Harwich Planning Board Agenda
Griffin Room, Town Hall, 732 Main Street, Harwich
Tuesday, January 28, 2020 – 6:30 PM

I. Call to Order - *Recording & Taping Notification – As required by law, the Town may audio or video record this meeting. Any person intending to either audio or video record this open session is required to inform the chair.*

II. Public Hearing

A. **PB2019-49 Kyle Douglas**, as owner, seeks approval of a Use Special Permit for Alternative Access pursuant to the Code of the Town Harwich §325-18.P and -51. The proposal seeks access via a private driveway easement over 344 Oak St (Lot 2 shown on Plan Book 591 Page 64). The property is located at 334 Oak Street, Map 82, Parcel T1-3, in the R-L and Six Ponds Zoning Districts.

B. ***Continued* PB2019-45 Royal Apartments LLC**, as owner, Alex Bardin, Representative, seeks approval of a Multi-Family Use Special Permits in the Harwich Center Overlay District and a Site Plan Review Special Permit for the proposed use and additional parking and other appurtenances pursuant to the Code of the Town of Harwich §§325-51.D and -51.O and 325-55. The property is located at 328 Bank Street, Map 41, Parcel N4 in the M-R-L, Harwich Center Overlay and Historic Districts. ***Hearing continued from January 14, 2020.***

C. ***Continued* PB2019-46 Greenskies Renewable Energy**, as applicant, All-Points Technology Corporation PC, as representative, seeks approval of a Site Plan Review Special Permit pursuant to the Code of the Town of Harwich §325-55, in conjunction with §325, Article XXIII to establish a Large Scale Photovoltaic Array at Cranberry Valley Golf Course, owned by the Town of Harwich. The proposal consists of both a ground-mounted array and a rooftop array on the cart barn building. The property is located at 183 Oak Street, Map 61, Parcel H1 in the R-R and W-R zoning districts. ***Hearing continued from January 14, 2020.***

D. ***Continued* PB2019-27 Wychmere Harbor Real Estate LLC**, applicant & owner, c/o Attorney Andrew Signer, representative, seeks to amend a Site Plan Review Special Permit granted in Case PB2010-26 by making improvements to the existing beach club; including replacing the existing restaurant/pool equipment building, two swimming pools, the pool decking and other site improvements with a new restaurant building, a small restroom and retail building, a pavilion expansion, two smaller swimming pools and a new concrete pool deck, and various beach amenities. The applicant is pursuant to the Code of the Town of Harwich §325-55 (Site Plan Review), §325-51 (structure greater than 7500 s.f.) and Chapter 400. The property is located in the RH-3 and R-L zoning districts at 23 Snow Inn Road, Map 8, Parcel P2-12. ***Hearing continued from January 14, 2020.***

E. **PB2019-47 525 Camelot, LLC** as owner, c/o Andrew Singer, Esq., representative, seeks approval of a Modification of a Site Plan Review Special Permit (PB2016-20 & 17-13) and a Restaurant / Fast Food Takeout Use Special Permit pursuant to the Code of the Town Harwich §§325-9, -14.O, -51 and 55. The use will be in association with a retail use and 24 seats (including 5 outdoor seats) are proposed. The property is located at 557 Route 28 (aka Harwich Port Commons), Map 14 Parcel V9 in the C-V and RH-1 zoning districts.

III. Public Meeting*

A. New Business:
   1. Advisory Opinions: Zoning Board of Appeals

B. Meeting Minutes: January 14, 2020

C. Old Business:
   1. Continued Zoning Discussion:
      A. IL Zoning District Expansion – Queen Anne Road
   2. PB2018-05 Cranberry Valley Golf Course Minor Site Plan changes discussion and possible vote

D. Briefings and Reports by Board Members

IV. Adjourn

*****Per the Attorney General's Office – Boards/Commissions may hold an open session for topics not reasonably anticipated by the Chair 48 hours in advance of the meeting following "New Business".

Next Planning Board Meeting (*Subject to Change****) –*** *Tuesday, February 11, 2020.*
Requests for accommodations for any person having a disability can be made by contacting the Administration Office at 508-430-7513.

Authorized Posting Officer: Elaine Banta, ebanta@town.harwich.ma.us or 508-430-7511

TOWN PLANNER ● 732 Main Street, Harwich, MA 02645

508-430-7511 fax: 508-430-4703

AGENDA ITEM # II.D

To: Planning Board
From: Charleen Greenhalgh, Town Planner
Date: January 22, 2020
Re: Staff Report – Site Plan Review Special Permit

PB2019-27 Wychmere Harbor Real Estate LLC, applicant & owner, c/o Attorney Andrew Signer, representative, seeks to amend a Site Plan Review Special Permit granted in Case PB2010-26 by making improvements to the existing beach club; including replacing the existing restaurant/pool equipment building, two swimming pools, the pool decking and other site improvements with a new restaurant building, a small restroom and retail building, a pavilion expansion, two smaller swimming pools and a new concrete pool deck, and various beach amenities. The applicant is pursuant to the Code of the Town of Harwich §325-55 (Site Plan Review), §325-51 (structure greater than 7500 s.f.) and Chapter 400. The property is located in the RH-3 and R-L zoning districts at 23 Snow Inn Road, Map 8, Parcel P2-12.

The Planning Board hearing was opened on August 13, 2019, continued to October 22, 2019, November 7, 2019 and January 14, 2020, with no testimony taken to date. The hearing was continued to Tuesday, January 28, 2020 no earlier than at 6:30 p.m. Abutters were originally notified on August 1, 2019.

Description

The applicant seeks approval to amend a Site Plan Review Special Permit for the southerly end of the Wychmere Harbor Beach Club. As provided in the January 17, 2020 narrative "*Specifically, the Applicant is proposing to replace the existing restaurant/pool equipment building, two swimming pools, the concrete pool deck, and some of the wooden decks and other existing site improvements at the swimming pool area as well as to relocate the existing Coastal Pavilion restaurant facilities, all with a new restaurant building, a relocated Coastal Pavilion with attached addition containing restrooms and a small retail space, two smaller swimming pools, new pool reception kiosk, and a new concrete pool deck with integrated open and planting areas.*" The application was filed with the Town Clerk on June 18, 2019 and information and plans filed on December 20, 2019, January 9, 2020, January 13, 2020 and January 17, 2020 including the following:

1. Form A – Special Permits & Site Plan Review.
2. A project narrative, date stamped received June 18, 2019.
3. Email Memorandum, date stamped 01-17-2020.
4. Fee of $2,604.00.
5. Plans prepared by Coastal Engineering Co., for Wychmere Harbor Real Estate, LLC., entitled:

A. Sheet C1.2.1, "Plans Showing Existing Site Conditions Around Building #12 and the Pool Area", dated 6-5-19, revised 12-18-19, prepared by John McElwee, P.L.S., scale as noted.
B. Sheet C2.2.1, "Proposed Building and Site Improvements", dated 6-12-19, revised 7-2-19, 12-20-19 and 01-17-2020, prepared by David J. Michniewicz, P.E., and scale as noted.
C. Sheet C2.4.1, "Site and Drainage Details", dated 6-18-19, revised 7-9-19 and 12-20-19, prepared by David J. Michniewicz, P.E., and scale as noted.

6. Plans prepared by GS Design Group Inc., dated 12/20/19, no professional stamps, scaled as noted and includes the following sheets:

"The Beach Grill"

A. A0.0, "Cover Sheet"
B. A1.0, "Ground Floor Plan"
C. A1.1, "First Floor Floor Plan"
D. A1.2, "Roof Plan"
E. A2.0
F. A2.1, "Elevations"

"Coastal"

A. A1.0, "Ground Floor Plan & Elevation"
B. A1.1 "Elevations"

7. Plans prepared by Hawk Design, Inc., for Wychmere Beach Club, dated 12/18/19, not stamped, scale 1"=20', entitled "Landscape Submission Plan", 3 pages, Sheets:
    1. L1.0
    2. L2.0
    3. L2.1
8. Lighting Plans as follows:
    1. Sheet LX, prepared by Hawk Design, Inc. for Wychmere Beach Club, dated 12/06/2019, CL Markups date 12-20-19
    2. Sheet A1.2, prepared by GS Design Group Inc. for The Beach Club, Roof Plan, dated 12/20/19, CL Markups date 1-08-20
9. "Stormwater Management Report", dated July 9, 2019, revised December 19, 2019, prepared by David J. Michniewicz, P.E.
10. Photometric Test Reports prepared by Javier Caban, Technician, Prepared for Auroralight Inc., as follows:
    1. Catalog Number HPL6-3-30, Order Number 11745044, Test Number 11745044.14, Test Date 2017-05-12
    2. Catalog Number HPL6-2-27, Order Number 11745044, Test Number 11745044.11, Test Date 2017-05-10
    3. Catalog Number HPL6-2-30, Order Number 11745044, Test Number 11745044.12, Test Date 2017-05-12
    4. Catalog Number HPL6-3-27, Order Number 11745044, Test Number 11745044.13, Test Date 2017-05-12
11. Cut Sheet for a variety of proposed outdoor lights, available for review electronically or in the case file.

MGL Reference and Planning Board Jurisdiction

Pursuant to MGL c.40 A, §9 the Planning Board must, within 65 days of submission of application for a special permit hold a public hearing. The decision of the Planning Board shall

take place within 90 days following the close of the public hearing. Further, a special permit issued shall require a two-thirds vote of the Board.

The Planning Board has jurisdiction to review this application pursuant to the Code of Town of Harwich:

> **§325-55 for Site Plan Review Special Permit** for the reconfiguration of an existing parking lot. Further, pursuant to §325-55.E.(1) "***If the site plan meets the requirements of this By-law and the Planning Board Rules and Regulations Governing Subdivision of Land and Site Plan Review, as amended, the Planning Board shall approve it"***. However, **the Board cannot deny approval of a site plan for a use which is allowed by right** (not by special permit) in the district, but may impose reasonable conditions on the proposed use. Please refer to §325-55.E. for specific allowable conditions.

Waivers At this time no waivers have been requested.

Comments from other Boards, Departments, Committees

Health: The septic system is regulated through the Department of Environmental Protection with a groundwater discharge permit. I recommend referral to the DEP to ensure the changes are within the scope of the wastewater system and do not require additional inspections.

The proposed restaurant will require a new food service permit through the Health Department. Review of the floor plans and finishes is required prior to approval of a building permit application. Full compliance with the 2013 Federal Food Code is required.

The new swimming pools fall under the jurisdiction of the Health Department and will require a full plan review through our office in addition to the Building Department. Full compliance with 105 CMR 435.00: Minimum Standards for Swimming Pools, the State Sanitary Code Chapter V is required.

Fire, Police & Highway: No concerns.

Conservation: Please see the attached memo from Amy Usowski, Conservation Administrator, date received January 16, 2020.

Engineering: The Town Engineer reviewed the plans with the Town Planner; comments are noted below.

Planning Staff Comments

1. As noted, the Town Engineer and Town Planner met to review the revised plans and application Jan. 8, 2020. Several question arose, and on Jan. 13, 2020 there was a staff level review with the applicant and several representatives. At this review meeting, several questions and concerns were raised and two revised plans were submitted on January 17, 2020 along with a more descriptive memo of the project.
2. The Town Engineer is awaiting additional information regarding the stormwater drainage.
3. The applicants propose to use artificial turf in an around the pool area. They are counting this material not as lot coverage, but as green space. No information has been provided to the Planning Board as to the composition of the proposed material and base that will be needed for this artificial turf. I am not convince one way or the other as to the validity of identifying this a "green space"; which historically has been vegetation, a living thing.
4. Additionally, with regard to the artificial turf, the question arose as to whether this will leach any chemicals or plastics into either the ground water or into Nantucket Sound.

5. The Conservation Commission should review and approve this application before the Planning Board renders a decision. A large portion of the area involved is within a FEMA Flood Zone, for which Conservation has jurisdiction. Any requirements imposed by the Conservation Commission should be adopted by the Planning Board.
6. This will also require relief from the Zoning Board of Appeals, which is scheduled on January 29, 2020.
7. For the Beach Club Building a Roof Deck elevation of 34' has been provided on the building plans; however an overall height of the proposed building has not been provided.
8. No height dimensions for the Pavilion have been provided.
9. As of January 21, 2020, two letters has been received, copies attached.
10. At this time, the recommendation is to hear from the applicant, any abutters or other citizens, and Board Members and to continue the hearing to a date and time specific.

VOTES

Continuance

If the Board will require additional information or wants to take the matter under advisement the following motion is recommended:

Move to continue the hearing for **PB2019-45 Royal Apartments LLC,** to no earlier than 6:30 pm on _____ (Next Meeting Dates: *Feb. 25, March 10, March 24)* for the following reason(s): *Need to provide reasons for the continuance…additional information.*

Law Office of Singer & Singer, LLC
26 Upper County Road
P. O. Box 67
Dennisport, Massachusetts 02639

Andrew L. Singer
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Myer R. Singer
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Harwich Planning Board

Email Memorandum Case No. PB2019-27

Wychmere Beach Resort
23 Snow Inn Road, Harwichport

January 28, 2020

Introduction

The Wychmere Beach Resort (Units 12-16 of the Wychmere Shores Condominium) located at 23 Snow Inn Road in Harwichport ["Property"] is a multi-use function and resort development. The Applicant/Owner, Wychmere Harbor Real Estate, LLC, is seeking to amend the Site Plan Review Special Permit granted in Case No. PB2010-26 (copy attached) in order to make further improvements to the beach club facilities at the southern end of the Property as shown on the submitted plans.

Specifically, the Applicant is proposing to replace the existing restaurant/pool equipment building, two swimming pools, the concrete pool deck, and some of the wooden decks and other existing site improvements at the swimming pool area as well as to relocate the existing Coastal Pavilion restaurant facilities, all with a new restaurant building, a relocated Coastal Pavilion with attached addition containing restrooms and a small retail space, two smaller swimming pools, new pool reception kiosk, and a new concrete pool deck with integrated open and planting areas.

The Beach Club is located completely within the R-H-3 Zoning District. The proposal has been designed to aesthetically complement the overall Harbor Club and Beach Club property. There will be no change in parking demand on the Property as part of the proposal. There will be no change of use on the Property. All parts of the proposal will conform to yard setbacks. Building coverage will remain conforming. There will be a decrease in the pre-existing nonconforming impervious site coverage as well as amenities coverage.

Property

The Property, which contains 15.0± acres of land and is shown as Parcel P-2 on Harwich Assessors Map 8, is bounded on the south by Nantucket Sound, on the east by the entrance to Wychmere Harbor, on the west by Snow Inn Road and Town-owned beach property, and on the north by residential properties.

The Property is improved with:

A. The Beach Resort facilities, including the:

1. Wychmere Harbor Club Building (two-story restaurant and function facility);

2. Wychmere Beach Club (including restaurants, pool bar, swimming pools, and associated amenities);

3. Snow Inn Building (26-guest room hotel plus offices);

4. Channel House Building (6-guest room hotel plus fitness club); and

5. Outside function lawns and decks;

B. Eleven (11) residential condominium units in three buildings; and

C. Associated parking, wastewater treatment, and amenities.

Coverages and Parking. The uses at the Property have previously been determined by the Town during numerous regulatory reviews to be pre-existing nonconforming because they were commenced decades ago and predate current zoning regulations. The site coverage and amenities coverage of the Property (parking areas, pools, spas, basketball court and similar impervious amenities and facilities) are also pre-existing nonconforming. With the creation of the new circular drive entrance to the beach club, there will be a reduction of fifteen (15) grass parking spaces from the existing 252 spaces. Shared parking will continue for the non-residential uses, including the previously-established parking management plan which also incorporates off-site parking and shuttle van service during the summer season (see below). The residential condominiums have separate, dedicated parking.

Occupancy. There will be no change in the currently-permitted occupancy of the Property. Current occupancy on the Property is as follows: 650 maximum restaurant seats spread throughout the site, 26 hotel bedrooms plus office space in the Snow Inn Building, six (6) hotel bedrooms in the Channel House Building, and 43 bedrooms in the 11 residential condominium units. As previously reviewed and approved the Planning Board, the on-site restaurant seats are shared between the various venues on site with the maximum number of authorized restaurant seats in use not being exceeded at any given time.

Prior Regulatory Approvals

Over the years, there have been numerous regulatory reviews and approvals granted for various redevelopments of different portions of the pre-existing nonconforming Property. The Board of Appeals, Planning Board, and Conservation Commission have each issued several decisions concerning the Property. The Beach Club was last redeveloped in 2010. In 2013, the Planning Board, Board of Appeals, and Conservation each approved a redevelopment of the Snow Inn Hotel building and construction of thirteen additional residential condominiums in a large, new building in the center of the Property. This redevelopment was ultimately not constructed.

Parking

There will be no change or intensification in use as part of the proposal, and parking will remain sufficient. With the exception of approximately eight (8) weekends during July and August for which a detailed parking management program is in place, there is an excess of parking at the Property. Shared

parking will continue for the non-residential uses. The existing eleven residential condominiums have separate, dedicated parking. Exclusive of this existing dedicated residential parking, the commercial parking spaces will continue to service the shared Beach Resort activities. All of the residential unit owners are also members of the Beach Resort and utilize their respective, personal parking spaces.

During the height of the season, the on-site parking spaces are allocated as needed among Beach Club members, event guests, and hotel guests. Because all events are scheduled months in advance, the Resort operators know how many guests are attending and when. This allows them to manage the parking efficiently to provide adequate coverage for all activities on the Property. Buses are arranged to transport guests to the Property from off-site locations when necessary. All employees park off site and are shuttled or ride bicycles to the Property. The shuttle runs from 8:00 a.m. to midnight on each Saturday and Sunday and any other day deemed necessary due to event scheduling (primarily between June 15th and Labor Day). In addition, events are staggered such that most functions take place at times when the Beach Club is less active, and Beach Club activity is highest when functions are less active.

Occupancy

Commercial occupancy at the Beach Resort will remain the same. This includes:

1. A maximum of 650 restaurant seats shared among multiple buildings and function areas;

2. Up to 600 members (potential) at the Beach Club;

3. 26 hotel bedrooms in the Snow Inn Building;

4. Six (6) hotel bedrooms in the Channel House Building; and

5. Office space.

There will be no change in the 43 bedrooms in the 11 residential condominium units.

Building Height

Maximum building height in the RH3 Zoning District is four stories and 50 ft. As shown on the submitted elevation plans, the reconstructed restaurant building (elevated to comply with flood plain regulations) will be a conforming two stories and height (49 ft. 10 in. to the top of the cupola, 36± ft. to the top of the roof bar, and the vast majority of the structure is at 27± ft.). The height of the relocated Coastal Pavilion structure will remain the same (35± ft.).

Coverages

Building coverage on the Property will remain conforming (11.4% proposed).

Site coverage will continue to be nonconforming (39.9% proposed), but will be decreased slightly from the 40.1% existing site coverage.

Amenities coverage will continue to be nonconforming (28.5% proposed), but will be decreased from the 29.9% existing amenities coverage.

Green space will total 397,424 sq. ft. (60.1%).

During the Conservation Commission review of the proposed redevelopment, the Commission members asked the Applicant to study reducing the application of fertilizer and nitrogen to the function lawn areas in order to better protect the environment and the coastal resource areas. The submitted plans meet this request by converting a portion of the manicured function lawn area to a new synthetic turf that requires no watering, no fertilization, and no maintenance.

The Applicant submits that the new turf area (to be installed as shown predominantly within the reconfigured swimming pool area to break up the massing of the concrete pool deck) is not site coverage or amenities coverage as each are defined in the Harwich Zoning By-Law. As discussed with Town Staff, the above analysis has been used in the calculation of the coverage numbers.

The definition of site coverage is "the aggregate coverage of an individual site by buildings, parking areas and driveways (regardless of surface material), pools, decks and other permanent structures and all impervious surfaces." Structure is defined as "a combination of materials assembled at a fixed location to give support or shelter, such as a building, bridge, trestle, tower, framework, retaining wall, tank, tunnel, tent, stadium, pool, reviewing stand, platform, bin or the like."

The definition of amenities coverage refers to "parking lots, roads, streets, tennis courts, swimming pools and like amenities and facilities…golf courses, putting greens, bowling greens and similar amenities which do not involve covering the ground with any impervious material shall not be included for the purpose of computing the total ground coverage of a project."

With the exception of parking (which is counted as site coverage no matter the surface materials), both site coverage and amenities coverage expressly exempt all pervious materials from being included in such calculations. The turf being proposed in response to the Conservation Commission's environmental request and the sand with loosely compacted gravel base are not only permeable materials, they have been documented to be significantly more permeable than the loam and seed that make up manicured lawns. The proposed turf in place of the lawn area does not meet the express definitions of either site coverage or amenities coverage as set forth in the Zoning By-Law.

Landscaping, Lighting, and Drainage

A detailed landscape plan program is proposed for the redeveloped beach club facilities.

A lighting plan and cut sheets have been provided. All lighting will comply with the Harwich lighting regulations and will be dark-sky compliant.

Drainage will be improved by the reconfiguring of the pool deck areas with integrated open areas as well as by the replacement of a portion of the lawn with the new turf and upgrading existing drainage facilities. There will be no adverse impacts to surface water quality or groundwater quality. A Stormwater Report has been submitted.

Conclusion

The proposal satisfies the provisions of the Zoning By-Law. The proposal will result in an existing building, including pool equipment and bathrooms, being relocated above the 100-year floor elevation. This will eliminate a pre-existing nonconforming condition and result in better environmental and stormwater protection than existing conditions. There will be no impact to parking, use, and traffic, and the proposal protects the safety, public health, convenience and general welfare of the community.

COMMONWEALTH OF MASSACHUSETTS
TOWN OF HARWICH
PLANNING BOARD

DECISION
Site Plan Review Special Permit

Case No.: PB2010-26 **Applicant: Wychmere Harbor RE LLC**

Map: 8 Parcel: P2 **Zone(s): R-H-3 & R-L**

Address: 23 Snow Inn Road **Owner: Wychmere Estates LP**

Hearing Date(s): December 14, 2010, & January 11, 2011

Decision Date: January 11, 2011

<u>Hearing</u>
Following a duly advertised and scheduled public hearing held on December 14, 2010 and continued to January 11, 2011, the Town of Harwich Planning Board, acting in the matter of case number **PB2010-26** voted to **approve** a **Site Plan Special Permit**, pursuant to MGL c 40A, §9 and the Harwich Code Section § Code of the Town of Harwich §325-55 for various improvements and enhancements to the area known as the Beach Club of the Wychmere Harbor Club. The property is located at **23 Snow Inn Road**, Harwich Port, Map 8, Parcel P2, in the R-H-3 and R-L Zoning District(s).

The Board was presented with the following documents and plans for consideration:

1. 'Site Plan – Showing Existing Conditions', dated October 29, 2010, and last revised December 13, 2010, prepared by Ryder & Wilcox, Inc., David A. Little, PLS, and scaled 1"=50'.
2. 'Site Plan – Showing Existing Conditions Beach House', dated October 29, 2010, prepared by Ryder & Wilcox, Inc., David A. Little, PLS, and scaled 1"=50'.
3. 'Site Plan – Showing Proposed Changes Beach Club', dated October 29, 2010, and last revised December 13, 2010, prepared by Ryder & Wilcox, Inc., David A. Little, PLS, and scaled 1"=50'.
4. Packet of Design Plans with cover plan entitled 'Landscape Plan (L-1)', dated 10-27-10, prepared by Landworks Collaborative, Matthew J. Mrva, RLA, scaled at 1"=20', Sheets 'Site Lighting Plan (L-2)', 'Coverage Plan (L-3)', 'Floor Plan (D-1)', 'Elevations [South Side](D-2)', 'Elevations [Pool North Side] (D-3)', and 'Sections (D-4)'.

Waivers - The Applicant's proposal and application included a request for the following waiver(s):

1. Approve the applicant's request for waivers of drainage calculations and general plan and detail plan contents beyond those submitted.

