

What is The DC350 - Design Requirements Manual?

The DC 350 Design Requirements Manual provides a comprehensive description of the minimum acceptable design requirement standards for buildings designed, constructed owned and maintained by the Department of Transportation and Infrastructure Renewal for the Province of Nova Scotia.

The DC 350 Design Requirements are to be read in conjunction with project specific scope of work documents.

How is the DC 350 Design Requirements Manual Organized?

The DC350 consists of two main Parts.

- **Part 1 General Design Requirements** contains 2 Sections:
 - Part 1 Section 1 is a General Design Requirements Overview.
 - Part 1 Section 2 is a description of minimum design requirements organized by Division and Section as follows:
 - Information contained within the Section 2 technical sections of the DC350 are numbered in conformance with the Master Format List of Divisions and Sections Titles and Numbers, published jointly by Construction Specifications Canada and the Construction Specifications Institute (CSI), and are arranged in their standard 50 - Division format.

- **Part 2 Design Requirements by Typology** documents are narrow in scope, provide specific standards for the topics covered, and specify detailed requirements regarding materials and assemblies.
 - Part 2 is divided into 2 Sections: These Section documents are provided as Appendices.
 - Part 2 Section 1 is the Electrical Structured Cable Guidelines Appendix
 - Part 2 Section 2 contains four Appendix Documents specific to the Education Specific Typology including:
 - Education Facilities Performance Criteria, Appendix A
 - Education Facilities Drawing Review Process, Appendix B
 - Education Facilities Drawing and Sketch Details, Appendix C
 - Education Facilities Gymnasium Floor Layouts, Appendix D

How does the DC350 address the various authorities, codes and standards used?

Where reference is made in the DC350 to:

- Jurisdictional Authorities:
 - It shall mean all authorities having, within their constitutional powers, the right to enforce the laws of the place of the Work.

- Codes, Standards, or References
 - Where the edition date is not specified, the code, standard or reference is considered that of the latest edition, including amendments, approved by the issuing organization.
 - In the case of a code, standard or reference date that is updated during the design or construction of a project, the date that is effective on the tender release date of the project will be the code, standard or reference that applies
 - Where such references are at variance with each other, the more stringent requirements shall govern.
 - In some specific cases an older standard may be specifically referenced; this situation will be specially noted as such in the DC350 as is not the typical or norm.

How does the DC350 address manufacturer's directions, instructions, and specifications?

- Where reference is made to the manufacturer's directions, instructions, or specifications, they shall be only those that are printed and issued for the specific project.

- Reference shall include information on storing, handling, preparing, mixing, installing, erecting, applying or other matters concerning the materials with which they represent.

What considerations should be given to products and manufacturers included in the DC350?

- Products, manufacturers, and systems are listed in the DC350 in order to provide a reference Standard of Acceptance.

- Products, manufacturers and systems specified in the DC350 indicate examples of products or manufacturers that meet the minimum design guideline requirements of the DC350. Other products and manufacturers that meet the DC350 stated design guideline requirements are considered Acceptable Alternates and can be used in the project specifications.

- A Variance form Request should be filled out for all products that do not meet the DC 350 Design Guideline.

What is the Request for Variance Process during the Design Process?

- Requests for variances from the products, manufacturers and systems in the DC350 may be made during the design process for the specific projects using the Variance Form included in the DC350 Manual.
- Acceptable alternative products manufacturers and systems, equal to or exceeding the specified standard of acceptance, will be considered by the Department, and are encouraged.
 - Requests for Variances for a specific product must be provided in writing by the Consultants to DTIR by using the Variance Form included herein and must include an explanation of the reason for the request, including cost impact of using the product.
 - The Ministers representative must be provided with sufficient information and shall be allowed a minimum of 10 working days to evaluate the request. If applicable, include with information, any changes required in the work to accommodate such products or systems.
 - Incorporate such requested products or systems only when approved in writing by the Ministers Representative.
 - The Department's approval or rejection of the requested product or system is for a specific project for which the review is being sought. A separate request is required for each project where a product is desired to be considered.
 - The Minister reserves the right to refuse to evaluate any requests received after the Schematic Design Stage for the project.
 - Variances which have not been submitted for approval during the Schematic Design Stage and subsequently approved by the Ministers Representative, may be rejected. In such a case, redesign costs will not result in additional design fees to the Minister.

What is the DTIR Process given to Requests for Variance?

- The Department reserves the right to review, comment, accept or reject products which are not the design standards incorporated in the DC350.
- The Department reserves the right to reject products which have failed to perform satisfactorily or meet DC350 stated requirements in previous NS government projects.

What is the Request for Variance Process during the Tender process?

- Request for Variance by Manufacturers during the Tender period must be made prior to the appropriate time outlined in the project's tender documents to allow for inclusion in addenda. Requests after this time stated in the Tender documents will not be considered.

Governance: In the event of differences between portions of the DC350

- In the event of conflicts between the various Parts of the DC350, or between the DC350 and its appendices, the following shall apply:
 - The executed Agreement between the Minister and any contracting body shall govern over all parts of the DC350, and Design Briefs.
 - Project specific Design Briefs shall govern over the DC350.
 - Where requirements of DC350 Part 1 General Design Requirements have not been changed, specifically exceeded or amended in Part 2, the requirements of Part 1 shall be considered the minimum standard.
 - Where requirements of DC350 Part 2 Design Requirements by Typology including Electrical and Education Specific Standards have changed, specifically exceeded, or amended information provided in Part 1, the Requirements of Part 2 shall govern.
 - DC350 Documents of a later date shall govern over DC350 documents of an earlier date.
 - DC350 Schedules shall rule over DC350 drawings.
 - DC350 drawings with figured dimensions shown on a drawings shall govern over dimensions scaled on drawings.
 - DC350 Drawings of larger scale shall govern over those of smaller scale.

