GUIDELINES FOR THE DHBC FAÇADE LIGHTING PROGRAM

The Rookery Building, Chicago, US.
Source: LIGHT FOR FAÇADES AND ARCHITECTURE, Zumtobel Co.

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01 INTRODUCTION

The Downtown Halifax Business Commission (DHBC) administers a grant program to encourage building owners and DHBC members in the Halifax downtown business area to add lighting improvements to their property exteriors. The intent of this report is to develop guidelines for the lighting of building exteriors for building owners and lighting professionals, and to establish criteria for review of lighting grant applications to the DHBC.

The presented guidelines are intended to be complimentary of existing regulations and laws governing the design and construction of buildings and urban environments. Adherence to these guidelines does not imply conformance with all governing laws, codes, regulations or bylaws which remains the responsibility of the grant applicant.

02 PROJECT LOCATION AND CONTEXT

The guidelines will apply to the area of downtown Halifax defined as the geographic area of concern of the DHBC, namely the area of the original founding Halifax city grid and lands extending south to include Pier 24, and westward to include the southern end of Barrington Street. This area includes the central business district for the city, the Barrington Street Heritage District, and the currently proposed South Suburb Heritage District, and much of the early 20th century seaport point-of-entry developments that characterize the publicly accessible south waterfront. These areas contain many of the earliest and contiguous heritage buildings and streetscapes, with a majority of buildings being urban in character and design. Given this context these guidelines will specifically address issues related to heritage properties and other buildings of an urban nature. Issues related to parking lot lighting, recreational lighting, landscape lighting, security lighting, and sidewalk lighting, are not specifically addressed by these guidelines.

While these guidelines are intended to apply to all buildings, they do not pretend to address all particular issues that may arise in lighting of particular buildings. They are guidelines to be interpreted rather than hard fast rules.

03 EXISTING REGULATIONS

The following list notes some existing regulations that may apply to the design or approval of exterior façade lighting.

1. Nova Scotia Building Code (NSBC)

2. National Building Code of Canada (NBCC)
3. Canadian Electrical Code (CEC), or CSA C22.1
4. National Fire Code of Canada (NFCC)
5. National Energy Code of Canada for Buildings (NECB)

   The NECB currently governs the energy performance for new construction. Exterior lighting governed under basic allowance under the Lighting Prescriptive path. Places restrictions on the amount of lighting applied to the exterior of new buildings.
6. Downtown Halifax Land use By-law, Schedule S-1: Design Manual

   Refer to 3.5.4 lighting, p 25. Attached as Appendix B.

04 WHY LIGHT BUILDINGS

Selective lighting of buildings can bring after-dark emphasis to the best design features and characteristics of our urban places and in turn, promote an active and lively evening civic life on our streets. An active after-dark streetscape encourages opportunities for business and increases the safety of our streets.

Selective lighting can re-inforce the particular underlying features that make a noted building special, directing the eye to the points that matter and away from those that do not. It can bring the attention to the most discrete detail, re-enforce common rhythms in streetscapes, and create larger, orienting landmarks within the nocturnal city.

05 GENERAL LIGHTING ISSUES

There are several general issues around urban lighting that designers should address. The following is a list of issues with recommendations for each item.

SKY GLOW / URBAN DARK SKY

Our cities are increasingly over-lit with implications for human health, animal behaviour, and our cultural connection to the night sky. In general terms this means we should be measured and considerate with any new exterior lighting. Buildings should not be lit for the sake of lighting them. If lighting does not bring obvious benefit it should not be done.

Recommendations:

- Do not over-light. All fixtures should be dimmable to control lighting levels. Lighting designs should be limited to the amount and placement of lighting that meets the desired effect.
- Select down lighting over up-lighting where either option is equal.
- Do not direct lighting into the night sky. Use cut off devices to control light direction.
- Use timers. Do not light all night or through daylight hours.
- Understand more lighting does not mean more safety, or less crime. LEED designers should note that EC 5.1 through 5.3 require some of these recommendations.

OVER-LIGHTING

Over lighting can occur in absolute turns when places are lit beyond that which is required to make the intended observations or effect. It also occurs when one place or objects are lit at significantly higher levels than those around it, with the resulting contrast making the lesser lit area less attractive. Over-lighting can lead to cases of one-up-manship, best understood by driving by an area of car dealerships at night.

