Performance Glazing
- Prefinished Kalzip Roofing System over the barrel roof with PVC Membrane Roofing applied to the flat roof areas.



4.5 INTERIOR DESIGN

The interior design of the building is simple and functional with pockets of higher-end design and finishes in the key public spaces. The overall look and feel is to be light and fresh. Design accents will be applied to the premium spectator elements such as the restaurant / lounge and private suites. Spaces along the main entry concourse and upper concourse will be dedicated to memorabilia sports wall of fame and trophies; highlighting the key events and community groups in Medicine Hat's past and future with respect to the existing Arena and New Regional Event Centre.

Building Materials

Interior Materials Include:

- Floors in spectator and general circulation areas will be sealed concrete.
- Skate flooring will be used on the Event level in all dressing rooms and along the concourse where access is required to the ice surface.
- Flooring in the administrative areas, offices and private suites will be carpet with resilient rubber cove base.
- Walls in public areas will be painted concrete block.
- Walls in public washrooms will be porcelain tile (to 1200mm above floor) on concrete block and painted above.
- Walls in the office areas and private suites will be painted gypsum board with appropriate acoustical separation to suit where required.
- Doors to be hollow metal in pressed steel frames.
- Ceilings in the administrative and office areas will be acoustic tile in metal grid suspension system.
- Roof structure above the main seating bowl to be painted out.



Direct Construction Costs	January 2007	August 2008	October 2009
Direct Construction Costs	*	*	**
On Site Development	\$1,000,000	\$1,000,000	\$11,420,992
Building	\$49,000,000	\$56,875,000	\$54,399,008
Parking & Related Site Work	\$6,300,000	\$11,130,000	
Escalation to midpoint construction	\$14,919,500	\$8,531,250	
Subtotal	\$71,219,500	\$77,536,250	\$65,820,000
Design Contingency @ 10%			\$6,582,000
Subtotal			\$72,402,000
Construction Contingency @ 5%			\$3,620,100
Total Direct Construction Costs	\$71,219,500	\$77,536,250	\$76,022,100

Indirect / Owner Costs	January 2007	August 2008	October 2009
Site remediation/demolation allowance	\$750,000	\$500,000	
Operating equipment FF&E	\$1,960,000	\$3,200,000	\$2,500,000
Off site construction costs			\$1,000,000
Soft costs – Legal, permits, survey, geotechnical, architectural, engineering (15%)	\$10,682,925	\$12,185,438	\$9,502,762
Land costs, building, 3 acre site (city valuation)	\$42,857		
Land costs, parking, 12 acre site (city valuation)	\$157,143		
Development charges and municipal levees (lump sum)			\$800,000
Total Indirect / Owner Costs	\$13,592,925	\$16,385,438	\$13,802,762
Total Cost of Project	\$84,812,425	\$93,921,688	\$89,824,862
Project Contingency @ 5% of Total Project Costs	\$4,240,621	\$14,013,253	\$4,491,243

TOTAL PROJECT VALUE	\$89,053,046	\$107,934,941	\$94,316,105
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* Maple Avenue Site
** Box Springs Business Park Site

NOTES FOR CAPITAL COST PLAN

Projected Capital Costs

In developing the Capital Cost Plan for the project the following method and assumptions have been used to establish the likely costs for the overall project. The costs have been broken down into two basic categories namely the Direct Construction costs together with associated contingencies and the Indirect / Owner costs.

Direct Construction Costs:

The direct construction costs consist of the site development costs that generally include parking and loading areas, site servicing and utilities, landscaping and the entry plaza. The building costs include all components provided by the Contractor together with their general conditions and fee. The cost of the building also contains certain FF&E components that are described below that are best procured through the constructors tendering process. Two contingencies are identified with the Direct Construction Cost. The Design Contingency is intended to cover any additional budget costs as a result of scope changes and refinements to the project during the design stages of the project. The Construction Contingency is intended to cover any additional costs generated during the course of construction. These two contingencies are based on Provincial Government recommended standards for capital projects.

The Direct Construction costs have been based on the assumption that the design phase of the project will begin in the first quarter of 2010 and that the construction on the project will begin in the third quarter of 2010 and will take approximately 28 months to complete. If these time frames are changed it is recommended that an inflation allowance be established based on the current consumer price index for southern Alberta at the time.

Indirect / Owners Costs

The Indirect / Owners costs are those items that are the direct responsibility of the Owner. Operating Equipment / FF&E items are described below in more detail and generally include all of the components that are needed to for the day to day operation of the building not carried by the Contractor. An allowance has been carried to cover the costs of certain off site costs such as traffic signalization and road improvements within the Box Springs Business Park to accommodate the new facility. Soft Costs generally include consulting fees, reports and studies, material testing and legal fees. Development Charges are those costs applicable to any project within Medicine Hat and generally include Municipal Levees and Urban Reserve contributions.

An overall project contingency of 5% has been carried to address any unforeseen circumstances.

Furniture Fixtures and Equipment Budgets

The Furniture Fixtures and Equipment for the project is typically provided by both the Owner and Contractor. The Contractor supplied items are generally those components that are a part of the building that are built in and are best procured and installed as a part of the tender process(s). The design and documentation of these items is the responsibility of the Prime Consultant and include:

- Dasher boards, glass, protective netting systems
- Seating systems - both standard and retractable
- Food Service and kitchen / concession equipment – hard wired and built in
- Facility signage and pedestal signage – those items that are a part of the building
- Garbage compactors and cardboard bailer

Owner supplied items are much more extensive and are generally any thing that is not built-in. All conduit, cabling and system components that complete a system are included in the contract documents and form a part of the construction costs. The Prime Consultant together with the Building Operator / Owner generally specify these items through FF&E drawings / specifications and generally include:

- Hockey related equipment such as ice resurfacers, ice edgers, paint carts, goal nets, rubber runners, player’s tunnels and hand tools / shovels.
- Basketball floor, timing equipment and netting
- Stage platform and mixing platform
- Concert floor chairs and storage trucks / racking system
- Half house curtains and motorized support system
- Black out curtains / pipe and drape system
- Dasher board covers
- House keeping equipment such as floor scrubbers, carpet cleaners and vacuums, housekeeping carts, power washers, trash cans and recycling bins, power washer and miscellaneous brooms and mops
- Maintenance equipment such as shop equipment and tools, garden equipment, storage racking and shelving, forklift, scissor lift and catwalk hoists
- Security equipment such as flashlights and hand wands, parking lot barricades and cones and event uniforms
- Furniture for office space(s), restaurant / lounge spaces, computers and office machines, two radios and A/V equipment for non production events
- Washers and dryers
- Score Clocks and Signage Ribbons
- Suite Furniture

Capital Cost Plan Assumptions

- In developing the capital cost plan the following assumptions have used.
- The cost of construction is based on a construction start date in the third quarter of 2010 and taking approximately 28 months to complete
- The cost of construction has been derived through an elemental cost breakdown based on the conceptual drawings and outline specifications prepared by GEC Architecture and sub consultants and was prepared by Graham Construction and Engineering
- The construction costs represent the likely cost of construction assuming either a stipulated sum or construction management delivery model
- The cost of construction contains no allowances for either inflation or escalation beyond the time frames noted above
- The site for the project is assumed to be fully serviced and in a state to allow for construction to begin in an unencumbered manner
- The development of the construction costs has relied on certain information contained within the Functional Servicing Report prepared for the Box Springs Business Park in terms of Environmental Assessment that indicated no existing contamination

Commentary on the Current Alberta Construction Market

When the previous report was completed in 2007 the Alberta construction market was experiencing unprecedented pressure in terms of both availability of labour and materials which resulted in an escalation factor of between 1%–1.5% per month. At that time this situation was not expected to change in the foreseeable future and a corresponding escalation allowance was carried in the previous Capital Plan. With the demise of the global financial markets and the resulting recession construction prices have moderated considerably to a point whereby recently publicly tendered projects are closing below the pretender estimates. With the economy and interest rates likely to strengthen over the coming months it is not recommended to budget for any further construction cost reductions at this time. The current market place however will offer the City of Medicine Hat a competitive environment to seek both design teams and contractors for the project. This market place will likely exist for a number of months. Forecast and business models beyond a year are unreliable.

Introduction

Global Spectrum was engaged by GEC to review and provide commentary on the layout and functional requirements for conceptual planning purposes. Further, Global was to provide background information and commentary on current market conditions for event centres of a similar nature in terms of likely number of event days, event mix and future projects. Finally Global was to prepare a five year pro-forma for revenues and expenses of the facility.

This analysis was intended to assist GEC and the City of Medicine Hat in taking action to potentially move forward with a new 6,500 seat event centre in Medicine Hat. We believe the numbers we created represent a realistic view of what the building can do. In light of current economic conditions and anticipated recovery rates, the numbers could be considered somewhat conservative.

We do not believe the sport and entertainment landscape is such that much will change over the course of the next 3–5 years that would significantly improve the bottom line. Typically once a venue has been opened for its initial year, it settles in to an operational mode and cost savings from utilities to maintenance to staffing can be realized, however, the original projection that concert activity would increase from an initial 10 concerts annually to 18 over the course of 5 years is probably unlikely given the population base and its ability to support that many shows, as well as historical information from other western Canadian facilities of similar size.

Methodology/Assumptions

Global Spectrum manages over 30 arenas, many of which are the same size and scope of the Medicine Hat facility. They specifically compared the Budweiser Events Center in Loveland, CO, a 5,300 seat arena and the Comcast Arena at Everett, an 8,300 seat arena which is home to a WHL team.

In addition the team used their experience in the following event centres in Canada:

- Abbotsford Entertainment & Sports Center, Abbotsford, BC
- EnCana Events Centre, Dawson Creek, BC
- General Motors Centre, Oshawa, ON
- General Motors Centre Community Ice Rink, Oshawa, ON
- John Labatt Center, London, ON
- Penticton Community Ice Rink, Penticton, BC
- South Okanagan Events Centre, Penticton, BC
- WFCU Centre, Windsor, ON

To develop this report, the team used a combination of our extensive facility experience, discussions with promoters, a basic profile and

background of the market, and history of regional and similar venues. The team looked at events likely to travel to Medicine Hat (family shows, concerts etc) by reviewing the local demographics as well as those of other western Canadian communities with facilities of similar size including Lethbridge, Abbotsford, Penticton and others. For example, the well established Enmax Centre in Lethbridge has had on average of ten concerts annually over the past 4 years. Our experience in the numerous other facilities we manage allows us to make an educated guess about event volume. We spoke with a number of Canadian concert promoters, one of whom was enthusiastic enough about the project to provide an unsolicited letter of support. Additionally, information from the previous feasibility studies was incorporated.

Global Spectrum evaluated routing possibilities and have concluded that the venue would be located far enough away from Lethbridge to allow shows that stop there to also make a stop in Medicine Hat en route east or west. A strong family demographic indicates that the market can support family shows and other events. It also looks to be a strong sports market to support special events like curling championships, Memorial Cup, skating exhibitions, etc.

Profile of Medicine Hat

The City of Medicine Hat is a thriving city of approximately 60,426 residents. Located in southeastern Alberta, it is an excellent destination for all ages at any time of the year.

Located in a semi-arid climate with approximately 2,500 hours of sunshine per year, Medicine Hat is Canada’s “sunniest city” with more hours of sunshine than anywhere in Canada. Medicine Hat has one of the longest growing seasons in the province at about 188+ days. Chinook winter winds, warm, dry winds that descend the eastern slopes of the Rocky Mountains in winter, can raise temperatures by as much as 34 degrees Celsius in one day. Low humidity makes the temperatures in summer and winter a little easier to endure.

Medicine Hat is also referred to as “the oasis on the prairies” for it lush greenery, over 100 city parks and hundreds of trees that line the shore of the South Saskatchewan River Valley that runs through the centre of the city. Medicine Hat is one of the only cities in the world that owns and manages its own electric and gas utility. Built on a massive natural gas field, Medicine Hat has been providing residents and businesses of the city with natural gas since 1904. In addition, a percentage of the revenue for the utilities is given back to the residents as dividends in the form of some of the lowest utility and property tax rates in the country.

Situated at the crossroads of the Trans Canada Highway 1 and Highway 3 and located 168 kilometres from Lethbridge, 293 kilometres Calgary and 146 kilometres from the United States border, Medicine Hat has easy access to every part of the world.

Commercial Rights

We reviewed opportunities for various commercial rights given the business mix in Medicine Hat.

- Naming and Sub-Naming Rights
- Beverage Pouring Rights
- Advertising Signage
- Event Sponsorships
- Branding of Food & Beverage Products

It is our goal to showcase how the City of Medicine Hat and its related properties can generate contractually obligated revenue outside of their traditional revenue streams.

Commercial rights sales have been, and remains, a booming industry. As the industry evolves, sponsors are looking for new ways to reach targeted audiences in unique ways. Events’ captivate audiences and provide an ideal “venue” for sponsorship activation for certain brands. The challenge is harnessing the assets of a property and providing an asset that can be easily understood by the corporate marketing decision makers.

MEDICINE HAT DRAFT PROFORMA		
	Ref	MEDICINE HAT EVENT CENTER
		12 Month OPERATING
		1st STABILIZED YEAR
Number of Events	Sch. 1 & 2	87
Attendance Paid	Sch. 1 & 2	283,000
Rental Income from Events	Sch. 1 & 2	\$346,000
Net- Reimbursable from Promoters/Team	Sch. 1 & 2	(50,500)
Suite Ticket Income	Sch. 1 & 2	0
Facility Fee Income	Sch. 1 & 2	283,568
Ticket Convenience Fee Income	Sch. 1 & 2	124,200
Ancillary Income		
Concessions	Sch. 1 & 2	\$ 214,115
Catering	Sch. 1 & 2	34,008
Novelties	Sch. 1 & 2	58,345
Parking	Sch. 1 & 2	87,750
Total Ancillary Income		\$394,217
Total Event Income		\$1,097,485
Other Income		
Advertising (Net after Comm.)	Sch. 3	224,000
Naming Rights (net after Comm.)	Sch. 3	100,000
Luxury Seating		
Club Seats	Sch. 4	42,750
Suites	Sch. 4	333,720
Loge Boxes	Sch. 4	30,528
Party Suites	Sch. 4	21,760
Net Order Fee/Fulfillment- Phone/Web	Sch. 1 & 2 (see note on sch 2a)	31,275
Miscellaneous		2,000
Ice Rentals		100,000
Total Other Income		\$886,033
Adjusted Gross Income		\$1,983,518
Indirect Expenses		
Salaries & Benefits (Full & Part-Time)	Sch. 5	1,225,672
Materials, Supplies & Services	Sch. 6	910,935
Total Indirect Expenses		\$ 2,136,607
Net Operating Revenue before Management & Incentive Fee, Capital Improvement Reserve Fund & Debt Service Payments.		\$ (153,089)

COMMENTARY FOR OPERATING MODEL

The previous report outlined three different Operating models for consideration and recommended that the new Event Center be either operated directly by the City in conjunction with other Civic venues such as the Esplanade or by an Arms Length Society. Subsequently the City has decided to engage a third party Facility Management company through an RFP process when a decision is taken to proceed with the project. There are a number of organizations that provide these services that will offer the City a strong competitive environment to source these services. The value in pursuing this approach will allow the City to engage an operator early in the process that will result in the operator being an integral part of the project team as the design proceeds. In addition to the operation of the actual facility there are a number of other operating systems that the successful vendor can assist the City with and need to be addressed during the planning process including food services, marketing and ticketing. The successful vendor, together with the City, will decide on the extent of services to be either contracted out to third parties or managed directly that is largely dependant on the local market place in Medicine Hat to provide these services. These include such items as elevator and major equipment maintenance, waste management, landscape, day of event staffing, uniform cleaning services and the like. The likely responders to an RFP in this regard all have a proven track record of successfully providing these services.

We strongly concur with the City’s decision to proceed in this regard given the proven track record of this type operation seen in other facilities of a similar size and location.

Development Models

The previous report examined three different development models each including a financing component and operating model. This report does not address the financing options available to the City which are currently being developed by City Administration nor does it recommend an operating model as the City has agreed to make use of a private sector operator. In deciding on the most appropriate overriding development model the City will need to marry the financial options and implications with the recommended procurement model in order to arrive at a holistic solution to complete the project.

For purposes of this particular report a Development Model means the total process of designing, procuring construction services and FF&E (furniture, fixtures and equipment). Within each development model there are a several variations available to the City in terms of procuring these services. Three models have been further considered to reflect the current situation and decisions taken by the City for the project to date.

Municipal Public Works Project (Recommended Model)

This is the most traditional method by which Municipalities contract directly with the service providers – designers, constructors and suppliers – for the procurement of these various components. This model assumes that City will own both the land and assets for the project and provide the required financing to complete the work. The surrounding site development and infrastructure work including the road network, deep services and shallow utilizes to the property line are the responsibility of Box Springs, their designers and contractors.

Within this option there are several variations available to the City:

- Lump Sum Design / Bid / Build where by the City engages a design team directly to prepare the design and contract documents for the project which then in turn are tendered as a single package to contractors on a stipulated sum basis – hard bid tender resulting in a stipulated price contract. The design team in this model also prepares the FF&E package which is competitively tendered to the various suppliers and vendors. The project is then constructed in a conventional fashion. Given the current trend in the construction market place in Alberta whereby trade pricing is considerably more competitive this method of contracting should be given serious consideration. The overall time to complete the project is likely longer than using a Construction Management process which relies on progressively contracting various components of the work.
- Construction Management / Progressive Contracting which is a variation to the lump sum method noted above whereby a Construction Manager is selected on a competitive basis during the design stage of the project who works together

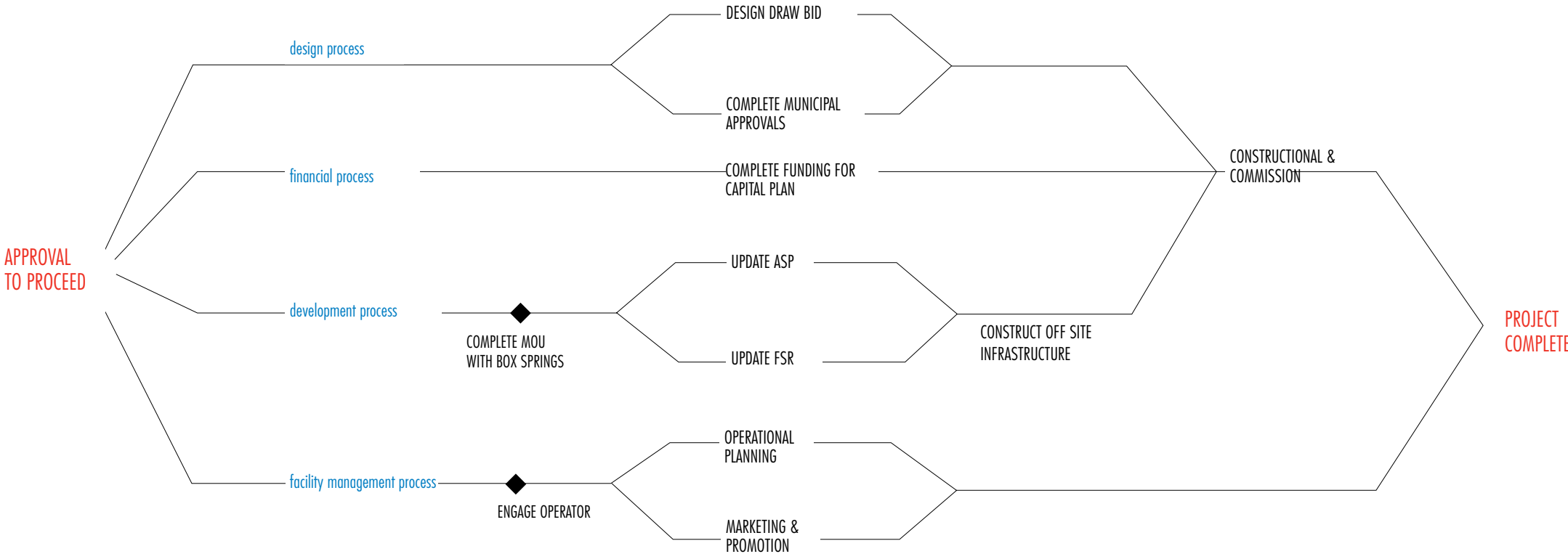
with the Design Team to establish construction budgets and implementation strategies that identifies packages of work that are tendered in a sequential fashion. This process allows for the start of construction to be advanced which will result in shorter overall project schedule. The construction contract can be either a stipulated price contract once all work is tendered or a construction management contract whereby the contractor is paid a fee to manage a series of individual trade contracts. In this method the contractor often makes use of individual trade contraction managers such as building envelop, mechanical and electrical which offers the client an ongoing level of value management as the design proceeds.

This method entails a degree of risk in that the final construction costs are not known until all tendering is complete which typically does not occur until 25% to 50% of the actual construction is complete. On the other hand this approach likely will result in an overall schedule saving of up to 6 months.

The municipal public works model has many advantages given Medicine Hat's sound fiscal position and consequent access to lower cost financing. It likely offers Medicine Hat the most control over the entire process given the recent decision to engage a facility operator early on in the process to assist in the development of the design. It is also a process that the City is familiar with having been used to develop the Esplanade project several years ago as a lump sum design / bid / build project.

Private Sector Finance / Design / Build Model / Operate

This model is based on a Design Build Team, usually working with a single entity under a developer, to provide the Owner with a turnkey package for a fixed price within a defined time frame based on a performance-based specification. Upon completion the provider assumes a contract for building operation. Several recent facilities in British Columbia have been developed along these lines. This model puts significant pressure on the Owner to accurately define the scope of work in the Performance Specification and resist changes as the project proceeds. This model places the responsibility for the building quality in the hand of the developer and can often result in a bare bones building that reflects the financial requirements of the agreement. This approach is often favoured as a mechanism to reduce both capital and operating risk to the municipality (through a single service provider). Furthermore, through the use of private sector financing this option may give a municipality access to capital that is not available through regular borrowing. As discussed, private sector borrowing costs are considerably higher than that available to municipalities in Alberta and additional development fees are incurred resulting in either a higher cost or lower quality development. Give the decisions taken by the City in regard to hiring an independent third party operator, the sound fiscal position the City is currently in and the inherent risks associated with this model as seen in some projects it is not recommended to make use of it as the preferred development model.



The development of this project is a significant undertaking for the City of Medicine Hat and will represent one of the most major capital commitments made to a single building project. As the project has evolved over time different risks have been identified and quantified and have involved a variety of stakeholders. At this juncture the major risks facing the various stakeholders are:

Capital Costs

It is still expected regardless of the funding model that the City of Medicine Hat will be the largest contributor to the capital plan. Regardless of the development model ultimately chosen the City will assume the bulk of the risk for the cost of construction and the associated consulting and associated contingencies. The capital cost presented in this report includes all known project costs given the current market place which has changed since the previous report was prepared – primarily in the area of construction cost escalation. In the very short term the cost of construction is likely to continue to moderate. In the near term the cost of construction is expected to stabilize and normal inflation will occur in the market place. If the project does not proceed in the 12 months it is recommended that the capital cost plan be reviewed and up dated to reflect the current market conditions. By proceeding in the near term the City can expect to receive favorable tender results.

Operating Costs:

The major operating risks continue to be the cost of utilities and the availability of labor to operate the facility. We continue to believe that these risks are minor in nature as the market place for labor has strengthened recently and the outlook for utilities and services will likely fall within the normal trends.

Revenue Generation:

The most significant risk related to revenue generation is the ability of the facility operator to successfully market the building in terms of both events and other revenue streams such as advertising and premium seating products (private suites / boxes, loge boxes and club seating). Increasing the number of revenue generating events will have a trickle down effect on other revenues such as parking, concessions and merchandising. This will require the operator to create a heightened awareness within the Medicine Hat region as well as within the event industry that stage and promote touring shows and events. Current projections indicate that the facility will continue to rely on an operating subsidy for a period of time.

Building Size and Seating Capacity

The previous report identified the seating capacity and building size as a major risk to the project. The seating capacity continues to be an issue with the Medicine Hat Tigers in terms of the concern of too many seats being available and the demand on their season tickets. This issue was reinforced by the Western Hockey League and Global Spectrum. This report recommends that the facility open with 5,500 seats in the seating bowl with the ability of expanding to 6,500 over time which is consistent with other building of a similar size in similar markets. We believe that the associated risks in terms of seating capacity have been mitigated as the proposed design for the building will allow for a variety of seating configurations for the different events in order to maximize revenues. The size of the building has been established to accommodate an increase in seating capacity over time.

Associated Agreements and Negotiations

There are two major agreements required that carry a level of risk to the successful outcome of the project: A Memorandum of Understanding leading to a Development Agreement will need to be concluded with the Box Springs Business Park .These negotiations are currently underway and the Capital Cost Plan has anticipated a certain value to address any items that may arise. The second agreement that will need to be completed is with the major building tenant – the Medicine Hat Tigers. The arrangements concluded with the Tigers will have a direct impact on revenue and ultimately the pro forma for the facility.

“Good lease with major tenant + Good corporate base = Good operating bottom line” – Global Spectrum

SWOT ANALYSIS

The following represents the various Strengths, Weaknesses, Opportunities and Threats associated with the project at this stage of development.

Strengths

- Current timing is economically beneficial in terms of capital costs
- Project will likely meet or exceed the Community expectation
- Builds on and strengthens work completed to date
- Project will generate economic development within the Box Springs Business Park and the greater Medicine Hat trading region
- Project will create both short term construction employment and long term permanent job opportunities
- The project will enhance the quality of life for the residents of Medicine Hat, southeastern Alberta and southwestern Saskatchewan.

