

Occupational Analyses Series

STEAMFITTER-PIPEFITTER

Standards, Planning
and Analysis

Human Resources
Partnerships Directorate

OTTAWA/HULL

Normes, planification
et analyse

Direction des partenariats
en ressources humaines

The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this occupational analysis as the national standard for the occupation of steamfitter-pipefitter.

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OTHER RELATED OCCUPATIONAL TITLES

This analysis covers tasks performed by a steamfitter-pipefitter whose occupational title has been identified by some provinces and territories of Canada under the following names:

Pipefitter: Heating System Installer
Steamfitter
Steamfitting and Pipefitting
Steamfitting-Pipefitting

LIST OF PUBLISHED OCCUPATIONAL ANALYSES *

TITLE	NOC** Code
Aquaculture Technician (1977)	2221
Arts Administrator (1989)	0114
Automotive Painter (1995)	7322
Automotive Service Technician (1995)	7321
Automotive Technician - Automatic Transmission (1990)	7321
Automotive Technician - Electrical/Electronics (1992)	7321
Automotive Technician - Engine Repair and Fuel Systems (1989)	7321
Automotive Technician - Front-End (1989)	7321
Automotive Technician - Manual Transmission, Driveline and Brakes (1990)	7321
Aviation Machinist (1994)	7331
Baker (1991)	6252
Blaster (Surface) (1987)	7372
Boilermaker (1994)	7262
Bricklayer (1993)	7281
Cabinetmaker (1992)	7272
Carpenter (1993)	7271
Cement Finisher (1995)	7282
Construction Electrician (1994)	7241
Cook (1991)	6242
Electrical Mechanic (1981)	7333
Electronics Technician Vol. I (1986) (Video Equipment)	2242
Electronics Technician Vol. II (1986)	2242

* **Red Seal analyses are indicated in bold**

** **National Occupational Classification**

(Audio Equipment)	
Electronics Technician Vol. III (1986) (Computer Equipment)	2242
Electronics Technician Vol. IV (1986) (Office Equipment)	2242
Electronics Technician Vol. VI (1986) (Communication Equipment)	2242
Electronics Technician Vol. VII (1986) (Signaling Equipment)	2242
Electronics Technician Vol. VIII (1986) (Navigation Equipment)	2242
Electronics Technician Vol. IX (1986) (Video Game Equipment)	2242
Electronics Technician Vol. X (1987) (CADD Equipment)	2242
Electronics Technician Vol. XI (1987) (CAM Equipment)	2242
Electronics Technician Vol. XII (1987) (Robotics Equipment)	2242
Electronics Technician Vol. XIII (1987) (Biomedical and Laboratory Equipment)	2242
Electronics Technician Vol. XIV (1987) (Industrial Process-Control Equipment)	2243
Farm Equipment Mechanic (1994)	7312
Floorcovering Installer (1991)	7295
Glazier (1994)	7292
Hairstylist (1992)	6271
Heating (Gas and Oil) Servicer - Commercial and Industrial (1978)	7331
Heavy Equipment Mechanic (1987)	7312
Heavy Equipment Operator (1983)	7421
Industrial Electrician (1987)	7242
Industrial Instrument Mechanic (1988)	2243
Industrial Mechanic (Millwright) (1996)	7311
Insulator (Heat and Frost) (1993)	7293
Ironworker (Generalist) (1993)	7264

Lather (Interior Systems Mechanic) (1994)	7284
Logistics (1992)	0713
Machinist (1992)	7231
Major Electrical Appliance Repairer (1984)	7332
Mobile Crane Operator (1992)	7371
Motorcycle Mechanic (1995)	7334
Motor Vehicle Body Repairer (1989)	7322
Motor Vehicle Repairer (Truck and Transport) (1983)	7321
New Home Builder and Residential Renovation Contractor (1992)	0712
Oil and Solid Fuel Heating Mechanic (1986)	7331
Painter and Decorator (1993)	7294
Partsperson (1995)	1472
Plumber (1996)	7251
Power Engineer (1986)	7351
Powerline Technician (1996)	7244
Refrigeration and Air-Conditioning Mechanic (1989)	7313
Roofer (1991)	7291
Sheet Metal Worker (1990)	7261
Sprinkler System Installer (1995)	7252
Steamfitter-Pipefitter (1996)	7252
Steel Fabricator (Fitter) (1994)	7263
Tool and Die Maker (1992)	7232
Truck-Trailer Repairer (1994)	7321
Welder (1996)	7265

REQUESTS FOR THESE PUBLICATIONS SHOULD BE FORWARDED TO:

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FOREWORD

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources Development Canada sponsors a program, under the guidance of the Canadian Council of Directors of Apprenticeship (CCDA), to develop a series of occupational analyses.

The Occupational Analysis Program has the following objectives:

- to identify and group the tasks performed by skilled workers in particular occupations;
- to identify those tasks that are performed by skilled workers in every province and territory;
- to develop instruments for use in the preparation of interprovincial standards "Red Seal" examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility, in Canada, of trainees and skilled workers; and
- to supply employers and employees, and their associations, industries, training institutions and governments with analyses of the tasks performed in particular occupations.

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GUIDE TO ANALYSIS

DEVELOPMENT OF ANALYSIS

A draft analysis is developed by a knowledgeable consultant who, with the assistance of a committee of industry experts in the field, identifies all the tasks performed in the occupation.

The draft is then assigned to occupational analysts at Human Resources Development Canada for review, translation and edit to ensure conformity with the nationally approved format.

The analysis is forwarded to provincial/territorial authorities for validation by specialists in the field. Their recommendations are assessed and incorporated into the final draft which also includes the identification of the common core tasks performed in the occupation.

The occupational analysis is published in both official languages.

STRUCTURE OF ANALYSIS

To facilitate the understanding of the nature of the occupation, the work performed is divided into the following divisions:

- A. **BLOCK** - is the largest division within the analysis and reflects a distinct operation relevant to the occupation.
- B. **TASK** - is the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform to complete a specific assignment within a "BLOCK".
- C. **SUB-TASK** - is the smallest division into which it is practical to sub-divide any work activity and, combined with others, fully describes all duties constituting a "TASK".

Supporting Knowledge & Abilities

The element of skill and knowledge that an individual must acquire to perform the task adequately.

Trend

Any shifts or changes in technology that affect the sub-tasks are identified under this heading.

VALIDATION METHOD

At the request of the Canadian Council of Directors of Apprenticeship (CCDA), the Standardization Sub-Committee developed a method for the validation of the national Red Seal occupational analyses.

A draft of the analysis is sent to all provinces/territories for validation. Each jurisdiction rates the sub-tasks and applies percentage ratings to blocks and tasks. This method for the validation of the national occupational analyses identifies common core tasks across Canada for a specific occupation. This feature facilitates the weighting of the Interprovincial Red Seal examinations.

DEFINITIONS

YES:	the sub-task is performed.
NO:	the sub-task is not performed.
BLOCK %:	the average time a worker spends performing each block in a given year in relation to other blocks of the analysis, taking into consideration the complexity (importance plus difficulty) of the block. (See Appendices "C" and "D" for numerical and graphical representations of this specific occupation.)
TASK %:	the average time a worker spends performing each task in relation to other tasks within the block, taking into consideration the complexity (importance plus difficulty) of the task. (See Appendix "C" for numerical representation of this specific occupation.)
NV:	<u>Not Validated</u> by the province/territory.
ND:	<u>Not Designated</u> in that province/territory.

COMMON CORE

The criteria for determining common core are dependant on the performance of sub-tasks. If 70% of the responding jurisdictions (excluding NVs and NDs) perform the sub-task, it shall be considered common core.

In the analysis, Block A is reserved for safety practices. Since safety practices are a mandatory feature of all occupations, it is considered common core and ratings are not required.

Interprovincial Red Seal examinations are based on the common core identified through this validation process.

SCOPE OF ANALYSIS

Steamfitters-pipefitters lay out, assemble, fabricate, maintain and repair piping systems carrying water, steam, chemicals and fuel in heating, cooling, lubricating and other process piping systems. Steamfitters-pipefitters are employed in maintenance departments of factories, plants and similar establishments, by pipefitting and sprinkler system contractors or they may be self-employed.

Throughout the installation of systems, the steamfitter-pipefitter must carry out quality control checks on all work performed. Once the job is complete, the system must be tested to verify the quality of work and to confirm that the system is operating to the specifications detailed in accompanying blueprints, work orders, etc. This requires the tradesperson to be very knowledgeable in reading and interpreting specifications, codes and blueprints.

As part of the job, the steamfitter-pipefitter may be required to act as a crew chief of subtrades (small crews). In this capacity, he or she would be required to carry out job planning, estimations of time and material costs as well as minor supervision (limited scope).

The job may involve working with large pipe and heavy equipment. Often heavy lifting equipment is required. The systems may carry dangerous substances such as high-pressure steam or chemicals. The steamfitter-pipefitter must be conscious of safety at all times and be very knowledgeable of environmental and government regulations.

The usual places of work include general construction, commercial industries, pulp and paper mills, thermal power plants, hydro power plants, chemical and industrial plants, pipelines, petroleum refineries, dairies, shipyards, oil drilling platforms and medical facilities.

Sprinkler system installer is a designated trade in all provinces and territories and, as a result, steamfitters-pipefitters are not being employed as a sprinkler system installers.

OBSERVATIONS AND TRENDS ARISING FROM ANALYSIS

There is a trend to the use of electronic controls instead of pneumatic controls and to the use of fibre optics for control systems. There is also on-going change in the general structural design of materials as new materials become economically feasible. Steam is being used less in office and apartment buildings. The trend in process industry is to use plastic pipe. In the pulp and paper and chemical industries there is a trend to the use of fibreglass.

The movement to more specialized materials will mandate the requirement for more highly skilled steamfitters-pipefitters at an earlier point in their careers. This will also require a more in-depth knowledge of quality control procedures to meet expanding International Standards Organization requirements (ISO 9000).

As with other industries the steamfitter-pipefitter trade is becoming computerized. There is an on-going trend towards the use of computers for reports, schedules, ordering material, completion of forms and rendering drawings (computer-assisted design or CAD).

Governments continue to pass increasing stricter safety, health and environmental regulations. The steamfitter-pipefitter must keep current on a large number of regulations and codes.

As companies re-structure, the crew sizes on a job are continuing to get smaller and the responsibility for supervising crews is being pushed downwards. There is an increasing requirement for steamfitters-pipefitters to be able to supervise crews at an earlier point in their careers. This requirement includes the ability to manage small jobs where the tradesperson is responsible for the initial planning and costing for both personnel and materials. Communication and management skills will be required in the future for junior tradespersons.

In some jurisdictions, steamfitters-pipefitters require gasfitter licences.

ANALYSIS

BLOCK A SAFETY

Task 1 Demonstrates safe working practices.

Trend: There is an increased requirement for certificates in first aid and cardiopulmonary resuscitation (CPR). Changes in legislation require an improved knowledge of government safety and environmental regulations.

	Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
1.01	Uses personal protective equipment.	<p>ability to adjust appropriate protective equipment, such as breathing, personal clothing and equipment, fall arresting devices</p> <p>knowledge of regulations outlining the requirements for personal protective equipment</p>	all personal protective equipment and tools
1.02	Uses tools and equipment in a safe manner.	<p>knowledge of safe tool handling procedures in hazardous areas, e.g. spark proof tools</p> <p>knowledge of the hazards of using defective hand/electrical tools</p> <p>knowledge of the dangers of moving parts on power tools</p> <p>knowledge of the dangers of loose clothing when using power tools or equipment</p> <p>knowledge of safety zones and working space required for working around power and process equipment</p> <p>ability to select proper guards</p> <p>ability to install guards</p> <p>ability to adjust guards</p>	all equipment and tools

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
1.03	Practises good housekeeping.	cleaning equipment
1.04	Applies first aid.	first aid kit and supplies
1.05	Evaluates safety.	
	<p>knowledge of personal hygiene</p> <p>knowledge of good housekeeping procedures</p>	
	<p>knowledge of industrial first aid procedures</p> <p>knowledge of toxic gas first aid procedures</p> <p>knowledge of chemical first aid procedures</p>	
	<p>knowledge of Workplace Hazardous Materials Information System (WHMIS)</p> <p>knowledge of handling procedures for flammable and toxic materials</p> <p>knowledge of <i>Occupational Health and Safety Act (OHSA)</i></p> <p>knowledge of relevant jurisdictional hoisting legislation</p> <p>knowledge of company safety policy and manual</p> <p>knowledge of applicable fire codes</p> <p>knowledge of American Society of Mechanical Engineers (ASME) codes</p> <p>knowledge of applicable electrical codes</p> <p>knowledge of applicable Canadian Standards Association (CSA) codes</p> <p>knowledge of Workers' Compensation Board regulations</p>	

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
1.06	Applies safety procedures.	locks, tags, rope-off material
	ability to complete accident reports	
	knowledge of site fire regulations	
	knowledge of site lock-out procedures	
	knowledge of isolation procedures	
	knowledge of evacuation procedures	
	ability to carry out evacuation procedures	
	knowledge of site safety procedures	
	knowledge of the safe handling and storage procedures for oxy-acetylene tanks and related equipment	
	knowledge of audio and visual alarms	
	knowledge of requirements for work permits	
	ability to obtain work permits	
	knowledge of confined space procedures	
	knowledge of requirement to locate emergency equipment	
	knowledge of requirement to rope off (secure) work areas	
1.07	Sets up temporary work platforms.	scaffolds, lifts, ladders, rope, rope-off material
	ability to erect ladders safely	
	knowledge of care and use of ladders	
	knowledge of ladders/scaffolding requirements under applicable codes	
	ability to erect manufactured	

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
	<p>scaffolding safely</p> <p>ability to operate mobile work platforms safely under relevant jurisdictional hoisting legislation</p> <p>ability to secure area for a temporary work platform</p> <p>ability to inspect mobile and stationary hoisting equipment</p>	
1.08	Rigs material/equipment.	rigging equipment and tools
	<p>ability to rig material/equipment according to CSA, OHSA and relevant jurisdictional hoisting legislation</p> <p>knowledge of safe rigging procedures</p> <p>knowledge of load requirements</p> <p>ability to calculate load requirements</p> <p>ability to determine equipment required for safe lifting</p> <p>knowledge of OHSA and CSA regulations</p> <p>ability to determine rigging material and size</p> <p>ability to position equipment</p> <p>knowledge of hand and voice signals</p> <p>ability to maintain rigging equipment</p> <p>knowledge of lifting points</p> <p>ability to rig material/equipment</p> <p>ability to operate rigging equipment</p> <p>ability to operate power lifting</p>	

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
	equipment	
	knowledge of safe handling and storage of rigging equipment	
	ability to disconnect and store rigging equipment	

BLOCK B TOOLS AND EQUIPMENT

Task 2 Uses tools and equipment appropriately.

Trend: No apparent change.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
2.01 Uses hand tools.	ability to use hand tools in accordance with CSA standards and manufacturers' operating instructions	
	knowledge of safe handling procedures for hand tools	
	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes yes yes yes yes NV	
2.02 Uses power tools.	ability to use power tools in accordance with CSA standards and manufacturers' operating instructions	
	knowledge of power tool safety procedures	

Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment		
	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
2.03	Uses drilling tools.			ability to use drilling tools in accordance with CSA standards and manufacturers' operating instructions								
	knowledge of drilling tools safety procedures											
	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
2.04	Uses grinding tools.			ability to use grinding tools in accordance with CSA standards and manufacturers' operating instructions								
	knowledge of grinding tools safety procedures											
	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
2.05	Uses impact tools.			ability to use impact tools in accordance with CSA standards and manufacturers' operating instructions								
	knowledge of impact tool safety procedures											
	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	NV
2.06	Uses test equipment.			ability to use test equipment in accordance with CSA standards and manufacturer's instruction								

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
	knowledge of test equipment safety procedures	
	knowledge of test equipment calibration procedures	
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV

Task 3 Maintains tools and equipment.

Trend: No apparent change.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
3.01	Inspects tools and test equipment.	knowledge of procedures for testing tools and equipment for correct operation
		ability to identify defective tools
		ability to identify defective test equipment
		ability to determine when to repair or replace defective tools and equipment
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV
3.02	Maintains tools.	ability to maintain hand tools
		ability to maintain power tools in accordance with manufacturers' instructions

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
	ability to maintain drilling tools in accordance with manufacturers' instructions	
	ability to maintain grinding tools in accordance with manufacturers' instructions	
	ability to maintain impact tools in accordance with manufacturers' instructions	
	ability to maintain test equipment	
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV

BLOCK C DRAWINGS AND SPECIFICATIONS

Task 4 Organizes blueprints.

Trend: There is a trend to the use of computer-assisted drafting (CAD).

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
4.01	Organizes detailed mechanical drawings.	knowledge of symbols knowledge of job schedule/time frame
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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4.02	Organizes detailed construction drawings.	knowledge of symbols											
		knowledge of job schedule/time frame											
		<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

4.03	Organizes detailed architectural drawings.	knowledge of symbols											
		knowledge of job schedule/time frame											
		<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

Task 5 Interprets blueprints and specifications.

Trend: There is a trend to the use of CAD.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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5.01	Locates work areas.	knowledge of drawing symbols											
		ability to use scale rule											
		knowledge of trade-related mathematics											
		ability to orient drawing to site											
		<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

	Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
5.02	Identifies system.	knowledge of symbols knowledge of systems	
	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes	<u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> yes yes yes yes yes yes	<u>NT</u> <u>YK</u> yes NV
5.03	Identifies material.	knowledge of material codes knowledge of standards	code books
	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes	<u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> yes yes yes yes yes yes	<u>NT</u> <u>YK</u> yes NV
5.04	Identifies specifications and applicable codes.	knowledge of applicable codes ability to identify code from drawings ability to locate codes ability to interpret the code as it applies to drawing	code books
	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes	<u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> yes yes yes yes yes yes	<u>NT</u> <u>YK</u> yes NV
5.05	Cross-checks drawings.	knowledge of symbols knowledge of symbols of other trades (general)	scale rule, calculator
	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes	<u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> yes yes yes yes yes yes	<u>NT</u> <u>YK</u> yes NV
5.06	Draws sketches.	ability to sketch isometric drawings ability to sketch spool drawings ability to sketch sleeving drawings	geometry set, scale, rule calculator

Sub-tasks		Supporting Knowledge & Abilities								Tools & Equipment			
		ability to sketch interference drawings											
		ability to sketch as-built drawings											
		<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
5.07	Prepares valve directory.	knowledge of symbols								geometry set, scale rule			
		knowledge of basic drawing skills											
		knowledge of CAD											
		ability to read and interpret an architectural scale											
		ability to draw (pencil/rule)											
		knowledge of trade-related mathematics											
		ability to identify valve function											
		knowledge of identification methods											
		ability to create legends, schedules and directories											
		<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

BLOCK D LAYOUT

Task 6 Lays out sleeves.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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Trend: No apparent change.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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6.01	Measures grid lines.	<p>ability to transfer information from drawings to the work site</p> <p>ability to scale drawing</p> <p>ability to establish elevation</p> <p>knowledge of trade-related mathematics</p>	measuring tape, scale rule, markers, calculator, levels
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u></p> <p>yes yes yes yes yes</p>	<p><u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes NV</p>

6.02	Identifies location of sleeve.	<p>ability to transfer information from drawings to the work site</p> <p>ability to select size and type of sleeve</p> <p>knowledge of applicable codes</p>	measuring tape, scale rule, markers, calculator, levels
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u></p> <p>yes yes yes yes yes</p>	<p><u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes NV</p>

6.03	Marks location of sleeve.	<p>ability to field-measure accurately</p> <p>ability to use builder's levels</p> <p>knowledge of measuring techniques</p> <p>knowledge of marking techniques and tools</p>	measuring tape, scale rule, markers, plumb bob, calculator, levels
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u></p> <p>yes yes yes yes yes</p>	<p><u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes NV</p>

Task 7 Lays out equipment and trim.Trend: No apparent change.

7.01	Measures grid lines.	<p>ability to transfer grid line information from drawings to work site</p> <p>ability to scale drawing</p> <p>knowledge of trade-related mathematics</p> <p>ability to establish elevation</p>	<p>measuring tape, scale rule, markers, calculator, levels, plumb bob</p>
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes yes yes yes NV</p>	
7.02	Identifies equipment.	<p>ability to transfer information from drawings to work site</p> <p>ability to select size and type of equipment</p> <p>ability to read and interpret manufacturers' shop drawings</p> <p>ability to verify field fit</p>	<p>measuring tape, scale rule, markers, calculator, levels</p>
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes yes yes yes NV</p>	
7.03	Marks equipment	<p>ability to transfer information from</p>	<p>measuring tape, scale</p>

location. drawings to work site rule, markers, calculator, levels, plumb bob

ability to select size and type of equipment

ability to read and interpret manufacturers' shop drawings

ability to verify field fit

NF NS PE NB PQ ON MA SK AB BC NT YK
 yes yes yes yes yes yes yes yes yes yes yes NV

Task 8 Lays out supports and piping.

Trend: No apparent change.

	Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
8.01	Measures grid line.	ability to transfer information from drawings to work site ability to scale drawing knowledge of trade-related mathematics ability to establish elevation	measuring tape, scale rule, markers, calculator, levels, plumb bob
	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes yes yes yes yes NV		
8.02	Identifies location.	ability to identify types of supports and piping ability to transfer information from drawings to work site ability to select size and type of supports and piping knowledge of applicable codes	measuring tape, scale rule, markers, calculator, levels
	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes yes yes yes yes NV		

8.03	Marks location of supports and piping.	ability to field-measure accurately ability to use builder's levels knowledge of measuring techniques knowledge of marking techniques and tools	measuring tape, scale rule, markers, calculator, levels, plumb bob
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<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

Task 9 Lays out accessories.

