

British Columbia Construction Association

Integrating Newcomers

A comparison of select British Columbian and Philippine apprenticeships

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Preface

We conducted a comparison of apprenticeship essential, health and safety, and legislated skills requirements, training contents, and certification processes between British Columbia and the Republic of the Philippines for 5 trades: Carpenter, Construction Electrician, Construction Craft Worker, Plumber, and Roofer.

The goal of the comparison is to provide a reasoned tool for newcomers - and their advisors - when they are trying to determine what BC trade best matches their trade credential and experience.

The report is in 4 parts:

1. A quick summary equivalency reference tool with upgrade recommendations;
2. A methodology section outlining how we arrived at the conclusions;
3. A results section containing full details of the analysis undergirding the reference tool; and,
4. A discussion section that addresses briefly what the results might mean and how these considerations might be used for make-up training and the job-aids.

The first section (“An applied glimpse at differences”) can be used as a stand-alone. Newcomers and their advisors will find all the key comparisons and upgrade recommendations there. The section is the summary of the other three sections which, together, provide a level of detail more appropriate to policy-driven endeavors.

Due to scope constraints, we have focussed the comparisons using the BC apprenticeship program and BC legislated requirements as bases for technical, safety, and compliance skills. But we used Employment and Social Development Canada’s Essential Skills profiles for our analysis of literacy and numeracy skills requirements.

An applied glimpse at differences

In this summary tool, we outline trade credential equivalency processes and “high-level” comparisons of the skills, programs, and certification mechanisms for the 5 trades. Three sections follow this “glimpse”: methodology, results, and discussion. The methodology section lists the data sources we used and how we conducted the analysis. The results section makes thorough use of tables and color-coding to provide fine-grained analysis and summative results. And the discussion section contains practical, reasoned recommendations. All of these elements are summarized in this “glimpse” section.

Credential equivalency

There is no formal recognition of foreign trade credentials in Canada; there is no assured exchange of a foreign trade credential for an equivalent Canadian credential.

In British Columbia (BC), no credential is required to work in any of the trades. Some specific trade activities, however, require a relevant base trade credential – for example to “pull” electrical permits or connect a gas furnace. Mandatory credential requirements vary across Canadian jurisdictions; consult the provincial Apprenticeship website or the Federal Ellis Chart¹.

Trade credentials in BC are awarded by the Industry Training Authority (ITA). Similar entities – provincial government departments or crown-enabled institutions – award trade credentials in the other Canadian provinces and territories.

In BC², the ITA issues 2 trade credentials: the Certificate of Apprenticeship (CofA) and the Certificate of Qualification (CofQ). These credentials bear the federal Red Seal endorsement for Red Seal trades³. CofA credentials are issued upon successful completion of the relevant apprenticeship program. CofQ credentials are issued upon successful completion of the relevant Red Seal or Interprovincial Standards examination (IP). CofQs without Red Seal endorsement are awarded for non-Red Seal trades upon successful completion of the relevant ITA CofQ examination.

Access to these examinations is by one of two routes: apprenticeship program completion or challenge based on time-in-trade. Apprenticeship programs vary in length and in the number of weeks of in-school training over the duration of the program – apprentices are registered with the ITA; in-school training is through ITA-approved public and private training providers. Time-in-trade challengers are required to prove they have practiced the trade for at least 1.5 times the stipulated length of the apprenticeship on-the-job hours (See Table below).

Table 1. Trade certification requirements in BC

Trade	Apprenticeship		Challenge	
	In-school (weeks)	On-the-job (hours)	On-the-job (hours)	Fee
Carpenter	28	6480	9720	C\$120
Construction Electrician	40	6000	9000	C\$120
Construction Craft Worker	8	4000	6000	C\$120
Plumber	32	6420	9630	C\$120

¹ <http://www.ellischart.ca/search/s.2.1rch-eng.html> last accessed 29 September 2016

² The same general process holds in the other Canadian jurisdictions.

³ <http://www.itabc.ca/discover-apprenticeship-programs/search-programs> accessed 23 September 2016

Trade	Apprenticeship		Challenge	
	In-school (weeks)	On-the-job (hours)	On-the-job (hours)	Fee
Roofer	12	3600	5400	C\$120

Essential skills equivalency

In all of the 5 trades, workers are expected to read, consult, and fill a range of documents, from simple forms requiring dates, times, or measurements to detailed reports to engineers, inspectors, or customers. The “Republic of the Philippines – All trades” scores reflect our assumption that newcomers who have had basic English language training have the skills to handle simple documents – these often provide or require numerical information such as readings or measurements. We also assumed that newcomers would be able to understand simple instructions (written or spoken) but would not have the technical language skills required to write complex reports, direct small teams, or take an active part in group discussions such as pre-job conferences or tailboards.

We recognized that English is one of the Official Languages in the Republic of the Philippines but that it is not necessarily the language of instruction, even if it is offered as a second language. Filipino⁴ has, over the past decade or so, become the standard but not necessarily so in areas where another local language is dominant. It is likely that graduates of colleges (private or public) in larger urban centres have completed their education in English or with a strong English component. And it is less likely that graduates of industry-based programs (including apprenticeships) have done so.

In the Republic of the Philippines all applicants for a trade qualification are expected to complete a certain number of “Core Competencies” and be tested on them in an approved testing centre under the supervision of an approved assessor. While the “dualized mode of training delivery is preferred and recommended⁵” is preferred, trainees may also use any of the other 5 pathways: modular/self-paced learning, peer teaching/mentoring, supervised industry training, distance learning, and Project-Based Instruction. Depending on the specific Certificates of Competency (CoC) achieved, one is awarded a National Certificate (NC) level I, II, III, or IV. In what follows, we have assumed that a holder of a, e.g., Level III would have first completed a Level II, but that is not necessarily the case.

Table 2. Summative select Essential Skills complexity scores (Carp. means Carpenter; C.E. means Construction Electrician; C.C.W. means Construction Craft Worker; Plumb. means Plumber; Roof. means Roofer)

Essential Skills’ Category	Trade					Republic of the Philippines
	Carp.	C.E.	C.C.W.	Plumb.	Roof.	All trades
Reading	2.56	2.11	1.67	2.44	1.67	0.78
Document use	1.89	2.78	1.11	1.89	1.67	0.89
Writing	1.60	1.60	1.20	1.20	0.40	0.00
Numeracy	1.64	1.71	1.14	2.00	1.71	1.21

⁴ Following the “Mother Tongue – Based Multilingual Education (MTB-MLE)” program. Filipino (standardized Tagalog) is the primary language of instruction in addition to the students’ mother tongue - there are approximately 135

⁵ This “Dual System” is modelled on the German Dual System where partnerships between industry partners and local training institutions are struck and the trainee spends about 40% of training time in school and 60% at work.

Essential Skills' Category	Trade					Republic of the Philippines
	Carp.	C.E.	C.C.W.	Plumb.	Roof.	All trades
Oral Communication	1.50	1.90	0.80	1.00	1.50	1.10

Health and Safety, and other legislated skills equivalencies

The “skills” listed in the table below are, at a minimum, those that trade persons are expected to have when reporting to the job site. Doubtless similar types of skills are required in the Republic of the Philippines, but since most of these are highly jurisdiction-specific, newcomers would not have BC-equivalent skills.

In some cases, it is the employer’s responsibility to provide training or equipment, but that is not always the case. Trade persons should make sure they have the skills and qualifications required to work safely and within the legislated framework for their trade’s most common demands.

Trade persons are often expected to drive a company vehicle – most likely a pick-up truck or van. These vehicles can be operated with a Class 5 BC Driver’s License. However, ICBC will not exchange a Philippine Driver’s License for a BC one and will, most likely issue a Class 7 or 8, both of which are restricted.

Table 3. Select Regulatory Requirements scores (using same complexity scores as for Essential Skills)

Regulatory requirements	Trade				
	Carp.	C.E.	C.C.W.	Plumb.	Roof.
OSH Requirements					
WorkSafeBC (WSBC) Rights and Responsibilities	0	0	0	0	0
WSBC Young / New Worker (Training & Orientation)	0	0	0	0	0
Personal Protective Equipment (PPE) requirements	0	0	0	0	0
Duty to co-operate with internal and external OSH officials	0	0	0	0	0
Other Regulatory Requirements					
WHMIS	0	0	0	0	0
Fall arrest / restraint / protection	1	1	1	N/A	1
Confined space	N/A	1	N/A	1	N/A
Building Code	0	N/A	0	0	0
Gas Code (B 149.1)	N/A	N/A	N/A	0	N/A
Canadian Electrical Code	N/A	0	N/A	0	N/A
Driver's License (Class 5)	5	5	5	5	5

Training contents equivalency

Major differences all trades

Table 4. Major differences between the BC and Philippine apprenticeship programs for 5 trades, by trade.

Trade	Major differences
Carpenter	• There is no concrete work or reinforcing steel competencies in the Philippine

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Trade	Major differences
	<p>NCII or NCIII.</p> <ul style="list-style-type: none"> • There is no forming or framing in the Philippine NCIII (and NCII is not a prerequisite). • There is no finishing carpentry in the Philippine NCII. • The Philippine NC II and III do not include oxy-fuel cutting, and exterior cladding. • Philippine building codes are different. • The BC program has 4 levels of block release in-school training over 4 years; the Philippine programs have no timeframe but list hours for NCII and NCIII broken into basic, common, and core competencies.
Construction Craft Worker	<ul style="list-style-type: none"> • There is no Philippine generic entry-level construction CoCs; CCW (or equivalent) is not listed in the March 2016 Promulgated Training Regulations (it does not appear in the TVET lists). • The BC program has 2 levels of block-release in-school training over 2 years; there is no training program for the occupation in Republic of the Philippines but some NCI or NCII such as masonry⁶, scaffold erection⁷, or reinforcing steel⁸ might partially match skills required of a BC CCW.
Construction Electrician	<ul style="list-style-type: none"> • The Philippine program does not include DC, HVAC, entertainment systems, and nurse call competencies. • The Philippine program emphasizes AC electrical theory and practice at residential voltage; very low and high voltages are not emphasized but are present. • The Philippine codes and common voltages are different than those in BC. • The BC program has 4 levels of block-release in-school training over 4 years; the Philippine, using the DTS / DTP as a guide has 3 “stacked” level, the sum of which stands at about 40% of the BC durations.
Plumber	<ul style="list-style-type: none"> • The BC program includes medical gas, compressed gas, and sprinkler systems; well and septic systems; hydronics, and GAS B components not present in the Philippine program. • The Philippine program has pump, valves, downfeed, cooled potable water, and multi-point hot water systems components not present in the BC program. • The BC program has 4 levels of block release in-school training; the Philippine has a competence-based, “stacked”, 3-step training and credentialing system with minimum training hours for each category of competencies (basic, common, core).
Roofer	<ul style="list-style-type: none"> • There is no Philippine roofing CoCs; roofing is not listed in the March 2016 Promulgated Training Regulations (it does not appear in the TVET lists).

