Scope of NBC(AE) Section 9.36

Section 9.36 of the National Building Code (Alberta Edition) contains the requirements to meet minimum energy performance requirements for homes and other small buildings. There are several compliance paths to choose from:

- Prescriptive
- Prescriptive with trade off
- Performance
- Tiered Performance

The NECB for energy code compliance for any building. The following table outlines acceptable compliance paths if a 9.36 compliance path is preferred. If a building does not meet the requirements for Acceptable 9.36 compliance paths are based on the size of the building and the type of occupancy:

	2023 NBC(AE) 9.36 Prescriptive/Trade Off (9.36.2 to 9.36.4)	2023 NBC(AE) 9.36 Performance (9.36.5) or Tiered Performance (9.36.7)	NECB 2020
Floor Area (m2)	< 300	< 600	>= 600
	and	and	or
Occupancies	C (residential) D (business and personal services) E (mercantile) F3 (low hazard industrial) A single occupancy or combination of the listed occupancies can follow the prescriptive/trade off path	House with or without a secondary suite Or Buildings containing only dwelling units and common spaces whose total floor area does not exceed 20% of the total floor area of the building	F2 (medium hazard industrial) Buildings containing D, E, or F3 occupancies with floor area greater than 300 m2.

Additions and Alterations

9.36 applies to all new conditioned floor area. This can be either a new building, or an addition to an existing building. Some applications may be exempt from 9.36 requirements, refer to 9.36.1.3.(7) for examples. Confirm exemptions with the Safety Codes Permits & Inspections group.

9.36 applies to existing construction to the extent reasonably practical. For example, foundation "frostwall" framing removed in a basement redevelopment shall be reconstructed to 9.36 requirements. However, lawfully existing, non-conforming framing that remains unchanged can be reinsulated and made airtight to the extent practical. The guiding principle is that the level of performance of a building shall not be decreased as a result of alterations.

Compliance Paths

There are five options to demonstrate compliance with 9.36:

- Prescriptive (9.36.2 to 9.36.4)
- Prescriptive with trade off (9.36.2 to 9.36.4)
- Tiered Prescriptive (9.36.8)
- Performance (9.36.5)
- Tiered Performance (9.36.7)

Once Tier 2 and above are adopted, the prescriptive, prescriptive with trade off, and performance options will not be acceptable options to demonstrate compliance. Only the tiered prescriptive and tiered performance options will be acceptable. Refer to edmonton.ca/energycode to see which tier is currently in force.

A description of each compliance path is found in Appendix A.

Documentation Requirements

Documentation for each compliance path is as follows:

Common to all paths

- Call out floor, wall, and roof assemblies on the building floor plans and elevations to relate to the corresponding assembly details
- Provide fully labeled sections of all assemblies forming floors, walls, and roofs both above and below grade. Each layer of material should be identified
- Show air barrier continuity according to the option chosen in 9.36.2.9.(1)

Prescriptive Path

Applicants are required to submit the following documents:

- A drawing set containing all the items in the above "common to all paths" section

- Effective thermal resistance (ETR) calculations shown on drawings for each assembly (refer to Appendix B for an example). Show ETR values in RSI (or metric R).
- No summary sheet is required as applicants will enter 9.36 data in their online application

Prescriptive with Trade Off

Applicants are required to submit the following documents:

- A drawing set containing all the items in the above “common to all paths” section
- Effective thermal resistance (ETR) calculations shown on drawings for each assembly (refer to Appendix B for an example). Show ETR values in RSI (or metric R).
- No summary sheet is required as applicants will enter 9.36 data in their online application
- Trade off calculations. Calculations can be a separate document or shown on the drawings. Indicate assemblies which are being traded on the drawings. A trade off calculator is available under the NBC(AE) 2023 section at edmonton.ca/energycode.

Performance Path

Applicants are required to submit the following documents:

- A drawing set containing all the items in the above “common to all paths” section
- A proposed house energy model report
- A reference house energy model report
- Performance path summary sheet
- Blower door test results if required (if using less than the prescriptive air change rate in the model, or for EnerGuide submissions)
- Window schedules to confirm USI and SHGC values used in the energy model

Energy models for Part 9 buildings are typically completed in HOT2000, but any ASHRAE 140 compliant software is acceptable. The “Full House Report” from HOT2000 is acceptable for the proposed and reference house energy model reports.

Inspection Process

For the prescriptive or trade off paths, City of Edmonton inspectors look to verify that prescriptive requirements are met on site. If non-compliant items are found they must be corrected prior to occupancy being granted. For performance path reports, inspectors look to verify that the assumptions made in a performance path report match the actual construction. If there were changes during construction which impact energy performance (eg. reducing stud spacing for a tall wall), an updated energy model is required before occupancy will be granted.

