SCHEDULE 3

DESIGN AND CONSTRUCTION SPECIFICATIONS

ABBOTSFORD LAW COURTS

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1. INTERPRETATION

1.1 Definitions

In this Schedule, in addition to the definitions as set out in Schedule 1 of this Agreement;

"24/7" means twenty-four hours a day, seven days a week.

"Authority Having Jurisdiction" means a person who has the delegated authority to determine, mandate, and enforce code requirements established by jurisdictional governing bodies.

"Best Practice" means a method or technique that has consistently shown results superior to those achieved by other means, and is used as a standard to be achieved.

"Borrowed Light" means that there must be a window in the direction of an exterior window and the centre of the space falls within the 8 meter light radius (10 meter light radius if the area is over 45 square meters).

"Building" means the Law Courts building.

"Building Envelope Consultant" refers to building technology professionals who specialize in the design and inspection of all elements of the Building envelope, including roofs, walls, foundations, and their component parts.

"Building Gross Area or Building Gross Square Meters" (BGSM) means the sum of all Building floor areas measured to the outside face of exterior walls for all stories or areas having floor surfaces. Building gross area includes component gross area, general circulation, mechanical and electrical space and exterior walls.

"BC Building Act" means the Building *Act* and includes the British Columbia Building Code (BCBC).

"Civic Precinct" means the pedestrian and vehicular zones in close proximity to the Facility including City Hall, The Reach Gallery, Matsqui Centennial Auditorium. the Clearbrook library, Abbotsford Police Department and existing public plaza elements.

"Component "or "Functional Component" means a cohesive grouping of activities or spaces related by service or physical arrangement. A planning component may or may not be a department since the term "department" refers to an administrative organization rather than a functional organization of space and activities.

"Convenient Access" means physical access between rooms or components through the use of convenient horizontal and/or vertical general circulation.

"**CPTED**" means Crime Prevention Through Environmental Design. CPTED is a multi-disciplinary approach to deterring undesirable and criminal activity and behaviour through environmental design.

"**dBA**" refers to the unit of sound pressure level when the "A weighting filter" is used.

"Design Life" means the period of time during which the item is expected by its designers to work within its specified parameters; in other words, the anticipated life expectancy of the item.

"Direct Access" means programmed area components, which are contiguous and avoid movement through other circulation systems of the Building. An acceptable alternative to horizontal contiguity

between components may be vertical contiguity by means of a dedicated elevator, escalator or internal stairs.

"Direct Natural Light" means that the space must have an exterior window and the centre of the space falls within the 8 meter light radius measured from the entire length of the window (10 meter light radius if the area is over 45 square meters); the window glass opening must be 1.7 square meters in area minimum.

"**Equipped"** means the rooms and/or spaces which are specified in the Functional Space Requirement as being completely finished, equipped and commissioned.

"**Functional Space Requirements**" refers to the list of required spaces to be included in the design of the Facility. The Functional Space Requirements document is located in the Appendix 3A - Functional Space Requirements.

"**Future Expansion**", means space that will not be built now but which Project Co must include in planning and design of the Building.

"General Circulation" means the system of connecting links (corridors, elevators, stairs, etc.) providing access for people and materials to or between functional components.

"I/O" means input/output.

"Industry Standard" means generally accepted technical requirements, methods, processes and practices followed by members of an industry.

"Integrated Design Process" means a holistic approach to high performance building design and construction. It relies upon every member of the project team sharing a vision of sustainability and working collaboratively to implement sustainability goals.

"Internal Circulation" means the system of connecting links (corridors, elevators, stairs, etc.) within functional components, connecting rooms of a component or directly connecting contiguous components.

"Net Area or Net Square Meters (NSM)" means the horizontal area of space assignable to a specific function. The net area of rooms is measured to the inside face of wall surfaces.

"Parkade" means the structure which accommodates vehicle parking for both the public and staff.

"Public Art" means public art which must be incorporated into the design of the Facility in accordance with the provisions of this Agreement and pursuant to an approval process involving Project Co, the City and the Province.

"Room Data Sheets" refers to the list of qualifying features and/or functions for specific rooms found in Appendix 3A.

"Site" has the meaning set out in Schedule 2 - Design and Construction Protocols;

"SLC Non-Secure" requires a type of construction that has no special detention or security requirements other than to provide normal structural integrity and maintainability.

"SLC Secure" requires a type of construction that provides secure containment in areas that accommodates accused/offender persons. This typically includes secure walls, ceilings and floors; utilizes secure glazing, secure doors and detention hardware. This construction standard is used in all accused/offender occupied/accessible areas throughout the Building.

"**Void Space**" means space which is trapped between walls and/or structure and is not intended to be finished or used.

1.2 Interpretation

1.2.1 This Schedule is written as an output specification and defines what Project Co must achieve in the Design and Construction. Except as expressly stated otherwise, Project Co must carry out the Design and Construction as required and contemplated by each provision of this Schedule and its Appendices whether or not the provision is written as an obligation of Project Co or is stated in the imperative form.

1.2.2 Where "cost effective", "appropriate", "sufficient", "minimize" and related and similar terms are used, they are to be construed and interpreted in terms of whether they are cost effective, appropriate, sufficient, minimizing, etc. from the perspective of a prudent public owner of a major law courts building who balances capital costs against maintenance, operations, efficiency and other non-capital costs over the life of the Facility.

1.2.3 The use of capitalization for programmed areas of the Facility is for consistency purposes with the Room Data Sheets contained in Appendix 3A.

1.2.4 Other capitalized words and phrases will be interpreted in accordance with Good Industry Practice.

1.3 Acronym List

1.3.1 ACH – Air Changes per Hour

1.3.2 ACS - Access Control System

1.3.3 AFFL – Above Finished Floor Level

1.3.4 AFUE - Annual Fuel Utilization Efficiency

1.3.5 ANSI - American National Standards Institute

1.3.6 ARCAL – Aircraft Radio Control of Aerodrome Lighting

1.3.7 AIBC – Architectural Institute of British Columbia

1.3.8 APEGBC – Association of Professional Engineers and Geoscientists of British Columbia

1.3.9 ASHRAE - American Society of Heating, Refrigerating and Air-conditioning Engineers

1.3.10 ASME - American Society of Mechanical Engineers

1.3.11 ASPE - American Society of Plumbing Engineers

1.3.12 ASTM - American Society for Testing and Materials

1.3.13 ATM – Automated Teller Machine

1.3.14 AV / IT – Audio Visual / Information Technology

1.3.15 AWMAC – Architectural Woodworker Manufacturers Association of Canada

1.3.16 AWWA – American Water Works Association

1.3.17 BIFMA – Business and Institutional Furniture Manufacturing Association

1.3.18 BCBC – British Columbia Building Code

1.3.19 BCERMS - British Columbia Emergency Response Management System

1.3.20 BCICA - British Columbia Insulation Contractors Association

1.3.21 BCLNA - British Columbia Landscape and Nursery Association

1.3.22 BCSLA - British Columbia Society of Landscape Architects

1.3.23 BGSM – Building Gross Square Meters

1.3.24 BICSI - Building Industry Consulting Service International

1.3.25 BIFMA – Business and Institutional Furniture Manufacturing Association

1.3.26 BMS - Building Management System

1.3.27 BSCS - Building Security and Communications Systems

1.3.28 CATV – Community Access Television

1.3.29 CCD Charge Couple Device

1.3.30 CCTV Closed Circuit Television

1.3.31 CEC Canadian Electrical Code

1.3.32 CFC Chlorofluorocarbon

1.3.33 CFL Compact Fluorescent Lamp

1.3.34 CGA - Compressed Gas Association

1.3.35 CGSM Component Gross Square Metres

1.3.36 CIF Common Intermediate Format

1.3.37 CISCA - Ceiling Interior Systems Construction Association

1.3.38 CMU Concrete Masonry Unit

1.3.39 CODEC Coder/Decoder

1.3.40 CPTED - Crime Prevention Through Environmental Design

1.3.41 CPU Central Processing Unit

1.3.42 CRTC Canadian Radio-television and Telecommunications Commission

1.3.43 CSA - Canadian Standards Association

1.3.44 Cx – Commissioning

1.3.45 DARS – Digital Audio Recording System

1.3.46 DCS - Door Control System

1.3.47 DDC - Direct Digital Controls

1.3.48 DEC – Detention Equipment Contractor

1.3.49 DFO - Department of Fisheries and Oceans

1.3.50 DHI - Door and Hardware Institute of Canada

1.3.51 DID Direct Inward Dialing

1.3.52 DVMS - Digital Video Management System

1.3.53 EIA/TIA Electronics Industry Association/Telecommunications Industry Association

1.3.54 EMT Electric Metallic Tubing

1.3.55 ESC – Electronic Security Control

1.3.56 ESS - Electronic Security Systems

1.3.57 FACP Fire Alarm Control Panel

1.3.58 FE - Future Expansion

1.3.59 FEMA Federal Emergency Management Agency

1.3.60 FIPPA Freedom of Information and Protection of Privacy Act

1.3.61 FM Factory Mutual

1.3.62 FOV – Field of View

1.3.63 GPS Global Positioning Satellite

1.3.64 HAZMAT - Hazardous Materials

1.3.65 HEPA - High Efficiency Particulate Air

1.3.66 HID - High Intensity Discharge

1.3.67 HP Horsepower

1.3.68 HPAS – Hewlett Packard Advanced Solutions

1.3.69 HRC High Rupting Capacity (fuse type)

1.3.70 HVAC - Heating, Ventilating and Air-Conditioning

1.3.71 IAQ-Interior Air Quality

1.3.72 IC - Intercom System

1.3.73 IDS / IPS Intrusion Detection System / Intrusion Prevention System

1.3.74 IEEE - Institute of Electrical and Electronic Engineers

1.3.75 IP Internet Protocol

1.3.76 IT Information Technology

1.3.77 IMIT Information Management Information Technology

1.3.78 ISO International Organization for Standardization

1.3.79 IT/Tel Information Technology / Telecommunication

1.3.80 KW Kilowatt

1.3.81 KWH Kilowatt hours

1.3.82 KV Kilovolt

1.3.83 KVA Kilovolt Ampere

1.3.84 LAN Local Area Network

1.3.85 LCD Liquid Crystal Display

1.3.86 LED Light Emitting Diode

1.3.87 LEED® - Leadership in Energy and Environmental Design (Version 3)

1.3.88 Mb – Megabit

1.3.89 MCP Motor Circuit Protector

1.3.90 MFP Multi-Function Peripheral (or Multi-Function Printer)

1.3.91 MMCD Master Municipal Contract Documents

1.3.92 MPI Master Painters Institute

1.3.93 NEMA - National Electrical Standards Association

1.3.94 NFPA - National Fire Protection Association

1.3.95 NTSC National Television Standards Committee

1.3.96 NRC-National Research Council

1.3.97 NSM Net Square Metres

1.3.98 PA – Paging Announcement (Paging System)

1.3.99 PBX Private Branch Exchange

1.3.100 PC Personal Computer

1.3.101 PDAS - Panic Duress Alarm System

1.3.102 PIDS - Perimeter Intrusion Detection System

1.3.103 PIPEDA Personal Information Protection and Electronic Document Act

1.3.104 PoE Power Over Ethernet

1.3.105 PPE - Personal Protective Equipment

1.3.106 PTS - Pneumatic Tube System

1.3.107 PTZ Pan Tilt Zoom

1.3.108 PVC Polyvinyl Chloride

1.3.109 QoS – Quality of Service

1.3.110 RCDD Registered Communications Distribution Designer

1.3.111 RCABC Roofing Contractors Association of British Columbia

1.3.112 RTLS Real Time Location System

1.3.113 SAM - Security Alarm Monitoring

1.3.114 SES Safety Engineering Society

1.3.115 SIP Session Initiated Protocol

1.3.116 SLC – Security Level Classification

1.3.117 SMACNA Sheet Metal and Air Conditioning Contractors National Association

1.3.118 SNR Signal to Noise Ratio

1.3.119 SPD- Surge Protective Device

1.3.120 SQL Structured Query Language

1.3.121 STC – Sound Transmission Coefficient

1.3.122 STI – Sound Transmission Index

1.3.123 TAB – Testing, adjusting and balancing

1.3.124 TCO – Total Cost of Ownership

1.3.125 TCP – Transmission Control Protocol

1.3.126 TDM – Time Division Multiplexing

1.3.127 THD - Total Harmonic Distortion

1.3.128 TIA – Telecommunications Industry Association

1.3.129 TTMAC – Terrazzo and Tile Manufacturers Association of Canada

1.3.130 TVOC – Total Volatile Organic Compounds

1.3.131 TVSS - Transient Voltage Surge Suppressor

1.3.132 UHF – Ultra High Frequency Radio System

1.3.133 ULC - Underwriters' Laboratories of Canada

1.3.134 UPS – Uninterruptible Power Supply

1.3.135 V – Volt

1.3.136 VAR – Volt Ampere Reactive power

1.3.137 VFD - Variable Frequency Drive

1.3.138 VLAN – Virtual Local Area Network

1.3.139 VOC – Volatile Organic Compounds

1.3.140 VoIP – Voice Over Internet Protocol

1.3.141 VSS – Video Surveillance Systems

1.3.142 WAN – Wide Area Network

1.3.143 WAP2 – Wireless Application Protocol 2

1.3.144 WMM – Wi-Fi Multimedia

2. GENERAL

2.1 Standards

2.1.1 Project Co must undertake the Design and Construction:

2.1.1.1 in accordance with the standards set out in this Schedule;

2.1.1.2 in accordance with the BC *Building Act* and all other applicable Laws, including all applicable City standards and bylaws and any other Municipal requirements:

2.1.1.3 having regard for the concerns, needs and interests of:

2.1.1.3.1 all Persons who will be Facility Users;

2.1.1.3.2 all Province Persons;

2.1.1.3.3 the community; and

2.1.1.3.4 the City;

2.1.1.4 in accordance with Good Industry Practice; and

2.1.1.5 to the same standard that an experienced, prudent and knowledgeable long term owner of a high quality courthouse building in North America would employ.

If more than one of the above standards is applicable then the most stringent standard must apply.

2.1.2 If Project Co makes reference to a code or standard from a jurisdiction outside of Canada, then Project Co must demonstrate to the Province's satisfaction that such code or standard meets or exceeds the requirements of this Schedule.

2.1.3 The most recent version of any standard and guideline listed in Section 2.1.4 or elsewhere in this document, that is in effect on the Financial Submission Date will govern.

2.1.4 Without limiting Section 2.1.1 of this Schedule, Project Co must undertake the Design and Construction in compliance with all applicable codes, standards and guidelines, including:

2.1.4.1 B.C. Building Code;

2.1.4.2 B.C. Fire Code;

2.1.4.3 B.C. Plumbing Code;

2.1.4.4 National Fire Code;

2.1.4.5 WorkSafe BC;

2.1.4.6 Sustainability:

2.1.4.6.1 CaGBC (Canadian Green Building Council);

2.1.4.6.2 Green Globes – Environment Assessment for New Buildings;

2.1.4.6.3 BOMA (Building Owner and Managers Association) Go Green Program;

2.1.4.6.4 ASTM E917.24401-1 Life Cycle Cost Assessment Methodology;

2.1.4.6.5 LEED® New Building (NC) Program;

2.1.4.6.6 BC Hydro High Performance Building Program.

2.1.4.7 All ANSI / ASHRAE standards and guidelines including:

2.1.4.7.1 52.2-2007: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size;

2.1.4.7.2 Thermal Environmental Conditions for Human Occupancy;

2.1.4.7.3 62.1-2007: Ventilation for Acceptable Indoor Air Quality;

2.1.4.7.4 111-2008: Practices for Measurement, Testing, Adjusting and Balancing of Building HVAC Systems;

2.1.4.8 All ASHRAE standards and guidelines including:

2.1.4.8.1 Handbooks: 2009 Fundamentals, 2006 Refrigeration, 2007 HVAC Applications, 2008 HVAC Systems and Equipment;

2.1.4.8.2 Design of Smoke Control Systems;

2.1.4.8.3 ASHRAE Guideline 1.1-2007 HVAC and R Technical Requirements for the Commissioning process;

2.1.4.8.4 ASHRAE Guideline 0-2005 The Commissioning Process;

2.1.4.8.5 ANSI/ASHREA/IESNA 90.1 Energy Standard for buildings except low-rise residential buildings;

2.1.4.9 All ANSI / EIA standards and guidelines including:

2.1.4.9.1 568-C.1 and 568-C.2 (CSA-0T529) Commercial Building Telecommunications Cabling Standard Parts 1 and 2;

2.1.4.9.2 568-C.3 (CSA-T529) Commercial Building Telecommunications Cabling Standard Part 3;

2.1.4.9.3 569-C (CSA-T530) Commercial Building Standard for Telecommunications Pathways and Spaces;

2.1.4.9.4 606-B (CSA-T528) Administration Standard for Telecommunications Infrastructure of Commercial Buildings;

2.1.4.9.5 607-B (CSA-527) Commercial Grounding and Bonding Requirements for Telecommunications; and

2.1.4.9.6 758 Customer Owned Outside Plant Telecommunications Cabling Standard.

2.1.4.10 All ANSI / TIA standards and guidelines including:

2.1.4.10.1 942 Telecommunications Infrastructure Standard for Data Centers;

2.1.4.10.2 TSB-162 Telecommunications Cabling Guidelines for Wireless Access Points;

2.1.4.11 ANSI / ESNA American National Standard Practice for Lighting;

2.1.4.12 ASPE Plumbing Engineering Design Handbook, Volumes 1-4;

2.1.4.13 All ASTM standards and guidelines including:

2.1.4.13.1 ASTM C568-03 - Standard Specification for Limestone Dimension Stone;

2.1.4.13.2 ASTM C615-03 - Standard Specification for Granite Dimension Stone;

2.1.4.13.3 ASTM C503-05 - Standard Specification for Marble Dimension Stone;

2.1.4.13.4 ASTM C616-03 - Standard Specification for Quartz-Based Dimension Stone;

2.1.4.13.5 BCSLA and BCLNA - BC Landscape Standard Current Edition;

2.1.4.13.6 ASTM C260 / C260M 10a Standard Specification for Air-Entraining Admixtures for Concrete;

2.1.4.13.7 ASTM C494 / C494M 13 Standard Specification for Chemical Admixtures for Concrete;

2.1.4.13.8 ASTM A36 A36M-12 Standard Specification for Carbon Structural Steel;

2.1.4.13.9 ASTM A193 / A193M-14 Standard Specification for Alloy Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications;

2.1.4.13.10 ASTM A307-12 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength;

2.1.4.13.11 ASTM S325-10e1 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength;

2.1.4.13.12 ASTM A653 / A653M-13 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process;

2.1.4.13.13 ASTM A792 / A792M-10 Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process,

2.1.4.13.14 ASTM A47 / A47M-99(2014) Standard Specification for Ferritic Malleable Iron castings;

2.1.4.14 All CAN ULC standards and guidelines including:

2.1.4.14.1 S524 Standards for the Installation of Fire Alarm Systems;

2.1.4.14.2 S537 Standards for Verification of Fire Alarm Systems;

2.1.4.15 All CAN/CSA-B651 standards and guidelines including:

2.1.4.15.1 B52-05: Mechanical Refrigeration Code;

2.1.4.15.2 Boiler, Pressure vessel and Pressure Piping Code;

2.1.4.15.3 B64.10 Selection and Installation of Backflow Preventers;

2.1.4.15.4 B139 Installation Code for Oil Burning Equipment;

2.1.4.15.5 B149.1-05: Natural Gas and Propane Installation Code;

2.1.4.15.6 B651-95: Barrier Free Design;

2.1.4.15.7 C22.1 and C22.2 Canadian Electrical Code as adopted in British Columbia;

2.1.4.15.8 C282 Emergency Electrical Power Supply for Buildings;

2.1.4.15.9 A23.4-09 - Precast Concrete - Materials and Construction;

2.1.4.15.10 W186-M1990 (R2012) - Welding of Reinforcing Bars in Reinforced Concrete Construction;

2.1.4.15.11 A370-14 - Connectors for Masonry;

2.1.4.15.12 A370-14 - Connectors for Masonry;

2.1.4.15.13 A23.3-14 – Design of concrete structures;

2.1.4.15.14 G40.20-13/G40.21-13 – General Requirements for rolled or welded structural quality steel / Structural quality steel;

2.1.4.15.15 G30.18-09 – Carbon steel bars for concrete reinforcement;

2.1.4.15.16 S269.3-M92 (R2013) – Concrete Formwork;

2.1.4.15.17 S832-06 – Seismic Risk Reduction of Operational and Functional Components (OFCS of buildings);

2.1.4.15.18 S478-95 (R2007) – Guideline on Durability of Buildings;

2.1.4.15.19 S413-14 Parking Structures;

2.1.4.15.20 S16-14 Design of Steel Structures;

2.1.4.15.21 S136-12 North American Specification for Design of Cold Formed Steel Structural Members;

2.1.4.15.22 S304-14 Design of Masonry Structures;

2.1.4.15.23 S832-06 Guidelines for Seismic Risk Reduction of Operational and Functional Components of Buildings;

2.1.4.15.24 W47.1-09 Certification of Companies for fusion welding of steel;

2.1.4.15.25 W48-14 Filler metals and allied materials for metal arc welding;

2.1.4.15.26 W55.3-08 (R2013) Certification of companies for resistance welding of steel and aluminum;

2.1.4.15.27 W59-13 Welded steel construction (metal arc welding);

2.1.4.15.28 W59.2M1991 (R2013) Welded Aluminum Construction;

2.1.4.15.29 W186-M1990 (R2012) Welding of Reinforcing Bars in Reinforced Concrete Construction;

2.1.4.15.30 CSA C282 Emergency electrical power supply for buildings, 2010 edition or later;

2.1.4.15.31 CSA-C22.3 No. 1, Overhead Systems;

2.1.4.15.32 CSA C22.2 No.65, Wire Connectors;

2.1.4.15.33 CSA C22.2 No.41, Grounding and Bonding Equipment;

2.1.4.15.34 CSA C22.2 No.0.4, Bonding of Electrical Equipment;

2.1.4.15.35 CSA C22.2 No.40, Cut-out, Junction and Pull Boxes;

2.1.4.15.36 CSA C22.2 No. 45, Rigid Metal Conduit;

2.1.4.15.37 CSA C22.2 No. 56, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit;

2.1.4.15.38 CSA C22.2 No. 83, Electrical Metallic Tubing;

2.1.4.15.39 CSA C22.2 No. 211.2, Rigid PVC (Unplasticized) Conduit;

2.1.4.15.40 No. 100 0, Motors and Generators;

2.1.4.15.41 CSA C22.2 No. 145 Motors and Generators for use in Hazardous Locations;

2.1.4.15.42 CSA C22.2 No.184.1, Solid State Dimming Controls (Bi national standard with UL 1472);

2.1.4.15.43 CSA C22.2 No.58, High Voltage Isolating Switches;

2.1.4.15.44 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel;

2.1.4.15.45 CSA C9, Dry Type Transformers;

2.1.4.15.46 CSA C22.2 No. 58, High Voltage Isolating Switches;

2.1.4.15.47 CSA C22.2 No.29, Panelboards and enclosed Panelboards;

2.1.4.15.48 CSA C22.2 No.144.1, Ground Fault Circuit Interrupters;

2.1.4.16 All NFPA standards and guidelines including:

2.1.4.16.1 10-2002: Standard for Portable Fire Extinguishers;

2.1.4.16.2 13: Standard for the Installation of Sprinkler Systems;

2.1.4.16.3 14: Standard for the Installation of Standpipe System;

2.1.4.16.4 30: Flammable and Combustible Liquids Code;

2.1.4.16.5 55: Storage, Use, and Handling of Compressed and Liquefied Gases in Portable Containers;

2.1.4.16.6 90A - Current Edition: Standard for Installation of Air Conditioning and Ventilation Systems;

2.1.4.16.7 92A - Current Edition: Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences;

2.1.4.16.8 101 - Current Edition: Life Safety Code. 2.1.6.26;

2.1.4.17 All NETA standards and guidelines including:

2.1.4.17.1 ATS International Electrical Testing Association (Acceptance Testing Specifications);

2.1.4.17.2 MTS Standards for Maintenance Testing;

2.1.4.18 Master Municipal Construction Documents (MMCD) – 2009 Platinum Edition Volume II;

2.1.4.19 Master Municipal Construction Documents (MMCD) – Platinum Edition Supplementary Updates;

2.1.4.20 Fire Underwriter Survey – Water Supply for Public Fire Protection, 1999;

2.1.4.21 Sheet Metal and Air Conditioning Contractors National Association Inc. (SMACNA) Manuals;

2.1.4.22 Industrials Ventilation Manual;

2.1.4.23 Hydronic Institute Manuals;

2.1.4.24 BICSI Telecommunications Distribution Methods Manual (TDMM);

2.1.4.25 American Society of Plumbing Engineer Manuals;

2.1.4.26 Associated Air Balance Council (AABC);

2.1.4.27 CAN/CSA-B72 Installation Code for Lightning Protection Systems;

2.1.4.28 Illuminating Engineering Society of North America Lighting Handbook - Reference and Application;

2.1.4.29 Commercial Building Telecommunications Cabling Standard TIA/EIA 568-C.1-2010 Including all Addendum's and Latest Drafts for requirements of Category 6;

2.1.4.30 Commercial Building Standard For Telecommunications Pathways And Spaces TIA 569-C-2012 including addendum;

2.1.4.31 Commercial Building Grounding And Bonding Requirements For Telecommunications TIA-607-B-2011;

2.1.4.32 TIA/EIA-606-B-2012 including addendum - Administration Standard For The Telecommunications Infrastructure Of Commercial Buildings (CSA T528);

2.1.4.33 CSA/CAN3-C235, Preferred Voltage Levels for AC Systems, 0 to 50,000 V;

2.1.4.34 CAN/CSA C22.2 No. 131, Type TECK 90 Cable;

2.1.4.35 NEMA WC7 ICEA S 66 524, Cross Linked Polyethylene Wire and Cable for Transmission and Distribution;

2.1.4.36 CAN/CSA C22.2No.18, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware;

2.1.4.37 CAN/CSA C22.2 No. 18, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada;

2.1.4.38 CAN/CSA C22.1 No.126.1, Metal Cable Tray Systems;

2.1.4.39 NEMA VE 1, Metal Cable Tray Systems;

2.1.4.40 ANSI C37.121, Unit Substations Requirements;

2.1.4.41 For by pass/isolating switches refer to CSA C22.2 No.178.1, Automatic Transfer Switches;

2.1.4.42 CAN/CSA-C2, Single-Phase and Three-Phase Distribution Transformers, Types ONAN and LNAN;

2.1.4.43 IEEE C57.19.91, IEEE Standard test code for dry-type distribution and power transformers;

2.1.4.44 CAN/CSA C22.2 No.31, Switchgear Assemblies;

2.1.4.45 NEMA PB2.2, Application Guide for Ground Fault Protection Devices for Equipment;

2.1.4.46 NFPA 20, Stationary Fire Pumps for Fire Protection;

2.1.4.47 Elevator regulatory standards including:

2.1.4.47.1 ASME A17.1/ CSA B44, and CSA B44.1;

2.1.4.47.2 CSA-C22.1 - Canadian Electrical Code, Part 1, Safety Standards for Electrical Installations;

2.1.4.48 Glazing standards including:

2.1.4.48.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass;

2.1.4.48.2 ASTM C1503, Mirrors, Silvered;

2.1.4.48.3 CAN/CGSB-12. 11-M90, Wired Safety Glass;

2.1.4.49 Civil engineering standards including:

2.1.4.49.1 Fire Underwriters Survey; and

2.1.4.49.2 Canadian Standards Association (CSA).

2.2 Use of Wood

2.2.1 Use wood as a featured material in both the interior and exterior of the Building.

2.2.2 As contemplated by the *Wood First Act* (British Columbia), Project Co must incorporate wood products into the design of the Facility to the extent that the use of wood products is consistent with the requirements of this Schedule and the BC Building Code.

2.3 Rooms and Spaces

2.3.1 Project Co must design and construct the Facility:

2.3.1.1 so that it accommodates all of the spaces, activities, functions, design features and adjacencies described in the Appendix 3A - Functional Space Requirements;

2.3.1.2 in accordance with the requirements of the Appendix 3A - Functional Space Requirements subject to any adjustments or refinements made in accordance with the User Consultation Process and the Design Review Procedure; and

2.3.1.3 if the net square meter area for any room is more than 2% smaller than the required area listed in the Functional Space Requirements, Project Co must provide a rationale for each variation and demonstrate to the Province's satisfaction that affected rooms retain their functionality. If, in the Province's opinion, the room does not meet the required functionality, the full net square metres must be provided as stated in the Functional Space Requirements.

2.3.2 Notwithstanding anything in the Functional Space Requirements, Project Co must design and construct the Facility to include all rooms and spaces as required to comply with the terms of this Agreement, including sufficient rooms and spaces as necessary for the operation and maintenance of the Facility and for Project Co to perform the Services in accordance with this Agreement. Spaces provided for operations, maintenance and other facility maintenance requirements must not impact program function or public and staff access to the Facility

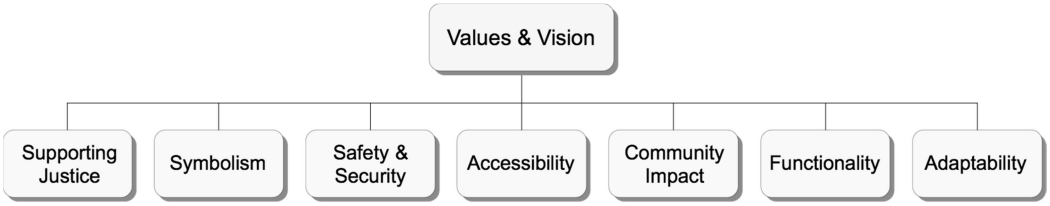
2.4 Processes and Submittals

2.4.1 For all requirements for the User Consultation Process and Review Procedure including shop drawings, commissioning requirements, demonstrations, training, and mock-ups, refer to Schedule 2 and its associated appendices.

3. DESIGN PRINCIPLES AND OBJECTIVES

3.1 Design Values and Vision

The Facility must meet the Province's values and vision as set out below:



3.1.1 Supporting Justice

3.1.1.1 A law courts facility is not simply an office building with courtrooms. It is a unique environment of dichotomies. There is the need to calm tense human emotion while at the same time maintain respect for the justice system. It must achieve a sense of equality and fairness - while acknowledging hierarchy. From the time of entering the Facility to leaving the Facility, the design must successfully manage these objectives.

3.1.2 Symbolism

3.1.2.1 The exterior of the building must relay a sense of dignity without being intimidating, and appropriately fit into the existing neighbourhood fabric. The interior, through its welcoming openness, must espouse the goals of supporting justice as defined in Section 3.1.1.

3.1.3 Safety and Security

3.1.3.1 The sense of feeling safe and secure for each and every person impacted by the Facility is a paramount objective. This is more than simply an internal building requirement. Starting at the Site boundaries, it must extend from the initial point of arrival or departure, be it by vehicular or pedestrian means, at any time of the day or night.

3.1.4 Accessibility

3.1.4.1 Public accessibility requires that the building is easy to navigate via clear and simple wayfinding systems, supported by additional guidance that is easy to obtain if needed. Site access and internal building movement must accommodate people with physical disabilities.

3.1.5 Community Impact

3.1.5.1 The Facility must generate a positive impact for the surrounding neighbourhood that contains institutional, commercial and residential uses. The design of hard and soft landscaped zones must impact this objective. It must also be achieved by means of the effective location of the Building and the Parkade, to minimize the resultant traffic patterns established.

3.1.6 Functionality

3.1.6.1 This is a universal objective that is relevant for the efficiency of all programmed areas of the Facility. However, courtroom design is to be considered on the highest of levels dealing with achieving optimal lines of sight, physical comfort (lighting, HVAC, ergonomics, acoustics) with reliable IMIT systems/support and integration.

3.1.7 Adaptability

3.1.7.1 Spaces within the Building must be provided that can be reconfigured and/or repurposed as may be required in a cost-efficient and effective manner. It is important that the Building demonstrate adaptability for evolving trends in the justice system and future courtroom technologies.

3.2 Design Objectives

3.2.1 Design Introduction

The intent of this Section 3.2 is to facilitate design excellence and establish the basis for an integrated and responsive design process. Project Co must provide a design that fulfills the aesthetic, experiential and technical aspirations of the Province.

The Province requires:

3.2.1.1 A Facility with quality working and public environments, reflective of the Province's identity as a symbol of justice, peace and a genuine respect for people and the rule of law.

3.2.1.2 A Facility that reflects optimum and rigorous architectural and urban design concepts within its regional context. The Facility must be an imaginative and timeless architectural interpretation of justice that conveys a message of social openness, equality and accessibility for those who use the Facility.

3.2.1.3 A Facility that meets the Province's functional, aesthetic and performance goals, from both a quantitative and qualitative perspective. The Facility must incorporate appropriate, durable and flexible architectural, structural mechanical, electrical and technological systems designs.

3.2.1.4 The Facility design must be responsive to Site characteristics and opportunities as well as climatic conditions, and must maximize provisions for environmental sustainability.

3.2.1.5 A design process ensuring that Facility Users are meaningfully engaged throughout in the evolution of the design following the Effective Date.

3.2.1.6 The Building must support future expansion of components, and capacity as a whole, including planning zones for growth, loose fit design to optimize functionality within a given floor area, and multi-use adaptable space.

3.2.1.7 The Facility must provide for integrated and adaptive technology including high-performing, upgradable and innovative technology for telecommunications infrastructure, wireless access, audio visual infrastructure and security infrastructure.

3.2.1.8 The Building must create a comfortable environment for the users including: quality thermal and ventilation conditions, safe materials, necessary acoustic and vibration separation between various functions supported by ergonomic furnishings.

3.2.1.9 The Building design must demonstrate the ability to add two new courtrooms in the future, with supporting program elements shown to be capable of meeting expansion demands. Expansion capabilities must include options for both Provincial and Supreme Courtrooms.

3.2.2 Robustness

The nature of operating a courthouse creates a higher instance of wear and tear, as well as Malicious Damage, than would be expected for other types of institutional facilities, therefore, Project Co must:

3.2.2.1 in its design, maximize the Facility's sustainability and resistance to damage through the Design and Construction while not impacting the requirements of the aesthetic, experiential and technical aspirations of the Province; and

3.2.2.2 provide a robust Facility that is designed and constructed to minimize the impact of damage resulting from the malicious, intentional, willful, negligent and careless conduct of Facility Users, visitors and others.

3.3 Operational Sustainability

3.3.1 The Building must be designed to accommodate program, service, work and equipment changes with minimized utility infrastructure and Facility impact.

3.3.2 The Facility must be designed with an infrastructure that allows for upgrades and future flexibility in Province technology or technological progression.

3.3.3 The Facility must be designed with the most up to date display technologies available at the time throughout the Facility as required.

3.3.4 The Design Life requirement is a minimum 75 year building starting at the date of Service Commencement.

3.3.5 In addition to the requirement to achieve LEED® Gold Certification for the Building in accordance with the terms of this Agreement, Project Co must:

3.3.5.1 Design and construct the Facility using design methods, building materials, operational practices, energy and life cycle considerations that promote environmental quality, social benefits and economic vitality throughout the Construction Period and the Operating Period, including by minimizing the Province’s operating costs (for example in relation to utilities and carbon taxes).

3.3.5.2 Apply a total systems approach to minimize energy consumption and incorporate Energy Consumption management techniques that are targeted to stabilize and optimize energy flows.

3.4 Design Sustainability

3.4.1 Integrated Design Process

3.4.1.1 Project Co must incorporate an Integrated Design Process into the overall Project delivery process to eliminate conflicting design elements and to optimize Facility performance. The Integrated Design Process must be a highly collaborative approach that incorporates stakeholder groups, designers and engineers and that merges the Project's aesthetic and technical requirements.

3.4.2 Passive Design

3.4.2.1 Project Co must utilize passive design principles to guide the design of the Building to maximize occupant health and comfort and minimize energy use by relying less on mechanical and electrical systems. Project Co must optimize the building form and thermal performance of building elements (including architectural, structural, envelope and passive mechanical) for interaction with the local microclimate.

3.4.3 Passive Design Elements

3.4.3.1 For optimizing site orientation of the Building, Project Co must:

3.4.3.1.1 design the building facades so that the south facade takes advantage of passive solar heating during winter and reduce overheating in the summer; and

3.4.3.1.2 design the building facades to reduce the unwanted heat loss through the north façade.

3.4.3.2 Landscape Considerations

3.4.3.2.1 Project Co must use mature, native vegetation and landscape features to reduce ambient temperatures and reduce the heat island effect of the Facility, protect the building from sun, wind and precipitation, and reduce solar intensity.

3.4.3.3 Space Planning

3.4.3.3.1 Project Co must match unique programmatic space requirements with building orientation and massing to decrease energy use and increase thermal comfort; and

3.4.3.3.2 Project Co must place building functions with particular thermal requirements in areas of the building that can provide those conditions without mechanical intervention.

3.4.3.4 Buffer Spaces

3.4.3.4.1 Project Co must, as required, use buffer spaces, such as double facades and sunspaces located along the building perimeter, to improve building energy performance by widening the range of outdoor temperatures in which thermal comfort can be maintained in the building with low mechanical energy consumption.

3.4.3.4.2 Project Co must integrate occupied buffer spaces as transition spaces to capitalize on the wider thermal comfort range in spaces like corridors and entryways, as opposed to other, more tightly conditioned spaces such as lab or office areas.

3.4.3.4.3 Project Co must incorporate entryway vestibules into the Building design maintained at wider thermal comfort ranges, helping to reduce the mechanical system energy consumption by limiting the loss of heated air during winter and cooled air during summer.

3.4.3.5 Windows

3.4.3.5.1 Project Co must design the Building's windows to achieve the optimal combination of heating, cooling and daylighting.

3.4.3.5.2 Project Co must, for any areas that exceed window to wall area ratios of 50% (including floor-to-ceiling glass), demonstrate that comfort and energy performance targets are met despite large amounts of glass.

3.4.3.6 Solar Shading

3.4.3.6.1 Project Co must use external shading devices on the south and west façades to intercept, absorb and/or reflect solar radiation before it reaches the exterior glazed surface of the Building envelope.

3.4.3.6.2 Project Co must design shading devices to their particular facade orientation and to be able to provide the appropriate performance to meet both winter heating and summer shading/cooling requirements.

3.4.3.6.3 Project Co must provide means for window washing and maintenance.

3.4.3.7 Air and Moisture Tightness

3.4.3.7.1 Project Co must use an air- and moisture-tight Building envelope to eliminate unwanted air and moisture infiltration.

3.4.3.7.2 Project Co must design the Facility to increase air-tightness and reduce infiltration to increase the envelope performance.

3.4.4 Passive Design Strategies

3.4.4.1 Project Co must demonstrate the consideration of the following passive building design strategies to ensure inherent synergies produce optimal comfort and building energy performance. Where passive design strategies have not been utilized

3.4.4.1.1 Passive Heating

3.4.4.1.1.1 Project Co must harness solar radiation and capture internal heat gains to add free thermal energy to the building.

3.4.4.1.1.2 Project Co must provide passive solar heating strategies and a well-insulated envelope to minimize energy losses and harness and store solar gains.

3.4.4.1.2 Passive Ventilation

3.4.4.1.2.1 Project Co must incorporate passive ventilation strategies into the Facility design to take advantage of naturally occurring airflow patterns around and in the building to introduce outdoor air into the interior spaces.

3.4.4.1.2.2 Project Co must incorporate induced ventilation strategies by means of high spaces, such as atria, stacks and wind towers, to provide adequate ventilation by passive means.

3.4.4.1.3 Passive Cooling

3.4.4.1.3.1 Project Co must use passive cooling strategies to prevent the building from overheating by blocking solar gains and removing internal heat gains.

3.4.4.1.3.2 Project Co must couple passive cooling strategies with passive ventilation strategies, such that the cooling function must be achieved by increased passive ventilation airflow rates during periods when the outdoor air temperature is low enough to flush heat from the building.

3.4.4.1.4 Daylighting

3.4.4.1.4.1 Project Co must reduce the need for artificial electric lighting by distribution of natural diffused daylight throughout the building's interior. Where specified in the Room Data Sheets, Clerestory windows may provide either direct natural light or borrowed natural light.

4. SITE DEVELOPMENT REQUIREMENTS

4.1 Urban Design and Site Development

4.1.1 Open Space Design Objectives

4.1.1.1 The public realm vision for the Facility is dignified and welcoming. It must create community identity, and effectively fit within its context while reinforcing and reinvigorating the existing Civic Precinct.

4.1.1.2 The public realm must embrace both the ceremonial Veterans Way and the Civic Precinct areas, creating opportunities for a south facing 'urban room'. It must announce the southeast corner as the Site entry, animate the streetscape and building edges, and allow for natural overlook around the Facility all hours of the day.

4.1.1.3 The public realm must be highly permeable and interconnected encouraging pedestrian, cyclist, and wheelchair mobility. It must serve as a bridge between the Civic Precinct to the west and the broader residential and commercial activities to the east.

4.1.2 Public Realm and Open Space

4.1.2.1 The public realm design must:

4.1.2.1.1 Maximize public benefit, encourage social interaction, and achieve overall project vision and design principles.

4.1.2.1.2 Seamlessly integrate with the Facility, embrace the Civic Precinct, and connect existing offsite pathways.

4.1.2.1.3 Create a hierarchy and variety of restful and safe outdoor gathering places including:

4.1.2.1.3.1 public open spaces;

4.1.2.1.3.2 semi–public spaces;

4.1.2.1.3.3 separate private open spaces for judiciary and staff;

4.1.2.1.3.4 semi-private open spaces for staff and visitors; and

4.1.2.1.3.5 accessible rooftops and balconies.

4.1.2.1.4 Demonstrate flexibility to facilitate small and larger gatherings, and accommodate nighttime use.

4.1.2.1.5 Provide a legible, high quality and consistent material and finishing treatment to achieve an integrated and unified built environment.

4.1.2.1.6 Be integrated with the Public Art implementation strategy as outlined in Section 4.1.14.

4.1.2.1.7 Acknowledge sustainability, respond to microclimatic site conditions.

4.1.2.1.8 Be integrated with an intuitive signage and wayfinding system.

4.1.3 Streetscapes

4.1.3.1 Trethewey Street

4.1.3.1.1 Trethewey Street is a north-south collector linking the Clearbrook Commercial Centre to the Abbotsford Exhibition Park. The current condition is automobile oriented and uninviting for pedestrian use.

4.1.3.1.2 The proposed streetscape and boulevard design must repurpose this zone to benefit and animate the public realm, and re-establish a civic presence and scale, both day and night. This must be coordinated with municipal objectives and requirements.

4.1.3.2 Veterans Way

4.1.3.2.1 Veterans Way is a ceremonial east-west route and is recognized for defining the sense of arrival to the Civic Precinct. The existing condition is defined by a pedestrianized boulevard and street, Thunderbird Square central paving motif, and significant existing tree canopy.

The proposed streetscape and boulevard design must repurpose this block to benefit and animate the public realm, while enhancing a civic presence and scale, both day and night.

The existing treed boulevard is to be retained and become an integral part of the public realm design.

It is the intent that the Facility will have a Veterans Way civic address.

4.1.4 Pedestrian Movement and Accessibility

4.1.4.1 The public realm must clearly, effectively and safely link all key pedestrian connections from the Facility (including the Parkade) with the existing Civic Precinct destinations:

4.1.4.1.1 the main entry of the Building;

4.1.4.1.2 the existing library main entry;

4.1.4.1.3 the entry to the University of the Fraser Valley premises;

4.1.4.1.4 the existing civic plaza; and

4.1.4.1.5 all municipal sidewalks, pathways and cycling routes.

4.1.4.2 The mobility strategy must:

4.1.4.2.1 be graceful, safe, barrier free and prioritize pedestrian and wheelchair accessible routes throughout;

4.1.4.2.2 compliment and integrate with the public realm lighting, hardscape, softscape and site wayfinding concept;

4.1.4.2.3 provide surfaces suitable and durable for the intended uses and functions;

4.1.4.2.4 encourage sustainable and alternative modes of transportation;

4.1.4.2.5 increase overall Site access and ability to navigate the Site;

4.1.4.2.6 provide for natural surveillance in accordance with CPTED principles; and

4.1.4.2.7 provide measures that create safe and secure pedestrian access to and from the Parkade at all times of the day or night.

4.1.5 Vehicular Movement and Access/Egress

4.1.5.1 General Objectives

4.1.5.1.1 Minimize vehicular traffic and pedestrian conflict throughout the Site.

4.1.5.1.2 The design must functionally separate public vehicles from service vehicles, judiciary access and accused holding areas.

4.1.5.1.3 Traffic calming measures and shared pedestrian routes must visually integrate with public realm design, use materials and markings that safely unify and designate routes, and allow wheelchair accessible passage.

4.1.5.1.4 Provide drop off and pick up near main entrance.

4.1.5.1.5 Design layout and materials must compliment the public realm concept, integrate water management, soft landscape, and sustainability strategies.

4.1.5.1.6 Pavement materials must function for the intended uses while meeting durability, longevity, and required maintenance requirements.

4.1.5.2 Parkade

4.1.5.2.1 Vehicular routes must be clear and intuitive when arriving to, leaving from and within the Parkade.

4.1.5.2.2 The placement of stairs and elevators must provide a clear, safe and intuitive link to the elements as described in Section 4.1.4.1.

4.1.5.2.3 Provide measures that create safe and secure pedestrian access to and within the Parkade at all times of the day or night.

4.1.5.3 Private Underground Parking and Sally Port

4.1.5.3.1 Vehicular access and egress must be achieved in an efficient, discrete and highly secure manner.

4.1.5.4 Bicycles

4.1.5.4.1 Provide secure Class A (indoor secure) storage with convenient access to shower and change facilities.

4.1.5.4.2 Provide Class B (outdoor) bicycle storage that is weather protected and in the vicinity of front door.

4.1.5.4.3 Class B bike rack design must be consistent with public realm design and site furnishing objectives.

4.1.5.4.4 Quantity of bicycle storage must minimally meet City and LEED® requirements.

4.1.6 Main Entry Plaza

4.1.6.1 A south-facing Plaza or ‘urban room’ is at the core of the public realm design, anchoring the Facility, while embracing the southeast corner of the Site, and reinvigorating the Civic Precinct.

4.1.6.2 As a civic and public open space, the plaza must function as a focal point and stage for daily events while also providing:

4.1.6.2.1 qualities of both prospect and refuge, providing opportunities for rest and reflection;

4.1.6.2.2 a variety of sitting choices;

4.1.6.2.3 flexibility in accommodating small and larger public and social interaction;

4.1.6.2.4 clear and legible connection to public lobby/reception space and orientation to interior public spaces;

4.1.6.2.5 a minimum of three (3) flagpoles purposefully located in relation to the Building; and

4.1.6.2.6 a materials palette, surfacing, and soft landscape treatment to accommodate civic use, and function, reinforce the sense of place and relay the sense of purpose of the Facility.

4.1.7 Building Entries and Exits

4.1.7.1 Ensure the main public entry is intuitive and welcoming, visible from both Trethewey Street and Veterans Way, and integral with the public realm and Facility design.

4.1.7.2 Public and staff access points to the Building must provide:

4.1.7.2.1 covered, weather protected forecourts for public entrances or protected from the elements through canopies or building overhang;

4.1.7.2.2 architectural definition to communicate their appropriate hierarchy of importance and/or security needs;

4.1.7.2.3 entrance vestibules with transparency from the exterior and from the interior immediately in front of the vestibule;

4.1.7.2.4 entrance vestibules configured and sized to preserve the airlock effect for climate control in conformance with LEED® requirements;

4.1.7.2.5 provisions for adequate distance between any sets of doors to allow for accessibility; and

4.1.7.2.6 automated entry and exit activated by accessible push-button controls located on the inside and outside of both sets of doors.

4.1.8 Tree Retention and Replacement

4.1.8.1 A tree management plan must be prepared by certified arborist, identifying retention protection, and replacement strategy.

4.1.9 Soft Landscaping and Planting

4.1.9.1 The Site planting design and rationale must be integrated with the public realm vision and Facility design. The overall Site planting approach must:

4.1.9.1.1 acknowledge the Site and spatial program, integrated with and expressive of the Facility and overall project identity;

4.1.9.1.2 develop a coordinated streetscape planting plan that unifies the street wall effect and urban character, supportive of a civic facility in the Civic Precinct;

4.1.9.1.3 provide sizes and type of plant materials appropriate for use, function, effect, and suitability to climate;

4.1.9.1.4 provide for full seasonal interest and supportive of avian habitat;

4.1.9.1.5 provide grow media depth and installation methods supportive of intended plant health and suitable to the type of locations outlined in design;

4.1.9.1.6 implement a program which minimizes the use of potable water, chemicals and fossil fuel use for routine maintenance;

4.1.9.1.7 landscape all areas not built upon or used for parking, loading or storage, which are to be consistent within the spirit of the overall Facility design and not to be considered leftover space;

4.1.9.1.8 allow for natural surveillance with plantings not exceeding 50cm in height next to walkways and or vehicular crossings;

4.1.9.1.9 provide exterior rated power and water supply to all exterior accessible public spaces, including accessible rooftop areas; and

4.1.9.1.10 provide a diverse range of flowering perennials, grasses and shrubs.

4.1.9.2 Roofdeck Planting

4.1.9.2.1 Provide opportunity for staff access, energy recovery, and to support pollinator and aviary habitat.

4.1.9.2.2 Ensure rooftop planting is visually appealing year round.

4.1.9.2.3 Ensure planting design minimizes potable water for irrigation requirements.

4.1.9.2.4 Include provisions for assemblies to support areas of extensive and intensive vegetative landscape complete with growing medium, structural support and drainage to meet the requirements of this Schedule.

4.1.9.2.5 Provide a diverse range of flowering perennials, grasses and shrubs.

4.1.10 Hardscape, Surfacing and Furnishings

4.1.10.1 Project Co must provide a coordinated and unified design for all exterior ground plane and roof deck areas. Finishes, surfacing, and furnishings to achieve an integrated high quality exterior environment. Materials must be selected on the basis of:

4.1.10.1.1 creating an identity that meets the requirements of the public realm vision and design principles;

4.1.10.1.2 a design that compliments and unifies the Facility image;

4.1.10.1.3 providing the functions for intended use and is flexible for site program requirements regarding flexibility for various sizes of public gatherings;

4.1.10.1.4 providing comfort, durability, longevity, adaptability, and low maintenance;

4.1.10.1.5 accommodating secure and aesthetically pleasing recycling and refuse enclosures near public entrances;

4.1.10.1.6 exterior surfaces that provide full accessibility and associated universal access requirements; and

4.1.10.1.7 a design that does not encourage the use of skateboards.

4.1.11 Exterior Lighting

4.1.11.1 Provide an expressive lighting design integrated throughout the public realm highlighting site structures and features, plantings, while also defining and supporting wayfinding, access, and circulation routes.

4.1.11.2 The lighting design must:

4.1.11.2.1 provide lighting fixtures and luminaire chosen for visual comfort, quality of light, and design supportive of the public realm vision;

4.1.11.2.2 include the boulevard and streetscape treatment and be complimentary to the overall site lighting concept and rationale;

4.1.11.2.3 provide LED luminaires in the CRI range of 3000-4000 Kelvin, exterior rated, dimmable, and with time clock photocell controller;

4.1.11.2.4 comply with LEED® requirements and prevent light spillage into neighbouring and adjacent sites; and

4.1.11.2.5 be durable and vandal resistant and within reach for maintenance purposes.

4.1.12 Screening, Fencing, and Walls

4.1.12.1 Where required to keep the Facility inaccessible to the public, screen views, or to retain site grading, the design material type, form, and height must respond to the following:

4.1.12.1.1 demonstrate functional and visual integration with the public realm design and architectural concept;

4.1.12.1.2 be appropriate for the level of screening, privacy and security required, or to retain site grading;

4.1.12.1.3 be integrated with the overall project design principles; and

4.1.12.1.4 inhibit graffiti and, when required, allows for easy cleaning.

4.1.13 Security Requirements

4.1.13.1 Provide Site protection barriers for the Facility where required to keep the Facility secure or inaccessible to the public. The design material type, form, and height must respond to the following:

4.1.13.1.1 creates a line of vehicular deterrence at the main entry of the Building;

4.1.13.1.2 uses materials and forms that are visually and functionally integrated with the public realm treatment; and

4.1.13.1.3 does not make obvious the security purposes of the barriers.

4.1.13.2 Incorporate principles of Crime Prevention through Environmental Design (CPTED) throughout all exterior zones within the Site boundaries.

4.1.13.3 Where exterior site security camera coverage is required, discretely position units so that they do not interfere with sightlines due to external foliage.

4.1.13.4 Maintain a minimum 2m clear (no landscaping) zone around the entire Building perimeter that shall be fully monitored by CCTV and motion detectors.

4.1.13.5 Where unprotected openings at grade with a sill height of less than 61cm (24”) are present, external barriers will be provided in accordance with Schedule 3, Section 4.1.13 – Security Requirements.

4.1.13.6 Unprotected openings at grade with a sill height of 61cm (24”) or higher will be constructed of minimum of 20cm (8”) reinforced concrete or equivalent to be accepted in advance by the Province.

4.1.14 Public Art

4.1.14.1 A Public Art plan must be developed, implemented and delivered by Project Co. It is anticipated that a committee will be established for this purpose comprised of municipal representatives, local residents, Project Co representatives and Provincial representatives. The Province will own all Public Art.

4.1.14.2 Representatives from the Province will be solely responsible for approval of the plan adopted and will be solely responsible for decisions rendered regarding the type of art and installation location(s).

4.1.14.3 The Public Art plan will express and represent the objectives as described in Section 3.1 – Design Values and Vision.

4.1.14.4 Project Co will be responsible for:

4.1.14.4.1 implementing the Public Art plan; and

4.1.14.4.2 the procurement and installation of Public Art.

4.1.14.5 Within 60 days after the Effective Date, Project Co must provide a Public Art plan demonstrating how Public Art will be implemented and delivered for review and approval by the Province.