Findings

1. There are no changes to the current parking conditions.
2. There will be no change in seating capacity for the entire site.
3. The storm water run-off is negligible.
4. Public Safety for both pedestrian and vehicles

Decision

After public deliberation, and following a duly made and seconded motion, the Board **unanimously adopted the finding and approved the applicant's waivers as shown above.** The Board members then reviewed the criteria for granting a special permit for Site Plan Review Special Permit approval.

On a motion by Mr. Jos. McParland and seconded by Mr. John Follas, the Board voted 5-0-1, to **approve and condition** the **Site Plan Review Special Permit** for various improvements to the area known as the Beach Club as shown on the plan(s) shown above and entitled **'Site Plan – Showing Existing Conditions', dated October 29, 2010, and last revised December 13, 2010, 'Site Plan – Showing Existing Conditions Beach House', dated October 29, 2010, 'Site Plan – Showing Proposed Changes Beach Club', dated October 29, 2010, and last revised December 13, 2010,** all prepared by Ryder & Wilcox, Inc. and **Packet of Design Plans with cover plan entitled 'Landscape Plan (L-1)', dated 10-27-10, Sheets 'Site Lighting Plan (L-2)', 'Coverage Plan (L-3)', 'Floor Plan (D-1)', 'Elevations [South Side](D-2)', 'Elevations [Pool North Side] (D-3)', and 'Sections (D-4)',** prepared by Landworks Collaborative. Approval is based on the fact that the proposal meets the necessary requirements and criteria for approval as supported by the findings.

Condition(s):

1. Planning Board approval is subject to pending Conservation Commission approval. Any Plan changes due as a result of the Conservation Commission's authority or action shall require the applicant to return to the Planning Board for an amendment.

Vote:

FAVOR:	McCaffery, Peterson, Stello, McParland, Follas
OPPOSED:	None
ABSTAIN:	Nordstrom

This Special Permit shall lapse at the end of two years from the date of filing of the Board's decision in the office of the Town Clerk if substantial use or, in the case of permit for construction, if construction has not commenced, without good cause.

Matthew F. McCaffery, Chairman

THIS DECISION HAS BEEN FILED WITH THE TOWN CLERK ON JAN 19 2011

Town Clerk

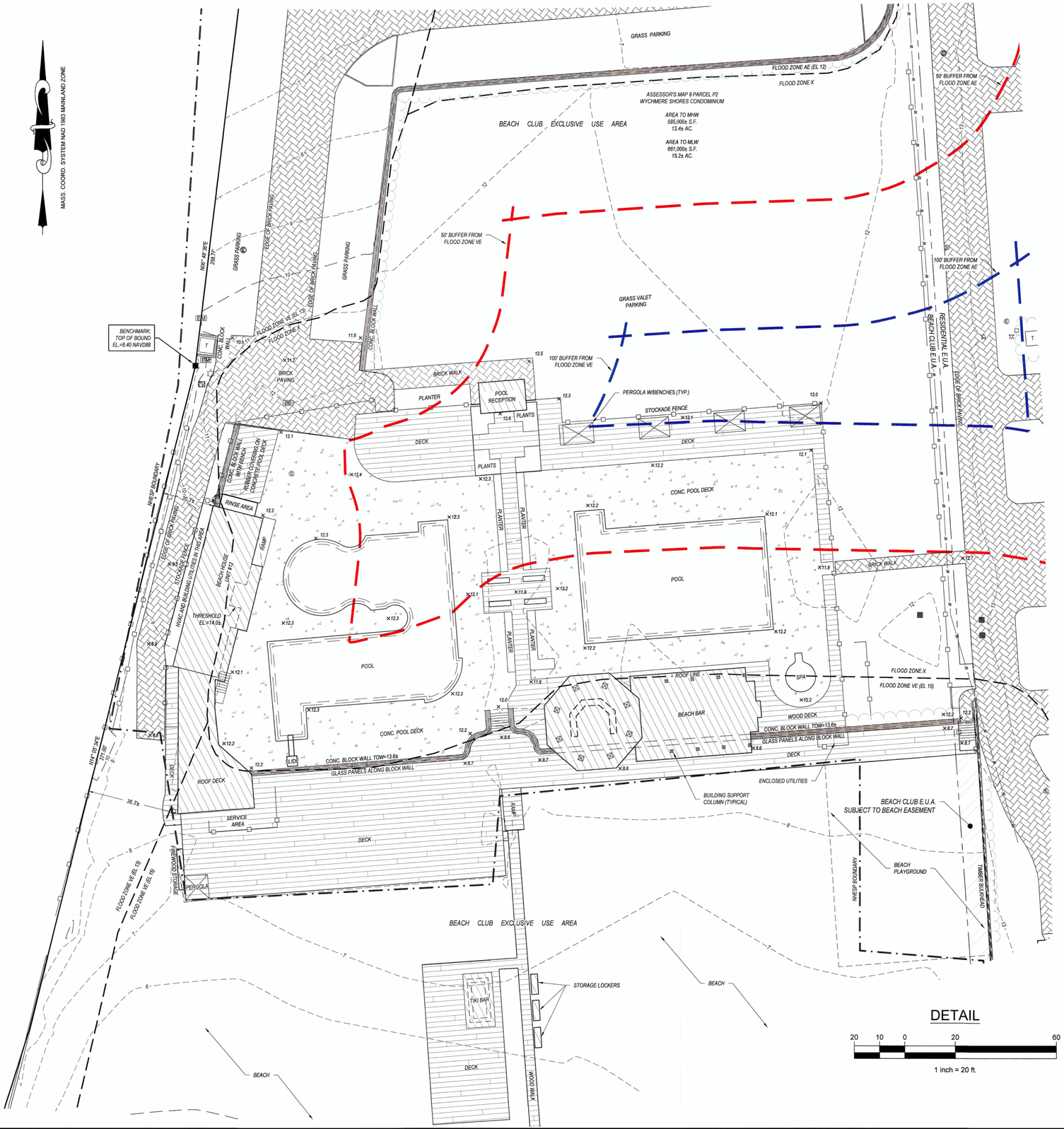
This is to certify that twenty days have elapsed after this decision was filed in my office and no appeal has been filed.

Date Filed JAN 19 2011 **Twenty Days Elapsed** FEB 09 2011

Town Clerk

FEB 22 2011

MASS. COORD. SYSTEM NAD 1983 MAINLAND ZONE



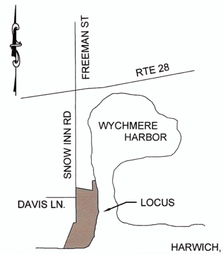
DETAIL

20 10 0 20 60

1 inch = 20 ft.

LEGEND

- BOUND
- LIGHT POLE
- T TRANSFORMER
- EM ELECTRIC METER
- PB PULL BOX
- S SEWER MANHOLE
- 12 CONTOUR
- X 12.2 SPOT GRADE
- STOCKADE FENCE
- W WATER SERVICE



KEY MAP
NO SCALE

REFERENCE:

ASSESSORS MAP 8, PARCEL P2

DEED BOOK 24547, PAGE 55
DEED BOOK 24546, PAGE 299
MASTER DEED
WYCHMERE CONDOMINIUM SHORES

PLAN BOOK 634, PAGES 57-66

FLOOD ZONE:

FLOOD ZONE VE (EL 15, EL 14 & EL 13), ZONE AE (EL 11 & EL 12), & ZONE X AS SHOWN ON FEMA FIRM PANEL #25001C0612J EFFECTIVE JULY 16, 2014. COMMUNITY FLOOD PLANE MANAGERS SHALL CONFIRM LOCATION OF SITE SPECIFIC FLOOD PLANE BOUNDARIES. PRIOR TO DESIGNING STRUCTURES. A CONDITIONAL LETTER OF MAP AMENDMENT (CLOMA) DETERMINATION SHOULD BE APPLIED FOR TO CONFIRM FLOOD INSURANCE REQUIREMENTS.

DATUM:

ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 1988)

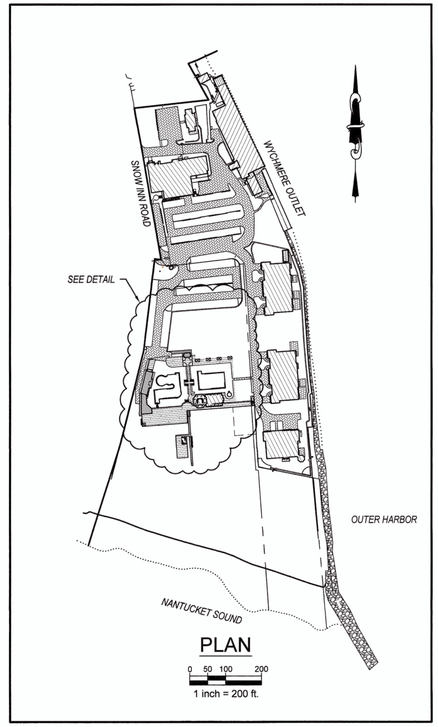
I HEREBY CERTIFY THAT THE CONDITIONS SHOWN HEREON ARE LOCATED AS THEY EXISTED ON THE GROUND AS OF 11-12-19.

DATE 12/18/19

P.L.S. JOHN McELWEE No. 33602 PROFESSIONAL LAND SURVEYOR COMMONWEALTH OF MASSACHUSETTS

OWNER:

WYCHMERE HARBOR REAL ESTATE, LLC
23 SNOW INN ROAD
HARWICHPORT, MA 02646



PLAN

0 50 100 200

1 inch = 200 ft.

COASTAL engineering co.
260 Cranberry Hwy, Orleans, MA 02653
508.255.6511 P 508.255.6700 F

NO.	DATE	REVISION	BY
1	12-18-19	EXPAND EXISTING CONDITIONS DETAIL AREA	JLH

SEAL

PROJECT
WYCHMERE HARBOR REALESTATE, LLC
23 SNOW INN ROAD HARWICH, MA

SHEET TITLE
PLAN SHOWING EXISTING SITE CONDITIONS AROUND UNIT #12 AND THE POOL AREA

SCALE	AS NOTED
DRAWING FILE	C15766-X.dwg
DATE	~~6-5-19~~
DRAWN BY	JLH
CHECKED BY	JM

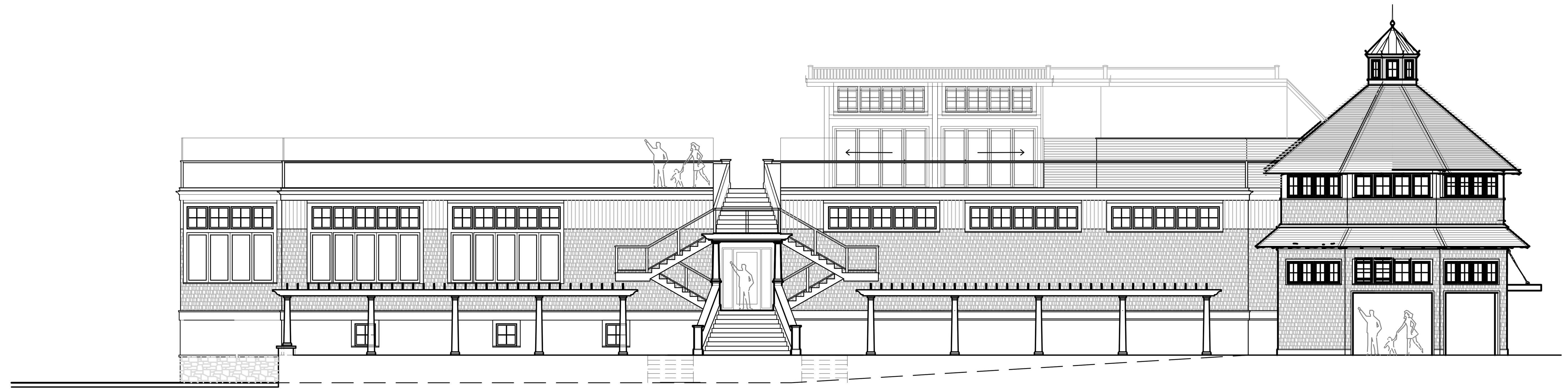
C1.2.1

1 OF 1 SHEETS

PROJECT NO. C15766.05

F:\SDS\PROJ\C15000\C15766\C15766-05\C15766-X.dwg 12/18/2019 10:08 AM

THE BEACH GRILL



GENERAL NOTES

DRAWINGS:

1. DO NOT SCALE DRAWINGS ALL WRITTEN DIMENSIONS SUPERSEDE SCALED DIMENSIONS.

2. ALL DIMENSIONS ARE TO "FACE OF STUD" UNLESS SPECIFICALLY NOTED OTHERWISE. EXISTING DIMENSIONS DENOTED BY "(E)" ARE TO " FACE OF EXISTING FINISH" UNLESS NOTED OTHERWISE. ALL EXISTING DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO PROCEEDING WITH THE WORK.

3. LARGE SCALE DRAWINGS TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS. WRITTEN SPECIFICATIONS TAKE PRECEDENCE OVER ALL DRAWINGS.

4. REFER TO EXTERIOR ELEVATIONS FOR INDICATIONS OF WINDOW OPERATION AND HANDING.

ASSEMBLIES:

PROVIDE VENTILATION OF ALL JOISTS, STUD AND RAFTER SPACES ENCLOSED BY BUILDING ASSEMBLIES BETWEEN HEATED AND UNHEATED AREAS: INCLUDING ATTICS, BASEMENTS, ROOFS, SOFFITS, PARAPET AND RAILING WALLS, ETC.

CONTRACTOR'S RESPONSIBILITIES:

1.. CONTRACTOR SHALL MAKE SITE INSPECTIONS AND BE RESPONSIBLE FOR ALL NEW AND DEMOLITION WORK, WHETHER DETAILED BY THE SPECIFICATIONS AND DRAWINGS, OR IMPLIED BY EXISTING CONDITIONS.

2.ANY DISCREPANCIES IN THE CONSTRUCTION DOCUMENTS , AS CONFLICTS WITH ACTUAL SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE GSDG/OR OWNER BEFORE PROCEEDING WITH THE WORK.

3. CONTRACTOR SHALL HAVE PROVIDED ALL TEMPORARY SHORING & UNDERPINNINGS AS NECESSARY; WORK TO BE PERFORMED UNDER SEPARATE PERMIT.

4. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE AND PROVIDE ALL NECESSARY TEMPORARY UTILITY HOOK-UPS FOR ALL EQUIPMENT DURING CONSTRUCTION.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR DISCONNECTION/ CAPPING OFF OF ALL EXISTING UTILITIES AND RE-CONNECTING WHERE RE-USE IS POSSIBLE.

6. CONFIRM ALL WINDOW SIZES WITH ACTUAL/ EXISTING ROUGH OPENING DIMENSIONS PRIOR TO ORDERING WINDOWS.

7. SLOPE AND FLOORS/ ROOFS TO DRAIN A MINIMUM OF 1/4" PER 1'-0", UNLESS SPECIFICALLY NOTED OTHERWISE.

MECHANICAL AND ELECTRICAL:

1. MECHANICAL AND ELECTRICAL WORK TO BE SHOWN ON DRAWINGS IS SCHEMATIC IN NATURE; CONTRACTOR TO CONFIRM FINAL LAYOUT WITH GSDG / OWNER, PRIOR TO PROCEEDING WITH THE WORK.

WATERPROOFING:

1. ALL SHEET METAL WORK TO BE IN ACCORDANCE WITH CURRENT EDITION OF S.M.A.C.N.A. STANDARDS.

2. PROVIDE GALVANIZED SHEET METAL FLASHING AT ALL WINDOW AND DOOR HEADS INSTALL UNDER EXTERIOR SIDING OR CEMENT PLASTER AND BUILDING PAPER, AND OVER HEAD FRAME OF ALL NEW DOORS AND WINDOWS UNLESS OTHERWISE NOTED COPPER OR ALUMINUM.

3. PROVIDE GALVANIZED SHEET METAL FLASHING AT ALL ROOF CONDITIONS INCLUDING BUT NOT LIMITED TO : PERIMETER EDGES, VALLEYS, PARAPET CAPS, WALL/ROOF INTERSECTIONS, ROOF PENETRATIONS, ETC. SEE DETAIL SHEET FOR SPECIFIC REQUIREMENTS.

4. ALL NEW EXTERIOR FINISHES TO BE INSTALLED OVER A MINIMUM MOISTURE BARRIER OF TWO LAYERS OF 15 POUND OR 30 POUND (GRADE D) BUILDING PAPER.

GRAPHIC SYMBOLS

- EARTH
- GRAVEL/COMP. FILL
- ROCK/LEDGE
- CONCRETE
- BRICK
- CONCRETE BLOCK
- STONE
- STEEL Large Scale / Small Scale
- FINISHED WOOD
- ROUGH WOOD — Dimensional Lumber Only
- BLOCKING — Misc. sized wood
- PLYWOOD Large Scale / Small Scale
- PARTICLE BOARD
- GLASS Large Scale / Small Scale
- GYPSUM BOARD
- ALUMINUM

DRAWING SYMBOLS

COLUMN GRID
- A — Column Or Grid Number

DETAILS
- 2 / A6 — Detail Number; Drawing Shown On (Only If NOT Same Dwg.)

SECTION
- C / A3 — Section Number; Drawing Shown On

WALL TYPES
- 3 — Detail Number

DOOR NUMBER
- 201 A — Door Number; Letter Used If More Than One Door Into Space

WINDOW TYPE
- C — Window Type

CEILING HEIGHTS
- 11'-6" — Finish Ceiling Elevations

NOTATIONS
- 1 — Notation Reference Number (Demolition Note)

DETAIL AREA
- 1 / A9 — Enlarged Detail Area; Detail Number; Drawing Shown On

EQUIPMENT
- 1 — Equipment Reference Number

NORTH ARROW
- True North; Plan North (Project Reference)

REVISIONS
- Revision Location

ARCHITECTURAL ABBREVATIONS

SYMBOLS used as abbreviations:

∠	angle
℄	centerline
[	channel
ø	round

ABBREVIATIONS:

AFF	above finished floor
AC	acoustical
ACT	acoustical tile
ADJ	adjacent
ADJT	adjustable
ALT	alternate
ALUM	aluminum
ANC	anchor, anchorage
AB	anchor bolt
ASPH	asphalt
BSMT	basement
BRG	bearing
BEL	below
BET	between
BIT	bituminous
BLKG	blocking
BD	board
BOT	bottom
BRK	brick
BLDG	building
CAB	cabinet
CPT	carpet (ed)
CB	catch basin
CLG	ceiling
CEM	cement
CER	ceramic
CT	ceramic tile
CIR	circle
CIRC	circumference
CO	cleanout
CLR	clear (ance)
COL	column
COMB	combination
COMP	compress (ed), (ion), (ible)
CONC	concrete
CMU	concrete masonry unit
CONST	construction
CONT	continuous
CJ	control joint
CTR	counter
CRS	course
DEP	depressed
DTL	detail
DIAG	diagonal
DIA	diameter
DIM	dimension
DR	door
DH	double hung
DWR	drawer
DWG	drawing
DW	dishwasher
EF	each face
ELEC	electric (al)
EWC	electric water cooler
EL	elevation
ELEV	elevator
ENCL	enclosure
EQ	equal
EXH	exhaust
EXG	existing
EXP	exposed
EXT	exterior
FOF	face of finish
FIN	finish (ed)
FF	finished floor
FA	fire alarm
FEC	fire extinguisher cabinet
FHC	fire hose cabinet
FP	fireproof
FLR	floor (ing)
FD	floor drain
FLUOR	fluorescent
FTG	footing
FND	foundation
FBO	furnished by others
FUR	furred (ing)
GA	gage, gauge
GALV	galvanized
GL	glass, glazing
GB	grab bar
GD	grade
GYP	gypsum
HDWD	hardwood
HDWR	hardware
HDR	header
HD	heavy duty
HT	height
HM	hollow metal
HOR	horizontal
INCL	include (d), (ing)
ID	inside diameter
INS	insulate (d), (ion)
INT	interior
INTM	intermediate
INV	invert
JT	joint
KO	knockout
LBL	label
LAB	laboratory
LAV	lavatory
LH	left hand
L	length
LT	light
LW	light weight
L.C.C.	lead coated copper
MH	manhole
MAS	masonry
MO	masonry opening
MAX	maximum
MECH	mechanical
MED	medium
MTL	metal
MIN	minimum
MIR	mirror
MISC	miscellaneous
MLD	molding
MTD	mount (ed)
NAT	natural
NOM	nominal
NIC	not in contract
NTS	not to scale
OC	on center (s)
OPG	opening
OPP	opposite
OD	outside diameter
OA	overalll
OH	overhead
PNT	paint (ed)
PNL	panel
PTD	paper towel dispenser
PAR	parallel
PVMT	pavement
PERIM	perimeter
PLAS	plaster
PLAM	plastic laminate
PL	plate
PLWD	plywood
PT	pressure treated
QT	quarry tile
REF	reference
REFR	refridgerator
REIN	reinforce (d)
RES	resilient
RA	return air
REV	revision (s), revised
RH	right hand
R	riser
RD	roof drain
RFG	roofing
RM	room
RO	rough opening
SCH	schedule
SEC	section
SHT	sheet
SIM	similar
SC	solid core
SQ	square
SS	stainless steel
STL	steel
STR	structural
SUSP	suspended
SYM	symmetry (ical)
SYS	system
TEL	telephone
TV	television
THK	thick (ness)
TPD	toilet paper dispenser
T&G	tongue and groove
TOC	top of concrete
TOS	top of steel
TOW	top of wall
T	tread
TRTD	treated
TYP	typical
UC	undercut
UNO	unless noted otherwise
UR	urinal
VB	vapor barrier
VNR	veneer
VERT	vertical
VCT	vinyl composition tile
VIF	verify in field
WH	wall hung
WC	water closet
WP	waterproof (ing)
WWM	welded wire mesh
W	width, wide
WIN	window
WG	wire glass
WO	without

DRAWING LIST

CODE COMPLIANCE

ALL WORK SHALL CONFORM TO CURRENT BUILDING CODES, FEDERAL, STATE AND LOCAL CODE REQUIREMENTS, LAWS AND ORDINANCES.

