

MARCH 24, 2022

# BEAVER CREEK RESORT LIGHTING MODERNIZATION MASTER PLAN



*Beaver Creek*®

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# 1.0 Beaver Creek Resort

## Colorado, USA

Beaver Creek is a family-friendly, world-class luxury resort in one of the most stunning areas of Colorado, boasting nearly one million yearly visitors. Its ski slopes and exceptionally user-friendly amenities make it one of the best resorts in the U.S.

With twenty-four ski lifts and 325 inches of snow each year, skiing at Beaver Creek is among the finest in any resort. By day, it is a beautiful resort surrounded by an awe-inspiring natural environment. At night, the artificial lighting must create a new vibrant nighttime personality with a focus on the architecture, the beautiful resort features and the various retail, restaurant, and entertainment offerings.

Our team was assembled to survey and assess the existing lighting quality throughout the exterior public-facing and common areas of the resort and curate and modernize the lighting quality throughout the resort to elevate the guest experience at night.

This Lighting Modernization Master Plan was created in response to the project's initial site survey findings, extensive guest and comparable resort research, maintenance, and sustainability goals as a guide for all public lighting within the common areas of the resort. Additionally, this plan includes media and interactive elements to further strengthen the illuminated experience at night.

This document aims to propose lighting, media and interactive approaches that will improve illumination, lighting fixtures, aesthetics, wayfinding, safety, and the guest experience overall.

The adoption and implementation of this plan will further enhance the evening experience at Beaver Creek to increase guest satisfaction with the resort and improve and expand upon guest engagement and nighttime involvement with the resort's various retail, restaurant, and entertainment offerings.

This Lighting Modernization Master Plan provides the framework by which the various Beaver Creek stakeholders can use lighting, media, and interactive experiences to achieve their common goal to be the world's best luxury family resort.

## 1.1 PROJECT TEAM



Team Lead, Lighting and Media Design

<https://visualterrain.net/>

Masterplan document prepared by Visual Terrain



System Integrator and Procurement Specialist

<https://www.banditlites.com/>



Interactive and Experiential Design

<https://www.binteractive.com/>

## 1.2 SCOPE OF WORK

There were three (3) initiatives included in the scope of work that led to the creation of this Beaver Creek Lighting Modernization Master Plan:

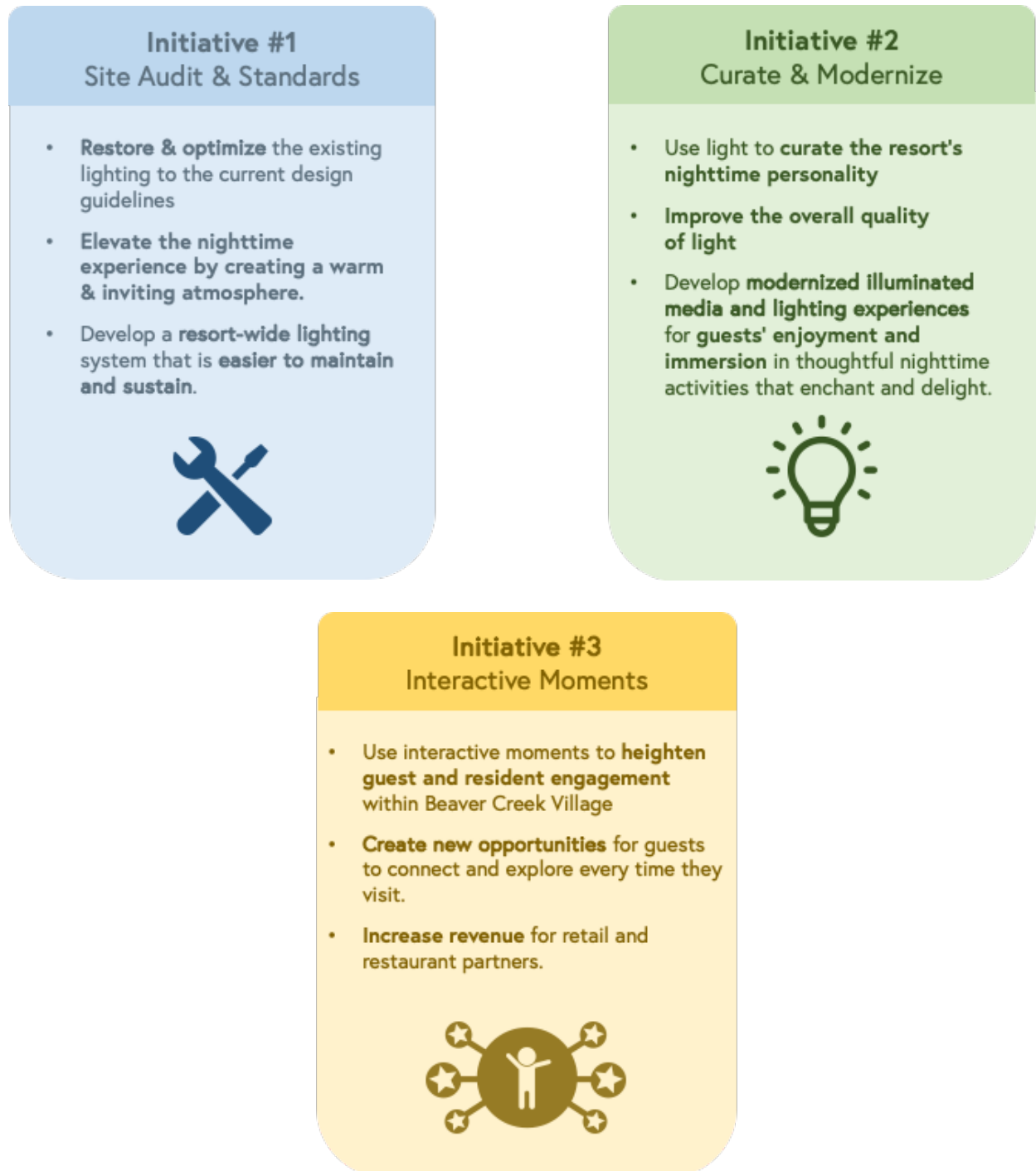


Figure 1.2.1 | Initiative Scopes of Work

## 1.3 AREAS INCLUDED

The project areas were defined in our scope of services and include the following public-facing areas within the Beaver Creek Resort, including but not limited to the areas listed and shown in (Figure 1.3.1):

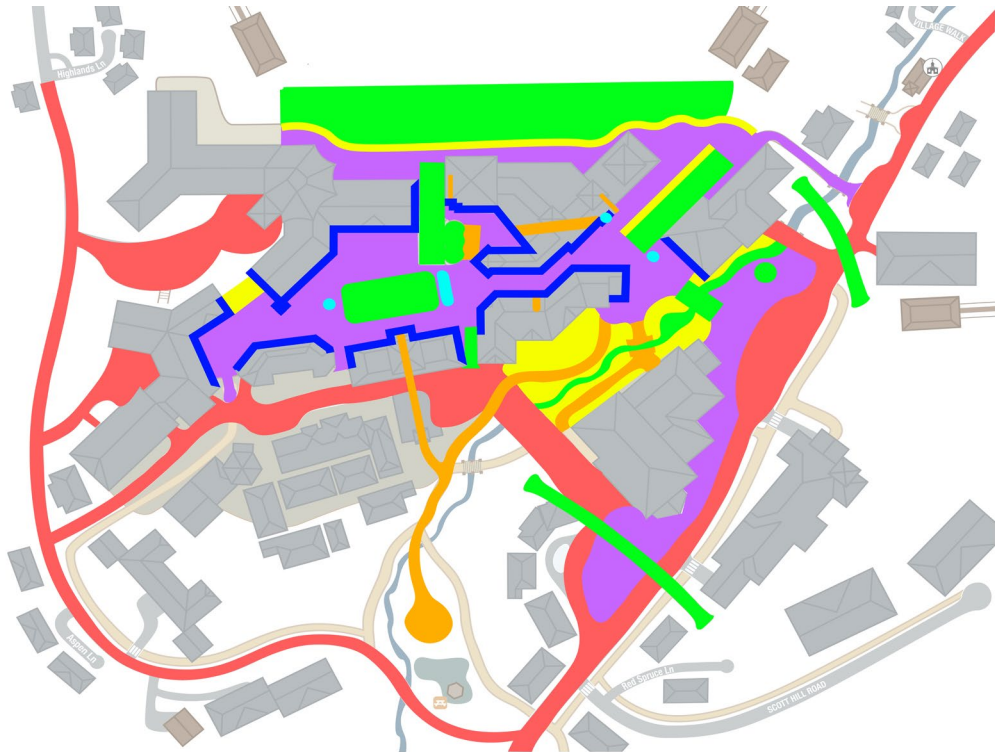


Figure 1.3.1 | Scope of Work Areas

<p><b>Features</b> Destinations and areas of interest <i>Ice Rink – Escalators – Creek – Firepit – Covered Bridge – Waterfall – The Beach – Strawberry Park Skier Bridge – Oxford Way Skier Bridge</i></p>	<p><b>Wonder Art Enhancements</b> <i>Frost Flowers – Reflections – Super G – Snowed In</i></p>
<p><b>Plazas / Public Spaces</b> Larger areas intended for guests to gather</p>	<p><b>Planters &amp; Gardens</b></p>
<p><b>Roadways, Sidewalks, Crosswalks</b> <i>Village Road – Avondale Lane – Offerson Road – Elk Track Road – E. Thomas Place</i></p>	<p><b>Pathways</b> Small areas for guest travel on property</p> <p><b>Building Façade s</b> Facing the Village Center To conform to design guidelines Part of Modernization efforts only</p>



## 1.4 ADDITIONAL AREAS / ELEMENTS OF OPPORTUNITY

Additional areas of opportunity were identified throughout the project including but not limited to the areas listed and shown in (Figure 1.4.1):

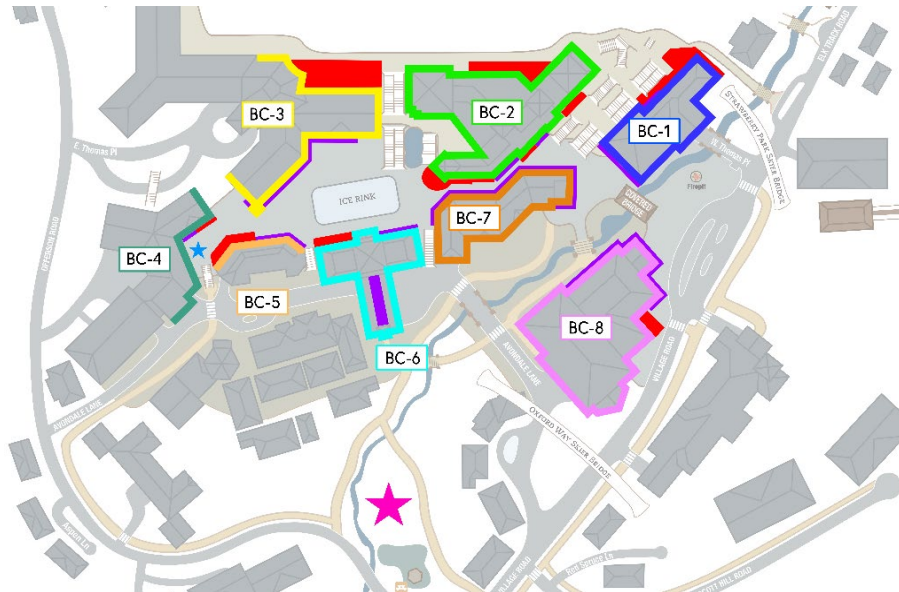


Figure 1.4.1 | Scope of Work Additional Areas

### Storefronts

Avlon Clothing Company – Base Mountain Sports – Beaver Creek Apothecary – Beaver Creek Gear – Beaver Creek Made – Beaver Creek Market & Deli – Beaver Creek Sports – Burton – C Anthony Gallery – Charlie's Resort Wear – Christy Sports – Craniologie – Eye Pieces of Vail – Generation BC – Gib Singleton Gallery – Giovanni Alexander – Gorsuch Ltd. – Horton Fine Art – Karin's – Kjus – Knox Galleries – LIV Sotheby's International Realty – Market Wine & Spirits – Maya Walker Jewels – The North Face – Patagonia – Quinti – Slifer, Smith and Frampton Real Estate – Siempre Viva Clothing – Smartwool – Sportsmen's Gallery & Paderewski Fine Art – Surefoot Ski Boots – Tony Newlin Gallery

### Building Façade s

- BC-1 One Beaver Creek
- BC-2 Village Hall
- BC-3 Park Hyatt
- BC-4 St. James Place
- BC-5 Post Montane
- BC-6 Market Square
- BC-7 Park Plaza
- BC-8 Beaver Creek Village

### Restaurant Patios

8100 Mountainside Bar & Grill – Powder 8 Kitchen & Tap – C Bar – Beaver Creek Chophouse – Vail Mountain Coffee & Tea – Coyote Café – Rimini – Golden Eagle Inn – Hooked – Toscanini – Dusty Boot Roadhouse – The Met Kitchen – Blue Moose Pizza – Alpine & Antlers

### The Playground

### The St. James Water Feature



## THE IMMEDIATE PROJECT GOALS WERE IDENTIFIED AS FOLLOWS:

1. To provide and use illumination that is not only functional, but welcoming, warm, inviting and engaging for the multi-generational guests that come to the resort seeking excellence.
2. Address the current deficiencies & strengthen the guests' connection to the Beaver Creek brand.
3. Increase energy & vibrancy in the village core by identifying opportunities to use lighting, media and interactive experiences to create a compelling nighttime experience that reinforces and enhances the luxury experience that Beaver Creek guests, residents and families expect.

The goals of the project are focused upon the design and implementation of the lighting, media and interactive strategies outlined in This Lighting Modernization Master Plan.

## 2.0 LIGHTING MODERNIZATION

Strategic Vision for the lighting modernization project is as follows; this vision should inform all lighting solutions from this point forward:

- *Transform Beaver Creek Village into a premier nighttime experience & destination.*
- *Cultivate memorable experiences that foster cross-generational togetherness.*
- *Elevate the sense of belonging & attract future generations.*

This Lighting Modernization Master Plan proposes lighting, media, and interactive approaches to help realize the strategic vision by doing the following:

1. Improve and expand the lighting throughout Beaver Creek by establishing functional, sustainable & aesthetic guidelines.
2. Define the role of illumination and quality of light and how it supports and nurtures the guest experience of world's best luxury family resort.
3. Identify building façadelighting opportunities to further energize the Village Core.
4. Improve and expand upon guest and resident engagement throughout Beaver Creek Resort.
5. Provide new opportunities for guests and residents to connect to each other and the Beaver Creek brand as a family.

Adoption and Implementation is easier with this road-map plan that can be followed immediately and for years to come.

The Lighting Modernization Vision has been developed using both the quality of light factors shown in section 4.0 of this document and the foundational principals of place making and experiential design and activation themes shown on the following page.

## FOUNDATIONAL PRINCIPLES OF PLACEMAKING AND EXPERIENTIAL DESIGN:

- Know your audience
- Walk in your guests' shoes
- Organize flow of people and ideas
- Create a visual magnet / anchor / 'Wienie' (A Walt Disney Imagineering Term)
- Activate spaces
- Engage audience / guests
- Provide lots of fun
- Avoid overload
- Fix or remove what is not working
- Keep it up / refresh / don't skimp on maintenance

## ACTIVATION THEMES:



Figure 2.0.1 | Activation Themes

## 3.0 CREATING A VISUAL VOCABULARY

Lighting, media, and interactive elements are all combined in this Lighting Modernization Master Plan to create a visual vocabulary for the resort. This visual vocabulary defines the look and feel of the resort both at night and during the day. Think of it as a set of visual elements that allows the guests, residents, and families to form a deeper connection to the built environment.

In this section we will explore some key lighting design components and how they will apply and inform the Beaver Creek Resort visual vocabulary moving forward. We will also explore media as a new part of the modernization plan and the illuminated landscape and visual experience within the built environment.

## 3.1 LIGHTING LAYERS

Lighting layers are a key idea in the Lighting Modernization Plan. They are a critical component to the look of the resort and the long-term success of the resort's ability to attract future generations. To create a well-lit, balanced and visually interesting environment, lighting designers use layered lighting solutions. These solutions are typically created by multiple lighting types being applied to the lit environment, with each one focused on one of the following illumination layers:

### ***General / Ambient Lighting***

The overall illumination of a space or architectural environment that doesn't focus on a particular task or feature. An example of ambient lighting within Beaver Creek are the lamp posts used for general lighting throughout the Village.

### ***Task Lighting***

Illumination that is used for a specific application or task such as at point-of-sale locations in a retail space or under-bar lighting for the bartender to see their work area in a restaurant. Other examples of task lighting within Beaver Creek are the step lights illuminating staircase treads.

### ***Accent / Feature Lighting***

Illumination used to create visual interest, often to highlight features, set a mood, and draw focus. Some examples of accent lighting within Beaver Creek are the lighting on the Wonder Art Enhancements, colored lighting on the ice-skating rink, and the fountain lighting on the children's fountain.

### ***Interactive Lighting***

Illumination that can respond to guest gestures and movements, creating a new, unexpected layer of playing together, surprise, delight, and moments to make lifelong memories, establishing a deeper connection to the Beaver Creek brand.

## EXAMPLES OF LIGHTING LAYER TECHNIQUES ARE AS FOLLOWS:

There are several different techniques to layering light and each is typically applied and defined by the overall lighting goals for the project or individual project areas.

1. **Combine layers (general, task, accent, and interactive) all at once to paint the visual picture of the resort at night, inform the viewer about their environment and activate areas within the Village differently.**

Use accent lighting to help draw guests deeper into a retail store or to beckon them to explore each building façade and/or feature within the resort. Use general lighting to set the mood of the lighting and combine it with task lighting to help the resort guests to feel a sense of comfort and belonging by making it easier to navigate their way through the resort. Use interactive lighting and/or media to create a sense of energy and vibrancy throughout the resort.

2. **Use individual layers only at certain times of the nighttime experience to respond to the varying energy levels within the Village core over the course of an evening.**

For instance: we typically recommend that general lighting and task lighting comes on one (1) hour before sunset. Accent lighting on certain features would also come on before sunset but will appear to get brighter as the sun goes down to draw focus to the features. Interactive lighting would only be activated at specific times each evening to help shape and craft the flow of energy and guest experience throughout the resort.

Within Beaver Creek, updating the quality of light and how it is layered within the overall property is truly essential to the success of this lighting modernization plan.

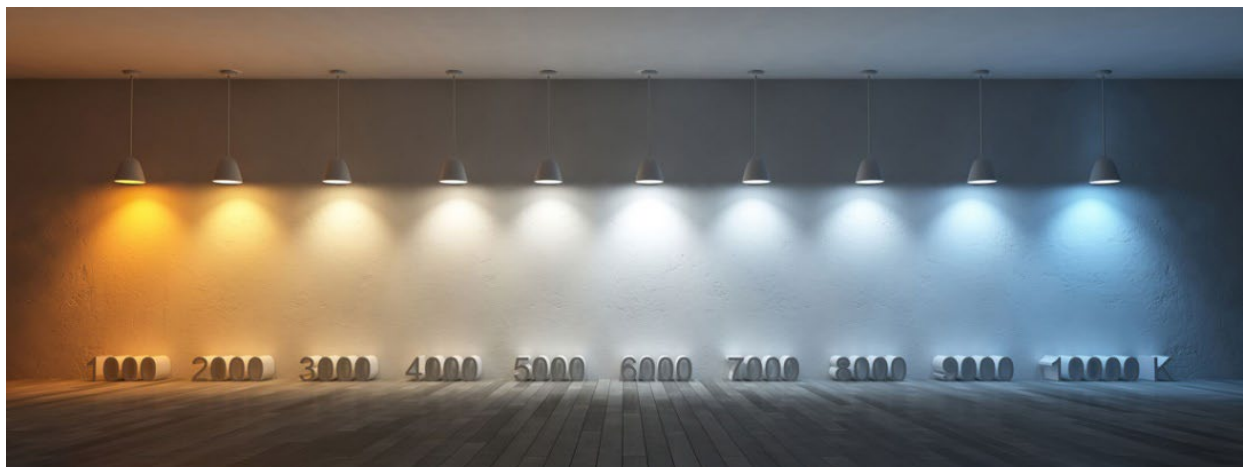
## 3.2 LIGHTING DYNAMICS

Lighting dynamics are another key element of the Lighting Modernization Plan. They are a critical component to the feel of the resort and the long-term success of the resort's ability to attract future generations. To create an environment that feels right and promotes a sense of connection and belonging, lighting designers use lighting dynamics. These dynamics are typically applied to the lit environment, with each one focused on creating fully developed illuminated nighttime personality and a visceral response:

### **Color**

In lighting, color is a significant component of visual perception and helps to shape the visual experience of a space. When we talk about color, we are discussing everything from the color temperature of various white lighting (*Figure 3.2.1*) sources to tunable sources and color-mixing or color-changing lighting sources. Color is defined and applied to illumination in terms of hue, saturation, and brightness. While the daylight spectrum of colors often feels more natural in architectural lighting, when combined with a sophisticated color palette and the additional use of color to activate areas within the built environment, the true identity of the resort can be revealed.

Our recommendation is to only use color in a meaningful and thoughtful manner. The use of color must be curated by understanding color rendition, color contrast, color effect, color movement, and answering the following questions: Which colors are to be used where? and to what effect? In refined luxury resorts such as Beaver Creek, the proper use of color really matters as it relates directly to a higher level of attention to detail and drives a psychological sense of belonging within the built environment.



*All colors of light shown to the right can be perceived as white light, but they appear very different when displayed next to each other.*

*Figure 3.2.1 | Examples of Various White Light Color Temperatures*



## **Movement**

Another key dynamic that directly relates to visual perception and how the guest feels within the built environment. It relates to the changing of the light whether it be in direction of origin, intensity, or color. Movement is used to inform the levels of activity and engagement throughout the resort. For instance, faster movement, i.e., lights that flash or flicker rapidly, feel very different than lights with more deliberate, subtle transitions in illumination levels, and/or color-changing sources throughout the night.

Movement is used to draw focus, help with wayfinding, to inform the viewer, and to provide surprise and delight. As with color, our recommendation is to only use movement in a meaningful and thoughtful manner. The use of movement must be curated by understanding direction, intensity goals, desired movement effect, and answering the following questions: When should movement be used? Where? And to what effect? Lastly and most importantly, how is it informing the illuminated story of the resort and its many architectural features?