Weaknesses

- Operational sustainability – the City of Medicine Hat will likely need to continue to subsidize the operation of the new Event Center until such time as the population base of the Medicine Hat region significantly increases
- The project relies in part on the future success of the Box Springs Business Park and their ability to successfully complete their development

Opportunities

- Economic development at both the local and regional level
- Expanded municipal tax base
- Ability to host national and international competitions
- Ability to offer a broader spectrum and greater number of events to the Medicine Hat region
- To combine the impact of municipalities and counties through the creation of a “regional” events center – both politically and financially

Threats

- Inability to successfully fund the project
- Public acceptance of the Capital Plan

APPENDIX A: CAPITAL COST PLAN BREAKDOWN



Medicine Hat New Regional Event Centre
Appendix 1

Budget Estimate Sept 2009

Siteworks		
Site Grading	\$	1,452,668
Utilities	\$	1,500,000
Asphaltic Paving	\$	3,256,926
Concrete Aprons / Sidewalks / Curbs	\$	2,319,550
Site Furniture/Fencing	\$	145,000
Commercial Crossing	\$	75,000
Landscaping/Irrigation	\$	660,000
Site Electrical	\$	85,000
Electrical Services	\$	50,000
Gas Services (City of Medicine Hat)	\$	20,000
Winter Conditions Allowance	\$	200,000
General Conditions, Overheads & Fee	\$	1,329,843
Permit, Bonds & Insurance	\$	327,005
Sub-Total Siteworks		\$ 11,420,992
Building		
Building Detailed Excavation & Backfill	\$	781,172
Concrete / Reinforcement	\$	4,548,453
Precast Concrete	\$	2,214,000
Masonry	\$	3,253,000
Structural Steel / Misc. Steel	\$	4,896,425
Metal Roof & Floor Deck	\$	495,500
Finish Carpentry / Millwork	\$	931,272
Roofing	\$	1,970,186
Insulation & Firestopping	\$	401,865
Metal Cladding	\$	3,063,696
Entrances & Glazing	\$	641,800
Drywall and Ceilings	\$	1,563,958
Metal Doors, Frames & H/W	\$	503,821
Flooring	\$	671,245
Painting & Wallcoverings	\$	481,380
Miscellaneous Specialties	\$	399,611
Equipment	\$	235,000
Furnishings	\$	195,000
Elevators	\$	255,500
Mechanical	\$	7,452,000
Refrigeration	\$	709,400
Electrical	\$	5,774,700
Hockey Arena Specialties	\$	607,512
Fixed & Retractable Seating	\$	818,814
Cash Allowances		
— Commercial Kitchen	\$	750,000
— TI to Home Changing Room	\$	1,000,000
— TI to Private Boxes	\$	240,000
— Exterior Pylon Sign	\$	150,000
— Acoustics & Sound Attenuation	\$	1,000,000
Winter Conditions Allowance	\$	500,000
General Conditions, Overheads & Fee	\$	6,336,217
Permit, Bonds & Insurance	\$	1,557,481
Sub-Total Building		\$ 54,399,008
Total Cost		\$ 65,820,000

APPENDIX B: DETAILED PROGRAM

Room	Area (m2)	Area (ft2)	Remarks
Concourse Level			
Mens North Washroom	36.2	389.7	
Womens North Washroom	36.2	389.7	
Mens East Washroom	60.4	650.1	
Womens East Washroom	65.3	702.9	
Mens South Washroom	45.9	494.1	
Womens South Washroom	45.9	494.1	
Mens West Washroom	60.4	650.1	
Womens West Washroom	65.3	702.9	
Family East Washroom	5.4	58.1	
Family West Washroom	5.4	58.1	
NE Janitor Room	16.7	179.8	
NW Janitor Room	16.7	179.8	
SE Janitor Room	22.0	236.8	
SW Janitor Room	22.0	236.8	
South Janitor Room	13.6	146.4	
NE Concession	52.4	564.0	6 P.O.S
NW Concession	52.4	564.0	6 P.O.S
SE Concession	52.5	565.1	6 P.O.S
SW Concession	52.5	565.1	6 P.O.S
South Concession	63.6	684.6	7 P.O.S
NE Kiosk	14.0	684.6	2 P.O.S
NE Kiosk	14.0	150.7	2 P.O.S
NE Storage Room	12.6	135.6	
NW Storage Room	12.6	135.6	
SE Storage Room	18.1	194.8	
SW Storage Room	18.1	194.8	
South Storage Room	13.6	146.4	
Suite 1	15.0	161.5	8 seats + standing
Suite 2	18.4	198.1	10 seats + standing
Suite 3	15.9	171.1	8 seats + standing
Suite 4	25.0	269.1	14 seats + standing
Suite 5	22.0	236.8	11 seats + standing
Suite 6	17.6	189.4	10 seats + standing
Suite 7	17.8	191.6	9 seats + standing
Suite 8	20.6	221.7	12 seats + standing
Suite 9	16.8	180.8	10 seats + standing
Suite 10	15.2	163.6	8 seats + standing
Suite 11	20.1	216.4	12 seats + standing
Suite 12	20.1	216.4	12 seats + standing
Suite 13	15.2	163.6	8 seats + standing
Suite 14	16.8	180.8	10 seats + standing
Suite 15	20.6	221.7	12 seats + standing

Room	Area (m2)	Area (ft2)	Remarks
Suite 16	17.8	191.6	9 seats + standing
Suite 17	17.6	189.4	10 seats + standing
Suite 18	22.0	236.8	11 seats + standing
Suite 19	25.0	269.1	14 seats + standing
Suite 20	15.9	171.1	8 seats + standing
Suite 21	18.4	198.1	10 seats + standing
Suite 22	15.0	161.5	8 seats + standing
Community Box A	29.3	315.4	20 seats + standing
Community Box B	29.3	315.4	20 seats + standing
Entry Level			
Entry	210.2	2262.6	
Tickets	73.7	793.3	
Shop (Retail)	24.9	268.0	
Restaurant/Lounge (Bar incl.)	430.0	4628.5	
Kitchen	206.0	2217.4	
Mens Washrooms	29.5	317.5	
Womens Washrooms	32.0	344.4	
Storage	19.6	211.0	
Janitor West	9.7	104.4	
Janitor East	19.6	211.0	
Womens Staff Change	55.6	598.5	
Mens Staff Change	55.6	598.5	
Building Administration	170.3	1833.1	
Tigers Administration	163.8	1763.1	
Shared Administration	101.1	1088.2	
Event Level			
Concession	51.7	556.5	6 P.O.S
Commissary	187.8	2021.5	
Mens w/c	46.6	501.6	
Womens w/c	46.6	501.6	
Community Dressing Room 1	60.3	649.0	
Community Dressing Room 2	60.3	649.0	
Community Dressing Room 3	75.3	810.5	
Community Dressing Room 4	75.3	810.5	
On-ice Officials Dressing Rm.	42.1	453.2	
Visiting Team Dressing Rm.	107.5	1157.0	
Home Team Dressing Rm. & Fitness Area	308.2	3317.4	
Medical	18.6	200.2	
Flex Room	55.3	595.2	
Production Space	85.9	924.6	
Production Offices	22.4	241.1	

Schedule of Accomodation

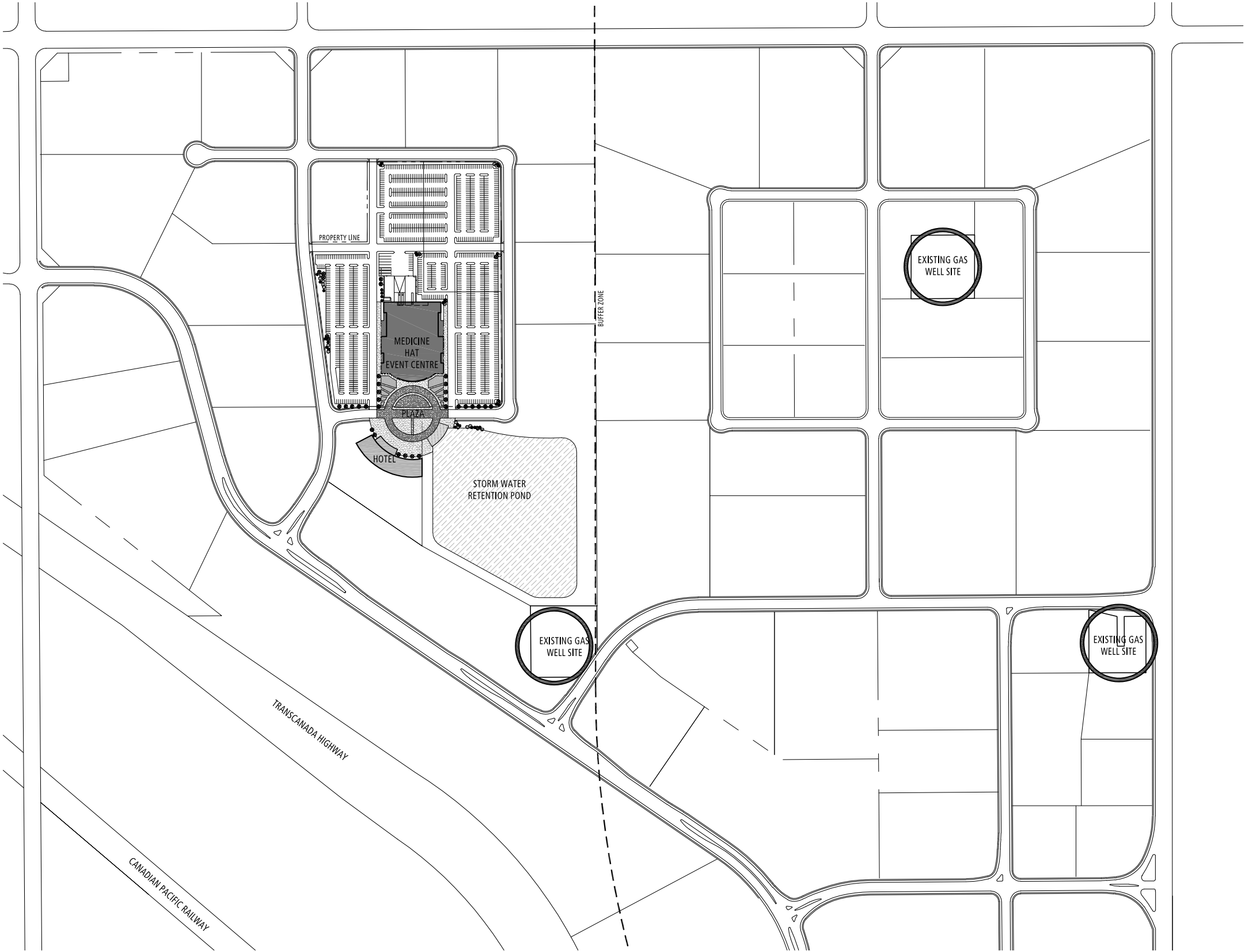
Room	Area (m2)	Area (ft2)	Remarks
Security/Operations	32.0	344.4	
Janitor 1	11.8	127.0	
Janitor 2	20.6	221.7	
Janitor 3	18.9	203.4	
Laundry	14.9	160.4	
Chiller/Refrigeration Room	108.5	1167.9	
Main Electrical Room	51.2	551.1	
Electrical 2	15.7	169.0	
Electrical 3	9.0	96.9	
Data 1	17.5	188.4	
Data 2	17.2	185.1	
Telecom	28.6	307.8	
Generator Room	48.4	521.0	
Mechanical Room	119.3	1284.1	
Zamboni Room/Ice Melt	53.6	576.9	
Loading Area	345.6	3720.0	
Workshop	61.7	664.1	
Garbage Room	47.0	505.9	
Storage 1	238.9	2571.5	
Storage 2	20.7	222.8	
Storage 3	43.9	472.5	
Storage 4	27.2	292.8	
Storage 5	112.6	1212.0	
Storage 6	187.9	2022.5	
Storage 7	20.6	221.7	
Storage 8	215.5	2319.6	
Storage 9	62.1	668.4	
Storage 10	53.0	570.5	
Storage 11	43.9	472.5	

APPENDIX C: ARCHITECTURAL DRAWINGS

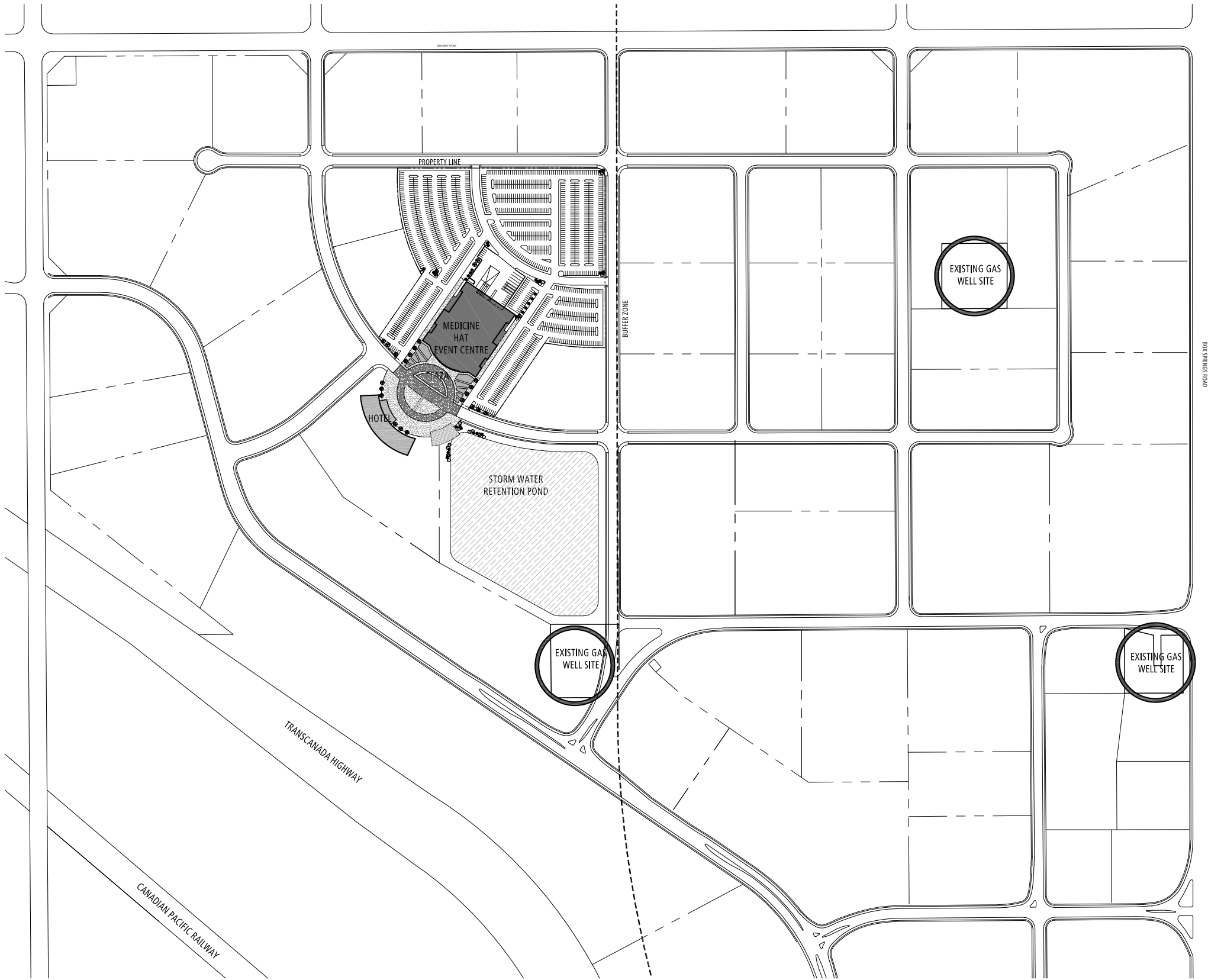


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EXISTING BOX SPRINGS SITE LOCATION PLAN	
Project No.	Drawing No.
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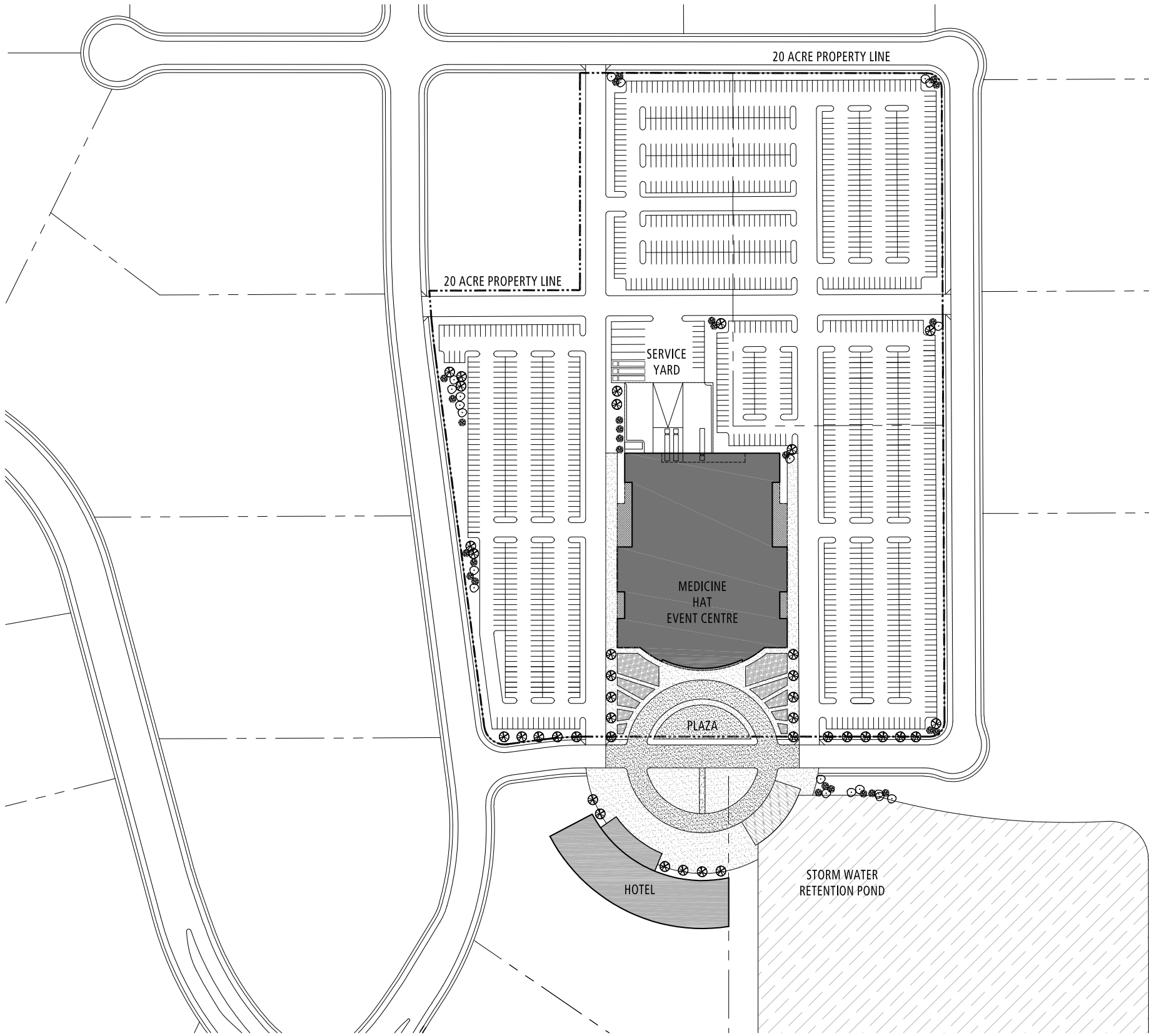


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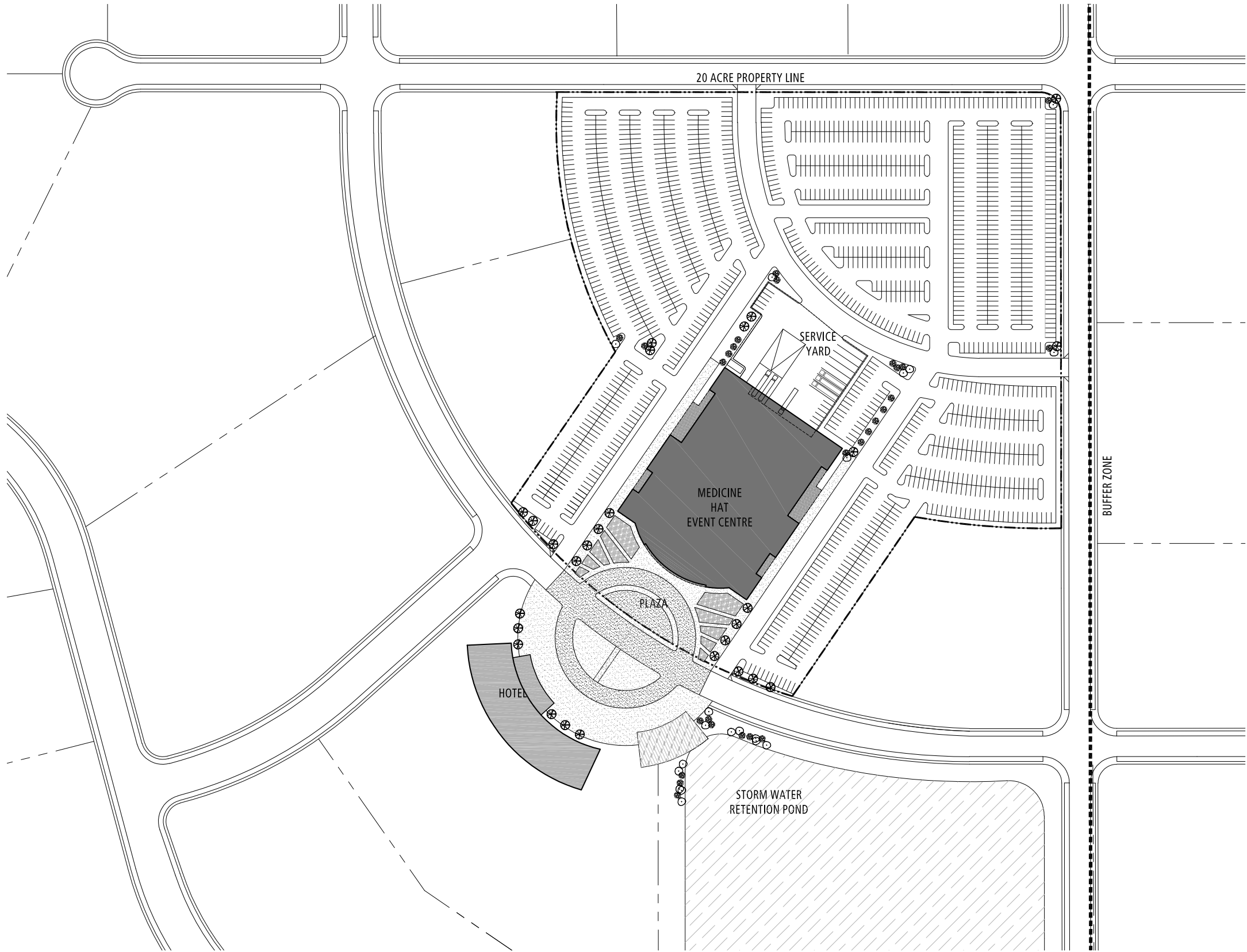
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Project No.	4991	Drawing No.	ASK01

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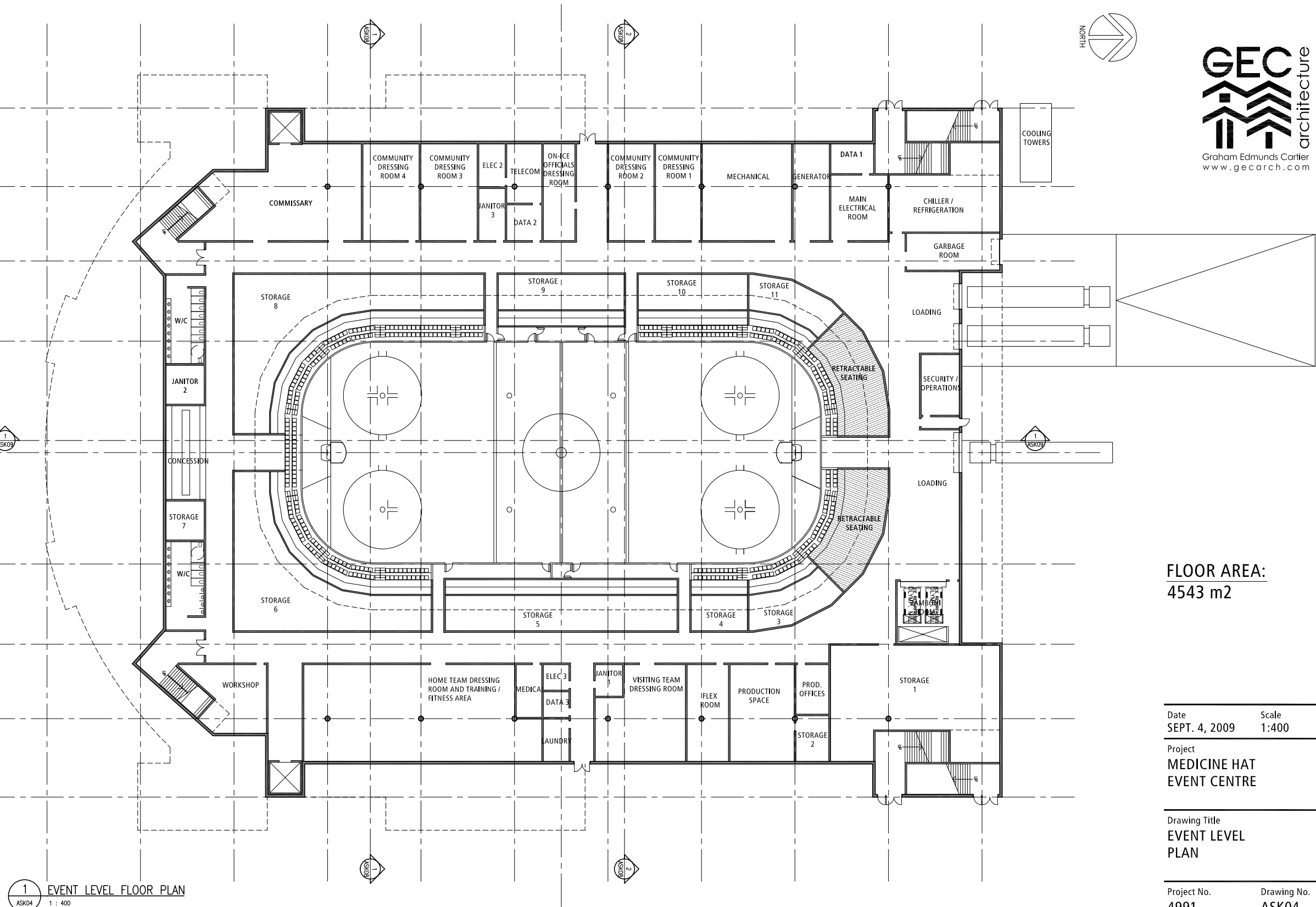
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FLOOR AREA:
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Date
SEPT. 4, 2009

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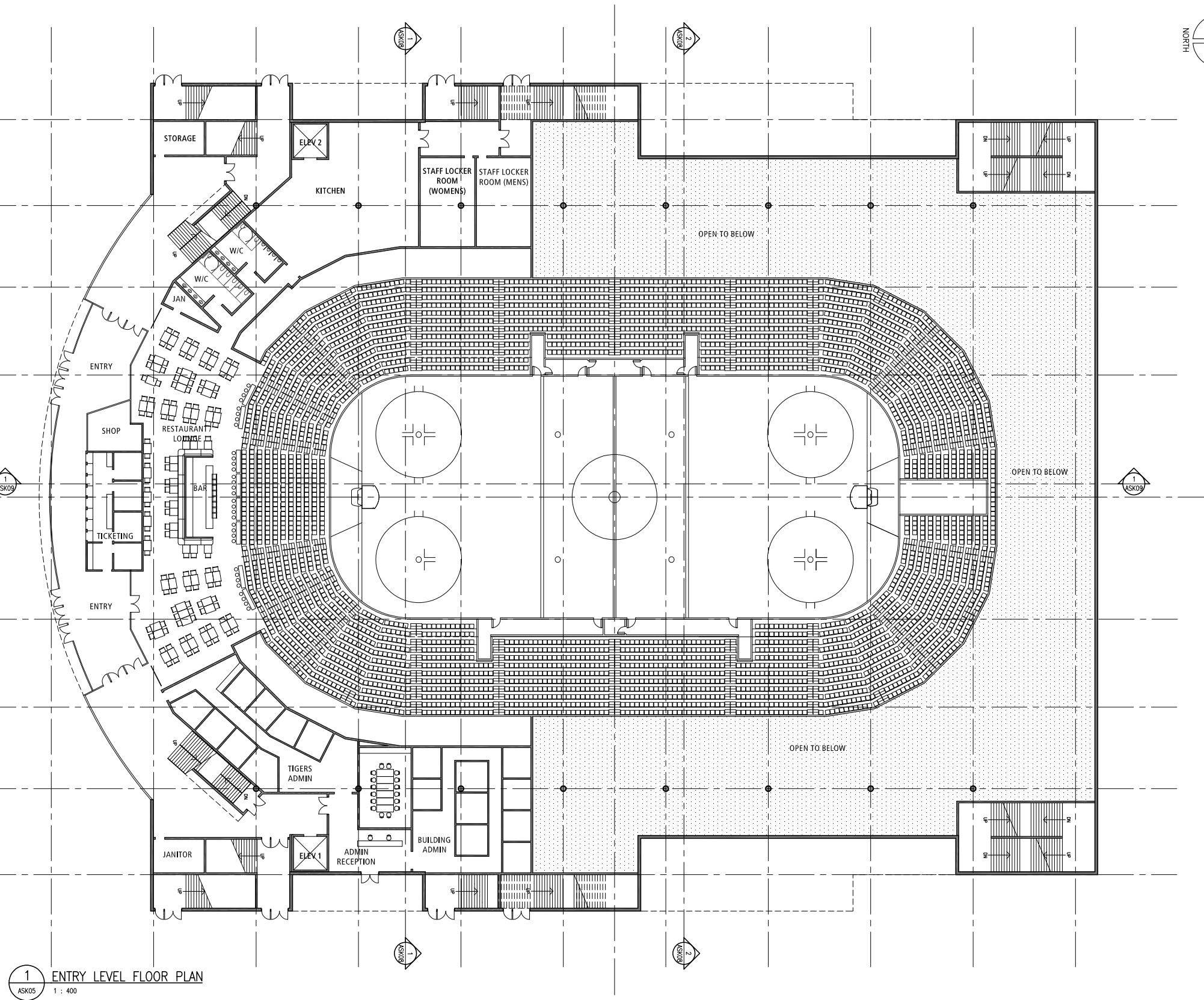
Project
MEDICINE HAT
EVENT CENTRE

