CNC/CIE - IESBC Workshop 2010

Lighting in the NECB 2011

Dr.-Ing. habil. Alexander Rosemann, P.Eng., LC, CEM

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Overview

- Building Codes Overview
- Existing Methodology – ASHRAE/IESNA 90.1
- NECB Compliance Paths for Lighting

Model National Energy Code of Canada for Buildings (MNECB)

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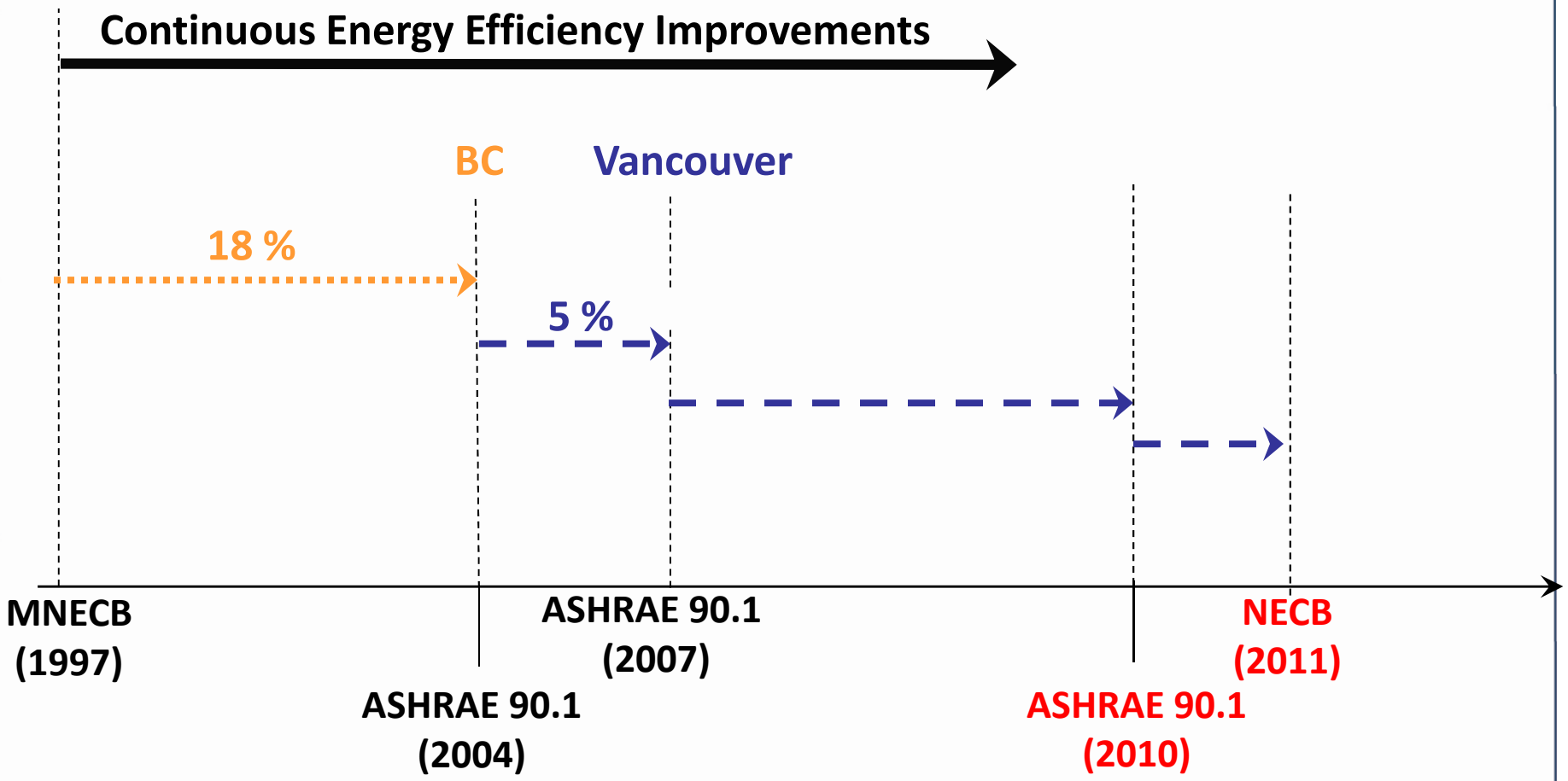
- First published in 1997
- Currently being updated - supported by NRCan and National Research Council of Canada (NRC) under the sponsorship of the Canadian Commission on Building and Fire Codes (CCBFC);
- Will be published as the first time in an objective-base format;
- Not an economic code - e.g., it will be fuel neutral;
- Anticipated release date in late 2011
- NECB – National Energy Code for Buildings