Most important trade areas equivalencies

⁶ Masonry NCI and Masonry NCII

⁷ Scaffold Erection NCII

⁸ Rigging NCI

The table below contains a rated summary of the 5 most important trade areas for each trade, where importance is based on in-school and on-the-job training effort expressed in percentage of the apprenticeship duration.

Table 5. Top 5 trade areas for all trades (ratings; 0=not mentioned; 1=some overlap with BC program; 2=substantial overlap with BC program). GACs are aligned to Certificates of Competency (CoCs) which are attached to specific National Certificates (NC).

Top 5 General Areas of Competence by trade				
Trade and GACs	BC program			Republic of the Philippines
	School	On-job	Total %	All NCs
	Hours	Hours		Rating
Carpenter (<i>Rough Carpenter - NCII; Carpenter III - NCIII</i>)				
Wood Frame Construction (NCII)	191.1	1474	23%	1
Concrete Formwork (NCII)	161.7	1247	19%	1
Documentation and Organizational Skills (NC II and NCIII)	157.5	1215	19%	2
Finishing Materials (NCIII)	96.6	745.2	12%	2
Tools and Equipment (NC II and NCIII)	67.2	518.4	8%	2
Construction Electrician (<i>Electrical Installation and Maintenance - NCIV</i>) ⁹				
Apply Circuit Concepts	441	2205	37%	1
Install Electrical Equipment	210	1050	18%	2
Install Low Voltage Distribution Systems	168	840	14%	2
Install Control Circuits and Devices	168	840	14%	2
Read and Interpret Drawings and Manuals	75	375	6%	2
Plumber (<i>Plumber III - NCIII</i>)				
Install Natural Gas and Propane Systems	192	1580	25%	0
Organize Work	122.5	1009	16%	2
Install Sanitary and Storm Drainage Systems	113.8	936.3	15%	2
Install Water Service and Distribution	96	790.1	12%	2
Install Hydronic Heating and Cooling	77.04	634.1	10%	0
Construction Craft Worker – No Philippine qualification				

⁹ There are several “job” names attached to the electrical qualifications in the Philippines. Holders of *Electrical Installation and Maintenance – NCII* are referred to as “Building-Wiring Electrician” or “Residential-Commercial-Wiring Electrician” or “Maintenance Electrician”. Holders of *Electrical Installation and Maintenance - NCIII* are referred to as “Industrial Electrician” or “Electrician Leadman” or “Electrical Foreman”. Holders of *Electrical Installation and Maintenance - NCIV* are referred to as “Electrical Foreman” or “Electrical Supervisor” or “Supervising Technician”.

Top 5 General Areas of Competence by trade				
Trade and GACs	BC program			Republic of the Philippines
	School	On-job	Total %	All NCs
	Hours	Hours		Rating
Perform Concrete Work	45.6	19%	760	N/A
Perform Site Work	43.2	18%	720	N/A
Use Scaffolding and Access Equipment	27.6	12%	460	N/A
Perform Utilities and Pipeline Tasks	26.4	11%	440	N/A
Organize Work ¹⁰	24	10%	400	2
Roofer (Damp- and Waterproofer) – No Philippine qualification (see footnote 10)				
Install Low Slope and Flat Roofing	138.0	1380	38%	N/A
Install Steep Roofing	55.2	552	15%	N/A
Organize Work	45.6	456	13%	2
Use Safe Work Practices	44.4	444	12%	1
Use Documentation	32.4	324	9%	1

Certification process equivalency

BC apprentices are required to pass each of 2-4 levels (blocks) of their trade’s in-school training. While only partially implemented, practical and theory tests are ITA-imposed (for the rest, they are institution-specific, but coordinated through a BC Articulation Committee). Successful completion of the final Level in-school final exam gives access to the Red Seal examination, the only certification mechanism for trade persons in BC (all the trades considered here are “Red Seal” trades).

This is more comprehensive and systematic than the Philippine credentialing system. While the Philippine trade training requirements always contain 3 elements – basic, common, core - which must be completed to get a credential, the competencies that make up the elements are independent and do not have to be taken in any order – the core competencies, however, are subject to a practical test unlike the basic and common competencies that are often tested independently by the Technical Vocational Institution (TVI) the trainee attends (if any). A credentialed Philippine trade worker’s NC levels are a good indicator of ability, but unrelated CoCs should also be considered as they attest to abilities other than those not listed as core requisites for NCs. Clearly, even with all the NCs available for a trade, Philippine trade workers need to address the skills gaps indicated in “Recommendations” below.

The table below summarizes the major differences between the BC and Philippine credentialing system.

Table 6. Comparison of BC and Republic of the Philippines examination and credentialing

Examination and certification		
Element	BC	Republic of the Philippines
Exam	Single	Multiple

¹⁰ “Organize work” or a set of basic and common competencies addressing these issues are common to all Philippine Construction trades profiles

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Examination and certification		
Element	BC	Republic of the Philippines
	Pencil & paper	Pencil & paper Hands-on
Domains tested	Multiple unspecified Proxy	Multiple specified Direct for core competencies
Domain inclusion	Negotiated norm	Criterion
Item type	Selected response	Unspecified for basic and common competencies; institution-specific Hands-on project for core competencies
Scoring	Machine	Unspecified for basic and common competencies; institution-specific Examiner for core competencies
Scores	One correct	Graded
Results	Unique fixed cut score	Competency-by-competency
Validity	Medium	Unknown for basic and common competencies; Strong for core competencies
Reliability	Unknown	Weak
Credential	Endorsement	National

Recommendations

[Essential Skills recommendations](#)

Clearly, English language skills could be the major stumbling block to a Philippine trade person recently arrived in BC, especially so depending on where they were schooled and took their trade training.

Offering generic English Second Language (ESL), while useful for integration into the larger community, will not help on the job site, especially to those who were (partially) schooled in English.

For those who require English language training, a two-part educational component made up of (i) trade and legalistic English and (ii) worksite protocols and business processes - making use of documents, such as trade regulations or codes pertinent to the newcomers' trade. The job aid would be a pocket or app-based trade dictionary (containing the most common terms and expressions aligned to the BC apprentice trade manual(s)).

[Health and Safety, and other legislated skills recommendations](#)

There are several online training opportunities for all the OSH requirements that are appropriate and recognized for all trades. These can be purchased for approximately \$200.

Code books (or relevant appropriate sections) can be purchased for \$150-250 online or at specialized bookstores – knowing the code will be important for those workers wanting to challenge the Red Seal examination, especially for Plumbers and Electricians.

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Plumbers wishing to install and connect gas-fired appliances will have to take a course and pass the relevant Safety Authority examination.

[Carpenter recommendations](#)

Philippine NCII+NCIII carpenters have the skills to be productive on a worksite.

But if they hold only one of the credentials, they will have substantial gaps. Philippine NCIII (Carpenter III) carpenters would require the in-school equivalent of the BC Carpenter Program H line (wood frame construction) in Level 1 (approximately 2 weeks; maybe shorter if emphasis is on stick-framing) and G Line (concrete work) in Level 2 (approximately 4 weeks).

Philippine NCII (Rough Carpenter), would bring them up to speed the in-school equivalent of the BC Carpenter Program H line (H3-10 as a refresher; H7-10 new) in Level 1, and G Line (concrete work; G1, G2, G7) in Level 2 (approximately 1 week).

Alternatively, they could pick up these skills on the job if they were employed as a Construction Craft Worker or general duty carpenter, whether as an apprentice or a laborer, getting to Red Seal certification in 2-3 years.

[Construction Electrician recommendations](#)

Philippine electricians have the skills to be productive on residential, commercial, or industrial worksites. But they will need to adapt to base voltage differences between the Republic of the Philippines (200V) and Canada. Likewise, codes and regulations driving work practices will be foreign to them – even though the Philippine Electrical Code has much in common with the US code. Most Philippine electricians would have the skills to install low voltage equipment such as entertainment systems, but they would be less familiar with high voltage vault and switching gear for large industrial or multi-story buildings. Providing them with an Electrical Code course (approximately 2 weeks a day/week and \$600) would bring them up to speed.

Alternatively, they could pick up these skills on the job, getting to Red Seal certification in a couple of years or so.

[Plumber recommendations](#)

Philippine “plumbers” have the skills to be productive on residential, commercial, or industrial worksites for installation, commissioning, and troubleshooting work. But codes and regulations driving work practices will be foreign to them. Providing them with the in-school equivalent of C3 (codes and regulations) in C line in Level 1 (approximately 1 week) of the apprenticeship program and a Gas B course (approximately 3 weeks and \$1000) would bring them up to speed. Depending on the mechanical contractor they are employed with they might never need either hydronics or specialized gas systems training – in any case they have all the basic skills to be able to pick up these applications quickly on the job under the supervision of an expert.

Alternatively, they could pick up code-related skills on the job and take the Gas B course – in order to get the Safety Authority qualification, and then challenge the Red Seal examination.

[Construction Craft Worker recommendations](#)

There are no competencies or National Certificates covering this trade in the Philippines. However, any Philippine trade person who holds a National Certificate will have been awarded Basic and Common

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Certificates of Competency which cover job site communications, team work, safety, work site prep, clean-up, and organization, etc.

An apprenticeship in this trade might be the quickest way for a Philippine newcomer to acquire a (somewhat) articulated construction industry credential.

[Roofer recommendations](#)

There are no competencies or National Certificates covering this trade in the Philippines. However, any Philippine trade person who holds a National Certificate will have been awarded Basic and Common Certificates of Competency which cover job site communications, team work, safety, work site prep, clean-up, and organization, etc.

An apprenticeship in this trade might be the second quickest way for a Philippine newcomer to acquire a construction industry credential.

