

# Construction Electrician and Industrial Electrician

**Transition Plan  
Version 2**

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## Abbreviations

<b>CCDA</b>	Canadian Council of Directors of Apprenticeship
<b>CE</b>	Construction Electrician
<b>CL</b>	Current level (2012/2013 Program Outlines)
<b>F2F</b>	Face to face (a training delivery method)
<b>FDN</b>	Foundation program
<b>IE</b>	Industrial Electrician
<b>HL</b>	Harmonized level (2017 Program Outlines)
<b>NOA</b>	Red Seal National Occupational Analysis
<b>RSOS</b>	Red Seal Occupational Standard; replaces NOA
<b>SLE</b>	Standardized Level Exam
<b>TP</b>	Training provider
<b>TT</b>	Technical training
<b>TW</b>	Trade worker
<b>WBT</b>	Work-based training

## Introduction: Harmonization

The Canadian Council of Directors of Apprenticeship (CCDA) is responsible for the Red Seal Program, which develops common interprovincial standards and examinations. The CCDA is undertaking the Harmonization Initiative in 30 Red Seal trades by 2020. British Columbia is an active participant in this initiative.

The goal is to substantively align apprenticeship systems across Canada by making apprenticeship training requirements more consistent in the Red Seal trades.

### Harmonization Priorities

1. Use of Red Seal trade name
2. Consistent total training hours (in-school and on-the-job)
3. Same number of training levels
4. Consistent sequencing of training content, including use of most recent Red Seal Occupational Standard (RSOS).

## Harmonization: What's Changing in BC?

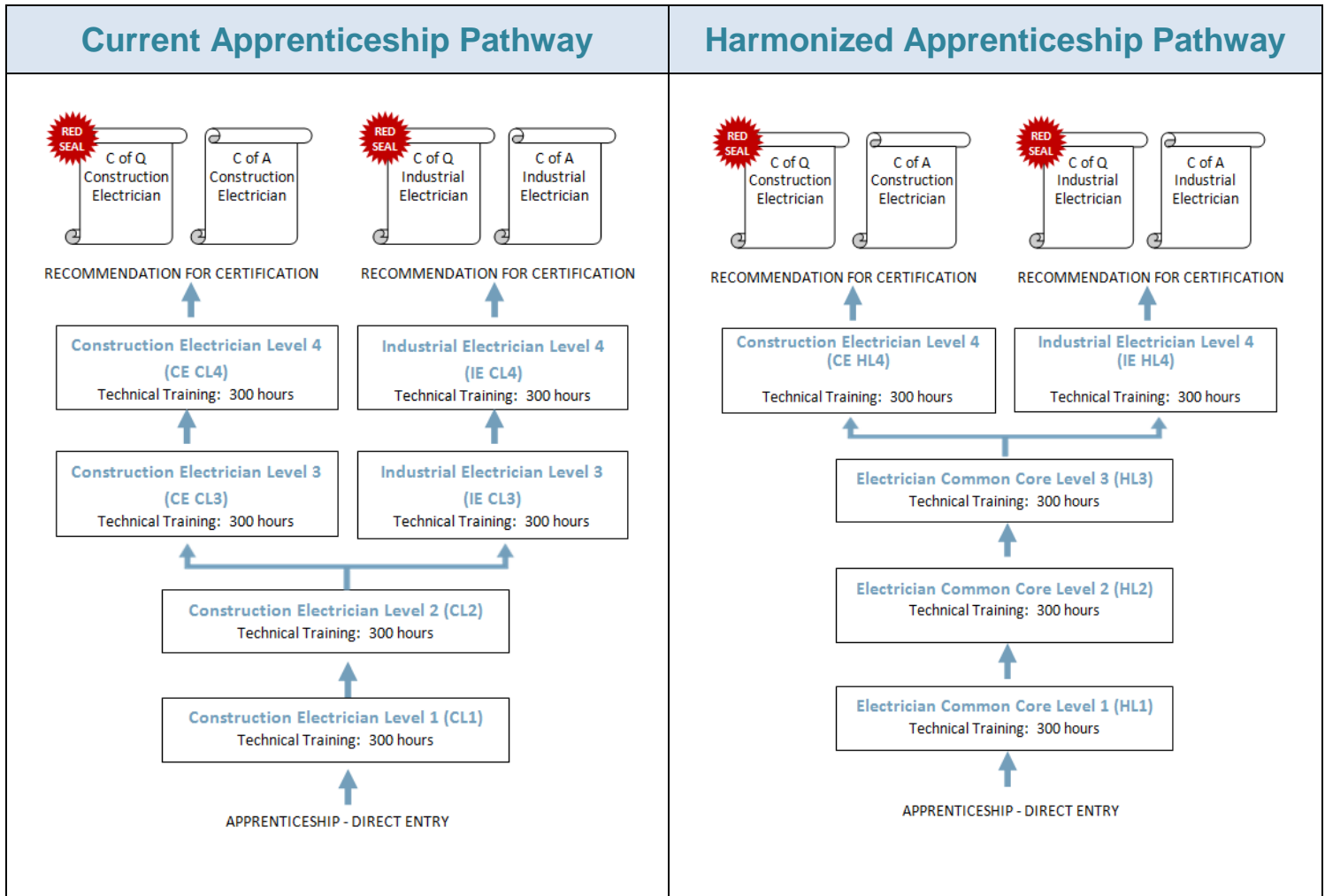
<b>CE</b>	Changing in BC?	What will it be?
TRADE NAME	NO	Construction Electrician
NUMBER OF TRAINING LEVELS	NO	4
TOTAL HOURS Technical + work-based training	NO	7200 hours
<b>TRAINING SEQUENCE</b> order of subjects taught	<b>YES</b>	<b>Changes to sequence*</b>

<b>IE</b>	Changing in BC?	What will it be?
TRADE NAME	NO	Industrial Electrician
NUMBER OF TRAINING LEVELS	NO	4
TOTAL HOURS Technical + work-based training	NO	7200 hours
<b>TRAINING SEQUENCE</b> order of subjects taught	<b>YES</b>	<b>Changes to sequence*</b>

\* Changes to sequencing resulted in **3 levels of common training** for CE and IE.