5. BUILDING DESIGN REQUIREMENTS

5.1 Adaptability and Flexibility

5.1.1 Project Co must:

5.1.1.1 provide a design layout that will accommodate changes to uses and functions in the Building with minimal required changes to the Building’s structure, Building Systems and impact to program operations;

5.1.1.2 utilize Building Systems and components that facilitate changes in the Building configuration and changes in servicing;

5.1.1.3 accommodate program, service, work and equipment changes with minimized utility infrastructure and Building impact, including downtime, e.g., during fit-out of shelled space or equipment installation;

5.1.1.4 locate permanent building elements, such as stairs, elevators and duct shafts, to minimize constraints on changes to the Building;

5.1.1.5 minimize interior columns for ease of planning and re-planning of program areas;

5.1.1.6 ensure that columns do not impact the functionality and intended use of a room and or area;

5.1.1.7 ensure that shear walls are located on the perimeter of the Building or adjacent to service cores to minimize impact on interior spaces;

5.1.1.8 provide adaptability and flexibility for rooms and areas affecting the placement of furniture and equipment;

5.1.1.9 standardize the design and layout of recurrent room types;

5.1.1.10 provide a minimum 20% excess capacity in vertical (and horizontal) distribution shafts and plenums to accommodate service system improvements, new equipment and future technologies;

5.1.1.11 accommodate the vertical and horizontal distribution of electrical and mechanical services to allow maintenance and changes to occur with no interruptions to courthouse operations, particularly where the need for service flexibility is highest;

5.1.1.12 provide building service systems and operations designed to minimize service disruptions to areas adjacent to building maintenance areas; and

5.1.1.13 provide a system of raceways for cable and fibre optic connections below and above each courtroom for future equipment. Identify/provide areas for coring and/or rough-in conduits through slabs as required.

5.2 Building Expandability

5.2.1 To support future expansion of the Building, and capacity as a whole, Project Co must provide a loose fit design to optimize functionality within a given floor area, and multi-use adaptable space. Provide floor zoning that allows for expansion of programs or services.

5.2.2 Provide an infrastructure that incorporates excess systems capacity and includes systems and components that support future expansion with minimized disruption and allows for upgrades in technology or technological progression.

5.2.3 Provide mechanical ventilation, including shaft requirements, to accommodate future use and equipment.

5.2.4 Provide sufficient mechanical, electrical and communications services to accommodate future uses and equipment.

5.3 Architecture

5.3.1 Facility Form and Character

5.3.1.1 The Facility must embody the following design principles:

5.3.1.1.1 The Building must relay a public image representing justice, peace and genuine respect for people.

5.3.1.1.2 The Building must be articulated to break down its scale, utilizing components such as glazing, canopy and shading systems, varying cladding patterns/design and exposed structural elements.

5.3.1.1.3 Glazing which allows visibility into the exit stair zones must be used for security and safety purposes, without creating a source of light pollution for residential neighbours. This includes the Parkade.

5.3.1.1.4 All roof top mechanical/electrical equipment must be screened and incorporated in architectural elements.

5.3.1.1.5 Where retaining walls are required, they must be consistent in materials, finish and quality to that of the Facility.

5.3.1.2 Exterior Facility Materials and Colour

5.3.1.2.1 The design must incorporate materials to create a distinct character appropriate to the function of the Building. Accordingly the material palette must:

5.3.1.2.1.1 promote variation and articulation of the exterior through selective use of materials;

5.3.1.2.1.2 avoid extensive unbroken exterior wall areas;

5.3.1.2.1.3 reinforce the recognition of the primary entry to the Building; and

5.3.1.2.1.4 be durable and appropriate to the character of the area.

5.3.1.2.2 Unacceptable materials include stucco, vinyl siding, large expanses of concrete and neon lighting.

5.3.1.2.3 Facade transparency and views into public zones must be provided, especially at grade levels and large public waiting areas.

5.3.1.2.4 Staff working areas at grade levels around the perimeter of the Building must have suitable daylighting, but must be safeguarded from public view by means achieving this objective during both day and night working conditions.

5.3.1.2.5 Glazing at grade areas must incorporate deterrents to breakage and forced entry such as tempered glass, film applications or laminated glass, suitable to the condition present.

5.3.1.3 Access to Daylight and Views

5.3.1.3.1 Building design must address access to daylight and views by:

5.3.1.3.1.1 the arrangement of circulation routes and occupied spaces to maximize opportunities for windows;

5.3.1.3.1.2 the careful selection of window size and placement consistent with the space use;

5.3.1.3.1.3 the inclusion of windows, of the largest possible size consistent with project sustainability and space use objectives;

5.3.1.3.1.4 the provision of skylights, with appropriate glare protection, where windows are not possible or suitable; and

5.3.1.3.1.5 the provision of door sidelights and glazing in doors to increase daylight within spaces.

5.3.1.3.2 Provide the following minimum requirements for access to daylight and views:

5.3.1.3.2.1 all principal horizontal public circulation routes must include natural lighting strategies and access to views in the form of windows or skylights;

5.3.1.3.2.2 glazed doors at entrances to exterior accessible roof areas; and

5.3.1.3.2.3 windows in corridors located on the perimeter of the Building.

5.3.1.3.3 Provide glare control and minimize heat gain with the provision of sun shades and other solar control measures at windows as required.

5.3.1.4 Roofs

5.3.1.4.1 Landscaping and other “green” treatments of roof areas not intended for future expansion are encouraged, including provision of useable outdoor open spaces.

5.3.1.4.2 Where not landscaped, roof areas must be designed to be attractive when viewed from above and must avoid use of large areas of undifferentiated gravel.

5.3.1.4.3 All roofs are to be accessible by maintenance staff. Ensure design incorporates all safety requirements required by the BC Building Code and Work Safe BC.

5.3.2 Building Configuration and Internal Circulation

5.3.2.1 Building Entrances

5.3.2.1.1 There must be a single main point of entry/control to the Building for public access.

5.3.2.1.2 All direct entries into the Building from the exterior must be protected from snow and rain by canopies or building overhangs.

5.3.2.1.3 Provide visible, easily accessible and safe places to sit near the main public entrance.

5.3.2.1.4 The design of the main entrance must instill a calm and respectful impression.

5.3.2.1.5 The main entrance vestibule(s) must provide complete transparency from the exterior, from the interior immediately in front of the vestibule, and from spaces adjacent to sides of the vestibule.

5.3.2.1.6 Entrance vestibules must be configured and sized such that only one set of doors must open at one time in order to preserve the airlock effect for climate control. No rotating doors are permitted.

5.3.2.1.7 Provide automatic doors at all public entrances and exits to the Building and to departments. Doors must be configured for push-pull manual operation in addition to automatic operation.

5.3.2.1.8 Visitor comfort at entries must be provided through specifically designed seating, signage, lighting and features that relay the Building's use.

5.3.2.1.9 The following access conditions to and from the main entry/vestibule are to be provided:

5.3.2.1.9.1 The Justice Access Centre is to have a clear, direct internal connection capable of accommodating after-hour visitors.

5.3.2.1.9.2 Community Corrections must have clear and direct internal access during regular business hours. For after-hours use a separate exterior entry/exit must be available.

5.3.2.1.9.3 The Judiciary and Crown Counsel must have 24/7 access, to be card controlled.

5.3.2.1.9.4 Lawyers must have 24/7 access to the library and counsel services, to be card controlled.

5.3.2.1.9.5 For in-custody accused/offender release purposes, ease of access from the Accused Holding zone to Community Corrections must be maintained.

5.3.2.1.10 The highest volume of visitors to the Facility is expected to occur at the connection from the Parkade to the main public entry. Access at this level must be accessible and avoid the use of ramps.

5.3.2.1.11 A discrete, private pedestrian entrance (B24) from the exterior of the Building for Court staff must be provided on the ground floor away from all other vehicular and pedestrian access points. It should not be concealed so as to create security concerns or be mistaken as a public entrance and must be directly connected to the restricted circulation system.

5.3.2.2 Exit Stairs

5.3.2.2.1 Locate exit stairs strategically for the convenience of staff and visitors to promote the use of stairs over elevators.

5.3.2.2.2 Avoid stair locations that negatively impact planning flexibility.

5.3.2.2.3 Provide day lighting and views from stairwells for orientation and amenity, and provide adequate lighting into stairwells for security at night. This includes exit stairs in the Parkade.

5.3.2.2.4 Wherever possible, provide glazed exterior walls maximizing views to and from all exit stairwells.

5.3.2.2.5 Provide access to exit stairs for all restricted judicial corridors and program areas so that public and judiciary need not converge in an emergency situation.

5.3.2.3 Convenience Stairs

5.3.2.3.1 Provide convenience stairs where appropriate, located strategically to reduce elevator use by staff and visitors. Use unenclosed stairs where possible.

5.3.2.3.2 Convenience stairs must have finishes similar to the floor levels they serve.

5.3.2.4 Safety of Stairs

5.3.2.4.1 Provide stairwells that do not allow for individuals to hide in the landing areas.

5.3.2.5 Corridors

5.3.2.5.1 The following minimum corridor widths must be maintained as follows:

5.3.2.5.1.1 Accused Holding zone – 1830mm (6’-0”).

5.3.2.5.1.2 Judiciary zone including corridor access to courtrooms – 1524mm (5-0”).

5.3.2.5.2 Design corridor ceiling space to accommodate mechanical and electrical services.

5.3.2.5.3 Design corridors to be level wherever possible. Where ramps are required, minimize the slope to the greatest extent possible.

5.3.3 Acoustics and Noise Control

5.3.3.1 Design and construct the Building in consultation with a consultant in acoustics and noise control.

5.3.3.2 Design and construct the Building to comply, at a minimum, with the requirements described in Appendix 3B – Acoustics and Noise Control.

5.3.3.3 Provide acoustic and noise measures necessary to create a safe and comfortable environment for users while providing for required levels of confidentiality where appropriate.

5.3.3.4 Appropriate acoustic and noise control measures must be considered to meet the functional requirements of the space by:

5.3.3.4.1 attenuation of sound within public, user and staff environments;

5.3.3.4.2 sound isolation between the exterior and interior spaces;

5.3.3.4.3 sound isolation between interior spaces within the Building at both horizontal and vertical separations;

5.3.3.4.4 sound and vibration isolation of building service noises and sound isolation of Building service rooms;

5.3.3.4.5 sound isolation as required for specialty rooms such as videoconferencing;

5.3.3.4.6 sound attenuation of noise from equipment within rooms; and

5.3.3.4.7 sound masking systems referred to in Appendix 3B – Acoustics and Noise Control.

5.3.3.5 Optimum sound isolation requires that the integrity of gypsum board partitions and ceilings (mass) never be violated by vent or grille cut-outs or by recessed cabinets, light fixtures, etc.

5.3.3.6 Where penetrations are necessary, minimize placing them back-to-back and next to each other. Stagger electrical boxes by at least one stud space. Use mineral fibre insulation to seal joints around all cut-outs such as electrical, TV and telephone outlets, plumbing escutcheons, recessed cabinets, and similar conditions.

5.3.3.7 Minimize constructions such as ducts, rigid conduits, or corridors that act as tubes to transmit sound from one area to another. At common supply and return ducts, provide sound attenuation liners at the diffuser and/or grill to maintain the acoustical requirements described in Appendix 3B – Acoustics and Noise Control. Seal around conduits.

5.3.3.8 Isolate structure-borne vibrations and sound with resilient mountings on vibrating equipment to minimize sound transfer to structural materials. Provide ducts, pipes, and conduits with resilient, non-rigid boots or flexible couplings where they leave vibrating equipment; isolate from the structure with resilient gaskets and sealant where they pass through walls, floors, or other building surfaces.

5.3.3.9 Use acoustic screens, vibration isolators, and carefully selected exterior equipment to prevent exterior noise that neighbours may find offensive.

5.3.4 Building Envelope

5.3.4.1 Complete the Design and Construction so as to prevent the accumulation and stagnation of rain, snow, ice and dirt on the horizontal and vertical surfaces of the building envelope(s) appropriate for the climate the Building is situated in.

5.3.4.2 Design exterior walls in accordance with the 'rain-screen principles' as described by the CMHC document "The Rain Screen Wall System". Include a continuous air space of minimum 25 mm clear width that has:

5.3.4.2.1 a predicted service life that exceeds 50 years as defined in CSA S478-95:

5.3.4.2.1.1 for components and assemblies whose categories of failure are 6,7,or 8 in Table 3 in CSA S478-95, use a design service life equal to the design service for the Building;

5.3.4.2.1.2 for components and assemblies whose categories of failure are 4 or 5 in Table 3 in CSA S478-95, use a design service life equal to at least half of the design service life of the Building; and

5.3.4.2.1.3 where component and assembly design service lives are shorter than the design service life of the Building, design and construct so they can be readily replaced.

5.3.4.3 Ensure continuation of the air barrier, vapour barrier, thermal barrier and rain barrier across the entire envelope including foundations, walls and roofs.

5.3.4.4 Below grade assembly must resist the ingress of water.

5.3.4.5 Design Building envelope details to avoid thermal bridging.

5.3.4.6 Include design features which control unwanted solar gain and glare.

5.3.5 Interior Walls and Partitions

5.3.5.1 Use interior walls and partition systems that:

5.3.5.1.1 provide acoustic separations as required for the specific functions to be carried out in the spaces affected, and in accordance with the requirements of Appendix 3B Acoustics and Noise Control - Sound Transmission Ratings; and

5.3.5.1.2 provide separations required for fire safety and protection.

5.3.5.2 Seismic resistance capabilities must conform to the requirements of CSA S832-06 Guidelines for Seismic Risk Reduction of Operational and Functional Components of Buildings.

5.3.5.3 Design and select interior walls and partitions, partition systems and interior finishes to comply with the following criteria as may be relevant for the particular or specific functions enclosed:

5.3.5.3.1 cleaning and maintenance as relevant for the particular or specific function;

5.3.5.3.2 wall finishes must be washable. In the vicinity of plumbing fixtures, wall finishes must be smooth and water resistant;

5.3.5.3.3 resist damage due to wear appropriate to programmed areas and resist damage due to collision in high traffic areas;

5.3.5.3.4 permanence and durability, including impact resistance are features required throughout SLC Secure areas;

5.3.5.3.5 low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality; and

5.3.5.3.6 flexibility to permit adaptability of the internal spaces, if required, to suit future process revisions.

5.3.5.4 Line of sight provides the ability to see what is important from where a person is located. The implications to the design include the general layout, use of low walls and furniture, glazed walls and corridors and doorways that line up.

5.3.5.5 Location and design of interior walls and columns must minimize disruption of exterior views and line of sight.

5.3.5.6 Provide line of sight:

5.3.5.6.1 in the Accused Holding area from staff zones into all hallways;

5.3.5.6.2 in the Accused Holding area from end to end of corridors;

5.3.5.6.3 in the Public areas from end to end of corridors;

5.3.5.6.4 Court Administration from public service counters into public gathering spaces; and

5.3.5.6.5 from Court Administration into public lobby and exit/entry.

5.3.6 Ceilings

5.3.6.1 Design ceilings to accommodate ceiling-mounted equipment as per Schedule 2, Appendix 2E - Equipment and Furniture and as required per Appendix 3A - Functional Space Requirements.

5.3.6.2 Accessible ceiling systems must provide access to the ceiling spaces throughout the system or at specific and particular locations.

5.3.6.3 Ceiling systems must comprise a major component of the acoustic or sound attenuation function as required in the spaces in which they are installed and must comply with the requirements of Appendix 3B – Acoustic and Nose Control - Sound Transmission Ratings.

5.3.6.4 Design and select ceiling systems and ceiling finishes to comply with the following criteria as may be relevant to the particular or specific functions of the space:

5.3.6.4.1 flexibility and access to the spaces above;

5.3.6.4.2 compatibility with mechanical, plumbing, electrical, communications services and fixtures;

5.3.6.4.3 low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality; and

5.3.6.4.4 aesthetic and design qualities suitable for the environment of a justice facility.

5.3.6.5 Provide fittings, attachments and internal bracing/backing as required to accommodate and support ceiling-mounted fixtures and equipment, including equipment at videoconferencing and other applicable rooms.

5.3.7 Floor Finishes

5.3.7.1 The floor and floor systems form a part of the interior space. Accordingly, Project Co must provide flooring that is complementary and integral to the functional and aesthetic requirements of the interior space.

5.3.7.2 Select floor finishes to suit types and concentration of pedestrian and/or vehicular/wheel traffic to be anticipated.

5.3.7.3 Design and select floor finishes complying with the following criteria:

5.3.7.3.1 ergonomic comfort, cleaning, maintenance and ease of replacement if and when required;

5.3.7.3.2 low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality; and

5.3.7.3.3 use water-resistant and slip-resistant flooring in all washrooms.

5.3.8 Interior design

5.3.8.1 Project Co to provide interior design as follows:

5.3.8.1.1 reflects the values of the Facility;

5.3.8.1.2 overall interior design throughout the Building is integrated;

5.3.8.1.3 provides a distinct character for the Facility which reflects its status and purpose;

5.3.8.1.4 appropriate design concepts meeting the needs and objectives for each of the component areas; and

5.3.8.1.5 coordinates with wayfinding concepts.

5.3.9 Interior Way Finding

5.3.9.1 Project Co must:

5.3.9.1.1 provide a simple configuration of the Building circulation systems and functions so that way finding is inherently easy for members of the public who are not familiar with the Facility;

5.3.9.1.2 locate major destinations, such as department entrances, directly off of entry spaces and/or along primary circulation paths, make waiting areas as open as possible to circulation routes without forming part of the circulation corridors;

5.3.9.1.3 provide recognizable, easily named and identified elements in key locations that can become ‘meeting points’ for all people using the Facility;

5.3.9.1.4 design public elevator and stair lobbies and public circulation routes to be separate from service routes and other non-public routes; and

5.3.9.1.5 orient all building plan directories to reflect the direction from which they are viewed.

5.3.9.2 Design the internal directional signs to include:

5.3.9.2.1 in directory, installed at the main public entrance that indicates the location of the Building in relation to the overall Civic Precinct, the location of areas and departments within the Building that are accessible to the public, and the location other parts of the Site, including parking zones, street names and north arrow;

5.3.9.2.2 installation of signage at each point at which a directional decision is required;

5.3.9.2.3 using consistent terminology with consistent and predictable locations of signage;

5.3.9.2.4 signage must identify every space in the Building and all directional information. Where required, additional braille language must be provided as determined in consultation with the Province;

5.3.9.2.5 directional signage for staff at each service elevator;

5.3.9.2.6 restricted access and card access signage for all non-public elevators;

5.3.9.2.7 signage required at each stairwell level;

5.3.9.2.8 signage required at all staff only doors (interior and exterior);

5.3.9.2.9 signage required at all public doors noting: Building name, hours of operation, if alternate entry location; and

5.3.9.2.10 final signage wording will be determined through the User Consultation Process.

5.3.10 Exterior Way Finding

5.3.10.1 Project Co must develop an integrated and comprehensive site wayfinding and exterior signage plan that is prepared by a consultant specializing in exterior site graphics, signage, and wayfinding. The plan must:

5.3.10.1.1 be coordinated throughout the Facility and be easily understandable for the first time;

5.3.10.1.2 identify the Facility building(s) including the main entry, drop-off areas, access to parking and similar information to easily and clearly navigate the Site;

5.3.10.1.3 inform routes to the major street and offsite civic facilities;

5.3.10.1.4 identify purpose, restrictions for both entry and/or parking for various vehicle types and any 'after-hours' access or security limitations;

5.3.10.1.5 be well-illuminated, backlit, reflective or high contrast, easily visible at night and minimize light spillage;

5.3.10.1.6 use universal symbols and graphics and be integrated with Provincial Government signage guidelines; and

5.3.10.1.7 be resistant to graffiti and meet BC Building Code and structural requirements.

5.3.11 Exterior Signage

5.3.11.1 Project Co must provide exterior signage suitable for identifying the Building from Trethewey Street, to be done in conjunction with Provincial guidelines and discussions with the Province, to be approved by the Province.

5.4 Programmed Areas

5.4.1 Courtrooms

5.4.1.1 Overview

Truly the most important rooms the Building are the courtrooms of the Provincial Courts and Supreme Courts. These rooms are where the majority of all Court hearings and trials take place. Rooms that are expected to observe the traditions of biblical times while also embracing technology in how matters are presented and recorded by the Court.

5.4.1.2 External Adjacencies and Relationships

True courtrooms (as opposed to Judicial Hearing Rooms) in the Building must have a minimum of three entrances. One from the public circulation area for all justice participants to attend into the courtroom; as these doors are used throughout the day, they need to align with the judicial dais allowing for clear line of sight from the dais to the public entrance of the courtroom.

A second entrance is required for the internal staff of the Court (Judiciary, Court Administration and BC Sheriffs), which includes the presiding adjudicator. This entrance must lead from the restricted circulation and must open into the courtroom in a manner that allows for clear line of sight into the room and also must be able to lock to not allow members of the public to gain access to the restricted area, while still being a fast 'escape route' for the judge accompanied by the clerk should there be a need for it. This door will also be used by Court staff while Court is in session. It must be able to open and close as quietly as possible to minimize disruption to the Court.

The third entrance must be a secured door that leads to the secure circulation and holding cells that will only be able to be controlled by sheriffs. This door must lead into a prisoner docket in the Provincial Court, and directly into the courtroom in the Supreme Courtrooms.

5.4.1.3 Internal Adjacencies and Relationships

In general, a pragmatic guideline used in BC Courthouses is that courtrooms be separated by intended usage. Groupings must include Supreme Courts vs. Provincial Courts, with intended Supreme Court Courtrooms being on the highest floor. Intended Provincial Criminal Courtrooms must be near Crown Counsel and Legal Aid offices with adjacency to other relevant public services accessible. Family and youth courtrooms need to be away from criminal courtrooms and a high security courtroom must be off on its own so that that area can be fully controlled by the sheriffs without creating disruption to the rest of the Building. The two rooms that are designated as the Criminal Remand Court and the Family remand Court must have their interview rooms nearly integrated into the courtrooms to always keep the scheduled Duty Counsel available to the courtroom when needed. The interview rooms adjacent to the criminal remand Court require videoconferencing.

5.4.1.4 Security Issues

Each courtroom must have three entrances as described above. The public and staff entrances are used throughout the day while Court is in session, while the prisoner entrance will normally result in the court 'waiting' for the prisoner to be brought before the Court, so more noise from that door is acceptable. The courtrooms are a 'weak link' in courthouse security as they are where public vs secure and prisoner areas all intersect, provisions need to be made to secure all aspects of the courtrooms easily. Courtrooms can have self represented litigants left alone in a courtroom for periods of time when a courtroom may not require a sheriff and the clerk and judge have not yet entered the hallway. Due to this, court clerks need to be able to lock up exhibits and files that must be accessed within the courtrooms during any session of Court. The jury deliberation rooms must have the highest acoustic privacy. It is of the utmost importance that anything discussed in that room never be overheard by anyone.

5.4.1.5 Access Issues

Courtrooms must be able to be accessed on a most direct route from the main entrance of the building. This may involve movement to another floor, but the flow of people is required to be natural and easy to keep them moving towards courtrooms and out the main entrance after court appearances are concluded.

5.4.1.6 Other

Staff access and file movement from the court registry to the courtrooms will require direct linkage to the restricted circulation.

5.4.2 Provincial Court Judiciary

5.4.2.1 Overview

The Provincial Court hears and adjudicates criminal, family, youth, and civil claims as well as traffic and municipal by-law matters. The Chief Judge of the Provincial Court is appointed by the Lieutenant Governor in Council and is responsible for assigning Judges and Judicial Justices, and designating court facilities for the hearing of cases within the jurisdiction of the Court and for providing administrative direction to Judges, Judicial Justices, and Judiciary staff.

5.4.2.2 External Adjacencies and Relationships

The Provincial Court judges are to be on a separate floor from all other members of the Court, with the exception of the Supreme Court, as the two judicial representatives agreed that with the proper divide, the two levels of Court could share a floor. Judicial Administrative Assistants (JAAs) must be in the same location/floor as the judges. The judicial case managers (JCMs) need not necessarily be on the same floor as the judges' chambers, but near the courtrooms for access by lawyers and lay litigants. Their offices must be secure and have secure access. The location of other justice system participants (e.g. Crown Counsel, Community Corrections, etc.) must be kept separate and distinct from the Provincial Court program area and the restricted circulation in order to avoid any perceptions of a relationship between the judiciary and other justice system participants.

5.4.2.3 Internal Adjacencies and Relationships

There must be linkages between the secure judges' chambers and secure access to the courtrooms. The judicial administration (JAAs) is to be in the secure judges' chambers and is where all central copier/equipment, storage/supply rooms and small waiting area must be located.

5.4.2.4 Security Issues

Provincial Court Judges require a high level of acoustic privacy within all chambers. There are no public waiting spaces within the secure judges' chambers. Visitors require escorted access to the chambers area. JCMs offices must require access by counsel and the public in setting trial matters.

5.4.2.5 Access Issues

Provincial Court Judges (PCJs) require secure access to their chambers via the secure parking area and includes access by the JCMs and JAAs. PCJs require 24 hour a day, 365/366 day a year access to the secure chambers area.

5.4.3 Supreme Court Judiciary

5.4.3.1 Overview

The Supreme Court of British Columbia is the province's highest trial court. The Supreme Court is a court of general and inherent jurisdiction which means that it can hear any type of case, civil or criminal. It also hears most appeals from the Provincial Court in civil and criminal cases and appeals from arbitrations. A party may appeal a decision of the Supreme Court to the Court of Appeal.

The *Supreme Court Act*, R.S.B.C. 1996, c. 443, provides for a Chief Justice of the Supreme Court, an Associate Chief Justice, and 90 other justices. The legislation also provides for supernumerary judges who sit hearing cases part-time. Including supernumerary judges, there are presently 100 judges. All judges of the Supreme Court are appointed by the federal government.

There are also 13 Supreme Court masters who hear and dispose of a wide variety of applications in chambers. The Supreme Court also has a Registrar and a District Registrar who hear assessments relating to bills of costs, reviews lawyers' accounts, settles orders, references of various types and deals with bankruptcy discharge

applications. The Masters, Registrar and District Registrar are appointed by the provincial government.

5.4.3.2 External Adjacencies and Relationships

The Judges, Masters and Registrars of the Supreme Court are housed on the same floor as the Provincial Court but on a separate floor from others who occupy the Building. The location of other justice system participants (eg. Crown Counsel, Community Corrections, etc.) must be kept separate and distinct from the Supreme Court judiciary program area and the restricted circulation in order to avoid any perceptions of a relationship between the judiciary and other justice system participants. Except as mentioned in the Internal Adjacencies and Relationships below in respect of scheduling, members of the public including lawyers do not have access to the Judicial area.

5.4.3.3 Internal Adjacencies and Relationships

Judicial Administrative Assistants (JAAs) must be located in the same area as the Judges, Masters and Registrars. Similarly, Supreme Court Scheduling staff must be located within the Supreme Court Chambers envelope but must also have a public face to facilitate the scheduling of matters in the Supreme Court. Judges, Masters and Registrars must be able to move between the Chambers area and the Courtrooms using secure hallways with access limited to Judges, Masters, Registrars, judicial and Court Services staff including sheriffs. Court Services Staff including sheriffs must be able to easily access Judges, Masters and Registrars to escort them to and from Court, deliver Court materials and ensure security. A coffee room, staff room and stationary/file storage room also must be within the Supreme Court Chambers area.

5.4.3.4 Security Issues

Access to the Supreme Court Chambers area must ensure there is a high level of security. Often Judges hear cases involving very dangerous criminals or families in very high conflict and it is not uncommon for threats to be made against Judges, Masters and Registrars. There is no public waiting area within the Supreme Court Chambers area. Any visitors to the area must be escorted. Also, within the Supreme Court Chambers area there must be a high degree of privacy and acoustic security.

5.4.3.5 Access Issues

Supreme Court Judges, Masters and Registrars require secure access to their Chambers via secure elevators/hallways connected to secure parking on a 24/7 basis. JAAs and Scheduling staff require access to the Supreme Court Chambers area in a secure manner after they have entered the Facility.

5.4.4 Court Administration

5.4.4.1 Overview

Court Administration is the heart of any courthouse. This is the area that is accessed by ALL users of the courthouse for information, forms, access to court records and court staff. A division of Court Services Branch, Court Administration provides the administrative support to in court operations and is responsible to prepare and maintain court records, exhibits, judicial records, collect fees and fines for the government and secure trust monies and other securities (passports, bonds) as

ordered by the Court. Court Administration is also responsible to meet various requests of the Court/judiciary to ensure that Court matters are able to proceed.

5.4.4.2 External Adjacencies and Relationships

Court Administration is one of two divisions of Court Services Branch. The second division is Sheriff Services. These two divisions staff the courts and work closely to satisfy the needs of the Court as well as meet other requests of other court participants. Court Administration is used by any/all court participants and plays a major supporting role to all direct court activities. Court Administration is very directly linked to the judiciary. Court Clerks go back and forth to Judge's Chambers throughout the day and judges, JCMs and JAAs attend at Court Administration regularly. Court Administration also plays a pivotal role for the public, requiring them to be 'front and centre' to the public, while also acknowledging that Court Administration has shorter operating hours than other court services, requiring them to be shut off and inaccessible to the public with limited and specific access only during these times.

5.4.4.3 Internal Adjacencies and Relationships

The core of Court Administration is the file room and exhibit storage. This organization remains paper/file based with all staff members requiring regular and constant access to the file room. Exhibits are accessed primarily by the exhibit clerk and court clerks. Court Administration is primarily divided into two major sections, in-court operations (court clerk staff, their operational manager and two supervisors) and out of court operations, also referred to as Court Registry or Registry operations (court registry clerks, accounting clerks, their supervisors and an operational manager). The Registry operations is further divided into three groups, the Civil Registry, the Criminal Registry and Accounting. Within these divisions areas are then grouped per program, JPs vs. data entry clerks, Family Clerks vs. Deputy District Registrars etc.

5.4.4.4 Security Issues

Beyond sheriff security, Court Administration has the highest level of security in any courthouse. This is directly related to the security of exhibits. Exhibits (evidence) must be maintained for continuity and security; some exhibits can have high financial value making it imperative that access is strictly controlled and that the exhibits are always under the watchful eye of staff that have them checked out or are securely locked away. Any loss of continuity or loss of exhibit is a critical error that will impact the result of the matter before the Courts. All exhibit storage must be reinforced to prevent loss from theft, fire or other situation that could jeopardize these areas and their contents. The file room is also an area that must be secured when the building is not operational. During the day, file rooms are used so frequently that there will almost always be a staff member in there. After hours or during any alarm situations the room(s) need to be locked and secured from damage similarly to exhibits.

Another high-security area is the Accounting Department. This area is only ever accessed by staff who are assigned to that area and a manager who may need to do a system over-ride or 'cash-out' at the end of the day. Beyond that there is no staff access at all.

5.4.4.5 Access Issues

Court Administration staff need to have access by way of public circulation and restricted circulation. Court Administration staff are often required to stay late and routinely leave the Building at the same time that prisoners are being released. Court Administration staff need to be able to exit and enter the building by a private pedestrian entrance (B24) on the ground level from the restricted circulation to avoid having contact with released prisoners.

5.4.4.6 Other

The Court Administration area must be prominent and welcoming when open, but obviously closed and uninviting when it is not open to the public. The courthouse will generally be open from 8am – 5pm, but Court Administration is only open to the public from 9am – 4pm. Staff are there, working, but need to avoid interruptions from the public when they are not able to help them, while still allowing access to the public, or the public to be 'brought in' when we need them for various reasons.

5.4.5 Sheriff Services

5.4.5.1 Overview

The British Columbia Sheriff Service has statutory authority for providing public safety and security at all court facilities in British Columbia. Sheriffs are also both armed peace officers and officers of the Court.

When sheriffs are on duty they assume overall authority and direction of the law courts in all emergency situations. Sheriffs follow the British Columbia Emergency Management System (BCERMS) for all such incidents which include all other emergency service providers as required.

Sheriffs operate the accused holding area, patrol the interior public areas, court administration and judicial areas as well as providing security to the courtrooms. Sheriffs also respond to all stakeholder emergency calls and alarms throughout the Building during regular courthouse hours, 8:30am to 4:30pm. Sheriffs require both public and restricted access to all program areas throughout the Building as well as quick, easy and multiple accesses between public and restricted circulation on all levels.

All parties and stakeholders along with members of the public attend the sheriff office

5.4.5.2 External Adjacencies and Relationships

The Sheriff Services program area must be prominently visible to the public and near the main public entrance. Access from the program area to the public circulation must include two access points, one from D9 and one in close proximity to D4 and D6.

It is critical that easy and quick access through all circulation routes to the courtrooms and accused holding is provided for emergency response by sheriffs at all times. Sheriffs also respond to emergent situations.

Sheriff Services must be close or adjacent, to Court Administration.

5.4.5.3 Internal Adjacencies and Relationships

Sheriff Services office open area (Court Security (D4) and In-custody Security (D6) workstations) is the main hub of the area with visual security CCTV monitoring, security alarm and fire alarm displays. This area is in direct line of sight of the Command Post Room and sheriff supervisor offices.

5.4.5.4 Security Issues

The Accused Holding requires a high level of security as there are concerns for attempts for escape, external threat, self harm, harm of staff, and the requirement for emergent access by sheriffs to and from the jail as required.

The Armoury requires a high level of security separation, both physically and acoustically to assure the safety of personnel both in and out of the Armoury as well as the protection of the contents. This room must be readily accessible to the general sheriff office area and also reasonably accessible to staff going to or from accused holding. The same concerns apply to the gun maintenance room.

5.4.5.5 Access Issues

5.4.5.6 Other

5.4.5.6.1 *Sheriff Office*

The public counter at Sheriff Services must be both physically and visually accessible from the main public entrance area as well as the Sheriff Services open work area. It must have a private lobby waiting area, with a secure counter and windows which provide clear visibility out into the main public corridor of the building. In the general sheriff office area and within hearing of the supervisors offices – there are required DVMS monitors integrated with panic and intrusion alarms, remote fire alarm panel, paging capabilities (same as jail), as well as panic and intrusion annunciation panel(s) as required by the Province.

5.4.5.6.2 *Sheriff Locker Rooms*

The Sheriff Services male and female change rooms are associated with the Sheriff Services office space as well as the Accused Holding areas. If near Accused Holding, the change rooms must be outside the in-custody security

perimeter, but adjacent to them. They must also have an easy access route to the general sheriff office area. As security equipment is stored in these locker rooms access is restricted to sheriffs and required maintenance staff only. Lockers for staff in this zone must be a minimum of 61cm (24”) wide.

5.4.5.6.4 *Sheriff Supervisory Offices*

Must be able to provide both security to the room along with acoustical privacy for discussions of privileged information throughout the day.

5.4.5.6.6 *Security Screening Areas*

The Security Screening Areas (F18 and A11) are used on an as needed basis. Scanner and x-ray area at front entrance (F18) is required in the lobby at the principal front entrance and baggage x-ray screening station (A11) is required outside the high security courtroom. Both locations must be:

5.4.5.6.6.1 Securable when sheriffs are not present to ensure the integrity of the equipment from tampering or damage;

5.4.5.6.6.2 Provided with sufficient public circulation around the equipment to avoid congestion, lineups and delays when not in use; and

5.4.5.6.6.3 Alarmed and monitored by CCTV cameras.

X-ray equipment must be under preventative maintenance in accordance with Schedule 4, including provision of radiation survey reports to Sheriff Services as required.

When security screening is operational, a controlled exiting process is required to prevent un-authorized entry and exit.

5.4.5.6.7 *Jury Deliberation*

These rooms are for the exclusive use of jurors assigned to a jury trial. While a jury occupies these rooms, no one other than sheriffs are permitted in these rooms without advance arrangement and under the supervision of a sheriff. Cleaning must be done during sheriff hours under sheriff supervision when the jury is not present as scheduled with Sheriff Services during jury trials.

5.4.5.6.9 *Sheriff Parking Area*

Sheriff vehicles entering and exiting the secure parking must be separated as much as possible to not allow views of the judiciary or their vehicles from any accused/offender in sheriff vehicles. Security of sheriff vehicles from being tampered with, vandalized or the ability to plant contraband is required. Adequate lighting to assist in vehicle pre and post inspections as well as searches is also required. Sheriff vehicles are washed within this zone which includes the use of power washers and water flow that requires suitable drainage and HVAC systems to address moisture and humidity issues.

5.4.5.6.10 *Vehicle Sallyport*

Accused are moved to and from vehicles and holding cells from this point. This is a critical security point of the jail operations and for officer safety.

5.4.5.6.11 *Facility Keys*

Sheriffs with their statutory authority and as initial first armed responders to security events require full access throughout the Facility during these events. The building keying system must be on a restricted key cylinder system and keying system to the Province's requirements. Key control is a critical component of facility security. Keys permitted to go off-site are highly restricted and require the Province's prior approval.

5.4.6 Accused Holding

5.4.6.1 Overview

The British Columbia Sheriff Service has statutory authority for providing public safety and security at all court facilities in British Columbia. Sheriffs are also responsible for the safe keeping of in-custody persons appearing in the facility. Accused are moved to and from Court through secure prisoner routes separate from all other circulation areas.

The Accused Holding area is a secure area for the processing and holding of accused in-custody persons before and after appearing in Court. While there normally is no overnight detention, joint emergency mutual aid agreements to support local police and corrections facilities in the event of emergencies may occasionally require after hours use.

Most accused enter the holding area in-custody, by way of the Sally port, in Sheriff Prisoner transport vehicles.

Accused in-custody are held in waiting cells both when entering and leaving the holding facility via the prisoner transport vehicles each day. All incoming and outgoing in-custody accused are processed through a central booking/search area and adjoining identification room (fingering printing and DNA).

The Sheriff Services in-custody security officers spend the majority of their time in the Accused Holding area or transporting the accused in-custody to and from the Accused Holding to the holding cells adjacent to the courtrooms.

One of the central challenges for holding accused in-custody persons is to keep incompatible persons separate. The health, safety and effective management of the Accused Holding Area is vital and is enhanced by holding cell segregation (based on incompatibility such as gender, illness, violent offenders and statutory requirements) as well as a staff first aid room for jail officers, eyewashes, mantraps, video monitoring, videoconferencing and security systems.

The Accused Holding area also includes rooms for legal counsel, Justices of the Peace, and other official visitors to access that wish to interview in-custody accused. Rooms that allow lawyers to communicate with their clients who are held, where documents can be signed (both electronically and by hand) and where the person can be released directly to the outside from Accused Holding. These rooms are closely supervised by Sheriff Services In-custody security staff.

5.4.6.2 External Adjacencies and Relationship

The Accused Holding area is part of the in-custody accused zone. This zone including the holding cell area, secure circulation to and from the courtrooms, courtrooms and the adjacent holding cells along with the prisoner sally port must be treated as a secure entity.

The secured circulation route from Accused Holding to In-Custody Courtrooms must be as short and direct as possible and never cross paths with the judicial secure corridors.

Sheriffs from outside of secure holding require fast and easy access to the holding area in emergency situations as do holding cell duties to areas within the Building that are outside of the jail. Sheriffs have to respond quickly to incidents of violence and calls for officer assistance as required.

Vehicle access to the sally port must be provided as separated, designated and controlled access. Judiciary and staff must not pass the sally port when driving into or out of their parking area.

5.4.6.3 Internal Adjacencies and Relationships

The Accused Holding area is organized into the following elements:

- Transport;
- Processing;
- Control;
- Holding, and

- Visiting

The area's internal adjacencies must enhance these elements while maintaining a high level of security and safety.

The holding cells must be organized to allow accommodation for:

- Adult females;
- Youth females;
- Adult males;
- Youth males;
- Protected custody/ segregation;
- In-custody witnesses, and
- Special security requirements

The ability to move prisoners and house them without the view of other prisoners is required.

Females need to be separated from males, youth are separated from adults and people in protected custody are separated from all others.

The location of the prisoner's emergency shower must be convenient to all cells and must have no views from any of the holding cells and must be securable as a cell.

Staff in the Security Control Room are required to be able to see the processing area as well as other parts of the area.

Within regular operating hours of the courthouse, the release point must be within the Building in close proximity to Justice Access Centre. Outside of regular operating hours, an alternative release point with direct access to outside from the Building is to be provided.

5.4.6.4 Security Issues

The Accused Holding requires a high level of security as there are concerns for attempts for escape, external threat, self harm, harm of staff, and the requirement for emergent access by sheriffs to and from the jail as required.

Security throughout this area is enhanced by video monitoring, alarms, electronic door control and mantraps.

All fixtures in cells must be detention grade, and not provide ligature points or places and ability to conceal contraband.

5.4.6.6 Other

5.4.6.6.1 *Sally port*

Is an enclosed and secure space to unload and load in-custody accused from vehicles. The safety of both the in-custody accused and sheriffs are enhanced by mantraps and drive through sally ports. There remains a high risk of violence and security concerns in this area.

5.4.6.6.2 *Holding Cell Area*

Air contaminants may occur in the holding area either by contraband brought into the jail, or by use of use of force measures that require negative air within the holding area. Sheriffs must also be able to shut down the air handling within the holding area as well as both domestic and fire sprinklers via electronic solenoid switches, or manually operated, monitored isolation valves within the within jail control.

5.4.6.6.4 *Jail First Aid Room*

Is for the use of jail deputy sheriffs only generally following incidents within the jail.

5.4.6.6.5 *Holding Area (in general)*

Must be able to continue to operate during building emergencies

5.4.7 Justice Access Centre (JAC)

5.4.7.1 Overview

The Justice Access Centre is a valuable partner in the justice complex. JACs give families a timely, cost-effective dispute resolution option by diverting cases to appropriate services at the first point of contact within the civil/family justice system. Agreements and settlements are often reached utilizing the JAC assistance provided, thus reducing the need for potential litigants to use court resources.

People coming to the Justice Access Centre often bring with them a myriad of problems accompanied with high levels of emotion and stress. These may include family troubles or other issues such as debt, housing and legal difficulties. These people are best served by accessing assistance for their problems at a single location where relevant support agencies are able to be identified, thus providing a holistic and integrated response.

5.4.7.2 External Adjacencies and Relationship

The JAC is ideally situated in a location that is highly visible to walk-in members of the public and in close proximity to the family/civil court registries.

5.4.7.3 Internal Adjacencies and Relationships

Justice Access Centers build on key mediation services offered by family justice counselors. To this end, JACs house other government and non-governmental organization justice partners that assist with debt counselling, Family Maintenance Enforcement Services, legal advice services such as Legal Services Society and Access Pro Bono. In addition, there is a self-help resource room where self-represented litigants are allocated a workspace to research information and have access to a computer workstation. Staff support services are also provided. This grouping of services is to be as contiguous as possible.

Some specific internal relationship aspects and requirements include:

5.4.7.3.1 *Client Waiting Area*

This is a warm and inviting area, roomy enough for space between clients. Accommodations for easily completing paper work are required. A child play area is to be next to this space. There must be clear sight lines between the administration area and the waiting area.

5.4.7.3.2 *Resource Room*

This open space welcomes walk-in clients and encourages self service. It includes height-adjustable workstations (computer kiosks), tables, chairs, and shelving for resource materials. It is spacious enough for required levels of privacy between clients and provides room for staff to circulate and assist. There is a resource room coordinator’s office built into the space. Clear sightlines from this office and from the reception area are important. The public computer kiosks require a non-standard IT setup.

5.4.7.3.3 *Community Partners*

JACs include community partners who are not government employees. A private internet provider (eg. Shaw) network is required for these individuals.

5.4.7.4 Security Issues

Specific Security issues in the JAC area include:

5.4.7.4.1 *Enclosed Offices*

Staff meet with clients in their offices and require a good acoustical barrier to preserve privacy. Offices need to be large enough to accommodate a small round table with guest chairs.

5.4.7.4.2 *Staff Washrooms*

These are to be located within the secure Justice Access Centre space or with safe, staff-only access to these facilities. Staff must not be required to pass from the secure area of the JAC and into the client waiting area to access washrooms.

5.4.7.4.3 *Mediation Rooms*

These are professional counselling spaces, each with a with round table and comfortable chairs for sessions that may last two hours or more. These rooms require a good acoustical barrier to preserve privacy. At least one mediation room must have a clear sight line into the child's play area.

5.4.7.4.4 *Large Meeting Room*

This is the 26-seat meeting room inside the Justice Access Centre or very close to the JAC where programs are held after hours. This requires secure, after-hours access with access to public washroom facilities. It requires a coffee nook and modular boardroom furniture incorporating flip-top design, allowing table components to be stored against walls when required.

5.4.7.4.5 *Administration Support Area*

Welcoming while also providing a professional/safe barrier between staff and public. There must be provisions made to assist clients in wheelchairs allowing effective communication with staff at the reception counter.

5.4.7.5 Access Issues

The Justice Access Centre will open earlier and close later than other typical courthouse functions. Evening programs offered require an after-hours entrance and access to public washrooms without compromising the general security of the Building. Beyond meetings with individuals, the JAC accommodates families who may bring children with them. To this end, a discrete circulation and waiting area providing separation between other client groups such as Community Corrections is a requirement.

5.4.8 Counsel Services

5.4.8.1 Overview

Counsel Services area is provided for the convenience of the barristers with business in the courthouse and supports them staying on Site throughout the day when required. This area is private space for barristers only. No meetings with clients, witnesses or others.

The Barristers Lounge is space that supports them before, between and after court sessions by offering a variety of activities areas (i.e. computer access, one on one conversation, layout areas, printing and copying, relaxing and coffee). This room must serve two over-arching functions beyond the videoconferencing; essentially it will be a 'coffee area' to allow for lawyers to socialize independently of other justice participants while recognizing that lawyers may be some distance from their offices and will need areas to be able to do pre-court work with some degree of independence from those that may be socializing.

The Robing Cubicles are in support of barristers attending Supreme Court and the adjacent washroom is for their safety (separated from public). The Videoconferencing Rooms allow the barristers to connect with their clients in accused holding or at remote custody facilities.

5.4.8.2 External Adjacencies and Relationships

Counsel Services accesses the Law Library throughout the day as well as interview rooms. Their location must allow for easy access to courtrooms without being in direct line of sight of the public.

5.4.8.3 Internal Adjacencies and Relationships

Counsel Services Video Conference Rooms as well as the male and female washroom/robing cubicles must have direct access from the Barrister's Lounge.

5.4.8.4 Security Issues

A high level of acoustic separation is required between Video Conference Rooms and Barrister Lounge to maintain lawyer/client confidentiality. The barristers require the ability to access Counsel Service area during work hours and after hours without impacting the integrity of the courthouse security system.

5.4.8.5 Access Issues

More than 50 Barristers require after hours access to the Counsel Services area and the Law Library. Access must be near the main public entrance and if possible, from the street.

5.4.9 Courthouse Law Library

5.4.9.1 Overview

The Courthouse Library Component is a legal reference library for lawyers, judges and the public. Public access is scheduled for one day a week.

The availability of online legal reference databases has greatly influenced the focus of the library in recent years. In addition, service to self-represented litigants has increased significantly. These two trends are expected to continue with the result that service to the public is especially important. While the space allocated to book stacks has decreased, the space requirements for computer use, online research and education is likely to increase. The Law Library also offers a quiet space for lawyers to work on case files between court sessions.

5.4.9.2 External Adjacencies and Relationships

The Law Library must be located near the Counsel Services (Barrister's Lounge) for easy access during work hours as well as after hour access. The Law Library must also be in close proximity to the Justice Access Centre.

5.4.9.3 Internal Adjacencies and Relationships

The Law Library has no internal adjacencies. It is a single room.

5.4.9.4 Security Issues

The Law Library requires a quiet location that allows for public access only one day a week. A high level of acoustic separation is required to assure that quiet, concentration work can occur.

5.4.9.5 Access Issues

The Law Library must also be located near the Public Entrance or have street access to support after hour access by the Barristers and Crown Counsel.

5.4.10 Crown Counsel/ B.C. Prosecution Service

5.4.10.1 Overview.

Crown counsel are lawyers who work for B.C.'s Prosecution Service of the Ministry of Attorney General. The B.C. Prosecution Service operates within the justice system at arm's length from government, in order to avoid any potential for real or perceived improper influence. In British Columbia, prosecutors decide whether criminal charges should be laid. Crown Counsel do not investigate crimes. Nor do they have authority over police in respect to individual investigations. The Courts have described the role of Crown counsel in Canada as a quasi-judicial function and a matter of significant public duty. In our system of justice, prosecutors do not represent individual victims; they perform their function on behalf of the society as a whole.

Provincial Crown Counsel prosecute all offences and appeals in British Columbia that arise under Canada's *Criminal* Code and provincial regulatory offences. Crown counsel advise government on all criminal law matters and develop policies and procedures for the administration of criminal justice in British Columbia.

5.4.10.2 External Adjacencies and Relationships

All Crown Counsel space must be on one floor. No day space elsewhere in the courthouse is required.

Crown Counsel must not be adjacent, or perceived to be adjacent, to Community Corrections, the Court Registry or the Judiciary.

For justice system efficiency, proximity to front end, high volume remand courtrooms on the same floor as the Crown Counsel office is desired.

5.4.10.3 Internal Adjacencies and Relationships

The large conference and resource room (J13) as well as the small meeting room (J12) are required to be adjacent to each other. J13 must have a movable wall to allow the room to be divided into two smaller rooms. The break room must be near the boardrooms.

The file room must be central to allow easy access for all staff.

Printer and multi-functional device locations (approximately eight) must be equally distributed throughout the office.

File preparation and work areas must also be equally distributed near open work space areas and have height adjustable surfaces.

Crown Counsel and administrative staff may be arranged in clusters of 4-5, to allow grouping into teams (e.g. front-end, Provincial Court trial etc). However, any clustering must not result in any group(s) being obviously separated from the remainder of the office.

Office manager (J2 and J4) spaces must be equally distributed throughout the office.

Access to natural light is very important. There must be a relatively equal mix of enclosed offices and open workstations located by windows (e.g. all enclosed offices should not line the exterior walls).

5.4.10.4 Security Issues

There is a distinct boundary between the public waiting area and the private, staff zone. The boundary though includes a “public interface element” for the interview/meeting rooms for Crown Counsel meeting with witnesses, police, lawyers and other visitors.

A high level of acoustic privacy within the Crown space is very important. This includes all enclosed offices and all meeting and interview rooms.

Interview rooms must include two doors – one for controlled entry from the visitor area by the public, and the other for safe entry and exit of staff. The entry door from the secure staff zone must have card controlled access and include a window pane so employees can look inside the interview room before entering.

Staff washrooms must be internal to the Crown Counsel space.

Visitors require access to public washrooms which in some cases may be after regular courthouse operating hours.

5.4.10.5 Access Issues

Separate staff-only access to the crown Counsel space is required.

After-hours access into the Crown Counsel space is required for staff and visitors. Access controls remain in place for visitors. Easy access into the Building to access

the Crown space is important, without compromising overall building security. After-hours access may be to a foyer, common area, or visitor waiting area, but not directly into Crown counsel space.

5.4.11 Initial Appearance Room (IAR)

5.4.11.1 Overview

This is the first hearing room that all non-in custody adult criminal court matters take place in. These cases continue to be dealt with in this hearing room for the purposes of settling mainly 'administrative' issues before the case is adjourned to go before a Provincial Court Judge. The case volume on any Court sitting day is very high, with court lists of up to 130 + matters being dealt with per half day session. This room is always under consideration for other court hearing uses by the Court when not in session.

5.4.11.2 External Adjacencies and Relationships

The initial appearance court must be near both the Crown Counsel office and the large non-volume courtroom; Legal Services also has a requirement to be close to this hearing room. The hallway outside of this area must have the ability to comfortable contain a large number of people who are not present willingly.

5.4.11.3 Internal Adjacencies and Relationships

The IAR room is not intended to have the same feel as a traditional courtroom, nor is it completely prescriptive in its use. The latest version of the IAR has evolved into what can best be described as a hybrid between a courtroom and a hearing room. The room has limited seating for spectators, most of which are lawyers who are waiting for their matter to be called. Although members of the public are not excluded from the room, the hearings are not of any public interest, so traditional room designs have never given an impression of an invitation to spectate. The room is presided over by a Judicial Case Manager (JCM) who sits as a Justice of the Peace. Both provincial and federal crown counsel have seating available to them and there is also seating available for the lawyer and accused. The JCM may or may not be elevated by way of a riser where they sit; this is more a matter of preference for the particular JCM. There also must be a workspace for a court clerk who will be recording the Court and capturing notes electronically. Accused who may be held in custody but are not appearing for bail hearing purposes may appear by way of video conference.

5.4.11.4 Security Issues

Key to this room are the doorways. There must be a distinct entrance and exit with the room inviting people to naturally move in that direction.

5.4.11.5 Access Issues

This room must be accessed through public areas while also being connected to the secure, judicial corridors to allow the JCM to come in from that area.

5.4.12 Community Corrections (CC)

5.4.12.1 Overview

Community Corrections is focused on "reducing reoffending and increasing public safety by changing the behaviour of offenders who are under Court-ordered supervision in the community". Each day, approximately 22,000 adults are supervised, and the Interior/Fraser region (which includes Abbotsford) supervises approximately 4,700 people daily. Of this total, approximately 800-1000 people from Abbotsford and Mission report to the Abbotsford Community Corrections office.

Clients are ordered to be supervised by probation officers who work in CC offices by the Court. The vast majority of the Abbotsford CC clients will be ordered to attend the office by a Judge within the Abbotsford Law Courts. The client will usually be directed to report forthwith so that the client will leave the courtroom and walk to the CC office on the ground floor. After the first appointment, they will be directed to report on a regular basis, either for preparation of a pre-sentence report, to monitor their conditions of bail or probation, or to attend court–ordered programming.

5.4.12.2 External Adjacencies and Relationships

The CC office is best located on the ground floor of the courthouse building to allow limited access to crown and judicial areas upstairs by clients and to have the ability for access to the CC office after hours to attend group programs. Adjacency to court services area is advantageous for clients and staff.

5.4.12.3 Internal Adjacencies and Relationships

The CC office must be divided into three main zones. Each zone is separated by security features and function:

5.4.12.3.1 Public area - client entrance/reception/wickets, and waiting area—access to client washroom.

5.4.12.3.2 Staff/Client Interaction - core program rooms, interview rooms, secure interview rooms. Access to all rooms is both from public waiting area (for clients) and from the staff/client area (fairly close to admin/inner reception).