END

DC350 REQUEST for VARIANCE

	Provide Variance Data Below
Date	
Firm	
Project	
DTIR Internal Project Number	
Variance Discipline (A/M/E/C)	
Requesting Variance from DC350	
Part	
Section	
Specification/Appendix	
Reason for Variance	
Proposed Alternate	
Estimated Cost/Credit	
Consultant Signature	
DTIR Representative Signature (A/M/E/C):	
Date	
Approved	
Rejected	
Note: Variance applies to this specific project only.	
Note: DTIR signatory is Senior A/M/E/C	

**PROVINCE OF NOVA SCOTIA
DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE RENEWAL**

DTIR Document DC350

PART 1

DTIR DESIGN REQUIREMENTS

Section 1

**DTIR General
Design Requirements**

2020 EDITION

November 2020

This portion of the DC350 document provides a comprehensive description of Department requirements for buildings, campuses, systems, and assemblies that perform particular functions and enable the Minister and the Consultant to identify the minimum acceptable standards during the Design and Construction stages, as well as, Site Reviews and Contract Administration requirements during construction under the Form of Agreement between The Province of Nova Scotia and the Consultant.

1 Codes, Standards, Bylaws and Acts:

1.1 The Department of Transportation and Infrastructure Renewal DC350 2020 Design Requirements Manual and the latest amended edition of the following documents provide the minimum standards for building design and construction. Where requirements conflict, the more stringent requirement shall govern unless noted otherwise in the adoption of various codes and acts. Design, in its entirety, shall be governed by all applicable codes, bylaws, standards, acts and regulations in the place of work, including but not limited to:

- The Nova Scotia Building Code Regulations, made under Section 4 of the Building Code Act.- Current Edition and Errata
- NRC-CNRC National Building Code of Canada- Current Edition and Errata
- The Model National Energy Code of Canada for Buildings.
- CAN/CSA B651 Accessible Design for the Built Environment.
- ASHRAE Handbooks and Standards, selected portions of 90.1.
- IES
- AMCA 99 2007 Standards Handbooks
- CSA B51, Boiler, Pressure Vessel, and Pressure Piping Code
- CSA B52 Mechanical Refrigeration Code
- CSA C22.1, Canadian Electrical Code, Part 1 Safety Standard for Electrical Installations
- CAN/CGA B149, Natural Gas & Propane Installation Code
- CAN/CSA-B139, Installation Code for Oil Burning Equipment
- Industrial Ventilation Manual by the American Conference of Governmental Industrial Hygienists.
- National Plumbing Code of Canada
- NFPA 13 Standard for the Installation of Sprinkler Systems
- NFPA 14 Standard for the Installation of Standpipe, and Hose Systems
- NFPA 17A Standard for Wet Chemical Extinguishing System
- NFPA 20 Standard for the Installation of Stationary Pumps for Fire Protection
- NFPA 22 Standard for Water Tanks for Private Fire Protection
- NFPA 24 Standard for the Installation of Private Fire Service Mains and their Appurtenances
- NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- Nova Scotia Department of Environment - Petroleum Management Regulations
- SMACNA HVAC Duct Construction Standards - Metal and Flexible
- SMACNA Air Duct Leakage Test Manual
- National Fire Code of Canada
- Safety Code for Elevators- CAN/CSA-B44
- IESNA/ANSI, RP-3, Educational Facilities Lighting, selected portions
- CAN/CSA-Z614 Children's Play Spaces and Equipment

- CAN/ULC-S524 Standard for the Installation of Fire Alarm Systems
- CAN/CSA-T568.1, ANSI/TIA/EIA T568-B.1 Commercial Building Telecommunication Cabling Standard – Part 1
- IEEE Standard 241-1990 Electrical Power Systems in Commercial Buildings
- CAN/CSA-C282, Emergency Electrical Power Supply for Buildings
- Nova Scotia Special Places Protection Act - an act to provide for the preservation, regulation and study of Archaeological and Historical Remains and Paleontological and Ecological sites.
- Nova Scotia Architects Act
- The Nova Scotia Engineering Profession Act
- Interior Designer Act of Nova Scotia
- Nova Scotia Occupational Health and Safety Act
- Nova Scotia Fire Safety Act - an act to amend and consolidate the Acts relating to Fires and Fire Escapes.
- Nova Scotia Ditches and Water Courses Act
- Canadian Water Act - an act to preserve and protect the Beaches of Nova Scotia.
- Ozone Layer Protection Act - An Act to protect the Ozone Layer from further damage.
- Erosion and Sedimentation Control Handbook for Construction Sites - Nova Scotia Department of Environment
- Nova Scotia Environment Act
- Nova Scotia Department of Transportation Standards Specification Highway Construction and Maintenance
- Halifax Regional Municipality Design Guidelines – HRM Design and Construction Services
- Halifax Regional Municipality Standard Details – HRM Design and Construction Services
- Halifax Regional Municipality Drawing Standards – HRM Design and Construction Services
- Design Specifications & Supplementary Standard Specifications for Water, Wastewater and Stormwater Systems – Halifax Water
- Standard Specification for Municipal Services – Nova Scotia Roadbuilders – Consulting Engineers of Nova Scotia- Landscape Nova Scotia
- Geometric Design for Canadian Roads and Streets - Transportation Association of Canada
- Manual on Uniform Traffic Control Devices -Transportation Association of Canada
- Nova Scotia Department of Labour and Workforce Development guidelines and regulations.
- Asbestos Control in Buildings - Pinchin and Associates
- Standard Specification for Municipal Services - NSRBA and NSCEA
- CSA approval on all equipment
- Canadian Electrical Code
- CGBC LEED, current version for the specific project seeking certification.
- Leadership and Environmental Design LEED Reference Guide for Building Design and Construction –

- ASHRE Handbook HVAC Applications. Noise and Vibration Control, Chapter 48
- ANSI S12.60. Acoustical Performance Criteria and Design Requirements and Guidelines for Schools
- Municipal By-laws and regulations
- Other standards to be found elsewhere in this Manual

1.2 Consult with authorities having jurisdiction in the place of work and provide documentation thereof (see Contract Agreement).