## Change to the Apprenticeship Pathway

The re-sequencing of the Construction Electrician and Industrial Electrician programs through the Harmonization Initiative has resulted in the ability to deliver levels 1-3 as 'Electrician Common Core' levels which will serve both CE and IE apprenticeship programs. Currently in BC, Industrial Electrician apprentices attend level 1 and 2 Construction Electrician training.



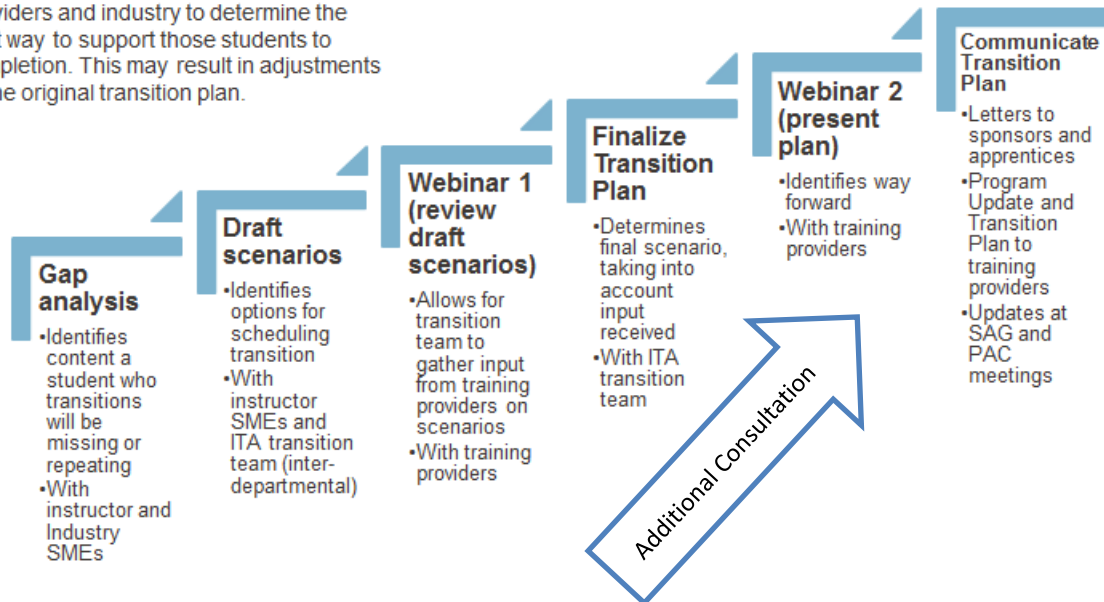
## Transition Planning

The re-sequencing of the Construction Electrician and Industrial Electrician programs through the Harmonization Initiative has resulted in significant changes to the sequencing of technical training.

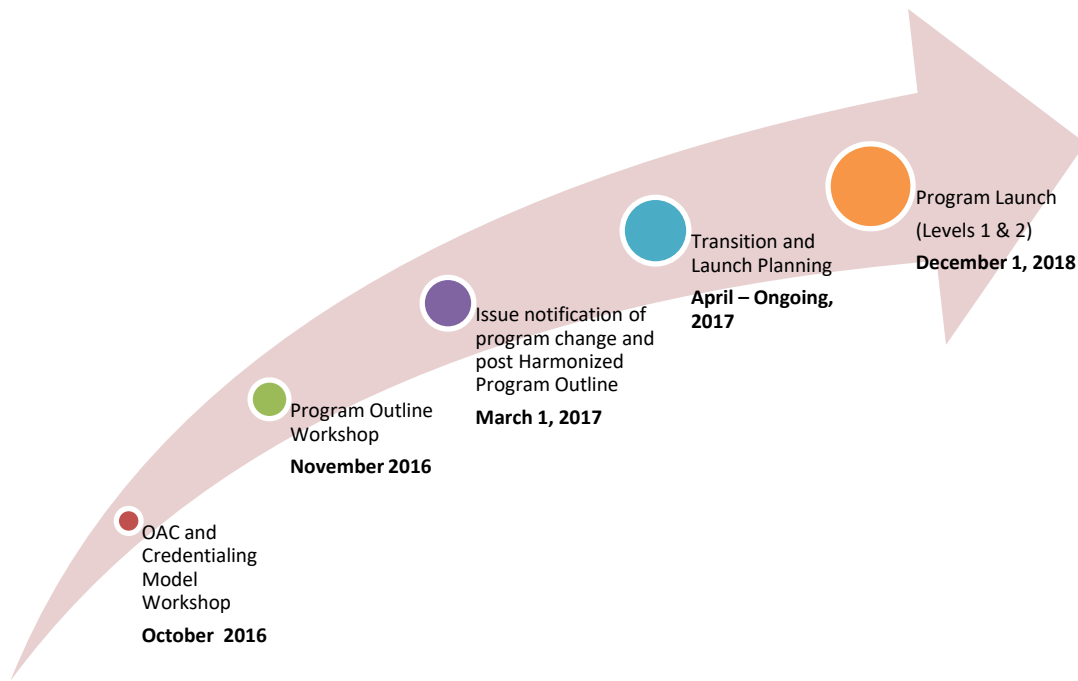
We consulted with the Deans of the 13 public post-secondary institutions that deliver the Construction Electrician and/or Industrial Electrician program, and also considered the input of our internal partners. We evaluated a number of scenarios, and the transition plan outlined in this document was identified as the best option. We have also ensured that there are options for all current apprentices to complete their apprenticeship.