Drawing Title
EVENT LEVEL
PLAN

Project No.
4991

Drawing No.
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FLOOR AREA:
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Date
SEPT. 4, 2009

Scale
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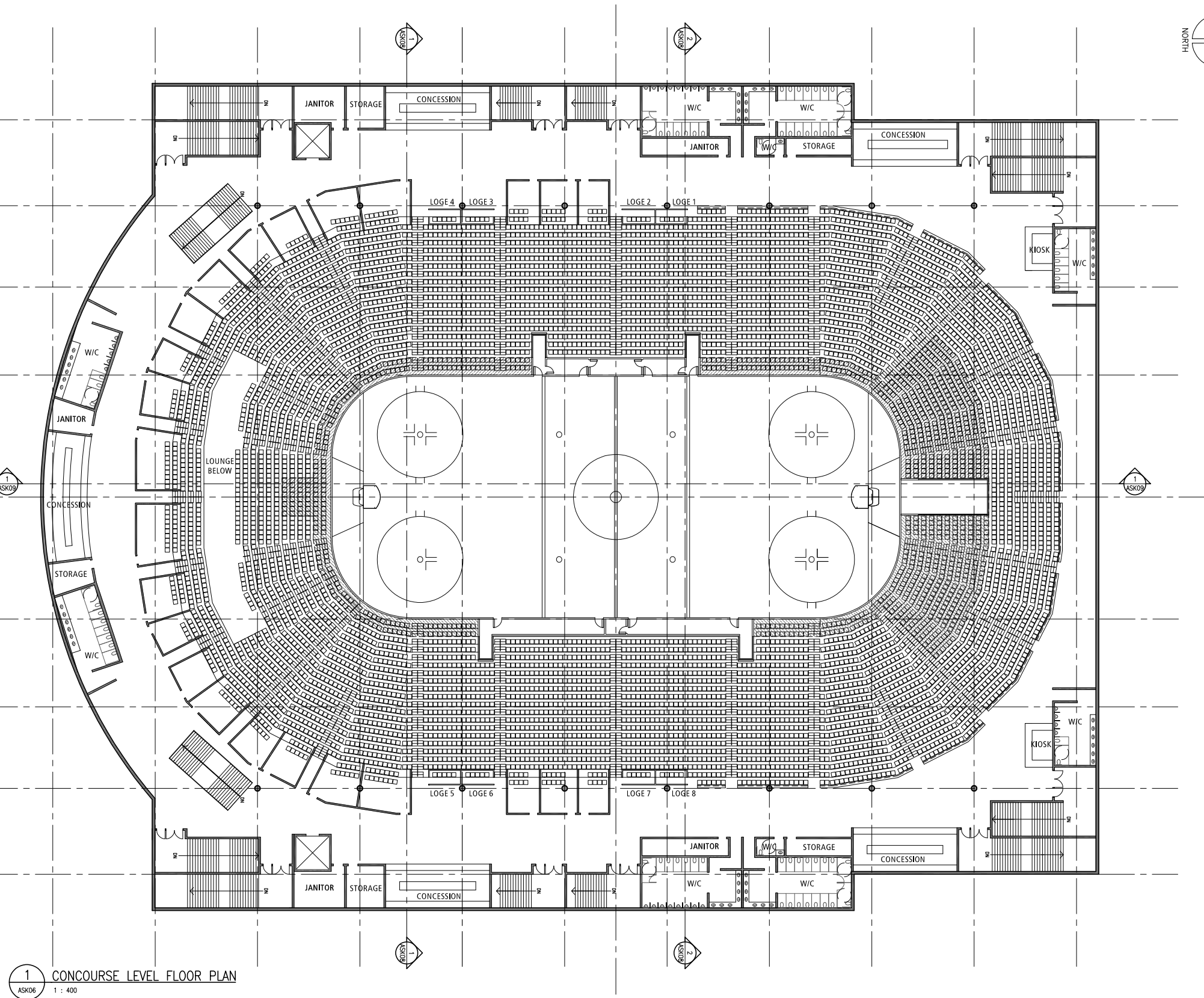
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EVENT CENTRE

Drawing Title
ENTRY LEVEL
PLAN

Project No.
4991

Drawing No.
ASK05

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FLOOR AREA:
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Date
SEPT. 4, 2009

Scale
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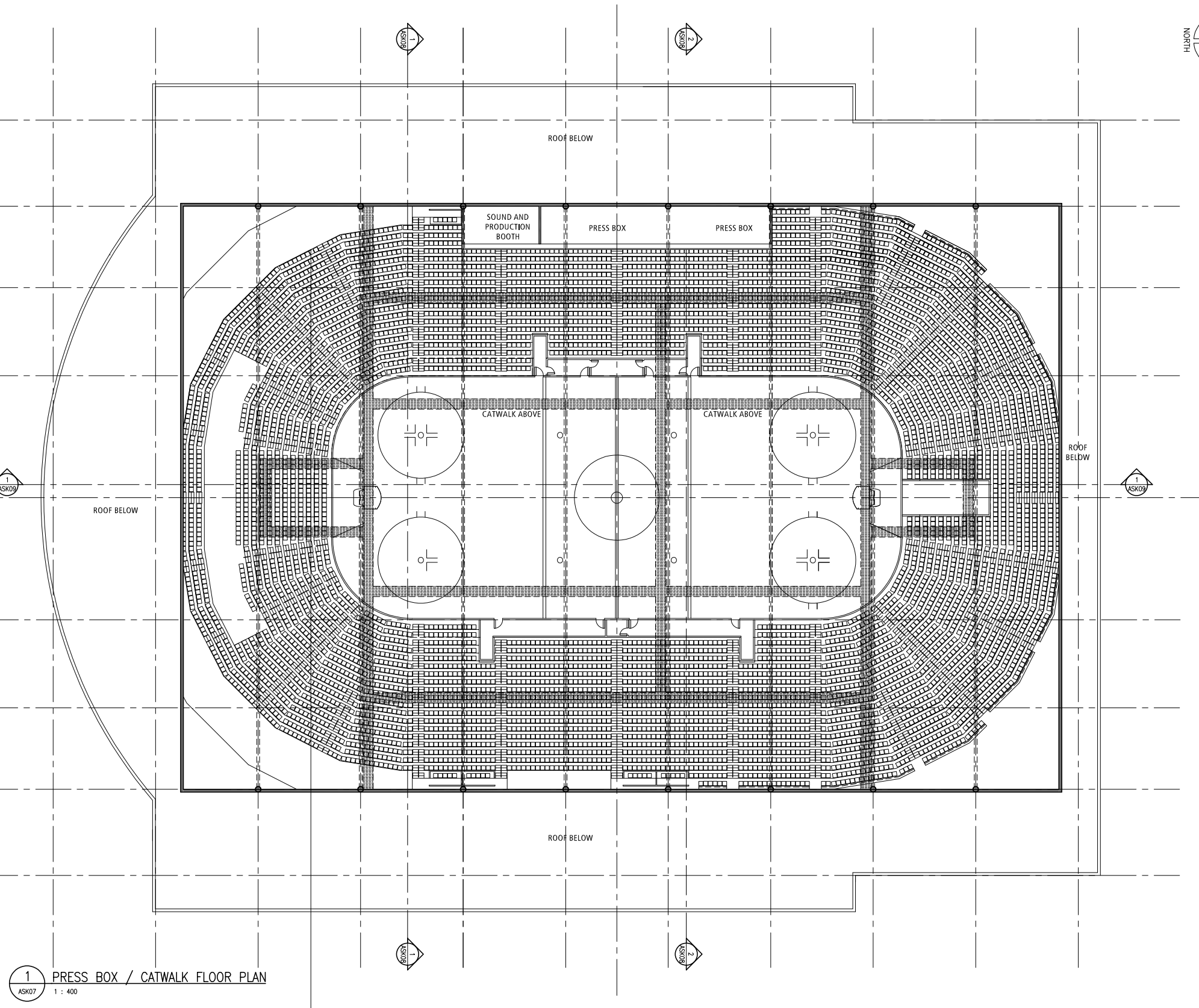
Project
MEDICINE HAT
EVENT CENTRE

Drawing Title
CONCOURSE LEVEL
PLAN

Project No.
4991

Drawing No.
ASK06

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1 PRESS BOX / CATWALK FLOOR PLAN
ASK07 1 : 400



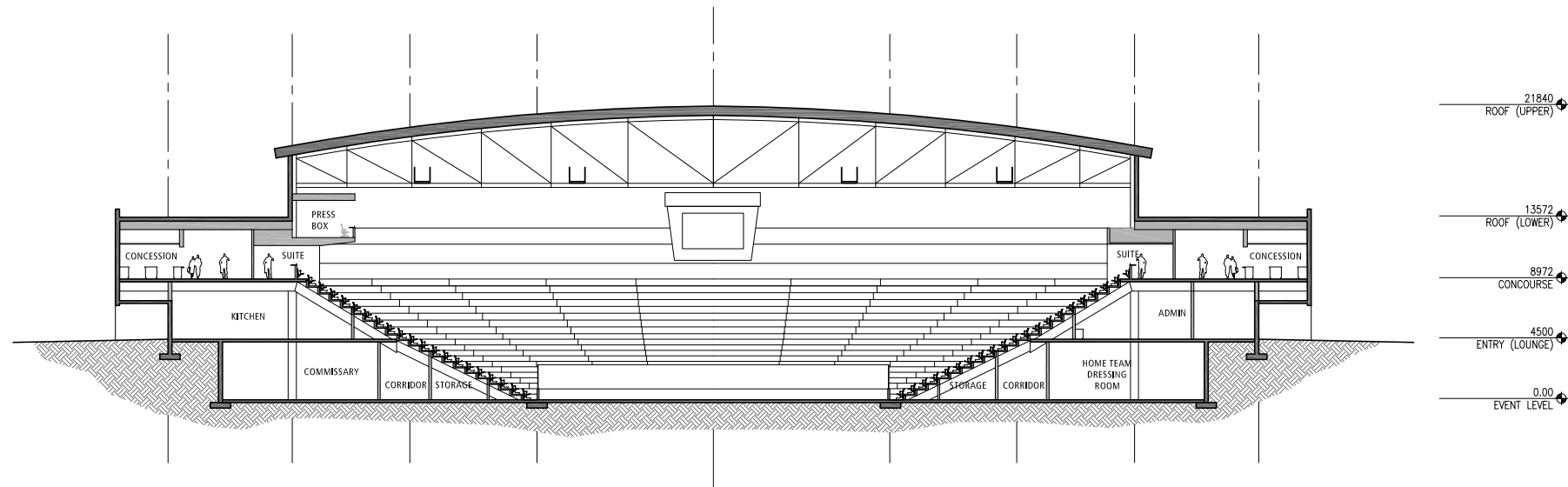
FLOOR AREA:
147 m²

Date	Scale
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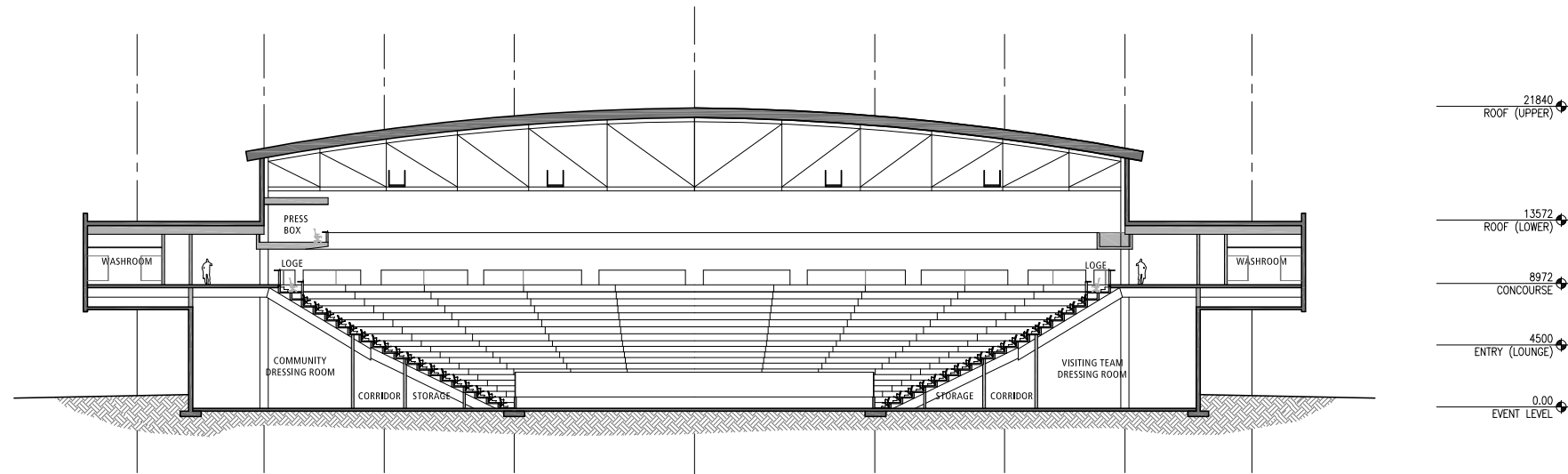
Project
MEDICINE HAT
EVENT CENTRE

Drawing Title
PRESS BOX/CATWALK LEVEL
PLAN

Project No.	Drawing No.
4991	ASK07



1 TYPICAL SOUTH BUILDING SECTION
ASK08 1 : 400



2 TYPICAL NORTH BUILDING SECTION
ASK08 1 : 400

Date
SEPT. 4, 2009

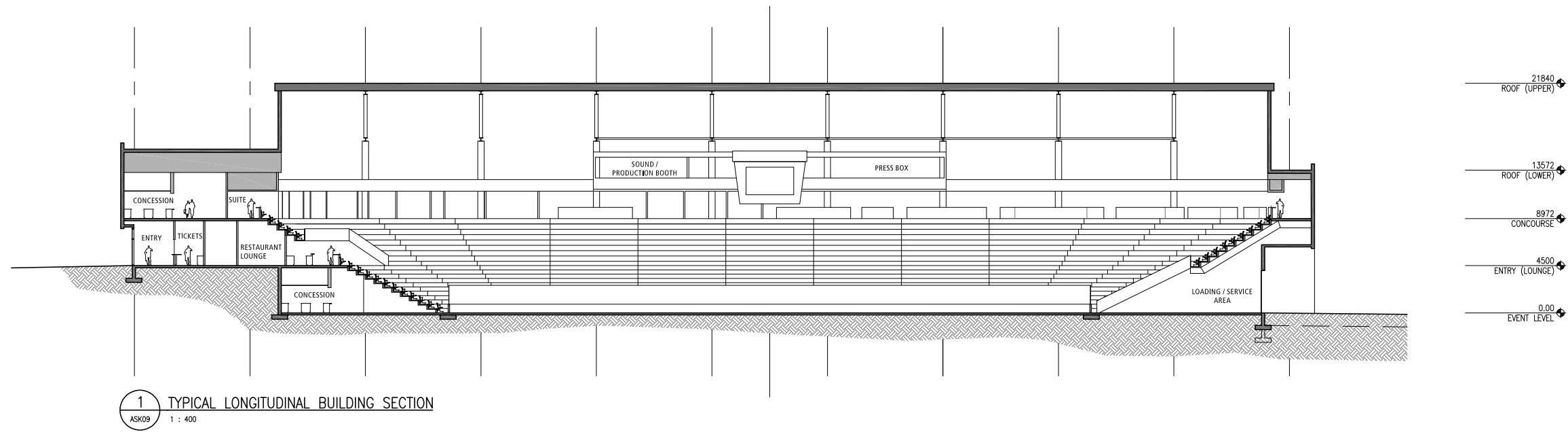
Scale
1:400

Project
MEDICINE HAT
EVENT CENTRE

Drawing Title
TYPICAL NORTH &
TYPICAL SOUTH
BUILDING SECTIONS

Project No.
4991

Drawing No.
ASK08



Date
SEPT. 4, 2009

Scale
1:400

Project
MEDICINE HAT
EVENT CENTRE

Drawing Title
LONGITUDINAL
BUILDING SECTION

Project No.
4991

Drawing No.
ASK09

APPENDIX C: OUTLINE SPECIFICATIONS

Area	Notes & Comments	Walls	Floors	Ceilings
1.0 GENERAL NOTES				
All paints and coatings to be low VOC				
All doors to be oversized				
Exit Stairs	Painted Metal Pipe and Picket Railings	Paint all walls	Concrete Sealer on all floors Colored edge on all treads	Exposed Structure
Seating Bowl	Minimum 20" wide seats; all seats to have cup holders. Hard surface seats for General Seating. Allow for 300 padded fabric Club Seats.		Sealed Concrete	All exposed metal deck to be galvanized, unpainted All exposed structural steel and ductwork to be painted.
Elevators	2 - 4000lb Passenger/Frieght Elevators Machine-Room-Less Traction All Stainless Steel cab finishes Centre opening doors.			
2.0 EVENT LEVEL				
Overall	Steel Columns/Beams to be sprayed with ULC approved Fire Protection Material. Columns to be clad with 90 block to 300mm A.F.F. to protect spray.	All partition walls to be Concrete Block	Sealed Concrete Unless Noted Otherwise	Exposed Structure and Ductwork
Ice Surface	42" NHL standard boards and glass; and NHL standard netting around ice surface. Refrigerated Ice slab extends beyond line of dasher boards, dasher boards fastened into refrigerated slab			
Community/Referee Dressing rooms Visitors Dressing Room	Paint out all ductwork Wood benches with puckboard on seating surfaces	Painted Concrete Block or Cast-In-Place Concrete Walls	Mondo Ramflex (10mm) Skate Flooring	Painted Exposed Structure; Paint out all Ductwork and Pipes
Dressing Room Washrooms	Block wall toilet partitions with pressed steel frames and HM doors	Tile on walls to 2400mm A.F.F. Walls Painted Above	Mondo Ramflex (10mm) Skate Flooring Sloped to Drain	Painted Exposed Structure; Paint out all Ductwork and Pipes
Dressing Room Showers	<u>Recessed slab to allow for:</u> Waterproof Membrane, Sloped Mortar Bed, & Tile	Full-Height Tile on block walls	1"x1" Tile (7.5% Grit) Sloped to Drain	Trespa Virtuon Ceiling. 13mm Panels with Vapour Barrier and Moisture Resistant Gypsum on Metal Suspension System
Home Team Dressing Rooms	Extensive Millwork for Dressing Room Benches, Lockers, Storage, etc.	Painted Block and Drywall Partitions	Mondo Sport Impact (10mm) Skate Flooring	Gypsum Ceilings , Acoustic T-Bar Ceilings, and Painted Exposed Structure.
Home Team Washrooms	Block wall toilet partitions with pressed steel frames and HM doors	Tile on walls to 2400mm A.F.F. Walls Painted Above	Mondo Ramflex (10mm) Skate Flooring Sloped to Drain	Painted Exposed Structure; Paint out all Ductwork and Pipes

Interior Materials Schedule and Specifications

Area	Notes & Comments	Walls	Floors	Ceilings
Home Team Showers	<u>Recessed slab to allow for:</u> Waterproof Membrane, Sloped Mortar Bed, & Tile	Full-Height Tile on block walls	1"x1" Tile (7.5% Grit) Sloped to Drain	Trespa Virtuon Ceiling. 13mm Panels with Vapour Barrier and Moisture Resistant Gypsum on Metal Suspension System
Staff Locker Rooms	Washrooms and Showers similar to Dressing Rooms. 2-tier metal lockers with millwork bench	Painted Concrete Block	Sheet Flooring	Exposed Structure and Ductwork
Staff Lunch Room	Kitchenette Millwork - PLAM cabinets with PLAM Countertop	Painted Concrete Block	Sealed Concrete	Exposed Structure and Ductwork
Flex Space & Production Office		Painted Concrete Block	Carpet Tile	Exposed Structure and Ductwork
Security / Operations Office	Pressed Steel Frame Windows into loading/storage area.	Painted Concrete Block	Sealed Concrete	Exposed Structure and Ductwork
Medical Room	Millwork - PLAM Cabinets with PLAM Countertop (drop-in sink)	Painted Concrete Block	Mondo Ramflex (10mm) Skate Flooring	Exposed Structure and Ductwork
Washrooms	Solid Surface Countertops (Wilsonart). Floor mounted Metal Toilet Partitions. Wall-mounted Porcelain Toilets and lavs.	Tile behind toilets, urinals, and sinks to 2400mm A.F.F. Painted Block Walls.	Sealed Concrete	Painted Exposed Structure; Paint out all Ductwork and Pipes
Main Corridor	All light fixtures and other finishings to be vandal resistant.	Paigned Concrete Block	Sealed Concrete Mondo Ramflex (10mm) Skate Flooring outside dressing rooms and to players benches/ice surface	Exposed Structure and Ductwork
Concession	Stainless Steel Prep Tables and new Food Services Equipment	Painted Concrete Block with Tile to 2400mm A.F.F.	Safety kitchen floor (sheet good)	Mylar-Faced moisture resistant T-Bar Ceiling
Commissary	Wire Shelving and Stainless Steel Prep tables	Epoxy Painted Concrete Block Walls	Safety kitchen floor (sheet good)	Mylar-Faced moisture resistant T-Bar Ceiling
Janitor Spaces	Stainless Steel panels around mop sinks to 1200mm A.F.F.	Painted Concrete Block	Sealed Concrete	Exposed Structure and Ductwork
Mechanical and Electrical Spaces		Painted Concrete Block or Cast-In- Place Concrete Walls	Sealed Concrete	Exposed Structure and Ductwork
Storage		Painted Concrete Block or Cast-In- Place Concrete Walls	Sealed Concrete	Exposed Structure and Ductwork
Loading Dock	3 Motorized Rolling Overhead Doors - 1 wide enough for driving straight in. Two Motorized Dock Levelers.	Painted Concrete Block or Cast-In- Place Concrete Walls. Structural Steel bumpers on walls and at base of walls.	Sealed Concrete with Concrete Hardener	Exposed Structure and Ductwork
Zamboni Rooms	11- 15 foot deep snow melt pit. Rolling Fire Shutter.	Block walls to underside of structure, painted	Sealed Concrete Sacrificial lay-down mats under re- surfacers.	Exposed Structure and Ductwork
3.0 ENTRY LEVEL				

Interior Materials Schedule and Specifications

Area	Notes & Comments	Walls	Floors	Ceilings
Entries	Aluminum and Glass Doors Aluminum and Glass Transoms Accessible Door Operators at each South Entry	Painted Concrete Block	Sealed Concrete	Painted Exposed Structure; Paint out all Ductwork and Pipes
Administration	Two reception areas. Shared Boardroom c/w projector and screen	Painted Drywall Walls	Carpet Tile c/w Rubber Base	Acoutic T-Bar Ceiling Tiles
Ticketing	Glass and Aluminum Ticketing Windows. PLAM millwork	Painted Drywall Walls	Carpet Tile c/w Rubber Base	Acoutic T-Bar Ceiling Tiles
Shop	Wood Veneer Slat Display Walls; Wood Veneer Millwork Sales Desk	Painted Drywall Walls Aluminum & Glass Storefront	Sealed Concrete	Painted Exposed Structure; Paint out all Ductwork and Pipes
Public Washrooms	Solid Surface Countertops (Wilsonart). Floor mounted Metal Toilet Partitions. Wall-mounted Porcelain Toilets and lavs.	Tile behind toilets, urinals, and sinks to 2400mm A.F.F. Painted Block Walls.	Sealed Concrete	Painted Exposed Structure; Paint out all Ductwork and Pipes
Kitchen	SS Corner Guards	Gysum walls with FRP panels to underside of tbar Continuous bumper guards on all walls	Safety kitchen floor (sheet good)	Mylar-Faced moisture resistant T-Bar Ceiling
Bar	Higher-end Millwork with Solid Countertops and Glass Tile Backsplash	Tiled and Painted Gypsum Board Partitions	Safety kitchen floor (sheet good)	Gypsum Ceilings
Restaurant & Lounge		Painted Gypsum Board Partitions	Polished Concrete	Gypsum Ceilings and Acoustic T-Bar Ceilings
Main Concourse/Circulation		Painted Concrete Block and Gypsum Board Partitions	Sealed Concrete	Exposed Structure and Ductwork
Feature Stairs	Stainless Steel and Glass Railings		Sealed Concrete with feature nosings	
4.0 CONCOURSE LEVEL				
Main Concourse/Circulation	Solid Concrete Block Standing Rail with Solid Countertop at top of seating bowl where suites don't exist	Painted Concrete Block Walls	Sealed Concrete	Exposed Structure and Ductwork
Suites	Millwork with Solid Surface Counters. Standing Rail at front. Seats to be padded fabric	Painted Gypsum on Concrete Block Walls	Carpet Tile	Gypsum Ceilings
Loge Boxes	Glass and Stainless Rails with Wood Drinking Rail		Sealed Concrete	
Washrooms	Solid Surface Countertops (Wilsonart). Floor mounted Metal Toilet Partitions. Wall-mounted Porcelain Toilets and lavs.	Tile behind toilets, urinals, and sinks to 2400mm A.F.F. Painted Block Walls.	Sealed Concrete	Painted Exposed Structure; Paint out all Ductwork and Pipes
Concessions	Stainless Steel Prep Tables and new Food Services Equipment	Painted Concrete Block with Tile to 2400mm A.F.F.	Safety kitchen floor (sheet good)	Mylar-Faced moisture resistant T -Bar Ceiling
Kiosks	Stainless Steel Countertops Millwork Cabinetry	Painted Concrete Block with Tile to 2400mm A.F.F.	Safety kitchen floor (sheet good)	Gypsum Ceilings

Interior Materials Schedule and Specifications

Area	Notes & Comments	Walls	Floors	Ceilings
Storage		Painted Concrete Block or Cast-In-Place Concrete Walls	Safety kitchen floor (sheet good)	Mylar-Faced moisture resistant T -Bar Ceiling
Janitor Rooms	Stainless Steel panels around mop sinks to 1200mm A.F.F.	Painted Concrete Block	Sealed Concrete	Exposed Structure and Ductwork
5.0 PRESS BOX LEVEL				
Press Box	Simple PLAM Millwork Countertops	Painted Gypsum Board Partitions Glass Dividers over millwork	Carpet Tile	Exposed Structure and Ductwork Acoustic T-Bar over Radio Booths

Architectural Outline Specification

1. Division 1 - General Requirements

1.1 01 00 10 – GENERAL REQUIREMENTS

- .1 The Construction Manager shall provide and be responsible for the following general requirements: .
 - .1 Coordination of all construction and related items.
 - .2 Project meetings including start-up meeting and regularly scheduled progress meetings.
 - .3 Submittals including shop drawings, project data, samples and mock-ups.
 - .4 Construction schedule, including phasing of the work.
 - .5 Quality control including all testing and inspections paid for by the Owner and cooperation with testing agencies selected by the Consultant, and inspections by authorities having jurisdiction.
 - .6 Temporary facilities including secure temporary 2m high chain link site fencing and all dust tight and fire resistance rated interior hoarding, security, temporary offices, sanitary facilities, temporary heating and temporary power and all other temporary facilities as required to facilitate construction of this project.
 - .7 Construction safety including fire safety precautions and WHMIS requirements.
 - .8 Conformance to all applicable codes and regulations, including the Alberta Building Code, 2006 edition and Alberta Fire Code.
 - .9 Project commissioning and systems demonstrations.
 - .10 Testing, adjusting and balancing of systems including mechanical and electrical systems.
- .2 No smoking is permitted on the construction site at any time.