5.4.12.3.3 Staff only:

5.4.12.3.3.1 Behind secure reception desk/glass are administrative assistant and office manager work stations; behind them file room, storage, equipment and workspace areas.

5.4.12.3.3.2 Behind or beside administrative area but with clear sightline to reception is Local Manager (LM) office. Behind LM are: PO workstations, Senior PO offices, STICS offices/workstation, visitor offices, privacy offices, meeting rooms, staff break rooms.

5.4.12.4 Security Issues

As described above, security between public and client/staff interaction areas is paramount. Security must consist of a combination of doors, lexan/plexiglass, locks, alarms and door buzzers as required.

5.4.12.5 Access Issues

After hours access to CC office is required both for staff (who will work beyond court hours) and clients who will be attending appointments after court hours and programs. Clients will generally use the public washrooms in courthouse but after hours will require access to designated washrooms. These washroom cannot be shared with other client groups or general public due to security and safety considerations of the CC client group.

5.4.12.6 Other

A covered space outside separate entrance door with secured ashtray/garbage receptacle must allow clients to wait in one area for program to start, without accessing other areas of the complex to find shelter or ashtray.

5.4.13 Building Services

5.4.13.1 Overview

This component provides support for the physical functionality of the Facility including maintenance, storage and service functions. Building Services is organized into four elements: Receiving, Operations, Staff Services and Program Storage.

5.4.13.2 External Adjacencies and Relationships

Loading bays and service access are integrated functions of Building Services. Receiving is to be adjacent to the loading dock and the vehicular service access. Garbage and recycling areas must be located within the Building Services area and have vehicular access either directly from the loading bay or have a separate overhead door access from a services delivery exterior compound or service laneway.

5.4.13.3 Internal Adjacencies and Relationships

Janitorial and mail areas must to be close to Receiving zone and also be connected to the courthouse via public circulation routes. Program Storage requires a connection to the rest of the courthouse via public circulation as well as easy access to Receiving. Staff Services (staff shower facilities) also must be connected to public circulation. In addition, personnel (as pedestrians or those wheeling a bike) using this area need a convenient way in from the outside, which could be through the service vehicle access.

5.4.13.4 Security Issues

Access to Building Services must be scheduled so as not to interfere with the daily operations of the courthouse. To maintain a secure perimeter, shipping/receiving must be contained and separated from public thoroughfares, and vehicle security barriers must be incorporated to provide appropriate security. Maneuvering of service vehicles must not occur in public rights of way where it may disrupt local traffic.

As the shipping and receiving area is another access point into the Building, free access by public compromises the secure perimeter of the Facility. Access to and from the shipping/receiving areas must be actively controlled. If a secure compound is not provided, then secure sally ports are necessary to control entry and access into the building.

5.4.13.5 Access Issues

Vehicular access to shipping and receiving must be direct and clearly distinct from the vehicle access for accused/offender transportation. Building Services must be conveniently accessible from Court Administration.

5.4.14 Public Services

5.4.14.1 Overview

The Public Services area encompasses the public entrance and its security search area, amenities for the public, conference facilities as well as space for organizations (both public and private sectors) that support the justice system. This area is broken into distinct work areas and is spread throughout the building.

Public Services area's key organizations are Legal Services Society (LSS), Victim Services (Ministry of Public Safety and Solicitor General) and Justice Education Society (JES).

LSS provides information, advice and representation by legal counsel with priority given to persons of low income. The main roles are Duty Counsel (located throughout the courthouse), Family Advice lawyers (located within the JAC) and Legal Aid Intake team (initialization of LSS representation).

Victim Services, Victim Court Support Workers, provide support to victims of crime - information, emotional support, practical assistance and referrals to victims. Victim Services assist victims navigate the judicial process and liaise with justice personnel.

The Justice Education Society of BC, JES, creates programs and resources that improve access to the justice system that include courtroom tours of courthouses and classroom-based learning.

The Public Services conference room is used by both the building tenants (both private and public sectors) and will be managed by Court Administration.

5.4.14.2 External Adjacencies and Relationships

The office component of the Public Service area is broken into two key sub areas – 1) an area for high volume traffic flow (noisy) that is easily accessible to public, and 2) an area that is quiet and deals with highly sensitive clients/issues. Office area 1 – LSS Legal Aid Intake team (Legal Aid Intake office, 2 legal counsel offices and 2 admin workstations) must be located next to Initial Appearance Courtroom (IAR) and Remand Court with the IAR the priority adjacency. The LSS Duty Counsel offices can be dispersed throughout the building near the courtrooms. JES and Associated Services Workers are to be located in line of sight of public (easy to find). Federal Crown office space can be located in this area or near courtrooms. Office area 2 – Victim Services and Director of Counsel for Child and Family are to be located in a quiet area away from busy traffic areas.

The front entrance includes entry vestibule, scanner/x-ray, search station and public lobby with the ability to seamlessly shift entry from open door entry to 'high security' entry (scanner and x-rays) when required.

The conference facilities must be located near public waiting areas and in close proximity to Court Administration.

The Media/Family/Board Room is to be in close proximity of the High Security Courtroom.

The Public Break Serving Area is to be located away from the courtrooms and high traffic flow.

5.4.14.3 Internal Adjacencies and Relationships

The Public Services' washroom and waiting are to be located in the high traffic office area along with LSS, JES, and Associated Service Workers. The scanner and x-ray area must be able to be locked down and out of the main traffic flow when 'building high security' isn't required.

5.4.14.4 Security Issues

The Public Services' office areas are to be designed to allow for Sheriff Services to response quickly to security and safety issues. This area often deals with clients who are new to the system.

The front entrance security is to be designed to allow Sheriff Services to seamlessly adjust the security levels without impacting their resources.

5.4.14.5 Access Issues

The conference room will require occasional after hour access.

5.4.15 Secure Access and Parking

5.4.15.1 Overview

Secure parking must be provided for vehicles belonging to the Judiciary as well as Sheriff Services. These two secure parking areas must be separate and distinct from each other, although they may share a common vehicular access point into the Facility. This parking must be at the lowest level of the Building with restricted access via the building access management system.

Both Sheriff parking area and sally port are restricted to Sheriff Services' access only. Non-sheriff access to these areas requires advance authorization by Sheriff Services at all times.

5.4.15.2 External Adjacencies and Relationships

The flow of judicial and sheriff vehicles must be prioritized, with multiple lanes if necessary. Services and accused transportation vehicles must not obstruct judicial and staff vehicles from entering the Facility at any time.

5.4.15.3 Internal Adjacencies and Relationships

The judicial parking area must have direct access to the restricted circulation system via a dedicated elevator accessing the Judiciary program area located at higher levels.

The sally port within the sheriff's parking area must have direct access to the accused holding area.

5.4.15.4 Security Issues

Required vehicular security barricades, garage doors, intercom pedestals and signage must be discretely integrated into the overall building and landscape design. Adequate queuing space at vehicular entrances points must be provided to ensure proper vehicular flow.

5.4.15.5 Access Issues

A secure area dedicated for accused transportation vehicles must be provided on the Site with direct access from a public thoroughfare. This area must be directly connected to the secure sally port. Accused transportation vehicles enter and exit the secure sally port in a forward motion and must have sufficient vehicle clearances so that they do not have to turn while reversing.

5.4.16 Parkade

5.4.16.1 Overview

The Parkade is for use by both the public as well as Facility Users. The Parkade must be designed to park a minimum of 336 vehicles.

5.4.16.2 External Adjacencies and Relationships

The main vehicle entrance to the Parkade must be clearly visible, identified and easy to access. In addition to providing staff parking, it will be used by members of the public accessing the Building as well as adjacent civic facilities including the library, University of the Fraser Valley and Abbotsford City Hall. Elevators and stairs servicing the garage are to be strategically located to permit convenient access to all facilities and be designed to enhance safety aspects.

5.4.16.3 Internal Adjacencies and Relationships

Public parking and staff parking are to be securely separated elements.

5.4.16.4 Security Issues

With 200 stalls provided for public use, the balance of 136 staff and jury member parking stalls are to be in a secure area separated by a security gate connected to the building access management system. Internal parking zones and the route from parking to the courthouse must be well lit, highly visible and designed to enhance the safety of those using the parking areas. Vehicular routes must be planned so as to prevent unauthorized vehicles from travelling beneath the courthouse building. The overall design must incorporate CPTED principles.

Access to and from the secured staff parking in the Parkade must have a separate entry/egress lobby separated from any public circulation using a security card system.

Any visual overview from the Parkade to the access route and entrance to judicial parking and sheriff's parking must be restricted. Openings from parking levels looking onto this route must also be configured to restrict direct views to windows and entrances of the courthouse where possible.

Project Co must demonstrate that adequate infrastructure is in place so that the future installation of a future payment station/system, a video monitoring system and duress alarm system can be easily achieved.

5.4.16.5 Access Issues

While there is currently no plan to incorporate paid parking, the Parkade design must demonstrate that this function can be easily incorporated in the future.

5.4.16.6 Other

On any upper parking level(s) open to the sky above, the design must demonstrate how snow removal must be managed without impacting the requirement of accommodating 300 vehicles at all times.

5.4.17 Main Entry Lobby

5.4.17.1 Overview

The majority of public and staff will access the Law Courts through the main entry lobby. It acts as the primary organizing element of the Building. Transparency through the use of glass must be used to distinguish the public space from the private spaces and promote natural day lighting of the public spaces. Being the first space encountered by the public, the main lobby must be a large ceremonial space that exhibits a sense of formality and decorum.

5.4.17.2 External Adjacencies and Relationships

The main entry must be clearly identifiable from the corner of Trethewey Street and Veterans Way. The lobby must be clearly identifiable from the main public plaza. It must have a weather-protected connection from the public Parkade to the main entry doors.

Wayfinding to this zone must be intuitive and obvious, rather than relying upon signage. The lobby must have ample space for waiting, viewing of court information,

brief conversations prior to entering courts as well as meeting and greeting functions that typically occur during peak hours.

5.4.17.3 Internal Adjacencies and Relationships

Where courtrooms are located on a floor immediately above or below the main entry lobby, a ceremonial stair must be provided as an active way finding device and reduce the dependency on the vertical transportation system.

In addition to providing clear directions to all courtrooms, the main lobby must also have direct adjacency to Court Administration as well as Sheriff Services.

Refer to other programmed space summaries for determining optimal adjacent space relationships with special attention given to 'after hours' access requirements.

5.4.17.4 Security Issues

The entries into the Building must be monitored via CCTV, be patrolled as part of the active security plan, and be fitted with secure entry devices such as card reader or keypad control.

The design must allocate sufficient public circulation space at the first stage of entry to the courthouse, as well as the entry to any large jury evaluation room(s) to allow for the temporary employment of security screening. A security screening station includes a magnetometer, a custom table to search bags (and store confiscated items) and a queuing area. Space must be provided to store the magnetometers near the main entrance. An x-ray machine must be accommodated near the entry which, when not in use, must be concealed within custom designed millwork shrouds.

5.4.17.5 Access Issues

The main entry lobby must be accessible during regular hours of operation for the Building. Departments which require after hours access must be accommodated through separate restricted after-hours access points.

5.4.17.6 Other

Consideration must be given to Public Art and the display of items of cultural or historical significance that may be courthouse related items.

Information displays listing the cases being heard in each courtroom must be clearly visible upon entry to the building.

5.4.18 Courtroom IM/IT Integration

5.4.18.1 Overview

Courtroom technology must consider current technology, projects planned and in progress that will affect in-court technology and some thoughts about how in-court technology is evolving. Historically and even presently, there are several in-court technologies and IT systems that are independent of each other including:

- Evidence Presentation Systems (EPS)
- Videoconferencing for remote appearances

- Judicial Officers using stand-alone laptops on the bench

Two projects in progress will affect in-court technology:

Remote Interpreters

Currently in development, this will facilitate remote interpreter services into the courtroom. This will provide greater efficiencies and cost reductions for non-English languages whereby there are few interpreters, provide more accessible and less costly services to remote court locations, and reduce wasted costs that result from the high collapse rate of court appearances.

Secure and Private Network

Currently in pilot, this network design accommodates intra-device communication of audio and video signals over Ethernet within the courtroom. The premise of the design must consider readiness for future expansion to a fully eCourt provisioned evidence management system however the base design includes all other audio and video devices within the courtroom; EPS, videoconferencing, overflow conference/court rooms and remote interpreters. The design must have built-in redundancy where, regardless of the state of GovNet (SpanBC/CE) connectivity. The courtroom must not be interrupted due to lack of network connection.

The expectation of where in-court technology will evolve and change the most includes:

Electronic Evidence

Even today, some courts are beginning to explore and facilitate the use of virtual reality, 360-degree video, 3-D rendering and holographic imaging. This requires different hardware for presentation in the courtroom and in the case of Supreme Court, facilitating viewing for the jury both within the courtroom and the jury deliberation room. Within traditional courtrooms this is a significant challenge, specifically for judicial officers at the bench. Another consideration is counsel meeting with accused/offender persons in courthouse meeting rooms need to review electronic evidence with their client in preparation for Court.

Evolution from Evidence Presentation to Evidence Management

Once electronic evidence is admitted into Court as an exhibit, the Court can only accommodate transferring possession to the Court by physical means (e.g. counsel providing the electronic evidence to the court clerk on a memory stick and Courts managing the memory stick as though the stick itself is the exhibit). In the future, this transfer must be entirely electronic (e.g. EPS connected to a court server that transfers evidence to a secure area and to an electronic exhibit management component of the Court). This in-court process will be a component of the entire electronic life-cycle of electronic evidence including electronic disclosure and judicial access when writing their judgments in their chambers. This same technology would be used to allow jurors access to view evidence, during deliberation, that was admitted as an exhibit.

Judicial Officer use of Technology

Increasingly each year judicial officers are bringing computers to the bench to reference documents and make personal notes. Judges will soon be able to access an electronic court file on the bench. Physical space and site lines are constraints around judges viewing the remote participants, viewing electronic evidence, viewing electronic files and electronic note taking while still observing all in-person participants in the courtroom. Ergonomic design of the bench, display hardware and the courtroom itself must incorporate all this technology while maintaining the expected decorum of a courtroom and still accommodating non-technology judicial officers.

Source of Content

A key point to understand is that the source of content impacts network design, security and capacity. For example, currently the electronic court file and electronic transcripts are located at the HPAS data centre in Kamloops. More dependency on technology in the courtroom will require a decision about relying on accessing content outside of the courtroom versus facilitating local copies of all content within the Courtroom. For example, DARS, while connected to a server in the HPAS data centre for permanent storage, facilitates local copies such that DARS continues to run on the Clerk's workstation should the network fail.

Respecting that forecasting technology for the life of a courthouse is problematic, there is an expectation that the courthouse, and specifically the courtrooms, must be designed with considerable forethought and flexibility to accommodate the introduction and evolution of in-court technology. The technologies as listed above will come into the courtroom and must be accommodated into the design. Ideas around future accommodation for unknown technologies are most welcome and desired.

5.4.18.2 External Adjacencies and Relationships

With respect to electronic evidence management, counsel will require means to pre-load electronic evidence in preparation for presentation in Court. Today, this could be done by:

- Counsel bringing in own laptop and connecting to Evidence Presentation System
- In some locations, provincial crown attorneys bring in a USB memory stick and use an in-court laptop provided by Court Services Branch. In the future, the laptop is expected to be replaced by a locked down PC.
- For a large (large in number of days or large in volume of electronic evidence) occurrences, counsel could bring in their own server into the courtroom. This has been done on an adhoc basis (less than five times).

In the future, it is anticipated counsel will utilize a 'cloud-based' document storage system to remotely upload electronic evidence prior to court which will then be connected to the Evidence Presentation System and when accepted as an Exhibit will be electronically transferred to an electronic Exhibit Management System. A first stage solution may require counsel to physically attend the courthouse to upload electronic evidence.

5.4.18.3 Internal Adjacencies and Relationships

Not used.

5.4.18.4 Security Issues

Prior to the Court accepting evidence as Exhibits, evidence is accessible and under the control of counsel and subject to the judicial officer controlling viewing within the courtroom (especially in a Supreme Court matter with a jury). Once accepted into the Court as an Exhibit, it is then under the control of the Court and must adhere to very specific security and audit controls. Within the context of a future electronic exhibit management system, these same controls must be adhered to whether in the context of network configuration and application design or physical access to servers.

5.4.18.5 Access Issues

Dependent on the solutions that evolve, counsel will likely request access earlier access to courtrooms to:

- Upload electronic evidence if that ends up being a first phase solution.
- Test evidence presentation, especially in the early stages of new technology formats (e.g. virtual).

5.4.19 Multipurpose Rooms

5.4.19.1 Overview

Two meeting rooms must be designed to support occasional use as a courtroom when an additional courtroom is required. These are designated as:

- Large Conference and Training Room in Public Services (room F19 – 85 SM).
- Conference and Resources Room in Crown Counsel (room J13 – 90 SM).

The basic configuration must allow for the temporary configuration of a Basic Courtroom (86 SM) and must have the same general proportions and ceiling heights.

Respecting that multiple uses in these spaces will have some compromises, it is the intention that all uses, be it general meeting space, courtroom use, circle sessions, gathering areas or other activities, are able to be accommodated in a high-grade manner. Project Co must supply and install flexible furniture to support this goal.

5.4.19.2 External Adjacencies and Relationships

The multipurpose rooms are to be centrally located within the courthouse.

5.4.19.3 Internal Relationships and Requirements

A judge's dias and bench must be built into one end of each room. This could be accommodated by the use of an expandable system in order to optimize space available when not being used as a courtroom. Care would have to be taken to ensure that this system meets the courtroom acoustic requirements. Alternatively, this area may be partitioned off when not in use for judiciary purposes.

Lighting systems must be easily adaptable to accommodate the wide variety of use conditions as described in the overview.

Room acoustics must be designed to support requirements of sound and video recording.

Install floor boxes are to be provided that meet the required electrical and IMIT requirements. Similarly, A/V requirements for Evidence Presentation must be met.

5.4.19.4 Security Issues

Judiciary access must be through a secure dedicated corridor or via a secure department, excluding the Crown Counsel zone.

5.4.19.5 Access Issues

Public access to these spaces is to be directly adjacent public corridor.

5.4.20 Evidence Presentation Systems (EPS)

5.4.20.1 Overview

An Evidence Presentation System is an amalgamation of several audio and video technologies designed to provide all courtroom participants a vehicle in which to present, view, listen and manage information during or in relation to court proceedings. This technology is used at all levels of Court in British Columbia and is shown to create efficiencies as a result of its use.

5.4.20.2 Audio

The audio technologies used in courtrooms are expected to interface seamlessly with the official record of the Court – the audio from the Digital Audio Recording System (DARS). To accomplish this, layered redundancy must be employed to reduce or eliminate the risk of court delays that may be attributed to network or equipment anomalies. This redundancy is achieved by isolating microphones from the courtroom sound system as well as the employment of standalone interface with the DARS mixer.

To meet several courtroom stakeholder requirements, several provisions are made for assistive listening, sound amplification as well as audio feeds for juries, counsel, media and the judge; this is accomplished by providing 3.5mm audio outlets for t-coil, headsets, media distribution sound boards or ancillary speakers.

Specialized microphones are placed at the judge bench and witness box to more effectively pick up low voices or individual that may not be ‘square’ to a standard goose-neck microphone. An audio voice lift mixer, using mix-minus technology, is used to ensure that all audio within the courtroom is heard by all courtroom occupants.

5.4.20.3 Video

In BC Courtrooms, the handling of video is accomplished using many techniques and technologies described as follows:

5.4.20.3.1 Videoconferencing is used to connect between one and three remote sites to accommodate stakeholders that are not physical present in the

courtroom. Videoconferencing can also be used to transmit EPS content to the far-end participant(s).

5.4.20.3.2 Video displays are strategically placed throughout the courtroom to provide all courtroom occupants the opportunity to see what is being presented by counsel to the Court described as follows:

5.4.20.3.2.1 displays are positioned at the jury box, jury deliberation room, all counsel tables, judge's bench, court clerk workstation, gallery, accused docket, presentation rostrum and any overflow or media room;

5.4.20.3.2.2 annotation devices are positioned at the witness box to permit real-time 'markup' of images / still video captures for later submission as an exhibit; and

5.4.20.3.2.3 the judge's bench may accommodate the ability for the judge to capture the image for confidential markup for note-keeping purposes.

5.4.20.4 Data

Data must be managed in a secured environment using a private and secure network that is managed by Office of the Chief Information Officer (OCIO) on GovNet (SpanBC/CE). The architecture of this environment is designed to provide business continuity in the event of WAN failure thus, the risk of interruption to the Court is mitigated and content security is ensured.

Within the private and secure bounds, data (EPS content) may be managed using one of several methods described as follows:

5.4.20.4.1 Counsel or Court Services provisioned PC or Laptop using pre-loaded content that may be captured during a trial for submission as evidence and accepted by the Court as an Exhibit that can be:

5.4.20.4.1.1 printed as a hard document to an in-court laser colour printer; and/or

5.4.20.4.1.2 saved to a provided external hard drive to be submitted as an 'electronic book of exhibits'.

5.4.20.4.2 Employment of full scale pre-submitted evidence on a server must be used to display evidence and later captured as outlined above.

5.4.20.4.3 No content (evidence) must leave the confines of the private and secure network in order to maintain continuity of that content for the Court.

5.4.20.5 External Adjacencies and Relationships

Counsel will require means to pre-load electronic evidence in preparation for presentation in Court as outlined above in Section 5.4.20.4.

5.4.20.6 Security Issues

Prior to the Court accepting evidence as Exhibits, evidence is accessible and under the control of counsel and subject to the judicial officer controlling viewing within the

courtroom (especially in a Supreme Court matter with a jury). Once accepted into the Court as an Exhibit, it is under the control of the Court and must adhere to specific security and audit controls. Within the context of a future electronic exhibit management system, these same controls must be adhered to whether in the context of network configuration and application design or physical access to servers.

5.4.20.7 Access Issues

Depending on the situation and the source for electronic evidence, counsel may wish to have access to the courtroom prior to the Court sitting in order to test the presentation.

5.5 Structural Design

5.5.1 General

The structure is to be designed in accordance with the latest edition of the BC Building Code (BCBC) and equivalent to the 2015 National Building Code of Canada (NBCC). Building material and construction to be in accordance with the Canadian Standards Association (CSA). Design for these areas to be:

5.5.1.1 Minimum Design Live Load = 4.8 kPa

5.5.1.2 Storage areas = 7.2 kPa

5.5.1.3 Importance Category = Normal

5.5.1.4 Location of elevator cores, stairwells, shear walls and columns must be placed to optimize future flexibility in re-purposing space.

5.5.1.5 Courtroom spaces are designed for clear span with no columns in the courtrooms.

5.5.1.6 All floor structures to be reinforced concrete to control vibration.

5.5.1.7 The roof structure must be structural steel or reinforced concrete.

5.5.1.8 Below grade parking areas must be designed and constructed in accordance to NBCC 2015 and CSA S413 Parking Structures Standards.

5.5.2 Structural Design Responsibility

Roles and responsibilities of the structural engineer and structural specialty engineers include:

5.5.2.1 The Engineer of Record must have responsibility for the structural design of all structural elements and connections to the structures ("Structural Engineer of Record" or "SER").

5.5.2.2 Specialty structural engineers or supporting registered professionals for the design of components and connections to be directed by the SER; designs by the specialty structural engineers or supporting registered professionals to be signed and sealed by the specialty structural engineers or supporting registered professionals registered in the Province of British Columbia.

5.5.2.3 SER to review all work by the specialty structural engineers and supporting registered professionals and certify that the design meets the specifications and requirements.

5.5.3 Design Loads

5.5.3.1 Dead Loads

5.5.3.1.1 Refer to BCBC, Part 4 for descriptions of dead loads. Dead loads acting on a structure or a portion thereof to consist of the vertical load due to the weight of all permanent structural and non-structural components such as architectural ceiling and floor finishes, mechanical and electrical services, fixed equipment, and partitions.

5.5.3.2 Live Loads

5.5.3.2.1 Refer to BCBC Part 4 for descriptions and values of live loads for various uses, occupancies, and other service conditions and design criteria;

5.5.3.2.2 Include all live loads acting on a structure consisting of loading not permanently fixed, but superimposed by use and occupancy including those uniformly distributed and concentrated on floors, handrails, guardrails, vehicle barrier systems, ladders, and stairs from use, occupancy, operation, impact, and vibration;

5.5.3.2.3 Use the following minimum live loads in the design of buildings;

5.5.3.2.3.1 Basement floor 4.8kPa (minimum)

5.5.3.2.3.2 Ground floor 4.8kPa (minimum)

5.5.3.2.3.3 Courthouse (above ground floor) 4.8 kPa (minimum)

5.5.3.2.3.4 File Storage 7.2 kPa

5.5.3.2.3.5 Library (stacks) 7.2 kPa

5.5.3.2.3.6 Public parking (upper levels) 2.4 kPa

5.5.3.2.4 Snow Load

5.5.3.2.4.1 Develop snow roof loads and built-up from BCBC and NBCC based on 1-in-50 year ground snow load Ss = 2.0 kPa.

5.5.3.2.4.2 Design each portion of the Facility roof(s) to sustain the load assuming primary drainage system assuming is blocked and the rainwater on roof rises above the inlet of the secondary drainage system.

5.5.3.2.4.3 Design for rain load Sr = 0.3 kPa with an Importance Factor of Is = 1.0.

5.5.3.2.5 Wind Load

5.5.3.2.5.1 Design to resist the wind effects determined in accordance with BCBC and NBC.

5.5.3.2.5.2 Use Importance Factor Iw = 1.0 for wind load calculation.

5.5.3.2.5.3 Hourly wind pressure q(1/10) = 0.34 kPa, q(1/50) = 0.44 kPa.

5.5.3.2.6 Earthquake Load

5.5.3.2.6.1 Design and construct all building structures and foundations to resist stresses produced by inertia forces induced by seismic ground motion in accordance with BCBC, NBCC and geotechnical recommendations.

5.5.3.2.6.2 Importance factor for Normal Category, Ie = 1.0.

5.5.4 Strength and Serviceability Limits

5.5.4.1 Strength Limits

5.5.4.1.1 Design and construct all building structures and foundations to resist stresses produced by load combinations in accordance with NBCC Table 4.1.3.2. A and B.

5.5.4.2 Serviceability Limits

5.5.4.2.1 Deflection Limits

5.5.4.2.1.1 Deflection of structural concrete and steel elements must not exceed the following limits:

5.5.4.2.1.1.1 immediate deflection due to applied live load: L/360 (where L= the span length);

5.5.4.2.1.1.2 long term deflection due to live load: L/480 per CSA 23.3-14 Cl 9.8.5.3.

5.5.4.2.1.2 Secondary structural elements must not exceed the following limits:

5.5.4.2.1.2.1 masonry veneer: L/600 or 3/8” maximum;

5.5.4.2.1.2.2 wall cladding: L/360 or 1/2” maximum.

5.5.4.2.2 Drift Limits

5.5.4.2.2.1 Use the 1/50 year full design wind load when calculating wind drift.

5.5.4.2.2.2 Limit allowable wind drift limits for concrete framed structures and steel structures with masonry infill panels to H/400, where H = structure height at elevation of drift consideration.

5.5.4.2.2.3 Limit the design story drift for steel buildings without masonry infill walls to H/200 (where H = structure height at elevation of drift consideration).

5.5.4.2.2.4 Conform to the seismic drift limits in accordance with NBCC requirements.

5.5.4.2.3 Settlement Limits

5.5.4.2.3.1 Differential settlement of all structures in the Facility is less than L/500 (where L = the length of foundations) to a maximum of 20mm.

5.5.4.2.3.2 Total settlement of all structures in the Facility (static and seismic) must be less than 40mm.

5.5.4.2.4 Vibration Limits

5.5.4.2.4.1 The floors must satisfy the following walking vibration limit:

$$\frac{0.29kN * e^{(-0.35f_n)}}{0.02 * W} < 0.5\%$$

Where: f_n $natural\ frequency\ of\ the\ floor\ structure$

W $Weight\ of\ the\ floor$ (kN)

5.5.5 Reinforced Concrete

5.5.5.1 Design Requirements

5.5.5.1.1 Design and construct reinforced concrete building structures and foundations to resist stresses produced by load combinations in accordance with NBCC 2015 and CSA Standards A23.1, A23.2 and A23.3.

5.5.5.1.2 Concrete to use Portland-Limestone (GUL) Cements in accordance to CSA A3001.

5.5.5.2 Durability of the Parkade

Durability of the Parkade must conform to CSA 413 including the required membrane protection and the following specifications:

5.5.5.2.1 Concrete Exposure Classification:

5.5.5.2.1.1 Slab on grade: C-4

5.5.5.2.1.2 Parkade footings, suspended slabs, walls: C-1

5.5.5.2.2 Reinforcing steel cover:

5.5.5.2.2.1 Columns and walls – 38mm (1-1/2 “)

5.5.5.2.2.2 Suspended slabs:

5.5.5.2.2.2.1 Topside – 38mm (1-1/2 “)

5.5.5.2.2.2.2 Underside – 26mm (1”)

5.5.5.3 Post Tensioning

5.5.5.3.1 The use of unbonded post-tensioning is only permitted in the floors above the main floor (first suspended floor).

5.5.5.3.2 Post tensioning is not permitted for the main floor (first suspended floor) of the Building.

5.5.5.3.3 The design, materials, and construction procedures must conform to CSA CAN3-A23.1, CAN3-A23.2, CAN3-A23.3 and CSA G279.

5.5.5.3.4 Materials must also conform to “Guide Specification for Post-Tensioning materials” by PTI 2000.

5.5.5.3.5 Field Procedure must conform to “Field Procedures Manual for Unbonded Single Strand Tendons” by PTI 2000.

5.5.5.3.6 Certification of Plants must conform to “Manual for Certification of Plants producing Unbonded Single Strand Tendons” by PTI 2014.

5.5.6 Structural Steel

5.5.6.1 Strength Limits

5.5.6.1.1 Design and construct all building structural steel structures to resist stresses produced by load combinations in accordance with NBCC 2015 and CSA Standards S16.

5.5.6.2 Limits of Use for Floors

5.5.6.2.1 Floors and mezzanines supporting mechanical equipment and roofs are permitted to use steel construction.

5.5.6.2.2 Floors other than those areas specified above must not be of steel construction.

5.5.7 Substructure

5.5.7.1 Foundations

5.5.7.1.1 Design and construct all foundations to resist stresses produced by load combinations in accordance with NBCC Table 4.1.3.2.A and B and geotechnical recommendations.

5.5.7.2 Sub Grade Enclosures

5.5.7.2.1 Sub grade enclosures for mechanical and electrical services and equipment to resist floor and traffic loading in accordance to NBCC Table 4.1.5.3 and 4.1.5.9. Lateral soil pressure in accordance with geotechnical recommendations.

5.5.7.3 Slab on Grade

5.5.7.3.1 Design slab on grade to resist uniform and point floor loading in accordance to NBCC Table 4.1.5.3 and 4.1.5.9.

5.5.7.3.2 Provide wet curing procedures and specifications for review.

5.5.7.3.3 Provide crack control detailing for review.

5.5.7.4 Water and Gas Mitigation

5.5.7.4.1 Provide dewatering and gas mitigation as required.

5.5.7.5 Substructure Related Activities

5.5.7.5.1 Geotechnical review and approval required prior to installation of concrete foundations by Project Co's geotechnical engineer. Excavation slopes to be in accordance to geotechnical recommendations as per Project Co's geotechnical engineer and Worksafe BC requirements.

5.5.8 Superstructure

5.5.8.1 Floor Construction

5.5.8.1.1 Design and construct all building structures to resist stresses produced by load combinations in accordance with NBCC Table 4.1.3.2.A and B.

5.5.8.1.2 Floor construction to be cast-in placed concrete: mild steel reinforced or with unbonded post-tensioning.

5.5.8.2 Roof Construction

5.5.8.2.1 Design and construct all roof structure to resist stresses produced by load combinations in accordance with NBCC Table 4.1.3.2.A and B including snow drifts, wind uplift, and ponding.

5.5.8.2.2 Deflection limits to be L/360 under live load; and L/480 for long term deflection under live load.

5.5.8.3 Special Structures

5.5.8.3.1 Special structures such as flagpoles and free standing signs supports to be designed and constructed in accordance to NBCC 2015 seismic and wind provisions.

5.5.8.4 Stairs

5.5.8.4.1 Interior stairs can be either concrete and/or steel construction. Exterior steel stairs to be hot-dipped galvanized with non-slip treads.

5.5.8.5 Handrails and Guards

5.5.8.5.1 Design guardrails and handrails to resist loads in accordance with NBCC clause 4.1.5.14.

6. FACILITIES CONSTRUCTION SUBGROUP SPECIFICATIONS

6.1 Procurement and Contracting Requirements (Division 1) – NOT USED

6.2 Existing Conditions (Division 2)

6.2.1 Refer to the Disclosed Data regarding the geotechnical and environmental reports.

6.3 Concrete (Division 3)

6.3.1 Basic Requirements

6.3.1.1 Section 2.1.4. listing technical references is not intended to be a complete list of applicable standards. Design and construction must comply with applicable standards and practices whether listed in this Section or not.

6.3.2 Overriding Principles

6.3.2.1 Honeycombing and bug holes must be repaired immediately under the direction of the structural engineer.

6.3.3 Quality Requirements

6.3.3.1 Cause cast in place concrete and concrete materials to be inspected and tested by a CSA certified testing laboratory.

6.3.3.2 Cause precast concrete materials and workmanship to be inspected and tested by the precast concrete contractor as part of its quality control program in accordance with all applicable standards.

6.3.3.3 Concrete building elements that will remain exposed to view from the exterior of the building or are located in SLC-Non Secure areas must be designed and constructed as Architectural concrete, as defined in Section 8.3 of CAN/CSA A23.1.

6.3.3.4 Concrete surfaces, excluding exposed concrete floors, not covered with building finishes must have a smooth-formed finish, as defined in Section 7.7.3.6 of CAN/CSA A23.1.

6.3.3.5 The use of any exposed concrete flooring will conform to the following minimum levels of finish as defined by the Concrete Polishing Association of America, as follows:

6.3.3.5.1 In SLC Non-Secure public and staff areas, the level of sheen is to be Level 2 – satin or Level 3 – semi-polished, with a Class B – fine aggregate or Class C – medium aggregate exposure.

6.3.3.5.2 In SLC Secure areas and utility spaces, the level of sheen is to be Level 1 – flat, with a Class A – cream aggregate exposure.

6.3.3.5.3 Alternatives to these standards may be proposed by Project Co for consideration by the Province based upon the interior design concept, but in all circumstances the Province will determine in its sole discretion the finish level(s) to be achieved.

6.3.4 Performance Criteria

6.3.4.1 Finish concrete floors with a smooth, dense, steel trowel finish with a Class A Flatness Classification in accordance with CSA A23.1 and in conjunction with 6.3.3.5 for final levels of finish. Overlay toppings to level floors must not be used.

6.3.4.2 Repair cracks in concrete floors and walls to suit the floor finish and long-term serviceability requirements of the floor.

6.3.4.3 Water proof foundation walls surrounding occupied spaces to prevent groundwater ingress. Construction joints must have purpose-made water stops. A perimeter footing drainage system must be installed around the exterior of the below grade spaces.

6.3.4.4 Exposed architectural concrete must comply with CAN/CSA A23.1 to minimize honey combing or patching and achieve a smooth and flat surface of uniform colour. Sandblast all concrete exposed to view in public areas on the interior and exterior of the Building. Repairs to be under the direction of the structural Engineer of Record.

6.4 Masonry (Division 4)

6.4.1 Basic Requirement

6.4.1.1 Masonry design and construction that meets or exceeds current Canadian standards and practices as set out in this Section, may be considered for building elements and systems.

6.4.1.2 Masonry design and construction must comply with all applicable codes and standards including CSA S304, CSA A371, the BC Building Code, for Technical References.

6.4.1.3 Masonry construction may be considered for exterior walls and walls systems where permanence of finishes, both visually and functionally, and ease of maintenance are primary considerations in the exterior fabric of the Building.

6.4.1.4 Masonry construction may be considered for interior walls and wall systems when priorities include permanence and maintenance, sound transmission control, fire resistance and separation requirements and security.

6.4.1.5 Face work must be laid plumb and true with all joints consistent in both width and colour.

6.4.1.6 Provide masonry sealers to all exterior masonry.

6.4.2 Concrete Masonry Units

6.4.2.1 Concrete unit masonry may be considered for both independent exterior walls and in exterior wall systems as a structural backing to other finish materials or systems.

6.4.2.2 Concrete unit masonry for interior applications may be considered as an integrally finished material, as a base for applied finish and as a structural backing to other finish systems.

6.4.2.3 Painted or unpainted concrete unit masonry can only be used as an exposed finish in building service zones and similar areas not readily accessible to the users and occupants of the Building.

6.4.2.4 Where concrete unit masonry is used as the exposed finish all exposed corners must be radiused.

6.4.2.5 Masonry design and construction must comply with Canadian Masonry Contractors Association (CMCA) Masonry Practices Manual, CSA-S304, and all applicable standards including CSA-A371.

6.4.3 Brick Masonry

6.4.3.1 Exterior wall systems comprising brick masonry as a finish veneer to concrete, concrete masonry or metal framing must be a rain screen or cavity wall system.

6.4.3.2 Brick masonry below grade for exterior applications is not permitted.

6.4.4 Stone Masonry

6.4.4.1 Stone masonry, subject to approval by the Province, can be used as a finish veneer to concrete walls or concrete masonry walls. Exterior wall systems in such applications must be a rain screen or cavity wall system.

6.4.4.2 Stone must be sound, hard and durable, well-seasoned and of uniform strength, colour and texture, and free of quarry sap, flaws, seams, sand holes, iron pyrites or other mineral or organic defects. Manufactured stone products are not permitted.

6.5 Metals (Division 5)

6.5.1 Basic Requirements

6.5.1.1 Structural steel, steel deck, miscellaneous metal fabrications, and cold-formed steel stud design and construction that meets or exceeds current Canadian standards and practices, including the BC Building Code, may be considered for building elements and systems.

6.5.2 Performance Criteria

6.5.2.1 Design structural steel, steel deck, and cold-formed steel stud systems to comply with the deflection and vibration criteria outlined in Section 5.5.4 - Strength and Serviceability Limits.

6.5.2.2 Erection tolerances for steel construction must be in accordance with CSA S16 Clause 29.3 except the maximum out-of-plumbness of exterior columns must be +/- 20mm over the full height of the Building.

6.5.2.3 For steel floor and roof construction, the deflection of steel beams, joists, and girders due to the wet weight of concrete topping slabs is to be considered. Topping slab thickness may have to vary to maintain floor levelness tolerances. The additional concrete ponding weight is to be considered in the design of the structure.

6.5.2.4 Concrete topping slabs must be finished with a smooth, dense, steel trowel finish with a Class A Flatness Classification in accordance with CSA A23.1. Thin overlay toppings to level floors must not be used to level floors.

6.5.2.5 Pay special attention to crack control of concrete topping slabs on steel deck to avoid random surface shrinkage cracking and radial cracking around re-entrant corners and special attention to curing is required for concrete topping slabs on metal deck. As a minimum, the following details and procedures must be implemented:

6.5.2.5.1 minimize wet weight deflections of steel decking and supporting structure;

6.5.2.5.2 where practical, place concrete in alternate bays. Avoid placing large areas at one time;

6.5.2.5.3 use concrete topping with a low design slump. Add superplasticizer to increase slump for placing and finishing; and

6.5.2.5.4 provide extra topping slab reinforcement around openings, columns and at corners.

6.5.2.6 Cracks in concrete topping slabs must be repaired to suit the floor finish and long term serviceability requirements of the floor.

6.5.2.7 Steel floor/roof decking is to be wide rib profile for ease of attachment of current and future services, equipment, and fixtures using drilled insert expansion anchors into the bottom of the deck ribs.

6.5.2.8 Steel floor/roof decking plus the concrete topping slab thickness is to satisfy the requirements of a ULC-rated assembly meeting the BC Building Code fire rating requirements. Spray on or applied fireproofing material is not to be used to achieve required floor deck fire rating.

6.5.2.9 Fire proof structural steel floor/roof framing and supporting members must be used to meet all fire rating requirements. Spray on fire proofing applications, which must be tamped while wet to densify product, must be used for floor and roof beams and girders, complete with an applied sealer creating a dense non-friable surface for ease of future attachment of services and equipment.

6.5.3 Structural Steel

6.5.3.1 Quality Requirements

6.5.3.1.1 Cause quality assurance testing and monitoring of workmanship to be carried out by an approved testing laboratory using testing procedures as specified in the CAN/CSA standards listed in this Schedule, including CSA S16, to verify soundness of representative shop and field welds. Test all full-strength welds.

6.5.3.1.2 Material quality including sourcing and welding quality must be monitored by an independent testing agency paid by Project Co.

6.5.3.1.3 The specification for preparation and painting of Structural Steel components must conform to the Master Painters Institute (MPI) Standards.

6.5.3.1.4 Exterior exposed structural steel must be hot dipped galvanized to 600 g/m2 or painted with a quality two part epoxy paint system.

6.5.4 Cold-Formed Metal Framing

6.5.4.1 Overriding Principles

6.5.4.1.1 Load bearing and non-load bearing steel studs may be considered as a component of the exterior wall systems to support exterior wall finishes and form an integral part of the perimeter envelope.

6.5.4.1.2 Rain screen walls utilizing cold-formed metal framing must be non-load bearing.

6.5.4.1.3 Load bearing steel studs must be independent of the principle structural system.

6.5.4.1.4 Utilize cold-formed metal framing systems as part of rain screen systems, including tested air barrier assemblies.

6.5.4.2 Quality Requirements

6.5.4.2.1 Design, detail and construct load bearing steel stud design and construction to comply with all applicable CAN/CSA standards. See Section 2.1.4 for Technical References.

6.5.4.2.2 Cold –formed metal framing design must be carried out by a Professional Engineer registered in the Province of British Columbia; construction must comply with CSA-S136. Field reviews of the cold-formed metal framing installation must be carried out by the cold formed metal framing design engineer.

6.5.4.2.3 The steel stud manufacturer must be certified in accordance with CSSBI Standard 30M-06 and all applicable CAN/CSA standards including CSA-A660.

6.5.4.2.4 Conform to the Association of Wall and Ceiling Contractor's Specification Standards Manual (AWCC).

6.5.4.3 Performance Requirements

6.5.4.3.1 Limit maximum deflection under specified wind loads to L/360 (including masonry veneers), unless a smaller maximum deflection is specifically required due to wall finishes.

6.5.4.3.2 Design components to accommodate erection tolerances of the structure.

6.5.4.3.3 Design wind bearing stud end connections to accommodate floor/roof deflections and to ensure that studs are not loaded axially.

6.5.4.3.4 Design steel studs to take into account the anchorage of other materials being supported including: sub-girts supporting metal cladding and composite panels, soffit finishes and the provision of lateral support at window heads.

6.5.5 Miscellaneous Metals

6.5.5.1 Quality Requirements

6.5.5.1.1 Primers and paints of miscellaneous metals must conform to Master Painters Institute (MPI) Architectural Specification Standards Manual.

6.5.5.1.2 Exterior elements must be hot dipped galvanized with 600 g/m2 to CAN/CSA – G164 or painted with a quality two part epoxy paint system.

6.5.5.2 Performance Requirements

6.5.5.2.1 Welding to be in accordance with CSA W59.

6.6 Wood, Plastics and Composites (Division 6)

6.6.1 Do not use products containing added urea formaldehyde in the Facility. The intent is to prevent the use of wood product such as particleboard made with formaldehyde-based resins and binders.

6.6.1.1 Provide rough carpentry, wood backing materials, backing boards for mechanical rooms and electrical/communication rooms, roof sheathing, copings, cant strips, finish carpentry and architectural woodwork, including but not limited to exterior fascia's, cabinets, casework (excluding MDR, Sterile Core and OR casework, which is included in Division 12), frames, panelling, ceiling battens, trim, installation of doors and hardware, and other wood-related products and applications as required:

6.6.1.1.1 to meet the requirements of this Schedule, support functionality as defined in the specifications and as required for operation of the Facility.

6.6.1.1.2 as required for wood products exposed to view in finished interior and exterior installations.

6.6.1.2 Provide acrylic plastic, stainless steel or epoxy products as required for wall cladding, wall protection, corner protection, casework finishing, trims, ornamental elements, and other applications to achieve a quality of interior finish suitable for use by staff, facility users and the public.

6.6.1.3 Use pressure treated wood for exterior exposed wood.

6.6.2 Performance Criteria

6.6.2.1 Finish Carpentry, Millwork and Architectural Woodwork

6.6.2.1.1 Conform to Architectural Woodwork Standards, First Edition, as issued by Architectural Woodwork Manufacturer's Association of Canada (AWMAC). Typically comply with Quality Standards Manual for minimum "Custom Grade," and Door and Hardware Institute (DHI) standards for the design, fabrication, materials, installation, and workmanship of finish carpentry and architectural woodwork.

6.6.2.1.2 All bottoms of sink cabinet boxes and areas that may come into contact with water must have a marine-grade plywood substrate. Do not use fibreboard or particleboard.

6.6.2.1.3 Use marine-grade plywood substrate for countertops. Do not use fibreboard or particleboard.

6.6.2.1.4 For millwork and cabinets, seal all wood surfaces and edges. All door, drawer and other exposed millwork edges must have applied an appropriately sized PVC edge strip, heat applied. There must be no P-Lam to P-Lam edges.

6.6.2.1.5 Comply with the LEED® requirements of credit 4.4 (Indoor Environmental Quality, Low-Emitting Materials: Composite Wood and Laminate Adhesives).

6.6.2.1.6 Adhesives must be non-toxic, non-solvent glue to comply with AWMAC Quality Standards Manual, Canadian 'Eco-Logo' program, and CaGBC (Canada Green Building Council).

6.6.3 Architectural Millwork

6.6.3.1 Provide architectural millwork including all counters, cabinet units, shelving, hardware, finishing and installing as follows:

6.6.3.1.1 all cabinets must be flush overlay construction;

6.6.3.1.2 design millwork so that no sharp edges are exposed, provide minimum 25 mm radiused corner to countertops;

6.6.3.1.3 all courtroom cabinets to be provided with locks;

6.6.3.1.4 where required, incorporate all required mechanical, electrical and communication services into the millwork so that wires and pipes are hidden from view, provide access panels to all services to allow for future adjustment;

6.6.3.1.5 coordinate millwork with equipment indicated in Schedule 2, Appendix 2E - Equipment and Furniture;

6.6.3.1.6 provide built in valance lighting underneath all upper cupboards for task oriented and staff areas; and

6.6.3.1.7 all architectural woodwork hardware to be stainless steel of durable quality to meet the standards of AINSI/BHMA grade 1 Cabinet Hardware.

6.6.3.2 Provide stainless steel counters and shelves as follows:

6.6.3.2.1 fabricate from Type 316, No. 4 finish stainless steel;

6.6.3.2.2 corners must be welded, ground, polished and crevice-free. Joints and welds must be polished to a uniform No. 4 satin finish. No filler or solders will be used. Straight lengths must be one-piece with all seams, including field joints, welded;

6.6.3.2.3 sound-deaden tops and reinforce with waterproof plywood core, bonded to tops with waterproof contact cement. Seal underside of top (plywood core) with a waterproof finish. The front edges of the tops must be marine edge. Form splashback as an integral part of the tops, radiused where the

splashback occurs in the top. Bond all splashbacks to plywood core, bonded the same as specified for the tops. Weld counter and sink assemblies into single units without seams or joints. Drill splashbacks, tops and sinks to receive plumbing and electrical fittings.

6.7 Thermal and Moisture Protection (Division 7)

6.7.1 Basic Requirements

6.7.1.1 Design construction assemblies according to Building envelope principles.

6.7.1.2 Design construction assemblies to prevent the ingress of moisture or water vapour from the exterior through the Building envelope and the passage of air through the building envelope from the interior spaces to the exterior and vice versa.

6.7.1.3 Design construction assemblies to prevent the ingress of moisture through foundation walls below grade, both subject and not subject to hydrostatic pressure.

6.7.2 Performance Criteria

6.7.2.1 Dampproofing

6.7.2.1.1 Provide foundation wall surfaces with dampproofing coverage that is sufficient to repel and prevent moisture ingress in accordance with BCBC 5.8.2 where no hydrostatic pressure is present.

6.7.2.2 Waterproofing

6.7.2.2.1 Provide waterproofing to prevent moisture ingress to occupied spaces below grade.

6.7.2.2.2 Use membrane waterproofing to prevent water ingress over suspended slabs and decks and associated walls over habitable spaces where water collection is anticipated. Use traffic-bearing fluid-applied waterproofing for mechanical room floors.

6.7.2.2.3 Provide waterproof membranes in exterior walls as part of the Building envelope and integral with rain screen or cavity wall assemblies.

6.7.2.3 Vapour Barriers

6.7.2.3.1 Prevent water vapour transmission and condensation in wall assemblies, roofing assemblies, and under concrete slabs-on-grade within the Building perimeter by means of a continuous vapour barrier membrane.

6.7.2.3.2 At underslab conditions, provide continuous vapour barrier not less than 0.15 mm thick plastic sheet complying with ASTM E1745, Class A.

6.7.2.3.3 Conduct dew-point analysis to determine correct placement of vapour barrier within wall and roof assemblies. Coordinate locations of thermal insulation, waterproof membranes, and air and vapour barriers to prevent creation of dew point, resulting in condensation within assemblies.

6.7.2.4 Air Barriers

6.7.2.4.1 Prevent air leakage caused by air pressure across the wall and roof assembly by means of air barrier assemblies.

6.7.2.4.2 Provide air barrier assemblies that:

6.7.2.4.2.1 limit air exfiltration and infiltration through materials of the assembly, joints in the assembly, joints in components of the wall assembly, and junctions with other building elements including the roof; and

6.7.2.4.2.2 prevent air leakage caused by air pressure across the wall and roof assembly, including interruptions to the integrity of wall and roof systems such as junctions with dissimilar constructions.

6.7.2.5 Thermal Protection

6.7.2.5.1 Provide thermal insulation as part of the Building envelope to prevent the transfer of heat both from the interior to the exterior and vice versa, depending on seasonal conditions, and to resist the absorption of water.

6.7.2.5.2 Use thermal protection materials of a type and quality that must provide consistent environmental quality to enclosed spaces.

6.7.2.5.3 Use foamed plastic insulation that is CFC and HCFC free and in compliance with the Province of British Columbia Ozone Depleting Substances Regulations.

6.7.2.6 Roofing

6.7.2.6.1 Comply with the Roofing Contractors Association of British Columbia Guarantee Corp (RGC) latest standards and requirements for a ten (10) year Guarantee as published in the RGC Roofing Practices Manual.

6.7.2.6.2 Comply with RGC Roofing Practices Manual “Acceptable Materials List,” including:

6.7.2.6.2.1 membrane for green roofs – SBS modified (two ply system); and

6.7.2.6.2.2 flexible membrane for reflective roofs – Elastomeric or Thermoplastic (single-ply system), Energy Star compliant (highly reflective) and high emissivity (of at least 0.9 when tested in accordance with ASTM 408).

6.7.2.6.3 Roof assembly design including deck, vapour barrier, insulation, board stock, and membranes must comply with British Columbia Building Code for fire classifications and with RGC requirements for wind uplift requirements, as well as requirements for live loads, dead loads, snow loads, and wind uplift. Comply with ULC Class 60 wind uplift classification.

6.7.2.6.4 Use foamed plastic insulation that is CFC- and HCFC-free and in compliance with the Province of British Columbia Ozone Depleting Substances Regulations.

6.7.2.6.5 Provide a complete horizontal barrier to weather and climate using one of the aforementioned roofing systems.

6.7.2.6.6 If a green roof is used, design the assembly so that the system dead load, measured according to ASTM D2397, when added to the weight of the roofing membrane system, does not exceed the maximum allowable dead load for the roof.

6.7.2.6.7 Roofing systems must include:

6.7.2.6.7.1 flashings and sheet metal;

6.7.2.6.7.2 thermal insulation;

6.7.2.6.7.3 assembly components for green roofs if used, otherwise provide roof with SRI complying with LEED® requirements;

6.7.2.6.7.4 roofing specialties and accessories required for completion;

6.7.2.6.7.5 interior access systems to roof areas;

6.7.2.6.7.6 protection from pedestrian traffic and solar radiation; and

6.7.2.6.7.7 roof drainage, including overflow scuppers.

6.7.2.6.8 Provide sheet metal flashings that divert water away from membrane flashing termination and protect the membrane from deterioration due to the exterior elements and mechanical damage. Provide roofing membrane continuously under the metal flashings. Ensure that sheet metal components comply with wind uplift requirements established for roofing system.

6.7.2.6.9 Metal roofing systems, if used, must provide clear internal paths of drainage to allow any trapped moisture to drain to the exterior and avoid the staining of architectural finishes, forming of puddles, forming of icicles, and dripping on pedestrians. In designing the Facility, including any roof systems, ensure that entrance ways are protected from sliding snow and ice and that there are no accumulations of snow and ice in roof valleys.

6.7.2.6.10 Steep Roofs (slopes greater than 1:6)

6.7.2.6.10.1 Configure steep roofs and perimeters so that snow, ice and rainwater must not create safety, maintenance or appearance problems. Design to prevent ice and snow from sliding onto areas intended for use by vehicles or pedestrians.

6.7.2.6.10.2 Size and design eaves troughs to accommodate water from contributory roof and wall areas and to resist expected snow and ice loads.

6.7.2.6.11 Ponding of water on roofs will not be accepted.

6.7.2.6.12 Support large roof top units on:

6.7.2.6.12.1 Structural pedestals or raised framework with at least 300 mm clearance between the roofing system and the underside of the framework.

6.7.2.6.12.2 Industry standard isolators to limit HVAC related noise and vibration to acceptable levels.

6.7.2.6.12.3 On curbs where access under the unit for maintenance to roofing is not required.

6.7.2.7 Fire and Smoke Protection

6.7.2.7.1 Use spray-applied cementitious fireproofing if required to achieve a fire resistance rating.

6.7.2.7.2 Spray-applied cementitious fire proofing must conform to the Code and ASTM E 605 and CAN/ULC –S102 standards.

6.7.2.7.3 Integrate barriers into vertical and horizontal space separations to protect against the spread of fire and smoke. Apply protection to exposed building elements (structural and non-structural) susceptible to fire and subsequent damage.

