

1.0: GENERAL CLARIFICATIONS AND CHANGES

1. Delete all Specification Sections titled Part 1 General 1.1 Related Sections. Typical throughout.
2. Specifications Division 2 through 10: Delete all reference to “Acceptable Materials” listed in Part 2 Products Section. Products are non-proprietary. Performance requirements listed in specifications Part 2 Products Section shall apply.

2.0: INQUIRY RESPONSES:

1. What is live load on floors?

The design live load for the lower (Exhibit) level is 9.6 kPa (200 psf) uniform load, or 9 kN (2,000 lb) concentrated load. The other floors have a lower design live load of 4.8 kPa (100 psf) uniform load, or 9 kN (2,000 lb) concentrated load.

2. Acoustic Wall Components:

- .1 Acoustic Paneling
 - .1 Design intent is not High impact Surface. Absorber panels to be moisture and mould resistant fabric with surface design pattern.
 - .2 Section 09 84 00 : Delete 2.2.2 , there is no Acoustic Absorber Panel Type 2.
 - .3 Request for alternate not applicable, there are no AAP-2 panels in the design.

3. Some Options for Lodging include:

- a.) Town of Jasper
- b.) Jasper Icefields Visitor Centre (operated by Brewsters)
- c.) Saskatchewan Landing on Highway 93.
- d.) Sunwapta Hotel

- 4.) Signage Installation: Refer to Drawing 603.1 Added to drawing package this addendum.

3.0: CIVIL/LANDSCAPE

SPECIFICATIONS:

1. Section 32 11 23 Aggregate Base Course
 - a. **REPLACE** first part of Sub Section 2.1.1 with:
.1 Granular Base: Material in accordance with Section 31 05 16 – Aggregates Materials...
 - b. **REPLACE** Sub Section 3.1.5.5.2 with:
.2 Backfill excavated subgrade with common material and compact in accordance with Section 31 00 99
 - c. **REPLACE** Sub Section 3.1.5.5.3 with:
.3 Replace sub base material and compact in accordance with Section 31 00 99

DRAWINGS

2. Reference Section 32 11 00

ATTACHMENTS

3. Drawing C100 REV1 – Gallery Theatre Access Route
4. Drawing C110 REV1 – Gallery Theatre Access Route, Sub Grade Profiles and Details

END OF CIVIL AND LANDSCAPE ADDENDUM



4.0: ARCHITECTURAL

SPECIFICATIONS

- .1 Section 00 00 10 Add to Table of Contents:
Section 12 21 13 Window Shading
(Specification section is included in the Issue for Tender specification).
- .2 Section 00 00 30 Information Documents
Add to 1.4.2
Jasper National Park Environmental Impact Analysis Additional Mitigations J13-040
MCSR Parks Canada Icefield Emergency Egress Route, July 2013,
(Report is Attached to this addendum, 23 pages)
- .3 Section 02 41 20 Selective Demolition
Edit 3.7.2: Delete reference to “Minister” AND substitute with “Departmental Representative”
- .4 Section 08 80 50 Glazing
Edit 2.1.3.2 : Delete reference to “Consultant” AND substitute with “Departmental Representative”
- .5 Section 09 84 00 : Delete 2.2.2 , there is no Acoustic Absorber Panel Type 2.
- .4 Section 09 65 00 Resilient Flooring
Edit 2.3.1.6 : Delete reference to “Consultant” AND substitute with “Departmental Representative”
- .5 Section 12 21 13 Window Shading
Edit 2.2.1.2.1 : Delete reference to “Consultant” AND substitute with “Departmental Representative”

DRAWINGS

- .6 Reference Drawing A601:
Drawing Add to Cover Page Drawing A603.1 Signage Schedule
- .7 Drawing Reference A603:
Sign Schedule removed from this drawing and added to new drawing A603.1

- .8 Drawing Reference A607: the correct dimension for Bench 2, Type 2 is 5227, not 5190.
- .9 Drawing A615 - The mechanical intake Louvre is located over the door as indicated in Mechanical drawings issue this addendum.
- .10 Drawing Reference A618 elevation A, Add mechanical louvre in the north wall of corridor B10. Refer to mechanical drawings issued this addendum.
- .11 Drawing A624 - Detail 2 name tag, should reach "Bench Type 2" , not Bench Type 1
- .12 Drawing A624 - Detail 3 name tag, should reach "Bench Type 3" , not Bench Type 1
- .13 Drawing A625 - Delete Requirement for custom laminate on 610 x 610 modules. Refer to A 603.1 this addendum for signage details.
- .14 Drawing A626 - Delete Detail 13.
- .15 Drawings A616 to A621- Refer to Drawing A603.1 for revised signage requirements.

ATTACHMENTS:
DRAWING A603.1

END OF ARCHITECTURAL ADDENDUM

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5.0: STRUCTURAL

SPECIFICATIONS

1. General – Delete Article 1.1 Related Sections (throughout.)
2. Reference Section 05 41 00 – Delete Article 1.1 Summary in its entirety

DRAWINGS

3. Reference Drawing S630
 - a. General Notes: Add the following note – “Load bearing metal studs: Refer to Specification Section 05 41 00 for additional requirements.”
4. Reference Drawing S631
 - a. Section 1: Add the following note – “Seismic load path: Through the diaphragm connection to the existing slab along GI 2X.”
 - b. Section 1 – Add transition reinforcing at each step consisting of 10M Z-Bars at 450 o.c. (5 steps total). Bars to have standard hooks each end of bar.
 - c. Section 4 – L100x100 to be on all 4 sides of the opening.
5. Reference Drawing S632
 - a. Add the following note – “Seismic load path: Primary load path is through the existing columns to the existing building diaphragms at second floor and exhibit levels. Secondary load path is through connection to the existing concrete wall at GL 8. Design lateral load = 1 kN per connection typical.”
6. Reference Drawing S633
 - a. Add the following note – “Sawcut new opening from both sides of wall to minimize overcuts.”
 - b. Add non-woven geotextile filter fabric with an average opening range of 50 µm to the back of the retaining wall.

7. Reference Drawing S635, Second Floor Framing Plan

- a. Add the following note – “Hanger design load (unfactored) = 1 kN per hanger.”

END OF STRUCTURAL ADDENDUM

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6.0: MECHANICAL

SPECIFICATIONS

- 1) Refer to Section 23 05 13 Common Motor Requirements for HVAC Equipment.
 - a. Delete Item 1.4 Quality Assurance

- 2) Refer to Section 23 09 33 Electric and Electronic Control System for HVAC
 - a. Add item 1.1.1.2: Sequence of operations for Theatre Space, A/V Room, and Gallery mechanical systems.
 - b. Delete Item 1.4 Quality Assurance
 - c. Add Part 4 Control Sequences as follows:
 - 4.1 THEATRE SYSTEM
 - .1 AHU-1 and EF-1 are constant volume units serving the theatre space and are to be interlocked.
 - .2 The system will be normally energized via an occupancy schedule to be maintained by the system controller. System is to operate at 100% capacity when energized.
 - .3 Upon system energization, outdoor air damper opens to minimum position, return air damper opens to maximum position, exhaust air damper opens to minimum position.
 - .4 Upon call for cooling, outdoor air damper modulates open, return air damper modulates closed, exhaust air damper modulates open to maintain minimum supply air temperature and space temperature set point. As demand for cooling increases, dampers continue to modulate to maintain supply air temperature until supply and exhaust dampers are fully open and return damper is fully closed.
 - .1 Should the supply air temperature drop below the minimum acceptable value (18°C), outdoor air damper modulates closed, return air damper modulates open, exhaust air damper modulates closed to maintain minimum supply air temperature.
 - .2 Should supply air temperature drop below minimum acceptable value after minimum outdoor air damper is reached, electric heating coil is to engage to maintain minimum supply air temperature.
 - .5 Upon system shut-down, outdoor air damper is to be fully closed, return air damper is to be fully open, and exhaust air damper is to be fully closed. Fan is to cycle and heating coil is to modulate during unoccupied hours to maintain space temperature settings.
 - .6 Provide system controller to execute sequences required. Unit is to be fully programmable complete with digital user interface. Provide complete

system of automatic controls including wire, control panels for fully functional system.

4.2 A/V ROOM SYSTEM

- .1 System is to operate on a reverse acting thermostat.
- .2 As space temperature rises above maximum acceptable value, transfer fan is to energize until such time as the space temperature reaches an acceptable value.

4.3 GALLERY SYSTEM

- .1 Existing thermostat controls for existing air handling unit are to be utilized.
- .2 Existing internal thermostats located in electric baseboards are to be utilized.

- 3) Refer to Section 23 33 00 Air Duct Accessories.
Revised section attached with silencer requirements added throughout the section.
- 4) Refer to Section 23 33 14 Dampers – Balancing
 - a. Delete Item 1.4 Quality Assurance
- 5) Refer to Section 23 34 00 HVAC Fans
 - a. Delete Item 1.5 Quality Assurance
- 6) Refer to Section 23 37 13 Diffusers, Registers and Grilles
 - a. Delete Item 1.4 Quality Assurance
- 7) Refer to Section 23 37 20 Louvres, Intakes and Vents
 - a. Delete Item 1.5 Quality Assurance
- 8) Refer to Section 23 44 00 HVAC Air Filtration
 - a. Delete Item 1.4 Quality Assurance
- 9) Refer to Section 23 82 19 Fan Coil Units
 - a. Delete Item 1.4 Quality Assurance

DRAWINGS

- 10, Reference Drawing M640:
 - a. Floor drain to be relocated as noted. Extend existing 100 mm sanitary piping in crawl space to new floor drain location.
- 11.) Reference Drawing M641:
 - a. Main Supply Air trunk size has been modified to be 650x350.
 - b. Balancing dampers located on branches have been removed.
 - c. New section view tags have been added to the drawing.
- 12) Reference Drawing M642:

- a. Force flow heater located near emergency exit has been modified to be surface mounted.
- b. Fire extinguisher in emergency exit hallway is to be surface mounted.
- c. Fire extinguisher in Theatre is to be surface mounted.
- d. New section view tags have been added to the drawing.
- e. 500mm Supply Air ductwork located at GL-2Y/3X has been modified to include a fire damper. Provide 100 mm flexible duct connection in this duct at the expansion joint location.
- f. Note for ductwork located at GL-2Y/3X has been modified for clarity.
- g. Revised fan EF-2 from a wall mounted propeller style to an in-line cabinet fan. Return grille added in A/V Room ceiling.

13) Reference Drawing M643:

- a. Tag for T-1 has been removed.
- b. Fire damper has been added to exhaust air ductwork leaving projector room.
- c. Supply air duct running through projectionists room (located between GL-3Y/4Y and GL-3X/4X) has been modified to include a fire damper.
- d. Modify type and location of exhaust fan EF-2 in A/V Room. Ductwork modified to suit.

14) Reference Drawing M644:

- a. Original Drawing M644 (Schematics, Details and Schedules) number has been modified to be Drawing M645. New Drawing M644 Mechanical Sections.
- b. Added section view 1/M644 North West Section Details.
- c. Added section view 2/M644 North East Section Details.
- d. Added section view 3/M644 South West Section Details.
- e. Added section view 4/M644 South East Section Details.

15) Reference Drawing M645:

- a. This drawing number was previously M644 and has been modified to M645.
- b. Louver and related ductwork on elevation view (Drawing 2/M644) has been revised to reflect location shown on drawing M643.
- c. Revise exhaust fan EF-2 in the Exhaust Fan Schedule as noted.
- d. Add note in Force Flow Heater Schedule. FF-1 to be surface mounted.
- e. Add Fire Rated Return Grille R-1 to the Air Inlet and Outlet Schedule.
- f. Add Fire Rated Return Air Grille R-1 to the Air Inlet and Outlet Schedule.
- g. Add Return Air Grille R-2 to the Air Inlet and Outlet Schedule.

ATTACHMENTS:

PWGSC – R. 015790.001

JASPER NATIONAL PARK ICEFIELD CENTRE RECAPITALIZATION – ICE 4.6

Addendum 01

Specifications Attached: Section 23 33 00 Air Duct Accessories
Drawings Attached: M640, M641, M642, M643, M644, M645

END OF MECHANICAL ADDENDUM



7.0: ELECTRICAL

SPECIFICATIONS

1. Reference Section 26 05 01
 - a. 1.13 Mounting Heights
 - .3 Install electrical equipment at following heights unless indicated otherwise:
 - .1 Local switches: 1200mm
 - .2 Wall receptacles: General – 300mm
 - .3 Fire alarm stations: 1200mm

DRAWINGS

2. Reference Drawing E650
 - a. All mounting heights to be coordinated with Architect on Site prior to installation.
 - b. Exit sign located above door in Theatre NW corner to be moved to wall next to door to accommodate the ceiling height.
3. Reference Drawing E651
 - a. Fixture type M located above open area to be connected top circuit A35 and switch located in the Reception Area.
 - b. Fixture type N located in Viewing Area 104 to be connected to circuit A33.
 - c. Recessed fixtures located in the theatre are to be rated for fire rated ceiling installations (type C).
4. Reference Drawing E652
 - a. All mounting heights to be coordinated with Architect on site prior to installation.
 - b. Updated panel A directory additional 3-15A breakers.
 - c. AV02 location changed from duct shaft.

5. Reference Drawing E653

- a. Receptacle and Data outlet in Project Room 105 to be moved next to opening to accommodate the projector location.

END OF ADDENDUM

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8.0: AV SYSTEMS

SPECIFICATIONS

1. Reference Section 27 00 16
 - a. 1.1 SCOPE OF WORK – Change to 1.1 PROJECT SCOPE
2. Reference Section 27 41 80
 - a. 1.1 SCOPE OF WORK – Change to 1.1 PROJECT SCOPE
3. Reference Section 27 00 16

- a. 1.2.1.1

The contractor shall supply and install a portable presentation podium that will have an AV input plate and microphone with shock mount input located on the top surface. The AV inputs shall connect to a UTP style transmitter located in the podium and the output of the UTP transmitter and the microphone will connect to a floor mounted AV plate with contractor supplied patch cables. The contractor shall complete millwork to fit AV devices and shall provide an access hatch in the base of the podium so that the podium can be placed over the floor box and be connected without exposed wiring. The podium shall be supplied with optional locking door so that cabling cannot be accessed.

Change to

- a. 1.2.1.1

The contractor shall supply and install into a portable presentation podium (supplied by others) an AV input plate and microphone with shock mount input located on the top surface. The AV inputs shall connect to a UTP style transmitter (supplied by contractor) located in the podium and the output of the UTP transmitter and the microphone will connect to a floor mounted AV plate with contractor supplied patch cables. The contractor shall co-ordinate millwork (with architect) to fit AV devices and access hatch in the base of the podium so that the podium can be placed over the floor box and be connected without exposed wiring. The podium shall be supplied with optional locking door so that cabling cannot be accessed.

