Government of
Northwest Territories

IDENTIFICATION

Department	Position Title	
Infrastructure	Technical Officer – Mechanical	
Position Number	**Community**	**Division/Region**
33-15053	Yellowknife	Design and Technical Services

PURPOSE OF THE POSITION

The Technical Officer – Mechanical is responsible for providing mechanical engineering technical expertise for building and works, and Fuel Services Division's bulk fuel storage facilities in the Northwest Territories, including energy efficiency improvements, in accordance with applicable policies, procedures and operating manuals, and adhering to relevant standards and codes and authorities having jurisdiction including, but not limited to, ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers), CSA (Canadian Standards Association), NBC (National Building Code of Canada), NPC (National Plumbing Code), NFPA (National Fire Protection Association), NFC (National Fire Code), API (American Petroleum Institute), as well as legislation and regulations applicable to the Northwest Territories.

SCOPE

Reporting to the Manager, Facilities Design and Technical Services, and under the guidance of Senior Technical Officers, this position is located in Yellowknife.

The Department of Infrastructure is highly decentralized in the delivery of its programs and services and is responsible for territory-wide government programs such as the operation and maintenance of public buildings and transportation infrastructure and systems, project management, facilities planning, design and technical support services, environmental assessment and remediation, property management, procurement shared services, information technology, information management, disposal of surplus property and goods motor vehicle and mechanical/electrical regulatory services and fleet management.

The Technical Officer – Mechanical provides guidance and advice to headquarters and regional staff, municipalities, program departments, regulatory bodies (i.e., Fire Marshal's Office, Arctic Energy Alliance (AEA), Energy Directorate, Electrical/Mechanical Safety, etc.) and boards and agencies including industry associations, northern based service businesses and manufacturers, designers, builders and any other organizations about developing, operating and maintaining buildings and works mechanical systems and Fuel Services Division (FSD) projects.

The position works independently in a segregated discipline/specialty with extended periods of intense concentration in reviewing and/or evaluating project plans, researching technical standards, conducting technical status/performance evaluations, investigating problems, and in developing procedures, methods and information packages.

The position will be conducted in a political socio-economic and cross-cultural setting, in accordance with Government policies and directives that develop and encourage northern and local employment and business. The Technical Officer – Mechanical is responsible to achieve agreement between independent contractors and the client Community / Department and may experience challenging situations at meetings (client/consultant/INF staff) when client expectations cannot be met.

Under the guidance of Senior Officers, the provision of technical services includes:

- Development and application of appropriate mechanical standards, codes and guidelines for design and construction of new buildings and FSD facilities, and for the operation and maintenance of existing and new buildings and FSD facilities;
- Establishing design requirements for mechanical systems in new and/or renovated facilities in regards to code requirements, energy efficiency requirements and appropriate equipment and systems;
- Assessing 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 or FSD facility 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 building performance compliance with design intent by commissioning all mechanical systems prior to acceptance of the facility;
- Verifying the ongoing performance of buildings through post occupancy performance testing/evaluations to confirm mechanical systems were constructed properly, and are being operated properly to prevent premature failure;
- Investigating and resolving performance problems (troubleshooting) occurring in GNWT buildings (including community/board buildings) (i.e., heating, ventilation, pumps, boilers, indoor air quality, controls – Direct Digital Control, 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 involving problematic building technology and operations;

- Reviewing and evaluating new or improved construction materials and products to determine if a proposed innovation will be effective in northern buildings and FSD facilities (i.e., water and fuel storage tanks, sewage holding tanks, toilets, solar energy, residual heat recovery, fire protection equipment and technologies, bulk fuel storage and dispensing facilities, etc.);
- Developing and coordinating energy efficiency projects for the Capital Asset Retrofit Fund (~$5M annually); producing energy benchmarks and auditing of GNWT facilities; monitoring and performance verification of completed energy projects and promoting awareness with respect to energy efficiency and conservation.
- Developing and coordinating all projects for and in consultation with FSD ensuring all are designed and constructed to appropriate codes and standards.