1.2 01 11 00 – SCOPE OF WORK

- .1 These specifications cover the work of constructing the Medicine Hat Regional Event Centre in Medicine Hat, Alberta.
- .2 These specifications are to be read in conjunction with Structural, Mechanical, Electrical, and Outline Specifications.

3 Division 3 – Concrete

3.1 SECTION 03 05 00 – CONCRETE FLOOR SEALER

- .1 Use products and materials with recycled content or resource efficient characteristics and with low VOC content.

3.2 SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

- .1 Comply with all notes on Structural Drawings
- .2 Provide concrete toppings as required.

3.3 SECTION 03450 - PRECAST CONCRETE

- .1 Comply with all notes on Structural drawings.

- .2 Contractor shall ensure that all elements retain their structural adequacy and there is no exposed reinforcing, chipped or damaged surfaces in installed units.

- .3 Verify the adequacy of all anchors, all connectors are galvanized and all precast is installed within tolerances.

4 Division 4 - Masonry

4.1 SECTION 04 20 00 - UNIT MASONRY

- .1 Provide concrete block conforming to CSA A165-94 Series, to partitions and walls as indicated. Use concrete block to 2 hour fire rated walls in accordance with code requirements. Provide special shapes including lintels, bond beams, bullnose corners, half blocks and solid block as required.
- .2 Construct fire rated concrete block partitions conforming to the Alberta Building Code.
- .3 Supply and install continuous 75 mm x 75 mm x 3 mm thick steel angles, fasten to underside of structure, and installed on each side of head of concrete block partitions for lateral support. Leave minimum 25 mm space between top of wall and underside of structure for deflection. Fill space with silicone based fire stop and smoke seal as required to maintain fire rating.
- .4 Exterior Veneer Masonry – IXL Brick: Giant Brick in 101 – Tile Red.
- .5 Grout in accordance with CAN# S304-M84.
- .6 Canadian Standards Association (CSA)
 - .1 CSA A370-94, Connectors for Masonry
 - .2 CSA A371-94, Masonry for Construction of Buildings
 - .3 CSA S304.1-94, Masonry design for Buildings

5 Division 5 - Metals

5.1 SECTION 05 41 00 - WIND BEARING STEEL STUD FRAMING SYSTEMS

- .1 Provide exterior wind bearing steel stud systems. Systems, including stud spacing and gauges, fasteners and connections to structure shall be engineered by the installation subcontractor. Engineering shall be by a professional engineer, registered in Alberta with expertise in steel stud design.
- .2 Design system to withstand 1 in 10 year loads for climatic conditions and seismic loads in Medicine Hat and maximum deflection of l/360 for metal cladding back-up and l/720 where masonry veneer back-up assembly. Designed to the Alberta Building Code 2006.
- .3 Design system with double top track to allow for a 15mm maximum vertical building structure deflection.

5.2 SECTION 05 50 00 - METAL FABRICATIONS

- .1 Metal fabrications shall be engineered as required.
- .2 All interior fabrications shall be shop prime painted with primer compatible to site finished paint systems.
- .3 All exterior items shall be galvanized finished to 600g per m.
- .4 Provide all metal fabrications required, including, but not limited to:
 - .1 Pipe railings and balusters, meeting Alberta Building Code requirements for loads resisted, clearances, size, picket spacing.
 - .2 Steel angle framing for equipment supports as required, prime painted.
 - .3 Above ceiling supports for equipment, prime painted.
 - .4 Roof access hatch ladders, welded construction, prime painted, fabricated and installed to conform to Alberta Building Code and Occupational Health and Safety Code requirements.
- .5 Roof access ladders, welded construction, galvanized finish, fabricated and installed to conform to Alberta Building Code and Occupational Health and Safety Code requirements.
- .6 All items required for elevator installation and addition, prime painted.
- .7 Steel gratings, galvanized finish, designed to withstand all superimposed loads.
- .8 All frames and covers, prime painted, diamond non-slip pattern top surface for covers.
- .9 All other metal fabrications as noted and detailed.

5.3 SECTION 05 51 00 - STEEL STAIRS

- .1 Provide all steel pan stairs with concrete filled pans, designed and installed by subtrade in compliance with Alberta Building Code.
- .2 Prime paint for final site painting.

5.4 SECTION 05 80 00 - EXPANSION JOINT COVERS

- .1 Provide manufactured, fire resistance rated aluminum expansion joint covers at building expansion joints walls and floors. Joint configuration, movement allowance shall accommodate building requirement.

6 Division 6 - Wood and Plastics

6.1 SECTION 06 10 00 - ROUGH CARPENTRY

- .1 Provide all plywood backboards. Backboards shall be fire retardant treated or painted with low VOC intumescent paint.
- .2 Provide all blocking and furring, roof curbs and sleepers required.

6.2 SECTION 06 20 00 - FINISH CARPENTRY

- .1 Provide all items to AWMAC 2005 edition “Quality Standards Illustrated” (QSI) manual “Custom Grade”.
- .2 All hardwood and hardwood plywood shall be stain/clear finish, low VOC.
- .3 Plywood, wood composite and wood fibre products shall not contain added urea-formaldehyde resins.
- .4 Provide all wood soffits, fascia and trim as well as interior wood panels and trim. Wood shall be clear stain finish hardwood Maple species.

6.4 SECTION 06 40 00 - ARCHITECTURAL WOODWORK

- .1 The AWMAC inspection Guarantee Service shall be used on this project.
- .2 All work shall be to AWMAC 2005 edition “Quality Standards Illustrated” (QSI) manual “Custom Grade” unless noted otherwise.
- .3 Plywood, wood composite and wood fibre products shall not contain added urea-formaldehyde resins.
- .4 All cabinets shall be constructed from M2 industrial grade particle board with plastic laminate face, overlay door style.
- .5 Countertops shall be plastic laminate faced and underside covered with laminate balancing sheet.
- .6 All plastic laminate to be NEMA LD 3, grade HGS, minimum 1.27mm thick, colours as selected by the Consultant, finish schedule or as otherwise selected by the Consultant.
- .7 All vanities shall be solid surface
 - .1 Materials shall be homogenous, thermoset polymer alloy, comprising of polyester and acrylic components and filled with aluminum trihydrate or similar; 13 mm thick unless note otherwise, of sizes noted on drawings, use one piece per locations. Use products with recycled content wherever possible.
 - .2 Backsplash: 100 mm high integral backsplash or as detailed.
 - .3 Accessories
 - .1 Use sealants, adhesives, sealers and finishes, complying to Volatile Organic Compound (VOC) Reference Guide Q Credit 4.1 and 4.2, to maximum VOC thresholds permitted.
 - .2 Joint Adhesive: manufacturer’s standard two part adhesive kit to create inconspicuous, non-porous joints.
 - .3 Sealant: manufacturer’s standard mildew resistant silicone sealant in colours matching components.
 - .4 Panel clips: metal Z clips as recommended by the manufacture for use in installation of panels on vertical surfaces.
- .8 Hardware: Cabinet hinges shall be 170 opening European style cup hinges, rated for 80,000 cycles.
- .9 Shelf standards shall be end gable recess mounted, Knappe & Vogt 255 c/w 256 clips, zinc cadmium plated.
- .10 Drawer pulls shall be brushed stainless steel wire “D” pulls.

- .11 All drawers except file drawers shall be equipped with 25 mm over extension side mounted drawer slides, Accuride 3834CSC series, Knappe & Vogt or Hettich equivalent. File drawers shall be Accuride 3640 series rated 91 kg per pair, 25 mm over extension.
- .12 The bottom of all modesty panels for desks must be no lower than 330mm from top of floor.
- .13 Cabinet construction:
 - .1 Gables, doors, drawer fronts to be 3/4" M2 particle board, all sides and edges plastic laminate faced
 - .2 Cabinet backs fabricated from 1/2" thick melamine faced (both sides) M2 particle board
 - .3 Fabricate drawers from 5/8" thick Baltic Birch. Proposed alternate constructions will be considered.
 - .4 Fabricate exposed shelves from 3/4" plywood, both sides and all edges faced with plastic laminate.

7 Division 7 - Thermal and Moisture Protection

7.1 SECTION 07 14 13 – HOT RUBBERIZED ASPHALT WATERPROOFING

- .1 Provide waterproofing that prevents the passage of water and complies with the physical requirements in CAN/CGSB-37.50, "Hot Applied, Rubberized Asphalt for Roofing and Waterproofing."
- .2 Surface conditioner: Cutback asphalt to CGSB 37-GP-9Ma.
- .3 Membrane: Rubberized asphalt, to CAN/CGSB-37.50-M89, one of the following accepted materials:
 - .1 Hydrotech 6125MM
 - .2 Permaquik 6100
 - .3 Bakor 790-11.
 - .4 SPI 6940.
- .4 Joint and corner reinforcement and Joint Cover Sheets to meet manufacturer's recommendations.
- .5 Provide drainage mat and perimeter foundation insulation.

7.2 SECTION 07 16 00 – CEMENTIOUS WATERPROOFING

- .1 Concrete Waterproofing: premixed compound comprised of chemicals, quartz, sand and cement supplied in a powder form ready to mix with water.
- .2 Mortar: to form coves, fill cracks, and honey combs, fill form tie holes, fill reglets formed over construction joints.

7.3 SECTION 07 21 00 - BUILDING INSULATION

- .1 All insulation shall be mechanically fastened to substrate.
- .2 Below grade insulation: Rigid polystyrene insulation conforming to ULC S701, CFC without ozone depletion potential greater than zero, EcoLogo certified, minimum 10% recycled content by weight; ship lapped edges, types as follows:
 - .1 To vertical perimeter foundation surfaces: extruded polystyrene insulation type 4, compressive strength of 240 kPa (30 p.s.i.). Acceptable Materials:
 - .1 Dow Styrofoam SM
 - .2 Owens-Corning Celfort 300.

- .2 To horizontal applications (flat) under slabs on grade: high density polystyrene insulation, type 4, with a compressive strength of 275 kPa (40 p.s.i.). Acceptable Materials:
 - .1 Dow Styrofoam HI-40
 - .2 Owens-Corning Formular 400 (Celfort).
- .3 Above grade insulation: basalt mineral fibre, semi-rigid board insulation, minimum 4.4 lb/ft3 density, 610mm x 1219mm board size, asbestos free, surface burning characteristics when tested in accordance with CAN/ULC-S102, ASTM E84 and UL 723 not to exceed flame spread of 5 and a smoke developed of 0. One of the following:
 - .1 Fibrex CWB 45
 - .2 Roxul CavityRock

Semi-Rigid Mineral Fibre insulation to above grade locations, including, but not limited to: all exterior wall and soffit assemblies, including behind concrete plinths, masonry veneer, metal cladding, composite metal panels and the like.

- .4 Roof Insulation: Polyisocyanurate Primary (and Tapered) Roof Insulation. (R20)

7.4 SECTION 07 27 00 - AIR/VAPOUR BARRIERS

- .1 Use Peel and stick air/vapour barrier throughout.
- .2 Acceptable products:
 - .1 WR Grace "Perm-A-Barrier"
 - .2 Soprema "Soprastick 1100". Corners and joints.
 - .3 Prime all surfaces prior to applying "peel and stick" membrane. For "DensGlas Gold" substrate apply 2 coats of primer.
 - .4 Apply material using tools and techniques recommended by the membrane manufacturer.
 - .5 Apply to ensure continuity of air/vapour barrier.
 - .6 Apply to ensure no flaws including "fishmouths", cracks, delamination, voids, etc.

7.5 SECTION 07 61 13 – STANDING SEAM METAL WALL CLADDING

- .1 Section includes, but is not limited to:
 - Standing Seam Metal wall cladding
 - Z-girt supports
 - Metal Flashings, closures, trim and break shapes to standing seam metal cladding, including break formed trim around windows and the like.
- .2 Design standing seam metal cladding to provide for thermal movement of component materials caused by ambient temperature range of 120 degrees C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
- .3 Appearance: Consider "Appearance" requirements of equal importance to "performance" requirements in the design and subsequent approval of the standing seam metal wall cladding system.
- .4 Standing Seam Metal Cladding; site formed prefinished metal, to standing seam profile of 38mm deep ribbed section 305mm wide sheets, standing seam of 0.61 mm thickness base metal, one piece continuous panel length.
- .5 Concealed Fastening Clip Assembly: to ASTM A653/A653M, galvanized, fixed and 2-part expanding clip to suit design requirements.
- .6 Acceptable Types:

- TS40 standing seam metal cladding system as manufactured by Thermal Systems KWC Ltd.
- CM38 standing seam metal cladding system as manufactured by Custom Metal Contracting Inc,
- Accu-Steel standing seam metal cladding system by Flynn Canada Ltd.

7.5 SECTION 07 54 19 – PVC MEMBRANE ROOFING

- .1 Flat roof areas (roofing system over steel deck): PVC roofing membrane meeting LEED requirements, fully adhered to top layer of polyisocyanurate insulation; top layer of polyisocyanurate insulation is fully adhered to bottom layer of polyisocyanurate insulation; bottom layer of polyisocyanurate insulation is mechanically fastened to DensDeck sheathing over metal decking. Insulation is installed over SBS Air/Vapour barrier on 13mm DeskDeck sheathing on metal deck.
 - .1 Membrane: Flexible polyvinyl chloride sheet to CAN/CGSB-37.54-95; Class B, type 2-reinforced with nonwoven glassfibre, UV resistant, dirt repellant 1.5mm thick, labeled under the Environmental Protection Agency’s EnergyStar program. Acceptable Products
 - .1 G410-15 as manufactured by Sarnafil.
 - .2 Carlisle Sure-Flex reinforced PVC membrane.
- .2 Barrel Roof (roofing option #1): PVC roofing membrane to match flat roof areas described above with the addition of decorative standing seams.
 - .1 Decorative Standing Seams: Extruded PVC sections, 25mm high, Décor Profile as manufactured by Sarnafil. Colour to match roof membrane.
- .2a Barrel Roof (roofing option #2): Prefinished Kalzip Roofing System.

7.6 SECTION 07 60 00 – METAL FLASHING

- .1 This section includes, but is not limited to: metal flashings to roofs; formed metal expansion joint upstands, parapet tops, and upstand around roofing; scuppers; flashing to protrusions through roofing; caulking to flashing; and flashing to masonry veneer, and metal cladding.
- .2 Metal Flashing and Scuppers: 0.61mm thick base metal, commercial quality sheet steel to ASTM A653/A653M with Z275 designation zinc coating to ASTM A924/A924M, prepainted with baked enamel, to CSSBI Technical Bullitin No. 20M, Baycoat 8000+ Series coating or Vicwest Colorite HMP series coating. Cleats to be of same material as sheet metal, not less than 50mm wide.

7.6 SECTION 07 72 33 - ROOF ACCESS HATCHES

- .1 Provide manufactured roof hatches c/w insulation, insulated curb, safety extension pole, weather-stripping, locking hasp. Bilco Type “S”.
- .2 Install to correct orientation and to tie into air/vapour membrane and roofing system

7.7 SECTION 07 81 00 - SPRAYED FIREPROOFING

- .1 Provide asbestos free, cementitious type sprayed fireproofing, to structural steel elements, open web steel joists and metal decking, to achieve the required fire ratings acceptable to the authority having jurisdiction.

7.8 SECTION 07 84 00 - FIRE STOP AND SMOKE SEAL

.1 Provide fire stop and smoke seal around all penetrations through assemblies, and structural elements and at all openings in fire rated assemblies, as required to maintain fire ratings.

.2 Fire stop and smoke seal materials and installation, shall conform to both temperature and flame ratings under ULC S115M and UL11479 and ASTM E814 and Alberta Building Code. Install to provide F, FT, FH and combination ratings as required.

7.9 SECTION 07900 - SEALANTS.

- .1 Seal all exterior joints including between dissimilar materials, with silicone sealant conforming to CAN/CGSB-19. 13-M87, such as Dow Corning 795, or pre-approved product. Colours to match adjacent materials.
- .2 Seal all interior joints such as between drywall and dissimilar materials and around all interior doors and frames, using acrylic sealant conforming to a CAN/CGSB-19. 17-M90.
- .3 Seal all joints between ceramic tiles and plastic laminate, solid polymer and stone counter tops using one component mildew resistant silicone sealant conforming to ASTM C920-02. Colour to be white.
- .4 Seal all joints in horizontal surfaces such as in concrete slabs, using multi-component, chemical curing, self-leveling, polyurethane sealant, Sika Sikaflex 2c-SL.
- .5 Apply all exterior sealants in strict accordance with manufacturer’s recommendations to provide complete weather-tight joints.

8 Division 8 - Doors and Windows

8.1 SECTION 08 11 00 - HOLLOW METAL DOORS AND FRAMES

- .1 Provide fire rated labelled doors and frames as required.
- .2 All doors shall be 18 gauge face skins, fully welded seam construction, all welded seams ground smooth and filled. Doors to be honey comb core construction unless noted otherwise or required to meet labelling/rating requirements.
- .3 Frames generally 16 gauge, 14 gauge in service areas. Welded construction only, knock down frames are NOT acceptable.
- .4 Fabricate all doors and frames with welded-in reinforcing (fillet welds) for all hardware mounting.
- .5 Fabricate doors with reinforced cutouts for glazing and c/w glazing stops, welded on secure side, glazing stops to be square corner type.
- .6 Doors and frames to be fabricated from ZF075 stretcher leveled steel, all cuts and welds prime painted after fabrication.
- .7 Fabricate pressed steel borrowed light frames as per door frame. Provide labelled frames as required.
- .8 Install labelled frames to requirements of Alberta Building Code and NFPA 80.

8.2 SECTION 08 14 00 - WOOD DOORS

- .1 Wood doors shall be solid core, pre-finished.
- .2 Door construction shall be 5 ply, sanded, fully bonded construction (including stiles, rails and hardware reinforcing blocks bonded to core. Entire unit shall be sanded prior to application of cross-banding and door faces. Where materials and construction techniques required to achieve fire rated labeling must be different than as specified herein construct to such requirements and identify such differences on shop drawing submission.
- .3 For cross-banding use dense hardwood such as Birch or Maple, either one piece or edge glued. MDF, particle board, and high performance composite products including HDF are NOT acceptable for cross-banding.
- .4 Core shall be “Structural Composite Lumber Core”, such as Baillargeon “LVL” core, “TimberStrand LSL (Laminated Strand Lumber), uniform density of approx. 38 pcf, or other SCL (Structural Composite Lumber) meeting the requirements of ASTM D5456.
- .5 For faces of doors, use wood veneer, 0.6 mm thick, Beech species.

8.3 SECTION 08 41 00 - ALUMINUM CURTAINWALL AND WINDOWS

- .1 Design system to withstand 1 in 30 year loads for climatic conditions and maximum deflection of l/185.
- .2 Curtainwall: Kawneer 1600 series curtainwall, back section depth to suit drawing details and contain steel reinforcing as required to resist wind loads, snap-on caps to be 45 mm deep unless noted otherwise on the drawings, provide all stops, reinforcing and other accessories required to accommodate doors and provide a complete weather-tight building envelope system. Construct system to meet the requirements of the Rain Screen Principle. All aluminum extrusions for this project shall be manufactured from “recycle billet”.
- .3 Construct system c/w all glass spandrel panels as shown on the drawings. Glass spandrels constructed w/ as double glazed sealed unit with an galvanized metal backpan thermally broken using a PVC anti-rotation clip.
- .4 Back bodies of curtainwall and all interior frames shall be clear anodize aluminum finish.
- .5 Snap Cap Colours to be determined during design development
- .6 Exterior and Vestibule Doors.
 - .1 All doors shall be supplied and installed c/w all accessories and hardware by the curtain wall subtrade.
 - .2 Door frame colour to match snap cap colour of adjacent curtain wall.

8.4 SECTION 08 70 00 - HARDWARE

- .1 Match existing in function, keyways and quality. Corbin Patented 39 series supplied with 2 keys per cylinder. All keys and cylinders shall be visually keyed within the bitting list submitted to the University.
- .2 Under the current agreement with the manufacturer all keys and cylinders shall be shipped directly to the university.
- .3 All hardware for labelled doors shall be labelled.

- .1 Locksets
 - Corbin Russwin mortise model LWA trim X613.
 - The Offices lockset shall be ML2055.
 - Store Rooms ML2057.
- .2 Door Closers – LCN-4041 X 695 brushed stainless steel, accessible.
- .3 Door Hold Opens – LCN-4040SE 695.
- .4 Panic Hardware – Von Duprin 98 RIM Device series hardware X 313 with lever handles.
- .5 Electric Strikes – Rim Exit Device - Von Duprin 6111, Mortise Locks – Von Duprin 6214.
- .6 Electric Panic Hardware - Von Duprin 98EL with RX Switch.

- .4 Provide labelled magnetic door hold-open devices, tied into fire alarm system to all locations noted.

- .5 Provide door closers, brushed finish stainless steel pushes, pulls, floor and wall mounted door stops, brushed finished stainless steel kick plates, stretcher plates and 1200 high door armor plates as designated.

8.5 SECTION 08 80 00 - GLASS AND GLAZING

- .1 All interior glass not required to be Georgian wired glass shall be 6 mm clear float tempered glass, meeting CAN/CGSB-12.1-M90, “Tempered or Laminated Safety Glass”, and CAN/CGSB-12.3-M91, “Flat, Clear Float Glass”.
- .2 All exterior glazing shall be argon filled sealed units, double pane, low “E” coating on #3 surface. Manufactured sealed units to CAN/CGSB-12.8-M90, “Insulating Glass Units” or ASTM E2190-02 “Standard Specification for Insulating Glass Unit Performance and Evaluation”.
- .3 Glass Materials
 - .1 Tinted glass for outer pane of sealed units: colour to be selected during design development.
 - .2 Laminated Glass Guards: to CAN/CGSB-12.1-M90clear, of 5mm tempered glass, .075mm interlayer lamination, 5mm float glass.
 - .3 Safety Glass: fully tempered to CAN/CGSB-12.1-M90, Type 2, ClassA 6mm thick.
 - .4 Silvered mirror glass: to CAN/CGSB-12.5, 6mm thick.
- .4 All tinted glass will be minimum heat strengthened, temper as required to prevent thermal shock breakage or for safety when used as side lights or within 300 mm of grade.

9 Division - Finishes

9.1 SECTION 09 11 00 - NON-LOAD BEARING STEEL STUDS

- .1 Interior stud framing: To ASTM C645-88, 20 gauge (1 mm) galvanized steel; roll-formed with knurled flanges, service and bracing cut-outs spaced at 400 mm o.c., sizes as noted on the drawings.
- .2 Interior floor/ceiling tracks: To ASTM C645-88, metal core thickness to match stud and widths to suit stud size, 33 mm flanges for floor track. Ceiling track with 50 mm flanges unless otherwise indicated on the drawings. Use double track top track to accommodate structure deflection at all partitions which extend to underside of structure.
- .3 Channel stiffener: 19 mm cold-rolled channel of 13 gauge steel with rust-resistive coating.

- .4 Sheet steel for backing/mounting: 18 gauge (1.2 mm), minimum width 300 mm, unless noted otherwise on the drawings or in the details, galvanized sheet steel to ASTM A653M-96 “Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process”.
- .5 Fasteners: To ASTM C1002-88, steel, self-drilling, self-threading case hardened shallow pan Phillips type heads, 25 mm minimum length.
- .6 Place interior studs vertically at not over 400mm o.c. and not more than 50mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Double studs (full height) to be installed on ALL door jambs.
- .7 Erect steel studs to tolerance of 3 mm in 3 m non-cumulative.
- .8 Install all attachments within steel-stud partitions for fixtures being hung from or anchored to such partitions.
- .9 Install 18 gauge galvanized sheet steel for blocking/mounting to all locations as noted on the drawings. Install strips in horizontal configuration continuously between studs for extent noted. Install multiple strips of mounting steel at indicated heights to accommodate items such as upper cupboards. Use pan-head sheet metal screws.
- .10 Install access doors to electrical or mechanical fixtures supplied under respective Sections.

9.2 SECTION 09 25 00 - GYPSUM BOARD

- .1 DO NOT ALLOW GYPSUM BOARD PRODUCTS TO BECOME WET DURING DELIVERY, HANDLING, STORAGE, OR INSTALLATION. Promptly, within 24 hours, remove any wet or damaged board from the site. Ensure that any gypsum board that is exposed to moisture is removed from the project to ensure there is NO possibility of board having mildew or mould before or after installation.
- .2 All gypsum board for interior application for the project shall be one of the following:
 - .1 Abuse Resistant Gypsum board, labeled for fire resistance rating as noted.
 - .1 Very High Impact (VHI) gypsum board.
 - .2 All exterior gypsum board for the project shall be one of the following:
 - .1 CGC “Fiberock AquaTough Exterior Panel”, thicknesses as noted on the drawings
 - .2 GP “DensGlass Gold”, thicknesses as noted on the drawings
 - .3 All interior ceramic and porcelain tile substrate shall be one of the following:
 - .1 CGC “Fiberock AquaTough Interior Panel”, thicknesses as noted on the drawings
 - .2 GP “DensShield”, thicknesses as noted on the drawings.
 - .4 Corner and casing beads: To ASTM C645-83, Minimum 0.455 mm metal core thickness (26 gauge) galvanized sheet steel with Z275 zinc finish to ASTM A525M-86, type with perforated steel flanges for screw fastening.
 - .5 Insulation, acoustic: To ASTM C423-84; fibrous glass semi-rigid batt, formaldehyde free binder; width to suit metal stud spacing to tight fit; thickness to match metal stud depth or as specifically noted on drawings, labeled for use in fire rated partitions.
 - .6 All exposed gypsum board shall be finished to minimum level 4 finish. Designated areas, and areas where dark colours, lighting and window locations and finished appearance are critical level 5 finish (including skim coatina) will be required.

9.3 SECTION 09 30 00 – CERAMIC & PORCELAIN TILE

- .1 Finishes shall be incorporated into mock-ups of acceptable quality prior to site installation.
- .2 Provide ceramic tile to walls and floors as indicated.
 - .1 Ceramic tile to conform to CAN/CGSB-75.1-M88.
 - .2 Provide slip resistant matte glazed tile finish to floors and glazed finish to walls.
- .3 Install tile to walls and floors in accordance with TTMAC details in accordance with TTMAC 2002 Specification Guide 09300 Tile Installation Manual.
- .4 Install tile to gypsum board walls using organic adhesive to TTMAC detail 304W-2002.
- .5 Apply tile to all floors using the latex modified thin-set method to TTMAC Detail No. 311f-2002.
- .6 Provide quarry tile in all public spaces and corridors on the main and second floors of the facility. Quarry tile shall be 300x300 pattern complete with two field colours and 1 accent colour as determine by the Consultant.
- .7 Tile types and colours to be as selected by the Consultant.
- .8 Provide anodized aluminum edge treatment such as Schluter strips between tile flooring and adjacent flooring. Install in accordance with manufacturer’s recommendations.
- .9 Provide ceramic tile grout conforming to ANSI A118.6-1999, factory prepared unsanded ceramic tile grout for walls, sanded for floors, complete with latex grout additive, acceptable manufacturers: Crest, Mapei, Custom. Colour as selected by the Consultant.
- .10 Install porcelain tile to washroom floors and all washroom walls to height of 1500 mm behind water closets & lavatories to the extent shown.