2 Nova Scotia Sustainable Development Goals Act

2.1 The DC350 design guidelines support the Nova Scotia Bill No. 213 Sustainable Development Goals Act including mandates such as the following:

- reduce greenhouse gas emissions by 53% below 2005 levels by 2030
- achieve net-zero emissions in Nova Scotia by 2050

3 Nova Scotia's Climate Change Action Plan (NSCCAP).

3.1 The DC350 design guidelines support the NSCCAP including its goals and mandates such as the following:

- NSCCAP has two main goals: reducing our contribution to climate change by reducing our greenhouse gas (GHG) emissions and preparing for changes to our climate.
- Actions identified in this plan which are specifically aimed at provincial government buildings include the improvements to the energy efficiency of new buildings and renovations, and effective 2011, amend the Nova Scotia Building Code Act to require all new commercial buildings of more than 600 m² to exceed the 1997 Model National Energy Code for Buildings by at least 25 per cent, or to adopt the updated version of the 1997 Model National Energy Code for Buildings expected in 2011.

3.2 The Consultant is required to submit all LEED required design documentation and to include for all contractor required documentation in the tender documents.

3.3 Sustainable Procurement Policy

3.4 When requested, assist DTIR staff in the development of tender evaluation criteria for products, systems or materials incorporated into the design in order to improve economic, social or environmentally sustainable government purchases. For example, the Minister will be interested to consider recommendations for the use of products manufactured in or near Nova Scotia, manufactured from renewable resources, recycled materials, or companies which have a written, publicly available policy or commitment to operating in a sustainable manner.

4 Submissions and Approvals:

4.1 Approval by the Minister's Representative of specific designs, systems, products, shop

drawings, reports and any other documents specific to and required for the project, throughout the development stages of the project, does not in any way limit the responsibility of the consultant to comply with all applicable codes, regulations and standards, including the DC350 Design Requirements Manual.

- 4.2 As required by the scope of work the Consultant shall prepare and submit a Site Concept Plan for review and approval by the Minister prior to proceeding with construction drawings and commencement of site work. The Site Concept Plan shall be prepared by a qualified site designer such as a professional landscape architect, architect or civil engineer with proven experience with projects of similar scope and size.
- 4.3 The Site Concept Plan shall be based on the program or preliminary design provided by the Minister and on information provided in the following Sections of the DC350 pertaining to site as appropriate to the project.

5 Site Planning:

- 5.1 Ensure that all areas of the site are safe for public use.
- 5.2 Site Planning objectives shall include the following:
- Minimize the impact of development on the site.
 - Retain as many natural site features as practical.
 - Preserve existing vegetation, especially forest / treed areas or specimen trees to the largest practical extent.
 - Conserve existing topsoil.
 - Plan new development to suit existing topography; accommodate existing changes in grade and incorporate in the design of buildings, paved areas and outdoor facilities.
- 5.3 Site Design
- Locate the building relative to the street and specialty areas considering use by the building staff, other occupants and visitors. Consider appropriateness of the building location relative to the street for security and safety of building users. Traffic patterns around the building are to take into consideration safety and security of the building and its users.
- 5.4 Where play and recreational areas are in the program, design shall ensure they are:
- barrier free
 - sheltered by landscaping and, where possible, are south facing
 - in close proximity to the building, with access as direct as practical
 - completely visible from the site exterior, from the main street or thoroughfare, and easily viewed from the designated supervising area within the building.
 - Apply (Crime Prevention Through Environmental Design) CPTED Principles to the site design

- 5.5 The layout of roads, driveways, parking areas and walkways shall meet the following requirements:
- control traffic patterns and access
 - separate pedestrians and vehicles
 - accommodate local active transportation infrastructure that is adjacent to or within the site
 - provide fire protection vehicle access
 - provide safe and convenient access to services areas
 - provide vehicle barriers where necessary to restrict public access
 - provide access for maintenance
 - incorporate recommendations of the Traffic Impact Study or Statement.
- 5.6 The design of the principal site areas such as sports fields, play areas, outdoor learning areas and other facilities shall meet the following requirements:
- compliance with current standards including Barrier Free
 - consideration of specific site conditions and community needs including historical use of the site
- 5.7 Future Expansion:
- Make provision in design to accommodate possibility of future expansion as directed in the Scope of Work, addenda or change orders for the project.
- 5.8 Provide adequate protection and control of surface water drainage. Resolve water supply, rainwater run-off, and sewage disposal issues within the boundary of the site in a manner that does not affect any neighboring property nor existing water courses. Design surface water management to Nova Scotia Environment and applicable Municipal Standards.
- 5.9 Where new buildings or additions are required in the design, consider orientation of the structure to utilize passive solar potential, natural light and view(s).
- 5.10 Where the structure is an addition, integrate with the existing building and site layouts. Minimize changes to site access, servicing and site circulation infrastructure.
- 5.11 Design such that the development will have a minimal impact on any of the neighboring properties. Provide sufficient separation buffers to address adjacency impact concerns. Address impact concerns by using distance, site grading, landscaping and any other measures necessary and appropriate to the site.
- 5.12 The site shall be graded to accommodate intended uses and provide drainage and to blend with the surrounding topography with minimal disturbance to natural features. Slopes shall not exceed 1:4 (rise: run) unless approved by DTIR Where slopes exceed 1:2, retaining walls shall be provided. At the top of retaining walls and at other hazardous locations, provide a safety guard or fence, as deemed necessary by DTIR and applicable codes.