## **NIGHTLY, SEASONAL, AND SPECIAL EVENT PROGRAMMING**

Each night throughout the evening the look and feel of the lighting can respond to the activity levels of the guests, residents, and resort overall. Every built environment has periods of rest and periods of activity. It is the intent of this Lighting Modernization Plan that the programming of the lighting throughout the resort reflects and informs these various periods and activity levels.

For instance, we would recommend that a base level of general, task and accent lighting turns on one hour before Sunset, following which, the resort would have timed lighting "events" to mark time and create and experience a "narrative arc" throughout the evening. By creating events that occur at specific, predictable times, the resort can create new family traditions, such as the way families anticipate the "cookie moment" each day.

Every night, the resort's programming would start with a "gathering" moment, followed by smaller, interspersed events to gain critical mass for the rest of the evening, which would end with a climactic "good night" moment that marks the end of the evening's formal programming and encourages departure. By engaging different senses and providing fun opportunities for different ages and interests within the resort's core groups, this Lighting Modernization Master Plan will encourage moments of playing together, surprise & discovery, and a sense of belonging.

### 3.3 LIGHTING AS AN AMENITY

Lighting at Beaver Creek is a desirable feature of the resort, helping to provide comfort, convenience, and enjoyment. When lighting solutions are implemented following this simple idea the lighting itself becomes something intended to make the resort life more pleasant and comfortable during each visit. Proper lighting can enhance the human experience and encourage the guests, residents, and families to have an even deeper connection to the resort and the Beaver Creek brand.



Figure 3.3.1 | Lighting as an Amenity

### 3.4 LIGHTING AS A BRAND EXPRESSION

As a desirable feature of the resort that provides comfort, convenience, and enjoyment, it is essential that the lighting be properly maintained, and the guidelines are followed. A commitment to executing and sustaining the recommendations contained within this Lighting Modernization Master Plan speaks to both the resort's legendary attention to detail and the guest's expectation that excellent quality can be found throughout all aspects of the built environment.

The language of light, when implemented properly, requires no translation. It is multi-national and multi-generational. Lighting has something for everyone, makes it easy to navigate the resort at night, beckons the guest to the evening's activities and aids in creating a true connection and sense of belonging.

## 3.5 LIGHTING ILLUMINATION MAP

In the following Illumination map you will see an overview of the different lighting layers and key ideas as defined in this Lighting Modernization Master Plan.



*Figure 3.5.1 | Illumination Map*

Defining the lighting layers and their respective intensity values throughout the resort helps to inform the guests' visual experience about the resort's outdoor natural and built environment after dark. How much light is enough? How much is too little? How much is too much?

In North America, the Illuminating Engineering Society (I.E.S.) has established consensus standards and provided guidance and recommended intensity values for most lighting applications as they relate to the physiological process of seeing. Within this Master Plan we have thoughtfully considered this information, along with making an assessment about the perception of light within each area of the resort as the cornerstone for identifying and recommending desired intensity values.

Within Beaver Creek, these layers build upon each other to form the visual vocabulary at night, and are further defined in the rendering below (*Figure 3.5.2*):



*Figure 3.5.2 | Visual Vocabulary Rendering*



# 4.0 QUALITY OF LIGHT

## CURATING THE ILLUMINATED ENVIRONMENT

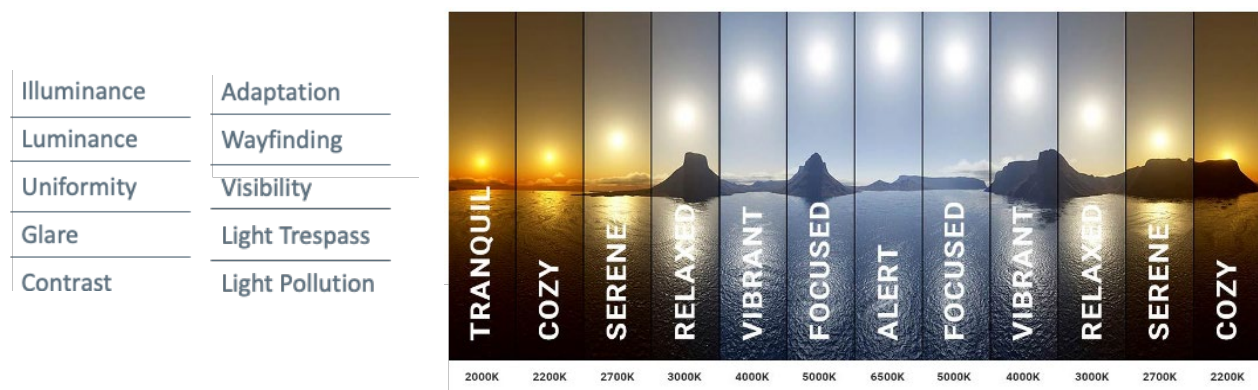
When curating an illuminated environment, as lighting designers, we carefully review and consider the 10 factors shown to the left of the graphic below (*Figure 4.0.1*). We also review and research guest demographics and the desired guest experience to determine the desired color temperature and quality of light that will be used within the various layers of illumination.

As noted in the previous section, color temperature is how the various colors of white light are described. It is described in terms of Kelvin (K). The higher Kelvin sources are cooler or bluer in appearance. The lower Kelvin sources appear warmer and more amber.

It is scientifically well-documented that illuminance and color temperature affect both human physiology and psychology. In the last 40 years, it is also well-documented that there are also a variety of biological effects, that are distinct from vision, that influence how people engage with the natural and built environment when artificially illuminated at night. Awareness of these factors that how they affect the guest experience is also a part of the curation efforts represented in this Lighting Modernization Master Plan.

Architectural lighting design applications support visual performance and visual comfort while appropriately rendering colors and addressing aesthetic and psychological considerations with an eye on maximizing energy efficiency.

In this simplified graphic (*Figure 4.0.1*) you can see how these color temperatures might feel and correlate to the natural light of sunrise (2000K on the left) to sunset (2200K on the right) and noon (5500-6500K) in the middle of the graphic.



*Figure 4.0.1 | Color Temperature & Quality of Light*  
*See Appendix B for a deeper dive into these factors & a primer of lighting vocabulary & concepts.*

*Credit: [lightology.com](http://lightology.com)*

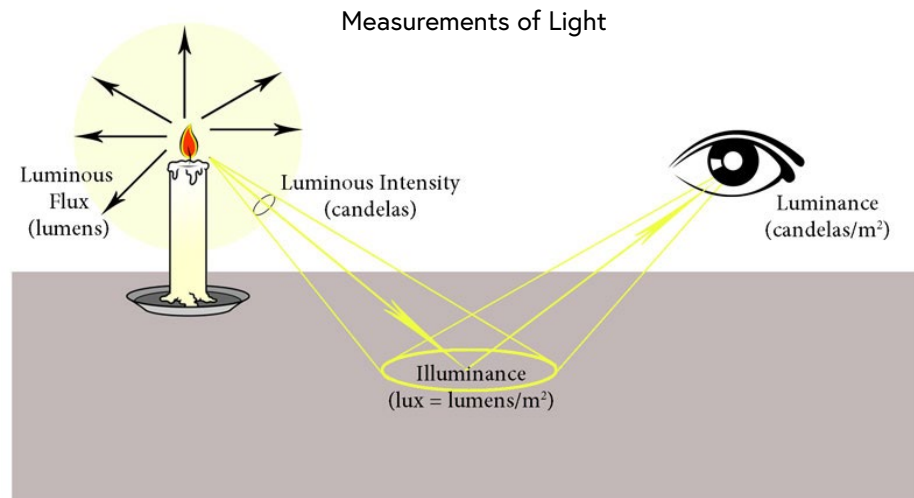
## 4.1 ILLUMINANCE & LUMINANCE

There are two commonly used measurements for the quantity of light in an area or room, Illuminance and Luminance. These two measurements answer the question: 'How much light do we have here?'

**Illuminance** is the amount of light on a given surface area. This amount of light is measured in the unit of Footcandles (fc) or Lux (lx), with fc being imperial, and lux being metric.

**Luminance** is the measure of light reflected from a flat surface toward a typical human eye from a particular angle. It is measured in Candela (cd). Brightness is the perceptual response to luminance and ranges from bright to dim.

*This image (Figure 4.1.1) shows the relationship between Illuminance and Luminance, the most used measures of light, and their expressed units.*



*Figure 4.1.1 | Relationship of Measures of Light*



## 4.2 UNIFORMITY & CONTRAST

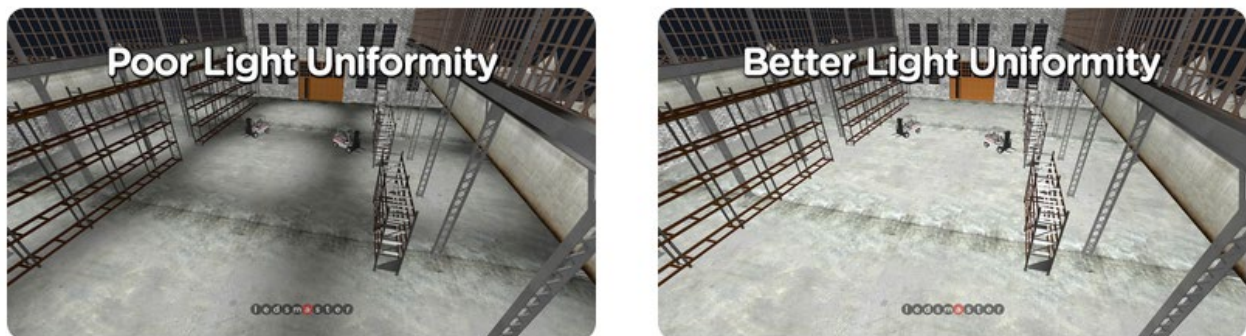
Uniformity is the human perception of how evenly light is distributed across an area. It is one of the elements that has the greatest impact on our perception of brightness. Recommended uniformity targets for the various areas within the resort are identified within the Illuminating Engineering Society (I.E.S.) standards, guidelines, and recommended practices.

The metric of uniformity on lighting is expressed as ratios. It is the ratio of the minimum lighting level to the average lighting level in a specified area. Low uniformity ratios mean that the light is uniform and evenly distributed in a space or environment. High uniformity ratios mean there is high contrast between the 'bright' and 'dark' areas.

Variations in the lighting levels across a space create Contrast. The greater the degree of variation, the higher the contrast. Contrast is also directly related to the way we perceive brightness as it relates to how we see the relationship of light and dark. For instance, when in the same field of view, bright areas appear brighter and dark areas appear darker.

Contrast is one of the lighting designer's most important tools and is often used to develop visual interest and hierarchy in an environment. Shadows are critical for establishing dimensionality of materials. But contrast must be applied thoughtfully to ensure there is good visibility in areas as appropriate for the use of the environment.

*In (Figure 4.2.1) below, both spaces have the same average illumination levels. The space on the left has a high uniformity ratio and high contrast. The space on the right has a low uniformity ratio and low contrast.*



*Figure 4.2.1 | Example of a Space with High Contrast and High Uniformity  
Credit: LEDmaster*

## 4.3 GLARE

Glare is a highly problematic part of the existing lighting throughout Beaver Creek. Glare is the sensation produced by excessive brightness within the field of view that is far greater than the brightness your eyes are already adapted to within the built environment.

Glare, simply put, makes it difficult for the human eye to function and can have detrimental effects to the guest experience, such as feelings of annoyance, discomfort and/or disconnection with the built environment. Additionally, an overall reduction in visual performance and/or visibility makes it less easy for guests to navigate their way around the resort at night and diminishes their sense of belonging.

Glare occurs in two ways: luminance (brightness) that is too high or luminance ratios that are too high. The result is visual discomfort associated with a light source. In other words, glare is created when the lighting is too bright or there is too much light in one location that is directly seen. Glare can also be described as light that obscures other objects within the field of view.

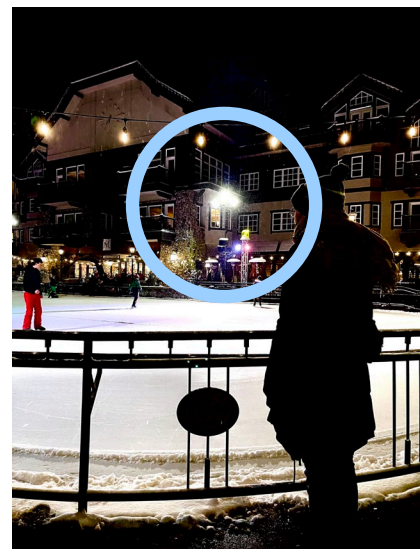
For instance, at Beaver Creek, the original lamp post lighting was updated to LED wafer sources placed at the top of the lantern aiming down. The use of these LED sources has resulted in too much glare and an overall lighting impression that disrupts and negatively impacts the nighttime experience. A variety of light control components and accessories like shields, baffles and louvers can be added to these lights and others found on property to mitigate and alleviate glare.

### ANOTHER EXAMPLE OF GLARE AT BEAVER CREEK

In this photo (*Figure 4.3.1*), the floodlights illuminating the Ice Rink create a sharp point of light that causes objects or people in the foreground to become dark silhouettes.

Facial features, details and colors are all obscured because of the contrast with the bright source of lighting in the distant background.

The unshielded light source illuminates the ice rink from one perspective, but creates problems for visibility and visual comfort from all other perspectives.



*Figure 4.3.1 | Example of Glare at Beaver Creek*

## 4.4 ADAPTATION

Adaptation refers to the retina of the human eye's ability to adjust to various levels of light. It often results in a change in the sensitivity to light. The ability to adapt is not instantaneous and occurs over time. Guests will notice the time it takes to adapt from one lighting level to another when transitioning between spaces with highly disparate lighting levels.

As people age, the eye's ability to adapt is diminished. The aging eye is less able to adapt to low lighting levels and the process of adaptation takes longer. This longer adaptation time must be taken into consideration when designing lighting for multi-generational environments.

To help alleviate the need for adaptation, lighting in adjacent areas can be designed to either have the same lighting levels or gradual differing lighting levels to minimize adaptation time and increase visual comfort throughout the resort.

## 4.5 WAYFINDING

Wayfinding encompasses all the ways in which people orient themselves in a physical space and navigate from place to place. Throughout the evening, lighting becomes an essential method of wayfinding by illuminating objects such as features, signage, storefronts, and architectural entrances. Dramatic illumination techniques can be employed to also attract people to certain places at certain times.

People are naturally drawn to well-lit areas, and they welcome visual cues that help them navigate their environments. Wayfinding is an integral part of how the guests understand and engage with Beaver Creek: the place and the brand.

## 4.6 VISIBILITY

Visibility is the state of being perceivable by the eye. In many outdoor applications, the distance at which an object can be perceived by the eye defines its visibility. It refers specifically to how clearly objects can be seen or how far you can see clearly.

Illumination levels, color, contrast, uniformity, and weather conditions all play a role in determining the visibility throughout the resort.

## 4.7 LIGHT TRESPASS

Light Trespass is the encroachment of light, typically across property boundaries in such a manner that it causes annoyance, loss of privacy or other nuisance. It is often a lack of control of the light output that results in unwanted light trespass conditions being present. Some examples are as follows:

- A streetlight is designed to illuminate a roadway, but its optics may not control the light to aim downward only and may also kick light into a nearby bedroom window.
- A wash light designed to illuminate an architectural feature on a building façade may not have optics or the ability to shutter the light to illuminate the feature only; light may trespass into a window on the façade illuminating an interior ceiling.

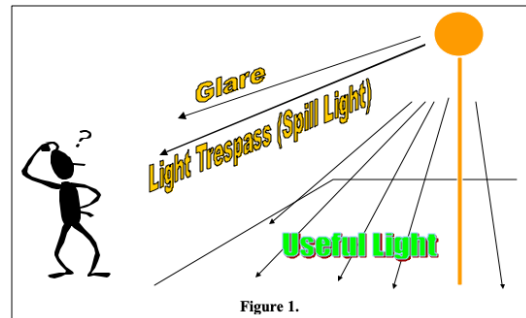


Figure 1.

Figure 4.7.1 | Light Trespass

Methods to minimize and/or eliminate the possibility of Light Trespass include carefully specifying fixtures with specific optics and/or shutters to only illuminate the areas requiring lighting, ensuring the installed lighting is focused and aimed properly to the specific areas that need to be illuminated and reducing the amount of light spill by using a shield to trap the excess light.

## 4.8 LIGHT POLLUTION

The International Dark-Sky Association (IDA [www.darksky.org](http://www.darksky.org)) defines Light Pollution as the inappropriate or excessive use of artificial light. The components of light pollution include glare, sky glow (the brightening of the night sky over inhabited areas which make it difficult to see the stars), light trespass, and clutter (bright, excessive groups of light sources).

Often these components are the result of inefficient lighting fixtures (that allow light to go beyond where it is needed without proper shielding or optics), and uncontrolled sources (that may be brighter than necessary, or that stay on all night regardless of their purpose). Best practices include specifying basic shielding requirements and/or optics for fixtures to ensure the light is applied appropriately and developing a specific programming timetable each night to reduce glare, light trespass and skyglow all with any eye on minimizing light pollution.

## 5.0 THE QUALITY OF LIGHT

The quality of light found throughout the resort at night will not only create a beautiful nighttime destination, but it will also help to define the guests' sense of place and promote a deeper connection to the Beaver Creek Resort and brand.

This Lighting Modernization Master Plan is the road map to develop a more refined, highly curated quality of light for the resort. It further defines how light is intended to be layered within the overall property in response to the built environment, the many features, and the various guest activities which occur over the course of an evening.

Using best practices and recommended illuminance criteria from the Illuminating Engineering Society (IES) the resort can modernize the lighting to attract the next generation of guests and their families.

For the technically minded, see the tables below regarding Lighting Zone Definitions and Outdoor Activity Level Definitions. See Appendix A for further information and reference material from the IES. Lighting Designers use these definitions along with the illumination factors shown in Section 4 to curate the lighting solutions for the resort.

Lighting Zone Definitions			
Lighting Zone	Definition	Description	Recommendations
LZ0	No Ambient Light	Lighting Zone 0 should be applied to areas in which permanent lighting is not expected and when used, is limited in the amount of lighting and the period of operation. LZ0 typically includes undeveloped areas of open space, wilderness parks and preserves, areas near astronomical observatories, or any other area where the protection of a dark environment is critical. Special review should be required for any permanent lighting in this zone. Some rural communities may choose to adopt LZ0 for residential areas.	<b>Recommended default zone for wilderness areas, parks, preserves, and undeveloped rural areas.</b>  Includes protected wildlife areas and corridors.

Lighting Zone Definitions			
LZ1	Low Ambient Light	Lighting Zone 1 pertains to areas that desire low ambient lighting levels. These typical include single and two family residential communities, rural town centers, business parks, and other commercial or industrial/storage areas typically with limited nighttime activity. May also include the developed areas in parks and other natural settings.	<p><b>Recommended default zone for rural and low density residential areas.</b></p> <p>Includes residential single or two family; agricultural zone districts; rural residential zone districts; business parks; open space including preserves in developed areas.</p>
LZ2	Moderate ambient light	Lighting Zone 2 pertains to areas with moderate ambient lighting levels. These typically include multifamily residential uses, institutional residential uses, schools, churches, hospitals, hotels/motels, commercial and/or business areas with evening activities embedded in predominately residential areas, neighborhoods serving recreational and playing fields and/or mixed use development with a predominance of residential uses. Can be used to accommodate a district of outdoor sales or industry in an area otherwise zoned LZ1.	<p><b>Recommended default zone for light commercial business districts and high density or mixed use residential districts.</b></p> <p>Includes neighborhood business districts; churches, schools and neighborhood recreation facilities; and light industrial zoning with modest nighttime uses or lighting requirements.</p>

Lighting Zone Definitions			
LZ3	Moderately high ambient light	Lighting Zone 3 pertains to areas with moderately high lighting levels. These typically include commercial corridors, high intensity suburban commercial areas, town centers, mixed use areas, industrial uses and shipping and rail yards with high nighttime activity, high use recreational and playing fields, regional shopping malls, car dealerships, gas stations, and other nighttime active exterior retail areas.	<p><b>Recommended default zone for large cities' and business districts.</b></p> <p>Includes business zone districts commercial mixed use; and heavy industrial and/or manufacturing zone districts.</p>
LZ4	High ambient Light	Lighting Zone 4 pertains to areas of very high ambient lighting levels. LZ4 should only be used for special cases and is not appropriate for most cities. LZ4 may be used for extremely unusual installations such as high density entertainment districts, and heavy industrial uses.	<p><b>Not a default Zone.</b></p> <p>Includes high intensity business or industrial zone districts.</p>

See IES Recommended Practice: Lighting Roadway and Parking Facilities, Table 4-1  
ANSI/IES RP-8-21

*Figure 5.0.1 | Lighting Zone Definitions Table*



Outdoor Activity Level Definitions		
Activity Level	Definition	Application examples
High	Areas with relatively high volumes of pedestrians and vehicles or only people during dark hours. Activity level is relative to a locale's population, density of related applications, and general expected norms across the community. Typified by high volumes or extreme swings of high volumes over short periods. Outdoor Facilities typical of large population centers.	<ul style="list-style-type: none"> <li>• Entertainment Districts</li> <li>• Outdoor pools at family hotels and community recreation centers</li> <li>• Shopping districts and sports venues</li> <li>• Transportation hubs</li> <li>• University campuses</li> </ul>
Medium	Areas with relatively moderate volumes of pedestrians and vehicles or only people during dark hours. Activity level is relative to a locale's population, density of related applications, and general expected norms across the community. Typified by some amount of constant activity over extended periods. Outdoor facilities typical of small-to-moderate population centers.	<ul style="list-style-type: none"> <li>• Civic and cultural districts</li> <li>• College campuses</li> <li>• Libraries</li> <li>• Office complexes</li> <li>• Outdoor pools at business hotels and community recreation centers</li> <li>• Recreation centers</li> <li>• Residential complexes</li> <li>• Small shopping or centers</li> <li>• Transit Lines</li> <li>• Urban central and waterfront parks</li> </ul>
Low	Areas with relatively low-to-very-low volumes of pedestrians and vehicles or only people during dark hours. Activity level is relative to a locale's population, density of related applications, and general expected norms across the community. Typified by little activity over extended periods. Outdoor facilities typical of suburban and rural population centers.	<ul style="list-style-type: none"> <li>• Outdoor pools at resorts and Spas</li> <li>• Residential neighborhoods</li> <li>• Small apartment complexes</li> <li>• Small college campuses</li> <li>• Small commercial establishments</li> </ul>

See IES Recommended Practice: Lighting Common Applications, Table 3-1  
ANSI/IES RP-10-20+E2

*Figure 5.0.2 | Outdoor Activity Level Definitions Table*

## 5.1 PATHS, TRAILS, & PROMENADES

### INTRODUCTION

Pedestrian paths and trails include the sidewalks and paved areas around the perimeter of the resort, between buildings, alongside the creek, and the promenade along the beach. At night the pedestrian paths, trails, and promenades are an integral part of the pedestrian guest experience, and it is essential that they promote orientation, wayfinding, sense of safety, and reassurance.