## Transition Planning Process

Transition planning is an iterative process. On a regular basis, ITA will analyze the numbers of students remaining in the current program, and work with training providers and industry to determine the best way to support those students to completion. This may result in adjustments to the original transition plan.



# BC Program Development



## Public Training Providers (13)

BC Institute of Technology  
Camosun College  
College of New Caledonia  
College of the Rockies  
Kwantlen Polytechnic University  
North Island College  
Northern Lights College

Northwest Community College  
Okanagan College  
Selkirk College  
Thompson Rivers University  
University of the Fraser Valley  
Vancouver Island University

## Private Training Providers (3)

Electrical Joint Training Committee  
Sprott Shaw College  
Vancouver Career College

**Note:** Not all institutions teach every level.



## Apprentice Numbers in Current Programs

<b>Construction Electrician</b>	<b>Status</b>	<b>FDN</b>	<b>0TT</b>	<b>1TT</b>	<b>2TT</b>	<b>3TT</b>	<b>Total</b>
<b>CE</b> (current model)	Active	10	1,534	2,229	1,835	1,356	<b>6,964</b>
	Inactive	119	1,581	866	474	154	<b>3,194</b>
	<b>Total</b>	129	<b>3,115</b>	<b>3,095</b>	<b>2,309</b>	<b>1,510</b>	<b>10,158</b>
<b>Industrial Electrician</b>	<b>Status</b>	<b>FDN</b>	<b>0TT</b>	<b>1TT</b>	<b>2TT</b>	<b>3TT</b>	<b>Total</b>
<b>IE</b> (current model)	Active		53	35	62	42	<b>192</b>
	Inactive		24	12	25	2	<b>63</b>
	<b>Total</b>		<b>77</b>	<b>47</b>	<b>87</b>	<b>44</b>	<b>255</b>
<b>Combined</b>	<b>Status</b>	<b>FDN</b>	<b>0TT</b>	<b>1TT</b>	<b>2TT</b>	<b>3TT</b>	<b>Total</b>
	Active	10	1,587	2,264	1,897	1,398	<b>7,156</b>
	Inactive	119	1,605	878	499	156	<b>3,257</b>
	<b>Total</b>	129 + approx. 1,000/yr	<b>3,192</b>	<b>3,142</b>	<b>2,396</b>	<b>1,554</b>	<b>10,413</b>

**Notes on the numbers and estimates:**

**Note 1:** This data is from February 1, 2017

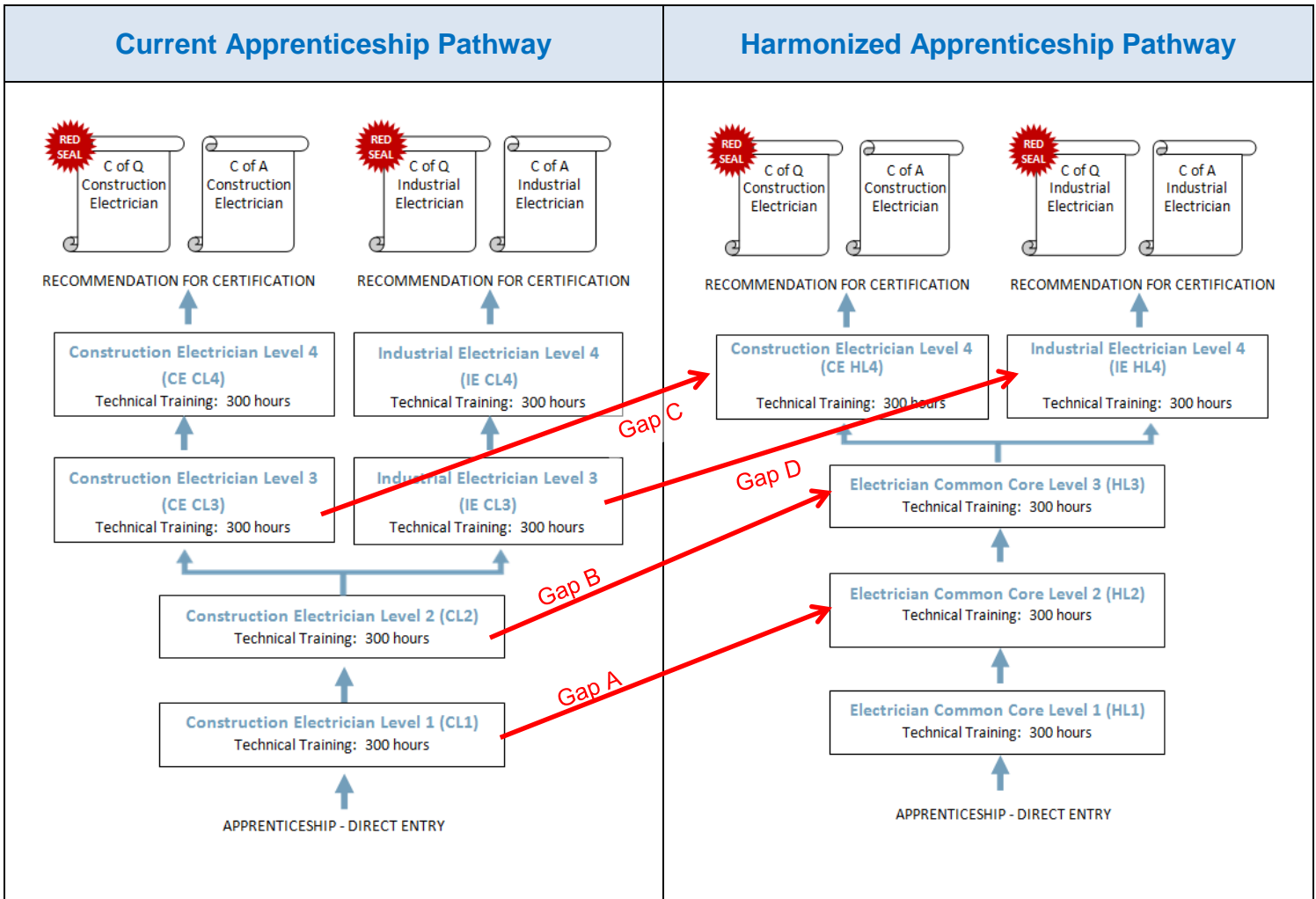
**Note 2:** Students who have completed Level 4TT are not considered in transition planning.