COMPLIANCE WITH CURRENT VERSIONS OF THE FOLLOWING CODES AND AGENCIES ARE REQUIRED:

IBRC – International Residential Building Code
IEBC – International Existing Building Code
IECC – International Energy Conservation Code
IMC – International Mechanical Code
IFC – International Fire Code

780 CMR – MA Amendments to the IBC
527 CMR – MA fire prevention and electrical regulations
521 CMR – MA accessibility regulations
248 CMR – MA plumbing regulations
524 CMR – MA elevator regulations

STATE OF MASSACHUSETTS BUILDING CODE 8th EDITION
BARNSTABLE COUNTY AND TOWN OF HARWICH

Project
The Beach Grill

23 Snow Road
Harwichport, MA

NOTES:
All notes on this drawing are typical and apply equally to all comparable conditions. dimensions shall take precedence. Errors or discrepancies on details are to be brought to the attention of the GSDesign Group Inc. before the work or materials have eather been commenced , and or purchased

GAKIDIS + STEWART
GS Design Group Inc.
215 Onset Ave.
P.O. Box 1200
Onset, MA 02532
Tel 508 . 295 . 2952

Issued For

REV.	ISSUE	DATE

DESIGN DEVELOPMENT

COVER SHEET

Drawing Title:

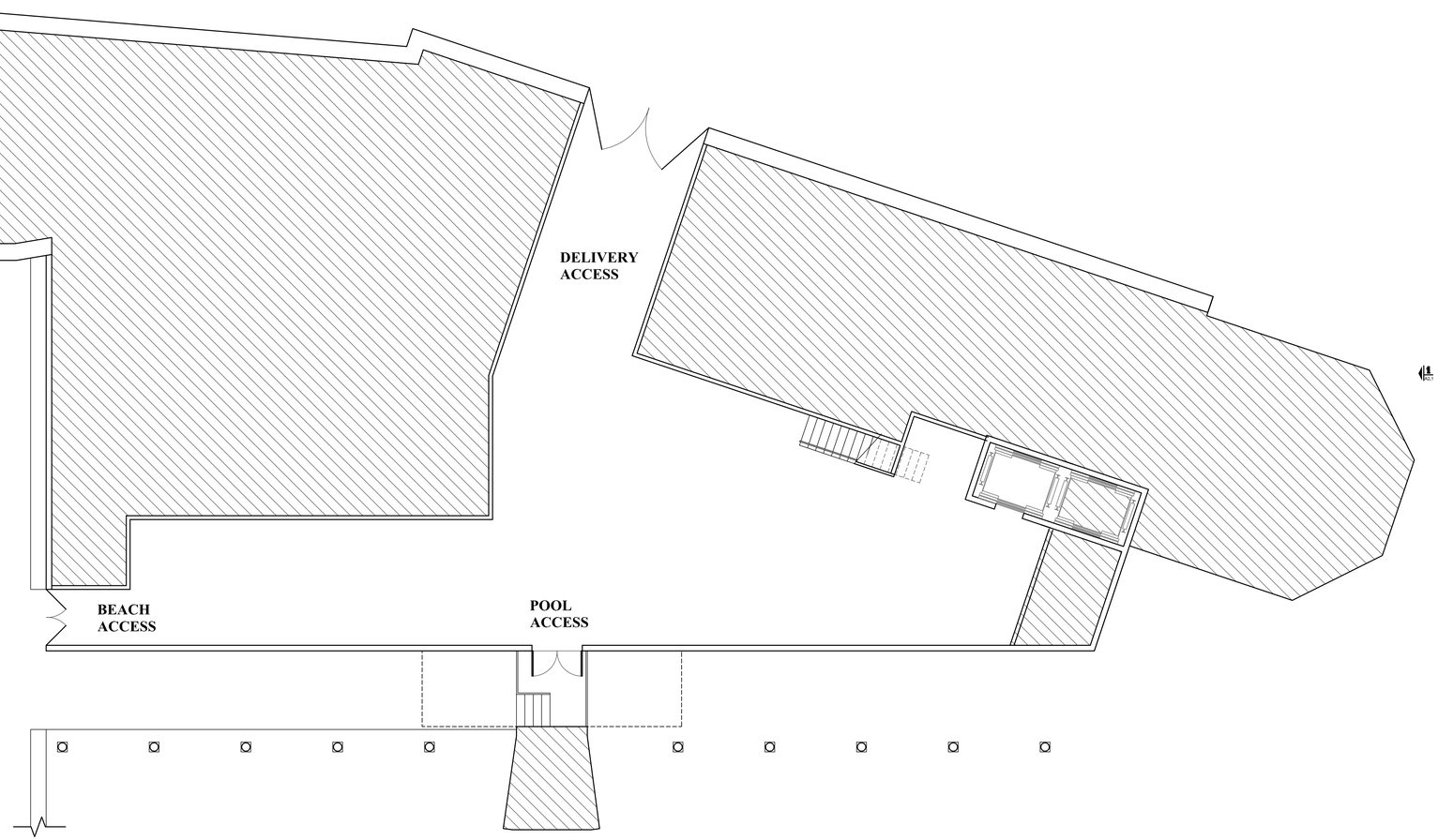
Drawn By: Checked By:

A0.0

Drawing Number:

File Name: Scale: AS NOTED

Date: 12/20/19



Ground Floor Plan Scale: 1/8" = 1'- 0" | 1

Project

The Beach Grill

23 Snow Road
Harwichport, MA

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REV.	ISSUE	DATE

DESIGN DEVELOPMENT

GROUND FLOOR PLAN

Drawing Title:

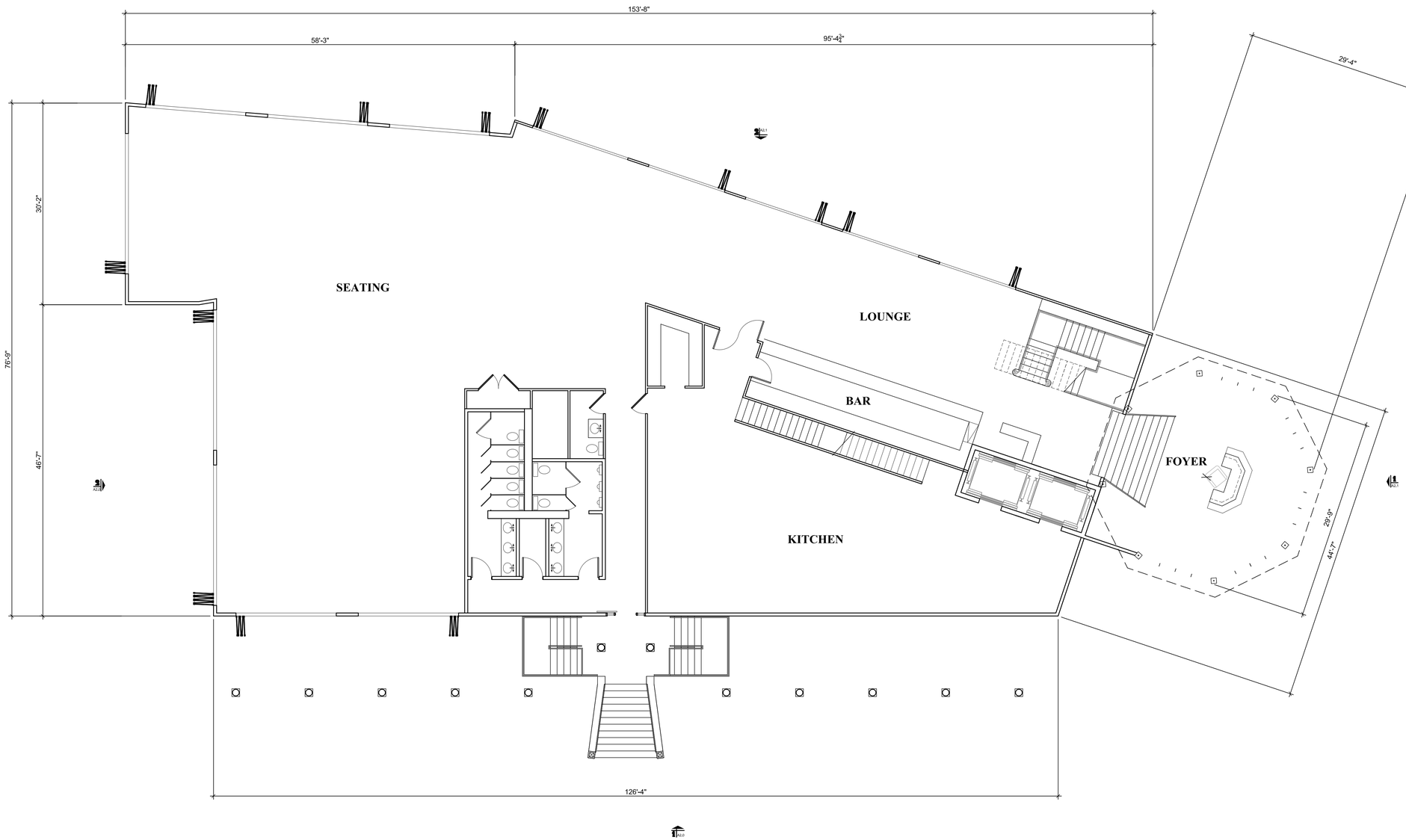
Drawn By: CT Checked By: GG

A1.0

Drawing Number:

File Name: Scale: AS NOTED

Date: 12/20/19



First Floor Plan Scale: 1/8" = 1'- 0" | 1

Project

The Beach Grill

23 Snow Road
Harwichport, MA

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DESIGN DEVELOPMENT

FIRST FLOOR FLOOR PLAN

Drawing Title:

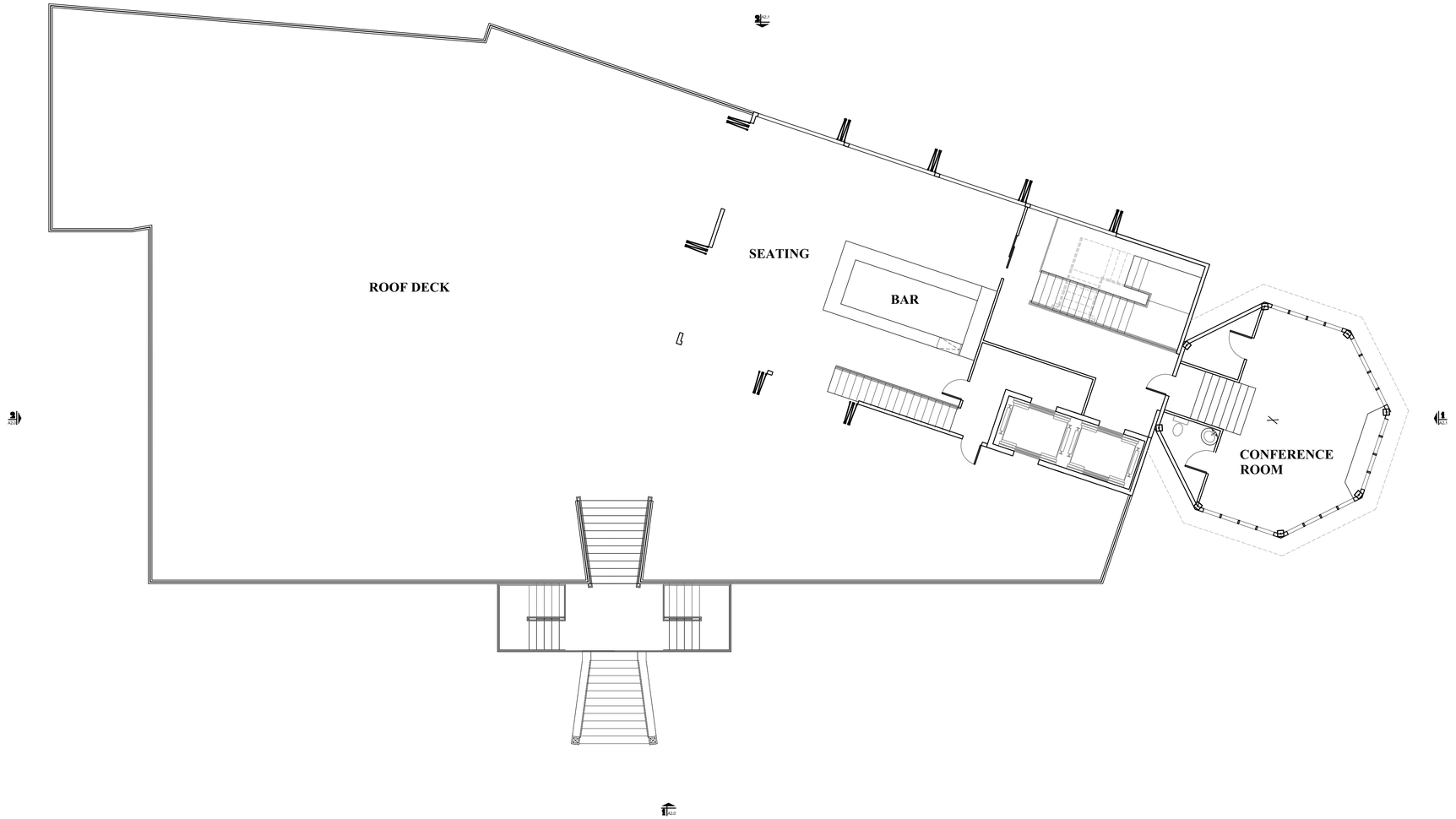
Drawn By: CT Checked By: GG

A1.1

Drawing Number:

File Name: Scale: AS NOTED

Date: 12/20/19



Roof Plan Scale: 1/8" = 1'- 0" | 1

Project

The Beach Grill

23 Snow Road
Harwichport, MA

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DESIGN DEVELOPMENT

ROOF PLAN

Drawing Title:

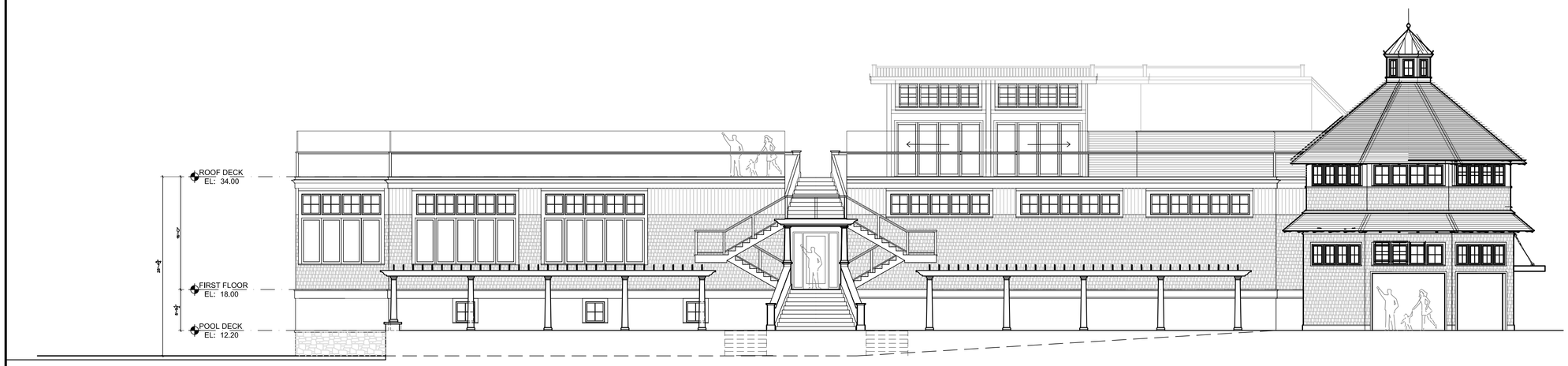
Drawn By: CT Checked By: GG

A1.2

Drawing Number:

File Name: Scale: AS NOTED

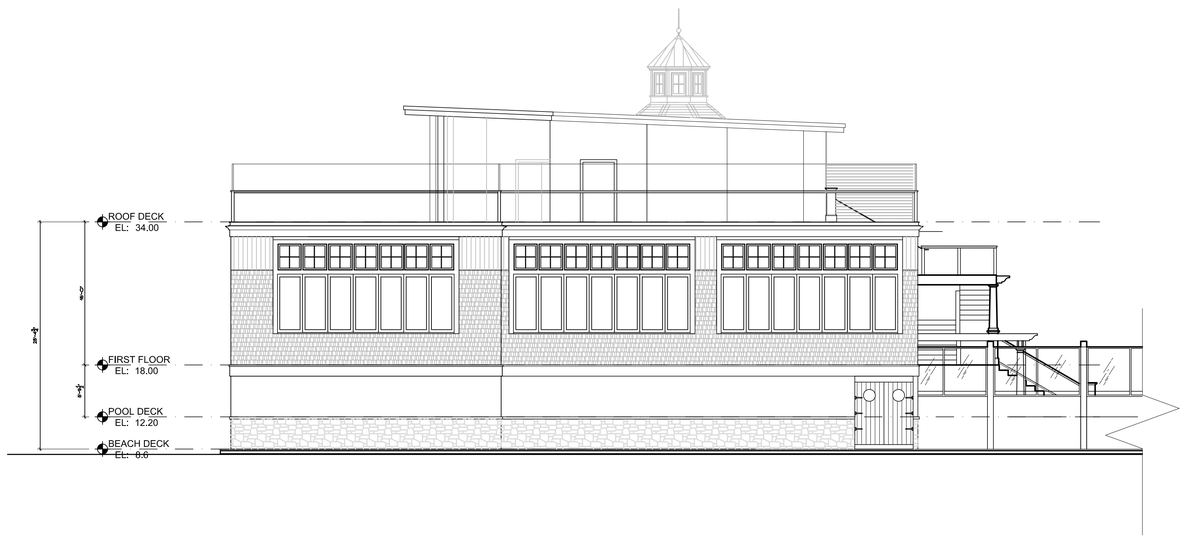
Date: 12/20/19



The Beach Grill East Elevation

Scale: 1/8" = 1'- 0"

2



The Beach Grill South Elevation

Scale: 1/8" = 1'- 0"

2

Project

The Beach Grill

23 Snow Road
Harwichport, MA

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DESIGN DEVELOPMENT

ELEVATIONS

Drawing Title:

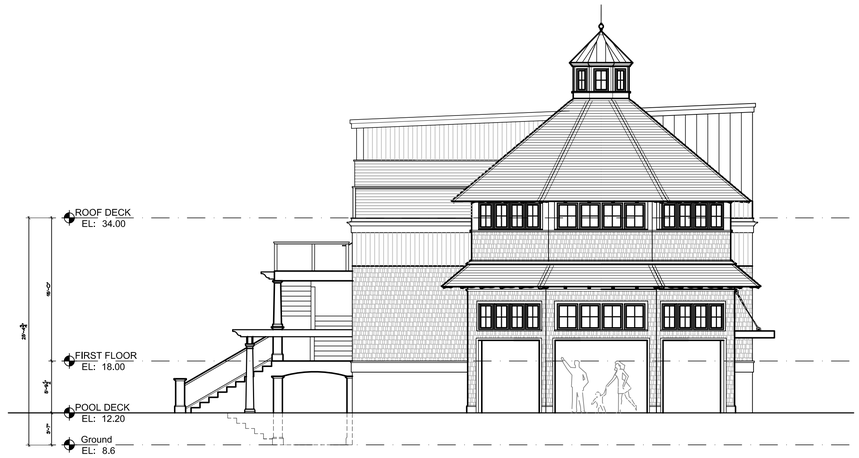
Drawn By: CT Checked By: GG

A2.0

Drawing Number:

File Name: Scale: AS NOTED

Date: 12/20/19



The Beach Grill North Elevation

Scale: 1/8" = 1'- 0" | 1

The Beach Grill West Elevation

Scale: 1/8" = 1'- 0" | 2

Project

The Beach Grill

23 Snow Road
Harwichport, MA

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DESIGN DEVELOPMENT

ELEVATIONS

Drawing Title:

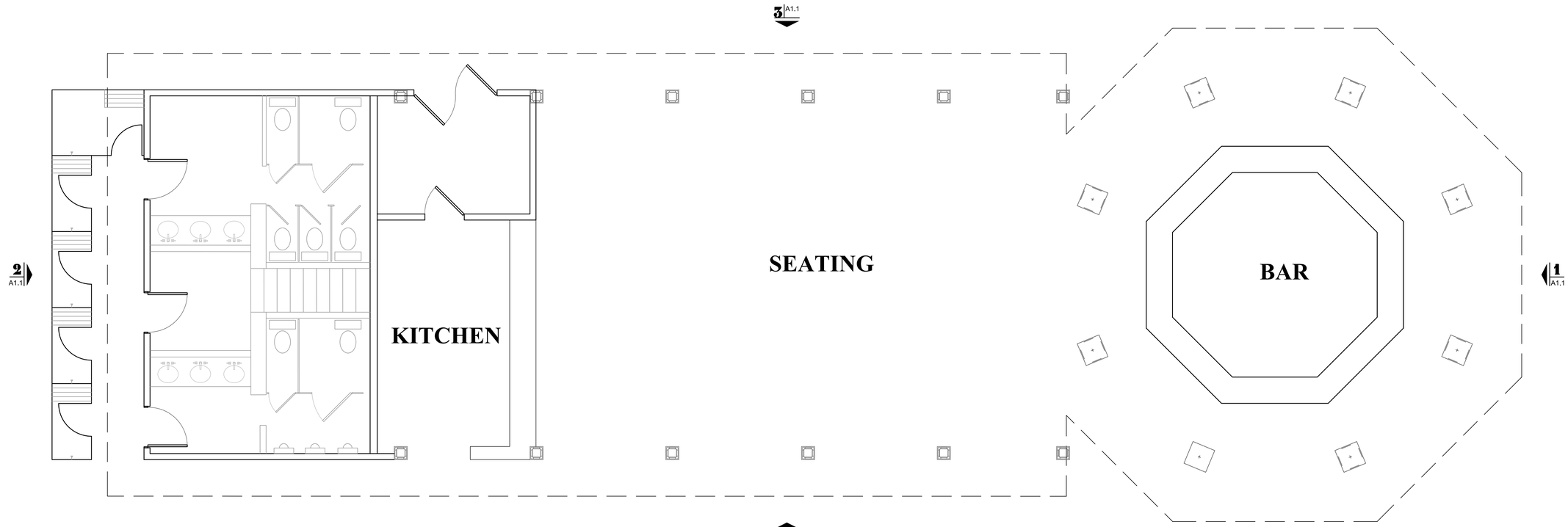
Drawn By: CT Checked By: GG

A2.1

Drawing Number:

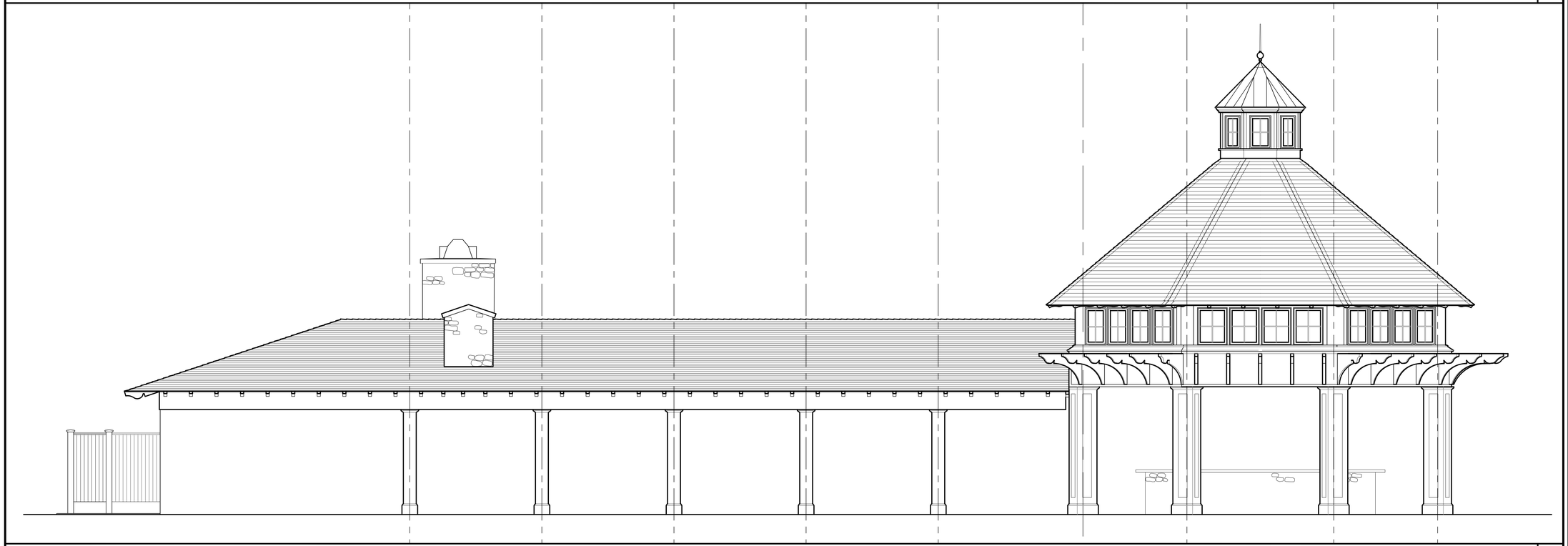
File Name: Scale: AS NOTED

Date: 12/20/19



Coastal Pavilion Bar Ground Floor Plan

Scale: 1/4" = 1'- 0" | 1



West Elevation

Scale: 1/4" = 1'- 0" | 2

Project

Coastal

23 Snow Road
Harwichport, MA

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Issued For

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DESIGN DEVELOPMENT

GROUND FLOOR PLAN & ELEVATION

Drawing Title:

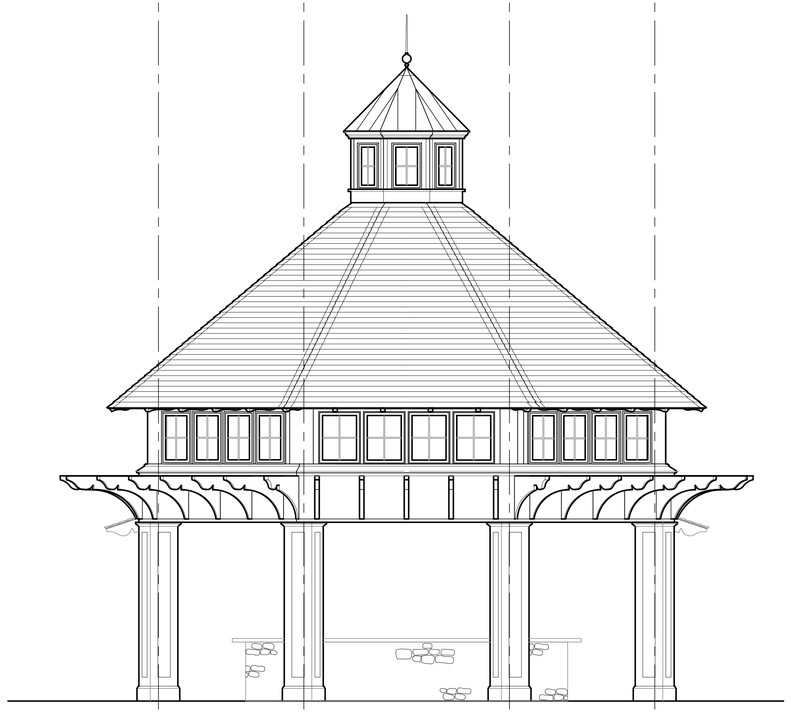
Drawn By: CT Checked By: GG

A1.0

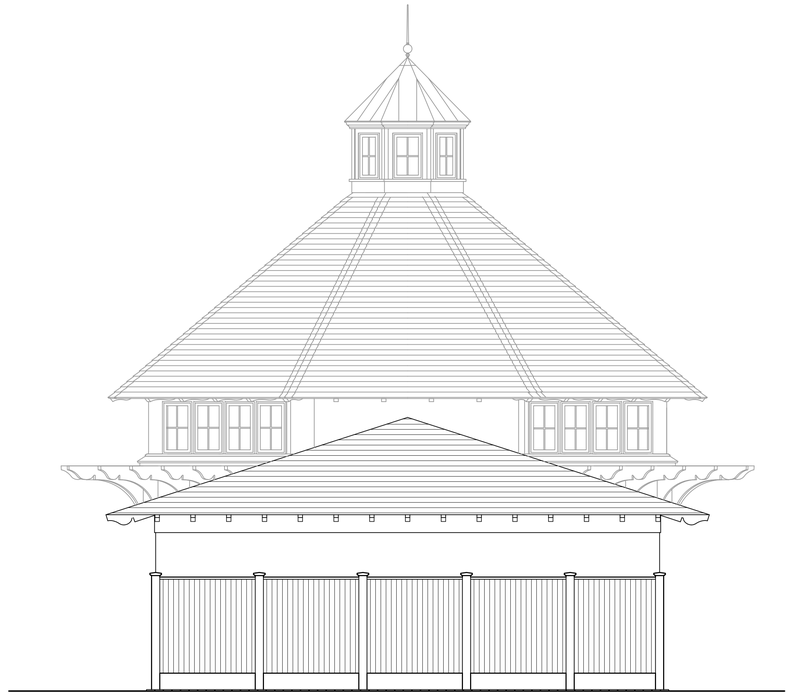
Drawing Number:

File Name: Scale: AS NOTED

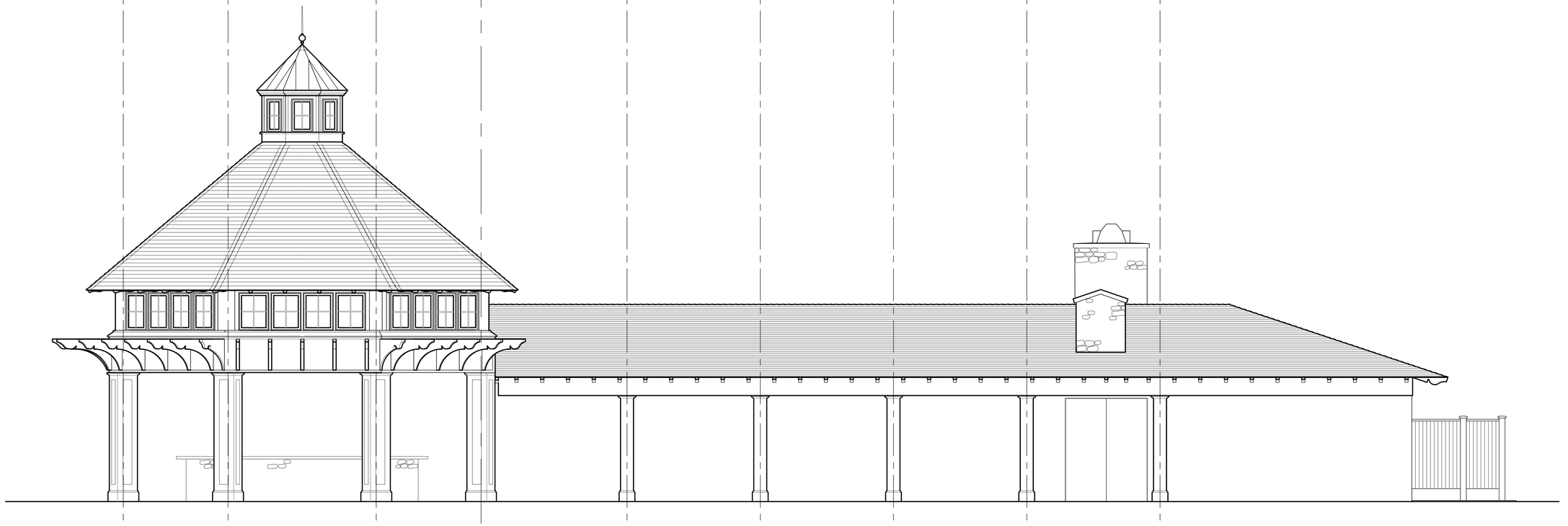
Date: 12/20/19



South Elevation Scale: 1/4" = 1'- 0" | 1



North Elevation Scale: 1/4" = 1'- 0" | 2



East Elevation Scale: 1/4" = 1'- 0" | 3

Project

Coastal

23 Snow Road
Harwichport, MA

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Issued For

REV.	ISSUE	DATE

DESIGN DEVELOPMENT

ELEVATIONS

Drawing Title:

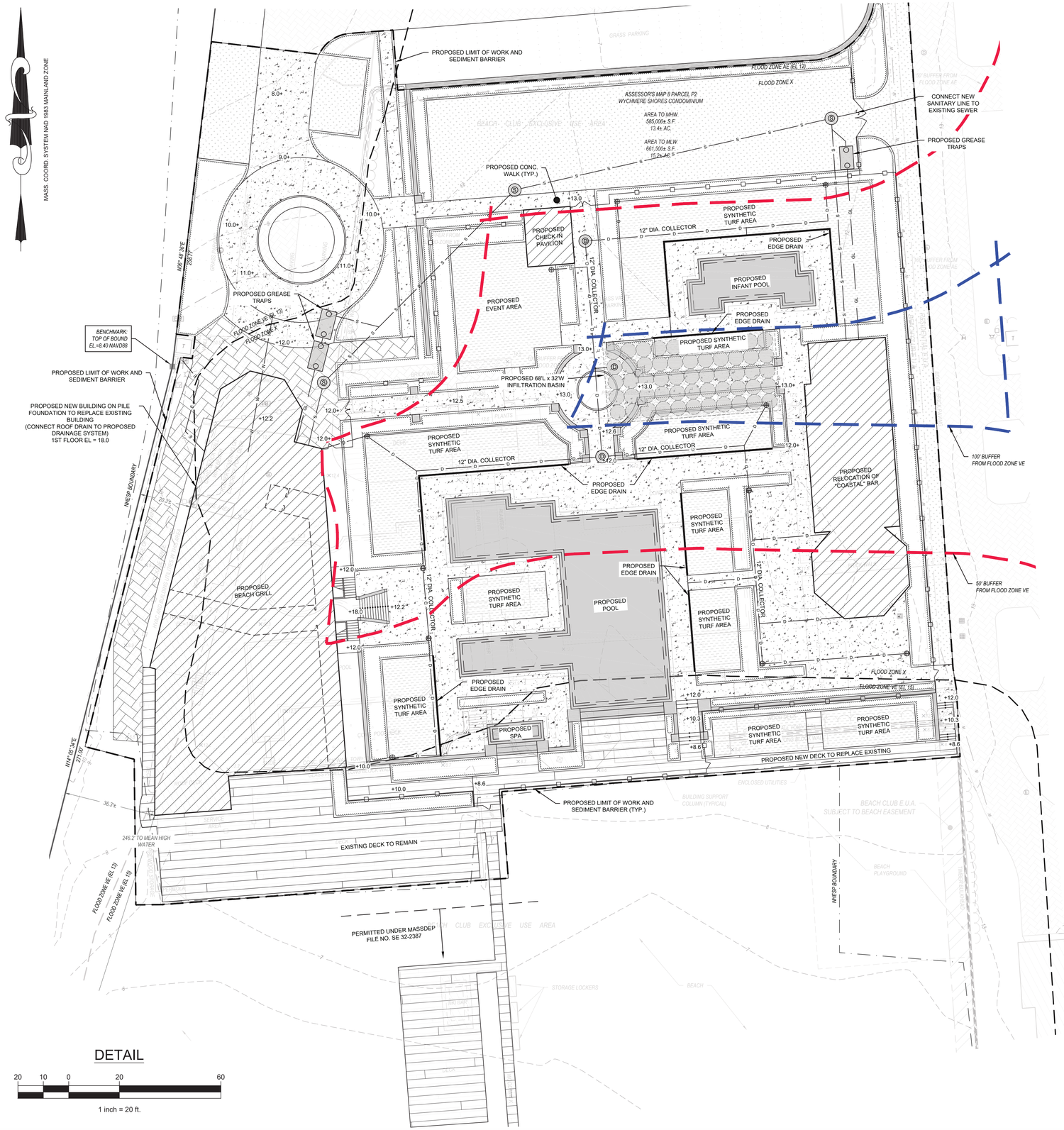
Drawn By: CT Checked By: GG

A1.1

Drawing Number:

File Name: Scale: AS NOTED

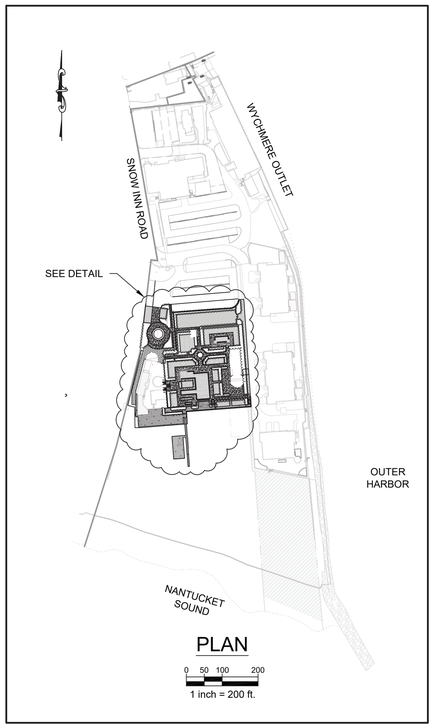
Date: 12/20/19



DETAIL

20 10 0 20 60

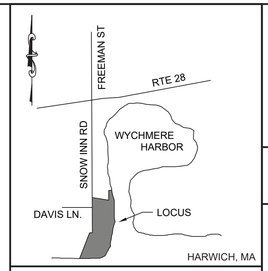
1 inch = 200 ft.



PLAN

0 50 100 200

1 inch = 200 ft.



KEY MAP

NO SCALE

REFERENCE:

ASSESSORS MAP 8, PARCEL P2

DEED BOOK 24547, PAGE 55

PLAN BOOK 634, PAGES 57-66

FLOOD ZONE:

FLOOD ZONE VE (EL 15, EL 14 & EL 13), ZONE AE (EL 11 & EL 12), & ZONE X AS SHOWN ON FEMA FIRM PANEL #25001C0612J EFFECTIVE JULY 16, 2014. COMMUNITY FLOOD PLANE MANAGERS SHALL CONFIRM LOCATION OF SITE SPECIFIC FLOOD PLANE BOUNDARIES PRIOR TO DESIGNING STRUCTURES. A CONDITIONAL LETTER OF MAP AMENDMENT (CLOMA) DETERMINATION SHOULD BE APPLIED FOR TO CONFIRM FLOOD INSURANCE REQUIREMENTS.

DATUM:

ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 1988)

OWNER:

WYCHMERE HARBOR REAL ESTATE, LLC
23 SNOW INN ROAD
HARWICHPORT, MA 02646

LEGEND

EXISTING		PROPOSED	
■	BOUND	⊕	AREA DRAIN
☼	LIGHT POLE	—□—	FENCING
T	TRANSFORMER	Ⓓ	DRAIN MANHOLE
EM	ELECTRIC METER	—·—	DRAIN LINE
PB	PULL BOX	Ⓢ	SEWER MANHOLE
Ⓢ ■	SEWER MANHOLE	—ᵍ—	GREASE LINE
— 12' —	CONTOUR	—·—	SEWER LINE
X 12.2	SPOT GRADE		
—□—	STOCKADE FENCE		

ZONING DISTRICT: RH-3 (RESIDENTIAL-HIGH DENSITY) AND R-L (RESIDENTIAL - LOW DENSITY) (1)			
USE GROUP: PARAGRAPH IV - USE:	30 (RECREATION AND AMUSEMENT SERVICES) 32 (RESTAURANT OR LOUNGE)		
SUBJECT	REQUIRED	EXISTING	PROPOSED
LOT AREA (TO M.L.W.)	40,000 S.F. MINIMUM	661,500 S.F.(3)	NO CHANGE
FRONTAGE	150 FT MINIMUM	447.91 FT	NO CHANGE
(2) FRONT SETBACK (BUILDING)	25 FT MINIMUM	301.9± FT	257± FT
(2) SIDE SETBACK (BUILDING)	20 FT MINIMUM	20.3± FT	NO CHANGE
(2) REAR SETBACK (BUILDING)	20 FT MINIMUM	246.2± FT (TO MHW)	NO CHANGE
BUILDING COVERAGE	15% MAXIMUM	10.2% (67,683± S.F.)	11.4% (75,715± S.F.)
AMENITIES COVERAGE	15% MAXIMUM	29.9% (197,824± S.F.)	28.5% (188,361± S.F.)
SITE COVERAGE (TOTAL)	35% MAXIMUM	40.1% (265,507± S.F.)	39.9% (264,076± S.F.)
GREEN SPACE	15% MINIMUM	59.9% (395,993± S.F.)	60.1% (397,424± S.F.)
BUILDING HEIGHT	50 FT & 4 STORIES MAXIMUM	---	SEE ARCH. PLANS

(1) THIS PROJECT IS LOCATED ENTIRELY WITHIN THE RH-3 ZONING DISTRICT.
(2) REQUIRED SETBACKS SHOWN ARE FOR RH-3 ZONING DISTRICT.
(3) CEC SURVEY AUGUST 15, 2019.

ISSUED FOR PLANNING BOARD AND ZBA REVIEW

COASTAL engineering co.
260 Cranberry Hwy, Orleans, MA 02653
508.255.6511 P 508.255.6700 F

NO.	DATE	REVISION	BY
3	01/17/2020	UPDATE LOT AREA AND COVERAGE AREAS IN ZONING TABLE	CPM
2	12/20/2019	REVISE PROPOSED POOL AREA AND DRAINAGE	CPM
1	07/02/2019	UPDATE PROPOSED BUILDING FOOTPRINT, POOL LOCATIONS, AND UTILITIES	TRG

SEAL

COMMONWEALTH OF MASSACHUSETTS — DAVID J. MICHNIEWICZ — CIVIL — NO. 31461 — REGISTERED PROFESSIONAL ENGINEER

PROJECT
WYCHMERE HARBOR REAL ESTATE, LLC
23 SNOW INN ROAD HARWICH PORT, MA

SHEET TITLE
PROPOSED BUILDING AND SITE IMPROVEMENTS AT WYCHMERE BEACH CLUB

SCALE	AS NOTED
DRAWING FILE	C15766-C.dwg
DATE	~~6/12/2019~~
DRAWN BY	TRG/CEM
CHECKED BY	DJM

C2.2.1

1 OF 1 SHEETS

PROJECT NO. C15766.05

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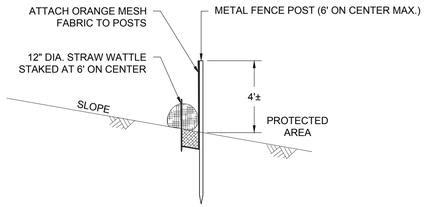


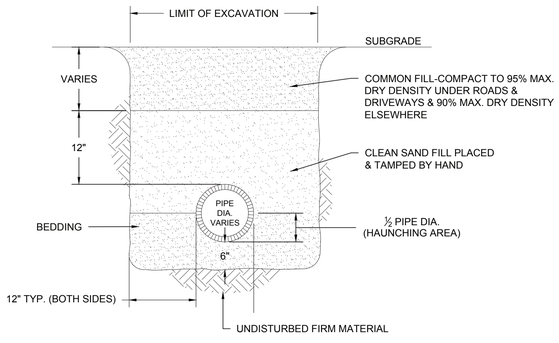
NOTES:

1. SILTATION BARRIER SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND MAINTAINED UNTIL REVEGETATION OF AREA DISTURBED BY CONSTRUCTION.
2. AREAS DISTURBED BY CONSTRUCTION SHALL BE REVEGETATED PRIOR TO COMPLETION OF PROJECT.
3. SEDIMENT SHALL BE REMOVED FROM BARRIER WHEN DEPTH EXCEEDS 1/3 THE HEIGHT OF THE STRAWBALE.

SEDIMENTATION BARRIER DETAIL
NOT TO SCALE

EROSION & SEDIMENTATION CONTROL NOTES:

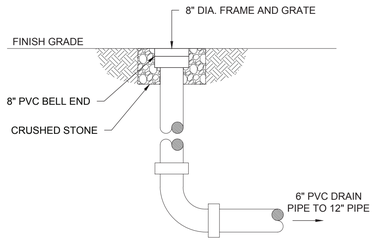
1. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION CONTROL AND PROTECTION OF DRAINAGE STRUCTURES UNTIL COMPLETION OF SITEWORK AND ESTABLISHMENT OF VEGETATIVE GROUND COVER.
2. THE CONTRACTOR SHALL PRACTICE GOOD HOUSEKEEPING MEASURES DURING THE DAY TO DAY OPERATION AT THE SITE. THE SITE SHALL BE POLICED DAILY TO REMOVE ANY LITTER OR DEBRIS.
3. PRIOR TO CONSTRUCTION, INSTALL PERIMETER SEDIMENT BARRIER IN LOCATION(S) SHOWN ON PLAN.
4. TEMPORARY SOIL MATERIAL STOCKPILES SHALL BE SURROUNDED WITH SILTATION BARRIER ON THE DOWNGRADIENT SIDE TO PREVENT DISCHARGE OF SEDIMENT FROM SITE. MATERIAL STOCKPILES THAT ARE IN PLACE FOR AN EXTENDED PERIOD OF TIME SHALL BE STABILIZED WITH VEGETATION, MULCHING, EROSION CONTROL BLANKETS, AND OTHER MEASURES THAT ARE NECESSARY TO PREVENT THE DISCHARGE OF SEDIMENT FROM THE PROJECT SITE.
5. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED AS SOON AS PRACTICABLE TO MINIMIZE OFF-SITE IMPACTS.
6. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
7. EXCEPT AS PROVIDED BELOW, STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.
   7.1. WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS, STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
   7.2. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
8. FOR SLOPES LESS THAN OR EQUAL TO 2H/1V, IF EXPOSED SLOPES CAN NOT BE STABILIZED WITH HYDROSEEDING/VEGETATION, NORTH AMERICAN GREEN SCl50BN EROSION CONTROL BLANKETS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
9. FOR SLOPES > 2H/1V, < 1.5H/1V, NORTH AMERICAN GREEN SC 150 BN. EROSION CONTROL BLANKETS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.



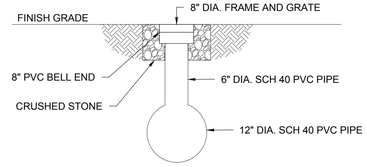
GENERAL NOTES:

1. FINISH GRADE MATERIAL VARIES (SEE SITE PLAN)
2. COMPACT SOIL IN HAUNCHING ZONE TO 85% MAX DRY DENSITY.

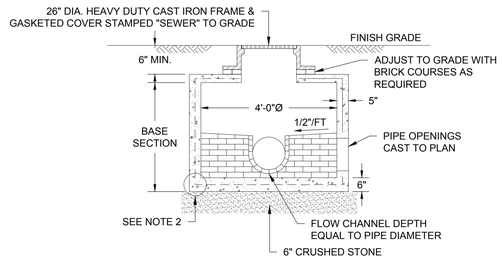
UTILITY TRENCH
NOT TO SCALE



OFF-LINE AREA DRAIN DETAIL
NOT TO SCALE



IN-LINE AREA DRAIN DETAIL
NOT TO SCALE

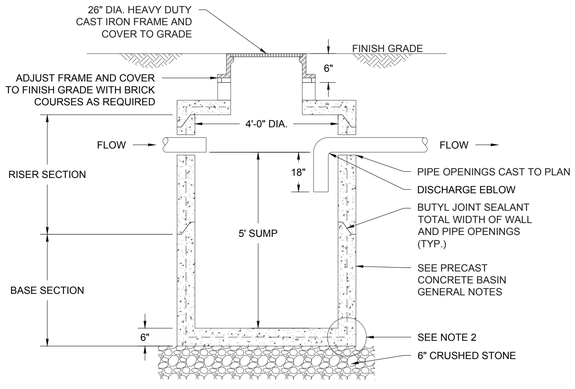


*CONTRACTOR MUST FIELD VERIFY ALL ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. NOTIFY ENGINEER OF ANY PLAN DISCREPANCIES PRIOR TO THE INSTALLATION OF ANY SYSTEM COMPONENTS. SEWER INSTALLATION SHALL BE IN STRICT CONFORMANCE WITH STATE AND LOCAL REGULATIONS AND SPECIFICATIONS. MINIMUM PIPE SLOPE OF 8" DIA. SDR 35 =0.4%.

GENERAL NOTES:

1. ALL REINFORCING STEEL MUST CONFORM TO THE LATEST ASTM A185 AND/OR A615
2. GRADE 60, SPECIFICATION 0.12 SQ. IN/LINEAL FT.
3. STEEL REINFORCEMENT FOR BASE SECTION BOTTOM SHALL BE A MIN. OF 0.12 SQ. IN/LINEAL FT. (BOTH WAYS)
4. MORTAR SHALL CONFORM TO SECTION M4.02.15 OF THE MASSACHUSETTS D.P.W. STANDARD SPECS. FOR HIGHWAYS AND BRIDGES.
5. ONE POUR MONOLITHIC BASE SECTION.
6. ANY NECESSARY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW-CUTTING AND/OR CORING ONLY. NO JACKHAMMERS, HAMMERS, CHISELS OR PNEUMATIC TOOLS WILL BE ALLOWED.
7. STEPS SHALL BE STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC.
8. RED CLAY BRICK SHALL CONFORM WITH SECTION M4.05.2 CLAY BRICK OF MASSACHUSETTS D.P.W. STANDARD SPECS. FOR HIGHWAY AND BRIDGES.
9. PIPE TO MANHOLE CONNECTIONS SHALL BE MADE USING PSX POSITIVE SEAL CONNECTIONS AS MANUFACTURED BY PRESS-SEAL GASKET CORPORATION, OR EQUAL.

