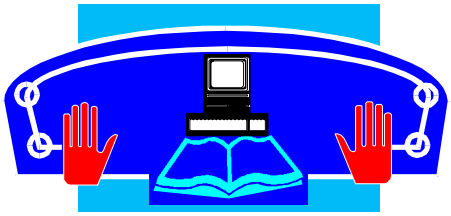

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Careers With The Department Of Public Works And The Department Of Transportation

Date of Report: 1990

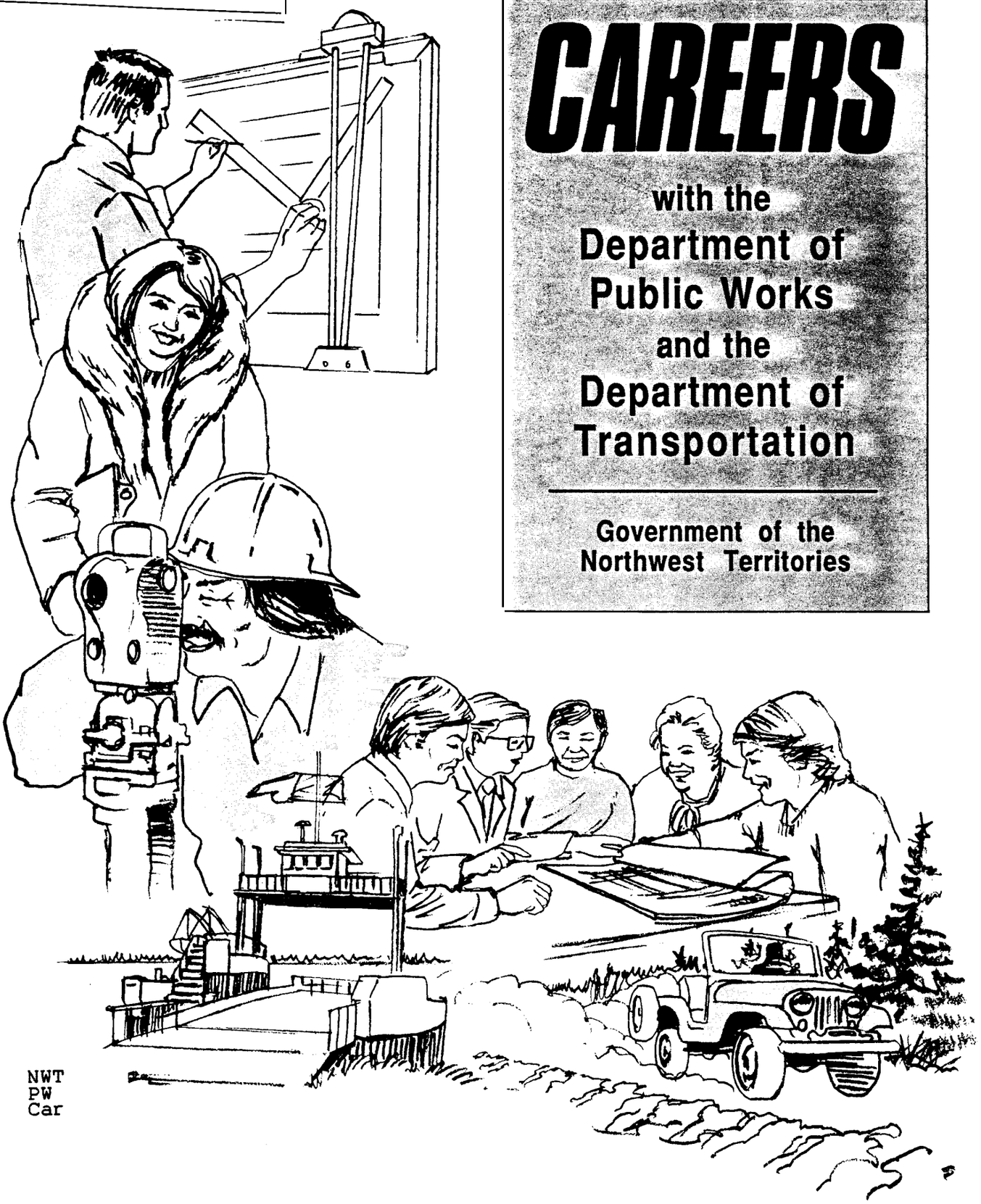
Author: G.n.w.t. - Public Works/tranportation

Catalogue Number: 9-5-249

CAREERS

with the Department of Public Works and the Department of Transportation

Government of the Northwest Territories



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CAREERSWITH

THE DEPARTMENT OF PUBLIC WORKS

AND

THE DEPARTMENT OF TRANSPORTATION

GOVERNMENT OF THE NWT

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INTRODUCTION

Purpose of Manual

The Departments of Public Works and Transportation are keenly interested in attracting northern students into new and exciting careers within the Government of the Northwest Territories. The purpose of this manual is to provide academic and student counselors as well as the students themselves with basic information on a wide variety of professional, technical and trades oriented positions within the departments. Through the use of this manual, it is hoped that students will become interested in careers with the Government and will remain in school and take the required courses to qualify for our jobs.

About the Departments

The Department of Public Works has the mandate to design, construct, acquire, operate and maintain all buildings, works and equipment required by the Government of the Northwest Territories to deliver its programs and services to NWT residents; and to promote efficient and economical energy use in the NWT. The department employs trades-oriented people in virtually all communities across the Territories as well as professional, technical, trades and administrative staff in the regional centres and in Headquarters in Yellowknife.

The Department of Transportation has the mandate to plan, design, construct or reconstruct, acquire, operate and maintain public transportation infrastructure in the NWT, including community airports and docks and the highway system and to regulate and license individuals and vehicles operating in the NWT. The department employs individuals in various communities, primarily in regional centres and in Headquarters. Positions include trades people as well as professional and technical staff.

Section 3 outlines the various Headquarters and field-based program responsibilities in each department.

SECTION 1

CAREER PROPILES

This section describes some of the careers available in the Departments of Public Works and Transportation. For each career, there is a general description, an indication of the training and education required, a description of the working conditions, and the personal qualities of people who work successfully in the occupation.

Some of the information in this section came from the Careers Alberta booklets.

ARCHITECT

Job Description

An architect designs buildings, develops plans, specifications and detailed drawings, arranges contracts and exercises general supervision over construction:

- Consults with client to determine type, style and size of building.
- Provides information regarding design, materials, costs and estimated building time.
- Plans layout, interior walls and location of equipment in project. Prepares sketches and documents of proposed project.
- Prepares or supervises the preparation of scale drawings, integrating structural, mechanical and aesthetic elements in unified design.
- Writes specifications and other contract documents for use by building contractors and craftsmen.
- Consults with engineers for specialized advice on soil, structural, electrical, mechanical and other technical probelms.
- Confers with other consultants to develop feasibility studies, financial analyses and arrangements, site location and land assembly.

Preparation and Training

• Educational Requirements

Employment in this occupation usually requires graduation from grade 12, plus completion of a 3 to 4 year university degree program in architecture or an acceptable field, plus completion of a post-graduate program leading to a Masters Degree.

•On-The-Job Training

A practical training period of 2 years duration under the supervision of a registered architect is required.

Working Conditions

. Environmental Conditions

Work is both indoors and outdoors. This work involves exposure to hot and cold temperatures and dampness. occasional traveling is required in the performance of the job.

•Physical Activities

Physical demands are light. Frequent physical activities include handling, fingering and seeing.

• **work** week
A 5&y work week of 37.5 hours is normal.

Personal Qualitities

• Aptitude Factors
The occupation usually requires people with above average ability to learn, reason and make decisions; understand and use words to express ideas and/or information; perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and/or predict their **resulting** position after movement in space; and see and compare slight differences in shape, **size** and detail of objects or pictorial material.

. Interest Factors
People in this occupation are usually interested in scientific and technical work; relating to people or communicating with or about them; and theoretical and creative work.

• Temperament Factors
People in this occupation enjoy situations involving managing a work group; achieving cooperative and successful working relationships; judging information against measurable standards; attaining precise standards; and making judgments based on evaluation of information using one's personal knowledge and experience.

CARPENTER

Job Description

A carpenter builds and repairs structures and fixtures of wood and other construction materials:

- Studies plans and building codes to determine dimensions and materials required.
- Constructs forms for concrete footings and walls.
- Saws lumber, erects framing, partitions and roofs.
- Lays floors and installs window frames, doors, finish trim and hardware.
- Builds stairs and fabricates and installs cabinets.
- Applies acousitc and decorative panels to ceilings and walls.

Preparation and Training

- Apprenticeship Programs

  Training is by an apprenticeship program or similar form of on-the-job training. Apprenticeship requires completion of grade 12 and is four years in length.

Working Conditions

- Environmental Conditions

  Work is both indoors and outdoors. This work involves exposure to hazards which require the use of safety equipment.

- Physical Activities

  Physical demands are medium. Frequent physical activities include lifting, carrying, pushing/pulling, climbing and balancing, stooping, kneeling, crouching, crawling, standing for prolonged periods, reaching, handling, fingering and seeing.

- Work Week

  A 5 day work week of 37.5 to 40 hours is normal.

Personal Qualitities

- Aptitude Factors

  The occupation usually requires people with average ability to learn, reason and make decisions; perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and/or predict their resulting position after movement in space; coordinate hand

and finger movements accurately and swiftly in response to what is seen; move hands skillfully and easily in placing and turning motions; and coordinate hand and foot movements in response to observations.

