

The CHBA Net Zero Home Labelling Program Version 1.1 Update

January 15, 2020





Webinar Agenda

- **Technical Requirements**
 - Approved change requests - and some clarifying notes
 - Declined change requests - reasons why
- **Administrative Requirements**
 - File Submission Process update
 - Project Registration Workbook
 - Participant Agreements
 - Quality Assurance Procedures



Important Dates – Grandfathering Periods

File Submission – Info Field 3 (Immediate)

- Effective date: February 1, 2020

Administrative Requirements (2 months)

- Effective date: February 1, 2020
- Grandfathering Period End: April 1, 2020

Technical Requirements (6 months)

- Effective date: February 1, 2020
- Grandfathering Period End: August 1, 2020

Webpage

www.CHBA.ca/nze

Program Requirements - Version 1.1

1) Administrative Requirements - Version 1.1

- Effective date: February 1, 2020
- Grandfathering Period End: April 1, 2020

2) Technical Requirements - Version 1.1

- Effective date: February 1, 2020
- Grandfathering Period End: August 1, 2020

Additional Documents:

- Project Registration Workbook (xls)
- NRCan PV Ready Guidelines

Net Zero Home Program

About the Program

Homes

Builders and Renovators

Service Organizations,
Energy Advisors & Trainers

Program Requirements

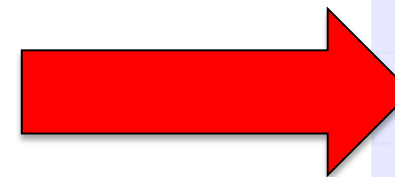
Training

Webinars

Boot Camp

Costing Database

Plaque





Technical Requirements Overview

- A 0 GJ rating shall be achieved using modelling methods and calculations in conformance with the EnerGuide Rating System v15, using HOT2000 v11.
- Annual space heating energy consumption (MJ) that is at least 33% lower than the corresponding reference house.
- An energy monitoring system shall be installed that provides electricity production and consumption data both in real time and aggregated over daily, weekly, and monthly time periods.



Changes to Ventilation Systems

CR-00000 Ventilation Systems Duplication

Approved: 4.7 Ventilation Systems - Deletion of 4.7.1.3

- Clause deleted because of duplication in 4.7.3 Design and Installation of Ventilation Systems
- Addition: reference subsection 9.32.3 of the National Building Code for clarify



Changes to Ventilation Systems

4.7.1 General

1. To help provide good indoor air quality, a balanced ventilation system with heat recovery shall be provided.
2. The ventilation system must be capable of meeting the principle ventilation air flow rate required by the home.
- ~~3. The ventilation system shall be installed such that the supply and exhaust flows are measured and balanced within 10% at high speed, with a label attached to the equipment indicating the installing company, who balanced the unit, and the measured flow rates, as per Section 4.7 of the ENERGY STAR® for New Homes requirements.~~

4.7.3 Design and Installation of Ventilation Systems

1. Ventilation systems for residential units shall be
 - (a) designed, installed and balanced in accordance with CAN/CSA F326-M91 (R2014) "Residential Mechanical Ventilation Systems", or Subsection 9.32.3 of the 2015 National Building Code, or local equivalent, and



Changes to Hot Water Pipe Insulation

CR-00009 Hot Water Pipe Insulation

Approved: 4.6 Water Heating Energy Conservation - Deletion of 4.6.1

- Hot water pipe insulation showed minimal energy reduction

4.6.1 Hot Water Pipe Insulation

1. Hot water pipes shall be insulated to minimum R-3 (RSI 0.5) for
 - (a) piping larger than $\frac{3}{4}$ " in nominal diameter,
 - (b) piping forming part of a continuously recirculating system, and/or
 - (c) piping located in a basement or outside conditioned space.



Changes to Ventilation Equipment

CR-00008 Ventilation Equipment

Approved: 4.7 Ventilation Systems – Addition of Note in 4.7.4

2. When tested in conformance with the low-temperature thermal and ventilation test methods described in CAN/CSA-C439-18, HRVs and ERVs shall have a sensible heat-recovery efficiency of at least 60% at an outside air test temperature of 0°C. In addition, locations with a 2.5% January design temperature less than -10°C shall have a sensible heat-recovery efficiency of at least 55% at an outside air test temperature of -25°C.