RESPONSIBILITIES

1. **Provides technical mechanical engineering and energy related services under the guidance of senior technical officers, in the development, maintenance, distribution and interpretation of standards and guidelines concerning the design, energy efficiency, construction, operation and maintenance of buildings and FSD (Fuel Services Division) facility mechanical systems, subsystems, components and materials.**
   - Leads or participates in discussions with a working group of selected colleagues to develop technical standards and guidelines for all GNWT buildings and works including FSD facilities;
   - Prepares 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;
   - Promotes the development and use of GNWT standards through presentations of the research and the developed standards to client departments, Department of Infrastructure (INF) staff (Headquarters (HQ) & regions), consultants and the construction industry;
   - Provides support to Project Officers and Facility Planners in the interpretation of design standards and guidelines and applicable codes for specific projects through consultation or by issuing clarifications for their use;
   - Establishes and delivers an annual work plan for the Capital Asset Retrofit Fund (CARF) based on previous energy benchmarking, audits and technical status evaluations;
   - Establishes and delivers scopes of work for Energy Retrofit activities on GNWT facilities;
   - Determines the applicability of, and practical limitations to, the implementation of existing and proposed GNWT standards in various community settings and responds with technically appropriate alternatives (i.e., mechanical controls, HVAC (Heating, Venting and Air Conditioning) systems and equipment, plumbing fixtures, residual heat recovery opportunities);

- Liaises with regulatory agencies, utility organizations and GNWT departments regarding codes, standards and regulations concerned with the construction and operation of GNWT facilities, including FSD;
- Works with the Fuel Services Division (FSD) in delivering their annual capital and O&M (Operations and Maintenance) projects in accordance with all relevant codes and authorities having jurisdiction.
- Maintains contacts and exchanges information regarding building mechanical system performance with O&M staff, governments (municipal, provincial and federal), and industry (i.e. manufacturers, consultants, contractors);
- Reviews and evaluates current and proposed codes and standards and other industry or technical association standards with respect to their impact on GNWT facilities, including FSD, and suggests modifications or enhancements to meet departmental objectives and environmental/climatic conditions of the NWT;
- Researches other jurisdictions and provides comparative analysis on relevant standards, practices and methods;
- Explains 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, and the introduction of new northern products, etc.

2. **Provides mechanical engineering technical support under the guidance of senior technical officers, 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.**
   - Establishes design requirements for mechanical systems in new and/or renovated facilities in regards to code requirements, energy efficiency requirements and appropriate equipment and systems;
   - Reviews 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,* GNWT FSD Standards, etc.);
   - Identifies any undesirable features or potential operating and maintenance problems associated with the designs and recommend changes where required;
   - Provides technical support to INF staff to verify that technical aspects of proposals are acceptable for northern environment;
   - Reviews and accepts or rejects 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);
   - Assists INF staff by defining or reviewing terms of reference for specialist consultants' reports and reviewing contents of reports for compliance.

3. **Conducts technical performance evaluations, status evaluations, commissioning, monitoring and verification and problem solving evaluations on building mechanical systems, sub-systems and components for new and existing GNWT/community/board buildings and FSD facilities.**

- Assists in the development of a design performance verification process with feedback to facility planning and design standards;
- Verifies building performance compliance with design intent by commissioning of all mechanical systems prior to acceptance of the facility;
- Identifies and investigates technical problems encountered in new or existing buildings;
- Performs building and FSD facility operational audits of systems, sub-systems and components applicable to the incumbent's specialty;
- Troubleshoots for problems with building systems, sub-systems and components; assesses the severity and the risk potential of deficiencies, determines the urgency of required corrective action and initiates or recommends action as appropriate;
- Observes and documents the results of specified tests to ensure that the performance of applicable components and systems are within required limits or meet required standards;
- Evaluates the thermal loss of a facility envelope through the use of thermal imaging;
- Identifies (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 to correct excessive air leakage issues;
- Prepares 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).
- Verifies the ongoing performance of buildings through post occupancy performance testing/evaluations to confirm the building or FSD facility mechanical systems were constructed properly, and are being operated properly to prevent premature failure;
- Completes annual whole building performance verification reporting on all energy related projects (i.e. CARF, biomass, etc.)

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 and FSD facilities.**
   - Identifies potential and actual operational and maintenance problems (i.e., indoor air quality, controls, HVAC equipment, sprinkler systems, fuel storage, pumping and dispensing, etc.);
   - Recommends and initiates corrective action after joint review and assessment of investigation outcomes with departmental and other contacts;
   - Reviews and evaluates the performance of, and collects information on, existing facilities from O&M staff, drawings, reports or other sources;
   - Reviews existing on-site operating and maintenance manuals for their conformance to current operating guidelines;
   - Trains INF staff in operating and maintaining the applicable systems and equipment in facilities (i.e., Direct Digital Control (DDC) systems, computer applications, testing, adjusting and balancing HVAC systems and equipment, building energy monitoring, residual heat recovery systems and equipment, etc.);

- Advises and answers queries from O&M staff regarding features, components and materials incorporated into new facilities and provides instructions regarding any special O&M procedures required.