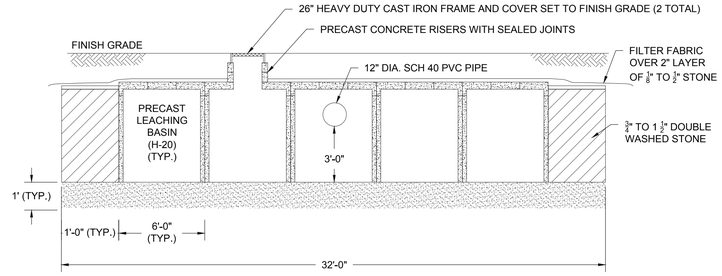
4' SEWER MANHOLE DETAIL
NOT TO SCALE



PRECAST CONCRETE DRAIN MANHOLE
NOT TO SCALE

DRAIN MANHOLE NOTES:

1. ALL REINFORCING STEEL MUST CONFORM TO THE LATEST ASTM A185 AND/OR A615 GRADE 60, SPECIFICATION 0.12 SQ. IN/LINEAL FT.
2. STEEL REINFORCEMENT FOR BASE SECTION BOTTOM SHALL BE A MIN. OF 0.12 SQ. IN/LINEAL FT. (BOTH WAYS)
3. MANHOLE SPECS. CONFORM TO THE LATEST ASTM C478 SPEC. FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS".
4. MORTAR SHALL CONFORM TO SECTION M4.02.15 OF THE MASSACHUSETTS D.P.W. STANDARD SPECS. FOR HIGHWAYS AND BRIDGES.
5. ONE POUR MONOLITHIC BASE SECTION.
6. ANY NECESSARY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW-CUTTING AND/OR CORING ONLY. NO JACKHAMMERS, HAMMERS, CHISELS OR PNEUMATIC TOOLS WILL BE ALLOWED.
7. RED CLAY BRICK SHALL CONFORM WITH SECTION M4.05.2 CLAY BRICK OF MASSACHUSETTS D.P.W. STANDARD SPECS. FOR HIGHWAY AND BRIDGES.
8. PIPE TO MANHOLE CONNECTIONS SHALL BE MADE USING PSX POSITIVE SEAL CONNECTIONS AS MANUFACTURED BY PRESS-SEAL GASKET CORPORATION, OR EQUAL.



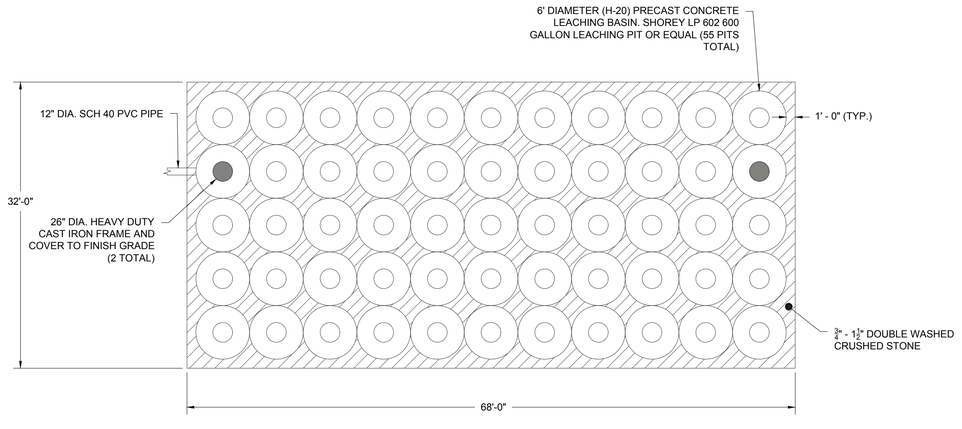
TYPICAL END VIEW OF STORMWATER RECHARGE BASIN
NOT TO SCALE

(SEE PLAN FOR CONCRETE STORMWATER LEACHING BASIN LAYOUT)

LEACHING RECHARGE BASIN NOTES:

1. DRAINAGE RECHARGE STRUCTURES TO BE PLACED IN CLEAN COARSE SAND. CONTRACTOR SHALL NOTIFY ENGINEER FOR ON-SITE INSPECTION OF SOILS PRIOR TO INSTALLATION OF ANY DRAINAGE SYSTEM COMPONENTS OR STONE.
2. STRUCTURE MAY BE PLACED ABOVE NATURALLY OCCURRING CLEAN SAND LAYER PROVIDED THAT CONTRACTOR PERFORMS A 5-FOOT SOIL REMOVAL LATERALLY AROUND LEACHING RECHARGE BASIN DOWN TO CLEAN SAND HORIZON. REMOVAL SHALL BE FILLED TO TOP OF STRUCTURE IN ACCORDANCE WITH NOTE #3. (CONTRACTOR SHALL INCLUDE A UNIT COST FOR REMOVAL AND REPLACEMENT IN THE BID PRICE).
3. FILL MATERIAL FOR SYSTEMS CONSTRUCTED IN FILL SHALL BE CLEAN GRANULAR SAND, FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS. THE SAND SHALL BE GRADED SUCH THAT NOT MORE THAN 45% OF THE SAMPLE, BY WEIGHT, SHALL BE RETAINED ON THE #4 SIEVE. THE FILL SHALL NOT CONTAIN ANY MATERIAL LARGER THAN 2 INCHES. THE MATERIAL THAT PASSES THE #4 SIEVE SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE SIZE	PERCENT PASSING
# 4	100%
# 50	10%-100%
# 100	0%-20%
# 200	0%-5%



PLAN VIEW OF STORMWATER RECHARGE BASINS (SRB-1)
NOT TO SCALE

(SEE PLAN FOR CONCRETE STORMWATER LEACHING BASIN LAYOUT)

ISSUED FOR PLANNING BOARD AND ZBA REVIEW

COASTAL engineering co.
260 Cranberry Hwy, Orleans, MA 02653
508.255.6511 P 508.255.6700 F

NO.	DATE	REVISION	BY
2	12-20-19	UPDATE PROPOSED BUILDING FOOTPRINT, POOL LOCATIONS AND UTILITIES	TRG
1	07-09-19	UPDATE DRAINAGE SYSTEM DETAILS	CEM

SEAL

COMMONWEALTH OF MASSACHUSETTS DAVID J. MICHNIEWICZ CIVIL No. 31493 REGISTERED PROFESSIONAL ENGINEER

PROJECT
WYCHMERE HARBOR REAL ESTATE, LLC
23 SNOW INN ROAD HARWICH PORT, MA

SHEET TITLE
SITE AND DRAINAGE DETAILS

SCALE	AS NOTED
DRAWING FILE	C15766-C.dwg
DATE	~~6/18/2019~~
DRAWN BY	CEM/TRG
CHECKED BY	DJM

C2.4.1

__ OF __ SHEETS

PROJECT NO. C15766.05

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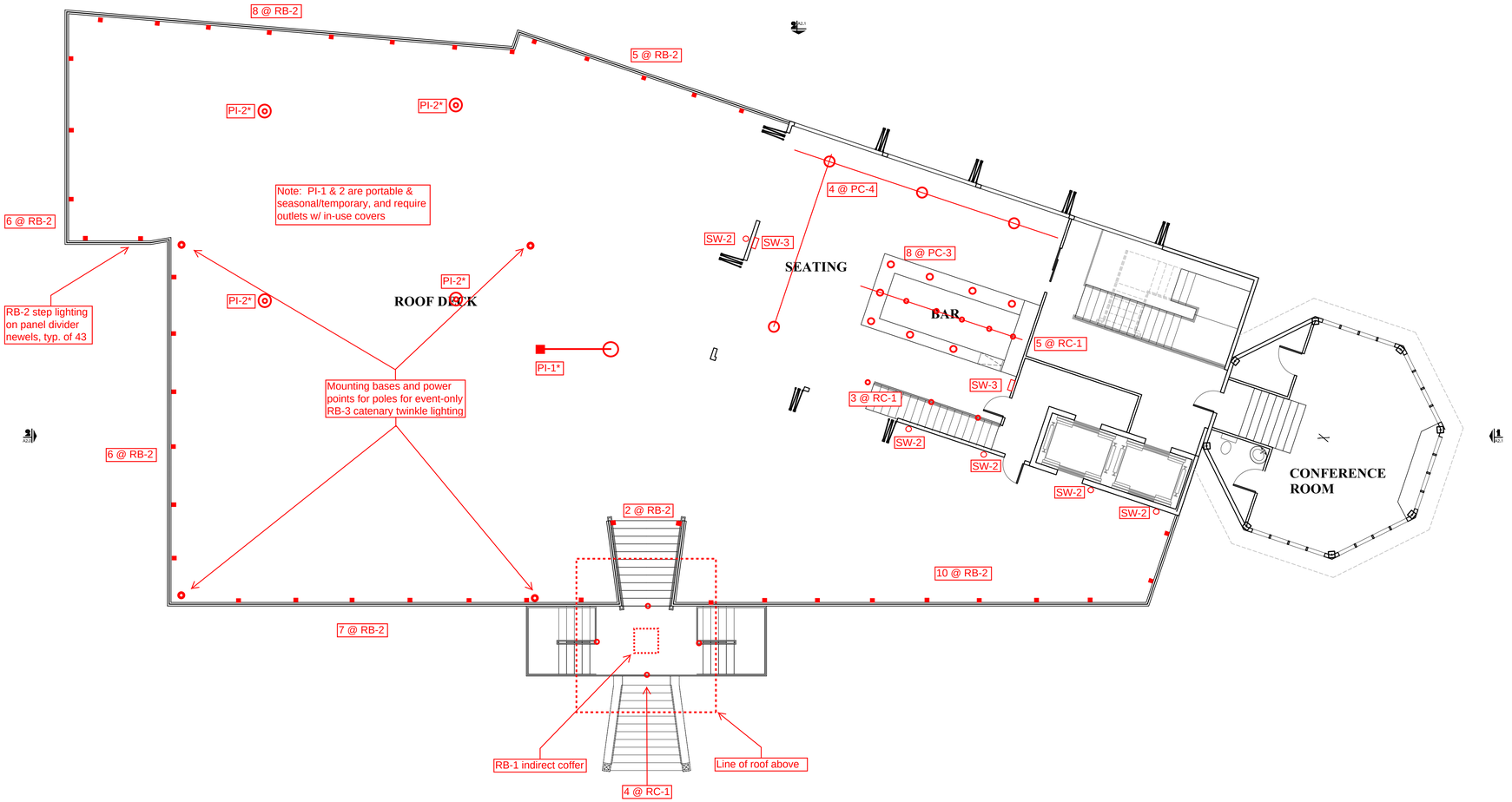


Roof Plan Scale: 1/8" = 1'- 0" 1

Project

The Beach Grill

23 Snow Road
Harwichport, MA

NOTES:

All notes on this drawing are typical and apply equally to all comparable conditions. dimensions shall take precedence. Errors or discrepancies on details are to be brought to the attention of the GSDesign Group Inc. before the work or materials have eather been commenced , and or purchased

GAKIDIS + STEWART

GS Design Group Inc.
215 Onset Ave.
P.O. Box 1200
Onset, MA 02532
Tel 508 . 295 . 2952

Issued For

REV.	ISSUE	DATE

DESIGN DEVELOPMENT

ROOF PLAN

CL Markups 1-08-20

Drawing Title:

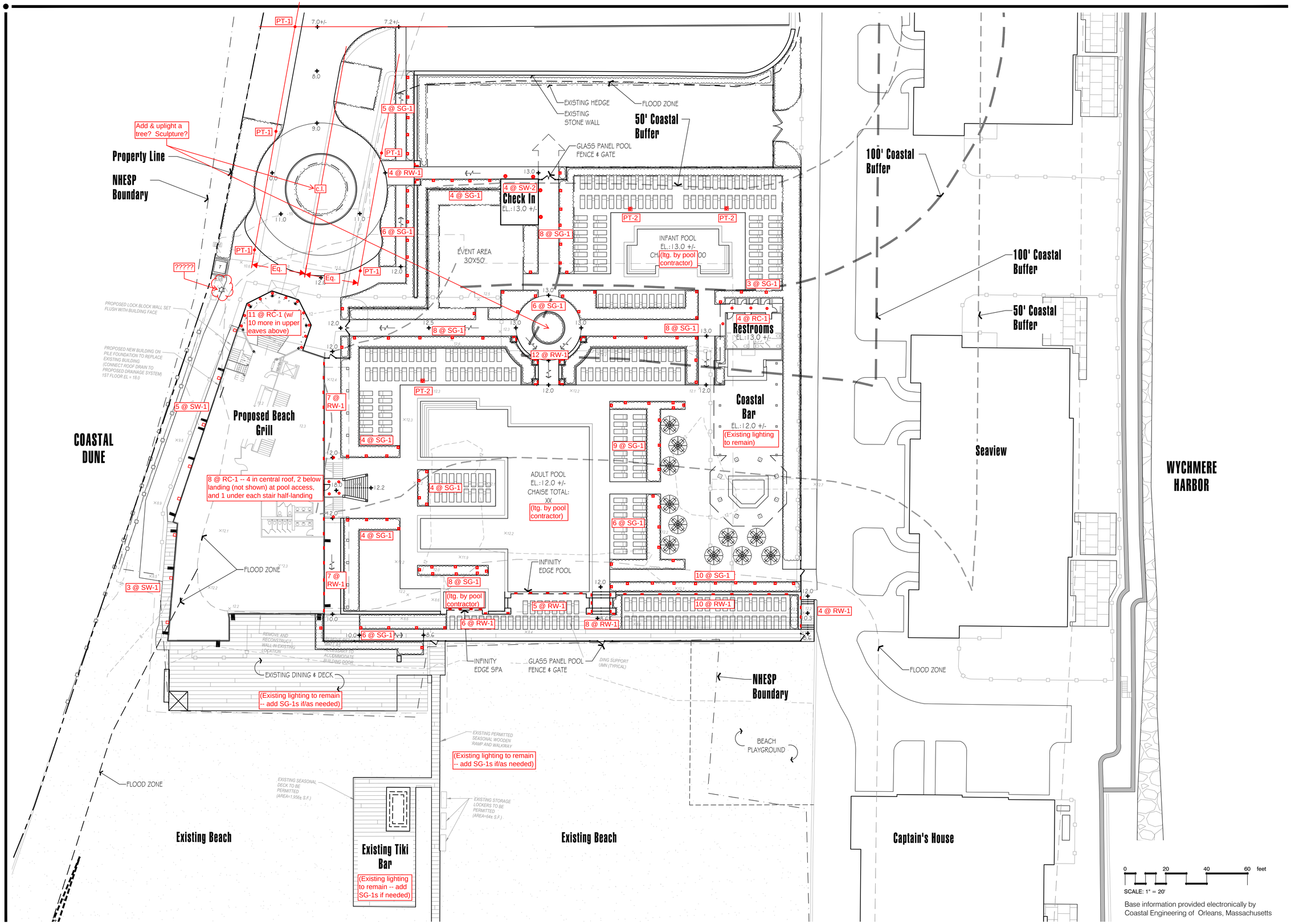
Drawn By: CT Checked By: GG

A1.2

Drawing Number:

File Name: Scale: AS NOTED

Date: 12/20/19



Base information provided electronically by Coastal Engineering of Orleans, Massachusetts

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
info@hawkdesigninc.com
www.hawkdesigninc.com

Date: 12/06/19

Revisions:
Num. Date Description

Wychmere Beach Club

22 Snow Inn Rd, Harwich Port, MA

Longwood Venues / Atlas Development

Drawn By: TM | Checked By: DH

Progress Print

CL Markups 12-20-19

Scale: 1" = 20'-0"

Sheet: Lx

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Glass Color:


Clear


Frosted

Size: Entryway

CHAT

Entryway Garden Estate

ADD TO PROJECT

Diagram

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Avenue Column Mount
By Arroyo Craftsman

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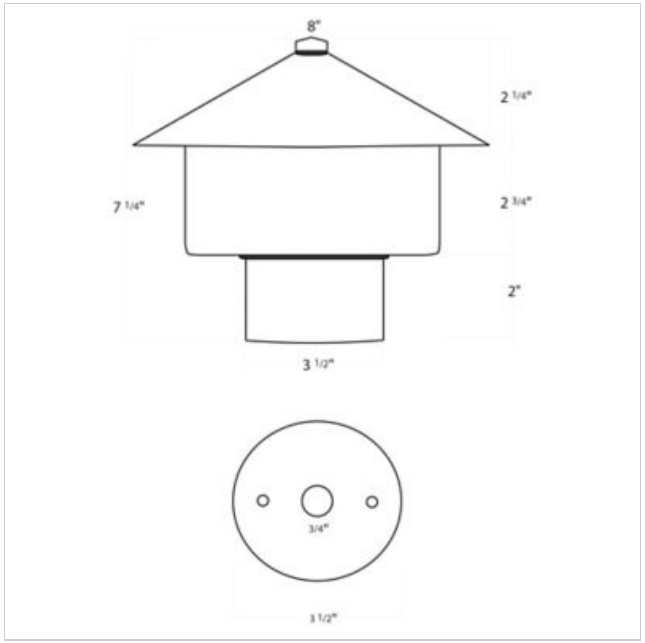
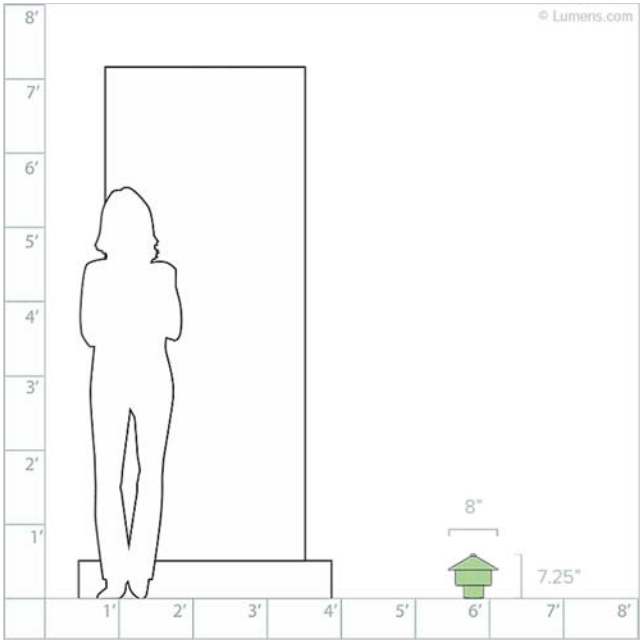
By dweLED

From: $388.95





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Allentown, PA 18106
610-774-1300

ACCREDITED

NVLAP LAB CODE 201042-0

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Avenue West
Carlsbad
CA, 92010
United States

Catalog Number

HPL6-2-27

Order Number
11745044
Test Number
11745044.11

Test Date

2017-05-10

Prepared By

Javier Caban

Javier Caban, Technician

Approved By

Tiffany Hamm

Tiffany Hamm, Project Handler

Luminaire Description: Conical 6" copper shade with clear glass lens, cylindrical copper stem and brass base
Lamp: 64 white LEDs
Mounting: Path/Area
Ballast/Driver: Integrated

Luminaire

Luminaire Characteristics
Luminous Diameter: 6.00 in.

Summary of Results

Roadway Classification:	Type V, Short
Cutoff Classification:	Cutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	25.4	°C
Voltage:	12.00	VAC
Current:	0.3035	A
Power:	2.202	W
Power Factor:	0.605	
Frequency:	60	Hz
Current THD:	86.0	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

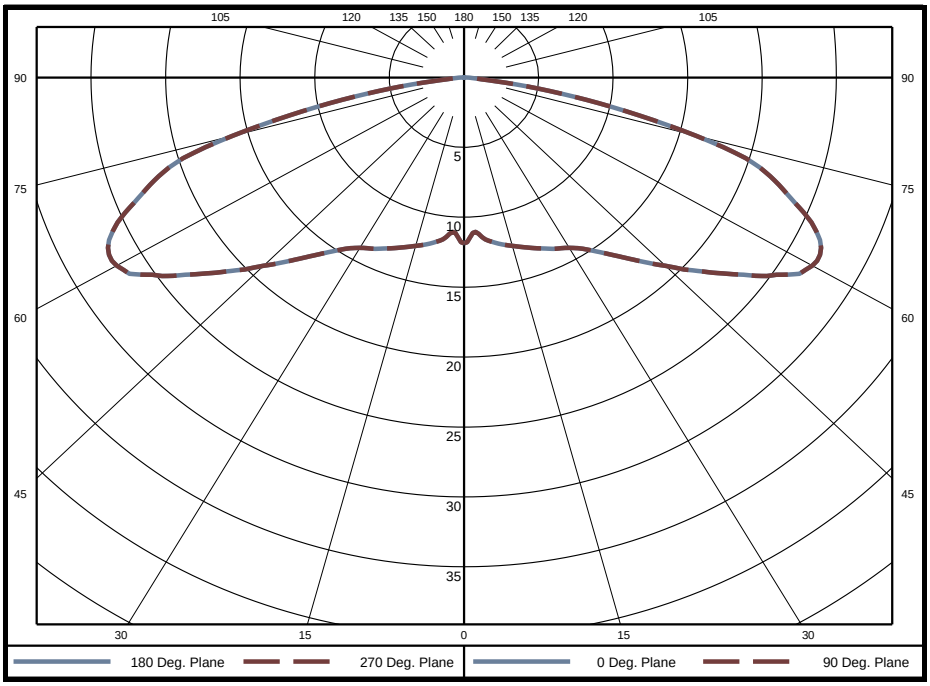
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.4 °C	12.00 VAC	0.3035 A	2.202 W	0.605	60 Hz	86.0 %

Summary of Results

Spacing Criteria
0-180: 2.32
90-270: 2.32

Total Lumen Output: 101.3 Lumens
Luminaire Efficacy: 46.0 lm/w
Maximum Candela: 27 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.27	0.3%	60-65	13.01	12.8%	120-125	0.01	0.0%
5-10	0.84	0.8%	65-70	12.29	12.1%	125-130	0.01	0.0%
10-15	1.45	1.4%	70-75	10.40	10.3%	130-135	0.01	0.0%
15-20	2.10	2.1%	75-80	5.97	5.9%	135-140	0.01	0.0%
20-25	2.78	2.7%	80-85	1.68	1.7%	140-145	0.01	0.0%
25-30	3.49	3.4%	85-90	0.27	0.3%	145-150	0.01	0.0%
30-35	4.28	4.2%	90-95	0.07	0.1%	150-155	0.01	0.0%
35-40	5.32	5.3%	95-100	0.03	0.0%	155-160	0.00	0.0%
40-45	6.64	6.6%	100-105	0.02	0.0%	160-165	0.00	0.0%
45-50	8.23	8.1%	105-110	0.02	0.0%	165-170	0.00	0.0%
50-55	10.08	10.0%	110-115	0.01	0.0%	170-175	0.00	0.0%
55-60	12.03	11.9%	115-120	0.01	0.0%	175-180	0.00	0.0%

Zone	Lumens	% of Luminaire
0-40	21	20.3%
0-60	58	56.8%
0-90	101	99.8%
90-180	0	0.2%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85	11.85
5	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22	11.22
10	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99
15	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46
20	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95	12.95
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35	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13
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85	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
90	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
95	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
100	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
105	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
110	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
115	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
120	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
125	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
130	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
135	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
140	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
145	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
150	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
155	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
160	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
165	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
170	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
175	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
180	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	649	649	649
45	1475	1475	1475
55	2364	2364	2364
65	3374	3374	3374
75	3403	3403	3403
85	546	546	546