The creek trail runs alongside several buildings as the creek winds its way through the resort. This trail is heavily used in the summer months and for easy passage from one area to another during the winter season. Nighttime use of the trail needs to be made safe and secure as there are no railings to keep guests out of the waters.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting for the features and artwork installations found throughout the resort.

1. During this site visit, 1,411 fixtures were audited in less than a week, and many of these were on the pedestrian paths and trails. The purpose of this audit was to identify which fixtures needed to be repaired, rehabbed, and/or replaced. All lighting was evaluated against the existing guidelines. Please see Appendix D for the site inspection reports, location maps and details regarding fixture repair/rehab reports.
2. During multiple trips to the resort in September 2021, January, and February 2022, the survey team noted that several of the fixtures specifically illuminating the paths and trails had significant problems including: a wide variety of lighting sources, lighting output, inconsistent color temperatures, broken glass, loose fittings and/or compromised fixture mountings, and areas where intended illumination levels were below IES recommendations.
3. The creek trail bollards were often not working, or installed improperly, and many were loose and easily swayed from one side to the next when leaned upon.
4. Many fixtures are also in need of repair and/or replacement parts and general cleaning.

## GOALS

1. Optimize the pedestrian experience throughout the resort's paths and trails by repairing and/or replacing existing lighting.
2. Modernize all of the fluted bollards along the perimeter path areas with a new more modern bollard with better light output and optics.
3. Modernize the fluted bollard lighting on the Creekside Trail to better illuminate the path and create more visual interest using patterned light.

Bollards and patterned lighting used to reveal the trail in *(Figure 5.1.1)* and *(Figure 5.1.2)*:



*Figure 5.1.1 | Bollard Reference A*



*Figure 5.1.2 | Bollard Reference B*

## LIGHTING STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on the paths and trails. This initial effort also includes repairing and/or replacing broken and missing parts.

The next strategy is to retrofit or replace the existing lamp posts and bollards to better light the pathway with increased uniformity and no nuisance glare.

It is recommended that the color temperature of all path lighting is to be 3000K consistently along the path and that the LED lighting sources have a 90+ CRI. Lighting on the pathway should have an average foot candle measurement of .5 FC or greater.

Care should also be taken to ensure that the light is primarily projected onto the pathway. A renewed attention to maintenance matters as it truly enriches the guest experience at night by demonstrating great care, and ultimately this will lead to better guest engagement.

It is essential that regular maintenance of the fixtures, LED lighting sources, associated drivers and power supplies, and the control systems be completed as these efforts speak directly to the Beaver Creek Brand and the quality of the guest experience.

Long-term sustainability measures should be established and implemented as a part of the resort wide lighting systems. These measures include replacing inefficient lighting sources with more energy efficient LED sources and employing control systems to better manage lighting levels and hours of operation.

Lighting fixtures should be specified in context with manageable maintenance and operational strategies to ensure the lighting can look it's best every time your guests return to the resort. Each maintenance team should be trained with the importance of their role in mind: upholding the high standards of the Beaver Creek brand and its position to have an unmatched attention to detail. Formal lighting reviews should be held at regular intervals to ensure fixtures are fully functional, in good repair, and properly maintained.

Unlike the original lighting sources (incandescent, metal halide, HPS, and halogen) found throughout the resort when it first opened, that would signal their end of life by burning out, LEDs gradually decrease their light output over time until they are no longer producing useful light. L70 is a lifetime measurement criterion developed by the Illuminating Engineering Society (IES) to evaluate the useful lifetime of an LED luminaire in terms of the expected number of operating hours until the light output has diminished to 70% of initial levels. This means periodic reviews of light output will need to be done over time to ensure

LED lighting sources are emitting light at the intended levels and don't need to be replaced. This is especially important where lighting is primarily intended for public safety, like on roadways, in crosswalks, and on sidewalks.

## UPDATED GUIDELINES

Pathways are to include light focused down to the pathway surface in addition to light poles or other lighting accents at key pathway corners, changes in elevation, or landings.

3000K LED lighting sources with a 90+CRI are to be used and the average foot candle measurement should be 1 FC or greater.

## BEST PRACTICES AND IES RECOMMENDATIONS

See the table below regarding best practices and recommended illuminance targets from the Illuminating Engineering Society's (IES) for exterior ramps, stairs, and steps. See Appendix A for further information and reference material from the IES.

Recommended Illumination Targets for Exterior Ramps, Stairs, and Steps								
Application Task/Area	Horizontal ( $E_h$ )		Uniformity		Vertical ( $E_v$ )		Uniformity	
Activity Level/Lighting Zone	Fc@Ft	Max Avg Min	Ratio	Ratio Basis	Fc@Ft	Max Avg Min	Ratio	Ratio Basis
High Activity/LZ2	0.6@ Task Surface	Avg	20:5:1	Max Avg Min	0.2@5	Avg	40:10:1	Max Avg Min
Medium Activity/LZ2	0.4@ Task Surface	Avg	20:5:1	Max Avg Min	0.2@5	Avg	40:10:1	Max Avg Min
Low Activity/LZ2	0.1@ Task Surface	Avg	20:5:1	Max Avg Min	0.1@5	Avg	40:10:1	Max Avg Min

See IES Recommended Practice: Lighting for Retail Spaces, Table A-2  
ANSI/IES RP-2-20

Figure 5.1.3 | Recommended Illumination Targets for Exterior Ramps, Stairs, and Steps Table

## 5.2 THE BEACH PROMENADE

### INTRODUCTION

The Beach Promenade is the exterior area next to the ski slopes extending from One Beaver Creek along Village Hall and Gerald R. Ford Hall and down to the Park Hyatt at Beaver Creek, excluding any exterior plaza areas specific to Park Hyatt.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting for the features and artwork installations found throughout the resort.

1. During this site visit, 1,411 fixtures were audited in less than a week and some of these were on the Beach Promenade. The purpose of this audit was to identify which fixtures needed to be repaired, rehabbed, and/or replaced. All lighting was evaluated against the existing guidelines. Please see Appendix D for the site inspection reports, location maps and details regarding fixture repair/rehab reports.
2. During multiple trips to the resort in September 2021, January, and February 2022, the survey team noted that several of the fixtures specifically illuminating the promenade created too much glare and was somewhat disorienting.
3. The areas between the lamp posts were too dark and this resulted in illumination levels that were below IES recommended targets.
4. Glare from the lamp posts also obscures any views of the ski slopes and the over brightness of the light sources makes the promenade area itself feel dark and somewhat unsafe overall at night.
5. Adjacent exterior areas at the Park Hyatt have some larger light sources that provide nice, soft illumination, but these do not extend along the entire promenade, making the remaining areas feel and appear darker.
6. Upon closing, all storefronts were dark and unwelcoming, instead of providing a nice vertical glow of light along the pedestrian promenade.

## GOALS

1. Better illuminate the Beach Promenade and increase nighttime foot traffic.
2. Provide more lighting on the edge of walking paths by concealing lighting under the benches. *(Figure 5.2.2)*
3. Use planters as large scale illuminated sculptures that would add visual interest and pops of color against the unlit mountain side at night. These sculptures could be refreshed seasonally. *(Figure 5.2.1)*



*Figure 5.2.1 | Large Scale Illuminated Planters Reference    Figure 5.2.2 | Under Bench Lighting Reference*

## LIGHTING STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on the promenade. This initial effort also includes repairing and/or replacing broken and missing parts.

The next strategy is to retrofit or replace the existing lamp posts with a better light to illuminate the promenade surface and bench seating areas with increased uniformity and no nuisance glare.

It is recommended that the color temperature of all path lighting is to be 3000K consistently along the promenade and that the LED lighting sources have a 90+ CRI.



The Beach Promenade planters are a potentially good location for large scale illuminated sculptures and could be used as such to create additional energy and vibrancy to this underutilized area.

Lastly, it is recommended that under bench lighting be installed to create a more uniform lighting expression along the promenade path.

A renewed attention to maintenance matters as it truly enriches the guest experience at night by demonstrating great care. Ultimately, this will lead to better guest engagement.

It is essential that regular maintenance of the fixtures, LED lighting sources, associated drivers and power supplies, and the control systems be completed as these efforts speak directly to the Beaver Creek Brand and the quality of the guest experience.

Long-term sustainability measures should be established and implemented as a part of the resort wide lighting systems. These measures include replacing inefficient lighting sources with more energy efficient LED sources and employing control systems to better manage lighting levels and hours of operation.

Lighting fixtures should be specified in context with manageable maintenance and operational strategies to ensure the lighting can look it's best every time your guests return to the resort. Each maintenance team should be trained with the importance of their role in mind: upholding the high standards of the Beaver Creek brand and its position to have an unmatched attention to detail. Formal lighting reviews should be held at regular intervals to ensure fixtures are fully functional, in good repair, and properly maintained.

Unlike the original lighting sources (incandescent, metal halide, HPS, and halogen) found throughout the resort when it first opened, that would signal their end of life by burning out, LEDs gradually decrease their light output over time until they are no longer producing useful light. L70 is a lifetime measurement criterion developed by the Illuminating Engineering Society (IES) to evaluate the useful lifetime of an LED luminaire in terms of the expected number of operating hours until the light output has diminished to 70% of initial levels. This means periodic reviews of light output will need to be done over time to ensure LED lighting sources are emitting light at the intended levels and don't need to be replaced. This is especially important where lighting is primarily intended for public safety, like on roadways, in crosswalks, and on sidewalks.

## UPDATED GUIDELINES

Lighting on the promenade should have an average foot candle measurement of 1 FC or greater and should be designed to achieve a more even appearance that feels safer and more comfortable to guests.

It is also recommended that the promenade lighting guidelines be amended to include increased illumination on storefronts and facades even after closing.

## BEST PRACTICES AND IES RECOMMENDATIONS

Recommended Illumination Targets for Exterior Retail Shopping Promenades								
	Horizontal ( $E_h$ )		Uniformity		Vertical ( $E_v$ )		Uniformity	
Activity Level/Lighting Zone	Fc@Ft	Max Avg Min	Ratio	Ratio Basis	Fc@Ft	Max Avg Min	Ratio	Ratio Basis
High Activity/LZ2	0.6@ Task Surface	Avg	20:5:1	Max Avg Min	0.2@5	Avg	40:10:1	Max Avg Min
Medium Activity/LZ2	0.4@ Task Surface	Avg	20:5:1	Max Avg Min	0.2@5	Avg	40:10:1	Max Avg Min
Low Activity/LZ2	0.2@ Task Surface	Avg	20:5:1	Max Avg Min	0.1@5	Avg	40:10:1	Max Avg Min

See IES Recommended Practice: Lighting for Retail Spaces, Table A-2  
ANSI/IES RP-2-20

Figure 5.2.3 | Recommended Illumination Targets for Exterior Retail Shopping Promenades Table

## ADDITIONAL OPPORTUNITIES FOR ACTIVATION

### ***Sightseeing Binoculars***

Location: beach area

Guests look through what appear to be ordinary binoculars and are treated to fun augmented reality overlays on the landscape.

See what the mountains look like in the opposite season. Watch a dog snowboard down the mountainside. Add sparkle trails and other digital effects to skiers coming down the mountains in real-time. Just like real binoculars, your view changes as you move the apparatus side-to-side.

Please see Appendix G for further detail about the activations.



*Figure 5.2.4 | Sightseeing Binoculars Reference*

# 6.0 PUBLIC SPACES

## 6.1 OVERVIEW

### INTRODUCTION

For the purposes of this document, Public Spaces is defined as any exterior common area spaces within the resort including the covered bridge at the main entry, escalators, the plaza including the fire pits and other gathering spaces, the exterior stairs, the ice rink, the creek, and the playground.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting within the public spaces.

1. During this site visit, 1,411 fixtures were audited in less than a week, and 263 of those were illuminating the public spaces. The purpose of this audit was to identify which fixtures needed to be repaired, rehabbed, and/or replaced. All lighting was evaluated against the existing guidelines. Please see Appendix D for site inspection reports, location maps and details regarding fixture repair/rehab reports.
2. Throughout the public spaces when lighting is present, it is often from a hodge-podge of fixtures, beam distributions, color temperatures, and/or lighting sources. Many of which are no longer in compliance with the existing DRB Design Guidelines or appear to have been repaired or replaced with elements that are also not in keeping with Beaver Creek's high standards of maintenance.
3. Many fixtures are also in need of repair and/or replacement parts and general cleaning.
4. During daylight hours, the public spaces are beautifully illuminated by the sun and the guests can clearly see the unique architectural detailing and embellishments on each building.
5. During the evening hours, most public spaces appear to recede into the darkness of the overall the resort, due to the glare from the lamp posts being so bright that it makes the village feel closed, dark, and dangerous.
6. Good intentions for lighting are evident throughout the public spaces, but they are often muddled by sub-par executions of lighting solutions throughout the resort.

7. The many inconsistent solutions that were observed appear to also have been installed over a long period of time and together they have diluted the luxury look and feel of the resort.

## GOALS

1. Optimize the lighting throughout all public spaces by layering the lighting to create a more cohesive visual picture at night and elevate the guest experience.
2. Use lighting to draw focus to the heart of the village, the ice rink, and the adjacent plaza, increasing dwell time.
3. Modernize the lighting by adopting a new warmer 3000K color temperature as a standard throughout the resort.
4. Retrofit LED lighting in all the decorative lamp posts and lanterns to conceal the sources, getting better performance from the fixtures.
5. Light as many vertical stone surfaces around the fire pits to encourage families and friends to gather.
6. Create timed lighting and media events that engage the guests in new, unexpected ways.

## LIGHTING STRATEGIES

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting. This initial effort also includes repairing and/or replacing broken and missing parts.

The next strategy is to replace all lamping in the lamp posts to more energy efficient dimmable 3000K LED lighting sources to optimize the lighting throughout the village and mitigate the glare issues.

Lastly, to add lighting to the built environment around the fire pits to highlight the stone texture.

## LIGHTING EQUIPMENT, SOURCES AND MAINTENANCE EXPECTATIONS

A renewed attention to maintenance matters, as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

It is essential that regular maintenance of the fixtures, LED lighting sources, associated drivers, power supplies, and the control systems be completed as these efforts speak directly to the Beaver Creek Brand and the quality of the guest experience.

Long-term sustainability measures should be established and implemented as a part of the resort wide lighting systems. These measures include replacing inefficient lighting sources with more energy efficient LED sources and employing control systems to better manage lighting levels and hours of operation.

Lighting fixtures should be specified in context with manageable maintenance and operational strategies to ensure the lighting can look it's best every time your guests return to the resort. Each maintenance team should be trained with the importance of their role in mind: upholding the high standards of the Beaver Creek brand and its position to have an unmatched attention to detail. Formal lighting reviews should be held at regular intervals to ensure fixtures are fully functional, in good repair, and properly maintained.

Unlike the original lighting sources (incandescent, metal halide, HPS, and halogen) found throughout the resort when it first opened, that would signal their end of life by burning out, LEDs gradually decrease their light output over time until they are no longer producing useful light. L70 is a lifetime measurement criterion developed by the Illuminating Engineering Society (IES) to evaluate the useful lifetime of an LED luminaire in terms of the expected number of operating hours until the light output has diminished to 70% of initial levels. This means periodic reviews of light output will need to be done over time to ensure LED lighting sources are emitting light at the intended levels and don't need to be replaced. This is especially important where lighting is primarily intended for public safety, like on roadways, in crosswalks, and on sidewalks.

## 6.2 COVERED BRIDGE

### INTRODUCTION

For many guests, the signature expression of Beaver Creek is the Covered Bridge entry where guests cross over from the bus drop-off into the resort proper. This simple wooden structure acts as a gateway into all that the resort offers, including flagship retail stores, unique restaurants, and gathering spaces for any time of year. Proper lighting levels, shadow-free illumination, and accurate color rendering is important to enhance the bridge and to create a memorable guest introduction to the resort.



Figure 6.2.1 | Covered Bridge Photo



Figure 6.2.2 | Covered Bridge Rendering A



Figure 6.2.3 | Covered Bridge Rendering B

## SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting within the public spaces. The team noted the following:

1. Decorative lanterns and sign lighting fixtures were not on during either visit.

## GOALS

1. Use lighting to create a true sense of arrival at night and ensure the guests know they are somewhere special.
2. Bathe the interior of the covered bridge in warm and inviting light
3. Use the pendants to provide general illumination within the bridge overall.
4. Retrofit the lanterns with an updated dimmable LED technology that is concealed within the lantern.
5. Replace the lanterns with a more modern, playful sconce during the winter season.

## LIGHTING STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting. This initial effort also includes repairing and/or replacing broken and missing parts.

## UPDATED GUIDELINES

No new guidelines are anticipated.



## 6.3 ESCALATORS

### INTRODUCTION

Beaver Creek Resort includes a vast assortment of experiences, all situated on terraced levels accessible via stairs, or convenient escalators.

Uniform bright lighting is essential in these areas, as the safe entry and exit is a concern. These areas need to be well illuminated, but not appear overpowering to the surrounding areas.



*Figure 6.3.1 | Escalator Photo  
Escalators become destinations through bold lighting on the glass*

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting within the public spaces. The team noted the following:

1. The team observed that 96% of the recessed uplight fixtures and 97% of the linear fixtures worked.
2. Overall, the escalator lighting was successful in creating an inviting atmosphere.
3. The recessed uplight fixtures highlighted the stonework of the columns while the linear fixtures created a pleasing warm glow on the underside of the wooden roof.
4. While the linear fixtures met the design guidelines with a color temperature of 3500K it appeared to give off a yellow/greenish tint that did not fit in with the rest of the resort.
5. The linear LED fixtures are too visible to the guests and should have louvers or shields installed to hide the sources from guest view.

## GOALS

1. To improve the overall lighting of the escalator canopies by shielding the linear lighting fixtures and warming the color temperature.

## LIGHTING STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting. This initial effort also includes repairing and/or replacing broken and missing parts.

It is recommended that the linear fixtures be changed to a warmer color temperature with a higher 90+ CRI and/or have a color-correcting lens installed, wherever possible.

The linear fixtures should include louvers or shields to hide the sources from guest view.

## UPDATED GUIDELINES

Guidelines encouraging the lighting sources to be more fully integrated and specifying warmer color temperatures will be included.

## 6.4 PLAZA

### INTRODUCTION

The Plaza in the Village Core is the heart of the Beaver Creek guest experience at night. Large communal fire pits and seating areas are located throughout the plaza. The central plaza is surrounded by restaurants, retail, and art galleries. The Village Core's most central features are the clock tower (*see section 9.7 on Market Square for more information*) and the ice-skating rink.

This Lighting Modernization Master Plan views the Plaza as the communal 'family room' of Beaver Creek. As such, it is recommended that the lighting be programmed throughout each evening to inform and create anticipated activities that guests and families can do together.

#### ***Evening Programming Possibilities:***

- Create events that occur at specific, predictable times to create new family traditions, like the way families anticipate the cookie moment.
- Start with a "gathering" moment, followed by smaller, interspersed events to gain critical mass for the rest of the evening.
- End with a climactic "good night" moment that marks the end of the evening's formal programming and encourages departure.
- Engage different senses and provide fun opportunities for different ages and interests within your core groups.
- Create a series of seasonal festivals and events that can be enhanced by the new lighting and media opportunities.
- Provide permanent infrastructure for support.

The lighting found throughout the Plaza will provide visual cues about when to gather, when to be active, and when to relax. taking in the architectural beauty of the resort's built environment and exploring the Village itself.

## SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting within the public spaces. The team noted the following:

1. Lighting within the plaza comes largely from the lamp posts and adjacent building mounted decorative fixtures.
2. Step lighting can be seen on the various staircases leading to the Gerald Ford Hall Plaza, the Beach, St. James Place, and the Park Hyatt. Most of this lighting was not working, creating a potential safety issue on these stairs.
3. Lamp posts throughout the plaza have an inconsistent variety of lamps and lighting sources with varying intensities and inconsistent color temperatures.
4. Lamp posts were retrofitted, starting 10+ years ago, to LED wafers aiming downward. They are now the primary source of visual discomfort due to the resulting glare.
5. There are areas that are brightly lit and areas that feel too dark and unwelcoming.
6. Many of the main entrances and exits into the Village Core are under lit and don't have a visual presence, making wayfinding more difficult.
7. Adjacent façades are not illuminated and seem to recede into the night sky instead of helping to provide visual context for the pedestrian experience at night.
8. The lack of lighting on the façades, combined with commercial tenants who turn-off their interior lights and storefront displays upon closing, really disengages the guests from the outdoor experience at night within the village. This makes the Village Core appear closed off and uninviting.

*Lack of illumination on building shown in (Figure 6.4.1) are made worse from the glare from adjacent lamp posts.*



*Figure 6.4.1 | Plaza Glare*

## GOALS

1. Optimize the lighting found throughout the village core by repairing and/or replacing existing lighting that is visibly not working.
2. Modernize older LED lighting sources and replace the wide variety of lighting sources within the lamp posts to better illuminate the Plaza overall and mitigate the current nuisance of glare issues.
3. Add the infrastructure and additional equipment to use lighting, media ,and activations to provide vibrancy and energy to the Plaza each evening.
4. Curate evening programming throughout the night that drives traffic to the Plaza and its commercial tenants to encourage moments of gathering, play, surprise, and discovery within the resort.

## LIGHTING STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting. This initial effort also includes repairing and/or replacing broken and missing parts.

It is recommended that one of the following three options be implemented to modernize the existing lamp posts found within the Village. If desired, a mock-up can be done for each solution prior to determining the best option overall. Please note that each option includes the addition of a new dimmable driver, which will allow the resort to have more control of these lanterns each evening and for special events too.

- **Option 1** – Cast upper hood and led plate. The construction will consist of a cast aluminum upper hood for durability and heat dissipation. Rotational mounting with multi directional led boards on cast aluminum plate including diode spreaders where needed. This will include a dimmable driver 0-10, new wire way and hardware.
- **Option 2** – Indirect led board and spun reflector polished metal reflector. The construction will consist of a cast aluminum led plate and new led board for mounting at the base of the fixture. Will include a dimmable driver 0-10, new mounting brackets, and hardware.
- **Option 3** – Cast aluminum led pate with led boards. The construction will consist of cast aluminum plate for heat distribution, new led boards including diode spreaders where needed. This will include a dimmable driver 0-10, new wire way and hardware.