-referenced NBC 9.36.3.9(3)



Changes to Ventilation Equipment

4.7.4 – Reference to updated Section 2.1.2 Energy Efficiency Regulations

4.7.4 Ventilation Equipment

1. HRV's and ERV's serving individual residential units shall be
 - (a) Of the type that is regulated under Canada's Energy Efficiency Regulations as described in Article 2.1.2, or
 - (b) ENERGY STAR certified.
2. Integrated HRV air handlers shall
 - (a) Be tested to Section 8 of CSA P.10-07 (R2012) "Performance of Integrated Mechanical Systems for Residential Heating and Ventilation", and
 - (b) have a defrost mechanism.

NOTE:

1. HRVs and ERVs must be tested in accordance with CAN/CSA C439-18 *Laboratory methods of test for rating the performance of heat/energy-recovery ventilators*.



Changes to Energy Efficiency Regulations

2.1.2 – Clarity provided on options to meet the requirement

2.1.2 Energy Efficiency Regulations

1. Equipment and products that are regulated under Canada's Energy Efficiency Regulations shall comply with the technical requirements of the regulations.
2. Compliance with Sentence 1 can be demonstrated by
 - (a) Having the energy performance of the installed equipment verified for compliance with the Energy Efficiency Regulations, by a test and certification body accredited by the Standards Council of Canada for energy performance verification of that equipment, or
 - (b) Having the installed equipment bear an energy efficiency verification mark from a test and certification body accredited by the Standards Council of Canada for energy performance verification, or
 - (c) Identifying the installed equipment in the NRCan searchable product list of compliant equipment.



Changes to Power Generation

CR-00001 Ground Mount solar power generation

Approved: 2.5 Power Generation - Addition of 2.5.2 (Note)

2. In the case of a ground-mount PV system for a Net Zero Home the “PV System Commissioning Report” and the “Ground Mounted PV Ready Checklist” must still be completed, and for a Net Zero Ready Home only the “Ground Mounted PV Ready Checklist” must be completed. The NRCan “Photovoltaic Ready Guidelines” should be referenced to ensure:
 - (a) Code compliance,
 - (b) Identification of PV Ready components,
 - (c) Adequate space allocated for the inverter and connection hardware (either on the wall in the electrical room or at the ground mount system),
 - (d) Electrical panel rating is of sufficient size,



Changes to Energy Production

2.2.4 – Clarity provided on recommendation for third party PV assessment

- This point was added to recommend that third party PV designers are being consulted to develop the proposed renewable energy production, particularly for Net Zero Ready Projects.
- A note was added clarifying the correct PV system reporting documentation
 - Photovoltaic (PV) System Commissioning Report (*improved*)
 - NRCan Photovoltaic (PV) Ready Checklist (*improved*)
 - Ground Mounted PV Ready Checklist (*new*)



Declined Change Requests

- CR-000002 Equivalent Technologies
- CR-000004 Alternative Compliance
- CR-000005 System Providing both Space and Water Heating



Agenda

Administrative Requirements

1. File Submission Process
 - Addition to Info Field 3 in the HOT2000 ERS file submission
 - Modelling Guidelines
2. Project Registration Workbook
3. Participant Agreements
4. Quality Assurance

File Submission Process

Modelling, Construction & Evaluation

- EA provides consulting to builder and models the proposed design.
- Builder follows regular ERS procedure to notify SO of coming file submission.
- Builder builds home to meet Technical Requirements.
- Builder schedules final evaluation with EA. *(NOTE: Builder will receive labels from SO within 3 weeks of final evaluation.)*
- EA evaluates home per ERS protocol and is responsible for verifying compliance with the Net Zero Home Labelling Program Technical Requirements.

File Submission, Labelling and Registration

IF EA FINDS THE HOME DEFICIENT:

- EA arranges to re-evaluate the home once all deficiencies are corrected.

IF EA FINDS THE HOME COMPLIANT:

- EA sends HOT2000 files and Net Zero/Ready Project Registration Workbook to SO.
- SO performs QA on the files then submits HOT2000 file to NRCAN for approval.
- Once approved by NRCAN SO mails ERS and Net Zero/Ready labels to the builder.
- Builder affixes ERS and Net Zero/Ready labels to the homes' electrical panel, takes a photo and emails it to the SO.
- Once photo is received, SO registers final Net Zero/Ready file with CHBA by sending the completed Project Registration Workbook to NZHLP@chba.ca.
- CHBA reviews the file then posts it on the website.