6.7.2.7.4 Apply protection around penetrations through vertical and horizontal fire-resistance rated separations.

6.7.2.7.5 Use firestopping and smoke seal systems that consist of asbestos- free materials and systems, capable of maintaining an effective barrier against flame, smoke, and gases.

6.7.2.7.6 Use firestopping that:

6.7.2.7.6.1 is compatible with substrates;

6.7.2.7.6.2 allows for movement caused by thermal cycles; and

6.7.2.7.6.3 prevents the transmission of vibrations from pipe, conduit or duct to structure and structure to pipe, conduit or duct.

6.7.2.7.7 When more than one product is required for an assembly, use products that are compatible with one another and from the same manufacturer. Products must comply with requirements established by ULC tested assemblies.

6.7.2.7.8 Use fire stopping sealants and coatings that are silicone-based and guaranteed not to re-emulsify if subject to wetting or standing water. Do not use acrylic-based coatings and sealants.

6.7.2.8 Sealants

6.7.2.8.1 All sealants and sealant primers used in the interiors of the Facility must comply with the requirements of LEED® - low VOC.

6.7.2.8.2 Apply sealant materials to achieve:

6.7.2.8.2.1 seals to the building envelope systems and around openings in the building envelope systems as required to prevent water ingress;

6.7.2.8.2.2 seals around and over cavities in or behind surface elements to allow effective infection prevention and control;

6.7.2.8.2.3 sealant around door frames must include joints at bottom of door frames (between floor finish and frames);

6.7.2.8.2.4 sealed joints between dissimilar or similar materials to allow a smooth or even transitions; and

6.7.2.8.2.5 sealed expansion or controls joints in the building envelope systems or structural systems to allow movement.

6.7.2.8.3 For the exterior; use sealants to completely and continuously fill joints between dissimilar and/or similar materials.

6.7.2.8.4 For the interior; use sealants (at frames such as those at doors, windows and skylights), to completely fill joints between dissimilar materials using one component, acrylic emulsion, paintable type.

6.7.2.8.4.1 Seal all door frames to floor.

6.7.2.8.4.2 Seal all top edge of equipment rails and wood hand, bumper and crash rails to wall.

6.7.2.8.4.3 Use silicone caulking that is mildew-resistant and impervious to water for caulking washroom plumbing fixtures.

6.7.2.8.4.4 Use sealants with self-levelling properties for expansion and control joints in concrete floors using two-component epoxy urethane sealants.

6.7.2.8.5 Use non-sag sealants for exterior vertical expansion and control joints in masonry or wall cladding.

6.7.2.8.6 Use sealants that allow for minimum 25% movement in joint width.

6.7.2.8.7 In corridors and other traffic areas used by laundry carts, supply carts, material handling equipment etc., use traffic bearing type sealants suitable to support imposed load without deformation or failure.

6.7.2.8.8 In public zones and SLC Secure areas, design and construct joints to prevent concealment of contraband.

6.7.2.8.9 Design and construct joints to prevent the ability to disassemble materials. No “pickable” cracks will be allowed in SLC Secure areas.

6.7.2.9 Traffic Coatings

6.7.2.9.1 Protect the suspended structural concrete floor slabs of Parkade structures with a traffic coating to prevent the ingress of moisture into the slab.

6.7.2.9.2 Use traffic coating that complies with the following:

6.7.2.9.2.1 Membrane: Fluid applied aliphatic polyurethane waterproof traffic membrane (colour as selected by the Province), liquid applied, with two component 100% solids. Topping: Polyurethane compound wear course.

6.7.2.9.2.2 Filler and Primer: As recommended by membrane manufacturer.

6.7.2.9.2.3 Sealant: Polyurethane type, compatible with system and adjacent materials.

6.7.2.9.3 Provide fluid applied integral flashings at all locations where a horizontal surface butts a vertical surface and at all deck projections. Apply the membrane over the prepared surfaces at a minimum thickness of 500 microns thick and extend the membrane a minimum of 10 cm on vertical and horizontal surfaces.

6.8 Openings (Division 8)

6.8.1 Basic Requirements

6.8.1.1 Except where wired glass is required in accordance with the BC Building Code, construct interior windows and sidelights of tempered glass. For exterior glazing at doors and sidelights, use laminated glass.

6.8.1.2 Doors

6.8.1.2.1 Provide doors that suit the intended function of spaces or rooms requiring acoustic or visual privacy, security, special HVAC requirements, fire-resistance rated separations or other closures.

6.8.1.2.2 For all doors: floor mounted rails, slides and/or locking pins are not permitted (top mount only).

6.8.1.2.3 Glazing in doors (interior and exterior) must allow for proper security, sight lines and natural lighting as per Appendix 3A – Functional Space Requirements and Schedule 2, Design and Construction Protocols.

6.8.1.2.4 Exterior doors must meet the requirements of ASHRAE 90.1.

6.8.1.2.5 Size Requirements for Doors:

6.8.1.2.5.1 Provide door openings of adequate width to suit the intended purpose of rooms on either side of the doors and also allow the movement of people and equipment associated with those rooms.

6.8.1.2.5.2 Main Entrance doors must be a minimum 2440 mm (8’-0”).

6.8.1.2.5.3 Minimum door width must be 914 mm (3’-0”).

6.8.1.2.5.4 Provide double 914 mm (3’-0”) width doors, a minimum of 2134 mm (7’-0”) high, or as required, to move large pieces of equipment in or out during the lifetime of the Building. This must include all mechanical and electrical rooms.

6.8.1.2.5.5 For acoustic requirements for Doors: refer to Appendix 3B – Acoustics and Noise Control.

6.8.1.2.5.6 Apply door sizes and designs consistently to rooms of similar use, location, and configuration.

6.8.1.2.5.7 Avoid doors swinging into corridors in a manner that may obstruct traffic flow or reduce the corridor width, except doors to spaces that are used infrequently and are not subject to occupancy such as small closets.

6.8.1.2.5.8 Provide all doors with appropriate hinges, edge protection, and face protection to minimize damage and resultant disruptive maintenance.

6.8.1.2.5.9 Be consistent with the extent of glazing in a door, or the size and quantity of sidelights, and balance these between the extent of observation required and the privacy requirements of the occupants of the room. Where appropriate, provide glazing in an adjacent sidelight rather than within the door itself.

6.8.1.2.5.10 Provide glazing in doors and sidelights in such a way that they allow for appropriate operational requirements of the spaces they serve.

6.8.1.2.5.11 Provide doors and door frames with the capability to withstand varying and high levels of impact that can occur within accused holding zones while maintaining their aesthetic and functional capacities.

6.8.1.2.5.12 In areas where security is considered paramount, achieve security with the appropriate location, configuration, materials, construction, and detailing of doors and hardware.

6.8.1.2.5.13 Wood doors are appropriate for user, staff and SLC-Non Secure areas.

6.8.1.2.5.14 Metal doors are required for service areas or zones where high impact to doors would be frequent.

6.8.1.3 Interior Windows

6.8.1.3.1 General Requirements

6.8.1.3.1.1 Size, configure, and adequately construct windows to suit rooms that require daylight, views and/or natural ventilation.

6.8.1.3.1.2 Provide Borrowed Light deep into the building, either through interior windows to occupied rooms that do not have exterior windows or through other means.

6.8.1.3.1.3 Operable windows may be provided (windows that may be opened and closed) in rooms and spaces where acceptable for the functionality and security of the room or space, as described in Appendix 3A - Functional Space Requirements.

6.8.1.3.1.4 Coordinate glazing heights with adjacent wall protection, handrails, and other accessories to achieve functional and aesthetic cohesiveness.

6.8.1.3.1.5 Glazing must provide for excellent optical clarity with ease of maintenance over time.

6.8.2 Performance Criteria

6.8.2.1 SLC Non-Secure:

6.8.2.1.1 Conventional window construction.

6.8.2.1.2 Provides normal security and resistance to abuse. No special resistance to attack is required.

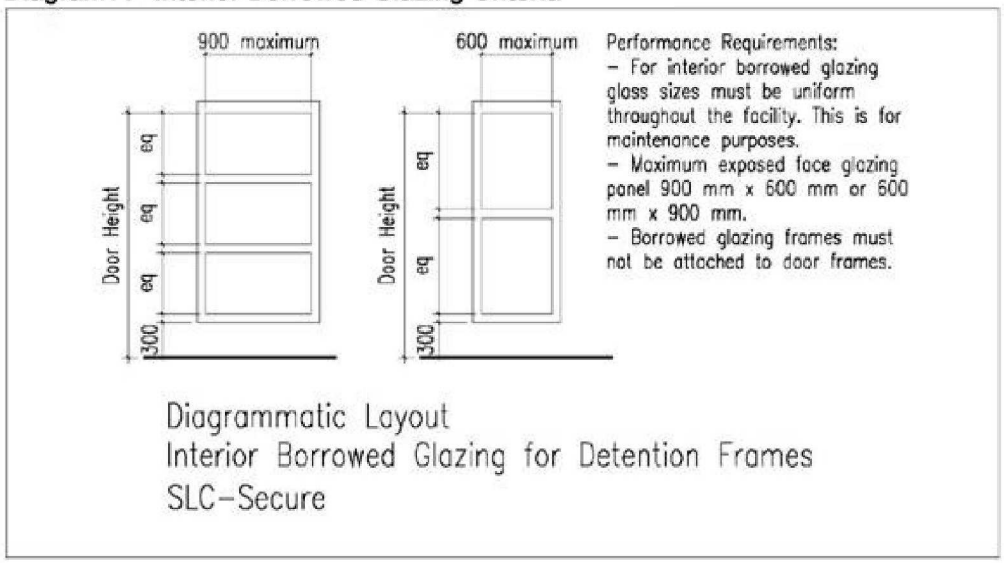
6.8.2.2 SLC Secure:

6.8.2.2.1 Forced Entry Testing Requirements: Underwriters Laboratories UL 972 and the American Standards Testing Methods ASTM F1233 and F1915.

6.8.2.2.2 Provides normal security and resistance to abuse. No special resistance to attack is required.

6.8.2.2.3 Limiting the dimensions of the window to the Interior Borrowed Glazing Criteria. (Diagram A below).

Diagram A - Interior Borrowed Glazing Criteria



6.8.2.3 Interior Glazing Selection Criteria

6.8.2.3.1 The use of polycarbonate glazing material for various levels of confinement and attack resistance must be based on the criteria described in this Section.

6.8.2.3.2 All detention windows are to be able to be re-glazed in place.

6.8.2.3.3 All secure glazing that uses polycarbonate must be protected on each side by heat tempered safety glass. The heat tempered glass must not be laminated with the polycarbonate but must be installed as a combination of glass layers installed in the frame. If the tempered glass is broken it is used as a sacrificial layer that can be easily replaced. The glazing must be installed such that when the sacrificial layer is broken the remainder of the glazing remains secure in the frame.

6.8.2.3.4 If glazing is required for a SLC Secure area in a fire separation, an alternative solution to fire rated glazing must be required to provide the required fire protection. Fire rated glass is not permitted.

6.8.2.4 Interior Glazing Schedule

6.8.2.4.1 Doors and Borrowed Lites in SLC-Non Secure zones: minimum 6 mm Tempered.

6.8.2.4.2 Janitor, exit and corridor doors: 6 mm Tempered.

6.8.2.4.3 Cell Doors and Borrowed Lites: 12 mm Tempered 12 mm Polycarbonate 6 mm Tempered.

6.8.2.4.4 High Security Courtroom Public Separation and Ballistic returns Level 3 Ballistic Security Glass.

6.8.2.4.5 SLC Secure interior corridors and Borrowed Lites: 6 mm Tempered 9 mm Polycarbonate 6 mm Tempered.

6.8.2.4.6 Security and Control:

6.8.2.4.6.1 Doors: 6 mm Tempered 9mm Polycarbonate 6 mm Tempered.

6.8.2.4.6.2 Borrowed lites: 6 mm Tempered 12mm Polycarbonate 6 mm Tempered.

6.8.2.4.7 Staff areas of refuge:

6.8.2.4.7.1 Doors and Borrowed lites: 6 mm Tempered 9mm Polycarbonate 6 mm Tempered.

6.8.2.5 Interior Doors and Grilles

6.8.2.5.1 Basic Requirements

6.8.2.5.1.1 Doors must be sized, fabricated, and installed to suit the intended function of spaces or rooms requiring acoustic or visual privacy,

security, special HVAC requirements, fire-resistance rated separations and other enclosure criteria.

6.8.2.5.1.2 Design doors and frames to resist expected use and abuse according to their respective zone(s), and to be easily maintainable and repairable.

6.8.2.5.1.3 Door and frames for use in SLC Secure facilities are classified as follows:

6.8.2.5.1.3.1 SLC Non Secure doors and frames (also referred to as commercial doors and frames).

6.8.2.5.1.3.2 SLC Secure doors and frames (also referred to as detention doors and frames).

6.8.2.5.1.4 SLC Non-Secure – To provide doors and frames of heavy duty commercial grade construction that have no special detention requirements.

6.8.2.5.1.5 SLC Secure – To provide detention doors and frames that exceed SLC Non-Secure requirements and are used to restrict and control movement through the Building.

6.8.2.5.1.5.1 All steel detention door assemblies, including frames, hinges and associated hardware and components, must be security Grade 2, as defined in the applicable ASTM standards. Sally port door assemblies, including frames, hinges and associated hardware and components, must be steel and must be security Grade 1, as defined in the applicable ASTM standards. Sally port door is to have a minimum clearance of 3.66m (12') to accommodate both BC Ambulance Service and BC Sheriffs' vehicles.

6.8.2.5.1.5.2

6.8.2.5.1.5.3 Installation methods and locations for doors, frames, and hardware must conform to Door and Hardware Institute (DHI) standards.

6.8.2.6 Performance Criteria

6.8.2.6.1 All work requiring the supply and installation of detention equipment must be coordinated through a single detention equipment contractor (the "DEC"), with the following qualifications:

6.8.2.6.1.1 A minimum of ten (10) years documented experience furnishing detention hardware.

6.8.2.6.1.2 The following certifications from the Door and Hardware Institute (DHI) of Canada:

- Architectural Hardware Consultant (AHC).

- Certified Door Consultant (CDC).

- Electrical Hardware Consultant (EHC).

6.8.2.6.2 Supply and installation of detention equipment may be through more than one source, however all products and installations that are related must be compatible and coordinated by the DEC.

6.8.2.6.3 Reports and documentation of testing and performance must be in accordance with ASTM F 1450, Section 9, “Report”, and in accordance with ASTM F 1592, Section 8, “Certification and Reports”.

6.8.2.6.4 Design and construct frames to accommodate the following:

6.8.2.6.4.1 compatible with adjacent wall assembly with respect to methods of anchoring, fire protection, door weight, and repetitive slamming;

6.8.2.6.4.2 provide the recessed card reader assembly and intercom station within the face of the jamb on the lock side. Coordinate with requirements of BSCS. Face plates for the card reader and intercom must be flush to the adjacent jam surfaces. Design and Construction must accommodate all BSCS equipment, and access panels;

6.8.2.6.4.3 provide door position indicator located on the lock side of the door jamb between 350 mm – 400 mm above the lock assembly. Coordinate with the location of the door lock, intercom and card reader assemblies.

6.8.2.7 Hollow Metal Doors and Frames

6.8.2.7.1 Materials and manufacture of metal doors must comply with the Requirements of the Canadian Steel Door and Frame Manufacturer’s Association (CSDFMA).

6.8.2.7.2 Provide interior metal doors with flush face construction.

6.8.2.7.3 Doors with an inactive leaf must not be floor bolted. Bolt into frame instead.

6.8.2.7.4 Provide exterior metal doors with:

6.8.2.7.4.1 flush face construction, continuously welded, seamless edge construction using steel sheet;

6.8.2.7.4.2 edge seams to correspond with door function and minimize maintenance needed;

6.8.2.7.4.3 prepared surfaces to receive finishes that resist corrosion from exposure to weather. Provide with ZF180 coating; and

6.8.2.7.4.4 all exterior doors that open out must be capped to avoid water collecting in welding channels.

6.8.2.7.5 Provide pressed metal frames with:

6.8.2.7.5.1 fully welded construction. Provide same gauge at frames as at doors to improve performance of assembly, including hardware;

6.8.2.7.5.2 thermally-broken door frames for exterior, non-fire rated openings; and

6.8.2.7.5.3 anchors to each jamb to suit wall type and receive the frame.

6.8.2.7.6 Door Glazing

6.8.2.7.6.1 For exterior hollow metal door glazing, use sealed units with warm edge, argon filled space in thermally-broken frames to prevent heat loss.

6.8.2.7.6.2 For interior hollow metal door glazing use tempered glass. Provide with safety label where required.

6.8.2.8 Wood Doors

6.8.2.8.1 All wood doors must comply with all applicable standards, including the Quality Standards for Architectural Woodwork published by the Architectural Woodwork Manufacturer's Association of Canada (AWMAC) and Door and Hardware Institute (DHI) standards.

6.8.2.8.2 Wood doors must have hardware and finishes that suit the intended function and aesthetics of the Building. Typically use Grade A faces for transparent finish. Factory finish is required for doors with transparent finish; use UV-cured polyurethane finish system. All wood door edges must be sealed.

6.8.2.8.3 Provide heavy duty commercial grade wood doors in flush design, Custom Grade quality (as defined in the AWMAC standards referred to above), 5-ply bonded particleboard core.

6.8.2.8.4 Doors with an inactive leaf must not be floor bolted. Bolt into frame instead.

6.8.2.8.5 Provide fire-resistance rated doors with a homogeneous incombustible mineral core and AWMAC Quality Standards Option 5 blocking.

6.8.2.8.6 Install finish hardware securely. Fasten to solid wood backing, except where hardware is designed to be through-bolted.

6.8.2.8.7 Glue stiles, rails and faces to the core with Type II water-resistant adhesive to minimize de-lamination or disassembly as a result of moisture ingress.

6.8.2.8.8 Use B-Grade hardwood veneer with AWMAC No. 3 edge, finish to suit the intended use.

6.8.2.9 Interior Aluminum Sliding Doors and Sidelights

6.8.2.9.1 Interior sliding doors and sidelights must have recessed mounted track with sliding and fixed panel(s), and include single glazing with 6 mm clear fully tempered float glass.

6.8.2.10 Aluminum Entrances and Storefronts

6.8.2.10.1 Aluminum entrances and storefront framing and doors may form part of the exterior envelope of the Building.

6.8.2.10.2 Provide glazed interior partitions as appropriate to comply with the functions of the spaces as defined by the Room Data Sheets.

6.8.2.10.3 Use aluminum doors within aluminum entrances and storefront.

6.8.2.10.4 Use frames that are thermally-broken, flush glazed, aluminum sections, to accept insulating glass units.

6.8.2.10.5 Incorporate in the frames drained and vented system (rain screen) with a complete air and vapour seal, allowing any moisture entering the frame to drain to the exterior and allowing air into the pressuring chamber.

6.8.2.10.6 Use aluminum swing entrance doors that are heavy-duty commercial or institutional grade, automatically operated, motion-detector controlled.

6.8.2.10.7 Apply aluminum finish for exposed aluminum surfaces. Finish to be permanent and resistant to corrosion caused by weather exposure and climate.

6.8.2.11 Specialty Doors

6.8.2.11.1 Overhead Rolling Service Doors

6.8.2.11.1.1 Restrain lateral movement of door curtain slats. Provide windlocks as required by door size or wind load requirements.

6.8.2.11.1.2 Provide interlocking flat slats, complete with bottom bar and contact type bottom astragal.

6.8.2.11.1.3 Provide motor operation for any overhead doors to be operated by staff.

6.8.2.11.1.4 Where manually operated doors are accepted by the Province, provide inside lift handle and locking bar or chain hoist. Motor operation must be provided on doors requiring constant usage. Chain operation must be by means of reduction gears and galvanized hand chain.

6.8.2.11.1.5 For fire doors, provide automatic closing device operated by fire door release device connected to fire alarm system.

6.8.2.11.2 Overhead Rolling Grilles

6.8.2.11.2.1 Provide grilles that allow visual access to secure areas.

6.8.2.11.2.2 Provide aluminum or steel guides that are: fabricated to withstand vertical and lateral loads; counterbalanced by helical torsion springs; and sound-deadened.

6.8.2.11.2.3 Provide motor operation for any overhead doors to be operated by staff.

6.8.2.11.2.4 For manually operated closures, provide inside lift handle and locking bar or chain hoist. Motor operation must be provided on grilles requiring constant usage. Chain operation must be by means of reduction gears and heavy chrome plated hand chain.

6.8.2.11.3 Overhead Rolling Counter Shutters / horizontal sliding grilles

6.8.2.11.3.1 Provide shutter curtains fabricated with extruded aluminum, galvanized steel, or stainless steel interlocking flat slats, complete with guides of similar materials.

6.8.2.11.4 Automatic Sliding Doors

6.8.2.11.4.1 Automatic sliding doors complete with break-away capability for exiting may be installed at the main entrance, providing that the size and configuration of the entrance vestibule is designed such that both sets of doors will not be open at the same time.

6.8.2.11.4.2 Provide door operators, including the motion and presence detection system, that are: capable of operating within the temperature ranges existing at the Building; and unaffected by ambient light or ultrasonic interference.

6.8.2.11.4.3 Provide energy-saving devices to reduce conditioned air or heat loss.

6.8.2.11.5 Automatic Swing Doors

6.8.2.11.5.1 Use automatic swing doors for interior and exterior locations where appropriate.

6.8.2.11.5.2 If used, provide directional motion sensor control devices that are unaffected by ambient light or ultrasonic frequencies.

6.8.2.11.5.3 Equip all in-swing doors that are required exits with an emergency breakaway switch that internally cuts power to the operator. No external power switch allowed.

6.8.2.12 Door hardware is to achieve the following:

6.8.2.12.1 The Province's goal is to limit the use of keys through door hardware technology. Location of card readers and other technologies such as keypads are described in Appendix 3A Functional Space Requirements.

6.8.2.13 Exterior Windows General

6.8.2.13.1 Exterior glazing must be a minimum of 30% of the Building exterior calculated as an average of all floors above and including the main entry level.

6.8.2.13.2 Based on known local climatic data provide windows to Good Industry Practice that comply with the following standards:

6.8.2.13.2.1 CAN/CSA-A440-00/A440.1-00, Windows and its appended Special Publication.

6.8.2.13.2.2 User Selection Guide to CSA Standard CAN/CSA-A440.1-00.

6.8.2.13.2.3 Windows: Aluminum Association Standards (AAS), and the American Architectural Manufacturers Association (AAMA) field testing specifications.

6.8.2.13.2.4 All exterior glazing must be installed and maintained from the exterior of the Building.

6.8.2.13.2.5 Provisions must be made in the building cladding for maintenance of the exterior glazing.

6.8.2.13.2.6 Where SLC Secure windows are accessible to the public and the window forms part of the exterior of the Building, the following are the minimum requirements:

6.8.2.13.2.6.1 Conform to CAN/CGSB-12.8.

6.8.2.13.2.6.2 Exterior lite: Min. 6.0 mm, tempered, “Low E” glass as specified above.

6.8.2.13.2.6.3 Airspace: 12.7 mm.

6.8.2.13.2.6.4 Interior lite: Min. 6.0 mm clear, tempered, float glass.

6.8.2.14 Aluminum Curtain Walls

6.8.2.14.1 Aluminum curtain walls must comply with all applicable standards, including the Aluminum Association Standards (AAS) and the American Architectural Manufacturers Association (AAMA) field testing specifications.

6.8.2.14.2 Incorporate in the curtain wall framing a drained and vented system complete with air and vapour seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and also allow air into the pressuring chamber.

6.8.2.14.3 Provide curtain wall framing that incorporates a thermal-break.

6.8.2.14.4 For exposed aluminum surfaces, provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

6.8.2.14.5 Provide assemblies that resist local seismic conditions and 1-in-100 year climatic events (with a safety factor).

6.8.2.14.6 Applied solar films are not permitted.

6.8.2.15 Aluminum Windows

6.8.2.15.1 Aluminum windows must comply with all applicable standards, including the Aluminum Association Standards (AAS) and the American Architectural Manufacturers Association (AAMA) field testing

specifications. Provide Architectural Grade windows unless otherwise noted.

6.8.2.15.2 Incorporate in windows a drained and vented system complete with air and vapour seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and also allow air into the pressuring chamber.

6.8.2.15.3 Provide windows that incorporate a thermal-break.

6.8.2.15.4 For exposed aluminum surfaces, Provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

6.8.2.15.5 Provide assemblies that resist local seismic conditions and 1-in- 100 year climatic events (with a safety factor).

6.8.2.16 Skylights and Clerestory Glazing

6.8.2.16.1 Skylights must comply with all applicable standards, including the Aluminum Association Standards (AAS), and the American Architectural Manufacturers Association (AAMA) field testing specifications.

6.8.2.16.2 Roof or skylight glazing may be provided where natural light is required in interior spaces to augment or complement interior ambient lighting.

6.8.2.16.3 For exposed aluminum surfaces, provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

6.8.2.17 Tubular Daylighting Devices (light tubes)

6.8.2.17.1 Tubular daylighting devices may be provided in interior spaces to augment or complement interior ambient lighting.

6.8.2.17.2 Provide tubular daylighting devices as follows:

6.8.2.17.2.1 transparent roof mounted skylight dome and self flashing curb, reflective tube and ceiling level diffuser assembly;

6.8.2.17.2.2 complying with the International Code Council ICC AC-16; and

6.8.2.17.2.3 minimum tube diameter to be 530 mm.

6.8.2.18 Glass and Glazing

6.8.2.18.1 Glass and glazing must comply with all applicable standards, including the Insulating Glass Manufacturers Association of Canada (IGMAC) Guidelines and the Glazing Contractors Association of B.C. (GCA) Glazing Systems Specifications Manual.

6.8.2.18.2 Exterior and/or interior glass and glazing may be provided as integral components of the exterior envelope, interior partitions and screens, exterior and interior doors, handrail balustrades, skylights and decorative and ornamental glazing.

6.8.2.18.3 Provide assemblies that resist local seismic conditions as defined in the BC Building Code.

6.8.2.18.4 Provide assemblies that resist 1-in-100 year climatic events (with a safety factor).

6.8.2.18.5 Use laminated safety glass in entry doors and sidelights, or as the inboard light of a double-glazed skylight.

6.8.2.18.6 Mirrors:

6.8.2.18.6.1 For full wall unframed mirrors, use 6 mm thick minimum float glass backed with electrolytically-applied copper plating. Grind smooth and polish all edges.

6.8.2.18.6.2 For wall mounted posture mirrors, use framed type; one piece, stainless steel channel frame with a No. 1 quality, 6 mm thick float glass mirror backed with electrolytically applied copper plating. Back with galvanized steel.

6.8.2.18.6.3 Identify whether safety glazing will be required. If so, apply laminate to back of mirror. Do not use tempered glass as this results in distortion.

6.8.2.19 Finish Hardware

6.8.2.19.1 Finish hardware must comply with all applicable standards, including the quality standards of the Door and Hardware Institute (DHI).

6.8.2.19.2 Provide all finish hardware from one supplier that is a member in good standing of the Door and Hardware Institute (DHI) and has in its employ one or more AHC (Architectural Hardware Consultant).

6.8.2.19.3 Hardware must be integrated with the security requirements and coordinated with electrical wiring and power requirements.

6.8.2.19.4 Select finishes providing maximum longevity and preservation of the finish.

6.8.2.19.5 Provide, where applicable, ULC-listed hardware for the required fire rating.

6.8.2.19.6 Use heavy-duty Grade 1 commercial quality hardware; locksets and latch sets fully mortised type and lever handles of solid material.

6.8.2.19.7 Hardware must not penetrate the floor.

6.8.2.19.8 For special areas provide hardware to suit the purposes unique to those areas, as described in Room Data Sheets and Section 7.10 [Electronic Safety and Security].

6.8.2.19.9 Keying

6.8.2.19.9.1 Provide high-security key cylinders, 6 pin (factory pinned).

6.8.2.19.9.2 Implement a minimum 4-level keying hierarchy.

6.8.2.19.9.3 Keying groups must be assigned by the Province.

6.8.2.19.9.4 New key fittings must be given to and controlled by the Province.

6.8.2.19.9.5 Turn over keys from factory to the Province.

6.8.2.19.9.6 Provide four (4) keys for each lock cylinder.

6.8.2.19.9.7 Provide Key Schedule to the Province.

6.9 Finishes (Division 9)

6.9.1 Basic Requirements

6.9.1.1 Select the appearance of finishes and colours to create and promote a calm and respectful environment, prevent glare, and minimize artificial lighting requirements.

6.9.1.2 For areas in which wear is a concern, such as areas with anticipated pedestrian or wheeled traffic, use durable finish materials able to withstand damage and easily replaceable in sections if damage does occur.

6.9.1.3 In areas where finishes and systems of installation will occur and water is anticipated to be present as part of cleaning or other procedures, allow water to collect and exit without causing damage to the finishes or substrate.

6.9.1.4 Acoustic characteristics of finish materials will also be a priority consideration.

6.9.2 Performance Criteria

6.9.2.1 Interior Wall Framing

6.9.2.1.1 Interior wall framing must comply with all applicable standards, including the Canadian Sheet Steel Building Institute Standards (CSSB1) and the Association of Wall and Ceiling Contractors of B.C. (AWCC) Wall and Ceiling Specification Standards Manual for materials and workmanship for interior walls, including steel studs and furring and gypsum board ceiling suspension systems.

6.9.2.1.2 Use prefabricated non-load bearing steel studs for interior partitions and furring with no axial load other than its own weight, the weight of attached finishes, and lateral loads of interior pressure differences and seismic loads.

6.9.2.1.3 Construct steel stud framing to accommodate electrical, plumbing and other services in the partition cavity, and to support fixtures, wall cabinets, and other such wall-mounted items. Provide reinforcement and backing.

6.9.2.1.4 Consider in design, the differences in air pressure that may result on opposite sides of the wall or partition due to factors such as wind and other lateral pressures, stack effects, or mechanically-induced air pressurization.

6.9.2.1.5 Design assembly to accommodate construction tolerances, deflection of building structural members, and clearances of intended opening.

6.9.2.1.6 Where gypsum board systems are required to provide fire resistance ratings, design wall assemblies tested by fire testing laboratories acceptable to Authorities Having Jurisdiction.

6.9.2.1.7 Provide secure room enclosures that assure a high level of resistance to malicious damage, dismantling and abuse.

6.9.2.1.8 Provide, through the selection of materials and assemblies, construction that prevents penetration through wall and ceiling assemblies by physical force in SLC Secure areas. All perimeters around SLC Secure areas must be constructed to SLC Secure construction standards.

6.9.2.1.9 Provide a high level of performance and durability for all materials and assemblies for the purpose of significantly reduced maintenance requirements.

6.9.2.1.10 The Security Level Classifications (SLCs) must be used to determine the specification criteria for interior construction:

6.9.2.1.10.1 Materials and installation methods must be selected to prevent forced entry or escape.

6.9.2.1.10.2 Materials used for walls, floors and ceilings must provide the same level of resistance as materials used for doors and windows where these elements in combination form a secure room enclosure.

6.9.2.1.10.3 Design of any SLC Secure occupied area must not offer any opportunity for accused/offender persons to conceal oneself from observation by staff. Alcoves and recesses are not permitted.

6.9.2.1.10.4 Joints must be designed and constructed such that there is no opportunity to hide contraband for later retrieval.

6.9.2.1.10.5 Design of assemblies must be such that there is no opportunity for ligature.

6.9.2.1.11 The following materials are permitted in SLC Secure interior wall construction. These materials may be used in conjunction with other interior finish materials as necessary:

6.9.2.1.11.1 Concrete block.

6.9.2.1.11.2 Cast-in-place concrete.

6.9.2.1.11.3 Glass unit masonry.

6.9.2.1.11.4 Steel-prefabricated sheets or panels.

6.9.2.2 Gypsum Board

6.9.2.2.1 Gypsum board must comply with all applicable standards, including the Association of Wall and Ceiling Contractors of B.C. (AWCC) Wall and Ceiling Specification Standards Manual.

6.9.2.2.2 Gypsum board must be no less than 5/8” (16 mm) in thickness.

6.9.2.2.3 Use cementitious backer board (tile backer board) behind ceramic wall tile in showers or other wet areas where tile is used. Use glass mat water-resistant gypsum backing panels behind sinks and other wet areas.

6.9.2.2.4 Use abuse-resistant gypsum board where required for increased resistance to abrasion, indentation, and penetration of interior walls and ceilings.

6.9.2.2.5 Use glass mat surfaced gypsum sheathing board wherever exterior gypsum sheathing is required at exterior walls.

6.9.2.2.6 Use fire rated gypsum board at fire rated wall assemblies.

6.9.2.2.7 Provide airborne sound insulation for gypsum board/steel stud assembly to close off air leaks and flanking paths by which noise can go around the assembly. Make assemblies airtight. Where it is necessary to install back to back devices in a single stud space, provide additional drywall separation between devices within the stud space to reduce sound transfer between rooms in order to meet requirements outlined in Appendix 3B – Acoustics and Noise Control. In addition, carefully cut any opening for fixtures to the proper size and appropriately seal piping penetration. Seal conduit/duct/piping penetrations with tape and fill at the plenum barrier. Make the entire perimeter of a sound insulating assembly airtight to prevent sound flanking. Use an acoustic caulking compound or acoustical sealant to seal between the assembly and all dissimilar surfaces (including at window mullions) in accordance with the recommendations of an acoustic consultant.

6.9.2.3 Ceramic Tilework

6.9.2.3.1 Ceramic tilework must comply with all applicable standards, including the Terrazzo Tile and Marble Association of Canada (TTMAC) Specification Guide 09 30 13 Tile Installation Manual.

6.9.2.3.2 For installations on wet and exterior surfaces, use floor tiles that have the following static coefficients of friction as per the American Society for Testing and Materials International (ASTM):

6.9.2.3.2.1 Level Surfaces: Not less than 0.50 for wet and dry conditions.

6.9.2.3.2.2 Stair Treads: Not less than 0.60 for wet and dry conditions.

6.9.2.3.2.3 Ramp Surfaces: Not less than 0.60 for wet and dry conditions.

6.9.2.3.3 For exterior installations, provide frost-resistant exterior tiles with a moisture absorption rating of 3.0% or less.

6.9.2.3.4 Provide control joints and expansion joints in conformance with the recommendations of the TTMAC Tile Installation Manual.

6.9.2.3.5 Provide crack isolation membranes to resist crack transmission from the substrate due to lateral movement; design for use in thin-set applications of tile over a cracked substrate. Use elastomeric sheets or trowel-applied materials suitable for subsequent bonding of ceramic tile.

6.9.2.3.6 Set ceramic tile with latex modified mortar and all grout must be epoxy based.

6.9.2.4 Ceilings

6.9.2.4.1 General Requirements

6.9.2.4.1.1 The ceiling systems must not compromise security objectives in the SLC Secure and publicly accessible areas.

6.9.2.4.1.2 The ceiling systems must provide permanence and durability appropriate for the applicable Security Level Classification.

6.9.2.4.1.3 Ceiling heights must comply with the following minimum requirements:

6.9.2.4.1.3.1 Office space (including meeting rooms, file storage and interview rooms) – 2.75m (9’-0”).

6.9.2.4.1.3.2 Courtrooms:

- 3.6m (11’-10”) for judicial conference, IAR, basic and large in-custody, and basic jury courtrooms
- 4.2m (13’-9”) for volume in-custody and high security courtrooms

6.9.2.4.1.3.3 Courtroom Vestibules:

- 2.7m (8’-10”) for 3.6m high courtrooms
- 3.65m (12-0”) for courtrooms with ceilings higher than 4m

6.9.2.4.1.3.4 Public Entry Lobby – 5.0m (16’-5”).

6.9.2.4.1.3.5 Public Washrooms - 2.75m (9’-0”).

6.9.2.4.1.3.6 Loading Bay – 3.65m (12’-0”).

6.9.2.4.1.3.7 Public circulation - Height to suit function of space including consideration of security, safety and number of people occupying this zone at peak times and in no case be less than – 3.0m (9’-10”).

6.9.2.4.1.3.8 Holding Cells – 3.0m (9’-10”).

6.9.2.4.1.3.9 SLC Secure corridors – 3.0m (9’-10”). Suspended ceiling systems are not permitted in SLC Secure corridors.

6.9.2.4.1.3.10 Mechanical and service spaces – 2.13m (7’-0”) headroom clearance.

6.9.2.4.1.4 Exposed building services in SLC Secure areas will not be permitted except where services are mounted at a minimum of 5200 mm above finished floor surfaces and stair landings and are otherwise unreachable.

6.9.2.4.2 Acoustic Tile Ceilings/Wood Battens

6.9.2.4.2.1 Ceiling tiles/wood batten may be used in the following locations in the following locations and in accordance with Appendix 3A – Functional Room Requirements.

6.9.2.4.2.1.1 Hallways (non-public).

6.9.2.4.2.1.2 Courtrooms.

6.9.2.4.2.1.3 Offices, meeting rooms.

6.9.2.4.2.1.4 Common lobbies (above 4m high).

6.9.2.4.2.1.5 Staff lounge area.

6.9.2.4.2.2 Acoustic Panel: Non-directional, fissured pattern, white ceiling panel, trim edge detail (square) to fit a standard 15/16” T-bar grid panel size.

6.9.2.4.2.3 Install acoustic ceiling tiles in the suspension system to provide the levels of sound attenuation required to suit the intended function of the room.

6.9.2.4.2.4 Provide accessibility to the ceiling spaces where access is required to mechanical, electrical or other service systems.

6.9.2.4.2.5 Special surface-treated ceiling tiles, such as wood, Mylar or metal-faced tiles may be used where maintenance and ease of cleaning are priorities as well as the accessibility and acoustic requirements.

6.9.2.4.2.6 Provide acoustical panels that are appropriate for the normal occupancy condition range of 15°C - 29°C and maximum 70% relative humidity. When the service use temperature and relative humidity are expected to exceed these ranges, consider use of acoustical units specifically designed for such applications.

6.9.2.4.2.7 Use tiles with scratch-resistant surfaces in any area where lay-in ceiling panels frequently need to be removed for plenum access.

6.9.2.4.2.8 Where allowed for by the Province in restricted or semi restricted areas use acoustic panels ceiling system that is monolithic, gasketed and clipped down. Perforated or highly textured tiles must not be used in these areas.

6.9.2.4.3 Hard Ceilings

6.9.2.4.3.1 Construct hard ceilings of 16 mm gypsum board where fire rating is not required. In fire rated rooms the gypsum board must be fire rated and the thickness of the gypsum board is to be determined by

the rating required by the BC Building Code. Provide hard ceilings for the following rooms:

6.9.2.4.3.1.1 public washrooms;

6.9.2.4.3.1.2 all SLC Secure areas; and

6.9.2.4.3.1.3 any areas requiring high levels of security.

6.9.2.5 Flooring

6.9.2.5.1 All Rooms except Wet Rooms

6.9.2.5.1.1 Use solid sheet flooring (or an equivalent product approved in advance by the Province) for all rooms as specified in this Schedule or as requested by the Province.

6.9.2.5.2 Resilient Flooring

6.9.2.5.2.1 If used, provide slip-resistant sheet vinyl with a static coefficient of friction of 0.6 on level surfaces and 0.8 on ramps.

6.9.2.5.2.2 If used, provide linoleum sheet flooring with a homogenous core of primarily natural materials, consisting of linseed oil, wood flour, and resin binders mixed and calendared onto a natural jute backing. Weld all seams. Provide integral cove bases.

6.9.2.5.2.3 If used, provide rubber flooring solid cushioned sheet or tile formulated with 100% virgin elastomers, reinforcing agents, soil-resisting agents, and migrating waxes compounded to create durability, excellent cleaning characteristics, and exceptional slip resistance. Stud designs to have chamfered edges with a sharply-defined edge at the top for higher slip resistance, easier cleaning, superior maintenance and low vibration design to minimize vibration and noise.

6.9.2.5.2.4 Hot weld all seam joints.

6.9.2.5.2.5 Finish flooring with high speed buffing as per manufacturer's operational specifications and to the Province's approval. Do not apply sealer or wax.

6.9.2.5.3 Stair Coverings

6.9.2.5.3.1 Use one piece treads and sheet risers with carborundum strip of a colour which must hide dirt (or an equivalent product approved in advance by the Province).

6.9.2.5.3.2 Provide tactile warning strips and stair nosings to assist the visually impaired.

6.9.2.5.4 Comply with all applicable standards, including the National Floor Covering Association (NFCA) Specification Standards Manual. US Federal Specification RR-T-650d.

6.9.2.5.5 Where epoxy flooring is used in wet areas, use water and slip-resistant grade and prevent water or moisture transmission to the substrate. Terminate flooring at the walls in the form of 150mm high flash coved bases. Above 150mm high flash cove, taper flooring material to allow smooth transition of the wall protection over the flooring.

6.9.2.5.6 Use permanent, heavy-duty integral materials such as seamless quartz epoxy flooring in areas subject to moisture and heat over extended periods of time.

6.9.2.5.7 Where epoxy flooring is used in wet areas, use water and slip-resistant grade and prevent water or moisture transmission to the substrate. Terminate flooring at the walls in the form of 150mm high flash coves. Above 150mm high flash cove, taper flooring material to allow smooth transition of the wall protection over the flooring.

6.9.2.5.8 The transition between epoxy flooring and sheet wall protection must be smooth. The wall protection must overlap the flooring.

6.9.2.5.9 Use suitable flooring throughout accused/offender areas and where cleaning on a regular or emergency basis is necessary.

6.9.2.5.10 Use water resistant and slip-resistant flooring in all washrooms.

6.9.2.5.11 Consider resilient tile products for flooring in service corridors and service areas.

6.9.2.5.12 Use anti-static flooring materials for telecommunication rooms.

6.9.2.6 Carpets and Carpet Tiles

6.9.2.6.1 Carpet finishes must be used in the public, staff and user areas where relaxation and comfort are primary considerations, including public lounges, staff lounges, staff offices, conference/meeting rooms, courtrooms and areas of similar function. Provide 100mm high rubber bases (4”).

6.9.2.6.2 Use carpeting that is certified under Canadian Carpet Institute/Canadian Rug Institute (CCI/CRI) Indoor Air Quality Program and having CRI/IAQ Label and number certifying that VOC emission rate of less than 0.6 mg/m2/h4 has been passed.

6.9.2.6.3 Choose carpet that has a maintained static generation at less than 3.5 KV at 21ºC and 20% relative humidity throughout its produce life.

6.9.2.6.4 Use a carpet designed to accept wheelchair traffic.

6.9.2.7 Access Flooring

6.9.2.7.1 Access flooring must be provided at a minimum in all courtrooms in areas that extend beyond the public viewing zone.

6.9.2.7.1.1 Structural Performance: Per CISCA's "Recommended Test Procedures for Access Floors":

6.9.2.7.1.1.1 Concentrated Loads: 4448 N (1000 lbs) with 2.54 mm maximum top surface deflection and 0.25 mm permanent set.

6.9.2.7.1.1.2 Ultimate Loads: Not less than twice concentrated load.

6.9.2.7.1.1.3 Use steel understructure.

6.9.2.7.1.1.4 Pedestals set in low-VOC adhesive or with mechanical anchors to suit seismic and acoustic design requirements.

6.9.2.7.1.2 Floor Panels:

6.9.2.7.1.2.1 Size: 610 x 610 mm.

6.9.2.7.1.2.2 Attachment to Understructure: Bolted.

6.9.2.7.1.2.3 Type: Cementitious-core steel panels.

6.9.2.8 Acoustic Treatment

6.9.2.8.1 Design and construct the Building to comply with the minimum sound transmission ratings between spaces described in Appendix 3B – Acoustics and Nose Control - Sound Transmission Ratings.

6.9.2.8.2 In addition, provide acoustic treatment where sound attenuation, soundproofing or other sound control measures are necessary to create a calming environment for the public and a safe and secure environment for staff and users where confidentiality is required.

6.9.2.8.3 Sound control must include:

6.9.2.8.3.1 attenuation of sound within public, user and staff environments;

6.9.2.8.3.2 sound isolation between the exterior and interior spaces;

6.9.2.8.3.3 sound isolation between interior spaces within the Building at both horizontal and vertical separations;

6.9.2.8.3.4 sound and vibration isolation of building service noises and sound isolation of building service rooms; and

6.9.2.8.3.5 sound isolation as required for specialty rooms such as video-conferencing.

6.9.2.8.4 Design partition and ceiling construction to provide approximately the same degree of sound control through each assembly. When a partition is used for sound isolation, extend the sound control construction from slab to slab.

6.9.2.8.5 Optimum sound isolation requires that the integrity of gypsum board partitions and ceilings (mass) never be violated by vent or grille cut-outs or by recessed cabinets, light fixtures, etc.

6.9.2.8.6 Where penetrations are necessary, minimize placing them back-to-back and next to each other. Stagger electrical boxes by at least one stud space. Use mineral fibre insulation to seal joints around all cut-outs such as electrical, TV and telephone outlets, plumbing escutcheons, and recessed cabinets.

6.9.2.8.7 Minimize constructions such as ducts, rigid conduits, or corridors that act as speaking tubes to transmit sound from one area to another. At common supply and return ducts, provide sound attenuation liners at the diffuser and/or grill to maintain assemblies' STC. Seal around conduit.

6.9.2.8.8 Isolate structure-borne vibrations and sound with resilient mountings on vibrating equipment to minimize sound transfer to structural materials. Provide ducts, pipes, and conduits with resilient, non-rigid boots or flexible couplings where they leave vibrating equipment; isolate from the structure with resilient gaskets and sealant where they pass through walls, floors, or other building surfaces.

6.9.2.8.9 Use acoustic screens, vibration isolators, and exterior equipment to prevent exterior noise. All Building Systems must be designed so that they do not produce more than 50 dBA at night and 60 dBA during the day when measured at the property line of the Site.

6.9.2.9 Painting and Protective Coatings

6.9.2.9.1 All paint materials to be rated under the Environmental Notation System (NTS) with acceptable VOC ranges.

6.9.2.9.2 Use only materials having a minimum MPI 'Environmental Friendly' E2 rating based on VOC (EPA Method 24) content levels.

6.9.2.9.3 If seamless epoxy wall coatings are used, provide a two component, high solids, zero or low VOC, solvent free, epoxy glaze wall coating which must be seamless, abrasion and chemical resistant, and UV resistant, Coatings must have been tested in accordance with ASTM D1308-Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.

6.9.2.9.4 Walls and shelving

6.9.2.9.4.1 Use eggshell or semi-gloss for all walls; for all accused/offender areas use semi-gloss.

6.9.2.9.5 Door frames and metal doors

6.9.2.9.5.1 Use semi-gloss for all door frames and metal doors.

6.9.2.9.6 Wood finish doors

6.9.2.9.6.1 Use clear coat interior rub varnish for all wood finish doors.

6.9.2.9.7 Paint Grade Doors

6.9.2.9.7.1 Use semi-gloss for all paint grade doors.

6.9.2.9.8 Ceilings

6.9.2.9.8.1 Use eggshell paint for all ceilings.

6.9.2.9.9 Floors, concrete

6.9.2.9.9.1 Use a 2-component (base component A, curing agent B).

6.9.2.9.10 Exposed Conduit and Services in the Parkade, and any electrical panel boards in Building corridors.

6.9.2.9.10.1 Paint to match the adjoining surface for finished appearance.

6.9.2.9.11 Conform to all applicable standards, including the material and workmanship requirements of Master Painters Institute (MPI) Architectural Painting Specification Manual.

6.9.2.9.12 Use exterior paints of a quality designed to protect substrate materials from weather and climate conditions.

6.9.2.9.13 Achieve a visually harmonious and aesthetically coordinated appearance across all areas of the Building.

6.9.2.9.14 Use exterior and interior finish materials with surface finishes either as integral to the finish material or field-applied separately to the surface of the finish material.

6.9.2.9.15 Treat exterior masonry materials such as brick and concrete block with water-repellent coatings to prevent water ingress into or through the material.

6.9.2.9.16 Provide a special protective coating on exterior and interior materials that are subject to corrosion from exposure to moisture or other corrosive agents, and where painting is deemed to be insufficient protection. Materials requiring a special protective coating include exterior and interior structural, galvanized, and miscellaneous steel.

6.9.2.9.17 Use paints with a minimal VOC level in user, staff, and public interior areas.

6.9.2.9.18 Use interior paint materials of a quality to withstand regular or repeated cleaning as the function of the area dictates.

6.9.2.9.19 Paint handrails, doors, and frames with a contrasting colour from walls in consideration of the visually impaired.

6.9.2.9.20 Do not use materials containing lead or mercury.

6.9.2.10 Vinyl Acrylic Wall Covering

6.9.2.10.1 If vinyl/acrylic wall covering is used, provide vinyl/acrylic high impact rigid sheet, minimum 0.60” thickness with colour-matched vinyl/acrylic trim for joint/transitions.

6.9.2.10.2 Furnish complete packaged system containing all primers and adhesive. Use water-based and non-hazardous primer and adhesive materials.

6.9.2.11 Dry Erase Wall Covering

6.9.2.11.1 Provide pigmented gloss vinyl wall covering presentation surfaces for dry erase markers, including .61 kg/sq.m, non-woven backing, in all meeting rooms.

6.9.2.11.2 Provide trim and other accessories including but not limited to wall covering trim of anodized aluminum, low profile trim.

6.9.2.11.3 For the rooms listed in Appendix 2E - Equipment and Furniture as having whiteboards; Project Co must provide either a whiteboard or dry erase wall covering to be determined through User Consultation Process with the Province.

6.10 Specialties (Division 10)

6.10.1 Provide specialty products manufactured for the specific purposes intended, and installed in strict accordance with the manufacturer's directions.

6.10.2 Bulletin Boards and Whiteboards

6.10.2.1 Provide and install, as defined in the Room Data Sheets:

6.10.2.1.1 bulletin board surfaces that have reasonable resistance to deterioration; and

6.10.2.1.2 whiteboard surfaces that allow use of felt-type writing instrument and allow erasing and cleaning with minimal effort. Use porcelain ceramic on steel surface, magnetic, scratch and abrasion-resistant and have maximum contrast, glare control, and reflectivity.

6.10.2.2 Provide bulletin boards and whiteboards with extruded aluminum frames, accessory trays, maprails and maphooks.

6.10.2.3 Use non-toxic, water based lamination adhesive for bulletin board and whiteboards.

6.10.3 Compartments and Cubicles

6.10.3.1 Provide compartments and cubicles including toilet partitions, change cubicles, shower partitions, and other compartments and cubicles requiring privacy and security.

6.10.3.2 Provide exposed surfaces that are permanent, water-resistant, corrosion-proof, and readily cleaned and maintained.

6.10.3.3 Secure partitions and standards to the floor or ceiling structure, and in a manner to resist lateral loading and impact.

6.10.3.4 For compartment/cubicle doors, use material matching the partitions and include permanent, purpose-made hardware. Design doors and hardware to provide barrier-free access.

6.10.3.5 Provide a mirror in all change compartments.

6.10.3.6 Provide coat hooks in each change compartment.

6.10.3.7 Provide duty shoe shelves in all staff locker rooms; provide adequate shoe shelf storage for the required staff levels anticipated.

6.10.3.8 Provide open coat rod and shelf in all staff locker rooms.

6.10.3.9 Provide all required benches and seating (chairs) in all change rooms/cubicles.

6.10.3.10 Provide all required benches and/or seating need in shower/change stalls.

6.10.4 Toilet Partitions

6.10.4.1.1 Galvannealed sheet metal must conform to ASTM A653 with minimum ZF001 (A01) zinc coating. Finish in polyester, baked enamel or powder coating.

6.10.4.1.2 For stainless steel, use Type 304 conforming to ASTM A240 with No. 4 finish.

6.10.4.1.3 For plastic laminate, use Grade 10/HGS GP50 scuff-resistant, high pressure laminate, conforming to NEMA LD-3.

6.10.4.1.4 For particleboard core used for partitions, conform to CAN3-0188.1 Industrial Grade “R”.

6.10.4.1.5 For fibre-reinforced plastic (fibreglass), use a moisture resistant grade.

6.10.4.2 Change Cubicle Partitions

6.10.4.2.1 Where not adjacent to showers, change cubicle partitions must comply with the above requirements for toilet partitions.

6.10.4.3 Shower Partitions

6.10.4.3.1 Use solid phenolic laminated thick stock, factory-laminated with decorative finish both faces of core and conforming to CAN3-A172 or NEMA LD3.

6.10.5 Wall Guards and Corner Guards, Handrails, Wall Protection, Door Edge and Door Frame Protection

6.10.5.1 Wall and corner guards

6.10.5.1.1 Provide protection of walls and exposed wall corners as required, to prevent damage due to impact from traffic such as equipment and service vehicles, including carts throughout the Building. Full height wall and stainless steel corner guards are required throughout the Accused Holding Area.

6.10.5.1.2 Design and install the height of wall and corner guards to be aesthetically pleasing throughout the room/area. Wall protection must continue above the handrail/wall bumper to fully protect the wall from damage as required.

6.10.5.1.3 Minimum sheet protection height is 1220 mm above the floor bases.

6.10.5.1.4 Select materials appropriate to the amount and degree of impact anticipated.

6.10.5.1.5 Protect wall areas around all elevator door entries.

6.10.5.2 Handrails

6.10.5.2.1 Select materials and shapes appropriate for the use, provide continuous uninterrupted supports.

6.10.5.3 Wall protection

6.10.5.3.1 Apply sheet wall protection and bumper guards as needed in locations where the there is a potential for impact damage. Minimum height of wall protection is nominally 1350mm (150mm floor base + 1200mm wall protection) above the finished floor except where an increased height is required to meet the requirements of the Province or otherwise noted in Schedule 3.

6.10.5.3.2 Provide wall bumper guards in high traffic pedestrian areas.

6.10.5.3.3 Apply sheet wall protection to faces of doors where impact damage is anticipated. Use sheet wall protection that complements the installation of door edge and frame protection.