Methodology

We obtained data from 6 major Philippine sources of information, and one German and one international source. The sources were:

- The Republic of the Philippines Department of Education¹¹
- The Republic of the Philippines Commission on Higher Education¹²
- The Republic of the Philippines Technical Education and Skills Development Authority¹³
- University of the Philippines, School of Statistics¹⁴
- The Senate of the Republic of the Philippines¹⁵
- German Federal Institute for Vocational Education and Training (BIBB) – Joint Philippine-German project¹⁶
- UNESCO¹⁷

On these sites, we collected data from the following documents or web pages:

- http://www.deped.gov.ph/sites/default/files/page/2016/Math%20CG_with%20tagged%20math%20equipment.pdf
- http://www.deped.gov.ph/sites/default/files/page/2017/Science%20CG_with%20tagged%20sci%20equipment_revised.pdf
- <http://www.deped.gov.ph/als>
- <http://www.tesda.gov.ph/About/TESDA/86>
- <http://www.tesda.gov.ph/About/TESDA/24>
- <http://www.tesda.gov.ph/About/TESDA/85>
- <http://www.tesda.gov.ph/About/TESDA/25>
- http://www.tesda.gov.ph/Download/Training_Regulations?Searchcat=Training%20Regulations (for all trades)
- BIBB-Philippines partnership papers and results all pages

The 3 British Columbian sources were:

- ITA (Industry Training Authority).
- WorkSafeBC¹⁸
- ICBC¹⁹

On these sites, we collected data from the following documents or web pages:

- ITA Program Profile
- ITA Program Outline
- WorkSafeBC Employee Roles, Rights and Responsibilities web pages
- WorkSafeBC Young or New Workers Training Guide pdf
- ICBC “Moving to BC” web pages

¹¹ <http://www.deped.gov.ph/> Last accessed 20 January 2017

¹² <http://www.ched.gov.ph/> Last accessed 20 January 2017

¹³ <http://www.tesda.gov.ph/> Last accessed 20 January 2017

¹⁴ http://www.stat.upd.edu.ph/docs/policynotes/pn_1602.pdf Last accessed 21 January 2017

¹⁵ <https://www.senate.gov.ph/lisdata/2363420280!.pdf> Last accessed 19 January 2017

¹⁶ <https://www.bibb.de/en/25679.php> Last accessed 20 January 2016

¹⁷ http://www.unescobkk.org/fileadmin/user_upload/epr/KEDI-seminar/2015/Philippines_-_Case_Study_PQF_UNESCO_Japan_Feb_2016_with_notes_page.pdf Last accessed 28 January 2017

¹⁸ <https://www.worksafebc.com/en> last accessed 2 October 2016

¹⁹ <http://www.icbc.com/driver-licensing/moving-bc/Pages/default.aspx> last accessed 2 October 2016

In the report, we use the BC trade name, requisites, and content as the reference.

Essential skills

Employment and Social Development Canada (ESDC)²⁰ has published essential skills profiles for over 350 occupations. Essential skills fall under a number of categories. To make things simpler, we have retained those shown in Table 8 below. We did not retain the “Thinking”, “Digital Technology”, “Working with Others”, or “Continuous Learning” as these, with the exception of “Working with Others”, categories address either the newcomer or her culture or his opportunities rather than portable skills amenable to improvement through training.

As a reference, we used the Essential Skills profile for Construction Trades Helpers and Labourers (NOC 7611, 7612) assuming it was similar to the used the BC Construction Craft Worker (C.C.W.) trade. And we aligned the Essential Skills for the other 4 trades to those for C.C.W. retaining the complexity score as published. Skills in each of the categories are accompanied by a “complexity rating” ranging from 1-5, where “1” means “basic” and “5” means “advanced”.

We married the Common European Framework of Reference for Languages: Learning, Teaching, Assessment (CEFR)²¹ to the Canadian complexity rating in order to assign a complexity score to an average Philippine trade person, i.e., a non-native speaker of English who might have had some basic training in English.

To assign complexity scores, we stipulated that the CEFR language proficiency were arranged on this continuum: reception (listening and reading – A1/A2) < production (spoken and written – B1) < interaction (spoken and written – B2) < mediation (translating and interpreting – C1/C2). We have assumed that these ratings are interval-based in order to calculate averages. We used 0 to indicate absence.

In effect, we boosted the complexity scale from an ordinal to and interval scale to legitimately calculate average scores. We used Bond and Fox, 2007²² scale explanation as a rationale:

- Nominal scales – separate the data of interest in defined, recognizable classes, for example, there is an “A”, a “B”, a “C”, ... a “n”
- Ordinal scales – separate nominal data along a quantitative axis, for example $A > B > C > \dots > n$, therefore, e.g. $A > n$
- Interval scales – separate ordinal data along a regular quantitative axis, for example $A > B > C > \dots > n$, such that $(A-z)=B$, $(B-z)=C$, $(C-z)=D$, ..., $(m-z)=n$, and z is invariant or constant but specific to the data (and scale) at hand (e.g. millimeters, cents, seconds, etc.)
- Ratio scales – separate interval data along a quantitative axis, for example $A > B > C > \dots > n$, such that $(A-z)=B$, $(B-z)=C$, $(C-z)=D$, ..., $(m-z)=n$, and z is invariant or constant across all possible scales

In the 5 trades, workers are expected to read, consult, and fill a range of documents, from simple forms requiring dates, times, or measurements to detailed reports to engineers, inspectors, or customers. The “Republic of the Philippines – All trades” scores reflect our assumption that newcomers who have had basic English language training have the skills to handle simple documents – these often provide or

²⁰ http://www.esdc.gc.ca/en/essential_skills/profiles/index.page accessed 20 September 2016

²¹ http://www.coe.int/t/dg4/linguistic/Cadre1_en.asp accessed 24 September 2016

²² Bond, T. & Fox, C. (2007). *Applying the Rasch model: Fundamental measurement in the human sciences* (2nd). Mahwah, NJ

require numerical information such as readings or measurements. We also assumed that newcomers would be able to understand simple instructions (written or spoken) but would not have the technical language skills required to direct small teams or take an active part in group discussions such as pre-job conferences or tailboards.

We used the classification and color scheme listed in Table 7 below

Table 7. Complexity level²³ for essential skills cross-referenced to CEFR

Essential Skill complexity rating descriptor	CEFR	Complexity Level
<ul style="list-style-type: none"> • Not present 	-	0
<ul style="list-style-type: none"> • Read relatively short texts to locate a single piece of information. • Follow simple written directions. 	A1 / A2	1
<ul style="list-style-type: none"> • Read more complex texts to locate a single piece of information or read simpler texts to locate multiple pieces of information. • Make low-level inferences. 	B1	2
<ul style="list-style-type: none"> • Choose and integrate information from various sources or from several parts of a single text. • Make low-level inferences from multiple sources. • Identify relevant and irrelevant information. 	B2	3
<ul style="list-style-type: none"> • Integrate and synthesize information from multiple sources or from complex and lengthy texts. • Make complex inferences and use general background knowledge. • Evaluate quality of text. 	C1	4
<ul style="list-style-type: none"> • Interpret dense and complex texts. • Make high-level inferences and use specialized knowledge. 	C2	5

Training Contents: GACs, Competencies, and Rating Scale

Rank-ordering GACs

We assumed that the in-school training hours assigned to any given GAC reflect the relative importance of that aspect of the trade. Further, we assumed that proportion of total training hours dedicated to any aspect of the trade reflect the frequency with which that aspect of the trade is practiced in the field.

We used the BC program outline posted on the ITA website as the reference document. We first listed all the General Areas of Competence (“Lines” or GACs) with the respective percentage of instructional time by level of apprenticeship. We calculated the number of hours devoted to each of these GACs by multiplying the training time allotment - over 4 levels - in percent by the number of training hours for each level and then summed these values.

$$\sum_{i=1}^4 (\%_{instructional\ time})(instructional\ time_{level}) \tag{1}$$

²³ http://www.esdc.gc.ca/en/essential_skills/profiles/readersguide.page accessed 24 September 2016

We divided this sum into the total program instructional time and expressed the quotient in percentage, then used this percentage and multiplied it by the on-the-job program hours.

$$\left(\frac{\sum_{i=1}^4 (\% \text{ instructional time}) (\text{instructional time}_{\text{level}})}{\text{Total}_{\text{instructional time}}} \right) (\text{Hours}_{\text{OJT}}) \quad (2)$$

Then we rank-ordered the GACs from largest number of program hours to smallest number of program hours.

Due to scope constraints, we did not perform the same analysis at the competency level.

[Competency rating scale](#)

Unlike the ITA documents, Philippine documents are less prescriptive when it comes to training hours on-the-job, focussing instead on competence attainment (based on tests cross-referenced to “end state” competences’ assessments in accredited testing centres).

Given the lack of specific time markers in Philippine trade training, we decided to limit our competency ratings on a three-point basis, using the following protocol:

- **0 (zero)** for BC competencies that are not mentioned in the Philippine documents.
- **1 (one)** for BC competencies that are partially covered by those described in the Philippine documents.
- **2 (two)** for BC competencies that are completely covered by with those described in the Philippine documents.

The GAC rating is the rounded mean of the constituent competency ratings.

Results

Essential Skills

Refer to the Methodology session, Table 7, for complexity rating explanation and color code.

We assumed that most Philippine trade workers master basic English and the ratings reflect this. Lack of familiarity with North American English trade technical terms, complex specialized documents, the imperial system (used interchangeably with the SI system in construction in BC), standards, codes (fire, building, plumbing, etc.), regulations, and business practices would put a Philippine trade Newcomer at a disadvantage.