Info Field 3 and Modeling Guidelines

General	Info	Specifications	Weather	Fuel Cost	Units & Mode	Window Tightness	Code Summary
ID	Value	Program Identifier					
Info. 1		NZ/r Label Number					
Info. 2	CHBANZH						
Info. 3	v1.1/105-00019/54%/NA						

Diagram illustrating the breakdown of Info Field 3 (v1.1/105-00019/54%/NA) components:

- Program Identifier (points to CHBANZH)
- NZ/r Label Number (points to 105-00019)
- Label Version (points to v1.1)
- Envelope Performance Improvement (points to 54%)
- Space Cooling Assessment (points to NA)

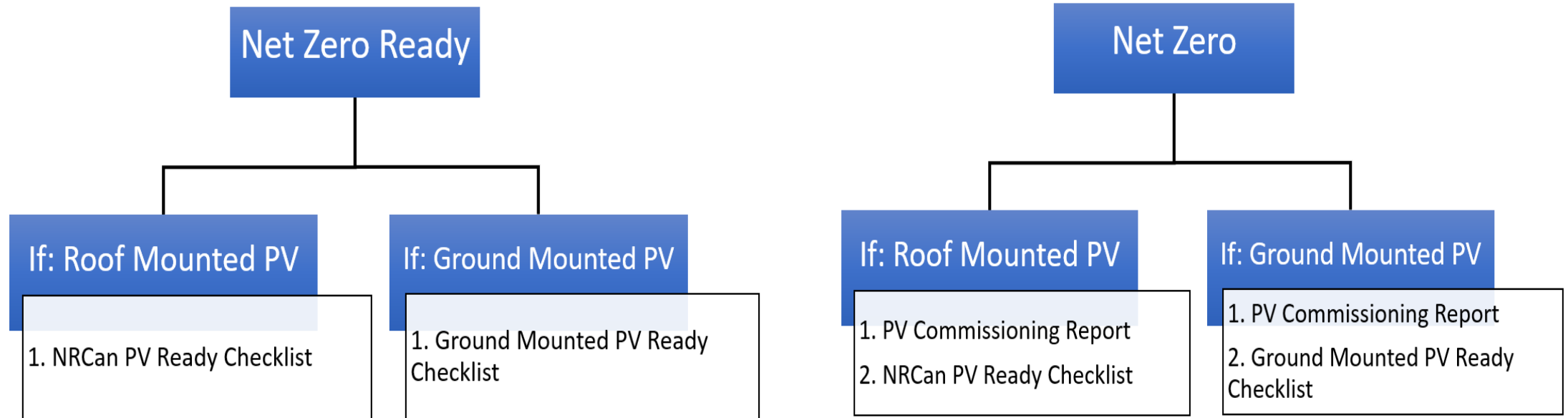


Project Registration Workbook

1. General Information
2. Technical Information
3. PV Commissioning Report
4. NRCan PV Ready Checklist
5. Ground Mounted PV Ready Checklist
6. Verification Checklist

PV System Reporting Requirements

The Following Forms must be completed in the Project Registration Workbook





Net Zero Ready 3rd Party PV Design

1. It is recommended that builders (or Energy Advisors on behalf of the builder) consult a professional third-party solar designer in the creation of a photovoltaic (PV) system design.
2. It is also recommended that this third-party PV system design be provided to the homeowner by the home builder.

1: General Information

This report shall be completed by the Qualified Net Zero Energy Advisor.

Net Zero Home

- ☐ 1 HOT2000 file modelled **WITH** the renewable energy system to 0 GJ
- ☐ Completed Project Registration Workbook (xls)

Net Zero Ready Home

- ☐ 1 HOT2000 file modelled **WITH** the renewable energy system to 0 GJ
- ☐ 1 HOT2000 file modelled **WITHOUT** the renewable energy system to 0 GJ
- ☐ Completed Project Registration Workbook (xls)
- ☐ Photovoltaic System Design (recommended)

Site Information

NZ/r Label Number:				
ERS File Number:				
Site Address:				
City:				
Province/Territory:				
Program Version:	Version 1:	<input type="checkbox"/>	Version 1.1:	<input type="checkbox"/>
Lot type:	Greenfield:	<input type="checkbox"/>	Infill:	<input type="checkbox"/>
Project type:	New:	<input type="checkbox"/>	Renovation:	<input type="checkbox"/>

Participant Information

Builder

Company:

Energy Advisor

Name:

Email Address:

Phone Number:

Service Organization

Company:



2: Technical Information

This report shall be completed by the Qualified Net Zero Energy Advisor.