Recommendations:

- Avoid high contrast with neighbouring properties.
- Illuminance levels should not be more than 3x those of neighbouring, sufficiently lit properties.

LIGHTING TRESPASS

Light trespass is light that shines on public or adjacent properties, or on internal private residences. Lighting should be controlled to respect the property lines of the site.

Recommendations:

- Do not shine lighting across property lines, including street frontages.
- Restrict the increase in ambient lighting at the property line to 1 lux[1].
- Use shielded fixtures.
- Do not shine lighting into residential windows.

[1] Best Practices for effective lighting, City of Toronto, 2017. P.43

COLOUR RENDITION AND LIGHTING

People rely on good colour rendition to properly interpret and enjoy the world around them. What may seem 'cool' to one person may be disconcerting or disorienting for another. Blue or cool lighting is known to disrupt human sleep patterns.

Recommendations:

- Typically use white lighting in the temperature range of 2700K to 3500K.
- While seasonally or holiday specific coloured lighting may add civic interest, it should generally be avoided in day-to-day use.

GLARE

Glare is the over-loading of the eye with direct bright light. Glare can cause discomfort, difficulty seeing, night-blindness, and obscure lesser lit areas through heightened contrast.

Recommendations:

- Avoid unshielded fixtures. Light only those surfaces you intend to light.
- Avoid horizontally directed lighting.
- Avoid directly lighting pedestrian areas with unshielded or lensed spot lighting.

THE ENVIRONMENTAL COST OF LIGHTING

The power required to manufacture and run lighting fixtures has an environmental cost. Owners and designers should be aware of Jevons paradox, where increased technological efficiency leads to increased fixture selection and output.

06 HERITAGE SPECIFIC LIGHTING CONCERNS

There are several questions one should ask before starting a façade lighting design for a heritage building. These questions are addressed here with focus on the heritage aspects of the discussion, but these questions can be equally applied to newer or more contemporary buildings. The first and most important question is, should the building receive additional exterior lighting? The following points will help us answer this question and direct design when the answer is yes.

IS THE CURRENT AMBIENT CIVIC LIGHTING OF THE BUILDING SUFFICIENT TO BRING ATTENTION TO OR HIGHLIGHT THE BUILDING?

If the answer to this question is yes, or one is unsure as to why the building requires additional lighting, then do not add additional lighting. At the risk of over-simplification, just because it can be done, doesn't mean it should be done.

WHAT IS THE SOCIAL POSITION AND IMPORTANCE OF THE BUILDING WITHIN THE CITY?

One might divide urban building into two general categories; fabric and monuments. Fabric buildings are the general architectural back drop that directs our day to day lives and which forms the general architectural character of the city. Historically these are the buildings that create continuous street walls and that frame our streets and open spaces. They are the homes, office buildings, stores of our daily lives. The most important question to ask when approaching lighting design for a fabric building is, what if every building was lit this way? *What if everybody did it?* Would it still work, or would the results be absurd? How special is the top of any office tower? Should fabric buildings generate lighting levels or displays that overpower the adjacent sidewalk or neighbours?

Monument buildings are those special buildings that materially represent our city as places of higher civic life; a dominating fort, a city hall, clock towers, important religious buildings, buildings that represent higher learning, or functions of the state. These buildings may be lit in more dramatic ways representing their greater importance in the city.

Is the line between these two building groups always clear? No. But, if consensus as to its type is not readily achievable, then the building is the former and not the later.

WHAT IS THE UNDERLYING HERITAGE VALUE OF THE BUILDING AND WHAT ARE THE HERITAGE DEFINING CHARACTERISTICS OF THE BUILDING THAT CARRY THAT VALUE?

For registered heritage buildings these values and characteristics are often explicitly defined and listed within the heritage registration of the building. Registration statements can usually be provided by the Municipal Heritage department, or through the National heritage register website[2].

[2] https://www.historicplaces.ca/en/pages/epub.aspx

Only by understanding the protected qualities and elements of a heritage building can one determine whether the proposed lighting is in keeping with the building.

WHAT IS THE UNDERLYING CONSERVATION APPROACH THAT HAS OR SHOULD BE APPLIED TO THE BUILDING?

Work to heritage buildings in Halifax is regulated through the Nova Scotia Heritage Property Act[3]. HRM administers the Act through its Heritage Design Guidelines which reference Parks Canada's *The Standards & Guidelines for the Conservation of Historic Places in Canada*.[4] This guideline establishes three principle types of conservation as Preservation, Rehabilitation and Restoration, with additional guidelines for the latter two types. Determining the conservation approach to the building will help direct the lighting strategy for the building.