4. Reference Section 27 41 16

- a. 2.5.2 Presentation Podium

- .1 Dimensions: 81cm W , 71cm, D, 114 cm H
- .2 Includes Keyboard slide shelf
- .3 Product: Exact Furniture PM-900 c/w optional locking door. Co-ordinate finish colour & device location with Departmental Representative.
- .4 Provide rack shelves, blank spaces, wire management hardware, and power bars as required.

Changed to

2.5.2 Presentation Podium (Not In Contract Provided By Others)

- .1 AV contractor to coordinate AV device locations and installation with Architect.

DRAWINGS

1. Reference Drawings E660

.1 THEATRE PLAN LOWER

- .1 Added AV rack location
- .2 Detailed conduit and box requirements
- .3 Added Keynote (1) for structural backing requirements for speaker mounting

.2 A/V RISER DETAIL

- .1 AV box numbers changed & co-ordinated
- .2 Conduit sizing added
- .3 AV boxes changed to 2-GANG DEEP BOX/W 1-GANG MUDRING

.3 PROJECTOR PORT DETAIL

- .1 Labelling of projector side & theatre side added for clarification
- .2 Coordination note added for clarification
- .3 Telescoping minimum & maximum distance added for clarification

.4 TYP. WALL MOUNTED AV BOX DETAIL added for clarification

.5 A/V WIRING NOTES added for clarification

2. Reference Drawing E661

.1 SOUTH WALL VIEWING

- .1 Elevation for speaker mounting added for clarification

3. Reference Drawing E662

PWGSC – R. 015790.001

JASPER NATIONAL PARK ICEFIELD CENTRE RECAPITALIZATION – ICE 4.6

Addendum 01

8.0: AV SYSTEMS

SPECIFICATIONS

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 - a. 1.1 SCOPE OF WORK – Change to 1.1 PROJECT SCOPE
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Change to

- a. 1.2.1.1

The contractor shall supply and install into a portable presentation podium (supplied by others) an AV input plate and microphone with shock mount input located on the top surface. The AV inputs shall connect to a UTP style transmitter (supplied by contractor) located in the podium and the output of the UTP transmitter and the microphone will connect to a floor mounted AV plate with contractor supplied patch cables. The contractor shall co-ordinate millwork (with architect) to fit AV devices and access hatch in the base of the podium so that the podium can be placed over the floor box and be connected without exposed wiring. The podium shall be supplied with optional locking door so that cabling cannot be accessed.

4. Reference Section 27 41 16

- a. 2.5.2 Presentation Podium



7.3 Model Class Screening for Routine Projects at Front Country Facilities in Jasper National Park

The Class Screening Project Report Form

The CSPR form is to be completed by the Parks Canada Staff proposing the routine front country projects described in Section 2.4 of the MCSR, and submitted to the Parks Canada Environmental Impact Analysis Services. Information and forms can be obtained at Environmental Impact Analysis Services for JNP.

Parts 1 to 4 of the form are to be completed by the Parks Canada staff proposing the project and submitted to Parks Canada Environmental Impact Analysis Services. Environmental Assessment staff will complete Parts 5 to 8.

If you have questions about completing the form or the assessment process, contact the Environmental Impact Analysis Services at:

Jasper National Park Environmental Impact Analysis Services #1 Compound Road, Box 10 Jasper, Alberta T0E 1E0 (780)852-6141(p) (780)852-4775(f)

The Parks Canada Environmental Impact Analysis Services will complete a review of the form within 14 days of submission, and the proponent will be informed of the decision.

It is the responsibility of the proponent to ensure that all information provided in the CSPR form is accurate and correct. Incomplete or inaccurate forms will be returned. In some cases you may be asked to supply additional information.

To assist you in the preparation of the form, the following attachments are provided:

- **Attachment 1:** Mitigations for reducing impacts of project activities (Tables 8 to 13)
- **Attachment 2:** Information relating to sensitive resources (Sensitive sites (Section 4.3), Special resources (Section 4.10), Tables 3 and 4.



PART 1: DESCRIPTION OF THE PROJECT

This section is designed to determine whether the project as defined under *the Parks Canada Interim Directive on Implementation of the Canadian Environmental Assessment Act 2012* requires an **Environmental Impact Analysis**. This CSPR is divided into three sub-sections covering **buildings and other structures; service lines; and roads, parking lots, pulloffs, sidewalks, boardwalks and trails.**

Please complete those sections which apply to the project and check "Not Applicable" in the sub-section heading line for those that do not.

Who is the project being completed for?

Name: Parks Canada Agency, Jasper National Park of Canada
Job title: Construction of an emergency egress path from the lower level of the Icefield Centre Building
Phone: 780 852 1871 Fax: 780 852 6135
E-mail: bhuwan.devkota@pc.gc.ca

Who is the Project Manager, if different from above?

Name: Bhuwan Devkota, Parks Canada Agency, Jasper National Park of Canada
Job title: Construction of an emergency egress path from the lower level of the Icefield Centre Building
Phone: 780 852 1871 Fax: 780 852 6135
E-mail: bhuwan.devkota@pc.gc.ca

1. FACILITY

Please provide a brief **summary description of your project** on a separate sheet and attach. The project description should include the following, although all of the bullets may not apply to all projects:

- A detailed account of all activities and related activities pertaining to the project (*e.g.* excavation, vegetation removal, dewatering, site rehabilitation, *etc.*);
- All excavation required for installation of utilities (gas, power, water, sewage, telephone) –include length, depth, width and equipment to be used;
- Construction methods and materials to be used and project timeframes;
- Details of how waste will be managed; plans for infrastructure that will be



demolished, decommissioned, or replaced (i.e. separated and transported off site to the regional landfill in Hinton);

- Detail techniques and technologies used to limit environmental impacts during and after construction. For certain projects this information will take the form of An Environmental Management Strategy (EMS). Parks Canada Environmental Impact Analysis Services will provide additional guidelines for an EMS if one is required.

Please attach a one page site plan indicating the following where applicable:

- North arrow;
- Scale;
- Units in meters;
- Footprint before (solid line) and after (dashed line) – also include location of other buildings on site;
- Detailed location of all utilities—gas, power, water, sewage, telephone – before (solid line) and after (dashed line) the project;
- Trees to be removed (species, age estimate);
- Trees to be added (species, age).

Buildings and other structures

× N/A

(a) Does your project involve (check all that apply)?

- | | | | |
|------|--|---|--|
| i. | The construction of a new structure | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| ii. | The replacement of an existing structure | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| iii. | The demolition of an existing structure(s) | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| iv. | The modification, maintenance or repair of an existing structure(s) | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| v. | A change in the method of sewage disposal or an increase in the amount of sewage, waste or emissions | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| vi. | Geotechnical investigation | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| vii. | Creation of a need for related facilities such as parking spaces | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |

(b) If your project is the replacement or modification of an existing building:

- | | | | |
|------|---|------------------------------|--|
| i. | Will it increase the footprint or height of the structure | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| ii. | By approximately how much _____ | | |
| iii. | Involve a heritage building | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |

(c) If your project involves the construction or installation of an interpretive display or exhibit associated with an existing building, road, pull off or trail, will it require the expansion



of any existing associated facilities?

YES NO

(d) If your project involves construction, installation, maintenance or repair of a sign, is the sign located:

- i. Within an existing right-of-way YES NO
ii. Less than 15 m from an existing building YES NO

Service Lines

× N/A

(a) Does your project involve (check all that apply)?

- i. The construction of a new service line YES NO
ii. The abandonment of an existing service line YES NO
iii. The modification/maintenance/repair of an existing service line YES NO
iv. Risk of physical harm to wildlife YES NO
v. Removal of contaminated materials YES NO
vi. Creation of a need for related facilities such as parking spaces YES NO

(b) If your project is the modification of an existing service line, will your project increase the carrying capacity of the water, sewer, electrical or telephone service lines?

YES NO

Roads, Parking Lots, Pulloffs and Sidewalks, Boardwalks and Trails

N/A

(a) Does your project involve (check all that apply)?

- i. The construction of a new pulloff, boardwalk, sidewalk or trail YES NO
ii. The decommissioning of a road, pulloff, parking lot, sidewalk, boardwalk or trail YES NO
iii. The modification of a pulloff, boardwalk, sidewalk or parking lot YES NO
iv. The modification, maintenance or repair of a road or trail YES NO

(b) Does your project involve:

- i. The application of a dust control product or salt to the road or a pest control product to areas adjacent to the road YES NO





2. SITE PREPARATION

- (a) Will your project involve blasting or dredging? YES NO
- (b) Will your project involve surface or groundwater dewatering? YES NO
- (c) Will your project involve excavation of contaminated soil? YES NO
- (d) If you answered **YES** to 2(c), and if any investigative work has been done, please attach a list of the work done or copies of the report or documents.
- (e) Will your project involve disposal of any hazardous materials? YES NO
- (f) If you answered **YES** to (a), (b), (c) or (e) please provide details on a separate sheet.

3. EXCAVATION

- (a) Will your project require excavation? YES NO

If **YES**, will it be:

- i. For geotechnical investigation YES NO
- ii. For building foundation YES NO
- iii. For post or footing holes only YES NO
- iv. Outside the footprint of an existing building YES NO
- v. Affecting adjacent trees, including trees beyond the property line (impacts inside the root zone) YES NO
- vi. Associated with work on a utility line YES NO
- vii. What is the total quantity of material to be excavated? _____ m³
- viii. Will the excavated material be re-used on site YES NO

4. RIGHT-OF-WAY (ROW)

- (a) Will a new right-of-way be required to accommodate your project? YES NO

5. VEGETATION MANAGEMENT

- (a) Does your project involve (check all that apply)?
- i. Tree removal. If yes, how many and what type? YES NO
- ii. Are you planting any trees? YES NO



If yes, how many and what type? (Consult the approved native species list for Jasper—available on the Municipality of Jasper website.)

- iii. Clearing to maintain the view at a viewpoint YES NO

6. POLLUTING SUBSTANCES

(a) If your project is a maintenance, modification or repair project, will it:

- i. Result in the potential release of a polluting substance into a waterbody YES NO
- ii. Involve the application of oil or salt to a road, sidewalk or parking lot YES NO
- iii. Involve the application of a control product (e.g. herbicide) to the areas adjacent to the road, sidewalk or parking lot YES NO

If the answer is YES for i, ii, and iii please provide additional information on what substances, amounts and concentrations.

PART 2: DESCRIPTION OF THE ENVIRONMENTAL AND CULTURAL SETTING

This section is designed to determine whether your project could potentially impact any valued environmental or cultural components and if it may cause any environmental effects not identified in the MCSR.

Please identify the ecosite of the project location. (Consult table 1 or 2 or with a Parks Canada Environmental Assessment Specialist if necessary).

Sensitive Resources

- (a) Will your planned development be located on or adjacent to any of the sensitive sites or special resources described in Attachment 2? YES NO

If YES, please identify the type of site or resource on a separate sheet.

- (b) Is your project located on undisturbed or undeveloped land? YES NO

Species At Risk

- (c) Is your project located in a front country area where there is the potential to disrupt a species at risk (see Table 3 in Attachment 2)? YES NO



Aquatic Resources

- (d) Is your project located within 30m of a waterbody? YES NO
- (e) Is your project located within 100m of a waterbody? YES NO
- (f) Is your project located in an ecosite identified as potential amphibian habitat (consult with the JNP Aquatics Specialist)? YES NO

Cultural Resources

- (g) Are there any archaeological resources within 100m of the project site (consult with the JNP Cultural Resource Specialist)? YES NO
- (h) If your project involves the maintenance, modification or disposal of an existing building:
- When was the building built? _____
 - If the building is more than 40 years old, has it been evaluated by FHBRO? YES NO
 - If you answered YES to question h(ii), is the building (circle the appropriate answer):
 - Recognized
 - Classified
 - Not Heritage

Soils/Landforms

- (i) Is your project located on land with steep or unstable slopes? YES NO
- (j) Will your project require geotechnical investigation (drilling, soil sampling, test pitting) to determine soil capacity, contamination, groundwater, *etc.*? YES NO

Pollution

- (k) Are you aware of any of the following:
- Possible contamination of the site YES NO UNSURE
 - The existence of hazardous materials in the building(s) on the site (*e.g.* asbestos, lead, PCB, pressure treated wood) or in the soil YES NO UNSURE



- iii. The presence of fuel tanks, fuel storage *etc.* on the site (fuel includes gasoline, propane, diesel, heating oil, *etc.*)
 YES NO UNSURE

(l) Has any investigative work been done to determine:

- i. Possible contamination of the site
 YES NO UNSURE
- ii. The existence of hazardous materials in the building(s) on the site (*e.g.* asbestos, lead, PCB, pressure treated wood) or in the soil
 YES NO UNSURE
- iii. The presence of fuel tanks, fuel storage *etc.* on the site (fuel includes gasoline, propane, diesel, heating oil, *etc.*)
 YES NO UNSURE

If any investigative work has been done please attach a list of the work done or copies of the reports or documents. (*A Phase I Environmental Site Assessment* may be requested as part of the Environmental Impact Analysis depending on the history of the site.)

(m) Will you be using any hazardous materials onsite? If yes, what?

PART 3: MITIGATION MEASURES

This section is designed to identify what mitigation measures will be used to remove or reduce the potential environmental effects identified above, and to determine the potential for impacts to remain after the mitigations are implemented. Please review the list of project specific mitigations listed in Attachment 1. In order to be in compliance with the MCSR, all mitigation measures identified in Attachment 1 that apply to your project must be implemented.

- (a) Will the standard MCSR mitigation measures as described in Attachment 1 be used?
 YES NO UNSURE
- (b) Will any environmental mitigation measures be undertaken other than or in addition to those listed in Attachment 1?
 YES NO UNSURE


If YES, please submit details on your proposed mitigation measures on a separate sheet.