Trend: No apparent change.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment																								
9.01	Measures grid lines. ability to transfer information from drawings to work site ability to scale drawing knowledge of trade-related mathematics ability to establish elevation	measuring tape, scale rule, markers, calculator, levels																								
	<table border="0"> <tr> <td><u>NF</u></td> <td><u>NS</u></td> <td><u>PE</u></td> <td><u>NB</u></td> <td><u>PQ</u></td> <td><u>ON</u></td> <td><u>MA</u></td> <td><u>SK</u></td> <td><u>AB</u></td> <td><u>BC</u></td> <td><u>NT</u></td> <td><u>YK</u></td> </tr> <tr> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>NV</td> </tr> </table>	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>															
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV															
9.02	Identifies location. ability to identify types of accessories ability to transfer information from drawings to work site ability to select size and type of accessories knowledge of applicable codes	measuring tape, scale rule, markers, calculator, levels																								
	<table border="0"> <tr> <td><u>NF</u></td> <td><u>NS</u></td> <td><u>PE</u></td> <td><u>NB</u></td> <td><u>PQ</u></td> <td><u>ON</u></td> <td><u>MA</u></td> <td><u>SK</u></td> <td><u>AB</u></td> <td><u>BC</u></td> <td><u>NT</u></td> <td><u>YK</u></td> </tr> </table>	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>													
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>															

Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment		
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
9.03	Marks location of accessories.			ability to field-measure accurately ability to use builder's levels knowledge of measuring techniques knowledge of marking techniques and tools						measuring tape, scale rule, markers, calculator, levels, plumb bob		
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	

BLOCK E COMMUNICATION AND ORGANIZATION

Task 10 Co-ordinates with other trades.

Trend: There is an increasing requirement for good speaking and writing skills.

Sub-tasks		Supporting Knowledge & Abilities			Tools & Equipment	
10.01	Identifies co-ordination requirements.	knowledge of steamfitter-pipefitter job description knowledge of responsibilities of other trades knowledge of job parameters			office supplies	

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment								
		ability to perform change notice work to alert other trades of changes to be carried out									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
10.02	Attends job-related meetings.	ability to take notes/minutes ability to explain tasks/concerns in meeting knowledge of steamfitter-pipefitter trade knowledge of other trades and engineering	office supplies								
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
10.03	Follows up on tasks set at co-ordination meetings.	ability to track job completion against tasks assigned at co-ordination meetings ability to report clearly on progress of tasks assigned ability to identify problems clearly in completing tasks									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

Task 11 Organizes work to meet assigned schedule.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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Trend: There is a trend to give more responsibility to the steamfitter-pipefitter to organize crews on small jobs. Tradespersons are beginning to complete reports and schedules on computer. Basic computers skills are becoming a requirement on the job site.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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11.01	Identifies task required.	<p>knowledge of trade</p> <p>knowledge of plans and specifications</p> <p>knowledge of limitations of work to be completed</p>	
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes yes yes yes NV</p>	

11.02	Interprets job schedule.	<p>knowledge of all trades on job</p> <p>knowledge of terminology</p> <p>knowledge of project management forms (e.g. Gantt, Pert charts)</p> <p>ability to read and interpret work-related instructions</p>	
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes yes yes yes NV</p>	

11.03	Maintains log or job site journal.	<p>knowledge of terminology and acronyms</p> <p>knowledge of items to track</p> <p>ability to write concise/clear entries</p> <p>knowledge of importance of times/dates/weather conditions</p>	<p>office supplies and equipment</p>
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Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment		
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	NV	
11.04	Prepares tools and equipment list.			knowledge of materials knowledge of tools knowledge of codes and standards knowledge of impact of site conditions on tools knowledge of crew size required knowledge of ordering/receiving procedures ability to select tools according to site limitations ability to order tools						office supplies and equipment		
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	
11.05	Prepares a material list.			knowledge of blueprints and specifications knowledge of materials knowledge of materials terminology knowledge of ordering/receiving procedures knowledge of ordering codes (e.g. ASME) knowledge of manufacturers' product number and descriptions ability to order material						office supplies and equipment		

Sub-tasks		Supporting Knowledge & Abilities						Tools & Equipment				
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	
11.06	Identifies human resource requirements.			<p>ability to read and interpret job schedules</p> <p>ability to read and interpret job descriptions</p> <p>ability to read and interpret plans and specifications</p> <p>knowledge of impact of weather conditions on job</p> <p>ability to determine availability of local work force</p>								
	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	NV
11.07	Prepares personnel schedule.			<p>ability to identify activities</p> <p>knowledge of time estimation</p> <p>ability to prioritize</p> <p>knowledge of job sequencing (with other trades)</p> <p>ability to determine impact of delays in equipment in other trades</p>								
	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	NV
11.08	Assigns jobs.			<p>knowledge of job requirements</p> <p>ability to outline clearly assigned</p>								

tasks

ability to monitor performance

knowledge of procedures to follow to deal with crew members who are unable to perform tasks

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	NV

Task 12 Performs liaison tasks.

Trend: There is an increasing requirement for steamfitters-pipefitters to improve communication skills. More computers are being placed in construction offices. Tradespersons are beginning to complete their reports on computers and forward them using a fax machine. Basic computers skills are becoming a requirement on the job site.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment									
12.01 Liaises with management.	<p>ability to write memos/letters</p> <p>ability to read memos/letters</p> <p>ability to communicate information orally</p> <p>ability to listen effectively (provide feedback to ensure instructions were delivered/received correctly)</p> <p>ability to deal with shipping information</p> <p>ability to complete forms, e.g. time sheets, work orders, extra work orders, expense accounts</p>	office supplies and equipment									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	NV

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment
12.02	Liaises with engineers.	<p>ability to write memos/letters</p> <p>ability to read memos/letters</p> <p>ability to communicate information orally</p> <p>ability to listen effectively (provide feedback to ensure instructions were delivered/received correctly)</p> <p>knowledge of terminology</p> <p>ability to complete engineering specific forms</p>	office supplies and equipment
		<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes no yes yes yes yes yes yes NV</p>	
12.03	Liaises with other trades.	<p>ability to communicate information orally</p> <p>ability to listen effectively (provide feedback to ensure instructions were delivered/received correctly)</p> <p>ability to complete forms</p>	office supplies and equipment
		<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes yes yes yes yes yes yes yes NV</p>	
12.04	Operates two-way radios.	<p>knowledge of radio terminology</p> <p>knowledge of radio procedures</p> <p>ability to operate two-way radios</p>	communication equipment
		<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes yes yes yes yes yes yes yes NV</p>	

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
12.05 Operates office equipment.	ability to use photocopier ability to use fax machines ability to use telephone	office equipment
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV
12.06 Operates computers.	ability to record data ability to access documentation ability to access specifications ability to do simple word processing ability to do simple CAD (NOT COMMON CORE)	computer
<u>NF</u> yes	<u>NS</u> no	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> no	<u>ON</u> yes
<u>MA</u> no	<u>SK</u> yes	<u>AB</u> yes
<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV

BLOCK F FABRICATION AND/OR INSTALLATION

Task 13 Identifies components and specifications of piping systems.

Trend: There is a trend to the use of longer lasting quality materials which require more sophisticated installation methods and specialized tools.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
13.01 Identifies piping requirements for comfort heating.	<p>knowledge of applicable codes</p> <p>knowledge of safety requirements</p> <p>knowledge of types of comfort heating systems</p> <p>knowledge of system terminology</p> <p>knowledge of materials</p> <p>knowledge of tools required</p> <p>knowledge of job specifications</p> <p>knowledge of required trim</p> <p>knowledge of required controls and instrumentation</p> <p>knowledge of required equipment</p> <p>knowledge of local by-laws</p>	code books
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes yes yes yes yes yes yes yes NV</p>	
13.02 Identifies piping requirements for comfort cooling.	<p>knowledge of applicable codes</p> <p>knowledge of safety requirements</p> <p>knowledge of types of comfort cooling systems</p> <p>knowledge of system terminology</p> <p>knowledge of materials</p> <p>knowledge of tools required</p> <p>knowledge of job specifications</p> <p>knowledge of required trim</p>	code books

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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		<p>knowledge of required controls and instrumentation</p> <p>knowledge of required equipment</p> <p>knowledge of local by-laws</p>	
	<p><u>NF</u> yes</p> <p><u>NS</u> yes</p> <p><u>PE</u> yes</p> <p><u>NB</u> yes</p>	<p><u>PQ</u> yes</p> <p><u>ON</u> yes</p> <p><u>MA</u> yes</p> <p><u>SK</u> yes</p> <p><u>AB</u> yes</p> <p><u>BC</u> yes</p> <p><u>NT</u> yes</p> <p><u>YK</u> NV</p>	
13.03	Identifies piping requirements for humidification.	<p>knowledge of applicable codes</p> <p>knowledge of safety requirements</p> <p>knowledge of types of humidification systems</p> <p>knowledge of system terminology</p> <p>knowledge of materials</p> <p>knowledge of tools required</p> <p>knowledge of job specifications</p> <p>knowledge of required trim</p> <p>knowledge of required controls and instrumentation</p> <p>knowledge of required equipment</p> <p>knowledge of local by-laws</p>	code books
		<p><u>NF</u> yes</p> <p><u>NS</u> yes</p> <p><u>PE</u> yes</p> <p><u>NB</u> yes</p> <p><u>PQ</u> no</p> <p><u>ON</u> yes</p> <p><u>MA</u> yes</p> <p><u>SK</u> yes</p> <p><u>AB</u> yes</p> <p><u>BC</u> no</p> <p><u>NT</u> yes</p> <p><u>YK</u> NV</p>	
13.04	Identifies piping requirements for refrigeration process.	<p>knowledge of applicable codes</p> <p>knowledge of safety requirements</p>	code books

		<p>knowledge of types of refrigeration process systems</p> <p>knowledge of system terminology</p> <p>knowledge of materials</p> <p>knowledge of tools required</p> <p>knowledge of job specifications</p> <p>knowledge of required trim knowledge of required controls and instrumentation</p> <p>knowledge of required equipment</p> <p>knowledge of local by-laws</p>	
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> no yes yes yes yes no no NV</p>	
13.05	Identifies piping requirements for combustible gas systems.	<p>knowledge of applicable codes</p> <p>knowledge of safety requirements</p> <p>knowledge of types of combustible gas systems</p> <p>knowledge of system terminology</p> <p>knowledge of materials</p> <p>knowledge of tools required</p> <p>knowledge of job specifications</p> <p>knowledge of required trim</p> <p>knowledge of required controls and instrumentation</p>	code books

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment
		knowledge of required equipment	
		knowledge of local by-laws	
		<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes no yes yes yes yes yes yes NV	
13.06	Identifies piping requirements for non-combustible gas systems.	knowledge of applicable codes knowledge of safety requirements knowledge of types of non-combustible gas systems knowledge of system terminology knowledge of materials knowledge of tools required knowledge of job specifications knowledge of required trim knowledge of required controls and instrumentation knowledge of required equipment knowledge of local by-laws	code books
		<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes no yes yes yes yes yes yes NV	
13.07	Identifies piping requirements for medical gas systems.	knowledge of applicable codes knowledge of safety requirements knowledge of types of medical gas systems	code books

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment								
		knowledge of system terminology									
		knowledge of materials									
		knowledge of tools required									
		knowledge of job specifications									
		knowledge of required trim									
		knowledge of required controls and instrumentation									
		knowledge of required equipment									
		knowledge of local by-laws									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	no	yes	yes	yes	yes	yes	no	NV
13.08	Identifies piping requirements for chemical/petrochemical systems.	knowledge of applicable codes	code books								
		knowledge of safety requirements									
		knowledge of types of chemical/petrochemical systems									
		knowledge of system terminology									
		knowledge of materials									
		knowledge of tools required									
		knowledge of job specifications									
		knowledge of required trim									
		knowledge of required controls and instrumentation									
		knowledge of required equipment									
		knowledge of local by-laws									

Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment		
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<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

13.09	Identifies piping requirements for steam systems.	knowledge of applicable codes	code books
		knowledge of safety requirements	
		knowledge of types of steam systems	
		knowledge of system terminology	
		knowledge of materials	
		knowledge of tools required	
		knowledge of job specifications	
		knowledge of required trim	
		knowledge of required controls and instrumentation	
		knowledge of required equipment	
		knowledge of local by-laws	

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

13.10	Identifies piping requirements for vacuum systems.	knowledge of applicable codes	code books
		knowledge of safety requirements	
		knowledge of types of vacuum systems	
		knowledge of system terminology	
		knowledge of materials	
		knowledge of tools required	

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
	<p>knowledge of job specifications</p> <p>knowledge of required trim</p> <p>knowledge of required controls and instrumentation</p> <p>knowledge of required equipment</p> <p>knowledge of local by-laws</p>	
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes yes yes yes no NV</p>	
13.11	<p>Identifies piping requirements for fire protection systems.</p> <p>knowledge of applicable codes</p> <p>knowledge of safety requirements</p> <p>knowledge of types of fire protection systems</p> <p>knowledge of system terminology</p> <p>knowledge of materials</p> <p>knowledge of tools required</p> <p>knowledge of job specifications</p> <p>knowledge of required trim</p> <p>knowledge of required controls and instrumentation</p> <p>knowledge of required equipment</p> <p>knowledge of local by-laws</p>	code books
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes no yes yes no yes no yes yes yes yes NV</p>	
13.12	<p>Identifies piping requirements for slurry</p> <p>knowledge of applicable codes</p>	code books

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
systems.	<p>knowledge of safety requirements</p> <p>knowledge of types of slurry systems</p> <p>knowledge of system terminology</p> <p>knowledge of materials</p> <p>knowledge of tools required</p> <p>knowledge of job specifications</p> <p>knowledge of required trim</p> <p>knowledge of required controls and instrumentation</p> <p>knowledge of required equipment</p> <p>knowledge of local by-laws</p>	
<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes yes yes yes yes yes NV</p>	
13.13 Identifies piping requirements for solids moved by air systems.	<p>knowledge of applicable codes</p> <p>knowledge of safety requirements</p> <p>knowledge of types of solids moved by air systems</p> <p>knowledge of system terminology</p> <p>knowledge of materials</p> <p>knowledge of tools required</p> <p>knowledge of job specifications</p> <p>knowledge of required trim</p> <p>knowledge of required controls and instrumentation</p>	code books

		knowledge of required equipment	
		knowledge of local by-laws	
	<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
	<u>NB</u> yes	<u>PQ</u> no	<u>ON</u> yes
		<u>MA</u> yes	<u>SK</u> yes
		<u>AB</u> yes	<u>BC</u> yes
		<u>NT</u> no	<u>YK</u> NV
13.14	Identifies piping requirements for hydraulics systems.	knowledge of applicable codes	code books
		knowledge of safety requirements	
		knowledge of types of hydraulics systems	
		knowledge of system terminology	
		knowledge of materials	
		knowledge of tools required	
		knowledge of job specifications	
		knowledge of required trim	
		knowledge of required controls and instrumentation	
		knowledge of required equipment	
		knowledge of local by-laws	
	<u>NF</u> yes	<u>NS</u> no	<u>PE</u> yes
	<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
		<u>MA</u> yes	<u>SK</u> yes
		<u>AB</u> yes	<u>BC</u> yes
		<u>NT</u> no	<u>YK</u> NV
13.15	Identifies piping requirements for pneumatic systems.	knowledge of applicable codes	code books
		knowledge of safety requirements	
		knowledge of types of pneumatic systems	

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment
		knowledge of system terminology	
		knowledge of materials	
		knowledge of tools required	
		knowledge of job specifications	
		knowledge of required trim	
		knowledge of required controls and instrumentation	
		knowledge of required equipment	
		knowledge of local by-laws	
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>
yes	yes	yes	yes
<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>
yes	yes	yes	yes
<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	NV
13.16	Identifies piping requirements for water purification systems.	knowledge of applicable codes	code books
		knowledge of safety requirements	
		knowledge of types of water purification systems	
		knowledge of system terminology	
		knowledge of materials	
		knowledge of tools required	
		knowledge of job specifications	
		knowledge of required trim	
		knowledge of required controls and instrumentation	
		knowledge of required equipment	
		knowledge of local by-laws	

Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment		
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	
13.17	Identifies piping requirements for water treatment systems.			knowledge of applicable codes knowledge of safety requirements knowledge of types of water treatment systems knowledge of system terminology knowledge of materials knowledge of tools required knowledge of job specifications knowledge of required trim knowledge of required controls and instrumentation knowledge of required equipment knowledge of local by-laws						code books		
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	
13.18	Identifies piping requirements for clean-room environment systems.			knowledge of applicable codes knowledge of safety requirements knowledge of types of clean-room environment systems knowledge of system terminology knowledge of materials knowledge of tools required						code books		

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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knowledge of job specifications

knowledge of required trim

knowledge of required controls and instrumentation

knowledge of required equipment

knowledge of local by-laws

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	no	yes	yes	yes	yes	no	yes	NV

13.19 Identifies piping requirements for food processing (ie. dairy, brewing).

knowledge of applicable codes

code books

knowledge of safety requirements

knowledge of types of food processing systems

knowledge of system terminology

knowledge of materials

knowledge of tools required

knowledge of job specifications

knowledge of required trim

knowledge of required controls and instrumentation

knowledge of required equipment

knowledge of local by-laws

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	NV

13.20 Identifies piping

knowledge of applicable codes

code books

Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment			
	requirements for industrial processes (including refining).				knowledge of safety requirements								
					knowledge of types of industrial process systems								
					knowledge of system terminology								
					knowledge of materials								
					knowledge of tools required								
					knowledge of job specifications								
					knowledge of required trim								
					knowledge of required controls and instrumentation								
					knowledge of required equipment								
					knowledge of local by-laws								
		<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
13.21	Identifies piping requirements for environmental containment systems.				knowledge of applicable codes							code books	
					knowledge of safety requirements								
					knowledge of types of environmental containment systems								
					knowledge of system terminology								
					knowledge of materials								
					knowledge of tools required								
					knowledge of job specifications								
					knowledge of required trim								
					knowledge of required controls and instrumentation								

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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	knowledge of required equipment	
	knowledge of local by-laws	
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
	<u>MA</u> yes	<u>SK</u> yes
	<u>AB</u> yes	<u>BC</u> no
		<u>NT</u> yes
		<u>YK</u> NV
13.22	Identifies piping requirements for marine systems.	code books
	knowledge of applicable codes	
	knowledge of safety requirements	
	knowledge of types of marine systems	
	knowledge of system terminology	
	knowledge of materials	
	knowledge of tools required	
	knowledge of job specifications	
	knowledge of required trim	
	knowledge of required controls and instrumentation	
	knowledge of required equipment	
	knowledge of local by-laws	
	(NOT COMMON CORE)	
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> no	<u>ON</u> yes
	<u>MA</u> yes	<u>SK</u> no
	<u>AB</u> no	<u>BC</u> yes
		<u>NT</u> no
		<u>YK</u> NV

Task 14 Prepares sleeves, pipe and supports.

Trend: A wider range of plastic compounds and joining methods are used in piping. There is more specialized requirements for anchors, supports and sleeves available. There is an increased requirement for air and water-tight sleeves.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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14.01	Identifies system criteria.	knowledge of how to interpret plans and specifications knowledge of various systems ability to identify applicable codes ability to locate code information	code books
	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes	<u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> yes yes yes yes yes	<u>BC</u> <u>NT</u> <u>YK</u> yes yes NV

14.02	Determines joining methods.	knowledge of basic metallurgy knowledge of melting points of materials knowledge of joining procedure - soldering knowledge of joining procedure - braising knowledge of joining procedure - welding knowledge of joining procedure - mechanical joint knowledge of joining procedure - threading knowledge of joining procedure - solvent welding knowledge of joining procedure - plastic fusion knowledge of joining procedure - bell and spigot	
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Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment								
		knowledge of joining procedure - flange joining									
		knowledge of joining procedure - fiberglass									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
4.03	Obtains material, tools and equipment.	knowledge of tools required									
		knowledge of materials required									
		knowledge of equipment required									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
14.04	Obtains measurements.	knowledge of measuring techniques	measuring tools								
		ability to transfer measurements in plans and specifications to the pipe and accessories									
		ability to use measuring tools									
		knowledge of trade-related mathematics									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
14.05	Bends pipe.	knowledge of material tolerances	measuring tape, levels, bending tools								
		knowledge of tools									
		knowledge of safe procedures for use of tools									

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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knowledge of codes pertaining to bending of materials

knowledge of different bending methods

knowledge of applicable codes/specifications

ability to use bending tools

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

14.06 Joins pipe.

knowledge of pipe end preparation procedures

all tools of the trade

knowledge of joining procedures

ability to join pipe using soldering

ability to join pipe using braising

ability to join pipe using welding

ability to join pipe using mechanical joint

ability to join pipe using threading

ability to join pipe using solvent welding

knowledge of joining procedure - plastic fusion

knowledge of joining procedure - fiberglass

ability to join pipe using bell and spigot

Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment		
				ability to join pipe using flange joining								
				ability to use oxy-fuel gas cutting tools								
				ability to use plasma arc welding tools								
				ability to use power cutting tools								
				ability to use hand cutting tools								
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	
14.07	Fabricates and installs sleeves.			ability to fabricate sleeves						drills, screwdrivers, measuring tape, scale rule, hammer, wrenches, welding equipment		
				knowledge of tools required								
				ability to monitor concrete pour for proper sleeving								
				knowledge of safe work habits								
				ability to use core drill								
				ability to use oxy-acetylene torches								
				ability to weld								
				ability to install sleeve in adjacent structural material								
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	

Task 15 Installs pipe systems.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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Trend: Trend is to fibre optics for control systems. New methods for making joints with new materials are continually being introduced.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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15.01	Installs pipe and supports.	knowledge of tools required knowledge of type of support ability to obtain support information from plans and specifications knowledge of installation method ability to install support onto structural materials ability to install anchors and guides ability to calculate contraction and expansion ability to use lifting equipment knowledge of hand signals ability to erect a piping system knowledge of rigging procedures ability to rig pipe	all tools of the trade
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<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

15.02	Installs equipment.	knowledge of tools required knowledge of type of equipment ability to obtain equipment information from plans and specifications	all tools of the trade
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Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
15.03	Installs trim.	<p>knowledge of installation method</p> <p>ability to install equipment onto structural materials</p> <p>ability to install anchors and guides</p> <p>ability to calculate contraction and expansion</p> <p>ability to use lifting equipment</p> <p>knowledge of hand signals</p> <p>knowledge of rigging procedures</p> <p>ability to rig equipment</p> <p>all tools of the trade</p>