9.4 SECTION 09 51 00 - SUSPENDED CEILINGS

- .1 Finishes shall be incorporated into mock-ups of acceptable quality prior to site installation.
- 2 Install tile in accordance with manufacturer’s directions. Cut tile as required. Treat cut edges of tegular edged tile where visible. Provide hold down clips for all tile within 3 m of exterior doors.
- .3 Acoustic Tile:
 - .1 Provide mineral fibre acoustic ceiling panels conforming to CAN/CGSB-92.1-M89, 610 x 610 angled tegular edge suitable for use with 9/16” T-bar, high NRC and light reflectance.
 - .2 Provide T-bar conforming to ASTM C635, flat white colour. Install level and to heights and configurations as indicated on the drawings and to ASTM C636 and ASTM E580-02. Tee bar shall be 9/16” width.

9.6 SECTION 09 68 00 - CARPETING

- .1 All office and private suite floor carpeting shall be modular carpet tile with a 20-year guarantee.
- .2 Include all components for installation of the flooring system. I.e. resilient base, seaming tape, seaming adhesive, concrete floor sealer, sub-floor filler, topping to adjust carpet sub-floor, edge trim - Schluter profile.

- .3 Carpet to CAN/CGSB-4.129 and as follows:
 - .1 Certified for flammability to Health Canada regulations under “Hazardous Products (carpet) Regulations”, Part II of the Schedule.
 - .2 Maximum flame spread rating 300, maximum smoke development classification 500.
 - .3 Conforming to manufacturer’s literature, in addition to other applicable requirements
 - .4 Certified under the CRI Indoor Air quality Carpeting Testing Program.
 - .5 Carpet pattern and colours to be selected by consultant.
- 9.7 SECTION 09900 - PAINTING**
- .1 Paint systems and application shall comply with the specifications and requirements stated in the Master Painters’ Institute (MPI) Architectural Painting and Repainting manuals, 2004 editions.
 - .2 All painting and repainting shall be inspected in accordance with the MPI Quality Assurance Inspection Program.
 - .3 Paint generally shall be water borne light industrial coating to MPI product numbers 151, 153 or 154 depending on gloss levels. Some walls will be painted with waterborne epoxy paint systems.
 - .4 Gloss levels shall be semi-gloss for all walls, eggshell for ceilings and as otherwise noted.
 - .5 Painting systems shall generally be 3 coat systems.
 - .6 Acceptable Products:
 - .1 Wooden Doors: Guardsman Ultraguard Conversion Varnish; Varnish 3797911350-505, Catalyst 3990-05005-505.
 - .2 Metal Doors and Frames: Waterborne Acrylic Primer & Finish; Devoe Devflex Semi-Gloss 4216 HP.
 - .3 Drywall: Interior Latex High Hide Sealer; Glidden 36600.
 - .4 Interior wall I.C.I. Dulux Lifemaster Eggshell.
 - .5 Concrete floors unpainted: Acrylic Floor Sealer Tennant 440.
 - .6 Concrete floors to be painted: Devoe Tru-Glaze; Product 4508 (Oil), 4508-00100, Catalyst 450809999.
 - .7 Mechanical Room Walls: Devflex Waterborne Acrylic semi-Gloss 4216-00100.
 - .8 Concrete Block: I.C.I. Block Filler 336250.

10 Division 10 - Specialties

10.1 SECTION 10 11 50 - WHITE BOARDS

- .1 Acceptable Manufacturers: Shanahans, Panel Products, CP Distributors, or approved equal.
- .2 Provide whiteboards in all classrooms as a standard.
- .3 All whiteboards shall be provided with a lifetime warranty on the writing surface, 28Ga porcelain enamel. Warranty to cover any deterioration or defect of the whiteboard writing surface.

- .4 Whiteboards shall be fixed.
- .5 Whiteboards shall conform to specifications of the Porcelain Enamel Institute.
- .6 Whiteboards shall be white
- .7 Provide full length pen-trays under all whiteboards.
- .8 Do not install whiteboards over top of electrical outlets or control boxes.
- .9 Provide conduit behind all whiteboards to allow for future SMART Boards in white board locations.

10.3 SECTION 10 21 13 - METAL WASHROOM PARTITIONS

- .1 Partitions shall be floor mounted, overhead braced, pre-finished metal, c/w all latches, hinges and accessories, baked enamel finish as selected by the Consultant.
- .2 Acceptable Manufacturers:
 - .1 Shanahan’s Alberta Ltd.
 - .2 GWS Inc.
 - .3 S.W. Fleming LTD.
 - .4 Hadrian
- .3 Arrange partitions for compliance with handicap accessibility requirements.
- .4 Attachment: #304 stainless steel screws and bolts. Do not use tamper-proof fasteners.

10.4 SECTION 10 21 23 – PRIVACY CURTAINS

- .1 Install black-out curtain behind standing room seats along entire concourse to block out bowl.
- .2 Three black-out curtain tracks to be provided at underside of trusses running across the bowl for use during full-house; half-house; and theatre style events. Provide single black-out curtain that can be used at each track location. Curtains to be at least 1.5 times fullness.

10.5 SECTION 10 26 00 - WALL AND CORNER GUARDS

- .1 Provide stainless steel corner guards within all service spaces as identified in the Room Finish Schedule.

10.6 SECTION 10 80 00 - WASHROOM ACCESSORIES

- .1 Provide washroom accessories as indicated.
 - .1 Soap Dispensers – Triad
 - .2 Toilet Paper Dispenser – Scott Designer #09642 Junior Jumbo
 - .3 Napkin dispenser - Frost Code #622
 - .4 Grab Bar - Frost 1001DPx48 & 1001Dox24
 - .5 Paper Towel dispenser - 109-50S
 - .6 Sanitary Napkin Disposal – Frost 622
- .2 Ensure that accessories are of type and located to meet requirements for handicap use.

11 Division 11 - Equipment

11.1 SECTION 11 24 23 - FALL RESTRAINT SYSTEM

- .1 Provide a fall restraint system, fully engineered and installed by the fall restraint system subcontractor. System shall comply with all requirements of the Alberta Occupational Health and Safety requirements.

11.2 SECTION 11 24 30 - MONITOR BRACKETS

- .1 Supply and install monitor brackets for wall and ceiling applications with required accessories such as DVD player mounting brackets. Size mounting brackets for television and flat screen applications noted. Monitor brackets shall be complete with all in wall and above ceiling anchoring and supports. Bracket finish to be black powdercoat.

11.4 SECTION 11 40 00 - FOOD SERVICE EQUIPMENT

- .1 Supply and install, complete with all connections to building services, a complete commercial kitchen containing all appliances, meeting City of Medicine Hat Food and Sanitation requirements to function as a servery for special events.

12 Division 12 - Furnishings

12.1 SECTION 12 24 13 - ROLLER SHADES

- .1 Manually operated roller shades: Acceptable manufacturers: Nysan or Silent Gliss.
- .2 Shade assemblies shall be made from extruded aluminum designed for spans required.
- .3 Shade material shall be inherently flame retardant, fibreglass reinforced, open weave as identified with the Room Finish Schedule.
 - .1 10% openness factor.
 - .2 Blackout shade.

12.2 SECTION 12 61 00 – FIXED AUDIENCE SEATING

- .1 Install riser mount fixed spectator seating throughout where possible. Floor mounted seats will to be installed along the upper most seating tier on the concourse level.
- .2 Acceptable type and Manufacturer:
 - .1 Ducharme Maxima Seats
 - .2 Camatic Quantum Seats - Preferred System.
- .2 All seats to be minimum 20” wide and be equipped with cup holders.
- .3 Seats structure to be heavy gauge tubular steel. General seating to have single piece seats and backs made of high density polyethylene. Suite seating and club seating to be upholstered. Allow for 300 club seats.
- .4 All attachment hardware to be concealed.

- .5 Seats to be equipped with automatic retraction systems.

13 Division 13

13.1 SECTION 13 16 00 – REFRIGERATED SLAB

- .1 Comply with all notes on Structural Drawings and Structural Specifications.
- .2 Provide all labour, materials, equipment and services necessary to supply and install concrete, inserts, dowels, sleeves, reinforcement, and chairs in the refrigerated slab.
- .3 Concrete work shall conform to the requirements of the following standards unless otherwise noted:
 - .1 CSA-A23.1-04 – Concrete Materials and Methods of Concrete Construction
 - .2 CSA-A23.2-04 – Methods of Test for Concrete.
- .4 Provide insulation and rink slip sheet as required by structural engineer.
- .5 The refrigerated slab shall be finished to the following tolerances:
 - .1 Maximum depression under a 3.0m straight – edge = 5mm
 - .2 Overall elevation variance from design elevation = +/- 5mm

14 Division 14 - Conveying Systems

14.1 SECTION 014210 - ELEVATORS

- .1 Install two machine room less elevators. Elevator control shall be nonproprietary type.
 - .1 Elevator capacity 4500 lbs.
 - .2 Operating speed: 350 fpm
 - .3 Travel distance: 3 stops.
- .2 Elevator installation shall comply with Alberta Labour and all Alberta Building Code 2006 edition requirements, and CSA B44 as currently adopted in Alberta.

31 Division 31 – Earthwork

31.1 SECTION 31 00 00 – EARTHWORK

- .1 Excavate to accommodate all new below grade work.
- .2 Engineer, install, maintain, and remove as applicable all shoring, underpinning, bracing, tiebacks and other items as required to perform the work.
- .3 Remove all excess excavated material from the site and dispose of legally.
- .4 Protect excavations from damage due to water, freezing conditions, snow and ice.

- .5 Prevent erosion.
- .6 Prevent sediment from the construction process from entering watercourses, in compliance with municipal, provincial and federal legislation.
- .7 Import all crushed granular material as required.
- .8 Prepare all bases by proof rolling, installation and compaction of gravel and as stated in Geotechnical Reports.
- .9 Comply with all Occupational health and safety requirements for protection of excavations and trenches.
- .10 Perform all backfilling and compaction as required upon completion of underground work. Compaction values shall be as stated in the Geotechnical reports.
- .11 Restore features such as concrete walks, curbs and gutters and asphalt paving to as new conditions. Construct to the City of Medicine Hat standards.
- .12 Replace sod, trees and planting as required.

32 Division 32 – Exterior Improvements

32.1 SECTION 32 13 13 CONCRETE WALKS, CURBS, AND GUTTERS

- .1 Provide new concrete sidewalks, curbs and gutters as required.
- .2 Concrete shall be manufactured from Type 10 Normal Portland cement. Construct to City of Medicine Hat standards. Finish: Broom finish.
- .3 Provide patterned coloured concrete sidewalks within the entry plaza.

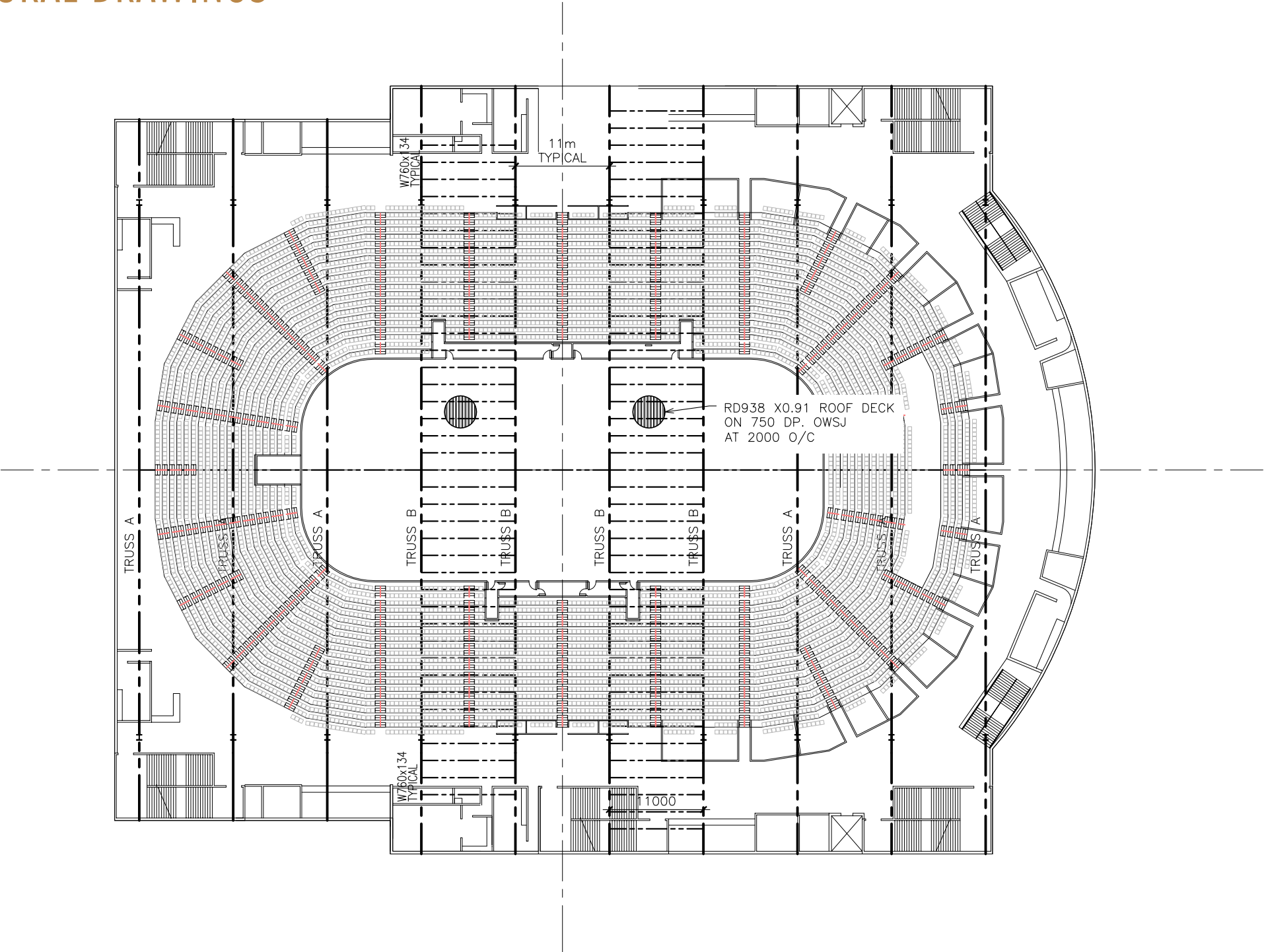
33 Division 33 – Utilities

33.1 SECTION 33 46 13 – FOUNDATION DRAINAGE

- .1 Subsurface Drainage Weepers
 - .1 150mm diameter perforated flexible drainage pipe meeting requirements of CGSB 410GP-29Ma, Type 1 for unperforated and Type 2 for perforated wrapped with filter fabric.
- .2 Provide unperforated pipe sections as required for connectors. Provide all adapters, fittings, and couplings required.

END OF OUTLINE SPECIFICATION

APPENDIX D: STRUCTURAL DRAWINGS



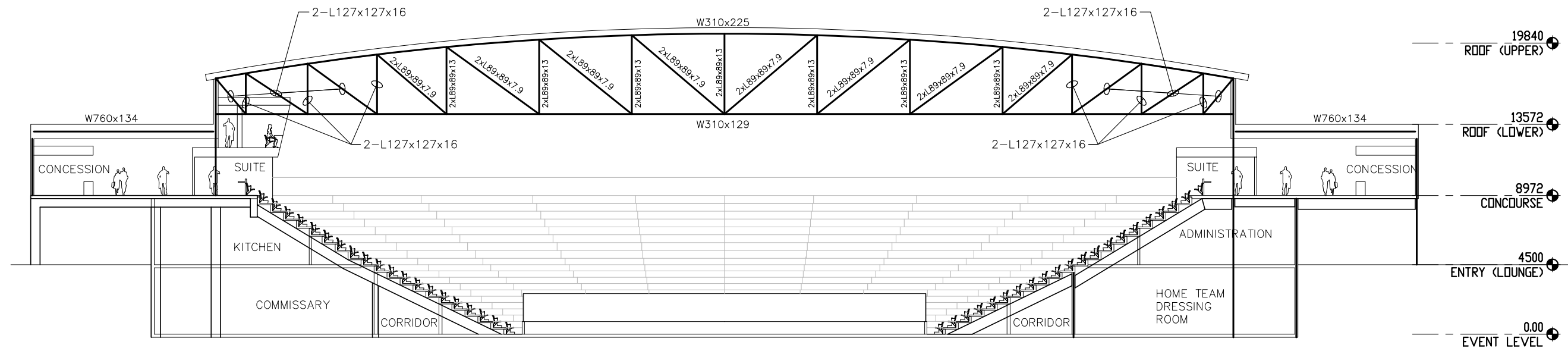
The City of Medicine Hat
New Regional Event Centre



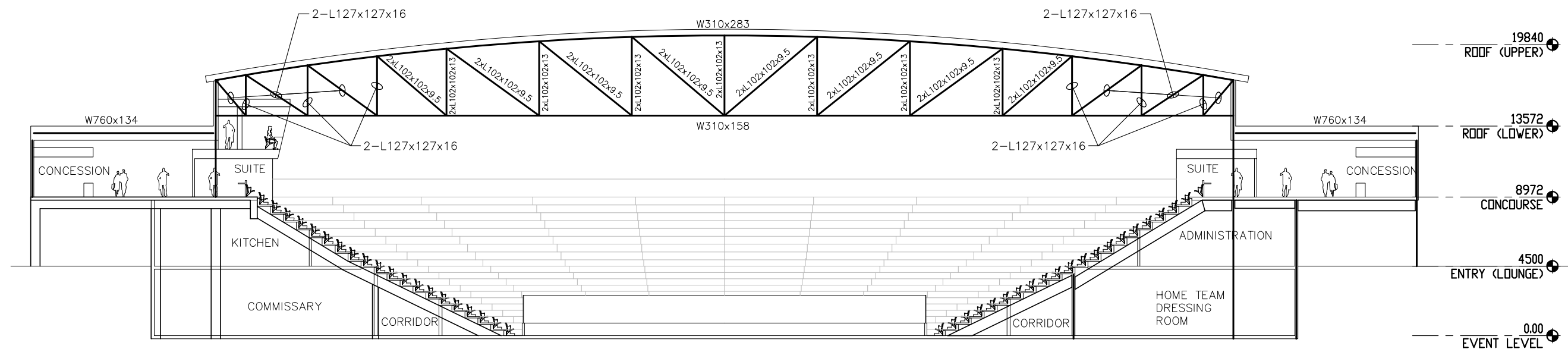
rjc Read Jones Christoffersen
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Office 403 283-5073 Fax 403 270-8402 www.rjc.ca

MAIN ROOF FRAMING PLAN

Scale	Date	Project No.	Sketch Number	Rev.
1:500	JULY 28, 2009	101776.P001	SK1	



1 TRUSS A
1:250



2 TRUSS B
1:250

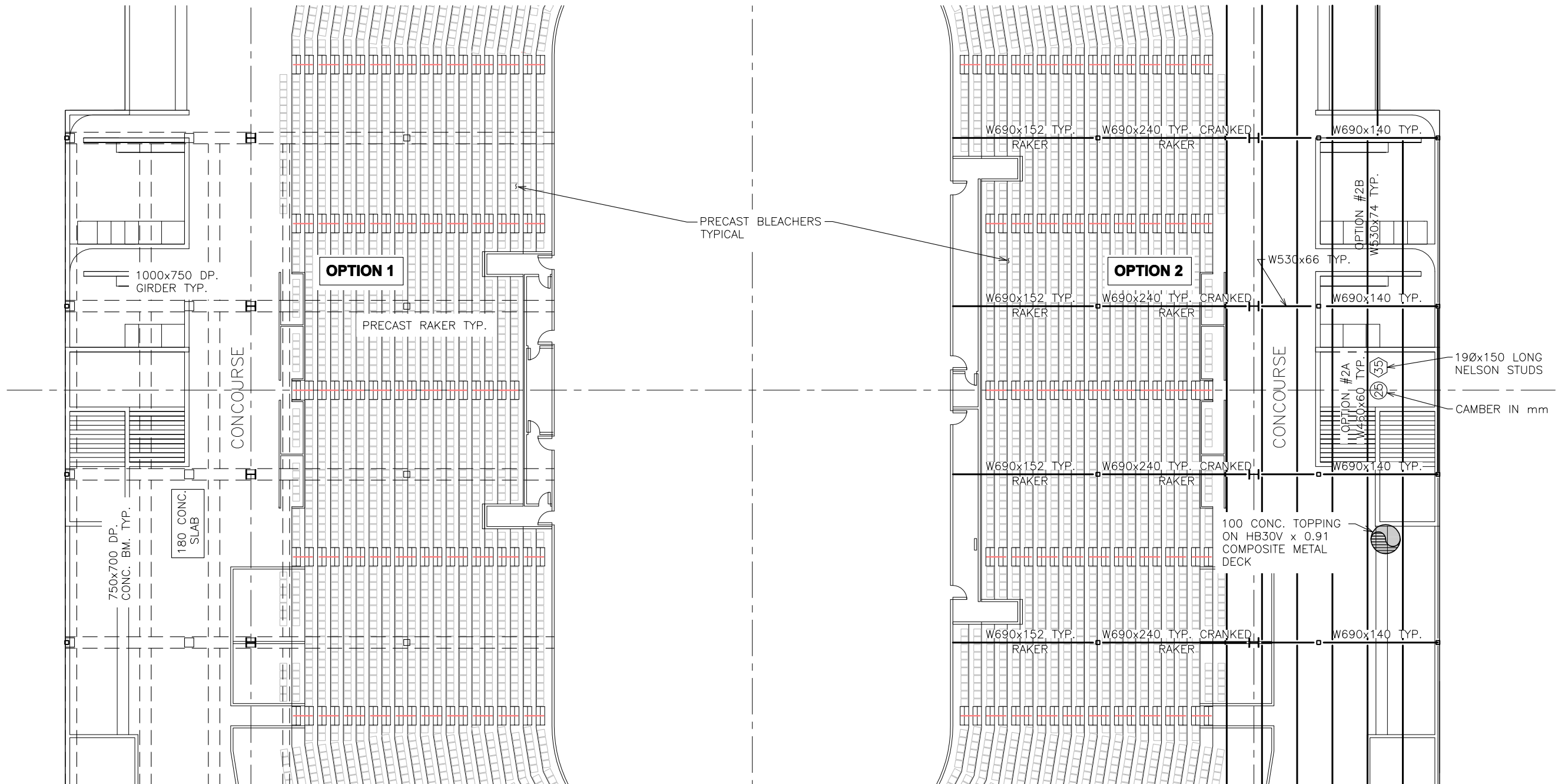
The City of Medicine Hat
New Regional Event Centre



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TYPICAL ROOF TRUSS OPTIONS

Scale	Date	Project No.	Sketch Number	Rev.
1:250	JULY 28, 2009	101776.P001	SK2	



The City of Medicine Hat New Regional Event Centre

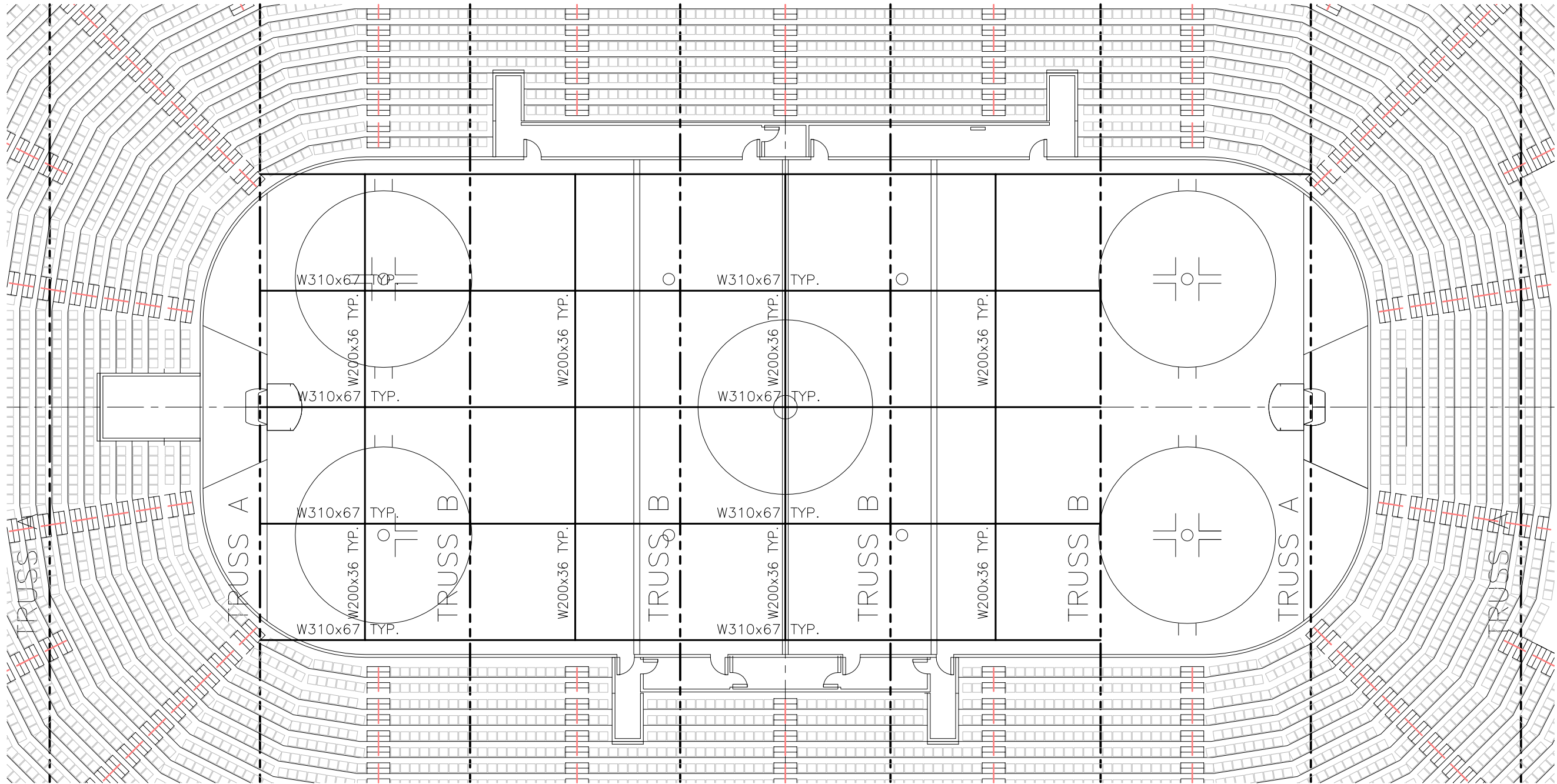


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CONCOURSE LEVEL FRAMING PLAN

Scale	Date	Project No.	Sketch Number	Rev.
1:250	JULY 28, 2009	101776.P001	SK3	



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RIGGING SUPPORT GRID

Scale	Date	Project No.	Sketch Number	Rev.
1:200	JULY 28, 2009	101776.P001	SK4	

S.1.0 Structural Design Parameters

S.1.1 General

The New Regional Event Centre project is a new arena and events facility proposed for the City of Medicine Hat at a site between Boundary Road & Box Springs Road and Broadway Avenue & the Trans Canada Highway. The project consists of three levels (events, entry, and concourse) with a roof spanning clear across the events floor.

S.1.2 Design Codes

The structural design of the New Regional Event Centre project will conform to the latest edition of the Alberta Building Code (ABC 2006) which is based on the National Building Code of Canada (NBC 2005).

S.1.3 Design Loads, Deflections and Vibration

Loads used for the design of the structure will be based on the following criteria given in the latest edition of the building code.