5.13 Water Courses

- A watercourse is defined by the Nova Scotia Department of Environment Regulations and Acts as the bed and bank of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water - whether it contains water or not. Ensure all in-stream work is done during the low flow months, June through September, under permit from the authority having jurisdiction.
- Existing watercourses and natural drainage patterns should be identified, preserved and incorporated into the site design.
- Existing water courses cannot be diverted or altered without approval from the Department of Environment. Where existing water courses are to be affected by design, contact the Department of Environment, take appropriate action and obtain such approval, as required.
- The Contractor must refrain from any action that may cause silt or contaminated runoff from reaching a watercourse. Grubbing of the site is not to commence until all perimeter controls are in place. Ensure Earthwork practices onsite adhere to the Provincial and Municipal Erosion and Sediment Control standards. In addition to the following principles, the Designer must prepare an Erosion and Sedimentation Control base plan for use by the Contractor in preparing the detailed Erosion and Sedimentation Control Plan.
- Ensure exposed surfaces are stabilized and protected from erosion. Do not apply hay to areas to be seeded for sports fields. Use straw or other seed free material.
- Minimize the length of time soil is exposed.
- Prevent siltation from leaving site by confirming that erosion and sediment control devices are in place, functioning and maintained. All run-off from the site shall be free of sediment.
- Avoid disturbing steep grades. Avoid constructing steep grades.
- Erosion and sedimentation controls are to be in place prior to disturbing the ground and are adequate for any storm event.

5.14 Driveways

- Provide for vehicle access as required by DTIR and as required to accommodate building servicing.
- Design driveways to requirements of Geometric Design for Canadian Roads and Streets issued by the Transportation Association of Canada and meeting all local requirements.
- Provide direct pedestrian access to the main entrance without crossing a roadway.
- Where walkways are adjacent to roads, concrete curb or other approved protected separation must be provided, unless works are being constructed to extend or match existing walkways without such separation. Provide curb cut as per barrier free codes.
- Where separate driveways for bus and car access meet the public road, they must be separated by a minimum distance of 46.0 metres, or be specifically reviewed and approved by the local traffic authority.
- All two way driveways shall be a minimum 7.3 m wide, except services driveways,

See Service Areas, paragraph 4.17 below.

- Surfaces shall be sloped to provide drainage in accordance with the site Stormwater Management Plan. Storm drainage shall be connected to a Municipal storm drainage system subject to the approval of the owner of the storm sewer and the Nova Scotia Department of Environment.
- Driveways shall be bordered by curbing, guard rails, fencing, or other measures approved by DTIR to prevent vehicle access to landscaped areas.
- Pedestrian crossovers shall be identified with appropriate crosswalk markings.
- Any variation of the above shall be reviewed and approved by the Minister prior to commencement of construction.
- All signage shall conform to the Transportation Association of Canada Manual on Uniform Traffic Control Devices, latest edition.

5.15 Parking:

- Provide general and Barrier-Free parking near the building in accordance with local by-law and DTIR direction.
- Parking space allocation, if in excess of municipal requirements, will be identified in the Project Program.
- Locate parking required for staff in proximity of a primary or secondary entrance to the building or design.
- Locate parking areas to minimize their visual impact on the street / entrance view of the building.
- Parking spaces shall be 2.75 m wide x 5.5 m long as painted.
- Barrier-free parking stalls shall be not less than 2.4 m wide by 5.5 m long provided on one side with an access aisle not less than 1.5 m wide. A single access aisle can serve two adjacent parking stalls.
- Driveways through parking areas shall be 7.3 m wide except where the driveway is part of a fire route, in which case the width shall be subject to the approval of the Fire Marshall.
- Parking areas shall be sloped for surface drainage to the site storm water management system.
- Parking areas shall be bordered by curbing, guard rails, boulders, fencing or posts to prevent vehicle access to landscaped areas. Other methods may be accepted subject to design review.
- Allocate space for carpool and secure bicycle parking.
- Consider permeable paving and travel surface alternatives.

5.16 Bus Loading / Unloading Areas:

- The number of buses to be accommodated will be provided in the specific building program.
- Ensure the full number of buses are able to line up, single file, in front of or adjacent to the building.
- Bus traffic shall be kept separate from other traffic, including pedestrian traffic, unless directed otherwise by the Province.
- Where the building has a dedicated administration area, bus drop-off and parking

zones are to be visible from that area.

- Bus areas are to be designed such that buses are not required to back up anywhere on the site.
- Where bus driveways intersect with public roads, the width of the driveway shall be determined by bus and fire fighting vehicle exiting requirements, as determined by DTIR and their traffic consultants. Provide additional width where right and or left turning lanes are required.
- The minimum outside radius for turning shall be 16 m.
- The minimum outside radius for a turning circle where buses will be standing along the outside of the circle shall be 20 m.
- Individuals accessing buses must be able to move directly from each bus to the building on a sidewalk without crossing other vehicular traffic.

5.17 Where bus access is provided to a site via a loop:

- Bus loop is to be designed to prevent the requirement to back up by providing a continuous loop or turning circle.
- Provide drop off area close to main entrance.
- Provide for off-loading on right side with no cross over of pedestrian and vehicular traffic routes, unless otherwise directed or approved by the Minister.