Application to Existing Buildings

The guiding principle is that the level of life safety and building performance of lawfully existing construction shall not be decreased as a result of alterations, rehabilitation, refurbishment, renovation, or repair. Refer to Appendix B for descriptions of specific scenarios.

Appendix A: Compliance Path Descriptions

Prescriptive Path

The prescriptive path is the least flexible but least complex of the 9.36 compliance paths. Applicants must meet each requirement in 9.36.2 (building envelope), 9.36.3 (HVAC), and 9.36.4 (service water heating). ETR calculations are required for each building assembly. Refer to note A-9.36.2.4.(1) for information on how to complete ETR calculations. The most commonly used method for wood frame ETR calculations is the parallel path method. The parallel path method does not apply to steel frame buildings.

Prescriptive with trade off

The prescriptive with trade off path allows applicants to use a level of performance below certain prescriptive requirements if the level of performance is higher in other allowable prescriptive requirements. Building envelope components can be traded with other building envelope components per 9.36.2.11. No trade offs are permitted for HVAC or service water heating systems. A typical example is increasing the insulation in one wall type to offset the reduction in performance for a tall wall due to narrower stud spacing.

Performance

The performance path is the most flexible option to demonstrate compliance with 9.36, but requires energy models of the proposed house and reference house:

- The proposed house model represents the actual design that will be constructed. This model uses the actual wall insulation values, the actual window to wall ratio, and actual HVAC systems.
- The reference house model represents the house as if it were built exactly to the requirements of 9.36.

Each model is then simulated over a year to determine the annual energy consumption of the building. If the proposed house uses less energy than the reference house, then the building complies with 9.36.

Tiered Performance

The tiered performance path requires the proposed home to show a minimum increase in energy performance compared to the reference home. This path is similar in procedure to the performance path. For example, if Tier 2 is the currently adopted tier, the proposed house would have to consume 10% less energy compared to the reference house. Refer to Subsection 9.36.7 of the 2023 NBC(AE).

Tiered Prescriptive

The tiered prescriptive path requires applicants to pick improvements to their buildings to earn points. A certain number of points is required for higher tiers. For example, increasing wall insulation to meet an effective thermal resistance of 4.4 would earn 10.3 points in Edmonton’s climate zone (7A). Ten points are required to meet Tier 2, therefore this one improvement to the building is enough to meet Tier 2.

Appendix B: Application to Existing Buildings

Existing buildings **not constructed** to any version of 9.36	Existing buildings **constructed** to any version of 9.36
Mechanical	
Maintenance and repair of existing mechanical components shall be to codes standards not less than at time of construction/installation	Maintenance and repair of existing mechanical components shall be to codes standards not less than at time of construction/installation
Installation of new mechanical components by alteration of existing mechanical systems shall be to codes standards not less than at time of construction/installation, but with efficiencies not less than found in Canada's Energy Efficiency Regulation at time of permit application for the new work.	Installation of new mechanical components by alteration of existing mechanical systems shall be to codes standards not less than at time of construction/installation but with efficiencies not less than found in Canada's Energy Efficiency Regulation at time of permit application for the new work, **however energy performance may not be reduced.**
Installation of new mechanical systems shall be to codes current at time of permit application for the new work. Apply minimum prescriptive requirements.	Installation of new mechanical systems shall be to codes current at time of permit application for the new work. Apply minimum prescriptive requirements, or optionally model the as-built building with proposed changes to derive new mechanical component efficiencies.
Enclosure/Envelope	
Maintenance and repair of existing envelope components/assemblies shall be to codes standards not less than at time of construction/installation.	Maintenance and repair of existing envelope components/assemblies shall be to codes standards not less than at time of construction/installation.
Installation of new envelope components in the replacement or alteration, other than additions, of existing construction shall be to codes standards current at time of permit application for the new work, applied to existing construction to the extent reasonably practical. Lawfully-existing exposed framing/structure/components that remain unchanged need be insulated/made airtight only to the extent practical. Existing windows, doors, hatches, etc. not intended to be changed may remain as is. For new components, apply minimum prescriptive requirements.	Installation of new envelope components in the replacement or alteration, other than additions, of existing construction shall be to codes standards current at time of permit application for the new work, applied to existing construction to the extent reasonably practical. Lawfully-existing exposed framing/structure/components that remain unchanged need be insulated/made airtight only to the extent practical. Existing windows, doors, hatches, etc. not intended to be changed may remain as is. For new components, apply minimum prescriptive requirements or optionally model whole house, **however energy performance may not be reduced.**
Construction of new building envelope assemblies through addition beside, above or below existing structure shall be to codes standards current at time of permit application for the new work. Apply minimum prescriptive requirements, or model whole house.	Construction of new building envelope assemblies through addition beside, above or below existing structure shall be to codes standards current at time of permit application for the new work. Apply minimum prescriptive requirements or optionally model whole house.