

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave. Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6
Bid Fax: (780) 497-3510

SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6

Title - Sujet PeSakastew Parking Lot Expansion	
Solicitation No. - N° de l'invitation EW038-160303/A	Amendment No. - N° modif. 007
Client Reference No. - N° de référence du client csc EW038-160303	Date 2015-07-09
GETS Reference No. - N° de référence de SEAG PW-\$PWU-183-10461	
File No. - N° de dossier PWU-5-38044 (183)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-07-15	Time Zone Fuseau horaire Mountain Daylight Saving Time MDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Tikhonovitch (RPC), Alex	Buyer Id - Id de l'acheteur pwu183
Telephone No. - N° de téléphone (780) 497-3541 ()	FAX No. - N° de FAX (780) 497-3510
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

This amendment has been raised to respond to the following questions and make the following revisions:

Question 1: I would like to confirm that the teck cable is to be direct buried(not in conduit). Is it to be in conduit under road crossings?

Answer 1: Yes, direct buried is fine for general installation, conduit is recommended for under road crossings.

Question 2: Dwg E01 shows a precast base. The drawing detail in Ammendment 1 TCS-E-601.1 shows a poured in place detail and 2.3 specifies cast in place. Which are we to use or is it up to the contractor?

Answer 2: It is up to the contractor to choose either one of the indicated methods.

Question 3: The attached pole detail for a davit pole in Ammendment 1 also differs from the pole specified in 2.2.1. Do we supply and install the pole as per specification?

Answer 3: Please follow the specification.

Question 4: What details will be provided in regards to Addendum 1 item 9. In regards to the twinning of cable? Is there cable tray that we can use? How are we to enter the building with the cable?

Answer 4: The existing cable is attached to the outside of the wall to an overhead height, it then enters the building through an electrical box and is assumed: strapped to the internal ceiling inside the building, proceeding across the first room ceiling and entering into the electrical room from an overhead position. The new cable is to be installed in similar fashion to the existing cable along the same alignment. The existing external box may be used if it is deemed upon site inspection that there is room, otherwise a new box shall be provided by the contractor. Panel # 6AA – 347V has been initially identified as available for use with the new line. If upon inspection by the contractor, this panel is deemed insufficient, an alternate panel shall be provided by the contractor.

Question 5: There are references in the Electrical Specifications to Section 01 47 15 but that is not part of the Div 01 general documents provided. Not sure if it is critical for the bid anyways.

Answer 5: For reference, please find attached a generic copy of specification 01 47 15 from the Canadian National Master Construction Specification.

REVISED CLOSING DATE TO: 02:00 PM on 2015-07-15

If your bid has already been forwarded and you wish to revise the same, this revision should reach the Bid Receiving Unit identified on Page 1 before the closing date.

All other terms and conditions remain the same.

1. General

1.1 PRECEDENCE

- .1 For Federal Government Projects, Division 1 Sections take precedence over technical specifications in other Divisions of this Project Manual.

1.2 SECTION INCLUDES

- .1 This Section includes specific environmental and sustainable development requirements for building materials, products and systems needed to ensure that this project complies with green design processes and clients' sustainable development plan.

1.3 RELATED SECTIONS

- .1 Section [01 33 00 - Submittal Procedures].
- .2 Section [01 35 73 - Procedures for Deconstruction of Structures].
- .3 Section [02 62 00.01 - Hazardous Materials].
- .4 Section [02 50 13 - Management of Toxic Waste].
- .5 Section [01 47 13 - Sustainable Requirements: Concept Design].
- .6 Section [01 47 15 - Sustainable Requirements: Construction].
- .7 Section [01 47 17 - Sustainable Requirements: Verification].
- .8 Section [01 47 19 - Sustainable Requirements: Operation].
- .9 Section [31 22 13 - Rough Grading].
- .10 Section [31 23 33.01 - Excavating, Trenching and Backfilling].
- .11 Section [32 93 10 - Trees, Shrubs and Ground Cover Planting].
- .12 Section [32 92 19.13 - Mechanical Seeding].
- .13 Section [32 92 23 - Sodding].

1.4 REFERENCES

- .1 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
 - .1 ASHRAE 62-[2001], Ventilation for Acceptable Indoor Air Quality.
 - .2 ASHRAE 52.2-[1999], Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size.
 - .3 ASHRAE 129-[1997], Measuring-Air Change Effectiveness.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-92.1-[1989], Sound Absorptive Prefabricated Acoustical Units.

- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A440.1-[2000], Windows - User Selection Guide.
- .4 Environmental Choice Program
 - .1 CCD-016-[97], Thermal Insulation.
 - .2 CCD-017-[98], Acoustical Products.
 - .3 CCD-025-[01], Commercial Modular Carpet.
 - .4 CCD-026-[01], Commercial Non-modular Carpet.
 - .5 CCD-029-[95], Water Conserving Products.
 - .6 CCD-045-[95], Sealant and Caulking Compounds.
 - .7 CCD-046-[95], Adhesives.
 - .8 CCD-047-[98], Surface Coatings.
 - .9 CCD-048-[95], Surface Coatings - Recycled Water-Bourne.
- .5 National Air Duct Cleaners Association (NADCA)
 - .1 NADCA ACR-[2002], Assessment Cleaning and Restoration.
 - .2 NADCA 05-[1997], Requirements for the Installation of Service Openings in HVAC Systems.
- .6 Sheet Metal and Air Conditioning National Contractors Association (SMACNA)
 - .1 SMACNA IAQ Guideline for Occupied Buildings Under Construction, 1995.

1.5 SUBMITTALS

- .1 Provide submittals for work in accordance with Section [01 33 00 - Submittal Procedures] [_____].
- .2 Submittals required:
 - .1 Submit name and experience of [Green design facilitator] [Integrated design manager] to [Engineer] [Consultant] [_____] for approval.
 - .2 Compliance Report indicating requirement to purchase energy efficient and environmentally benign products.
 - .3 Use Report indicating understanding of requirement to use materials and methods of construction, which improve energy and water efficiency, reduce hazardous by-products, and use recycled materials, or materials, which can be reused.
 - .4 Energy Report: to indicate EnerGuide ratings of new equipment and appliances.
 - .5 Building systems and material evaluation report.

- .6 Ventilation performance rating report for designate interior smoking areas.
- .7 Submit CFC inventory report.
- .8 Submit CFC phase-out plan.
- .3 Material Safety Data Sheets (MSDS)
 - .1 Submit Material Safety Data Sheets (MSDS) in accordance with Section [01 33 00 - Submittal Procedures] [_____] for the following products. Indicate VOC emissions, prior to installation or use:
 - .1 Adhesives.
 - .2 Caulking compounds.
 - .3 Sealants.
 - .4 Insulating materials.
 - .5 Fireproofing or fire stopping materials.
 - .6 Paints.
 - .7 Carpets.
 - .8 Floor and wall patching or levelling materials.
 - .9 Lubricants.
 - .10 Clear finishes for wood surfaces.
 - .2 MSDS sheets to comply with Occupational Health and Safety requirements.
- .4 Construction Schedule
 - .1 Submit schedule of construction in accordance with Section [01 33 00 - Submittal Procedures] [_____] , prior to start of work, in coordination with scheduling requirements, including:
 - .1 Sequence of finish applications and allowances for curing times.
 - .2 Identification of finish types. See Table A
 - .3 Schedule and duration of proposed temporary ventilation.
 - .4 Delivery schedules of manufactured materials which are anticipated to off-gas in timely manner, which will allow for airing of those materials prior to their scheduled installation.
 - .5 Indicate and schedule commissioning procedures and temporary usages of building mechanical systems, identifying types of filtration and schedule for filter replacement.
- .5 IAQ Management Plan

- .1 Submit Indoor Air Quality (IAQ) Management Plan in accordance with Section [01 33 00 - Submittal Procedures] [____], for construction and preoccupancy phases of building.
- .6 EcoLogo Labelled Products
 - .1 Submit of list of EcoLogo products and services proposed for this project in accordance with Section [01 33 00 - Submittal Procedures] [____].
 - .2 Submit list of proposed non-endorsed products and services to [Engineer] [Consultant] [____] for review.

1.6 HAZARDOUS MATERIALS

- .1 Follow methods and procedures specified in Section [02 62 00.01 - Hazardous Materials]; Section [02 50 13 - Management of Toxic Waste] [____].
- .2 Take measures to ensure chemical spills do not enter drains.
- .3 Provide proper storage and containment of herbicides and indoor pesticides.
 - .1 Design and construction of storage spaces for hazardous materials in accordance with [NBC] [OBC] [and] [local] [____] building and fire codes.
 - .2 Provide ventilation of areas, which contain potential sources of air contamination. Comply with standards for storage of flammable, combustible and hazardous materials, explosives, compressed gas cylinders, and reactive, corrosive and oxidizing materials.
 - .3 Storage conditions, ventilation requirements, construction materials storage areas, containers, drums and tanks, compatibility issues, and labelling: in accordance with federal and municipal guidelines supplemented as follows:
 - .1 Confine storage of chemicals and hazardous wastes to designated areas with security of access.
 - .2 Provide access to hose bib and water for mixing concentrated chemicals.
 - .3 Provide containment to prevent spills from entering drains.
 - .4 Provide venting to exterior.
 - .5 Keep storage areas under negative pressure, where possible.