Comparison Chart – Building Codes



Note: Chart is not to scale

ASHRAE/IESNA 90.1-2007

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- Prescriptive Requirements:
  - Lighting Power Density (LPD) given for:
    - → Building Area Method
    - → Space-By-Space Method
- Mandatory Provisions
  - Use of automatic control devices
    - → Automatic Lighting Shutoff
  - Space Control
    - → Manual
    - → Automatic
  - Additional Control
    - → Manual
    - → Automatic

NECB – Part Lighting

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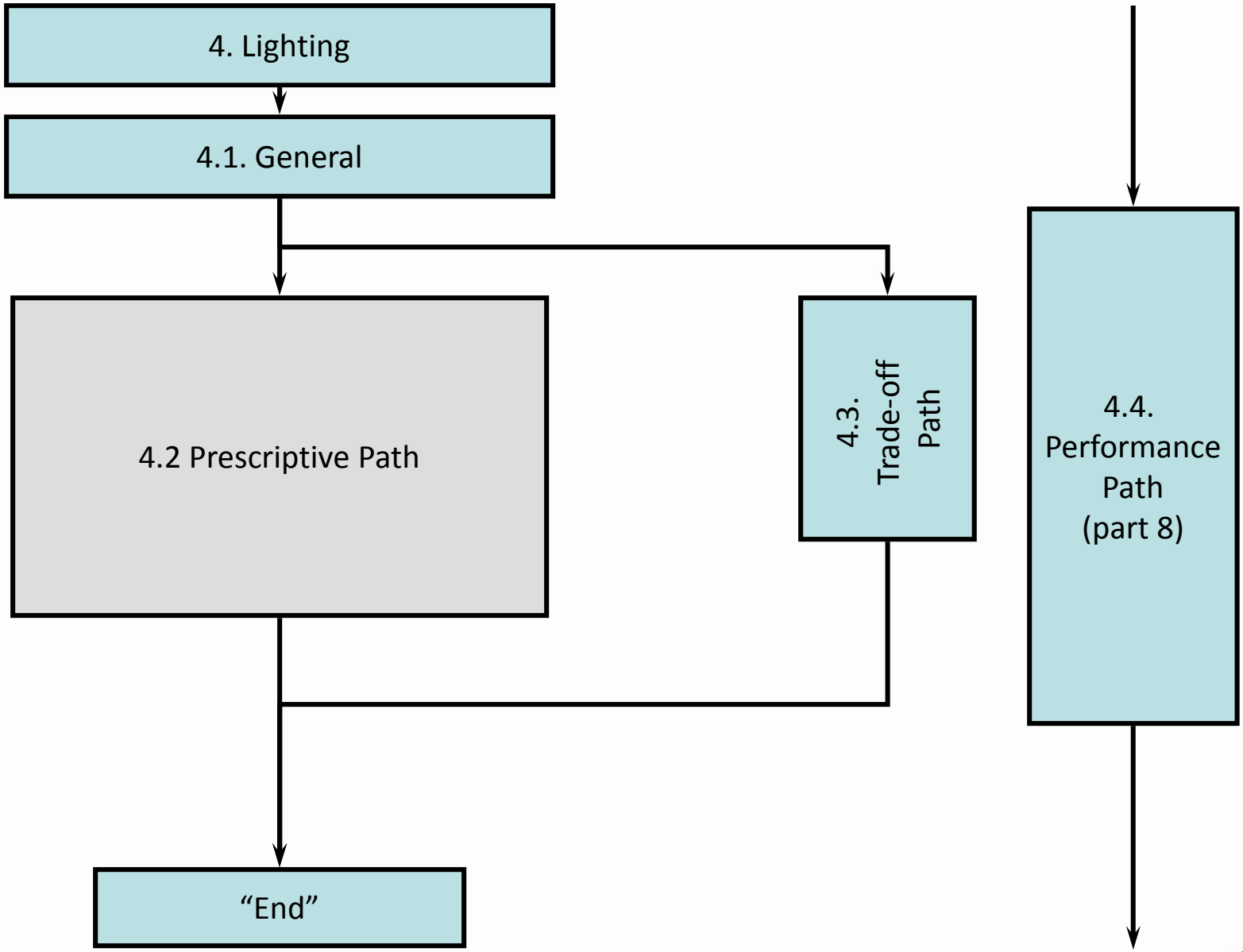
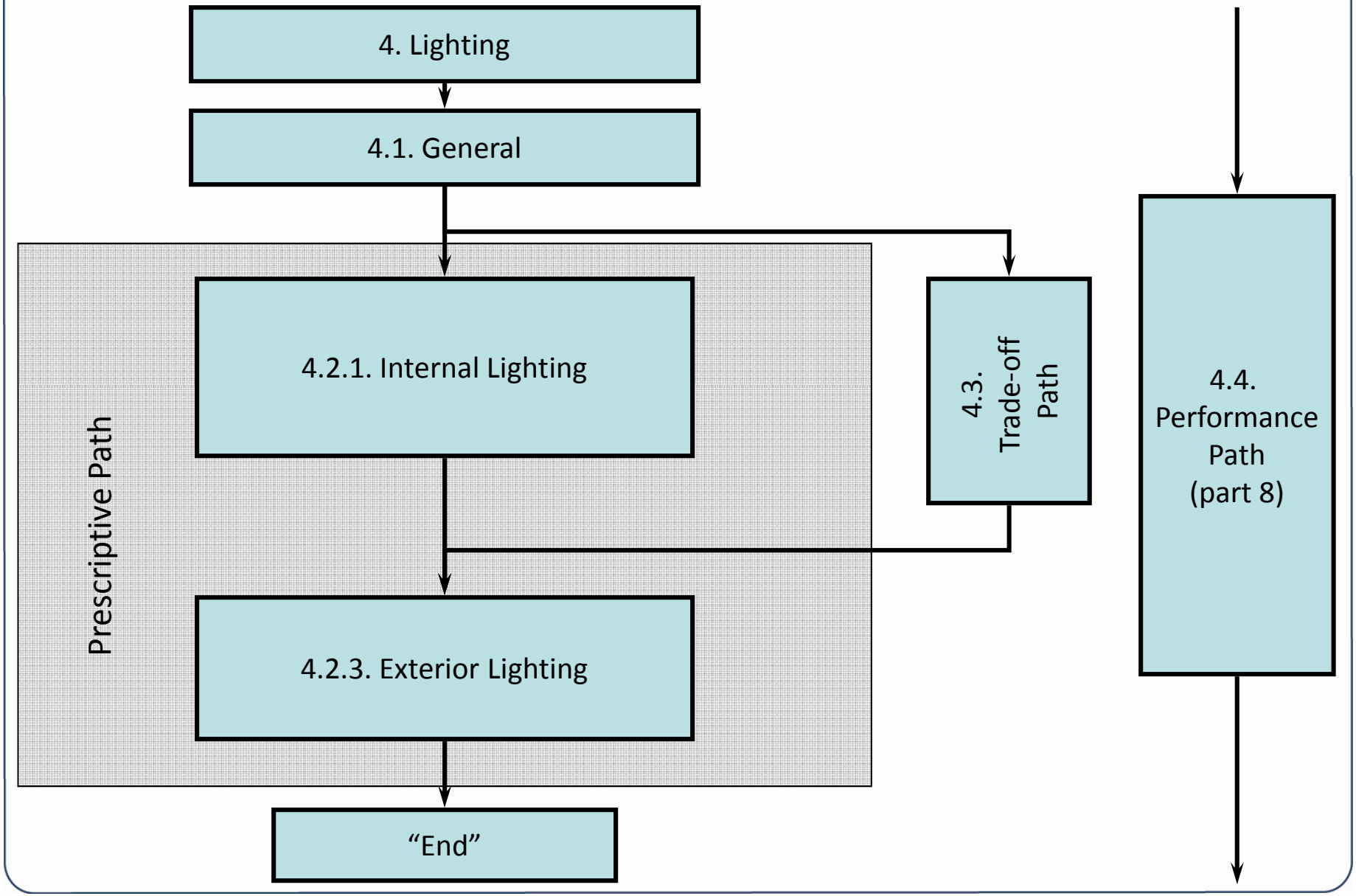
- Update the Lighting Power Density table to reflect advancement in lighting technologies
- Incorporate more daylight dimming/controls for additional energy savings;
- Two compliance paths within the part:
  - Prescriptive Path
    based on the proposed ASHRAE/IESNA Standard 90.1-2010
  - Trade-off Path
    based on DIN 18599-4