**Note 3:** Numbers for FDN are those that pre-registered with ITA. There are also approximately 1,000 FDN seats/year.

**Apprentices with out of sequence technical training**  
 (49 CE and 1 IE TWs) as of Aug 17, 2017

<b># of TWs</b>	<b>Achieved</b>	<b>Missing</b>
2	CL2, CE CL3, CE CL4	CL1
4	CL1, CE CL3, CE CL4	CL2
2	CL1, CE CL3	CL2, CE CL4
17	CL2, CE CL3	CL1, CE CL4
24	CL2	CL1, CE CL3, CE CL4
1 IE apprentice	CL2	CL1, IE CL3, IE CL4

# The Gaps

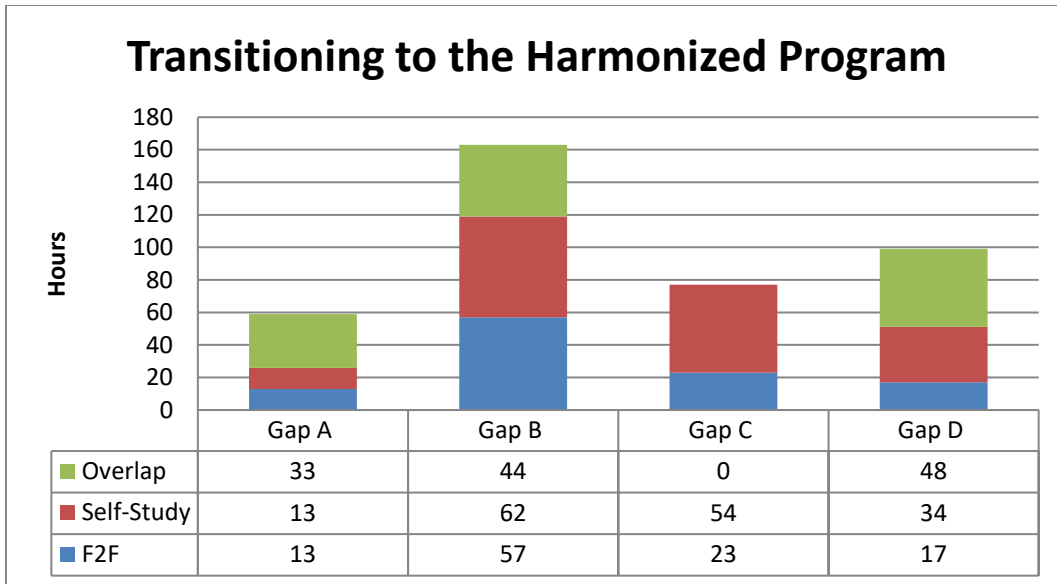


**Gap A (CL1→HL2)**

**Gap B (CL2→HL3)** \*Note that the transition plan has changed to include dual streaming of CE or IE CL3 and HL3 rather than Gap B training.

**Gap C (CE CL3→CE HL4)**

**Gap D (IE CL3→IE HL4)**



**Gap A (CL1→HL2)** applies to a student who has completed Current Level 1 or Foundation and is moving into Harmonized Level 2.

**Gap B (CL2→HL3)** \* Note that the transition plan has changed to include dual streaming of CE or IE CL3 and HL3 rather than Gap B training.

**Gap C (CE CL3→CE HL4)** applies to a student who has completed Current Level 1, 2 & CE Level 3 and is moving into Harmonized CE Level 4.

**Gap D (IE CL3→IE HL4)** applies to a student who has completed Current Level 1, 2 & IE Level 3 and is moving into Harmonized IE Level 4.

**\*\*See Appendix A: Details of Gaps for a list of the missing competencies\*\***

## Transition Plan

Harmonized Level Implementation Timelines	
Electrician Common Core Level 1	December 1, 2018
Electrician Common Core Level 2	December 1, 2018
Electrician Common Core Level 3	December 1, 2019
CE Level 4	December 1, 2020
IE Level 4	December 1, 2020

<b>Year 0 2017- 2018</b>	CL1	CL2	CE CL3 IE CL3	CE CL4 IE CL4
<b>Year 1 2018- 2019</b>	HL1	HL2	CE CL3 IE CL3	CE CL4 IE CL4
		Gap A TP Support 2 days		
<b>Year 2 2019- 2020</b>	HL1	HL2	CE CL3 IE CL3	CE CL4 IE CL4
		Gap A TP Support 2 days	HL3	
<b>Year 3 2020- 2021</b>	HL1	HL2	CE CL3 IE CL3	CE HL4 IE HL4
			HL3	Gap C TP Support 4 days Gap D TP Support 3 days
<b>Year 4 2021- 2022</b>	HL1	HL2	CE CL3 IE CL3	CE HL4 IE HL4
			HL3	Gap C TP Support 4 days Gap D TP Support 3 days
<b>Year 5 2022- 2023</b>	HL1	HL2	HL3	CE HL4 IE HL4
				Gap C TP Support 4 days Gap D TP Support 3 days

## Details of Transition Plan

Apprentices with no technical training (i.e. OTT) and those who have completed Current FDN or CL1 will be transitioned to the Harmonized Program. Doing this will capture 75% of current apprentices into the Harmonized program.