Table 8. Detailed Essential Skills requirements by trade cross-referenced to "Most Philippine Trade Newcomers" skills

Essential Skills (by profile)	Trade					
	Carp.	C.E.	C.C.W.	Plumb.	Roof.	Republic of the Philippines
Reading						
Read instructions and warnings written on signs, labels and packaging.	1	1	1	0	1	1
Read short text entries on forms and technical drawings.	1	1	1	1	1	2
Read notices and bulletins.	2	2	2	2	2	2
Read a variety of instructions, procedures, and workplace safety materials.	2	2	2	2	1	1
Read safety-related information, and equipment use instructions.	3	3	3	3	2	1
May read trade journals, brochures and website articles to learn about new products and technologies.	3	3	3	3	2	0
May read manuals, and instructions and procedures contained in manuals.	3	3	3	3	3	0
May read technical reports and trade textbooks.	4	0	0	4	0	0
Read and interpret building codes, regulations, bylaws and standards.	4	4	0	4	3	0
"Average"	2.56	2.11	1.67	2.44	1.67	0.78
Document use						
Scan labels on product packaging and equipment to locate specifications, times, safety information and identification numbers.	1	1	1	1	1	1
View digital readouts, and readings on equipment.	0	1	1	0	0	1
Refer to lists to identify identification numbers and quantities.	0	2	1	2	2	1
Locate and enter data on labels.	1	3	0	1	2	1

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Essential Skills (by profile)	Trade					
	Carp.	C.E.	C.C.W.	Plumb.	Roof.	Republic of the Philippines
Complete a variety of forms and check boxes; enter dates, times, and identification numbers.	2	3	2	2	2	1
Locate data, such as dates, times and dimensions, in tables and conversion charts.	3	3	2	3	2	1
May interpret technical drawings including floor plans, schematics, and assembly drawings.	3	4	3	4	3	1
Complete complex entry forms and building permits.	3	4	0	0	0	0
Study a variety of plan, elevation, detail, elevation and section drawings.	4	4	0	4	3	1
"Average"	1.89	2.78	1.11	1.89	1.67	0.89
Writing						
Write short comments in log books to, e.g., record the outcome of safety inspections.	1	1	1	1	1	0
Write short notes to co-workers to, e.g., inform them about defective equipment.	1	0	1	1	0	0
May write text entries in forms.	2	2	2	2	0	0
May write short reports to describe events leading up to workplace accidents.	2	2	2	2	1	0
Write comments in forms, schedules, job hazard assessment forms.	2	3	0	0	0	0
"Average"	1.60	1.60	1.20	1.20	0.40	0.00
Numeracy						
May purchase supplies using petty cash and receive change.	1	0	1	1	1	1
Take a variety of measurements using basic tools.	1	1	1	1	2	2
Measure the dimensions and angles using basic tools.	0	1	1	1	2	1
Compare measurements to specifications.	1	1	1	1	2	2
May estimate distances.	0	1	1	0	0	1
Calculate material requirements.	2	2	2	2	3	1
May calculate averages.	2	2	2	2	1	1
May estimate quantities.	2	2	2	2	2	1
Estimate the length of time that it will take to complete projects.	2	1	0	2	3	0
May estimate weights.	0	2	2	3	2	1

Essential Skills (by profile)	Trade					
	Carp.	C.E.	C.C.W.	Plumb.	Roof.	Republic of the Philippines
May schedule the completion of construction.	2	2	0	3	3	0
Calculate amounts for estimates and invoices.	3	2	0	3	3	0
May take precise measurements using specialized measuring instruments.	3	3	3	3	0	3
Calculate runs, rises and offsets.	4	4	0	4	0	3
"Average"	1.64	1.71	1.14	2.00	1.71	1.21
Oral Communication						
Speak to suppliers.	1	1	1	1	1	1
Exchange information with co-workers and other tradespeople.	2	2	2	2	2	2
Participate in group discussions.	2	2	2	0	2	2
Talk to safety and building inspectors.	2	2	0	2	2	1
Speak with manufacturer representatives.	2	0	0	0	1	0
Listen to instructions.	0	0	3	0	0	2
Speak with customers.	3	3	0	2	3	0
May provide detailed instructions to co-workers.	3	3	0	3	1	2
Interact with co-workers regarding critical safety issues.	0	3	0	0	3	1
Exchange information with engineers, owners, architects, inspectors and other trades.	0	3	0	0	0	0
"Average"	1.50	1.90	0.80	1.00	1.50	1.10

Health and Safety, and other legislated skills

We have assessed the skill level of newcomers with Canadian and BC OSH, as well as code requirements as non-existent. It is certain that requirements exist in the Republic of the Philippines but it is most likely different from those in BC.

We have applied that reasoning to WorkSafe BC (WSBC) rights and responsibilities for workers – and “new” workers, Fall Protection, and Confined Space requirements, as well as to the Federal Workplace Hazardous Materials Information System (WHMIS) legislation required for all types of work and workplaces.

We also applied that reasoning to the codes relevant to their occupation is necessary. We have included a special consideration for plumbers who, in BC, are expected to have a “Gas B License”.

We have assumed that trade persons are often expected to drive a company vehicle – most likely a pick-up truck or van. These vehicles can be operated with a Class 5 BC Driver’s License. ICBC does not have an agreement in place to exchange a Philippine driver’s license for a BC one. Instead the applicants will be

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required to have their documents translated (if they are not in English), and, based on their years of driving experience would be awarded a Class 7 or 8 (restricted) and have to pass theory and on-road tests to get a Class 5.

Table 9. Regulatory requirements for 5 trades - training (and certification) may be undertaken by the employer (refer to Table 7 for complexity rating explanation and color code)

Regulatory requirements	Trade				
	Carp.	C.E.	C.C.W.	Plumb.	Roof.
WSBC Rights					
Right to a healthy and safe workplace	0	0	0	0	0
Right to safety training and orientation	0	0	0	0	0
Right to refuse unsafe work	0	0	0	0	0
WSBC Responsibilities					
Young / New Worker (Training & Orientation)	0	0	0	0	0
Follow safe work procedures and act safely in the workplace at all times.	0	0	0	0	0
Use the protective clothing, devices, and equipment provided. Be sure to wear them properly.	0	0	0	0	0
Co-operate with joint occupational health and safety committees, worker health and safety representatives, WorkSafeBC prevention officers, and anybody with health and safety duties.	0	0	0	0	0
Miscellaneous Requirements					
WHMIS	0	0	0	0	0
Fall arrest / restraint / protection	1	1	1	N/A	1
Confined space	N/A	1	N/A	1	N/A
Building Code	0	N/A	0	0	0
Gas Code (B 149.1)	N/A	N/A	N/A	0	N/A
Canadian Electrical Code	N/A	0	N/A	0	N/A
Driver's License (Class 5)	5	5	5	5	5

Training programs comparisons

In the table below, we compare key structural and procedural elements of the apprenticeship programs in BC and in the Republic of the Philippines. Note that we have “lumped” all National Certifications as if they were “stacked”, that is, we have assumed that a NCI is a pre-requisite for a NCII which is a pre-requisite for NCIII, etc. – trade NCIV are uncommon, as this NC level is reserved for university qualifications. While the Dual Training System /Dualized Training Program (DTS / DTP) is the preferred and recommended training pathway – that is, learners take courses at a public or private school and work in industry – it is not the only pathway (see “Essential Skills” and footnote 5). In the Republic of the Philippines NCs are awarded regardless of training path taken since all “core” competencies (trade competencies) are assessed one at a time in a TESDA-approved testing center.

Trade training programs and program elements in the Republic of the Philippines are shorter and less structured than their BC equivalents. The ability to perform, to do things pertinent to the trade are tested “for real”, rather than relying on a paper-and-pencil proxy (supplemented by an employer’s say-so) as it is in BC.

Table 10. Comparison of BC and Philippine apprenticeship program elements across 5 trades

Program element		British Columbia	Republic of the Philippines (All NCs)
Entry requirements	Type	Recommended	Required (minimum age: 15)
	Special requirements	None	Recommended physical and academic abilities
	Lowest scholastic	Grade 9 (Roofer)	All trades; 10 years of schooling; NCI
	Preferred scholastic	Grade 10 (Carpenter, Construction Craft Worker, Roofer)	All trades; 10 years of schooling; NCI
	Highest scholastic	Grade 12 (Plumber) Grade 12 (Electrician)	All trades; 10 years of schooling; NCI
	Topics scholastic	English, math, science	Filipino, mother tongue, math, science, physics, socials, English (national curriculum for junior high)
In-school training	Total length	Varies (0 - 1200 hours total)	162-196 hours total (NCII) 160-248 hours total (NCIII) 516 hours Elec. NCIV
	Number of periods	Varies (3-4)	40% at school 60% OJT for Dual System trainees only; others are self-paced or competence-based
	Additional studies		All compulsory to attain NC level; elective for CoC-level
On-the-job training	Total length	Fixed for each trade, but varies by trade (3600 – 6480 hours)	600-700 hours NCII (Dual System min.); 600-900 hours NCIII (Dual System); no mandatory OJ training period stipulated
	Number of periods	Fixed but varies by trade	Unspecified, competence-based

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Program element		British Columbia	Republic of the Philippines (All NCs)
Assessment	School-based exams	Institution-specific (moving to standardized tests)	Institution-based
	On-the-job	Employer hours sign-off	Documented standardized competence tests in testing centers with TESDA-approved evaluator
	Certification	“Paper-and-pencil” single test	Ministry-controlled competence tests in Ministry-approved testing centers

Training Contents Comparison

[Carpenter programs comparison at-a-glance](#)

Table 11. BC apprenticeship and Philippine Carpenter “traineeships” (2 NCs); duration and prerequisites

British Columbia - Carpenter	Republic of the Philippines		
		Rough Carpenter (NCII)	Carpenter III (NCIII)
Level 1 in-school: 210 hours	Basic competencies	18 hours – no OJT stipulated	20 hours – no OJT stipulated
Level 2 in-school: 210 hours	Common competencies	24 hours – no OJT stipulated	24 hours – no OJT stipulated
Level 3 in-school: 210 hours	Core competencies	120 hours – no OJT stipulated	320 hours – no OJT stipulated
Level 4 in-school: 210 hours			
		Total in-school: 162 hours	Total in-school: 364 hours
Total in-school: 840 hours	Total in-school for holders of both NCII and NCIII	Total in-school: 526 hours	
	Total work based minimum (calculated on 40/60 basis for Dual system)	Total work base: 405 hours	Total work base: 910 hours
Total work-based: 6480 accumulated work based hours	Total in-school for holders of both NCII and NCIII	Total work-based: 1315 hours	
Recommended entry: Grade 10 English, Math, and Science	Recommended entry:	NCI (Grade 10 equivalent), national curriculum	NCI (Grade 10 equivalent), national curriculum

[Carpenter GACs and Competencies comparison \(details\)](#)

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In the table below we list all the GACs and attendant competencies rated as described above. The ratings are indicative of the differences between trade practices in BC and the Republic of the Philippines – they have not been curved to account for time-differentials (if any exist in practice) or competence approach (rather than the block release, lock-step used in BC).

