



## **IDENTIFICATION**

<b>Department</b>	<b>Position Title</b>	
Infrastructure	Senior Technical Officer - Electrical	
<b>Position Number</b>	<b>Community</b>	<b>Division/Region</b>
33-00182	Yellowknife	Design and Technical Services – Facilities

## **PURPOSE OF THE POSITION**

The Senior Technical Officer is an electrical engineering technical expert for buildings, airfield lighting systems (High Voltage Systems) and works owned, operated and leased by the Government of Northwest Territories (GNWT).

This position provides expert technical guidance and advice to Headquarters (HQ) and Regional Project Management, Airport, and Operational and Maintenance (O&M) staff, Municipalities, Program Departments, Regulatory Bodies (i.e., Fire Marshal's Office, Workers' Safety and Compensation Commission (WSCC), Electrical/Mechanical Safety, Transport Canada, Labour Canada etc.) and boards and agencies including industry associations, northern based service businesses and manufacturers, designers, builders and any other organization requiring technical advice about planning, constructing, operating and maintaining airfield lighting systems, buildings (including fuel storage and distribution facilities) and works (water and sewage treatment plants, sewage lift stations, water truck fill stations, etc.) electrical systems and equipment (electrical controls, motors, pumps, generators, lighting, refrigeration/air-conditioning, electrical fixtures).

## **SCOPE**

The Design and Technical Services Division is responsible to provide technical expertise for the proper planning, design, construction, acquisition, operation and maintenance of public buildings, airfield lighting systems (High Voltage Systems) and works. This includes 27 public airports, 660+ owned buildings, 100+ leased buildings, 14 fuel storage and distribution facilities, and 15 biomass facilities in 33 communities across the Northwest Territories (NWT).

As the Division responsible for planning and design, the incumbent requires electrical knowledge of many differing types of public transportation systems, commercial and



institutional infrastructure (i.e. health care facilities, correction and education facilities, general purpose office buildings, fuel storage/distribution facilities, and municipal facilities for water and sewage treatment) for a varied clientele that ranges from knowledgeable contacts in other departments to members of community councils. The incumbent supports the GNWT's interest in providing transportation infrastructure, buildings and facilities which are technically appropriate, consistent, energy efficient at a reasonable cost and have the most economical life cycle while meeting program department and community needs to serve the public.

Located in Yellowknife and reporting to the Manager, Facilities Design and Technical Services, the incumbent provides technically advanced electrical technical services for buildings, airfield lighting systems (High Voltage Systems), and works infrastructure owned or leased by the GNWT. This work is done in accordance with Canadian Electrical Code (CEC), National Building Code (NBC), Canadian Standards Association (CSA), National Fire Codes (NFC), National Fire Prevention Association (NFPA), National Energy Codes, Canadian Aeronautics Act, Canadian Aviation Regulations, Aerodrome Standards and Recommended Practices (TP-312), Airfield Lighting System Design and Rehabilitation, Construction Methods and Inspection, Construction Materials and Testing, and International Civil Aviation Organization (ICAO) Annex 14, Aerodromes.

GNWT infrastructure operates in a physical environment with severe climate and operational challenges which if not appropriately considered during design, construction and operations phases can affect program delivery, public safety and services offered to the public. The results of the incumbent's work directly affect the operational efficiency and effectiveness and the cost effectiveness of GNWT's operations and services and reduce the GNWT's exposure to safety and environmental liabilities.

## **RESPONSIBILITIES**

### **1. Provides technical services in the planning, construction, operation, maintenance, distribution and interpretation of standards and guidelines concerning the design, construction, operation and maintenance of building electrical systems, subsystems, components and materials, airfield lighting systems, and works by:**

- Leading or participating in discussions with a working group of selected colleagues to develop technical standards and guidelines for all GNWT buildings, airfield lighting systems and works so they are appropriate and protect public safety.
- Providing recommendations to update departmental guidelines, procedures and checklists intended to be used as a basis for reviewing design of buildings, airfield lighting systems, projects or for other procedures related to airfield lighting and building construction, operation and maintenance.
- Promoting the development and use of GNWT standards through presentations of the research and the developed standards to client departments, Department's staff (HQ & regions), consultants and to other members of the construction industry.