PART 4: APPLICATION SIGNATURE

As the proponent of the proposed project or authorized agent, I guarantee that to the best of my knowledge all information provided here is complete, correct and accurate:

Signature: 	Date: June 03, 2013
Name: Bhuwan Devkota	Phone: 780 852 1871
Job title: Project Manager	

PART 5: ENVIRONMENTAL IMPACT ANALYSIS (Parks Canada Environmental Assessment Specialist to complete)

- (a) Does the project require an assessment under the *Parks Canada Interim Directive on Implementation of the Canadian Environmental Assessment Act 2012*?
 YES NO
- (b) If YES, from the information supplied in Parts 1-4, is the project covered by the MCSR?
 YES NO
- (c) Do activities proposed for this project indicate a need to consult with Aboriginal groups?
 YES NO
- (d) If YES, do issues raised during Aboriginal consultation have the potential to adversely impact any potential or established Aboriginal and Treaty rights?
 YES NO
- (e) Will the project cause any effects to the environment or cultural/heritage setting that have not been identified below in Table 1?
 YES NO



Table 1: Potential Environmental Effects From Routine Front Country Projects

<ul style="list-style-type: none"> • Dust production • Decrease in air quality • Changes in landforms 	<ul style="list-style-type: none"> • Habitat loss, fragmentation • Wildlife sensory disturbance • Encroachment on wildlife movement corridors
<ul style="list-style-type: none"> • Soil compaction and erosion • Slope instability, ground subsidence • Soil sterilization • Soil and water contamination 	<ul style="list-style-type: none"> • Habituation • Disruption of nests and dens • Direct mortality • Impact to historical or archaeological resources
<ul style="list-style-type: none"> • Alteration of surface or groundwater patterns • Reduced water quality • Alteration of substrates • Damage/loss of vegetation • Introduction of non native species 	<ul style="list-style-type: none"> • Increased traffic • Risk to public safety • Waste production • Hazardous materials

(f) If you answered **YES** for Part 5(c), briefly describe in Table 2:

- the environmental effects not identified in Table 1
- site specific mitigation measures

(e) Will the standard and site specific mitigation measures reduce the significance of the environmental effects of the project? Please rate the level of significance for potential residual environmental effects in Table 2 (use the criteria provided in Table 15 in the MCSR).

Table 2: Project Environmental Effects Not Covered in the MCSR

Potential Effects	Significance Rating ^(a)	Mitigation Measures ^(b)

- ^(a) N – negligible
 MA – minor adverse
 S – significant

^(b) Standard and additional mitigation measures as described in Table 2 will be attached as conditions of the project approval

If the environmental effect is rated as significant, or if the effects are not adequately



addressed through the CSRP, the project is not suitable for the MCSR and will require a in-depth Environmental Impact Analysis.

PART 6: CUMULATIVE EFFECTS ASSESSMENT

In general, projects in compliance with the MCSR will not contribute to cumulative effects. This section is designed to evaluate any potential cumulative environmental effects associated with MCSR projects in conjunction with any other activities occurring in the class screening area.

- (a) Have any other projects or activities in the area been identified which may interact or contribute to the environmental effects of the proposed front country maintenance activity, *i.e.* additional cumulative effects? YES NO

If YES, please check the relevant projects/activities:

- Highway and/or secondary road operation and maintenance
- Pipeline operation, construction or maintenance
- Electrical power transmission or distribution line operation and maintenance
- Communications infrastructure operation and maintenance
- Operation and maintenance of outlying commercial accommodation
- Other Parks Canada activities (*e.g.* prescribed burns, trail maintenance *etc.*)
- Other (please describe):

- (b) Will the project contribute to any cumulative effects that have not been identified in Table 3? YES NO

Table 3: Potential Cumulative Effects From Routine Front Country Projects

• Dust production	• Habitat loss, fragmentation
• Decrease in air quality	• Wildlife sensory disturbance
• Changes in landforms	• Encroachment on wildlife movement corridors
• Soil compaction and erosion	• Habituation
• Slope instability, ground subsidence	• Disruption of nests and dens
• Soil sterilization	• Direct mortality
• Soil and water contamination	• Impact to historical or archaeological resources
• Alteration of surface or groundwater patterns	• Increased traffic
• Reduced water quality	• Risk to public safety
• Alteration of substrates	• Waste production
• Damage/loss of vegetation	• Hazardous materials
• Introduction of non native species	

- (c) If you answered YES for Part 6(b), briefly describe in Table 4:



- the cumulative effects not identified in Table 3
- site specific mitigation measures

(d) Will the standard and site specific mitigation measures reduce the significance of the cumulative effects of the project? Please rate the significance level of the potential residual cumulative effects in Table 4 (use the criteria provided in Table 14 in the MCSR).

Table 4: Cumulative Environmental Effects not covered in the MCSR

Potential Effect	Significance Rating ^(a)	Mitigation Measures ^(b)

- (a) N – negligible
 MA – minor adverse
 S – significant

(b) Standard and additional mitigations as described in Table 2 will be attached as conditions of the project approval

If the cumulative effect is rated as significant, or if the cumulative effects are not adequately addressed through the CSRP, the project is not be suitable for the MCSR and will require a in-depth Environmental Impact Analysis.

PART 7: SPECIES AT RISK

(a) Will the project adversely affect species at risk, either directly or indirectly, such as by adversely affecting their habitat? YES NO

For the purposes of this document, Species at Risk include:

- Species identified on the *List of Wildlife Species at Risk* set out in *Schedule 1* of the *Species at Risk Act*, including the critical habitat or the residences of individuals or that species, as defined in subsection 2(1) of the *Species at Risk Act*.
- Species that have been recognized as *at risk* by COSEWIC or by provincial or territorial authorities.

If YES, consult with Parks Canada Wildlife, Vegetation or Aquatics Specialists and/or the Park Ecologist/Species at Risk Coordinator to determine if the project may proceed.



PART 8: DECISION STATEMENT

Is the project likely to cause significant environmental effects if all of the mitigation measures are followed based on the following criteria: magnitude, geographic extent, frequency, duration and reversibility?

YES, the project is likely to cause significant adverse environmental effects, project is not approved.

NO, the project is not likely to cause significant adverse environmental effects, project is approved.

Additional mitigation measures are attached.

Environmental Impact Analysis Reviewed:

<u>MELANIE HINDLE</u>	
Environmental Assessment Specialist (print name)	
<u>Melanie Hindle</u>	Date: <u>June 26/13</u>
Signature	

Environmental Impact Analysis Reviewed and Recommended:

<u>MABAYE JIA</u>	
Senior Environmental Assessment Scientist (print name)	
<u>Mabaye Jia</u>	Date: <u>July 02, 2013</u>
Signature	

Environmental Impact Analysis Recommended:

<u>Shawn Cardiff</u>	
Manager, Integrated Land Use Policy and Planning (print name)	
<u>Shawn Cardiff</u>	Date: <u>July 15/13</u>
Signature	

Environmental Impact Analysis Approved:

<u>Greg Fenta</u>	
Park Superintendent (print name)	
<u>Greg Fenta</u>	Date: <u>15-07-13</u>
Signature	



Jasper National Park Environmental Impact Analysis Additional Mitigations

J13-040 MCSR – Parks Canada – Icefields Centre Emergency Egress
July 02, 2013

1. Project Description

Parks Canada has identified the requirement for a new Theatre space to be located in the existing Gallery area of the Jasper Icefields Centre at the lower level. Demolition of existing Gallery was completed in October 2012 leaving the space ready for the Theatre addition. As part of the National Building Code compliance as emergency egress path will be constructed to provide access to a safe public way from the lower level of the Icefields Centre building. The proposed egress path will serve two functions:

- a) Emergency egress from the lower level of the building, and
- b) Construction access during the period of the construction of Gallery Theatre renovation.

The design criteria for the trail will be compliant to the building code. It needs to be wheelchair accessible and stable on the given cross slope. The egress footprint will be the minimum width allowed by code to retain the as much vegetation as possible on the existing slopes. The trail will be built with granular surface on top of the mechanically stabilized granular sub-grade with the building up approach (compacted granular fill). This project is tentatively scheduled to commence in the Fall of 2013 and will be completed during the fall of 2014.

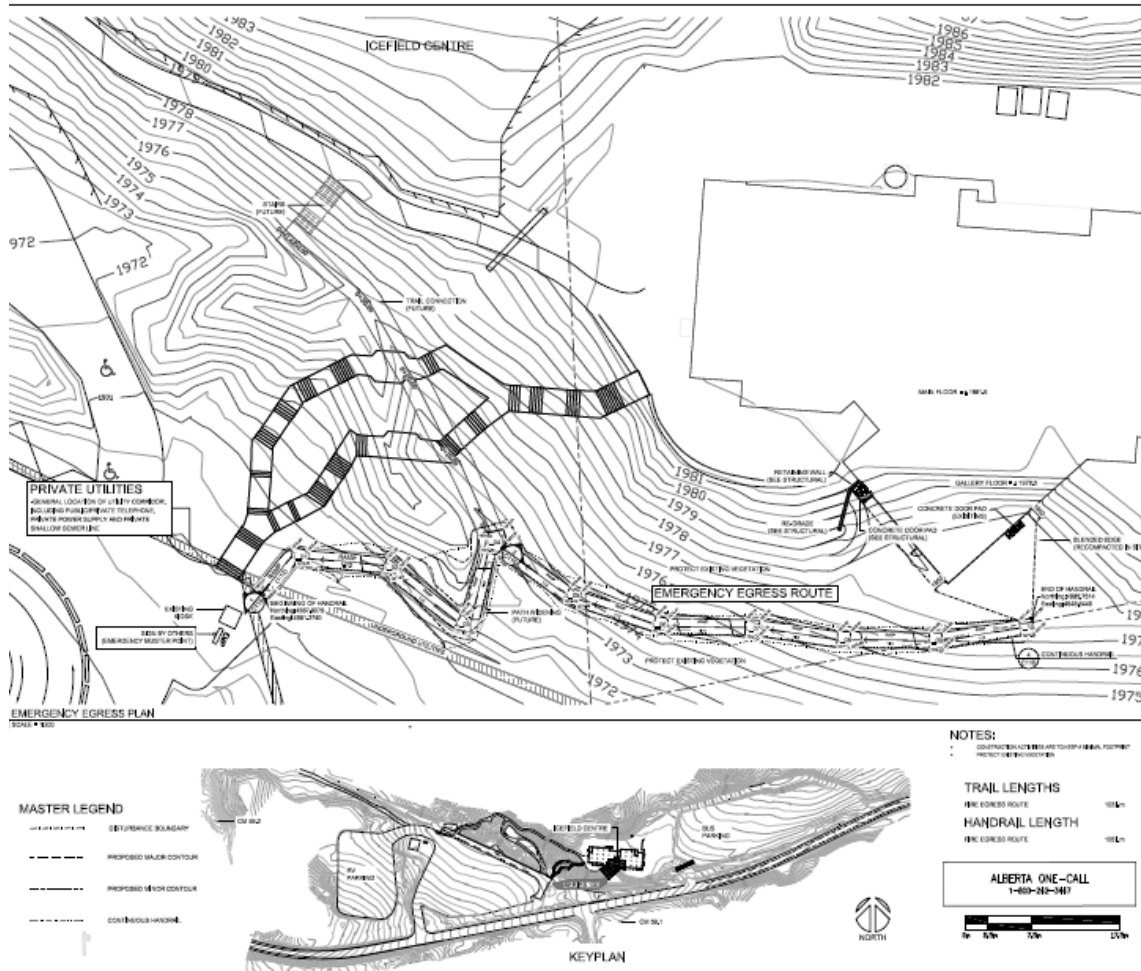
This site falls within the TR1 – Tyrrell 1 Ecosite within the Upper Subalpine Ecozone which is typical in this area in valley bottoms and benchlands.



Photo 1. Photo facing West showing the South-East door (circled in red) coming from the Theatre. This door will be made into an Emergency Exit. The green arrows roughly indicate the placement of the proposed emergency egress.



Figure 1. Site plan for proposed emergency egress trail



2. Relevant Best Management Practices:

Parks Canada has determined that this project will be assessed through the Best Management Practices (BMPs) pathway under the *Parks Canada Interim Directive on Implementation of the Canadian Environmental Assessment Act 2012* and the *Guide to the Parks Canada Environmental Impact Analysis Process under CEEA 2012* (the guide) will be followed. Thus, all applicable activities of this project will comply with the best practices outlined in:

Model Class Screening for Routine Projects: Table 11.2 – Mitigation for Reducing Impacts of Trails, Parks and Recreation Grounds



3. Additional Mitigations:

1. Please contact the ESO - Jurgen Deagle (780.852.6224) two weeks (or as soon as possible) prior to commencement of work. The ESO will schedule an on-site start up meeting, arrange site surveillance, and will issue Special Activity Permits.
2. The proponent is responsible for site security and public safety at all times.
3. All equipment will clean of mud and vegetative debris prior to use on this project.
4. A spill kit capable of handling 110% of the total fuels on-site will be available at worksite and all staff trained in its use. Parks Canada dispatch (780-852-6155) or ESO (780-852-6224) will be notified immediately of any fuel spills or leaks.
5. All vehicle re-fuelling will take place at licensed facilities (gas station) or on hardened surfaces (roadways or parking lots).
6. Noise and air pollution from equipment on-site will be kept to a minimum by shutting off equipment when not in use.
7. All workers must have the required protective equipment for the job and be trained in accordance with the provisions included in the *Alberta Occupational Health and Safety Act* and *Worker's Compensation Board*.
8. All garbage must be stored and handled in compliance with the National Park Garbage Regulations. Burning or burial of waste is not permitted.
9. Work shall stop immediately if cultural resource materials are uncovered at any time and shall only recommence upon the instruction of a cultural resource specialist.
10. The ESO may require other mitigations in response to any unforeseen environmental impacts.

Implementation of the above mitigation measures and those identified in *The Model Class Screening for Routine Projects: Table 11.2 – Mitigation for Reducing Impacts of Trails, Parks and Recreation Grounds* will be the responsibility of the *project* proponent. The ESO may inspect the work.

Table 11.2 Sub-Class 4: Mitigation for Reducing Impacts of Trails, Parks and Recreation Grounds

Activity	Potential Impacts	Mitigation Measures
Pre-Planning		
General activities	Runoff / sedimentation; Soil contamination	<ol style="list-style-type: none"> 1. Prepare an Emergency Response Plan for the worst case, i.e., heavy rainfall and runoff events, high winds, spills, fires, etc. 2. In the event of emergency operations (as defined in Section 11.11 of the MCSR), call Emergency Services and/or Parks Canada at the phone numbers indicated on Attachment 2. 3. Ensure all activities are conducted at least 30 m from waterbodies.
	Wind and water erosion	<ol style="list-style-type: none"> 4. Prepare a satisfactory Sediment and Erosion Control Plan covering all construction and restoration periods. 5. Acquire necessary sediment control equipment (i.e., straw bales, landscaping fabric, sediment fences, etc.) and install prior to construction. 6. Extra planning should be used for areas with silty deposits and sloped areas with sandy deposits.
	Compaction of soils	<ol style="list-style-type: none"> 7. Identify soils susceptible to compaction (fine textured and organic soils). 8. In sensitive areas, use equipment of low bearing weight, low PSI tires, or tracked vehicles, especially in sensitive sites. 9. Building material storage must be contained in one area and clearly flagged to prevent soil compaction and reduce area of disturbance.
	Habitat loss and fragmentation; or encroachment on wildlife movement corridor	<ol style="list-style-type: none"> 10. Identify wildlife habitat that may be impacted by activities and avoid sensitive areas. 11. Identify and avoid wetlands. 12. Ensure only necessary vegetation is removed and delineate areas to be avoided with biodegradable flagging tape and/or temporary fences.
	Sensory disturbance and mortality of wildlife	<p>When working adjacent to natural areas:</p> <ol style="list-style-type: none"> 13. According to the wildlife that may be present, schedule high noise level activities and other intrusive construction activities to avoid critical life stages (breeding, nesting, rearing, migration). Consult with Parks Canada to discuss any localized wildlife concerns. 14. Confine “noise” activities to hours set out in Attachment 2. 15. Consider posting wildlife signs to reduce vehicle speeds and increase driver awareness near construction areas where wildlife mortality has or is likely to occur. 16. Educate workers to not harass or attract wildlife, keep the site free of food scraps, and dispose of garbage in bear proof containers.
	Disturbance of archaeological resources	<ol style="list-style-type: none"> 17. Determine there are archaeological sites in the area (see attached maps). 18. Consult with Parks Canada if sites are identified.