- Interest Factors

  People in this occupation are usually interested in dealing with things and objects; working with details, processes, machines and techniques; and work resulting in clearly visible results.

- Temperament Factors

  People in this occupation enjoy situations involving judging information against measurable standards; and attaining precise standards.

DRAFTSPERSON, ARCHITECTURAL

Job Description

An architectural draftsperson prepares drawings showing interior, exterior, or other architectural features of office blocks, residential structures, industrial, commercial and other buildings:

- Prepares preliminary sketches showing proposed interior, exterior and other principal features, as directed by architect.
- Makes calculations to determine type and quality of materials required.
- Prepares working drawings showing plans, elevations, sections and typical details, for use on construction site, using a variety of drafting instruments.
- May estimate quantities of materials required for project and compute costs.

Preparation and Training

- Educational Requirements

  Employment in this occupation usually requires graduation from grade 12 with emphasis on mathematics and physics, plus completion of a 1 to 2 year college program in architectural drafting or drafting technology with an option in architecture.

- On-The-Job Training

  For those with little or no drafting training, at least 4 years of on-the-job training and related experience under the supervision of an experienced worker, preferably supplemented by courses in drafting, are required. Those with formal drafting training require at least 1 year of on-the-job training to become proficient in the field of architectural drafting. Those with specific training in architectural drafting require ar least 6 months of experience to become proficient.

Working Conditions

- Environmental Conditions

  Work is indoors.

- Physical Activities

  Physical demands are light. Frequent physical activities include reaching, handling, talking, hearing and seeing.

- Work Week

  A 5 day work week of 37.5 hours is normal.

Personal Qualitities

- **Aptitude Factors**

  The occupation usually requires people with above average ability to learn, reason and make decisions; perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and/or predict their resulting position after movement in space; see and compare slight differences in shape, size and" detail of objects or pictorial material; and manipulate small objects rapidly or accurately with fingers. Also required is average ability to recognize detail, differences or errors, in written words and numbers.

- Interest Factors

  People in this occupation are usually interested in scientific and technical work; working with details, processes, machines and techniques; and dealing with things and objects.

- Temperament Factors

  People in this occupation enjoy situations involving judging information against measurable standards; and attaining precise standards.

DRAFTSPERSON, CIVIL

Job Description

A civil draftsperson prepares drawings for the construction of structural, sanitary, transportation, hydrological and other civil engineering projects by performing any combination of the following duties:

- Prepares plans for structures, using structural steel.
- Drafts diagrams of water, gas and sewage disposal systems for use by maintenance crews in diagnosing and locating causes of disturbances or failures.
- Develops plans for highways and auxilary projects, such as roads, culverts and bridges, from data received from field surveys.
- Drafts detailed drawings of wharfs, breakwaters, dikes, and other hydrological structures.
- Prepares drawings showing profiles, cross-sections and rights-of-way, indicating relation of topographical contours and elevations to buildings, roads, tunnels, mains and other civil engineering projects.

Preparation and Training

•Educational Requirements

Employment in this occupation usually requires graduation from grade 12 with emphasis on mathematics and physics, plus completion of a 1 to 2 year college program in engineering drafting or drafting technology.

. On-The-Job Training

For those with little or no drafting training, at least 4 years of on-the-job training and related experience under the supervision of an experienced worker, preferably supplemented by courses in drafting, are required. Those with formal drafting training require at least 1 year of on-the-job training to become proficient in the field of civil drafting. Those with specific training in civil drafting require ar least 6 months of experience to become proficient.

Working Conditions

•Environmental Conditions

Work is indoors.

• Physical Activities

Physical demands are light. Frequent physical activities include reaching, handling, talking, hearing and seeing.

• Work Week

A 5 day work week of 37.5 hours is normal.

Personal Qualitities

- Aptitude Factors

  The occupation usually requires people with above average ability to learn, reason and make decisions; perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and/or predict theirs resulting position after movement in space; and see and compare slight differences in shape, size and detail of objects or pictorial material. Also required is average ability to recognize detail, differences or errors, in written words and numbers; and manipulate small objects rapidly or accurately with fingers.

- Interest Factors

  People in this occupation are usually interested in scientific and technical work; working with details, processes, machines and techniques; and dealing with things and objects.

- Temperament Factors

  People in this occupation enjoy situations involving judging information against measurable standards; and attaining precise standards.

DRAFTSPERSON, MECHANICAL

Job Description

A mechanical draftsperson prepares drawings of industrial machines, machine parts, engines, tools and other mechanical equipment:

- Drafts general assembly and detail drawings of gears, levers, pulleys and reduction gears indicating dimensions and tolerance, fasteners and joining requirements and other engineering data.
- Prepares working drawing showing methods of manufacture, joining and fastening, utilizing knowledge of machine shop practice.

Preparation and Training

- Educational Requirements

  Employment in this occupation usually requires graduation from grade 12 with emphasis on mathematics and physics, plus completion of a 1 to 2 year college program in engineering drafting or drafting technology.

- On-The-Job Training

  For those with little or no drafting training, at least 4 years of on-the-job training and related experience under the supervision of an experienced worker, preferably supplemented by courses in drafting, are required. Those with formal drafting training 'require at least 1 year of on-the-job training to become proficient in the field of mechanical drafting. Those with specific training in mechanical drafting require ar least 6 months of experience to become proficient.

Working Conditions

- Environmental Conditions

  Work is indoors.

- Physical *Activities*

  Physical demands are light. Frequent physical activities include reaching, handling, talking, hearing and seeing.

- Work Week

  A 5 day work week of 37.5 hours is normal.

Personal Qualitities

- Aptitude Factors

  The occupation usually requires people with above average ability to learn, reason and make decisions; mentally picture the position and shape of objects and/or predict their resulting position after movement in space; see and compare slight differences in shape, size and detail of objects or

pictorial material; and manipulate small objects rapidly or accurately with fingers. Also required is average ability to recognize detail, differences or errors, in written words and numbers.

- **Interest Factors**

  People in this occupation are usually interested in scientific and technical work; working with details, processes, machines and techniques; and dealing with things and objects.

- Temperament Factors

  People in this occupation enjoy situations involving judging information against measurable standards; and attaining precise standards.

ENGINEER, CIVIL

Job Description

A civil engineer prepares design proposals and advises on works and facilities such as roads, railways, bridges, dams, sewage and waste disposal systems and buildings structures, and coordinates their construction and maintenance, performing any combination of the following duties:

Studies project proposal, accumulates and analyses basic data.

Prepares preliminary plans for the project, applying knowledge of mathematics and engineering design to superstructures, structural frames and infrastructure.

Supervises preparation of detail design drawings and specifications for contractors, and consults other specialists.

Secures approval of plans from client, management and other authorities.

- Inspects project during construction and certifies that completed structure is in accordance with specifications.

Supervises the maintenance and repair of civil engineering projects.

Conducts studies into improving maintenance practices and the use of new materials to keep completed facilities in service.

Preparation and Training

- Educational Requirements

Employment in this occupation usually requires graduation from grade 12, plus completion of a 4 to 5 year university degree program in civil engineering. Completion of a Master degree may be required for some positions.

Working Conditions

. Environmental Conditions

Work is both indoors and outdoors. This work involves exposure to hot and cold temperatures and dampness. occasional travel is required in the performance of the job.

- Physical Activities

Physical demands are light. Frequent physical activities include handling, talking, hearing and seeing.

- Work Week

A 5 day work week of 37.5 hours is normal.

Personal Qualitities

- Aptitude Factors

  The occupation usually requires people with above average ability to learn, reason and make decisions; understand and use words to express ideas and /or information; perform arithmetic operations quickly and accurately; and mentally picture the position and shape of objects and/or predict their resulting position after movement in space. Also required is average ability to see and compare slight differences in shape, size and detail of objects or pictorial material.

- Interest Factors

  People in this occupation are usually interested in saentific and technical work; and working with details, processes, machines and techniques.

- Temperament Factors

  People in this occupation enjoy situations involving managing a work group; judging information against measurable standards; and attaining precise standards. . . .

ENGINEER, ELECTRICAL

Job Description

An electrical engineer prepares design proposals and supervises the manufacture, installation, testing, maintenance, modification and repair of electrical equipment and components used for generation, transmission, distribution and utilization of electrical energy by performing any combination of the following duties:

- Develops products and systems.
- Determines type and arrangements of circuits, transformers, switches and lighting arresters.
- Supervises installation and layout of machinery and equipment.
- Directs modification and repair of electrical power systems and of complicated and sensitive automatic controls and components.
- Supervises technical aspects of manufacturing processes.
- Evaluates technical specifications, examines installed electrical equipment to ensure compliance with safety standards, and recommends modification, maintenance and repair procedures.

Preparation and Training

- **Educational** Requirement

  Employment in this occupation usually requires graduation from grade 12, plus completion of a 4 to 5 year university degree program in electrical engineering. Completion of a Master degree may be required for some positions.

Working Conditions

- Environmental Conditions

  Work is both indoors and outdoors. This work involves exposure to hot and cold 'temperatures and hazards which require the use of safety equipment and clothing. Occasional travel is required in the performance of the job.

- **Physical** Activities

  Physical demands are light. Frequent physical activities include reaching, handling, fingering, talking, hearing and seeing.

- Work Week

  A 5 day work week of 37.5 hours is normal.

Personal Qualitities

- Aptitude Factors

  The occupation usually requires people with above average ability to learn, reason and make decisions; understand and use words to express ideas and/or information; perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and/or predict their resulting position after movement in space; and see and compare slight differences in shape, size and detail of objects or pictorial material.