- Providing support to Project Officers and Facility Planners in the interpretation of electrical design standards and guidelines, construction plans and specifications, and applicable codes for specific projects through consultation or by issuing clarifications for their use.
  - Determining the applicability of and practical limitations to the implementation of existing and proposed GNWT standards (Good Building Practice for Northern Facilities, Canadian Electrical Code, etc.) in various community settings and responding with technically appropriate alternatives (i.e., electrical controls, lighting systems and equipment, electrical fixtures, electric motors, generators, etc.).
  - Liaising with regulatory agencies, utility organizations and GNWT departments regarding codes, standards and regulations concerned with the construction and safe operation of GNWT facilities.
  - Maintaining contacts and exchange information regarding building electrical systems and equipment performance with O&M staff, governments (municipal, provincial and federal), and industry (i.e., manufacturers, consultants, contractors).
  - Reviewing and evaluating current and proposed codes and standards and other industry or technical association standards with respect to their impact on GNWT facilities and suggest modifications or enhancements to meet departmental objectives (i.e., safety, durability, energy conservation, user satisfaction, etc.) of the NWT.
  - Researching other jurisdictions and provide comparative analysis on relevant standards, practices and methods.
  - Explaining implications of technical standards, codes, regulations and construction technology to own or other departmental contacts in support of litigation activity, change orders, cost cutting measures, material selection, introducing new northern products, etc.
  - Developing, coordinating, and compiling cost estimates, scopes of work and justification for funding applications.
- 2. Provides technical support for ensuring that good construction documentation is provided and that appropriate construction methods are used in/on GNWT airports, buildings and works with respect to the incumbent's knowledge of electrical engineering and technology by:**
- Reviewing design submissions for appropriateness, accuracy and adherence to technical standards (*Good Building Practice for Northern Facilities, Canadian Electrical Code, National Building Code, Canadian Standards Association, National Energy Code, National Fire Code, Aerodrome Standards and Recommended Practices (TP-312), and ICAO Annex 14, Aerodromes* etc.).
  - Applying specialized technical knowledge of design and construction standards for airport lighting system design, maintenance and management, aircraft landing aids, airside signage, and airfield marking systems.



- Identifying any undesirable features or potential operating and maintenance problems associated with the designs and recommending changes where required.
- Providing technical support to Department staff to verify that technical aspects of proposals are acceptable for the northern environment.
- Reviewing calculations and designs submitted by consultants or others for conformance to codes and regulations, departmental standards, objectives and good practice (i.e., Good Building Practice for Northern Facilities).
- Assisting Department staff by delineating or reviewing terms of reference for specialist consultants' reports and reviewing contents of reports for responsiveness.

**3. Conducts technical performance evaluations, status evaluations, commissioning evaluations and problem-solving evaluations (troubleshooting) by providing or monitoring performance verification and testing of electrical systems, sub-systems and components for new and existing buildings and works infrastructure by:**

- Assisting in the development of a design performance verification process with feedback to facility planning and design standards.
- Identifying and investigating technical problems encountered in new or existing buildings, performing building operational audits of systems, sub-systems and components applicable to the incumbent's specialty in electrical engineering.
- Monitoring life cycles, condition and capacity of infrastructure systems to determine appropriate maintenance, restoration and replacement strategies.
- Troubleshooting problems with building systems, sub-systems and components; assess the severity and the risk potential of deficiencies, determine the urgency of required corrective action and initiate or recommend action as appropriate.
- Witnessing and documenting the results of specified tests to ensure that the performance of applicable components and systems is within required limits or meet required standards; identifying, in consultation with building operators, users and client departments, the need for and the required type of direct measurements and physical tests, survey or studies to be conducted.
- Preparing technical status evaluation reports describing the status or condition of building systems, sub-systems and components using written, graphic, photographic, videotape and other field recording methods (using *Technical Evaluations of Northern Facilities* brochure).
- Commissioning for measuring, verifying and recording the performance of the electrical building and works systems to ensure that systems are designed, installed, functionally tested, and capable of being operated and maintained to perform in conformity with the design intent.



**4. Provides general technical problem-solving support and technical training to departmental staff, communities, boards/agencies, and client departments for operation and maintenance of buildings by:**

- Identifying potential and actual operational and maintenance problems (i.e., lighting systems, fire alarms, standby power equipment, electrical controls and panels, motors, communication relay systems, electrical fixtures, energy conservation systems and equipment, sprinkler systems, life safety systems, etc.).
- Recommending and initiating corrective action after joint review and assessment of investigation outcomes with departmental and other contacts.
- Reviewing and evaluating the performance of and collection of information on existing facilities from O&M staff, drawings, reports or other sources.
- Reviewing existing on-site operating and maintenance manuals for their conformance to current operating guidelines.
- Training Department staff in operating and maintaining the applicable systems and equipment in facilities: DDC systems, fire alarms, infrared thermal scanning, testing, adjusting lighting systems, equipment and fixtures, motors, pumps, generators, etc.
- Advising and answering queries from O&M staff regarding features, components and materials incorporated into new facilities and provide instructions regarding any special O&M procedures required.
- Undertaking post occupancy performance testing/evaluations to verify the building and works (water and sewage treatment plants, pump house, etc.) electrical systems were designed and constructed properly, and are being operated and maintained properly or are not subject to premature failure or compromising public safety.