1.1 Climatic Data

- Ground snow load factors: S_s (snow) = 1.1 kPa, S_r (rain) = 0.1 kPa
- One day rain (1/50) = 92 mm
- Wind load: Hourly wind pressure (1/50) = 0.54 kPa
- Earthquake load: S_a (T) = 5% damped spectral response acceleration value in accordance with soil classification and building structure period.
- PGA (peak ground acceleration) = 0.059

1.2 Gravity Loads

Loads used in the design will be as follows:

.1 Roof

- Live (LL) – snow or rain
- Superimposed Dead (SDL) – 1.0 kPa

.2 Event Floor & Loading Dock

- LL – 12.0 kPa
- SDL – 0.0 kPa

.3 Storage, Dressing Rooms, & Commissary

- LL – 4.8 kPa
- SDL – 1.5 kPa

.4 Entry, Restaurant, & Concourse

- LL – 4.8 kPa
- SDL – 1.5 kPa

.5 Mechanical Rooms

- LL – 6.0 kPa – dependent on mechanical equipment weights.
- SDL – 3.6 kPa

.6 Seating Bowl

- LL – 4.8 kPa
- SDL – 1.0 kPa

.7 Stairs and Corridors

- LL – 4.8 kPa
- SDL – 0.0 kPa

1.3 Lateral Loads

Lateral loads used in the design will be based on the Climatic data given in the latest edition of the Alberta Building Code.

This building will be considered as an Importance Category: Normal Building in accordance with ABC clause 4.1.2.1.

1.4 Deflection and Vibration

The New Regional Event Centre building will be checked for serviceability limit states under the effect of service loads for both Deflection and Vibration as specified or recommended in ABC clauses 4.1.3.5 and 4.1.3.6, as well as the materials standards specified in ABC clause 4.3.

S.1.4 Construction Materials

The construction of the New Regional Event Centre project could consist of a variety of structural materials including reinforced cast-in-place concrete, pre-cast concrete, metal deck and structural steel framing members. Cast-in-place concrete and pre-cast concrete will be designed in accordance with CSA A23.3 – Design of Concrete Structures and structural steel will be designed in accordance with CAN/CSA S16 – Limit States Design of Steel Structures.

S.1.5 Geotechnical Conditions

The project site is located between Boundary Road & Box Springs Road and Broadway Avenue & the Trans Canada Highway in the City of Medicine Hat, Alberta.

A preliminary geotechnical evaluation has been completed on the site by AMEC Earth & Environmental with a report prepared in February 2006. Based on the borehole information contained in the report, the following soil conditions are expected to be encountered on the site.

The general soil profile based on the boreholes drilled on-site consists of a layer of topsoil, typically 50 to 100 mm thick, overlying native clay and/or sand deposits and/or clay till. Sand seams and lenses were noted within the clay deposit across the site.

Groundwater elevations varied between the boreholes, but they were typically dry to 9.5m.

*Note that a request has been made to the owner for the Geotechnical Consultant to drill additional boreholes and provide a specific soils investigation relative to the proposed building site.

S.1.6 Structural Outline

1.1 Floors

.1 Event Level - Event Floor

- 200 Refrigerated Slab Continuous Pour
- Slip-sheet and Insulation
- Sand Bed
- $f_c' = 35 \text{ MPa}$; Exp. Class F-1; 10mm Agg; Shrinkage reducing agent.
- Wet cure minimum of 7 days.

.2 Event Level – Exterior Loading Dock

- 200 SOG c/w sawcuts at max. 4.5m o/c
- $f_c' = 35 \text{ MPa}$; Exp. Class C-1

.3 Event Level – Interior Loading Access

- 200 SOG c/w sawcuts at max. 4.5m o/c
- $f_c' = 25 \text{ MPa}$; Exp. Class N

.4 Event Level – Service Areas; Dressing Rooms; Corridors

- 150 SOG c/w sawcuts at max. 4.5m o/c
- $f_c' = 25 \text{ MPa}$; Exp. Class N

.5 Entry / Restaurant & Concourse Levels

OPTION #1

- 100 concrete topping on 76 composite metal deck.
- Steel beams (composite or non-composite options) supported by steel girders. See sketches SK-1, SK-2, and SK-3 for sizing.
- Topping Concrete - $f_c' = 25 \text{ MPa}$; Exp. Class N

OPTION #2

- 180 structural concrete slab.
- Concrete beams supported by concrete girders.
- See sketches SK-1, SK-2, and SK-3 for sizing.
- $f_c' = 30 \text{ MPa}$. Exposure Class N

.6 Seating Bowl

OPTION #1

- Pre-cast concrete bleachers supported by pre-cast concrete rakers.

OPTION #2

- Pre-cast concrete bleachers supported by steel rakers.
- See sketches SK-1, SK-2, and SK-3 for raker sizing.

.5 Roof Level

- 38 metal deck.
- OWSJ supported by clear span trusses and steel girders.
- See sketches SK-1, SK-2, and SK-3 for sizing.
- Roof design based on retaining snow on roof with the use of snow cleats.

1.2 Foundations

- Awaiting specific geotechnical information from the proposed building footprint in order to determine if we are using footings or piles and frost walls or grade beams.
- $f_c' = 35 \text{ MPa}$ at 56 days, Exposure Class S-1

1.3 Foundation Walls

- Foundation wall thickness = 200 to 400 dependent on height of site grading on foundation wall.
- $f_c' = 35 \text{ MPa}$ at 56 days, Exposure Class S-1

1.5 Columns

STEEL OPTION

- Columns on gridline supporting main trusses – W690x323
- All other columns – W250x80

CONCRETE OPTION

- Columns on gridline supporting main trusses
 - o W690x289 (Concourse to Roof Level) – Moment Connect the steel column to the concrete column below.
 - o 600x1000 cip concrete (Event level to Concourse level).
- All other columns – 500x500 cip concrete.
- $f_c' = 30 \text{ MPa}$. Exposure Class N

1.6 Stair Core Walls

- Core walls - 300
- $f_c' = 30 \text{ MPa}$. Exposure Class N

1.7 Rigging Grid

- 6100 x 5500 rigging grid at the u/s of roof truss elevation
- See sketch SK-4 for sizing.
- Rigging grid design based upon 180,000 lb total load over a 22 m x 26 m area.
- W310 beams are designed for a 10,000 lb point load.
- W200 beams are designed for a 2,500 lb point load.

S.1.7 Miscellaneous

1.1 Reinforcing Steel

- Footings or Piles – TBD once geotechnical information is received.
- Typical Foundation Walls – 105 kg/m³
- CIP Concrete Columns - 195 kg/m³
- Core Walls – 115 kg/m³
- 200 Refrigerated Slab-on-Grade – 50 kg/m³ + 152 x 152 - MW25.7 x MW25.7 Welded Wire Mesh
- 150 & 200 Slab-on-Grade – 50 kg/m³
- Suspended concrete slab on beams & girders – 130 kg/m³
- Toppings – 152 x 152 – MW9.1 x MW9.1 Welded Wire Mesh + 15M1500@500 centered over all interior girders + 15M1000@300 at all deck laps
- Architectural curbs and walls – 50 kg/m³

1.2 Stairs, Steps & Curbs

- Access stairs to the event centre to be constructed of cast-in-place concrete.
- Typical non-structural (architectural) curbs to be 150 thick.

1.3 Cladding Walls

- Curtain wall construction does not require any special structural details other than coordination with the connection plates.
- Other types of wall systems may require the use of a miscellaneous structural steel sub-framing system.

END OF REPORT

APPENDIX E: MECHANICAL REPORT



MEDICINE HAT EVENT CENTER

PROPOSED MECHANICAL SYSTEMS REPORT

Prepared For:

GEC Architects

Prepared By:

Wiebe Forest Engineering
Division of SNC-LAVALIN INC.

July 2009

WFE Project No: XXXX
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- 1. GENERAL
 - .1 Introduction
 - .1 This report outlines the Mechanical Design Concept for the new Medicine Hat Event Center.
 - .2 The mechanical system concepts have been selected to minimize building energy use, to maximize building sustainability, and be accommodating to maintenance.
 - .2 Design Criteria and Standards
 - .1 Heating and cooling load calculations are based on the ASHRAE Handbook of Fundamentals. The design conditions are:
 - Winter: Outdoor Temp: -31°C DB
Arena: 15° to 18°C DB
Dressing Rooms/Restaurant/Office: 21°C DB
 - Summer: Outdoor Temp: 29°C DB/17°C WB
Arena: 15° to 18°C DB
Dressing Rooms/Restaurant/Office: 21°C DB with Air Conditioning
 - .3 Code and Code-Referenced Standards
 - .1 The following are applicable codes, and standards. The requirements of these codes and standards will be met by the mechanical design.
 - Alberta Building Code
 - Alberta Fire Code
 - ANSI/ASHRAE 62- 2001
 - CAN/CGA-B149.1 - Natural Gas and Propane Installation Code
 - CSA B51 - Boiler, Pressure Vessel and Pressure Piping Code
 - CSA B52 - Mechanical Refrigeration Code
 - NFPA 10 - Standard for Portable Fire Extinguishers
 - NFPA 13 - Standard for the Installation of Sprinkler Systems
 - NFPA 96 - Ventilation Control and Fire Protection of Commercial



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Cooking Equipment

- National Energy Code of Canada
- The Canadian Plumbing Code

2. **SITE SERVICES**

.1 **Water**

- .1 2-150mm water services will be fed from the City of Medicine Hat's municipal main. The services will be looped together within the building.

.2 **Sanitary**

- .1 A single 200mm sanitary service will accommodate the building sanitary requirements, and the service will tie into the City of Medicine Hat's municipal service.

.3 **Storm**

- .1 A storm service will accommodate the roof loads and weeping tile requirements. The storm service for the roof area will be approximately 450 mm in size

.4 **Natural Gas**

- .1 A gas service will feed an outdoor meter set. The gas meter will be at 35 kPa (5lb) pressure feeding a pressure gas piping system.

3. **PLUMBING**

.1 **Storm Drainage**

- .1 The building roof will be drained by full flow roof drains selected to suit the type of roof construction and at the locations determined by the Architectural design.
- .2 Roof storm drainage will be collected by an internal piping network sized to satisfy the 15-minute rainfall intensity as dictated by the Alberta Building Code.
- .3 Storm water will NOT be retained on the roof, drains will be full flow type.



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.2 **Sanitary Drainage**

- .1 The proposed Medicine Hat Event Centre will be provided with a single 200mm sanitary sewer service connection to the site services.

.3 **Domestic Water Supply**

- .1 A dual 150 mm water service complete with backflow preventers will be provided into the building to meet the requirements of the domestic water, fire protection water systems and irrigation systems.

.4 **Domestic Water Heating**

- .1 Domestic hot water will be generated by two separate sources to accommodate dual temperature requirements. The first is domestic hot water for showers, kitchen, etc. which will be delivered at 120°F, the second is the ice resurfacing room which requires flood water at 160 to 180°F.
- .2 Domestic hot water will be tied into the high efficiency heating plant. 2 individual instantaneous hot water generators using heating hot water and a double wall U-tube heat exchanger will generate semi-instantaneous hot water for the 2 independent sources. The domestic hot water systems will have the ability to be interconnected to provide redundancy should one of the water heaters fail.
- .3 Domestic hot water will be preheated utilizing waste heat off the refrigeration system.
- .4 Roof mounted solar heating panels will provide an alternate means of heating domestic hot water, refer to Item 6.0 of this report.

.5 **Plumbing Fixtures**

- .1 Fixtures will be of commercial grade quality and will be selected to minimize water consumption. Plumbing fixtures will be of commercial quality as follows:



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- Water Closet 1.6 Gal (6 L) flush valve, vitreous china, floor mount.
- Urinals Wall mount vitreous china, battery operated infrared flush valve.
- Lavatories Modular lavatory system with infrared controls and 0.5 US gpm flow rate.
- Showers Electronic metering valve and vandal proof head, 1.5 US gpm flow rate.
- Janitor Sinks Molded stone 600 x 600 floor mount basin, wall trim with vacuum breaker.
- Sinks Single or double compartment stainless steel sinks where required.
- Drinking Fountains Stainless steel wall mount complete with water coolers and bottle filters.
- Mixing Valves Thermostatic mixing valve for showers.

.6 Natural Gas

Natural gas will be supplied to the site and metered outdoors at grade level. Gas will be distributed via a 35 kPa (5 lb) pressure gas system throughout the building to all gas fired equipment.

.7 Waste Water Reuse

It is proposed to reuse the waste water which is generated from the following 2 potential sources:

- Ice resurfacing room snow melt pits
- Water softener regeneration

The waste water from these 2 sources will be stored in a fibreglass storage tank. The water will be recirculated for filtration and chlorination on a continuous basis. 2 distribution jet pumps and pressure tanks will maintain the system pressure as needed. A separate pipe distribution system will feed all water closets and urinals throughout the facility. The piping will be identified as non-potable.



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4. FIRE PROTECTION
- .1 Fire sprinkler systems will be installed in compliance with NFPA 13.
 - .2 A wet sprinkler system will be installed throughout the facility.
 - .3 The site water pressure is likely sufficient to not require a fire pump – this will be confirmed by the sprinkler contractor's engineer.
 - .4 A fire department siamese connection will be provided near the main building entrance within 45m of an exterior hydrant.
 - .5 Hand held extinguishers in wall mounted cabinets, will be provided throughout in compliance with NFPA 10 and local authorities.
5. HEATING PLANT
- .1 **A central heating plant will service the entire buildings heating requirements:**
 - Perimeter hot water heating
 - Glycol heating for air handling equipment
 - Domestic hot water heating
 - Radiant slab
 - .2 **Source Equipment**
 - .1 Three natural gas boilers will provide heating water for the building heating systems.
 - .2 Boilers will be of cast iron construction with a hybrid type plant. One boiler will be with power burners and a minimum of 85% efficiency and two boilers will be condensing type boilers with the potential of 98% efficiency. Each boiler will be housed with a boiler circulation pump.
 - .3 Two primary pumps will circulate heating water to terminal heating equipment throughout the building. The pumps will be controlled by variable frequency drive (VFD) speed controllers to maintain constant pressure in the heating distribution main piping.
 - .4 The pumps will operate in duty/standby configuration with the standby pump operating only if the duty pump fails.



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.3 Heating Terminal Equipment

- .1 Continuous hot water convection cabinet or radiant panel located along all outside walls will generally heat the building perimeter.
- .2 Cabinet unit heaters will heat entrances.
- .3 Suspended unit heaters will heat the receiving dock and mechanical rooms.
- .4 Two-way modulating valves will control heating water flow to all terminal heating units.

.4 Radiant Slab System

- .1 Glycol radiant slab heating will be provided for the loading dock and locker rooms.
- .2 A hot water to glycol heat exchanger will be located in the mechanical room to supply glycol to the slab heating system.
- .3 Cross-linked polyethylene (PEX) piping will be embedded in the slab for the heat transfer.

.5 Circulating Pumps

- .1 Base mount pumps will circulate the heat transfer fluid through a primary loop and a glycol loop. The glycol loop will feed heating coils on the ventilation units and the primary loop will feed the perimeter radiation, unit heaters, entrance vestibule heaters, etc. Standby pumps will be provided on each loop.

.6 Piping

- .1 The high temperature and heat pump loops will consist of Schedule 40 steel pipe to ASTM A53, grade B standard. Pipe joints for piping 2" and under will be screwed and for 2 1/2" and over will be welded fittings. The high temperature loops will be insulated and canvas jacketed where exposed. A pipe identification system will be incorporated throughout with a painted stencil system identifying the contents and direction of flow.



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6. SOLAR HEATING

.1 System Concept

- .1 Roof mounted solar tube collectors will be located on a portion of the roof with good south exposure. A bank of evacuated tube solar collectors will be installed and piped in parallel. The heated solar/glycol solution will be circulated to domestic hot water in the roof top mechanical penthouse.

.2 Solar Collectors

- .1 Solar collectors will be the evacuated tube type which consist of 3/8" copper tubing encased in a clear, cylindrical evacuated tube of glass construction.

.3 Piping Heat Exchangers

- .1 Insulated closed loop type ' L ' copper piping system will circulate a 50% water/50% glycol solution through the bank of solar collectors and plate and frame heat exchangers in the basement. A plate and frame heat exchanger will be installed upstream of the domestic water heater.

.4 Pumps

- .1 A single base mounted circulating pump will circulate the heat transfer fluid through the piping loop. No standby pump will be provided.

7. COOLING

.1 System

- .1 A single centrifugal chiller will provide the chilled water source for the facility using an alternate refrigerant.
- .2 Chilled water will be distributed from the chiller to chilled water coils in the air handling units by a single pump.



- .3 The pump will supply constant temperature chilled water at a variable flow rate dependant on chilled water load. The pump will be controlled by a variable frequency speed controller.
- .4 A single evaporative cooling tower will reject heat from the chiller's condenser water loop.
- .5 The cooling tower will be up-blast style with VFD controlled propeller type fans.
- .6 The chilled water plant will operate only at outdoor temperatures above 17°C. Below 17°C chilled water will not be required for building air conditioning, ventilation units will all be sized for 100% free cooling.

8. **VENTILATION**

.1 System Concept

- .1 The ventilation systems will be independent for the facility based on the occupancy they serve. The ventilation systems will breakdown as follows:
 - .1 Main arena seating bowl
 - .2 Dehumidification
 - .3 Locker/dressing rooms
 - .4 Concourse/suites
 - .5 Administration
 - .6 Restaurant/lounge
 - .7 Receiving area
 - .8 Refrigeration plant
 - .9 Food services areas



.2 Main Arena Seating Bowl

- .1 The ventilation system for the main seating bowl will be a conventional constant volume ventilation system.
- .2 The ventilation unit will be a constant volume unit but will be housed with VFD's on the supply and return fans for capacity control depending on occupancy levels. It will be a mixed-air air handling unit housed with the following components:
 - .1 Supply air plenum
 - .2 Centrifugal supply air fan
 - .3 Glycol heating coil
 - .4 Chilled water cooling coil
 - .5 Filters
 - .6 Air blenders
 - .7 Air mixing section
 - .8 Centrifugal return fan
 - .9 Return air plenum
- .3 The air handling unit will mix building return air with outside air in varying amounts. The minimum percentage of outside air will be sufficient to meet the requirements of ASHRAE Standard 62. The outside air quantity will be varied from minimum up to 100% on demand for free cooling. The minimum will be determined by locating CO2 sensors within the occupied space and measuring the occupant load.
- .4 A significant component of indoor environmental quality is indoor air quality. ASHRAE 62 outlines ventilation requirements to maintain healthy spaces. Providing ventilation based strictly on peak occupancy using the ventilation rate procedure will result in over ventilation during low use periods. The positive impact of over ventilation will be outweighed by the cost associated with the energy required to condition the ventilation air. The seating bowl is a variable occupancy space. CO2 sensors mounted within the space will be utilized to measure and control the per person ventilation rate and reduce energy consumption during low use periods. This is what is referred to as ventilation demand control.



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- .5 There are 2 options for air delivery. There is the traditional option which involves running all the distribution ductwork within the roof structure and there is the displacement ventilation option which delivers the air in the occupied zone.

Option 1 – Overhead: Most arenas have a very deep roof structure due to their long spans. Typically the air distribution ductwork for the seating bowl is run within this structure and air is thrown from high level down to seating level using high velocity drum diffusers. The downfall of this system is the drafts that are typically created with the air throw and the uneven distribution throughout the bowl.

Option 2 – Displacement: Displacement ventilation is a system which relies on air delivered at a temperature slightly lower than the desired room temperature. It will be supplied horizontally at low velocities under the seating. The supply air spreads over the tiered seating and then rises by convection as it picks up the heat load from the occupants. It displaces the stale, polluted air forcing it up to the return air located at high level on the concourse level. A displacement ventilation system will provide a ventilation effectiveness that will exceed 100%. There is an added cost to consider to create a plenum under the seating risers and rakers, this plenum could be constructed out of sheet metal or drywall.

.3 Arena Dehumidification System

- .1 The main arena space will be housed with a packaged indoor unit to handle dehumidification. The package unit is housed with a dessicant wheel which removes the humidity from the space. Ice resurfacing and occupant load are the primary contributors to elevated humidity levels.
- .2 The ventilation unit will be a packaged constant volume unit and will be housed with the following components:
- .1 Supply air fan
 - .2 Mixing section for outside and return air only
 - .3 Dessicant wheel
 - .4 Regeneration fan
 - .5 Direct fired burner



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- .6 Single stage filter section

- .3 The unit will cycle based on humidity levels.

.4 Locker/Dressing Rooms – VAV Unit with Heat Recovery

- .1 Each locker room consists of approximately 1/3 wet area (showers, washrooms) and 2/3 change room. Washrooms will be exhausted at a rate of 2 CFM/ft2 in accordance with ASHRAE 62. It is proposed that the equal amount of air is fed into the locker room area and exhausted thru the wet areas.
- .2 The ventilation system proposed is a VAV air system with 100% outside air and 100% exhaust with full heat recovery. Each locker room will be housed with a VAV box for supply air and a VAV box for exhaust air. The boxes will be fed from medium pressure duct systems off the ventilation unit. Because the locker rooms are variable occupancy, when they are occupied, the system will run at 100%, however when they are unoccupied, the boxes will close to 20% and reduce air volumes and energy consumption dramatically.
- .3 The air handling unit will be housed with the following components:
- .1 Supply side
 - supply air plenum and fan controlled by VFD.
 - heating coil
 - cooling coil
 - heat enthalpy wheel
 - single stage of filtration
 - .2 Exhaust side
 - exhaust air plenum and fan controlled by VFD.
 - filter
 - heat enthalpy wheel

.5 Concourse/Suites – 4 Pipe Fan Coil with Constant Volume (CV) Boxes for Outside Air

- .1 A four pipe fan coil will be utilized to provide heating, cooling and filtration to each suite and concession on the concourse level. Outdoor air to each fan coil will be provided from a VAV system that supplies 100% outside air. Ductwork will feed overhead ceiling diffusers and grilles.



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- .2 The make-up air will be designed utilizing a VAV system with constant volume (CV) boxes. The air handling unit will feed a medium pressure duct system. CV boxes will supply fixed air volumes to satisfy occupant loads.
- .3 The air handling unit will be located in the basement. It will be housed with the following components:
- .1 Supply air plenum
 - .2 Centrifugal supply air fan complete with variable frequency drive
 - .3 Glycol heating coil
 - .4 Filters
- .4 The fan coil units and CV boxes will be tied into occupancy sensors. When the spaces are unoccupied, the fan coil will be disabled and the CV box will close.

.6 Administration – VAV

- .1 Ventilation will be provided by a single variable air volume ventilation unit. The unit will provide conditioned air to terminal units thru a medium pressure distribution system. The terminal units will have flow control ability and reheat coils for discharge air control. Each terminal unit will have an electronic controller. Each perimeter zone will be equipped with at least 1 terminal unit which will operate in conjunction with the perimeter heating.
- .2 The ventilation unit will consist of the following:
- Supply air fan with variable speed controller
 - Return air fan with variable speed controller
 - Outdoor/exhaust/return mixing section with 100% free cooling capability
 - Filters (30% ASHRAE)
 - Glycol heating coil
 - Chilled water cooling coil
- .3 The administration area does have variable occupancy spaces. Occupancy sensors mounted within the space will be utilized to control lights and VAV boxes and reduce the energy consumption during unoccupied periods



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.7 Restaurant/Lounge – VAV

- .1 Ventilation will be provided by a single variable air volume ventilation unit. The unit will provide conditioned air to terminal units thru a medium pressure distribution system. The terminal units will have flow control ability and reheat coils for discharge air control. Each terminal unit will have an electronic controller. Each perimeter zone will be equipped with at least 1 terminal unit which will operate in conjunction with the perimeter heating.
- .2 The ventilation unit will consist of the following:
- Supply air fan with variable speed controller
 - Return air fan with variable speed controller
 - Outdoor/exhaust/return mixing section with 100% free cooling capability
 - Filters (30% ASHRAE)
 - Glycol heating coil
 - Chilled water cooling coil
- .3 The administration area does have variable occupancy spaces. Occupancy sensors mounted within the space will be utilized to control lights and VAV boxes and reduce the energy consumption during unoccupied periods.

.8 Miscellaneous

- .1 There are some remaining areas that will require independent ventilation systems, they are as follows:
- .1 Receiving Area: A ventilation unit will be hung within the receiving area at high level. It will be a constant volume unit with supply air fan, heating coil, filter section and mixing section.
 - .2 Kitchen: A direct fired make-up air unit will make up the volume of air being exhausted thru kitchen exhaust equipment.
 - .3 Refrigeration and Chiller Plants: A ventilation unit will feed this space and will be sized in accordance with CSA Standard B52 on mechanical refrigeration. The ventilation equipment is required to run whenever:
 - .1 the room is occupied
 - .2 the ice plant is operational or
 - .3 there is an ammonia refrigerant leak



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.9 Controls

.1 General

- .1 A direct digital control (DDC) energy management and controls systems (EMCS) will control and monitor all mechanical equipment and will provide zone HVAC control.
- .2 The EMCS will be of a standard architecture consisting of terminal controllers, remote control panels, and operator interface workstations.
- .3 Space temperature control will be provided through terminal controllers, electronic room temperature sensors, and electronic reheat control valves.
- .4 Standalone remote control panels will operate and monitor major mechanical equipment.
- .5 Building operators will interface with the EMCS through personal computer based operator workstations using graphical software.
- .6 All field devices including valve and damper actuators, room temperature controllers, and HVAC system and equipment control and monitoring devices will be electronic.

1 RINK LIGHTING PLAN
E1 SCALE: 1:200

LEGEND:
 [A] REC LEVEL 50FC
 [B] HOCKEY LEVEL 100FC

△

City of Medicine Hat New Regional Event Centre

ELECTRICAL DESIGN BASIS MEMORANDUM

SUBMITTED BY:
Stebnicki + Partners
Cody Bargholz, P. Eng

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- 2.0 Introduction
- 3.0 General – Power & Distribution Systems
- 4.0 General Lighting
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- 7.0 Commissioning
- 8.0 Energy Efficient Savings
- 9.0 Individual User Group Design Guidelines
- 10.0 Outline Specifications

Date: July 23, 2009
Job#: 29999

1.0 ELECTRICAL STANDARDS AND GUIDELINES

1.1 Electrical Design

1.1.1 Electrical design will comply with the following standards and guidelines:

- Canadian Electrical Code, Part 1
- "Fire Protection Engineering Standards of the Fire Commissioner of Canada for Fire Alarm System Requirements"
- National Building Code of Canada
- Alberta Building Code
- Canadian Standards Association
- Illuminating Engineering Society of North America

2.0 INTRODUCTION

Electrical systems for complexes of this nature tend to be categorised into two major classifications; Power & Distribution Systems and Auxiliary Systems.

Power & Distribution systems generally comprise the following:

- Utility Service
- Distribution Panelboards
- Branch Panelboards
- Motor Control Centres
- Transformers
- Convenience Power
- Lighting Systems
- Emergency Power Systems
- Special Power Systems for ancillary equipment

Auxiliary Systems usually comprise the communication systems within the complex, they include:

- Telephone/Data Systems
- Paging, Intercom, and Sound Systems
- Security Systems
- Fire Alarm Systems
- Broadcast Centre and Equipment
- Scoreboard

This report provides an overview of the Electrical systems for this complex, identifying key issues to foster discussion on user requirements and preliminary cost analysis. A general specification is included for basic materials and methods.

3.0 GENERAL – POWER & DISTRIBUTION

It is proposed that a new 2000 kVA, distribution transformer be installed to service the facility. The supply and installation of transformer and all associated equipment primary to the transformer is to be by the utility.

4 - 100mm conduits c/w 4-500MCM feeders and on 100mm spare conduit will be installed to bring the main service capacity to 1600amps.