### Gap A

TP can request 2 days of funding from ITA Training Investment to provide gap training for FDN/CL1 students, who are transitioning to Harmonized Level 2. We will not require a document assessment for this gap. Delivery model is up to the TP.

### Dual Streaming of CE or IE CL3 and HL3

Dual streaming provides a pathway for students in both the current and harmonized programs to continue in their program without transitioning from CL2→HL3. It will prevent apprentices from transitioning where there is a 60-hr gap in training (Gap B).

**Where dual streaming is indicated in a transition plan, students must remain in their program.**

Apprentices who have completed CL2 cannot transition into the harmonized program. They must take CE or IE CL3. Please do not allow apprentices in the current program to register in HL3, as this will result in substantial gaps in their training.

Apprentices with Harmonized Level 2 (HL2) must take HL3. Students who have completed the previous level in the HL program must take the next level in the HL program. Allowing HL apprentices to register into the CL program will result in substantial gaps in their training.

Delivery method and schedule are up to the training provider. Some options are:

- Deliver CE or IE CL3 and HL3 during the same semester.
- Deliver CE or IE CL3 in one semester and HL3 in a subsequent semester.
- Coordinate with another training provider in the same region to offer CE or IE CL3 at one school and HL3 at the other school.

ITA is committed to working with training providers to provide pathways for apprentices to complete their training.

If you have questions that relate to the delivery of dual streaming, please contact ITA Program Standards at [programstandards@itabc.ca](mailto:programstandards@itabc.ca).

If you have any questions that relate to the funding of programs, please contact the ITA Training Investment Department at [investment@itabc.ca](mailto:investment@itabc.ca).

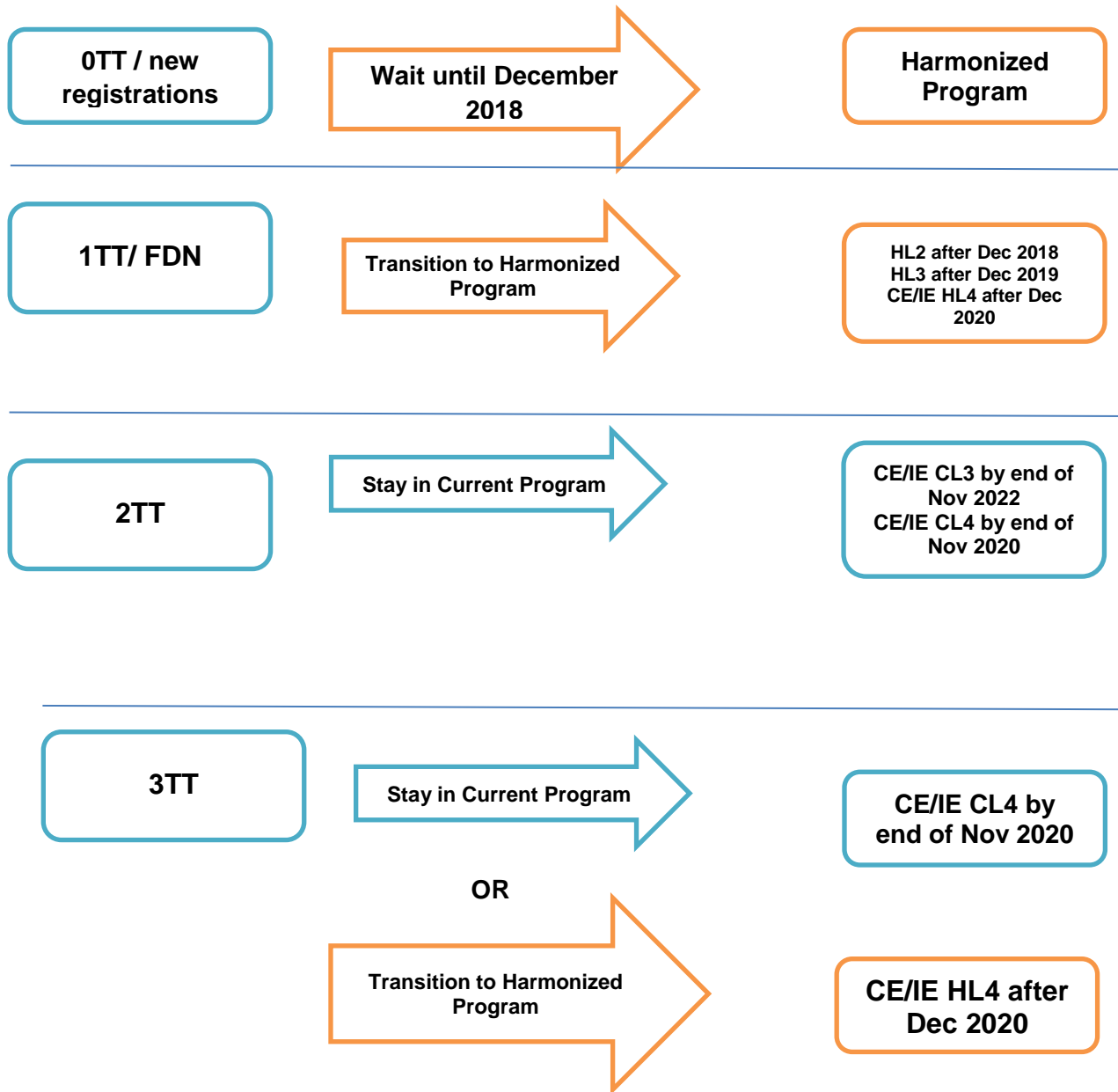
### **Gap C**

TP can request 4 days of funding from ITA Training Investment in order to provide gap training for CE CL3 students who are transitioning to CE Harmonized Level 4. ITA will not require a document assessment for this gap. Delivery model is up to the TP.