Table 12. Rank-ordered BC Carpenter GACs and competencies (0=not present in Philippine program; 1=partial overlap; 2=substantial or complete overlap with BC program) – Note Hours & percentages are for the BC program

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Wood Frame Construction	191.1	23%	1474	1
Describe Wood Frame Construction				1
Select Framing Materials				1
Build Floor Systems				2
Build Wall Systems				2
Build Stair Systems				2
Build Roof Systems				2
Build Specialized Framing Systems				0
Perform Renovations and Additions				0
Build Timber and Engineered Wood Construction				0
Build Decks and Exterior Structures				0
Concrete Formwork	161.7	19%	1247	1
Use Concrete Types, Materials, Additives and Treatments				0
Select Concrete Forming Systems				2
Build Footing and Vertical Formwork				2
Build Slab-On-Grade Forms and Suspended Slab Forms				1
Install Reinforcement and Embedded Items				0
Build Concrete Stair Forms				1
Place and Finish Concrete				0
Install Specialized Formwork				1
Documentation and Organizational Skills	157.5	19%	1215	2
Describe Carpentry Trade				0
Use Construction Drawings and Specifications				2
Interpret Building Codes and Bylaws				0
Plan and Organize Work				2
Perform Trade Math				2

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General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Finishing Materials	96.6	12%	745.2	2
Describe Roofing Materials				0
Install Doors and Hardware				2
Install Windows and Hardware				2
Install Exterior Finishes				2
Install Interior Finishes				2
Install Cabinets				2
Install Interior Floor, Ceiling and Wall Systems				2
Tools and Equipment	67.2	8%	518.4	2
Use Hand Tools				2
Use Portable Power Tools				2
Use Stationary Power Tools				1
Use Oxy-Fuel Equipment				0
Survey Instruments and Equipment	50.4	6%	388.8	0
Use Levelling Instruments and Equipment				0
Use Site Layout Equipment				0
Building Science	35.7	4%	275.4	0
Control the Forces Acting on a Building				0
Control Heat and Sound Transmission				0
Control Air and Moisture Movement in Buildings				0
Site Layout	33.6	4%	259.2	1
Lay Out Building Locations				1
Prepare Building Site				1
Apply Excavation and Shoring Practices				1
Access, Rigging and Hoisting Equipment	25.2	3%	194.4	0
Use Ladders, Scaffolds and Access Equipment				1
Use Rigging and Hoisting Equipment				0
Safe Work Practices	21	3%	162	1
Apply Shop and Site Safety Practices				1
Apply Personal Safety Practices				1

Construction Electrician programs comparison at-a-glance

Table 13. Construction electrician and Electrical duration and prerequisites

British Columbia – Construction Electrician	Republic of the Philippines (NCIV) – DTS / DTP
Level 1 In-school training: 300 hours	NCII in-school training: 196 hours
Level 2 In-school training: 300 hours	NCIII in-school training: 160 hours
Level 3 In-school training: 300 hours	NCIV in-school training: est. 160 hours (if trainee is holder of NCII and NCIII)
Level 4 In-school training: 300 hours	
Approximate in-school: 1200 hours	Total in-school: 516 hours
Total work based: 6000 accumulated work based hours	Total work base: est. min. 1300 hours
Recommended but not required: recent Grade 12 graduation (within 5 yrs.) with demonstrated mechanical aptitude; Math and Physics 11; English or Communications 12; or successful completion of an electrical industry assessment exam; or recent (with 5 yrs.) Electrical Foundation Program graduate.	Access to NCII program: Grade 10 preferred national curriculum or ALS ²⁴ G.10 equivalent. Access to NCIII program: NCII holder. Access to NCIV program: NCIII holder or equivalent experience and training.

Construction Electrician GACs and Competencies comparison (details)

In the table below we list all the GACs and attendant competencies, rated as described above. The ratings are indicative of the differences between trade practices in BC and the Republic of the Philippines – they have not been curved to account for time-differentials (if any exist in practice) or competence approach (rather than the block release, lock-step used in BC). We have used the profile of an Electric Installation and Maintenance NCIV graduate of the DTS / DTP as it is most comparable, in essence, to the BC program. Of note is that it is possible for a trainee to skip both the NCII and NCIII levels – by providing proof of experience - and proceed directly to the NCIV level. But the NCIV credential will not be granted until the core competencies for both the NCII and NCIII have been completed and assessed.

Table 14. Rank-ordered Construction Electrician GACs and competencies (0=not present in Philippine program; 1=partial overlap; 2=substantial or complete overlap with BC program)

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Apply Circuit Concepts	441	2205	37%	1

²⁴ ALS stands for Alternative Learning System: "... a parallel learning system in the Philippines that provides a practical option to the existing formal instruction ... ALS includes both the non-formal and informal sources of knowledge and skills ... ALS Non-formal Education happens outside the classroom, community-based, usually conducted at community learning centers, barangay multi-purpose hall, libraries or at home, managed by ALS learning facilitators, such as mobile teachers, district ALS Coordinators, instructional managers at an agreed schedule and venue between the learners and facilitators." <http://www.deped.gov.ph/als> Last accessed 31 January 2017

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General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Use Electrical Circuit Concepts				2
Analyze DC Circuits				0
Solve Problems Using the Principles of Electromagnetism				0
Analyze Single-phase AC Circuits				2
Analyze Three-phase Circuits				2
Analyze Electronic Circuits				0
Install Electrical Equipment	210	1050	18%	2
Install Lighting and Lighting Controls				2
Install Transformers				1
Install Protective Devices				2
Install DC Motors and Generators				0
Install AC Motors and Alternators				2
Install HVAC				1
Install Emergency Power Systems				1
Install Alternative Power Systems				1
Install Low Voltage Distribution Systems	168	840	14%	2
Apply Codes, Regulations and Standards				1
Install Service Equipment				2
Install Grounding and Bonding				2
Install Distribution Centres				2
Install Raceways, Boxes and Fittings				2
Install Conductors and Cables				2
Install Utilization Equipment and Devices				2
Install Control Circuits and Devices	168	840	14%	2
Install Manual Motor Controls				2
Install Magnetic Motor Controls				1
Install Electronic Motor Controls				2
Install PLCs				2
Install Automated Controls				1
Read and Interpret Drawings and Manuals	75	375	6%	2
Use Circuit Drawings				2
Use Construction Drawings and Specifications				2

A Comparison of Select British Columbia and Philippine Apprenticeships

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Use Manuals and Manufacturers' Instructions				2
Plan Time and Materials				1
Install Signal and Communications Systems	42	210	4%	1
Install Fire Alarm and Suppression Systems				1
Install Structured Cabling Systems				1
Install Nurse Call Systems				0
Install Building Integrated Control Systems				1
Install Sound Systems				0
Install Entertainment Systems				0
Install CATV Systems				1
Install Security Alarm Systems				1
Use Test Equipment	42	210	4%	2
Use Analog Meters				2
Use Digital Meters				2
Use Scopes				2
Use Power Quality Analyzers				1
Perform Structured Cable Testing and Reporting				2
Install High Voltage Systems	24	120	2%	1
Apply High Voltage Safety Procedures				2
Install High Voltage Cable				1
Install High Voltage Switch Gear				1
Use High Voltage Test Equipment				1
Use Safe Work Practices	18	90	2%	2
Perform Lockout Procedures				2
Apply WCB Standards and Regulations				0
Apply Safe Work Practices				2
Apply WHMIS				0
Use a Daily Safety Plan				2
Use Safe Rigging Techniques				1
Use Essential Skills	12	60	1%	2
Use Tools and Equipment	0	0	0%	2
Use Hand Tools				2

[A Comparison of Select British Columbia and Philippine Apprenticeships](#)

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Use Power Tools				2
Use Fastening Systems				2
Use Powder Actuated Tools				0
Use Access Equipment				2

Plumbers programs comparison at-a-glance

Table 15. BC Plumber and Republic of the Philippines Plumber III duration and prerequisites (DTS / DTP)

British Columbia – Plumber	Republic of the Philippines – Plumber III (DTS / DTP)
Level 1 In-school training: 180 hours	Plumber I/NCI in-school training: 168 hours
Level 2 In-school training: 180 hours	Plumber II/NCII in-school training: 202 hours
Level 3 In-school training: 180 hours	Plumber III/NCIII in-school training: 248 hours
Level 4 In-school training: 240 hours	
Total in-school: 780 hours	Total in-school Plumber III/NCIII: 618 hours
Total work based: 6420 accumulated work based hours	Total work base: minimum 1545 hours
Recommended but not required: Grade 12 English, Grade 11 Algebra or Trade Math 11, Grade 11 Physics or Science and Technology 11	Access to NCI program: Grade 9 (10 preferred) national curriculum. Access to NCII program: Plumber I, or proven 2 years' industry experience, or Grade 11 & 12 national curriculum. Access to NCIII program: Plumber II, or proven 3 years' industry experience, or minimum Grade 12 national curriculum.

Plumbers GACs and Competencies comparison (details)

In the table below we list all the GACs and attendant competencies, rated as described above. The ratings are indicative of the differences between trade practices in BC and the Republic of the Philippines – they have not been curved to account for time-differentials (if any exist in practice) or competence approach (rather than the block release, lock-step used in BC). We have used the profile of a Plumber III graduate of the DTS / DTP as it is most comparable, in essence, to the BC program.