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment
		<p>knowledge of field protection for trim</p> <p>ability to install protection</p> <p>ability to install control system components</p>	
		<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes no yes yes yes NV</p>	
15.04	Installs accessories.	<p>knowledge of tools required</p> <p>knowledge of types of accessories</p> <p>ability to obtain accessories information from plans and specifications</p> <p>knowledge of installation method ability to install accessories onto structural materials</p> <p>ability to install anchors and guides</p> <p>ability to calculate contraction and expansion</p> <p>ability to use lifting equipment</p> <p>knowledge of hand signals</p> <p>knowledge of rigging procedures</p> <p>ability to rig accessories</p> <p>ability to install control system components</p>	all tools of the trade
		<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes yes yes yes yes NV</p>	

BLOCK G QUALITY ASSURANCE**Task 16 Applies codes and standards.**

Trend: Trend today is for increased quality control, especially due to International Standards Organization requirements (ISO 9000). In addition there is more demand that the job site tradesperson has full knowledge of the applicable codes.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
16.01 Identifies materials.	<p>ability to interpret codes/ specifications/QA or QC manuals ability to locate/access applicable codes/specifications/QA or QC manuals</p> <p>ability to create an accurate material list which meets codes and specifications</p>	code books, office supplies and equipment, QA/QC manuals
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes yes yes yes yes NV</p>	
16.02 Determines tests.	<p>ability to interpret codes/ specifications/QA or QC manuals</p> <p>ability to locate/access codes/ specifications/QA or QC manuals</p> <p>knowledge of requirements for notification of authorities</p> <p>ability to obtain test documentation</p>	code books, office supplies and equipment, QA/QC manuals

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	NV

16.03 Determines methods of fabrication and installation.

ability to interpret codes/specifications/QA or QC manuals

ability to locate/access codes/specifications/QA or QC manuals

ability to determine correct methods to follow to meet codes/specifications/QA or QC manuals

code books, office supplies and equipment, QA/QC manuals

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

Task 17 Co-ordinates and performs testing.

Trend: As more codes and standards are introduced, there is an increased requirement for performance evaluation inspections in testing systems.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
17.01 Performs visual testing.	<p>ability to recognize deficiencies</p> <p>ability to record test documentation</p> <p>ability to identify/tag deficiencies</p> <p>knowledge of notification requirements</p> <p>knowledge of faults which can be corrected immediately</p> <p>ability to correct faults</p>	

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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17.02	Performs non-destructive testing.	ability to recognize deficiencies ability to identify/tag deficiencies ability to record test documentation knowledge of notification requirements ability to secure area safely knowledge of requirements for test knowledge of test equipment ability to conduct test	non-destructive test equipment, rope-off material, tags
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17.03	<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes	<u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> no yes no yes yes ability to recognize deficiencies ability to identify/tag deficiencies ability to record test documentation knowledge of notification requirements ability to secure area safely knowledge of requirements for test knowledge of test equipment ability to conduct test	<u>BC</u> <u>NT</u> <u>YK</u> no yes NV destructive test equipment, rope-off material, tags
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(NOT COMMON CORE)

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	no	no	yes	no	yes	yes	no	no	NV

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment
17.04	Performs hydrostatic testing.	<p>ability to recognize deficiencies</p> <p>ability to identify/tag deficiencies</p> <p>ability to record test documentation</p> <p>knowledge of notification requirements</p> <p>knowledge of faults which can be corrected immediately</p> <p>ability to correct faults</p> <p>ability to secure area safely</p> <p>knowledge of requirements for test</p> <p>knowledge of test equipment</p> <p>ability to conduct test</p>	<p>hydrostatic test equipment, rope-off material, tags</p>
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u></p> <p>yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u></p> <p>yes yes yes yes yes</p>	<p><u>BC</u> <u>NT</u> <u>YK</u></p> <p>yes yes NV</p>
17.05	Performs pneumatic testing.	<p>ability to recognize deficiencies</p> <p>ability to identify/tag deficiencies</p> <p>ability to record test documentation</p> <p>knowledge of notification requirements</p> <p>knowledge of faults which can be corrected immediately</p> <p>ability to correct faults</p> <p>ability to secure area safely</p> <p>knowledge of requirements for test</p>	<p>pneumatic test equipment, rope-off material, tags</p>

		knowledge of test equipment	
		ability to conduct test	
	<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
	<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
		<u>MA</u> yes	<u>SK</u> yes
		<u>AB</u> yes	<u>BC</u> yes
		<u>NT</u> yes	<u>YK</u> NV
17.06	Performs in-service (performance) testing.	ability to recognize deficiencies	locks, tags
		ability to identify/tag deficiencies	
		ability to record test documentation	
		knowledge of notification requirements	
		knowledge of faults which can be corrected immediately	
		ability to correct faults	
		ability to secure area safely	
		knowledge of requirements for test	
		knowledge of test equipment	
		ability to conduct test	
	<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
	<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
		<u>MA</u> yes	<u>SK</u> yes
		<u>AB</u> yes	<u>BC</u> yes
		<u>NT</u> yes	<u>YK</u> NV
17.07	Performs heat treatment testing.	knowledge of preheat requirements	tags, rope-off materials
		knowledge of post-weld heat treatment requirements	
		ability to recognize deficiencies	
		ability to identify/tag deficiencies	

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
	<p>ability to record test documentation</p> <p>knowledge of notification requirements</p> <p>knowledge of faults which can be corrected immediately</p> <p>ability to correct faults</p> <p>ability to secure area safely</p> <p>knowledge of requirements for test</p> <p>knowledge of test equipment</p> <p>ability to conduct test</p>	
<u>NF</u> yes	<u>PQ</u> no	<u>BC</u> no
<u>NS</u> yes	<u>ON</u> yes	<u>NT</u> yes
<u>PE</u> yes	<u>MA</u> yes	<u>YK</u> NV
<u>NB</u> yes	<u>SK</u> yes	
	<u>AB</u> yes	
17.08	<p>Performs water treatment testing.</p>	locks, tags, rope-off material
	<p>ability to recognize deficiencies</p> <p>ability to identify/tag deficiencies</p> <p>ability to record test documentation</p> <p>knowledge of notification requirements</p> <p>ability to secure area safely</p> <p>knowledge of requirements for test</p> <p>knowledge of test equipment</p> <p>ability to conduct test</p> <p>knowledge of water treatment testing</p> <p>knowledge of system design specifications</p> <p>ability to take samples</p>	

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment
		knowledge of correctable faults	
		ability to correct faults	
		(NOT COMMON CORE)	
		<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes no yes no no yes yes yes yes no yes NV	
17.09	Performs bolt testing.	knowledge of engineering specifications ability to use tensioning tools ability to record test results knowledge of notification requirements ability to tension bolts to specifications	wrenches, tensioning tools, torque wrenches
		<u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes yes yes no yes NV	
17.10	Supervises smoke test heating, ventilating and air-conditioning (HVAC).	ability to recognize deficiencies ability to identify/tag deficiencies ability to record test documentation knowledge of notification requirements knowledge of faults which can be corrected immediately ability to correct faults ability to secure area safely	smoke equipment, rope-off material, tags

knowledge of requirements for test

knowledge of test equipment

(NOT COMMON CORE)

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	no	no	no	no	yes	no	no	yes	no	no	NV

BLOCK H COMMISSIONING (Start-up, Testing, Adjusting and Balancing)

Task 18 Verifies testing.

Trend: Job site personnel are required to complete more documentation to verify that testing has been completed.

	Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment																								
18.01	Obtains test results.	<p>knowledge of tests required</p> <p>knowledge of personnel responsible for test</p> <p>ability to obtain test/reports</p>	office supplies and equipment																								
		<table border="0"> <tr> <td><u>NF</u></td> <td><u>NS</u></td> <td><u>PE</u></td> <td><u>NB</u></td> <td><u>PQ</u></td> <td><u>ON</u></td> <td><u>MA</u></td> <td><u>SK</u></td> <td><u>AB</u></td> <td><u>BC</u></td> <td><u>NT</u></td> <td><u>YK</u></td> </tr> <tr> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>yes</td> <td>NV</td> </tr> </table>	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>																
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV																

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment									
18.02	Reviews test results.	ability to interpret test results knowledge of systems being tested ability to schedule/reschedule tests	office supplies and equipment								
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes	<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes	<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes	<u>BC</u> yes	<u>NT</u> no	<u>YK</u> NV
18.03	Notifies authorities of system readiness.	knowledge of personnel responsible for system ability to liaise with authority knowledge of documentation required ability to complete documentation ability to transmit documentation	office supplies and equipment								
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes	<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes	<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes	<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV

Task 19 Performs flushing of system.

Trend: There is an increased requirement to use environmentally safe materials to flush systems. Where unsafe materials are used to flush the system there is an increasing stress on safe disposal of the material.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment	
19.01	Sets up system for flush.	knowledge of complete flushing procedure (including time frames, materials required)	

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment
		ability to apply procedures	
		ability to identify equipment required to be protected	
		ability to protect equipment	
		ability to liaise with authorities and representatives	
	<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
	<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
	<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
	<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV
19.02	Adds appropriate solutions.	knowledge of appropriate cleaning solutions	chemical handling equipment
		knowledge of safety precautions	
		knowledge of disposal requirements	
		knowledge of equipment required	
		knowledge of flushing procedures	
		ability to handle solutions safely	
		ability to operate equipment	
		ability to follow procedures	
	<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
	<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
	<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
	<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV
19.03	Conducts sample testing.	knowledge of water treatment test equipment	chemical test equipment
		knowledge of test procedures	
		ability to take samples	

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
	ability to test samples	
	ability to liaise with testing firms	
	ability to record results	
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> no	<u>PQ</u> no	<u>ON</u> yes
	<u>MA</u> yes	<u>SK</u> yes
	<u>AB</u> yes	<u>BC</u> no
		<u>NT</u> yes
		<u>YK</u> NV

19.04	Completes records.	knowledge of notification requirements	office equipment and supplies
		knowledge of forms required	
		ability to complete forms	
		ability to liaise with authorities	
		ability to transmit documentation to proper authorities (such as regulatory bodies, customers)	
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes	<u>NB</u> yes
	<u>PQ</u> no	<u>ON</u> yes	<u>MA</u> yes
		<u>SK</u> yes	<u>AB</u> yes
		<u>BC</u> no	<u>NT</u> yes
			<u>YK</u> NV

Task 20 Starts up system.

Trend: More exacting and involved start-up procedures are required.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
20.01	Carries out final set-up.	ability to re-install protected equipment
		ability to install additional trim
		all tools of the trade

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
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		<p>knowledge of equipment/trim function specifications</p> <p>ability to check equipment/trim function</p> <p>ability to liaise with other trades/engineers</p>	
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> yes yes yes yes yes</p>	<p><u>BC</u> <u>NT</u> <u>YK</u> yes yes NV</p>
20.02	Adds product to lines.	<p>ability to liaise with owner's representatives</p> <p>ability to fill system to operating levels</p> <p>knowledge of product ability to test product quality to engineering specifications (e.g solution strength)</p> <p>knowledge of documentation required to verify product</p> <p>ability to complete documentation</p>	pumps, chemical testing equipment
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> yes yes yes yes</p>	<p><u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> no yes yes yes yes</p>	<p><u>BC</u> <u>NT</u> <u>YK</u> yes yes NV</p>
20.03	Verifies system performance.	<p>ability to start equipment</p> <p>ability to test actuators</p> <p>knowledge of system performance specifications</p> <p>ability to liaise with manufacturers'</p>	tachometer, pressure gauges, ampere probe

representative for start-up

ability to balance system

ability to measure flow/pressure

ability to calibrate system

knowledge of documentation

ability to complete test documentation

ability to transmit documentation

<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	NV

BLOCK I MAINTENANCE AND SERVICE

Task 21 Troubleshoots system.