### **Gap D**

TP can request 3 days of funding from ITA Training Investment in order to provide gap training for IE CL3 students who are transitioning to IE Harmonized Level 4. ITA will not require a document assessment for this gap. Delivery model is up to the TP.

## Pathways for Current Apprentices (Summary)





## Cross Program Credit

*The Harmonized CE and IE programs contain Cross Program Credit for holders of the other Electrician Certificate of Qualification. Holders of a CofQ in one Electrician program will receive credit for levels 1, 2 and 3 and 4,500 WBT hours in the other Harmonized Electrician apprenticeship program. Individuals who receive this credit **must wait until Harmonized Level 4 is implemented** to attend the final year of training.*

<p><b>CE CofQ holder registering in IE Apprenticeship Program</b></p>	<p><b>OPTION A</b> – IE Harmonized apprenticeship program (After Dec 1, 2018)</p> <ul style="list-style-type: none"> <li>▪ Register in Harmonized IE Program</li> <li>▪ Automatically receive cross credit for HL1, HL2, HL3 and 4,500 WBT</li> <li>▪ Take IE HL4 <b>after</b> Dec 1, 2020 (TWs who receive the Harmonized cross program credit may <b>not</b> take IE Current Level 4)</li> </ul> <p><b>OPTION B</b> – Current IE apprenticeship program (Before Dec 1, 2018)</p> <p>In the current IE program standards, <b>no</b> cross program credit is granted for holders of a CE CofQ.</p> <p>However, if a TW has already taken current Level 1 and current Level 2 in the CE apprenticeship program, that credit will transfer into the IE apprenticeship program.</p> <ul style="list-style-type: none"> <li>▪ Register in Current IE program</li> <li>▪ Credit will transfer for CL1 and CL2</li> <li>▪ Complete IE CL3 by end of Nov 2022</li> <li>▪ Complete IE CL4 by end of Nov 2020</li> <li>▪ 0 WBT hours are granted</li> </ul>
<p><b>IE CofQ holder registering in CE Apprenticeship Program</b></p>	<p><b>OPTION A</b> – CE Harmonized apprenticeship program (After Dec 1, 2018)</p> <ul style="list-style-type: none"> <li>▪ Register in Harmonized CE Program</li> <li>▪ Automatically receive cross credit for HL1, HL2, HL3 and 4,500 WBT</li> <li>▪ Take CE HL4 <b>after</b> Dec 1, 2020 (TWs who receive the Harmonized cross program credit may not take CE CL4)</li> </ul> <p><b>OPTION B</b> – Current CE apprenticeship program (Before Dec 1, 2018)</p> <ul style="list-style-type: none"> <li>▪ Register in Current CE program</li> <li>▪ Automatically receive cross credit for CL1 and CL2</li> <li>▪ Complete CE CL3 by end of Nov 2022</li> <li>▪ Complete CE CL4 by end of Nov 2020</li> <li>▪ 0 WBT hours are granted</li> </ul>

## Standardized Level Exams

Standardized Level Exams are being developed for the harmonized program.

Exam	Exam Development	Exam Launch (tentative)
HL1	2017	Summer 2019
HL2	2017	Summer 2019
HL3	2018	Spring 2020

An **OPSN** will be sent to announce the implementation of the SLEs as they are launched.

## Appendix A: Details of Gaps

**In context** content may be covered in context with other competencies, in subsequent levels of training, on the job, or in self-study. **F2F** content is covered best in a face-to-face classroom setting.

### GAP A: CL1→HL2 Gap (Missing Content)

This table lists the content that a student will be **missing** if they have completed Current Level 1 (CL1) and then take Harmonized Level 2 (HL2).

	Competency	Objectives/LT	In context	F2F
A1	Use Electrical Circuit Concepts	Describe the generation of an alternating voltage Describe the features of alternating current Describe the difference between DC ohmic and effective AC resistance	2.5	7
G2	Use communication and mentoring techniques	Describe the shared responsibility for workplace learning	0	3
J1	Install Low Voltage Distribution Equipment	HL1 single phase, 3 wire services (HL3 three phase, three phase services)	0	0
L1	Install Grounding and Bonding Systems	HL1 single phase, 3 wire services, system ground and bonding conductor (HL3 three phase, three phase services, system ground and bonding conductor)	0	0
R1	Install Luminaires	Describe basic LED lighting Describe incandescent lighting	3	1.5
R3	Install Lighting Controls	Describe control of LED and incandescent lamps	1.5	1.5
R4	Install Lighting Standards	Describe types and installation of lighting standards	3	0
AA1	Install Voice/Data/Video (VDV) Systems	Types of structured cabling systems CAT5 and coaxial, termination	3	0
			<b>13</b>	<b>13</b>

### Overlap (Repeated Content)

This table lists the content that a student will be **repeating** if they have completed Current Level 1 (CL1) and then take Harmonized Level 2 (HL2).

	Competency	Overlap Hours
V1	Install Motor Starters and Controls	10
V2	Maintain Motor Starters and Controls	23
	<b>Total Overlap Hours</b>	<b>33</b>

## GAP B: CL2→HL3

### Gap (Missing Content)

This table lists the content that a student will be **missing** if they have completed Current Level 2 (CL2) and then take Harmonized Level 3 (HL3).