The new 1600A, 347/600V, 3 phase, 4 wire main distribution will allow for new mechanical, ice making equipment, sub-distribution panels, motor control and central distribution panels.

All distribution will be provided at 347/600 volts, 3 phase, 4 wire to reduce line loss, installation costs and improve performance to larger power loads. All distribution will be sized to allow future growth and be complete with a PTY filter to reduce transient noises and protect against power surges.

All mechanical and some of the lighting loads will be powered from the 347/600 volt, 3 phase, 4 wire system. This type of system is recommended to its capacity to reduce installation costs for feeders and conduits while improving performance of the electrical equipment by lowering voltage drop.

Dry type step down transformers will provide 120/208 volt, 3 phase, 4 wire power to the central distribution panels located in each electrical room. The central distribution panels will subfeed panelboards to provide power to lighting, communications, receptacles and fractional kilowatt motor loads.

All panelboards will be sized and located in areas to allow for proposed power demands and future circuitry. Panelboards used to provide service to computer equipment will be complete with PTY filters to protect against power surges and transient noises. As well, all circuitry will have separate neutrals with each circuit to further reduce dirty power.

Motor Control Centres (MCC) and Variable Speed Drives (VFD) will be located in mechanical rooms. The MCC will incorporate low voltage and single phase sensing to protect motors during power line disturbances. MCC will also contain motor starter equipment to facilitate control of motors by the building management system. VFD will be supplied by Division 26 and equipped with bypass.

4.0 GENERAL LIGHTING

4.1 Inside Lighting

Interior lighting will be designed to provide a warm and inviting atmosphere, with the lighting designed to reflect the needs of the area they have been installed in.

Careful consideration will be given to take advantage of Day lighting with the use of lighting controls and fixture selection to obtain the desired results.

Generally, most lighting will be provided with fluorescent lighting fixtures to allow for instant on operation and 120 volt distribution to take advantage of proven new lamp/ballast/control technology. Today fluorescent lamps have an extended lamp life of 30,000 hours, improved color rendering and cost effective dimmable ballast which will all help with being environmentally accountable.

The fixtures selected will be based on several key factors including vandalism, performance and architectural appearance to improve life cycle, reduce maintenance and improve energy performance.

Consideration will be given to keep the lamp types to a minimum, again to help reduce inventory. All lamps will be specified with the environment in mind to meet low mercury content.

Lighting in office areas, where reduced glare on screen and visual comfort is important, will be done generally with indirect/direct linear fixtures unless ceiling height is restricted and then recessed fixtures will be installed.

Lighting in corridors with high ceilings may be done with high intensity discharge; lighting complete with metal halide lamps where the use of fluorescent lighting is not practical. In areas where paintings or murals will be located, lighting will be designed to enhance their appearance.

In the gathering space and proposed presentation area, lighting will be designed to allow for multi-levels and provisions for serial control.

Lighting in mechanical and non public areas will be done generally with fluorescent strip lights c/w wire guards.

A low voltage lighting control system will be used in selected areas to allow for both individual controls in all areas as well as networking of panels for central control of the lighting system.

In areas where use is varied, lighting control will be done with motion sensors. Photo-light sensors will be installed in all areas where Day lighting is available in conjunction with motion sensors. All offices will be done with a combination of motion and photo-light sensors, as well.

4.2 Rink Lighting

Rink lighting will be done using a combination of 1000W pulse start metal halide flood lighting c/w blackout shutters and internal glare control to improve vertical levels and suspended fluorescent luminaires complete with white louvers for glare control. The system will be designed to allow

for blackout, 10, 50 and 100 foot candles. The multi-level light intensity switching options will allow for cleaning, recreational hockey and high performance requirements.

Rink lighting will be suspended from a catwalk system. Power will be provided at select rigging locations for special event lighting systems.

Strobe lights will be installed at six (6) locations above the rink for photography.

4.3 Outside Lighting

The exterior lighting will be designed to create a secure environment and to enhance the facility's night appearance with the lowest energy consumption, dark sky compliant and maintenance methods available.

Pedestrian routes for staff and users will be provided with minimum 3500mm poles complete with metal halide luminaires. Parking lot lighting will be done with pole mounted metal halide luminaires located on 900mm concrete bases. All lighting will be designed to meet a minimum of 6 lux. The selection of metal halide is to assist in providing a safe environment.

Principal entrances to the building will utilise white metal halide sources. Exterior lighting will be installed at all doorways and other modular located points around the exterior perimeter of the building.

All exterior luminaires will be chosen to provide maximum protection against vandalism and be controlled via photo-cell and the building management system.

Consideration will be given for the use of LED lamp technology where practical, to further assist in environmental accountability.

5.0 GENERAL – AUXILIARY SYSTEMS

Auxiliary systems are an adjunct to the efficient operation of any facility, and as such, should be relatively flexible to accommodate any changes that administrative functions dictate.

5.1 Telephone and Inter-facility Communication Systems

The telephone/data service to the facility will be provided by Telus and/or other supplier as approved by owner into a dedicated telephone/communications demarcation room located near the electrical service entrance location within the building.

5.2 Data and Voice Cabling

From the main communications room single mode fibre, multi-mode fibre and Cat.5E copper wire will be installed to individual

data/communications rooms. All cabling installed will be to E1A/T1A568A standards, the standards presently in place for communications requirements. It is anticipated that all installations will be done to Cat.5E standards.

These rooms will house the normal passive component requirements, such as racks and patch panels.

Provisions for horizontal wiring will be provided to each area from the communication rooms to meet the various user requirements. All infrastructure cabling will be installed in conduit or ventilated cable trays judiciously located for accessibility.

All fibre and Cat.5E cabling is to be terminated and labelled onto rack mounted fibre and copper patch panels.

Allow for Cat 5E to office area work stations, dressing rooms, press box, suites, banquet area, kitchen, lobby, concessions, training etc.

6.0 GENERAL LIFE SAFETY SYSTEMS

6.1 Fire Alarm System

From a capital cost and user perspective, it would be prudent to install a microprocessor based addressable system for the overall facility. The system will comprise a main fire alarm control panel, with remote annunciators at each entry. Individual transponder panels will be installed at each facility with peer to peer communication to allow either independently or integral functionality for maximum user flexibility.

A two stage fully addressable fire alarm system will be installed in conjunction with the sprinkler system. This type of system allows for easy identification equipment activated. Each device is self-monitoring for ground fault and wiring supervision reducing installation costs in conduit and wiring.

The system will have installation of system detectors in any un-sprinklered areas, pull station at all exit doors and floor areas, connection to monitor sprinkler system, emergency power, magnetic door releases and provision to provide a signal to a monitoring company or fire alarm department.

6.2 Exit Signs

Exit luminaries will be minimum maintenance, long life, low energy use LED type and be connected onto emergency power.

6.3 Emergency Power and Lighting

Emergency power for this facility will be done using one emergency 250 KW, 347/600 volt generator c/w enclosure and tanks.

An emergency distribution system will be installed and interconnected onto the utility system to allow for capacity to meet code and other selected loads to be energized in the event of a utility power failure.

Emergency lighting, exit signs, UPS, selected mechanical and other designated loads will connected onto the emergency distribution system.

In conjunction, standalone emergency battery packs and remote heads will be installed in all electrical rooms and selected areas to provide for instant on lighting until the emergency system is activated.

6.4 Security Systems

Each user group will be installing a security system to monitor all corridors, computer rooms, office areas and other designated locations. The systems will have all conductors installed in conduit and will include for motion detectors, control panels, card access, CCTV, annunciator, keypads, intrusion switches and dialers.

The security system will allow for monitoring for fire alarms, HVAC system and door access at user request.

Allow for door intrusion alarm monitoring of all outside doors and up to six (6) internal partitions (Zones), card access in the office stairways, six (6) main entrance doors, elevators, change rooms and fitness facilities.

Allow for camera monitoring at all entrances, loading dock, three (3) PTZ locations outside, three (3) PTZ & 15 fixed camera in selected interior areas including general circulation hallways.

Allow for minimum of three (3) DVR and required head end.

6.5 Event Control Room

Provisions will be made to include for an event control room located adjacent to the press boxes. From the event control room users will have access to event lighting controls, event sound controls and instant replay controls.

Installation of conduit, base system cabling and cable tray will be included in the base building construction.

It is anticipated that provisions will be made for 10 camera locations. As well, provisions will be made for power to broadcast trucks and

intercommunication between camera and other selected locations to assist in TV production.

6.6 Sound System

The sound system will be a distributed system consisting of three clusters of suspended speakers located above the ice surface and speakers suspended above the seating areas distributed approximately every twenty five (25) feet. Attention will be paid to suspension heights and locations to ensure they do not interfere with site lines.

The system will be designed to include for wireless mics and control from ice level and from event control room when major events take place.

7.0 COMMISSIONING

Commissioning will include MCC, security/door access, communication system, lighting control, identification and balancing of panels, CDP, etc.

8.0 ENERGY EFFICIENT SAVINGS

Cost savings can be attained with several options while paying a minimal premium on original installations. We would recommend the use of T-8 and T-5 lamps and electronic ballasts in fluorescent lighting fixtures, motion detectors in all washrooms, storage rooms and all other areas where the space is periodically used.

Lighting control will be done with local on/off switches, low voltage relays, photo light sensors, dual technology motion sensors in selected areas, and integration with the base building and local building management systems.

With today's technology, the use of solar energy in glass will be investigated and reviewed to see if there can be viable use of this system to again help with energy consumption and comply with LEED® innovation guidelines.

9.0 INDIVIDUAL USER GROUP GUIDELINES

9.1 Common Areas

Power for the common areas will include public space, parking lot receptacles, rough-in for other designated areas, signage and exterior lighting.

A 347/600 volt distribution center for the common areas will be used to provide power to the central chiller system, strategically located panels and transformers for 120/208 volt convenience power and lighting. The system will be sized to accommodate future growth and provide convenience power throughout.

Lighting systems within the common areas will be provided through the use of fixtures and sources in conjunction with the intended ambience at each of the facilities within the complex.

Emergency lighting and exit signage will be connected onto the emergency distribution system.

Exterior lighting will be provided using post-top fixtures that have been carefully selected to blend with residential environment surrounding the facility.

The issue of energy efficiency will be addressed by using proven technology, such as energy efficient lighting, judicious load control, photo-light sensors, power factor control and interface, with the Building Management Systems.

Provisions will be made for security, pay phones, commercial retail units, signage and displays.

The addressable fire alarm system will be installed to meet Code and user requirements with LCD read out and non-active coloured graphics located at the emergency vehicles designated entrance.

Provisions will be made to provide services to the main building information desk for data/phone, security monitoring etc.

9.2 Kitchen Area

An 800 Amp, 347/600 volt, 3 phase, 4 wire sub-distribution panel will be installed to provide power for the Kitchen, Commissary and surrounding dressing rooms and operations rooms. From the distribution centre, 347/600 volt power will be provided to mechanical systems and selected lighting loads

The 120/208 volt distribution system will be provided from 600/120/208 volt transformers onto the 120/208 volt distribution system. Panels will be installed throughout the space and will be lightly loaded so as to allow for full flexibility to meet the ever changing demands for this type of space for power and lighting.

Power for 120 volt convenience power will be provided throughout the area with dedicated neutrals installed for circuitry used to power computers and other designated electronic equipment.

The space will be provided with telephone/data cabling from the main communication center to a designated telephone/data backboard. The conduit and junction box system will be designed to permit future installations of data cabling to designated locations.

A security system will be provided and will include card access, door monitoring and CCTV in selected areas.

Lighting within the kitchen will generally be done using T-8 and T-5 recessed fluorescent technology and electronic ballast's. Cover guard lamp technology will be employed to ensure any broken fluorescent lamps will be completely self contained.

Lighting in open areas will be provided from direct/indirect fixtures using 55 watt bias lamps to allow for multi-level control and improved visual comfort.

Lighting in the restaurant and lounge areas will be designed to provide enhanced visual comfort and relaxation.

Lighting control will be done using local low voltage control in conjunction with motion sensors, BMS and Day lighting where possible.

9.3 Administration Area

A 400 amp, 347/600 volt, 3 phase, 4 wire distribution panel will be installed to provide power for administration, medical and dressing room areas. The 120/208 volt power will be provided using a 600-120/208 volt transformer and 120/208 volt, 3 phase, 4 wire distribution system and panels for lighting and convenience outlets. This panel will be equipped with TVSS filters to help provide additional protection for sensitive electronic equipment.

All panels used for computer and other selected electronic loads will be complete with dedicated neutrals with each circuit, and sized to allow for future growth.

The electrical system will be designed and adaptable to allow for future technology and growth. These provisions will include both power and communications where practical.

A cable and/or conduit system will be installed in a network fashion, and will be of sufficient size to allow for easy addition and relocation.

A conduit and cabling system will be provided to meet the requirements of the following systems: telephone, data, security, internet, signage, pay phones, monitors, etc. Provisions will be made for wireless network systems, as well.

Power and control will be provided for hand dryers, signage, fax machines, photocopy machines, scanners, etc.

It is anticipated that the office system will be modular and will be coordinated with the supplier to provide outlets and wiring to selected spaces to meet the vendor and users needs.

The lighting within the space will be provided by a long life, energy efficient, low maintenance system to provide a bright well-lit ambience to assist in the overall appearance of the new facility. It is anticipated that lighting in this space will be done using steel linear direct/indirect T-8 lamps and electronic ballast's. All fixtures will be suitably located to permit adequate levels between and as even as possible distribution throughout each space.

Lighting levels, switching and style will be incorporated to allow for a variety of task and control. The use of motion and Day light sensors will be used to assist in energy consumption and individual user needs.

Lighting in the meeting rooms will be designed to allow for multi-level use and DMX control to meet the intended multi-use functions.

Emergency lighting will be provided by connecting onto the emergency power distribution system.

9.4 Rink

The distribution center for this area will be fed from the main electrical room. 600/208/120 transformers and 400 amp distribution systems will be provided in two locations around the rink on the event level to allow for power requirements for special events such as concerts and/or other non hockey related venues.

120 volt convenience power will be provided through the area from 120/208 volt panels fed through 600V – 120/208 volt transformers.

Convenience power will be provided throughout the change rooms, offices, mechanical rooms and circuitry where computer equipment will be complete with separate neutral.

Lighting in general change rooms, public washrooms and spaces will be fluorescent vandal-proof fixtures. Lighting control will be done with dual Tech motion sensors in all change rooms.

Lighting in home team change rooms to be of high quality to allow for multi-media demands, control and impact on users.

In home team rooms systems will be installed to allow for smart boards, LCD projectors, sound system and TV.

There will be a player's lounge area and the design will include for TV, fridge, micro wave, etc.

There will be a fitness area which will include for cold tubs, power for TV, bikes, sound and training equipment.

In the press box area provisions will be for phone, data, power, TV and other selected amenities.

The rink will have a suspended scoreboard with replay.

The rink will have high end sound system complete with wireless mics. The system will be designed to allow for 7000 spectators and special event needs.

In the design provisions will be required for an event control room.

A conduit and cabling system will be installed for both the scoreboard and sound system and event control room. The system will be extended to the timekeeper’s box to permit control of both systems as required.

Conduit, cabling and equipment will be installed to system will be provided for data, telephone, security, adverting etc.

10.0 VALUE ADDED OPTIONS

The value added options included above are as follows:

- Stobe lighting for photography.
- Blackout shutters for instant on and off rink lighting control.
- Multimedia cabling prewired throughout building for decreased event set up time and cost.
- Exterior power hook ups for broadcast trucks for decreased event set up time and cost.

11.0 OUTLINE SPECIFICATIONS

A. General Provisions

1. Work Included:

Applicable systems include:

1. Incoming power, telephone and cable TV services and utility co-ordination.
2. Complete electrical distribution system including main switchboard and sub-distribution with provision for metering, feeders, distribution with provision for metering, feeders, distribution panel, branch circuit panels, branch circuits, etc.
3. Telephone distribution raceway system, outlet boxes and termination panels.
4. Cable television distribution system.
5. Complete fire alarm system.
6. Complete emergency and exit lighting system.

7. Complete grounding and ground fault system where required,
 8. Power and telephone to elevator motors and controllers.
 9. Exterior site lighting and building security lighting.
 10. Interior lighting.
 11. Interior light control, exterior lighting control.
 12. Connection of all mechanical, plumbing and owner furnished equipment.
 13. Security system raceways.
 14. Computer/data system raceway system.
 15. Switches, receptacles and special outlets as noted herein.
 16. Testing of all systems, equipment and conductors.
 17. Co-ordination with all other trades.
2. Work or items not Proposed by Division 16, or Included in Other Work:
1. The owner will pay for electrical primary and secondary costs charged by the utility company telephone.
 2. Primary utility cable to be furnished and installed by the utility company.
 3. Secondary cable to be furnished by electrical contractor. Connections at transformer by utility, at secondary switchgear by electrical.
 4. Package starters for elevators.
 5. HVAC temperature control wiring.
 6. Sprinkler flow switches and valve tamper monitors.
 7. Package starter units for air compressors, fire pump and water pumps.
 8. Irrigation controllers and low voltage wiring for control valves.
 9. Electric door hardware.
3. Reference Standards and Codes:
1. Canadian Electrical Code (17th Edition).
 2. Current National Building Code. (1994).
 3. Current Alberta Building Code.
 4. Current National Fire Protection Act.
 5. Inspection Program Requirements: (CSA 7299.4).
 6. ULC – S524 – M1987 (Standard for Installation of Fire Alarm Systems).
 7. Current Dominion Fire Code.
 8. Local Requirements from:
 1. Electrical Inspection Branch
 2. Alberta Standards
 3. City of Calgary Planning Department
 4. Telus Communications Inc.
 5. City Electric System

9. EEMAC (Electrical and Electronic Manufacturer’s Assoc. Council).

B. Basic Materials and Methods

1. Raceways:

1. Schedule 40 PVC for underground services, feeders, branch circuits and underground signal runs.

2. EMT for exposed feeders and branch circuit conduits and for communication conduits.

3. Rigid steel for exposed conduits where exposed to weather and/or subject to physical damage.

4. Flexible conduit will be used for motor connections. (max 450mm), transformer connection (max 450mm), recessed lighting fixtures (max 1800mm). Liquid tight for all connections in mechanical rooms, where water lines are present.
2. Wiring and Cable:

1. Insulated copper 600V, solid #10 AWG and smaller, stranded for #8 and larger. Aluminium conductors will be considered for feeders #1 and larger.

2. Minimum #12 AWG, except runs over 33m to be #10 AWG.

3. Junction Boxes:

1. Sheet metal for interior use.

2. Cast for exterior use.

3. Concrete for exterior use.
3. Wiring Devices:

1. Receptacles – 15A, 125V, duplex, grounding type, convenience outlets, specification grade

2. Switches – 15A, 120V, quiet type, specification grade
4. Panelboards:

1. Bolt on moulded case circuit breakers.

2. Aluminium bus.

3. 10,000A IC minimum rating for 120/208V panels.
5. Distribution Switchboards:

1. Bolt on circuit breakers and fused switches.

2. Aluminium bus bars.

3. EEMAC 1 enclosure.

4. Components braced for and rated for available short circuit current.
6. Dry Type Transformers:

1. 600 – 208V/120 3-phase, 4 wire, delta-wye.

2. Dry type, class H insulation.

3. Secondary wye connection grounded.

4. 100mm concrete housekeeping pad under transformer.

5.
7. Generator

1. 150 KW , 600 volt, three phase, four wire

2. Transfer switch

3. Tier 1 complete with dual tank diesel fuel tank in base

C. General Guidelines and Standards

1. Main Service

Characteristics

15 kV, incoming service from utility to a main pad-mount utility supplied transformer. The transformer will reduce voltage to 347/600V for distribution throughout the complex.

Interrupting Rating

42,000 amps

Power Factor Correction

Individual at designated loads

Ground Fault Protection

Over 1,000 amps feeders

T.V.S.S.

At selected locations.
2. Load Expansion Capacity

40%

Space for future

2 @ 400 amps in each

Sub-feeders

374/600V sub distribution board
3. Metering

Upgrade existing primary metering
4. Main Service Conductors Distribution System

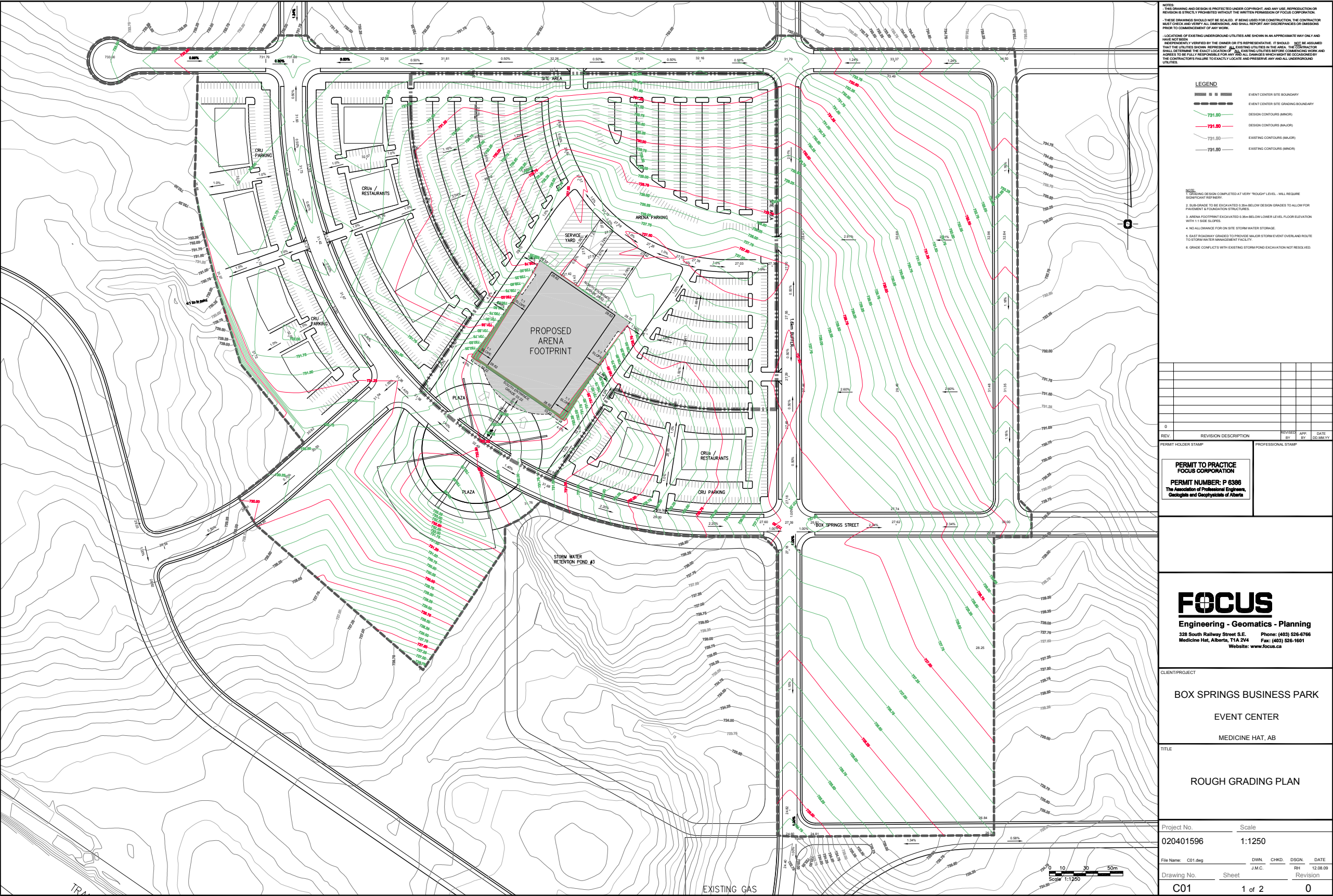
Copper

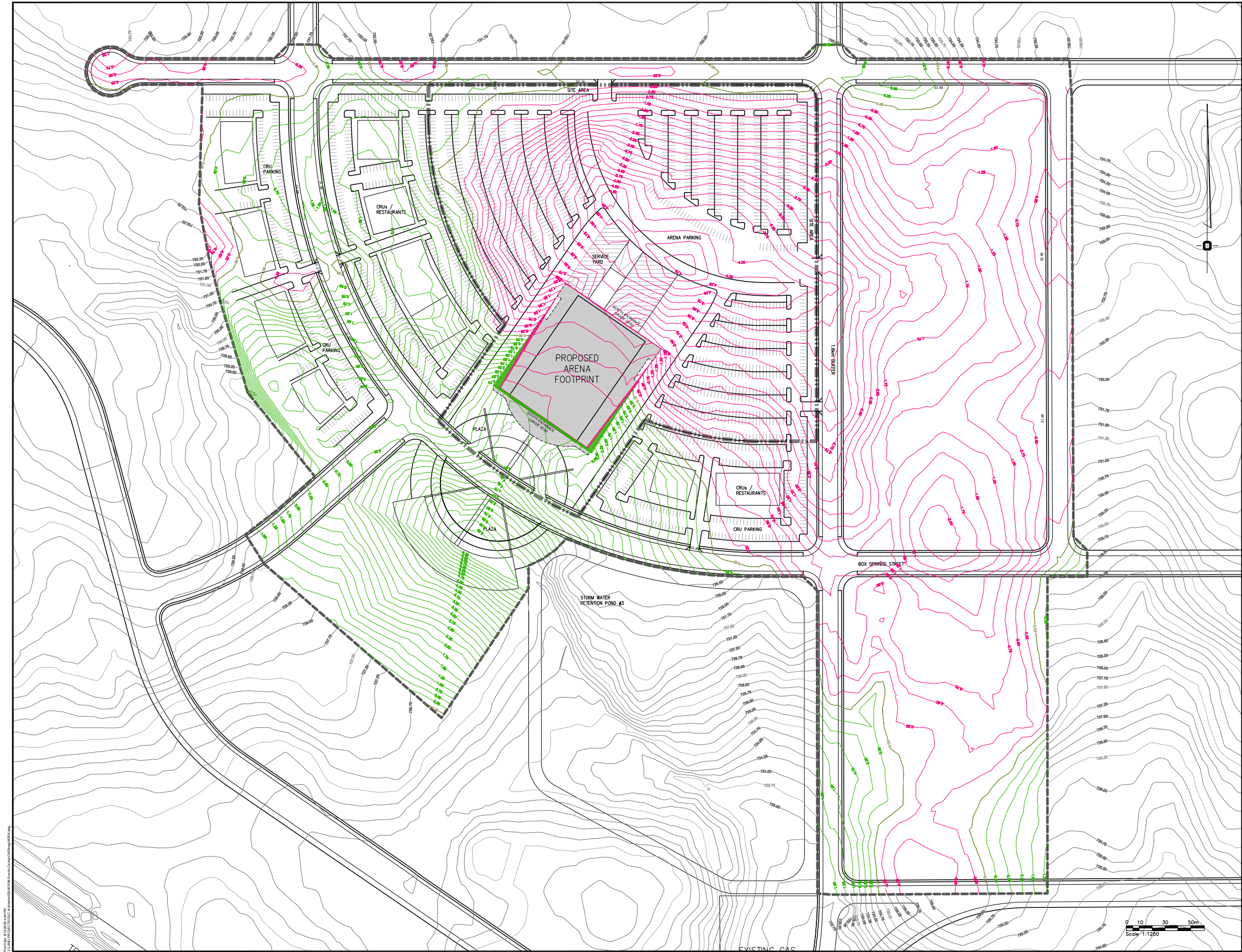
5. Main Distribution Risers	Copper	
Bus Switches	Breakers	
6. Building Dry Type Transformers	Harmonic Mitigating	
7. Kiosk Dry Type Transformers	Standard	
8. Kitchen Dry Type Transformer	Standard	
9. Lighting Panels	Bolt in circuit breaker,	
	347/600 volt	
10. Power Panel breaker	120/208V bolt in circuit	
11. T.V.S.S.	Future space in power panels	
	only.	
12. Panel Feeders Under 100 amp	Copper	
13. Panel Feeders Over 100 amp	Copper	
14. Major Mechanical Feeders	Copper	
15. Chiller Feeders	Copper	
16. Fire Rated Feeders	Pyrotenax	
17. Separate Neutrals for Computer Circuits	Yes	
18. Tenant Metering	Future	
19. Exterior Lighting	Security Yes	
	Decorative/ Flood Lighting	Yes
	Control	Photocell & Time Clock BMS
	Voltage	347 volt
20. Parking Lot Lighting	General	MH
	Levels	6 to 30 LUX
	Control	BMS/LV
	Voltage	347 volt
21. Service Spaces Lighting	General	Fluorescent
	Levels	1ES
	Control	Switch
	Voltage	120 volt