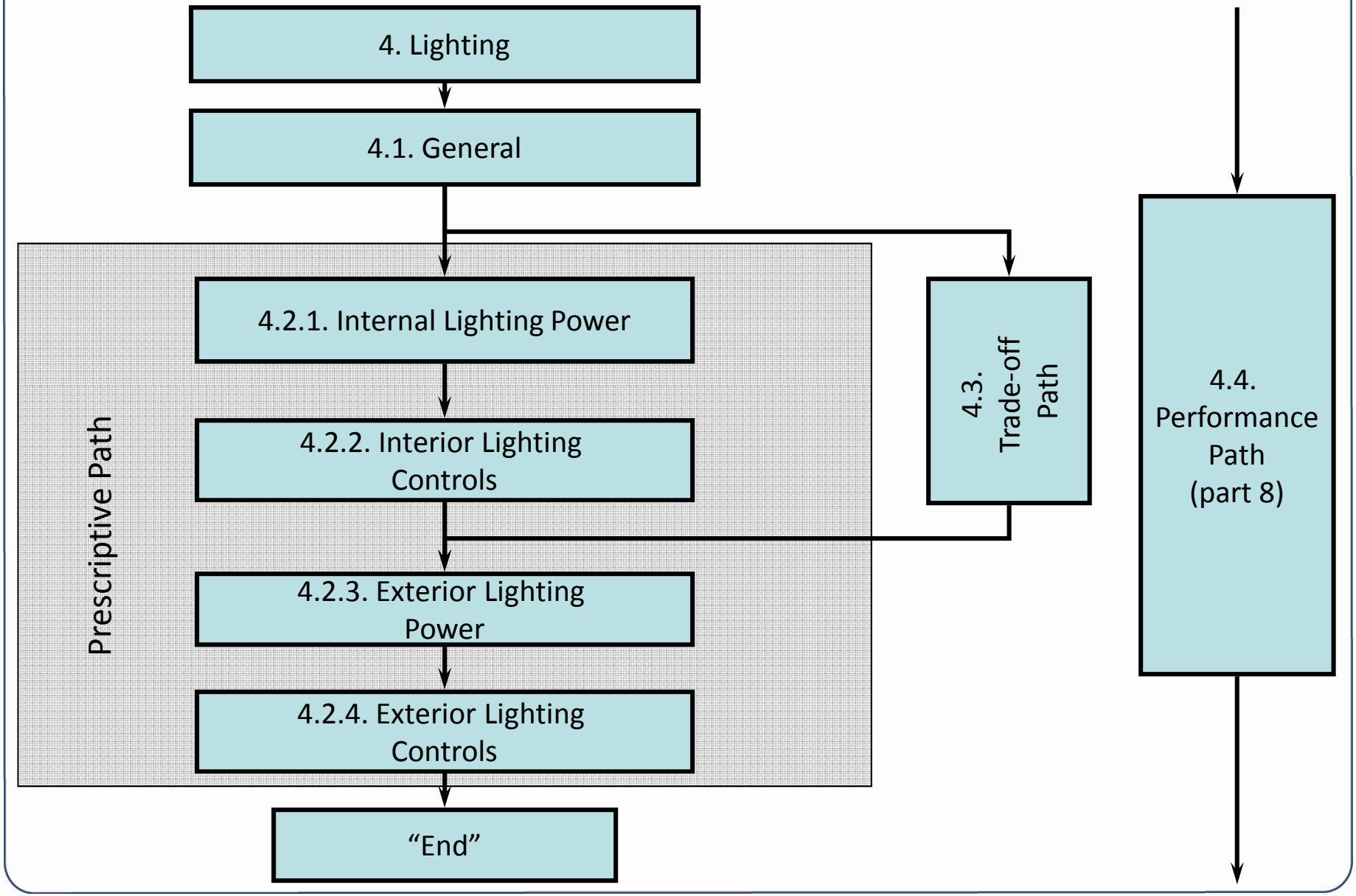
NECB – Lighting Compliance Paths



NECB – Lighting Compliance Paths



NECB – Lighting Compliance Paths



NECB – Lighting Compliance Paths

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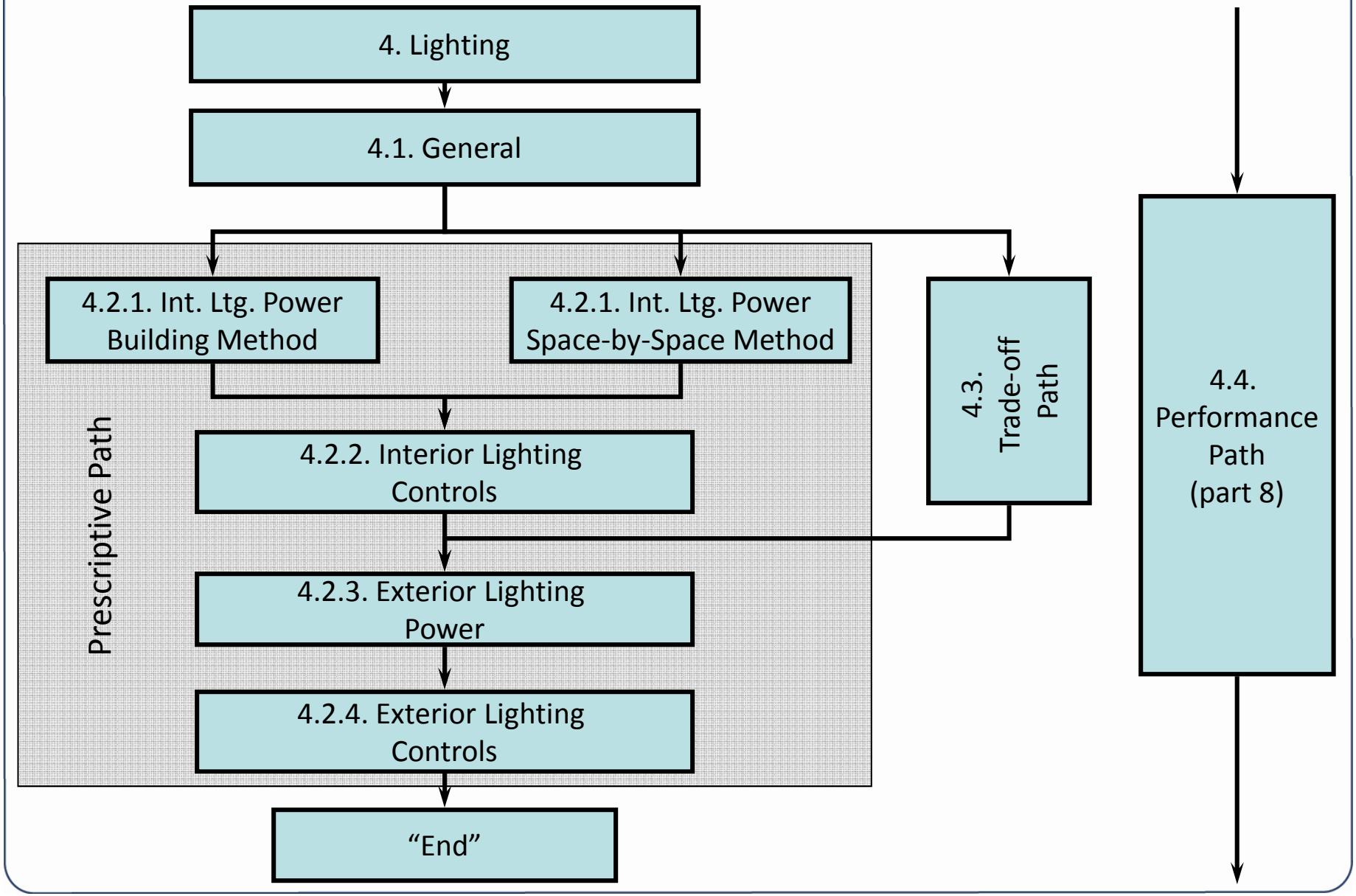

The Prescriptive Path in ASHRAE 90.1-2010 and NECB

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Main Differences:

- No RCR adders/modifiers in NECB
- Slight differences in LPDs
- Adjustments in wording

Common:

- All “calculations” are based on power

Energy Computation

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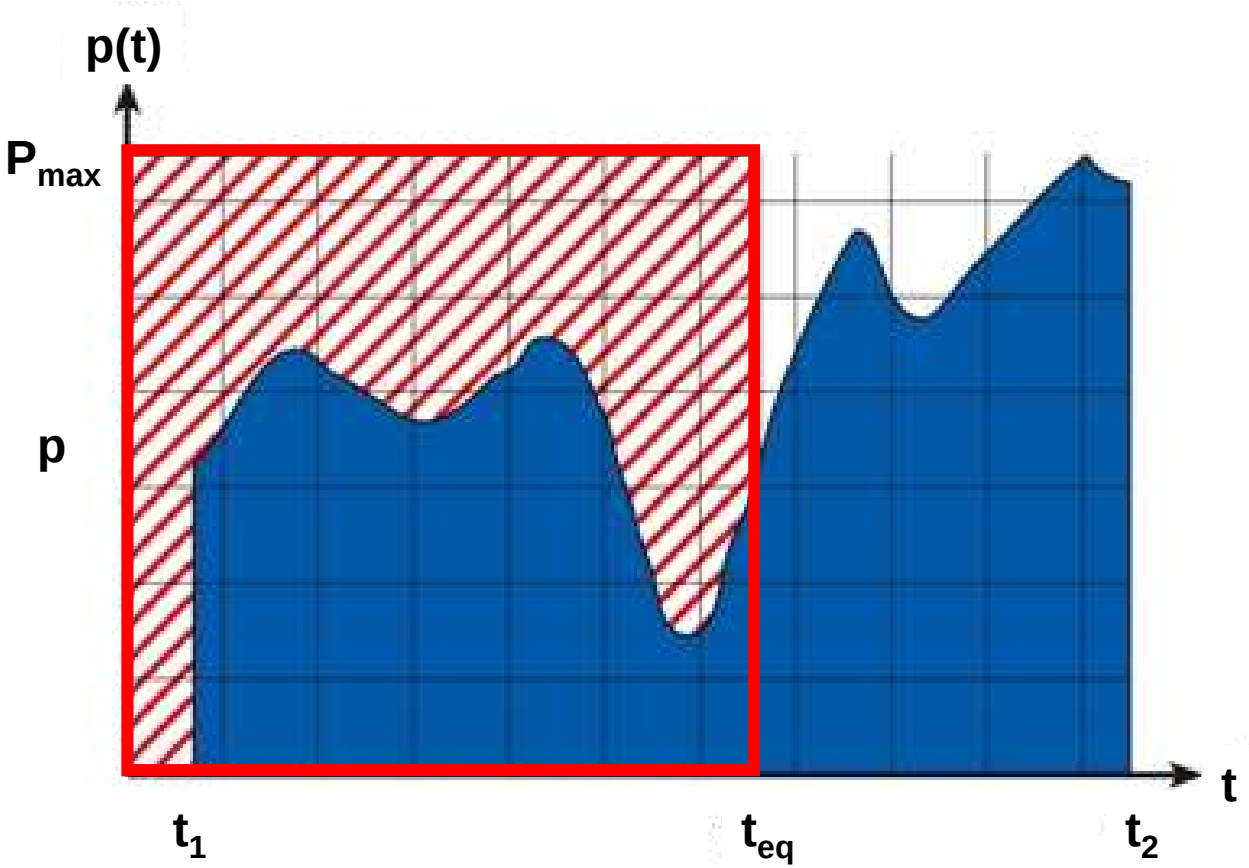
$$Q_{light} = \int_{t_1}^{t_2} P(t) \cdot dt$$