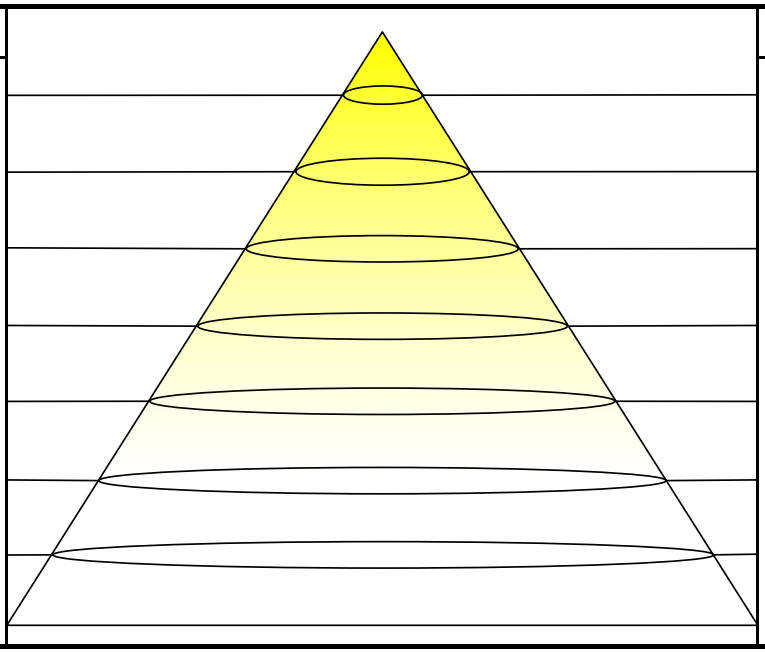
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	121	121	121	121	118	118	118	118	112	112	112	108	108	108	103	103	103	101
1	107	100	95	90	104	98	93	88	94	89	85	89	86	83	86	83	80	78
2	94	83	74	66	91	81	73	66	77	70	64	73	67	62	70	65	61	58
3	83	69	59	50	80	68	58	50	64	56	49	61	54	48	58	52	47	44
4	74	59	48	40	71	58	47	39	55	46	38	52	44	38	50	43	37	35
5	67	51	40	32	64	50	39	32	47	38	31	45	37	31	43	36	30	28
6	61	45	34	26	59	44	33	26	42	32	26	40	32	25	38	31	25	23
7	56	40	29	22	54	39	29	22	37	28	22	35	27	21	34	27	21	19
8	51	36	26	19	50	35	25	19	33	25	18	32	24	18	31	23	18	16
9	48	32	23	16	46	32	22	16	30	22	16	29	21	16	28	21	16	14
10	45	29	20	14	43	29	20	14	28	20	14	27	19	14	26	19	14	12

Beam and Field Information	
CIE Type:	Direct
Center Beam Intenisty:	11.85 Candela
Central Cone Intensity:	11 Candela
Beam Flux:	99.5 Lumens
Beam Angle (0-180):	160.8 Degrees
Beam Angle (90-270):	160.8 Degrees
Field Angle (0-180):	168.0 Degrees
Field Angle (90-270):	168.0 Degrees

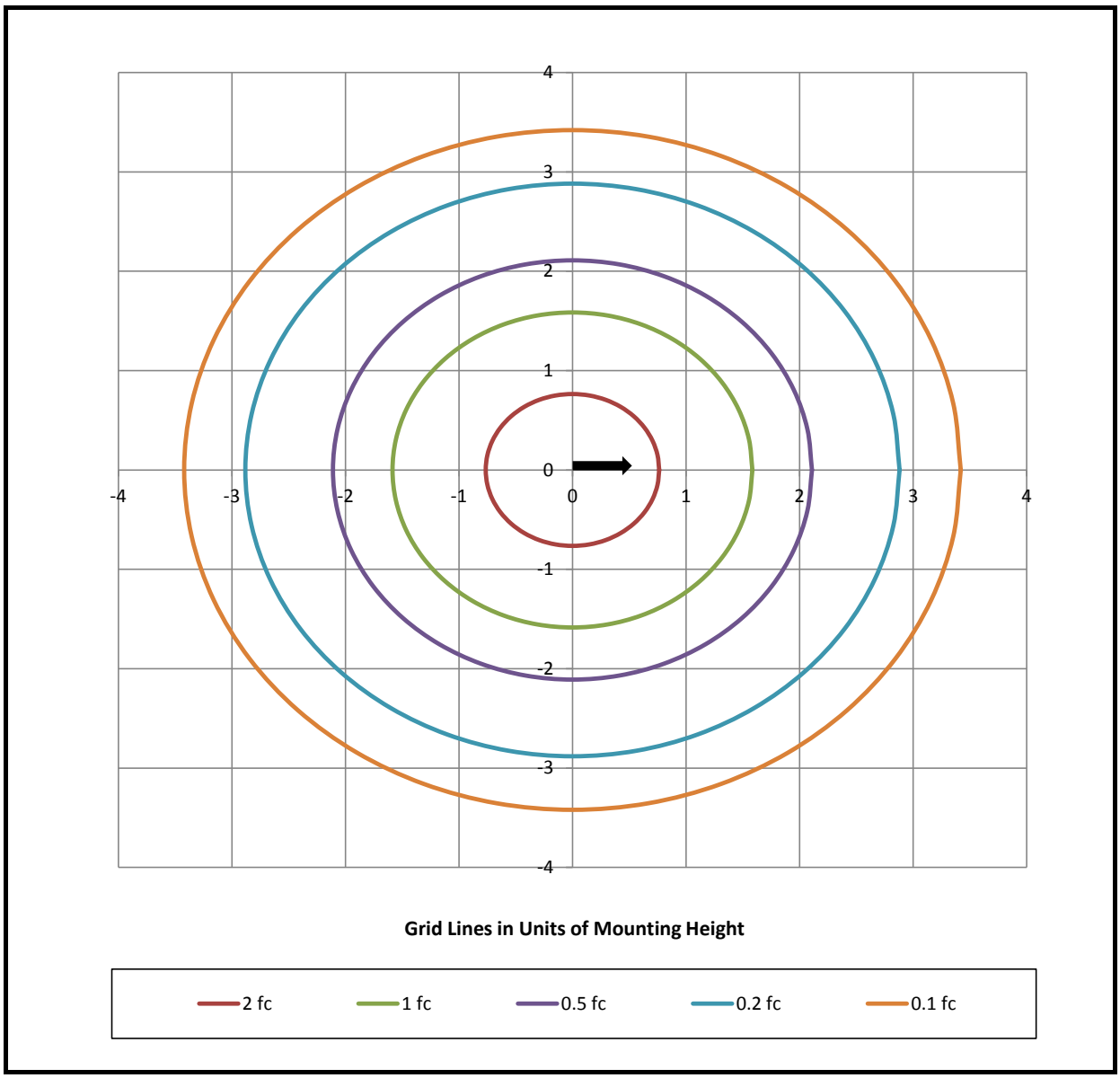
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.740	9.27
6.00	0.329	13.9
8.00	0.185	18.5
10.0	0.118	23.2
12.0	0.0823	27.8
14.0	0.0604	32.5
16.0	0.0463	37.1

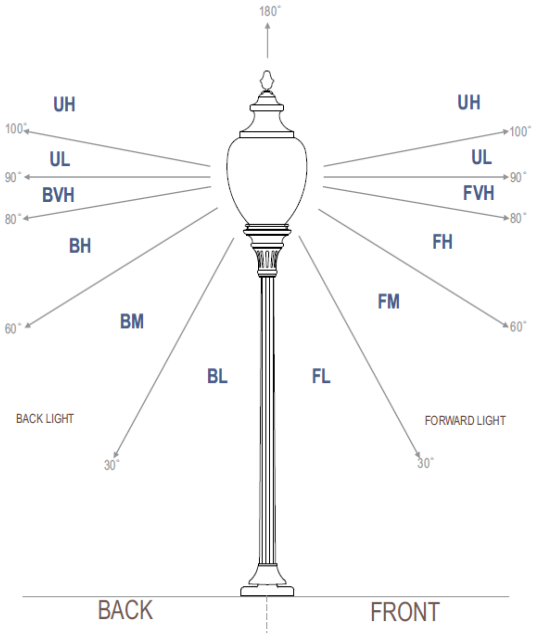


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	5.5	5.4%
FM	(30-60)	23.3	23.0%
FH	(60-80)	20.8	20.5%
FVH	(80-90)	1.0	1.0%
BL	(0-30)	5.5	5.4%
BM	(30-60)	23.3	23.0%
BH	(60-80)	20.8	20.5%
BVH	(80-90)	1.0	1.0%
UL	(90-100)	0.1	0.1%
UH	(100-180)	0.1	0.1%
Total		101.5	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

ACCREDITED

NVLAP LAB CODE 201042-0

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Avenue West
Carlsbad
CA, 92010
United States

Catalog Number

HPL6-2-30

Order Number
11745044
Test Number
11745044.12

Test Date

2017-05-12

Prepared By

Javier Caban, Technician

Approved By

Tiffany Hamm, Project Handler

Luminaire Description: Conical 6" copper shade with clear glass lens, cylindrical copper stem and brass base
Lamp: 64 white LEDs
Mounting: Path/Area
Ballast/Driver: Integrated

Luminaire

Luminaire Characteristics
Luminous Diameter: 6.00 in.

Summary of Results

Roadway Classification:	Type V, Short
Cutoff Classification:	Cutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.6	°C
Voltage:	12.00	VAC
Current:	0.3024	A
Power:	2.198	W
Power Factor:	0.606	
Frequency:	60	Hz
Current THD:	85.8	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

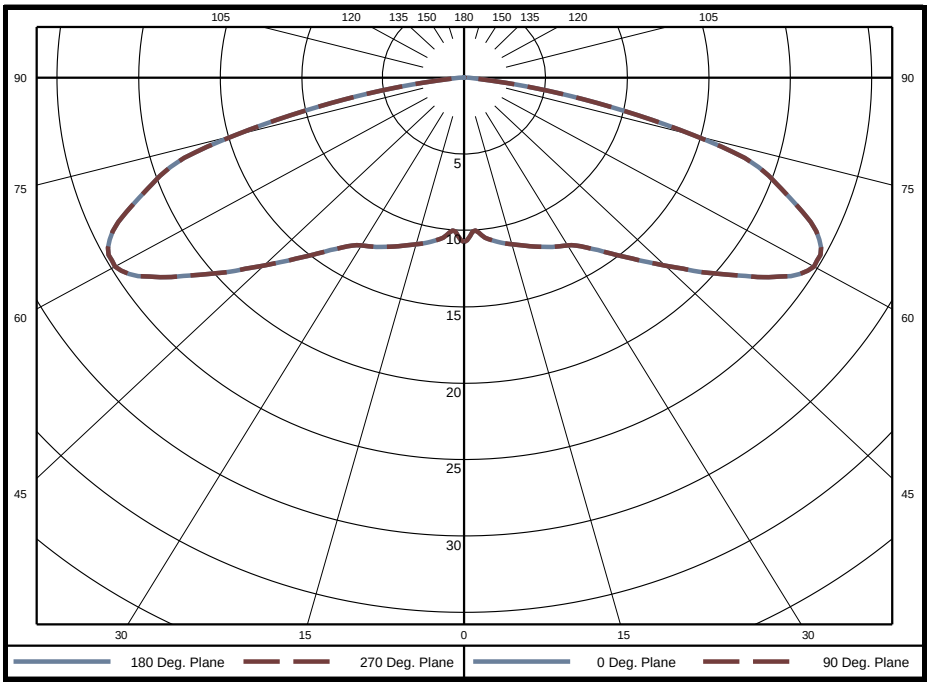
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.6 °C	12.00 VAC	0.3024 A	2.198 W	0.606	60 Hz	85.8 %

Summary of Results

Spacing Criteria
0-180: 2.35
90-270: 2.35

Total Lumen Output: 92.52 Lumens
Luminaire Efficacy: 42.1 lm/w
Maximum Candela: 25 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.24	0.3%	60-65	11.90	12.9%	120-125	0.01	0.0%
5-10	0.76	0.8%	65-70	11.21	12.1%	125-130	0.01	0.0%
10-15	1.32	1.4%	70-75	9.46	10.2%	130-135	0.01	0.0%
15-20	1.90	2.1%	75-80	5.40	5.8%	135-140	0.01	0.0%
20-25	2.52	2.7%	80-85	1.54	1.7%	140-145	0.01	0.0%
25-30	3.16	3.4%	85-90	0.26	0.3%	145-150	0.01	0.0%
30-35	3.86	4.2%	90-95	0.07	0.1%	150-155	0.01	0.0%
35-40	4.83	5.2%	95-100	0.03	0.0%	155-160	0.00	0.0%
40-45	6.05	6.5%	100-105	0.02	0.0%	160-165	0.00	0.0%
45-50	7.54	8.1%	105-110	0.02	0.0%	165-170	0.00	0.0%
50-55	9.28	10.0%	110-115	0.01	0.0%	170-175	0.00	0.0%
55-60	11.07	12.0%	115-120	0.01	0.0%	175-180	0.00	0.0%

Zone	Lumens	% of Luminaire
0-40	19	20.1%
0-60	53	56.8%
0-90	92	99.8%
90-180	0	0.2%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76
5	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17
10	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86	10.86
15	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29	11.29
20	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74	11.74
25	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23
30	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68
35	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69	13.69
40	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32	15.32
45	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40
50	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93
55	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78	22.78
60	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74	24.74
65	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80
70	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38	20.38
75	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55
80	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97
85	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
90	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
95	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
100	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
105	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
110	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
115	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
120	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
125	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
130	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
135	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
140	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
145	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
150	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
155	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
160	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
165	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
170	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
175	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
180	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	590	590	590
45	1349	1349	1349
55	2177	2177	2177
65	3087	3087	3087
75	3081	3081	3081
85	513	513	513

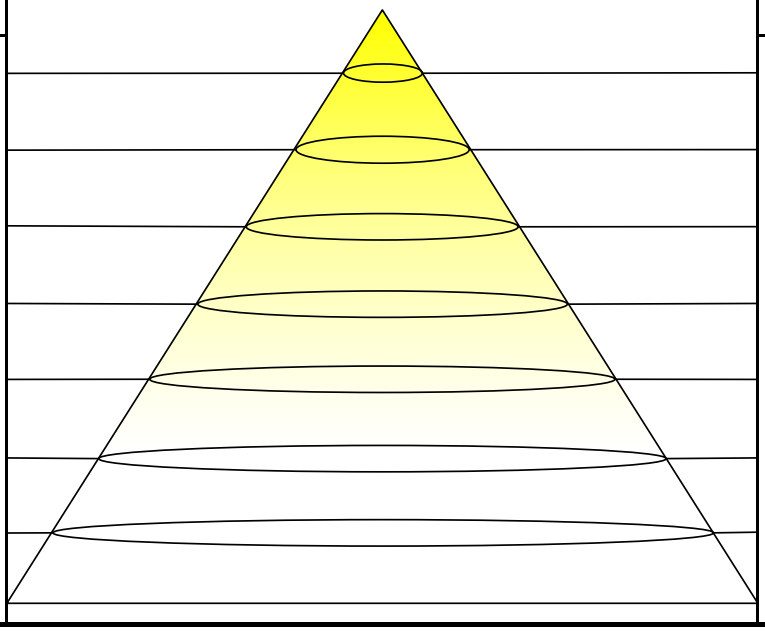
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	110	110	110	110	108	108	108	108	103	103	103	98	98	98	94	94	94	92
1	97	92	87	82	95	89	85	80	85	81	78	82	78	75	78	75	73	71
2	86	76	67	61	83	74	66	60	70	64	58	67	62	57	64	59	55	53
3	76	63	54	46	73	62	53	46	59	51	45	56	49	44	53	48	43	40
4	68	54	44	36	65	52	43	36	50	42	35	48	40	35	45	39	34	31
5	61	47	36	29	59	45	36	29	43	35	28	41	34	28	39	33	27	25
6	56	41	31	24	53	40	30	24	38	30	23	36	29	23	35	28	23	20
7	51	36	27	20	49	35	26	20	34	26	20	32	25	19	31	24	19	17
8	47	32	23	17	45	32	23	17	30	22	17	29	22	17	28	21	16	14
9	44	29	21	15	42	29	20	15	28	20	15	26	19	14	25	19	14	12
10	41	27	18	13	39	26	18	13	25	18	13	24	17	13	23	17	13	11

Beam and Field Information	
CIE Type:	Direct
Center Beam Intenisty:	10.76 Candela
Central Cone Intensity:	10 Candela
Beam Flux:	90.7 Lumens
Beam Angle (0-180):	160.8 Degrees
Beam Angle (90-270):	160.8 Degrees
Field Angle (0-180):	168.6 Degrees
Field Angle (90-270):	168.6 Degrees

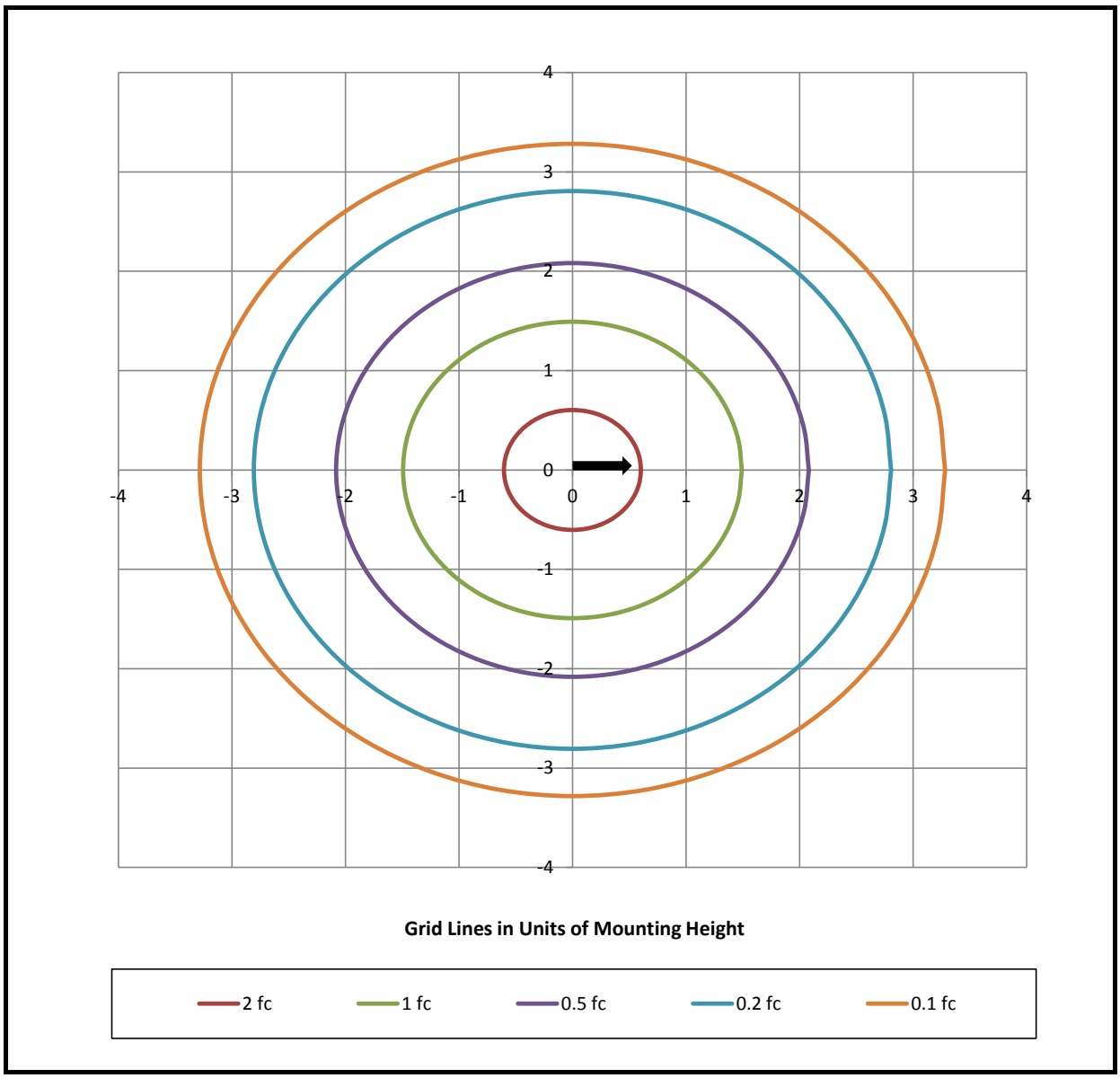
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.673	9.38
6.00	0.299	14.1
8.00	0.168	18.8
10.0	0.108	23.5
12.0	0.0747	28.1
14.0	0.0549	32.8
16.0	0.0420	37.5

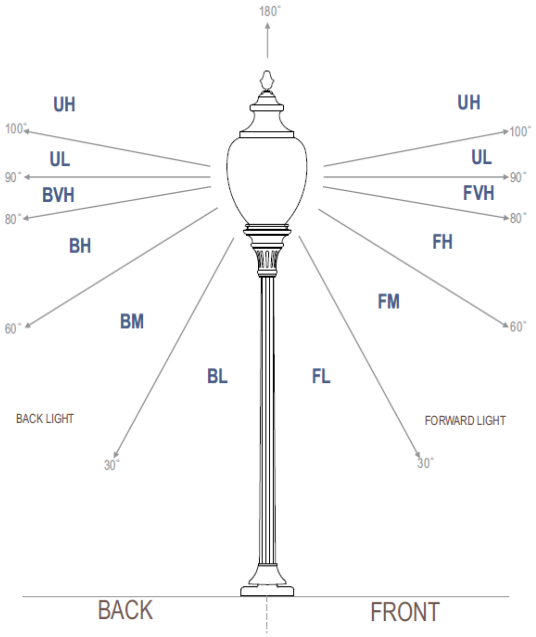


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	5.0	5.3%
FM	(30-60)	21.4	23.0%
FH	(60-80)	19.0	20.5%
FVH	(80-90)	0.9	1.0%
BL	(0-30)	5.0	5.3%
BM	(30-60)	21.4	23.0%
BH	(60-80)	19.0	20.5%
BVH	(80-90)	0.9	1.0%
UL	(90-100)	0.1	0.1%
UH	(100-180)	0.1	0.1%
Total		92.8	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
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Allentown, PA 18106
610-774-1300

ACCREDITED

NVLAP LAB CODE 201042-0

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Avenue West
Carlsbad
CA, 92010
United States

Catalog Number

HPL6-3-27

Order Number
11745044
Test Number
11745044.13

Test Date

2017-05-12

Prepared By

Javier Caban

Javier Caban, Technician

Approved By

Tiffany Hamm

Tiffany Hamm, Project Handler

Luminaire Description: Conical 6" copper shade with clear glass lens, cylindrical copper stem and brass base
Lamp: 64 white LEDs
Mounting: Path/Area
Ballast/Driver: Integrated

Luminaire

Luminaire Characteristics
Luminous Diameter: 6.00 in.