## UPDATED GUIDELINES

All ambient lighting sources within the Village Core are to be LED 3000K 90+CRI, moving forward.

## ADDITIONAL OPPORTUNITIES FOR ACTIVATION

### ***Luminous Terrain™, An Outdoor Interactive Lighting Experience***

Location: Plaza areas adjacent to the Ice Rink

Play with intelligent moving lights and media projections that can interact with the guests immersing them in color, patterns and beautiful imagery to create fun family and friends entertainment. This experience is so intuitive that the guests and lights will appear to "See and Play" with each other.



Figure 6.4.2 | Luminous Terrain: An Outdoor Interactive Lighting Experience



### ***Magical, Musical Staircase***

Location: staircase adjacent to waterfall.

Play your favorite tune on this highly engaging musical staircase. Accompanied by lights and sound, guests "play" the staircase by moving up and down the stairs. Different musical modes can be activated throughout the evening hours.



*Figure 6.4.3 | Magical, Musical Staircase*

### ***Interactive Life-Size Sculpture (e.g., seesaw)***

Large-scale interactive sculptures and play pieces (e.g., jumbo seesaw with light and sound activations as guest move up & down).



*Figure 6.4.4 | Oversized Games*



*Figure 6.4.5 | Interactive Seesaw*

## ***Wishing Garden***

Location: garden area across from Blue Moose.

The wishing garden is a truly magical place. Populated with interactive lit-up columbine flowers and sprites, the garden invites guest to make a wish at the uniquely-themed wishing well where it will be cherished and kept safe. The garden has a unique response for each wish and grows as more wishes are shared over the course of an evening. The Garden Sprites also respond to movement around the garden along the staircases and landings. Stand long enough and you might find a small collection of Sprites following you around the garden.



*Figure 6.4.6 | Wishing Well*



*Figure 6.4.7 | Garden Photo*



*Figure 6.4.8 | Wishing Garden Rendering*

Please see Appendix G for further detail about the activations.



## 6.5 ICE RINK

### INTRODUCTION

At the center of the Plaza is the Ice Rink that serves as an icon of the resort and true heart of the Village, beckoning guest to come experience the activities it offers.

As the focal point of the Plaza, the rink is uniformly illuminated at night. Brightly lit in white light, and overlaid with illuminated moments of choreographed lighting, media, color, and movement as the evening progresses. Each element works together to create an illuminated 'experience arc' throughout the evening. Various levels of activation can happen using the base infrastructure for lighting that surrounds the rink.



Figure 6.5.1 | Ice Rink Projections

Activations on the ice rink spill over into the Plaza, encouraging families and friends to play together. Activations can build anticipation for what might happen next and entice resort guests to dwell in the Village core longer. This drives traffic to the commercial tenants and fosters a more meaningful connection to the Beaver Creek brand as the guests experience extraordinary events that can only be found here in the Village on and off the ice rink.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting within the public spaces. The team noted the following:

1. The general lighting for the ice rink area appears to come from decorative lamp posts surrounding the rink but these lamp posts have a variety of lighting sources, color temperatures, and too much glare.
2. Large white floodlights mounted to poles adjacent to the rink provide illumination for the skating/playing area. While these floodlights help provide more lighting on the ice, the wide beam spread creates a lot of glare, causing visual discomfort for those watching games from the opposite side of the poles.
3. Festoons were strung along the perimeter of rink from lamp post to lamp post with the intent of adding a festive element to the space, but they are hung at a

somewhat low angle and not properly tied to the poles as if they were a bit of an afterthought.

4. Color changing moving lights were added to temporary truss to add pops of color to the rink, but the lighting programming was very simple and not as engaging as it could be.

## GOALS

1. To optimize the lighting throughout the village core to elevate the pedestrian experience and encourage people to dwell longer.
2. To activate the core of the village with lighting, media, and activation moments that the resort guests can experience together.
3. To retrofit the lamp post fixtures to provide better illumination overall and mitigate the glare issues.

## LIGHTING STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting. This initial effort also includes repairing and/or replacing broken and missing parts.

The next strategy is to retrofit the lamp posts to the newer LED solution that will mitigate the glare issues and add a level of dimming and control that was not previously possible.

The final strategy will be to add an overlay of intelligent fixtures and control, media projectors, basic sound system, and interactive controls that can be used for all the ice rink activations.

## LIGHTING EQUIPMENT, SOURCES AND MAINTENANCE EXPECTATIONS

A renewed attention to maintenance matters as it truly enriches the guest experience at night by demonstrating great care, and ultimately this will lead to better guest engagement.

It is essential that regular maintenance of the fixtures, LED lighting sources, associated drivers and power supplies, and the control systems be completed as these efforts speak directly to the Beaver Creek Brand and the quality of the guest experience.

Long-term sustainability measures should be established and implemented as a part of the resort wide lighting systems. These measures include replacing inefficient lighting sources with more energy efficient LED sources and employing control systems to better manage lighting levels and hours of operation.

Lighting fixtures should be specified in context with manageable maintenance and operational strategies to ensure the lighting can look it's best every time your guests return to the resort. Each maintenance team should be trained with the importance of their role in mind: upholding the high standards of the Beaver Creek brand and its position to have an unmatched attention to detail. Formal lighting reviews should be held at regular intervals to ensure fixtures are fully functional, in good repair, and properly maintained.

Unlike the original lighting sources (incandescent, metal halide, HPS, and halogen) found throughout the resort when it first opened, that would signal their end of life by burning out, LEDs gradually decrease their light output over time until they are no longer producing useful light. L70 is a lifetime measurement criterion developed by the Illuminating Engineering Society (IES) to evaluate the useful lifetime of an LED luminaire in terms of the expected number of operating hours until the light output has diminished to 70% of initial levels. This means periodic reviews of light output will need to be done over time to ensure LED lighting sources are emitting light at the intended levels and don't need to be replaced. This is especially important where lighting is primarily intended for public safety, like on roadways, in crosswalks, and on sidewalks.

Recommended Illumination Targets for Ice Rinks					
		Horizontal (E <sub>h</sub> )		Uniformity	
Application Task/Area	Class of Play	Fc@Ft	Max Avg Min	Ratio	Ratio Basis
Skating Area	Recreational	20@3	Avg	5:1	Max:Min

See IES Recommended Practice: Lighting for Lighting Sports and Recreational Areas, Table A-2  
ANSI/IES RP-6-20

Figure 6.5.2 | Recommended Illumination Targets for Ice Rinks Table

## UPDATED GUIDELINES

All ambient lighting sources within the area are to be LED 3000K 90+CRI sources, moving forward.

## ADDITIONAL OPPORTUNITIES FOR ACTIVATION

### ***Luminous Terrain™, An Outdoor Interactive Lighting Experience***

Location: On the Ice Rink

Play with intelligent moving lights and media projections that can interact with the guests immersing them in color, patterns and beautiful imagery to create fun family and friends entertainment. This experience is so intuitive that the guests and lights will appear to "SEE and PLAY" with each other.



Figure 6.5.3 | Luminous Terrain

### ***Ice Rink Activation: Ice Bikes and/or Zamboni***

Guests no longer need to be sad when leaving the rink for the Zamboni to do its work. Instead, make it a show moment, tracking the Zamboni as it moves around the rink, enhanced with lights and media content.

The same infrastructure can also be used to track the ice bikes around the rink, giving them their special lighting and media moment as they pedal around the ice.



*Figure 6.5.4 | Ice Bikes*

### ***Ice Rink Activation: Human Curling***

These are not your normal curling stones. Rather, stones are replaced by guests in inner tubes where teams compete for the high score.



*Figure 6.5.5 | Ice Rink: Human Curling*

### ***Ice Rink Activation: Augmented Style Games***

Utilizing the existing technical infrastructure (lights, sound, media, and sensing), enhance the space through augmented gameplay. These may include: an interactive paint roller to paint on ice or on grass, 'Billie Jean' musical panels to dance on, shuffleboard or bowling on ice or on grass with projected targets.



*Figure 6.5.6 | Ice Rink: Augmented Style Games*

### ***Ice Rink Activation: Concert Lighting***

Responsive lighting package that automatically coordinates with musical performances, bringing to life the entire Center Village.

Please see Appendix G for further detail about the activations.



*Figure 6.5.7 | Ice Rink: Concert Lighting*

## 6.6 CREEK

### INTRODUCTION

The creek is a beautiful gathering spot during both the warmer and colder times of the year.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting within the public spaces. The team noted the following:

1. There was no apparent lighting illuminating the creek and the landscape adjacent to it anywhere along the creek as it flows throughout the resort.
2. It appears there may have been fixtures located under the covered bridge that were aimed out into the creek to give it some visual presence at night, but it was not operational.

### GOALS

1. To optimize the lighting illuminating the creek and the landscape adjacent to it along the length of the creek as it flows throughout the resort.
2. To modernize the adjacent creek trail as shown in Section 5 with patterned lighting from low level bollards.

### LIGHTING STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting. This initial effort also includes repairing and/or replacing broken and missing parts.

The subsequent strategy would be to find opportunities to add moments of illumination - most likely under each bridge to aim downstream on the creek bed.

### UPDATED GUIDELINES

No new guidelines are anticipated.

## 6.7 THE PLAYGROUND

### INTRODUCTION

Guests travel along the creek trail to reach the playground. In the warmer months the playground is easily accessible but in the winter the playground is often filled with snow and is generally left unused.

The nighttime use of the playground should be a safe, well illuminated, and inviting space for kids and their families.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting within the public spaces. The team noted the following:

1. Found that there were no dedicated fixtures illuminating the playground.
2. The playground was solely dependent on lighting from lamp posts on the path surrounding the playgrounds that are approximately 24'+ away.
3. The lamp poles were not close enough to the playground to provide direct lighting.

### GOALS

1. Develop a visually interesting nighttime lighting design that entices kids and their families to make the journey at night. Use soft lighting angles and colored washes to illuminate the playground.
2. Illuminate the playground equipment not only for safety and the play at hand, but also to entice the families to engage and play together too.



## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting. This initial effort also includes repairing and/or replacing broken and missing parts.



*Figure 6.7.1 | Ropes Course*



*Figure 6.7.2 | Playground Equipment*

## UPDATED GUIDELINES

No new guidelines are anticipated.

# 7.0 FEATURES & ARTWORK

## 7.1 OVERVIEW

### INTRODUCTION

The Beaver Creek Resort already has a series of art installations known as Beaver Creek Wonder. Each installation is an oversized sculpture designed to entice families and friends to capture a photo-worthy memory of their time together at the Beaver Creek resort.

The Wonder art installations are placed throughout the resort, inviting guests of all ages to gather and enjoy them.

While the resort has already begun to activate the village by adding these photo-ops for guests during the day, the lighting at night on each piece often detracts from the guest experience.

Each artwork element deserves carefully thought-out lighting looks to help highlight the guests and make each feature the perfect photo opportunity for guests to share on social media.

In addition to the Wonder Art installations, the resort also includes many beautiful water features that can be found within the built environment. These include the children's fountain at the St. James and the large waterfall fountain in the heart of the village.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting for the features and artwork installations found throughout the resort.

1. During this site visit, 1,411 fixtures were audited in less than a week; some of those were on the features and artwork. The purpose of this audit was to identify which fixtures needed to be repaired, rehabbed and/or replaced. All lighting was evaluated against the existing guidelines. Please see Appendix D for site inspection reports, location maps and details regarding fixture repair/rehab reports.
2. During multiple trips to the resort in September 2021, January, and February 2022, the survey team noted that each of the features and artwork is illuminated, but in many cases the lighting appears to be an afterthought instead of being fully integrated into

the design of the artwork pieces or hidden from guest view. Wiring is often exposed and/or lighting positions are less than ideal.

3. The programming of the lighting elements is often too frenetic. It doesn't appear to have any sort of visual story arc throughout the evening, in the way the intensity changes or colors move from one to the next.
4. The programming of the color-changing lights on some of the installations appears to be set to a factory-programmed color roll, instead of curating which colors are used, and how they transition on each art element.
5. The brightness of the lighting fixtures is often not enough to draw focus within the existing nighttime environment surrounding each art installation. There is often no lighting for the faces of the guests taking their photos with the art installation, which places them in silhouette.
6. Several of the fixtures were not fully functional, and instead were flashing and/or flickering.
7. The lighting at the children's fountain appears to be on at full, which is simply too bright within the context of the nighttime environment of the resort. Additionally, the lighting from the uplights trespass all over the St. James façade, making it appear eerie and uninviting.

## GOALS

1. Optimize the lighting on each feature by repairing existing lighting and controls that are visibly not working.
2. Optimize the lighting on each feature by updating the focus and programming of the existing lighting to respond to the resort's various energy levels throughout the evening and to various seasons.
3. Modernize the lighting by adding front lighting for the guests faces at each photo-opportunity.
4. Add lighting to the area around each Wonder art element to give it a special sense of place on the pavement.
5. Highlight the natural stone elements within and surrounding each water feature in addition to the water itself.

## LIGHTING STRATEGIES

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on each art installation and water feature. This initial effort also includes repairing and/or replacing broken and missing parts.

A renewed attention to maintenance – like ensuring fixtures aren't flickering uncontrollably – matters, as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

The subsequent strategy involves curating the illuminated color palette and overall programming to better reflect the story of each art installation and feature.

The placement of additional light on the pavement surrounding each Wonder element is based on the idea of creating a sense of place for the art piece and the guests who will interact with each piece.

The addition of lighting for the guests' faces will foster a sense of belonging in each photo taken.

Once all the art installations and water features are better-illuminated, they will work together to create a highly impactful visual aesthetic for both the near and far field of views throughout the resort, encouraging the guests to encounter and explore each one.

## LIGHTING EQUIPMENT, SOURCES, MAINTENANCE RECOMMENDATIONS, AND SUSTAINABILITY EXPECTATIONS

We are recommending that high-quality, long-life, color-changing or tunable-white, programmable LED lighting sources be used to highlight and accent each art installation and the water features.

It is essential that regular maintenance of the fixtures, LED lighting sources, associated drivers and power supplies and the control systems be completed, as these efforts speak directly to the Beaver Creek brand and the quality of the guest experience.

Long-term sustainability measures should be established and implemented as a part of the resort-wide lighting systems. These measures include replacing inefficient lighting sources with more energy-efficient LED sources and employing control systems to better manage lighting levels and hours of operation.

Lighting fixtures should be specified in context with manageable maintenance and operational strategies to ensure the lighting can look its best every time your guests return to the resort. Each maintenance team should be trained with the importance of their role in mind: upholding the high standards of the Beaver Creek brand and its position to have an unmatched attention to detail. Formal lighting reviews should be held at regular intervals to ensure fixtures are fully functional, in good repair, and properly maintained.

Unlike the original lighting sources (incandescent, metal halide and halogen) found throughout the resort when it first opened, which would signal their end of life by burning out, LEDs gradually decrease their light output over time until they are no longer producing useful light. L70 is a lifetime measurement criterion developed by the Illuminating Engineering Society (IES) to evaluate the useful lifetime of an LED luminaire in terms of the expected number of operating hours until the light output has diminished to 70% of initial levels. This means periodic reviews of light output will need to be done over time to ensure LED lighting sources are emitting light at the intended levels and don't need to be replaced. This is especially important where lighting is primarily intended for public safety, like on roadways, in crosswalks, and on stairs.

## BEST PRACTICES AND IES RECOMMENDATIONS

While there are no specific foot-candle value recommendations for features and art installations, the IES does have recommendations for accenting feature elements and recommended uniformity levels based on defining the attraction. See the table below for more information on accent illuminance ratios.

Accent Illuminance Ratios Table				
Attraction	Role	Focal-Point Reflectance	Illuminance Ratio <sup>a</sup>	Application Notes
<b>Strong</b>	Dominant	≥50%	~20:1, focal point to task	Use very sparingly for short durations on no more than a few relatively small focal points, for a momentous occasion or experience. Focal points lit to these ratios may be a fraction of the total focal areas.
		<50%	~40:1, focal point to task	
	Dramatic	≥50%	~10:1, focal point to task	Use sparingly on as many as several focal areas for significant effect. Focal point lit to these ratios may be a fraction of the total focal area.
		<50%	~20:1, focal point to task	
<b>Moderate</b>	Feature	≥50%	~5:1, focal point to task	Use on focal points for visual attention. Focal point lit to these ratios may be a fraction of the total focal area.
		<50%	~10:1, focal point to task	
<b>Soft</b>	Visual Edge	≥50%	~2:1, focal point to task	Use on focal points or features for visual interest.
		<50%	~5:1, focal point to task	
<b>Subtle</b>	Visual Relief	≥50%	~1:1, focal point to task	Use liberally on focal points for visual relief.
		<50%	~1:1, focal point to task	

<sup>a</sup> Ratio of  $E_v$  (average on focal point typically of vertical orientation) to  $E_h$

See IES Recommended Practice: Lighting Common Applications, Table A-3  
ANSI/IES RP-10-20+E2

Figure 7.1.1 | Accent Illuminance Ratios Table

Outdoor Activity Level Definitions		
Activity Level	Definition	Application examples
<b>High</b>	Areas with relatively high volumes of pedestrians and vehicles or only people during dark hours. Activity level is relative to a locale's population, density of related applications, and general expected norms across the community. Typified by high volumes or extreme swings of high volumes over short periods. Outdoor Facilities typical of large population centers.	<ul style="list-style-type: none"> <li>• Entertainment Districts</li> <li>• Outdoor pools at family hotels and community recreation centers</li> <li>• Shopping districts and sports venues</li> <li>• Transportation hubs</li> <li>• University campuses</li> </ul>
<b>Medium</b>	Areas with relatively moderate volumes of pedestrians and vehicles or only people during dark hours. Activity level is relative to a locale's population, density of related applications, and general expected norms across the community. Typified by some amount of constant activity over extended periods. Outdoor facilities typical of small-to-moderate population centers.	<ul style="list-style-type: none"> <li>• Civic and cultural districts</li> <li>• College campuses</li> <li>• Libraries</li> <li>• Office complexes</li> <li>• Outdoor pools at business hotels and community recreation centers</li> <li>• Recreation centers</li> <li>• Residential complexes</li> <li>• Small shopping or centers</li> <li>• Transit Lines</li> <li>• Urban central and waterfront parks</li> </ul>
<b>Low</b>	Areas with relatively low-to-very-low volumes of pedestrians and vehicles or only people during dark hours. Activity level is relative to a locale's population, density of related applications, and general expected norms across the community. Typified by little activity over extended periods. Outdoor facilities typical of suburban and rural population centers.	<ul style="list-style-type: none"> <li>• Outdoor pools at resorts and Spas</li> <li>• Residential neighborhoods</li> <li>• Small apartment complexes</li> <li>• Small college campuses</li> <li>• Small commercial establishments</li> </ul>

See IES Recommended Practice: Lighting Common Applications, Table 3-1  
ANSI/IES RP-10-20+E2

*Figure 7.1.2 | Outdoor Activity Level Definitions Table*

## 7.2 VILLAGE WATER FEATURE

### INTRODUCTION

The Village water feature is truly multi-purpose depending on the season. In the warmer months the feature is a cascading water feature with additional planting and rock work elements. In the colder months, the feature is covered in snow and becomes a performance stage and/or a multi-tiered area to display ice sculptures or other seasonal items.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the lighting for the water feature, but it was covered in snow and a full assessment could not be completed.
2. The recessed fixtures surrounding the water feature were opened to conduct a survey on their physical status. Upon opening the fixtures, it was discovered that a series of retrofits had been made over time to ensure they would be in good working order.
3. The lensing and color of the lamps within the recessed fixtures was very yellow, giving a more antiquated feel to the fixture and the light.

### GOALS

1. Update the water feature lighting system to better respond to the various seasons and multi-purpose area that this has become.
2. Illuminate the water feature so that it is a beautiful background for summer or winter performances. It is essential to celebrate this iconic water feature in the heart of the village.



## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on the water feature. This initial effort also includes repairing and/or replacing broken and missing parts.

A renewed attention to maintenance matters, as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

A subsequent strategy is to update the lighting to high-quality, color-changing LED fixtures to add more dynamic illumination for each event that happens throughout an evening.

## UPDATED GUIDELINES

Adding water feature lighting guidelines will help ensure future installations will carefully consider the lighting of such elements.

## 7.3 ST. JAMES WATER FEATURE

### INTRODUCTION

In the warmer months, the St. James water feature is a fun splash pad, where kids of all ages to chase the dancing water jets. At night, this water feature does help draw guests from one side of the village to the other, as the lights of the fountain can be seen trespassing on the St. James façade from near and far, all the way across the village.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. A series of in-grade waterproof fixtures provides more than enough light to the water feature itself.
2. The water coming from the pop-jets were successfully illuminated, but the color temperature was an oddly cool white that felt out of place and unfriendly compared to the warmer color temperatures found throughout Beaver Creek.
3. The fountain lighting color temperature is not in compliance with the DRB guidelines.
4. The lighting programming appears too frenetic and is at times too visually disturbing resulting in an eerie, unfriendly vibe at night.
5. Lighting levels were exceedingly high and seemed to stay at full no matter what time it was during the evening hours.
6. The beautiful stone wall surrounding the water feature was not illuminated and was a missed opportunity for providing a background to the fountain. Without this background layer of illumination, the fountain is perceived to be more two-dimensional.

### GOALS

1. Update the water feature lighting system programming to create a better nighttime experience both in terms of intensity levels and dynamics.
2. Light the beautiful, warm wall surrounding the fountain so that it becomes a more attractive background for the fountain itself. By illuminating this warmer, natural surface, the cooler lighting on the water will be highlighted even more and appear to have dimensionality.
3. Add color-changing LED fixtures that can be programmed to different colors throughout the evening.

## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on the water feature. This initial effort also includes repairing and/or replacing broken and missing parts.

A renewed attention to maintenance matters, as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

A subsequent strategy is to update the lighting to high-quality, color-changing LED fixtures to add more dynamic illumination for each fountain show that happens here throughout an evening.

Additionally, warmer color temperature lighting sources will feel more inviting and comply with the updated Beaver Creek design guidelines.

## UPDATED GUIDELINES

Adding water feature lighting guidelines will help ensure future installations will carefully consider the lighting of such elements.