Table 16. Rank-ordered Plumber GACs and competencies (0=not present in Philippine program; 1=partial overlap; 2=substantial or complete overlap with BC program)

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines (NCII)

A Comparison of Select British Columbia and Philippine Apprenticeships

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines (NCIII)
Install Natural Gas and Propane Systems	192	1580	25%	0
Install and service fuel systems				0
Install and service gas equipment				0
Install venting and air supply				0
Install and service controls and safeguards				0
Use gas codes, regulations and standards				0
Organize Work	122.5	1009	16%	2
Use mathematics and science				2
Read drawings and specifications				2
Use codes, regulations and standards				0
Use manufacturer and supplier documentation				2
Plan a project				2
Install Sanitary and Storm Drainage Systems	113.8	936.3	15%	2
Install sanitary drain, waste and vent systems				2
Install storm drainage systems				2
Install sanitary sewer systems				2
Test and commission sanitary and storm drainage systems				2
Maintain and repair sanitary and storm drainage systems				2
Install Water Service and Distribution	96	790.1	12%	2
Install water services				2
Install potable distribution systems				2
Install private potable water supply systems				0
Install water treatment systems				0
Test and commission potable water systems				2
Maintain and repair potable water systems				2

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General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines (NCIII)
Install Hydronic Heating and Cooling	77.04	634.1	10%	0
Describe the operation of hydronic heating and cooling systems				0
Install hydronic heating and cooling systems				0
Test and commission hydronic systems				0
Maintain and repair hydronic systems				0
Use Tools and Equipment	55.28	455	7%	2
Use hand tools				2
Use portable power tools				2
Use stationary power tools				2
Use measuring and leveling tools				2
Use cutting, brazing, and soldering equipment				2
Use ladders and platforms				0
Use rigging and hoisting equipment				0
Prepare and Assemble Plumbing Components	35.1	288.9	4%	2
Install pipes				2
Install valves				2
Install fittings				2
Penetrate structures				2
Apply Plumbing Principles	23.32	191.9	3%	2
Install Fixtures and Appliances	22.4	184.4	3%	2
Install fixtures and trims				2
Install appliances				2
Test and commission fixtures and appliances				2
Maintain and repair fixtures and appliances				2
Install Specialized Systems	18.42	151.6	2%	0
Install medical gas systems				0
Install irrigation systems				0
Install compressed air systems				0
Install fire protection systems				0

[A Comparison of Select British Columbia and Philippine Apprenticeships](#)

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines (NCIII)
Test and commission specialized systems				0
Maintain and repair specialized systems				0
Use Safe Work Practices	12.42	102.2	2%	2
Control workplace hazards				2
Use information in the OSH Regulation and WCB standards				2
Use WHMIS				0
Use Personal Protective Equipment				2
Practice fire prevention				2
Install Private Sewage Systems	11.76	96.79	2%	0
Install private sewage disposal systems				0
Repair and maintain private sewage disposal systems				0

[Construction Craft Workers programs comparison at-a-glance](#)

Table 17. BC Construction Craft Worker and Republic of the Philippines Construction (any) NC holder duration and prerequisites

British Columbia – Construction Craft Worker	Republic of the Philippines – Basic & Common Competencies
Level 1 In-school training: 120 hours	N/A
Level 2 In-school training: 120 hours	N/A
Total in-school: 780 hours	N/A
Total work based: 4000 accumulated work based hours	N/A
Recommended but not required: Grade 12 English, Grade 11 Algebra or Trade Math 11, Grade 11 Physics or Science and Technology 11	This trade is not available for certification in the Republic of the Philippines.

[Construction Craft Workers GACs and Competencies comparison \(details\)](#)

In the table below we list all the GACs and attendant competencies, rated as described above. The ratings are indicative of the fact that this trade is not listed in the PTRs of the Republic of the Philippines. However, any holder of a Construction NC from the Republic of the Philippines would have taken Basic and Common competencies during training. We have recorded this below but we have not been curved to account for time-differentials (if any exist in practice) or competence approach (rather than the block release, lock-step used in BC).

Table 18. Rank-ordered Construction Craft Worker GACs and competencies (0=not present in Philippine program; 1=partial overlap; 2=substantial or complete overlap with BC program)

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Perform Concrete Work	45.6	19%	760	N/A
Form Concrete				N/A
Place and Finish Concrete				N/A
Modify Concrete				N/A
Install Grout, Epoxies and Caulking				N/A
Perform Site Work	43.2	18%	720	1
Prepare Site				0
Perform Ground Work				0
Perform Demolition				0
Apply Excavation and Shoring Practices				0
Service Site				1
Use Scaffolding and Access Equipment	27.6	12%	460	N/A
Use Scaffolding and Access Equipment				N/A
Use access equipment				N/A
Perform Utilities and Pipeline Tasks	26.4	11%	440	N/A
Install utility piping				N/A
Perform pipeline activities				N/A
Perform pipeline maintenance				N/A
Organize Work	24	10%	400	2
Use Documentation, Blueprints and Specifications				2
Communicate with Others				2
Use Basic Trade Math				2
Perform Routine Trade Activities	24	10%	400	1
Install Permanent and Temporary Fencing				0
Erect and Dismantle Hoarding / Enclosures				0
Perform Traffic Control				0
Establish Grades and Elevations				0
Handle Materials				2
Install Membranes				0
Install Insulating Materials				0
Use Safe Work Practices	18	8%	300	1

A Comparison of Select British Columbia and Philippine Apprenticeships

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Manage Workplace Hazards				1
Apply OHS Regulations and WorkSafeBC Standards				0
Use Fall Protection Systems and Equipment				0
Use Personal Protective Equipment				1
Use Fire Safety Procedures				1
Use Safety Committees				1
Perform Safety Watch				0
Use Tools and Equipment	12	5%	200	1
Use hand tools				1
Use power tools				1
Use powder-actuated tools				0
Use Rigging and Hoisting Equipment				0
Use portable equipment				0
Use mobile equipment				0
Use sandblasters				0
Use packers				0
Perform Masonry Work	12	5%	200	N/A
Prepare masonry work				N/A
Tend to bricklayers				N/A
Perform Roadwork	7.2	3%	120	N/A
Install paving materials				N/A
Install roadwork components				N/A

Roofer (Damp-and Waterproof) programs comparison at-a-glance

Table 19. BC and Philippine (any) Construction NC level holder; duration and prerequisites

British Columbia - Roofer	Republic of the Philippines – Basic & Common Competencies
Level 1 In-school training: 120 hours	N/A
Level 2 In-school training: 120 hours	N/A
Level 3 In-school training: 120 hours	N/A
Total in-school: 360 hours	N/A
Total work based: 6480 accumulated work based hours	N/A

[A Comparison of Select British Columbia and Philippine Apprenticeships](#)

British Columbia - Roofer	Republic of the Philippines – Basic & Common Competencies
Recommended entry: Grade 10 English, Math, and Science	This trade is not available for certification in the Republic of the Philippines.

[Roofer \(Damp-and Waterproofing GACs and Competencies comparison \(details\)\)](#)

In the table below we list all the GACs and attendant competencies, rated as described above. The ratings are indicative of the fact that this trade is not listed in the PTRs of the Republic of the Philippines. However, any holder of a Construction NC from the Republic of the Philippines would have taken Basic and Common competencies during training. We have recorded this below but we have not been curved to account for time-differentials (if any exist in practice) or competence approach (rather than the block release, lock-step used in BC).

Table 20. Rank-ordered Construction Roofer GACs and competencies (0=not present in Philippine program; 1=partial overlap; 2=substantial or complete overlap with BC program)

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Install Low Slope and Flat Roofing	138.0	1380	38%	N/A
Install Gypsum Board and Insulation				N/A
Install Overlay Board				N/A
Install Vapour Retarders and Air Barriers				N/A
Install Flashing Materials				N/A
Install Built-Up Roofing Systems				N/A
Install Flexible Membrane Roof Systems				N/A
Install Steep Roofing	55.2	552	15%	N/A
Install Asphalt Shingles				N/A
Install Wood Shingles and Shakes				N/A
Install Concrete and Composite Materials				N/A
Install Metallic Materials				N/A
Organize Work	45.6	456	13%	2
Describe Roof Types				2
Communicate with others				2
Prepare the worksite				2
Estimate quantities of materials				2
Use Safe Work Practices	44.4	444	12%	1
Describe Workplace Hazards				2
Interpret the Occupational Health and Safety Regulation and WCB				0

A Comparison of Select British Columbia and Philippine Apprenticeships

General Area of Competence (GAC)	In-school hours	%/GAC	On-the-job hours	Rating
Competencies				Republic of the Philippines
Standards				
Use WHMIS				0
Use Personal Protective Equipment				1
Use fire safety procedures				1
Use Documentation	32.4	324	9%	1
Read Drawings and Specifications				1
Use Building Codes and RCABC Standards				0
Read Manufacturers' Information				0
Use Tools and Equipment	21.6	216	6%	1
Use hand tools				1
Use portable power tools				1
Use propane-fuelled equipment				0
Use hot process equipment				0
Use Hoisting, Lifting and Rigging Equipment				0
Use Motorized Equipment				0
Use Ladders and Platforms				0
Assess and Maintain Roof, Damp and Waterproofing	12.0	120	3%	N/A
Assess Roof Conditions				N/A
Maintain and Repair Roofs, Damp and Waterproofing				N/A
Apply Waterproofing and Damp-Proofing	7.2	72	2%	N/A
Waterproof surfaces				N/A
Damp-proof surfaces				N/A
Prepare Roofs	3.6	36	1%	N/A
Prepare Roofs For Replacement				N/A
Prepare Roofs For New Installation				N/A

Discussion

In this section, we consider the meaning of the results.

Essential Skills

Reading

The overall score on 0.78 reflects our assumption that Philippine trade persons have had at least rudimentary training in English. But this assumption sets the bar at its lowest: it is possible that some newcomers master English at a more advanced level. However, it is safe to assume that (limited) English fluency would not include familiarity with safety, trade or legislation technical terms, trade processes language (including trade jargon), or codes and regulations (often in legalistic language and non-intuitive formats.)

In addition, reception (listening and reading – A1/A2), reading tending to be a more complex literacy skill than listening (and understanding), this even more so in a specialized field.

Document Use

The overall score on 0.89 reflects the language assumption we mentioned above. We can expect a Philippine newcomer with basic English to be able to handle most common documents, especially plans, schematics, blueprints etc. The Philippine trade person's limitations would be linked to differing protocols embedded in the plans rather than the language skills. The only skill we thought might be out of a Philippine trade person is that of completing complex forms and building permits (score of 0). Here we have assumed that both language and process worked synergistically "against" a newcomer.

The most complex literacy skill required here is that of mediation (translating and interpreting - C1/C2). But Philippine trade persons have had to practice that skill in their day-to-day practice in their home country. In BC their only impediment is that of having to apply the skill in a foreign language.