6.10.5.3.4 Secure wall and corner guards to reinforcing and backing in the walls, such backing sufficient to withstand expected impact loads.

6.10.5.3.5 Use wall protection handrails, bumper and corner guard products that are high impact resistant, stain-resistant to pen marks, paint, and graffiti, and able to withstand commercial cleaners without fading or staining.

6.10.5.4 Horizontal Surfaces

6.10.5.4.1 Protect all horizontal drywall surfaces (pony wall, window sills, etc.) with plastic laminate c/w PVC or wood edging, solid surface or solid wood caps. Sub-surface material must be plywood; no particle board permitted.

6.10.6 Metal Lockers

6.10.6.1 Provide individual and shared storage facilities in designated staff areas as appropriate for operation of the Building. Such storage facilities must be metal lockers and metal locker systems of sizes, numbers, and groupings as determined through the User Consultation Process.

6.10.6.2 For sheet metal, use galvannealed steel conforming to ASTM A653 with ZF001 (A01) zinc coating.

6.10.6.3 Finish steel surfaces with polyester baked enamel or powder coating. Colour(s) to be approved by the Province.

6.10.6.4 For single, double, or multiple-tier metal lockers for staff use, include a provision for locking with padlock, and complete with number plates, and hanging hooks.

6.10.6.5 Lockers for general staff must be a minimum of 46cm (18”) wide. Lockers for use by sheriffs must be a minimum or 61cm (24”) wide.

6.10.7 Storage Shelving Systems

6.10.7.1 Provide metal storage systems for materials in designated storage areas complete with all required backing. Install and brace systems to resist seismic loads.

6.10.8 Washroom Accessories

6.10.8.1 Install washroom accessories in all washrooms of the Building.

6.10.8.2 Determine the type, size, and number of accessories with regard for the numbers and categories of users.

6.10.8.3 Washroom accessories and installation must be in conformance to the BC Building Code requirements for persons with disabilities.

6.10.8.4 Washroom accessories to be provided by Project Co must include:

6.10.8.4.1 soap dispensers;

6.10.8.4.2 toilet paper dispensers;

6.10.8.4.3 paper towel dispensers or electric hand dryers;

6.10.8.4.4 feminine hygiene dispensers and disposals;

6.10.8.4.5 paper towel / garbage disposals;

6.10.8.4.6 mirrors;

6.10.8.4.7 barrier-free grab bars (with integral tactile grip finish);

6.10.8.4.8 coat hooks; and

6.10.8.4.9 baby change tables (in public washrooms only).

6.10.8.5 Shower rooms or showers in washrooms must include the following accessories;

6.10.8.5.1 provide shower curtain and breakaway track or breakaway rod as appropriate;

6.10.8.5.2 provide handicap grab bars; and

6.10.8.5.3 use commercial grade accessories free from imperfections in manufacture and finish.

6.11 Equipment (Division 11)

6.11.1 Protection and Window Washing

6.11.1.1 Provide a complete system with safety tie-back, life line anchors, horizontal life line system and associated equipment for safe building maintenance operations including window-washing for both interior and exterior glazing as required.

6.12 Furnishings (Division 12)

6.12.1 General

6.12.1.1 All upholstered items to be environmentally friendly. Upholstery to have a minimum rating of 140,000 double rubs. All fabric and upholstery foam must be tested and certified to meet CAL 117 standards. Upholstery must be 100% recycled polyurethane. Environmentally friendly vinyl or Crypton© are acceptable alternates.

6.12.1.2 All upholstered items must preclude infiltration of bed bugs. All furniture upholstery must be stain and moisture resistant and must include sealed seaming or tight stitching. Thread distances must be smaller in width than typical bed bugs to prevent entrance into furniture.

6.12.1.3 Furniture in public areas to be washable and hose able. Fabric upholstery must not be specified in public areas.

6.12.1.4 All furniture to be Green Guard certified and minimum BIFMA level 2. Furniture and equipment specifications must be constructed with environmentally sustainable initiatives.

6.12.1.5 Furniture and equipment to be constructed for high durability. Powder coated paints to be resistant to scratching and graffiti.

6.12.1.6 All materials must conform to CAN/ULC – S102, Standard Test for Surface Burning Characteristics of Building Material and Assemblies.

6.12.1.7 Sherriff's furniture must be constructed to allow maximum cleaning ability. Furniture constructed with clean outs and remove able seats are acceptable. Furniture must be constructed for high durability, and stand up to 24 hour 3 shift staff operations. All furniture specifications must be specified for high durability and be long lasting.

6.12.2 Furniture, Millwork and Casework

6.12.2.1 Refer to Appendix 2E - Equipment and Furniture and Appendix 3A -Functional Space Requirements.

6.12.2.2 In addition to Project Co's obligation to provide Equipment and Furniture as per Appendix 2E - Equipment and Furniture, provide all furniture, millwork and casework to support the programs and functions in this Schedule and as described in the Functional Space Requirements to support the operation of the Building, including:

6.12.2.2.1 millwork, casework, tables, work stations, furniture, grommets, mounting brackets, storage, storage carts and work surfaces to meet the needs of each department, locks and keyboard trays and all items described.

6.12.2.3 Building Casework Quantities:

6.12.2.3.1 Design of casework must comply with Schedule 3 and Appendix 3A - Functional Space Requirements. Any fixtures, which involve electrical, plumbing and/or communications infrastructure are to be provided. Coordination of casework is part of Project Co responsibility. Specific design parameters such as heights, depths, open vs. closed and locking vs. not, must be developed in consultation with the Province.

6.12.2.3.2 Project Co must allow for all casework that is required to allow proper function and operation in that room/area. The Province's requirement to provide proper function in a room or area for the quantity and configuration of casework will be final and not open to challenge.

6.12.2.4 The Province will consider modular furniture in lieu of fixed casework where it is appropriate and the modular systems being proposed by Project Co meet all the requirements for durability and the user/staff needs.

6.12.2.5 All furniture and millwork supplied by Project Co must:

6.12.2.5.1 Be functional and ergonomically designed. Where designated in Room Data Sheets, multi work height desks/workstations must be provided to allow for sitting, stool-height and standing positions.

6.12.2.5.2 Provide the necessary millwork locks to secure all cabinets in courtrooms.

6.12.3 Window Coverings

6.12.3.1 Provide window coverings for:

6.12.3.1.1 All exterior windows. Roller shades are preferred but other products may be used if they provide equivalent privacy, sun and heat control with minimal maintenance.

6.12.3.1.2 All interior windows where privacy may be required in staff working areas, offices and meeting rooms.

6.12.3.1.3 Window coverings must allow control of exterior light entering the room during daylight hours and provide privacy during daylight and non-daylight hours.

6.12.3.1.4 Window coverings must be fully coordinated and complimentary with the interior design concept for their respective programmed areas.

6.12.3.1.5 Where window covering controls are difficult to reach, motorized assist systems must be provided.

6.12.4 Window Shade Systems

6.12.4.1 Use shading fabric of PVC or vinyl-coated polyester or fiberglass yarn and that:

6.12.4.1.1 is waterproof, washable, rot-proof, flame-resistant, colourfast to light, glare-reducing, and able to control heat gain while providing external visibility.

6.12.5 Roller Shades

6.12.5.1 Where used, roller shades systems must operate with a spring wrap mechanism, adjustment - free continuous qualified #10 nickel-plated brass ball chain (50-lb. test) and pulley clutch operating system. System must be chain operated with spring assist when required to reduce pull force to lift heavy or large shades. Fabric must be inherently anti-static, flame retardant, fade and stain resistant, light filtering, room darkening, and blackout fabrics providing 0% - 3% openness factors. Fabric weight 320g/m^2 (9.4 oz/sy) containing fiberglass, PVC, polyester, acrylic or vinyl laminates.

6.12.6 Venetian-Type Blinds between Glass (Integral Blinds)

6.12.6.1 Where used, these systems must be of institutional quality with the blinds consisting of tempered aluminum alloy slats uniformly spaced and 100% interlaced between cross-ladders on at least one tape. Use tapes with no special end rails required to attach the suspension members from the window opening to the blind. Controls must be user friendly.

6.13 Special Construction (Division 13) - Not Used

6.14 Conveying Equipment (Division 14)

6.14.1 General

6.14.1.1 Provide elevator systems as described in this Schedule to be:

6.14.1.1.1 A minimum of four elevators providing transport for the public, general staff and persons with disabilities. At a minimum, one elevator must be sized to accommodate a wheeled hospital stretcher.

6.14.1.1.2 A minimum of one elevator providing exclusive, non-shared transport for members of the Judiciary.

6.14.1.1.3 A minimum of two elevators providing transport for escorted accused/offender persons.

6.14.1.1.4 A minimum of one elevator providing transport within the Parkade.

6.14.1.2 Elevators must provide local control when enabled by a card reader, key fob or key.

6.14.1.3 There must be no access to elevator shafts other than as required by the applicable codes or regulations.

6.14.1.4 Elevator sumps must remain dry under all conditions.

6.14.1.5 Durable elevator cab finishes (including stainless steel fronts as well as hand and bumper rails) must be provided.

6.14.1.6 Elevator machine design must not require lubrication after installation.

6.14.2 Performance Criteria for Elevators

6.14.2.1 Elevators must comply with equipment noise Section 7.8 [Electrical] of this Schedule and Appendix 3B – Acoustics and Noise Control.

6.14.2.2 Seismic requirements

6.14.2.2.1 Elevator system must withstand the effects of earthquake motions determined according to CAN/CSA S832.

6.14.2.2.2 Comply with section 8.4 (Elevator Safety Requirements For Seismic Risk Zone applicable to the Facility, or greater) in ASME A17.1/CSA B44 Safety Code for Elevators and Escalators.

6.14.2.3 Operational Requirements

6.14.2.3.1 Elevator movement must be controlled through card readers.

6.14.2.3.2 Standby power operation.

6.14.2.3.3 Must conform to Earthquake Emergency Operation: ASME A17.1/CSA B44.

6.14.2.3.4 Emergency voice communications from elevator car to monitoring station must be provided.

6.14.2.3.5 Emergency recall provisions must be provided.

6.14.2.4 Security Requirements

6.14.2.4.1 Design elevators to receive and for use of card readers and CCTV.

6.14.2.4.2 Activation of Car Operating Pane: By hall card reader or key from hall call.

6.14.2.4.3 Key Access: By standard lock cylinders. Provide key access only for use by Province staff.

6.14.2.4.4 Intrusion Alarm: Provide alarm and signal to alert in the event of intrusion to elevator shaft or elevator equipment by Accused/offender persons and any unauthorized access.

6.15 Demountable Partitions

6.15.1 All demountable partitions must:

6.15.1.1 Be moveable solid and glass walls, demountable partitions or a product of equivalent quality.

6.15.1.2 Include sliding, butt hinge, pivot, aluminum with glass lite, wood with optional glass lite, frameless glass doors and glazing, and double sliding barn doors, all sourced from a single manufacturer.

6.15.1.3 Be fully coordinated with the interior design concept for the relevant programmed area.

6.15.1.4 Have an STC rating of 37 minimum (determined using ASTM E90).

6.15.2 Electrical, Communications, and Security System Requirements

6.15.2.1 Integrate voice, data and security system components into demountable partitions.

6.15.2.2 Provide conduit, boxes and electrical duplexes and integrate into electrical and communication components.

6.15.2.3 Provide for installation of electrical, communications, and security system items arranged so that wiring can be readily removed and replaced.

6.15.2.4 Boxes: Provide outlet and pre-wired device boxes in cavity of demountable partitions for all outlets and devices. Provide metal junction and pull boxes where required. Must offer plug and play electrical solution.

6.15.2.5 Conduit: Provide option for metal conduit in cavity of demountable partitions, from outlet and device boxes to top or bottom of demountable partitions to permit wiring installation and connections.

6.15.2.6 Components: Provide all cut-outs and reinforcements required for demountable partitions to accept electrical, communications, and security system components.

7. FACILITIES SERVICES SUBGROUP SPECIFICATIONS

7.1 Mechanical Systems Design Principles

7.1.1 This section is accompanied and must be read in conjunction with Schedule 2, Appendix 2E - Equipment and Furniture.

7.1.2 Mechanical and mechanical systems is defined as fire suppression/protection, Plumbing systems, HVAC systems and controls, including specialty systems within these disciplines.

7.1.3 The mechanical systems must be designed to provide a comfortable and productive environment for the Facility Users and provide the environmental and infrastructure needs of all equipment.

7.1.4 Indoor Temperature: 22°C occupied and 16°C unoccupied for winter, 22°C occupied and 27°C unoccupied for summer.

7.1.5 The mechanical systems must be designed to minimize impact on the natural and physical environment and greenhouse gas emissions through energy efficiency, optimization of resource use, and simplification of the systems.

7.1.6 The mechanical systems must be designed and located to be hidden or blend into the overall building. The design and location of equipment must mitigate noise transmission to areas of staff and visitors.

7.1.7 All mechanical systems, equipment, material and installation must conform to the latest version of all the applicable codes, standards, regulations and guidelines.

7.1.8 The mechanical systems component selection, system design, and installation must incorporate the flexibility and adaptability for future repurposing without major disruption or alteration to the facilities infrastructure.

7.1.9 Mechanical systems must be planned for future repurposing. Expansion space must be shown on the developed drawings for the heating and cooling plants for future installation of one heating unit, one cooling unit and associated pumps and equipment, valved connection points must be provided to connect future equipment to the associated systems. Valved connections must be provided for connection of future capacity noted above. Easy access must be provided and shown on drawings for moving the new equipment in and out of the mechanical rooms and energy plant without disruption and major rework.

7.1.10 The mechanical design must incorporate the following levels of redundancy:

7.1.10.1 Systems with hot water boilers must include an N+1 arrangement of both pumps and boilers, such that one boiler or one pump can be taken out of service and repaired with the system still providing 100% capacity.

7.1.10.2 Systems with hot water boilers must be sized assuming the largest heat recovery device is out of service.

7.1.10.3 For heating systems not containing boilers the same levels of redundancy is required.

7.1.10.4 Heating systems within air handling units that include heat recovery must be sized assuming the heat recovery is offline.

7.1.10.5 Systems with chilled water cooling must provide sufficient redundancy such that 66% of the capacity of the system is available with one pump, chilling unit, or cooling tower out of service.

7.1.10.6 No single fan system must serve more than 33% of the building. Furthermore, no single fan system must serve more than 50% of the courtrooms.

7.1.11 Provide water, sanitary, storm and gas utilities as required and sized to suit the consumption and discharge needs of the building occupancy based on Schedule 3 requirements.

7.1.12 All mechanical piping systems, i.e. heating, cooling, domestic water, sewer, storm, plumbing venting, natural gas, etc. must have 20% additional capacity above building requirements on date of occupancy built into all main piping distribution sizing. The 20% additional capacity is inclusive of the future courtrooms. Shaft space for future must be accessible at each floor.

7.1.13 Mechanical services in electrical, communication, and telecommunications rooms must maintain a clear height of 2200 mm above finished floor. Hydronic and domestic piping must not be routed through these room types and any sanitary piping must be prohibited. Slab penetrations above these rooms must be equipped with sleeves which terminate 75mm above the slab to prevent water from entering the sleeves.

7.1.14 Water, glycol and other fluids used within mechanical systems must be treated to prevent corrosion, algae growth and buildup of deposits to prolong the equipment life.

7.1.15 All mechanical systems must have vibration isolated to minimize noise and vibration through the structure or other components of the Building. Refer to acoustic section for the additional requirements.

7.1.16 All mechanical systems must comply with standard acoustic requirements as indicated in the acoustic section of this document and current ASHRAE application handbooks, whichever is more stringent.

7.1.17 All pipes, ducts and fittings must be insulated to conserve energy, prevent condensation, attenuate noise and prevent accidental burns, with the exception of piping conveying fluids between 18 °C and 40 °C.

7.1.18 All building services and ductwork must be run inside the Building envelope.

7.1.19 Public and staff entrances must be protected by vestibules with force flow heaters. Service entrances must be protected with force flow heaters.

7.1.20 No “drop in anchors” will be used to support, hang, or brace piping, ductwork, or other equipment.

7.2 Fire Suppression (Division 21)

7.2.1 Fire Protection

7.2.1.1 Basic Requirements

7.2.1.1.1 Provide all required fire protection for the Facility.

7.2.1.1.2 The sprinkler system and equipment must be designed to the occupancy classification that it protects.

7.2.1.1.3 The fire pump, if required, will require emergency power supply and must have a transfer switch which is part of the fire pump controller; package mounted in separate mechanically attached enclosure to form one assembly, specifically approved for the purpose as a complete unit.

7.2.1.1.4 Sprinklers subject to freezing temperatures such as the Parkade and exterior overhangs must be protected by a dry system. Glycol systems will not be allowed.

7.2.1.1.5 Pendant concealed quick response sprinklers must be provided in all areas with dropped ceilings with temperature ratings to suit the specific hazard area.

7.2.1.1.6 Provide a double interlocked, cross-zoned dry pre-action supplied sprinkler system to the following rooms:

7.2.1.1.6.1 Holding cell areas (note this is in addition to the shut-off requirements of 7.7.3.2.5)

7.2.1.1.6.2 Storage Room

7.2.1.1.6.3 Storage Room,

7.2.1.1.6.4 Audio Visual Service Room (A19)

7.2.1.1.7 Each fire extinguisher must be located per relevant codes and to the satisfaction of the Authority Having Jurisdiction and approved for the hazard and classification of the space it serves.

7.2.1.1.8 All fire extinguishers in finished spaces must be in fully recessed cabinets.

7.2.1.1.9 There must be no wet sprinkler system in main Electrical Room per B.C. Building Code. Provide either a double interlocked, cross zoned pre-action supplied sprinkler for the main Electrical Room or provide 3-hour rating around main Electrical Room and do not install sprinklers in the room.

7.2.1.1.10 Along with the requirements of Section 7.2.1.1.6, provide a gas suppression (or other non-destructive) system as the first stage for fire suppression and a 3-hour fire separation rating for the following rooms:

7.2.1.1.10.1 Storage Room

7.2.1.1.10.2 Storage Room,

7.2.2 Performance Criteria

7.2.2.1 All fire protection systems must be hydraulically sized to NFPA standards.

7.2.2.2 All equipment and installation must be in accordance with manufacturers' requirements.

7.2.2.3 Locate zone shut-off valves so they are visible and accessible from the floor. Do not conceal from view: do not locate in janitor rooms, storage rooms, or stairwells. All valves controlling water flow must be monitored.

7.2.2.4 Fire department connection must be installed at a location approved by the local governmental authorities.

7.2.2.5 Install fire extinguishers in a semi (unfinished areas) or fully recessed (finished areas) cabinet to the satisfaction of the Authority Having Jurisdiction.

7.3 (Division 22)

7.3.1 Provide individual water and fire protection services as required. A single incoming service may be substituted, however, all City requirements must be met. The incoming water service must be located within a secure area and not accessible to anyone that is not properly cleared.

7.3.2 Provide individual natural gas, sanitary, and storm services as required and sized to suit the usage needs of the Facility based on Schedule 3 requirements. Sewer, storm and water service penetrations must be designed for flexibility and movement. No service will be buried in concrete.

7.3.2.1 Basic Requirements

7.3.2.1.1 Provide utilities-grade meters for domestic water and natural gas.

7.3.2.1.2 The meters must be used to accurately measure water flow and natural gas consumption in all flow conditions. Refer to Appendix 2C - Design and Construction Energy Target.

7.3.2.1.3 Provide the plumbing in such a manner as to avoid disruption to the operation of the building during maintenance or repairs. Design the systems so that, as much as possible, the rooms do not need to be entered when performing these functions. All isolation, maintenance, balancing, and other service valves must be located in the corridor ceiling spaces and will be accessible.

7.3.2.1.4 Incorporate flexibility in the system designs to accommodate future alterations. Label all systems clearly, including painting and labelling of all

pipes, ceiling identification dots, valve tagging, and emergency valve identification signage.

7.3.2.1.5 Provide and install all fixtures and equipment to manufacturer's specifications, standards, and instructions.

7.3.2.1.6 Provide the water systems to ensure that water is supplied at the required pressures to all water outlets. Minimum water pressure must be maintained at 35 PSI to the most remote fixture.

7.3.2.1.7 Provide durable materials to allow for 24 hour a day operation with minimal downtime. Domestic and non-potable water piping in the building must be copper, ductile iron, or stainless steel. Pex piping is only permitted for use in trap primer lines run in the slab. Sanitary and storm piping above ground in the building must be cast iron or copper or PVC with 25/50 flame and smoke as required for the location it is being installed in.

7.3.2.1.8 Domestic and non-potable water piping must be connected by soldering, brazing, threading, flange or roll grooved systems. Connections utilizing compression must not be used except for connection of trap primer lines run in the slab.

7.3.2.1.9 Provide services with easy access and serviceability and to avoid interference with other services during operation and maintenance activities. All equipment valves and serviceable items must be accessible and removable without adapting wall/ceiling finishes or structure.

7.3.2.1.10 Provide floor drains in all mechanical rooms, rooms noted in Room Data Sheets, and for all devices requiring these drains including but not limited to emergency showers, and backflow prevention devices. Ensure all equipment drain piping is terminated at floor drains and floors slope to the drains.

7.3.2.1.11 Provide domestic water strainers on the incoming services into the Facility. Design will allow for strainer maintenance to occur without affecting water flow to the facility.

7.3.2.1.12 All piping must be accessible. No in-slab piping is allowed except piping serving the trap primers.

7.3.2.2 Performance Criteria

7.3.2.2.1 Pumping systems for subsurface, storm, or sanitary drainage must include 100% redundancy (one redundant unit for each active unit) and related equipment must be supplied with emergency power. The storm / subsurface sump must have twin compartments for settling and pumping and must be sized to prevent short cycling of the pump. Provide local alarm and outputs to the BMS for high water levels, status, and pump failure.

7.3.2.2.2 Insulate storm drainage, domestic water piping, cooling water and exposed p-traps throughout per BCICA quality standards. Where piping and/or piping components are subject to freezing, provide insulation and heat tracing. Provide canvass or vinyl service jacket on all exposed insulation

inside, provide aluminum jacketing outside. Ensure life-safety systems are not installed in locations subject to freezing.

7.3.2.2.3 Provide drainage as required to alleviate water pressure exerted onto the bottom of foundations and/or floor slabs.

7.3.2.2.4 Provide flushing and disinfection of domestic water systems to AWWA and CSA standards. Provide independent testing of piping systems once flushing and cleaning has been completed.

7.3.2.2.5 Provide trap primers in drains that are subject to losing the trap seal.

7.3.2.2.6 Conceal all sanitary, waste, and water piping in walls. Only trap arms and water supply piping must be exposed. Fixture outlet piping for adjustable height fixtures must be installed so that no water can collect in the piping at any fixture height.

7.3.3 Plumbing Fixtures

7.3.3.1 Basic Requirements

7.3.3.1.1 All plumbing fixtures must be suitable for a law courts facility. Fixtures selected must have proven acceptable performance from previous installations. All wall hung fixtures must be supported by floor mounted carriers.

7.3.3.1.2 Consult with the Province on the selection of fixtures. The dimensions must at a minimum meet CSA Standards for all hand hygiene sinks, including public washrooms. Small ‘bar’ type sinks are not acceptable. Public lavatories provided for handicap accessibility must meet BCBC Part 3 guidelines for accessible fixtures.

7.3.3.1.3 Provide security fixtures where needed.

7.3.3.1.4 Public toilets, with the exception of handicap accessible toilets, will consist of wall hung elongated bowls with an open front seat and wired electronic flush valves. Handicap accessible toilets will be WALL mounted rear outlet bowls with an open front seat and wired electronic flush valves. Wall hung toilets will be a minimum height of 18” from floor to rim.

7.3.3.1.5 Staff toilets must consist of wall hung elongated bowls with an open front seat and wired electronic flush valves. All toilets must be a minimum height of 18” from floor to rim.

7.3.3.1.6 Showers must be provided with pressure balanced and high temperature limit shower valves, metal shower heads must be utilized. Shower bases must ensure that the water is contained within the shower area and drain fully without puddling. Install shower heads at 6’-6” AFF minimum. Shower bases must not be fiberglass. Showers required for accessible use must follow the guidelines put forth in the BCBC Part 3.

7.3.3.1.7 Showers must not be less than 1200 x1200 mm.

7.3.3.1.8 Urinals must be wall-hung and low-consumption with electronic hands-free flush valve operation.

7.3.3.1.9 Public washroom lavatory fixtures must be made of an impervious, durable material and must have electronic hands-free type faucets with single temperature supply that can be adjusted and set to the desired temperature. Lavatories must be wall hung and must be wheelchair accessible when there is no millwork and under counter mounted in millwork.

7.3.3.1.10 Combination water fountains/bottle fillers must be fully recessed, stainless steel, hardwired, with no touch sensor activation. Fixtures must be BCBC accessible compliant and be conveniently located in the public zones of the Building.

7.3.3.1.11 Provide a chilled water dispenser in all staff lunch/kitchen areas.

7.3.3.1.12 Provide suitable quantities of janitors' sinks and hose bibs to provide sufficient service to the Facility.

7.3.3.1.13 Provide floor mop sink in each housekeeping room of an adequate size, depth and access to support the floor burnishers and other required housekeeping equipment. Faucet must have blade handles, integral stops, vacuum breaker, and be equipped with a hose connection on the spout.

7.3.3.1.14 Provide a protected hose thread connection to all housekeeping detergent dispensing systems, minimum one per janitor's room.

7.3.3.1.15 Provide eyewash and emergency shower fixtures to comply with the latest ANSI Z358.1 and WorkSafe BC Guidelines.

7.3.3.1.16 Hose bibs must be provided around the building and in the Parkade. The Parkade system must be isolated from the building by a reduced pressure backflow device. The design must incorporate the ability to drain down the Parkade system and sally port during the winter so piping does not require heat tracing.

7.3.3.2 Performance Criteria

7.3.3.2.1 Provide isolation valves for all plumbing services and clearly identify the location of all valves. Isolate individual washroom fixtures groups separately to allow for maintenance in one room without affecting other areas.

7.3.3.2.2 Provide accessible clean-outs for all sinks and lavatories.

7.3.3.2.3 Provide low consumption toilets to reduce water consumption.

7.3.3.2.4 Fixtures requiring backflow preventers must have backflow preventers concealed in wall or located in mechanical rooms or janitor's rooms.

7.3.3.2.5 Size flush valves for the water consumption of the bowl.

7.3.3.2.6 If system pressure exceeds the acceptable delivery pressure, then provide pressure reducing valves. Place the valves in accessible locations in mechanical rooms or chases.

7.3.4 Domestic Hot Water

7.3.4.1 Basic Requirements

7.3.4.1.1 Provide a domestic hot water system with sufficient capacity and recovery rate for the hot water requirements of the Facility.. Calculate domestic hot water demand in accordance with ASPE Plumbing Engineering Design Handbook or similar good engineering practice. The method of calculation will be provided to the Province for review during design development.

7.3.4.1.2 Domestic hot water supply must be of adequate temperature to serve the needs of the Facility and stored and circulated at temperatures noted in the codes and standards. Provide thermostatic mixing valves where temperatures are required to be less than 60ºC at point of use.

7.3.4.1.3 Ensure timely delivery of hot water to all fixtures where low consumption lavatories are installed, the recirculation water line must connect in the wall at the fixture to ensure hot water is delivered without excessive delay (within 5 seconds).

7.3.4.1.4 Design the domestic hot water system to prevent growth and spread of Legionella bacteria within the piping, fixtures, or any other component. Design methods must include eliminating dead- leg piping and minimizing uncirculated piping by connecting the circulation system as close as possible to fixtures.

7.3.4.2 Performance Criteria

7.3.4.2.1 Provide the hot water generating equipment with a minimum of 2 units sized at 60% total capacity each.

7.3.4.2.2 Generate domestic hot water at 60°C to minimize conditions for Legionella bacteria.

7.3.4.2.3 Recirculate domestic hot water from the distribution system(s) back to the generating equipment.

7.3.4.2.4 Monitor hot water supply temperatures via the BMS and provide alarm outputs when the temperature exceeds the design set point.

7.3.4.2.5 The domestic hot water generating equipment must meet the energy efficiency requirements of ASHRAE 90.1 referenced in the latest BCBC.

7.3.4.2.6 Tanks used to store domestic hot water must have active heating elements (gas, steam or hot water) capable of attaining a water temperature in the tank of 60 °C.

7.4 Heating, Ventilating and Air Conditioning (Division 23)

7.4.1 Building Heat Source

7.4.1.1 Project Co must provide heating by providing a stand-alone heat source for the Building.

7.4.1.1.1 Project Co to provide a stand-alone heat source as per the following:

7.4.1.1.1.1 Project Co must provide multiple hot water heating devices to provide all necessary heating and domestic hot water generation, if applicable, for the Building to meet the standards as required.

7.4.1.1.1.2 Two-pipe change over systems (such as two-pipe fan coil units) are not allowed.

7.4.2 Heating

7.4.2.1 Basic Requirements

7.4.2.1.1 Supplemental perimeter heating can be provided with warm air from ceiling diffusers only in cases where envelope heat losses are less than 400W/m and overall vision glass height is less than 2.4m. Where glass is taller or envelope losses are greater, than perimeter heating must be either radiant panels or continuous hot water heating elements. Radiant floor heating may be substituted in multi-story lobbies and public assembly areas. The radiant floor system may be zoned by primary exposure provided the rooms grouped maintain individual temperature control.

7.4.2.1.2 Boilers, if applicable, must be capable of operating at a minimum AFUE efficiency of 93% at all firing rates.

7.4.2.1.3 Provide adequate expansion compensation for heating piping.

7.4.2.1.4 Location of anchors and guides, design of expansion compensation loops and selection of expansion compensation devices must be based on a thorough review of piping layout, and piping stress analysis. Anchor systems to be pour-in-place type (imbed or pre-set).

7.4.2.1.5 All high points in piping must be equipped with automatic air removal devices including air collection chambers and air vents. Relief must be piped to nearest drain, glycol systems pipe to receiver or back to feed tank. Discharge termination must be visible

7.4.2.1.6 Provide the HVAC systems to avoid disruption to the operation of the Building during maintenance or repairs. Design the systems so that, as much as possible, the rooms do not need to be entered when performing these functions. All isolation, maintenance, balancing, and other service valves must be located in the corridor ceiling spaces and must be accessible.

7.4.2.1.7 Equipment and piping must be installed with adequate service space, access panels and the ability to remove equipment for servicing or replacement without adapting wall/ceiling finishes or structure.

7.4.2.1.8 Isolation valves, unions and bypass piping must be provided to allow for equipment isolation and removal without unduly affecting the system operation or major drain down.

7.4.2.1.9 Balancing valves, flow-measuring devices, temperature and pressure sensors must be provided throughout the system to facilitate system balancing.

7.4.2.1.10 Design pumps to operate at the system fluid temperature without vapor binding and cavitation. Pumps, must be non- overloading in parallel or individual operation, and must operate within 25% of the midpoint of published maximum efficiency curve. Where there is more than 40% variation in flow, variable frequency drives must be provided. Provide grounding rings on all motors equipped with VFD's.

7.4.2.1.11 Pump construction and installation must permit complete pump servicing without disrupting piping or motor connections.

7.4.2.1.12 Locate services that require access for regular maintenance above non-critical spaces such as corridors to minimize or eliminate disruptions.

7.4.2.1.13 Insulate all heating water piping, equipment and accessories in accordance with the most stringent of all applicable standards, including applicable BCICA and ASHRAE standards. Provide canvass or PVC service jacket on all exposed piping inside, exterior piping must have aluminum jacketing. Piping above 3 meters off finished floor in mechanical rooms does not require service jacketing.

7.4.2.1.14 Utilize screw fittings for steel piping 50mm and smaller and welded fittings for steel piping 65mm and larger. Copper piping for run outs, coil connections, and radiant panel circuiting must be soldered with lead free or 95/5 solder. PEX piping used for in slab radiant heat must be connected with fittings approved by the PEX pipe manufacture for installation type.

7.4.2.1.15 All piping must be accessible. With the exception of in floor active radiant heating elements and trap primer piping, no in-slab piping is allowed.

7.4.3 Air Conditioning

7.4.3.1 Basic Requirements

7.4.3.1.1 Provide all necessary space, ventilation and process cooling for the Building. The design must accommodate the removal of heat.

7.4.3.1.2 The design and installation must comply with all applicable standards, including CSA B52, Mechanical Refrigeration Code.

7.4.3.1.3 Equipment must be CSA approved, and must meet all applicable standards, including applicable sections of the ASME Code.

7.4.3.1.4 Welding materials, fabrication standards, and labor qualifications must comply with all applicable standards, including applicable ANSI and ASTM Codes.

7.4.3.1.5 Cooling towers, if applicable, performance must be certified in accordance with CTI (Cooling Tower Institute) Standard STD-201.

7.4.3.1.6 Provide chillers and cooling towers if applicable, or any cooling units for ease of operation, accessibility for maintenance, safety and appearance.

7.4.3.2 Performance Criteria

7.4.3.2.1 Provide dedicated and continuously available cooling systems for all areas containing specialized equipment, elevator rooms, server rooms, communication and IMIT rooms, and electrical rooms where heat rejection to outdoors is not possible for managing continuous internal heat gains. This system may be supplied from the central cooling plant.

7.4.3.2.2 Provide sufficient space cooling capacity to meet the required indoor design temperatures outlined in applicable Standards while using the July 2.5% outside design wet and dry bulb temperatures outlined in the BC Building Code.

7.4.3.2.3 The Building must be able to provide 100% outdoor air for free cooling as a means of space cooling except to the extent that peak cooling loads require the use of mechanical cooling.

7.4.3.2.4 Ensure that no air within the air conditioning system, outside of the central air handling equipment, drops below its dew point temperature.

7.4.3.2.5 CFC and HCFC based refrigerants must not be used in the refrigeration equipment.

7.4.3.2.6 Design piping to be installed in an orderly manner (aligned with structural elements and at right angles). Slope piping to permit complete drainage of the system.

7.4.3.2.7 All high points in the closed loop piping must be equipped with automatic air removal devices, such as air collection chambers and air vents. Relief must be piped to drain. Glycol systems must be piped back to make up tank.

7.4.3.2.8 Provide equipment and piping with adequate service space, access panels and ability to remove equipment from the Facility for servicing or replacement without affecting Facility operations.

7.4.3.2.9 Provide isolation valves, unions and bypass piping to allow for equipment isolation and removal without unduly affecting the system operation or major drain down.

7.4.3.2.10 Select pumps that operate without vapor binding or cavitation, be non overloading in parallel or individual operation, and operate within 25% of the mid-point of published maximum efficiency curve.

7.4.3.2.11 Pump construction and installation must permit complete pump servicing without breaking piping or motor connections.

7.4.3.2.12 Locate services that require access for regular maintenance above non-critical spaces so that there is minimal to no disruption to the delivery of health care services.

7.4.3.2.13 Insulate all chilled water piping, equipment and accessories in accordance with the most stringent of applicable standards, including BCICA and ASHRAE standards. Provide canvass or PVC service jacket on all exposed piping inside. Exterior piping must have aluminum jacketing.

Piping above 3meters off finished floor in mechanical rooms does not require service jacketing.

7.4.3.2.14 Utilize screw fittings, welded fittings or roll grooved mechanical couplings for all piping.

7.4.4 Ventilation

7.4.4.1 Basic Requirements

7.4.4.1.1 Provide all necessary ventilation for the Building per applicable standards.

7.4.4.1.2 Regardless of the nature of the heating and cooling system type, HVAC system must provide minimum of three ACH of total airflow to spaces during occupied periods.

7.4.4.1.3 Demand (CO_2) controlled ventilation must be utilized for all systems over 5 tons.

7.4.4.1.4 Air systems serving the public circulation and administrative areas of the building.

7.4.4.1.5 Return air paths must be arranged to avoid ‘cross talk’ between spaces.

7.4.4.1.6 Ductwork velocity not to exceed 1700 feet per minute or as indicated in the Appendix 3B – Acoustics and Noise Control and reduce to below 800fpm within 9m of courtrooms for those systems dedicated to courtrooms or as required to meet the acoustic requirement.

7.4.4.1.7 Include system interconnections such that one fan system may be manually adjusted to supply air to a different system in the event of a critical fan failure.

7.4.4.1.8 Provide an HVAC system that maintains appropriate pressure relationships between various areas of the Building and provides necessary outdoor air quantity, air filtration, cleansing.

7.4.4.1.9 Provide air handling units with sectional heating and cooling coils and manual isolation valves that will enable isolation removal, or repairs to the damaged sections of coils without stoppage of the system. Provide space for coil removal and replacement without removing piping or accessories serving other equipment.

7.4.4.1.10 The air handling system must provide redundant capacity so that, in the event of a failure or scheduled shutdown of one unit for servicing, the remaining units must continue to run and provide 100% service to the affected areas.

7.4.4.1.11 Provide air filtration in accordance with all applicable standards.

7.4.4.1.12 Provide the ventilation system and all components in accordance with all applicable standards, including ASHRAE standards.

7.4.4.1.13 Provide fans with Variable Frequency Drives (VFDs) for energy savings under part-load conditions. Motor loads of 100 hp. or greater must be provided with reduced voltage motor starter acceptable to BC Hydro. Provide grounding rings on all motors with VFD's.

7.4.4.2 Performance Criteria

7.4.4.2.1 All equipment below the roof for supply air, return air and general exhaust systems must be located inside the Building envelope.

7.4.4.2.2 Rooftop equipment must be hidden from public view in a manner consistent with the exterior architectural façade treatment.

7.4.4.2.3 Provide fresh air intakes, cooling coil drain pans, air handling units, duct mounted humidifiers, ductwork, and all other interconnected components to prevent moisture or contaminants from collecting within the system. Provide sufficient access panels to allow for inspection and cleaning.

7.4.4.2.4 Fresh air intakes must be located to not entrain contaminants from outdoor sources. All intakes must be located in areas that are not accessible by the public and must not be located near exhaust air outlets. Take into account the location of the emergency generator exhaust and ensure that fumes from the generator exhaust are not introduced into the Building or adjacent buildings' fresh air intakes.

7.4.4.2.5 All supply, transfer, and exhaust air must be fully ducted to the space being served.

7.4.4.2.6 Locate services that require access for regular maintenance above non-critical spaces so that there is minimal disruption to court services.

7.4.4.2.7 Insulate all ductwork in accordance with the most stringent of applicable standards, including BCICA, ASHRAE and CSA standards. Provide canvass service jacket on all exposed insulation inside and up to three meters above finished floor in mechanical rooms.

7.4.5 Exhaust Systems

7.4.5.1 Design Principles

7.4.5.1.1 Provide exhaust fans and locate them as close as possible to the end of the exhaust ductwork systems. Ensure that the fans will be readily serviceable and are separated from spaces that house other mechanical equipment.

7.4.5.1.2 Provide exhaust systems for enclosed parking areas controlled by CO_2-monitors tied to BMS.

7.4.5.1.3 Provide exhaust above all floor model printers or multipurpose business machines to remove fumes.

7.4.6 Metering Requirements for Energy Measurement and Verification

7.4.6.1 Provide all required system meters, and trend logging equipment sensors to comply with and fulfill the energy measurement and verification requirements set out in Schedule 4.

7.4.6.2 Metering intervals must be coordinated with Schedule 4.requirements.

7.4.7 Sound Attenuation and Vibration Isolation

7.4.7.1 Basic Requirements

7.4.7.1.1 Provide all mechanical systems to prevent sound and vibration transmission between spaces, and transmission from mechanical equipment to the spaces. Provide sound attenuation to limit sound levels in accordance with Appendix 3B – Acoustics and Noise Control. Design and install mechanical systems located at or near any exterior wall to minimize sound transmission to the neighbouring community.

7.4.7.1.2 Provide vibration isolation devices on all equipment with rotating components.

7.4.7.1.3 All hung equipment must utilize spring isolators designed for the weight and vibration characteristics of the equipment.

7.4.7.1.4 Provide flexible connections where needed to isolate mechanical equipment sound and vibration from ducting, piping and electrical wiring systems.

7.4.7.2 Performance Criteria

7.4.7.2.1 Ensure duct silencers meet or exceed the requirements of the ductwork for cleanliness and inspection.

7.4.7.2.2 Utilize fiber free internal insulation.

7.4.7.2.3 Ensure that testing, adjusting, balancing and commissioning (without limiting Project Co's commissioning obligations under Section 12 [Commissioning] of Schedule 2 [Design and Construction Protocols]) demonstrate to the Province that the mechanical and electrical systems are substantially operational by testing, adjusting and balancing the systems in accordance with Good Industry Practice. Demonstration will include redundancy in the case of equipment failure and spare capacity.

7.5 Major Equipment – Performance Specification

7.5.1 Custom Air Handling Units

7.5.1.1 The systems and units noted on the following performance specifications are, in the Province's opinion, capable of meeting the general design intent, quality and performance characteristics specified. It remains the responsibility of the Project Co to ensure the products supplied (whether from the specifications below or others) meet the performance specifications in this Agreement.

7.5.1.2 Air handling units must be designed and manufactured to the specific requirements of this project. This specification applies to the custom air handling units for supply, return, and heat recovery systems.

7.5.1.3 Units must be produced by a recognized manufacturer who maintains a local service agency and parts stock.

7.5.1.4 Air handling units and major components must be products of manufacturing firms regularly engaged in production of such equipment whose products have been in satisfactory use in similar service for not less than ten years.

7.5.1.5 Units with factory wiring must be factory approved and labeled.

7.5.1.6 Environmental Requirements:

7.5.1.6.1 Units must not be operated for any purpose, temporary or permanent, until ductwork is clean and space served is clean, filters are in place, bearings lubricated, isolators adjusted, belt tension checked, sheaves aligned and the fan has been test run under observation.

7.5.1.6.2 The manufacturer will provide the factory assembled air handling unit. The unit must include all specified components installed at the factory. Field fabrication of units and their components will not be accepted. Air handling units must sit directly on housekeeping pads; all vibration isolation must be internal to the air handling unit.

7.6 Energy Model

7.6.1 Requirements

7.6.1.1 The Building must be designed to achieve a minimum of eleven (11) points for Credit EAc1: Optimize Energy Performance equal to or better than 22% below ASHRAE 90.1 2010.

7.6.1.2 The Facility energy performance must be compared to either of the following building standards: ASHRAE 90.1-2010 or MNECB at equivalent energy reduction.

7.7 Integrated Automation (Division 25)

7.7.1 Controls

7.7.1.1 Basic Requirements

7.7.1.1.1 Provide a stand-alone, web based BMS or Building Management System (also referred to as a BAS or Building Automation System) for the Facility that performs the following functions:

7.7.1.1.1.1 automatically operates, monitors and manages the Building's mechanical systems to provide a high level of occupant comfort;

7.7.1.1.1.2

7.7.1.1.1.3 interfaces with the building mechanical, electrical and communication systems and controls;

7.7.1.1.1.4 meters, trends and archives all data related to the flow of services into and out of the Building, including domestic water and electricity and takes into account seasonal variations in flow rate;

7.7.1.1.1.5 annunciates building and equipment alarms, including fire alarm, security alarms, lighting, UPS, emergency power systems and switchgear alarms; and

7.7.1.1.1.6 acquires and collates all data associated with energy measurement and verification as required by this Schedule and Appendix 8C Utility Payment.

7.7.1.2 Design the controls systems to allow monitoring and operation of the Facility from a BMS location in the Building. Display building related alarms at the Systems monitoring space.

7.7.1.3 The BMS must be a completely integrated (front-end and back-end) Native BacNET DDC system.

7.7.1.4 The BMS must be non-proprietary and designed with open protocol.

7.7.1.5 The BMS must optimize the system performance under all operating conditions to minimize Building energy usage.

7.7.1.6 The BMS must accommodate future technological changes and the architecture of the BMS must permit expansion of the system for future renovations. System must have additional 20% capacity floor by floor for traffic increases and future expansion. If panels are not mounted on every floor provide spare conduits to floors served to accommodate the 20% additional capacity utilization without coring.

7.7.1.7 The BMS must be an independent system separate from the fire alarm and other control systems. The BMS must be provided as a complete package from one manufacturer, not a composite system from several manufacturers.

7.7.1.8 Provide a separate physical network and any required network equipment for the BMS.

7.7.2 Performance Criteria

7.7.2.1 Zoning for HVAC systems will be based on occupancy, room location within the Building, room orientation, and room heating and cooling loads. At a minimum, the following must be provided:

7.7.2.1.1 No zone must be larger than 100m^2.

7.7.2.1.2 Zones serving the exterior of the building must not be more than 5m wide along the exposure.

7.7.2.1.3 Areas with more than one exposure must be defined as a separate control zone (the corners of a floor plate must be separated).

7.7.2.1.4 No more than three individual offices on a single control zone provided each room is less than 20m^2.

7.7.2.1.5 Any enclosed room larger than 20m^2 must be provided with a control zone.

7.7.2.2 Every individual courtroom, judge's chamber and crown counsel office must be provided with individual temperature control zone.

7.7.2.3 Zone floor areas to provide control of smoke in a fire situation as required by the B.C. Building Code.

7.7.2.4 Failsafe components must be hard-wired to provide reliable operation in all circumstances.

7.7.2.5 Refer to Schedules regarding energy management system, which may be connected to the BMS.

7.7.2.6 The BMS must monitor, control, indicate alarms, and provide trending where applicable for all connected sensors and control points.

7.7.2.7 The BMS must be connected to emergency power.

7.7.2.8 The BMS must monitor critical alarms for essential building and life safety systems. Provide ability to direct alarms to an e-mail address and an alpha numeric pager. Critical alarms include:

7.7.2.8.1 fire alarm system for alarm, supervisory and trouble;

7.7.2.8.2 all temperature alarms resulting from set point deviations;

7.7.2.8.3 failure of any major HVAC or plumbing equipment;

7.7.2.8.4 all alarms relating to the fire protection system; and

7.7.2.8.5 UPS, emergency power systems. Upon activation of a critical alarm, Project Co will notify the Province.

7.7.2.9 The BMS documentation must include a detailed narrative description of the sequence of operation of each system.

7.7.2.10 User interface must be graphical in nature with animated graphics to indicate equipment operation. Graphics must be grouped in systems and in departments. Generate a pop-up window on the browser display panel with audible alarm, informing operator that an alarm has been received.

7.7.3 Special Mechanical Considerations

7.7.3.1 Courtrooms

7.7.3.1.1 The mechanical design must include the following features and the design process must incorporate the following concepts to ensure these critical spaces perform as needed:

7.7.3.1.1.1 The strict criteria for background noise levels within courtrooms is to ensure the performance of the highly sensitive audio recording equipment used to record most Court proceedings.

7.7.3.1.1.2 Tight control of air movement and air velocities within the courtroom is essential to the performance of this space. Special attention must be made during the design of the air diffusers to avoid any drafts,

especially along the walls. The back row of the jury box typically results in jurors sitting with their back against the wall and any down drafts may impair their ability to sit for long periods. Placement and sizing of diffusers must be examined in detail with the Province.

7.7.3.1.1.3 Air balancing dampers may be located within the ceiling space of courtrooms.

7.7.3.1.1.4 There must be no distribution of any systems routed through courtrooms.

7.7.3.1.1.5 No buried services are to be run under courtrooms such as sanitary or storm piping. Only systems serving the courtroom are allowed within the space.

7.7.3.2 Detention Areas

7.7.3.2.1 The mechanical design must include the following features and the design process must incorporate the following concepts to ensure these critical spaces perform as needed: The HVAC system must provide 100% exhaust air from any detention or holding areas. Airflow rate must be sized at a minimum of 6ACH. Supply air and transfer air must be provided outside of individual cells and each cell must have exhaust air located towards the back of the cell or near any plumbing fixtures.

7.7.3.2.2 Individual holding cells near courtrooms must also be provided with 100% exhaust air sized for a minimum of 6ACH.

7.7.3.2.3 All air grilles (both supply and return) must be ‘maximum security risk resistant grilles’ that include injury-inhibiting cores that impede efforts to thread anything into the grilles.

7.7.3.2.4 Provide stainless steel combination toilet and lavatory fixtures as required by the program. Fixtures must be specifically designed for use within detention cells. All shut off valves must only be accessible from outside of the cell.

7.7.3.2.5 The design must include features that allow the water to be remotely shut off to different zones within the detention area. Control for remote water shut off must be located within security control room.

7.7.3.2.6 Sanitary drain piping leaving the detention area must be routed through a sump, intended to intercept any foreign objects flushed.

7.7.3.2.7 No floor drains or clean outs are to be located within the cells. However, provide hose bibs and floor drain outside of each cell to facilitate wash down of area.

7.7.3.2.8 Provide sprinkler heads within cell specifically designed for detention applications that include limits to the ability to tamper or for accused to harm themselves or others.

7.7.3.2.9 Provide security showers in areas used or accessed by those in custody.

7.7.3.2.10 Provide supervised sprinkler zone valve for detention area sprinklers near the guard station. Zone valve must be located within the security control room for quick access. Valves to be equipped with a solenoid shut-off control with the 'off' button located at the guard station.

7.7.3.2.11 Provide an independent HVAC system for security control room.

7.8 Electrical (Division 26)

7.8.1 General

7.8.1.1 Basic Requirements

7.8.1.1.1 All electrical systems, materials and equipment must be new and of a type and quality intended for use in a courthouse facility. Configure electrical systems to meet requirements of the identified program in an efficient manner, with optimal utilization of space, staff and equipment resources.

7.8.1.1.2 Provide electrical systems that provide redundancy, protection, continuity of service and a comfortable and safe working environment for all occupants, visitors, and staff.

7.8.1.1.3 Integrate systems where integration provides efficiency, operational and cost advantage.

7.8.1.1.4 Incorporate into the design and construction the principle that change will be a constant and inevitable fact within the Building. Completed electrical systems must permit change while minimizing the cost of change and the amount of disruption to the regular Building activities.

7.8.1.1.5 Include systems and equipment coordinated to provide synergy and reliable electrical performance for the various Building functions.

7.8.1.1.6 Provide provisions to minimize the noise and vibrations of electrical equipment/ components (transformers, luminaires, cables etc.) to below an acceptable level as required in a courthouse.

7.8.1.1.7 Locate electrical rooms and power distribution equipment in order to minimize the distances for feeder runs, to provide easy access for equipment move and to avoid interference with other services and equipment.

7.8.1.1.8 Provide clear aisle ways and routes to permit removal of major electrical equipment from the building as well as to bring in new equipment into the electrical rooms without impacting courthouse operations and site access.

7.8.1.1.9 Install equipment, conduits, piping, ductwork etc., in electrical rooms such that a minimum clear height of 2000 mm (6'-6") AFF is available.

7.8.1.1.10 All outlets to be installed at a height which allows for good ergonomics and not less than 400 mm above finished floor except in corridors, unless noted otherwise.

7.8.1.1.11 Outlets for equipment must be coordinated with Appendix 2E - Equipment and Furniture List and the Room Data Sheets.

7.8.1.1.12 Electrical and communication rooms must not have drain pipes, plumbing pipes or water-cooled fan-coil units located in the ceiling space.

7.8.1.1.13 Incorporate energy management systems to minimize demand pressures on the Building Systems and minimize the anticipated increase to energy costs.

7.8.1.1.14 Electrical systems to be the most recent and up to date and proven systems that are available be provided.

7.8.1.1.15 Electromagnetic interference (EMI) to be considered in installation of electrical equipment. EMI reduction to be achieved by electromagnetic shielding for transformers and switchgear, use of ferrous raceways such as EMT as required by electrical Code, close spacing of conductors in feeders, running all the phases of a feeder together to cancel net magnetic fields, locating all distribution transformers in electrical rooms and running feeders in service spaces and ceiling spaces away from occupied areas. Bus Duct is acceptable when used only in electrical rooms or in vertical risers from electrical room to electrical room and must be fully enclosed. Should there be an electromagnetic field that results in interference to equipment Project Co will mitigate the electromagnetic field with appropriate techniques.

7.8.1.2 Performance Criteria

7.8.1.2.1 Install electrical systems and equipment in a fixed and permanent manner. Plan installation of equipment to allocate space for future additions and to facilitate easy access to other systems and equipment which may require inspection or maintenance.

7.8.1.2.2 Design and construct all systems with protection, grounding, isolation and control to address the functional requirements where they are located.

7.8.1.2.3 Power throughout the building must comprise of a combination of 347/600V and 120/208V for all power, lighting and equipment loads.

7.8.1.2.4 All electrical equipment must be located interior to the Building with the exception of the high voltage outdoor single-ended substation.

7.8.1.2.5 Every electrical system must be installed in a fixed and permanent manner, adequately seismically restrained to meet the Facility needs, including the areas identified as post-disaster. The installation must economically occupy available space, leaving space for future additions, and must be planned to facilitate easy access to other systems and equipment, including but not limited to mechanical equipment, Building Systems access ways, and architectural building components which may require periodic inspection or maintenance.

7.8.1.3 Access Doors

7.8.1.3.1 Supply flush-mounted access doors, for installation by building trades in non-accessible type ceilings and walls where necessary for access to service and/or to inspect electrical equipment and accessories and life safety devices and where specifically indicated.

7.8.1.3.2 Unless otherwise noted, access doors must be minimum 450 mm x 450 mm (18” x 18”) for body entry; 300 mm x 300 mm (12” x 12”) for hand entry; 200 mm x 200 mm (8” x 8” for cleanout access.

7.8.1.3.3 Locate access doors so that all concealed items are readily accessible for adjustment, operation, maintenance and inspection. Locate in service and storage areas wherever possible. Do not locate in paneled, feature or special finish walls or ceilings, without prior approval of the Province.

7.8.2 Electrical Utilities

7.8.2.1 Basic Requirements

7.8.2.1.1 Within three months after Financial Close, notify the Province of the anticipated power requirements for the Facility.

7.8.2.2 Performance Criteria

7.8.2.2.1 Identify the location of existing underground and overhead service lines in the area to avoid interference with proposed routing of new services and future services for known expansions. Use latest techniques (ground penetration radar test) to verify and confirm all existing underground services in the direction of service lines to the Building. Remove or relocate existing site lighting, branch circuit power and communications to accommodate the Facility. Reconnect all power and controls to electrical and communication circuits affected by the site preparation work.