1.7 SITE SELECTION

- .1 Enhancing ecological value of site by [____].
- .2 Establishing landscape buffer zones by: [____].

1.8 EROSION AND SEDIMENTATION CONTROL

- .1 Follow methods and procedures specified in Section [31 23 33.01 - Excavating, Trenching and Backfilling] [____].

- .2 Establish long-term soil stabilization program as indicated.
- .3 Take measures to prevent loss of soil by storm water runoff.
- .4 Protect stockpiled topsoil.

1.9 REDUCING SITE DISTURBANCES

- .1 When building is to be on previously undeveloped site comply with following requirements:
 - .1 Avoid major alterations to sensitive topography, vegetation and wildlife habitat in areas indicated.
 - .2 Create traffic patterns, that cause minimum site disruptions, as per [Engineer's] [Consultant's] [] approval.
- .2 Minimize disturbances to watershed using site water management measures to ensure that watersheds and groundwater will be preserved.
- .3 Construct and erect erosion barriers to locations indicated and as directed by [Engineer] [Consultant] [].
- .4 Take measures to avoid soil compaction.
- .5 Re-grade and plant vegetation in accordance with Section [31 22 13 - Rough Grading] [].

1.10 BUILDING ENVELOPE

- .1 Provide window systems to minimized heat loss in winter, and solar gain minimized in summer.
- .2 Provide interior shading to minimized solar gain in summer.
- .3 Provide exterior shading to minimized solar gain in summer.
- .4 Provide insulation to optimize reduction of heat losses or heat gains through building envelope.
- .5 Insulation to levels specified in Model National Energy Code (MNEC).
- .6 Use building morphology strategies to moderate interior temperature extremes.
- .7 Maintain integrity of building envelope using air barriers and vapour retarders and avoid thermal bridging to provide thermal comfort and prevent condensation.
 - .1 Air barrier: to NBC 1990, Article 5.3.
 - .2 Air leakage through air barrier system within roof area: not to exceed 0.15 l/s*m² @ 75 Pa.
 - .3 Air leakage through air barrier system within roof area: not to exceed 0.15 l/s*m² @ 75 Pa.
 - .4 Air leakage through air barrier system within area of exterior walls (excluding window): not to exceed 0.30 l/s*m² @ 75 Pa.

- .5 Air leakage through floor: not to exceed 0.10 l/s*m² @ 75 Pa.
- .6 Air leakage through windows: not to exceed limits specified in CSA-A440.1.

1.11 GENERAL BUILDING DESIGN

- .1 Green design facilitation is used on this project to support green design integration.
 - .1 [Green design facilitator] [Integrated design manager] provided by [Contractor] [Owner] [_____].
 - .2 Submit name and experience of [Green design facilitator] [Integrated design manager] to [Engineer] [Consultant] [_____] for approval.
 - .3 Have [green design facilitator] [integrated design manager] report to [Engineer] [Consultant] [_____].
 - .4 Role of [Green design facilitator] [Integrated design manager] [_____] in accordance with Section [01 47 13 - Sustainable Requirements: Concept Design] [_____].
- .2 Indicate in writing to [Engineer] [Consultant] [_____].
 - .1 Compliance Report: indicating requirement to purchase energy efficient and environmentally benign products.
 - .2 Use Report: indicate understanding of requirement to use materials and methods of construction, which improve energy and water efficiency, reduce hazardous by-products, and use recycled materials, or materials which can be reused.
 - .3 Energy Report: to indicate that new equipment and appliances meet high energy efficiency criteria.
- .3 Existing building reuse.
 - .1 Re-use of [50] [75] [100] [_____] % of existing facades in fully renovated buildings.
 - .2 Re-use [50] [_____] % of existing major structures other than building shell such as walls, floors and ceilings.
- .4 Building design is adaptable to:
 - .1 Provide accommodation of future additions and alterations.
 - .2 Provide modular space planning.
 - .3 Accommodate prefabrication and standardization of repetitive building elements.
 - .4 Develop specific programming criteria and standards for adaptability based on program, activities, and operational change considerations.
 - .5 Establish appropriate adaptability design criteria, such as considerations for footprint, window modules, building facade, floor-to-floor height, structural systems, mechanical and information systems, and spatial organization that may support range of anticipated future uses and adaptations.
- .5 Building Flexibility: considered following building issues:

- .1 Technical building systems (HVAC), lighting, cabling or telecom are easily changed and are adaptable for changing tenant requirements.
 - .1 Layout is suitable for major changes in future uses.
 - .2 Floor height is suitable for major changes in future uses.
 - .3 Floor loading is suitable in capacity for other uses.
 - .4 Building is adaptable to future changes in type of energy supply.
- .6 Building disassembly: Ensure provisions for building disassembly are incorporated into project.
 - .1 Disassembly to Section [01 35 73 - Procedures for Deconstruction of Structures] [_____].
- .7 Releasable assembly methods: [snap release connectors] [friction joints] [bolts] [screws] [clips] [_____].