**Note that the transition plan has changed to include dual streaming of CE or IE CL2 and HL3 rather than Gap B training.**

	Competency	Objectives	In context	F2F
G2	Use communication and mentoring techniques	Describe the shared responsibility for workplace learning	0	3
I1	Install Overcurrent Protection Devices	Theory of protection	0	0
I2	Install Ground Fault, Arc Fault and Surge Protection Devices	Fault mitigation devices	5	3
N1	Install Renewable Energy Generating and Storage Systems	Describe types	0	3
M3	Install DC (Direct Current) Generating Systems	Describe the characteristics and operating principles of DC generators	15	30
M4	Maintain DC Generating Systems	Describe the maintenance of DC generators		
Y3	Install DC Motors	Describe the operating principles of DC motors Connect DC motors		
Y4	Maintain DC Motors	Describe maintenance and troubleshooting for DC motors		
V1	Install Motor Starters and Controls	DC motor controllers	3	6
V2	Maintain Motor Starters and Controls	Control of DC machines		
Q1	Install Conductors and Cables	Identify conductors and cables Determine conductor and cable requirements	3	0
Q2	Install Raceways, Boxes and Fittings	Determine requirements for raceways, boxes and fittings	3	0
R4	Install Lighting Standards	Describe types and installation of lighting standards	3	0
S1	Install HVAC Systems and Controls	Environmental heating controls	12	12
S2	Maintain HVAC Systems and Controls	Environmental heating controls		

	Competency	Objectives	In context	F2F
U1	Install Cathodic Protection Systems	Describe cathodic protection systems	6	
U2	Maintain Cathodic Protection Systems	Describe the maintenance of cathodic protection systems		
T1	Install Exit and Emergency Lighting Systems	Describe exit and emergency lighting systems	9	0
T2	Maintain Exit and Emergency Lighting Systems	Describe procedures to test exit and emergency lighting systems Describe procedures to maintain exit and emergency lighting systems		
AA1	Install Voice/Data/Video (VDV) Systems	Types of structured cabling systems CAT5 and coaxial, termination	3	0
		<b>Total Gap Hours</b>	<b>62</b>	<b>57</b>

### Overlap (Repeated Content)

This table lists the content that a student will be **repeating** if they have completed Current Level 2 (CL2) and then take Harmonized Level 3 (HL3).

	Competency	Objectives	Overlap Hours
A6	Analyze Electronic Circuits	Field effect transistors (FETs)	2
V1	Install Motor Starters and Controls	A/C, plugging, anti-plugging	30
V2	Maintain Motor Starters and Controls	A/C, plugging, anti-plugging	12
		<b>Total Overlap Hours</b>	<b>44</b>

## Gap C: CE CL3→CE HL4

### Gap (Missing Content)

This table lists the content that a student will be **missing** if they have completed Current CE Level 3 (CE CL3) and then take CE Harmonized Level 4 (CE HL4).

	Competency	Objectives	In context	F2F
D7	Identify Hazardous Locations	Wiring methods for hazardous locations	4	9
G2	Use communication and mentoring techniques	Describe the shared responsibility for workplace learning	3	0
P5	Install high voltage transformers	Calculate voltage, current, kVA Non-destructive testing Describe installation of high voltage transformers	3	2
R4	Install Lighting Standards	Describe types and installation of lighting standards	3	0
N1	Install Renewable Energy Generating and Storage Systems	Describe types	3	0
L3	Install Ground Fault Detection Systems	High capacity installations	2	0
Q1	Install Conductors and Cables	Identify conductors and cables Determine conductor and cable requirements	3	0
Q2	Install Raceways, Boxes and Fittings	Determine requirements for raceways, boxes and fittings	3	0
S1	Install HVAC Systems and Controls	Environmental heating controls	12	12
S2	Maintain HVAC Systems and Controls	Environmental heating controls		
T1	Install Exit and Emergency Lighting Systems	Describe exit and emergency lighting systems	9	0
T2	Maintain Exit and Emergency Lighting Systems	Describe procedures to test exit and emergency lighting systems Describe procedures to maintain exit and emergency lighting systems		
U1	Install Cathodic Protection Systems	Describe cathodic protection systems	6	0
U2	Maintain Cathodic Protection Systems	Describe the maintenance of cathodic protection systems		
AA1	Install Voice/Data/Video (VDV) Systems	Types of structured cabling systems CAT5 and coaxial, termination	3	0
		<b>Total approximate hours</b>	<b>54</b>	<b>23</b>

**Note:** There is **no overlap** (repeated content) for students if they have completed Current CE Level 3 (CE CL3) and then take Harmonized CE Level 4 (CE HL4).

## Gap D: IE CL3→IE HL4

### Gap (Missing Content)

This table lists the content that a student will be **missing** if they have completed Current IE Level 3 (IE CL3) and then take IE Harmonized Level 4 (HL4).

	Competency	Objectives	In context	F2F
D7	Identify Hazardous Locations	Wiring methods for hazardous locations	2	6
G2	Use communication and mentoring techniques	Describe the shared responsibility for workplace learning	3	0
P5	Install high voltage transformers	Calculate voltage, current, kVA Meggering Describe installation of high voltage transformers	3	2
N1	Install Renewable Energy Generating and Storage Systems	Describe types	3	0
L3	Install Ground Fault Detection Systems	High capacity systems	2	0
Q1	Install Conductors and Cables	Identify conductors and cables Determine conductor and cable requirements	3	0
Q2	Install Raceways, Boxes and Fittings	Determine requirements for raceways, boxes and fittings		
T1	Install Exit and Emergency Lighting Systems	Describe exit and emergency lighting systems	9	0
T2	Maintain Exit and Emergency Lighting Systems	Describe procedures to test exit and emergency lighting systems Describe procedures to maintain exit and emergency lighting systems		
U1	Install Cathodic Protection Systems	Describe cathodic protection systems	3	3
U2	Maintain Cathodic Protection Systems	Describe the maintenance of cathodic protection systems		
W1	Install Drives	Size, install and configure variable speed drives	3	6
AA1	Install Voice/Data/Video (VDV) Systems	Types of structured cabling systems CAT5 and coaxial, termination	3	0
		<b>Total approximate hours</b>	<b>34</b>	<b>17</b>

### Overlap (Repeated Content)

This table lists the content that a student will be **repeating** if they have completed IE Current Level 3 (IE CL3) and then take IE Harmonized Level 4 (IE HL4).