**5. Researches and advises on value (cost/benefit and life cycle costs) for GNWT building systems, sub-systems and components by:**

- Reviewing and evaluating 20-year needs, 5-year needs and O&M plans and recommending priorities for rehabilitation, restoration, reconstruction and replacement.
- Reviewing proposed buildings during design and recommending systems, materials and designs which provide greatest value.
- Reviewing cost benefits of new technical developments, standards and products.
- Researching information about new products, construction materials, components and systems with particular emphasis on their application in Arctic conditions.
- Undertaking routine reviews/analysis of technical bulletins such as NRC documents, trade magazines, published research results, design review commentaries, commissioning reports, post occupancy evaluations and other appropriate literature produced in or for the Division.
- Assisting in maintenance, distribution, and interpretation of current technical resource information of manufacturer's product and process literature to Department staff.



- Updating and procuring manufacturer's product catalogues and technical publications; participating in maintaining an updated library of manufacturers' information for reference by other divisional staff.
- Exchanging information on new design concepts and products with consultants, manufacturers, and other agencies (i.e., National Research Council, Universities, etc.)
- to improve knowledge of, and set criteria for, expected system performance, reliability and safety.

## **WORKING CONDITIONS**

### **Physical Demands**

Occasional physical effort is required in lifting and carrying testing equipment.

### **Environmental Conditions**

There may be exposure to insulation materials, paints, glues, cooling fluids, asbestos, electrical fixtures and adverse weather conditions while on-site.

### **Sensory Demands**

No unusual demands.

### **Mental Demands**

No unusual demands. The position travels on average 2 to 3 days each month to conduct technical evaluations.

## **KNOWLEDGE, SKILLS AND ABILITIES**

- Knowledge of buildings and airports and specialized knowledge of building electrical and airfield lighting systems (High Voltage Systems) and their sub- systems and components specific to electrical and engineering controls including an understanding of how these interact with each other.
- Knowledge of design and construction standards and best practices including: Canadian Electrical Code (CEC), National Building Code (NBC), Canadian Standards Association (CSA), National Fire Codes (NFC), National Fire Prevention Association (NFPA), National Energy Codes, Canadian Aeronautics Act, Canadian Aviation Regulations, Aerodrome Standards and Recommended Practices (TP-312), Airfield Lighting System Design and Rehabilitation, Construction Methods and Inspection, Construction Materials and Testing, and ICAO Annex 14, Aerodromes.
- Knowledge of airport planning, airport master and development plans, airport operations, safety regulations, zoning requirements and terminology, air carrier operations and aircraft characteristics and performance.



- Ability to communicate both orally and in writing and communicate complex concepts to both technical and lay audiences.
- Knowledge of cost estimating, cost control, and time scheduling.
- Ability to interpret technical electrical designs and verify the appropriateness of such designs for conditions in the NWT.
- Ability to read, comprehend, interpret and apply building codes, standards and regulations (i.e., NBC, CSA, NFC, NFPA, CEC, Energy Codes, etc.).
- Field inspection knowledge and testing skills required for investigations and performance verification, including the use and maintenance of applicable equipment.
- Analytical skills, such as problem solving and decision making, for successful participation in troubleshooting or failure investigations.
- Contract and project administrative and management skills needed to engage, direct and evaluate consultants and contractors.
- Conflict resolution and negotiation skills.
- Computer skills necessary to use word processing, spreadsheets, database management software; knowledge of other application programs and mainframe computer access skills may have to be acquired on the job for e-mail, scheduling and graphic presentations.
- Understanding of legal framework surrounding design and construction to understand implications of actions.
- Ability to work in a cross-cultural environment.
- Ability to commit to actively upholding and consistently practicing personal diversity, inclusion and cultural awareness, as well as safety and sensitivity approaches in the workplace.

**Typically, the above qualifications would be attained by:**

A Post Secondary Education in Electrical Engineering plus five (5) years of relevant experience, including one (1) year relevant experience in a setting similar to those found in the NWT (isolated, cold climate, limited resources and logistical challenges).

Equivalent combinations of education and experience will be considered.



## **ADDITIONAL REQUIREMENTS**

### **Position Security** (check one)

- No criminal records check required
- Position of Trust – criminal records check required
- Highly sensitive position – requires verification of identity and a criminal records check

### **French language** (check one if applicable)

- French required (must identify required level below)

Level required for this Designated Position is:

ORAL EXPRESSION AND COMPREHENSION

Basic (B)  Intermediate (I)  Advanced (A)

READING COMPREHENSION:

Basic (B)  Intermediate (I)  Advanced (A)

WRITING SKILLS:

Basic (B)  Intermediate (I)  Advanced (A)

- French preferred

### **Indigenous language:** Select language

- Required
- Preferred