1.12 INDOOR AIR QUALITY

- .1 Provide moisture control methods within building to prevent mould growth.
- .2 Provide exhaust at source for areas that will generate contaminants including:
 - .1 [Elimination or isolation of high hazard areas] [_____].
 - .2 Provision of floor to ceiling partitions and dedicated exhaust ventilation systems for housekeeping chemical storage and mixing areas (central storage facilities and janitors closets) and copy/fax/printing rooms.
- .3 IAQ Performance
 - .1 Comply with following minimum indoor air performance requirements. Total volatile organic compounds level requirements include formaldehyde:
 - .1 Total Volatile Organic Compounds Emissions Rate Standard:
 - .1 Product emission rate measured in mg/m² /hr.
 - .2 Indoor air concentration levels greater than 0.5 mg/m³ of total volatile organic compounds at anticipated loading [30] [_____] days after installation.
 - .3 4-Phenyl Cyclohexene (4-PC) Emission Rate Standard:
 - .1 Product emission rate measured in mg/m² /hr.
 - .2 Indoor air concentration levels greater than 1 ppb at anticipated loading [30] [_____] days after installation.
 - .2 Provide ventilation rates in accordance with ASHRAE 62.
 - .3 Indoor Environmental Quality

- .1 Reduce quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and occupant health and comfort as indicated.
- .2 Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.
- .3 Minimize cross-contamination of regularly occupied occupancy areas by chemical pollutants.
 - .1 Employ permanent entry way systems [grills] [and] [grates] [] to capture dirt and particulates from entering building at high volume entry ways.
 - .2 Provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms).
 - .3 Provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.
 - .4 Comply with recommended measures in MSDS sheets to protect health and safety of personnel.
- .4 Construction IAQ Management Plan
 - .1 Develop and implement Indoor Air Quality (IAQ) Management Plan for construction and preoccupancy phases of building as follows:
 - .1 During construction: meet or exceed minimum requirements of SMACNA IAQ Guideline for Occupied Buildings under Construction.
 - .2 Protect stored on-site or installed absorptive materials from moisture damage.
 - .3 Replace filtration media immediately prior to occupancy.
 - .1 Filtration media: in accordance with ASHRAE 52.2, Minimum Efficiency Reporting Value (MERV) of 13.
 - .4 Conduct minimum [2] [] week building flush-out with new filtration media at [100%] [] outside air after construction ends and prior to occupancy.
 - .1 Test contaminant levels in building.
 - .5 Adopt IAQ management plan during construction procedures, including:
 - .1 Protection of HVAC system during construction to control pollutant sources, and interrupt pathways for contamination.
 - .2 Sequencing of materials installation to ensure dissipation of high emissions from finishes that off-gas unacceptably high quantities of potentially harmful materials during curing to avoid contamination of absorptive materials.

- .3 Apply Type 1 interior finishes and allow these finishes to completely cure according to intervals and times stated in respective finish manufactures printed instructions before commencing installation of any Type 2 materials in same area.
- .4 Do not store any Type 2 materials in areas where installation or curing of Type 1 materials is in progress.
- .5 Table A

<u>Type 1 - Materials and Finishes</u> Materials and finishes which have potential for short term levels of off-gassing from chemicals inherent in their manufacturing process, or which are applied in a form requiring vehicles or carriers for spreading which release a high level of particulate matter in the process of installation and/or curing Composite wood products, including particleboard and plywood from which millwork, wood paneling, doors or furniture may be fabricated. Adhesives, sealants and glazing compounds. Wood preservatives, wood finishes, primers and paints and paint like wall finishes. Control and/or expansion joint fillers, firestopping materials and caulking. Hard finishes requiring adhesives installation including, but not	<u>Type 1 materials and finishes include, but are not limited to the following:</u>
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limited to plastic laminate, linoleum and rubber tile.

Gypsum board and associated finish processes and products.

Type 2 - Materials and Finishes Soft materials and finishes which are

Type 2 materials and finishes include, but are not limited to the following:

woven, fibrous, or porous in nature and may absorb chemicals off-gassed by Type 1 materials and finishes, or may be adversely affected by airborne particulate. These materials have the potential to become 'sinks' for deleterious substances which may be released much later, or act as collectors of contaminants that may promote subsequent bacterial growth.

Carpet and underpadding, and other woven or fibrous floor finishes.

Fabric wall coverings.

Insulation materials exposed to the airstream.

Acoustic ceiling materials.

Furnishings with fabric coverings.