Trend: There is an increasing requirement for the tradesperson to understand all systems that integrate with the piping system, e.g. electrical, ventilation. In addition, the tradesperson needs to be able to cost repairs when troubleshooting a system. This means that the tradesperson must have a more in-depth understanding of the cost of material, labour and impact on other areas. There is also a requirement for a better understanding of time estimation.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
21.01 Analyzes problem.	knowledge of systems	tachometer, pressure gauges, ampere probe, ohmmeter, voltmeter
	knowledge of specifications	
	knowledge of equipment	

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment								
		<p>knowledge of special tools for troubleshooting</p> <p>knowledge of trim</p> <p>ability to use tools</p> <p>knowledge of troubleshooting procedures</p> <p>ability to liaise for access</p> <p>ability to identify potential solutions</p>									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
21.02	Estimates costs.	<p>ability to estimate time required</p> <p>ability to identify material required</p> <p>ability to estimate labour required</p> <p>ability to liaise with estimator to cost solution</p> <p>ability to liaise with customer</p>									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	no	yes	yes	yes	yes	yes	no	NV
21.03	Drains system.	<p>ability to liaise with owner's representative</p> <p>knowledge of system</p> <p>knowledge of product</p> <p>ability to isolate affected system/ equipment</p> <p>knowledge of lock-out procedures</p>	locks, tags, hoses, containers								

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
	ability to follow appropriate lock-out procedures	
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
<u>BC</u> yes	<u>NT</u> yes	<u>YK</u> NV

Task 22 Performs preventative maintenance.

Trend: No apparent change.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
22.01	Develops preventative maintenance schedule.	
	knowledge of specifications	
	knowledge of equipment	
	knowledge of codes	
	knowledge of product	
<u>NF</u> yes	<u>NS</u> yes	<u>PE</u> yes
<u>NB</u> yes	<u>PQ</u> yes	<u>ON</u> yes
<u>MA</u> yes	<u>SK</u> yes	<u>AB</u> yes
<u>BC</u> yes	<u>NT</u> no	<u>YK</u> NV
22.02	Performs preventative maintenance procedures.	all tools of the trade
	knowledge of preventative maintenance schedule	
	ability to follow schedule	
	ability to service equipment	
	ability to interpret maintenance manuals	
	ability to complete maintenance documentation	
	ability to conduct product tests	

Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment		
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	

Task 23 Repairs system.

Trend: There is an increasing requirement for the tradesperson to cost repair to replacement when repairing a system. This means that the tradesperson must have a more in-depth understanding of the cost of material, labour and impact on other areas. There is also a requirement for a better understanding of the repair procedures and time estimation.

Sub-tasks				Supporting Knowledge & Abilities						Tools & Equipment		
23.01	Removes equipment and trim components for replacement or repair.	knowledge of equipment/ components									all tools of the trade	
		knowledge of specifications										
		knowledge of tools required										
		ability to use tools										
		ability to remove components										
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	

23.02	Repairs equipment and trim components.	knowledge of specifications									all tools of the trade
		knowledge of tools required									
		ability to use tools									
		ability to obtain shop/ manufacturers' drawings									
		ability to read and interpret drawings and specifications of equipment									
		knowledge of repair procedures									

ability to follow repair procedures to specifications

ability to bench-test components if applicable

NF NS PE NB PQ ON MA SK AB BC NT YK
 yes yes yes yes yes yes yes yes yes yes yes NV

23.03 Installs equipment and trim components. knowledge of specifications all tools of the trade

knowledge of tools

ability to install equipment to specifications

ability to test components

knowledge of test requirements

ability to use tools

NF NS PE NB PQ ON MA SK AB BC NT YK
 yes yes yes yes yes yes yes yes yes yes yes NV

Task 24 Reactivates system.

Trend: No apparent change.

Sub-tasks	Supporting Knowledge & Abilities	Tools & Equipment
24.01 Fills the system.	<p>knowledge of specifications</p> <p>knowledge of product</p> <p>knowledge of system</p> <p>ability to liaise with owner's representatives to arrange for filling of system</p>	pumps, hoses
	<p><u>NF</u> <u>NS</u> <u>PE</u> <u>NB</u> <u>PQ</u> <u>ON</u> <u>MA</u> <u>SK</u> <u>AB</u> <u>BC</u> <u>NT</u> <u>YK</u> yes yes yes yes yes yes yes yes yes yes yes NV</p>	

Sub-tasks		Supporting Knowledge & Abilities	Tools & Equipment								
24.02	Removes lock-outs at isolation.	<p>knowledge of procedures</p> <p>ability to liaise with owner</p> <p>ability to follow removal lock-out procedures</p> <p>ability to follow removal of isolation procedures</p>									
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
24.03	Tests system.	<p>knowledge of test procedures</p> <p>ability to conduct test</p> <p>ability to document results</p> <p>knowledge of documentation requirements</p> <p>ability to liaise with owner's representative regarding test results</p>	test equipment								
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV
24.04	Puts system on-line.	<p>knowledge of system</p> <p>knowledge of product</p> <p>ability to verify calibration of system</p> <p>ability to balance system or test performance</p>	tachometer, pressure gauges, ampere probe, ohmmeter, voltmeter								
<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV

APPENDICES

TOOLS AND EQUIPMENT

air compressor	levels - laser, standard, telescope instrument
alignment clamps - external and internal	lifts - electrical, hydraulic, pneumatic, winch (hand and power), material, men and material, one-man and platform
ampere probe	marking tool
angle finder	measuring tape
bending machine - power	micrometer
bending tools - hand and hydraulic	pin punch
bevelling tools - hand, electric drive and oxy-fuel	pipe cutters - single-wheel, multi-wheel
bolt cutter	pipe reamer
bolt tap	pipe stands - roller and V type
bolt threader	pipe tap
C-clamp	pipe threader
calculator	pipe vises - chain and yokes, trisland and bench, power vise (power drive)
caliper	pliers
centre finder	plumb bob
centre punch	powder-actuated tools
chain pipe tongs	prying tool
chisels - coal and wood	ratchet
coil fin straightener	rigging equipment and tools - chain block, chain puller, cable puller, cable hoist power (pneumatic hydraulic), jacks hydraulic, ram and piston - toe, shackle, sling, snatch block, spreader bar, tag line, cranes
contour markers	rule
coring machine	saws - circular, cutoff, jig, sabre
drills - hand, electric, pneumatic, hammer, bench or stand press	scaffolding
feeler gauge	screwdriver
files	shear
flange alignment pins	squares - standard 24 in., combination, flange
flange spreader (jacks)	straightedge
flaring tool	swaging tool
geometry set	tachometer
grinders (electric or pneumatic) angle, bench, pedestal	tee drill with freeze pack
hacksaws - hand, portable band, large band	tube cleaner
hammers - ball, chipping, sledge, soft-face	vise-grip pliers
hydrostatic pump	
impact driver	
ladders - extension, step	

welding equipment - oxy-fuel cutting
and welding torches, arc welding
machine, tanks (fuels, purge gas,
shield gas), tip cleaner
wheel and bearing pullers

wrap-around
wrenches - adjustable (crescent), chain,
combination (open-/closed-end), hammer,
hex-key, non-spark, pin, pipe, socket,
torque

Protective clothing and devices

breathing apparatus
chemical protective clothing
coveralls (standard and fire retardant)
dust mask
ear protection
face shield
fire extinguisher
hard hat

leather apron
leather gloves and sleeves
rubber gloves
safety boots
safety belt and harness
safety glasses
welding goggles and helmet

GLOSSARY OF TERMS

air charger valve	globe valve on top of cushion tank used when more air has to be put into tank.
air scoop	a device installed in the hot-water supply main at or near the heating source which separates and directs the air to a cushion tank or automatic air vent (as it pertains to hot-water heating).
Airtrol tank fittings	a device with an extended tube which is installed on the bottom of a cushion tank with a tube or tubes extending up into the tank. Its purpose is to allow expanded and contracted water to and from the tank, but discourage the escape or withdrawal of air from the tank. (Airtrol is a trade name used by the Armstrong Co., but is widely used in the industry.)
annealing	process of heat treating metal to obtain desired condition of softness and ductility (easy to bend into a new shape).
aquastat	an automatic switching device which is operated by temperature change. On a hot-water boiler, it may act as a high limit or operator control of the burners to maintain a boiler temperature differential.
ASME	American Society of Mechanical Engineers.
atmospheric vent	a pipe leading from some piece of equipment, such as flash tanks, blowoff basins or exhaust steam systems, which expels steam, vapour or gas directly to the atmosphere.
automatic air vent	a device used to automatically let air out of a system, but which prevents the escape of water or steam.
backfire or popping	flame backs up into the tip of a welding torch and generally re-establishes itself with a bang or pop almost instantly. In the odd case it may pop and blow out (ie. combustion ceases and both gases are flowing from the tip normally but not ignited). If the work is hot or molten the gases usually re-ignite.
back pressure	pressure on the discharge side of a steam trap or steam driven device (as it pertains to steam).
back-pressure valve	a valve which prevents excessive back pressure in an exhaust steam piping system.

balancing valve	valve used on hydronic systems to give each circuit the same pressure drop friction loss, milinch per foot resistance.
bight	the bend of a line, rope or cable.
blast coil	a coil which heats outside air to a temperature about 40°F - 60°F.
blind controller	controller which regulates but does not indicate or record.
blowdown	a connection at the bottom or lowest portion of a gauge glass, low-water cutoff, automatic water feeder, cast iron water column, etc., to facilitate cleaning out or testing of the equipment.
blowoff	a connection tied in at the lowest possible level of the water section of a steam boiler and at the boiler water line to enable boiler drainage or removal of sludge, mud, scale, etc.
blowoff tank	a device or apparatus used to receive boiler blowoff for the purpose of cooling the water temperature to 170°F.
boiler heating surface	the area of the heat transmitting surface within a boiler which is in contact with water (or steam) on one side and products of combustion (hot gases) and/or radiant heat from fire on the other side (direct heating surface (radiant), indirect heating surface (hot gases)).
boiler horsepower	the ability of a boiler to evaporate 34.5 pounds of water per hour under atmospheric conditions (the equivalent to an output of 33,475 Btus per hour). This is from water at 212°F to steam at 212°F.
boiler priming	water being carried out of the boiler with the steam.
boiler scoop	a device installed on the outlet or supply connection of a hot-water boiler to separate and direct the air to the cushion tank.
Btu	British thermal unit, a quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit.
bullheaded tee	tee installed in manner that all the flow goes through the branch.
bypass valve	manual controlled passage around a controlling device.
CAD	computer assisted drafting; used for drawing, altering and recalling views and details on a computer.
calibrate	comparison of the instrument/system to be tested with a standard.
carry-over	water and solids being carried out of the boiler with the steam.

