



## **IDENTIFICATION**

<b>Department</b>	<b>Position Title</b>	
Infrastructure	Senior Technical Officer, Mechanical	
<b>Position Number</b>	<b>Community</b>	<b>Division/Region</b>
33-7110	Yellowknife	Design & Technical Services

## **PURPOSE OF THE POSITION**

The Senior Technical Officer - Mechanical (“Senior Technical Officer”) is a mechanical engineering technical expert for buildings and works in the Government of Northwest Territories (GNWT).

The incumbent provides technical guidance and advice to Department of Infrastructure staff, municipalities, program departments, regulatory bodies (i.e. Office of the Fire Marshal, Electrical/Mechanical Safety Section, etc.) and boards and agencies including industry associations, northern based service businesses and manufacturers, designers, builders and any other organization requiring technical advice about developing, operating and maintaining buildings and works mechanical systems (i.e., HVAC systems and equipment, HVAC applications, refrigeration/air-conditioning, plumbing fixtures, using appropriate standards and building codes- American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE), Canadian Standards Association(CSA), National Building Code (NBC), National Plumbing Code (NPC), National Fire Protection Association (NFPA), National Fire Code (NFC), etc.).

## **SCOPE**

Reporting to the Manager, Facilities Design & Technical Services, the Senior Technical Officer provides technically advanced services for buildings owned or leased by the GNWT in:

- The development and application of appropriate mechanical standards, codes and guidelines for design and construction of new buildings, and for the operation and maintenance of existing and new buildings;
- Judging and commenting on the appropriateness and accuracy of consultant's designs and technical specifications through review of submitted documentation;
- Conducting technical status evaluations on the status of building condition for ongoing use, renovation or expansion to identify which mechanical system, subsystem, components and



materials are at or near the end of their economic service life, and may be in need of repair or replacement;

- Verifying the performance of designs through post occupancy performance testing/evaluations to confirm the building mechanical systems were constructed properly, are being operated properly or are subject to premature failure;
- Investigating and resolving performance problems (troubleshooting) occurring in GNWT (including community/board buildings) buildings (i.e., heating, ventilation, pumps, boilers, indoor air quality, controls - DDC, air distribution equipment and system, cooling equipment, heat recovery equipment, furnaces, solar energy equipment, sprinkler equipment/systems, etc.);
- Organizing and delivering technical training to find practical, economical solutions to problems of building technology and operation;
- Reviewing and evaluating new or improved construction materials and products to determine if a proposed innovation will be effective in northern buildings (i.e., water and fuel storage tanks, sewage holding tanks, toilets, solar energy, residual heat recovery, fire protection equipment and technologies, etc.); and,
- Performing any other special tasks related to the activities of the Technical Support Services as may be assigned (i.e., preparing technical papers/reports, establishing design standards and guidelines, developing training programs/proposals, resolving claims in incumbent's area of expertise, etc.).

## **RESPONSIBILITIES**

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

- Leading or participating in discussions with a working group of selected colleagues to develop technical standards and guidelines for all GNWT buildings;
- Preparing suggestions and recommendations to update departmental guidelines, procedures and checklists intended to be used as a basis for reviewing design of buildings, projects or for other procedures related to 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, INF departmental staff, consultants and to other members of the construction industry;
- Providing support to Project Officers and Facility Planners in the interpretation of mechanical design standards and guidelines 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 in various community settings and responding with technically appropriate alternatives (i.e., mechanical controls, HVAC systems and equipment, plumbing fixtures, residual heat recovery opportunities, etc.);