Lighting design and work should be understood as considered through the relevant guidelines from the Standards. These standards are listed here:

General Standards for Preservation, Rehabilitation and Restoration

1. Conserve the *heritage value* of an *historic place*. Do not remove, replace or substantially alter its intact or repairable *character defining elements*. Do not move a part of an historic place if its current location is a character-defining element.

2. Conserve changes to an *historic place* that, over time, have become *character-defining elements* in their own right.

3. Conserve *heritage value* by adopting an approach calling for *minimal intervention*.

4. Recognize each *historic place* as a physical record of its time, place and use. Do not create a false sense of historical development by adding elements from other historic places or other properties, or by combining features of the same property that never coexisted.

5. Find a use for an *historic place* that requires minimal or no change to its *character-defining elements*.

6. Protect and, if necessary, stabilize an *historic place* until any subsequent *intervention* is undertaken. Protect and preserve archaeological resources in place. Where there is potential for disturbing archaeological resources, take mitigation measures to limit damage and loss of information.

[3] https://nslegislature.ca/sites/default/files/legc/statutes/heritage.htm

[4] https://www.historicplaces.ca/en/pages/standards-normes.aspx

7. Evaluate the existing condition of *character-defining elements* to determine the appropriate *intervention* needed. Use the gentlest means possible for any intervention. Respect *heritage value* when undertaking an intervention.

8. Maintain *character-defining elements* on an ongoing basis. Repair character-defining elements by reinforcing their materials using recognized conservation methods. Replace in kind any extensively deteriorated or missing parts of character-defining elements, where there are surviving *prototypes*.

9. Make any *intervention* needed to preserve *character-defining elements* physically and visually compatible with the *historic place* and identifiable on close inspection. Document any intervention for future reference.

Additional Standards Relating to Rehabilitation

10. Repair rather than replace *character-defining elements*. Where character-defining elements are too severely deteriorated to repair, and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements. Where there is insufficient physical evidence, make the form, material and detailing of the new elements compatible with the character of the *historic place*.

11. Conserve the *heritage value* and *character-defining elements* when creating any new additions to an *historic place* or any related new construction. Make the new work physically and visually compatible with, subordinate to and distinguishable from the historic place.

12. Create any new additions or related new construction so that the essential form and integrity of an *historic place* will not be impaired if the new work is removed in the future.

Additional Standards Relating to Restoration

13. Repair rather than replace *character-defining elements* from the *restoration* period. Where character-defining elements are too severely deteriorated to repair and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements.

14. Replace missing features from the *restoration* period with new features whose forms, materials and detailing are based on sufficient physical, documentary and/or oral evidence.

The Parks Canada document also contains a guideline specific to mechanical and electrical systems. 4.3.9 *Mechanical and Electrical Systems*. While this guideline does not specifically address facade lighting, it should be understood particularly in relation to electrical components that form part of the heritage character of the property.

How Does Lighting Related to the standards and Guidelines?

When reviewing the standards and guidelines when considering adding new lighting to a building one should note ideas such as *maintain, minimal intervention, protection, evidence, in-keeping-with,* and *integrity*. What do these mean to lighting?

First, determine whether the lighting forms part of the value and character of the building. Are the lighting fixtures or locations part of the original design or of an important later addition or intervention? If they are, then the work will be governed by the Preservation standards, or possibly up to the Restoration standards. If so, these works may require the maintenance of the existing lighting fixtures, placements and lighting design. New fixtures replacing older lost fixtures must be based on surviving evidence. Care should be exercised in selecting a 'new historical' fixture, such that the design is in keeping with the building, but discernable as a later addition or change to a knowledgeable person. Generally, this would exclude taking a salvage 'heritage fixture' and applying it to the building, if it was not in keeping with the style of the building. If a 'contemporary' fixture is chosen, it should generally meet the stylistic characteristics of the building, but in a manner that is "physically and visually compatible with, subordinate to and distinguishable from the historic place".

Where new lighting is added to a heritage building that is not part of historical fabric of the building, the work generally falls under the category of *rehabilitation* as a later addition. The new lighting fixtures should align with the "physically and visually compatible with, subordinate to and distinguishable from" requirement. This is to say that the fixtures themselves or their lighting patterns should not compete with the heritage features.