## 7.4 FROST FLOWERS

### INTRODUCTION

Frost Flowers is one of the Wonder Art installations. It is located adjacent to the ice rink. This artwork element features larger than life sculptural flowers, but has a winter twist with snowflake shaped petals. The flowers provide a lively burst of color within the heart of the Village.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Small color-changing LED fixtures attached to the Frost Flowers worked intermittently.
2. The fixtures were set to a color fade, but a couple of fixtures did not smoothly change between colors, instead they strobed on and off.
3. The fixtures that did work provided a wash of colorful light on the underside of the flowers and within the glowing orbs.
4. Accent fixtures appeared to be an afterthought, as they are just mounted to the side of the Frost Flower stem structure and had exposed wiring. This is simply not a good practice, as it makes these lights vulnerable to potential vandalism issues.

### GOALS

1. Conceal or shield the exposed accent lights behind decorative elements, so that the petals appear to emit light all on their own.
2. Update the lighting programming to create a more playful nighttime personality for the Frost Flowers that responds directly to the energy and vibrancy within the heart of the Village each evening.

## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on this Wonder art feature. This initial effort also includes repairing and/or replacing broken and missing parts.

A renewed attention to maintenance matters, as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

The subsequent strategy would be to update the existing lighting programming to create a variety of nighttime personalities.

## UPDATED GUIDELINES

Adding Wonder art lighting guidelines will help ensure future installations will carefully consider the lighting of each element.

## ADDITIONAL OPPORTUNITIES FOR ACTIVATION

Thoughtful programming of color and subtle movement create an evening story for this iconic art installation.



*Figure 7.4.1 | Frost Flowers*

## 7.5 REFLECTIONS

### INTRODUCTION

Reflections is a Wonder art installation located inside the Beaver Creek resort at the base of the escalators. It is one of the first art installations that guests will see once they cross over the Beaver Creek Resort entry covered bridge. (Figure 7.5.1)

It consists of an array of double mirrored skis seemingly 'planted' into the sidewalk, creating a semi-circular alcove where guests can gather before hitting the slopes, and guests of all ages can memorialize their trip in group photos at the end of the day.



Figure 7.5.1 Wonder Art: Reflections

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Small color-changing LED wash fixtures were mounted onto nearby columns at varying heights, aimed at the art elements from 3 sides creating multiple washes of colored light.
2. The location and lower mounting height of these fixtures is such that they create nuisance glare for the guests while they are trying to get their photo-opportunity.
3. This lighting detracts from the guest experience because of the visual discomfort these lights cause as the guests can see directly into the light source.
4. Additionally, passers-by going up the escalator behind the installation are blinded by the accents meant to illuminate the sculpture, whenever they try to observe the sculpture as they pass.

## GOALS

1. Add updated lighting programming to transform this experience and beckon the guest closer as the sun sets.
2. Celebrate the location of this installation at night by setting it amongst a carpet of illumination on the pavement surrounding it. Not only will this help to feature the artwork, but it will also give the guest a sense of arrival and invite them to interact with the installation.

## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on this Wonder art feature. This initial effort also includes repairing and/or replacing broken and missing parts.

A renewed attention to maintenance matters, as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

The subsequent strategy would be to update the existing lighting programming to create a variety of nighttime personalities.

It is highly recommended that the existing fixtures be replaced with higher-lumen, color-changing accents, located higher up at a steeper angle, to allow the lighting to better illuminate the art element. This will minimize and/or reduce the visual discomfort caused by the existing lighting.

It is also highly recommended that lighting be added on the pavement surrounding the art installation to help with wayfinding and create a mini-destination.

## UPDATED GUIDELINES

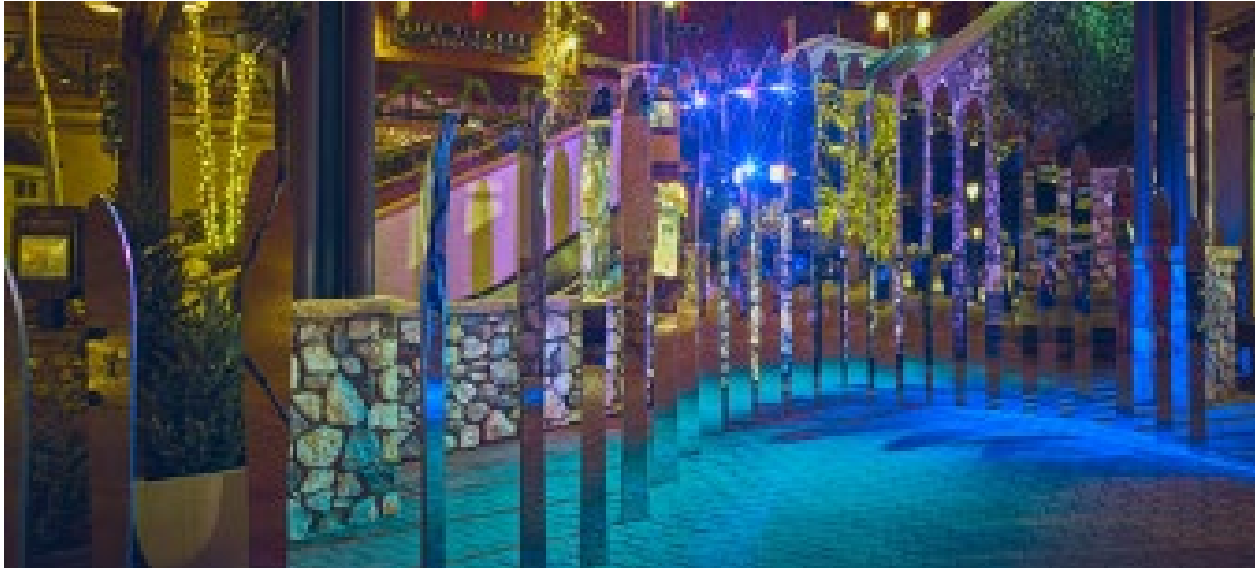
Add Wonder art lighting guidelines to help ensure future installations will carefully consider the lighting of each element.



## ADDITIONAL OPPORTUNITIES FOR ACTIVATION

### ***Wonder Art: Reflective Skis***

Add proximity sensing that can trigger animations or sound effects, like the sound of plucked strings, as guest walk past each individual ski.



*Figure 7.5.2 | Wonder Art: Reflective Skis*

Please see Appendix G for further detail about the potential activations.

## 7.6 SNOWED IN

### INTRODUCTION

Snowed In is another Wonder Art installation located on the upper plaza of Village Hall near the ticketing booth. Guests can climb into an oversized 10' diameter snow globe made of tempered glass panels for fun and photo-opportunities. Snowed In includes recessed color-changing uplights within that create dazzling effects on the patterned glass surfaces and integrally illuminated Beaver Creek graphic. (Figure 7.6.1)



Figure 7.6.1 | Wonder Art: Snowed In

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. The lighting is a combination of color-changing recessed LED uplight fixtures in the interior floor and color-changing LED linear tapelight behind the signage panel.
2. Several of the color-changing recessed LED uplight fixtures were not working and/or flickering and flashing.
3. When taking a picture inside this art installation, the recessed fixtures in the floor make it difficult to see the person.
4. The lighting mostly focused on the tempered glass exterior of the snow globe, and created odd shadows on the person inside.

### GOALS

1. Add updated lighting programming to transform this experience and beckon the guest closer as the sun sets.
2. Celebrate the location of this installation at night by setting it amongst a carpet of illumination on the pavement surrounding it. Not only will this help to feature the artwork, but it will also give the guest a sense of arrival and invite them to interact with the installation.
3. Add additional lighting in front of the art element for guests who want their selfie on the outside.

## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on this Wonder art feature. This initial effort also includes repairing and/or replacing broken and missing parts.

A renewed attention to maintenance matters as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

The subsequent strategy would be to update the existing lighting programming to create a variety of nighttime personalities.

Updated lighting and programming within the globe helps make this a memorable evening stop.

It is highly recommended that lighting be added on the pavement surrounding the art installation to help with way-finding and create a mini-destination.

## UPDATED GUIDELINES

Add Wonder art lighting guidelines to help ensure future installations will carefully consider the lighting of each element.

## 7.7 SUPER G

### INTRODUCTION

The Super G sculpture is located next to the firepits of the ice rink. This Wonder Art piece features an oversized ski goggle photo op. The color-changing lights create a fun and happy atmosphere at guests take a photo. (Figure 7.6.1)



### SURVEY & ASSESSMENT OF EXISTING CONDITIONS *Figure 7.6.1 | Wonder Art: Snowed In*

1. Exposed color-changing tapelight outlines the inside of the goggles.
2. The tapelight being used does not have a diffuser or lens, making the individual LED diodes visible to guest as they pass by.
3. The tapelight was set to a very active strobing color change which was visually distracting and off-putting when walking by or near the art installation.
4. The tapelight feels like an afterthought as it is not fully integrated into the art element.
5. The fixture should look like a single line of light instead of a dotted line of light.

### GOALS

1. Add updated lighting programming to transform this experience and beckon the guest closer.
2. Celebrate the location of this installation at night by setting it amongst a carpet of illumination on the pavement surrounding it. Not only will this help to feature the artwork, but it will also give the guest a sense of arrival and invite them to interact with the installation.
3. Add additional lighting in front of the art element for guests who want their selfie on the outside.

## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on this Wonder art feature. This initial effort also includes repairing and/or replacing broken and missing parts.

A renewed attention to maintenance matters, as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

The subsequent strategy would be to optimize the LED lighting fixture and update the existing lighting programming to create a variety of nighttime personalities.

Visual Terrain recommends updating the color-changing tapelight by adding a diffuser to mitigate seeing the LED diodes, and/or replacing the tapelight altogether with color-changing faux neon.

Explore adding fixtures to nearby poles and/or façades surrounding the area of Super G to encourage guests to take pictures at night.

Updated lighting and programming within Super G helps make this a memorable evening stop.

It is highly recommended that lighting be added on the pavement surrounding the art installation to help with wayfinding and create a mini-destination.

## 7.8 LOOKING FORWARD

As Beaver Creek's Wonder program continues to evolve and expand in the coming years and/or other features and artistic installations are added to the public spaces within the resort to further engage with the guests, light should be considered as a vital component that contributed to the energy and vibrancy of the village at night.

We recommend the following steps be initiated whenever a new art piece of art or feature is being installed:

- Define and include a lighting budget in every project.
- Engage the lighting designer, artists and fabricators in a discussion about best methods to integrate the lighting fixtures into the structures or elements being developed for the project.
- Be sure to share the Beaver Creek design guidelines and the relevant sections of this Resort Lighting Modernization Master Plan to any first-time lighting designers to inform their design process.

Promote and grow lighting centric festivals and experiences to keep guests on property, drive traffic to the Village and generate more revenue for the commercial tenants.

# 8.0 ROADWAYS, SIDEWALKS, & CROSSWALKS

## 8.1 OVERVIEW

### INTRODUCTION

The Roadways, sidewalks, and crosswalks are the primary means of access to get to the Village. As such their illumination is not only vital to the guest safety, but the overall guest experience at night too. Guests want to feel safe and secure as they traverse these areas.

Design considerations for the roadways, sidewalks, and crosswalks should include the following:

1. Appearance and scale of the various fixtures (i.e., taller street lighting poles vs. shorter pedestrian-friendly lamp posts)
2. The visual tasks of both the drivers and the pedestrians (i.e., reading signage, seeing other elements within the streetscape etc.)
3. Integration of non-lighting elements (i.e., wireless access points, banners, flower baskets)
4. Coordination with adjacent building elements, street furniture, tree canopies, and landscape elements.
5. Assessment and mitigation of potential environmental issues of glare, light trespass, and sky glow.
6. Color temperatures of the lighting sources.
7. The effects of headlights.
8. Beaver Creek's multi-generational guests and families means the aging eye plays a role in evaluating and determining recommended illumination level for each of these tasks.



The Illuminating Engineering Society (IES) has issued a two-part Recommended Practice: Lighting Roadway and Parking Facilities for Roadways and Parking facilities (RP-8-21) that can be referred to for guidance in designing appropriate roadway and street lighting systems.

In RP-8-21, the following design methodologies are recommended:

- Luminance for straight roadways and streets
- Horizontal illuminance for curved roadways and streets
- Horizontal and vertical illuminance for pedestrian crosswalks and sidewalks
- Horizontal illuminance for intersections

## SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the roadway, sidewalks, and crosswalks lighting.

1. During this site visit, 1,411 fixtures were audited in less than a week, and 98 of those were illuminating the roadways, sidewalks, and crosswalks. The purpose of this audit was to identify which fixtures needed to be repaired, rehabbed, and/or replaced. All lighting was evaluated against the existing guidelines. Please see Appendix D for individual building site inspection reports, location maps and details regarding fixture repair/rehab reports.
2. Many fixtures are also in need of repair and/or replacement parts and general cleaning.
3. During multiple trips to the resort in September 2021, January, and February 2022, the survey team noted that both the bollards along the primary access road and the roadway lighting had a wide variety of replacement lighting sources. Additionally, their color temperatures were very inconsistent.

## GOALS

1. Optimize the illumination of roadways, crosswalks, and sidewalks by restoring the appropriate distribution optics in the existing lighting fixtures and lighting sources back into compliance.
2. Properly illuminating the roadways, crosswalks, and sidewalks will aid the guests with illuminated wayfinding cues as they navigate their way through the resort each night.
3. Developing a well-cared-for and properly lit vehicular and pedestrian lighting strategy will result in higher real estate values and increased pride in ownership.

4. Develop and standardize a kit of parts for the roadways, crosswalks, and sidewalks; including updates to lighting sources which should be more uniform throughout the resort.
5. These modernization updates will go a long way towards improving and elevating the guest experience once they are within the boundaries of the resort.

## LIGHTING STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment is fully operational as quickly as possible to optimize the existing lighting on the roadways, sidewalks, and crosswalks. This initial effort also includes repairing and/or replacing broken and missing parts.

The next strategy is to retrofit the existing lighting sources within the roadway poles to each have appropriate LED lighting sources with roadway lighting distribution optics and/or controls to optimize the roadway lighting overall.

It is also highly recommended that the resort critically reviews the current lighting from both a driver, passenger, and pedestrian standpoint against current IES guidelines and recommended best practices.

These updates will not only allow for greater visibility and security for drivers and pedestrians alike, but it will also encourage the guests to feel confident as they move about the resort.

## LIGHTING EQUIPMENT, SOURCES AND MAINTENANCE EXPECTATIONS

All fixtures for roadways, sidewalks, and crosswalks should be constructed of sturdy materials that are sustainable, vandal resistant, and impact resistant. Bollards and light poles should be constructed in a way that allows for high visibility from vehicles, with no nuisance glare and energy-efficient, 90+ CRI, 3000K LED lighting sources.

Fixtures and retrofit kits should include easy, quick-disconnect LED circuit boards, and replaceable transformers and drivers in easily accessible locations.

A renewed attention to maintenance matters as it truly enriches the guest experience at night by demonstrating great care. Ultimately this will lead to better guest engagement.

The main strategy would be to optimize the existing roadway lighting fixtures to a consistent LED lighting source with appropriate lighting distribution patterns and color temperatures, resulting in a greater uniformity of lighting on the roadways.

It is essential that regular maintenance of the fixtures, LED lighting sources, associated drivers and power supplies and the control systems be completed as these efforts speak directly to the Beaver Creek Brand and the quality of the guest experience.

Long-term sustainability measures should be established and implemented as a part of the resort wide lighting systems. These measures include replacing inefficient lighting sources with more energy efficient LED sources and employing control systems to better manage lighting levels and hours of operation.

Lighting fixtures should be specified in context with manageable maintenance and operational strategies to ensure the lighting can look its best every time your guests return to the resort. Each maintenance team should be trained with the importance of their role in mind: upholding the high standards of the Beaver Creek brand and its position to have an unmatched attention to detail. Formal lighting reviews should be held at regular intervals to ensure fixtures are fully functional, in good repair, and properly maintained.

Unlike the original lighting sources (incandescent, metal halide, HPS, and halogen) found throughout the resort when it first opened, that would signal their end of life by burning out, LEDs gradually decrease their light output over time until they are no longer producing useful light. L70 is a lifetime measurement criterion developed by the Illuminating Engineering Society (IES) to evaluate the useful lifetime of an LED luminaire in terms of the expected number of operating hours until the light output has diminished to 70% of initial level. This means the periodic reviews of light output will need to be done over time to ensure LED lighting sources are emitting light at the intended level and don't need to be replaced. This is especially important where lighting is primarily intended for public safety, like on roadways, in crosswalks, and on sidewalks.

## BEST PRACTICES AND IES RECOMMENDATIONS

It is highly recommended that a professional architectural lighting designer, system integrator, and electrical engineer work together with the metro team to develop updated lighting solutions, replacement specifications, and provide a fully-operational and functional lighting system that can be easily maintained for years to come.

The Illuminating Engineering Society (IES) recommends distinct guidelines for roadways, crosswalks, and sidewalks. As part of the modernization efforts, the resorts vehicular and pedestrian lighting strategies should ideally be developed together.

Please see the tables below and Appendix A for additional tables summarizing the IES recommended practice for lighting as noted.

## 8.2 ROADWAYS

### INTRODUCTION

Beaver Creek includes serpentine roadways that connect various resort homes, hotels, individual retail stores, the performing arts center, restaurants, and the world-famous skiing areas. Appropriate, crisp, and clear lighting on the streets is vitally important for providing interconnectivity to the key areas of the resort. These roadways serve as major arteries providing supply and guest access that is safe, secure, and suitable for each building and amenity's requirements.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Early in January 2022, a team of four performed a site visit to survey and audit the building lighting for the façades and adjacent areas facing the Village core.
2. Streetlights along the roadways have a combination of candelabras, metal halides, high pressure sodium (HPS), and LED arrays. The combination of fixture elements creates an inconsistent range of assorted color temperatures throughout the resort.
3. A handful of the roadway poles appear to have been re-wired to accept incandescent A-lamps. This is truly problematic as it no longer has the intended lighting distribution or lighting output to appropriately light the road.
4. As the streetlights are not laid out in a consistent manner nor with regular spacing, the lighting on the roads has significant areas of darkness mixed with other areas of brightness, making it more difficult for drivers to navigate their way to the resort.
5. The lack of uniformity creates a visually confusing drive around the resort and diminishes the guests' ability to use the lighting as a visual cue for wayfinding.
6. The roadway lighting fixtures at night, from a guest experience point of view, creates visual bright spots that contrast with moments of darkness. In the winter months, when snow is present, these contrast issues are even worse, and the result is visual discomfort and reduced sense of arrival.
7. During multiple trips to the resort in September 2021, January, and February 2022, the survey team noted that the fluted bollards along the primary access road to the resort have a variety of replacement lighting sources. The color temperatures are inconsistent too. Most bollards have a 4000K color temperature that does not conform to the Beaver Creek guidelines and the illuminated lines of light on the bollards create nuisance glare issues.

8. The fluted bollards were also often not installed properly, and many were loose and easily swayed from one side to the next when leaned against.

## GOALS

1. To replace all the fluted bollards along the roadway drop-off areas and perimeter sidewalks with a sturdier, more modern bollard with a better light output and optics to create a better pedestrian experience.
2. Explore a larger effort to improve the roadway lighting layout overall and increase uniformity to create a better driving experience in the coming years. This effort is especially important due to the multi-generational and international demographics of your guests.
  - The aging eye must be carefully considered when designing the lighting for the roadways, sidewalks, and crosswalks. As our eyesight matures, our eyes have an increased sensitivity to glare and often a need for higher light levels due to their restricted ability to absorb light. Uniformity and contrast issues must be carefully managed to ensure a safe and comfortable driving and pedestrian experience exists throughout the resort.
  - Beaver Creek has a large international community presence. It is quite common to hear a number of different languages as the guest explore the resort. Good roadway, sidewalk, and crosswalk lighting becomes even more important to visitors that may come from quite different roadway experiences and differing traffic patterns as it helps provide the visual cues needed for wayfinding and a sense of belonging by making it easier to drive and walk during their visit.
3. Ideally, roadway light poles should be located as far apart as possible, taking advantage of enhanced LED lighting distributions that illuminate the roadways with truly little light trespass to surrounding areas. This is not to say that only the roadway should be illuminated, lighting fixture heads should also supply some degree of illumination to reveal hillsides, trees, and hidden turns, but the primary beam of light should focus mainly on roadways.
4. Additionally flag lighting, signage lighting and other roadway artistic features should be accented with illumination to allow drivers to understand their position and orientation to the resort. These features should be accented to pay homage to the nations whose flags are shown, and the artists who have created the sculptures and artwork alongside the roadways.

## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to update all existing roadway lighting to properly illuminate the roadways as quickly as possible to optimize the existing lighting on the roads. In addition to retrofitting the fixture heads to have appropriate roadway lighting distribution optics, this initial effort also includes repairing and/or replacing broken and missing parts.

The subsequent strategy includes adding roadway lighting poles and fixtures as necessary with specific lighting distribution patterns for better uniformity and proper roadway illumination along the entire route.

Lighting the other roadside features, such as the multi-national flags, and artwork elements along the route is also a critical part of the roadway lighting as they provide visual cues for the driver. Because of heavy snowfall, and other changes throughout the seasons, it is recommended that flag lighting be attached to the poles above anticipated snow levels, allowing for an extended season where the flags are properly illuminated. Sculptures and other artwork elements should also include illumination from within and/or from a protected area where snowfall will not prohibit proper illumination.

A renewed attention to detail, like ensuring proper lighting distribution sources, matching lamps, and consistent color temperatures, matters as it truly enriches the guest experience and encourages a sense of belonging, demonstrates great care. Ultimately leading to higher property values throughout the resort.

Once all of the roadways are properly illuminated, they will work together to create a highly impactful visual aesthetic and truly elevated sense of arrival at a luxury destination.

## UPDATED GUIDELINES

If a larger effort is pursued to update the roadway lighting, it is recommended that new roadway guidelines and standards be established to address fixture and LED lighting source performance criteria, while also establishing on-going maintenance and sustainability goals.

## BEST PRACTICES AND IES RECOMMENDATIONS

Please see the tables on the following pages: *(Figure 8.2.1)* *(Figure 8.2.2)* *(Figure 8.2.3)* and *(Figure 8.2.4)* and Appendix A for additional tables summarizing the IES recommended practice for lighting roadways (streets), sidewalks and crosswalks.