Writing

The overall score on 0 reflects both the language assumption we mentioned above and the fact that both written production (written – B1) and document "interaction" (B2) are more difficult for non-native or non-fluent writers.

i.e., reception (listening and reading – A1/A2) < production (spoken and written – B1) < interaction (spoken and written – B2) < mediation (translating and interpreting – C1/C2)

Numeracy

The overall score on 1.21 reflects the language assumption even though its importance is not as great here as it is in the other essential skills categories. We can expect a Philippine newcomer to be able to handle all common tasks requiring trade mathematics since the Philippine national curriculum K-10 includes robust theoretical and applied mathematics training. The only numeracy skills we thought might be out of a Philippine trade person's ken is that of scheduling and estimating costs and time-to-completion (scores of 0). And that is more because we have assumed that Philippine trades workers lack familiarity with the industry in a BC context, especially when it comes to productivity and compliance parameters.

Oral communications

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The overall score on 1.10 reflects the language assumption and the complexity level: interaction (spoken – B2) < mediation (translating and interpreting – C1/C2). Language demands such as understanding simple requests, what is said at crew meetings, or what a customer might want ought to be within the grasp of a newcomer with basic English language skills. But talking to building and safety inspectors, engineers, manufacturers, or acting as a crew leader might be beyond a Philippine trade person’s abilities (scores of 0) – although holders of NCIII have had advanced training in communication, albeit not necessarily in English. Here as well, lack of familiarity with the industry in a BC context is a major contributing factor, especially when paired with limited English skills.

[Essential Skills recommendations](#)

Clearly, English language skills are the major stumbling block to a Philippine trade person. It remains that offering generic English Second Language (ESL) courses, while useful for integration into the larger community, will not help on the job site.

The best intervention is most likely an educational approach supported by a job aid. The educational component would be in 2 parts: (i) trade and legalistic English and (ii) worksite protocols and business processes, both making use of documents, such as regulations or codes, pertinent to the newcomers’ trade. The job aid would be a pocket or app-based trade dictionary containing a subset of the most common trade terms and aligned to the BC apprentice trade manual(s)).

[Health and Safety, and other legislated skills](#)

WorkSafe BC (WSBC) lists rights and responsibilities for workers – and additional training for “new” workers. While compliance is commonly taken care of by the employer, it is up to the trade person to know what they can and cannot do safely, as well as how to be in compliance with WSBC regulation. WSBC requirements with respect to Personal Protective Equipment (PPE) varies from trade to trade but usually includes regulation-approved footwear, clothing (including high visibility clothing), ear/eye/hand protection, and hard hat. In addition, for some types of work, respirator proficiency is required.

Workplace Hazardous Materials Information System (WHMIS) is a requirement for all types of work and workplace. WHMIS certification is often a pre-requisite for jobs – it may be offered through the employer.

Proof of training and a certificate in Fall Prevention (covered under Part 11 of the WSBC Regulation) is a requirement for all workers who work at heights exceeding 3 meters. And while it is possible to work without fall restraint (for example if guardrails have been installed), roofers and carpenters will often be required to have and know how to use fall restraint equipment.

Electricians and plumbers often work in confined spaces (covered under Part 9 of the WSBC Regulation). Proof of training and a certificate is required for those workers who might come across such environments.

For all constructions trades a familiarity with the codes relevant to their occupation is necessary. In addition, plumbers in BC are expected to have a “Gas B License” in order to install and connect gas-fired appliances.

Trade persons are often expected to drive a company vehicle – most likely a pick-up truck or van. These vehicles can be operated with a Class 5 BC Driver’s License. ICBC does not have an agreement in place to exchange a Philippine driver’s license for a BC one. Submitting a certified translated copy of the

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Philippine document alongside proof of at least 2 years' driving experience either in the form of a formal letter or as attested by the issuance date on the driver's license itself will allow a Philippine Newcomer to get either a Class 7 or 8 license. Operating commercial vehicles with more than 2 axles, especially those equipped with air brakes requires a special license and an air brake endorsement.

[Health and Safety, and other legislated skills recommendations](#)

There are several online training opportunities for all the OSH requirements that are appropriate and recognized. These can be purchased for approximately \$200.

Code books (or relevant appropriate section) can be purchased for \$150-250 online or at specialized bookstores – knowing the code will be important for those workers wanting to challenge the Red Seal examination, especially for Plumbers and Electricians.

Plumbers wishing to install and connect gas-fired appliances will have to take a course and pass the relevant Safety Authority examination.

[Training Contents Comparisons](#)

[Carpenter](#)

The gaps listed below are for those Philippine newcomers who hold both NCII and NCIII qualifications. Refer to the table above to see which GAC aligns to either the NCII or NCIII or both.

The differences between trade practices in BC and the Republic of the Philippines stem from the nature of the training system. While BC uses a time-based, block-release, lock-step system, the Philippine system is self-paced and competence-based. In addition, the Philippine system appears to be better aligned to what work is commonly available and allows learners to acquire competencies flexibly.

Here we have focused on those carpenters who hold both a NCII and NCIII certificate and have acquired them entirely through the DTS / DTP. There are not enough solid data available to determine how long someone travelling the industry-route, or distance education, or peer-teaching route might take to get qualified or whether some “basic” and “common” competencies “buckets”, e.g., job planning, electrical theory, communications, etc., might have been missed or under-emphasized.

Briefly, in Republic of the Philippines carpenters do not routinely

- Use rebar, order, and place concrete.
- Use oxy-fuel equipment.
- Use rigging equipment.
- Use stationary power equipment (beyond a table saw).
- Do not timber-frame, or build access or outdoors structures.
- Do not survey or site buildings.
- Engage in building science.

[Carpenter recommendations](#)

Philippine NCII+NCIII carpenters have the skills to be productive on a worksite.

But if they hold only one of the credentials, they will have substantial gaps. Philippine NCIII (Carpenter III) carpenters would require the in-school equivalent of the BC Carpenter Program H line (wood frame

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construction) in Level 1 (approximately 2 weeks; maybe shorter if emphasis is on stick-framing) and G Line (concrete work) in Level 2 (approximately 4 weeks).

Philippine NCII (Rough Carpenter), would bring them up to speed the in-school equivalent of the BC Carpenter Program H line (H3-10 as a refresher; H7-10 new) in Level 1, and G Line (concrete work; G1, G2, G7) in Level 2 (approximately 1 week).

Both would require rigging, hoisting, and scaffold training – NCII program contains scaffold components but these are only as needed when forming.

Alternatively, they could pick up these skills on the job if they were employed as a Construction Craft Worker or general duty carpenter, whether as an apprentice or a laborer, getting to Red Seal certification in 2-3 years.

[Construction Electrician](#)

The differences between trade practices in BC and the Republic of the Philippines stem from technologies, codes and regulations, and electrical distribution systems, including voltage differences. Briefly, in Republic of the Philippines electricians do not

- Deal with DC systems.
- Routinely install HVAC, entertainment, or nurse call systems.
- Routinely install, commission, and service high voltage systems.

Philippine electricians are trained in 2 AC voltage levels in order to be able to work on residential, commercial, or industrial projects:

- NCII (simple residential work – service in the Republic of the Philippines is 220V):
 - AC: $50 < U \leq 600$ V
- NCIII and NCIV:
 - AC: $600 < U \leq 1\text{kV}$ ²⁵

Here we have focused on those electricians who hold a NCIV certificate and have acquired it (and the NCII and NCIII) entirely through the DTS / DTP. There are not enough solid data available to determine how long someone travelling the industry-route, or distance education, or peer-teaching route might take to get qualified or whether some “basic” and “common” competencies “buckets”, e.g., job planning, electrical theory, communications, etc., might have been missed or under-emphasized.

[Construction Electrician recommendations](#)

Philippine electricians have the skills to be productive on residential, commercial, or industrial worksites. But they will need to adapt to base voltage differences between the Republic of the Philippines (200V) and Canada. Likewise, codes and regulations driving work practices will be foreign to them – even though the Philippine Electrical Code has much in common with the US code. Most Philippine electricians would have the skills to install low voltage equipment such as entertainment systems, but they would be less familiar with high voltage vault and switching equipment for large industrial or multi-story buildings. Providing them with an Electrical Code course (approximately 2 weeks a day/week and \$600) would bring them up to speed.

²⁵ 1 kV limit is inferred from the “medium” voltage listed in the Transmission Line Installation and Maintenance NCII (entry-level Lineman, aka PLT) as this trade is specifically excluded from “Electrician” competencies.

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Alternatively, they could pick up these skills on the job, getting to Red Seal certification in a couple of years or so.

[Plumber](#)

The differences between trade practices in BC and the Republic of the Philippines stem from technologies, codes and regulations, and distribution and evacuation systems (besides the rather esoteric specialized systems). The differences, depending on the credential held (NCI, II, or III), are also due, in part, on the training stream used to acquire any of the NCs. Here we have focused on those plumbers who hold a NCIII certificate and have acquired it (and the NCI and NCII) entirely through the DTS / DTP. There are not enough solid data available to determine how long someone travelling the industry-route, or distance education, or peer-teaching route might take to get qualified or whether some non-core competencies might have been missed. We also would not be able to determine if those accessing higher levels of certification based on experience have covered the materials listed in the “basic” and “common” competencies “buckets”, e.g., job planning, plumbing theory, communications, etc.

Briefly, in the Republic of the Philippines “Plumbers” do not

- Install medical or compressed gas supply systems.
- Install sprinkling systems.
- Install hydronics systems.
- Routinely install well and septic systems.
- Hold a Gas B (or Philippine equivalent) licence.

But Philippine NCIII plumbers have advanced training and experience with

- Team and worksite management and supervision.
- Pumps and valves.
- Downfeed water systems.
- Cooled potable water systems.
- Multi-point hot water systems.

[Plumber recommendations](#)

Philippine NCIII plumbers have the skills to be productive on all types of worksites. But codes and regulations driving work practices will be foreign to them. Providing them with the in-school equivalent of C3 in C line in Level 1 (approximately 1 week) of the apprenticeship program and a Gas B course (approximately 3 weeks and \$1000) would bring them up to speed. Depending on the mechanical contractor they are employed with they might never need either hydronics or specialized gas systems training – in any case they have all the basic skills to be able to pick up these applications quickly on the job under the supervision of an expert.

Alternatively, they could pick up code-related skills on the job and take the Gas B course – in order to get the Safety Authority qualification, then challenge the Red Seal examination.

[Construction Craft Worker](#)

There are no competencies or National Certificates covering this trade in the Philippines. However, any Philippine trade person who holds a Construction National Certificate will have been awarded Basic and

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Common Certificate of Competency which cover job site communications, team work, safety, work site prep, clean-up, and organization, etc.