	Competency	Hours
AA1	Install Voice/Data/Video (VDV) Systems	3
AC1	Install Automated Control Systems	20
AC3	Program Automated Control Systems	25
		<b>48</b>

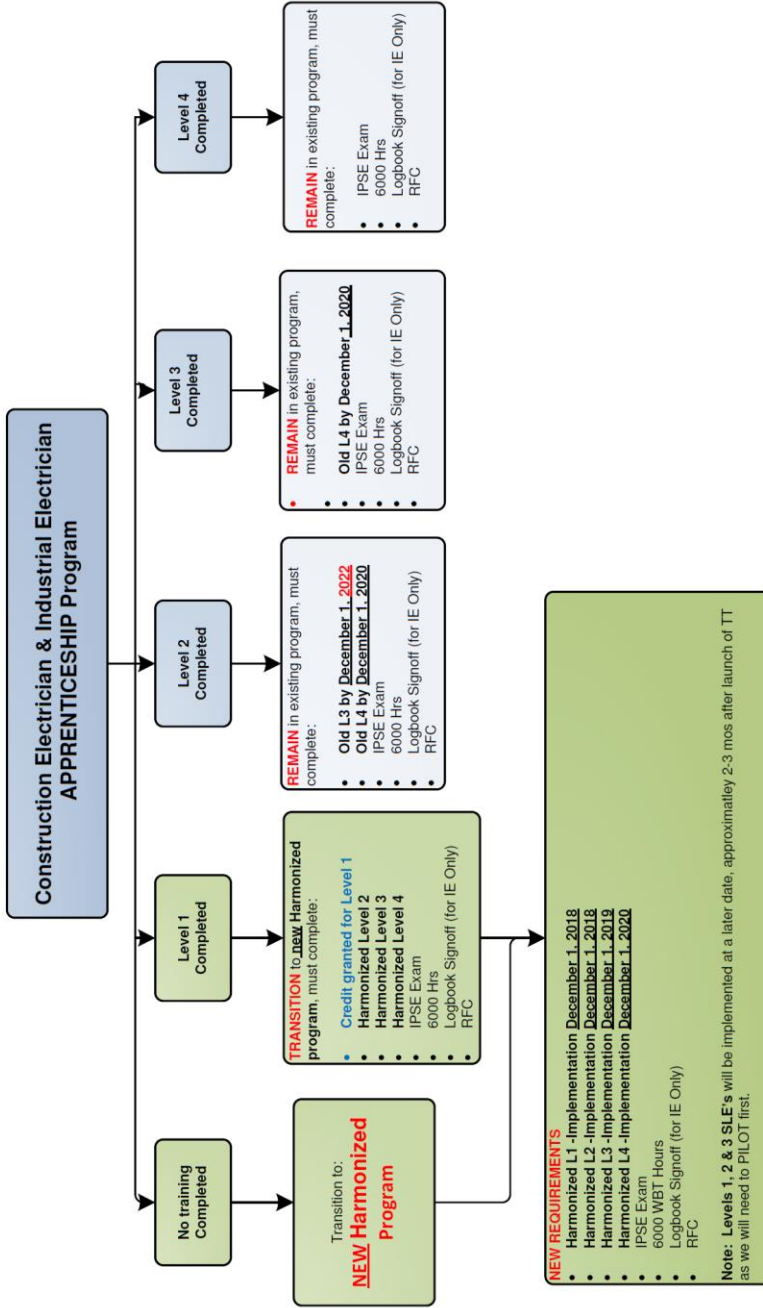


## Appendix B: Overall Communication Plan

Audience	Purpose	Mode
<b>Training Providers</b>	To announce the changes to training standards and the publication of a new Program Outline and Program Profile on the trade webpage on the ITA website	Official Program Standards Notification (OPSN) via email and posting on trade webpage
<b>Training Providers</b>	To plan for transitioning to the new program	Webinar(s), phone calls and/or face to face meetings
<b>Training Providers</b>	To announce the final transition plan	Program Update and Transition Plan via email and posting on trade webpage
<b>Training Providers</b>	To announce the launch of the harmonized level exams	OPSN via email and posting on trade webpage
<b>Employers</b>	To gather input on transition scenarios	Webinar(s), phone calls and/or face to face meetings
<b>Employers</b>	To inform on the upcoming changes to the program and the pathways to completion for their apprentices	Letters sent through ITA Direct Access (DA)
<b>Employers</b>	To inform on the upcoming changes to the program and the pathways to completion for their apprentices	Presentations at Program Advisory Committees (PAC) and other industry events
<b>Apprentices</b>	To inform on the upcoming changes to the program and their pathways to completion	Letters sent through ITA Direct Access (DA)
<b>Apprentices</b>	To inform on the upcoming changes to the program and their pathways to completion	Targeted outreach via phone and email
<b>Apprentices</b>	To inform on the upcoming changes to the program and their pathways to completion	Classroom visits by Apprenticeship Advisors

# Appendix C: Transition Map

## Construction Electrician & Industrial Electrician Transition Map EFFECTIVE December 1, 2018



Last Updated: March 28, 2019  
(Dual streaming for Level 3 to December 2022)