7.8.2.2.2 Obtain prior written authorization from the Province for all service connections. Service connections must be installed to the Province’s reasonable satisfaction.

7.8.2.2.3 Prepare and submit to the Province a detailed Protective Device Coordination, Short Circuit and Arc Flash Hazard Study signed and sealed by a professional engineer registered in British Columbia and provide equipment labeling indicating available energy levels and level of PPE required when servicing the equipment.

7.8.2.2.4 The detailed Protective Device Coordination, Short Circuit and Arc Flash Hazard study to:

7.8.2.2.4.1 indicate all new service equipment from the point of utility supply and standby generators; and

7.8.2.2.4.2 include all transformers, distribution equipment, Generators, UPS and panelboards.

7.8.2.2.5 Make all changes and recommendations from the protective device coordination, short circuit and arc flash hazard study.

7.8.3 High Voltage Distribution (Over 750 Volts)

7.8.3.1 Basic Requirements

7.8.3.1.1 Utilize transmission and distribution equipment that are robust, reliable, easily operated and maintained. Design with additional capacity to accommodate load growth and equipment additions.

7.8.3.1.2 Provide high voltage switchgear, cast-coil or FR3 oil filled high voltage transformer for the power incoming 25kV feeders in the Building.

7.8.3.1.3 The 750V low-voltage normal power distribution to be derived from one 25kV – 600V step-down cast-coil or FR3 oil filled power transformers of equal kVA capacity. Transformers to be sized to carry the maximum anticipated demand load, including identified future expansions, plus 25% spare capacity. Additionally, size the power transformers such that, in the natural cooled configuration, each transformer is capable of providing 100% of the ultimate normal power demand.

7.8.3.1.4 Provide clear physical space equal to one vertical switchboard section on both ends of all distribution panels (in addition to required clearance) to permit capability for expansion in the future.

7.8.3.2 Performance Criteria

7.8.3.2.1 The 25kV feeder is to terminate on a load-break switch in the Building. The load-break switch, in turn, to feed a 15kV rated switchboard comprised of:

7.8.3.2.1.1 one main draw-out vacuum circuit breaker;

7.8.3.2.1.2 revenue-grade digital metering;

7.8.3.2.1.3 3-phase, solid-state multi-function type protective relay at the vacuum circuit breaker with ANSI functions 50/51, 50N/51N, 86 and additional functions as required. Protective relay to have integral digital metering capable of displaying V, A, KVA, KW and harmonic parameters;

7.8.3.2.1.4 communication port integrated with the Facility's Building Management System to indicate status of breaker; and

7.8.3.2.1.5 125V DC battery-backed power supply with charger for protective relays and controls.

7.8.3.3 Power Transformers:

7.8.3.3.1 To be dry-type cast-coil or FR3 oil filled, with copper or aluminum windings. The kVA capacity indicated to be based on Class 220 degree C insulation, 115 degree C rise.

7.8.3.3.2 To have delta connected primary windings and star-connected secondary windings. The secondary star point to be solidly grounded.

7.8.3.3.3 If dry-type, to have ANN/ANF (air natural cooled / air force cooled) ratings and have cooling fans that must provide an additional 33% capacity over the base (air natural cooled) rating.

7.8.3.3.4 To have four $2^1/_2$% full capacity primary taps, two above and two below nominal voltage.

7.8.3.3.5 To have a digital thermometer, indicating average coil temperature, with two stage alarm contacts connected to the building management system. The first stage to alarm when the fans start up and the second stage to alarm at a higher temperature. Alarms to indicate on the BMS.

7.8.3.3.6 To have integral intermediate class lightning arrestors connected to the primary terminals.

7.8.3.3.7 To be suitable for interior installation with CSA type 2 ventilated housing with overhanging drip proof louvers.

7.8.4 Low Voltage Distribution (750V and below)

7.8.4.1 Basic Requirements

7.8.4.1.1 Provide electrical power transmission and distribution from the main, secondary and other sources of supply (power transformers and diesel generators) to meet all requirements of the Facility.

7.8.4.1.2 Design the distribution system to provide security of supply and the flexibility to allow concurrent safe maintenance without impacting operations. Provide tie breakers with key interlocking devices on all main and secondary distribution. Provide double bypass automatic switches.

7.8.4.2 Performance Criteria

7.8.4.2.1 The main normal power 600V Distribution Equipment must directly feed:

7.8.4.2.1.1 Automatic Transfer Switches (ATS).

7.8.4.2.1.2 Motor Control Centres (MCC).

7.8.4.2.1.3 Central Distribution Panels (CDP).

7.8.4.2.1.4 Surge Protection Device (SPD).

7.8.4.2.1.5 Large individual loads. Example: chillers.

7.8.4.2.1.6 Fire Pump Transfer Switch.

7.8.4.2.1.7 Automatic power factor correction systems, one on each side of the switchboard.

7.8.4.2.2 Configure the distribution downstream of the main Automatic Transfer Switches such that each one of the main ATS's feed a double-ended 600V distribution panel for emergency power.

7.8.4.2.3 600V Distribution Panels:

7.8.4.2.3.1 to be designed, factory-assembled and tested in accordance with CSA C22.2 No.31-10 “Switchgear Assemblies”;

7.8.4.2.3.2 to be provided with motorized draw-out type power circuit breakers complying with ANSI/IEEE C37.13 at mains, ties, and outgoing feeder breaker positions and labeled to work continuously at 100% rated current. Fuses must not be used;

7.8.4.2.3.3 to have circuit breakers with solid-state trip units with adjustable time and current elements for Long time, Short time, Instantaneous, and Ground fault pickup settings. The trip units to have integral digital metering capable of displaying V, A, KVA and KW parameters and retaining the maximum recorded value of each parameter. The metering function of the circuit breaker trip units to be connected to the overall metering system and the building management system; breakers 200A and larger must be LSI electronic trip fully adjustable selective breakers. Breakers 400A and larger must be LSGI electronic trip fully adjustable selective breakers to have circuit breaker auxiliary contacts connected to the Building;

7.8.4.2.3.4 management system to indicate operational status of each breaker;

7.8.4.2.3.5 to have a coloured lamicoid mimic bus single line diagram riveted on the front; and

7.8.4.2.3.6 to have coloured engraved lamicoid nameplates for cubicle and circuit identification on front and rear sections.

7.8.4.2.4 Provide individual dry-type step-down 600V – 120/208V transformers in the main electrical room, mechanical rooms and additional 600V 120/208V transformers to be located as required by the design.

7.8.4.2.5 Centralized Distribution Panels located on the same floor must have tie breakers to at least one other system CDP.

7.8.4.2.6 All Centralized Distribution Panels (CDP) to utilize molded case circuit breakers.

7.8.4.2.7 600V Centralized Distribution Panels for Normal power to feed 120/208V Centralized Distribution Panels in electrical rooms. These 120/208V CDPs to feed panel boards on each floor. Additional 120/208V panelboards must be installed throughout the Building as required by the design.

7.8.4.2.8 Provide a minimum of one electrical riser room on each floor level to house electrical equipment serving that floor. Vertically stack the electrical rooms on all floors throughout the height of the Building. If a second electrical room is required on any floor, spatially separate the two rooms on plan and position these in different architectural fire-compartments and such that each room can serve one half of the floor plate. Vertically stack the electrical rooms on all floors throughout the height of the Building.

7.8.4.2.9 Install 600:120/208V dry type transformers for small equipment loads in electrical rooms on concrete pads or suspend from structure. Install transformers so that removal can be facilitated without removal of any

other equipment or conduit serving the room. Utilize sound and vibration mitigation installation methods for all transformers.

7.8.4.2.10 Locate the main electrical room separate from plumbing and mechanical equipment. Design the electrical room to be readily accessible, well ventilated and free of corrosive or explosive fumes, gases or any flammable material. Provide a minimum of two entrances/exits from the electrical room and doors sized to allow removal of large electrical equipment.

7.8.4.2.11 Locate major electrical equipment to minimize run length of feeders and branch circuits, and locate within the Building to provide a clean, dry, safe, accessible installation protected from unauthorized access.

7.8.4.2.12 Locate and design electrical equipment for ease of maintenance and with due regard for future expansion and renovation.

7.8.4.2.13 Rate all distribution devices to handle available fault duty at line terminals. Perform a computer generated fault study to ensure that all devices are properly rated.

7.8.4.2.14 Design and install protection equipment so that the initial electrical installation, future additions and modifications must be fully coordinated to isolate only the faulty portion of the system.

7.8.4.2.15 Select, configure, locate and install all components of transmission and distribution systems to minimize the transmission of noise, vibration or unwanted heat into other parts of the Building.

7.8.4.2.16 Provide a networked digital metering system to monitor electrical loads and quality of power in the Building. System to be part of the central electrical metering and monitoring system or Building Management System (BMS).

7.8.4.2.17 Provide automatic power factor correction equipment within the Building to ensure the Facility power factor does not fall below the 95% lag threshold. Coordinate capacitors with adjustable frequency drives and other harmonic generating equipment to avoid resonance conditions.

7.8.4.2.18 Provide circuit breaker type panel boards fully rated to handle calculated fault current level. Series rating of breakers and panel boards is not acceptable.

7.8.4.2.19 Oversize neutral(s) for panel boards, feeders and branch circuiting where significant non-linear load(s) are anticipated, such as in open office and other areas with a high density of personal computers. Provide extra neutral terminal bus in such panels to accommodate dedicated neutrals in branch circuit wiring.

7.8.4.2.20 Construct flush mounted panel boards with three spare 27mm conduits stubbed into ceiling space above.

7.8.4.2.21 Provide panel boards with integral surge protective devices to serve electronic equipment susceptible to electrical transients. Panel boards serving the Main Cross-connect Room and the on-floor communication riser rooms to have integral surge protective devices in addition to panels intended to provide power to electronic equipment.

7.8.4.2.22 Install Centralized Distribution Panels and Panelboards must be on the same floor as the loads they serve and be located inside of electrical rooms.

7.8.4.2.23 All Panelboards to have minimum of 25% spare capacity after all connected loads have been installed.

7.8.4.2.24 Components of the transmission and distribution systems in any public, administrative or staff area must have long life expectancy without perceptible deterioration and a good appearance. Design and install to permit easy and complete cleaning. Such equipment must be lockable.

7.8.4.2.25 Provide individual enclosed motor starters for individual motors. Utilize motor control centers for groups of four or more motors that require individual motor starters.

7.8.4.2.26 Motor starters to be combination magnetic MCP (Motor Circuit Protector) type with integral control power transformers, Hand-Off-Auto (HOA) or start/stop control and at least two auxiliary contacts in addition to seal-in contacts.

7.8.4.2.27 Provide combination starters for all motors 1/2 HP and larger that are not already controlled by adjustable frequency drive or include an integral control package. All motors of $^{1}/_{2}$ HP or more to be 600 volt 3 phase.

7.8.4.2.28 Provide surge protection for the main 600V and 120/208V Centralized Distribution Panels and all other panel boards serving sensitive electrical loads and adjustable frequency drives.

7.8.4.2.29 Locations of receptacles to comply with all applicable codes and standards and the requirements for each program area.

7.8.5 Emergency Power

7.8.5.1 Performance Criteria

7.8.5.1.1 Provide an emergency power system to supply code-required loads and additional loads indicated in the event of a power failure.

7.8.5.1.2 The emergency power system to include a diesel generator unit capable of supplying power to the following:

7.8.5.1.2.1 UPS branch loads;

7.8.5.1.2.2 fire pump;

7.8.5.1.2.3 selected loads in the Sheriff Control Rooms;

7.8.5.1.2.4 unit battery equipment for in-custody, accused holding and circulation corridors;

7.8.5.1.2.5 cooling for critical equipment in the following rooms:

7.8.5.1.2.5.1 Main BSCS Room;

7.8.5.1.2.5.2 Main CER

7.8.5.1.2.5.3 all Sub Telecom/BSCS Rooms;

7.8.5.1.2.5.4 Security Control Room

7.8.5.1.2.5.5 AV rooms; and

7.8.5.1.2.5.6 Command Post;

7.8.5.1.2.6 parking gates;

7.8.5.1.2.7 elevators as required by code and elevators that are used to transport the accused; and

7.8.5.1.2.8 sump pumps.

7.8.5.1.3 Provide diesel generator and support systems that are capable of running continuously for at least eight hours at 100% rated load.

7.8.5.1.4 Generator must be located so as to permit convenient servicing and monitoring, to prevent unauthorized access, ease of removal and to avoid interruption due to floods and seismic event.

7.8.5.1.5 Generator must be diesel to ensure a continuous source of fuel supply. The fuel supply must be independent to other building equipment and must be stored on site in permanent storage for the Building. Fuel level to be electronically monitored by the BMS system to alarm when fuel supply drops below 4 hours. Fuel system to comprise dedicated dual wall sub-base tank for each generator.

7.8.5.1.6 Locate diesel generator in a dedicated 2-hr fire rated room or in a dedicated exterior rated self-attenuated enclosure.

7.8.5.1.7 Diesel generator exhaust emissions at full load on 100% diesel fuel must not exceed the U.S. Environmental Protection Agency Non-Road 'Tier 2 Interim' limits. The diesel generator exhaust must vent vertically above roof level of building or enclosure and must be located to prevent re-entrainment of emissions into the Building's air-intakes. Provide after-treatment of engine exhaust if necessary to maintain Nitrous Oxide concentration within 500 $\mu g/m^3$ at all air-intakes.

7.8.5.1.8 Generator must be located, vibration isolated, and muffled so that neither sound nor vibration are perceptible outside of the room or generator enclosure containing the generator. Provide acoustic panels, silencer at air intake and critical grade muffler to limit the generated noise in compliance with local regulations and sound bylaws.

7.8.5.1.9 Automatic transfer switches must be closed transition and must include a means of bypass to both the normal and standby sources. A connection point for load banks should be provided to allow the augmentation of building load during the 100% load test of the standby power generation system.

7.8.5.1.10 Locate the main emergency distribution equipment such as ATS's and 600V Centralized Distribution Panels in the main electrical room. Provide a fire separation between the main distribution equipment for emergency power and normal power such that a catastrophic failure in one system does not affect the other system.

7.8.5.1.11 Provide annunciation of alarms for generator and ATS to the BMS.

7.8.5.1.12 Include 'run' and 'fail to run' alarms to the BMS.

7.8.5.1.13 Provide emergency power to serve essential loads as defined by CEC, CSA C282 and as required, including:

7.8.5.1.13.1 fire pump and jockey pump via dedicated transfer switch;

7.8.5.1.13.2 the BMS to monitor and record emergency loads;

7.8.5.1.13.3 providing a UPS branch panel board in the Main Cross-connect Room (main telecommunications equipment room) and in each on-floor communication room. Each panel board to be capable of independently supporting all the telecommunication equipment in the respective room.

7.8.5.1.14 Temporary emergency generator connection:

7.8.5.1.14.1 the emergency power system will include a temporary generator connection point;

7.8.5.1.14.2 the connection point design must mitigate security risks; and

7.8.5.1.14.3 when a temporary generator is connected, it will not impede traffic flow.

7.8.6 Uninterruptible Power Supply

7.8.6.1 Basic Requirements

7.8.6.1.1 Provide a centralized Uninterruptible Power Supply (UPS) system arranged in a redundant N+1 configuration to serve all areas, equipment and systems that require a continuous and uninterrupted source of power as per the requirements of this Schedule 3 and for the following additional outlets, equipment and systems:

7.8.6.1.1.1 25% of lighting and room receptacles;

7.8.6.1.1.2 provide UPS capacity allowance to add up to 25% of the initial quantity of lights, receptacles and equipment;

7.8.6.1.1.3 the Building Management System;

7.8.6.1.1.4

7.8.6.1.1.5 ;

7.8.6.1.1.6 ;

7.8.6.1.1.7 ;

7.8.6.1.1.8 public address system;

7.8.6.1.1.9 selected loads in the Security Control Room, AV rooms and Command Post;

7.8.6.1.1.10 clock system;

7.8.6.1.1.11 all equipment and systems located in main entrance facility and main communications room, each telecommunication room and including:

7.8.6.1.1.11.1 network equipment for the wired and wireless networks;

7.8.6.1.1.11.2 wireless access points;

7.8.6.1.1.11.3 PBX and other telephone equipment; and

7.8.6.1.1.11.4 wireless communications system.

7.8.6.2 Performance Criteria

7.8.6.2.1 The centralized UPS system to be fed from the power system backed by diesel generator.

7.8.6.2.2 Centralized UPS system:

7.8.6.2.2.1 The UPS module must consist of the following main components:

7.8.6.2.2.1.1 Rectifier/charger.

7.8.6.2.2.1.2 Static inverter.

7.8.6.2.2.1.3 Bypass.

7.8.6.2.2.1.4 Output isolation transformer.

7.8.6.2.2.1.5 Control panel.

7.8.6.2.2.1.6 Monitor panel.

7.8.6.2.2.1.7 Communication panel.

7.8.6.2.2.1.8 Dual Conversion.

7.8.6.2.2.1.9 Isolation Transformer.

7.8.6.2.2.1.10 Maintenance Bypass.

7.8.6.2.2.1.11 Dual Input.

7.8.6.2.2.1.12 30 Minute Battery Run Time.

7.8.6.2.2.2 The UPS module must operate as an online, fully automatic system in the following modes: Normal, Battery, Recharge and Bypass.

7.8.6.2.2.3 To have modular architecture with no system-level single-point-of failure.

7.8.6.2.2.4 To have two (2) or more UPS modules connected in parallel providing N+1 redundancy, to ensure UPS power to support 100% of the initial load and 40% spare capacity when one UPS module is unavailable. The spare capacity must be calculated by adding the connected loads minus the IMIT loads located in the MCR and all TRs multiplied by 1.4 plus the IMIT loads located in the MCR and all TRs.

7.8.6.2.2.5 To have a dedicated battery string for each UPS module rated to provide 30 minutes of back up time when the UPS module is carrying 100% rated load.

7.8.6.2.2.6 To be online, double-isolation type having output power factor of minimum 0.9.

7.8.6.2.2.7 To have input filter at each UPS module to limit the total harmonic current distortion to 5% when the UPS module is carrying 100% rated load.

7.8.6.2.2.8 To have static bypass to automatically bypass the UPS in the event of UPS failure.

7.8.6.2.2.9 To have external maintenance bypass switching cabinet for servicing the UPS system.

7.8.6.2.2.10 Must have a network connection for monitoring and will indicate any alarms to the BMS.

7.8.6.2.3 The main distribution panel that is fed from the UPS system output to have an alternate input that can be energized directly from the main distribution equipment in the event of a UPS system-failure. Provide interlock controls such that only one feeder can be energized at any one time.

7.8.6.2.4 Size breakers, electrical equipment and conductors feeding the UPS unit and the conductors and immediate electrical equipment connected on the load side of the UPS to the maximum capacity of the modular UPS such that the addition of future modules in the UPS must not require an upgrade to the electrical equipment infrastructure.

7.8.7 Metering

7.8.7.1 Basic Requirements

7.8.7.1.1 Provide networked, digital microprocessor metering to provide detailed information about power quality and power consumption at key points throughout the Building. Key points include:

7.8.7.1.1.1 high voltage feeders from the Utility;

7.8.7.1.1.2 secondary feeder of all 12.47kV-600V step-down transformers;

7.8.7.1.1.3 600V Centralized Distribution Panels, mains and each feeder breaker;

7.8.7.1.1.4 output of each automatic transfer switch;

7.8.7.1.1.5 emergency power branch;

7.8.7.1.1.6 UPS;

7.8.7.1.1.7 power and lighting panelboards at 600V and 120/208V;

7.8.7.1.1.8 motor control centres;

7.8.7.1.1.9 panelboards feeding mechanical equipment and elevators; and

7.8.7.1.1.10 all other requirements of ASHRAE 90.1 and LEED®.

7.8.7.1.2 Ensure that metering is provided to record total energy consumed by lighting fixtures and equipment. Integrate information from all meters on a common software platform residing on a dedicated electrical metering server.

7.8.7.1.3 Metering must be provided on all normal and UPS power branches.

7.8.7.1.4 Ensure that sufficient metering is provided to record the energy consumed by all major mechanical equipment including chillers, fan and pump motors.

7.8.7.1.5 Implement a networked metering system with terminals for maintenance and plant administration, and data transfer to the Building's BMS. Provide network software, hardware, licensing to provide remote monitoring and third party assistance, reprogramming and troubling shooting.

7.8.7.1.6 Connect electrical demand and consumption meters to the BMS.

7.8.7.1.7 Include trend logging equipment sensors to comply with and fulfill energy measurement and verification requirements. Logged information must not be overwritten and must be archived.

7.8.7.1.8 Provide additional meters required to measure energy performance to determine performance in accordance with Appendix 8C.

7.8.7.2 Performance Criteria

7.8.7.2.1 The metering system must provide easily read locally displayed information for all distribution at primary voltage and for each secondary distribution switchboard.

7.8.7.2.2 Metering intervals must be 15 minutes or less.

7.8.7.2.3 Design the metering system network to store historical data and to have the capability to generate user configurable electronic and printed reports on demand.

7.8.7.2.4 Support the metering system by a backup power source(s), which ensures operation when the metered circuit is de-energized. The metering system must not be dependent on power from the metered circuit for its operation.

7.8.7.2.5 The metering system must, at a minimum, provide the following information about each metered circuit: Phase-to-Phase Voltage (all phases), Line-to-Neutral Voltage (all phases), Phase Demand and Peak Current (all phases and neutral), KW (peak and average), KVA (peak and average), Power Factor, KWH, VAR hours, frequency, current and voltage harmonics.

7.8.7.2.6 Utilize power quality type meters for monitoring harmonics and surges / sags. Provide power quality meters capable of monitoring harmonics on the Distribution Panels.

7.8.7.2.7 Draw-out circuit breakers on the 600V main normal and emergency Distribution Panels must be provided with trip units with integral 3 phase true RMS digital meter with local LCD display to indicate the phase current for each phase, kW and kVA.

7.8.8 Grounding and Bonding

7.8.8.1 Basic Requirements

7.8.8.1.1 Provide grounding and bonding for all electrical equipment and systems in the Facility for the safety of people and for protection against damage to equipment or property in the case of a fault occurring in any of the equipment or systems. Install grounding and bonding as required by all applicable codes and standards, including CEC, IEEE, CSA and ANSI/TIA standards for communications and security equipment and systems.

7.8.8.2 Performance Criteria

7.8.8.2.1 Utilize non-alloyed copper for all conductors and all conducting components of electrical equipment which form part of the grounding and bonding systems in the Facility.

7.8.8.2.2 Provide solid or low resistance system grounding including conductors and bussing.

7.8.8.2.3 Provide a ground bus in each electrical and communication room connected to the central grounding system.

7.8.8.2.4 Provide a copper ground conductor within all raceways for feeders and branch circuit wiring.

7.8.8.2.5 Provide a minimum #6 AWG copper ground conductor to be run to the Telecommunications Main Bus Bar (and bond communications systems in accordance with ANIS/TIA 607 requirements).

7.8.8.2.6 Label all grounding and bonding conductors and bus bars consisting of the ‘bonding backbone’ with printed labels.

7.8.9 Seismic Requirements for Electrical Systems

7.8.9.1 Basic Requirements

7.8.9.1.1 Provide seismic restraint for all electrical equipment and components of electrical systems which are part of the building electrical systems as defined in the BC Building Code. The seismic restraints systems to facilitate the maintenance and reconfiguration, as well as the installation is to coordinate with the buildings architectural finishes.

7.8.9.2 Performance Criteria

7.8.9.2.1 Provide seismic support for all electrical equipment and components of electrical systems that have the potential to cause injury or damage during or following a seismic event.

7.8.9.2.2 Use seismic restraint systems that are designed by a professional engineer, registered in British Columbia, or, where an identified pre-designed standard restraint device or system exists for a particular item, that equipment may be used provided that written confirmation of its acceptability for the installation is provided by a professional engineer registered in British Columbia. Provide signed and sealed drawings as well as typewritten field reports from a professional seismic engineer, registered in British Columbia. Obtain certification of the main electrical distribution equipment for “seismic withstand capability” and, to maintain the certification, anchor such equipment according to the manufacturer’s instructions.

7.8.10 Power Quality

7.8.10.1 Basic Requirements

7.8.10.1.1 Establish and maintain an overall power quality which assures suitable conditions for operation of all electrical and electronic equipment throughout the Facility.

7.8.10.1.2 Provide equipment and systems which assure that electrical equipment and systems must not be harmed or impaired either by external events or conditions, such as lightning and disturbances on the utility service, or by internal events or conditions generated within the Facility.

7.8.10.1.3 Meet or exceed the IEEE established standards for power quality including, but not limited to, Harmonic Mitigating Transformers, Harmonic Filters, Surge Protective Devices (SPD’s).

7.8.10.1.4 Provide harmonic mitigation equipment, as necessary, to ensure that power quality meets or exceeds recommendations in IEEE, including standard 519. For the purposes of measuring the harmonic distortion, the “Point of Common Coupling” will be the two main 12.5kV-600V step-down transformers.

7.8.10.2 Performance Criteria

7.8.10.2.1 Provide equipment, such as filters, zigzag transformers, surge protective devices (SPD’s), etc, specifically designed to control and remove all

adverse power quality conditions that could damage or impair function of sensitive electronic equipment used in the Facility. Adverse power quality conditions include single phasing, voltage sags, voltage dips, voltage surges, voltage spikes, transients, harmonics, power factor and radio frequency interference.

7.8.10.2.2 The voltage phase imbalance must not exceed 3 percent between phases A, B, C anywhere within the power distribution system.

7.8.10.2.3 Provide station class lighting arrestors on the primary side of the 12.47kV-600V main step-down transformer. Provide integral surge protective devices (SPD's) on all 600V Centralized Distribution Panels, all120/ 208V Centralized Distribution Panels. 120/208V Panel boards supplying power to sensitive electronic equipment must also have integral SPDs and dedicated neutrals for electronic equipment.

7.8.10.2.4 Provide a third party specializing in power quality systems to fully test and commission all power quality systems. Submit the reports with the commissioning documents.

7.8.10.2.5 Provide harmonic filtration to achieve IEEE519 standards based on a harmonic study of the Facility's electrical system.

7.8.11 Wiring Methods, Material and Devices

7.8.11.1 Basic Requirements

7.8.11.1.1 Use wiring methods, materials and devices that result in a safe, reliable and flexible electrical power, lighting control, communication, data, and life safety system.

7.8.11.1.2 Install all wiring in a neat and secure manner so that it is protected from damage, is not in conflict with mechanical or architectural components and allows for future changes and additions.

7.8.11.1.3 Receptacle colours must be, white for Normal power, red for Emergency power, and grey for UPS power.

7.8.11.1.4 All receptacles must be identified with source panel and circuit number with a colour coded printed label as specified in IMIT infrastructure specifications.

7.8.11.1.5 Utilize non-alloyed copper for all conductors and all conducting components of electrical equipment, which form part of the Facility's wiring systems. Minimum conductor size must be #12AWG. Aluminum conductor installed in conduits may be used for feeders to equipment, not electrical panels, greater than 100 Amp current rating except for vibrating equipment, which must have copper feeds.

7.8.11.1.6 Feeders 100 Amp and larger to be installed in EMT conduit. Do not install armoured flexible cable (example: TECK or ACWU cable) for feeders.

7.8.11.1.7 Provide panel boards, feeders and branch circuiting with double neutral(s) capacity where significant non-linear load(s) are anticipated. This includes,

but not limited to, all offices, open office and other areas with a medium to high density of personal computers.

7.8.11.1.8 Provide two 15A 120V duplex receptacles to each computer/ workstation. These receptacles will have a dedicated neutral. Where receptacles are required to be switched by ASHRAE 90.1 the dedicated neutral receptacle must not be switched. The two receptacles must be of differing power sources.

7.8.11.1.9 Conceal all wiring and wiring support systems from public access and view.

7.8.11.1.10 Separate all wiring for systems of different voltages and from different source and do not run in common raceways. Maintain adequate shielding and separation between wiring for power and communication systems to prevent interference.

7.8.11.1.11 Identify system voltage, phase, neutral and grounding of all pull boxes, junction boxes, conduits and wiring. Provide additional colour coding for wiring and “P Touch” self-adhesive labeling for receptacles and switches.

7.8.11.1.12 Provide tamper resistant receptacles in public areas.

7.8.11.1.13 Label receptacles in offices switched as required by ASHRAE 90.1 as ‘Controlled’.

7.8.11.1.14 Utilize stainless steel cover plates for receptacles and switches in all SLC Secure areas. Grouped receptacles and switches must have a single cover plate for the whole group.

7.8.11.1.15 Provide a quantity of receptacles to meet the requirements indicated elsewhere in this Schedule, Appendix 3A – Functional Room Requirements and for equipment indicated in Appendix 2E - Equipment and Furniture.

7.8.11.1.16 Allow a maximum connection of four general use receptacles to one 15 or 20 amp circuit maximum. Number of receptacles per 15AMP circuit to be adjusted in accordance with equipment manufacturer’s requirements and Good Industry Practice.

7.8.11.1.17 Final location of all receptacles and connections must be determined in the User Consultation Process.

7.8.11.1.18 Provide, at a minimum, one (1) duplex convenience receptacle rated at 15/20A, 120V in all rooms, alcoves, and vestibules. Provide additional receptacles identified in this Schedule, in Appendix 3A - Functional Room Requirements , and as required by code or applicable standard.

7.8.11.1.19 Utilize NEMA 5-20R 15/20Amp style receptacles for copiers. Provide separate dedicated circuits for each fax machine, printer and copier.

7.8.11.1.20 Utilize NEMA 5-20R 15/20Amp style receptacles for housekeeping staggered on alternate sides of the hallways spaced a maximum of 10 meters apart and as required for complete coverage of the Building and at each stairwell landing.

7.8.11.1.21 Provide one 15/20A 120V duplex receptacle for every 10 square meters, or portion thereof, of service and storage space. GFCI duplex receptacles must be provided as required.

7.8.11.1.22 Provide one 15/20A 120V duplex receptacle on alternate sides of corridors and hallways, and in lobbies, and waiting/seating areas, with carpets and one duplex receptacle and one 208V receptacle in non-carpeted areas spaced at 10 meters on centre maximum. Each wall must have minimum one receptacle.

7.8.11.1.23 In staff washrooms, provide one (1) GFCI 15A 120V duplex receptacle.

7.8.11.1.24 Install approved fire stopping to maintain all fire separations and as required by Governmental Authorities.

7.8.11.1.25 Provide raceways for all wiring and cabling to support, protect and organize all wiring and cabling systems.

7.8.11.1.26 Design raceways to provide ease of access and install with capacity for expansion and change, consistent with the requirements of the equipment and systems that they serve.

7.8.11.1.27 Install all raceways in a neat and secure manner in such a way that it is protected from damage, is not in conflict with mechanical or architectural components and allows for future changes and additions.

7.8.11.1.28 Separate raceways, conduits, pull boxes and back boxes must be provided for all other related systems including:

7.8.11.1.28.1 Controls and Instrumentation.

7.8.11.1.28.2 Intercom System.

7.8.11.1.28.3 Door Control System.

7.8.11.1.28.4 Video Surveillance System.

7.8.11.1.28.5 Audio Surveillance System.

7.8.11.1.28.6

7.8.11.1.28.7

7.8.11.1.28.8 Master Clock System.

7.8.11.1.28.9 Telephone System/Structured Cabling System.

7.8.11.1.28.10 Audiovisual Equipment.

7.8.11.1.28.11 sheriff mobile radio systems.

7.8.11.1.28.12 Electronic Signage.

7.8.11.1.29 Except for underground portions of services, install power wiring in EMT with steel couplings and connectors.

7.8.11.1.30 Install low tension wiring (unless otherwise required by applicable Laws) in EMT with steel couplings and connectors and cable trays. Install EMT (or flex) conduits with low tension conductors between individual backboxes of devices (on walls or ceilings) and cable tray. Provide conduits and cable trays for low tension system wiring such that the maximum length of exposed wire between tray and conduit is less than 200mm.

7.8.11.1.31 EMT is to be surface mounted in service rooms and concealed in ceiling spaces and partition walls. Use rain tight connectors for surface mounted conduits. Do not encase EMT in concrete, unless such installation is:

7.8.11.1.31.1 for fire alarm wiring; install in rigid green guard steel conduit if in slab on grade. For power wiring to lighting fixtures and receptacles, use rigid PVC conduit where conduit is installed in slab on grade; or

7.8.11.1.31.2 a concealed installation in finished spaces such as exposed concrete stairwells.

7.8.11.1.32 Electrical conduits, whether metal or otherwise must not be embedded in toppings.

7.8.11.1.33 Metal electrical conduits, junctions and fixture boxes and other services that can erode must not be embedded within the concrete slab or topping of the Parkade.

7.8.11.1.34 Where EMT conduit is encased in concrete, such conduit runs must:

7.8.11.1.34.1 be as short as possible; and

7.8.11.1.34.2 emerge from the concrete in the closest adjacent space above suspended ceilings.

7.8.11.1.35 Minimum EMT conduit size is 21mm (3/4”), except that minimum EMT conduit size for all communications are 27mm (1”).

7.8.11.1.36 Use flexible conduit for all final connections to mechanical equipment or equipment that generates vibrations.

7.8.11.1.37 Minimum flexible conduit size is 21mm (3/4”) and maximum length of any flexible conduit run is 1.5 metres.

7.8.11.1.38 Armoured cable (BX) may be used only for final connections from concealed junction boxes to lighting fixtures on suspended ceilings. The maximum length of any individual piece of BX cable is 3.0 metres.

7.8.11.1.39 Use rigid PVC conduits for the underground portion of services to lighting and power outlets located outside of the Building.

7.8.11.1.40 Install individual bond conductor in each conduit and/or raceway.

7.8.11.1.41 Provide cable trays for installation of all low tension wiring for data, telephone, public address and other such communication and IMIT systems. Install cable trays from communication rooms and above all corridors. If cable trays pass through walls with fire resistance ratings,

provide removable twist and adjustable (Hilti) mechanism fire stopping to allow easy installation of cables in the future. Cable fill through each Adjustable Hilti Mechanism Fire Stop sleeve must not exceed 40% of the available internal cross-sectional area. Provide additional Hilti firestop sleeves at each location for future use, capable of accepting 40% of the number of cables initially installed at each location.

7.8.11.1.42 Cable tray to be aluminum or steel wire mesh, ladder type with manufactured fittings. Provide continuous #6AWG minimum green insulated copper bond wire in the tray. Provide #6AWG green insulated copper bonding jumper between the cable tray and every associated conduit to ensure continuous bond between tray and low tension raceways.

7.8.11.1.43 Identify all conduits, raceways, pull boxes, and junction boxes using colour bands. Provide power, lighting, fire alarm, BMS, 600 volt systems etc. with unique colours in accordance with the colouring scheme. Major colour to be 100 mm wide and minor colour to be 50 mm wide. Identify raceways with coloured bands using coloured duct tape at intervals of 6 m, plus at the point where the raceway enters a wall or floor (i.e. raceway is identified on both sides of a penetration to facilitate tracing of raceway). Colour-code all junction boxes using coloured duct tape on the cover. Neatly identify the relevant system and circuit ID using permanent marker pen. Identify parallel conduit runs at common locations. Indicate the location of conductors encased or embedded in concrete or masonry by acceptable permanent markers set in the walls, floors, or ceilings.

7.8.11.2 Performance Criteria

7.8.11.2.1 Construct separate raceways or raceways with barriers to isolate systems of different voltages and prevent magnetic interference.

7.8.11.2.2 Design and install raceways without sharp edges or sharp bends so that cables can be pulled in or laid in and removed without damage to the cables. Any bends in raceways not to exceed the soft 90 degree bend as per ANSI/TIA cabling standards.

7.8.11.2.3 Provide all cable trays with minimum 40% spare (physical space) capacity for the installation of future cables.

7.8.11.2.4 Provide a minimum of two spare 103 mm conduits from the main electrical room to each sub-distribution room. Provide pull cords for future, and label accordingly.

7.8.11.2.5 Install all conduits in finished areas within finished walls and above finished ceilings.

7.8.11.2.6 Provide bonding conductor within the metallic raceways and bond raceways continuously.

7.8.11.2.7 Provide a minimum of three spare 27mm EMT conduits from all panelboards to terminate in a 154mmx154mm ceiling mounted junction box. Install smoke seal and pull string for future.

7.8.11.2.8 Provide pull string and smoke seal all spare conduits. Label accordingly.

7.8.12 Lighting

7.8.12.1 Basic Requirements

7.8.12.1.1 All luminaires to be selected with emphasis on energy efficiency, aesthetics, glare reduction and high colour rendering.

7.8.12.1.2 Provide aesthetically pleasing, exceptional visual comfort luminaires with dimming and scene setting as detailed in this section.

7.8.12.1.3 In the evening, provide a minimum level of constant lighting within the Building for security purposes.

7.8.12.1.4 Ballasts must be high efficiency extra-long life type. Luminaires must have the following characteristics:

7.8.12.1.4.1 LED 3500°K to 4100°K with minimum CRI 80.

7.8.12.1.4.2 3 Areas with a Color Appearance (and Color Contrast) of Very Important as listed in Table 3B of the IESNA RP 29-06 must be 4100°K and have a CRI of 85 to 90.

7.8.12.1.4.3 Provide luminaires and light sources that enhance safety and allow personnel to circulate throughout spaces and perform required tasks.

7.8.12.1.4.4 Lighting power density levels must be lower than the ASHRAE Standard 90.1 2010 by 10%.

7.8.12.1.4.5 Provide a low voltage fully programmable lighting controller complete with power management system. Provide low voltage occupancy, vacancy, daylight sensor, dimmers and switches where lighting control is to be low voltage; otherwise provide line voltage sensors.

7.8.12.2 Performance Criteria

7.8.12.2.1 Utilize LED lighting predominantly. Use wall sconces or down lighting for decorative purposes. Use high efficiency electronic fluorescent ballasts and linear T5 25W lamps when LEDs are not used. Do not use incandescent, compact fluorescent or HID lighting unless otherwise indicated in this Schedule.

7.8.12.2.2 Light emitting diodes (LEDs) must have a CRI no less than 80 and must be minimum 1.2 to 3W per LED. For colour temperature consistency, LEDs to be from the same bin number. To ensure a full lamp life, control the maximum temperature at the base of the “LED cap” mounted to the substrate. LEDs must be measured to LM79 standards and tested to LM80 and L70 using TM-21 standards. Provide minimum five year warranty.

7.8.12.2.3 Battery operated emergency lighting is an acceptable alternative as a second level of emergency lighting in areas including electrical rooms, mechanical areas and other areas determined and directed by any other specification section or reference document, code or standard. Remote heads must utilize LED technology.

7.8.12.2.4 Provide unit battery equipment complete with remote heads for lighting in the following areas:

7.8.12.2.4.1 Accused holding area and secure circulating areas;

7.8.12.2.4.2 above in-custody box in courtrooms;

7.8.12.2.4.3 above judge's dais in courtrooms;

7.8.12.2.4.4 sheriff's offices;

7.8.12.2.4.5 private corridors;

7.8.12.2.4.6 generator room; and

7.8.12.2.4.7 communications rooms containing alarm, security and life safety systems.

7.8.12.2.5 Utilize recessed volumetric or indirect luminaires in offices, reception areas and other areas where computer terminals and similar screens are present. Provide lighting control in accordance with ASHRAE 90.1. Provide dual technology occupancy sensors with manual on/auto off in offices. Utilize 10% - 100% dimming control or multi-level switching and daylight dimming where appropriate.

7.8.12.2.6 Design lighting in conference rooms, meeting rooms and videoconferencing facilities to maximize viewing of monitors and screens and provide suitable vertical and horizontal illumination of people being viewed. Provide fully dimmable lighting with switching to allow for general and ambient lighting selection.

7.8.12.2.7 As architectural features, design lighting in main lobbies, waiting areas, staff lounges and the main entrance must be provided with high quality products aesthetically pleasing to the public and staff. Staff areas and rooms must have multiple switching and dimming controls.

7.8.12.2.8 Provide under counter lights on a dedicated switch for all above counter cabinets.

7.8.12.2.9 Where multi-level lighting is required, each luminaire must be dimmable using 0-10V dimming technology. Switching of different luminaires on and off will not constitute multilevel lighting control.

7.8.12.2.10 Utilize daylight dimming for lighting at exterior glazing.

7.8.12.2.11 Controls to be to ASHRAE 90.1 requirements. Occupancy and Vacancy sensors to be dual technology and designed for the application in which they are used.

7.8.12.2.12 Exterior luminaires to be LED vandal resistant and have full cut off.

7.8.12.2.13 Utilize LED type edge lit green pictogram exit signs in finished areas, and steel in unfinished areas. Provide exit signs wherever required to provide wayfinding to exit doors from corridor intersections and as required by code.

7.8.12.2.14 Control Rooms

7.8.12.2.14.1 Provide volumetric or indirect recessed fixtures.

7.8.12.2.14.2 Provide for under counter lighting at workstations on a separate switch.

7.8.12.2.14.3 Provide dimming for room lighting.

7.8.12.2.15 Offices and Workrooms

7.8.12.2.15.1 Provide uniformly luminous, recessed mounted volumetric or indirect luminaires.

7.8.12.2.15.2 Position ceiling luminaires to avoid direct and reflected glare.

7.8.12.2.15.3 Provide multi-level or dimming lighting controls, dual technology occupancy sensors with manual on/auto off and daylight sensing where appropriate.

7.8.12.2.16 Meeting Rooms (including Multipurpose, Videoconference)

7.8.12.2.16.1 Provide uniformly luminous, recessed mounted volumetric or indirect luminaires or linear luminaries mixed with down lights. Provide appropriate luminaires where videoconferencing will take place to illumine faces while minimizing glare.

7.8.12.2.16.2 Position ceiling luminaires to avoid direct and reflected glare.

7.8.12.2.16.3 Provide dimming lighting controls, dual technology occupancy sensors with manual on/auto off and daylight sensing where appropriate.

7.8.12.2.17 Public Areas, such as Reception, Waiting, Lobby and Seating

7.8.12.2.17.1 Provide decorative lighting for visual interest, and lighting that illuminates feature wall and specialty signage, design features, and special features of the area.

7.8.12.2.18 Staff and Public Washrooms

7.8.12.2.18.1 Provide lighting for general illumination above sinks.

7.8.12.2.18.2 Provide ceiling mounted dual technology occupancy sensor.

7.8.12.2.19 Public and Non-Public Corridors

7.8.12.2.19.1 In publicly accessible corridors, provide volumetric or indirect recessed lighting and in corridors not accessible by the public provide lensed recessed lighting.

7.8.12.2.19.2 Provide daylight dimming sensors for corridors with exterior glazing. Provide dimming controls of corridors.

7.8.12.2.20 Parkade Lighting

7.8.12.2.20.1 Provide LED fixtures suitable for Parkade use with low glare and be vandal resistant.

7.8.12.2.20.2 Control Parkade lighting to ASHRAE 90.1 requirements. Do not provide each fixture with occupancy sensor controls. Provide occupancy sensors zoned such that lights are turned on ahead of traffic and people. Lighting in Parkade to only be reduced at each fixture; do not shut lighting off.

7.8.12.2.20.3 Connect Parkade lighting to the BMS system. All Parkade lights to turn on upon activation of any panic alarm station within the Parkade or 2nd stage fire alarm.

7.8.12.2.21 Exterior Lighting

7.8.12.2.21.1 Provide LED fixtures suitable for exterior use with full cut off and be vandal resistant. Provide low level lighting, bollards, wall mounted and post top lighting where needed to provide safe, well lit walkways, parking areas and roads.

7.8.12.2.21.2 Mix lighting sources so no area is dark with loss of one source of power.

7.8.12.2.21.3 Control exterior lighting to ASHRAE 90.1 requirements.

7.8.12.2.21.4 Comply with LEED® requirements for light trespass and light pollution.

7.8.12.2.21.5 Connect Exterior lighting to the BMS system. Exterior lights to be controlled via astronomical time clock and photocell.

7.8.13 Lighting Control

7.8.13.1 Basic Requirements

7.8.13.1.1 Lighting controls to comprise a significant part both of the energy management of the Facility and of the flexibility required to adjust lighting to suit functions and activities.

7.8.13.1.2 Lighting control to permit simple and integrated control of lighting; controls must be easily operated and located for each area and function in consultation with the Province.

7.8.13.1.3 Lighting controls are to meet or exceed ASHRAE 90.1 requirements.

7.8.13.1.4 All of the lighting in a space to be capable of being switched at all entrances to the space.

7.8.13.1.5 Integrate the lighting control system with the Building Management System for remote control of the lighting and energy management.

7.8.13.1.6 Dual Technology Occupancy Sensors, Vacancy Sensors and daylight dimming control systems to be utilized to maintain light levels at levels

based upon the occupancy of the room and the quantity of daylight. On/Off daylight controls are not permitted.

7.8.13.2 Performance Criteria

7.8.13.2.1 Where lighting controls are required to be located in areas accessible to the public, they must be protected from unauthorized operation. Controls to be multilevel (to provide a lower light level at night) and capable of overriding the BMS night setback control.

7.8.13.2.2 Lighting control system to be interfaced to the Building Management System to permit override '100% on' and night set back control. Lighting program to be established by the Province and Project Co to address different conditions such as power outage and fire alarm.

7.8.13.2.3 Lighting controls in locations where they may be subjected to excessive moisture or to chemicals that might cause deterioration are to be rated specifically for the application.

7.8.13.2.4 Locate all lighting control panels and relay devices within electrical rooms and non-public corridor walls, and not within ceiling spaces. Provide dedicated lighting panels for all lighting. Do not mix lighting loads with power loads.

7.8.13.2.5 Provide lighting control schedules that respond to individual departmental requirements and occupancy/use. Design a schedule of lighting control and include in the design specifications.

7.8.13.2.6 Lighting in open areas and common areas to be zoned and subdivided to permit energy management control and variation of light levels.

7.8.13.2.7 Provide zone control of lighting for all corridor, circulation and atrium areas. Zoning control must include floor by floor and department by department, as a minimum. Provide master switches to control groups of lighting zones with the capability of direct on/off control or on/flick-then-off control ('flick-then-off' function is that the lights will flick prior to turning completely off)

7.8.13.2.8 Any master switch which could cause an occupant to be left in the dark must have the 'flick-then-off' warning function.

7.8.13.2.9 Dual Technology Occupancy Sensors in ceilings must be automatic on/off type and must control both room lighting and HVAC systems (via sensor contact interface to BMS).

7.8.13.2.10 Dual technology occupancy sensors on the wall to be manual on/automatic off type and must control both lighting and HVAC systems (via sensor contact interface to BMS).

7.8.13.2.11 Vacancy sensors, a subset of occupancy sensors, manual on/off/dimming, automatic off type.

7.8.13.2.12 Daylighting controls to be provided for all lighting in areas adjacent to exterior glazing and to provide dimming to 0% of lamp output. Provide combination daylight harvesting and occupancy control to the rooms exposed to daylight and requiring occupancy sensors.

7.8.13.2.13 Daylighting to meet the following performance criteria:

7.8.13.2.13.1 The average luminance across a representative portion of the task surface to be at least 30% of the target design level for that space type within 5 meters of the daylight source.

7.8.13.2.13.2 Overhead lights within the space to be dimmed as low as possible (or turned off) while satisfying above criteria.

7.8.13.2.14 Occupancy sensors and daylighting controls to be extra-low or line voltage type; and where low voltage will be integrated into the lighting control system and located on ceilings to avoid interference with furniture. Occupancy sensors must typically be dual technology with other types to suit application.

7.8.13.2.15 Exterior lighting to be controlled via BMS and photocell.

7.8.14 Energy Management

7.8.14.1 Basic Requirements

7.8.14.1.1 Provide an integrated energy management system to monitor, record, analyze, report on and control energy consumption from all sources that supply energy to the Facility. This system to be connected to the BMS.

7.8.14.1.2 Design the system to provide sufficient information to enable the Province to make Facility-wide “demand-side management” decisions relating to overall energy demand, with the intent of reducing overall energy consumption and demand throughout the Facility. Provide and coordinate with the owner’s representative to provide an IP address for energy management monitoring capabilities.

7.8.14.1.3 Provide a system and equipment that is flexible, controllable, and must form an integral part of the Building.

7.8.14.2 Performance Criteria

7.8.14.2.1 Design the energy management system to be accessible from any networked computer using appropriate software.

7.8.14.2.2 Provide a minimum of five site software licenses if licensing is required.

7.8.15 Mechanical Equipment Connections

7.8.15.1 Basic Requirements

7.8.15.1.1 Provide electrical power control and monitoring connections to all mechanical equipment as required for proper operation, protection and maintenance of the equipment. Materials and installation methods must result in safe, reliable and serviceable mechanical equipment and systems in the Building.

7.8.15.2 Performance Criteria

7.8.15.2.1 Utilize institutional or industrial quality cables, connectors, conduit systems, fittings and hardware used to make connection to mechanical equipment to provide for high levels of reliability, durability and ease of maintenance of the equipment.

7.8.15.2.2 Design connections made to motors and/or motor driven equipment or equipment with noticeable levels of vibration to accommodate the vibration.

7.8.15.2.3 Design connections to mechanical equipment to easily permit removal and replacement of the equipment.

7.8.15.2.4 Size motor control centres, main feeders to motor control centres, and mechanical distribution centres to accommodate the current mechanical equipment with an additional 40% spare capacity.

7.8.15.2.5 Utilize motor control centres when three 3-phase motors that require a starter are located within 50m of each other.

7.8.15.2.6 Provide labeling on MCC's to match motors.

7.8.15.2.7 Provide wring diagrams of each starter type.

7.8.15.2.8 Provide full size starters.

7.8.15.2.9 For motors 20 hp. and above, provide reduced current starters. Provide integral harmonic cancellation devices to limit harmonics to 5% current harmonics (iTHD) of the full load fundamental current if solid-state starters are employed.

7.8.15.2.10 Starters and MCC's to be indoor sprinkler-proof, type 2 enclosures. Arc Flash reducing type must be utilized for 600V MCCs.

7.8.15.2.11 Provide individual control transformers for each starter.

7.8.15.2.12 Starters or MCC's connected to emergency and normal power to be coloured to match the corresponding system colour. All interiors to be white.

7.8.15.2.13 Electrical connections and power-paths to mechanical equipment must reflect the redundancy considerations of the corresponding mechanical system or portion of the mechanical system serving an area.

7.8.16 Specialty Systems

7.8.16.1 Basic Requirements

7.8.16.1.1 Special electrical and communications systems are required in the Facility (as described in this Schedule) and form essential parts of the Building. Provide power supply, specially conditioned power and communication conduits and other electrical operational support equipment to meet all requirements of these special electrical and electronic systems.

7.8.16.2 Performance Criteria

7.8.16.2.1 Utilize institutional or industrial quality cables, connectors, conduit systems, fittings and hardware to make connection to special equipment and to provide for high levels of reliability, durability and ease of maintenance of the equipment.

7.8.16.2.2 Provide connections to special equipment that easily permit removal and replacement of the equipment.

7.8.17 Clock System

7.8.17.1 Basic Requirements

7.8.17.1.1 Provide a synchronized wireless clock system to assure accurate, consistent time is available in the Facility. The system must provide automatic correction for daylight savings time and self-correct if power fails.

7.8.17.1.2 Provide master time controllers and all clocks by a recognized industry leader with all components by the same manufacturer.

7.8.17.1.3 The finish and appearance of the clocks are to complement the architectural finishes and be flush mount type within rooms.

7.8.17.2 Performance Criteria

7.8.17.2.1 Install digital-type synchronized clocks that will receive correction signals from the master clock as identified in the Room Data Sheets.

7.8.17.2.2 Clock size and placement to be determined in consultation with the Province.

7.8.17.2.3 The elapsed time clocks must include control pushbuttons to allow for interval timing and reset.

7.8.17.2.4 In the event of a power loss, the control system must continuously maintain proper internal time.

7.8.17.2.5 Provide local satellite transmitters to provide signals to all clocks in the Facility where required.

7.8.18 Fire Alarm System

7.8.18.1 Basic Requirements

7.8.18.1.1 Provide a fire alarm system for the Facility and ensure that that system meets or exceeds the requirements in this Section.

7.8.18.1.2 Provide a complete two stage (general and evacuation), supervised, fire detection and alarm system that includes addressable, intelligent, automatic and manual initiation devices and audio/visual alarm devices with voice evacuation capabilities. Alarm activation will be initiated by manual pull stations, smoke / heat detection, and fire sprinkler water flow

devices. Alarm indication to consist of visual and combination visual/audible devices.

7.8.18.1.3 The fire alarm system to comply with all applicable standards, including:

7.8.18.1.3.1 Can/UL S524 Standard for Installation of Fire Alarm Systems;

7.8.18.1.3.2 Can/UL S537 Standard for Verification of Fire Alarm Systems;

7.8.18.1.3.3 applicable NFPA Codes; and

7.8.18.1.3.4 Elevator Code CSA-B44.

7.8.18.2 Performance Criteria

7.8.18.2.1 Install all fire alarm wiring in conduit. Provide two hour rated cable where required to meet survivability requirements of NFPA 72.

7.8.18.2.2 Provide addressable smoke detectors as required, self-correcting analog type to maintain consistent sensitivity. The following areas to be provided with smoke detector coverage, in addition to sprinklers, for early detection:

7.8.18.2.2.1 Electrical rooms.

7.8.18.2.2.2 Communication rooms.

7.8.18.2.2.3 Audio-visual equipment rooms.

7.8.18.2.2.4 Security equipment rooms.

7.8.18.2.2.5 sheriff's control posts.

7.8.18.2.3 Smoke detectors in the Accused Holding area must be installed in mechanical air return ducts part of the ventilation system. Project Co will use all reasonable efforts to prepare and submit an alternative solution to all authorities having jurisdiction to meet this requirement. In the event the alternative solution is not able to be obtained, the smoke detectors in the Accused Holding areas must be equipped with ULC rated, #7 gauge wire zinc plated, with small perforations suitable for prison environments. A sample of any proposed smoke detector guards under these conditions must be presented for review and acceptance by the Province.

7.8.18.2.4 Provide addressable two stage manual pull stations at all exit doors and entrances to exit stairs as required.

7.8.18.2.5 Manual pull stations must be key operated in all security areas including but not limited to accused circulation and holding areas. Pull-type with covers to prevent false alarms must be provided in all other general areas. Covers must be locally alarmed.