- Interest Factors

  People in this occupation are usually interested in saentific and technical work; and working with details, processes, machines and techniques.

. Temperament Factors

People in this occupation enjoy situations involving managing a work group; achieving cooperative and successful working relationships; judging information against measurable standards; and attaining precise standards.

ENGINEER, MECHANICAL

Job Description

A mechanical engineer arranges, supervises or conducts the study, design, development, construction, operation and maintenance or machines, mechanisms and processes by performing any combination of the following duties:

- Prepares designs and cost estimates for machines, mechanisms and industrial processes.
- Analyzes and solves problems involving the utilization of power, machinery, materials and equipment.
- Collates data and writes reports.
- Supervises preparation of working drawings and specifications, indicating materials to be used and the method of manufacture.
- Directs feasibility studies, construction, modification and final testing of prototypes, products or pilot plants.
- Evaluates installed plants, mechanical processes and products to ensure compliance with specifications and safety standards, and recommends modifications, repairs or maintenance procedures.

Preparation and Training

•Educational Requirements

Employment in this occupation usually requires graduation from grade 12, plus completion of a 4 to 5 year university degree program in mechanical engineering. Completion of a Master degree may be required for some positions.

Working Conditions

•Environmental Conditions

Work is indoors. This work involves exposure to noise and hazards which require the use of safety equipment and clothing. occasional travel is required in the performance of the job.

•Physical Activities

Physical demands are light. Frequent physical activities include talking, hearing and seeing.

• Work Week

A 5 day work week of 37.5 hours is normal.

Personal Qualities

- Aptitude Factors

  The occupation usually requires people with above average ability to learn, reason and make decisions; understand and use words to express ideas and/or information; perform arithmetic operations quickly and accurately; and mentally picture the position and shape of objects and/or predict their resulting position after movement in space. Also required is average ability to see and compare slight differences in shape, size and detail of objects or pictorial material.

- Interest Factors

  People in this occupation are usually interested in scientific and technical work; and working with details, processes, machines and techniques.

- Temperament Factors

  People in this occupation enjoy situations involving managing a work group; achieving cooperative and successful working relationships; judging information against measurable standards; and attaining precise standards.

ENGINEERING TECHNICIAN, CIVIL

Job Description

A civil engineering technician performs technical functions in various aspects of civil engineering, primarily in support of installation, operation, maintenance, production and quality control:

- Makes routine computations and cost estimates, and assists in preparation of engineering drawings for buildings, bridges and other structures.
- Conducts field and laboratory tests of construction materials, takes soil samples, summarizes data and writes reports for construction and maintenance of highways, railways, waterways and other civil engineering projects.
- Collects data for traffic volume studies.
- Summarizes information from maps, reports, field investigations and books for urban planning studies.
- Prepares, operates and maintains field experiment and sampling stations for air pollution monitoring.
- Processes air and other source samples to determine level of pollution and reports findings to regulatory agencies.

Preparation and Training

- Educational Requirements

  Employment in this occupation usually requires graduation from grade 12 with emphasis on mathematics and physics, plus completion of a 1 to 2 year college program in civil engineering technology.

- On-The-Job Training

  Up to 12 months of on-the-job training under the supervision of an experienced worker may be required. The length of training required varies with the individual's educational background and complexity of the position.

Working Conditions

- Environmental Conditions

  Work is both indoors and outdoors. This work involves exposure to noise, vibration and hazards which require the use of safety equipment. Occasional travel may be required in the performance of the job.

- Physical Activities

  Physical demands are light. Frequent physical activities include reaching, handling, talking, hearing and seeing.

- Work Week

  A 5 day work week of 37.5 hours is normal.

Personal Qualitities

. Aptitude Factors

The occupation usually requires people with above average ability to learn, reason and make decisions. Also required is average ability to understand and use words to express ideas and / or information: perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and / or predict their resulting position after movement in space; see and compare slight differences in shape, size and detail of objects or pictorial material; manipulate small objects rapidly or accurately with fingers; and move hands skillfully and easily in placing and turning motions.

- Interest Factors

  People in this occupation are usually interested in scientific and technical work; working with details, processes, machines and techniques; and dealing with things and objects.

- Temperament Factors

  People in this occupation enjoy situations involving judging information against measurable standards; and attaining precise standards.

ENGINEERING TECHNICIAN, ELECTRICAL

Job Description

A electrical engineering technician performs technical functions in various aspects of electrical engineering, primarily in support of installation, operation, maintenance, production and quality control:

- Maintains power generation and distribution equipment and tests water and coal used in boilers, and oil, used in circuit breakers and as a lubricant in generators.
- Assembles prototypes or final assemblies of protected relays and metering and indicating devices and other electrical equipment, using hand and power tools and test equipment.
- Assembles, installs, tests and calibrates electrical testing equipment.
- Assists corrosion engineers with problems related to measuring static electricity discharge between gas pipeline and ground.
- Makes recommendations to correct or improve lighting arrangements.

Preparation and Training

- Educational Requirements

  Employment in this occupation usually requires graduation from grade 12 with emphasis on mathematics and physics, plus completion of a 1 to 2 year college program in electrical engineering technology.

- On-The-Job Training

  Up to 12 months of on-the-job training under the supervision of an experienced worker may be required.

Working Conditions

- Environmental Conditions

  Work is indoors. This work involves exposure to hazards which require the use of safety equipment. Occasional travel may be required in the performance of the job.

- Physical Activities

  Physical demands are light. Frequent physical activities include reaching, handling, talking, hearing and seeing.

- Work Week

  A 5 day work week of 37.5 hours is normal.

Personal Qualities

. Aptitude Factors

The occupation usually requires people with above average ability to mentally pictues the position and shape of objects and/or predict their resulting position after movement in space; and learn, reason and make decisions. Also required is average ability to understand and use words to express ideas and/or information: perform arithmetic operations quickly and accurately; see and compare slight differences in shape, size and detail of objects or pictorial material; manipulate small objects rapidly or accurately with fingers; and move hands skillfully and easily in placing and turning motions.

. Interest Factors

People in this occupation are usually interested in scientific and technical work; working with details, processes, machines and techniques; and dealing with things and objects.

. Temperament Factors

People in this occupation enjoy situations involving judging information against measurable standards; and attaining precise standards.

ENGINEERING TECHNICIAN, MECHANICAL

Job Description

A mechanical engineering technician performs technical functions in various aspects of mechanical engineering:

- Develops specifications for non-standard instrumentation apparatus according to engineering data, characteristics of equipment and capabilities of procurable test apparatus.
- Selects, installs, calibrates and checks out sensing, telemetering and recording instrumentation and circuitry to control plant processes.
- Operates test apparatus to produce, regulate and record effects of actual or simulated conditions in testing of mechanical components.
- Assembles of installs new or modified mechanical components or assemblies for industrial or power equipment, machine tools, and measuring and control instruments.
- Designs and makes metalworking dies, cutting tools, jigs and fixtures, using milling machines, lathes, shapers and other metalworking machines, and inspects finished dies for conformance to original model or drawing using calipers, micrometers and other measuring devices.

Preparation and Training

- Educational Requirements

  Employment in this occupation usually requires graduation from grade 12, plus completion of a 2 year college program in mechanical engineering technology.

- On-The-Job Training

  Up to 12 months of on-the-job training under the supervision of an experienced worker may be required.

Working Conditions

- Environmental Conditions

  Work is indoors. This work involves exposure to hazards which require the use of safety equipment. Occasional travel may be required in the performance of the job.

- Physical Activities

  Physical demands are medium. Frequent physical activities include kneeling, fingering, talking, hearing and seeing.

- Work Week

  A 5 day work week of 37.5 hours is normal.

Personal Qualitities

- Aptitude Factors

  The occupation usually requires people with above average ability to learn, reason and make decisions. Also required is average ability to understand and use words to express ideas and / or information: perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and / or predict their resulting position after movement in space; see and compare slight differences in shape, size and detail of objects or pictorial material; coordiante hand and finger movements accurately and swiftly in response to what is seen; and move hands skillfully and easily in placing and turning motions.

- Interest Factors

  People in this occupation are usually interested in scientific and technical work; working with details, processes, machines and techniques; and dealing with things and objects.

- Temperament Factors

  People in this occupation enjoy situations involving judging information against measurable standards; and attaining precise standards.

HEAVY DUTY EQUIPMENT MECHANIC

Job Description

A heavy duty equipment mechanic repairs, adjusts, and services heavy mobile equipment used in construction, logging and mining:

- Observes equipment in operation to assist in fault diagnosis.
- Dismantles engines and equipment to repair component parts.
- Carries out typical repairs such as testing and setting up fuel injection systems.
- Measuring devices and hand and power tools.
- Services machine by lubricating drirve chains and control linkages and cleaning or replacing air filters.

Preparation and Training

- Apprenticeship Programs

  Training is by an apprenticeship program. Apprenticeship requires completion of grade 12 and is four years in length.

Working Conditions

- Environmental Conditions

  Work is both indoors and outdoors. This work involves exposure to both hot and cold temperatures, noise, vibration and liquids, fumes, dust, odours and hazards which require the use of safety equipment.

- Physical Activities

  Physical demands are heavy. Frequent physical activities include lifting, carrying, pushing/pulling, stooping, kneeling, crouching, reaching, handling, fingering, feeling, hearing and seeing.

- Work Week

  A 5 day work week of 37.5 to 40 hours is normal.