Model Class Screening Report for Routine Projects

Activity	Potential Impacts	Mitigation Measures
		<p>19. If potential archaeological sites may be subject to ground disturbance, adapt activities to avoid them.</p> <p>20. Educate workers to stop work immediately and to notify site supervisor upon finding any archaeological artefacts. Contact Parks Canada immediately.</p>
	Public safety	<p>21. Use appropriate signage for closed trails, parks and Recreation Grounds (e.g., signage for trail detours during construction/maintenance).</p> <p>22. Call utility line companies to identify infrastructure locations</p>
	Reduced aesthetics (noise and visual)	<p>23. Evaluate the site layout, access routes and construction activities to minimize their visual impact.</p> <p>24. Plan work schedule to confine “noise” activities to hours set out in Attachment 2 and, if possible, periods of low visitation.</p>
<i>Construction of Trails, Parks and Recreation Grounds</i>		
Clearing of vegetation;	Runoff / sedimentation	<p>25. Minimize vegetation cover removal and grubbing.</p> <p>26. Initiate replanting of disturbed areas immediately after construction is completed.</p> <p>27. Halt construction activity on exposed soil during events of high rainfall intensity and runoff and refer to the Sediment and Erosion Control Plan. Periodically inspect and repair erosion control structures.</p>
	Compaction	<p>28. Restrict vehicles to access routes.</p> <p>29. Select appropriate equipment, especially in erosion/slump prone areas (as identified on mapping). In sensitive areas, for example: wide tracked equipment, rubber tired vehicles and low bearing pressure weight equipment can be used.</p>
	Reduced aesthetics	<p>30. Transport stockpiled material offsite immediately or stockpile cleared vegetation in an area out of view from public until it can be disposed of appropriately.</p>
Preparing base, grading, trail/playfield surfacing and installation of fixtures	Runoff / sedimentation (through intermittent drainage pathways including storm sewer systems)	<p>Particularly areas with slope class of 5 (5-15%) or greater and sites close to water:</p> <p>31. Cover stockpiles with polyethylene sheeting, tarps, or vegetative cover.</p> <p>32. Minimize vegetation cover removal.</p> <p>33. Filter or settle out sediment before the water enters any drainage pathway; including stormwater systems.</p> <p>34. Control overland flow up and down gradient of exposed areas by use of diversion ditches, bales, vegetative filter strips, and/or sediment traps.</p>
	Wind and water erosion	<p>All Ecosites, in steeply sloped areas, and sloped areas with sandy loam/loamy sand soils for water erosion.</p> <p>35. Protect exposed soils with coarse granular materials, mulches, or straw.</p> <p>36. Cover fills or stockpiles with polyethylene sheeting, tarps, or vegetative cover.</p> <p>37. Line steep ditches with filter fabric, rock or polyethylene lining to prevent channel erosion.</p>

Model Class Screening Report for Routine Projects

Activity	Potential Impacts	Mitigation Measures
Establishing turf; Landscaping	Contamination from fertilizers and herbicides	<p>38. Accurately assess the need for chemicals. Must have an approved current integrated pest management plan.</p> <p>39. Minimize use of fast-release fertilizers.</p> <p>40. Do not use herbicides in areas where residue may enter a waterbody.</p> <p>41. Do not over water.</p>
	Attracting wildlife and causing increased potential for interaction between wildlife and people	42. Plant Parks-approved grass seed and native non-palatable species (see Attachment 2) of trees and shrubs, to discourage wildlife.
	Water erosion	43. Initiate replanting of disturbed areas as soon as possible after construction is completed.
Fence installation	Barrier to wildlife movement	<p>44. Evaluate the need for all fences.</p> <p>45. Construct fences and orient in such a manner to reduce impacts on wildlife movement (see attached maps if appropriate). Consult with Parks staff to determine appropriate fence designs and locations.</p>
<i>Modification, Maintenance and Repair of Trails, Parks and Recreation Grounds</i>		
Resurfacing	Runoff / sedimentation (through intermittent drainage pathways including storm sewer systems)	<p>Particularly areas with slope class of 5 (5-15%) or greater and sites close to water.</p> <p>46. Cover stockpiles with polyethylene sheeting, tarps, or vegetative cover.</p> <p>47. Minimize vegetation cover removal.</p> <p>48. If necessary, use bales, vegetative filter strips, and/or sediment traps to control any sedimentation along the trail being resurfaced.</p>
	Wind and water erosion	<p>49. Protect exposed soils with coarse granular materials, mulches, or straw.</p> <p>50. Use mulch or aggregate to prevent soft areas from turning into large depressions</p> <p>51. Cover fills or stockpiles of surfacing materials with polyethylene sheeting or tarps.</p>
Maintaining facilities (including irrigation)	Runoff / sedimentation (through intermittent drainage pathways including storm sewer systems)	<p>52. Minimize the time that the excavation remains open during irrigation repairs. If deemed necessary, use site-specific erosion control methods, including bales, vegetative filter strips, and/or sediment traps.</p> <p>53. Do not schedule work during wet weather</p>
Vegetation management (including herbicide use in parks and Recreation Grounds)	Contamination from fertilizers and herbicides	<p>54. Accurately assess the need for chemicals. An approved current integrated pest management plan must be in place.</p> <p>55. Minimize use of fast-release fertilizers.</p> <p>56. Do not use fertilizers and herbicides in areas where residue or run-off may enter a waterbody or drainage pathway.</p> <p>57. Do not over water.</p>

Model Class Screening Report for Routine Projects

Activity	Potential Impacts	Mitigation Measures
	Damage to adjacent vegetation, loss of native vegetation	58. Do not go off-road or trail to remove trees. 59. Chip dead or dangerous trees, stockpile and use for tree beds. Buck remainder of trees to be used as firewood. Dispose of diseased vegetation by burning. A burning permit is required.
Winter plowing and sanding	Runoff / sedimentation (through intermittent drainage pathways including storm sewer systems)	60. Ensure that sand spreading mechanisms are properly tuned to minimize the use of sand on trails. 61. Train staff in proper use of plowing machinery so adjacent vegetation is not damaged.
<i>Decommissioning and Abandonment of Trails, Parks and Recreation Grounds</i>		
Reclamation or restoration	Contamination from accidental spills	62. Accurately assess the need for chemicals. An approved current integrated pest management plan must be in place. 63. Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 11.11 of the MCSR), call Emergency Services and/or Parks Canada at the phone numbers indicated on Attachment 2. All spills must be reported to Parks Canada. 64. Minimize use of fast-release fertilizers. 65. Do not use herbicides in areas where residue may enter a waterbody. 66. Do not over water.
	Erosion (water)	67. Initiate replanting of disturbed areas within 48 hours after construction is completed. 68. For every tree removed, plant two native trees.
<i>General Activities</i>		
Waste management (general)	Visual impacts (including viewscales)	69. Collect all waste, store appropriately and dispose trade waste at designated facilities.
	Contamination of soil and water from accidental spill or improper disposal	70. Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 11.11 of the MCSR), call Emergency Services and/or Parks Canada at the phone numbers indicated on Attachment 2. All spills must be reported to Parks Canada. 71. If any hazardous waste is uncovered during excavation/construction, it must be investigated, source identified, properly removed and disposed to an approved landfill. 72. Dispose of contaminated soil at provincially certified disposal sites outside of the park. Written proof of disposal must be provided to Parks Canada. No treatment of contaminated soils (e.g., bioremediation) is allowed in the park. 73. No rock, silt, cement, grout, asphalt, petroleum product, lumber, vegetation, domestic waste, or any deleterious substance shall be placed or allowed to disperse into any stream, river, pond, storm or sanitary sewer, or other water course. Excess material will not be disposed of on or adjacent to the site.

Model Class Screening Report for Routine Projects

Activity	Potential Impacts	Mitigation Measures
		<p>74. All construction sites will be equipped with containers suitable for the secure, temporary storage of hazardous wastes. Hazardous wastes will be separated by type. Storage and handling of hazardous waste must be in accordance with applicable regulations and codes.</p> <p>75. All construction sites will be equipped with containers suitable for the secure, temporary storage of hazardous wastes. Hazardous wastes will be separated by type. Follow all applicable regulations and codes for the management and handling of hazardous wastes.</p> <p>76. If any hazardous waste is uncovered during excavation/construction it must be investigated, source identified, properly removed and disposed to an approved landfill.</p>
Equipment operation and maintenance	Decrease in ambient air quality due to emissions	<p>77. Ensure all equipment is properly tuned, in good operating order, and fitted with standard air emission control devices.</p> <p>78. Minimize idling of engines at all times.</p>
	Dust production	<p>79. Wet down dry and dusty roads.</p> <p>80. Do not use oil-based dust suppressants.</p> <p>81. Reduce speeds.</p> <p>82. Ensure fine materials being stored or transported are covered with tarps or equivalent material.</p>
	Soil and water contamination from accidental spills.	<p>83. Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 11.11 of the MCSR), call Emergency Services and/or Parks Canada at the phone numbers indicated on Attachment 2. All spills must be reported to Parks Canada.</p> <p>84. Avoid work in high risk areas, particularly in areas of high water table, steeply sloped sites or in close proximity to streams.</p> <p>85. Spill contingency plans, equipment and supplies (to clean up 110% of the site's largest possible fuel/chemical spill) will be present on-site at all times and employees trained in their use.</p> <p>86. Ensure all construction equipment is free of leaks from oil, fuel or hydraulic fuels.</p> <p>87. The crossing of any waterbody (including wetlands) by construction equipment, or the use of such equipment within waterbodies is strictly prohibited unless prior approval has been confirmed.</p> <p>88. Designate refuelling areas at least 100 m away from any water body. Stationary fuel storage sites will be bermed with an impermeable liner or other appropriate secondary containment to contain 125% of the anticipated fuel quantity. Any contaminated rainwater will be moved out of the park.</p> <p>89. Refuelling activities should not be conducted where run-off could carry contaminants into drainage pathways (including storm sewers).</p> <p>90. Dispose of contaminated materials at provincially certified disposal sites outside of the park. No treatment of</p>

Model Class Screening Report for Routine Projects

Activity	Potential Impacts	Mitigation Measures
		contaminated soils (e.g., bioremediation) is allowed in the park. All applicable documentation demonstrating proper disposal must be provided to Parks Canada.
	Compaction of soils	<p>91. Restrict vehicular travel and other equipment operation to the construction site and approved access routes.</p> <p>92. Vehicle parking will be restricted to specialized areas on the construction site.</p> <p>93. Minimize or halt construction traffic during wet conditions when the soil shows signs of ponding or rutting.</p> <p>94. In sensitive areas, use equipment which minimizes surface disturbance including low ground pressure tracks/tires, blade shoes and brush rake attachments.</p>
	Damage to adjacent vegetation	<p>Undeveloped areas adjacent to development site:</p> <p>95. Careful machine operation is required to ensure that damage to surrounding vegetation does not occur.</p> <p>96. Excavated material must not be permitted to bury plant material that is to be retained. Snow fences may be used to prevent excavated material entering the surrounding forest.</p>
	Weed invasion	<p>97. All construction equipment from outside the park will be steam cleaned prior to arrival to minimize the risk of introducing weeds.</p> <p>98. Construction equipment from outside the park will not be washed while in the park.</p>
	Sensory disturbance to wildlife	<p>All undeveloped areas and areas bordering natural habitat:</p> <p>99. Use existing roadways, pathways and previously disturbed areas for site access and travel within the site.</p> <p>100. Educate workers not to enter wildlife corridors.</p> <p>101. Confine “noise” activities to hours set out in Attachment 2 and, if possible, to periods of low visitation.</p>
	Increased traffic levels	102. Time activities to minimize vehicle conflicts on access roads.
	Public Safety	<p>103. If equipment infringes on driving lane, flag persons are required.</p> <p>104. All roadway signage must be in accordance with provincial standards. Signs must be bilingual or symbolic.</p> <p>105. The proponent is responsible for site security at all times.</p>
	Aesthetics	106. All heavy equipment operating on paved surfaces should be equipped with street pads. Damage to paved surfaces will be restored to original conditions.

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 Materials and installation for duct accessories including flexible connections, access doors, vanes and collars.
 - .2 Duct silencers.

1.2 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
- .2 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
 - .1 SMACNA - HVAC Duct Construction Standards - Metal and Flexible, 95.

1.3 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet. Indicate the following:
 - .1 Flexible connections.
 - .2 Duct access doors.
 - .3 Turning vanes.
 - .4 Instrument test ports.
- .3 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
 - .1 Certification of ratings: catalogue or published ratings to be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Instructions: submit manufacturer's installation instructions.
- .6 Manufacturer's Field Reports: manufacturer's field reports specified.
- .7 Closeout submittals: submit maintenance and Department Representativeing data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .8 Silencer Performance Data:
 - .1 Silencer manufacturer to provide submittal drawings detailing all duct silencer data specified in the mechanical drawing schedule.
 - .2 Submit laboratory acoustic and aerodynamic performance obtained according to ASTM E477-06a and so certified when submitted for

approval. The laboratory must be currently NVLAP accredited for the ASTM E477-06a test standard. A copy of the accreditation certificate must be included with the submittals. Data from non-NVLAP accredited test facilities will not be accepted. Shop drawings submitted without proper certifications will be rejected.