Summary of Results

Roadway Classification:	Type V, Short
Cutoff Classification:	Cutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	25.4	°C
Voltage:	12.01	VAC
Current:	0.4960	A
Power:	3.341	W
Power Factor:	0.561	
Frequency:	60	Hz
Current THD:	77.8	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

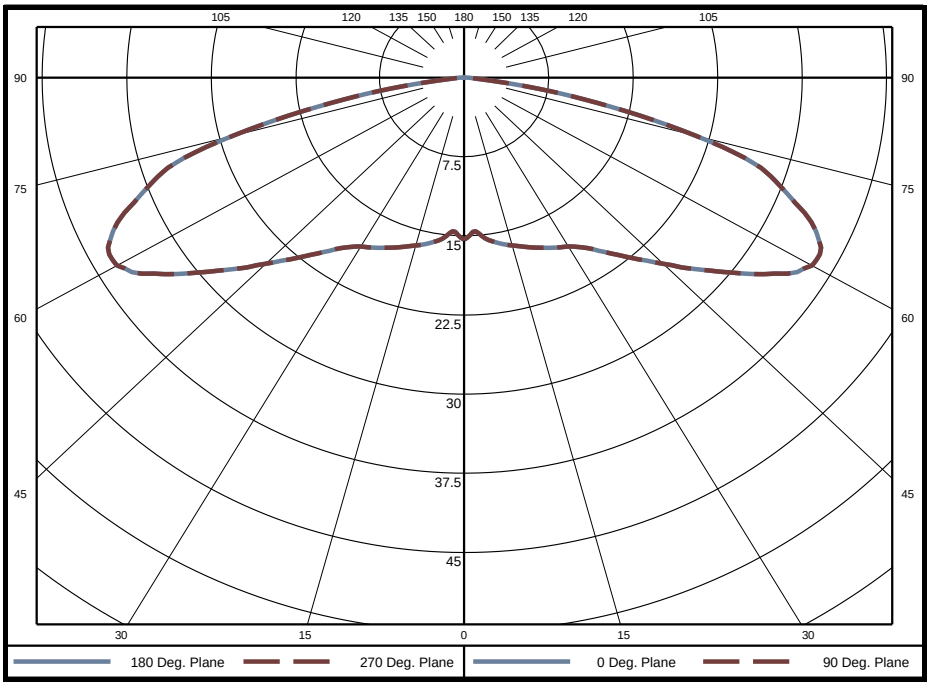
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.4 °C	12.01 VAC	0.4960 A	3.341 W	0.561	60 Hz	77.8 %

Summary of Results

Spacing Criteria
0-180: 2.35
90-270: 2.35

Total Lumen Output: 133.8 Lumens
Luminaire Efficacy: 40.0 lm/w
Maximum Candela: 36 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.35	0.3%	60-65	17.21	12.9%	120-125	0.01	0.0%
5-10	1.11	0.8%	65-70	16.29	12.2%	125-130	0.01	0.0%
10-15	1.92	1.4%	70-75	13.77	10.3%	130-135	0.01	0.0%
15-20	2.77	2.1%	75-80	7.91	5.9%	135-140	0.01	0.0%
20-25	3.67	2.7%	80-85	2.21	1.7%	140-145	0.01	0.0%
25-30	4.60	3.4%	85-90	0.36	0.3%	145-150	0.01	0.0%
30-35	5.63	4.2%	90-95	0.10	0.1%	150-155	0.01	0.0%
35-40	7.00	5.2%	95-100	0.04	0.0%	155-160	0.01	0.0%
40-45	8.71	6.5%	100-105	0.03	0.0%	160-165	0.01	0.0%
45-50	10.81	8.1%	105-110	0.02	0.0%	165-170	0.00	0.0%
50-55	13.26	9.9%	110-115	0.02	0.0%	170-175	0.00	0.0%
55-60	15.86	11.9%	115-120	0.02	0.0%	175-180	0.00	0.0%

Zone	Lumens	% of Luminaire
0-40	27	20.2%
0-60	76	56.6%
0-90	133	99.7%
90-180	0	0.2%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36	15.36
5	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81	14.81
10	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85	15.85
15	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48
20	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13	17.13
25	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82	17.82
30	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50
35	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85	19.85
40	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14	22.14
45	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98	24.98
50	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49	28.49
55	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.51
60	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64	35.64
65	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42	34.42
70	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72
75	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22
80	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79
85	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
90	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
95	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
100	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
105	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
110	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
115	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
120	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
125	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
130	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
135	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
140	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
145	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
150	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
155	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
160	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
165	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
170	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
175	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
180	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	842	842	842
45	1937	1937	1937
55	3107	3107	3107
65	4465	4465	4465
75	4495	4495	4495
85	717	717	717

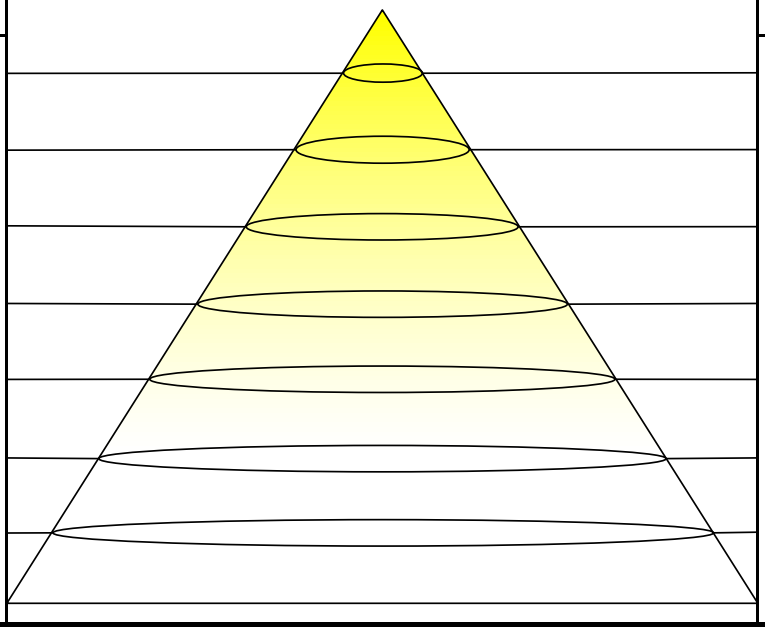
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	159	159	159	159	155	155	155	155	148	148	148	142	142	142	136	136	136	133
1	141	133	125	118	137	129	123	116	123	118	113	118	113	109	113	109	106	102
2	124	109	98	88	120	107	96	86	101	92	84	97	89	82	92	86	80	77
3	109	91	78	67	106	89	76	66	85	74	64	81	71	63	77	69	62	58
4	98	78	63	52	94	76	62	52	72	60	51	69	58	50	65	56	49	46
5	88	67	53	42	85	66	52	42	62	50	41	60	49	40	57	47	40	36
6	80	59	45	34	77	58	44	34	55	43	34	52	42	33	50	40	33	30
7	74	52	39	29	71	51	38	29	49	37	28	47	36	28	45	35	28	25
8	68	47	34	25	65	46	33	25	44	32	24	42	32	24	40	31	24	21
9	63	42	30	21	61	42	30	21	40	29	21	38	28	21	37	28	21	18
10	59	39	27	19	57	38	26	19	37	26	19	35	25	18	34	25	18	16

Beam and Field Information	
CIE Type:	Direct
Center Beam Intenisty:	15.36 Candela
Central Cone Intensity:	15 Candela
Beam Flux:	131.3 Lumens
Beam Angle (0-180):	161.0 Degrees
Beam Angle (90-270):	161.0 Degrees
Field Angle (0-180):	168.2 Degrees
Field Angle (90-270):	168.2 Degrees

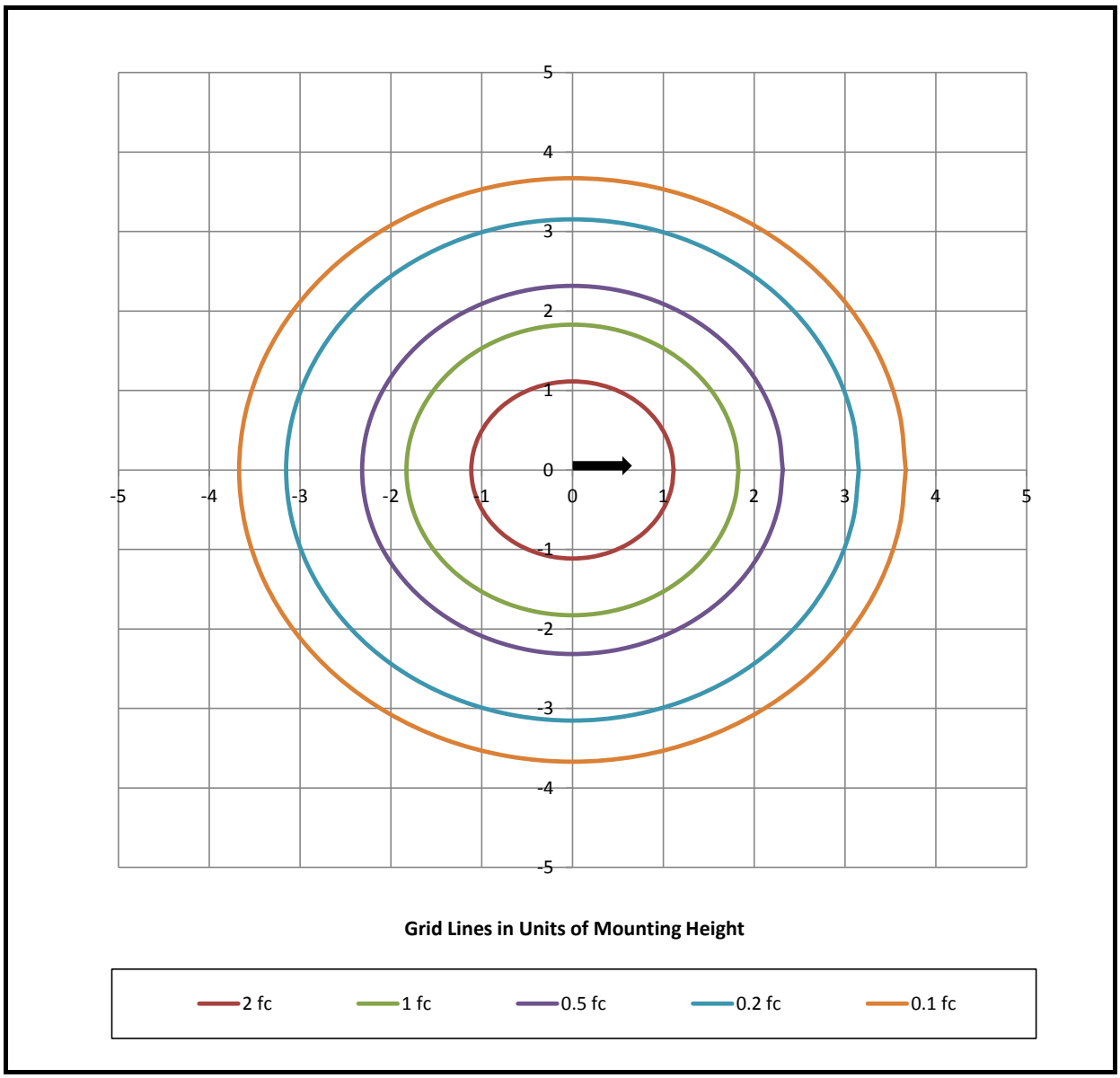
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.960	9.40
6.00	0.427	14.1
8.00	0.240	18.8
10.0	0.154	23.5
12.0	0.107	28.2
14.0	0.0784	32.9
16.0	0.0600	37.6

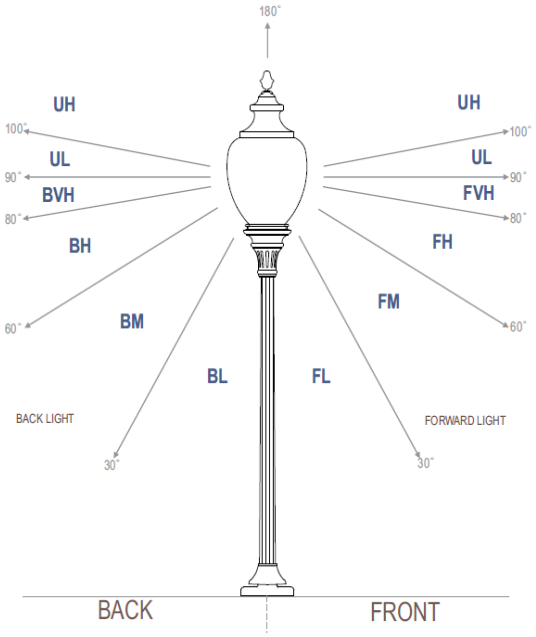


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	7.2	5.4%
FM	(30-60)	30.6	23.0%
FH	(60-80)	27.4	20.5%
FVH	(80-90)	1.3	1.0%
BL	(0-30)	7.2	5.4%
BM	(30-60)	30.6	23.0%
BH	(60-80)	27.4	20.5%
BVH	(80-90)	1.3	1.0%
UL	(90-100)	0.1	0.1%
UH	(100-180)	0.2	0.1%
Total		133.5	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

ACCREDITED

NVLAP LAB CODE 201042-0

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Avenue West
Carlsbad
CA, 92010
United States

Catalog Number

HPL6-3-30

Order Number
11745044
Test Number
11745044.14

Test Date

2017-05-12

Prepared By

Javier Caban

Javier Caban, Technician

Approved By

Tiffany Hamm

Tiffany Hamm, Project Handler

Luminaire Description: Conical 6" copper shade with clear glass lens, cylindrical copper stem and brass base
Lamp: 64 white LEDs
Mounting: Path/Area
Ballast/Driver: Integrated

Luminaire

Luminaire Characteristics
Luminous Diameter: 6.00 in.

Summary of Results

Roadway Classification:	Type V, Short
Cutoff Classification:	Cutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.7	°C
Voltage:	12.01	VAC
Current:	0.4876	A
Power:	3.278	W
Power Factor:	0.560	
Frequency:	60	Hz
Current THD:	79.1	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

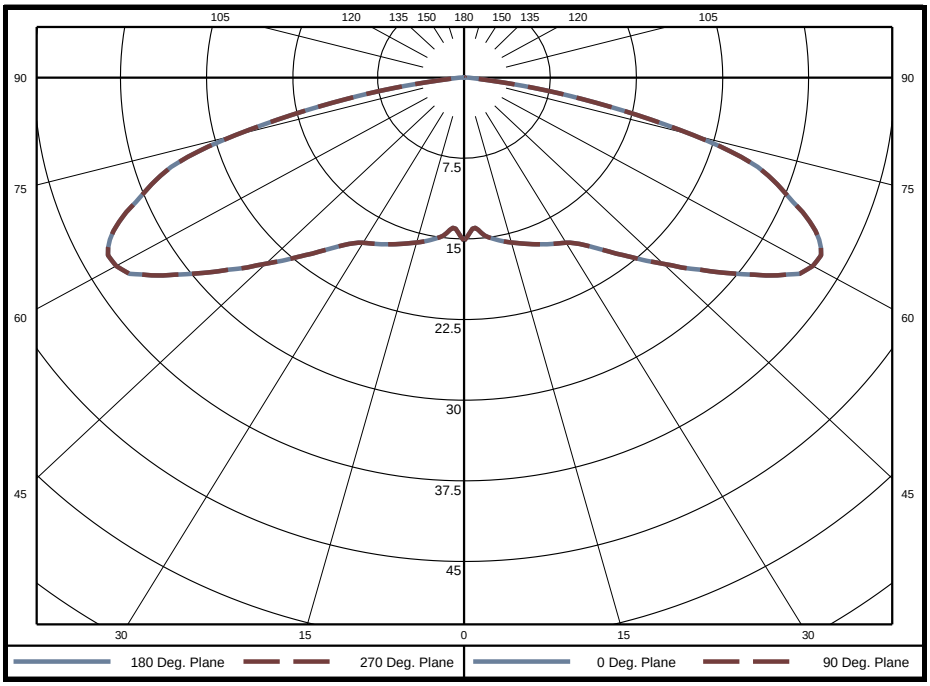
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.7 °C	12.01 VAC	0.4876 A	3.278 W	0.560	60 Hz	79.1 %

Summary of Results

Spacing Criteria
0-180: 2.34
90-270: 2.34

Total Lumen Output: 130.5 Lumens
Luminaire Efficacy: 39.8 lm/w
Maximum Candela: 35 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.34	0.3%	60-65	16.91	13.0%	120-125	0.01	0.0%
5-10	1.07	0.8%	65-70	15.91	12.2%	125-130	0.01	0.0%
10-15	1.85	1.4%	70-75	13.38	10.3%	130-135	0.01	0.0%
15-20	2.67	2.0%	75-80	7.64	5.9%	135-140	0.01	0.0%
20-25	3.52	2.7%	80-85	2.10	1.6%	140-145	0.01	0.0%
25-30	4.41	3.4%	85-90	0.36	0.3%	145-150	0.01	0.0%
30-35	5.41	4.1%	90-95	0.09	0.1%	150-155	0.01	0.0%
35-40	6.79	5.2%	95-100	0.04	0.0%	155-160	0.01	0.0%
40-45	8.52	6.5%	100-105	0.03	0.0%	160-165	0.00	0.0%
45-50	10.60	8.1%	105-110	0.02	0.0%	165-170	0.00	0.0%
50-55	13.05	10.0%	110-115	0.02	0.0%	170-175	0.00	0.0%
55-60	15.65	12.0%	115-120	0.02	0.0%	175-180	0.00	0.0%

Zone	Lumens	% of Luminaire
0-40	26	20.0%
0-60	74	56.6%
0-90	130	99.8%
90-180	0	0.2%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16
5	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21	14.21
10	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25
15	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87	15.87
20	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46	16.46
25	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10
30	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72
35	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17	19.17
40	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55	21.55
45	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48	24.48
50	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02	28.02
55	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07
60	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04
65	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75
70	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01	29.01
75	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65
80	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41	8.41
85	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
90	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
95	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
100	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
105	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
110	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
115	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
120	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
125	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
130	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
135	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
140	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
145	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
150	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
155	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
160	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
165	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
170	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
175	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
180	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	831	831	831
45	1898	1898	1898
55	3066	3066	3066
65	4378	4378	4378
75	4374	4374	4374
85	722	722	722

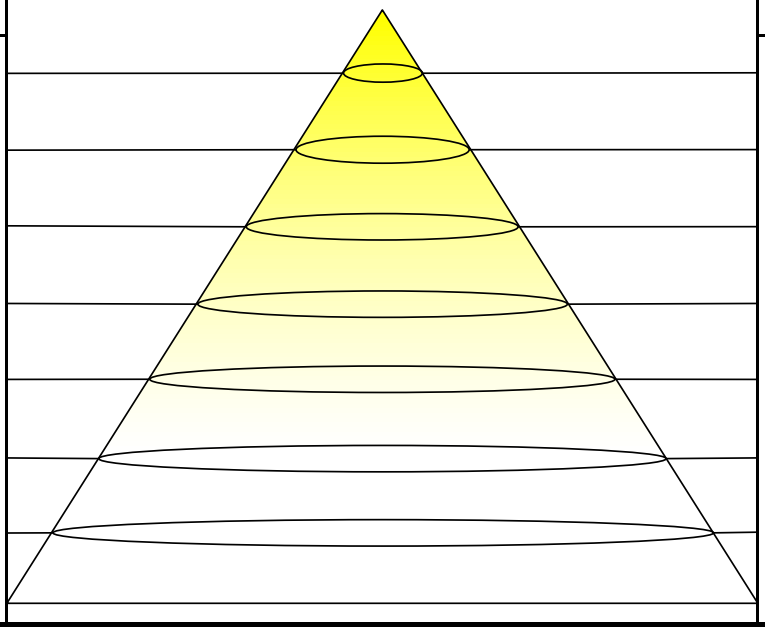
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	155	155	155	155	152	152	152	152	145	145	145	139	139	139	133	133	133	130
1	137	129	122	115	134	126	120	114	120	115	110	115	110	106	110	106	103	100
2	121	107	95	85	117	104	93	84	99	90	82	94	87	80	90	84	78	75
3	107	89	76	65	103	87	74	64	83	72	63	79	69	62	75	67	60	57
4	95	76	62	51	92	74	61	50	70	59	49	67	57	49	64	55	48	44
5	86	66	51	41	83	64	50	40	61	49	40	58	47	39	55	46	39	35
6	78	57	43	33	75	56	43	33	53	42	33	51	40	32	49	39	32	29
7	72	51	38	28	69	50	37	28	48	36	28	45	35	27	43	34	27	24
8	66	46	33	24	64	45	32	24	43	32	24	41	31	23	39	30	23	20
9	61	41	29	21	59	40	29	21	39	28	20	37	27	20	36	27	20	17
10	57	38	26	18	55	37	26	18	36	25	18	34	25	18	33	24	18	15

Beam and Field Information	
CIE Type:	Direct
Center Beam Intenisty:	15.16 Candela
Central Cone Intensity:	14 Candela
Beam Flux:	128.0 Lumens
Beam Angle (0-180):	160.8 Degrees
Beam Angle (90-270):	160.8 Degrees
Field Angle (0-180):	168.1 Degrees
Field Angle (90-270):	168.1 Degrees

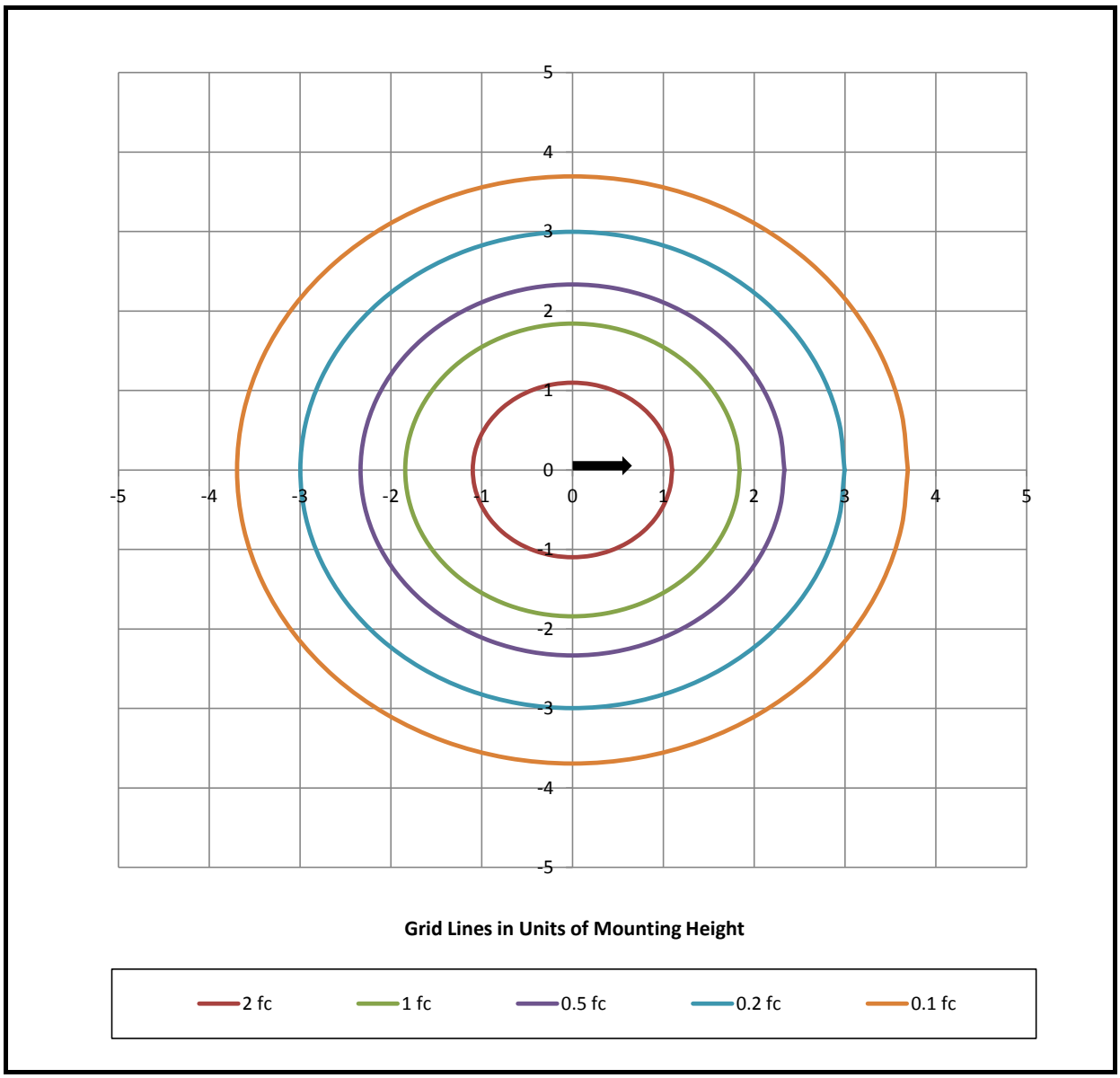
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.948	9.35
6.00	0.421	14.0
8.00	0.237	18.7
10.0	0.152	23.4
12.0	0.105	28.0
14.0	0.0774	32.7
16.0	0.0592	37.4

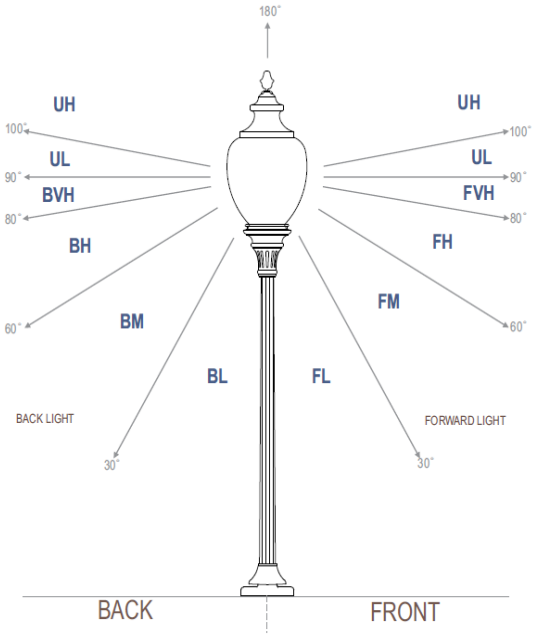


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	6.9	5.3%
FM	(30-60)	29.9	23.0%
FH	(60-80)	26.7	20.5%
FVH	(80-90)	1.3	1.0%
BL	(0-30)	6.9	5.3%
BM	(30-60)	29.9	23.0%
BH	(60-80)	26.7	20.5%
BVH	(80-90)	1.3	1.0%
UL	(90-100)	0.1	0.1%
UH	(100-180)	0.2	0.1%
Total		130.1	100.0%
BUG Rating	**B0 U1 G0**		

LIGHT LABORATORY INC.
8165 E Kaiser Blvd.
Anaheim, CA 92808
p. 714.282.2270f. 714.676.5558

Test #: L06131608
Date: 6/18/2013

NVLAP LAB CODE 200927-0

Test Report: **L06131608**

Model Number: **LPL1 2.5 WATTS**

Report Prepared For: AURORA LIGHT INC
2742 LOKER AVE WEST CARLSBAD, CA 92010

Test: Electrical and Photometric tests as required by the IESNA test standards.