[Construction Craft Worker recommendations](#)

An apprenticeship in this trade might be the quickest way for a Philippine newcomer to acquire a (somewhat) articulated construction industry credential.

[Roofer](#)

There are no competencies or National Certificates covering this trade in the Philippines. However, any Philippine trade person who holds a Construction National Certificate will have been awarded Basic and Common Certificate of Competency which cover job site communications, team work, safety, work site prep, clean-up, and organization, etc.

[Roofer recommendations](#)

An apprenticeship in this trade might be the second quickest way for a Philippine newcomer to acquire a construction industry credential.

[Credentialing comparisons](#)

[British Columbia](#)

Apprentices are required to pass each of 4 levels (blocks) of in-school training. At the time of this writing, the practical and theory tests were institution-specific, but coordinated through a BC Articulation Committee for the trade. The Industry Training Authority (ITA) intends to impose standardized level theory tests starting in 2016. There is no standardized practical test: instructors assign cumulative marks for in-school projects (similar but not standardized).

Successful completion of the Level 4 in-school final exam gives access to the Red Seal examination, the only certification mechanism for carpenters in BC.

[The Red Seal - Apprentices and challengers](#)

[Introduction](#)

Apprentices and approved challengers are required to write the Red Seal examination in order to get a BC carpenter credential. There is no partial credit, no part credential.

The Red Seal examination is a timed “paper and pencil” test. All questions on the examination are machine-scorable multiple choice.

The Red Seal Certification examination is based on the National Occupational Analysis (NOA). The NOA is broken down into a number of blocks, tasks, and sub-tasks. Examination questions are based on the sub-tasks, the number of questions on each sub-task is based on a national mathematical average of estimated time spent on task by the carpenters in each jurisdiction, curved to the total number of question on the examination.

There is no weighting of any section of the Red Seal examination based on either heightened safety implications or criticality of task. There is no jurisdictional examination overlay for the Red Seal examination.

Red Seal examinations are prepared cooperatively between all Canadian jurisdictions but are hosted by a designated jurisdiction (designate status for any Red Seal examination is assigned through the

CCDA²⁶'s Product Committee's ISEC²⁷). Red Seal examinations are item bank-generated; that is for each examinable sub-task of the NOA a number of items are developed and then randomly assigned to an instrument based on a ToS²⁸ that mirrors the NOA percentages.

Bank-generated examinations are more comprehensive and more "difficult²⁹" than many of the "before-bank" examinations: items address more areas of the trade at more varied/complex levels than in one-off, instructor-developed examinations.

Problems

It is generally assumed that the ability to pass the examination³⁰ can be directly attributed to a candidate's work experience: that there is a direct proportional relationship between the level, scope, and quality of on-the-job training (OJT) and experience, and performance on the examination. It is also assumed that the instructional content (and activities) delivered by the institutions reflect the National Occupational Analysis (NOA) - our analysis shows this to be a dubious assumption, at best.

There are several problems with these assumptions. First, it is questionable if a pencil and paper test can stand as a proxy for practical ability. Second, it is unclear whether the candidates are able, for the purpose of the test only, to conceptualize what they do to answer a "word" problem. Third, domain hierarchy is neither considered nor established. And fourth, the NOA sub-tasks are not worded clearly enough to permit domain definition (e.g. "G21.01 Removes existing materials").

The third and fourth problems are of interest to the carpenter Red Seal examination because they are borne out of examination development design and practice. As a pencil and paper test, the carpenter IP assumes that all candidates can read, thus making the examination a test of literacy. As well, many items require candidates to apply mathematical concepts to identify (not necessarily generate as they would on the job) the correct answer, as such, the Red Seal is a test of numeracy. These two domains are listed in the Essential Skills, but these are not tested for, nor are they part of the requirement for challengers, but they are tested in conjunction with the job skills. All Red Seal examinations are made up of items that test an indeterminate number of domains in an indeterminate fashion.

Success on the Red Seal examination means the candidate scored >70%. All Red Seal examinations have this unique cut score. The cut score is not adjusted to the compounded psychometric profile of the items used for the examination – items are not differentially weighted. And, while results are available at the task level, the score obtained is the unweighted ratio of correct answers over number of questions at the sub-task level.

Validity

Validity is a measure of confidence in the inferences made based on a test score. With high stakes tests (like the Red Seal), it is crucial that test developers and administrators ensure inferences drawn from

²⁶ Canadian Council of Directors of Apprenticeship

²⁷ The *Interprovincial Standards Examination Committee* is made up of provincial/territorial government representatives

²⁸ A *Table of Specifications* is developed by the host jurisdiction and assigns weights and taxonomic item levels to sub-tasks

²⁹ Where "difficulty" is a perceptual measure from the candidates' perspective rather than statistically derived through Item Response or Classical theories

³⁰ 70% aggregate cut score for all Red Seal examinations

test scores are accurate. In the case of carpenters, a score <70% means that the candidate is not a competent carpenter, a serious professional issue.

Validation studies are recommended prior to the introduction of any test and should be mandatory for high stakes tests like the carpenter Red Seal. Usually three types of validation studies are conducted: content, criterion-related, and construct. With Red Seal examinations in general, only a cursory content validation is conducted when local experts review items.

Some may argue that the use of subject matter experts (SMEs) during item development is a validation exercise. This is a spurious argument, as content validation exercises ought to be conducted by independent judges, not the people who developed the items. Moreover, there is no indication that the SMEs are fully cognizant of all domains tested, are representative of the population of carpenters, or are able to precisely determine what is being tested.

[Reliability](#)

If a test is an accurate measure of an individual's ability³¹, then any candidate's observed scores should be consistent over a number of tries on the same test or parallel, equated tests. Reliability indices are numerical values that provide a statistical measure of the consistency of test scores; one would expect z-scores of a given individual to remain relatively consistent over repeated tries.

Score consistency is affected both by random and systematic errors. Random errors are chance happening and cannot be controlled (but they can be accounted for). Systematic errors are due to either examination flaws or candidates' characteristic (e.g. visual impairment). Red Seal examinations are developed, produced, and implemented without any reliability studies. In fact, some jurisdictions do not track reliability indices, even rudimentary α s or z-scores distributions in or for test-re-test situations.

[Republic of the Philippines](#)

In the Republic of the Philippines, all holders of a National Certificate Qualification have gone through at least 2 testing processes. The first process is that which covers Basic and Common competencies and is usually institution-based and learner-entrained (and captured in a "Self-Assessment Guide (SAG) for submission to the TESDA assessor). The second process, which can be supplemented by institutional evidence, tests the candidates' ability to perform the trade-specific (Core) competencies. This formal, credential-granting assessment takes place in TESDA-accredited sites by TESDA-accredited assessors and consists of (a) "project(s)" aligned to identified or perceived skills gaps.

TESDA defines "Competency Assessment [as] the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards."³² All TESDA documents provide simple scoring rubrics for each competency that make up a program leading to an NC level. And a candidate is expected to be able to show competence in all the "units" (i.e. competencies) listed in the program.

³¹ i.e. that E (the error unrelated to the domain(s) being tested – see footnote 2) is minimized in $T=X+E$ so that the test score (X) is a stable, true reflection of the true score (T),

³² See, e.g., Electrical Installation and Maintenance NCII, Sections 3 and 4 – these are generic to all programs in the "Promulgated Training Regulations".

Candidates who are graduates of formal, non-formal, and informal (including enterprise-based education/training programs/courses), and experienced workers (including self-employed workers) are eligible for certification through the processes explained above, or through project-based assessments that might include basic and common competencies³³.

These assessment tools are cross-referenced to “end state” competences, and have a prescribed set of givens listed in the scoring rubrics.

The NCs are issued by the Director General of TESDA.

Validity

The Philippine summative tests are (optional) “constructed response” tests that rely on the candidate’s SAG. That is, and unlike the Red Seal, the candidate must generate his or her own answer or solution to a given problem but is given input in how they think they master the competencies. In addition, a Philippine candidate must demonstrate both cognitive and hands-on abilities when tackling a project-based assessment (but all assessments are not necessarily project-based). “Marks” as such are not used. Rather, based on SAG data, assessor-candidate conversations, and (sometimes) performance tests, the candidate is deemed competent or not, as opposed to being machine graded. The terminal competences, are those the training program and the trade require as minimum proof of competence.

Reliability

Having many tests increase challenges to reliability if we added a reliability index for each test and summed those. One of the mechanisms the Philippine system relies on to increase individual “tests” reliability is using multiple data sources. However, one of these sources is the candidate and the final decision appears to be normative (negotiated) rather than criterion referenced, scoring rubrics notwithstanding.

BC vs. Republic of the Philippines

Table 11 compares the major elements of the testing and credentialing systems for apprentices and trade persons in BC and in the Republic of the Philippines. Both systems reflect general beliefs and philosophy about education and training.

Briefly, BC, like most North American jurisdictions, consistent with a greater reliance on technology and quantitative, large scale standardized testing uses a machine scorable test. The Red Seal examinations are designed and produced by a broad-based Canadian consensus, and are managed by a local arms-length government agency, ITA, an institution removed from the training institutions and the field. The Red Seal endorsement is meant to qualify the worker.

By contrast, the Philippine approach is holistic and learner-centered reflects being able to do something, the respect of older or informally-educated candidates, and is reliant on a working partnership between the expert educators and the candidate. The credential is meant both to qualify the person and to qualify the worker/actor.

Table 21. Comparison of BC and Republic of the Philippines examination and credentialing

Examination and certification

³³ The guidelines on assessment and certification are discussed in detail in the “Procedures Manual on Assessment and Certification” and “Guidelines on the Implementation of the Philippine TVET Competency Assessment and Certification System (PTCACs)”

A Comparison of Select British Columbia and Philippine Apprenticeships

Element	BC	Republic of the Philippines
Exam	Single	Multiple
	Pencil & paper	Pencil & paper (SAG)
		Hands-on
Domains tested	Multiple unspecified	Multiple specified
	Proxy	Direct (for Core competencies)
Domain inclusion	Negotiated norm	Criterion (rubric-based)
Item type	Selected response	Constructed response
Scoring	Machine	Rubric-based
		Examiner / negotiated
Scores	One correct	Graded
Results	Unique fixed cut score	Compounded
Validity	Medium	Unknown for basic and common competencies; Strong for core competencies
Reliability	Unknown	Weak
Credential	Endorsement	National