5. **Conducts value engineering (cost/benefit and life cycle costs) for GNWT building systems, sub-systems and components.**
   - Reviews proposed buildings and FSD facilities during design and recommends systems, materials and designs which provide greatest value;
   - Reviews cost benefits of new technical developments, standards and products;
   - Researches information about new products, construction materials, components and systems with particular emphasis on their application in Arctic conditions for potential use in the NWT;
   - Undertakes routine reviews/analysis of technical bulletins such as NRC (National Research Council) documents, trade magazines, published research results, design review commentaries, commissioning reports, post occupancy evaluations and other appropriate literature produced in or for the division;
   - Assists in maintaining and distributing to INF staff current technical resource information of manufacturer's product and process literature;
   - Updates and procures manufacturer's product catalogues and technical publications as needed for own use; participates in maintaining an updated library of manufacturers' information for reference by other divisional staff;
   - Exchanges information on new design concepts and products with consultants, manufacturers, and other agencies (i.e., National Research Council, Universities, BTTF, etc.) in order to improve knowledge of, and set criteria for, expected system performance and reliability;
   - Promotes energy efficiency and conservation to GNWT and community members.

6. **Provides reporting specific to energy usage and performance.**
   - Monitors utility consumption, identifies and follows up on anomalies in energy consumption and costs;
   - Ensures utility information is being properly entered into the financial system;
   - Provides training to regional O&M departmental staff on how to enter utility information into the financial system;
   - Completes energy baselines/benchmarks for GNWT assets and compares energy use against assets operated by other government and non-government organizations;
   - Maintains and updates information on energy prices charged by utilities and suppliers;
   - Reports annually on energy project performance;
   - Provides analysis on new building utility costing for the Forced Growth submissions.
   - Utilizes utility tracking software/online tools to compare the performance of GNWT buildings against industry performance and norms.

7. **Performing any other specialized 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 construction claims, etc.).**

WORKING CONDITIONS

Physical Demands

Occasional physical effort is required in lifting and carrying heavy testing equipment and documents. During regional site visits the position is involved in climbing and maneuvering in awkward positions during inspections or technical investigations.

Environmental Conditions

When conducting technical evaluations the position may be exposed to adverse weather conditions.

Sensory Demands

The nature of the work requires accuracy, dexterity and concentrated sensory attention at all times (i.e., exposure to insulation materials, paints, glues, cooling fluids, asbestos, electrical fixtures, etc.).

Mental Demands

The incumbent will be required to travel away from Yellowknife, on average 4 to 5 days each month, to conduct technical status or performance evaluations, troubleshooting, commissioning or other reasons concerning the construction and operation of GNWT facilities, including FSD.

KNOWLEDGE, SKILLS AND ABILITIES

- General working knowledge of buildings, FSD facilities and specialized knowledge of mechanical systems, sub-systems and components specific to mechanical and control including an understanding of how these interact with each other;
- Knowledge and experience with building energy auditing, modeling and monitoring and verification in accordance with standard industry practices (ASHRAE, NECB, IPMVP);
- Ability to interpret technical mechanical designs and judge the appropriateness of such designs for conditions in the NWT;
- Ability to read, comprehend, interpret and apply building codes, standards and regulations (i.e., ASHRAE, NBC, CSA, NFC, NFPA, NPC, NECB, API, 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, in a risk based framework for successful troubleshooting or failure investigations;
- Technical writing and presentation/training skills;
- Contract administrative and management skills needed to engage, direct and evaluate consultants retained to assist the Asset Management Division;

- Word processing, spreadsheets, project scheduling, 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 and FSD facility design and construction to understand implications of actions.

Typically, the above qualifications would be attained by:

A bachelor degree in Mechanical Engineering plus 5 years of relevant experience; or Mechanical Engineering Technology Diploma plus 7 years of relevant experience.

Some experience must be cold climate related.

The work experience must be varied in nature of tasks as well as scope of projects.

ADDITIONAL REQUIREMENTS

Position Security

☒ 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

Aboriginal language: To choose a language, click here.

☐ Required
☐ Preferred