$$Q_{light} = P_{\max} \cdot t_{eff}$$



Flowchart Trade-off Compliance Path

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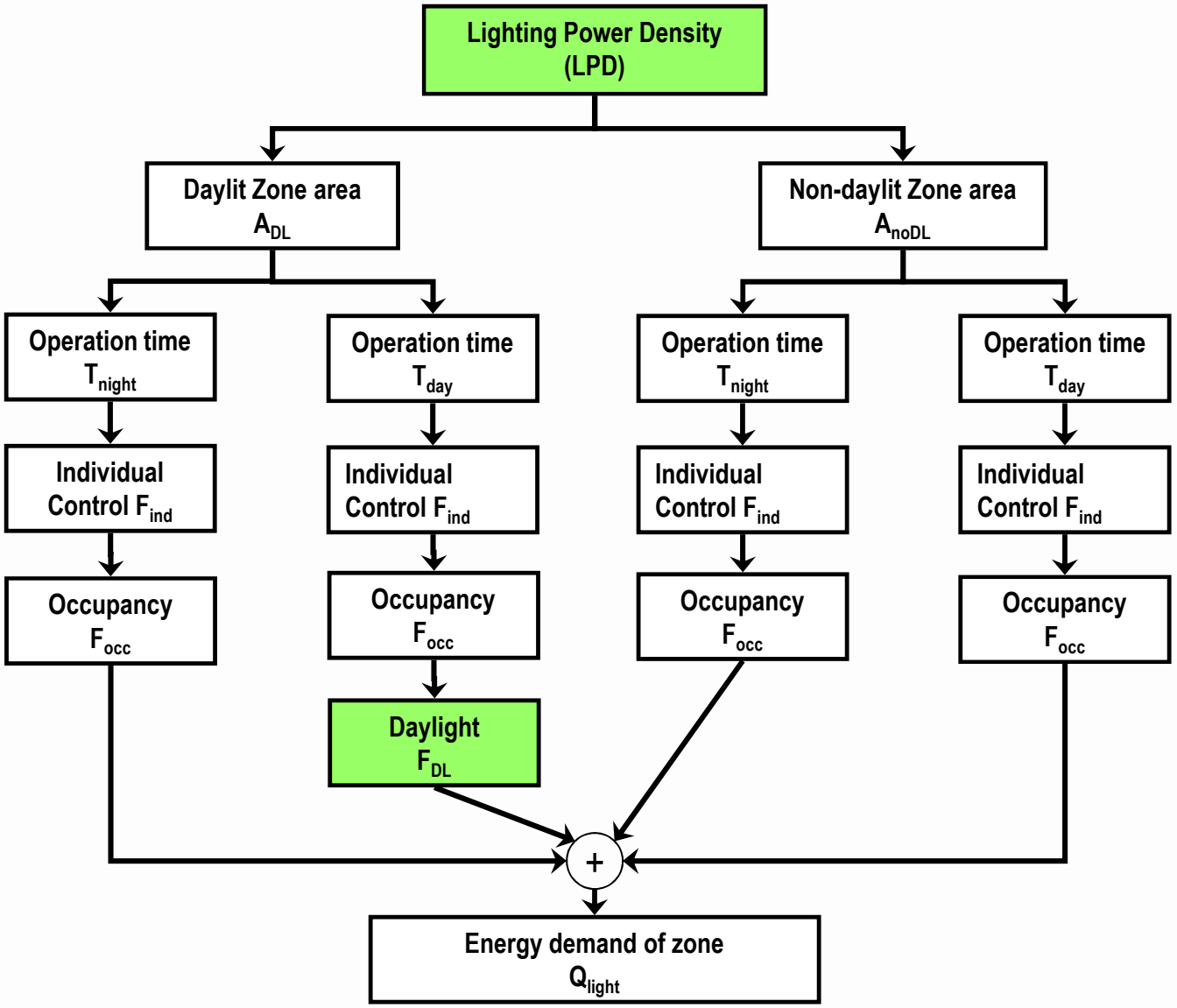
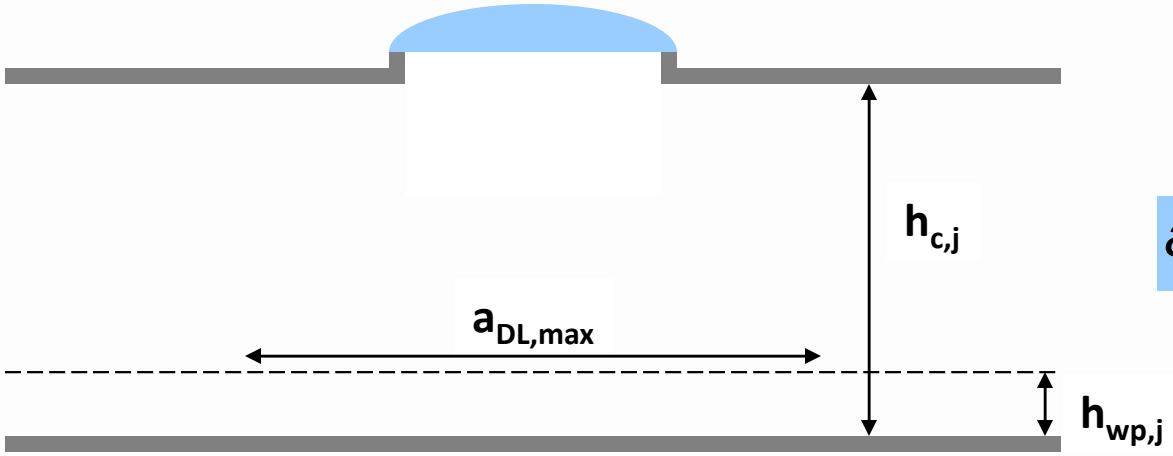
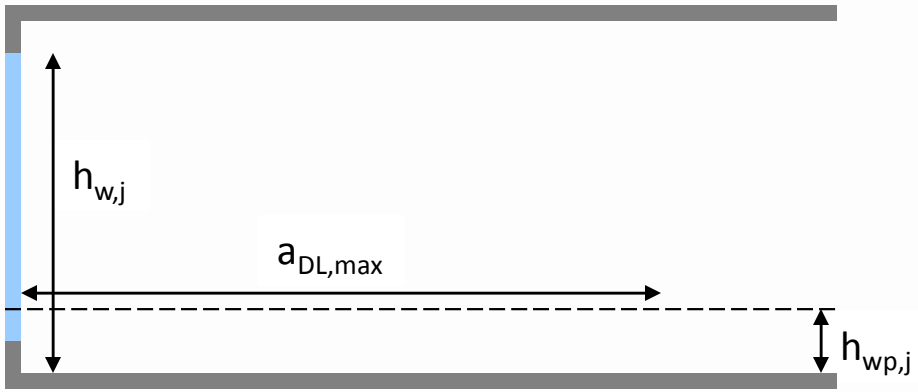


Daylit zones



$$a_{DL,\max} = 2 \cdot \left(h_{c,j} - h_{wp,j}\right)$$



$$a_{DL,\max} = 2.5 \cdot \left(h_{w,j} - h_{wp,j}\right)$$

Daylighting performance data developed with the help of Shuaul Qamar and Dr.-Ing. Jan de Boer