- .6 Erect appropriate noise and dust barriers where demolition or construction procedures are to occur adjacent to occupied space.
- .1 Take necessary steps to minimize interference with occupants.
- .7 Permanent HVAC system [may be used] [] as approved in writing by [Engineer] [Consultant] [] to move both supply and return air during construction process. Meet following conditions:

- .1 Install and maintain filters with air filtration of [60] []% efficiency.
 - .2 Do not use permanent diffusers.
 - .3 Do not use plenum type return air system.
 - .4 Seal HVAC duct system to prevent spread of airborne particulate and other contaminants.
 - .5 Vacuum dust systems following building flush out.
 - .6 Use portable HEPA vacuums, certified clean in accordance with NADCA specifications.
- .5 Environmental Tobacco Smoke (ETS) Control
 - .1 Smoking [will] [will not] [] be permitted in building.
 - .2 Provide designated smoking room as indicated.
 - .1 Exhaust directly to outdoors.
 - .2 Enclose with impermeable structural deck-to-deck partitions.
 - .3 Provide negative pressure minimum 7 Pa when compared with surrounding spaces.
 - .4 Provide fresh air ventilation: to ASHRAE 129, rate of 24-32 litres/second/person.
- .6 Carbon Dioxide (CO₂) Monitoring
 - .1 Provide carbon dioxide detectors to assess and monitor air quality and ventilation rates.
 - .1 Acceptable levels:
 - .1 Average concentration of [600-800 parts per million (PPM)] [] CO₂.
 - .2 Maximum continuous exposure limit of [1000] ppm.
 - .2 Provide [8 L/s of fresh air per person in open areas] [and] [10 L/s of fresh air per person in closed offices] to maintain CO₂ concentration at 1000 parts CO₂ per million parts of air or less.
- .7 Indoor Chemical and Pollution Storage
 - .1 Locate and install cooling towers as indicated.

1.13 GENERAL CONSTRUCTION MATERIALS/PRACTICES

- .1 Materials and Resources
 - .1 Use uncontaminated demolition materials for fill and hardcore and/or granular base.
 - .2 Incorporate reused building materials as indicated.

- .3 Use products and services that meet criteria of EcoLogo guidelines.
- .4 Provide list of non-endorsed products and services, provided the green labelled product or services are capable of meeting specified performance requirements.
- .2 Storage and Collection of Recyclables
 - .1 Provide separate storage/handling facilities for consumer recyclables including used paper, newspaper, newsprint, cardboard, glass, metal and plastic.
 - .1 Storage space area:
 - .1 2 m² per 1,000 m² of office space.
 - .2 Where building is more than 5,000 m² in area, provide minimum of 10 m².
 - .2 Provide on-site centralized area for composting organic waste as indicated.
 - .3 Provide area for waste compactor, size and location as indicated.
- .3 Construction Waste Management
 - .1 Follow recommendations and requirements of this projects construction, renovation and demolition (CRD) waste management plan in accordance with Section [01 74 19 - Construction/Demolition Waste Management and Disposal].
 - .2 Resource Reuse
 - .1 Use materials that have been remanufactured for this projects building systems and materials.
 - .3 Recycled Content
 - .1 .1 Use systems and materials with post-consumer and post-industrial recycled content.
 - .4 Local/Regional Materials
 - .1 Use systems and materials having [25]% of total percentage of products or materials manufactured within [1600] kilometers of project site.
 - .5 Rapidly Renewable Materials
 - .1 Use systems and materials that originate from renewable sources.
 - .6 Wood
 - .1 Use lumber sourced from independently certified well-managed forests in accordance with CSA or Forestry Stewardship Council.
 - .2 Materials made from composite wood materials or agricultural products: not contain urea-formaldehyde resins.
 - .7 Durability

- .1 Use durable building systems and materials:
 - .1 Requiring low maintenance (painting, retreatment, and waterproofing).
 - .2 Having minimal environmental impact.

1.14 INSULATION

- .1 Utilize insulation materials meeting following requirements:
 - .1 Board-type thermal insulation materials must contain, when calculated on 12-month rolling basis:
 - .1 Over 35% recycled material by weight of finished product if made from glass fibre.
 - .2 Over 45% recycled material by weight of finished product if made from mineral composition.
 - .2 Loose-fill and spray-on thermal insulation materials must contain, when calculated on 12-month rolling basis:
 - .1 Over 75% recycled material by weight of finished product, if made from cellulose fibre.
 - .2 Over 35% recycled material by weight of finished product if made from glass fibre.
 - .3 Over 50% recycled material by weight of finished product, if made from mineral wool.
 - .3 Use insulation materials manufactured or installed that do not include CFC's.