Personal Qualitities

- **Aptitude** Factors
  The occupation usually requires people with average ability to learn, reason and make decisions; mentally picture the position and shape of objects and/or predict their **resulting** position after movement in space; see and compare slight differences in shape, size and detail of objects or pictorial material; coordinate hand and finger movements accurately and swiftly in response to what is seen; manipulate small objects **repaidly** or accurately with fingers; and move hands skillfully and easily in placing and turning motions.

- Interest Factors
  People in this occupation are usually interested in dealing with things and objects; working with details, processes, machines and techniques; and work resulting in clearly visible results.

- Temperament Factors
  People in this occupation enjoy situations involving judging information against measurable standards; attaining precise standards; and a variety of duties that change constantly.

HEAVY EQUIPMENT OPERATOR

Job Description

A heavy equipment operator operates heavy equipment such as cranes, bulldozers, graders and scrapers.

Preparation and Training

Apprenticeship Programs

Training is by an apprenticeship program. Apprenticeship requires completion of grade 10 and is one or more years in length.

Working Conditions

. Environmental Conditions

Work is both indoors and outdoors. This work involves exposure to noise, vibration, fumes, dust, odours and hazards which require the use of safety equipment.

• Physical Activities

Physical demands are medium to heavy. Frequent physical activities include lifting, carrying, pushing/pulling, climbing and balancing, reaching, handling, and seeing.

. Work Week

A 5 day work week of 37.5 to 40 hours is normal.

Personal Qualitities

• Aptitude Factors

The occupation usually requires people with average ability to mentally picture the position and shape of objects and/or predict their resulting position after movement in space; coordinate hand and finger movements accurately and swiftly in response to what is seen; move hands skillfully and easily in placing and turning motions; and coordinate hand and foot movements in response to observations.

. Interest Factors

People in this occupation are usually interested in dealing with things and

objects; working with details, processes, machines and techniques; and routine, clearly organized work.

- Temperament Factors
  People in this occupation enjoy situations involving attaining precise standards; and tasks that are repeated often and regularly and are done according to set procedures.

INTERIOR DESIGNER

Job Description

An interior designer plans and designs aesthetic interiors for homes, industrial, commercial and institutional establishments and other structures:

Analyzes functional requirements, desired mood and purpose of furnishing interior, based on client's needs and preferences.

Devises harmonious colour sherne, and sketches plans of areas showing arrangements of furniture and accessories.

Estimates cost and amount of materials required, and presents plans to client for approval.

May direct workers painting walls, laying carpets, installing fixtures and draperies, and arranging furniture and accessories.

Preparation and Training

- Educational Requirements

  Employment in this occupation usually requires graduation from grade 12, plus completion of a 4 year university degree program in interior design.

Working Conditions

- Environmental Conditions

  Work is indoors. While there is a permanent work site, project sites change and may be located anywhere in the NW'T. Therefore, traveling may be required in the performance of the job.

- Physical Activities

  Physical demands are light. Frequent physical activities include reaching, handling, talking, hearing and seeing.

- Work Week

  A 5 day work week of 37.5 hours is normal.

Personal Qualitities

- Aptitude Factors

  The occupation usually requires people with above average ability to learn, reason and make decisions; understand and use words to express

ideas and/or information; mentally picture the position and shape of objects and/or predict their resulting position after movement in space; and recognize similarities and/or differences among colours. Also required is average ability to see and compare slight differences in shape, size and detail of objects or pictorial material.

- Interest Factors

  People in this occupation are usually interested in business contact with people; theoretical and creative work; and relating to people or communicating with or about them.

- Temperament Factors

  People in this occupation enjoy situations involving managing a work group; achieving cooperative and successful working relationships; judging feeling, ideas or facts in terms of personal values; and making judgments based on evaluation of information using one's personal knowledge and experience.

PAINTER / DECORATOR

Job Description

A painter and decorator applies paints, wallpapers and various finishes to interiors and exteriors of buildings and other structures:

- Removes existing finishes by scraping, wire-brushing and sanding or with water, steam or chemical preparations.
- Prepares surfaces by filling cracks and smoothing area with sander.
- Applies paint finishes using brushes, rollers or spray equipment.
- Mixes paint to match sample colours.
- Measures and cuts wallpaper, fabric or plastics and applies to walls or ceilings.
- May estimate costs, provide quotations and advise on suitability of different materials.
- May erect and dismantle scaffolds.

Preparation and Training

- Apprenticeship Programs

  Training is by an apprenticeship program. Apprenticeship requires completion of grade 12 and is three years in length.

Working Conditions

- Environmental Conditions

  Work is both indoors and outdoors. This work involves exposure to fumes, dust, odours and hazards which require the use of safety equipment.

- Physical Activities

  Physical demands are light to medium. Frequent physical activities include climbing and balancing, stooping, kneeling, crouching, crawling, standing for prolonged periods, reaching, handling, fingering, feeling and seeing.

- Work Week

  A 5 day work week of 37.5 to 40 hours is normal.

Personal Qualities

- Aptitude Factors

The occupation usually requires people with average ability to see and compare slight differences in shape, size and detail of objects or pictorial material; coordinate hand and finger movements accurately and swiftly in response to what is seen; move hands skillfully and easily in placing and turning motions; coordinate hand and foot movements in response to observations; and recognize similarities and/or differences among colours.

• Interest Factors

People in this occupation are usually interested in dealing with things and objects; and routine, clearly organized work.

. Temperament Factors

People in this occupation enjoy situations involving attaining precise standards; and making judgments based on evaluation of information using one's personal knowledge and experience.

PLUMBER

Job Description

A plumber lays out, fits, assembles and repairs piping and fixtures used for water distribution and waste disposal in homes, schools and other buildings, according to plumbing codes:

Studies specifications to determine layout for systems.
Locates and cuts holes for connections in walls and floors.
Measures, cuts threads and bends pipe to specifications.
Assembles and installs valves, fittings and pipes made of metal, plastic, glass or vitrified clay, and sets fixtures, tests systems as required by plumbing codes.

- Repairs plumbing installations by removing and replacing defective items.

Preparation and Training

- Apprenticeship Programs

Training is by an apprenticeship program. Apprenticeship requires completion of grade 12 and is four years in length.

Working Conditions

- Environmental Conditions

Work is both indoors and outdoors. This work involves exposure to dampness, fumes, dust, odours and hazards which require the use of safety equipment.

- Physical Activities

Physical demands are heavy. Frequent physical activities include lifting, carrying, climbing and balancing, stooping, kneeling, crouching, crawling, reaching, handling, fingering, feeling and seeing.

- Work Week

A 5 day work week of 37.5 to 40 hours is normal.

Personal Qualitities

- Aptitude Factors

  The occupation usually requires people with average ability to learn, reason and make decisions; perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and/or predict their resulting position after movement in space; coordinate hand and finger movements accurately and swiftly in response to what is seen; move hands skillfully and easily in placing and turning motions; and coordinate hand and foot movements in response to observations. Aso necessary is some ability to see and compare slight differences in shape, size and detail of objects or pictorial material.

- Interest Factors

  People in this occupation are usually interested in dealing with things and objects; working with details, processes, machines and techniques; and work resulting in clearly visible results.

. . .

. Temperament Factors

  People in this occupation enjoy situations involving judging information against measurable standards; attaining precise standards; and a variety of duties that change constantly.

POWER ENGINEER

Job Description

A power engineer operates and maintains various types of stationary engines and mechanical equipment such as boilers, pumps, compressors, motors and generators and refrigeration, and water or industrial waste treating equipment, to provide heat, power and other utility services for buildings or industrial processes

- Starts equipment, observes meters, gauges and warning lights, and adjusts levers, valves and switch controls to obtain specified operating conditions and output.
- Analyzes temperature, pressure, fuel flow and other instrument readings to ensure efficient operation of combustion.
- Listens to and observes operation of equipment to detect or isolate malfunctions and prevent damage to machinery.
- Compiles records of instrument readings, hours of operation, fuel consumption and power output, and reports on equipment performance and serviceability.

Preparation and Training

• Apprenticeship Programs

Training is by an apprenticeship program. Apprenticeship requires completion of grade 12 and is one to four years in length.

Working Conditions

• Environmental Conditions

Work is indoors. This work involves exposure to hot temperatures, dampness, aburpt changes in temperature, noise, fumes, odours and hazards which require the-use of safety equipment.

• Physical Activities

Physical demands are medium. Frequent physical activities include climbing and balancing, stooping, crouching, reaching, handling, hearing and seeing.

• Work Week

A 5 day work week of 37.5 to 40 hours is normal.

Personal Qualitities

. Aptitude Factors

The occupation usually requires people with average ability to learn, reason and make decisions; and mentally picture the position and shape of objects and / or predict their resulting position after movement in space. Also necessary is some ability to perform arithmetic operations quickly and accurately; see and compare slight differences in shape, size and detail of objects or pictorial material; **arecognize** detail, differences or errors, in written words and numbers; coordinate hand and fiiger movements accurately and swiftly in response to what is seen; and move hands skillfully and easily in placing and turning motions.

•Interest Factors

People in this occupation are usually interested in" dealing with things and objects; and working with details, processes, machines and techniques. and work resulting in clearly visible results.

. Temperament Factors

People in this occupation enjoy situations involving judging information against measurable standards; and attaining precise standards.

PROPERTY MANAGER

Iob Description

A property manager administers the acquisition, appraisal, management and disposal of governmental or private properties:

Exarnines title deeds and documents relating to the sale, purchase and lease of property to ensure that details are recorded and legal requirements covered.