Fixtures:

- Make generally discernable as modern interventions where not original to the building.
- Where not original, chose the smallest fixture possible, and hide where possible.
- Provide electrical services as through-wall where possible or run in true-aligned rigid conduit painted to match the building, where surface mounting is un-avoidable.
- Secure in a manner so as to not damage the fabric of the building. Water ingress is to be prevented. Avoid securing to top faces of building projections, flashings, and sills. Anchors

should be located in masonry joints rather than within the faces of stones. Securing to intricate detailing should be avoided as should imposing significant point loads onto a building element.

- Install in such a way that the work can be removed at a later date without damage to the building.
- Do not remove historical elements of the building for the lighting.
- Choose locations that are accessible and can be maintained.

LIGHTING DESIGN:

- Constrain lighting to accentuate the character defining features of the building such as the rhythm of windows, doors or columns, or of important detailing or features. Emphasize the pattern and rhythm of elements, rather than the uniform lighting an entire facade.
- Do not cast large shadows across the building that obscure important features or entire portions of a façade that are intended to be generally lit. This requires care in fixture placement in relation to features that project from the general plane of the building.
- Do not use coloured lighting unless accentuating a colour feature of the building, or for seasonal celebration.
- Do not extend lighting beyond the building, or element of the building that is to be lit, either to the night sky or to adjoining properties.
- Do not create shadows or contrasts that would cause hazards when moving around the building.
- Do not choose lighting work over general maintenance. Areas of buildings to be lit should be in good repair. Lighting damaged portions of a building only heightens the negative effect of poor maintenance.
- Lighting intensity should consider general reflectivity of the building.
- Utilize mock ups where possible.
- Use coordinated controls for designs with multiple fixtures to enable uniform setting of lighting levels. Utilize ‘smart’ or blue-tooth enables fixtures where possible.
- Consider fixture placement, its physical relation to the elements it is lighting, and the lighting intensities and directional properties of the fixtures.
- Give preference to more, smaller fixtures over fewer, larger fixtures. This can be applied even when spot-lighting important features or civic buildings.
- Façade Lighting should not form part of a larger marketing strategy or advertising. Lighting needs comply with applicable signage by-laws.

- Consider use of interior lighting to accentuate regular window patterning where building occupancy permits, such as the lighting of the Grafton Street Catholic Diocese building (without the colour).

07 EXAMPLES

The Following images are not intended to be definitive, but instead show good examples for dealing with a particular façade type. Multiple solutions may work for the same façade depending on particular design. Note that many of the shown solutions include up-lighting which generally improves detail and element lighting in the examples shown, as well as limiting ground shadows, and direct glare. As up-lighting is generally understood to exacerbate night sky glow, the designer should take care in fixture placement, luminaire selection, and fixture shielding to limit contributions to light pollution when up-lighting.

FAÇADE Type: Flat surfaced facades, with regular window patterning.

Solution: Cylindrical type fixtures centered between window bays. Vertically centered within the field or aligned with windows for up/down lighting.

1740 Argyle Street

Façade lighting accents window bay spacing while lighting decorative eaves and outlining the texture of the shingle cladding. Generally narrow beam width. No visible wiring. Solution would

work for upper residential use. Historic-style lighting denotes entry. Note need for bulb replacement.

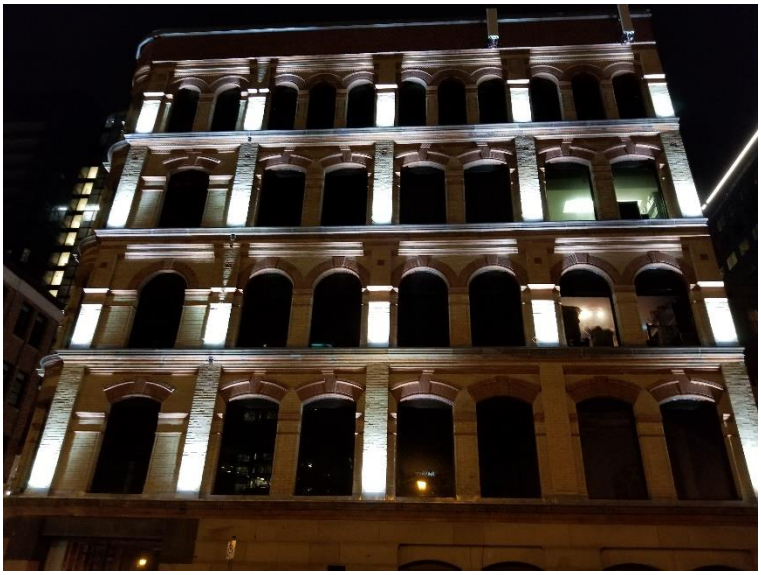
FAÇADE Type: Flat facade, with regular window patterning and horizontal accent bands.
Solution: Cylindrical type fixtures centered between window bays. Vertically centered within the field or aligned with windows for up/down lighting.