choker	hitch made by using a sling in a manner so that the heavier the load, the tighter the sling will hold it.
circuit	the piping path from a boiler or heat exchanger to a heat transfer unit and back to the boiler, e.g. on a monoflo system each rad has a circuit.
coefficient of expansion	a number indicating the degree of expansion or contraction of a substance.
combination gauge	a gauge which indicates pressure and temperature of water.
compound gauge	a Bourdon tube pressure gauge which will indicate inches (mm) of vacuum or psig (kPa).
contour marker	instrument used in the fabrication of pipes that will trace lines for the cutting of Ts, Ys and laterals.
control valve	a globe-type valve which controls the flow of a liquid or gas automatically as directed by an electrical or pneumatic signal or a capillary tube. It may be a single or double seated valve. See <u>also</u> modulating; normally open; normally closed.
controller	attempts to regulate a measurement at some preselected valve. May also indicate or record, e.g. recorder-controller.
converter	a piece of equipment used to heat or cool water and other liquids by means of steam, high temperature hot water, or chilled water without the two mediums coming in contact with each other (heat exchanger; indirect heater).
cooling leg	a length of uninsulated pipe through which the condensate flows to a steam trap which has a sufficient cooling surface to permit the condensate to dissipate enough heat to prevent flashing in the return line when the trap opens, or to expose a thermostatic trap element to excessive temperature. In the case of thermostatic traps, a cooling leg may be necessary to allow the condensate to cool sufficiently to permit the trap to open quicker.
cracking	term used when a valve is opened a small amount.
cushion tank (compressure tank)	a completely closed tank which contains liquid and air or inert gas. Its purpose is to allow expanded water from a closed hydronic system to enter and leave the tank without an appreciable change in system pressure. The air compresses and expands as the water enters and leaves.
dead-end service	this refers to an application or installation of a steam PRV, or

	control valve which is operating "On" and "Off" instead of continuously.
deaerator	a device used to heat the feedwater before it enters the steam boiler. It may be used for reducing thermal shock, saving of fuel, removing temporary hardness and unwanted gases (such as oxygen and carbon dioxide) from the make-up water.
design temperature difference	the lowest prolonged anticipated outdoor temperature (below 0°F) added to the desired indoor temperature (as it pertains to heat loss).
desuperheater	a device which uses water as a cooling medium to lower the temperature of the superheated steam.
direct return	a two-pipe heating system (hydronic systems) in which the first unit feed has the shortest return to the pump.
dirt pocket	a short piece of pipe and a cap in which scale, dirt or any other foreign matter may gather and which prevents their entry into an automatic control, usually a steam trap.
dog everything	to lock and secure a load where it is and wait for further signals.
double-seated control valve	a control valve with two seats and one or two plugs.
d/p cell	differential pressure transmitter.
drip	a piping arrangement by which condensate accumulation is handled or removed in a steam system.
dry return	a steam condensate return line which carries air and condensation.
economizer	a heat exchanger-type device installed in a flue gas passage of a boiler through which feed water passes to be heated.
emission rate	a figure given in Btus which expresses the amount of heat given off per hour per unit.
equivalent length	the resistance to the flow of fluids or gases that valves and fittings create by friction within a pipeline. It is expressed in straight feet of pipe of the same diameter as the fitting being described.
erosion	the wearing away effect on a valve disc, plug or seat, or any other fitting apparatus.

exhaust head	a device which utilizes centrifugal action or force to separate water and/or oil from steam being expelled through an atmospheric vent and directs the water or oil to a safe place of dispersment.
expansion joint	a manufactured, mechanical device to take up or to compensate for the expansion and contraction of a pipe line due to temperature change.
feed water	water that is fed into a steam boiler.
fire tube boiler	a boiler in which the hot gases of combustion are in the tubes.
flashback	flashback always occurs in the line carrying the lower pressure and will always occur beyond the mixer, and may include the hose and regulator as well. It is usually a devastating explosion or series of explosions, leaving the equipment in shambles.
flashing (flash steam)	the act of water changing to steam. Steam which is formed when hot condensate under pressure is released to a lower pressure.
flash tank	a device or apparatus used to cool high temperature condensate to a low enough temperature to prevent it from flashing in a low-pressure return.
gantry	fabricated structural crane with the traverse beam elevated and bridged over the area of lifting.
hardness (in water)	water is expressed as being hard or soft depending upon the quantity of scale making materials which it contains. The quantity is expressed in "parts per million" or "grains per gallon". <u>See also</u> permanent hardness; temporary hardness.
headache block	the travel block of the multiple, or main load line on a crane.
head pressure	used in designating the capacity of a circulating pump, it is a way of expressing pressure drop. The maximum head (pressure) of a pump (usually in feet of water) is actually the maximum pressure drop against which a pump can induce a flow of liquid.
high-pressure boiler	a steam boiler which operates above 15 psig.
high temperature hot-water system	a system which has hot water above 350°F.
HVAC system	heating, ventilation and air-conditioning system.

hydrostatic pressure indicator	pressure exerted by a column of fluid at rest. an instrument that shows a measurement, but makes no permanent record, e.g. pressure gauge.
injector (steam)	a device used to inject water into a boiler with the boiler steam pressure.
intermediate trapping	taking condensate out of steam lines in the middle of long runs, e.g. in a 200 ft horizontal run install a drip and steam trap into the middle.
jib	extension attached to the boom point of a lifting device to add length.
jib or whip line	a single load line on a crane.
lift fitting	a manufactured device made of cast iron or assembled pipe and fittings which creates a liquid seal through a pressure differential, enabling the elevating of a vacuum-dry return line.
low-pressure boiler	a steam boiler which operates below 15 psig.
low-water cutoff	a device which shuts off the automatic fuel control valve when the water falls below a safe level in the boiler.
measuring section, metering run	that portion of the process piping which includes a primary flow measuring device.
medium temperature hot-water system	a hot-water heating system which has a supply temperature of above 250°F.
milinch	a term used to express friction in a hot-water heating system. It is the equivalent to 1/1000 of an inch of head (12,000 milinches are equal to the pressure exerted by one foot head of water).
mousing	wiring the throat of a hook to prevent a choker from jumping out of the hook. Also to prevent a block that is hooked to a lashing or a choker from slipping off.
negative pressure	pressure below atmospheric on the suction side of a pump (hot-water heating).
normally closed (R/A)	valve which stays in the closed position when there is no signal being applied to the activating device.
normally open (D/A)	valve which stays in the open position when there is no signal being applied to the activating device.

orifice plate	a thin steel plate put between orifice flanges to produce a pressure drop in a pipe line so measuring instruments can get a reading.
permanent hardness	the presence of calcium and magnesium sulphates. They are removed only by chemical treatment.
pipe anchor	a means of securing a run of pipe in a fixed location to control the direction of expansion and contraction.
post heating	use of heat source to heat an area after a process such as welding takes place.
preheating	use of heat source to heat an area before a process such as welding takes place.
pressure drop	difference in pressure in two points of a hydronic system. On a steam system it pertains to the supply line and is measured in psig. In a hydronic system it pertains to supply and return lines and is measured in feet of head or milinches per foot.
pressure-reducing valve	a device of a globe valve pattern used to reduce steam pressure from a higher to a lower pressure. They may be single- or doubled-seated. A device of a globe valve pattern used to reduce city water pressure to the minimum desired system pressure (hot-water system).
pressuretrol	an automatic switching device which is operated by pressure. On steam boilers it controls the "On" and "Off" pressure within a boiler and also the high limit "Off".
primary device	that part of an instrument in close contact with material to be measured.
quick connect	a snap connection that allows a pressure line to be connected or disconnected without the loss of pressure.
receiver	receives the signal from a transmitter and converts it into a measurement. May be recording or indicating and may control, e.g. receiver recording controller.
recorder	makes a permanent record of measurement.
reheat coil	a coil in an HVAC system which heats the air from the air handling unit to a temperature required to maintain heat loss and set point for the area it serves.

resin	a bonding agent used in the fibre glass process. Used in the pulp and paper industry because of its resistance to acids and alkalines.
reverse return	as it pertains to two-pipe hydronic systems, a system in which the first unit supply has the longest return to the pump.
root pass	the first pass in a weld or the inter-most pass in a weld on pipe.
running end	the end of the rope with which you are working when you tie a knot.
runout	a horizontal branch of piping which leads from a riser.
saddle	a metal support for pipe, when being held by a suspended hanger, or a method of joining one pipe to another forming a "T" connection.
safety relief valve	a safety device that will open before a dangerous pressure is reached.
saturated steam	steam which is at the same temperature as the boiling water from which it was formed (dry saturated; wet saturated).
scrubbers	filters found in smoke stacks to remove fly ash.
shackle	a "U" shaped piece of metal provided with a means of applying a bolt or pin through the ends.
short-circuiting	the flow of a liquid, gas or vapour taking the route which offers the least resistance to its flow.
single-seated control valve	a control valve with a single seat and a single plug or disc.
snatch block	a single-sheaved block made so that the shell opens on one side at the base of the hook to permit a rope to be slipped over the sheave without threading the end of it through the hook.
snubber	a device installed between a pressure gauge and fluid line to prevent damage to the gauge if the line is pulsating.
softeners	anything that is used to protect the load or cable from damage while making a lift, also prevents loads from slipping.
soot blower	a device which blows the soot off the tubes in the boiler with the use of steam.

spool sheets	detail valves of a piping system identifying specific pipes and closing pieces to be fabricated.
spreader bar	a bar that keeps a set of slings from closing up around a piece of equipment and doing damage when in the process of lifting.
spreaders	a set of chokers or slings of equal length used to lift a load.
springpiece	a horizontal branch of piping which leads from a horizontal main.
standing part	the inactive length of rope when tying knots.
steam nozzle	the outlet(s) from a steam boiler through which the steam exits the boiler.
steam separator	a device used to remove entrained moisture present in steam.
steam tracing	a small tube, 3/8 in. - 5/8 in., which is wrapped around pipes, vessels and pumps and is filled with steam to keep liquids in them from freezing.
steam trap	an automatic device which allows the passage of air and condensate but prevents the passage of steam.
straightening vanes	a device used to take the turbulence out of liquids and gases flowing in pipes so measuring instruments can get an accurate reading.
stratification	arrangement in strata or layers. In heating, stratification of air may occur in a room with a high ceiling, resulting in a marked temperature difference between floor and ceiling. This also applies to liquids in vessels.
superheated steam	saturated steam with the addition of sensible heat. An increase in temperature of saturated steam without an increase in pressure.
superheater	a device used to reheat dry or wet-saturated steam and increase the temperature without increasing the pressure of the steam.
tag line	a length of rope used to guide a load being lifted into a desired position.
temperature drop	the difference in boiler temperature and return temperature from any circuit. In a hydronic system it is the difference in temperature between any two parts of the system.
temporary hardness	the presence of calcium and magnesium sulphates. They are

	removed by boiling or heating.
three-way diverting control valve	a control valve which has two outlets and a common inlet.
three-way mixing control valve	a control valve which has two inlets and a common outlet.
unit trapping	expression used to indicate the use of a separate steam trap on each individual appliance or coil of a multi-coil unit. The "unit trapping" method is highly encouraged to eliminate short-circuiting.
vacuum pump	a device used to lower atmospheric pressure inside a vessel or piping system, it is highly efficient and needs a water seal to produce near-perfect vacuum.
venturi tee	tee (soldered or screwed) which creates an obstruction in a pipeline and creates a drawing effect on the down-steam side. It is used on a one pipe forced hot-water heating system (diverter fitting; monoflo tee).
vibration compensator	a device used to isolate vibration and/or noise from transmitting or being carried from pump, motor, etc., into a piping system (noise compensator; isolator).
water tube boiler	a boiler in which water or water and steam are in a tube.
wet return	a steam condensate return line which is carrying only condensate.
whipping robe	the fastening which prevents fraying and does not increase the size of the end of a rope.
wiredrawing	the "knife-like" cuts or cutting effect on a valve, disc plug or seat.
wrap-around	a coil of gasket material used to wrap around pipe, when in the process of marking a square cutoff line.