Negotiates or approves purchase, rental or sale of property on behalf of government department or private corporation.

Initiates and directs studies to compile data for the analysis of rents, real property values and maintenance costs.

Maintains records or property revenues and expenditures, administers budget and prepares associated reports.

Inspects properties and recommends or directs disposal by negotiated sale of lease of those surplus to requriements.

Supervises activities of personnel engaged in real estate operations, and in 'clerical, security and maintenance duties related to management of property.

Preparation and Training

Canadiates must have a good knowledge of real estate- procedures, budget management and business accounting.

- Educational Requirements

  Employment in this occupation usually requires graduation from grade 12. Completion of a 2 year community college program in property management is an asset.

- Specialized Education

  Persons wishing to become Certified Property Managers must have 1 to 5 years of property management experience and meet the course, examination and experience requirements of the Real Estate Institute of Canada.

Working Conditions

- Environmental Conditions
  Work is usually indoors. Traveling may be required in the performance of the job.

- Physical Activities
  Physical demands are light. Frequent physical activities include talking and hearing.

- Work Week
  A 5 day work week of 37.5 hours is normal.

Personal Qualitities

- Aptitude Factors
  The occupation usually requires people with above average ability to learn, reason and make decisions; understand and use words to express ideas and/or information; and perform arithmetic operations quickly and accurately.

- Interest Factors
  People in this occupation are usually interested in business contact with people; relating to people or communicating with or about them; and work resulting in prestige.

- Temperament Factors
  People in this occupation enjoy situations involving managing a work group; achieving cooperative and successful working relationships; making judgments based on evaluation of information using one's personal knowledge and experience; judging information against measurable standards; and a variety of duties that change constantly.

REFRIGERATION AND AIR-CONDITIONING MECHANIC

Job Description

A refrigeration and air-conditioning mechanic installs, repairs and services air-conditioning and refrigeration systems according to drawings and specifications:

Mounts units according to established plans for installation using material handling equipment and measuring instruments.

Cuts, bends and threads piping according to specifications.

- Drills holes and installs mounting brackets and hangers into floors and walls Of buildings.

Attaches piping to refrigeration units to form circulatory system for refrigerant.

- Installs functional components such as motors, controls and switches.

Adjusts mechanisms such as valves and controls to regulate level of fluid, pressure and temperature in system.

Tests refrigerant lines to detect leaks.'

Replaces or adjusts defective or worn parts to repair system.

Preparation and Training

- Apprenticeship Programs

Training is by an apprenticeship program. Apprenticeship requires completion of grade 12 and is four years in length.

Working Conditions

- Environrne,ntal Conditions

Work is usually indoors. This work involves exposure to both hot and cold temperatures, dampness, abrupt changes in temperature, noise, vibration, liquids, and hazards which require the use of safety equipment.

- Physical Activities

Physical demands are medium. Frequent physical activities include climbing and balancing, stooping, kneeling, crouching, reaching, handling, fingering and seeing.

• **Work** Week
A 5 day work week of 37.5 to 40 hours is normal.

Personal Qualitities

. Aptitude Factors
The occupation usually requires people with average ability to mentally picture the position and shape of objects and/or predict their resulting position after movement in space; perform arithmetic operations quickly and accurately; coordinate hand and finger movements accurately and swiftly in response to what is seen; and move hands skillfully and easily in placing and turning motions.

. Interest Factors
People in this occupation are usually interested in dealing with things and objects; working with details, processes, machines and techniques; and work resulting in clearly visible results.'

• Temperament Factors
People in this occupation enjoy situations involving judging information against measurable standards; attaining precise standards; and a variety of duties that change constantly.

STEAM FITTER

Job Description

A steam fitter installs, alters and repairs high-pressure and low-pressure systems of piping for conducting hot water used in heating and other industrial processing systems

- Studies specifications to determine materials required and layout of systems.
- Plans sequence of work to coordinate piping installation with activities of other construction trades.
- Cuts openings in structures to accommodate piping.
- Measures, cuts, threads, bends and welds pipe to size and shape.
- Assembles, installs, secures and tests metal piping and fittings.

Preparation and Training

- Apprenticeship Programs

  Training is by an apprenticeship program. Apprenticeship requires completion of grade 12 and is four years in length.

Working Conditions

- Environmental Conditions

  Work is both indoors and outdoors and is frequently from ladders or scaffolds, or in awkward positions. This work involves exposure to both hot and cold temperatures, dampness, fumes and hazards which require the use of safety equipment.

- Physical Activities

  Physical demands are heavy. Frequent physical activities include lifting, carrying, pushing/palling, climbing and balancing, stooping, kneeling, crouching, crawling, standing for prolonged periods, reaching, handling, fingering, feeling and seeing.

- **Work Week**

  A 5 day work week of 37.5 to 40 hours is normal.

Personal Qualitities

• Aptitude Factors

The occupation usually requires people with average ability to learn, reason and make decisions; perform arithmetic operations quickly and accurately; mentally picture the position and shape of objects and/or predict their resulting position after movement in space; coordinate hand and finger movements accurately and swiftly in response to what is seen; move hands skillfully and easily in placing and turning motions; and coordinate hand and foot movements in response to observations. Also necessary is some ability to see and compare slight differences in shape, size and detail of objects or pictorial material.

. Interest Factors

People in this occupation are usually interested in dealing with things and objects; working with details, processes, machines and techniques; and work resulting in clearly visible results.

• Temperament Factors

People in this occupation enjoy situations involving judging information against measurable standards; attaining precise standards; and a variety of duties that change constantly.

SECTION 2

TRAINING AND CERTIFICATION

Some jobs require additional schooling after you complete high school (Grade 12). This section describes the locations of engineering, engineering technology, architecture, architecture technology, property management, interior design and trades programs. It also tells you what the minimum requirements are to get into each program and what areas of specialization are offered within each program.

ENGINEERING

Bachelor of Science -4 year program

UNIVERSITY OF ALBERTA, Edmonton, Alberta

Pre-requisites:	-Grade 12 completion with min average of 65% -Chemistry 30, English 30, Mathematics 30, Physics 30 and Mathematics 31
Areas of Specialization	- chemical, civil, computer, electrical, mechanical, mineral process, metallurgical, mining, and petroleum

UNIVERSITY OF BRITISH COLUMBIA, Vancouver, British Columbia

Pre-requisites:	-Grade 12 completion -Chemistry 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- bio-resource, chemical, civil, electrical, engineering physics, geological, mechanical, metallurgical, mining and mineral process

UNIVERSITY OF CALGARY, Calgary, Alberta

Prerequisites:	-Grade 12 completion with minimum average of 60% -Chemistry 30, English 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- chemical, civil,electrical, mechanical, surveying

CARLETON UNIVERSITY, Ottawa, Ontario

Pre-requisites:	-Grade 12 completion with minimum average of 65% -Chemistry 30, Mathematics 30, Physics 30 recommended
Areas of Specialization	- civil, electrical, mechanical

UNIVERSITY OF GUELPH, Guelph, Ontario

Pre-requisites:	-Grade 12 completion with minimum average of 65% -Chemistry 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- agricultural, biological, water resource
"Note:	*- a co-op program is available in third year*

LAKEHEAD UNIVERSITY, Thunder Bay, Ontario

Prerequisites:	-diploma in technology
Note:	- two year program

LAURENTIAN UNIVERSITY, Sudbury, Ontario

Prerequisites:	-Grade 12 completion with minimum average of 60% -Chemistry 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- chemical, civil, mechanical, metallurgical, mining

UNIVERSITY OF MANITOBA, **Winnipeg,** Manitoba

Pre-requisites:	-Grade 12 completion with rnin average of 70% -Chemistry 30, Mathematics 30, and Physics 30 required
Areas of Specialization	- agricultural, civil, computer, industrial, electrical, geological, mechanical

McMASTER UNIVERSITY, Hamilton, Ontario

Pre-requisites:	-Grade 12 completion with minimum average of 70% -Chemistry 30, Mathematics 30, Physics 30 and Math 31 required
Areas of Specialization	- ceramic, chemical, civil, computer, electrical, manufacturing, metallurgical, engineering physics

UNIVERSITY OF OTTAWA, Ottawa, Ontario

Pre-requisites:	-Grade 12 completion with minimum average of 70% -Chemistry 30, Mathematics 30, **Physics** 30 and **Mathematics** 31 recommended
Areas of Specialization	- chemical, **civil,** electrical, mechanical
**Note:*	- ***Co-op program available***

QUEENS **UNIVERSITY,** Kingston, Ontario

Pre-requisites:	-Grade 12 completion with minimum average of 70% -Chemistry 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- chemical, **civil, electrical,** engineering chemistry, engineering physics, geological, mathematics and engineering mechanical, metallurgical, mining

UNIVERSITY OF REGINA, Regina, Saskatchewan

Pre-requisites:	-Grade 12 completion -Chemistry 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- agricultural, chemical, **civil,electrical,** engineering physic, mechanical
**Note:*	***-The*** *program is* ***spread*** *over 5 years with* ***co-op work/study*** terms *interspersed*

ROYAL MILITARY COLLEGE, Kingston, Ontario

Pre-requisites:	-Grade 12 completion -Chemistry 30, English 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of **Specialization**	- fuels and materials engineering, **civil,** computer, electrical, engineering physics, geological, **mechanical,** metallurgical, mining and mineral process

RYERSON POLYTECHNICAL INSTITUTE, Toronto, Ontario

Pre-requisites:	-Grade 12 completion -Chemistry 30, English 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- applied computer science, architectural science, chemical, civil, electrical, industrial, laboratory **science,** mechanical, survey, technological studies