General	
Energy Monitoring Device	
Make:	
Model:	

The inputs below will be auto-filled

% Better than Reference - Envelope		
Percentage:	--	
Space Cooling Threshold		
	N/A	

2: Technical Information

Building Envelope		
NRCan Reference house: Energy consumption summary report		
ERS Reference house	Value	
a) Estimated space heating energy consumption		MJ

Annual space heating summary		
Space heating system load	Value	
a) ERS Reference house		MJ
b) Proposed house with standard operating conditions		MJ

Building Envelope Performance Target		
Reference house space heating energy consumption		0 MJ
Space heating performance target		0 MJ
Estimated house energy consumption w/ reference HVAC		-- MJ
% improvement over code reference house		--

Space Cooling		
House Size		
Building parameters summary	Value	
House volume		m ³

Space Cooling Loads		
Hot2000 report parameter	Value	
Total annual sensible Load		MJ
Total annual latent Load		MJ
Total space cooling load		0 MJ

Space Cooling Requirement		
Estimated space cooling load	N/A	MJ/m ³

3: PV Commissioning Report

This commissioning report shall be completed by the installer of the PV system. A copy shall be provided to the customer as part of the system documentation.

Documentation

The system documentation should include, as a minimum, the following elements:

- ☐ As-built system drawings and specification sheets of all system components from suppliers/manufacturers
- ☐ Operations manuals of all system components from suppliers/manufacturers
- ☐ Verification of proper system installation, performance and operation (via tests & photos)
- ☐ Grid connection confirmation
- ☐ The installation is under warranty, including installer's workmanship and performance warranty
- ☐ Training/orientation to owner on basic system operation, typically at pre-delivery inspection

PV System Details

PV module make		Module nameplate rating		Number of PV modules	
Roof Mount	<input type="checkbox"/>	Wall Mount	<input type="checkbox"/>	Ground Mount	<input type="checkbox"/>
Make/model of other major system components (i.e. inverter)					
Horizontal tilt angle and azimuth (direction) of PV system on all planes					
System Peak DC Watts (as designed) - the product of the nameplate PV module rating and the total number of PV modules					
System Operational DC Voltage (as designed) - the input DC voltage rating of the inverter					
System Open Circuit DC Voltage (as designed) - the PV module open circuit voltage rating and the number of PV modules connected					
System Short Circuit DC Current - the nameplate PV module short circuit rating and the number of PV modules in the array					
Energy monitoring device make/model - real time energy consumption/generation information must be available to occupants					
Shut off/disconnect switch is clearly marked and visible - note location					

Array Tests

Solar conditions at time of the array tests (i.e. irradiance and temperature)	
Measure the open circuit voltage of each PV string of PV modules in series before they are interconnected and record	
Record the system DC Voltage - at string level or array level	
Record the system DC Current - if not available specify N/A	
Record the grid Voltage	
Record the system VAC - the Voltage between the inverter and the meter	
Record the system PAC - the energy the system is generating at one point in time (in Watts)	

Declaration, Name & Signature

4: NRCan PV Ready Checklist

[Click here for NRCan PV Ready Guidelines \(pdf\)](#)

V. PHOTOVOLTAIC (PV) READY CHECKLIST AND BUILDER'S DECLARATION

V. PHOTOVOLTAIC (PV) READY CHECKLIST AND BUILDER'S DECLARATION

Each of the following specifications shall be completed by the builder in accordance with Section II of the *Photovoltaic (PV) Ready Guidelines*.

1. On the Roof

Completed

Roof orientation and mounting angles:

Area 1: _____ azimuth (degrees) _____ slope (degrees) or pitch (rise:run)

Area 2 (as required): _____ azimuth (degrees) _____ slope (degrees) or pitch (rise:run)

Area 3 (as required): _____ azimuth (degrees) _____ slope (degrees) or pitch (rise:run)

Unobstructed, unshaded roof space for PV system:

Area 1: _____ m² or ft² (circle one)

Area 2 (as required): _____ m² or ft² (circle one)

Area 3 (as required): _____ m² or ft² (circle one) Total Area: _____ m² or ft² (circle one)

Consulted with municipality to determine needs for ridge setbacks and / or pathway access