5.18 Service Areas

- Provide access for service vehicles to all entrances of the building where shipping and receiving activity will take place.
- Provide access by truck for special building areas; including, but not limited to, loading areas, kitchens, boiler rooms, oil tanks, recycling rooms, gymnasiums and secure holding areas.
- Service driveways shall be a minimum of 3.6 m wide. Provide paved surface necessary to accommodate turning and turn-around, compatible with the expected design vehicle type.
- Provide gates and barriers as required to restrict public access to service areas. Confirm requirement with client department, if other than DTIR.
- Ensure asphalt design in service vehicle routes supports vehicles' design load criteria.

5.19 Emergency Service Vehicles

- Provide access to buildings for Emergency Service Vehicles, including, but not limited to fire and ambulance services.
- Fire lanes shall be 6.0 m wide, except when they pass through a parking lot in which case there must be a minimum 8.5 m between painted stalls.
- Design of fire and emergency access must be reviewed by and approval received from the local and Provincial fire authority.
- Provide bollards, gates or barriers as required to restrict public access to emergency access areas. Confirm requirement with client department, if other than DTIR.

5.20 Private and Other Vehicles

- Provide all driveways necessary to access buildings, facilities and parking.
- Provide a continuous loop driveway or turning circle to allow drop off to the main entrance of building. Number of drop off spaces to be confirmed by DTIR.
- Ensure vehicles are not required to reverse, except for exiting parking spaces.

5.21 Walkways

- Provide a Portland cement concrete walkway from the public road to the building.
- Provide direct access to the main entrance of the building and facilities.
- Provide asphalt paved access to all other building entrances, and concrete aprons at exit door.
- Provide main entrance at grade without stair or ramps where possible. Provide secondary entrances at grade without stairs or ramps where possible.
- Where exterior stairs are required, material to be concrete, riser shall be 150 mm, tread shall be 305 mm or as directed, and provide handrail on at least one side. Additional handrails will be required based on stair width and local codes.

5.22 Waste Containment Area

- Provide an appropriate visually screened containment area for garbage containers.
- Include in the design a concrete pad for container placement and for garbage collection vehicle use during container pick-up.
- Ensure garbage containment area is not located near air intake louvers.
- Do not use treated wood for screening fences.
- Provide space for recycling and composting storage and processing.

5.23 Site Surfaces

- No disturbed or crushed stone surfaces are permitted unless directed by the Minister.
- Bus and heavy vehicle driveways shall be heavy duty asphalt pavement.
- Other driveways, parking areas, and non-concrete walkways shall be standard asphalt pavement, or as directed.
- Sidewalks and main pedestrian route to front door shall be Portland cement concrete pavement, minimum width 1.5 metres, thickness 100mm, 150mm at ramps.
- Where a building is located more than 100 metres from a public road, a portion of the main walkway may be constructed with asphalt pavement, as approved by the Minister.
- Bus loading / unloading sidewalk area shall be concrete Portland cement pavement, minimum width 3.0 metres.
- All other surfaces shall be finished landscaping, or as directed.

5.24 Public Safety on Site: the following standards are to be met:

- Provide guard rail or fencing at top of all hazardous slopes and edges where a fall could result in serious injury, as per Nova Scotia Department of Labour and Advanced Education Guidelines.

- Provide fencing and or adequate surveillance of any open water areas.
- Areas that will cause ice patches are not permitted in driveways or pedestrian areas.
- Any boulders used on-site shall have a smooth non-jagged surface and be placed at not less than 1.5 metres apart. Boulder size to be approved by DTIR.
- Treated wood structures are not acceptable on the site unless preservative is approved by DTIR.
- Gabion walls must be free from protruding wire and rock edges.

5.25 Tree, Shrub and Natural Areas Preservation

- There shall be no disturbance within any area designated to be preserved unless directed by the Minister.
- Areas designated to be preserved shall be protected as follows:
 - The preservation area shall be clearly indicated on all site plans.
 - The perimeter of the preservation area shall be fenced with orange PVC ‘snow’ fencing or other approved temporary fence and approved and recorded by the Minister before any cutting is permitted (including cutting for surveying purposes).
 - There shall be no disturbance within the preservation area, unless indicated on the approved Site Plan.
 - The Contractor shall repair any damage within the preservation area resulting from construction activity to the approval of the Minister.
 - The preservation area shall be periodically monitored by the Minister during construction and inspected for damage at the end of the construction.
 - All hazardous deadwood shall be removed from the preservation zone as directed by the Minister.

6 Site Engineering:

- 6.1 If no municipal sewer is within proximity of the site, develop the property incorporating an engineered, on-site sewage disposal or sewage treatment system, unless directed otherwise by the Minister. The site development master plan shall include the onsite sewage disposal/sewage treatment system as part of the design consideration when locating new buildings, additions or other site design elements. The on-site sewage disposal or sewage treatment system requires review, approval and permitting by Nova Scotia Department of Environment.
- 6.2 Equipment such as power transformers, fuel tanks and garbage enclosures shall be located so as not to impede use nor impact appearance of the site. Equipment shall not be located near the main driveway access or building entrance unless approved by the Minister. Where equipment is visible from public areas, it shall be completely screened, by fencing and landscaping.
- 6.3 Provide Off-Gassing Mitigation and a vapour extraction system for potential radon or TPH contamination

6.4 Geotechnical Site Development Plan

- During the Design Development stage of the project the Prime Consultant (or Contractor's Consultant) shall provide footing and foundation drawings to the Geotechnical Consultant and Environmental Consultant Reports(s) (previously engaged by the Province report).
- Under consultation with the Prime Consultant, the Geotechnical Consultant shall review these design drawings and prepare a Geotechnical Site Development Plan which will clearly indicate the subsurface design requirements for the site in relation to the proposed grades, footing and foundations, including soil removal and fill requirements and specifications for fill material for construction.
- If required, the footing and foundation drawings shall be revised by the Consultant responsible to accommodate the subsurface construction requirements indicated by the Geotechnical Site Development Plan.