PERCENTAGE RATINGS**BLOCK A SAFETY**

Task 1 Demonstrates safe working practices.

BLOCK B TOOLS AND EQUIPMENT

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	5	20	5	8	10	19	10	2	10	14	8	NV

Nat.
Avg.

10%

Task 2 Uses tools and equipment appropriately.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	70	75	90	90	80	90	80	95	95	70	70	NV

Nat.
Avg.

82%

Task 3 Maintains tools and equipment.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	30	25	10	10	20	10	20	5	5	30	30	NV

Nat.
Avg.

18%

BLOCK C DRAWINGS AND SPECIFICATIONS

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>
	20	10	10	9	15	5	18	5	5	13	8	NV

Nat.
Avg.

11%

Task 4 Organizes blueprints.

																		Nat. Avg.
%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>						22%
	35	40	10	20	30	5	30	5	10	34	20	NV						

Task 5 Interprets blueprints and specifications.

																		Nat. Avg.
%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>						78%
	65	60	90	80	70	95	70	95	90	66	80	NV						

BLOCK D LAYOUT

																		Nat. Avg.
%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>						11%
	12	15	10	7	5	10	18	15	10	9	8	NV						

Task 6 Lays out sleeves.

																		Nat. Avg.
%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>						16%
	30	25	25	10	10	16	20	5	5	25	10	NV						

Task 7 Lays out equipment and trim.

																		Nat. Avg.
%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>						21%
	20	15	25	10	35	26	20	20	10	20	25	NV						

Task 8 Lays out supports and piping.

																		Nat. Avg.
%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>						47%
	30	40	25	70	25	47	45	70	80	39	50	NV						

Task 9 Lays out accessories.

Nat.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	10	20	10	10	10	20	34	5	10	25	20	NV	

16%

Task 14 Prepares sleeves, pipe and supports.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	20	30	30	45	30	50	33	5	40	30	50	NV	

33%

Task 15 Installs pipe systems.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	70	50	60	45	60	30	33	90	50	45	30	NV	

51%

BLOCK G QUALITY ASSURANCE

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	8	5	7	2	10	8	5	3	5	7	15	NV	

7%

Task 16 Applies codes and standards.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	80	60	25	10	20	20	40	30	20	45	40	NV	

35%

Task 17 Co-ordinates and performs testing.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	20	40	75	90	80	80	60	70	80	55	60	NV	

65%

BLOCK H COMMISSIONING (Start-up, Testing, Adjusting and Balancing)

Nat.
Avg.

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%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	5	5	5	2	5	10	2	5	5	6	12	NV	

6%

Task 18 Verifies testing.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	40	25	20	10	15	10	33	5	20	15	30	NV	

20%

Task 19 Performs flushing of system.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	40	40	20	70	30	50	34	20	50	63	40	NV	

42%

Task 20 Starts up system.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	20	35	60	20	55	40	33	75	30	22	30	NV	

38%

BLOCK I MAINTENANCE AND SERVICE

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	2	25	15	20	10	10	2	25	10	14	15	NV	

Nat.
Avg.

13%

Task 21 Troubleshoots system.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
	20	10	30	10	15	9	25	10	20	22	25	NV	

18%

Task 22 Performs preventative maintenance.

Nat.
Avg.

%	<u>NF</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>PQ</u>	<u>ON</u>	<u>MA</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	
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27%

5 50 20 40 15 46 25 40 20 16 15 NV

Task 23 Repairs system.

Nat.
Avg.

% NF NS PE NB PQ ON MA SK AB BC NT YK
70 30 35 40 50 36 25 40 50 40 40 NV

Task 24 Reactivates system.

Nat.
Avg.

% NF NS PE NB PQ ON MA SK AB BC NT YK
5 10 15 10 20 9 25 10 10 22 20 NV

TITLES OF BLOCKS

- A SAFETY****
- B TOOLS AND EQUIPMENT**
- C DRAWINGS AND SPECIFICATIONS**
- D LAYOUT**
- E COMMUNICATION AND ORGANIZATION**
- F FABRICATION AND/OR INSTALLATION**
- G QUALITY ASSURANCE**
- H COMMISSIONING (Start-up, Testing, Adjusting and Balancing)**
- I MAINTENANCE AND SERVICE**

** Since safety practices are a mandatory feature of all occupations, they are considered common core, ratings are not required and thus Block A does not appear on the chart.

BLOCKS		TASKS	SUB-TASKS							
A	Safety	1. Demonstrates safe working practices.	1.01 Uses personal protective equipment.	1.02 Uses tools and equipment in a safe manner.	1.03 Practises good housekeeping.	1.04 Applies first aid.	1.05 Evaluates safety.	1.06 Applies safety procedures.	1.07 Sets up temporary work platforms.	1.08 Rigs material/equipment.
B	Tools and Equipment	2. Uses tools and equipment appropriately.	2.01 Uses hand tools.	2.02 Uses power tools.	2.03 Uses drilling tools.	2.04 Uses grinding tools.	2.05 Uses impact tools.	2.06 Uses test equipment.		
			3. Maintains tools and equipment.	3.01 Inspects tools and test equipment.	3.02 Maintains tools.					
C	Drawings and Specifications	4. Organizes blueprints.	4.01 Organizes detailed mechanical drawings.	4.02 Organizes detailed construction drawings.	4.03 Organizes detailed architectural drawings.					
		5. Interprets blueprints and specifications.	5.01 Locates work areas.	5.02 Identifies system.	5.03 Identifies material.	5.04 Identifies specifications and applicable codes.	5.05 Cross-checks drawings.	5.06 Draws sketches.	5.07 Prepares valve directory.	
D	Layout	6. Lays out sleeves.	6.01 Measures grid lines.	6.02 Identifies location of sleeve.	6.03 Marks location of sleeve.					
		7. Lays out equipment and trim.	7.01 Measures grid lines.	7.02 Identifies equipment.	7.03 Marks equipment location.					
8. Lays out supports and piping.	8.01 Measures grid line.	8.02 Identifies location.	8.03 Marks location of supports and piping.							
9. Lays out accessories.	9.01 Measures grid lines.	9.02 Identifies location.	9.03 Marks location of accessories.							
E	Communication and Organization	10. Co-ordinates with other trades.	10.01 Identifies co-ordination requirements.	10.02 Attends job-related meetings.	10.03 Follows up on tasks set at co-ordination meetings.					

BLOCKS	TASKS	SUB-TASKS										
	11. Organizes work to meet assigned schedule.	11.01 Identifies task required.	11.02 Interprets job schedule.	11.03 Maintains log or job site journal.	11.04 Prepares tools and equipment list.	11.05 Prepares a material list.	11.06 Identifies human resource requirements.	11.07 Prepares personnel schedule.	11.08 Assigns jobs.			
	12. Performs liaison tasks.	12.01 Liaises with management.	12.02 Liaises with engineers.	12.03 Liaises with other trades.	12.04 Operates two-way radios.	12.05 Operates office equipment.	12.06 Operates computers.					
F	Fabrication and/or Installation	13.01 Identifies piping requirements for comfort heating.	13.02 Identifies piping requirements for comfort cooling.	13.03 Identifies piping requirements for humidification.	13.04 Identifies piping requirements for refrigeration process.	13.05 Identifies piping requirements for combustible gas systems.	13.06 Identifies piping requirements for non-combustible gas systems.	13.07 Identifies piping requirements for medical gas systems.	13.08 Identifies piping requirements for chemical/ petrochemical systems.	13.09 Identifies piping requirements for steam systems.	13.10 Identifies piping requirements for vacuum systems.	13.11 Identifies piping requirements for fire protection systems.
		13.12 Identifies piping requirements for slurry systems.	13.13 Identifies piping requirements for solids moved by air systems.	13.14 Identifies piping requirements for hydraulics systems.	13.15 Identifies piping requirements for pneumatic systems.	13.16 Identifies piping requirements for water purification systems.	13.17 Identifies piping requirements for water treatment systems.	13.18 Identifies piping requirements for clean-room environment systems.	13.19 Identifies piping requirements for food processing (ie. dairy, brewing).	13.20 Identifies piping requirements for industrial processes (including refining).	13.21 Identifies piping requirements for environmental containment systems.	13.22 Identifies piping requirements for marine systems.
	14. Prepares sleeves, pipe and supports.	14.01 Identifies system criteria.	14.02 Determines joining methods.	14.03 Obtains material, tools and equipment.	14.04 Obtains measurements.	14.05 Bends pipe.	14.06 Joins pipe.	14.07 Fabricates and installs sleeves.				
	15. Installs pipe systems.	15.01 Installs pipe and supports.	15.02 Installs equipment.	15.03 Installs trim.	15.04 Installs accessories.							
G	Quality Assurance	16.01 Identifies materials.	16.02 Determines tests.	16.03 Determines methods of fabrication and installation.								
		17. Co-ordinates and performs testing.	17.01 Performs visual testing.	17.02 Performs non-destructive testing.	17.03 Performs destructive testing.	17.04 Performs hydrostatic testing.	17.05 Performs pneumatic testing.	17.06 Performs in-service (performance) testing.	17.07 Performs heat treatment testing.	17.08 Performs water treatment testing.	17.09 Performs bolt testing.	17.10 Supervises smoke test heating, ventilating and air-conditioning (HVAC).
H	Commissioning (Start-up, testing, Adjusting and Balancing)	18.01 Obtains test results.	18.02 Reviews test results.	18.03 Notifies authorities of system readiness.								

STEAMFITTER-PIPEFITTER (1996)

BLOCKS

TASKS

SUB-TASKS

I Maintenance and Service

19. Performs flushing of system.	19.01 Sets up system for flush.	19.02 Adds appropriate solutions.	19.03 Conducts sample testing.	19.04 Completes records.
20. Starts up system.	20.01 Carries out final set-up.	20.02 Adds product to lines.	20.03 Verifies system performance.	
21. Troubleshoots system.	21.01 Analyzes problem.	21.02 Estimates costs.	21.03 Drains system.	
22. Performs preventative maintenance.	22.01 Develops preventative maintenance schedule.	22.02 Performs preventative maintenance procedures.		
23. Repairs system.	23.01 Removes equipment and trim components for replacement or repair.	23.02 Repairs equipment and trim components.	23.03 Installs equipment and trim components.	
24. Reactivates system.	24.01 Fills the system.	24.02 Removes lock-outs at isolation.	24.03 Tests system.	24.04 Puts system on-line.