Lighting Design Criteria for Streets					
Street Classification	Pedestrian Activity Classification	Average Luminance $L_{avg}$ (cd/m <sup>2</sup> )	Average Uniformity Ratio $L_{avg}/L_{min}$	Maximum Uniformity Ratio $L_{max}/L_{min}$	Maximum Veiling Luminance Ratio $L_{v,max}/L_{avg}$
Major	High	1.2	3.0	5.0	0.3
	Medium	0.9	3.0	5.0	0.3
	Low	0.6	3.5	6.0	0.3
Collector	High	0.8	3.0	5.0	0.4
	Medium	0.6	3.5	6.0	0.4
	Low	0.4	4.0	8.0	0.4
Local	High	0.6	6.0	10.0	0.4
	Medium	0.5	6.0	10.0	0.4
	Low	0.3	6.0	10.0	0.4

**Major Street:** serves as the principal network for through-traffic flow

**Collector Street:** a road that serves traffic between major and local streets

**Local Street:** used primarily for direct access to residential, commercial, industrial, or other abutting property

**High pedestrian activity areas:** more than 100 pedestrians during the highest nightly average one-hour volume period

**Medium pedestrian activity areas:** between 11 and 99 pedestrians during the highest nightly average one-hour volume period

**Low pedestrian activity areas:** 10 or fewer pedestrians during the highest nightly average one-hour volume period

See IES Recommended Practice: Lighting Roadway and Parking Facilities, Table 11-1  
ANSI/IES RP-8-21

*Figure 8.2.1 | Lighting Design Criteria for Streets Table*

Pavement Illuminance Criteria for Full Intersection Lighting (Lux/Fc)				
Functional Classification	Pedestrian Activity Level Classification (pedestrian volume during hours of darkness)			$E_{avg}/E_{min}$
	High	Medium	Low	
Major/Major	34/3.2	26/2.4	18/1.7	3.0
Major/Collector	29/2.7	22/2.0	15/1.4	3.0
Major/Local	26/2.4	20/1.9	13/1.2	3.0
Collector/Collector	24/2.2	18/1.7	12/1.1	4.0
Collector/Local	21/2.0	16/1.5	10/0.9	4.0
Local/Local	18/1.7	14/1.3	8/0.7	6.0

See IES Recommended Practice: Lighting Roadway and Parking Facilities, Table 12-1  
ANSI/IES RP-8-21

Figure 8.2.2 | Pavement Illuminance Criteria for Full Intersection Lighting Table

Pavement Illuminance Criteria for Partial (Isolated) Intersection Lighting			
Road Classification	$E_{avg}$ , lux (fc)	$E_{v,avg}$ lux (fc)	$E_{avg}/E_{min}$
High pedestrian activity	10 (0.9)	5 (0.5)	5.0
Medium pedestrian activity	5 (0.5)	2 (0.2)	5.0
Low pedestrian activity	2 (0.2)	1 (0.1)	10.0

See IES Recommended Practice: Lighting Roadway and Parking Facilities, Table 12-2  
ANSI/IES RP-8-21

Figure 8.2.3 | Pavement Illuminance Criteria for Partial Intersection Lighting Table



Pavement Illuminance Criteria for Roundabouts (Lux/Fc)				
Functional Classification	Pedestrian Activity Level Classification			$E_{avg}/E_{min}$
	High	Medium	Low	
Major/Major	34/3.2	26/2.4	18/1.7	3:1
Major/Collector	29/2.7	22/2.0	15/1.4	3:1
Major/Local	26/2.4	20/1.9	13/1.2	3:1
Collector/Collector	24/2.2	18/1.7	12/1.1	4:1
Collector/Local	21/2.0	16/1.5	10/0.9	4:1
Local/Local	18/1.7	14/1.3	8/0.7	6:1

See IES Recommended Practice: Lighting Roadway and Parking Facilities, Table 12-4  
ANSI/IES RP-8-21

*Figure 8.2.4 | Pavement Illuminance Criteria for Roundabouts Table*

## 8.3 SIDEWALKS

### INTRODUCTION

Smaller sidewalks and staircases connect roadways to the inner areas of Beaver Creek. Although secondary to the public spaces and roadways, these sidewalks allow for easy access from the roadways to the village interior and around the buildings to parking areas, ticketing, and ski school locations. Lighting in these areas is reduced but must include safe levels and smooth illumination to allow for safe passage.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. There are currently no dedicated fixtures illuminating sidewalks adjacent to the roads. The lighting of sidewalks is entirely dependent on the roadway lighting and ambient lighting from nearby façades and windows.
2. Sidewalks between buildings, which lead to the Village Core from perimeter areas and roadways, do include some bollards that emit lighting in a wider, somewhat uncontrolled wash. These bollards are also a source of nuisance glare and a visual discomfort. Nearby light poles illuminate the general area, but do not contribute light specifically to the sidewalks.
3. Many sidewalks often are under lit, especially if there was no roadway pole lighting to illuminate them. Guests were not observed using these sidewalks much at night, due to the lack of illumination.
4. Most ancillary sidewalks also appeared to have no lighting planned for them and were consequently unlit, save for the twinkle lights and/or nearby roadway poles. Guests were not observed using these ancillary sidewalks much at night due to the lack of illumination.
5. It was observed that the sidewalks adjacent to the buildings were better illuminated from the lighting mounted to the buildings.

### GOALS

1. Develop an overall sidewalk lighting plan to identify opportunities to enhance the pedestrian experience at night throughout the resort.
2. Sidewalks are to be lit with strongly secured decorative bollards and/or pedestrian friendly light poles which will create a beautiful and safe pedestrian experience in the resort.

3. The sidewalk lighting fixtures should include high-efficiency, 90+ CRI LED light sources that illuminate the sidewalk from concealed sources without creating glare or other visibility issues for pedestrians or drivers.

## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment contributing to the light of the sidewalks is fully operational as quickly as possible to optimize the existing lighting on the sidewalks. This initial effort also includes repairing and/or replacing broken and missing parts.

The subsequent strategy includes developing a sidewalk lighting program using decorative bollards and/or pedestrian scale lamp posts that reflect the personality and stylistic perspective of the various neighborhoods of the resort.

## BEST PRACTICES AND IES RECOMMENDATIONS

Please see the table below and Appendix A for additional tables summarizing the IES recommended practice for lighting roadways (streets), sidewalks and crosswalks.

Recommended Design Criteria for Walkways Within Road Right of Way			
Condition	$E_{avg}$ , lux (fc)	$E_{v,avg}$ lux (fc)	$E_{avg}/E_{min}$
High pedestrian activity	10 (0.9)	5 (0.5)	5.0
Medium pedestrian activity	5 (0.5)	2 (0.2)	5.0
Low pedestrian activity	2 (0.2)	1 (0.1)	10.0

See IES Recommended Practice: Lighting Roadway and Parking Facilities, Table 11-2  
ANSI/IES RP-8-21

*Figure 8.3.1 | Recommended Design Criteria for Walkways Within Road Right of Way Table*

## GUIDELINES

If an effort is pursued to modernize the resort by adding sidewalk illumination, it is recommended that new sidewalk lighting guidelines and standards be established to address fixture and LED lighting source performance criteria, while also establishing on-going maintenance and sustainability goals.

## 8.4 CROSSWALKS

### INTRODUCTION

There are several areas where roadways and sidewalks intersect, creating an entirely new guest interaction, requiring specific lighting considerations. In these areas, lighting must include all requirements of roadways, with enhanced sidewalk lighting to delineate transition areas, and enhanced visibility for motorists to clearly see pedestrians at all times of the year.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Like with sidewalks, there are currently no dedicated fixtures lighting the crosswalks. The crosswalks are dependent on the roadway lighting being placed at the corners of each crosswalk to provide enough light.
2. Crosswalks often appear under lit, especially if there was no roadway pole lighting to fill in this area.
3. Guests were not observed using these crosswalks as much at night due to the lack of illumination.

### GOALS

1. Primarily, the goal with crosswalk illumination is to create a safe transition point for pedestrians to travel from one side of the street to another, and allow cars, trucks, and other vehicles to clearly see pedestrians as they make their way across roadways. This is achieved through proper lighting that illuminates the surfaces in such a way that all parties have enhanced visibility unhindered by any glare or inferior lighting strategies.
2. To add bollard lighting at primary crosswalks not only to increase pedestrian awareness and encourage their use and night, but to also make it easier for the drivers to see the pedestrians as they cross.

## STRATEGIES AND RECOMMENDATIONS

The initial strategy is to ensure all existing lighting equipment contributing to the light of the crosswalks is fully operational as quickly as possible to optimize the existing lighting on the crosswalks. This initial effort also includes repairing and/or replacing broken and missing parts.

The next strategy is to retrofit the existing lighting sources within these fixtures to each have appropriate LED lighting sources with appropriate lighting distribution optics and/or controls to optimize the crosswalk lighting overall, wherever possible.

It is highly recommended that bollard lighting be added to the primary crosswalks to encourage their use and night by pedestrians and promote a sense of safety. Crosswalk lighting solutions should include strong, vandal resistant, impact resistant lighting bollards specifically chosen to illuminate the crosswalk, and not create glare or stray light out into the surrounding environment.

These fixtures should allow for downward and illumination which clearly delineates the crosswalk as a transition point between one side of the street and the other. Illumination in these areas should be slightly greater than the sidewalks and roadway lighting to draw attention to crossing pedestrians.

## BEST PRACTICES AND IES RECOMMENDATIONS

Please see the table below (*Figure 8.4.1*) and Appendix A for additional tables summarizing the IES recommended practice for lighting roadways (streets), sidewalks and crosswalks.

Pavement Illuminance Criteria for Full Intersection Lighting (Lux/Fc)				
Functional Classification	Pedestrian Activity Level Classification			$E_{avg}/E_{min}$
	High	Medium	Low	
Major/Major	34/3.2	26/2.4	18/1.7	3.0
Major/Collector	29/2.7	22/2.0	15/1.4	3.0
Major/Local	26/2.4	20/1.9	13/1.2	3.0
Collector/Collector	24/2.2	18/1.7	12/1.1	4.0
Collector/Local	21/2.0	16/1.5	10/0.9	4.0
Local/Local	18/1.7	14/1.3	8/0.7	6.0

See IES Recommended Practice: Lighting Roadway and Parking Facilities, Table 12-1  
ANSI/IES RP-8-21

*Figure 8.4.1 | Pavement Illuminance Criteria for Full Intersection Lighting Table*

## GUIDELINES

If an effort is pursued to modernize the resort by adding sidewalk illumination, it is recommended that new crosswalk lighting guidelines and standards be established to address fixture and LED lighting source performance criteria, while also establishing on-going maintenance and sustainability goals.

# 9.0 BUILDING ARCHITECTURE & FAÇADES

## 9.1 OVERVIEW

### INTRODUCTION

The various and unique architecture of the buildings within the Beaver Creek Resort are an integral part of the Beaver Creek guest experience. As such, residents and guests that visit the resort expect that the buildings are held to, and contribute to, the overall standards of safety, comfort, and the daytime and nighttime visual appearance.

During the day, the guest experience is focused more on the natural environment and the mountains surrounding the resort and the sun reveals all the architectural details and enhancements on the building façades. At night, the resort's-built environment becomes the guests' center of focus, and the artificial lighting must take over the important task of illuminating the building façades.

Additionally, the architectural façades that face toward the village core are a key component of the visual vocabulary each night. They help to provide visual cues and vibrancy to the entire guest experience as they navigate between the various retail, restaurant and entertainment opportunities held within the village core.

While lower-level façade elements, such as storefronts and building entries, are illuminated to inform the pedestrian experience it is the upper level façade elements that inform the view from afar for both pedestrians within the resort and drivers approaching the village at night.

The lighting developed for the façades must be conscious of its role in the overall nighttime experience of Beaver Creek and work with the other illuminated elements to establish a refined sophisticated nighttime personality.

The lighting on these façades should not only reinforce a sense of safety and security, but it should also reinforce wayfinding and aesthetic goals.

Illuminating the façade surfaces in a careful and thoughtful way will have a significant impact on the overall quality of the nighttime environment and will help attract future generations of residents and guests to own and/or visit the resort.

## SURVEY & ASSESSMENT OF EXISTING CONDITIONS OVERALL

Early in January 2022, a team of four lighting designers performed a site visit to survey and audit the building lighting for the façades and adjacent areas facing the Village core.

1. During this site visit, 1,411 fixtures were audited in less than a week, 1,050 of those were on the buildings. The purpose of this audit was to identify which fixtures needed to be repaired, rehabbed and/or replaced. All lighting was evaluated against the existing guidelines. Please see Appendix D for individual building site inspection reports, location maps, and details regarding fixture repair/rehab reports.
2. During multiple trips to the resort in September 2021, January, and February 2022, the survey team noted that currently only a few buildings include lighting from sconces along the first story of the building or lighting fixtures on the upper levels of the façades. This, coupled with the fact that the glare from the lamp posts makes the façades feel even darker, creates a visual disconnect between the façades, the pedestrian paths, the surrounding storefronts, and the nighttime sky beyond.
3. Many of the façades along the Beach area did not appear to have fixtures at all. This resulted in the promenade feeling dark and foreboding.
4. When lighting is present, it is often from a hodge-podge of fixtures, beam distributions, color temperatures and/or lighting sources. Many light sources are no longer in compliance with the existing DRB Design Guidelines or appear to have been repaired or replaced with elements that are also not in keeping with Beaver Creek's high standards of maintenance.
5. Many fixtures are also in need of repair and/or replacement parts and general cleaning.
6. During daylight hours, the façades are beautifully illuminated by the sun and the guests can clearly see the unique architectural detailing and embellishments on each building.
7. During the evening hours, most of the façades appear to recede into the darkness surrounding the resort, including the building entrances and exterior passageways, making the village feel closed, dark, and dangerous.
8. Good intentions for lighting are evident, but they are currently muddled by sub-par executions of lighting solutions throughout the various buildings.
9. The many inconsistent solutions that were observed appear to also have been installed over a long period of time; together they have diluted the luxury look and feel of the resort.



## GOALS

1. Optimize the illumination of the various façades by bringing the façade lighting fixtures and lighting sources back into compliance on each building.
2. Properly illuminating the façades will make the entire village feel more occupied, vibrant, and lively throughout the night, even if the commercial spaces are closed for the night.
3. Develop a well-cared-for and well-lit building strategy that will result in higher real estate values and increased pride in ownership.
4. Use façade lighting to aid the guests with illuminated wayfinding cues as they navigate their way through the resort each night.
5. Illuminate each building in a manner that celebrates its unique architecture details and enhancements.
6. Update lighting sources to accent finish colors more appropriately.
7. Develop and standardize a kit of parts for each building; including updates to lighting sources which should be more uniform throughout the resort.
8. Work with the HOAs to develop modernized lighting solutions that include easily maintainable lighting sources and sustainable fixtures.
9. Optimize the lower-level façade lighting fixtures to better inform the pedestrian experience.
10. Modernize the façade lighting to reveal the building's nighttime personality.
11. Update the lighting fixtures and/or sources to include increased light output, minimal fixture size, updated color temperature at 3000K throughout the store and include better color rendering. Better color rendering, higher output and less glare puts all the emphasis onto the architecture, and not on the equipment.

These updates more fully enhance the façades by accenting the unique architectural details and contribute to the vibrancy of the village core by including each building in the nighttime visual experience of the resort.

## LIGHTING STRATEGIES

The initial strategy is to bring all existing lighting into full compliance as quickly as possible to optimize the existing lighting on each building. This initial effort also includes repairing and/or replacing broken and missing parts.

A renewed attention to detail, like ensuring matching lamps and consistent color temperatures, matters. It truly enriches the guest experience and encourages a sense of belonging, demonstrates great care, and will lead to higher property values.

The subsequent strategy involves adding light to upper-level façade elements to celebrate and highlight the unique architecture of each building. The placement of the additional light and fixtures on each façade is to be based on each building's architecture to create layers of lighting that work together for a cohesive whole.

Once all the façades are illuminated, they will work together to create a highly impactful visual aesthetic for both the near and far field of views and truly elevated sense of luxury and harmony.

## LIGHTING EQUIPMENT, SOURCES, MAINTENANCE RECOMMENDATIONS, AND SUSTAINABILITY EXPECTATIONS

In the nearly 42 years since Beaver Creek originally opened, there have been multiple revolutionary leaps in lighting technology. Light Emitting Diode (LED) lighting is currently the most prevalent source of artificial illumination. In addition to power, it often requires a data connection to work.

We are recommending that good color-rendering, energy-efficient, and quality LED lighting sources and fixtures be used moving forward, whenever existing fixtures and lamping have met the end of their usable lives.

We also recommend that all façade lighting be either 2700K to 3000K color temperatures, dependent upon the finish color of the façade and that the color temperature is consistent across the entire building.

## BEST PRACTICES AND LIGHTING DESIGN FOR AESTHETIC ENHANCEMENT

It is highly recommended that a professional architectural lighting designer, system integrator and electrical engineer work together with each HOA team to develop updated lighting solutions, replacement specifications, and provide a fully operational and functional lighting system that can be easily maintained for years to come.

This process would typically involve the following steps once you have engaged the independent architectural lighting designer:

1. Lighting designer and client would meet to kick-off project, review architecture, and discuss project goals.
2. Lighting designer would prepare a preliminary lighting design plan and present it to the client. Approx. time frame: 3-4 weeks minimum for the design efforts plus 3-4 additional weeks for an associated cost estimate to be completed by procurement specialist.
3. Lighting designer would then incorporate all client feedback on the preliminary lighting design plan and costing into a final set of drawings and documentation. The Lighting Designer will present it all to the client for their final approval. Approx. time frame: 3-4 weeks minimum for the design efforts plus 3-4 additional weeks for a final cost quotation to be completed by procurement specialist.
4. While the final cost quotation is being prepared, the Lighting Designer will meet with the project team to coordinate the lighting design. This may include meeting with project engineers, system integrators, procurement specialists, and any other stakeholders as needed. Typically, 3-4 weeks minimum for the coordination efforts.
5. During the Construction phase, the lighting designer will respond to RFI's and coordinate the installation efforts with the various contracting teams and the system integrator as required.
6. Once the lights are installed, the lighting designer will supervise the focus and programming efforts.
7. Upon project completion, all stakeholders and the lighting designer will celebrate!

The Illuminating Engineering Society (IES) recommends distinct guidelines for building façades based on façade details or façade fields. The resorts lighting strategy would be defined as façade details, as the goal is to only light certain features and/or architectural details rather than the entire façade.

Please see the table below and Appendix A for additional tables summarizing the IES recommended practice for lighting the elements as noted. Please note that the buildings within Beaver Creek Resort are a combination of residences and various types of lodging; as such there is a wide variety of recommended illumination values.

Recommended Illumination Values for Building Façade Details (Lighting Zone 2 - Medium Activity)				
		Vertical (EV) Targets (lux)		
		Visual Ages of Observers (years) where at least half are:		
Façade Details or Features	Notes	<25	25-65	>65
Lighter-toned façade materials with a surface reflectance of $\geq 0.5$	Apply strategically to $\leq 15\%$ of area of building façade	25	50	100
Darker-toned façade material with a surface reflectance of $< 0.5$	Apply strategically to $\leq 15\%$ of area of building façade	100	200	400

See IES Recommended Practice: Lighting for Exterior Environments, Table 2e  
IES RP-33-14

*Figure 9.1.1 | Recommended Illumination Values for Building Façade Details Table*

## ENCOURAGING THE HOMEOWNER ASSOCIATIONS (HOAS)

When each HOA board is ready to move forward to elevate the nighttime illumination on their building façade, it is strongly encouraged that they engage the services of an architectural lighting design professional to aid them in developing and realizing an appropriate façade lighting plan.

There are many questions to be answered such as:

- What architectural features, details or enhancements should be revealed by the lighting, and which should not be illuminated?
- How will the finish and building materials inform the lighting approach, color temperature, use of color beam angles, and light locations?
- Are there any physical or structural restrictions to installing the new lighting?
- Can the new lighting be easily maintained and is it using sustainable sources and technology?
- Will the new lighting impact skyglow? Can uplight be captured by existing ledges or overhangs?

Independent architectural lighting design professionals can easily be found throughout the world, and also on the International Association of Lighting Designers (IALD) website under the Designer Directory tab at the following link: <https://www.iald.org/Designer-Directory/Search-for-Designer>

The benefits of using an IALD lighting designer is that they have signed a code of ethics and are also deeply skilled in developing quality lighting designs, utilizing cost-control techniques, and providing energy-efficient solutions that can reduce operating costs. All of these benefits will go a long way to instilling a high degree of confidence that the design solutions as developed for the façade were thoughtfully, skillfully and carefully chosen.

## UPDATED GUIDELINES

1. Updated guidelines will call for a lighting design that highlights each building façade individually in a unique way that enhances the building architecture and reflects the nighttime personality of the building itself. While the approaches are expected to vary from façade to façade, that reflects the overall refined look and feel of the larger resort at night.
2. All storefronts update their lighting to include 3000K LED sources that are CRI 90+, with increased light outputs, energy efficiency, and glare free illumination. Utilizing light sources with these qualities guarantees that all merchandise is revealed in the best manner possible.
3. Lighting control systems should be installed to help regulate intensity throughout the day and allow for levels of illumination to be lowered through evening and overnight hours.
4. Storefront windows be updated to smaller, less intrusive fixtures that place the emphasis on merchandise rather than lighting equipment.
5. These updates should be done over time, allowing for initial repair and refurbishment of existing equipment, then updates to lighting sources, and then fixtures, and control systems, when possible, to complete the lighting upgrade for each store.
6. The use of higher quality, higher light output, greater color rendering, and more energy-efficient sources is important to allow shop owners to keep their costs lower, while maintaining the highest quality to their stores.

## INDIVIDUAL FAÇADES

The following pages include survey and assessment information, a summary of fixtures needing rehabilitation, repair or more information and a rendered example of a possible lighting scheme to inspire the conversation about potential lighting design solutions for each individual building within the resort.

## 9.2 BC-1 ONE BEAVER CREEK

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Building was reviewed as part of the survey trip in January 2022. The team noted that approximately 23% of the fixtures had significant problems, including fixtures not working, sources with incorrect or inconsistent color temperatures, and missing or broken pieces.
2. Craftsman-style sconces around the building had a few fixtures with missing or broken glass, otherwise the lamps were working and the warm glow from the amber glass created an inviting pedestrian experience.
3. It could not be verified whether tenant balcony sconces were working.
4. Beyond the sconces at the tenant balconies, the upper façades, above the commercial level, are unlit, resulting in the building façade feeling dark and unfriendly.
5. Store signage tended to be lit with the same linear fixture and a range of functionality levels, lighting sources, and disrepair was observed.
6. The signage and stores recede from the guest focus at night, due to the sconces being a brighter illuminated element.
7. Upon closing for the night, the commercial window displays were not lit, making the adjacent pedestrian paths feel dark.
8. Upon closing for the night, restaurants around the building were also not illuminated, leaving the outdoor seating areas in the dark.