1673 Barrington Street

Up-lighting positioned between windows is located off of the façade sufficient to avoid strong shadowing from the continuous arched eyebrow moldings while uniformly lighting the light-coloured façade and decorative eave bracketing. This solution is largely made possible by the strong delineation between storefront and upper façade. The fixture location just above sign band keeps

majority of the upper façade free of lighting fixtures and re-enforces the two distinct halves of the façade. Storefront lighting is limited to interior lighting. Entries and sign band could be better lit.

FAÇADE Type: arcaded facade, with regular window patterning and horizontal bands.
Solution : Up-lighting fixtures centered on columns forming the principle bays of the elevation.



1684 Barrington Street

Lighting re-enforces the horizontal rhythm of the main divisions of the façade, while also illuminating the strong horizontal banding at each floor level. Strong shadow at the roof line keeps attention away from area of removed parapet detailing. Lighting generally avoids lighting interiors.

Additional similar, yet dimmer, lighting of the minor piers would improve design and lessen shadowing of principle piers between capitals and entablatures and would allow for lessening of overall lighting intensity to reduce hot-spots. Note how on the second row of piers from the left, lighting highlights masonry not repaired where penetrating piping has been removed.

1684 Barrington Street

The coloured holiday lighting is a cautionary tale about strong foreboding shadows, Chicago styling, and red lighting. One believes the desired result was intended to be ‘Christmas’ but it did not achieve the desired effect.

Similar to the first example this façade has an arcaded pattern, with strong vertical emphasis re-enforced by up-lighting at the base of each pier. The façade acknowledges the division between upper façade and storefront, with heritage style lighting gracing the lower level.

Note that the pier capitals cast the spring-points of their supported arches into heavy shadow due to the extent of projection of the capitals and the angle and distance of the lighting. Lesser lighting over the capitals would have removed this shadow and allowed the full legibility of the arches.

Additional minor lighting at the sill level of the upper floor would have removed its shadow and completed the lighting of the decorative eave.

While the preceding examples are generally successful, they both reinforce the notion that more lights, of lesser intensity, provide improved results. Refer again to the cover photo and to a photo of the same building below.

The Rookery Building, Chicago, US.
Source: LIGHT FOR FAÇADES AND ARCHITECTURE, Zumtobel Co.

Here we have the same arcaded façades with horizontal banding. The lighting has been subtlety located just to the inside of the piers, lighting the rounded sides of the piers with luminaries at each floor level evenly lighting the entablature banding within and above the arches. The top floor has also been intentionally lit with interior fixtures to create a lantern effect.

FAÇADE Type: The dominate store-front

Recommended Solution: Bring emphasis to open storefront and sign-band and signage.

1662 Barrington Street

The above solution has been included as an example that facades need not be lit in their entirety to be successful. Here the focus has been placed on the public storefront, with lower glazing lit with decorative string lighting and with the internal lighting of the establishment. The sign band is well lit as is the hung sign board. The focus is clearly on the liveliness of the principle tenant. Note the quality of the top parapet and the dominance of the glazing of the upper floors. Is lighting of the upper floors achievable? Likely. Would it add or detract from the focus on the storefront? Some sense of internal lighting on the upper floor would eliminate the need. Sign board lighting fixture could be shielded for glare.

APPENDICES:

Appendix A: Known Lighting Design Resources
Appendix B: Downtown Halifax Land use By-law, Schedule S-1: Design Manual, 3.5.4 lighting, p 25.