- .1 Submitted silencer pressure drops shall not exceed those listed in the silencer schedule. Silencer pressure drop measurements shall be made in accordance with the ASTM E-477-06a test standard. Tests shall be conducted and reported on the identical units for which acoustical data is presented.
 - .2 The manufacturer shall supply certified dynamic insertion loss and self-noise power level data for each scheduled silencer. The data shall match the project's air distribution system requirement for forward or reverse flow, and total system airflow. All ASTM E-477-06a tests to obtain this data shall be conducted in the same facility and shall utilize the same silencer.
 - .3 Silencer dynamic insertion loss shall not be less than that listed in the silencer schedule.
 - .4 Silencer generated noise shall not be greater than that listed in the silencer schedule
- .3 The silencer manufacturer shall provide, for approval, acoustical system calculations for all duct systems with silencers to demonstrate that the submitted silencers will reduce mechanical fan noise to NC30 in the occupied space. Use sound power levels of actual equipment to be installed on project. Analysis shall include breakout noise calculations. In the absence of specified background sound level criteria, the guidelines as expressed in Table 34 of Chapter 47, "Sound and Vibration Control" of the *2003 ASHRAE Handbook - HVAC Applications*, shall be used.
- .4 The silencer manufacturer shall test the silencer(s) as indicated in the silencer schedule. The Engineer shall be notified of the test date at least two weeks in advance and the test may be witnessed by the Engineer. Test shall show compliance with the project criteria and is subject to engineer approval. Test facilities and test reports shall be open to inspection upon request from the Engineer.
- .1 For specific silencers indicated on the silencer schedule, the silencer manufacturer shall provide Computational Fluid Dynamics (CFD) aerodynamic analysis. The analysis shall include the attached ductwork, a minimum of 5 equivalent duct diameters up and downstream of the silencer, as shown on the drawings, to determine silencer pressure drop, including system effects, at design airflow. The manufacturer must report and validate a converged solution domain of the CFD analysis to show the solution is independent of mesh refinement such that two models of different mesh refinement levels produce equivalent results, each with a maximum residual tolerance of 0.001. The minimum cell count shall be 200,000 and the validation model shall have a cell count at least 50% higher. The manufacturer must report the selection of CFD parameters, including mesh type, mesh size, boundary conditions, convergence criteria, and turbulence model. Each CFD analysis shall also include additional

post-processed information including number of iterations, convergence status, and resulting y+ values.

- .9 Source quality-control reports:
 - .1 Silencer manufacturer to provide a copy of their laboratory NVLAP accreditation certificate for the ASTM E-477-06a test standard with the submittals. Data from non-NVLAP accredited test facilities will not be accepted.

1.4 QUALITY ASSURANCE

- .1 Silencer is to comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- .2 Silencer performance must have been substantiated by laboratory testing in a duct-to-reverberant room test facility according to ASTM E477-06a. The test facility must provide for airflow in both directions through the test silencer. The test set-up, procedure and facility shall eliminate all effects due to flanking, directivity, end reflection, standing waves and reverberation room absorption. The aero-acoustic laboratory must be currently NVLAP accredited for the ASTM E477-06a test standard.
- .3 Silencer manufacturer shall provide a written test report by a third party organization showing silencer assemblies have flame-spread index not exceeding 25 and smoke-developed index not exceeding 50 when tested according to ASTM E 84, NFPA 255 or UL 723.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material for recycling in accordance with Waste Management Plan (WMP).
 - .4 Separate for reuse and recycling and place in designated containers Steel, Metal, Plastic waste in accordance with Waste Management Plan (WMP).
 - .5 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.

Part 2 Products

2.1 GENERAL

- .1 Manufacture in accordance with SMACNA - HVAC Duct Construction Standards.

2.2 FLEXIBLE CONNECTIONS

- .1 Frame: galvanized sheet metal frame with fabric clenched by means of double locked seams.
- .2 Material:
 - .1 Fire resistant, self extinguishing, neoprene coated glass fabric, temperature rated at minus 40 degrees C to plus 90 degrees C, density of 1.3 kg/m².

2.3 ACCESS DOORS IN DUCTS

- .1 Non-Insulated Ducts: sandwich construction of same material as duct, one sheet metal thickness heavier, minimum 0.6 mm thick complete with sheet metal angle frame.
- .2 Insulated Ducts: sandwich construction of same material as duct, one sheet metal thickness heavier, minimum 0.6 mm thick complete with sheet metal angle frame and 25 mm thick rigid glass fibre insulation.
- .3 Gaskets: neoprene.
- .4 Hardware:
 - .1 Up to 300 x 300 mm: two sash locks.
 - .2 301 to 450 mm: four sash locks.
 - .3 451 to 1000 mm: piano hinge and minimum two sash locks.
 - .4 Doors over 1000 mm: piano hinge and two handles operable from both sides.

2.4 TURNING VANES

- .1 Factory or shop fabricated single thickness or double thickness with trailing edge, to recommendations of SMACNA and as indicated.

2.5 DUCT SILENCERS

- .1 Basis-of-Design Product: Silencers shall be Vibro-Acoustics.
 - .1 Alternate manufacturers must request and obtain written approval by the Engineer to bid the project at least 10 days prior to the bid due-date. As a condition of pre-approval, alternate manufacturers must submit to the Engineer a minimum of twenty (20) different HVAC silencer test reports. Each report shall be for a silencer tested in full accordance with the ASTM E-477-06a silencer test standard in an aero-acoustic test facility which is NVLAP accredited for the ASTM E-477-06a standard. Each test shall have been conducted within the last 12 month period. A copy of the laboratory's NVLAP accreditation certificate must be included with the submitted reports. Any changes to the specifications must be submitted and approved in writing by the Engineer at least 10 days prior to the bid due-date.
- .2 General Requirements:
 - .1 Silencers shall be of the size, configuration, capacity and acoustic performance as scheduled on the drawings. All silencers shall be factory fabricated and supplied by the same manufacturer.

- .2 Silencer inlet and outlet connection dimensions must be equal to the duct sizes shown on the drawings. Duct transitions at silencers are not permitted unless shown on the contract drawings.
- .3 Silencers shall be constructed in accordance with ASHRAE and SMACNA standards for the pressure and velocity classification specified for the air distribution system in which it is installed. Material gauges noted in other sections are minimums. Material gauges shall be increased as required for the system pressure and velocity classification. The silencers shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge.
- .4 All casing seams and joints shall be lock-formed and sealed or stitch welded and sealed except as noted in Section G below, to provide leakage-resistant construction. Airtight construction shall be achieved by use of a duct-sealing compound supplied and installed by the contractor at the jobsite.
- .5 All perforated steel shall be adequately stiffened to insure flatness and form. All spot welds shall be painted.
- .6 Fire-Performance Characteristics: Silencer assemblies, including acoustic media fill, Vibar™ film liner, sealants, and acoustical spacer, shall have flame-spread index not exceeding 25 and smoke-developed index not exceeding 50 when tested according to ASTM E 84, NFPA 255 or UL 723.
- .7 Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2007.
- .3 Rectangular Elbow Silencers: Outer casing shall be ASTM A 653/A 653M, G90 galvanized sheet steel, 18 gauge. All acoustical splitters shall be internally radiused and aerodynamically designed for efficient turning of the air. Half and full splitters are required as necessary to achieve the scheduled insertion loss. All elbow silencers with a turning cross-section dimension greater than 48" shall have at least two half splitters and one full splitter.
- .4 Inner perforated metal liner: ASTM A 653/A 653M, G90 galvanized sheet steel.
 - .1 Rectangular Elbow Silencers: 22 gauge.
- .5 Principal Sound-Absorbing Mechanism:
 - .1 Dissipative and Film Lined silencers:
 - .1 Media shall be of acoustic quality, shot-free glass fiber insulation with long, resilient fibers bonded with a thermosetting resin. Glass fiber density and compression shall be as required to insure conformance with laboratory test data. Glass fiber shall be packed with a minimum of 15% compression during silencer assembly. Media shall be resilient such that it will not crumble or break, and conform to irregular surfaces. Media shall not cause or accelerate corrosion of aluminum or steel. Mineral wool will not be permitted as a substitute for glass fiber.
- .6 Source Quality Control: Test according to ASTM E 477-06a.
 - .1 The manufacturer shall test the silencer(s) as indicated in the silencer schedule. The engineer shall be notified of the test date at least two weeks in advance and the test may be witnessed by the engineer. Test

- shall show compliance with the project criteria and is subject to engineer approval.
- .2 Test facilities and test reports shall be open to inspection upon request from the Engineer. Silencer performance must have been substantiated by laboratory testing according to ASTM E-477-06a and so certified when submitted for approval. The aero-acoustic laboratory must be NVLAP accredited for the ASTM E-477-06a test standard. A copy of the accreditation certificate must be included with the submittals. Data from non-NVLAP accredited test facilities will not be accepted.
 - .7 Capacities and Characteristics: See duct silencer performance schedule on mechanical drawings.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 INSTALLATION

- .1 Flexible Connections:
 - .1 Install in following locations:
 - .1 Inlets and outlets to supply air units and fans.
 - .2 Inlets and outlets of exhaust and return air fans.
 - .3 As indicated.
 - .2 Length of connection: 100 mm.
 - .3 Minimum distance between metal parts when system in operation: 75 mm.
 - .4 Install in accordance with recommendations of SMACNA.
 - .5 When fan is running:
 - .1 Ducting on sides of flexible connection to be in alignment.
 - .2 Ensure slack material in flexible connection.
- .2 Access Doors and Viewing Panels:
 - .1 Size:
 - .1 600 x 600 mm for person size entry.
 - .2 300 x 300 mm for servicing entry.
 - .3 As indicated.
 - .2 Locations:
 - .1 Fire and smoke dampers.
 - .2 Control dampers.
 - .3 Devices requiring maintenance.
 - .4 Required by code.
 - .5 Elsewhere as indicated.

- .3 Instrument Test Ports:
 - .1 General:
 - .1 Install in accordance with recommendations of SMACNA and in accordance with manufacturer's instructions.
 - .2 Locate to permit easy manipulation of instruments.
 - .3 Install insulation port extensions as required.
 - .4 Locations:
 - .1 For traverse readings:
 - .1 Ducted inlets to roof and wall exhausters.
 - .2 Inlets and outlets of other fan systems.
 - .3 Main and sub-main ducts.
 - .4 And as indicated.
 - .2 For temperature readings:
 - .1 At outside air intakes.
 - .2 In mixed air applications in locations as approved by Departmental Representative.
 - .3 At inlet and outlet of coils.
 - .4 Downstream of junctions of two converging air streams of different temperatures.
 - .5 And as indicated.
- .4 Turning vanes:
 - .1 Install in accordance with recommendations of SMACNA and as indicated.
- .5 Duct Silencers:
 - .1 Ensure duct silencers are installed with airflow arrows in direction of airflow.

3.3 CLEANING

- .1 Perform cleaning operations as specified in Section and in accordance with manufacturer's recommendations.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 PROJECT SCOPE

- .1 Supply, fabricate, install, program, test, commission & document a complete Audio Visual System for the Theatre Room at the Icefield Centre as described herein and on accompanying drawings.
- .2 Provide all audio, video and control cables for video displays, speakers, input plates, touch screens, etc. All low voltage cabling must meet local building and fire codes.
- .3 Supply, deliver, fabricate & install every product that is necessary and/or incidental to complete a fully operational system as described in these specifications. These include, but are not limited to all matching transformers, baluns, interfaces, adapters, converters, etc.
- .4 AV systems touchscreen programming shall allow users to access and control all aspects and functionality of the AV systems and shall also incorporate low voltage lighting room control and any window shade control so that users can control room lighting and shade control scenes from the touchscreen.
- .5 Supply, deliver, fabricate & install all construction materials necessary and/or incidental to complete the Work. These include, but are not limited to equipment rack hardware, connectors, interconnects, adapters, brackets, mounts, AC power distribution bars, grommets, cable management hardware (lacing bars, cable ties, cable tie mounts, cable ID labels etc.), enclosures, equipment labels, shrink tubing, etc.
- .6 Provide close coordination with other trade contractors to facilitate installation Work. Extra costs arising from conflicts or delay due to improper bid shall be the responsibility of the AV Contractor.
- .7 Provide all equipment, personnel, & resources necessary to facilitate system engineering, installation, testing, documentation, end-user training, and after-sales service/support.
- .8 Where projector, flat panel displays and wall or ceiling mounted projection screens are supplied and installed contractors are to mount devices so that environmental vibration shall not affect the projected image.
- .9 Supply, deliver, fabricate & install every product that is necessary and/or incidental to complete a fully operational system as described in these specifications. These include, but are not limited to all matching transformers, baluns, equalizers, UTP and or IR transmitters and receivers, interfaces, adapters, converters, etc.
- .10 Provide close coordination with other trade contractors to facilitate installation work. Extra costs arising from conflicts or delay due to improper bid shall be the responsibility of the AV Contractor.
- .11 Provide all equipment, personnel, & resources necessary to facilitate system engineering, installation, testing, documentation, end-user training, and after-sales service/support.

1.2 SYSTEM DESCRIPTIONS

- .1 The following paragraphs are intended solely to provide a functional description of the Audio Visual systems so that the Contractor has an understanding of the functional goals for the systems.
 - .1 The Icefield Visitor Centre is open approximately 6 months of the year due to winter road closures. Temperatures within the building's interior during winter months can be as low as -40° C. The AV systems need to be installed to allow all major components like the projector, touch screen and AV rack to easily be removed at the end of each summer and reinstalled in late spring. So, custom connectors will be required to simplify this process and all cables need to be specially marked to simplify re-connection in spring.
 - .2 This facility is also located at approximately 6200 feet above sea level. The video projector must be rated for use at this altitude.
 - .3 The AV contractor is responsible for the supply and install of all AV wiring required in this project
 - .4 The contractor shall supply and install a HD (1080P) capable (16:9) high lumen output projector, ceiling mounted in the projection room. The projector shall be connected to the AV surround processor matrix switch through the use of a digital room control scaler module.
 - .5 The contractor shall supply and install the ceiling mounted projector mount with device specific adapter plate and ceiling style projector mount.
 - .6 The contractor shall supply and install a 108" wide x 192" high HDTV (16:9 aspect ratio) (220" diagonal) projection screen mounted on a fixed black square frame using snaps.
 - .7 There will be a surround sound system comprising of a commercial rated 7.1 digital surround capable sound A/V preamp, amplifiers and multiple speakers. The digital surround sound preamp will be capable of decoding digital audio signals such as Dolby Digital and DTS.
 - .8 The contractor shall supply and install a rack mounted DSP for the system, The DSP shall be integrated to the facility, AV system to allow for speaker processing, AV presentation capability, as well as muting of the program audio when activated by the fire alarm system.
 - .9 The balanced audio outputs of the AV surround preamp shall integrate to a contractor supplied DSP processor to allow the system to be calibrated to maximize acoustics based on the room environment.
 - .10 The receiver will have a minimum of 7 discrete channels to drive 3 front speakers, 2 side surround speakers and 2 rear surround speakers. There will be a passive subwoofer to reproduce low frequency sound effects and to extend the low-end frequency range of the overall speaker system.
 - .11 There will be a separate power-amplifier's for the L,C,R, all surround speakers and the subwoofer.
 - .12 There will be 3 front channels speakers located above the projection screen, 2 surface wall-mounted side channel speakers, 2 surface wall-

- mounted side channel speakers and a subwoofer located on the floor at the front of the theatre.
- .13 The A/V receiver, DSP, and amplifiers will be rack mounted into a 19" professional series rack in the AV equipment room adjacent to the Theatre. Also in the rack will be a rack-mounted A/V surge protector that the A/V receiver, DSP and Blu-Ray DVD should be plugged into plus a rack-mounted UPS unit for the Crestron processor.
 - .14 There will be a high-definition (HD) Digital Media Player (DMP) that will use a removable compact flash card to store content. It will be capable of outputting 1080P signals via the HDMI output. It will have a built-in Ethernet port and/or RS-232 and contact closure capability to allow users to remotely update content and control its various functions over the Departmental Representative's computer network through a remote control system (described elsewhere in this document). It will support high-definition audio and video formats such Dolby Digital 5.1 and DTS. Video content will be looped continuously during operating hours. The custom AV clip will be provided by the Departmental Representative and the AV contractor shall be responsible for installing and integrating this video clip.
 - .15 The Digital Media Player will be capable of playing a second Departmental Representative supplied AV clip for evacuation during a fire alarm. The AV clip shall take precedence and playback of the AV clip shall be triggered by the fire alarm system. The AV contractor shall be responsible for installing and integrating this video clip.
 - .16 A commercial rated Blu-Ray/DVD player will be mounted in the AV rack. This will allow users to playback Blu-Ray or DVD discs for presentations or entertainment from the theatre.
 - .17 The contractor shall supply and install a portable presentation podium that will have an AV input plate and microphone with shock mount input located on the top surface. The AV inputs shall connect to a UTP style transmitter located in the podium and the output of the UTP transmitter and the microphone will connect to a floor mounted AV plate with contractor supplied patch cables. The contractor shall complete millwork to fit AV devices and shall provide an access hatch in the base of the podium so that the podium can be placed over the floor box and be connected without exposed wiring. The podium shall be supplied with optional locking door so that cabling cannot be accessed.
 - .18 The AV contractor shall provide all plates, jacks and wiring to connect AV systems from the stage floor box (for podium) to the AV systems rack. This shall include connections for mic lines, UTP AV cable and UTP cable for touchscreen.
 - .19 The AV contractor shall provide all patch cables for power, data and AV cables to cross connect from the floor box to the podium plates and devices.
 - .20 An auxiliary analog A/V input will be located in the A/V rack. This input will include a composite type video and L&R audio on RCA style inputs. These inputs shall be rack-mounted and a 1 RU blank rack panel.