UNIVERSITY OF **SASKATCHEWAN, Saskatoon,** Saskatchewan

Pre-requisites:	-Grade 12 completion -Chemistry 30, Math 30, Physics 30 and required
Areas of Specialization	- **agricultural,** chemical, **civil,electrical,** engineering physics, geological, mechanical

SIMON FRASER UNIVERSITY, **Burnaby, British** Columbia

Prerequisites:	-Grade 12 completion -Chemistry *30,* English 30, Mathematics 30, Physics 30 required
Areas of Specialization	- **computing,** microelectronics, communications
**Note*	*- Optional **co-op** program available*

University OF TORONTO, Toronto, Canada

Pre-requisites:	-Grade **12** completion -Chemistry 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- chemical, **civil,** electrical, engineering **science,** geo-engineering industrial, mechanical, metallurgical, materials **science**

UNIVERSITY OF VICTORIA, Victoria, British Columbia

Pre-requisites:	-Grade **12** completion -Chemistry 30, Mathematics 30, Physics 30 recommended
Areas of **Specialization** ,	- computer, electrical
**Note:*	*- **co-op** program*

UNIVERSITY OF WATERLOO, Waterloo, Ontario

Pre-requisites:	-Grade 12 completion with minimum average of 60% (most students admitted have averages in final year of high school of over 75%) -Chemistry 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- chemical, **civil, computer,** electrical, geological, mechanical, systems design

UNIVERSITY OF WESTERN ONTARIO, **London,** Ontario

Pre-requisites:	-Grade 12 completion -Chemistry 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- chemical and biochemical, **civil,** electrical, materials, mechanical

UNIVERSITY OF WINDSOR, Windsor, Ontario

Pre-requisites:	-Grade 12 completion with minimum average of **70%** -Chemistry 30, English 30, Mathematics 30, Physics 30 and Mathematics 31 recommended
Areas of Specialization	- chemical, civil, electrical, engineering materials, geological, industrial, mechanical

Master of Science (Engineering)

UNIVERSITY OF CALGARY, MANITOBA, SASKATCHEWAN, & VARIOUS EASTERN UNIVERSITIES

Pre-requisites:

-completion of acceptable undergraduate degree

1st year Engineering Programs

One and two year programs which allow you to transfer into a four year program at one of the universities listed above are at

Cariboo (Kamloops, B.C.)
Malaspina (Nanaimo, B.C.)
Okanagan (Kelown, B.C.)
Lethbridge (Lethbridge, Alta.)
Red Deer m (Red Deer, Alta.)
Kwantlen (Surrey, B.C.)
New Caledonia (Prince George, B.C.)
Selkirk (Castlegar, B.C.)
Mount Royal (Calgary, Alta.)

Engineering Technology (2 year program)

CAMBRIAN, **Sudbury,** Ontario
Pre-requisites: -Grade 12 English and Mathematics, Grade 11 Physics

Areas of Specialization - **civil,** electrical

CAMOSUN, Victoria, British Columbia
Pre-requisites: -Completion of Grade 12 including English, Mathematics and a science

Areas of Specialization - **civil,** mechanical

CANADORE, North Bay, Ontario
Pre-requisites: -Grade 12 Mathematics, Grade 11 Physics

Areas of Specialization - **civil, drafting,** mechanical

CENTENNIAL, Scarborough, Ontario
Prerequisites: -Grade 12 English and **Mathematics,** Grade 11 Physics

Areas of Specialization - civil, mechanical

DURHAM, **Oshawa,** Ontario
Pre-requisites: -Grade 12 English and Mathematics

Areas of Specialization - **civil,** mechanical

GEORGE **BROWN,** Toronto, Ontario
Pre-requisites: -Grade 12 Mathematics. **Drafting,** physics and **surveying** recommended

eas of Specialization - civil, drafting, electrical

GEORGIAN, Barrie, Ontario

Pre-requisites: -Grade 12 English and **Mathematics,** Grade 11 Physics (or a senior science)

Areas of Specialization - civil, electrical, mechanical

HUMBER, Toronto, Ontario

Pre-requisites: -Grade 12 English and **Mathematics,** 2 different senior **science** credits or one senior **science** and a related senior technical **course**

Areas of Specialization - **civil,** mechanical

LOYALIST, **Belleville,** Ontario

Pre-requisites: -Grade 12 **Mathematics.** Physics and Drafting **recommended**

Areas of Specialization - civil, electrical, mechanical

MOHAWK, **Hamilton,** Ontario

Pre-requisites: -Grade 12 Mathematics and Chemistry, Grade 11 Physics

Areas of Specialization - civil, mechanical

NAIT, Edmonton, Alberta

Pre-requisites: -Completion of Grade 12 including English, **Mathematics** and one science

Areas **of** Specialization - **civil,,** electrical, mechanical .

NORTHERN, Kirkland Lake, Ontario

Pre-requisites: -Grade 12 English and **Mathematics**

Areas of Specialization - civil, **drafting,** electrical, mechanical

OKANAGAN, Kelwona, British Columbia
Pre-requisites: -Completion of Grade 12 including Mathematics and Grade 11 Physics

reas of Specialization - civil, drafting, electrical

RED RIVER, Red River
Prerequisites: -Grade 12 English, Mathematics and Physics

Areas of Specialization - civil, drafting, electrical, mechanical

SAIT, Calgary Alberta
Prerequisites: -Completion of Grade 12 including English, Mathematics and Chemistry or Physics

Areas of Specialization - civil, drafting, electrical, industrial, mechanical

SASKATCHEWAN TECHNICAL, Moose Jaw, Saskatchewan
Pre-requisites: -Completion of Grade 12 including Mathematics and one science

Areas of Specialization - civil, drafting, electrical

SENECA, North York, Ontario
Prerequisites: -Grade 12 English and Mathematics, Grade 11 Physics

Areas of Specialization - civil, mechanical

SHERIDAN, **Oakville,** Ontario
Pre-requisites: -Grade 12 Mathematics

Areas of Specialization - civil, mechanical

SIR S. FLEMING, Petersborough, Ontario

Pre-requisites:	-Grade 12 English, **Mathematics,** Grade 11 or 12 **Chemistry** or Physics
Areas of Specialization	- civil, **electrical, mechanical**

ARCHITECTURE

Bachelor of Architecture

UNIVERSITY OF BRITISH COLUMBIA (3 year program) Vancouver, B.C.

Prerequisites:
-Completion of first degree with minimum average of 65% *or* completion of at least three years of an approved program of study in a school of architecture in Canada or completion of an approved diploma course in Building Technology of at least two years' duration plus three years of university study

CARLETON UNIVERSITY (5 year program) Ottawa, Ontario

Prerequisites:
-Grade 12 completion with rnirnimum average of 65%
-Mathematics 30, Physics 30 and Mathematics 31
- Submission of a portfolio

UNIVERSITY OF TORONTO (5 year program) Toronto, Ontario

Pre-requisites:
-Grade 12 completion with mimimum average of 75%
-English 30, Mathematics 30, and Mathematics 31
- Submission of a portfolio

UNIVERSITY OF WATERLOO (5 year program) Waterloo, Ontario

Pre-requisites:
-Grade 12 completion with mimimum average of 60%
-English 30, Mathematics 30, Physics 30 and Mathematics 31

Note:
This is a co-operative program involving a rotating work/study schedule

Masters Degree

UNIVERSITY OF BRITISH COLUMBIA, Vancouver, British Columbia
Pre-requisites: - post-professional degree

Note: *-2 year program*

UNIVERSITY OF CALGARY, Calgary, Alberta
Pre-requisites: - Bachelor's degree from a recognized university

Specializations: - architecture, environmental science, industrial design, urban and regional planning

Note: *-3 year program*

UNIVERSITY OF MANITOBA, **Winnipeg, Manitoba**
Pre-requisites: - Bachelor of Environmental Studies completed or equivalent with acceptable standing

Note: -3 *year program*

1st year Transfer Programs

One and two year programs which allow you to transfer into architectural programs at one of the wester[n] universities listed above are offered at

Medicine Hat (Medicine Hat, Alta) - Camosun (Vistora, B. C.)
Capilano (North Vancouver, B.C.) - Cariboo (Kamloops, B.C.)
Columbia (Burnably, B.C.) - Douglas (New Westminister, B. C.)
East Kootenay (Cranbrooke, B.C.) - Fraser Valley (Chilliwack, B. C.)
Kwantlen (Surrey, B.C.) - Malaspina (Nanaimo, B. C.)
New Caledonia (Prince George, B.C.) - North Island (Comox, B.C.)
Northern Lights (Dawson Creek, B.C.) - Northwest (Terrace, B. C.)
Okanagan (Kelowna, B. C.) - Selkirk (Castlegar, B. C.)
Open Learning Institute (Richmond, B.C.)