1.15 CEILINGS

- .1 Utilize ceiling tiles (panels) that:
 - .1 Comply with CAN/CGSB-92.1.
 - .2 Have noise reduction coefficient (NRC) of at least [0.50] when tested on E400 mounting in accordance with CAN/CGSB-92.1.
 - .3 Contain, when calculated on 12-month rolling average:
 - .1 Over [75]% recycled material by weight of finished product, if made from cellulose fibre.
 - .2 Over [35]% recycled material by weight of finished product if made from glass fibre or mineral composition.

1.16 PAINTS, STAINS, AND VARNISHES

- .1 Use paints and coatings that meet or exceed VOC limits established by Environmental Choice Programs guideline for water borne surface coatings CCD-047 and CCD-048.

1.17 SEALANTS, ADHESIVES AND COMPOUNDS

- .1 Use adhesives that meet or exceed VOC limits established by Environmental Choice Programs guideline for adhesives CCD-046.
- .2 Use sealant products that meet or exceed VOC limits established by Environmental Choice Programs guideline for sealants, CCD-045.

1.18 FLOORING

- .1 Carpet systems: meet or exceed [Carpet and Rug Institute Green Label Indoor Air Quality Test Program] [For broadloom carpet Environmental Choice guideline CCD-026] [For carpet tile Environmental Choice guideline CCD-025].
- .2 Undercushion materials: free of ozone depleting substances.
- .3 Undercushion to include [_____] % recycled content.
- .4 Resilient flooring: [recyclable] [manufactured with recycled content] [manufactured from renewable resources].

1.19 HVAC EQUIPMENT

- .1 CFC Reduction in HVAC and Refrigeration Equipment
 - .1 Use non CFC-based refrigerants in HVAC and refrigeration equipment.
 - .2 Use non HCFC-based refrigerants and refrigeration equipment.
 - .3 Conduct inventory on existing HVAC and refrigeration equipment and submit report on components operating with CFC's.
 - .4 Provide and use cooling system design criteria conforming to regulatory requirements.
 - .5 Replace HCFCs or halons in existing building systems [as indicated] [directed by [Engineer] [Consultant]] [_____].
 - .6 Use HCFC and halon free refrigeration and fire suppression systems.
 - .7 Provide comprehensive CFC phaseout conversion plan, when existing base building HVAC equipment is to be reused.
- .2 Thermal Comfort
 - .1 Provide adjustable ventilation rates to varying needs related to occupancy, activities, and operations throughout building conforming to ASHRAE 55, Addenda 1995 for thermal comfort.
 - .1 Provide office air (dry bulb) temperatures range from 20 - 23 degrees C.
 - .1 In cooling season maintain temperatures at 23 - 26 degrees C.
 - .2 Provide indoor relative humidity within range 40-60%.
- .3 Ventilation Effectiveness

- .1 Provide ventilation system to ASHRAE 62.
 - .1 Size mechanical system as indicated to ensure adequate ventilation rates, based on ASHRAE 62.
 - .2 Provide ventilation rate of 10 L/sec/person.
- .2 Provide ventilation system to effectively deliver and mix fresh air with air change rates as follows:
 - .1 For mechanically ventilated buildings, air change effectiveness (E) greater than or equal to 0.9 in accordance with ASHRAE 129.
 - .2 For naturally ventilated buildings provide distribution and laminar flow pattern that involves not less than 90% of room or zone area in direction of air flow for at least 95% of hours of occupancy.
- .3 Meet requirement to prevent contamination of indoor air from external sources.
 - .1 Locate outdoor air intake/outlet ducts should to prevent "re-entrainment" (short-circuiting) of exhaust air.
 - .2 Keep carbon monoxide sources such as flues, driveways, and parking lots away from indoor air source[s] as indicated.
 - .3 Ensure typical carbon monoxide levels range from 0.3 to 5 ppm.
 - .1 Maximum exposures of 35 ppm over 1 h period and 9 ppm over 8 h period total weighted average (TWA).
 - .2 Maximum exposure of 9 ppm over an 8 h period is not to be exceeded more than once a year.
 - .4 Identify sources of external contamination in writing to [Engineer] [Consultant] [_____].
- .4 Provide filtration system in accordance with ASHRAE 52.2.
 - .1 Air-cleaning or filtration system to meet or exceed efficiency ratings of ASHRAE Standard 52.2.
 - .1 Provide particulate filtration with efficiency grade between 60% and 80%.
 - .2 Provide particulate matter filters or air cleaners upstream of humidifiers, evaporative coolers, fin-tube heating coils, cooling coils and heat exchangers through which air is supplied.
- .4 Ventilation: Parking Garage
 - .1 Provide mechanical ventilation of enclosed parking areas.
- .5 Controllability of systems
 - .1 Provide occupants with personal control over ventilation rates using [operable windows] [personalized HVAC controls].