7.8.18.2.6 Connect the sprinkler system to the fire alarm system and provide full annunciation of all alarms and trouble conditions (wet, dry and pre-action).

7.8.18.2.7 Connect the fire alarm to the generator system to annunciate 'Generator Run' and 'Generator Fail-to-Run' troubles.

7.8.18.2.8 Speaker must be used as the signaling device. Audible fire alarm devices must not be permitted in courtrooms unless required by Authorities Having Jurisdiction (AHJ). Strobes/Horn devices must be provided in courtrooms, mechanical rooms and in areas of high ambient noise level and in all public corridors.

7.8.18.2.9 Provide fire alarm speakers throughout the Facility as required. Speaker system will be available to announce alarm conditions and for use as public address announcements. Provide a microphone at the sheriff's jail control room and sheriff's main office, with telephone interface, for use of the speaker system. Pre-programmed messages will be transmitted over overhead paging system to annunciate origin of alarm. Any program sources on paging system to be muted while alarm messages are transmitted. Audible alert levels and public address systems to be 10dBA above ambient with a minimum of 75dBA, and be audible in every room of the Building.

7.8.18.2.10 Alternate fire alarm speakers to be wired to the same circuit with a minimum of two (2) circuits per floor (riser wiring in two separate locations).

7.8.18.2.11 Use combination audible alarm and visual notification devices where applicable, including but not limited to boiler and mechanical rooms.

7.8.18.2.12 Include control devices and connection to close fire and smoke doors on activation of alarm condition.

7.8.18.2.13 Incorporate smoke control systems with control fans and dampers.

7.8.18.2.14 Provide a minimum of two isolation modules per floor for alarm circuits to isolate wire to wire shorts.

7.8.18.2.15 Provide a graphic annunciator complete with LCD display at the main entrance for the Building, as required and approved by the local fire department. Provide additional LCD, alphanumeric annunciator panel in the Security Control Room, Holding Area Control Post and Sheriff's Control Post and as noted and required by relevant code or standard.

7.8.18.2.16 The fire alarm system to control the smoke evacuation system. Facility controls to interface with the fire alarm system to provide an integrated system.

7.8.18.2.17 Provide elevator homing and sequencing on first stage alarm.

7.8.18.2.18 The fire alarm system to have the capability for remote notification.

7.8.18.2.19 The fire alarm system to monitor fire pumps, heat tracing for sprinkler system and generator equipment.

7.8.18.2.20 Sprinkler zoning and fire speaker zoning to be compatible with the fire alarm zoning.

7.8.18.2.21 Provide a computer work station in the maintenance department and main security office within the Building.

7.8.18.2.22 The fire alarm control panel (FACP), remote annunciators and printers must indicate general alarm and trouble conditions.

7.8.18.2.23 Provide gel electrolyte type batteries with overcharge protection for FACP and all transponders. Provide solid state battery charger(s) with capacity to recharge entire battery system in four hours. Batteries must have enough capacity (with 25 percent spare time) to operate entire system (except magnetic door holders) in accordance with the BC Building Code.

7.9 Communications (Division 27)

7.9.1 General

7.9.1.1 Basic Requirements

7.9.1.1.1 Provide the latest proven technology for transferring, securing, and storing information available eight months prior to Service Commencement.

7.9.1.1.2 Communications systems to be easy to operate, easy to maintain and adaptable to change, and expandable to accommodate growth.

7.9.1.1.3 Communications and BSCS equipment provided must be the current production model that is fully supported by the manufacturer, with no known or manufacturer-published scheduled end of life date, eight months prior to Service Commencement.

7.9.1.1.4 Physical network design and installation to:

7.9.1.1.4.1 accommodate multiple separate networks and VLANs administered by multiple system administrators;

7.9.1.1.4.2 support Unicast and Multicast communication;

7.9.1.1.4.3 have high availability and security that meets or exceeds the all applicable standards for use in and support courthouse applications; and

7.9.1.1.4.4 network equipment manufacturers must be of current Province standard. The Disclosed Data includes details regarding this standard.

7.9.1.1.5 The Province anticipates that the following stand-alone networks will be required in the Facility:

7.9.1.1.5.1 Sheriff's Security System Network to include the following systems:

7.9.1.1.5.1.1 BSCS and all related subsystems.

7.9.1.1.5.1.2 Building Management System (Private).

7.9.1.1.5.1.3 Public (Wireless/Shaw).

7.9.1.1.5.1.4 BC Government Network (BCGN).

7.9.1.1.5.1.5 All government staff connect to BCGN / log on to the IDIR domain:

- Court Services Branch

- B.C. Prosecution Service

- Corrections Branch Community Corrections

- Justice Services Branch

7.9.1.1.5.1.6 Building Videoconferencing.

7.9.1.1.5.1.7 Provincial Court.

- Provincial Court Judicial Chambers;

- Provincial Court Administration offices including JAAs and Judicial Case Managers;

- Bench in any courtroom or other hearing room that may facilitate Provincial Court; and

- Any conference rooms or meeting rooms that may be used by Provincial Court Judiciary or Judicial staff.

7.9.1.1.5.1.8 Courtroom Private and Secure Network.

7.9.1.1.5.1.9 Superior Courts.

- Supreme Court Judicial Chambers;

- Supreme Court Administration offices including JAAs and Managers of Supreme Court Scheduling;

- Bench in any courtroom or other hearing room that may facilitate Supreme Court; and

- Any conference rooms or meeting rooms that may be used by Supreme Court Judiciary or Judicial staff.

7.9.1.1.5.1.10 Other occupants of the building that have offices are responsible for their own data connections through private service providers (e.g. Shaw, Telus). These include:

- PPSC – Public Prosecution Service of Canada;

- Friends of the Court; and

- Law Library.

7.9.1.1.5.1.11 Other users of the court building that don't have offices but have the following connectivity needs beyond using the public access:

- Duty counsel, private counsel and self-represented litigants must be able to connect to the internet at the counsel tables in all courtrooms and conference rooms; and

- The JAC will need external private internet access for their clients (i.e. separate from their staff that connect to the BCGN).

7.9.1.1.6 Provide systems which promote operational efficiency and integrate systems where this integration provides efficiency and operational and cost advantages.

7.9.1.1.7 Provide a common pathway for all communications systems wiring referenced herein, including the BMS, and coordinate the requirements of the individual communications systems as established by the vendors.

7.9.1.1.8 Communications systems to accommodate all media types, including data, voice, video and overhead paging.

7.9.1.1.9 Provide an Communications Service Entrance Room for all incoming services designed using Industry Standards and Best Practices.

7.9.1.1.10 Commissioning of the Structured Cabling System must confirm that:

7.9.1.1.10.1 EIA/TIA Category 6A performance is met for the entire system, including all horizontal and backbone runs (failed test results are not accepted), excluding the Augmented Cat. 6 UTP backbone cabling required pursuant to Section 7.11 [Communications] of this Schedule;

7.9.1.1.10.2 all fibre optic cabling must have a loss budget of less than that allowable by the manufacturer requirements and EIA/TIA parameters for OM4, 10Gb performance.

7.9.1.1.11 Commissioning for all other Communications and BSCS must test each input and output point to function as expected and confirm functional inter-operability as described in Sections 7.9 [Communications] and 7.10 [Electronic Safety and Security] of this Schedule inclusive.

7.9.1.2 Performance Criteria

7.9.1.2.1 The Communications and BSCS must be proven technology, effectively used in other SLC Secure facilities, will be easy to operate, and easy to maintain. Communications and BSCS must be integrated with the other Communications and ESC sub systems within the Building and must fully support external communications with other off-premise systems and networks throughout the province by means of highly secure industry-standard IP and WAN connectivity. Systems selection will be done in consultation with the Province.

7.9.1.2.2 IP Protocol is used for data network based equipment. Telecom equipment to be a mix of VoIP, and analog equipment.

7.9.1.2.3 Project Co to maintain the manufacturer's warranties on all communications systems equipment, in accordance with Section 7.5 [Warranties] of Appendix 2E, and ensure that the warranties are assignable to the Province at Service Commencement for Category 4 Equipment and Furniture and at Handback for Category 3 Equipment and Furniture.

7.9.1.2.4 All applications, software modules and any related software installed, operated or used by Project Co will not interfere with the operation or performance of, or reduce the security or privacy of, any Province applications or equipment.

7.9.1.2.5 The Communications and BSCS' design must be flexible to accommodate changing operational requirements and must be scalable to accommodate growth throughout its useful life.

7.9.2 Structured Cabling System

7.9.2.1 Basic Requirements

7.9.2.1.1 Provide a Structured Cabling System capable of supporting all data, voice and video services throughout the Facility, including the Parkade.

7.9.2.1.2 All structured cabling must operate as a single integrated system throughout the Facility.

7.9.2.1.3 BSCS and Communications must use structured cabling for all IP devices and manufacturer approved cabling, applicable for the specific installation, for all non-IP devices. All cabling must meet all applicable codes and standards.

7.9.2.1.4 Provide the following rooms:

7.9.2.1.4.1 Communications Service Entrance Room.

7.9.2.1.4.2 Main BSCS Room.

7.9.2.1.4.3 Main Communications Equipment Room (Main CER).

7.9.2.1.4.4 Sub Telecom/Security Equipment Rooms.

7.9.2.2 Prescriptive Requirements

7.9.2.2.1 Only BSCS and Communications equipment cabling and wiring are permitted to be routed in Communications and BSCS pathways.

7.9.2.2.2 Main CER, Main BSCS Room, Communications Service Entrance Room, and Sub Telecom/BSCS rooms (referred herein collectively as BSCS and Communications rooms):

7.9.2.2.2.1 must be designed and constructed to Province standard security construction requirements;

7.9.2.2.2.2 must contain only BSCS and Communications equipment;

7.9.2.2.2.3 must not contain any equipment (electrical, mechanical or otherwise) that is not directly related to supporting the BSCS and Communications systems;

7.9.2.2.2.4 must not act as a pathway for ducts or piping not related to the BSCS and Communications systems to be routed through these rooms;

7.9.2.2.2.5 except for field devices, BSCS and Communications equipment must not be located in any spaces, rooms, junction boxes, equipment boxes or any version thereof, other than the Main CER, Main BSCS, Communications Service Entrance and Sub Telecom/BSCS Rooms;

7.9.2.2.2.6 all junction boxes, equipment boxes and cabinets housing Communications and BSCS related equipment and devices must be Installed in a manner such that the cabinet or enclosure is inaccessible to unauthorized persons and resistant to malicious damage;

7.9.2.2.2.7 Include alarm tamper switch reporting unauthorized access into cabinets or enclosures to the Security Alarm Monitoring interface;

7.9.2.2.2.8 Main CER, Main BSCS, Communications Service Entrance and Sub Telecom/BSCS Rooms must:

7.9.2.2.2.8.1 be sized to accommodate all BSCS and Communications equipment, racks and cabinets, and spare capacity as set out in Sections 7.9 [Communications] and 7.10 [Electronic Safety and Security] of this Schedule;

7.9.2.2.2.8.2 be corridor accessible with a min 914mm door working clearance to allow for a fully loaded rack to be wheeled in and out;

7.9.2.2.2.8.3 have a finished, open, dust-free ceiling (no false ceilings);

7.9.2.2.2.8.4 have 19mm (3/4”) G1S fire treated plywood backboard to a height of at least 2440mm on all walls;

7.9.2.2.2.8.5 have a cable tray around the perimeter of the room , and across the top of the racks and cabinets (300mm clearance above the top of cabinets) to facilitate routing of cabling into the racks and cabinets. The upper perimeter and above rack/cabinet cable trays must be sized to accommodate all cabling with 40% spare capacity unless and must be not less than 600mm in width. The cable tray at the lower perimeter of the room must be at least 100mm in width. All cable trays must have a minimum of 300mm unobstructed clearance above, below and at least one side for serviceability.

7.9.2.2.2.9 All wiring between wall mounted equipment in the BSCS and Communications rooms will be housed in wall mounted raceways and routed parallel to floor and walls and must cross perpendicular to each other.

7.9.2.2.2.10 If permitted by the Code(s), the door to all BSCS and Communications rooms will swing out.

7.9.2.2.2.11 All BSCS and Communications equipment must be connected to "Critical (UPS)" branch power with generator backup.

7.9.2.2.2.12 BSCS and Communications rooms must have convenience outlets at 6” AFF every 6’ along perimeter walls. Each receptacle must be connected to a dedicated 15A circuit.

7.9.2.2.2.13 Provide a minimum of 2 – 120V/15A single phase, and 2 – 208V/20A 3-phase, non-switched branch circuits above each rack and cabinet in the BSCS and Communications rooms complete with twist locking receptacles matching the rack mounted power strips.

7.9.2.2.3 Communications Service Entrance Room

7.9.2.2.3.1 Provide incoming conduits c/w with pull ropes, secure pull pits and secure pull boxes for communications services to enter the Communications Service Entrance Room from the property line as required by the local communications service provider. Provide a minimum 1x103mm conduit each for data, voice and CATV incoming services; 2x103mm spare conduits c/w pull string, for Province use; and, all terminated into the Communications Service Entrance Room.

7.9.2.2.3.2 In addition to the conduits required for the Communications Service Entrance Room, provide an additional 2 x 103mm redundant, diverse conduits c/w pull ropes, secure pull pits and secure pull boxes, for Province use, extended from the Communications Service Entrance Room to a secondary redundant ISP junction box outside the building, located on the opposite side of the building from the primary incoming conduits required by Section 7.9 [Communications] of this Schedule. Extend the conduits from the ISP junction box to the northwest corner of the property line.

7.9.2.2.4 Main BSCS Room

7.9.2.2.4.1 The Main BSCS Room must be designed and constructed to SLC Secure requirements,

7.9.2.2.4.2 The Main BSCS Room layout must:

7.9.2.2.4.2.1 comply with TIA/EIA standards. Provide space to accommodate two future server or switch cabinets each with adequate clearances per TIA/EIA standards;

7.9.2.2.4.2.2 be serviced from completely diverse electrical and HVAC distribution sources from those servicing the Main CER; and

7.9.2.2.4.2.3 act as a fully redundant room to the Main CER, so that if the Main CER becomes unavailable for any reason, the Main BSCS Room will fully support the Facility such that the BSCS and Communications systems are not disrupted.

7.9.2.2.5 The Main CER must:

7.9.2.2.5.1

7.9.2.2.5.2

7.9.2.2.5.3 be serviced from completely diverse electrical and HVAC distribution sources from those serving the Main BSCS Room;

7.9.2.2.5.4 act as a fully redundant room to the Main BSCS Room so that if the Main BSCS Room becomes unavailable for any reason, the Main CER will fully support the Facility such that the BSCS and Communications are not disrupted; and

7.9.2.2.5.5 have a layout that complies with TIA/EIA standards. Provide space to accommodate two future server or switch cabinets with adequate clearances per TIA/EIA standards.

7.9.2.2.6 Sub Telecom/BSCS Rooms

7.9.2.2.6.1 All Sub Telecom/BSCS Rooms, including pathways and spaces, must support a single Structured Cabling System throughout the Facility.

7.9.2.2.6.2 Each Sub Telecom/BSCS Room must be located:

7.9.2.2.6.2.1 central within the area it serves;

7.9.2.2.6.2.2 away from sources of water and from washrooms (adjacent to, above or below);

7.9.2.2.6.2.3 adjacent to the applicable SCR;

7.9.2.2.6.2.4 outside of detainee areas and physically accessible only to staff; and

7.9.2.2.6.2.5 above levels where there is potential for flooding.

7.9.2.2.6.3 Category 6a horizontal cable length must not exceed 90m.

7.9.2.2.6.4 The layout of the Sub Telecom/BSCS Rooms must comply with EIA/TIA standards. Provide space to accommodate one future server or switch cabinet with adequate clearances per EIA/TIA standards.

7.9.2.2.6.5 Must have physically redundant and diverse pathways from each Sub Telecom/BSCS Room to the Main CER; and from each Sub Telecom/BSCS Room to the Main BSCS Room.

7.9.2.2.7 Redundancy of Pathways and Spaces

7.9.2.2.7.1 Provide redundant diverse major communications pathways for the following:

7.9.2.2.7.1.1 Main BSCS room to each Sub Telecom/BSCS Rooms.

7.9.2.2.7.1.2 Main CER to each Sub Telecom/BSCS Rooms.

7.9.2.2.7.1.3 Main BSCS room to Main CER.

7.9.2.2.7.1.4 Communications Service Entrance Room to Main BSCS room and Main CER.

7.9.2.2.7.1.5 Main electrical room to Main BSCS room and Main CER.

7.9.2.2.7.2 Provide primary communications pathways for the incoming primary communications (telephony, Internet and CATV) service to terminate in the Communications Service Entrance room, and diverse redundant secondary communications pathways for the secondary communications services to terminate in the main electrical room.

7.9.2.2.7.3 Diverse redundant pathways must:

7.9.2.2.7.3.1 be routed such that there can be no single points of failure affecting both pathways;

7.9.2.2.7.3.2 not occupy the same physical space; and

7.9.2.2.7.3.3 have a minimum of 3m separation in all directions.

7.9.2.2.7.4 The primary major communications pathways must be routed: inside secure spaces, within the building and above grade, and not be visible or accessible by detainees or members of the public (including any junction or pull boxes). Junction boxes must be secure and not located in spaces accessible by detainees or members of the public.

7.9.2.2.7.5 The diverse redundant secondary major communications pathways must be routed below grade and within the Site.

7.9.2.2.7.6 All pathways must include all required cabling and provide for 40% growth. Provide inner ducts for all required fibre optic cabling and empty inner ducts for future fibre optic cabling.

7.9.2.2.8 Redundant Power

7.9.2.2.8.1 Vertical power strips (match twist locking receptacles to overhead power modules and receptacles) within the cabinets and racks in the BSCS and Communications rooms must be plugged into both the A and B power circuits as described in Section 7.8 [Electrical] of this Schedule; all equipment with redundant power supplies must plug into both the A and B power circuits.

7.9.2.2.8.2 Refer to the electrical requirements section for more detail on redundant power requirements.

7.9.2.2.9 Targeted Cooling

7.9.2.2.9.1 Provide targeted cooling in the Main BSCS Room and Main CER..

7.9.2.2.9.2 Targeted cooling (in-row, overhead, chimney, hot aisle containment, and cold aisle containment) must cool the equipment within the racks and separate HVAC system must maintain environmental operating conditions as described in Section 7.9 [Communications] of this Schedule. Select equipment cabinets and racks to fully integrate with the targeted cooling solution.

7.9.2.2.9.3 As a minimum, provide cooling capacity for the following thermal loads per rack (increase as required to accommodate final equipment within each room):

7.9.2.2.9.3.1 10KW of heat for BSCS and Communications equipment cabinets in the Main BSCS room, Main CER and Sub Telecom/BSCS Rooms;

7.9.2.2.9.3.2 5KW of heat in 2-post racks in Sub Telecom/BSCS Rooms; and

7.9.2.2.9.3.3 allowance for 20% spare cooling capacity.

7.9.2.2.9.4 All HVAC equipment serving these rooms must be rated for 24/7 operation and must be powered by generator in the event of a power brown out or outage.

7.9.2.2.9.5 Environmental operating conditions in the Main BSCS Room, Main CER and all Sub Telecom/BSCS Rooms must be maintained between 18°C and 23°C; and relative humidity within the range of 35% to 55%.

7.9.2.2.9.6 Target cooling is not required for the Communications Service Entrance room, however, the ambient temperature and relative humidity must be maintained within the range of 18°C to 23°C and 35% to 55%, respectively.

7.9.2.2.9.7 Install blank panels on all unused rack units in each equipment cabinet to prevent short circuiting of the targeted cooling solution.

7.9.2.2.10 BSCS and Communications Racks and Cabinets

7.9.2.2.10.1 Equipment cabinets that house servers or computers for the BSCS or Communications must be a minimum of 30” wide x 42” deep and have a minimum of 44 rack units useable; For each BSCS server cabinet, provide a 48-port patch panel cabled to each BSCS switch cabinet terminated on a corresponding a 48 port patch panel; For each Province server cabinet, provide a 48-port patch panel cabled to each Province switch cabinet terminated onto a corresponding a 48-port patch pane.

7.9.2.2.10.2 Equipment cabinets that house data switches must be 30” wide x 30” deep and must have a minimum of 44 rack units useable.

7.9.2.2.10.3 All BSCS and Communications equipment cabinets must have solid, lockable side panels, lockable perforated front and rear doors, and vertical wire management on both sides of each equipment cabinet. Remove solid side panels between BSCS equipment cabinets when multiple BSCS equipment cabinets are ganged together to facilitate cross-cabinet cable routing.

7.9.2.2.10.4 Two-post relay racks must be used only for patch panels that support workstation voice and data horizontal cabling, and security field device cabling. Two-post racks are not permitted in the Main CER or the Main BSCS Room. BSCS and Communications active equipment are not permitted to be installed in two-post racks.

7.9.2.2.10.5 Provide a minimum of 150mm wide vertical wire management on each side of each two-post rack. Provide a single 300mm wide vertical wire management between two-post racks where multiple two-post racks are ganged together.

7.9.2.2.10.6 Provide primary and redundant secondary 120V/20A power strips for each Province rack and cabinet. Primary power strips must be mounted on the left side and secondary power strips mounted to the right side of each rack.

7.9.2.2.10.7 Provide primary and redundant secondary 208V/20A power strips for each Province rack and cabinet. Primary power strips must be mounted on the left side and secondary power strips mounted to the right side of each rack.

7.9.2.2.10.8 Connect primary power strips to A-power circuits and secondary power strips to B-power circuits as described in Section 7.8 [Electrical] of this Schedule

7.9.2.2.11 Intelligent Infrastructure Management System (IIMS)

7.9.2.2.11.1 Provide a complete infrastructure management system to monitor and manage the copper connectivity of the BSCS Structured Cabling System.

7.9.2.2.11.2 Patching between patch panels, network switches and other active equipment will be managed by the IIMS. Disconnected patch cords and/or cords plugged to incorrect ports must be reported in real

time by management software and an alarm must be sent to the BSCS.

7.9.2.2.11.3 Provide analyzers to continuously monitor connectivity. Analyzers must provide audible warning when unauthorized patching or disconnects occur; must have a display to indicate proper ports for patching, and be connected to the IIMS network. Alarms must report to the SAMS. Analyzer must be sized to support all patch panel ports multiplied by two (2).

7.9.2.2.11.4 Provide sensor strips for all BSCS Data Network switches (refer to Section 7.10 [Electronic Safety and Security] of this Schedule for BSCS Data Network requirements.

7.9.2.2.11.5 Provide all required I/O cables.

7.9.2.2.11.6 Provide IIMS server and management software to manage the IIMS over standard TCP/IP networking.

7.9.2.2.11.7 Segregate the IIMS network onto its own VLAN as a part of the BSCS Data Network.

7.9.2.2.12 Cable Management in the BSCS and Communications rooms must comply with the following:

7.9.2.2.12.1 Vertical cable management for two-post racks must:

7.9.2.2.12.1.1 be minimum of 150mm in width;

7.9.2.2.12.1.2 complete with latching front cover;

7.9.2.2.12.1.3 be used for vertical wire management of patch cords;

7.9.2.2.12.1.4 be provided on both sides of each rack from top to bottom (no horizontal cables must be installed in these troughs); and

7.9.2.2.12.1.5 provide a single trough 600mm minimum in width, complete with latching front cover in between racks where two-post racks are to be ganged together.

7.9.2.2.12.2 Vertical cable management for BSCS and Communications cabinets must be integral with the cabinet, mounted on both sides of each cabinet top to bottom and must not contain any horizontal cabling.

7.9.2.2.12.3 Provide horizontal cabling management to support patch cords in each rack and cabinet. Horizontal cable managers must:

7.9.2.2.12.3.1 be fabricated from steel, standard 19” rack mounting, 1 RU in height and consist of 4 D-rings each ring at 38mm x 102mm (1.5” x 4”); and

7.9.2.2.12.3.2 be placed above and below each patch panel.

7.9.2.2.12.4 Provide one additional horizontal cable manager for every patch panel installed in the switch cabinets. This will be used for the Province provided data switches.

7.9.2.2.12.5 Provide cable drop outs sized to support transition of cabling from cable trays to racks and cabinets.

7.9.2.2.12.6 Provide cable management to support horizontal cabling at the rear of each patch panel.

7.9.2.2.13 Voice Backbone

7.9.2.2.13.1 Provide primary and secondary diverse, redundant voice riser cable from:

7.9.2.2.13.1.1 Communications Service Entrance Room to Main CER and to Main BSCS Room;

7.9.2.2.13.1.2 Main electrical room to Main CER and to Main BSCS Room;

7.9.2.2.13.1.3 Main CER to each Sub Telecom/BSCS Room;

7.9.2.2.13.1.4 Main BSCS Room to each Sub Telecom/BSCS Room; and

7.9.2.2.13.1.5 Main CER to Main BSCS Room.

7.9.2.2.13.2 Voice riser cable must be a minimum of 200 pairs.

7.9.2.2.14 Data Backbone

7.9.2.2.14.1 Provide primary data backbone (copper and fibre backbone cabling) from:

7.9.2.2.14.1.1 Communications Service Entrance Room to Main CER and to Main BSCS Room;

7.9.2.2.14.1.2 Main electrical room to Main CER and to Main BSCS Room;

7.9.2.2.14.1.3 Main CER to each Sub Telecom/BSCS Room;

7.9.2.2.14.1.4 Main BSCS Room to each Sub Telecom/BSCS Room; and

7.9.2.2.14.1.5 Main CER to Main BSCS Room.

7.9.2.2.14.2 Provide secondary diverse, redundant data backbone (copper and fibre backbone) from:

7.9.2.2.14.2.1 Communications Service Entrance Room to Main CER and to Main BSCS Room;

7.9.2.2.14.2.2 Main electrical room to Main CER and to Main BSCS Room;

7.9.2.2.14.2.3 Main CER to each Sub Telecom/BSCS Room;

7.9.2.2.14.2.4 Main BSCS Room to each Sub Telecom/BSCS Room; and

7.9.2.2.14.2.5 Main CER to Main BSCS Room.

7.9.2.2.14.3 Route primary data backbone in primary communication pathways. Route secondary redundant data backbone in secondary communication pathways.

7.9.2.2.14.4 Each primary and secondary data backbone must consist of: 24 strand hybrid fibre, 125m/12mm, OM4 fibre optic cable and six 4-pair Augmented Category 6 UTP cables.

7.9.2.2.15 BSCS Backbone

7.9.2.2.15.1 Provide primary BSCS backbone (copper and fibre backbone cabling) from:

7.9.2.2.15.1.1 Communications and BSCS Service Entrance Room to Main CER and to Main BSCS Room;

7.9.2.2.15.1.2 Main electrical room to Main CER and to Main BSCS Room;

7.9.2.2.15.1.3 Main CER to each Sub Telecom/BSCS Room;

7.9.2.2.15.1.4 Main BSCS Room to each Sub Telecom/BSCS Room; and

7.9.2.2.15.1.5 Main BSCS Room to Main CER.

7.9.2.2.15.2 Provide secondary diverse, redundant BSCS backbone (copper and fibre backbone) from:

7.9.2.2.15.2.1 Communications Service Entrance Room to Main CER and to Main BSCS Room;

7.9.2.2.15.2.2 Main electrical room to Main CER and to Main BSCS Room;

7.9.2.2.15.2.3 Main CER to each Sub Telecom/BSCS Room;

7.9.2.2.15.2.4 Main BSCS Room to each Sub Telecom/BSCS Room; and

7.9.2.2.15.2.5 Main BSCS room to Main CER.

7.9.2.2.15.3 Route primary data backbone in primary communication pathways. Route secondary redundant data backbone in secondary communication pathways.

7.9.2.2.15.4 Each primary and secondary BSCS data riser must consist of: 48 strand hybrid fibre, 245m/24mm OM4 fibre optic cables and twelve 4-pair Augmented Cat. 6 UTP cables.

7.9.2.2.15.5 Provide six strand single mode fibre optic cabling from the Communications Service Entrance Room to the Main CER and to the Main BSCS Room.

7.9.2.2.15.6 Provide six strand single mode fibre optic cabling from the main electrical room to the Main CER and to the Main BSCS Room.

7.9.2.2.16 Horizontal Cable

7.9.2.2.16.1 All horizontal cabling must terminate onto rack mounted patch panels in the Main CER, Main BSCS Room or the Sub Telecom/BSCS Room servicing that area.

7.9.2.2.16.2 All horizontal cabling must be 4-pair Category 6A UTP cables. All exterior cameras must utilize 4 strand mm, 50/125∝m laser optimized OM4, tight buffer, all dielectric OSP fibre cable.

7.9.2.2.16.3 Copper horizontal cables must extend from the communications outlet or equipment with direct connect terminations in the field back to the Sub Telecom/BSCS Room servicing that area, but will not exceed 90m in length.

7.9.2.2.16.4 Fibre horizontal cabling must:

7.9.2.2.16.4.1 not exceed 550m in length;

7.9.2.2.16.4.2 be free from splices;

7.9.2.2.16.4.3 terminate only in the Main BSCS Room, Main CER or a Sub Telecom/BSCS Room; and

7.9.2.2.16.4.4 where installed outside the building, including where installed below slab, must be rated for outdoor use. Any modifications to the weather proof jacketing structure of the fibre optic cabling is not permitted.

7.9.2.2.16.5 BSCS cabling is permitted to be installed in the same cable tray as voice, data and CATV cabling provided that the operation of one system does not interfere with the performance of any other systems. Where potential interference (such as alien crosstalk) may occur the cabling must be installed in separate raceway systems such that the interference is eliminated.

7.9.2.2.16.6 Communications and BSCS cabling must not be installed in the same pathway or raceway as electrical cabling and must be separated by sufficient distance to prevent any interference effects.

7.9.2.2.17 Communications Outlets

7.9.2.2.17.1 Each communication outlet must consist of one Augmented Category 6 RJ45 jack at the point of utilization connected to an

Augmented Category 6 RJ45 patch panel in the Sub Telecom/BSCS Room serving the area using one Category 6A cable.

7.9.2.2.17.2 Provide communication outlets for voice and data throughout the Building as required, excluding Cells, and corridors. Exact locations for outlets will be determined in consultation with the Province and will suit furniture and equipment layouts, and support functional use of the space.

7.9.2.2.17.3 Communication outlets required will be in addition to the following communication outlets and any other communication outlets specifically described elsewhere in this Schedule;

7.9.2.2.17.3.1 provide all communication outlets required for complete operation of the BSCS;

7.9.2.2.17.3.2 provide a minimum of two communication outlets for each workstation, unless otherwise stated;

7.9.2.2.17.3.3 provide communication outlets at all locations where telephones or computer data are required within Appendix 3A - Functional Space Requirements. Each location must have a minimum of two communication outlets, one for data and one for voice, unless otherwise specified;

7.9.2.2.17.3.4 within each enclosed office, provide a minimum of four communications outlets at the desk and two communications outlets on the opposite wall;

7.9.2.2.17.3.5 each interior IP based CCTV camera must be provided with a communication outlet. Coordinate the CCTV communications outlet locations with the BSCS design to achieve interior CCTV camera coverage required pursuant to Section 7.10 [Electronic Safety and Security] of this Schedule;

7.9.2.2.17.3.6 each exterior IP CCTV camera must be provided with a fibre communications outlet with LC connectors. Terminate on LC fibre patch panels located in the Main CER, Main BSCS Room or a Sub Telecom/BSCS Room. Coordinate the CCTV communications outlet locations with BSCS design to achieve exterior CCTV camera coverage pursuant to Section 7.10 [Electronic Safety and Security] of this Schedule;

7.9.2.2.17.3.7 each intercom station must be provided with a communications outlet;

7.9.2.2.17.3.8 provide all communication outlets required to support wireless access points, so as to achieve continuous wireless network coverage throughout all areas of the Building. Each wireless access point location must be provided with two communication outlets (2-RJ45).

Preliminary wireless coverage and access point locations will be determined through the use of wireless network simulation software based on the use of 2.4 GHz and 5 GHz frequencies. Wireless simulations must demonstrate 100% continuous coverage on both frequencies, with signal strength no less than 65dB taking into account simulated noise, interference and wall construction. Final wireless coverage and access point locations must be confirmed based on a physical RF site survey once the all structures that may cause RF interference and attenuation has been constructed;

7.9.2.2.17.3.9 provide two communications outlet for each video court, video interview and videoconferencing equipment location. Coordinate location and connection with videoconferencing hardware. All connections and wiring must be concealed;

7.9.2.2.17.3.10 within each meeting room, provide two communications outlets on each wall; and two communications outlets in two separate locations in the meeting room table; and

7.9.2.2.17.3.11 within each multipurpose room, provide two communications outlets every 5m around the perimeter of the room and two communications outlets located in the floor every 10 square metres.

7.9.2.2.18 Termination

7.9.2.2.18.1 All horizontal, data and voice riser cable terminations must use TIA/EIA T568A pin configuration.

7.9.2.2.18.2 All structured cabling must terminate on RJ45 outlets including: data, voice, videoconference, video court, intercom and all IP based devices for BSCS and the Province data network. Unless otherwise specified, BSCS field devices designed with direct-connect type connections do not require RJ45 outlets.

7.9.2.2.18.3 All communications outlet RJ45 jacks must be the same colour. Outlet faceplates must be labelled with Brother P-style label. Outlet faceplates in Accused Holding Area must be stainless steel c/w Robertson screw and must be sealed.

7.9.2.2.18.4 All structured cabling horizontal UTP cables must terminate on 19” wide, 48- port, 1 RU, rack mounted RJ45 patch panels.

7.9.2.2.18.5 Horizontal UTP cables for voice, data, video, the Province data network and the BSCS must be segregated onto their discrete patch panels in discrete racks or cabinets for review and approval by the Province.

7.9.2.2.18.6 Separate patch panels must be used to terminate horizontal cables, data riser, voice riser, Province data network and BSCS backbone cables.

7.9.2.2.18.7 Horizontal fibre optic cables for exterior CCTV cameras must terminate on fibre patch using LC connectors, separate from backbone fibre optic cabling.

7.9.2.2.18.8 Voice riser/tie cables must have one end terminated adjacent to the main telephone service field (in Communications Service Entrance Room) on wall mounted BIX1A/110 blocks with the other end terminated on separate rack mounted RJ45 patch panels in Sub Telecom/BSCS Rooms, Main CER and Main BSCS Room. Terminate (2) pair per RJ45 jack. Provide all required jumper and patch cables.

7.9.2.2.18.9 All BSCS fibre backbone cable must terminate in rack mounted fibre interconnect boxes with LC connectors at each end. All LC connections must be consistent throughout the facility.

7.9.2.2.18.10 All data fibre riser cable must terminate in rack mounted fibre interconnect boxes with simplex LC connectors at each end. Separate fibre patch panels must be used for the data and the BSCS fibre backbone cable terminations.

7.9.2.2.18.11 All patch panels must be connected to the Intelligent Infrastructure Management System.

7.9.2.2.19 Patch Cords

7.9.2.2.19.1 All copper patch cords must be Augmented Category 6, pre-manufactured c/w RJ45 plug on each end and a snagless boot.

7.9.2.2.19.2 The quantity of copper patch cords for data/voice/video must equal the total quantity of communication outlets installed for data/voice/video plus 25% spare. Lengths of patch cords must suit final rack in equipment layouts. Minimum slack length to be 30cm.

7.9.2.2.19.3 All data fibre patch cords must be duplex, 50/125∝m pre-manufactured c/w simplex LC connectors. Provide 2 patch cords per each data fibre backbone pair.

7.9.2.2.19.4 All BSCS fibre patch cords must be pre-manufactured 50/125∝m complete with LC connectors.

7.9.2.2.19.5 The copper and fibre patch cords for the BSCS must match the performance of the cabling system installed. Provide all patch cords required for complete operation of the BSCS plus 25% spare.

7.9.2.2.19.6 All patch cords must be connected to the Intelligent Infrastructure Management System.

7.9.2.2.20 Copper Work Area Cords

7.9.2.2.20.1 Copper work area cords must:

7.9.2.2.20.1.1 be the same type as copper patch cables; and

7.9.2.2.20.1.2 be a minimum of 3m in length (provide longer as required by the final room and rack layout).

7.9.2.2.20.2 Provide copper work area cords for data/voice/video equipment in the quantity equal the total quantity of communication outlets installed for data/voice/video plus 25% spare. Lengths and gauge of patch cords must suit final furniture and millwork design but will not be less than three metres.

7.9.2.2.20.3 Provide all required copper or fibre work area cords for all BSCS equipment and workstations plus 25% spare.

7.9.2.2.21 Community Access Television Distribution System (CATV)

7.9.2.2.21.1 CATV cabling distribution system must include of, but will not be limited to, horizontal cable infrastructure, inter/intra-building trunk cables, amplifiers, and splitters required for complete and operational infrastructure. All cables must be coaxial type.

7.9.2.2.21.2 CATV outlets must be provided in the Staff Lounges, designated Office and Administration areas, waiting areas and designated public spaces as indicated in Appendix 3A - Functional Space Requirements.

7.9.2.2.21.3 Provide all required horizontal and riser trunk coaxial cabling for the distribution of CATV signals throughout the Building. Size of coaxial cabling must support standard full high definition (1080p) resolution video content with surround audio.

7.9.2.2.21.4 Performance requirements

7.9.2.2.21.4.1 Performance of signals for each UHF channel, at each CATV outlet, must be free from ringing, ghosting, noise, changes in colour hue, cross channel inter-modulation, RF beats, and hum modulation.

7.9.2.2.21.4.2 Minimum signal available at output of any CATV outlet must be 10 dBmV and not exceed 15 dBmV across the complete frequency range. Signals must also meet local CATV service provider requirements (e.g. Shaw and Telus TV).

7.9.2.2.21.4.3 Signal on any specific channel measured at any television receptacle in the CATV system must be within 6 dB of the same signal measured at any other CATV receptacle in the CATV system; and

7.9.2.2.21.4.4 There must be a minimum RF isolation between the receivers attached to the CATV system of 18 dB. CATV System as installed must be capable of distributing future channels.

7.9.2.3 Performance Criteria

7.9.2.3.1 The conduits, pathways, room layouts, and design must comply with TIA/EIA-569 Commercial Building Standard for Telecommunications Pathway and Spaces. Where the TIA/EIA standards differ from the requirements of Governmental Authorities Project Co will notify the Province and obtain building and/or electrical code variances in order to achieve compliance with TIA/EIA 569 and TIA/EIA 607 standards.

7.9.2.3.2 The cabling design and installation must comply with TIA/EIA – 568B.1, B.2 and B.3 Commercial Building Cabling Standards and Optical Fibre Cabling Standards for Category 6A horizontal cabling and 10Gb fibre performances.

7.9.2.3.3 The management and administration of the cabling plant must comply with the TIA/EIA 606 standard – The Administration Standard for the Telecommunications infrastructure of Commercial Buildings. Develop and maintain a labeling scheme based on TIA/EIA 606 standards in consultation with the Province pursuant to Appendix 2B [Review Procedure] incorporating site-specific rooms, pathways and structured cabling infrastructure design.

7.9.2.3.4 The grounding of the conduit pathways and components must be in accordance with most current version at time of Service Commencement of TIA/EIA 607 Standard – Commercial Building Grounding and Bonding Requirements for Telecommunication.

7.9.2.3.5 The Structured Cabling System must be installed by a contractor who is certified by the cable manufacturer.

7.9.2.3.6 Coordinate demarcation requirements for telephone, CATV and Internet services so as to comply with applicable requests of the local service providers.

7.9.2.3.7 The cable plant must meet or exceed Category 6A channel performance as defined in TIA/EIA 568 B.1, B.2 and B.3 standards.

7.9.2.3.8 The Structured Cabling System must employ a star topology with each communications outlet wired back to the Main CER, Main BSCS Room or Sub Telecom/BSCS Room servicing that area. Each Sub Telecom/BSCS Room backbone and riser cabling must be routed back to the Main CER and Main BSCS Room.

7.9.2.3.9 All cabling must be run in conduit or cable tray and must not be accessible to accused/offender persons, members of the public or any unauthorized persons. The use of J-hooks is not permitted.

7.9.2.3.10 All cable drops must be terminated at both ends.

7.9.2.3.11 The cable plant must be tracked, managed and maintained using a cable management labelling software and electronic drawing system.

7.9.2.3.12 Specialized systems requiring multiple drops must have sufficient drops at each location to ensure system operation.

7.9.3 Network Equipment

7.9.3.1 Basic requirements

7.9.3.1.1 Province and Courts (Provincial and Superior) data network equipment will be provided (supplied, installed and maintained) by the Province and will utilize the Structured Cabling System.

7.9.3.1.2 Project Co must provide all BMS and BSCS Network Equipment of this Schedule. Project Co to:

7.9.3.1.2.1 provide all required network equipment including network switches;

7.9.3.1.2.2 complete all logical network design, program and configure all network equipment; and

7.9.3.1.2.3 be responsible for all network management licensing.

7.9.3.1.3 If network design and cable lengths permit, Building network equipment may be located in the same Telecommunication Room as the Province network equipment. If network equipment is collocated then locate such equipment in the telecommunications rooms in the Building in cabinets/racks separate from the Province's equipment cabinet/racks.

7.9.3.1.4 All BMS and BSCS network equipment must be located in lockable cabinets or have a mechanism in place in front of the active network equipment clearly indicating that is BMS/BSCS network equipment and not Province network equipment. This additional level of security is required to ensure that proper patching procedures are followed.

7.9.3.1.5 For the BMS/BSCS networks, Project Co to mount and connect all network switches and pigtails and cross connect and test all network equipment and cable infrastructure in accordance with the Province IMIT Infrastructure requirements.

7.9.3.1.6 Install all network equipment in accordance with all applicable IEEE and EIA/TIA standards, including the 802.1 and 802.3 standards.

7.9.3.1.7 The Province will provide and manage all firewalls, security and IDS/IPS systems for connections to the Province's networks. Project Co is responsible for securing all networks in the Facility other than the Province's network such as but not limited to the BMS and BSCS data networks.

7.9.3.1.8 All network equipment to be open architecture.

7.9.3.1.9 Project Co will retain a certified network engineer trained on the network equipment throughout the Construction Period and for commissioning.

7.9.3.1.10 Network equipment to support converged communications, a combination of the three media types of voice, video and data and all equipment to support the prioritization of traffic. The systems to include the main telephone system, videoconferencing, CCTV, dictation, fax, transcriptions and all information systems.

7.9.3.1.11 Redundancy and security to be taken into account in all network designs.

7.9.3.1.12 Facility network equipment to connect to new incoming services.

7.9.3.1.13 All network equipment must be dual corded with redundant power supplies. Power must be supplied from both UPS and Emergency power.

7.9.3.2 Performance Criteria

7.9.3.2.1 BSCS Data Network must be designed so that any system or systems using the BSCS Data Network must not negatively impact the functionality and performance of any other systems on the same network.

7.9.3.2.2 In addition to employing VLANs, subnets and QoS to segregate and streamline network performance of each subsystem within the BSCS Data Network provide physically separate network(s) for system(s) that consume high bandwidth or which may negatively impact other system functionality or performance on the BSCS Data Network.

7.9.3.2.3 All racks/cabinets requiring electrical power and cooling to be provided with a minimum of:

7.9.3.2.3.1 5 KW redundant power per rack for telecommunication racks; and

7.9.3.2.3.2 10 KW redundant power per rack for 4 post fully enclosed racks.

7.9.3.2.4 Network design to include:

7.9.3.2.4.1 a Core layer (connections to the TRs and routing); and

7.9.3.2.4.2 an Aggregate layer (connections to servers located in the Building MCR).

7.9.4 Building Audio Visual (AV) Systems

7.9.4.1 Basic Requirements

7.9.4.1.1 Provide AV systems, videoconferencing systems, and AV conduit/power provisions for each space as defined within this Schedule.

7.9.4.1.2 Conduit, power rough-ins and communications outlets must be provided to support videoconferencing for the rooms described in Section 7.9 [Communications] of this Schedule.

7.9.4.1.3 AV systems include displays (active LCD or projector and screen), AV input interfaces, audio and video distribution, basic control system and all required wiring, configurations and programming.

7.9.4.2 Performance Criteria

7.9.4.2.1 For each room requiring AV systems, provide the following:

7.9.4.2.1.1 Inputs

7.9.4.2.1.1.1 Provide in-table AV inputs, each with HDMI, VGA, and discrete audio input in all boardrooms as well as Command Post for laptop connections. HDMI and VGA must be autosensing and autoswitching; Provide 2 in-table input boxes c/w power and communication outlet in each table box.

7.9.4.2.1.1.2 Input (audio and video) from local computer.

7.9.4.2.1.1.3 Input (audio and video) from the local DVMS PC or VV workstation.

7.9.4.2.1.2 Outputs

7.9.4.2.1.2.1 Provide 70 inch, interactive multi-touch LCD display with 1920x1080 resolution. Sized to suit room, 16 point font to be legible from the farthest position in the room.

7.9.4.2.1.2.2 Wall mount the display on the end wall away from the door at a height that is suitable for comfortable viewing from a sitting position based on the room design, dimensions and site line analysis.

7.9.4.2.1.2.3 Provide in-wall seismic backing for all display mounts.

7.9.4.2.1.2.4 In the spaces where one 70 inch display is too small to display 16-point font and have it legible from the farthest position in the room (e.g. multi-purpose and computer training rooms) additional displays must be provided.

7.9.4.2.1.2.5 Provide ceiling mounted high fidelity speakers for playback of content audio; Audio signal must be capable of producing a maximum intelligible signal level of 85dBA sound pressure level at a plane 1.5M above the floor.

7.9.4.2.1.3 AV Switching and Control System

7.9.4.2.1.3.1 Provide audio/video switch and amplifier with adequate input and output ports to accommodate required inputs; c/w with HDCP and EDID minder; c/w video distribution amplifier where there is a local DVMS so that computer display and LCD display or projector are showing the same cloned content.

7.9.4.2.1.3.2 For boardrooms, a push-button control panel must be wall mounted near the door and must provide system on/off, volume control, screen control (where projector/screen installed) and input selection. The control panel is to be a desktop touchscreen in courtrooms and conference rooms.

7.9.4.2.1.3.3 Integrate control system with: projection screen to lower and raise with system down and up; with LCD display for on/off, and input selection on display based on system input selection.

7.9.4.2.1.4 Infrastructure Requirements

7.9.4.2.1.4.1 Provide conduit to house all cabling. Conduits must be routed in walls, ceilings and floors and must not be visible.

7.9.4.2.1.4.2 Provide all power and communications cabling and outlets to support the AV systems.

7.9.4.2.1.4.3 No wiring must be visible.

7.9.4.2.1.4.4 Lighting must be designed conducive to AV presentation systems with dimming fixtures and controllability to turn off the fixtures near the display to avoid glare or reflections on the display surface.

7.9.5 Courtroom Audio Visual (AV) Systems

7.9.5.1 Basic Requirements

7.9.5.1.1 Provide complete, functional Courtroom AV systems and AV conduit/power provisions within each facility courtroom for each AV subsystem defined below:

7.9.5.1.1.1 Evidence Management System (EMS)

7.9.5.1.1.2 Evidence Presentation System (EPS)

7.9.5.1.1.3 Courtroom Audio Amplification System

7.9.5.1.1.4 Courtroom Digital Display Signage System

7.9.5.1.1.5 Judicial Videoconferencing System (Judge's Chambers)

7.9.5.1.2 Provide complete conduit/power rough-in requirements within each facility courtroom to support each AV subsystem defined below:

7.9.5.1.2.1 Digital Audio Recording System (DARS)

7.9.5.1.3 The Courtroom AV systems identified will be designed to the current level of courtroom technology and with specific project requirements related to complete courtroom system integration to meet the current and future requirements of the Province.

The project design for the Courtroom AV Systems will require considerable forethought and system flexibility to accommodate current technology and the ability to incorporate future technologies. Project Co shall have the ability to identify/submit system technology enhancements for any/all of the AV sub-systems as long as they meet the overall operational requirements of the province's Courts system.

7.9.5.2 Performance Requirements

7.9.5.2.1 Evidence Management System (EMS)

7.9.5.2.1.1 Courts typically enable presentation of electronic evidence in courtrooms via an Evidence Presentation System (EPS), once the Court accepts evidence as an exhibit, it must be physically provided to the clerk (e.g. printed on an in-court printer and submitted as paper, saved to a provided external hard drive to be submitted as an “electronic book of exhibits”).

7.9.5.2.1.2 An Evidence Management System (EMS) must support and manage the entire lifecycle of electronic evidence including but not exclusive to:

7.9.5.2.1.2.1 Provisioning counsel to bring in their own device and software to connect to the EPS for purposes of displaying in Court.

7.9.5.2.1.2.2 Provisioning of Court supplied devices connected to the EPS for purposes of displaying in Court; this ensures all parties, including self- represented litigants, have equal access within the courtroom.

7.9.5.2.1.2.3 Enabling pre-loading of electronic evidence in order to be adequately ready for presentation during court appearances.

7.9.5.2.1.2.4 Submission of electronic evidence to the Court to be accepted as an exhibit.

7.9.5.2.1.2.5 Provision of electronic exhibit management that assigns exhibit numbers, provisioning an auditable system to ensure the integrity of the exhibits while under the care of the Court.

7.9.5.2.1.2.6 Provision of electronic access to Jury both in the courtroom and during deliberations in the jury room, when approved.

7.9.5.2.1.2.7 Provision electronic access to a judge wherever the judge is securely accessing the system (e.g. from chambers or from a home office).

7.9.5.2.1.2.8 Electronic destruction of exhibits as per Court rules.

7.9.5.2.1.3 The system must meet the requirements of all divisions of Court (criminal, civil, family) and all levels of trial court (Supreme and Provincial).

7.9.5.2.1.4 In addition, the system must consider all counsel (i.e. private counsel as well as provincial and federal crown) and self-represented litigants.

7.9.5.2.2 Evidence Presentation System (EPS)

7.9.5.2.2.1 Evidence Presentation System (EPS) is a secure document scanning, storage, retrieval, sharing and viewing system. Evidentiary documents are entered electronically and stored or distributed as needed prior to or during a trial, which eliminates the chance that they will be lost or tampered with. During the Court proceedings, the documents in the system are available to all participants and are easily retrieved, viewed or displayed as needed, Multiple EPS stations located within the courtroom shall allow all trial participants to simultaneously view evidence materials as they are presented and referenced.

The EPS is an integrated combination of several audio and video technologies designed to provide all courtroom participants a vehicle in which to present, view, listen and manage information during or in relation to Court proceedings. This technology is used at all levels of Court in the province and is shown to create efficiencies as a result of its use.

7.9.5.2.2.2 Audio Requirements

7.9.5.2.2.2.1 The audio technologies used in courtrooms are expected to interface seamlessly with the official record of the Court – the audio from the Digital Audio Recording System (DARS). To accomplish this, layered redundancy must be employed to reduce or eliminate the risk of court delays that may be attributed to network or equipment anomalies. This redundancy is achieved by isolating microphones from the courtroom sound system as well as the employment of standalone interface with the DARS mixer.

To meet several courtroom stakeholder requirements, several provisions are made for assistive listening, sound amplification as well as audio feeds for juries, counsel, media and the judge; this is accomplished by providing 3.5mm audio outlets for t-coil, headsets, media distribution sound boards or ancillary speakers.

Specialized microphones are placed at the judge bench and witness box to more effectively pick up low voices or individual that may not be ‘square’ to a standard goose-neck microphone.

An audio voice lift mixer, using mix-minus technology, is used to ensure that all audio within the courtroom is heard by all courtroom occupants.

7.9.5.2.2.3 Video Requirements

7.9.5.2.2.3.1 In courtrooms, the handling of video is accomplished using many techniques and technologies.

Videoconferencing is used to connect between one and three remote sites to accommodate stakeholders that are not physical present in the courtroom. Videoconferencing can also be used to transmit EPS content to the far-end participant(s).

Video displays are strategically placed throughout the courtroom to provide all courtroom occupants the opportunity to see what is being presented by counsel to the Court.

- Displays are positioned at the jury box, jury deliberation room, all counsel tables, judge's bench, court clerk workstation, gallery, accused docket, presentation rostrum and any overflow or media room.

- Annotation devices are positioned at the witness box to permit real-time 'markup' of images / still video captures for later submission as an exhibit.

- The judge's bench may accommodate the ability for the judge to capture the image for confidential markup for note-keeping purposes.

- The court clerk workstation may accommodate the ability for the clerk to capture images for exhibit purposes.

7.9.5.2.2.4 Data Requirements

7.9.5.2.2.4.1 Data will be managed in a secured environment using a private and secure network that is managed by OCIO on GovNet (SpanBC/CE). The architecture of this environment is designed to provide business continuity in the event of WAN failure thus, risk of interruption to the Court is mitigated as well as ensure content security within the courtroom.

Within the private and secure bounds, data (EPS content) may be managed using one of several methods:

- Counsel or Court Services provisioned PC or Laptop using pre-loaded content that may be captured during a trial for submission as evidence and accepted by the Court as an Exhibit.

    - Printed as a hard document to an in-court laser colour printer.

- Saved to a provided external hard drive to be submitted as an 'electronic book of exhibits'.

- Employment of full scale pre-submitted evidence on a server that will be used to display evidence and later captured as outlined above.

  No content (evidence) will leave the confines of the private and secure network in order to maintain continuity of that content for the Court.

7.9.5.2.2.5 With respect to electronic evidence management, counsel will require means to pre-load electronic evidence in preparation for presentation in Court as outlined above.

7.9.5.2.2.6 Prior to the Court accepting evidence as Exhibits, evidence is accessible and under the control of counsel and subject to the judicial officer controlling viewing within the courtroom (especially in a Supreme Court matter with a jury). Once accepted into the Court as an Exhibit, it is now under the control of the Court and must adhere to very specific security and audit controls. Within the context of a future electronic exhibit management system, these same controls must be adhered to whether in the context of network configuration and application design or physical access to servers.

7.9.5.2.3 Courtroom Audio Amplification Systems

7.9.5.2.3.1 Courtroom Audio Amplification Systems are typically the foundation of courtroom technology. In addition to providing sound reinforcement within the courtroom to enable participants to hear the Court proceedings, the audio systems are critical to support additional important courtroom technologies including court recording, remote appearances, language interpretation and assistive listening technology.