Roof structure designed and constructed with Solar-Ready Trusses™ or equivalent and roof structure design will support additional loads of at least 0.17 kPa or 3.5 psf associated with PV system

2. PV Conduit and Utility Connection Conduits

Minimum one PV conduit, sized 2.5 cm (1") if metallic or 5.1 cm (2") if non-metallic, run from the attic or roof to the electrical panel location

Two utility connection conduits, sized 3.2 cm (1 1/4") run from the indoor electrical panel to the outdoor utility meter and back

3. Installation and Termination of PV conduit and Utility Connection Conduits

PV conduit installed entirely within the building envelope (except for section terminating above the roof if applicable)

PV conduit with bends / elbows greater than 45 degrees requires pull-rope installed; Check if pull-rope installed

Electrical panel termination workspace provided, conduit sealed and capped

Check one: Attic termination workspace provided, conduit sealed and capped

Roof termination workspace provided, conduit sealed, flashed and capped

Utility connection conduits capped and sealed.

OR

4. Space / Electrical Panel Rating / Breaker Slot / Network Communications

Designated wall space near electrical panel provided for PV hardware

Electrical panel will accommodate a PV supply breaker rated up to _____ Amperes in net-metering configuration

Available double pole slot at bottom of electrical panel for PV breaker

Wired network communications available: Check if network jack provided at designated PV wall space

5. Code Compliance

Electrical Safety Code and Building Code inspections passed

6. Identification of Components

Copies of the *PV Ready documentation* have been included in the home-buyer's information package, filed with the local building permits office, and affixed to the designated PV wall space on-site.

7. Declaration, Name & Signature

I hereby confirm that the PV Ready upgrades have been installed in this house according to Section II of *NRCan's Photovoltaic Ready Guidelines*

Home Address

City, Province, Postal Code

Name

Signature

Company Name

Date (yyyy-mm-dd)



5: Ground Mounted PV Ready Checklist

Each of the following specifications shall be completed by the builder.

	Completed
1. PV Array site	
Array orientation and mounting angle:	<input type="checkbox"/>
Array 1: _____ azimuth (degrees) _____ slope (degrees) or pitch (rise:run)	
Unobstructed, unshaded ground space for PV system:	<input type="checkbox"/>
Array 1: _____ m ² or ft ² (circle one)	
Consulted with municipality to determine requirement for ground mounted array	<input type="checkbox"/>
2. Installation and Termination of PV conduit and Utility Connection Conduits	
Two utility connection conduits, sized 3.2 cm (1 1/4") run from the indoor electrical panel to the outdoor utility meter and back	<input type="checkbox"/>
Check one of the following: Minimum one PV conduit or sleeve	
OPTION 1: PV conduit sleeve installed through building envelope, 10 cm (4") non-metallic, caulked, sealed, capped on both ends, stuffed with temporary insulation that is easily removable, and ready to facilitate installation of future PV conduit (as per PV design). This conduit sleeve shall be visible from the main electrical panel inside the	<input type="checkbox"/>
OPTION 2: PV conduit installed through building envelope, sized 2.5 cm (1") if metallic or 5.1 cm (2") if non-metallic, caulked, sealed, terminated at appropriately rated pull-boxes for future connection to future solar system (outside) complete with metering, and to inverters etc. inside	<input type="checkbox"/>
PV conduit with bends / elbows greater than 45 degrees requires pull-rope installed; <i>Check if pull-rope installed</i>	<input type="checkbox"/>
Workspace is provided around the electrical panel sufficient to accommodate future installation of solar equipment.	<input type="checkbox"/>
3. Space / Electrical Panel Rating / Breaker Slot / Network Communications	
Designated space either near the electrical panel or at the array site is provided for PV hardware and electrical connections	<input type="checkbox"/>
Electrical panel will accommodate a PV supply breaker rated up to _____ Amperes in net-metering configuration	<input type="checkbox"/>
Available double pole slot at bottom of electrical panel for PV breaker	<input type="checkbox"/>

4. Code Compliance	
Electrical Safety Code and Building Code inspections passed	
5. Identification of Components	
Copies of the <i>PV Ready documentation</i> have been included in the home-buyer's information package, filed with the local building permits office, and affixed to the	
6. Declaration, Name & Signature	
Home Address	City, Province, Postal Code
Name	Signature
Company Name	Date (yyyy-mm-dd)