22. Public Lobbies Lighting	General	Fluorescent and HID
	Levels	10 – 40 f.c.
	Control	BMS/LV
	Voltage	120 volts
23. User Group Lighting	General	Fluorescent recessed
		K12A lens, and/or linear direct/indirect downlighting & HID
	Option	Fluorescent recessed deep cell
	Lamps	2@32 watts/fixture
	Ballast	120 volt electronic
	THD	Less than 10%
24. Service Rooms Lighting Control	Local Switches	
25. Parking Lot Lighting Control	Low Voltage/BMS	
26. User Group Lighting Control	Low Voltage and/or line switches	
27. Exterior Lighting Control	Low Voltage/BMS/Photo Sensor	
28. Low Voltage System	Plug-in Relays	
	Local Control	
	Cleaning Switch	
	Sweep/Off Function	
	Typical Floor	
29. Service Entry Data/Telephones	Underground	
	Copper	
	Fibre	
30. Demarkation Rooms Data/Telephones	Yes (4)	
31. Tenant Equipment Data/Telephones	On Tenant Premises	
32. User Group Distribution Data/Telephones	Conduit or Cable Tray in ceiling space	

33. Addressable Fire Alarm System	Yes
34. Interface with BMS Fire Alarm System	Yes
35. Telephone Interface Fire Alarm System	Yes
36. Speaker / Strobes Fire Alarm System	Yes
37. Expandable Capacity Fire Alarm System	25%
38. Smoke Control Fire Alarm System	Yes

APPENDIX G: CIVIL DRAWINGS





NOTES:

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- THESE DRAWINGS SHOULD NOT BE SCALED, IF BEING USED FOR CONSTRUCTION, THE CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS, AND SHALL REPORT ANY DISCREPANCIES OR OMISSIONS PRIOR TO COMMENCEMENT OF ANY WORK.
- LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. IF SHOULD, THE CONTRACTOR SHALL BE ASSURED THAT THE UTILITIES SHOWN REPRESENT THE EXISTING UTILITIES IN THE AREA. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

Site Volume Table: Unadjusted	Fill	Net	Method
Site Stratum Surf2	Surf2	CUm	CUm

EVENT CENTER			
rdg lowered 0.35m eg lowered 0.2m R.DG-LOWERED 0.35m			
287824	21158	76938 (C)	Grid
288101	21268	75723 (C)	Composite
existing (stripping) eg current eg lowered 0.2m			
63559	0	63269 (C)	Grid
63579	0	63579 (C)	Composite

LEGEND

- EVENT CENTER SITE BOUNDARY
- EVENT CENTER SITE GRADING BOUNDARY
- FILL CONTOURS
- CUT CONTOURS
- EXISTING CONTOURS (MAJOR)
- EXISTING CONTOURS (MINOR)

NOTE:

1. FILLING DESIGN COMPLETED AT VERY TROUGH OR HIGH LEVEL - WILL INCLUDE SIGNIFICANT REFINERY.
2. CUT/FILL CONTOURS BASED ON 0.35m CUT BELOW DESIGN GRADES TO ALLOW FOR PAVEMENT & FOUNDATION STRUCTURES.
3. ARENA FOOTPRINT EXCAVATED 0.35m BELOW LOWER LEVEL FLOOR ELEVATION WITH 1:1 SIDE SLOPES.
4. NO ALLOWANCE FOR ON SITE STORM WATER STORAGE.
5. EAST ROADWAY GRADED TO PROVIDE MAJOR STORM EVENT OVERLAND ROUTE TO STORM WATER MANAGEMENT FACILITY.
6. GRADE CONFLICTS WITH EXISTING STORM POND EXCAVATION NOT RESOLVED.

REV.	REVISION DESCRIPTION	REVISED BY	APP BY	DATE
0				

PERMIT HOLDER STAMP

PROFESSIONAL STAMP

PERMIT TO PRACTICE
FOCUS CORPORATION
PERMIT NUMBER: P 6386
The Association of Professional Engineers,
Geologists and Geoscientists of Alberta

FOCUS
Engineering - Geomatics - Planning
328 South Railway Street S.E. Phone: (403) 526-6766
Medicine Hat, Alberta, T1A 2V4 Fax: (403) 526-1601
Website: www.focus.ca

CLIENT/PROJECT

BOX SPRINGS BUSINESS PARK
EVENT CENTER
MEDICINE HAT, AB

TITLE

OVERALL GRADING
CUT & FILL PLAN

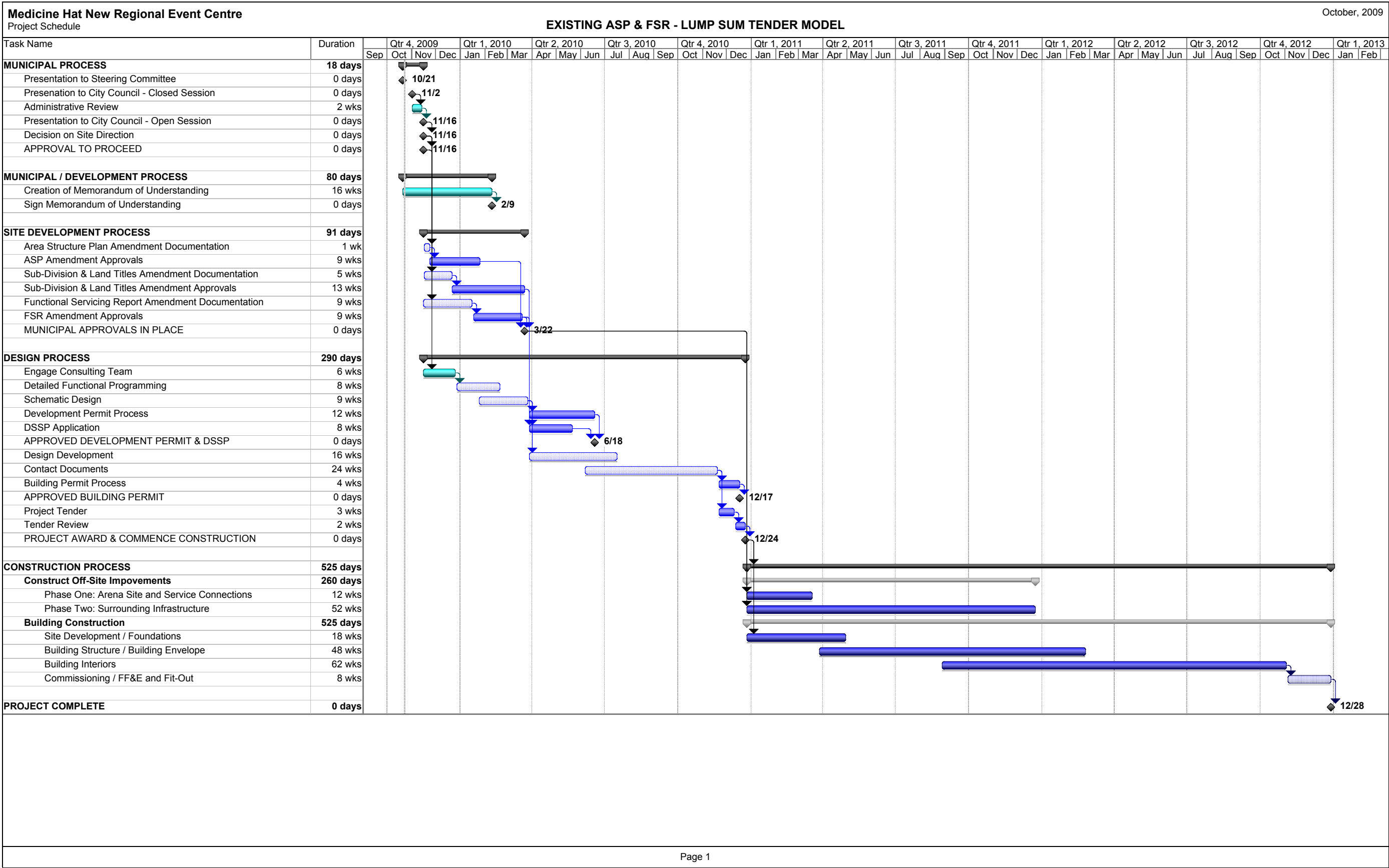
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APPENDIX H: ADDITIONAL PROJECT SCHEDULES

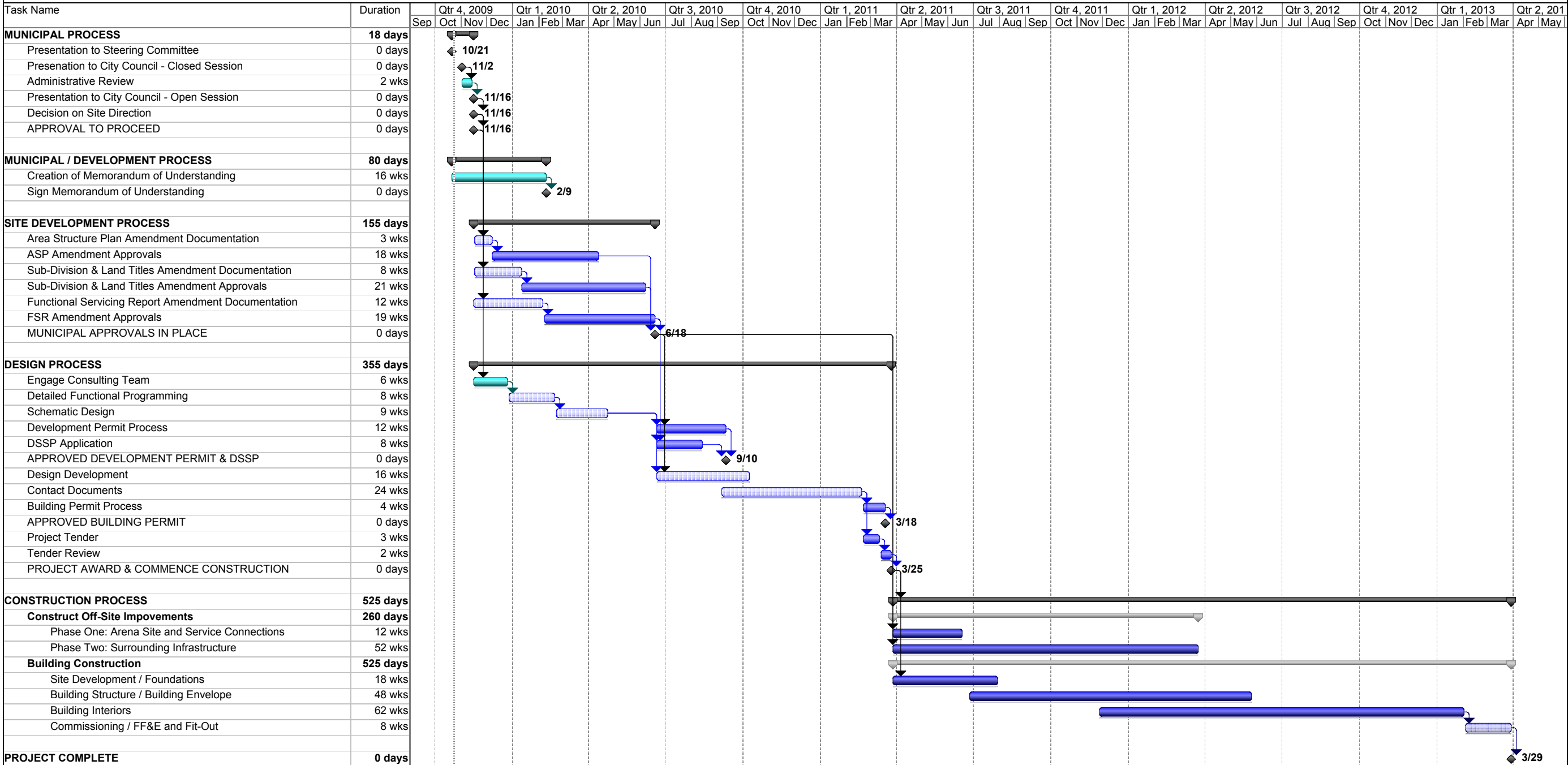


Medicine Hat New Regional Event Centre

Project Schedule

October, 2009

ARENA DISTRICT ASP & FSR - LUMP SUM TENDER MODEL



APPENDIX I: DETAILED PROFORMA

Schedule 1

MEDICINE HAT MEDICINE HAT ARENA DRAFT PROFORMA - PROJECTION OF EVENT REVENUE- STABILIZED OPERATING YEAR 1																	
TYPES OF EVENTS	# OF PERF	AVG. TICKET PRICE	AVERAGE TURNSTILE	GENERAL PAID			RENTAL INCOME	REIMBURSED INCOME(LOSS)	SUITES		NET FACILITY FEE	(net of \$4.00 processing fee)	NET CONCESSIONS	NET CATERING	NET NOVELTIES	PARKING	TOTALS
				AVERAGE ATTND	TOTAL ATTND	GROSS TICKET SALES			AVERAGE ATTND	TOTAL ATTND		NET TICKET CONV					
FAMILY SHOWS																	
Vee Family Show	3	\$18.00	3,640	3,500	10,500	189,000	7,500	(1,500)	90	270	10,770	6,300	7,371	540	1,574	4,050	36,605
Circus	4	\$18.00	3,120	3,000	12,000	216,000	10,000	(2,000)	90	360	12,360	7,200	8,424	720	1,806	5,400	43,910
Ice Show/Figure Skating	1	\$20.00	3,640	3,500	3,500	70,000	5,000	(500)	90	90	3,590	2,450	2,457	225	1,049	1,350	15,621
Miscellaneous	2	\$18.00	3,640	3,500	7,000	126,000	5,000	(1,000)	90	180	7,180	4,200	4,914	450	1,049	2,700	24,493
Total	10	\$18.21			33,000	601,000	27,500	(5,000)	360	900	33,900	20,150	23,166	1,935	5,477	13,500	120,628
SPORTING EVENTS																	
Hockey Pre-Season	1	\$12.00	2,100	2,000	2,000	24,000	5,000	(250)	90	90	2,090	100	1,418	450	274	1,350	10,431
Hockey Reg-Season	36	\$14.00	4,725	4,500	162,000	2,268,000	180,000	(18,000)	144	5,184	167,184	8,100	51,030	12,960	21,911	48,600	471,785
Hockey Post-Season	2	\$15.00	4,725	4,500	9,000	135,000	10,000	(1,000)	162	324	9,324	450	2,835	810	1,222	2,700	26,341
Miscellaneous	4	\$14.00	4,725	4,500	18,000	252,000	10,000	(2,000)	90	360	18,360	(3,600)	17,010	1,800	4,213	5,400	51,183
Total	43	\$14.03			191,000	2,679,000	205,000	(21,250)	486	5,958	196,958	5,050	72,293	16,020	27,619	58,050	559,740
CONCERTS																	
Concerts-Major	5	\$50.00	6,120	6,000	30,000	1,500,000	50,000	(7,500)	144	720	30,720	63,000	73,440	2,700	17,618	6,750	236,728
Concerts-Minor	5	\$40.00	3,060	3,000	15,000	600,000	37,500	(7,500)	162	810	15,810	31,500	32,130	3,038	6,041	6,750	125,269
Total	10	\$46.67			45,000	2,100,000	87,500	(15,000)	306	1,530	46,530	94,500	105,570	5,738	23,659	13,500	361,996
MISCELLANEOUS																	
Rodeo	2	\$12.00	3,090	3,000	6,000	72,000	4,000	(1,500)	90	180	6,180	4,500	7,416	315	1,590	2,700	25,201
Trade Shows/Flat Floor	3	\$0.00	1,000	0	0	0	6,000	(1,500)	0	0	0	0	1,800	0	0	0	6,300
Religious	1	\$0.00	2,000	2,000	2,000	0	2,000	(750)	0	0	0	0	600	0	0	0	1,850
Graduations	2	\$0.00	1,200	0	0	0	3,000	(1,000)	0	0	0	0	720	0	0	0	2,720
Community	6	\$0.00	1,000	1,000	6,000	0	3,000	(1,500)	0	0	0	0	2,250	0	0	0	3,750
Meetings/Banquets/Rentals	8	\$0.00	100	0	0	0	4,000	(2,000)	0	0	0	0	0	10,000	0	0	12,000
Misc	2	\$0.00	250	0	0	0	4,000	(1,000)	0	0	0	0	300	0	0	0	3,300
Total	24	\$5.14			14,000	72,000	26,000	(9,250)	90	180	6,180	4,500	13,086	10,315	1,590	2,700	55,121
GRAND TOTAL																	
	87	\$19.27		3,253	283,000	\$5,452,000	\$346,000	(\$50,500)	1,242	8,568	\$283,568	\$124,200	\$214,115	\$34,008	\$58,345	\$87,750	\$1,097,485

Schedule 2a

MEDICINE HAT MEDICINE HAT ARENA PROJECTION OF EVENT REVENUE - ASSUMPTIONS															
TYPES OF EVENTS	NET RENTAL RENTAL % (OF NET)	RENTAL (PER DAY)	FACILITY FEE	% OF Phone/Web SALES++	GROSS TICKET CONV SALES	TICKET CONV FEE	GROSS CONCESSION SALES	CONCESSION PER CAP	GROSS CATERING SALES	SUITE/ CATERING PER CAP	GROSS NOVELTY SALES	NOVELTY PER CAP	GROSS PARKING SALES	PARKING PER CAP	EVENT INCOME PER PERFORM
FAMILY SHOWS															
Vee Family Show	0%	2,500	1.00	60%	31,500	5.00	24,570	2.25	2,160	8.00	12,589	1.13	10,920	2.00	12,202
Circus	0%	2,500	1.00	60%	36,000	5.00	28,080	2.25	2,880	8.00	14,445	1.13	12,480	2.00	10,977
Ice Show/Figure Ska	0%	5,000	1.00	70%	12,250	5.00	8,190	2.25	900	10.00	8,393	2.25	3,640	2.00	15,621
Miscellaneous	0%	2,500	1.00	60%	21,000	5.00	16,380	2.25	1,800	10.00	8,393	1.13	7,280	2.00	12,247
SPORTING EVENTS															
Hockey Pre-Season	0%	5,000	1.00	5%	500	5.00	9,450	4.50	1,800	20.00	2,190	1.00	2,100	2.00	10,431
Hockey Reg-Season	0%	5,000	1.00	5%	40,500	5.00	340,200	2.00	51,840	10.00	175,284	1.00	170,100	2.00	13,105
Hockey Post-Season	0%	5,000	1.00	5%	2,250	5.00	18,900	2.00	3,240	10.00	9,774	1.00	9,450	2.00	13,170
Miscellaneous	0%	2,500	1.00	5%	0	0.00	56,700	3.00	7,200	20.00	33,705	1.75	18,900	2.00	12,796
CONCERTS															
Concerts-Major	0%	10,000	1.00	70%	147,000	7.00	244,800	8.00	10,800	15.00	140,940	4.50	30,600	2.00	47,346
Concerts-Minor	0%	7,500	1.00	70%	73,500	7.00	107,100	7.00	12,150	15.00	48,330	3.00	15,300	2.00	25,054
MISCELLANEOUS															
Rodeo	0%	2,000	1.00	30%	9,000	5.00	24,720	4.00	1,260	7.00	12,720	2.00	6,180	2.00	12,601
Trade Shows/Flat Flc	0%	2,000	0.00	0%	0	0.00	6,000	2.00	0	0.00	0	0.00	0	0.00	2,100
Religious	0%	2,000	0.00	0%	0	0.00	2,000	1.00	0	0.00	0	0.00	0	0.00	1,850
Graduations	0%	1,500	0.00	0%	0	0.00	2,400	1.00	0	0.00	0	0.00	0	0.00	1,360
Community	0%	500	0.00	0%	0	0.00	7,500	1.25	0	0.00	0	0.00	0	0.00	625
Meetings/Banquets/F	0%	500	0.00	0%	0	0.00	0	0.00	0	50.00	0	0.00	0	0.00	1,500
Misc	0%	2,000	0.00	0%	0	0.00	1,000	2.00	0	0.00	0	0.00	0	0.00	1,650
					373,500		897,990		96,030		466,762		286,950		

Facility Share of Ancillaries

Concessions/Catering 43% Blended return to Building

Novelties 13% (75/25 promo split- 50/50 with concessionaire)

Parking 2 attendee's per car

25% Cost

Hockey Concession share expense

50% of Net Building Share

++ Order Fee Income- assumes 62,550 tickets sold via phone/web, 3 tickets per order @ \$1.50 per order

MEDICINE HAT
DRAFT PROFORMA

MEDICINE HAT ARENA
12 Month
OPERATING
1st STABILIZED YEAR

ADVERTISING REVENUE

Gross Arena Advertising *	\$240,000
Gross Arena Pouring Rights*	\$40,000
Less Commissions (20% initial term of sale)	(\$56,000)
Net Arena Advertising	\$224,000

Net Naming Rights*

Gross Arena Naming Rights	\$125,000
Less Commissions (20% initial term of sale)	(\$25,000)
Net Naming Rights	\$100,000

* These amount anticipates that the Venue will retain certain Advertising signage rights (i.e. concourse signs, fascia signs, scoreboard, marquee signage, step signage, other signage located above the playing surface)

These amounts anticipate that the Venue retains the Naming Rights, Pouring Rights (beer & soda), Other Vending rights (hot dog, pizza, etc)

The Hockey Team will retain the advertising rights for Rink board signage, ice logos (except Name of Arena – ctr ice logo), hockey print materials, TV & Radio partners.

MEDICINE HAT
DRAFT PROFORMA - PROJECTION OF LUXURY SEATING INCOME

MEDICINE HAT ARENA
12 Month
OPERATING
1st STABILIZED YEAR

Club Seating	
Number of Seats	500
No. of seats sold	375
Gross amount per seat- Includes Pre&Reg Hockey Season Tx's	\$825
Net amount per seat (after Team Share and Commission)	\$114
Gross Amount Sold	\$309,375
Less: Hockey Team(s) Share*	(\$204,750)
Less Commissions (20% initial term of sale)	(\$61,875)
Net to Facility	\$42,750
Suites	
Number of Suites	20
No. of Seats per Suite	10
No. of Suites sold	18
Gross amount per suite- Includes All Tickets	\$30,000
Net amount per suite (after Team Share and Commission)	\$18,540
Gross amount Sold	\$540,000
Less: Hockey Team Ticket Share*	(\$98,280)
Less Commissions (20% initial term of sale)	(\$108,000)
Net to Facility	\$333,720
Party Suites	
Number of Suites (10- 12 Seats per box)	2
Amount per suite	\$800
Number of Events	17
Gross amount Sold	\$27,200
Less Commissions (20% initial term of sale)	(\$5,440)
Net to Facility	\$21,760
Loge Boxes	
Number of Boxes - 4 seats per box	10
No. of boxes sold	8
Gross amount per box- Includes Pre&Reg Hockey Season Tx's	\$7,500
Net amount per suite (after Team Share and Commission)	\$3,816
Gross amount Sold	\$60,000
Less: Hockey Team Ticket Share*	(\$17,472)
Less Commissions (20% initial term of sale)	(\$12,000)
Net to Facility	\$30,528

MEDICINE HAT
DRAFT PROFORMA

FULL TIME STAFF COSTS

Position	12 Month OPERATING 1st STABILIZED YEAR Annual Salary
General Manager	\$100,000
Adm. Assistant	\$45,000
TOTAL	\$145,000
Director of Finance/HR	\$85,000
TOTAL	\$85,000
Box Office Manager	\$65,000
Sellers - PT see part time	
TOTAL	\$65,000
Director of Marketing	\$85,000
TOTAL	\$85,000
Sales Manager- Grps/PS/Advert/Sponsorship	\$65,000
Sales Commissions- See Indirects	
TOTAL	\$65,000
Event Manager	\$75,000
TOTAL	\$75,000
Director of Operations	\$90,000
Operations Manager	\$65,000
Engineer/Electrician/IT	\$75,000
Conversion/Maintenance Supervisor	\$50,000
Facility Worker	\$35,000
Operations - PT see part time	
TOTAL	\$315,000
Building Security- see part time	
Custodial - PT see Indirect cleaning labor	
Total Salary (Full Time)	\$835,000
# of Staff	12
Benefits & Payroll Taxes -	\$246,062
	29%
Total Full-Time Staff Costs	\$1,081,062

MEDICINE HAT
DRAFT PROFORMA

PART TIME STAFF COSTS

	AVG.	PEOPLE/	HOURS/	HOURS/	WEEKLY		MEDICINE HAT ARENA
	RATE	UNITS	WKDAYS	WKEND	COST	WEEKS	12 Month OPERATING 1st STABILIZED YEAR
Box Office Supervisor	\$20.00	1	8	10	\$ 1,000.00	40	\$ 40,000
Total							
Box Office Seller	\$15.00	1	6	6	\$ 540.00	40	\$ 30,600
Box Office Seller - Busy	\$15.00	1	5	5	\$ 450.00	20	
Total							
Event Services Staff Training	\$18.00	100	4	4	\$ 14,400.00	1	\$ 14,400
Total							
Operations PT	\$22.00	1	8	4	\$ 1,056.00	44	\$ 46,464
Total							
Total							\$ 131,464
Benefits & Taxes at 10%							\$ 13,146
TOTAL							\$ 144,610

MEDICINE HAT
PROJECTION OF MATERIALS, SUPPLIES & SERVICES
COMBINED INDIRECTS
DRAFT PROFORMA

MEDICINE HAT ARENA	
12 Month	OPERATING
1st STABILIZED YEAR	
Background Checks	2,000
Banking Fees	1,200
Building Repairs and Mainten.	25,000
Building Security	31,200
Building Supplies	25,000
Cable TV	6,000
Cell Phone	6,000
Cleaning Supplies	14,400
Computer (Network)	60,000
Contract Labor (Parking, Snow, Lawn)	75,000
Commission -Groups	12,020
Credit Card Fees	5,000
Customer Relations	2,500
Dues and Subscriptions	2,500
Equipment Leases	5,000
Equipment Rental	5,000
Equipment Repairs & Maint.	12,000
Exterminator	5,400
Grounds Supplies	5,000
Institutional Advertising	25,000
Insurance	84,215
Legal Fees	2,000
License and Permits	3,000
Linens	5,000
Maintenance Contracts	5,000
Meetings, Conv, Training	5,000
Miscellaneous	5,000
Office Supplies	12,000
Personnel Recruitment	5,000
Photography/Design	5,000
Postage	6,000
Printing and Stationery	5,000
Professional Fees	10,000
Promotions and Brochures	10,000
Protective Services	10,000
Relocation	5,000
Selling Expense	5,000
Signage Production	5,000
Software Purchase/Maintenance	5,000
Telephone	12,000
Trash Removal	10,000
Travel and Entertainment	10,000
Uniforms and Laundry	5,000
Utilities	350,000
Vehicle Fuel	3,000
Vehicle Repair & Maintenance	2,500
Water Treatment	1,000
TOTAL EXPENSES	\$910,935



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