AREAS	BROKEN/MISSING ITEMS		TOTAL
	Glass Broken	Unconfirmed Need	
BUILDING BC-1	1	6	7

Figure 9.2.1 | BC-1 Broken / Missing Parts Table



Figure 9.2.2 | BC-1 Daytime Photo



Figure 9.2.3 | BC-1 Nighttime Photo



Figure 9.2.4 | BC-1 One Beaver Creek Rendering A

## POTENTIAL LIGHTING STRATEGIES AND RECOMMENDATIONS (AS SHOWN IN RENDERING)

- Locate shielded accent fixtures on the underside of the first-floor canopy, to provide front light on the vertical walls where commercial tenants are located.
- Add sconces to light both up and down the upper levels of the façade, helping to illuminate the upper parts of the building and create more visual interest.
- Add shielded accent fixtures to the underside of the higher roof line elements at the top of façades to highlight the architecture, adding a visual presence for both the near and far view.



## 9.3 BC-2 VILLAGE HALL

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Building was reviewed as part of the survey trip in January 2022. The team noted that that Village Hall contains a variety of downlights with differing lighting sources and a wide variety of color temperatures and beam spreads.
2. Due to this wide variety of lighting sources, color temperatures and beam spreads, there here are contrasting pools of light and dark that result in the guests and residents feeling uneasy as they walk-through the exterior paths surrounding the building. This is particularly noticeable in the hallway between the Gerald Ford entrance and ticketing, and the entrance overhang to the Ski school areas.
3. Some storefronts were lit with sconces and clip-lights; some were lit only with sign lighting, which created an inconsistent appearance and inappropriate lighting levels.
4. The functionality of the fixtures and color temperatures varied wildly per commercial tenant.
5. Many signage lighting fixtures were not truly focused on the signs as intended, but instead were focused on the adjacent paths, creating a nuisance glare to pedestrians navigating.
6. Sconces along the Village Core were in working order and provided some lighting onto the lower façades.
7. The upper façades, above the commercial level, are unlit, resulting in the building façade feeling dark and unfriendly.
8. The façades along the beach had only a couple of fixtures on at night, which left the back of the building particularly dark and foreboding.
9. The Gerald Ford Plaza area artwork is lit in a manner that doesn't allow the guests to see the art at night.
10. Small point-source accents located strategically on the façade to aim down to the plaza are inefficient and detract from the architecture instead of enhancing it.
11. Upon closing for the night, the commercial window displays were not lit, making the adjacent pedestrian paths feel dark.
12. Upon closing for the night, restaurants around the building were also not illuminated leaving the outdoor seating areas in the dark.

AREAS	BROKEN/MISSING ITEMS		TOTAL
	Glass Broken	Unconfirmed Need	
BUILDING BC-2	10	19	29

Figure 9.3.1 | BC-2 Broken / Missing Parts Table



Figure 9.3.2 | BC-2 Daytime Photo



Figure 9.3.3 | BC-2 Nighttime Photo



Figure 9.3.4 | BC-2 Rendering A



Figure 9.3.5 | BC-2 Rendering B

## POTENTIAL LIGHTING STRATEGIES AND RECOMMENDATIONS (AS SHOWN IN RENDERING)

- Horizontal illuminated lines of light are located across the façade to accentuate the various levels and height of the building, emphasizing the architecture to create visual interest.
- Accents highlight the flags to celebrate both the domestic and international guests visiting the resort.
- Front light on the lower-level façades of the building help to highlight the restaurants, storefronts, and ticketing areas
- Signage light that fully illuminates the signs to help the guests navigate their way through the space.
- Sconces along the lower-level help create a cohesive unified feeling along the commercial tenant storefronts.

## ADDITIONAL OPPORTUNITIES FOR ACTIVATION

### **Luminous Terrain**

- Beaver Creek's own version of Luminous Terrain™ an outdoor interactive lighting experience could activate the plaza in front of Gerald Ford Hall.
- Here are a few highlights:
- Luminous Terrain is about Activation, Discover, Human Interaction, and Play!
- Intelligent moving lights and media interact with your guests, immersing them in bright colors and patterns to create fun family entertainment.
- The experience is so intuitive that the guests, lights and media will appear to “SEE and PLAY” with each other.
- It is instruction-free, with nothing to read with play that crosses cultural barriers and generations.

For further information about Luminous Terrain™ please see Appendix H.



Figure 9.3.6 | Luminous Terrain Rendering Series

### **Storefront Window Activations: Kinetic Sculpture**

Location: Gerald Ford Passageway

Kinetic sculptures can be fascinating to watch, particularly if there is some complexity and a touch of randomness to keep the visitors guessing on what might happen next.

Themed to align with the associated retail establishment, the kinetic sculpture can be a great way to get visitors excited about your brand.



Figure 9.3.7 | Kinetic Sculpture



### ***Passageway Window Activations: Pepper's Ghost***

Location: Gerald Ford Passageway

Pepper's ghost uses a transparent mylar mirror to create digital objects that appear to be moving & floating through a physical space. When off, it's just your regular diorama or window dressing. When on, it's truly magic.

This is a great opportunity to create a little surprise and delight moment.



*Figure 9.3.8 | Passageway Window Activation  
Pepper's Ghost*

### ***FEC / Teen Lounge***



*Figure 9.3.9 | FEC / Teen Lounge A*

The FEC/Teen Lounge is a fantastic opportunity to engage with your tweens & teens in the evening hours. This space comes alive with bespoke games, comfy lounges, and family booths, along with food & bev geared towards this picky demographic.

Refer to Appendix G for a deeper dive into what's possible for this space. We recommend starting an "ideation & concept design" phase.



*Figure 9.3.9 | FEC / Teen Lounge B*



*Figure 9.3.9 | FEC / Teen Lounge C*

Please see Appendix G for further detail about the activations.

## 9.4 BC-3 PARK HYATT

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Building was reviewed as part of the survey trip in January 2022. The team noted that signage was typically lit with floodlights or spots in a manner that didn't appropriately illuminate the sign. Additionally, this lighting approach often created nuisance glare as it's light travels beyond the sign to the eyes of the guests passing by.
2. A wide range of downlights were observed within the existing canopies of the storefronts and many of these lighting sources had inconsistent beam spreads and/or color temperatures.
3. Decorative sconces are located on multiple levels of the building. The lower-level locations were in working order while the sconces at the second level were never observed to be on suggesting they possibly did not work.
4. The tower at the edge of the building had two (2) lines of light that were partially not working and the lighting in these locations was not really contributing to the façade illumination.
5. The upper façade did not have much lighting and the façade tends to disappear at night.
6. One chimney is brightly lit; it can be seen from the roadway as the guests approach the Village core. It is currently a lone beacon inviting the guests from afar to explore the village at night.

AREAS	BROKEN/MISSING ITEMS			TOTAL
	Glass Broken	Lamp Missing	Unconfirmed Need	
BUILDING BC-3	1	4	15	20

Figure 9.4.1 | BC-3 Broken / Missing Parts Table



Figure 9.4.2 | BC-3 Daytime Photo



Figure 9.4.3 | BC-3 Nighttime Photo



Figure 9.4.4 | BC-3 Rendering A

## POTENTIAL LIGHTING STRATEGIES AND RECOMMENDATIONS (AS SHOWN IN RENDERING)

- Lines of light going across the façades, helping to break up the building and create more layers of visual interest.
- Small accent lights light the dormers at top of façade, helping to illuminate the upper parts of the building to create more visual interest and a visual presence for both the near and far view.
- Existing decorative sconces and supplemental fixtures provide light on the façade between storefront windows and building entries creating a cohesive look along the lower façade.

## 9.5 BC-4 ST. JAMES

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Building was reviewed as part of the survey trip in January 2022. The team noted that approximately 70% of the fixtures had significant problems, including fixtures not working, sources with incorrect or inconsistent color temperatures, and missing or broken pieces.
2. This building has been retrofitted with a variety of downlights and a variety of lighting sources. While many of the downlights are new, they have too many differing beam spreads and inconsistent color temperatures resulting in a sub-par lighting experience.
3. It should also be noted that much of the signage lighting for the local businesses appears to be on time clocks that are not in sync with each other. The result is a type of visual confusion due to some signs being lit while others are not.
4. The signage lighting fixtures were often not focused on the signs, with many signs being missing lighting entirely.
5. The façade of the building did not have any lighting per se, but was brightly bathed in a wash of cool colored light coming from the children's fountain. The fountain lighting trespasses all over the façade surface and the lighting on the façade appears to abruptly change in intensity and movement due to the programming of the lighting on the children's fountain. The flashes of light can be seen from across the village; they make this façade feel eerie, creepy, or at best malfunctioning.
6. It could not be verified whether tenant balcony sconces were working.

AREAS	BROKEN/MISSING ITEMS			TOTAL
	Cover Missing	Glare Shield Missing	Unconfirmed Need	
BUILDING BC-4	1	4	18	23

Figure 9.5.1 | BC-4 Broken / Missing Parts Table





Figure 9.5.2 | BC-4 Daytime Photo



Figure 9.5.3 | BC-4 Nighttime Photo



Figure 9.5.4 | BC-4 Rendering A

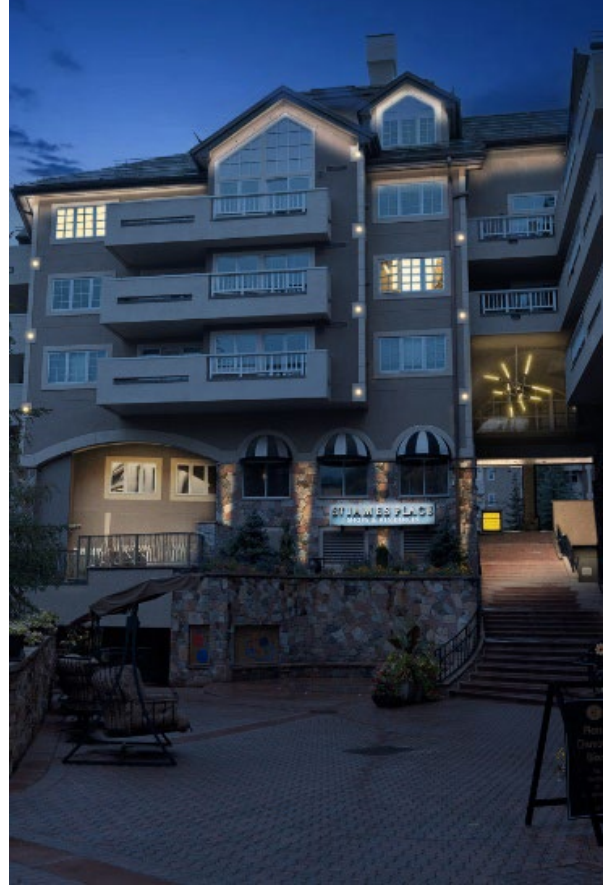


Figure 9.5.5 | BC-4 Rendering B

## POTENTIAL LIGHTING STRATEGIES AND RECOMMENDATIONS (AS SHOWN IN RENDERINGS)

- Linear lines of expose neon outline the lower-level of the building façade and canopies.
- Circular sconces are mounted to the façade to provide 360° illumination and a highlight on the architectural features.
- Linear lines of illumination at the corners of the façades further emphasize the height of the façade and draw the guests' eyes upward on the architecture.
- A decorative chandelier is added to the main staircase and set against a curved window background to provide visual interest and a sense of arrival.
- Lines of light to outline the underside of the roof tops to create more visual interest and a visual presence for both the near and far view.
- Up lights and/or accents are used to accent the stone clad columns.
- The intensity of the children's fountain is re-programmed to more appropriate levels of illumination and varying levels of activation over the course of each evening.

## 9.6 BC-5 POST MONTANE

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Building was reviewed as part of the survey trip in January 2022. The team noted that approximately 48% of the fixtures did not work and were in need of being entirely repaired or replaced. These fixtures mostly being by the street-side of the Post Montane Lodge.
2. Every step light by the Post Montane entrance to the village is filled with water and does not work.
3. The lower-level façades and the adjacent pathways feel very dark and uninviting at night.
4. The upper level façade areas have no lighting and this results in the building receding into the dark of the night. This is made even worse when the St. James children's fountain brightly illuminates the entirety of the St. James façade.
5. The most effective lighting is on the commercial tenant level at the restaurant and retail storefronts which has been recently renovated and refreshed. The façades of this restaurant are well lit and accent lights highlight the stone-calc columns. Lighting sources also appear to have a good color temperature and are pleasantly bright and noticeable at night.

AREAS	BROKEN/MISSING ITEMS	TOTAL
	Unconfirmed Need	
BUILDING BC-5	21	21

Figure 9.6.1 | BC-5 Broken / Missing Parts Table





Figure 9.6.2 | BC-5 Daytime Photo



Figure 9.6.3 | BC-5 Nighttime Photo



Figure 9.6.4 | BC-5 Rendering A

## POTENTIAL LIGHTING STRATEGIES AND RECOMMENDATIONS (AS SHOWN IN RENDERING)

- Accent lights are added to highlight the lower-level of the façades to brighten the pedestrian experience.
- Signage lights are to be consistent LED sources that are aimed to illuminate only the sign without trespass on adjacent façades, helping to mitigate unwanted shadows.
- Accents are added to illuminate the chimneys at the upper level of the façade helping to create more visual interest and a visual presence for both the near and far view.
- Miniature accent fixtures are located at the base of the windows to emphasize the perimeter window ledge and provide illumination along the mid-level windows.

## 9.7 BC-6 MARKET SQUARE

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Building was reviewed as part of the survey trip in January 2022. The team noted that the façade lighting facing towards the center of the village is an appropriate color temperature, but does not accentuate the storefronts.
2. At night, the storefronts are too dimly lit and fade into the background.
3. Adjacent pathway lighting is much brighter and draws focus away from the building and the commercial tenant storefronts at night.
4. The Vilar Performing Arts Center has many broken fixtures, especially those at the tops of all the columns, that need replacement or repair.
5. Additionally the overall impression of color temperature within the performing arts center is skewed due to the color emanating from the heat lamps over the bus loading/unloading areas.
6. Signage lighting overall was inconsistent with exposed lamps, broken fixtures, a variety of color temperatures and a variety of beam spreads making it difficult to read the signage.
7. The art gallery signage lighting does not properly or fully illuminate the signage, but instead creates hot spots on only part of the sign making it impossible to read.
8. It appears that a line of white linear lighting was added to the bottom of the storefront window displays for each gallery at some point after the initial installation. Due to the direct view nature of this product and the adjacency of nearby storefronts, these linear lines are too visually distracting both for the pedestrian passing by and the guest lingering at the windows to see what art might be within each gallery. Each line of light is reflected in multiple panes of glass throughout the passageway and has diluted the beauty of the art being displayed in the storefront windows.
9. Additionally there is beautiful stone around the base of each display window that could be beautifully illuminated.
10. The passageway is lit with a variety of wall mounted uplights that poorly illuminate the ceiling using inconsistent color temperature lighting sources. The resulting feeling is of uneasiness combined with a perception of darkness.

11. The passage way to get to the art galleries and beyond is poorly illuminated with no visual hierarchy helping the guest to navigate from point A to point B.
12. The statue at the far end of the passageway within the center of Market Square by the parking lot elevators is not illuminated, nor is the statue in the middle of the stairs leading down to the trail.
13. There has been an attempt to activate this passageway by adding rotating snowflake patterns in two (2) spots, however the guests appear to find it a bit confusing and either pass right through it or stand in the center of it waiting for it to respond to their movements.
14. The Building clock tower was also reviewed as part of the survey trip in January 2022. The team noted that that the clock tower was never illuminated during their visit.
15. The clock tower presides over the Ice Rink at the heart of the Village core, with a quiet wisdom that is understated, gently noting the passing of time throughout the resort.
16. The paint treatment on the clock allows its markings and hands to be subtly visible during the daytime, relying on strong sunlight to reveal the hands with shadows against the building wall.
17. In its current state, the clock disappears at night, and does not have a separate nighttime personality.

AREAS	BROKEN/MISSING ITEMS							TOTAL
	Lamp Missing	Top Element Missing	Lamp Socket Missing	Lamp Socket Broken	Shade Broken	Housing Broken	Unconfirmed Need	
BUILDING BC-6	2	24	1	1	3	5	2	38

*Figure 9.7.1 | BC-6 Broken / Missing Parts Table*



Figure 9.7.2 | BC-6 Daytime Photo



Figure 9.7.3 | BC-6 Nighttime Photo



Figure 9.7.4 | BC-6 Rendering A



Figure 9.7.5 | BC-6 Rendering B

## POTENTIAL LIGHTING STRATEGIES AND RECOMMENDATIONS (AS SHOWN IN RENDERINGS)

- It is critically important that the clock tower must be illuminated each evening.
- The façade should be illuminated from concealed sources aiming at key architectural features.
- Lines of linear light at the corners of the clock side of the façade help to further define this important central façade making it a beacon for wayfinding at night.
- Add upper-level lighting to the façades helps to create more visual interest and a visual presence for both the near and far view.
- Signage lighting must be optimized to properly illuminate storefront signage.
- Storefront display lighting intensity levels must be increased to provide energy and vibrancy for the pedestrian experience.
- Explore different ways to activate the passageway with lighting at night to encourage foot traffic.
- Illuminate the statues at the far end of the passageway and on the stairs.
- Use lighting to celebrate this façade's adjacency to the ice rink as the central gathering space.



## ADDITIONAL OPPORTUNITIES FOR ACTIVATION (LIGHTING, MEDIA AND INTERACTIVE)

### **Market Square Clock Tower: Bavarian Cuckoo Clock**



*Figure 9.7.5 | Daytime Clock Tower*



*Figure 9.7.6 | Clock Tower Rendering A*

- Every hour on the hour, the clock tower turns into a magical and whimsical display marking the time.
- Create memorable moments with surprising and sophisticated nighttime lighting and media shows, themed to the seasons and events.
- Permanent technical infrastructure lets the resort more easily update shows year-round.
- These projections could be passive immersion or interactive response to guests on ice.



## 9.8 BC-7 PARK PLAZA

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Building was reviewed as part of the survey trip in January 2022. The team noted that there was a big inconsistency in the types of fixtures and lighting sources being used around the building.
2. Each commercial tenant had their own system of lighting which did not create a cohesive uniform aesthetic at the pedestrian level.
3. Some storefronts had fixtures within their canopies, but the color temperature of these lighting sources was a cool 4000K, which does not comply with DRB design guidelines.
4. Certain passageways were observed to have an unintended combination of warm color temperature sconces with cooler color temperature downlights also being used. The two color temperatures were competing instead of complementing each other and created an odd blend of light that was visual distracting to the pedestrian and their surroundings.
5. It could not be verified whether tenant balcony sconces were working.
6. At night, the storefronts are too dimly lit and fade into the background.
7. Downlights in the passageways created pools of light and dark on the pedestrian path leaving parts of the walkways in shadow and/or unintentional scallops of light on the adjacent walls making the passageway feel dimly lit and unwelcoming.
8. Upper-level building eaves and lower-level façades were unlit making the entire façade appear to recede into the dark of the night.
9. Flags were not illuminated.
10. Storefront window lighting and signage lighting was inconsistent and/or too exposed distracting, instead of beckoning, the pedestrians passing by.
11. Several of the decorative lanterns on this façade were loosely mounted and they were shifted crookedly on the façade.
12. One lone lamp holder with an exposed lamp on a piece of unpainted pipe was found in the middle of an architectural column lighting a storage rack below. Exposed, unshielded lamps distract from the beauty of the architecture and should be avoided at all costs.

AREAS	BROKEN/MISSING ITEMS	TOTAL
	Unconfirmed Need	
BUILDING BC-7	22	22

Figure 9.8.1 | BC-7 Broken / Missing Parts Table



Figure 9.8.2 | BC-7 Daytime Photo



Figure 9.8.3 | BC-7 Nighttime Photo



Figure 9.8.4 | BC-7 Rendering A

## POTENTIAL LIGHTING STRATEGIES AND RECOMMENDATIONS (AS SHOWN IN RENDERING)

- Accent lighting, up/down light sconces, or additional decorative lanterns should be added to the façade at various levels to create more visual interest and a visual presence for both the near and far view.
- Signage lighting must be optimized to properly illuminate storefront signage.
- Storefront display lighting intensity levels must be increased to provide energy and vibrancy for the pedestrian experience.
- Storefront display lighting fixtures should be updated to smaller fixtures that don't distract from the display.
- All lighting sources are to be updated to 3000K within the commercial tenant spaces and in their window displays.
- Accents highlight the flags to celebrate both the domestic and international guests visiting the resort.

## 9.9 BC-8 BEAVER CREEK LODGE

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. Building was reviewed as part of the survey trip in January 2022. The team noted that 25% of the fixtures either did not work or had the incorrect color temperature.
2. While there was a cohesive approach to the signage lighting, but the fixtures were showing too much wear and tear. Additionally, many appear to have lost their focus.
3. Signage lighting tended to be directed towards the ground or onto pathways causing nuisance glare for the pedestrians passing by.
4. Downlights were operational but had an inconsistently wide range of color temperatures, making them visually distracting and unwelcoming to the guests. Additionally, the beam spread of these fixtures could be updated to light the building walkways more uniformly.
5. Upper-level building eaves and lower-level façades were unlit making the entire façade appear to recede into the dark of the night.

AREAS	BROKEN/MISSING ITEMS						TOTAL
	Lens Missing	Lamp Missing	Lamp Socket Broken	Finial Missing	Fixture Head Missing	Unconfirmed Need	
BUILDING BC-8	1	4	1	2	1	13	22

Figure 9.9.1 | BC-8 Broken / Missing Parts Table



Figure 9.9.2 | BC-8 Daytime Photo



Figure 9.9.3 | BC-8 Nighttime Photo



Figure 9.9.4 | BC-8 Rendering A

## POTENTIAL LIGHTING STRATEGIES AND RECOMMENDATIONS (AS SHOWN IN RENDERING)

- Accenting various chimneys and celebrating the vertical elements of this façade creates visual interest, improving visual presence for both the near and far view.
- This building's location at the main entrance of the resort is adjacent to the covered bridge, elevating the need for appropriate façade lighting. The warm glow of the new fire pit from across the entrance plaza makes this building more noticeably unlit. It appears unfriendly and unwelcoming rather than warm and inviting.
- Accent fixtures hidden within the canopies provide illumination to the façades adjacent to the storefronts and help brighten the pedestrian level experience.
- Carefully aimed signage accents add an extra pop of light to the sign while also controlling potential trespass and unintended shadow issues.