7.9.5.2.4 Courtroom Digital Display Signage System

7.9.5.2.4.1 The Courtroom Digital Display Signage System includes the hardware infrastructure and software required to interface to various case management systems including JUSTIN/CEIS and the Supreme Court Scheduling System in order to display daily list of Court appearances in any given courtroom. Small displays will be required outside individual courtrooms to display that room's court list. Large displays will be required in main public areas, such as the courthouse lobby, to display the court lists for multiple courtrooms. The displays must be housed in protective cases with data cabling and power provided within. The system must be configurable to display either the appearances for a single courtroom, a set of courtrooms or all of the courtrooms in the courthouse. It must also allow for real time updates. The displayed information will include the names of the parties on the appearance, the courtroom and the time of the appearance.

7.9.5.3 Videoconferencing

7.9.5.3.1 Court Audio Recording System (CARS)

7.9.5.3.1.1 The Digital Audio Recording System (DARS) and Court Clerk Desktop (CCD) is a combination of hardware and software, provided by the Province, that when installed in any courtroom or location will be making an official record (recording) of a court or court related session. DARS and CCD are integrated with the functionality of the Courtroom Audio Amplification Systems to be utilized to perform the following:

- Make an audio record of Court proceedings that stands as the official record of proceedings according to the Evidence Act [RSBC 1996]Chapter 124.
- Make a "logsheet" of links to the audio: these links are related to court events, and also to notes on verbatim speech, which may act as orientation "signposts" to the audio record.
- Send a comprehensive list of trackable court events to the CEIS (civil) and JUSTIN (criminal) case-tracking systems, including but not limited to:
  - Attendance of participants, judge, and counsel, if any.
  - Orders made (including detention, bail, sentencing, and other orders in criminal cases) (including payment, custody, support and other orders in civil cases).
  - Protection Order Registry (POR) and Canadian Firearms Centre (CFC) notifications.
  - Appearance results and scheduling information for next appearance (if another appearance is set).
  - Videoconference and telephone appearance information.
  - Total court time spent on each case.
  - Notes from court clerk instructing court registry personnel to take a specific action on a file or an order.
- Allow the court clerk to call up audio and logsheets from past proceedings, for playback to the Court or to answer questions about Court events.
- Allow the court clerk to view file contents and electronic reports without reference to the paper file.

7.9.5.3.1.2 Project Co is responsible for:

7.9.5.3.1.2.1 Microphones – dynamic – one for each fixed participant position and one on each central speaking podium or rostrum with 'hold to mute' option;

7.9.5.3.1.2.2 Microphones – condenser array – one each for judge's bench and witness stand with 'hold-to-mute' button;

7.9.5.3.1.2.3 Button security microphone for prisoner dockets and jury foreperson position;

7.9.5.3.1.2.4 All microphone cabling and terminations;

7.9.5.3.1.2.5 Mixer (DMX-8 USB Mixer, Biamp Tesira Forte Mixer or equivalent subject to Province review);

7.9.5.3.1.2.6 Court recording failover redundancy;

7.9.5.3.1.2.7 Voice lift technology and related mix minus technology; and

7.9.5.3.1.2.8 All speakers and sound enhancement.

7.9.5.3.2 Infrastructure Requirements

7.9.5.3.2.1 Provide conduit to house all cabling. Conduits must be routed in walls, ceilings and floors and must not be visible.

7.9.5.3.2.2 Provide all power and communications cabling and outlets to support the AV systems.

7.9.5.3.2.3 No wiring must be visible.

7.9.5.3.2.4 Lighting must be designed conducive to AV presentation systems with dimming fixtures and controllability to turn off the fixtures near the display to avoid glare or reflections on the display surface.

7.9.6 Videoconferencing Systems

7.9.6.1 Basic Requirements

7.9.6.1.1 The videoconferencing systems must be IP-based and communicate using industry standard videoconferencing communications protocol l – ITU h.323 (proprietary communications protocols are not permitted).

7.9.6.1.2 Videoconferencing systems must use the Structured Cabling System and must be integrated with the Province data network.

7.9.6.1.3 The Province will provide the configuration of the security settings to allow videoconferencing and teleconferencing traffic to leave the Building and deployment of QoS of video- and tele-conferencing network traffic.

7.9.6.1.4 Provide a complete and fully operational videoconferencing system for each space requiring videoconferencing as described in Section 7.9 [Communications] of this Schedule.

7.9.6.2 Performance Requirements

7.9.6.2.1 Provide minimum 1080p full HD PTZ videoconferencing camera(s) as required for adequate coverage of the room. All rooms identified as being capable of operating as a Courtroom require a minimum of three (3) PTZ camera.

7.9.6.2.2 Videoconferencing system CODEC must:

7.9.6.2.2.1 be IP-based and communicate using industry standard H.323 videoconferencing communications protocol;

7.9.6.2.2.2 have teleconferencing card complete with both analogue and SIP ports;

7.9.6.2.2.3 SIP ports must be compatible with Microsoft Lync communications platform and Cisco switches;

7.9.6.2.2.4 licensing for operating at full HD (1080p) resolution and allow 4-way multipoint operation; and

7.9.6.2.2.5 employ automatic bandwidth management including adjustment of video resolution and/or compression in order to maintain required audio quality.

7.9.6.2.2.6 be selected based on size, complexity and number of users in each designated room.

7.9.6.2.3 Videoconferencing must operate as video with audio and as audio only conferencing and must have analogue and SIP communications ports.

7.9.6.2.4 Provide audio DSP (digital signal processor) to process audio signals. Employ echo and noise cancellation on all microphone inputs.

7.9.6.2.5 Videoconferencing system must allow users to select any AV input to be shared in addition to the display of the near and far end video.

7.9.6.2.6 Provide ceiling mounted condenser microphones in the quantity and arrangement necessary to pickup all participants in the room for intelligible audio-only or video with audio conferencing.

7.9.6.2.7 Provide digital video matrix for dual screen use.

7.9.6.2.8 Video CODEC must be manufactured by Cisco/Tandberg.

7.9.6.2.9 Provide AV control solution complete with a GUI that is customized to the space and AV system functionality in the space the AV control solution is being installed.

7.9.6.2.10 Videoconferencing system audio and video quality must:

7.9.6.2.10.1 have voice quality comparable to that offered on circuit- switched voice networks;

7.9.6.2.10.2 employ an IP network that complies with the current, at time of Service Commencement, ITU-T G.114 standards, including the requirement for a one-way delay budget of not more than 150 ms for high voice quality;

7.9.6.2.10.3 employ a DSP (digital signal processor) with a jitter buffer;

7.9.6.2.10.4 compliant with current, at time of Service Commencement, ITU-T G.165 for echo cancellation; and

7.9.6.2.10.5 video and audio quality must meet or exceed the ITU-T standards with a MOS score of 4.0 or greater and be suitable for evidentiary purposes.

7.9.6.3 Integration Requirements

7.9.6.3.1 Integrate the videoconferencing system for user-selectable (through the AV control system): picture-by-picture or picture-in-picture on the AV system video display.

7.9.6.3.2 Integrate the videoconferencing system with the room AV control solution with a dedicated “Videoconferencing” and “Audio Conferencing” modes to allow users to operate the operate the videoconferencing system without the need any other remote control devices.

7.9.6.4 Judiciary Videoconferencing

7.9.6.4.1 Basic Requirements

7.9.6.4.1.1 Remote access to courtrooms is a continued evolution where courtroom participants require easily accessed technology to appear, virtually and securely, in a courtroom as required or as permitted by the Court. The Judiciary, in some circumstances, may elect to appear in court in the same manner.

Despite the best efforts in scheduling courtroom appearances, at times there are more judges in one location than are required. The Province is looking to technology to bring efficiencies to court appearances across the province.

Currently, remote video conference court appearances requires two courtrooms in the province; one for the judge and one for the remote participant at another courthouse.

The Judiciary videoconferencing will allow judges easy remote access to any courthouse in the province for these typically administrative appearances from their Judicial Chambers; therefore opening up more court time availability for other matters.

7.9.6.4.1.2 The technology solution provided may be hardware or software based.

7.9.6.4.2 Performance Requirements

7.9.6.4.2.1 The technology solution must:

7.9.6.4.2.1.1 Provide virtual appearances for judges into a remote location from their Judicial Chambers, meeting rooms or boardrooms within the Judiciary program area.

7.9.6.4.2.1.2 Allow for bi-directional simultaneous audio and video.

7.9.6.4.2.1.3 Comply with h.323 standards.

7.9.6.4.2.1.4 Be 100% compatible with, and integrated into, the videoconferencing solution provided in Section 7.9.6.

7.9.6.4.2.1.5 Not require transcoding to achieve compatibility.

7.9.6.4.2.1.6 Be configured to be administered by the designated support service (Court Services Branch).

7.9.6.4.2.1.7 Have no external administrative access.

7.9.6.4.2.1.8 Reside within the pre-existing secure BCGN.

7.9.6.4.2.1.9 Support multi-site dialing.

7.9.6.4.2.1.10 Support full HD video.

7.9.6.4.2.1.11 Support full duplex audio.

7.9.6.4.2.1.12 Support bandwidth capacity to prevent latency greater than 100ms. (or achieve latency less than)

7.9.6.4.2.1.13 Support QoS.

7.9.6.4.2.1.14 Accommodate the ability for the host user (Judge) to have full access to their computer for the purpose of note taking, access electronic content (e.g. electronic court file) and research while engaged in a videoconference.

7.9.6.4.2.1.15 Include the ability for the user to share content from their computer or device during a videoconference session with the proviso that a user error could result in the inadvertent/unintended visual sharing of sensitive information. The sharing of content will never include the transfer of data to the remote location. It is simply a visual/audible sharing of information.

7.9.6.4.2.2 All videoconferencing performance requirements in section 7.9.6.2 apply to judicial videoconferencing.

7.9.7 Computerized Maintenance Management System (CMMS)

7.9.7.1 Basic Requirements

7.9.7.1.1 Provide a complete Computerized Maintenance Management System complete with all required servers, hardware, software and licensing to constitute a fully operational computerized maintenance management system pursuant Schedule 4 [Services Protocols and Specifications], Part 6 (Computerized Maintenance Management System).

7.9.7.1.2 The CMMS must be survivable and fully operational during and following any communications failure (Internet, land line or otherwise) to the Facility. The onsite survivable servers must automatically synchronize changes upon recovery from a communications failure with any off-premise services or servers. The CMMS/BMS servers (primary or survivable) must be located in the Main CER, rack mounted in the PA system equipment cabinet accessible by Project Co. The CMMS/BMS hosts and switches are dedicated to the CMMS/BMS network; and the CMMS/BMS server(s and switches are not permitted to be installed in Province server or BSCS cabinets.

7.9.7.1.3 Ensure that the Province computers can access the CMMS server without the need for the Province data network to be directly connected to the CMMS server or service.

7.9.7.1.4 Provide a secure CMMS wireless LAN, including all required data network equipment and software to support wireless functionality as described in Part 6 (Computerized Maintenance Management System) of Schedule 4 [Services Protocols and Specifications]. The CMMS wireless LAN must be completely separate and independent from and must not conflict or interfere with the BSCS Data Network, or the Province data network, including the Province wireless LAN.

7.9.8 Wireless Infrastructure

7.9.8.1 Basic Requirements

7.9.8.1.1 Subject to Section 7.10 of this Schedule, Project Co shall design and install a complete wireless network solution for each identified network with the Facility in accordance with the Province's "Secure Wireless Local Area Network Standards". Refer to Section 7.9.1.1.5 for facility network identifications.

7.9.8.1.2 Project Co must:

7.9.8.1.2.1 procure, program and configure required network equipment as identified within Appendix 3D;

7.9.8.1.2.2 be responsible for all logical network integrated design and network equipment configuration;

7.9.8.1.2.3 install all network switches and pigtails and cross connect and test all network equipment and cable infrastructure for each wireless network as identified within Appendix 3D. Install all network equipment in accordance with all applicable standards, including the following IEEE and EIA/TIA standards: 802.1, 802.11 and 802.3;

7.9.8.1.2.4 provide a complete structured cabling infrastructure that will allow the installation of the complete wireless networks, including PoE wireless access points. Project Co must locate data outlets for Wireless Access Points (WAP) as developed through the Schedule 2 Design and Construction Protocols and the User Consultation Process;

7.9.8.1.2.5 setup and test of all aspects of the wireless network and provide heat maps for the Building indicating the channel coverage, signal level, data rate and noise floor for 802.11b, 802.11g, 802.11a and 5GHz 802.11n, 802.11ac wireless networks, as required;

7.9.8.1.2.6 ensure wireless management tools include access point locations mapped to a floor plan with RF characteristics defined for structural layers including glass, concrete, wood, drywall and metal permanently mounted RF obstacles; and

7.9.8.1.2.7 provide the wireless network management tool configuration file to the Province at the completion of the wireless network testing.

7.9.8.1.3 The wireless infrastructure must be Cisco based system and will service 802.11b (2.4Ghz DSSS), 802.11g (2.4Ghz OFDM), 802.11a (5Ghz OFDM)

, 802.11n(5Ghz and 2.4Ghz MIMO), and 802.11ac (5Ghz QAM) wireless communications and data transfer requirements for access by wireless devices to data and voice services within the Facility and across the Province via the Province WAN.

7.9.8.2 Design Requirements

7.9.8.2.1 Work with the Province in creating an operational plan for the wireless network complete with management strategy alerts notifications and resource requirements for maintenance.

7.9.8.2.2 Retain a certified network engineer with expertise and experience in working with the Province approved equipment to design the wireless network.

7.9.8.2.3 All wireless network components must be a Cisco based 802.11a/b/g/n/(ac) system with current (or latest) Cisco model wireless access points for internal and external coverage respectively, and current (or latest) Cisco Wireless LAN Controllers as are currently managed by the Province. Provide all required modular components in each switch to support all protocols and functionality as designed.

7.9.8.2.4 The Cisco Access Points to be part of a wireless switch infrastructure and to be serviced by 10/100/1000 base T Ethernet ports. The Telecommunication Rooms switch backbone to the Main Cross-connect Room (MCR) to provide enough bandwidth to allow wireless services to function as designed. The wireless LAN Controllers to reside in the MCR and be serviced by Gigabit Ethernet services as required by the wireless switches. The wireless switches to be deployed in a redundant fashion, with redundant power supplies, Ethernet feeds and switches. Telecommunication Room wireless switches to be dual 10GB to the core switches in MCR. All uplinks to terminate in a redundant core switch fabric. Ports on layer 2/3 edge switches to be capable of 10/100/1000 Mb, regardless of what is connected to them.

7.9.8.2.5 Each WAP to support redundant PoE connections and be connected with two physically separate Ethernet cables from WAP to PoE Switch. Each identified WAP location shall be provided with 30 feet of Ethernet cable to allow for WAP location adjustment.

7.9.8.2.6 Deploy each wireless controller with local load balancing and stateful failover appropriate for the wireless access point density and application. Each controller must have license to support the full complement of the deployed access points. Deploy the wireless controllers such that there is at a minimum 5% spare access point licenses per controller and an overall minimum of 10% spare access point licenses.

7.9.8.2.7 Include the switch ports required by the wireless network access points in the total port count for the Building. The list of layer 2/3 switch ports must be provided indicating the ports connected to a given access point, and the power load on the switch with the remaining available PoE power on the switch. The wireless network documentation to include a list of access points with the switch identification and port number indicated in a spreadsheet.

7.9.8.2.8 Project Co to coordinate with all program groups and/or vendors that require Wireless Network access to ensure proper coverage and performance is maintained by all systems.

7.9.8.3 Performance Criteria

7.9.8.3.1 Provide channel dB separation consistent with the strictest specifications provided by the wireless end-use equipment.

7.9.8.3.2 Provide an RF environment consistent with the noise floor and signal strength requirements (SNR) and consistent with the strictest specifications provided by the wireless end-use equipment.

7.9.8.3.3 Provide at a minimum, signal strength of -70dBm at the boundaries of the Site.

7.10 Electronic Safety and Security (Division 28)

7.10.1 General

7.10.1.1 Design, provide and install a security system to meet the Province's security programs within a courthouse facility.

7.10.1.2 Provide a fully networked integrated security system to protect staff, accused/offender persons, visitors and property. As part of this overall security program, at a minimum, provide the following:

7.10.1.2.1 a door control system to control the movements of persons within the detention area;

7.10.1.2.2 CCTV and digital video management systems to view and record events throughout the Facility

7.10.1.2.3 an access control system to restrict access/movement to secure areas/locations to authorized personnel only;

7.10.1.2.4 intercommunications systems for local intercom communications to staff and detainees within the detention areas;;

7.10.1.2.5 Building-wide staff paging communications

7.10.1.2.6

7.10.1.3

7.10.1.4

7.10.17 Intercom (INT) System

7.10.17.1 Objective

7.10.17.1.1 Provide an Intercom System to provide two-way voice communications with staff and detainees throughout the Accused Holding Area and to the Holding Cells. (Reference: Harding).

7.10.17.2 Performance Requirements

7.10.17.2.1 Provide master controllers/exchanges, expanders, master stations, sub-stations, mounting hardware, and wiring, terminations required to support the Intercom System, including all software, programming and setup of controllers, exchanges and stations operating over the BSCS Data Network. Each intercom exchange must be capable of independent local operation.

7.10.17.2.2 Intercom system must provide two-way voice communications that is clear and intelligible between communicating parties without producing any type of noise or interference (electrical or mechanical).

7.10.17.2.3 Provide Intercom stations in Holding Cells that connect to the GUI system.

7.10.17.2.4 Intercom system must be scalable, modular and IP based utilizing VoIP (voice over IP) technology.

7.10.17.2.5 Administration, control, diagnostics, programming and maintenance of the Intercom System must be via MAW PCs.

7.10.17.2.6 Intercom stations must be designed for use in a detention environment. Intercom stations to be ruggedly constructed and must resist Malicious Damage; to the greatest extent preventable.

7.10.17.2.7 All field device wiring must run in conduit or cable trays back to the Main BSCS Room, and the Sub Security Equipment Rooms and must be supervised for short circuit or open circuit faults and device connectivity faults for IP devices.

7.10.17.2.8 Intercom system, including intercom stations, must be homerun, free of splices, to the Main BSCS Room and the Security Equipment Rooms and terminated at the head end equipment.

7.10.17.2.9 All processing equipment must be contained within BSCS security equipment racks and cabinets.

7.10.17.2.10 Intercom station pushbuttons must be rugged construction, backstopped to prevent excessive travel and switch must have positive tactile action

with minimum 1 million-operation lifetime. Pushbuttons to be software assignable (i.e. change call routing without requiring physical wiring changes) for placement of call requests or control of auxiliary functions.

7.10.17.2.11 Provide intercom master stations at each BSCS Control post.

7.10.17.3 Functional Requirements

7.10.17.3.1 Program the intercom master station to have the following functionality:

7.10.17.3.1.1 display alphanumeric descriptions of functions, station and device names and current activity. Function key labeling must change depending on the location within the menu structure or options available to the operator; and

7.10.17.3.1.2 display, in a defined area on the HMI screen, the current number of calls in the queue, number of acknowledged calls, and number of stations removed from service of monitor points in bypass mode.

7.10.17.3.2 Master stations, through their command functions and the DCS, must have the ability to:

7.10.17.3.2.1 answer calls;

7.10.17.3.2.2 place calls;

7.10.17.3.2.3 place calls on hold;

7.10.17.3.2.4 transfer calls to another master station;

7.10.17.3.2.5 place conference calls;

7.10.17.3.2.6 place group calls;

7.10.17.3.2.7 monitor intercom stations;

7.10.17.3.2.8 control program distribution to stations and zones;

7.10.17.3.2.9 adjust volume levels;

7.10.17.3.2.10 independently adjust each station's volume level;

7.10.17.3.2.11 monitor alarm points;

7.10.17.3.2.12 bypass alarm monitor points;

7.10.17.3.2.13 remove stations from service;

7.10.17.3.2.14 recall the last station with a single control;

7.10.17.3.2.15 adjust display back lighting;

7.10.17.3.2.16 select 12 or 24 hour clock display; and

7.10.17.3.2.17 adjust the step rate for switching between monitored stations.

7.10.17.3.3 Volume adjustment of master station and intercom station levels must be controllable during communications. The volume level of each master station must be software adjustable on the HMI screen and the settings must be retained, until modified by a future adjustment.

7.10.17.3.4 Master stations must include the ability to be placed in an unmanned mode which automatically routes all of the associated call handling functions to a pre-defined secondary master station.

7.10.17.3.5 Provide programming for call placement from an intercom station to function as follows:

7.10.17.3.5.1 depressing an intercom station's call pushbutton must place a call request in the queue of the master station or stations assigned to receive that station's calls. Calls must be queued in order of priority level assigned to the intercom station and time the call was placed;

7.10.17.3.5.2 master station must normally display the identity of the top five calls in its call request queue. Call identity must include the device ID number and an alphanumeric descriptor. Descriptor to be up to 20 characters;

7.10.17.3.5.3 the master station display must indicate the total number of calls currently in its queue. All calls in the queue can be viewed by using scroll button with the ability for staff answer any call in any order; and

7.10.17.3.5.4 calls not answered within a preprogrammed time must place a secondary call request on an assigned secondary master station.

7.10.17.3.6 Provide programming of call answering at an intercom master station to function as follows:

7.10.17.3.6.1 Intercom master stations must be able to answer the top call request in its queue by depressing the ‘NEXT’ function key. At the completion of a call, the ‘END’ function key to close the communication link and remove the call from the queue.

7.10.17.3.6.2 Subsequent calls may be similarly handled for the remaining calls in the queue.

7.10.17.3.6.3 Queued calls may be answered out of sequence by scrolling through the queue to the desired call and depressing the ‘ENTER’ key. ‘End’ key must close the communication link, remove the call from the queue and return the master station display to the top of the queue; and A call that is currently connected to a master station must be displayed as connected, along with the type of device connected and the identity of the connected device.

7.10.17.4 Voice Communication Requirements

7.10.17.4.1 Telephone handset voice communication between intercom master stations to be full duplex.

7.10.17.4.2 Open voice communications between intercom master stations to be automatically switched half duplex with press-to-talk override.

7.10.17.4.3 Voice communications between intercom master stations and intercom stations to be automatically switched half duplex with press-to-talk override.

7.10.17.5 Station Monitoring Requirements

7.10.17.5.1 Master stations to be able to monitor an individual intercom station or a pre-defined group of intercom stations.

7.10.17.5.2 Intercom System to permit establishing as many station monitor groups as there are unused station ID numbers.

7.10.17.5.3 Each master station to individually control the rate at which stations in the monitor group are sequenced through.

7.10.17.5.4 Connection to intercom station(s) must be silent and without visual alert at the monitored station(s).

7.10.17.6 Paging-Intercom Integration Requirements

7.10.17.6.1 Master station at selected operator consoles must be equipped with gooseneck microphone with PTT and selector switches, push to talk foot pedal and two speakers. The master station must include:

7.10.17.6.1.1 one speaker to be used for listening to the selected audio channel;

7.10.17.6.1.2 second speaker for listening to the radio non-selected audio of either UHF or cellular radio;

7.10.17.6.1.3 microphone c/w one larger PTT button and three smaller selector switches. The three smaller buttons must be used to “select” radio communications and paging. Selecting the Paging System with no other selections made on the DCS screen and activating the PTT switch must generate an All Page; and

7.10.17.6.1.4 headset and foot operated PTT pedal switch.

7.10.17.6.2 Master stations must have the ability to page to predetermined groups of intercom stations, overhead paging speakers, UHF radio, cellular radio. Provide interface modules for the intercom system as required and wiring to radio base stations.

7.10.17.6.3 Paging selection must be made by selecting the page function and a group of zone from the selection list. Alternately, the paging zone number may be entered after the page function has been selected.

7.10.17.7

7.10.17.8

7.10.18 Security Alarm Monitoring (SAM)

7.10.18.1 Objective

7.10.18.1.1 The SAM system is the amalgamation of all alarms from ESC sub systems, BMS and any other alarms pertaining to the security of the Facility to be monitoring on a single display monitor located at each BSCS.

7.10.18.1.2 SAM system must provide functionality for staff to view and access and manage alarms that are detected and reported by unauthorized entry into protected spaces throughout the Building.

7.10.18.1.3 Systems connected to and monitored by the SAM system either by hardwire or software interconnection include Perimeter Intrusion Detection Systems, door and window position switches, Motion PIR's, DCS, ACS and CCTV system analytics (audio and motion detection).

7.10.18.1.4 The Fire Alarm System and PDAS must operate as stand-alone systems and must not be connected to the SAM system.

7.10.18.2 Performance Requirements

7.10.18.2.1 Security systems connected to the SAM system must communicate through the BSCS Data Network where system field controllers are connected via industry standard TCP/IP communications protocol.

7.10.18.2.2 All alarms generated within the Building are to be received and annunciated using components of the BSCS.

7.10.18.2.3

7.10.18.2.4

7.10.18.2.5

7.10.18.2.6

7.10.18.2.7

7.10.18.3.3 The Fire Alarm System and PDAS must operate as stand-alone systems and must not be connected to the SAM.

7.10.18.3.4 BMS must report alarms pertaining to the security of the Facility to the SAM; integration must be in a manner such that the connectivity must not compromise the security or performance of the BSCS Data Network in any manner.

7.10.19 Video Surveillance Systems

7.10.19.1 Closed Circuit Television (CCTV) and Digital Video Management Systems (DVMS)

7.10.19.1.1 Objective

7.10.19.1.1.1 Provide a complete and fully functional CCTV and Digital Video Management System (DVMS) suitable for use in a SLC Secure facility environment.

7.10.19.1.1.2 The DVMS must be Avigilon (no substitutions).

7.10.19.1.1.3 All IP cameras and CCTV components must be compatible with the Avigilon DVMS.

7.10.19.1.1.4 CCTV system must provide simultaneous monitoring and real-time display, camera control, video playback and recording of multiple video streams.

7.10.19.1.1.5 CCTV cameras must be deployed throughout the Facility for monitoring, recording and surveillance of activities that pertain to the safety of staff, detainees, and public and to security of the Facility

7.10.19.1.1.6

7.10.19.1.2.33.1 people counting;

7.10.21 Paging, UHF Radio

7.10.21.1 Paging System (PA)

7.10.21.1.1 Objective

7.10.21.1.1.1 Install a loudspeaker Paging System to effectively communicate with clear and intelligible messages to all Persons (staff and public) throughout the Building.

7.10.21.1.2 Performance Requirements

7.10.21.1.2.1 Provide all programming for functional operation of the PA system and its integration with the BSCS.

7.10.21.1.2.2 Provide all field equipment, head-end electronics, paging amplifiers, mounting hardware, wiring, terminations and remote I/O modules required to support the various distributed paging controllers, stations, and speakers. Provide programming and setup of all field devices and field modules.

7.10.21.1.2.3 PA system must comprise of Paging System controllers (each capable of standalone operation) operating over the BSCS Data Network. The PA system must be scalable and modular.

7.10.21.1.2.4 Provide PA speakers for complete coverage throughout the Building including, the Accused Holding Area. Courtrooms must not have PA capability.

7.10.21.1.2.5 PA system may be integrated with the Fire Alarm Systems pursuant to all code requirements, provided that the integrated system is operationally and functionally independent and all PA System requirements as described in this Section are met, including PA System paging zones.

7.10.21.1.2.6 PA system must utilize a matrix based system with the following inputs; UHF radios, cellular radios, telephone interface, paging microphones, message box c/w minimum of 10 message recording capacity for zone selection by operators.

7.10.21.1.2.7 PA system includes paging controllers, (software and hardware), amplifiers sized to drive all speakers within each zone with 25% spare capacity for each zone, paging master stations, speakers (mounted out of reach of accused/offender persons, ruggedly constructed and resistant to environmental damage and malicious damage from soil, sprays and inserting objects (contraband) through speaker grille.

7.10.21.1.2.8 Provide software for administration, control, diagnostics and programming the PA system.

7.10.21.1.2.9 All field device wiring must be supervised for short circuit or open circuit faults.

7.10.21.1.2.10 Provide separate paging microphones at the CP and SCR. Paging microphones must have a push to talk and will be in addition to the UHF radio base station. The operator must be able to choose to use one paging microphone to page to the PA system and the UHF radio system (through the push buttons on the HMI screens); or use separate microphones for PA system paging and UHF radio paging (push to talk buttons the base of each paging microphone).

7.10.21.1.2.11 Consult with the Province regarding the operational programming of the PA system including determination of coverage

zones and grouping of multiple zones based on the design of the Building.

7.10.21.1.2.12 PA paging zones are not the same as Fire Alarm System speaker zones (PA zones are operational and user driven, whereas Fire Alarm System zones are driven by BC Building Code requirements), and must be wired as a separate zone for each space as defined by the Functional Program, *excepting* holding cells enclosed single occupancy office spaces and maintenance closets, within which an individual can hear the paging announcement from a nearby PA speaker. Areas contained in an open environment (e.g. open office space) may be combined as one zone. PA announcement volume and intelligibility requirements exceed that of fire alarm speaker announcements.

7.10.21.1.2.13 PA system must be able to generate a tone at scheduled times.

7.10.21.1.2.14 Provide all necessary software and licensing as required to administer, modify and control the operation of the PA system.

7.10.21.1.2.15 Integrate the PA System with the Intercom System to allow paging between systems.

7.10.21.1.2.16 The following program areas require paging capabilities to the locations noted below:

Program Area	Paging Locations			
	Inter-department	Public Waiting Areas Adjacent to Program Space	All Public Areas	Building Wide
Courtrooms			X	
Court Administration		X	X	
Crown Counsel	X			
Sheriff Services	X	X	X	X
Community Corrections	X			

7.10.21.1.2.17 Inter-department paging for Crown Counsel and Community Corrections will be from the front counter station to the open workstations in the local staff area.

7.10.21.1.2.17.1 All local staff in Crown Counsel and Community Corrections must be able to hear their respective front counter paging, without interrupting regular work or causing nuisance.

7.10.21.1.2.18 Courtroom paging will be integrated into the court clerk desk.

7.10.22 UHF Radio System

7.10.22.1 Objective

7.10.22.1.1 UHF radio systems will be used for wireless communications by Province staff throughout the Facility and the surrounding Civic Precinct.

7.10.22.2 Performance Requirements

7.10.22.2.1 UHF radio coverage must encompass the Facility.

7.10.22.2.2 Provide conduits as required from the Main Telecom/BSCS Room to the roof of the Facility for radio communications system.

7.10.22.2.3 Provide all head-end components, antennae, RF cables and handheld communications devices (portable radios) comprising the UHF radio system.

7.10.22.2.4 Provide and install mounting and structural support for antennae.

7.10.22.2.5 The radio system must not cause RFI/EMI interference with any other system; isolate, separate and/or attenuate as required.

7.10.22.3 Prescriptive Requirements

7.10.22.3.1 UHF transmission must be digital and encrypted.

7.10.22.3.2 Provide all necessary base stations with push to talk buttons at each BSCS workstation in CP and SCR.

7.10.22.3.3 Base station radio transmitters must not be located in the SCR or CP and must not be located in any area that causes interference to other ESC sub systems or equipment.

7.10.22.3.4 Provide repeaters as required to achieve required coverage.

7.10.22.3.5 Provide all necessary modules to integrate with the BSCS.

7.10.22.3.6 Provide 45 UHF portable radio units complete with push to talk external speaker microphone (for talking and listening) and charging stations for each radio.

7.10.22.3.7 Digital UHF radio system must be manufactured by Motorola (no substitutes).

7.10.23 Cellular Radio System

7.10.23.1 Objective

7.10.23.1.1 Project Co must work with the Province's preferred provider to develop a cellular radio system throughout the Site.

7.10.23.1.2 The cellular radio system must achieve 100% coverage on all floors of the Facility and reach to the Site boundaries.

7.10.23.1.3 The coverage must meet the BC Sheriffs Work Safe BC requirements.

7.10.23.1.4 Project Co must provide UPS/Emergency power circuits to each location as well as conduit/raceway for routing of all system cabling/fibre for connections by the cellular radio provider at each location.

7.10.23.1.5 The Province's service provider will provide cell repeaters and signal enhancing equipment as necessary to achieve the required coverage. Project Co will provide all other necessary equipment, cabling or other items required to establish a functioning cellular radio system.

7.10.23.1.6 BC Sheriffs will participate in commissioning of the cellular radio system to identify any dead zones or weak zones that do not meet the safety and security needs or Work Safe BC requirements. Project Co will rectify the identified locations with the Province's service provider to achieve the performance required.

7.10.24 Centralized Power Supply (Low voltage) CPS

7.10.24.1 Objective

7.10.24.1.1 Provide a centralized low voltage power supplies to provide low voltage power to BSCS equipment.

7.10.24.1.2 Provide all equipment, mounting hardware, wiring, terminations bulk power systems and distribution panels required to support the various low voltage loads in the Facility.

7.10.24.1.3 Provide single source low voltage distribution systems including, design, supply, manufacture, fabricate, assembly, test, delivery, installation, and field calibration of N+1 redundant DC power supplies.

7.10.24.1.4 Bulk power supplies must be based on N+1 principle and must be configured to power low voltage equipment and devices. Each system must consist of modular power supply, backup interconnectivity and distribution circuit breakers.

7.10.24.2 Performance Requirements

7.10.24.2.1 CPS must be connected to "Critical" (UPS) branch power.

7.10.24.2.2 CPS equipment must be designed for long service life including intermittent or continuous operation. All components must be production proven models.

7.10.24.2.3 CPS low voltage power supply systems and all associated equipment must be rated for and capable of 24 hours per day, seven days per week continuous operation.

7.10.24.2.4 Power supplies must provide status indication for normal operation and trouble/fault conditions.

7.10.24.2.5 CPS must be modular and expandable. It must be possible at a future date to add more modules and associated equipment to the basic installed complement to increase capacity by at least 25%.

7.10.24.2.6 CPS must be designed such that any failure of any component will report an alarm to the SAM and must not result in a complete system failure; the fault must be limited to the failed module.

7.10.24.2.7 All CPS products must conform to CSA standards, or CSA recognized approved equivalent.

7.10.25 BSCS Data Network

7.10.25.1 Objective

7.10.25.1.1 Provide a resilient, high availability BSCS Data Network to support the BSCS and all ESC subsystems.

7.10.25.1.2 Servers and systems must be designed to 99.99% system availability.

7.10.25.1.3 Provide an application environment with high availability to minimize downtime of servers to five minutes or less per occurrence.

7.10.25.2 BSCS Data Network Design

7.10.25.2.1 The BSCS Data Network and server environment must meet or exceed the required system availability of 99.99%.

7.10.25.2.2 The network and server environment redundancy requirements stipulated herein are minimum requirements and do not absolve Project Co from meeting the required availability requirements.

7.10.25.2.3 BSCS Data Network Availability and Redundancy

7.10.25.2.3.1 Communication between and ESC Subsystems is carried out via TCP/IP protocol on Ethernet, on diverse redundant communication paths. If one communications path fails or is disabled, the other path must enable uninterrupted operations. These connections must reside on the BSCS Data Network and must be physically separate from governmental, IT, and corporate networks including the Province data network.

7.10.25.2.3.2 The BSCS Data Network must have a minimum of 99.99% network availability.

7.10.25.2.3.3 Locate the primary core switch and servers in the Main BSCS Room and the backup redundant core switch and servers in the Main CER.

7.10.25.2.3.4 Provide connectivity from access layer switches to the core switch in the Main BSCS Room and the Main CER. Primary connectivity must use the primary BSCS data backbone, backup redundant connectivity must use a redundant secondary BSCS data backbone.

7.10.25.2.3.5 Design and configure the BSCS Data Network architecture so that if the either the Main BSCS Room or the Main CER experiences a catastrophic failure and is lost, the surviving room must continue to operate and the BSCS operation and functionality is not affected.

7.10.25.2.3.6 The design must account for all foreseeable threats affecting network availability and incorporate any mitigation and/or contingency measures necessary to meet the minimum reliability requirement specified in Section 7.10 [Electronic Safety and Security] of this Schedule.

7.10.25.2.3.7 Develop a comprehensive network Disaster Recovery Plan (DRP) for the BSCS in consultation with the Province. As a minimum, the DRP must address all threats identified in the Network Threat and Risk Assessment; and include:

7.10.25.2.3.7.1 a system backup and recovery plan for every server and network switch;

7.10.25.2.3.7.2 recovery plan for all critical system components;

7.10.25.2.3.7.3 software and firmware patch and update plan; equipment end-of-life refresh;

7.10.25.2.3.7.4 the approach to replacing failed equipment; and

7.10.25.2.3.7.5 Include expected impacts for each item including estimated downtime (if any), area affected, and how seriousness of impact.

7.10.25.2.4 Network Devices

7.10.25.2.4.1 The design of the BSCS Data Network must include all required network devices (e.g. routers, core switches, access layer switches, DHCP servers, firewalls etc.) to constitute a fully functional data network supporting the BSCS and all ESC sub systems and ready to connect to the Province data network.

7.10.25.2.4.2 Provide PoE access layer data switches compliant to the current, at time of Service Commencement, IEEE 802.11 standards for Power over Ethernet (minimum IEEE802.11 at PoE+); Access layer data switches must be the current, at time of Service Commencement, production model of the Cisco 3850 series (no substitutes); Each access layer data switch must be connected back to each core switch through a minimum of dual 10Gb uplinks, configured to maintain continuous connectivity in the event of failure and recovery of any one of the core switches and one of the access

layer switches in a stack; Provide multiple switches as necessary to support connected devices and multiple stacks as required to avoid oversubscribing, with each stack connecting back to the core switches. Employ the current, at time of Service Commencement, version of Cisco Stackwise, Cisco Virtual Switching System (VSS), and Cisco StackPower.

7.10.25.2.4.3 All network devices must employ Quality of Service (QoS).

7.10.25.2.4.4 Provide managed network devices and any required interfaces for devices to transport high bandwidth data information on an Ethernet network to head-end processing and recording equipment over copper UTP or fibre optic cabling. Provide power injectors as required to support devices and associated components installed.

7.10.25.2.4.5 Provide media converters required to encode and decode transmission of signals over copper and fibre cables.

7.10.25.2.4.6 Provide core switches located in the Main BSCS Room and Main CER configured to operate in 2N redundancy mode.

7.10.25.2.4.7 Failure and recovery of any one of the core switches must not disrupt the operations of the BSCS and its connected devices.

7.10.25.2.4.8 Failover time from one core switch to the surviving core switch must be not exceed one network heartbeat (128ms).

7.10.25.2.4.9 BSCS Data Network core switches must be the current, at time of Service Commencement, production model of the Cisco 6500 series (no substitutes) switches complete with dual power supplies and fan trays operating in 2N redundant mode, all required cards to support connected servers and network appliances (including Supervisory 720-10GE cards).

7.10.25.2.4.10 Provide multiple core switches as required to support all Communications and BSCS servers and network appliances in accordance with Sections 7.9 [Communications] and 7.10 [Electronic Safety and Security] of this Schedule, respectively.

7.10.25.2.4.11 Employ the current, at time of Service Commencement, version of Cisco Virtual Switching System (VSS).

7.10.25.2.5 Virtual Server Environment

7.10.25.2.5.1 All servers must be virtualized using the latest, at time of Service Commencement, supported VMware.

7.10.25.2.5.2 Provide all required software, operating systems and licensing to support the virtualized environment.

7.10.25.2.5.3 All server virtual machines must have High Availability instances so that failure of any non-critical VM must limit the disruption to the time it takes for the secondary VM instance to boot up (five minutes or less).

7.10.25.2.5.4 Provide all necessary hardware, software and licensing so that the Main CER becomes the 2N redundant disaster fail over site for all 2N redundant BSCS and Communications servers and data switches. In other words, if the Main BSCS Room is lost, all services must automatically fail over to the Main CER as the backup fail over disaster site.

7.10.25.2.5.5 Storage of DVMS data and VM profiles and data must be on SANs (storage array network). Each SAN must have 2N internal redundancy (e.g. 2N power supplies, minimum 2N disk controller, 2N backplane). Failure of one of the disk controllers, or recovery from failure, must not impact the operation of the SAN or BSCS in any manner.

7.10.25.2.5.6 Locate the primary SAN in the Main BSCS Room and a fully redundant secondary failover SAN in the Main CER as the disaster failover site. The catastrophic failure or recovery from failure, of one of the SANs must not impact the operation of the BSCS in any manner.

7.10.25.2.5.7 Configure the SANs with a RAID array: so that failure of one drive, replacing of a failed drive, and recovering from a failed drive must not impact the BSCS operations in any way; provide a global hot spare for each SAN; with adequate IOPs (input/output operations) and bandwidth to support the BSCS with no perceivable delay or latency.

7.10.25.2.6 Bandwidth Management

7.10.25.2.6.1 The BSCS Data Network must have adequate bandwidth throughout to transport BSCS data without delay or latency that impedes normal operations by Province staff.

7.10.25.2.6.2 The BSCS Data Network must employ mechanisms to prevent over-subscription by ESC sub-systems throughout the entire network; the mechanisms used must calculate the available bandwidth, determine actual usage (i.e., admission control), and deploy corrective actions to prevent over subscription when the available bandwidth is exceeded at any point in the BSCS Data Network.

7.10.25.2.7 Quality of Service

7.10.25.2.7.1 The BSCS Data Network must employ QoS and priority queuing as necessary to achieve and maintain optimal network performance.

7.10.25.2.7.2 The BSCS Data Network must employ QoS algorithm(s) and priority queuing to manage jitter, delay, packet loss and collisions to optimize and maintain data network performance.

7.10.25.2.7.3 The BSCS Data Network must be designed to permit a voice over IP telephony solutions and meet or exceed International Telecommunications Union (ITU) Standards for voice quality to achieve voice quality comparable to that offered on a circuit-switched voice network.

7.10.25.2.7.4 QoS algorithms must facilitate IP-based audio and video communications such as the Video Visitation system with little to no delay in the video component, and voice quality meeting or exceeding that for Voice-over-IP telephony applications.

7.10.25.3 BSCS Data Network Performance

7.10.25.3.1 Employ VLANs, subnets, QoS, bandwidth management as necessary to achieve and maintain optimal network performance.

7.10.25.3.2 Optimize network performance to achieve the system speeds as described in this Section.

7.10.25.3.3 Optimize network to support IP video and IP audio as follows:

7.10.25.3.3.1 employ an IP network that complies with ITU-T G.114 standards, including the requirement for a one-way delay budget of not more than 150 ms for high voice quality;

7.10.25.3.3.2 compliant with ITU-T G.165 for echo cancellation; and

7.10.25.3.3.3 video and audio quality must meet or exceed the ITU-T standards with a MOS score of 4.0 or greater.

7.10.25.4 BSCS Data Network Security

7.10.25.4.1 Network Security Principles

7.10.25.4.1.1 Provide security applications having flexibility to be installed on various network components including the LAN switch and WAN routers as either additional hardware or software.

7.10.25.4.1.2 Provide one common management platform for all security devices in order to give consistent and efficient implementation of security policy.

7.10.25.4.1.3 Network security must support published standards where they exist.

7.10.25.4.1.4 Network security must employ strong endpoint user authentication compliant with IEEE 802.1x.

7.10.25.4.2 Firewalls

7.10.25.4.2.1 Provide appliance type firewalls (software firewalls are not permitted) and configured to align with the security mitigation measures arising from Network Threat Risk Assessment and the Facility TRA.

7.10.25.4.2.2 Provide firewall protection for layers 3-7 of the OSI model including stateful packet inspection.

7.10.25.4.3 Network Intrusion Detection

7.10.25.4.3.1 Provide network intrusion detection and access control capable of supporting all network devices and users.

7.10.25.4.3.2 Provide network intrusion detection for protection against external/internal threats.

7.10.25.4.3.3 Provide host-based intrusion detection for protection of all servers connected to the BSCS Data Network.

7.10.25.4.3.4 Consult with the Province on network access levels prior to configuration.

7.10.25.4.4 Network Authentication

7.10.25.4.4.1 Authentication must be token-based.

7.10.25.4.4.2 Provide dedicated DHCP server (embedded DHCP servers are not acceptable).

7.10.25.4.4.3 Provide primary domain controller and AD (active directory). Populate users in AD in consultation with the Province.

7.10.25.4.5 Network Monitoring, Reporting and Diagnostics

7.10.25.4.5.1 Provide network monitoring for the BSCS Data Network to allow reporting and diagnostics by Project Co and the Province for investigative, auditing and diagnostic purposes.

7.10.26 BSCS Central Time Server

7.10.26.1 Basic Requirements

7.10.26.1.1 Provide a central time server to synchronize all Communications and BSCS servers.

7.10.26.1.2 BSCS Central Time Server must be GPS based and obtain time from localized geo-synchronous satellite(s).

7.10.26.1.3 Employ automatic switch over to day light savings time.

7.10.26.1.4 BSCS Central Time Server must communicate and synchronize all servers and workstations connected to the BSCS Data Network.

7.10.26.1.5 Integrate the BSCS Central Time Server to synchronize the clock system, BMS, and lighting control system.

7.10.26.2 BSCS Maintenance and Administration Workstations

7.10.26.2.1 For each ESC sub system that requires a dedicated computer for administration of the ESC sub system, provide a rack mounted maintenance administration workstation (MAW) PC in both the Main BSCS Room and Main CER complete with all required administration software

and licensing. ESC sub systems that do not required a dedicated PC for the administration software, may be installed on the same MAW PC.

7.10.26.2.2 Provide one rack unit (RU) slide out monitor, keyboard and mouse/trackball with integrated minimum 8 input KVM switch for all MAW PCs and servers. Provide slide out monitor with KVM switch as necessary to connect to all MAW PCs and BSCS servers in the Main CER and Main BSCS Room.

8. SITE AND INFRASTRUCTURE SUBGROUP SPECIFICATIONS

8.1 General

The Civil design requirements apply to those aspects of the design that pertain to the Site, underground utilities, roads onsite and offsite, and storm drainage.

The design requirements presented herein are general in nature and may not be applicable in every situation. Project Co is responsible to use its professional judgement in all aspects of the design.

Buried utilities are to be provided with sufficient cover and protection to withstand long term loading from loaded vehicles and from frost.

All works shall be performed in accordance with the standards set out in Section 2.1 as well as the Provincial Land Development Guidelines in the control and prevention of erosion and sediment during all phases of construction. No release of site sediment laden waters or deleterious substances is permitted into any existing City storm or drainage system during any phase of the development of the lands.

8.2 Earthworks (Division 32)

8.2.1 Refer to:

8.2.1.1 Geotechnical and Environmental information forming part of the Disclosed Data;

8.2.1.2 Bylaws around trucking and soil removal; and

8.2.1.3 City of Abbotsford Erosion and Sediment Control Bylaw.

8.3 Exterior Improvements (Division 33)

8.3.1 Trethewey Upgrading

8.3.1.1 Under the approval process for the City design and implement the improvements listed below:

8.3.1.1.1 widen curb lane to 4.6m;

8.3.1.1.2 barrier curb and gutter;

8.3.1.1.3 1.65m boulevard improvements including soil to support trees;

8.3.1.1.4 2.5m enhanced concrete sidewalk on the west side;

8.3.1.1.5 new line painting entire roadway along frontage;

8.3.1.1.6 ornamental streetlights;

8.3.1.1.7 drainage works for roadway; and

8.3.1.1.8 traffic signage.

Engineered drawings are to be submitted along with a traffic control plan to the City for approval and comment prior to construction.

8.3.2 Driveways/Access

8.3.2.1 Provide a roadway system that complies with the following:

8.3.2.1.1 Primary vehicular access and egress to the Site must be from Veterans Way.

8.3.2.1.2 Arrange the Site for efficient and safe access into and throughout the Site;

8.3.2.1.3 Standard design private vehicles and Z class vehicles (oversized transport vans) must be able to pass Heavy Single Unit (HSU) Trucks at all times on the roadways.

Sheriff Z-Class Vehicle specifications are as follows:

- Height: 2591 mm
- Width: 2640 mm
- Length: 7235 mm
- Rear overhang: 1830 mm
- Turning radius clearance (minimum): 8497 mm
- Outside radius: 8734 mm
- Inside radius: 4870 mm
- Curb weight: 6,046 kg
- Gross vehicle weight: 11,300 kg

8.3.2.1.4 Z class vehicles must be able to pass each other in opposing directions under all conditions.

8.3.2.1.5 The shipping and receiving zone must be able to accommodate a Heavy Single Unit (HSU)Truck.

8.3.2.1.6 Any ramps must be a minimum width of 6.1 m with a maximum vertical grade of 12.5%.

8.3.2.1.7 Design roadway geometrics to enable access and egress by Z class vehicles for the Accused Holding Area so that the vehicle can perform a 360 degree unencumbered turn.

8.3.2.1.8 If required, design the roadway for the Loading dock such that Heavy Single Unit (HSU) Truck can be maneuvered in a three point turn.

8.3.2.1.9 Adhere to local municipal bylaws and standards where interfacing with District roads and intersections.

8.3.2.1.10 Pave all roads within the Facility.

8.3.2.1.11 Provide a vertical concrete curb on all road edges.

8.3.2.1.12 Provide concrete sidewalks adjacent to all roads.

8.3.2.1.13 Provide a minimum of one access point to/from Veterans Way that allows continuous access to all parts of the roadway.

8.3.2.1.14 Provide concrete paved walkways for routine foot traffic including pathways from parking areas and roads to entry doors and to exterior equipment and structure that require routine access.

8.3.2.2 Grade

8.3.2.2.1 Provide roads that meet the following grade requirements:

8.3.2.2.1.1 minimum gutter grade of 0.5%;

8.3.2.2.1.2 minimum longitudinal gradient around curb returns of 1.00%;

8.3.2.2.1.3 allow for anticipated settlements in design grades to assure that future grades meet allowable minimums; and

8.3.2.2.1.4 direct surface drainage to the stormwater collection system.

8.3.2.3 Cross Sloping

8.3.2.3.1 Provide roadways that meet the following cross sloping requirements:

8.3.2.3.1.1 include a centre-line crown with standard cross-slope of 2.0%; or

8.3.2.3.1.2 include a continuous cross-fall of 2.0%.

8.3.3 Sidewalks

8.3.3.1 Provide roadways that meet the following cross sloping requirements:

8.3.3.1.1 have a cross-fall of 2% towards the road curb;

8.3.3.1.2 have a minimum width of 1.5 m;

8.3.3.1.3 are a minimum 125 mm thick when adjacent to roll-over type curb and gutter, or 100 mm thick when independent or adjacent to barrier type curb and gutter;

8.3.3.1.4 include wheelchair ramps at all intersections where curbs separate sidewalks; and

8.3.3.1.5 locate wheelchair ramps at the mid-point of the curb return.

8.3.4 Pavement

8.3.4.1 Provide pavement based on the following design criteria:

8.3.4.1.1 minimum design life of 20 years;

8.3.4.1.2 design to be based on methods encompassed by Chapter 6 "Pavement Structural Design" of the Transportation Association of Canada (TAC) Pavement Management Guide;

8.3.4.1.3 consideration of the subgrade soil type, frost susceptibility, moisture conditions, subgrade drainage provision, and any special vehicle loads as foreseen; and

8.3.4.1.4 asphaltic concrete.

8.3.5 Stormwater Drainage

8.3.5.1 General

8.3.5.1.1 Provide an Engineer certified stormwater management plan to demonstrate how runoff is handled on-Site, treated, stored and infiltrated. Construct the drainage to match this plan. The work identified in the plan must be completed before Service Commencement.

8.3.5.1.2 Relocate any existing storm sewer under the Building.

8.3.5.2 Detention and Infiltration

8.3.5.2.1 The underlying soil is generally gravel and sand, which is suitable for infiltration.

8.3.5.2.2 Provide on-Site source controls and infiltration in accordance with the City’s Development Bylaw without a service connection.

8.3.5.2.3 Provide on-Site detention for 1 in 100 year events.

8.3.5.2.4 Provide sealed geotechnical design documentation if infiltration facilities are located within 5m of foundations.

8.3.5.2.5 Construct treatment devices to treat runoff from pollutant-generating surfaces such as roads, driveway and parking areas with overflow directed to underground infiltration facilities designed for 100-yr rainfall.

8.3.5.2.6 Provide a minimum 300 mm absorbent soil for lawn and other permeable areas.

8.3.5.3 Site Grading

8.3.5.3.1 Provide site grading to the following minimum requirements:

8.3.5.3.1.1 grade all areas of the Site to stormwater drainage systems; and

8.3.5.3.1.2 grade areas around buildings/tankage away from foundations at a minimum of 1%.

8.4 Utilities (Division 34)

8.4.1 Sewer

8.4.1.1 Provide sewer service in accordance with the City's Development Bylaw.

8.4.1.2 Nearest trunk main runs north along west boundary of the Site.

8.4.1.3 Depending on building/parking layout, potential realignment of portion of section between Veterans Way and George Ferguson Way may be required.

8.4.1.4 Extend a 200 dia. sewer from the Facility and connect to the trunk main.

8.4.1.5 No offsite improvements required.

8.4.2 Water Supply and Fire Protection

8.4.2.1 Water supply to meet the demands outlined by the mechanical engineer for both domestic and fire protection. Service to be a minimum 250mm main from the 400mm main in Trethewey Street.

8.4.2.2 A domestic water meter, between 50mm and 100mm in diameter, is required at the property line. A separate fire service is required at the property line or alternatively housed in the mechanical room. If placed in the mechanical room then a Cat 6a wire needs to go to the exterior such that the City may mount an antennae. The fire service line requires a double check assembly and a tattle tale meter.

8.4.2.3 A minimum of two (2) fire hydrants will be required. One at the north-east corner of the Site connecting to the existing 150mm diameter watermain that extends to the library and a second connecting to the required new 250mm service.

8.4.2.4 Provide water service in accordance with the City's Development Bylaw.

8.4.2.5 Buildings on Site to be designed such that Fire Underwriters Survey (FUS) calculated requirement is below what City water system can provide.

8.4.2.6 No offsite improvements required.

Appendix Schedule

APPENDIX 3A - Functional Space Requirements

APPENDIX 3B - Acoustics and Noise Control

APPENDIX 3C - Systems Responsibility Matrix

APPENDIX 3D - Networks