- .21 There will be count-down timers (2) located upstairs and at the entrance to the theatre. It will let patrons know how much time is left before the start of the next show. The timer resets itself every time the presentation starts. The AV contractor shall supply and install the countdown timer and integrate it to the AV control system so that the timer will be synchronized with the show schedule.
- .22 An intuitive remote control system with a 7" LCD touch panel will provide unified and simple control of all AV system functions. This system will be programmed to start playback of the system each morning at a pre-determined time and to stop playback at a pre-determined time. Staff will be able to manually override the AV system from the 7" LCD touch panel. Users shall be able to control all aspects of the AV system from the touch screen.
- .23 The AV contractor shall supply and install a wall mounted shelf for the touch screen in the projection room to be mounted on.
- .24 A second 7" LCD touch panel will be mounted at the presentation podium and will be programmed to allow users to control all aspects of the AV system from this panel.
- .25 There will be a contact closure output from the fire alarm panel to the AV controller in the AV rack. This contact will initiate a looped playback of the Evacuation AV clip. The AV contractor shall integrate this functionality to the AV control system.
- .26 There will be a RS-232 connection from the AV controller to the lighting control module to allow the touch panel to control all Theatre lights.
- .27 All AV devices shall be installed in a portable style rack that will be located in the theatre AV closet. The AV rack will be connected to the building infrastructure with a series of patch cables.
- .28 AV contractor shall provide cross connect patch cables from AV rack to wall plates.
- .29 All patch cables shall be labeled so that users can re-connect the system at the end of the season and season startup.
- .30 The AV systems rack shall be mounted on casters so that it can be removed and/or moved as required.

Part 2 Products

2.1 GENERAL PRODUCT SPECIFICATIONS

- .1 Product features listed in product specifications are not necessarily the minimum requirement. All components in the A/V contractors bid must meet the requirements of specific product listed.

2.2 VIDEO COMPONENTS

- .1 Unless otherwise specified, all digital video HDMI, DVI, DisplayPort signal processing, routing and management equipment to have a minimum bandwidth

of 6.68 Gbps (1080p DeepColor). All digital video equipment must be compatible with HDMI V1.3 or later and be HDCP compliant.

- .2 All video components will meet local building codes and will be CSA and/or ULC approved with said marking clearly visible. The Contractor will be responsible for replacing all components found not to be CSA or UL-C approved. Or, the Contractor will be responsible for obtaining the CSA or UL-C approvals at no extra cost to the Departmental Representative.
- .3 High-Definition Video Projector (Theatre):
 - .1 Minimum Brightness: 10000 ANSI Lumens;
 - .2 Imaging Chip: DLP;
 - .3 Minimum Native Resolution: 1920 x 1200 (16:10 aspect ratio). Can be set to project a 16:9 image size;
 - .4 Dual lamp system for extended use without having to change lamps;
 - .5 Input connection: DVI (HDCP compatible) or HDMI;
 - .6 Remote Control: RS-232 or EtherNet;
 - .7 Lens: Provide appropriate lens based in projection throw distance (refer to floor plans) and screen image size;
 - .8 Provide two replacement lamps and air filter kit;
 - .9 Product: Panasonic PT-DZ8700U complete with appropriate lens (ETDLE30), 2 spare lamps, spare air filter kit, and all other hardware required for a complete and functional system or equivalent
- .4 Fixed Projection Screen:
 - .1 Screen image area: 108" x 192" (220" diagonal, 16:9 aspect ratio);
 - .2 Screen material: matte white, flexible, fire retardant and mildew resistant with reinforced black binding on all four sides. It will attach to the frame using metal snaps;
 - .3 Frame: It will conceal the snaps and binding. It will be 1.5" square matte black powder-coated aluminum. Walls will be ribbed for strength and light weight. It will be slip-jointed at the corners and joints;
 - .4 Provide wall-mounting brackets and seismic restraints;
 - .5 Product: Dalite DaSnap and all required mounting hardware or equivalent.
- .5 Blu-Ray/DVD Player:
 - .1 Type: Commercial-grade (consumer-grade models not acceptable);
 - .2 With bi-directional RS232 Control;
 - .3 HDMI output;
 - .4 Provide rack mount shelf;
 - .5 Product: Denon DBP-1713UDP or equivalent, include IR emitter and flasher for connection to control processor.

- .6 Digital Media Player:
 - .1 Capable of HD (1080p) video storage and playback;
 - .2 Output connection: HDMI and component video.
 - .3 Supported video format: MPEG-2 and H.264 (MPEG-4 part 10) up to 1080p (using HDMI output);
 - .4 Built-in scheduler for timed events;
 - .5 Built-in audio format support for MPEG-1 LayerI/II, MPEG-2 Layer II, MPEG-2 AAC, MPEG-4 AAC LC2-Channel, Dolby Digital EX 9Bitstream) Pro Logic II;
 - .6 File storage/playback media format: HDSD flash card. Provide HDSD flash card of sufficient capacity to contain a 20-minute MPEG-2 HD video/audio clip and a 5 minute fire/evacuation video/audio clip;
 - .7 Built-In RS-232 port;
 - .8 Product: Alcorn McBride DVM8500 HDSD flash card or equivalent and rack mount kit.
- .7 VGA/HDMI UTP Transmitter:
 - .1 Range: Up to 100 meters at 1080p @ 60Hz resolution;
 - .2 HDCP Compliant;
 - .3 VGA w. Audio and HDMI input;
 - .4 Bidirectional RS-232/IR pass-through;
 - .5 Colour: Black
 - .6 Product: AMX AVB-TX-MULTI-DXLINK w. PDXL-2 power supply
- .8 VGA/Audio UTP Receiver:
 - .1 Range: Up to 100 meters at 1080p @ 60Hz resolution;
 - .2 HDCP Compliant;
 - .3 Output: HDMI;
 - .4 Scaling output w. EDID;
 - .5 Bidirectional RS-232/IR pass-through;
 - .6 Input: Female RJ-45 connector;
 - .7 Receives high resolution video and summed mono audio signals over a single CAT 5-type c;
 - .8 Product: AMX AVB-RX-DXLINK-HDMI w. PDXL-2 power supply.

2.3 AUDIO COMPONENTS

- .1 A/V Surround Sound Preamp:
 - .1 Type: Commercial-grade Surround Sound A/V Receiver (consumer-grade not acceptable);
 - .2 Surround sound decoding: 7.1 Dolby Digital or DTS;

- .3 With balanced audio outputs;
 - .4 Minimum # of HDMI Inputs: 6;
 - .5 With built-in analog video to HDMI scaling up to 1080p output resolution;
 - .6 With RS232C serial remote control port;
 - .7 With standard rack-mounting hardware;
 - .8 Product: Denon DN-500AV or equivalent.
- .2 Presentation Podium Shotgun Microphone:
- .1 Dual Section Flexible Gooseneck;
 - .2 XLR Output;
 - .3 Operating Voltage; 12 – 48V phantom power (stand alone): 13.8 V DC;
 - .4 Length 400mm
 - .5 Product: Sennheiser MZH3042 w. ME36 Capsule & MZS31 Shockmount
- .3 Facility DSP Processor:
- .1 12 Analog Inputs;
 - .2 8 Analog Outputs;
 - .3 Ethernet/RS-232 Control;
 - .4 48 Channel Digital Communication Bus;
 - .5 12 control inputs, 6 logic outputs, GPIO integration;
 - .6 DSP control processor to be installed in AV systems rack; and
 - .7 Product: BSS London BLU-100
- .4 Left, Centre & Right Channel Speakers:
- .1 3-way, Full-range speaker with user rotatable horn;
 - .2 Laminated 11 ply birch cabinet;
 - .3 Speaker Driver: 12-inch diameter woofer with a 6.5" Mid and a 1"horn-loaded high-frequency driver or better;
 - .4 Sensitivity: 99dB 1W/1M
 - .5 Max Input 200W continuous, 500W program (RMS);
 - .6 Nominal Impedance: 8-ohms;
 - .7 Frequency Response: 80-Hz to 16-kHz, +/- 3dB;
 - .8 Sound coverage: 90x40-degrees.
 - .9 Provide all required wall-mount hardware and seismic restraints:
 - .10 Product: Community Sound Veris V2-3294 c/w wall-mount hardware.
- .5 Side and Rear Channel Surround Speakers:
- .1 2-way, Full-range dual speaker with user rotatable horn;
 - .2 Laminated 11 ply birch cabinet;

- .3 Speaker Driver: 8-inch diameter woofer with a 1" horn-loaded high-frequency driver;
- .4 Sensitivity: 92-dB 1W/1M;
- .5 Nominal Impedance: 8-ohms;
- .6 Frequency response:100-Hz to 16-kHz, +/- 3dB;
- .7 Sound coverage: 90x70-degrees or wider (in vertical position).
- .8 Provide all required wall-mount hardware and seismic restraints
- .9 Product: Community Sound Veris V2-8 c/w wall-mount hardware.
- .6 Subwoofer:
 - .1 Type: Passive;
 - .2 Dual 12" vented bass subwoofer drivers;
 - .3 Impedance: Nominal 4-ohms;
 - .4 Sensitivity: 98 dB (1W/1m half-space);
 - .5 Max. Power Handling: 300-watts continuous RMS;
 - .6 Operating Range: 50 Hz – 125 Hz (-3dB);
 - .7 Provide a vibration isolation pad underneath the subwoofer similar to Mason Industries Mini Super W Pads;
 - .8 Product: Community Sound Veris V2-212S c/w vibration isolation pad.
- .7 4 Channel Power Amplifier (L,C,R, Speakers):
 - .1 Fan Cooled;
 - .2 2 RU Height;
 - .3 Amplifier Type: Class D;
 - .4 Independent power supply for each channel;
 - .5 Inputs: Phoenix style screw terminal;
 - .6 Power Outputs: 300W (RMS) 4/8 Ohms/channel;
 - .7 Product: Crown DCI4/300N
- .8 4 Channel Power Amplifier (Surround Speakers):
 - .1 Fan Cooled;
 - .2 2 RU Height;
 - .3 Amplifier Type: Class D;
 - .4 Independent power supply for each channel;
 - .5 Inputs: Phoenix style screw terminal;
 - .6 Power Outputs: 300W (RMS) 4/8 Ohms/channel;
 - .7 Product: Crown DCI4/300N
- .9 2 Channel Power Amplifier (Subwoofer):

- .1 Fan Cooled;
- .2 2 RU Height;
- .3 Amplifier Type: Class D;
- .4 Independent power supply for each channel;
- .5 Inputs: Phoenix style screw terminal;
- .6 Power Outputs: 600W (RMS) 4/8 Ohms/channel;
- .7 Product: Crown DC12/600N

2.4 CONTROL COMPONENTS

- .1 Remote Control Processor:
 - .1 7 configurable RS-232/422/485 Serial ports;
 - .2 8 relays;
 - .3 8 IR/Serial ports;
 - .4 8 Digital I/O ports;
 - .5 2 Communication Networks AXLink & Ethernet;
 - .6 2 GB CompactFlash;
 - .7 404 MIPS Processor Speed;
 - .8 Product: AMX NI-3100 c/w rack kit.
- .2 7" Tabletop LCD Touch Screen:
 - .1 Viewable Area 6.05" x 3.54";
 - .2 16:9 aspect ratio;
 - .3 Resolution 1024 x 600;
 - .4 Contrast Ratio 800:1;
 - .5 Illumination: LED
 - .6 Device to be located on presentation podium and in projection booth on a shelf.
 - .7 Product: AMX MXT-700.
- .3 Custom Countdown Clock:
 - .1 Enclosure to be provided to suit exhibit mounting requirements. Coordinate with Project Architect for details;
 - .2 LED digit height: 4";
 - .3 LED color: Blue;
 - .4 User-adjustable count-down timer. Timer adjustment will be done using a wired remote control unit in the AV equipment rack. Countdown duration adjustable in 30-second increments or finer;
 - .5 Relay contact closure will close to signal end of countdown. Contact closure to stay closed for 1-second. Countdown timer will automatically

commence countdown once the relay contact closure is back in its NO (normally-open) state, i.e. after 1-second;

- .6 The master clock will accept a contact closure from the remote control system to toggle the timer to stop or start. Once the timer starts, it will continuously loop until a momentary dry contact closure is applied to stop it or when the power to the unit is disconnected;
- .7 It will have battery back-up to save the user-settings during power outages;
- .8 Manufacturer: BRG Precision (www.brgproducts.com) or approved manufacturer.