Lighting Trade-off Path

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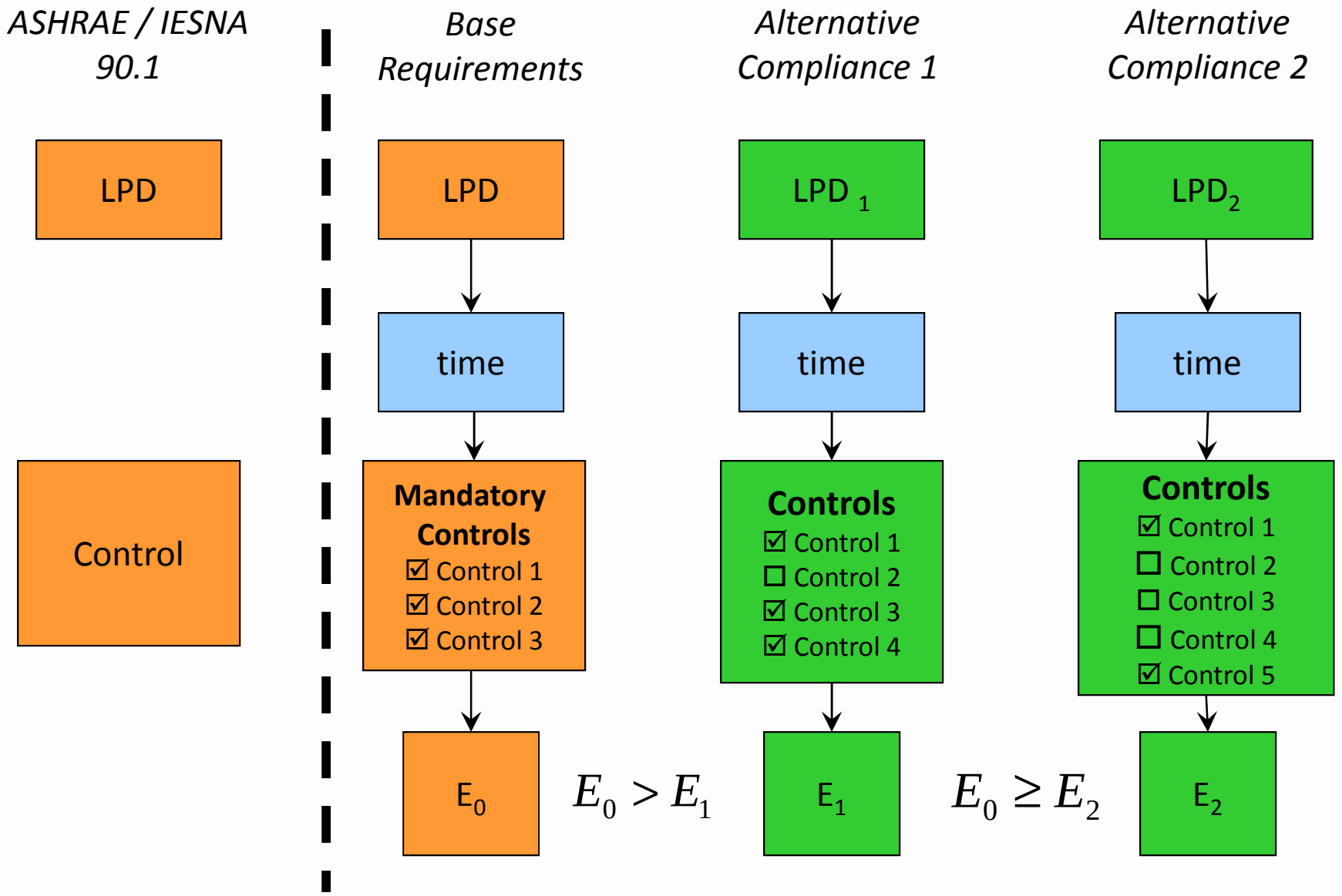

Public Review Process

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A public review is taking place this fall to provide Canadians with an opportunity to participate in updating the technical content of the National Energy Code of Canada for Buildings (NECB) and shaping it into an objective-based format, where every technical requirement achieves one or more of that code's stated objectives and functional statements. This is the same format now used for Canada's other National Model Construction Codes.

The Canadian Commission on Building and Fire Codes (CCBFC) is holding this review to seek your comments on a new objective, functional statements, and proposed technical changes for the revised NECB, scheduled to be published in 2011. The NECB 2011 will offer intent and application statements as well as objectives and functional statements for all technical requirements.

The public review will run from October 4 to November 26, 2010 on the National Codes website (**www.nationalcodes.ca**). An explanation of the proposed changes, as well as instructions on how to submit comments, will be provided.

If you are interested in receiving more information, please contact Anne Gribbon, Secretary to the CCBFC, at 613-993-5569 or email **anne.gribbon@nrc-cnrc.gc.ca**.

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Important Notices

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