6: Verification Checklist

2.1 Compliance with Building Codes and Regulations		Verified	N/A
2.1.1	Comply with local building code or regulation.	<input type="checkbox"/>	<input type="checkbox"/>
2.1.2	Comply with the technical requirements of Canada's Energy Efficiency Regulations for regulated products.	<input type="checkbox"/>	<input type="checkbox"/>
2.1.3	Equipment and Technologies are commercially available, meet applicable North American Standards, and are suitable for the intended application.	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Proposed House			
2.2.2	The annual space heating energy consumption (MJ) is at least 33% lower than the NRCan reference house.	<input type="checkbox"/>	<input type="checkbox"/>
2.2.3	The space cooling threshold is calculated, and if cooling load exceeds threshold, space cooling energy consumption is included in total annual energy consumption (if an ASHP is used, check "N/A").	<input type="checkbox"/>	<input type="checkbox"/>
2.2.4	When modelled with renewables, net energy consumption of the proposed house is not greater than 0 GJ.	<input type="checkbox"/>	<input type="checkbox"/>
2.4 Energy Modelling			
2.4.1	0 GJ rating shall be achieved using modelling methods and calculations in conformance with ERS v15, using HOT2000 v11.	<input type="checkbox"/>	<input type="checkbox"/>
2.5 Renewable and Energy Production Systems			
2.5.2	Renewable energy generation technologies used comply with the current and applicable version of the relevant industry standard.	<input type="checkbox"/>	<input type="checkbox"/>



Participant Agreements

- All participants sign attestation annually
 - Reiterate fees
 - Ensure Builder and EA complete Verification Checklist on each project

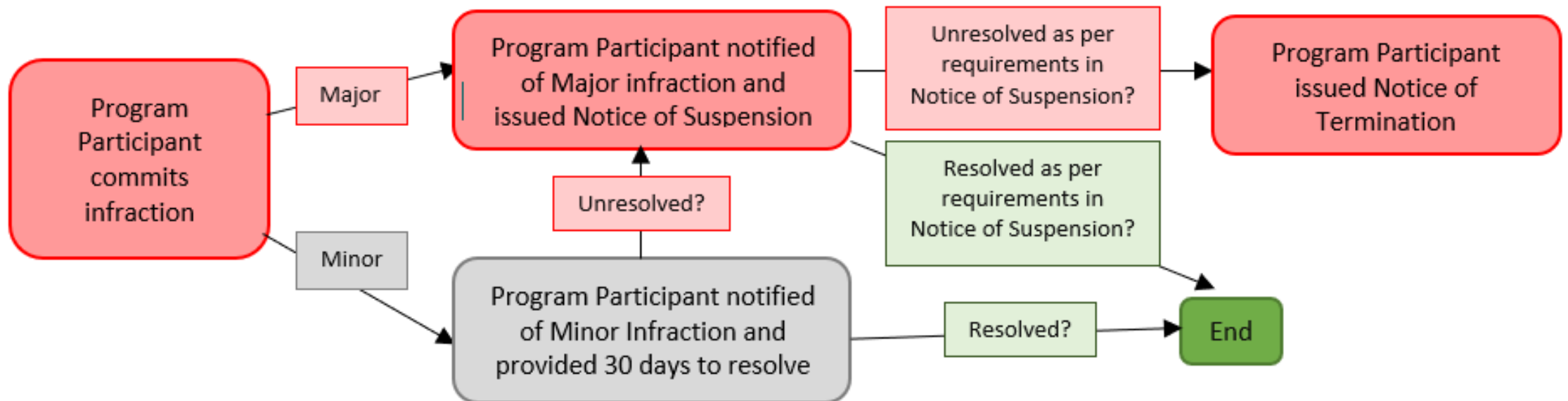


Quality Assurance Procedures

- All Audits will be done by CHBA
- Home Files Audits
 - 5% of EA's files annually
 - Energy Production modelling will be looked at closely
- Participant Audits
 - all Qualified participants annually

Disciplinary Policies

- Suspension & Terminations
- Major Infractions
- Minor Infractions





In Summary

Builder:

- Technical Requirements
- Verification Checklist
- PV Ready Checklists

Energy Advisor:

- Technical Requirements
- Verification Checklist
- 1 HOT2000 file
- Info field 3

Service Organization:

- Project Registration Workbook (sent to NZHLP@chba.ca)
- Info field 3

Contact



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