BRG Precision: Contact: Jim Juckett
600 N. River Street, Derby, KS 67037 USA
Tel: (800) 295-0220, x231
Fax: (720) 293-9393
Email: jjuckett@brgproducts.com

.4 Ethernet Switch:

- .1 8 port minimum.
- .2 10/100/1000 Base-T Ports
- .3 Provides POE
- .4 Develop a security approach in consultation with the Departmental Representative.
- .5 Device to be mounted inside the AV systems rack.
- .6 Product: AMX NXA-ENET8-2POE series or approved equivalent. Ensure full compatibility with the exact AV equipment, software and firmware.

2.5 MISCELLANEOUS COMPONENTS

.1 Equipment Rack:

- .1 Locate in AV room by the theatre;
- .2 Rack space: 35-RU;
- .3 Type: Floor-standing.
- .4 Provide a caster base;
- .5 Provide side and top panels;
- .6 Depth: 20”;
- .7 Supply complete with front door and all required equipment rack hardware and accessories to allow for a clean and organized installation.
- .8 Product: Middle Atlantic ERK3520, CBS-ERK-20 caster base and VFD-27 front door or equivalent.

.2 Presentation Podium: (Not In Contract – Supplied By Others)

- .1 AV contractor to coordinate AV device locations and installation with architect.
- .3 Uninterruptible Power Supply Unit:
 - .1 Type: On-line or double-conversion UPS (switch-over UPS not acceptable);
 - .2 Back-up load capacity: 750-VA;
 - .3 With built-in power conditioning (over-voltage, under-voltage, and severe under-voltage);
 - .4 Product: Tripplite Model SU750RTXL2U or equivalent.
- .4 HDMI Cable to 75':
 - .1 Type: High Speed Cable;
 - .2 Supports 1920 x 1200 @ 60Hz and 1080p/60 up to 75 feet without a cable equalizer;
 - .3 Data Rate to 4.95 Gbps;
 - .4 Refresh rate to 60 Hz;
 - .5 Cable to be used for interconnect of HDMI signals in council chambers; and
 - .6 Product: Extron HDMI Pro Series
- .5 Podium AV Input Plates:
 - .1 Black Anodized Aluminum Finish
 - .2 VGA w. Audio & HDMI Input & Data
 - .3 Product: Extron AAP Series
- .6 Rack Mounted Power Bar:
 - .1 2 Stage Surge Suppression
 - .2 9 Outlets 1 Front, 8 Rear
 - .3 1 RU height
 - .4 LED Power Indication
 - .5 Product: Middle Atlantic PDC915
- .7 Projector Ceiling Mount:
 - .1 Maximum Load: 100 lb;
 - .2 Gear adjustment for alignment;
 - .3 Quick release for service; and
 - .4 Product: Peerless PAG – UNV – HD w. projector specific adapter plate, ceiling mount plate and extension column.

Part 3 Execution
3.1 INSTALLATION GENERAL

- .1 Coordinate all aspects of installation work and schedules with the Departmental Representative.
- .2 The contractor shall install all audiovisual components.
- .3 The contractor shall supply and install all AV systems wiring.
- .4 Installed equipment shall be easily accessible for cleaning, adjustment, replacement, and routine maintenance, have proper ventilation, and shall provide safety and convenience for the operator.
- .5 All boxes, conduits, cabinets, equipment, and related wiring shall be firmly mounted in place. Mounting shall be plumb and square.
- .6 Care shall be exercised in wiring the systems to avoid damage to cables and equipment. All joints and connections shall be made with rosin core solder or with mechanical connectors. Crimp type connections shall be accomplished with manufacturer recommended ratchet type crimping tools. Cables shall be free of splices between terminations at the specified equipment. Unused conductors, shields, or drain wires shall be dressed under heat shrink tubing, not cut.
- .7 Wires and cables shall be formed into harnesses that are tied and supported in accordance with accepted engineering practice. Care shall be taken to bundle and secure all cables that interconnect electronic devices integral to the exhibit with destinations outside the exhibit. Where applicable, ensure harnessing and bundling of cables accommodates movement of exhibit on casters to provide access to the rear or interior of the exhibit.
- .8 Harnessed cables shall be combed straight. Harnesses with intertwining members are unacceptable. Each cable that breaks out from a harness for termination shall be provided with a service loop. Cables shall be formed in either a vertical or horizontal relationship to equipment, controls, components, or terminations.
- .9 Terminal blocks or connectors shall be provided for all cables that interface with racks, cabinets, consoles, or equipment modules. All control panel cables shall be terminated on their own terminal strip in the rack, all bussing of the cables shall be done on the controller side of the terminal strip.
- .10 Unless specified by make and model in the design package the use of gender adapters, video or audio connection adapters, and prefabricated, molded, or modular connecting cables are prohibited for use in these systems. The low quality generic cables that are shipped with players are prohibited.
- .11 Follow manufacturers' instructions for installing, operating, configuring, and programming their equipment. Do not perform modifications to equipment that would void its warranty.
- .12 Install and terminate all cables, and interconnect all equipment and components in accordance with approved drawings. Install AV cover plates and faceplates onto all boxes.
- .13 All audio, video, and control system signal cables shall be free from kinks, sharp bends, tear, stress, etc. that could degrade their performance.
- .14 All set-up, programming and calibration of A/V components to be included by the Contractor.

- .15 Appropriate test equipment and test software to be supplied by the Contractor.
- .16 Install, calibrate and program fully working Audio/Video System, please adhere to all requirements in section 27 00 10.

3.2 CONTROL SYSTEM GENERAL

- .1 The touchscreen control system GUI is integral to the operation of the systems and the Contractor shall meet with the Departmental Representative to ensure that all system capabilities are provided for on the system touchscreen GUI interface displays. To ensure a complete design process the creation of the touchscreen control interface and programming of the control system shall adhere to the following minimum protocol. This process shall involve a minimum of 2 iterations and more may be required based on user input.
- .2 The AV contractor will supply to the Departmental Representative a mockup of the proposed system GUI. After review by the representative the proposed GUI shall be forwarded to the Departmental Representative for feedback.
- .3 The proposed mockup shall include colour PDF files showing the proposed graphical layout and nomenclature for each touchscreen page for each unique touchscreen and virtual touchscreen layout
- .4 The proposed mockup shall also include a Windows executable file of the GUI that will allow the Departmental Representative to run a simulation of the panel functionality on the Departmental Representative's computer
- .5 Prior to installation the Contractor shall present to the Departmental Representative a final mockup for review, feedback and approval. The final mockup shall include PDF copies of GUI touchscreens and a Windows executable file as outlined in C & D above.
- .6 After installation the Departmental Representative shall use the system for a period of 60 days to obtain information on system functionality. At the end of the 60 day period the Departmental Representative shall provide the Contractor feedback on minor change requirements and the Contractor shall provide programming service to affect changes.

3.3 CONTROL SYSTEM PROGRAMMING

- .1 The following paragraphs represent guidelines for the touchscreen programming only. They are intended to reflect the general control philosophy, the design intent, and the minimum overall requirements. The Contractor is expected to provide a complete state-of-the-art touchscreen interface.
- .2 The philosophy of the touchscreen interface design is to be simplicity and intuitiveness – "one button per task." Pressing a button marked "PC" may: turn on the video projector; select matrix video switcher input and output, select DSP audio input; and preset volume control.
- .3 Once the set-up requirements for a presentation type have been completed, the panel is to display basic operating controls for the selected presentation device, along with buttons to allow the user to jump directly to another presentation type without needing to back up one or more levels.
- .4 The touchscreen pages are to be arranged in descending layers of complexity such that a basic user only sees basic functions, and more complex control for

- advanced users or technical staff is only revealed by drilling down to a deeper level.
- .5 A sleep mode is to turn off the panel illumination after an adjustable period of inactivity (initially set to 5 minutes). Once asleep, touching the panel brings it back to life without changing screens.
 - .6 Button nomenclature is to be simple and unambiguous. Except for standard transport controls (i.e. fast forward, rewind, play, pause, etc.) or DVD menu navigation controls, icons are not to be used alone without text. Button highlighting (i.e. to indicate the active state) is to be immediately obvious (e.g. change button background to contrast with the inactive state).
 - .7 Power On Screen:
 - .1 Display the facility logo and a button to access a panel adjustment/set-up page. Touching this screen anywhere other than the set-up button causes the default "Main Control Page" to display.
 - .2 If a set of maintenance pages is required, the main page is to be accessed from this screen. This access must be password protected.
 - .3 Reset all devices to a predefined idle state.
 - .8 Power off Button: Display a power off button on all system mode screens. When this button is pressed a pop up display should ask if the user is sure they want to turn the system off with a "YES" and "NO" button option. This will ensure that the user can easily turn off all aspects of the system without accidentally shutting off the system and having to wait while the projector goes through its cool down period. When "YES" is selected, all aspects of the AV system should turn off automatically
 - .9 Setup Page: At a minimum, provide the following functions:
 - .1 Timer duration for the screen sleep mode;
 - .2 Panel brightness;
 - .3 Audible key click on/off and key click volume (if supported by the screen).
 - .10 Touchscreen GUI Programming Guidelines. Note: This guideline is not a definitive instruction on how to program the remote control system. Its objective is to provide a conceptual guideline to the Contractor on how the control system should perform based on Departmental Representative feedback. It is the responsibility of the Contractor to take the information provided and combine it with their practical engineering experience to develop a fully functional program that will satisfy the needs of the Departmental Representative for a simple and easy to operate AV system. Coordination between Contractor and Departmental Representative is definitely a must during the programming stage. The remote control touchscreen is to have the following pages, buttons, macro functions, and operations:
 - .1 AV System Operating Mode Page: This page will contain 4 possible system modes that the user can select
 - .1 Play Looping Video Clip;
 - .2 Presentation / DVD;

- .3 Stop Looping Video;
- .4 Theatre Power Off.

It will also be the main default page when the system or touch screen is first started up. Icefield Centre logo and title will be located across the top part of the page.

- .2 Common Controls: The following controls will always be available on all of the Operating Mode Sub-pages: Audio Volume Level (Up/Mute/Down), Return button (return to previous page, when needed), Manual Control (takes the user to the manual control page to manually operate certain elements of the AV system such as projector, microphone levels, etc.), all Operating Mode choices (on tabs across the top part of the touch screen), and a small Icefield Centre logo on the top left corner of the screen (when pressed, the touch screen will send the user to a Help Page that contains the contact information of the resident AV technician, the AV Contractor, and the AV Consultant .
- .3 Play Looping Video Clip: This page will activate the following suggested macro functions when this mode is selected:
 - .1 Turn ON Projector: Default projector input to DVI-D.
 - .2 Turn ON A/V Receiver: Default Input to Digital Media Player HDMI input; preset audio to approximately 80dB and audio mode should be Dolby Digital.
 - .3 Select low level lighting scene on lighting controller.
 - .4 Start clip on Digital Media Player after projector warm-up or immediately if projector was already on when button was pressed.
 - .5 Start Count-down clock timer for next show. This time should include approximately a 60 second time for people to leave Theatre before the clip plays again.
- .4 Presentation / DVD Mode Sub-Page: Activating this mode will have buttons to allow the user to select the available sources. The following are the suggested macro functions that will be executed when this mode is selected:
 - .1 Turn ON Projector: Default projector input to RGBHV.
 - .2 Turn ON A/V Receiver: Default Input to analog PC audio; preset audio to approximately 80dB and audio mode should be Dolby Pro-logic. Selecting source will bring up source control page with GUI appropriate for selected source.
 - .3 Source selection shall be displayed along top or side of screen to allow users to select other sources like DVD, HDMI or Auxiliary input.
 - .4 Microphone input shall be able to be selected as an audio source only or with the analog PC input.

- .5 Stop Looping Video: Activating this mode will stop video clip from running but keep projector and A/V receiver on and return the screen to the A/V Systems Operating Mode Page.
- .6 Theatre Power Off: Activating this mode will turn off all Theatre A/V equipment and return the screen to the A/V Systems Operating Mode Page.
- .7 Source Selection: When a video source like the Blu-Ray DVD Player, the HDTV Cable Box or the Camera is selected the panel should automatically default to a sub-control page which allows full control of the selected source. The following controls will always be available on all of the Source Control Page: Audio Volume Level (Up/Mute/Down), return button (return to previous page, when needed), Manual Control (takes the user to the manual control page to manually operate certain elements of the AV system such as projector, microphone levels, etc.), all Operating Mode choices (on tabs across the top part of the touchscreen), and a small logo on the top left corner of the screen (when pressed, the touchscreen will send the user to a Help Page that contains the contact information of the resident AV technician or Departmental Representative). When selecting PC sources or input plate sources, the panel will remain on the Main Control Page.

When a source is selected in a room it will automatically default to the display that is in the room. To provide for client flexibility when source selection page for a device is activated it should also display a button for destination. This will allow the Departmental Representative to send any source to any AV display.
- .8 Mic Setup Page: This page will have the following control functions when this mode is selected:
 - .1 Individual microphone On/Off;
 - .2 Individual microphone level control
- .9 Room Lighting/Shade Scene Selection: This page will have the following control functions when this mode is selected:
 - .1 Buttons for each room lighting scene control; and
 - .2 Selection buttons for room shade control
- .11 Facility Specific GUI & Control System Guidelines: The control system and GUI shall provide, at a minimum the following capabilities and control functionality:
 - .1 The operation of the system as an audio presentation system to be controlled from the projection room and/or the presentation podium.
 - .2 The control of the theatre and all aspects of the theatre shall be controlled by both touchscreens.
 - .3 Pre-set buttons for re-configuration of the audio system.
 - .4 The control system and GUI shall integrate to and provide for control of the facility lighting control system.
 - .5 The control system shall integrate to the facility countdown timer system and provide for user control re-scheduling and re-set

capability. The countdown timer shall be fully integrated to the facility control system and shall re-set when movies are paused, stopped or times of play are changed.

3.4 GENERAL TESTING

- .1 Upon system completion, Contractor shall test the entire system to ensure the system is fully operational. This systems testing shall be completed prior to occupancy date.
- .2 The system shall perform, as a minimum, as specified within these specifications. It is the Contractor's responsibility to correct all systems problems and deficiencies.
- .3 Check and verify every furnished product. Demonstrate the full inventory to be all new equipment, in full compliance with the specification, or as modified by approved submission.
- .4 Check and verify against stray AC voltages on any equipment accessible to a user relative to ground.
- .5 Check and verify that there are no sharp or jagged surfaces accessible to a user.
- .6 Check and verify system serviceability. This includes accessibility to equipment to be easily pulled for repair by one person; neatly dressed cables; bundled in forms described herein; having no excessive pressure on cables at termination points and connectors; utilize service loops; and, have each cable number in agreement with as-built drawings. All switches, knobs and receptacles shall be logically and permanently labeled as specified herein.