- .1 Provide minimum of one operable window and one lighting control zone per 20 m² for occupied areas within 5 metre of perimeter wall.
 - .2 Provide, in air conditioned office occupancies, individual controls for each occupant for airflow, temperature, and lighting for 50% of non perimeter, regularly occupied areas.
- .6 Water Reduction
 - .1 Provide air-cooled towers.
- .7 Maintenance
 - .1 Provide mechanical system, designed and installed to prevent microbial contamination.
- .8 Storage Tanks
 - .1 Provide on site storage tanks to federal guidelines and local codes.
 - .2 Provide ladders and access for cleaning and inspection of filters.
 - .3 Provide access to air-handling units for service and inspection.

1.20 LIGHTING

- .1 Light Pollution Control
 - .1 Provide controllable internal or external blinds.
- .2 Daylight and Views
 - .1 Install windows and glazing as indicated to maximize useful light.
 - .2 Integrate day lighting with electrical lighting systems as indicated to take into account daily and seasonal variations.
 - .3 Provide illuminance levels and luminance ratios indicated.
 - .4 Ensure that windows are sized as specified.
 - .5 Install light shelves as specified.
 - .6 Ensure that installed windows meet specified performance standards.
 - .7 Install shading devices as specified.
 - .8 Install light sensing controls as per specified zones with day-lighting potential.
 - .9 Provide specified task lighting.
 - .10 Integrate lighting controls as specified related to room occupancy, circulation space, day-lighting, and number of work stations (in office areas) using [stepped] [dimming] day-light controls.
- .3 Lighting Fixtures

- .1 Provide high efficiency lamps and luminaries with electronic ballasts. Lamps and luminaries to have following requirements:
 - .1 Fit electronic ballasts to luminaries.
 - .2 Provide task lighting as indicated.
 - .3 Provide personal controls as indicated.

1.21 ACOUSTIC CONTROL

- .1 Use methods indicated to reduce noise levels including:
 - .1 Sound isolation.
- .2 Occupancy acoustics
 - .1 Meet recommended noise level guidelines:
 - .1 Small Offices: below 45 dBL.
 - .2 Conference rooms: below 45 dBL.
 - .3 Large offices: 50 dBL.
 - .2 Units adjacent to elevators and garbage chutes: STC rating 55.

1.22 PLUMBING FIXTURES

- .1 Water Efficiency
 - .1 Provide showerheads, kitchen and bathroom faucets with low flow models aerators.
 - .2 Provide efficient equipment to heat and supply service water to meet water-use target of [less than 2.0 m³ /m² /year] [less than 1.0 m³ /m² /year] [less than 0.5 m³ /m² /year].
- .2 Water Use Reduction
 - .1 Install water metres as indicated.
 - .2 Use [low-flow] [foot-operated] [electronic sensor] faucet.
 - .3 Provide low flow toilets to CAN/CSA 45.0, maximum 6 Litres/flush.
 - .4 Provide urinals to CAN/CSA 45.0, maximum flow rate of 0.06 Litres/flush cycle complete with [electronic proximity devices] [adjusting flush valves for minimum acceptable volume].
 - .5 Provide water saving showerheads: flow rates [9.5 l/min @ 5.5 kg/cm²] [] litres/min.
- .3 Innovative Waste Water Technologies
 - .1 Use gray-water systems to reduce use of potable water on site and/or within building.

- .2 Provide on-site biological waste treatment system to reduce volume of effluent entering municipal system as indicated.
- .3 Meet or exceed minimum effluent standards as quantified in Guidelines for Effluent Federal Quality and Wastewater Treatment at Federal Establishments.
- .4 Treat effluents discharged to receiving waters such that effluent meets minimum quality.
 - .1 Effluent limits outlined in federal guidelines:

1.23 ELEVATORS

- .1 Install high efficiency elevators as specified.