6.5 Stormwater Management is required as part of the site design. The stormwater management plan is to follow Municipal and Provincial guidelines, requirements and Acts. Review and Approval of stormwater management plan is required.

7 Landscape Design:

7.1 The scope and program for landscape design shall be determined by the Province

7.2 A landscape plan shall be prepared by a landscape architect and submitted for review and approval by the Minister

7.3 New landscaping shall be designed to preserve and enhance natural features and native vegetation communities, and shall incorporate:

- the use of native plant species
- maximizing biodiversity
- providing year-round interest
- a mix of deciduous and coniferous species
- protection from wind and sun exposure
- buffering between vehicular and pedestrian areas
- creating pleasant and interesting outdoor spaces for human use
- minimizing maintenance requirements.

7.4 Use tree and shrub planting to create a strong landscape design that defines spaces, directs views and provides vistas.

7.5 Use planting to offer shelter and shade to buildings and people, filter dust and noise, and provide varied habitats and green belts.

7.6 Ensure planting design provides low maintenance features.

- Take care that the width, shape and edge details for shrub borders ensures planting

- will thrive amid intense use.
 - Use appropriate shrubs adjacent to pathways.
 - Plant trees with appropriate clearance; with consideration given to distance from buildings, boundaries, roads, paths, overhead services and underground services.
- 7.7 Where an irrigation system is required, it shall be supplied from a non-potable water system.
- 7.8 Apply the principles of CPTED to the design and selection of plantings and their use in landscape design.

8 Building Design

- 8.1 Respect the neighborhood scale and character, complementing the community with the building, unless otherwise directed by the Minister. Minimize perception of building mass by creative use of material and colour as well as other building elements. Give consideration to existing materials, colours and massing used in neighborhood buildings.
- 8.2 Design building to respect the natural topography and minimize site disturbance.

9 Design and Building Functionality - Performance Criteria

- 9.1 Buildings of more than One Storey
- Multi-storey buildings require a clearly defined main entrance lobby with circulation space with volume and natural light appropriate to the scale of the building.
 - Where a main or ceremonial stairway or elevators are part of the design requirements they must:
 - be part of, or directly accessible from, the main entrance to the building
 - be separate and apart from any emergency egress stairways.
- 9.2 Consider the use and effect of colour in the project, facilitating relaxation, stimulation, focus or productivity, as the design may require. Use colours appropriate to the various functional areas.
- 9.3 Consider the use of pattern/design on floors to support circulation functions and wayfinding and also consider effect of colour and pattern as it relates to Barrier Free design.
- 9.4 When evaluating and selecting construction methods and materials, building systems and components, give consideration to the following criteria:
- building occupancy and use
 - maintenance and life cycle costing
 - capital costing
 - proven performance of products or systems
 - is the product manufactured in or near Nova Scotia

- recycled content of products
- progressive nature of systems (“state of the art”)
- performance requirements (i.e. humidity requirements) Advise and discuss with Departmental Staff prior to incorporation into the design.

9.5 Consultant that become aware of environmental conditions in and around existing facilities that may have an impact on the safety, functionality and efficiency of a renovated or expanded facility, as well as the health of the occupants shall notify the Ministers Representative.

10 Building Security

- 10.1 Where required by the program, allow for public access to the following areas while providing for security for all other areas:
- Washrooms.
 - Elevators, where public access space on a floor level other than the main entry level is required.
- 10.2 Design circulation routes to allow for maximum visibility, facilitating building security.
- 10.3 Apply CPTED principles for building security.

11 Building Envelope Assemblies

- 11.1 Provide building envelopes that will effectively and efficiently separate the interior from the exterior environment by controlling the permeability of the building components, the movement of air, water, heat and water vapour using assemblies that are practical, and economical and will minimize operating and maintenance life cycle costs.
- 11.2 Design and detail the building envelope so that water cannot stand on any surface, and so that ice formation is minimized. Eliminate thermal bridges, ensuring that condensation does not occur, and air/vapour barrier continuity is maintained.
- 11.3 Exterior Wall Assembly
- Design exterior wall assemblies to the Rainscreen Principle, creating pressure-equalized cavities. Ensure that moisture or vapour introduced to the cold side of the vapour barrier is directed or dissipated to the outside atmosphere.
 - Size and locate cavity vents to achieve “nearly instantaneous” pressure equalization and to protect from rain entry.
 - Compartmentalize cavities to isolate major pressure differences.
 - Ensure no moisture migration from the exterior environment to the interior environment occurs through the exterior building assemblies, including wall and floor assemblies at or below grade.
 - Materials:

- Provide building finishes varying in colour, texture and pattern as appropriate to the project.
- provide canopy protection at main entrance area to high use buildings. Discuss requirements for other entries with DTIR.
- Refer to Part 1, Section 2, Division 07 for wall insulation requirements

11.4 Roof Assemblies

- Roof structural framing system shall be designed to maintain a minimum slope of 2%, ensuring positive roof drainage.
- Insulation is to be applied in uniform thickness.
- No gypsum board sheathing containing organic materials shall be used within roof assembly.

11.5 Air/Vapour Retarders

- Design and locate air/vapour retarder so that condensation will not occur within the assembly.
- In exterior walls, locate air retarder on a flat, plane surface where possible.
- Air barriers are to be fully supported.
- Particular attention shall be given to overhangs and hidden spaces so that condensation will not occur in these areas. Consider air/vapour retarder continuity and buildability, insulation location, thermal bridging and air circulation in order to determine if the space will perform better as cold exterior or warm interior space.