3.5 A/V SYSTEM TESTING

- .1 Ensure the A/V systems are free of artifacts such as hum, noise, or distortion of any level above that specified by the manufacturers of the equipment specified and/or provided. System components and related wiring shall be located to minimize electromagnetic and electrostatic hum, spurious oscillation, wiring length, and shall provide proper ventilation, safety, and convenience for the operator.
- .2 The contractor shall verify all circuits and extensions for correct connection, continuity, and phasing.
- .3 The contractor shall make all adjustments and modifications so that all systems are operational. Lifting of ground on AC Plug is not an acceptable fix and is against Electrical Code.
- .4 Each video source shall be tested to each video display. Ensure that video display picture quality is at acceptable standards and is free any distortion including hum bars.
- .5 It is the A/V Contractor's responsibility to fully test and troubleshoot all aspects of the Control System's operations.
- .6 Where projector, flat panel displays and wall or ceiling mounted projection screens are supplied and installed contractors are to mount devices so that environmental vibration shall not affect the projected image.

3.6 SYSTEM TRAINING

- .1 The contractor to provide a qualified representative for a minimum (2) two hour sessions of training to the Departmental Representative. The exact date of each session shall be coordinated with Departmental Representative's schedule and availability.
- .2 One session shall occur immediately AFTER the system has been tested and fully operation.
- .3 The other session shall occur approximately 3-6 weeks after first training session and after all deficiencies have been completed.

END OF SECTION 27 41 16

Part 1 General

1.1 PROJECT SCOPE

- .1 Supply, install, & document all required cables for the sound systems described herein and on drawings.
- .2 The scope of work includes, but is not limited to, the following.
 - .1 Supply, deliver, & install every cable type that is necessary and/or incidental to complete a fully operational system as described in these specifications. These include, but are not limited to coaxial, speaker, UTP, RGB and twisted pair shielded cables;
 - .2 Provide close coordination with Departmental Representative and other trade contractors to facilitate installation Work. Extra costs arising from conflicts or delay due to improper RFP will be the responsibility of the Contractor;
 - .3 Provide all equipment, personnel, & resources necessary to facilitate system engineering, installation, testing, documentation, end-user training, and after- sales service/support.

Part 2 Products

2.1 GENERAL CABLES

- .1 All cables will meet local building codes and meet minimum FT4 fire rating and will be CSA and/or ULC approved with said marking clearly visible on outer jacket. Where local jurisdiction applies all cable shall be FT-6 rated and will be CSA and/or ULC approved with said marking clearly visible on outer jacket.
- .2 All cables will be clearly labeled at both ends. There will be a corresponding cable list listing all cables. This list will identify cable number, room name or number and destination.
- .3 All cables and cables at the equipment rack head end will be bundled together by type of cable with a minimum excess length of 12-feet, this bundle will be wrapped in plastic for protection. All cables terminating at a wall mounted j-box will have a minimum excess length of 12 inches.
- .4 A/V cables will be categorized as follows;
 - .1 Group 1: Microphone and Line-Level Audio Signal Cables;
 - .2 Group 2: Video Signal and Loudspeaker Cables;
 - .3 Group 3: Digital Audio & Digital Video Cables;
 - .4 Group 4: Data / Control Network Cables and DC Power Cables (Under 100-Volts);
 - .5 Group 5: AC Power Cables.
- .5 Maintain the recommended cable groupings within each equipment rack. Run Group 4 and 5 cables on the right hand side of the equipment rack. Run Group 1, 2 and 3 on the left hand side of the equipment rack. Maximize distance

- between cable bundles inside the rack. Dress, bundle and tie all rack cables to appropriate wiring management accessories (lacing bars – vertical/horizontal, strain relief, etc.) for equipment rack use.
- .6 Use grommets or sleeves on all cable pass-through or knock-out holes cut out on plastic or metal panels. Pay particular attention on all cable paths. Ensure that cables do not have direct contact with any sharp or rough edges that can damage them.
 - .7 Provide sufficient slack to cable bundles going into equipment racks. Equipment rack will be movable for servicing and maintenance without straining the cable bundles.
 - .8 Provide sufficient slack to cable bundles for equipment located in millwork or cabinetry. Sufficient slack should be available to remove the equipment from its shelf and disconnect it from its harness. This rule also applies to equipment on pull-out shelves.
 - .9 Prevent cable stress due to over-tightened cable ties, sharp bends, insufficient cable slack, and pulling tension. Excessive cable stress can change the electrical properties of most cables and will affect overall system performance.
 - .10 No splices are allowed anywhere between cable ends. All cable runs should be continuous.
 - .11 Practice good soldering or crimping techniques when terminating cable with a connector or lug. The Departmental Representative will perform checks on soldered and/or crimped connectors from time to time. Inspect all solders and crimps before finalizing the termination, re-terminate all bad terminations.
 - .12 Unused cables will be 'capped and stowed'.
 - .13 All exposed conductors at cable ends, e.g. cable shields, will be insulated using heat shrink to prevent accidental short circuits with other cables in the connector or in its surrounding area.
 - .14 The Contractor will assume all expenses of replacing any supplied or installed cables rejected by an inspection authority.
 - .15 Take all necessary precautions to avoid electromagnetic, electrostatic, and common-mode interference within specified systems or with other existing equipment or equipment furnished and installed by other trades. The Contractor will assume all expenses incurred by furnishing filters and/or isolation devices required to suppress interference problems of any type.
 - .16 All AV interconnect cables, whether pre-made or field assembled, will utilize color coded strain reliefs or color O-rings or color shrink tubing to provide a visual reference or guide that will identify the type of AV signal it will pass through.
 - .1 Green – Component Video Signal Y;
 - .2 Blue – Component Video Signal, Pb;
 - .3 Red – Component Video Signal Pr;
 - .4 Black – 15-P HD Computer Video;
 - .5 Red – Computer Color Component Red;

- .6 Green – Computer Color Component Green;
- .7 Blue – Computer Color Component Blue;
- .8 Black – Horizontal Sync Signal;
- .9 Yellow - Vertical Sync Signal;
- .10 Red – Right Channel Stereo Audio;
- .11 White – Left Channel Stereo Audio;
- .12 Black – Mono Audio.

2.2 AUDIO CABLES - GENERAL

- .1 Unbalanced audio signals will not be run through cables greater than 30 feet. Use balanced line transmitter /line receiver units when required.
- .2 When wiring devices within single or multi-ganged equipment racks, two audio devices with high-impedance and unbalanced input and/or outputs can be connected together using two-cable unbalanced lines provided that the cable is shielded. Connect shields to ground at source-end only.
- .3 All audio outputs will match audio inputs. Use appropriate signal transformers such as RANE BB-44, RANE BB-22, RDL TX-1A, TX-LC2, RDL FP-UBC2 to convert unbalanced to balanced lines and vice versa. The Contractor will furnish the required type and quantity of transformers at no additional cost.
- .4 Use appropriate signal transformers such as RDL TX-LM2 and RDL STM-1 to convert microphone-level to line-level signals and vice versa. The Contractor will be responsible for furnishing the required type and quantity of transformer at no additional cost.
- .5 Do not passively split ('Y' connections) unbalanced audio signals. Balanced audio signals can be split once only. Use appropriate active amplifiers to distribute signals to two or more destinations. The Contractor will be responsible for furnishing the required type and quantity of distribution or amplification devices at no additional cost. An exception to this would be the presence of a passive 'loop out' connection from an audio device. In such a case, this passive 'loop out' can be used as a duplicate audio source. However, if the passive 'loop out' signal has to be sent to two or more destinations, an active amplifier will be used to accomplish this task. A device with an active or buffered 'loop out' signal can be used to drive an indefinite chain of devices having a similar active or buffered looping output.

2.3 VIDEO CABLES - GENERAL

- .1 Use video cables that have a bandwidth rating of, at least, twice the maximum frequency of the source signal. Inappropriately furnished or sub-standard cables will be rejected by the Departmental Representative.
- .2 All cables shall have a minimum FT-4 rating. Where local jurisdiction requires FT-6 cable must be used.
- .3 Use RG6 cables for all cable runs exceeding 65 feet, otherwise use RG59 cable for all standard video applications

- .4 Use high-quality BNC and RCA type connectors with matching compression crimp tools.
- .5 Use only 75-ohm rated connectors for video / graphics signals.
- .6 Use the correct type of BNC connector specifically for the furnished video cable.
- .7 Avoid the use of adapters whenever possible (e.g. BNC to RCA).
- .8 Do not passively split video signals (e.g. 'Y' connections or passive splitters). Use appropriate active amplifiers to distribute video signals. The Contractor will furnish these distribution amplifiers at no additional cost. An exception to this would be the presence of a 'loop out' connection from a VTR or Video Monitor. In such a case, this 'loop out' can be used as a duplicate video source. However, if the 'loop out' signal has to be sent to two or more destinations, an active amplifier will be used to accomplish this task.
- .9 Digital Video:
 - .1 Unless otherwise specified, all digital video HDMI and DVI cables shall support a minimum bandwidth of 6.68 Gbps (1080p DeepColor).
 - .2 All cables shall have a minimum FT-4 rating. Where local jurisdiction requires FT-6 cable must be used.
 - .3 Maximum length of HDMI cables is 11 meters.
 - .4 Maximum length of DVI cables is 5 meters.
 - .5 For lengths greater than 11 meters with HDMI cables and 5 meters with DVI cables, repeaters cable equalizer or an active transmitter / receiver based system shall be used. All such devices must be HDCP and EDID compliant.
 - .6 All HDMI and DVI cables must be installed in conduit unless FT-4 rated. Use FT-6 cables where required by local jurisdiction.
 - .7 All HDMI and DVI cable shall be pre-terminated; field terminations are not acceptable.

2.4 AUDIO / VIDEO / CONTROL CABLE SPECIFICATIONS

- .1 General:
 - .1 All cables shall have a minimum FT-4 rating. Where local jurisdiction requires FT-6 cable must be used.
 - .2 All cables will have clear markings showing the manufacturer's name, cable model number/part number, and fire rating. Sequential foot markings are optional but preferred.
- .2 Approvals:
 - .1 Submit samples and cut sheet for each proposed cable that will be used in this project. Obtain an approval from the Departmental Representative prior to ordering and installing the cables.
- .3 DigitalMedia Cable – Non Plenum
- .4 DigitalMedia Cable – Plenum
- .5 HDMI Cable High-speed, FT-4 or FT-6

- .1 Product: Rapid Run, Liberty Cable E-HDSM-series or equivalent. Non-compliant cables will be rejected.

2.5 INTERCONNECT CABLES, SIGNAL CONNECTORS & ADAPTERS

.1 General:

- .1 Acceptable Manufacturers: Rapid Run, Liberty, Kings, Amp, Canare, Amphenol, Extron, Neutrik, Trompeter, ADC, Altinex, Covid.
- .2 Use the same manufacturer for each type of connector (i.e., panel mount, cable end, adapters, etc.).
- .3 Do not mix and match mating connectors. Use mating connectors of the same manufacture and model series.
- .4 All video connections (BNC or RCA) will be of the compression-fit type. No solder connections will be allowed anywhere along the signal chain except on panel mount BNC or RCA connectors using a willow junction box.
- .5 Ensure that compression fit connectors are matched to the signal cable. Ill-fitting connectors due to mismatched components will be rejected.
- .6 Minimize the use of audio, video, or CATV adapters as much as possible. Proper connectors should be installed at cable ends of interconnecting cables to match the input connectors of equipment. In certain cases, such as a 15-pin HD connector need to be broken out into 5-BNC connectors or vice versa, an adapter cable is a necessary requirement.
- .7 Only pre-made and molded 15-pin HD connectors, adapters and interconnect cables will be allowed. Site assembled 15-pin HD connectors are only allowed if using 15-pin HD connectors made by Positronics or Extron. Pre-approved interconnect cable manufacturers: Extron, Altinex, Covid, Comprehensive Video, CALRAD.

.2 Unbalanced Audio and Video RCA Panel Mount Connectors:

- .1 Recessed type connectors with Nickel finish;
- .2 Color coding: Yellow for video, Red for audio right channel, and White or Black for audio left channel;
- .3 Mount connector from rear of wall plate.
- .4 Product: Neutrik D-series or Canare RJ-RU.

.3 Video RCA Panel Mount Connectors:

- .1 Recessed type connectors with Nickel finish;
- .2 Impedance 75-ohms;
- .3 Mount connector from rear of wall plate.
- .4 Product: Neutrik D-series or Canare RJ-RU.

.4 Balanced Audio Panel Mount Connectors:

- .1 3-pin XLR-type male or female;
- .2 Finish: Nickel housing with Silver Contacts;

- .3 With solder terminals.
- .4 Mount connectors from rear of wall plate.
- .5 Product: Neutrik D-series.
- .5 Audio/Video/CATV In-Line Connectors (BNC, RCA, F-type):
 - .1 Compression-fit type. No crimp-on or solder connectors allowed;
 - .2 Provide color-coded O-rings for connectors to match the signal type and follow industry-standard color schemes for different video signal formats;
 - .3 With integral inspection "window" to view actual termination;
 - .4 Product: Liberty ConnecTec Termination System.
- .6 Speaker Connectors, panel-mounted or in-line:
 - .1 Product: Neutrik Speak-On series connectors.

Part 3 Execution

3.1 INSTALLATION GENERAL

- .1 All cables will be run through conduit or in specifically designated ceiling drops and chase ways. All conduit is part of base building contract and is not part of contractor's contract.
- .2 Coordinate all aspects of installation scheduling with General Contractor.
- .3 Contractor is responsible for any required permits. Cost of such permits shall be included.

3.2 LABELLING AND IDENTIFICATION

- .1 All cables and connecting blocks will be clearly, logically and permanently-marked and identified by the following means:
 - .1 Use cable labels similar to the Panduit Polyolefin Self-laminating Labels for Ink-Jet or Laser-Jet printers or any other means acceptable to the Departmental Representative. Cable labels should be machine printed and not handwritten. Other approved labels and labeler machines include Dymo Industrial (not the consumer or business Dymo products), Brady Industrial, or other similar professional labelers.
 - .2 For labeling equipment, use engraved Lamacoid labeling.
 - .3 Cable labels should be placed approximately 12-cm. from each end of the cable.
 - .4 The following identification standard will be adopted:
 - .1 Audio Speaker Cables: Sxxx (Low Impedance, High Impedance, etc.);
 - .2 Audio Line Cables: Axxx (Balanced or Unbalanced Line and/or Mic Level);
 - .3 Video Line Cables: Vxxx (Video, RGBHV, Digital Media, etc.);

- .4 Control Line Cables: Cxxx (Proprietary networks, Serial, Logic, etc.);
 - .5 Low-Voltage Power Cables: Pxxx;
 - .6 Network Cables: Lxxx;
 - .7 "xxx" will mean sequential numbering from 001;
 - .8 Include all cable identification numbers on all wiring diagrams and cable schedules.
- .5 Labeling conventions will be clear and logical, any deviation from the above standard must be submitted in writing to the Departmental Representative. It is up to the discretion of the Departmental Representative to reject or accept the written submission.

END OF SECTION 27 41 80