# 10.0 STOREFRONTS & WINDOW DISPLAYS, CANOPIES, AND PATIOS

## 10.1 OVERVIEW

### INTRODUCTION

The Beaver Creek Resort boasts twenty-one restaurants and forty-four retail shops spread throughout the entire Village Core and beyond. From art galleries to realty, and coffee shops to fine dining, Beaver Creek has a lot to offer its guests.

The illumination of storefronts and window displays is essential to the pedestrian experience within the resort. While pedestrian lighting often focuses on the horizontal plane of the paths and sidewalks, it is vertical planes of illumination – created by storefronts and window displays – that provide visual cues about the resort's nighttime environment and help create energy within the Village Core.

The layer of light at each storefront provides a soft glow on the pavement in front of each store, while the window displays use accent lights to attract the guests to shop, dine and stroll.

Patio spaces, both designed and improvised, allow for public gathering and dining opportunities throughout the resort. Based on the pandemic of 2020 through 2022, utilizing outdoor space for dining has become even more crucial to the ongoing success of many restaurants.

Beaver Creek enjoys status as a resort where high-end retail and fine restaurants are found.

Each storefront has one or more windows facing out to the Village Core, allowing guests to clearly see the offerings of each commercial tenant.

Each of the commercial tenants at Beaver Creek has a distinct window architecture, which encourages a variety of lighting methods, equipment, and illumination levels. The proposed lighting updates will increase traffic to each tenant's location by generating more interest and increase their revenue.

## SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. During trips to the resort in September 2021, and January and February 2022, the survey team noted that many of the storefronts included lighting fixtures and bulbs that had little to no accentuation of the merchandise. Many of these fixtures appear to be retrofitted with LED lightbulbs that emit low quality illumination, and minimal light output that did not enhance the merchandise.
2. During daylight hours, the stores appeared dull and lifeless, and the storefront windows were barely visible, due to the competition from strong sunlight. Some storefronts included larger track fixtures and other lighting equipment visible through the windows that detracted from the display merchandise.
3. During the evening hours, many stores were completely dark, including the storefronts, which made the stores and the village seem closed, dark, and foreboding.
4. While several window displays did include lighting, many others were either under-lit or generally left unlit.
5. Many of the commercial tenants have unintentionally backlit window displays due to the general lighting in the store being brighter than the lighting in the window displays.
6. Tenants that do have window display lighting tended to have fixtures very close to the display, creating uneven and sometimes harsh lighting that doesn't flatter the products being displayed.
7. Tenant patios did not have specific fixtures for the seating areas. Patios were dependent on ambient light from surrounding poles, façades, and storefronts. If there were no nearby or adjacent fixtures the patios, many were left completely unlit.
8. Often, upon closing, the retail space lighting was turned off, leaving the window displays dark, rendering them unable to be seen by the guests and resulting in a huge drop in energy and vibrancy for the Village.

## GOALS

1. To optimize the illumination of the storefronts, window displays, patios and interiors of the commercial spaces during evening hours. This change will make the entire village feel occupied, vibrant, and lively throughout the night, even if the stores, galleries, and restaurants are closed. Guests will be able to peruse and understand the tenant's offerings, and decide to visit when the commercial tenant opens up again the next day.
2. To allow and encourage the interior lighting to spill out into the plaza areas, creating a pad of light on the ground in front of the shops which will further delineate and welcome guests to walk through the village and explore each window.
3. To update the lighting fixtures and/or sources to include: increased light output, minimal fixture size, updated color temperature at 3000K throughout the store, and include better color rendering. Better color rendering, higher output and less glare put all the emphasis onto the merchandise, and not on the equipment.

These updates will allow the storefronts to be more fully enhanced, accent the merchandise, and activate the shops during evenings in both the winter and summer seasons.



## LIGHTING STRATEGIES AND BEST PRACTICES

The illumination and accent of storefronts and window displays is a science, and an art form. The Illuminating Engineering Society (IES) outlines three best practices that should always be considered when developing lighting for retail spaces:

1. **Lighting Should Attract the Customer.** The first step in the merchandising process is to attract the customer to the retail space and merchandise. Lighting creates an immediate impression of the merchandise and the appearance of the area (show window or store interior) that can draw customers toward merchandise or spaces when the selling process can begin. Show windows as well as store interiors are important to customer attraction.
2. **Lighting Should Allow the Customer to Evaluate the Merchandise.** The next step is to enable the customer to visually evaluate the merchandise. The customer must be able to visually evaluate characteristics such as texture, color, and quality, and to read labels. Fitting rooms as well as sales areas are important for merchandise evaluation.
3. **Lighting Should Facilitate the Completion of the Sale.** Finally, proper lighting at the point of sale is necessary to complete a transaction. Sales personnel should be able to perform services quickly and accurately such as recording sales on the register, preparing paperwork, reading prices, using credit card transaction tools, and packaging. Points of sales as well as customer service areas are important to sales completion.

During the day, sun angles and shadows are important to address. Visual Terrain recommends that dimming controls for artificial lighting be installed to balance lighting from brighter daytime settings to less intense nighttime settings.



Storefront window lighting should ideally be brighter than the ambient conditions to attract attention and to minimize the impact of outdoor reflections that may hinder visibility of merchandise. The following factors should be considered in the design of storefront lighting:

- Location of show window (facing into the sun, covered by balconies, etc.)
- Night and day use and associated ambient illuminances
- Neighboring stores, and adjacent storefront windows
- Fully enclosed (contained window/lightboxes)  
    **or** open-back configuration (view into the store)
- Size and shape
- Reflections, contour, and slant of show window glazing
- Architectural canopies, coverings, and ornamentation
- Interior surface reflectance and colors
- Size and location of display graphics

The following types of illumination and their associated recommended foot-candle levels from The Illuminating Engineering Society (IES) should always be considered when developing lighting for retail window displays:

### ***Dazzle***

Defined as strategically applying lighting to  $\leq 10\%$  of the total display or displays visible from the primary viewing direction.

- Daytime:       A maximum of 1000 foot-candles measured vertically at 0 feet A.F.F. on the relevant areas of displays in the windows
- Nighttime:     A maximum of 50 foot-candles measured vertically at 0 feet A.F.F. on the relevant areas of displays in the windows.

### ***Highlight***

Defined as strategically applying lighting to  $\leq 25\%$  of the total display or displays visible from the primary viewing direction.

- Daytime:       A maximum of 500 foot-candles measured vertically at 0 feet A.F.F. on the relevant areas of displays in the windows.
- Nighttime:     A maximum of 30 foot-candles measured vertically at 0 feet A.F.F. on the relevant areas of displays in the windows.

### **Total Display**

Defined as applying overall lighting to the display or displays visible from the primary viewing area.

Daytime: An average of 100 foot-candles measured vertically at 0 feet A.F.F. on the relevant areas of displays in the windows.

Nighttime: An average of 5 foot-candles measured vertically at 0 feet A.F.F. on the relevant areas of displays in the windows.

Developing a cohesive commercial tenant lighting methodology that works to create a greater whole through the entire resort should include the following ideas:

- All storefront entrances should be illuminated with a gentle welcome pad of light allowing guests to acclimate between exterior lighting conditions in the interior store lighting conditions.
- All awnings, overhangs, and other overhead obstructions should include lighting aimed down to the pedestrian level and illumination on vertical surfaces allowing guests to easily navigate into and out of the store.
- Ideally, window displays should include multiple layers of light including wide washes of illumination in addition to bright accent spots to highlight key merchandise.
- From the storefront, the resort guest should always be able to see well into the tenant space at night to draw them into the space.
- Illumination levels are to vary throughout the night, being brighter at sunset to encourage higher levels of activity/shopping, and lower after hours when the space has closed to encourage exploration and a desire to return the next day.
- With the advent of LED technology, fixture size can be reduced, allowing for lighting equipment to be less obtrusive in the window displays, placing more focus onto merchandise.
- Additionally, interior lighting of the windows can be adjusted to allow light spill out into the exterior spaces, creating a warm and welcoming pad of light where guests will feel comfortable walking, gathering, and viewing the window displays.

## LIGHTING EQUIPMENT, SOURCES AND MAINTENANCE EXPECTATIONS

To future-proof Beaver Creek Resort, it is important to plan, and accommodate, for new technologies. Currently, LED technology dominates the lighting in the field, and outdated technologies, such as halogen, metal halide, and other sources are no longer preferred - and often not able to be maintained or repaired.

An emphasis on energy efficiency, lower energy costs, and higher color rendering has made LED light sources an ideal solution. In combination with modern lighting control systems, lighting levels, pre-determined timed events and color-tuning are all possible.

## UPDATED GUIDELINES

Visual Terrain recommends a system that highlights each store individually in a unique way for each tenants brand identification and to attract customers, but in a manner that reflects the overall refined look and feel of the larger resort at night.

Visual Terrain recommends that all storefronts update their lighting to include LED sources that have great color rendering, higher light outputs, energy efficiency, and glare-free illumination. Utilizing light sources with these qualities guarantees that all merchandise is revealed in the best manner possible. Lighting control systems help regulate intensity throughout the day and allow for levels of illumination to be lowered through evening and overnight hours.

Visual Terrain recommends that lighting in storefront windows be updated to smaller, less intrusive fixtures that place the emphasis on merchandise rather than lighting equipment. These updates should be done over time, allowing for initial repair and refurbishment of existing equipment, then updates to lightbulbs, and then fixtures, and control systems, when possible, to complete the lighting upgrade for each store. The use of higher quality, higher light output, greater color rendering, and more energy-efficient sources is important to allow shop owners to keep their costs lower, while maintaining the highest quality to their stores.

## ADDITIONAL OPPORTUNITIES FOR ACTIVATION

Window activations are a great way to draw guests to your retail partners as well as places that might not get as much foot traffic as the more centrally-located locations. Please refer to Appendix G for deeper dive on these window activation concepts.

### **Storefront Window Activation: Art Train**



*Figure 10.1.1 | Sportsmen's Gallery & Paderewski Fine Art  
Art-themed multi-media train installation*



*Figure 10.1.2 | Detail: Frog Art Train*

Location: Sportsmen's Gallery & Paderewski Fine Art

This art-themed activation draws upon our nostalgia for model trains while adding a little digital magic and possibly activating some of the adjacent sculptures outside the window for additional moments of surprise and delight.

### Storefront Window Activation: Snowflakes



Figure 10.1.3 | The North Face  
Interactive 1: Snowflake reveal Windows



Figure 10.1.4 | The North Face  
Interactive 2: Skiing Adventure Game Window

Possible Location: The North Face

This window activation utilizes a transparent display in front, a traditional display in back, and cubbies for physical props and merchandise. As guests touch the glass the hidden moment in each cubby is revealed.

### Storefront Window Activation: Miniature Scene



Figure 10.1.5 | Beaver Creek Sports  
Mini Dioramas (Windows 1 and 2)

Location: Beaver Creek Sports KIDS

This activation is for our smallest guests. Situated at the bottom, or even just below, a traditional window lies a miniature scene that is activated with motion and proximity.

## Storefront Window Activations: Wonderfalls



Figure 10.1.6 | Beaver Creek Sports KIDS  
Wonderfalls



Figure 10.1.7 | Beaver Creek Sports KIDS  
Wonderfalls Reference

Location: Beaver Creek Sports KIDS

This camera-based window activation is based off b/i's popular "Wonderfalls®" experience. Here guests use their bodies to interact with a variety of "falling" media content, such as snow & autumn leaves in the cooler months, flowing waterfalls in the warmer months

Please see Appendix G for further detail about the activations.



## 10.2 AWNINGS & CANOPIES

### INTRODUCTION

Architectural awnings and canopies can be found throughout the resort, allowing for protection from the elements, shielding of UV rays to storefront merchandise, and shade from summertime heat. These elements enhance the architecture of the façade and help create visual interest. At night they also create special opportunities for lighting that can enhance the property and aid with wayfinding.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

Not all awning and canopies include lighting within and were subsequently unlit. Those that did have lighting typically contain a mismatch of downlights with varying beam spreads and color temperatures.

### GOALS

These awnings and canopies offer a great opportunity to create warm and inviting areas for guests to enjoy while perusing merchandise inside retail windows.

Warm lighting from awnings contributes to the guest's comfort within the built environment by enhancing the architecture of the façade and helping to draw passersby to the amenities within each building.

### STRATEGIES AND RECOMMENDATIONS

When feasible, and the awning material is more translucent, or constructed of a lightly colored fabric, use internal lighting that can create large glowing surfaces that attract guests. This internal lighting can be from wide flood or open fixtures hidden within the canopy or awning structure itself and will create a beautiful glowing appearance.

When the awning material is not translucent, it is highly recommended that internal lighting be hidden within the canopy to illuminate the architecture of the storefront and draw focus to the entrance of the establishment.

It is essential that this approach of hiding lighting within each canopy or awning structure, is done in a manner without causing shadows, hard lines, or hotspots and that these fixtures need to be shielded from direct guest view. The installation should be completed as cleanly as possible and it is recommended to discreetly hide conduit, and other

mounting hardware. Installation should also allow for bounce lighting from the awning down to the pedestrian level where guests will be bathed in warm light.

Recommended Illumination Values for Exterior Applications and Tasks (Lighting Zone 2 - Medium Activity) (lux)								
	Horizontal (Eh) Targets			Vertical (Ev) Targets			Uniformity Targets Over Area of Coverage	
Applications and tasks	<25	25-65	>65	<25	25-65	>65	Max:Avg	Avg:Min
Canopied Entries/Exits	5	10	20	3	6	12	3:1	2:1(4:1)

See IES Recommended Practice: Lighting for Exterior Environments, Table 2a  
IES RP-33-14

*Figure 10.1.1 | Recommended Illumination Values for Exterior Applications and Tasks Table*

## UPDATED GUIDELINES

Update lighting inside existing canopies to be 3000K LED sources, clean up any exposed conduit, and internally illuminate either the canopy and/or the architecture of the storefront from lights hidden within each canopy structure.



# 11.0 SIGNAGE

## 11.1 OVERVIEW

### INTRODUCTION

Illuminated signage is a yet another key component of the layers of light found within the resort. Good signage lighting makes graphics easier to read and understand. The lighting can enhance the guest experience by helping guests focus their attention on important signage information.

### SURVEY & ASSESSMENT OF EXISTING CONDITIONS

1. During trips to the resort in September 2021, January, and February 2022, the survey team noted that most of the signage lighting was not in compliance with the DRB design guidelines.
2. Many of the signage lighting fixtures appeared to be retrofitted with LED replacement lightbulbs that emit low quality illumination and minimal light output which did not properly illuminate the signage.
3. Blade signs were primarily lit from external sources on arms coming off the main signage structure.
4. A variety of lamping sources and color temperatures are currently in use.
5. Many of the fixtures were broken, missing lenses and/or other elements that would shield the light source from pedestrian view or had fully exposed lamps.
6. Often, the signage lighting creates glare or casts unwanted shadows on nearby architecture and/or trespasses into a nearby window. (*Figure 11.1.1*)
7. While the BC-7 Park Plaza did not employ blade signage lighting, the remaining buildings typically had a singular approach to their choice of signage lighting fixtures as shown in the (*Figure 11.1.2*)



*Figure 11.1.1 | Signage Unwanted Shadows, and Light Trespass*



BC-1 ONE BEAVER CREEK



BC-2 VILLAGE HALL



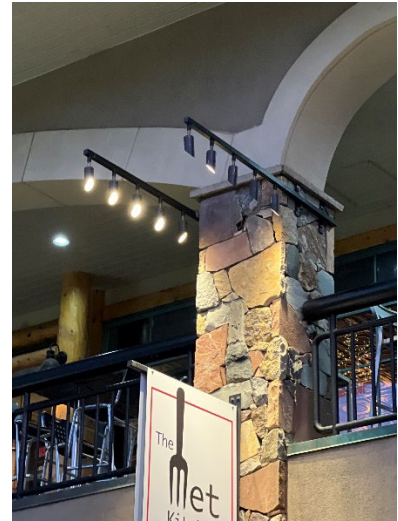
BC-2 VILLAGE HALL



BC-3 PARK HYATT



BC-4 ST. JAMES



BC-6 POST MONTANE



BC-8 BEAVER CREEK LODGE

Figure 11.1.2 | Various Signage Lighting

## GOALS

The immediate goal is to optimize the signage lighting throughout the resort by bringing the signage lighting fixtures and the utilized lighting sources back into compliance on each building. Further goals include:

1. To uniformly illuminate the signage in a manner that increases visibility, and renders graphic colors accurately.
2. To develop a standardized lighting source and fixture specification for the blade signage on each building. By attending to this detail, the HOAs and the resort can minimize the visual clutter of too many sources and too many varied lighting solutions and elevate the guest experience.
3. To work with the commercial tenants and HOAs to develop modernized lighting solutions that include easily maintainable lighting sources and sustainable fixtures.

## LIGHTING STRATEGIES, BEST PRACTICES AND RECOMMENDATIONS

Although each retailer can use their own font, sign sizes, and other criteria specific to their brand identity, it is important that all signs comply with the current DRB guidelines and incorporate these lighting standards:

- The entire sign, or lettering within the sign, should be smoothly illuminated without hotspots or shadows.
- All lighting sources are to be shielded or shrouded from guest view while walking through the resort to minimize glare to pedestrians.
- All signage lighting should include 3000K light sources with 90+ CRI color rendering.
- If LED lighting sources are used, they should be specified with optics that allow for uniform illumination of the sign.
- All lighting for signage should not create shadows onto building façades or neighboring merchant storefronts.
- All lighting should enhance, not detract from the overall enjoyment of the resort.



*Figure 11.1.3 | Signage Strategies*



## LIGHTING EQUIPMENT, SOURCES AND MAINTENANCE EXPECTATIONS

In order to future-proof the Beaver Creek Resort, it is important to plan, and accommodate, for new technologies. Currently, LED technology dominates the lighting in the field, and outdated technologies, such as halogen, metal halide, and other sources are no longer preferred - and often not able to be maintained or repaired. An emphasis on energy efficiency, lower energy costs, and higher color rendering has made LED light sources an ideal solution. In combination with modern lighting control systems, lighting levels, pre-determined timed events and color-tuning are all possible.

It is recommended that the signage lighting throughout the resort be further updated to exceed the latest standards based on current (and future) developments in lighting technology, governmental code and energy efficiency recommendations.

It is also expected that signage lighting will be as standardized as possible, allowing for the fewest number of lighting fixture styles, and/or lighting sources required to properly illuminate the variety of blade signs existing in the resort currently.

Some signage across the Beaver Creek Resort is 'village wide', meaning that they are signs for the overall resort, not an individual tenant or building. This would include any wayfinding maps, escalator signage, street signposts, the covered bridge entry, and signs for amenities located throughout the village core. These elements should be uniformly illuminated to help with wayfinding and to make it easy for the guests to explore the resort.

## UPDATED GUIDELINES

The color temperature of the signage lighting is to be 3000K with a CRI of 90+. High efficiency LED sources are recommended to meet energy efficiency goals.

Blade signage is to be illuminated in a manner that contains the lighting to the sign itself to avoid light trespass on nearby façades or the pedestrian path.

Signage lighting is to stay on from one hour before sunset to dawn using automatic timers to control and main the sign's illumination.

# 12.0 RESORT WIDE

## A CENTRALIZED INVENTORY SYSTEM

When the resort originally opened 42 years ago, lighting was simply a fixture, a lamp and a power cord. Today, lighting fixtures are highly sophisticated solid-state lighting components that use Light Emitting Diodes (LEDs) or Organic Light Emitting Diodes (OLEDs) which typically require power and data. This means additional power supplies/drivers and control equipment may be required for the lights to be fully functional.

As the resort continues to age and technologies continue to evolve and emerge, it is the goal of this Lighting Modernization Master Plan to ensure the resources and support systems are in place to handle these changes.

As part of this lighting modernization plan, it is strongly recommended that a resort-wide centralized lighting inventory system be developed and deployed. This will greatly assist the various maintenance teams trying to keep the resort properly maintained and provide a means to truly take care of the many lighting requirements that need to be handled.

A centralized lighting system would have the following benefits:

- Highly competitive pricing secures the buying power of resort management, HOAs, metro district and commercial tenants who will be buying together in bulk instead of one at a time.
- A standardized kit of parts minimizes the number of unique kit of parts being used between the various maintenance teams and will eliminate the guess work about replacement parts and lighting sources.
- This system streamlines the ordering lighting equipment and lighting controls.
- This system ensures that consistent lamping will be delivered each time.
- This system tasks the vendor to help mitigate the issue of future discontinued lamps by procuring attic stock.
- The vendor helps evaluate replacement technology quality and equivalencies to ensure the lighting design isn't degraded by sub-par replacement equipment.
- Future-proofing the standards ensures the resort lighting sustains the high quality of lighting that the guests have come to expect.
- This system leverages manufacturer relationships to get even better, more competitive pricing.
- A one-stop shop is created for all of the resort's lighting needs.
- Risk of using experimental/untried equipment and minimizes failures is eliminated.

- This system ensures that only high-quality equipment and LED sources from proven manufacturers would be provided.
- The centralized lighting system vendor becomes a true lighting partner. They hold the warranties of the equipment they provide, become a resource for all of the resort's lighting equipment questions and even provide support services for the equipment when/if required.

This proposed system relates directly to the resort maintenance and sustains the optimized and modernized lighting for decades to come.

## ACTIVATIONS

### **Scavenger Hunt: Overview**

A long-form game that sends the guests to various places around the resort to find clues, collect objects, and win rewards. It's a great way to engage the entire family while getting your guests to explore the entire village.

### **Scavenger Hunt: Low Tech**

The low-tech version involves a printed handbook or map the guests use as their guide on their scavenger hunt adventure. It's a great way to introduce the concept of a scavenger hunt to your guests without a lot of technical overhead. As other interactives and activations get introduced to the village, these locations can serve double duty functioning as stops within the scavenger hunt gameplay.



Figure 12.0.1 | Scavenger Hunt: Low Tech

### **Scavenger Hunt: High Tech**

The high-tech version involves more sophisticated gameplay that activity tracks guest progress and potentially changes the course of their adventure based on their achievements. This version of scavenger will often utilize the technical infrastructure at the various waypoints and will grow as this infrastructure grows with new experiences.



Figure 12.0.2 | Scavenger Hunt: High Tech

### ***Interactive Wayfinding***

Make it easy for guests to find all the exciting activities in and around BCR Village. Wayfinding has become increasingly important in getting information to your guests exactly when they need it.



*Figure 12.0.3 | Wayfinding A*



*Figure 12.0.4 | Wayfinding B*

Please see Appendix G for further detail about the activations.