Architectural Technology (Two Year Programs)

ALFONQUIN, Nepean (Ottawa), Ontario
Prerequisites: - Grade 12 Mathematics

CENTENNIAL, Scarborough, Ontario
Pre-requisites: - Completion of a two-year Architectural Technician program with a B average in architectural courses (available at Confederation and Humber)

CONFEDERATION, Thunder Bay, Ontario
Prerequisites: - Grade 12 **Mathematics** and Drafting. Grade 11 Physics

FANSHAWE, London, Ontario
Pre-requisites: - Grade 12 Mathematics. Grade 11 or 12 Physics

GEORGE BROWN, Toronto, Ontario
Pre-requisites: - Grade 11 or 12 Mathematics

HUMBER, Toronto, Ontario
Pre-requisites: - Grade 12 English, Mathematics and two senior **sciences**

MOHAWK, **Hamilton,** Ontario
Pre-requisites: - Grade 12 Mathematics and Chemistry, Grade 11 Physics

NAIT, Edmonton, Alberta
Pre-requisites: , - Grade 12 including Grade 12 English, Mathematics and one of Chemistry, Physics or Biology

Areas of specialization: - architecture, building development, interior design, landscape, urban and regional planning

NORTHERN, South Porcupine, Ontario
Pre-requisites: - Grade 12 English, **Mathematics**

ST. **CLAIR,** Windsor, Ontario
Prerequisites: - Grade 12 English, **Mathematics** and Chemistry, Grade 11 Physics

SAIT, Calgary, Alberta
I?re-requisites: - Grade 12 including Grade 12 English, Mathematics and one of Chemistry, **Physics** or Biology

Areas of specialization: - architecture, building development, interior design, landscape, urban and regional planning

SASKATCHEWAN TECHNICAL, Moose Jaw, Saskatchewan
Pre-requisites: - Grade 12 including Grade 12 Mathematics, prefer Physics

SAULT, Sault Ste. Marie, Ontario
Pre-requisites: - Grade 12 English, Mathematics. Completion of Architectural Drafting Technician Program.

PROPERTY MANAGEMENT

Property Management Trainee

IN-HOUSE (3 -S year program)

Pre-requisites: -Completion of Grade 12

Note:, - *This training includes work* experience *and home study courses.*

INTERIOR DESIGN

Bachelor of Interior Design (four years)

UNIVERSITY OF MANITOBA, **Winnipeg,** Manitoba
Pre-requisites: -Completion of Grade 12 with English and Mathematics

RYERSON, Toronto, Ontario
Pre-requisites: -Completion of Grade 12 with English and Mathematics
- Presentation of a portfolio

Diploma in Interior Design (two or three years)

ALGONQUIN, **Nepean** (Ottawa), Ontario
Pre-requisites
- Graphic ability test
- Portfolio

CONFEDERATION, Thunder Bay, Ontario
Prerequisites
- Portfolio
- Interview

DURHAM, Oshawa, Ontario
Pre-requisites
- Grade 12 English

FANSHAWE, London, Ontario
Pre-requisites
- Grade 12 English, Grade 11 Mathematics, art, drawing, home economics
- portfolio
- interview

GEORGIAN, **Barrie,** Ontario
Pre-requisites - Portfolio
- Interview

HUMBER, Toronto, Ontario
Pre-requisites - Portfolio
- Interview
- skills test

KWANTLEN, Surrey, B.C.
Pre-requisites - Completion of Grade 12 or mature student

LAKELAND,
Pre-requisites - Completion of Grade **12** or mature student

MOUNT ROYAL, Calgary, Alberta
Pre-requisites - Submission of **portfolio**

NAIT, Edmonton, Alberta
Pre-requisites - Completion of Grade 12 including Mathematics or mature student

NIAGRA, Niagra Falls, Ontario
Prerequisites - None

ST. CLAIR, Windsor, Ontario
Prerequisites - Art and drafting recommended, English and **geometry**

TRADES

Apprenticeship Program

The NWT Apprenticeship program is administered by the Advanced Education Department of Education. An apprenticeship involves learning a trade through observation, practice and study, and attending short technical courses. Apprentices work under the supervision of a qualified tradesperson. Many apprentices work in the Departments of Public Works and Transportation.

The following are some of the apprenticeship trades available in the NWT.

CARPENTER

Pre-requisites	- Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or TABE level of 9.9 for English and pass an entrance exam
Length of Apprenticeship	- four years

ELECTRIC APPLIANCE REPAIR

Pre-requisites	- Completion of Grade 12 with Math 30 or a passmark of 60% in English 13, a passmark in Math 30 and a minimum of 3 credits in a Science program or TABE level of 9.9 for English and pass an entrance exam
Length of Apprenticeship	- three years

ELECTRICIAN (Construction)

Pre-requisites	- Completion of Grade 12 with Math 30 or a passmark of 60% in English 13, a passmark in Math 30 and a minimum of 3 credits in a Science program or TABE level of 9.9 for English and pass an entrance exam
Length of Apprenticeship	- four years

GADFITTER

Pre-requisites	- Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or TABE level of 9.9 for English and pass an entrance exam
Length of Apprenticeship	- three years

HEAVY DUTY EQUIPMENT MECHANIC

Pre-requisites	- Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 reedits in a Science program or TABE level of 9.9 for English and pass an entrance exam
Length Of Apprenticeship	- four years

HOUSING **MAINTAINER**

Pre-requisites	- None
Length of Apprenticeship	- three years

INDUSTRIAL INSTRUMENT MECHANIC

Prerequisites
- Completion of Grade 12 with Math 30 or a passmark of 6070 in English 13, a passmark in Math 30 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship
- four years

MACHINIST

Pre-requisites
- Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimurn of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship
- four years

MARINE ENGINEER

Pre-requisites
-"Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English, pass an entrance exam and serve eighteen months sea time in an engine room (or have completed the BC Pre-Employment Diesel Mechanic Course)

Length of Apprenticeship
- four years

MOTOR VEHICLE MECHANIC

Pre-requisites - Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship - four years

OIL BURNER MECHANIC (Residential)

Pre-requisites - Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship - three years

OPERATING ENGINEER (4th or 3rd Class)

Pre-requisites - Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship - 4th Class one year
- 3rd Class two years

OPERATING ENGINEER **(2nd Class)**

Pre-requisites - Completion of Grade 12 with Math 30 or a passmark of 60% in English 13, a passmark in Math 30 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship - four years

PAINTER AND DECORATOR

Pre-requisites - Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship - *three* years

PLUMBER

Pre-requisites - Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship - four years

REFRIDGERATION AND AIRCONDITIONING MECHANIC

Pre-requisites - Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship - four years

STEAMFITTER/PIPEFITTER

Pre-requisites . . - Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or
TABE level of 9.9 for English and pass an entrance exam

Length of Apprenticeship - four years

WELDER

Pre-requisites	- Completion of Grade 12 with Math 10 or 13 or a passmark of 60% in English 13, a passmark in Math 13 and a minimum of 3 credits in a Science program or TABE level of 9.9 for English and pass an entrance exam
Length of Apprenticeship	- three years

For information on these or other trades, please contact Advanced Education, Department of Education in Yellowknife or your local Apprenticeship Training Officer.

PUBLIC WORKS

Within the Department, there are a number of Divisions. Each one has a different job to do and employs people with different types of skills.

THE DIRECTORATE

The Directorate is composed of five different divisions: the Deputy Minister's Office; Finance; Contracts and Capital Planning; Policy, Planning and Training; and Energy Conservation. Most positions are in Yellowknife.

The Deputy Minister's Office is responsible for the overall management of the Department throughout the NWT. "This Office employs the Deputy Minister, an Assistant Deputy Minister, a Management Systems Coordinator (computers), and secretaries.

The Finance Division provides information, assistance and advice to Departmental staff on all financial-related matters. People working in Finance include financial analysts, finance clerks and clerical staff.

The Contracts and Capital Planning Division is responsible for the tendering of Departrne"nts of Public Works and Transportation construction contracts, helps the staff in contract administration, and coordinates the Department's capital planning (capital means things like construction of buildings and roads). In this Division, there are contracts and capital planning managers, cost analysts, a library technician, contracts clerks and secretaries.

The Policy, Planning and Training Division helps Departmental staff develop policies and directives, does personnel tasks (like job descriptions and pay

cheque distribution) and coordinates Departmental training and implementation of affirmative action programs. People in this division include training, administration and policy officers, a personnel clerk and secretaries.

The Energy Conservation Division provides information and technical advice, identifies energy-effiaent opportunities for clients and assists clients in doing energy projects. The Division employs managers and secretaries in Yellowknife as well as Energy Management Officers in each Region.

ARCHITECTURE DIVISION

The Architecture Division is responsible for the design and construction of most Government buildings including schools, multipurpose community halls, gymnasiums, offices, courthouses, correctional centres, maintenance garages, warehouses, group homes and park shelters. Most of the design work is conducted by architectural engineering services firms (consulting firms) while contractors perform the construction. Departmental project teams coordinate the many activities of the clients (departments that want buildings), communities, consultants and contractors.

The Division also has an Interior Design Section which assists the Project Officer/Project Manager and the Government of the NWT with interior design requirements. This includes detailed office plannings (use of space, furniture, etc.) and, the Visual Identity Program (signs).

The Division employs architects, architectural technicians, engineers, trades people, interior designers and secretaries.

ENGINEERING DIVISION

The Engineering division is responsible for the design and construction of new capital works and upgrading of facilities for water distribution, sewage and solid waste disposal, the storage and dispensing of bulk petroleum products and central heat distribution including the recovery and distribution of heat from diesel-electric power plants. The Division is also responsible for community programs which include granular materials, dust control and community access roads.

Engineers, engineering technicians and secretaries work in this Division.

OPERATIONS DIVISION

The Operations Division is responsible for overall management and coordination of the acquisition/disposal and operation and maintenance of Territorial Government buildings, works and equipment. The Division is separated into three sections: Buildings and Works, Vehicles and Equipment, and Accommodation Services.