1.24 ENERGY

- .1 Energy and Atmosphere
 - .1 Provide work practices, methods of work, equipment, machines and machinery conforming to minimum emissions standards as quantified in National Emission Guideline for Commercial/ Industrial Boilers and Heaters issued by the Canadian Council of Ministers of the Environment (CCME) National Emission Guideline for Commercial/Industrial Boilers and Heaters Initiative N306.
 - .2 Emissions of nitrogen oxides (NO_x) in units of g/GJ, from new fossil fuel-fired boilers and heaters, should not exceed limited established in National Emission Guideline for Commercial/Industrial Boilers and Heaters.
- .2 Energy Performance
 - .1 Provide equipment to meet energy performance requirements of the Concept Design strategy of [$< 387.5 \text{ kWh/M}^2 \text{ -yr}$] [$< 344.4 \text{ kWh/M}^2 \text{ -yr}$] [$< 301 \text{ kWh/M}^2 \text{ -yr}$] [$< 258.3 \text{ kWh/M}^2 \text{ -yr}$] [$< 215 \text{ kWh/M}^2 \text{ -yr}$] [$< 193 \text{ kWh/M}^2 \text{ -yr}$] [$< 172 \text{ kWh/M}^2 \text{ -yr}$] [$< 150 \text{ kWh/M}^2 \text{ -yr}$] [$< 129 \text{ kWh/M}^2 \text{ -yr}$] [$< 107.6 \text{ kWh/M}^2 \text{ -yr}$].
 - .2 Construction to exceed requirements of ASHRAE 90.1 and Model National Energy Code for Buildings by: [50% or more] [40% or more] [30% or more] [20% or more].
 - .3 Construct project to orientation indicated to:
 - .1 Maximize passive solar gains and/or control unwanted solar heat gain.
 - .2 Maximize opportunities for natural ventilation.
 - .3 Maximize opportunities for day lighting and glare control.
 - .4 Provide shading devices and systems indicated to reduce excessive summer solar heat.
- .3 Optimize Energy Performance
 - .1 Use co-generation as indicated to reduce environmental impact of total building energy use.

- .1 Cogeneration using: [natural gas] [propane] [diesel] [landfill] [raw solution] [digester gas].
 - .2 Provide high-efficiency boilers and chillers.
 - .3 Provide [heat pump heat recovery systems] [desiccant dehumidification] to reduce heating and cooling energy use.
 - .4 Provide high efficiency motors and variable speed drives in mechanical system equipment.
- .4 Energy Efficient Equipment
 - .1 Install high efficiency lamps and luminaries with electronic ballasts.
 - .2 Integrate high efficiency or condensing type boilers or other higher efficiency heating systems as indicated.
 - .3 Uses variable air volume distribution systems with variable speed drives on fans/pumps and zone areas for different hours of occupancy and loads including:
 - .1 Building automation systems.
 - .2 Hot water savings devices.
 - .3 Solar water heating system.
 - .4 Utilizing energy saving systems or measures such as [heat pumps] [displacement ventilation] [heat recovery] [variable speed fans] [high efficiency motors].
- .5 Renewable Energy
 - .1 Use [on-site renewable] [alternate energy sources [wind] [photovoltaics] [geothermal] [biomass] [low-impact hydro] [fuel cells]] as indicated.
 - .1 Total energy load be supplied through building-integrated or directly-connected renewable or other low impact energy systems: [30] [20] [10] %.
 - .2 Provide renewable energy systems: [active solar air heating] [ground-source heat pumps] [high-efficiency/low-emission s biomass combustion] systems.
- .6 Green Power
 - .1 Provide energy generated from zero polluting sources: [solar sources] [wind] [geothermal] [biomass] [low impact hydro sources].
- .7 Transportation
 - .1 Provide car pool parking pick-up areas, and covered waiting spaces located near building entrance as indicated.
 - .2 Provide parking areas for bicycles next to building entrances as indicated.
 - .3 Provide parking and changing facilities for [5]% of building occupants in locations and sizes indicated.

1.25 EXTERIOR SITE

.1 Storm water Management

- .1 Direct rainwater for use as non-potable water on site and/or within building.
- .2 Use biologically-based storm-water management features along drainage courses to retain and/or treat storm-water on site as indicated.
- .3 Take measures to prevent soil erosion before, during, and after construction by controlling storm-water runoff and wind erosion. Use:
 - .1 Detention ponds.
 - .2 Infiltration trench.
 - .3 Capture rainwater from impervious areas of building for groundwater recharge or for reuse in building.

.2 Landscape and Exterior Design

- .1 Planting requirements: to Section [32 93 10 - Trees, Shrubs and Ground Cover Planting]; Section [32 92 19.13 - Mechanical Seeding]; Section [32 92 23 - Sodding].
 - .1 Minimum of [75]% of species planted on site are to be native to local area.
 - .2 Minimum of [75]% of total quantity of trees and shrubs are to be native material.
- .2 Minimize hardscapes and provide [pervious materials] [and] [vegetated areas] as indicated.
 - .1 Provide permeable area no greater than [20]%.
- .3 Provide [site enhancement] [and] [remediation] to areas indicated.
- .4 Implement integrated pest management (IPM) strategies as indicated [and] [as required by [Engineer] [Consultant]] [_____].

.3 Water Efficient Landscaping

- .1 Provide landscape to promote water-conserving landscaping (xeriscaping), including native, drought resistant plants that require no irrigation as indicated.

2. PRODUCTS

2.1 NOT USED

- .1 Not Used.

3. EXECUTION

3.1 3.1 NOT USED

.1 Not Used.

END OF SECTION