11.6 The number of openings through waterproof membranes shall be kept to an absolute minimum. Openings through waterproof membranes subject to hydrostatic pressures shall be fully coordinated between structural, mechanical and electrical designs.

12 Architectural Guidelines

12.1 Hazardous Substances

- Materials which require the use of the following hazardous substances in their manufacture, installation or operation are prohibited including, but not limited to:
 - Chlorofluorocarbons
 - Asbestos
 - PCB's
 - Ozone depleting substances
 - Lead
 - Toxic preservatives on wood products
- Specify materials with low formaldehyde content.

12.2 Environmental Impact

- Select materials to minimize off-gassing of volatile organic compounds or other noxious products.
- Ensure products of combustion are unable to migrate to any part of the building.

- Select materials which will not support microbial growth.
- Consider the recycling potential of materials and recycled content of materials during the selection process.
- Select material requiring lower embodied energy during production.
- Select materials which do not require noxious products or substances for maintenance.
- Allocate space for recycling.

12.3 Longevity

- The following longevity assumptions will be used by the Minister in calculating life-cycle costs of the project assuming normal maintenance and replacement of subsidiary components:

● Parking, walkways, ramps	30 years
● Lawns and Planting	15 years
● Building Structure	100 years
● Roofing	20 years
● Roof substrate components	35 years
● Exterior walls	35 years
● Foundations	100 years
● Sealants	10 years
● Fenestration, doors & openings	35 years
● Architectural Systems and Components (other than floors/painting)	15 years
● Floor Finish	10 years
● Wall Finish	5 years
● Vertical conveyors	35 years
● Appliances	15 years
● Washroom equipment/accessories	15 years
● Plumbing (less water heating)	35 years
● Ventilation systems	15 years
● HVAC delivery (other than ducting)	15 years
● Ducting	35 years
● Electrical	35 years
● Lighting Fixtures	15 years
● Building	15 years
● Structured Cabling	15 years
● Equipment	5 years

12.4 Mock-ups are required of all finishes, millwork and cabinetry.

12.5 Grouping of Spaces and Space Requirements

- Measurement of floor areas for all new construction shall be to the Building Owners and Managers Association (BOMA) International, Standard Method for Measuring Floor Area in Office Buildings ANSI/BOMA Z65.1 latest version.

- Spaces having similar environmental requirements should be grouped together.
- Provide vestibules at primary and secondary entrances.
- Ceiling systems shall be designed to allow for mechanical ventilation and electrical lighting work.
- Space for Air Handling Equipment
 - Incorporate rooms or penthouses to ensure air handling systems are located inside.
 - Ensure such space is easily accessed. Where level access is not possible, provide by means of a stair system. Do not use a ladder system.
 - Ensure sufficient space is provided around equipment to facilitate repair and maintenance.
- Ensure fan rooms and boiler rooms are remote from quiet areas and separated from the remainder of the building by a vestibule with gaskets and seals on doors. (refer to DC350, Part 2 for Educational Facilities' specific requirements)

12.6 Electrical Rooms

- All electrical rooms shall be located on the ground floor. This will accommodate the following:
 - Limits the possibility of flooding.
 - Allows for quick access to the main switch for fire fighters.
 - Ensures easy access for personnel and equipment for alterations, additions, and maintenance.
 - Easy connection to underground feeder conduits.
- Ensure rooms containing transformers are remote from occupied areas that are either adjacent to, above, or below same. Provide buffer rooms, such as storage rooms, between rooms containing transformers and other occupancies.
- Ensure that no water lines are run in or on walls or ceilings.
- Ensure that the room is large enough to house all required electrical equipment while maintaining all required clearances. Note that some main switchboards require clearance on all sides (reference Part 1, Section 2, Division 26,).
- Provide ventilation, especially where transformers are present, based on calculated temperature rises due to equipment heat losses.
- Ensure doors are large enough to allow the removal of equipment for repairs or replacement.
- Provide concrete housekeeping pads for all floor mounted equipment. Note that some equipment also requires the installation of a concrete trough (reference Part 1, Section 2, Division 26 and 28).
- Electrical rooms are not to be located under washrooms, locker rooms, shower rooms, janitor's closets, kitchens, staff rooms with sinks, labs with sinks, or any other areas where flooding could occur.

12.7 Communication Rooms

- Coordinate ventilation with requirements of Part 1, Section 2, Division 27
- Provide communications rooms throughout the building, ensuring the longest

- maximum run of structured cabling is as per the Nova Scotia Government Structured Cabling Guidelines.
- In main communications rooms, provide a counter (minimum 6'-0"L x 3'-0"D) and working space for technicians.
 - Provide rooms containing servers with additional ventilation based on calculated temperature rises due to equipment heat losses. Such rooms are to be positively pressurized in relation to adjacent spaces.
 - Provide AC power outlets to supply communication equipment, including servers, switches, routers, hubs, rack mounted power outlets, etc.
 - Ensure that no water lines are run in or on walls or ceilings.
 - Ensure that the room is large enough to house all required electrical equipment while maintaining all required clearances.
 - Ensure doors are large enough to allow the removal of equipment for repairs or replacement.
 - Communications rooms are not to be located under washrooms, locker rooms, shower rooms, janitor's closets, kitchens, staff rooms with sinks, labs with sinks, or any other areas where flooding could occur.
 - In multi-story buildings, vertically align communications rooms.
 - Provide one communications room per floor, as a minimum.