The Building and Works Section is responsible for coordinating the Regional Offices' operation, maintenance and repair of buildings and works owned or leased by the Government. Emphasis is placed on the energy efficient operation of facilities such as schools, hostels, staff houses, office buildings, warehouses and water systems. Buildings and Works employs tradespeople, engineers, technical officers and operation and maintenance staff. These people work in almost every community in the NWT.

The Vehicles and Equipment Section is responsible for the acquisition,

maintenance and operations of all Government vehicles and mobile equipment except Highways Divisions vehicles and equipment. Equipment Officers work in this Section.

The Accommodation Services Section provides Territorial Government Departments and certain Boards and **Agencies** with office and special purpose space by allocating available space in Government owned buildings or by leasing the required space. Regular inspections of leased properties are carried out. Employees of this Section are property managers or property management trainees.

REGIONAL OPERATIONS

In each region, there is a Regional Superintendent of Public Works and other staff ranging from clerical workers to **technicians** and engineers. Regional Operations is responsible for overseeing and implementing the department's work in each region.

TRANSPORTATION

THE DEPUTY MINISTERS OFFICE

The Deputy Minister's Office is responsible for the overall management of the Department throughout the NWT. This Office employs the Deputy Minister, Assistant Deputy Minister, and executive secretaries.

FINANCE AND ADMINISTRATION DIVISION

The Finance and Administration Division provides information, assistance and advice to Departmental staff on all financial, administrative, personnel and contract matters. People working there include financial accountants, financial analysts, and contract administrators as well as clerks and a secretary,

POLICY AND PLANNING DIVISION

This Division is responsible for planning the future transportation requirements for the NWT, including highways, airports and (marine) ferry systems. Engineers, planning officers, human resource officers, economists, information technology specialists as well as clerical and secretarial staff are among the people working in this Division in Yellowknife.

TRANSPORTATION ENGINEERING DIVISION

The Transportation Engineering Division is responsible for providing engineering planning, design and construction services in support of all transportation programs. These programs include new highway construction, existing highway reconstruction, and design and construction of bridges, landings, docks and airports.

The Division employs engineers, engineering technologists, draftspersons, highway technicians, soils technicians, clerks and secretaries.

HIGHWAYS OPERATIONS DIVISION

The Highways Operations Division is responsible for maintaining the highways to standards that ensure safe and reliable travel between communities. The Division also does winter and ice road construction, and minor construction work such as gravel hauling and pavement marking, The Division maintains all Highways vehicles and equipment. In addition it is responsible for highway safety and enforcement through weigh scales operation and highway patrols. . . .

The Division employs heavy equipment operators, mechanics, finance and administration officers, weigh scale officers, highway foremen and superintendents, project managers as well as clerks and secretaries. These staff are located in Hay River, Yellowknife, Inuvik and Enterprise and various smaller communities as well as highway camps on the road system.

MARINE OPERATIONS DIVISION

The Marine" Operations Division is responsible for the operation and maintenance of ferries at river crossings on the highway system and for providing expert advice on all marine matters. Ferry crews are hired on a contract basis. Marine captains, engineers, deck hands, clerks and secretaries are employed by this Division directly or through contracts. Staff are located in Yellowknife, Fort Simpson and Fort McPherson and Inuvik.

AIRPORTS DIVISION

The Arctic Airports Division provides safe and efficient airports under local government control. It encourages the provision of regular, reliable and accessible commercial air services. It also identifies and acts upon concerns regarding current and planned air services and their effect on the local social and economic environment. It employs engineers, airport planners from engineering backgrounds, and (indirectly) observer/communicators in over 40 communities.

MOTOR VEHICLES DIVISION

The Motor Vehicles Division coordinates, all functions relating to the issuing of driver licenses and vehicle registrations and the testing of drivers. The Division has two programs - driver examination and registries. It employs driver examiners, administrators and clerks.

INUVIK REGION

This office is responsible for coordinating and conducting the Highways, Airports and Marine operations in that Region. It employs engineers, technologists, marine professionals, enforcement officers, an airports manager, clerks and a secretary.

SECTION 4

FOR MORE INFORMATION

For more information on possible careers with the Departments of Public Works and Transportation, please contact;

DEPARTMENT OF PUBLIC WORKS

Human Resource Planning Officer
Department of Public Works
Yellowknife (403) 920-8668

Regional Superintendents
Department of Public Works
Fort Smith (403) 872-7308
Inuvik (403) 979-7140
Keewatin (819) 645-2722
Kitikmeot (403) 983-7285
Baffin (819) 979-5251

Director
Architectural Division
Department of Public Works
Yellowknife (403) 873-7535

Director
Engineering Division
Department of Public Works
Yellowknife (403) 873-7826

DEPARTMENT OF TRANSPORTATION

Human Resource Planning Officer
Department of Transportation
Yellowknife (403) 920-7327

Regional Superintendent
Department of Transportation
Inuvik (403) 979-7343

Director
Transportation Engineering
Department of Transportation
Yellowknife (403) 873-7800

APPENDIX A

This appendix provides examples of the types of courses that a student will take in their first year of programs such as engineering, engineering technology and architectural technology.

Architectural Technology

Typical first year courses

Mathematics (1 course)
Graphics and Detailing (2 courses)
Design (2 courses)
History of Man-Built Environment (1 course)
Building Science (1 course)
Building Codes (1 course)
Construction Techniques (1 course)
Programming (1 course)
Communications (1 course)
Statics (1 course)
Products and Materials (1 course)
Contracts (1 course)

Typical second year courses (Architecture Technology Option)

Environmental Control (2 courses)
Communications (1 course)
Design (1 course)
Architectural Graphics (2 courses)
CAD (1 course)
Estimating (1 course)
structures (2 courses)
Surveying (1 course)
Acoustics (1 course)
Architectural Models (1 course)
Architecture Profession (1 course)
Building Inspection (1 course)
Business Fundamentals (1 course)

Typical second year courses (Interior Design Option)

Interior Products and Materials (2 courses)
Communications (1 course)
Interior Design (2 courses)
Interior Graphics (2 courses)
CAD (1 course)
Estimating (1 course)
Presentation (2 courses)
Electrical and Illumination (1 course)
History of Art and Furniture (1 course)
Colour Psychology (1 course)
Interior Design Profession (1 course)

(CONT'D) Typical second year courses (Interior Design Option)

Mechanical Services (1 course)
Business Fundamentals (1 course)
Furniture Construction (1 course)

Civil Engineering Technology

Typical first year courses

Communications (2 courses)
Mathematics (2 courses)
Computers (1 course)
Mechanics (1 course)
Soil Mechanics (1 course)
Surveying (2 courses)
Drafting (1 course)
Materials (1 course)
Air Photo (1 course)
Concrete Technology (1 course)

Typical second year courses

Structural Design (2 courses)
Highways Materials/Technology (3 courses)
Soil Mechanics (2 courses)
Drafting (1 course)
Municipal Technology (2 courses)
Estimating (1 course)
Asphalt Technology (1 course)
Materials Testing (1 course)
Presentation and Project Administration (2 courses)

Electrical Engineering Technology

Typical first year courses

Communications (1 *course)*
Mathematics (2 courses)
computers (1 course)
Physics (1 course)
Electricity and Electronics (4 courses)
Drafting (1 course)
DC Machines (1 course)

Typical second year courses

Electrical Design (2 *courses)*
Digital Control (1 course)
AC Machines (1 course)
Power systems (1 course)
Industrial Control (2 courses)
Communications (1 course)

Engineering

First and Second Year Engineering is similar for all Engineering students except those in interested in Chemical Engineering or Geological Engineering.

Typical First Year Courses are

Chemistry (1 course)
Computer Science (1 course)
Mechanics (2 courses)
Electricity and Magnetism (1 course)
Analysis and Design (1 course)
Graphics and Design (1 course) also known as drafting
Descriptive geometry and Design (1 course)
Geology (1 course)
calculus (2 courses)

Typical Second Year Courses are

Surveying (1 course)
Mechanics (1 course)
Electricity and Magnetism (1 course)
Strength of Materials (1 course)
Thermodynamics (1 course)
Statistics (1 course)
Materials and Design (1 course)
Linear Systems and Design (1 course)
Fluid Mechanics (1 course)
Calculus (2 courses)

Engineering Designing and Drafting Technology

Typical first year courses

Communication (2 courses)
Mathematics *(2 courses)*
Computers (1 course)
Mechanics (2 courses)
Fluid Mechanics (1 course)
Surveying (2 courses)
Drafting (1 course)
Machine Design (1 course)
Electrical Theory (1 course)

Typical second year courses

Computer-Aided Design (2 courses)
Machine Design (1 course)
Process Design (1 course)
Drafting (2 courses)
Agreements and Specifications (1 course)
Estimating (1 course)
Steel Design (1 course)
options

Mechanical Engineering Technology

Typical first year courses

Communications (2 courses)
Mathematics (2 courses)
Computers (1 course)
Drafting (1 course)
Materials (1 course)
Physics (1 course)
Statics (1 course)
Machine Tool Practice (1 course)
Electricity (1 course)
Manufacturing (1 course)
Stress Analysis (1 course)
Machinery (1 course)
Metrology (1 course)
Computer-Aided Drafting

Typical second year courses

Welding (1 course)
Heat Energy (1 course)
Fluid Mechanics (1 course)
Hydraulics and Pneumatics (1 course)
CAD (1 course)
Machine Design (1 course)
Project Planning (1 course)
Plant Engineering (1 course)
Statistics (1 course)
Industrial Productivity (1 course)
Robotics (1 course)
Tool Design (1 course)
Quality Control (1 course)
Estimating (1 course)
Management (1 course)