- Maintaining contacts and exchanging information regarding building mechanical system performance with Operational and Maintenance (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 and environmental/climatic conditions of the NWT;
  - Researching other jurisdictions' standards, practices and methods and providing comparative analysis; and,
  - Explaining implications of technical standards, codes, regulations and construction technology in support of litigation activity, change orders, cost cutting measures, material selection, introducing new northern products, etc.
- 2. Provides technical support for ensuring that good construction documentation is provided and that appropriate construction methods are used in GNWT buildings and works with respect to the incumbent's knowledge discipline by:**
- Reviewing design submissions for appropriateness, accuracy and adherence to technical standards (Good Building Practice for Northern Facilities, National Building Code, Canadian Standards Association, National Energy Code, National Plumbing Code, National Fire Code, etc.);
  - Identifying any undesirable features or potential operating and maintenance problems associated with the designs and recommending changes where required;
  - Providing technical support to departmental staff to verify that technical aspects of proposals are acceptable for northern environment;
  - Reviewing and accepting or rejecting 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); and,
  - Assisting departmental 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 by providing or monitoring performance verification and testing of building mechanical systems, sub-systems and components for new and existing GNWT/community board buildings and reports 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;
  - Troubleshooting problems with building systems, sub-systems and components;
  - Assessing the severity and the risk potential of deficiencies, determining the urgency



- of required corrective action and initiating or recommending action as appropriate;
  - Witnessing and documenting the results of specified tests to ensure that the performance of applicable components and systems are 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 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).
- 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., indoor air quality, controls, HVAC equipment, sprinkler 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 existing facilities and collecting relevant information from operations and maintenance personnel, technical drawings, reports, and other available documentation;
  - Reviewing existing on-site operating and maintenance manuals for their conformance to current operating guidelines;
  - Training departmental staff in operating and maintaining the applicable systems and equipment in facilities (i.e., DOC systems, computer applications, testing, adjusting and balancing HVAC systems and equipment, building energy monitoring, residual heat recovery systems and equipment, etc.); and,
  - Advising and answering queries from O&M staff regarding features, components and materials incorporated into new facilities and providing instructions regarding any special O&M procedures required.
- 5. Researches and advises on value (cost/benefit and life cycle costs) for GNWT buildings systems, sub-systems and components by:**
- 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 for potential use in the NWT;
  - 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 maintaining and distributing to departmental staff the current technical resource information of manufacturer's product and process literature;
- Updating and procuring manufacturer's product catalogues and technical publications as needed for own use;
- Assisting 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, federal/provincial/territorial counterparts, etc.) to improve knowledge of, and set criteria for, expected system performance and reliability.

## **WORKING CONDITIONS**

### **Physical Demands**

Occasional physical effort is required in lifting and carrying testing equipment. During site visits, the incumbent will be walking during inspections or technical investigations.

### **Environmental Conditions**

Likelihood of exposure to insulation materials, paints, glues, cooling fluids, asbestos, electrical fixtures, etc.

### **Sensory Demands**

The nature of the work occasionally requires dexterity and concentrated sensory attention.

### **Mental Demands**

The position travels to other NWT communities on average two to three days each month to conduct technical evaluations.

## **KNOWLEDGE, SKILLS AND ABILITIES**

- Knowledge of buildings and specialized knowledge of building systems, sub-systems and components specific to mechanical and control including an understanding of how these interact with each other.
- Technical writing and speaking/training skills.
- Ability to interpret technical mechanical designs and judge the appropriateness of such designs for conditions in a cold climate.
- Ability to read, comprehend, interpret and apply building codes, standards and regulations (i.e., ASHRAE, NBC, CSA, NFC, NFPA, NPC, Energy Codes, etc.).
- Field inspection knowledge and testing skills required for investigations and performance verification, including the use and maintenance of equipment for such purposes.



- Analytical skills, such as problem solving and decision making, for successful participation in troubleshooting or failure investigations.
- Contract administrative and management skills needed to engage, direct and evaluate consultants.
- 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.
- Basic understanding of legal framework surrounding building design and construction to understand implications of actions.
- 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 Degree in Mechanical Engineering or related field plus three years of relevant experience, including two years' experience in a cold climate environment.

Equivalent combinations of education and experience will be considered.

**ADDITIONAL REQUIREMENTS**

Registration with the Northwest Territories and Nunavut Association for Professional Engineers and Geoscientists (NAPEG) within 90 days of hire is required, with flexibility for international registrants.

**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