References:

Best Practices for effective lighting, City of Toronto, 2017.
https://www.toronto.ca/wp-content/.../8ff6-city-planning-bird-effective-lighting.pdf

External Lighting for Historic Buildings, Historic England, 2007
https://historicengland.org.uk/images-books/publications/external-lighting-for-historic-buildings/

Exterior Lighting Design
http://www.buildingconservation.com/articles/exterior-lighting-design/exterior-lighting-design.htm

HRM Registry of Heritage Properties
https://www.halifax.ca/media/64029

The Standards & Guidelines for the Conservation of Historic Places in Canada
https://www.historicplaces.ca/en/pages/standards-normes.aspx

Parks Canada Register
https://www.historicplaces.ca/en/pages/epub.aspx

Upgrading Lighting in Historic Buildings, Caroline Alderson, GSA
https://www.gsa.gov/cdnstatic/TechnicalGuideLightingFINAL2.pdf

Some aspects of architectural lighting of historical buildings, M. Górczewska, Poznan University of Technology, Institute of Electrical and Electronics Engineering, Poland
https://www.witpress.com/Secure/elibrary/papers/LIGHT11/LIGHT11010FU1.pdf

LIGHT FOR FAÇADES AND ARCHITECTURE, Zumtobel Co.
https://www.zumtobel.com/PDB/Ressource/.../AWB_Fassade_und_Architektur.pdf

Illuminating the Future: How Bluetooth Mesh will Fundamentally Change Lighting Systems
https://www.archdaily.com/912394/illuminating-the-future-how-bluetooth-mesh-will-fundamentally-change-lighting-systems

Appendix A: Known Lighting Design Resources

The following is a short list of lighting designers and suppliers known to provide lighting design and lighting products in HRM. The list is not definitive, nor recommendation or endorsement of the companies or individuals. Any lighting project should consider involving the design services of an electrical engineer and be performed by a qualified electrician. Where possible, we recommend the employment of separate entities for design and construction.

The Illuminating Engineering Society, IES, is a lighting industry society whose mandate is the promotion of good lighting practice. https://www.ies.org

The IES publishes guidelines for good lighting design including IES RP-33-14 *Lighting for Exterior Environments* as well as the IES HB-10-11 *Lighting Handbook, 10th Edition*.
https://www.ies.org/product/lighting-for-exterior-environments/
https://www.ies.org/product-category/lighting-handbooks/

The IES is represented locally by the IES Halifax Section. The link below contains a roll-call of local members.
https://community.ies.org/membership/communities/community-home?CommunityKey=11c40e61-6f89-4413-a703-504c0987f77c

For a list of electrical engineering firms contact Engineers Nova Scotia
https://engineersnovascotia.ca/

For a list of architectural firms contact The Architects Association of Nova Scotia
https://nsaa.ns.ca/

Lighting Designers and Suppliers:

Ledelco Lighting – Halifax LED Lighting Design 902-292-5331 http://halifaxled.com/

Custom LED. 902-223-0771 http://customled.ca/

Rhyno's Landscaping Inc. 902-865-2468 http ://www.rhynoslandscaping.ca

Graybar Canada (902) 457-8787 https://www.graybarcanada.com/

Marcel Dion Lighting Design, Toronto 647 991 6523 http://www.marceldion.ca/

Martin Conboy Lighting Design (MCLD), Toronto (613)-569-4845 http://www.mcld.ca/

Dramatic lighting highlights architectural detail

3.5.3 Surface Parking

a. Surface lots shall be located out of sight behind buildings or inside city blocks rather than adjacent to streets or at corners.

b. Surface lots shall only be moderate in size (10-20 cars) for the handicapped and visitors, and must include bicycle parking opportunities.

c. Surface parking shall be designed to include internal landscaping or hardscaping on islands at the ends of each parking aisle, clearly marked pedestrian access and paths, lighting and be concealed with landscaped buffers or other mitigating design measures.

d. In addition to landscaping, a variety of hard-scaping materials should be used to add visual texture and reduce apparent parking lot scale. Landscaping should be low maintenance.

3.5.4 Lighting

Night image is an important aspect of the downtown's urban character and form.

a. Attractive landscape and architectural features can be highlighted with spot-lighting or general lighting placement.

b. Consider a variety of lighting opportunities inclusive of street lighting, pedestrian lighting, building up- or down-lighting, internal building lighting, internal and external signage illumination (including street addressing), and decorative or display lighting.

c. Illuminate landmark buildings and elements, such as towers or distinctive roof profiles.

d. Encourage subtle night-lighting of retail display windows.

e. Ensure there is no 'light trespass' onto adjacent residential areas by the use of shielded "full cut-off" fixtures.

f. Lighting shall not create glare for pedestrians or motorists by presenting unshielded lighting elements in view.