13 Barrier Free Access/Universal Design

- 13.1 Except as noted otherwise, as a minimum, provide:
- Barrier-Free Access to the requirements of the Nova Scotia Building Code Regulations.
 - Project specific requirements as outlined in the statement of Requirements provided they do not reduce the requirements of the Nova Scotia Building Code Regulations.
 - To CAN/CSA B651 (CSA B651-18) Accessible Design for the Built Environment.
- 13.2 Ensure that provincially owned and leased properties, built environment and site developments are accessible to all persons.
- 13.3 New buildings shall be designed and constructed to provide unassisted access to all users.
- 13.4 Way Finding
- Incorporate into the design a layout of circulation that is simple, straight forward, and encourages easy way finding.
 - Ensure such routes are light, bright and without projections or obstacles which would impede physical movement for persons with visual impairments.
 - Ensure accessible routes have adequate signage to the appropriate standards referenced above.
 - Entrances and lobbies shall be provided at grade without stairs or ramps if possible.

- Incorporate contrasting colours into design, that assist people with visual impairments. As a minimum, ensure a contrasting colour scheme is provided in stairways, walls, and floors.
- Incorporate visual contrasting strip on stair treads, as per CAN/CSA-B651 (CSA B651-18), Item 4.1.5.2.
- At the tops of stairs and at stair landings, provide detectable warning surfaces as per CAN/CSA-B651 (CSA B651-18), Item 4.1.5.3.

14 Acoustics

14.1 General

- Acoustics should be considered early in the building design process to ensure occupant comfort and well-being.

14.2 Acoustic Performance:

- Exterior Noise
Assess environmental noise of the site. For high noise sites (peak hours 60 dBA) implement acoustic treatment and other measures to minimize noise transmission from the exterior to the interior.
- Background Noise
HVAC is to be selected to meet the best practices for mechanical system noise control. Use basic design techniques to minimize sound transmission from Mechanical system components to occupied space as outlined in ASHRAE 211 Handbook Design Guidelines. Chapter 48.
- As per the Design Guidelines- minimize sound transmission by separating noisy areas from quiet areas, locating mechanical rooms away from occupied areas, use washrooms and storage rooms as sound buffers between high and low noise areas, locate air handling equipment and electrical transformers away from quiet areas. Size ducts to minimize noise generation, and use vestibules with gaskets and seals on doors between noisy mechanical spaces and occupied areas.
- Sound Transmission: Standard
Meet the composite sound transmission class (STC) ratings required by local building code. Meet STC requirements - LEED Reference Guide for Building Design and Construction-Indoor Environmental Quality Credit. Acoustic Performance Table 1 Maximum composite sound transmission class ratings for adjacent spaces.
- Reverberation Time: Standard
The preferred reverberation time for a space is dependent on its physical volume, and intent of the space. Meet reverberation times- LEED Reference Guide for Building Design and Construction-Indoor Environmental Quality Credit. Acoustic Performance. Table 2 Reverberation Time Requirements adapted from Table 9.1 in

ASHREA Performance Measurement Protocols for Commercial Buildings.

15 CADD / Drawing Standards

- 15.1 All work to be in accordance with the document entitled “Nova Scotia Department of Transportation and Infrastructure Renewal CADD Standards”, latest edition, unless otherwise approved.
- 15.2 All drawings shall be prepared using metric measurement. Imperial dimensions given in the Design Requirements Manual (i.e. gymnasium games line) shall be shown on the Contractors drawings as hard conversion to metric. Where project involves renovations to building with imperial existing drawing, the Department may choose to waive these requirements.
- 15.3 Contractor As-Built Drawings.
- The Contractor shall keep an accurate record of as-built conditions including recording any variations from the contract documents, showing all changes made on site, including but not limited to, actual dimensions, elevations, inverts, sizes and other description notations.
 - For Design-Build Contracts, the Contractor shall supervise and direct the development and production of computer generated as-built drawings showing comprehensive coordination and integration of all work of the project including, but not limited to: Architectural, Electrical, Mechanical, Structural, Fire Protection and all other project disciplines.
 - Contractor As-Built Drawings are to conform to the requirements of the Department of Transportation and Infrastructure Renewal CADD Standards document, latest edition.
- 15.4 Consultant Record Drawings.
- Record drawings are to conform to the requirements of the Department of Transportation and Infrastructure Renewal CADD Standards document, latest edition.
 - All submissions are to be on standard TIR sheets as per DTIR CADD Standards document.
 - Record documents shall be submitted to meet the requirements of FPTP (refer to Facility Services Sub-Group Sections) and in third quarter of the warranty period or as specified in the Contract.
- 15.5 Hard copy submission:
- DTIR requires hard copies to be submitted in conjunction with required electronic files.
 - All Record drawings and As Built drawings shall be submitted on material suitable for long term achievable storage. The Department reserves the right to inspect and

reject hard copy that it deems to be not on suitable media.

- All Record drawings and As Built drawings are to be prints of the electronic version and are to be identical to the CADD drawings.
- All hard copy Record drawings from the Consultant are to bear the seal (stamp) of the designer and each drawing is to be hand signed and verified as accurate representations of on-site conditions.
- The Consultant is to provide Record Drawings that incorporate the Contractor As-Built drawings and all contract changes at the completion of the project.

15.6 Mechanical and Electrical Drawing Requirements by Contractor:

- Record interface/installation drawings produced for Mechanical/Electrical work shall meet all the above requirements and incorporate the logo& title requirements.
- Provide As Built drawings showing all Communications rooms in the building and details regarding the voice/data structured cabling system, including floor plan layouts and riser.
- Include detailed equipment rack layouts for each communication room in the building as installed.
- Provide one overall copy of documentation complete with all appropriate drawings and documentation enclosed in 8-1/2 x11 binder format.
- Cable contractor to provide electronic copy of communication drawings to most recent DTIR CADD Standard.

END