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products

Description of Sample: Client submitted the sample. Fixture catalog number is LPL1 2.5 WATTS . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no modifications.

Sample Arrival Date: 5/24/13

Date of Tests: 6/18/13 - 6/18/13

Seasoning of Sample SSL: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	01/04/14
Xitron Power Analysis System	2503AH	MT-EL01	01/09/14
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/14
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Test #: L06131608
Date: 6/18/2013

NVLAP LAB CODE 200927-0

LM-79 Test Summary	
Manufacturer:	AURORA LIGHT INC
Model Number:	LPL1 2.5 WATTS
LAMPCAT:	N/A
Driver Model Number:	N/A
Total Lumens:	181.10
Input Voltage (VAC/60Hz):	15.00
Input Current (Amp):	0.39
Input Power (W):	3.19
Input Power Factor:	0.5412
Total Harmonic Distortion @ 120V(%)	147.7%
Total Harmonic Distortion @ 277V(%)	N/A
Efficacy:	56.78
Color Rendering Index (CRI):	81.70
Correlated Color Temperature (K):	2988
Chromaticity Coordinate x:	0.4379
Chromaticity Coordinate y:	0.4045
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:50
Total Operating Time (Hours):	1:30
Off State Power(W):	0.00

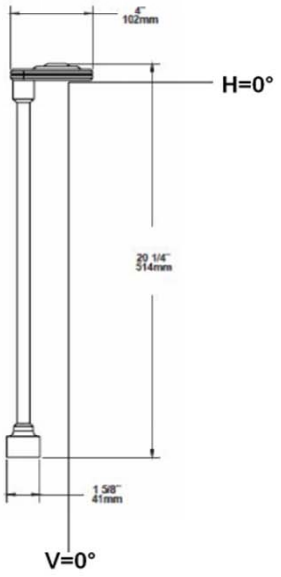

FIG1. LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Test #: L06131608
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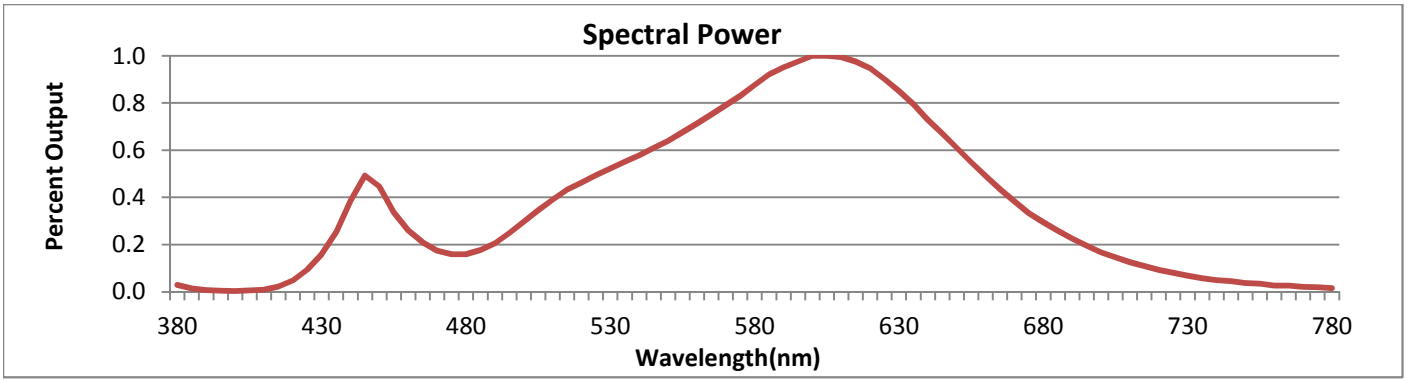
NVLAP LAB CODE 200927-0



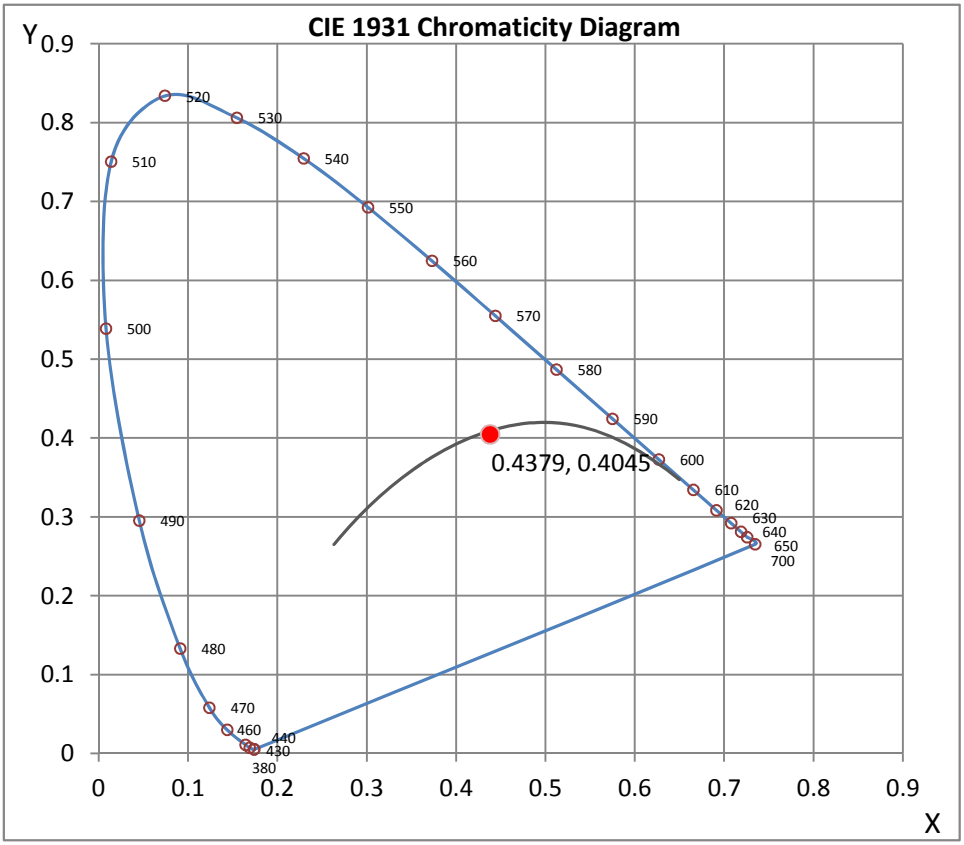
Wavelength	W/m²nm	440	0.0066	510	0.0067	580	0.0151	650	0.0105	720	0.0016
380	0.0005	450	0.0077	520	0.0080	590	0.0164	660	0.0084	730	0.0012
390	0.0001	460	0.0045	530	0.0090	600	0.0172	670	0.0066	740	0.0008
400	0.0001	470	0.0030	540	0.0099	610	0.0171	680	0.0051	750	0.0007
410	0.0002	480	0.0028	550	0.0110	620	0.0163	690	0.0039	760	0.0005
420	0.0008	490	0.0035	560	0.0123	630	0.0146	700	0.0029	770	0.0004
430	0.0027	500	0.0051	570	0.0136	640	0.0126	710	0.0022	780	0.0003

CRI & CCT

x	0.4379
y	0.4045
u'	0.2510
v'	0.5217
CRI	81.70
CCT	2988
Duv	0.00004

R Values

R1	79.94
R2	88.45
R3	95.73
R4	80.66
R5	79.51
R6	85.09
R7	83.97
R8	60.34
R9	8.12
R10	73.22
R11	79.32
R12	69.11
R13	82.16
R14	97.31



*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Test #: L06131608
Date: 6/18/2013

NVLAP LAB CODE 200927-0

Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Report Prepared by : Keyur Patel

Test Report Released by:

Jeff Ahn
Engineering Manager

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 12*

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

LIGHT LABORATORY INC.
8165 E. Kaiser Blvd. Anaheim, CA 92808
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Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L06131608.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L06131608
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 6/18/2013
[MANUFAC] AURORA LIGHT
[LUMCAT] LPL1 2.5 WATTS
[LUMINAIRE] 4"DIA. X 20-1/4"H. LED FIXTURE
[MORE] CLEAR LENS
[LAMPPOSITION] 0,0
[LAMPCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[_INPUT] 15VAC, 3.19W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type II
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	181
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	57
Total Luminaire Watts	3.19
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	87.5
Maximum Candela Angle	5H 5V
Maximum Candela (<90 Degrees Vertical)	87.5
Maximum Candela Angle (<90 Degrees Vertical)	5H 5V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	2.9 (1.6% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L06131608.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	30.9	N.A.	17.0
FM - Front-Medium (30-60)	56.7	N.A.	31.3
FH - Front-High (60-80)	10.6	N.A.	5.9
FVH - Front-Very High (80-90)	0.8	N.A.	0.4
BL - Back-Low (0-30)	26.6	N.A.	14.7
BM - Back-Medium (30-60)	47.8	N.A.	26.4
BH - Back-High (60-80)	7.4	N.A.	4.1
BVH - Back-Very High (80-90)	0.3	N.A.	0.2
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	181.1	N.A.	100.0
BUG Rating	B0-U0-G0		

IES ROAD REPORT
PHOTOMETRIC FILENAME : L06131608.IES

CANDELA TABULATION

Vert. Angles	Horizontal Angles									
	0	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
0	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95
5	87.48	87.50	87.46	87.38	87.11	86.92	86.58	86.25	85.89	85.45
10	81.27	81.27	81.19	81.12	81.10	81.02	80.92	80.71	80.39	80.11
15	77.01	77.01	76.91	76.99	76.93	76.98	76.87	76.58	76.46	76.16
20	73.70	73.79	73.60	73.67	73.74	73.63	73.46	73.14	73.04	73.04
25	70.05	70.09	70.05	70.09	70.12	70.02	69.80	69.69	69.54	69.35
30	65.62	65.62	65.69	65.82	65.84	65.64	65.64	65.47	65.16	65.09
35	61.39	61.36	61.39	61.53	61.46	61.36	61.20	61.17	61.12	61.15
40	57.23	56.94	57.08	57.08	56.87	56.82	56.82	56.80	56.80	56.89
45	51.94	51.86	52.13	51.98	51.76	51.67	51.60	51.58	51.67	51.81
50	46.08	46.21	46.54	46.64	46.57	46.38	46.23	46.13	46.04	45.92
55	39.97	40.07	40.18	40.31	40.21	40.07	39.97	39.77	39.60	39.58
60	32.67	32.98	33.39	33.51	33.41	33.29	33.07	33.10	33.13	33.05
65	25.24	25.48	26.07	26.43	26.33	26.23	26.11	26.04	26.01	25.12
70	4.40	4.49	4.74	4.91	4.86	4.74	4.66	4.55	4.23	3.89
75	3.17	3.24	3.45	3.56	3.51	3.41	3.31	3.14	3.02	2.92
80	2.66	2.71	2.83	2.90	2.85	2.75	2.59	2.37	2.27	2.17
85	2.25	2.25	2.23	2.23	2.17	2.06	2.00	1.89	1.83	1.74
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles	Horizontal Angles									
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**
0	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95
5	84.99	84.46	84.04	83.61	83.25	82.81	82.30	81.77	81.36	81.07
10	79.89	79.60	79.50	79.50	79.38	79.31	79.19	78.95	78.75	78.72
15	75.99	76.07	76.06	76.11	76.12	76.23	76.35	76.31	76.24	76.29
20	73.05	73.17	73.22	73.16	73.19	73.21	73.29	73.36	73.38	73.43
25	69.20	69.29	69.39	69.58	69.78	69.92	69.97	70.02	70.09	70.14
30	65.06	65.29	65.45	65.69	65.76	65.84	65.99	66.10	66.15	66.47
35	61.24	61.31	61.53	61.85	62.16	62.31	62.38	62.40	62.40	62.50
40	56.87	56.96	57.25	57.33	57.59	57.89	58.06	58.15	58.18	58.29
45	51.60	51.62	51.53	51.86	52.03	52.10	52.37	52.71	52.85	52.98
50	46.06	45.92	45.97	45.92	46.01	46.23	46.49	46.74	46.84	47.08
55	39.56	39.56	39.46	39.53	39.44	39.63	39.80	39.99	40.11	40.33
60	32.83	32.61	30.92	32.40	26.24	20.24	19.01	18.78	18.64	18.62
65	16.80	14.38	14.21	14.46	15.48	12.62	11.85	9.16	8.80	9.70
70	3.74	3.62	3.38	3.26	3.19	3.05	2.93	2.83	2.75	2.66
75	2.76	2.61	2.49	2.35	2.37	2.17	2.06	2.01	1.91	1.84
80	2.05	2.00	1.93	1.89	1.83	1.74	1.65	1.60	1.54	1.45
85	1.65	1.62	1.57	1.47	1.42	1.36	1.30	1.23	1.14	1.06
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles	Horizontal Angles									
	100	**105**	**110**	**115**	**120**	**125**	**130**	**135**	**140**	**145**
0	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95	85.95
5	80.85	80.61	80.40	80.23	80.03	79.84	79.59	79.35	78.90	78.36
10	78.53	78.36	78.34	78.29	78.26	78.22	78.15	78.10	77.95	77.76
15	76.29	76.17	76.11	76.06	76.00	75.94	75.88	75.77	75.88	75.87
20	73.55	73.55	73.65	73.60	73.69	73.67	73.67	73.70	73.67	73.55
25	70.33	70.43	70.50	70.58	70.62	70.55	70.50	70.55	70.55	70.48
30	66.64	66.71	66.73	66.78	66.71	66.69	66.61	66.61	66.57	66.59

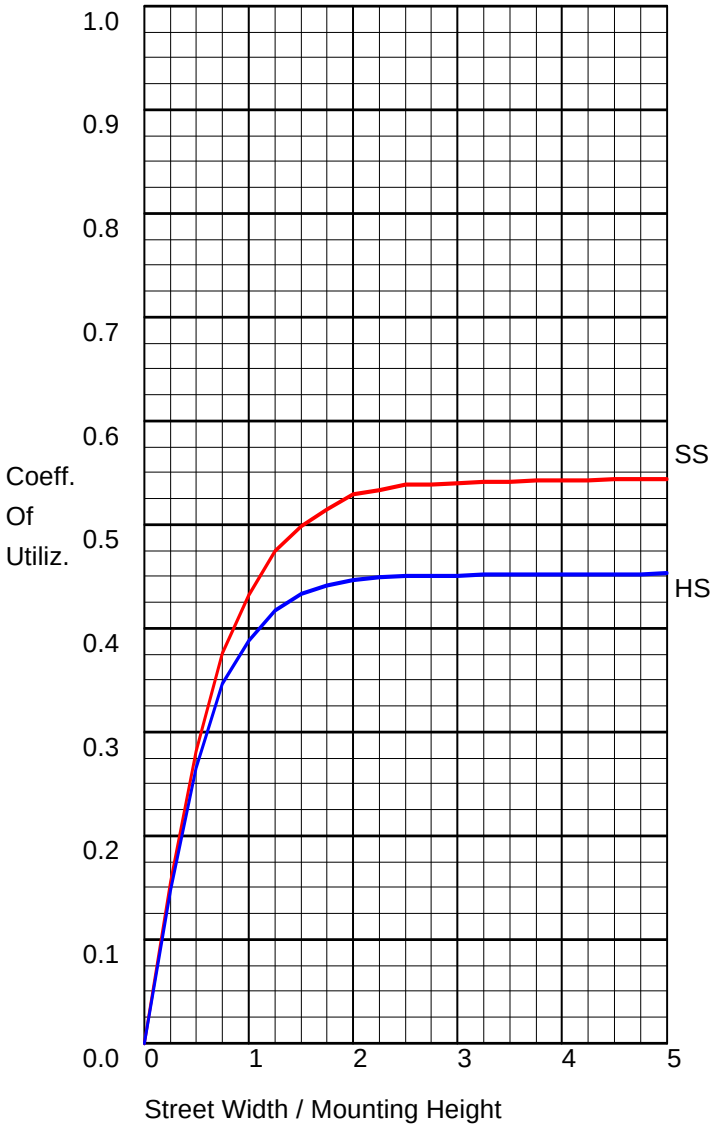
CANDELA TABULATION - (Cont.)

35	62.52	62.53	62.69	62.84	62.91	62.79	62.79	62.72	62.82	62.82
40	58.35	58.42	58.47	58.56	58.70	58.87	58.97	58.93	59.04	59.00
45	53.05	53.21	53.38	53.61	53.90	54.14	54.13	54.07	53.89	53.73
50	47.17	47.34	47.66	47.95	48.12	48.28	48.34	48.28	48.26	48.04
55	40.53	40.62	40.82	41.06	41.23	41.28	41.35	41.35	41.30	41.08
60	18.76	19.65	23.52	29.45	33.95	34.12	34.14	34.12	33.99	33.65
65	11.82	13.39	13.30	13.15	13.01	13.18	17.99	24.69	24.30	23.87
70	2.59	2.56	2.49	2.46	2.46	2.41	2.42	2.46	2.58	2.51
75	1.79	1.74	1.71	1.69	1.64	1.64	1.71	1.76	1.74	1.74
80	1.38	1.30	1.21	1.18	1.13	1.06	1.02	1.02	1.08	1.13
85	0.99	0.89	0.80	0.72	0.65	0.60	0.56	0.53	0.53	0.56
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles	**Horizontal Angles**						
	150	**155**	**160**	**165**	**170**	**175**	**180**
0	85.95	85.95	85.95	85.95	85.95	85.95	85.95
5	74.52	48.35	34.31	4.23	2.93	1.94	1.54
10	77.35	76.89	76.36	64.42	25.53	2.00	1.67
15	75.63	75.24	74.73	70.58	20.52	1.74	1.54
20	73.45	73.17	72.82	69.30	16.01	1.64	1.43
25	70.46	70.34	70.07	68.52	14.34	1.52	1.30
30	66.71	66.57	66.28	42.33	2.37	1.35	1.19
35	62.86	62.72	62.19	59.60	3.60	1.21	1.09
40	58.82	58.59	57.83	43.95	2.37	1.07	0.99
45	53.55	53.19	39.89	2.95	1.33	0.99	0.89
50	47.92	47.54	37.99	2.30	1.21	0.89	0.85
55	40.98	40.69	35.35	1.76	1.02	0.78	0.75
60	33.56	33.30	29.14	1.31	0.84	0.67	0.61
65	23.58	23.23	18.96	0.94	0.70	0.61	0.58
70	2.42	2.32	1.98	0.78	0.65	0.55	0.55
75	1.74	1.67	1.48	0.72	0.60	0.53	0.51
80	1.19	1.25	1.11	0.61	0.55	0.50	0.48
85	0.63	0.75	0.72	0.51	0.48	0.48	0.48
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IES ROAD REPORT
PHOTOMETRIC FILENAME : L06131608.IES

COEFFICIENTS OF UTILIZATION

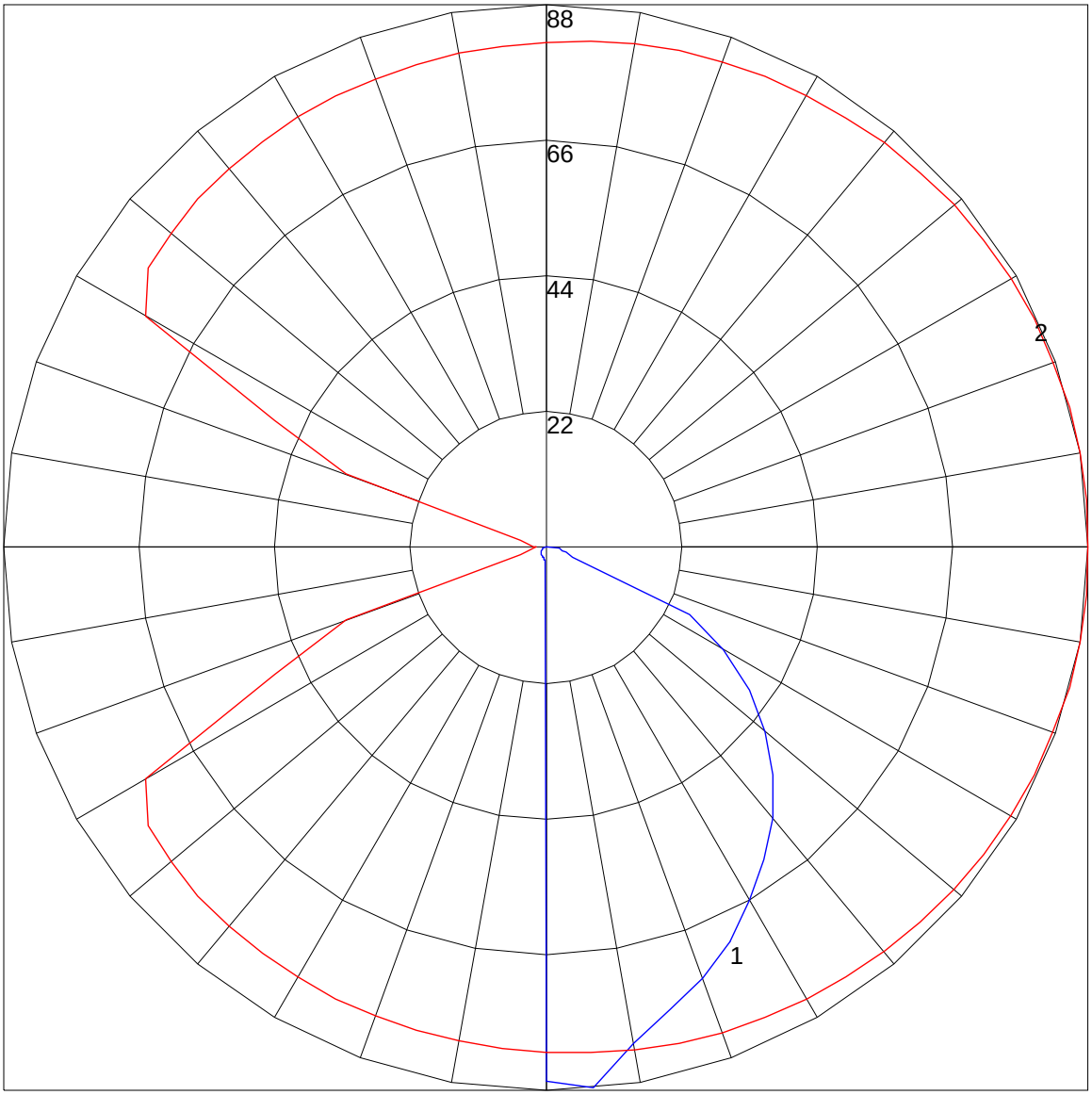


FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	99.0	54.7
Downward House Side	82.1	45.3
Downward Total	181.1	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	181.1	100.0

IES ROAD REPORT
PHOTOMETRIC FILENAME : L06131608.IES

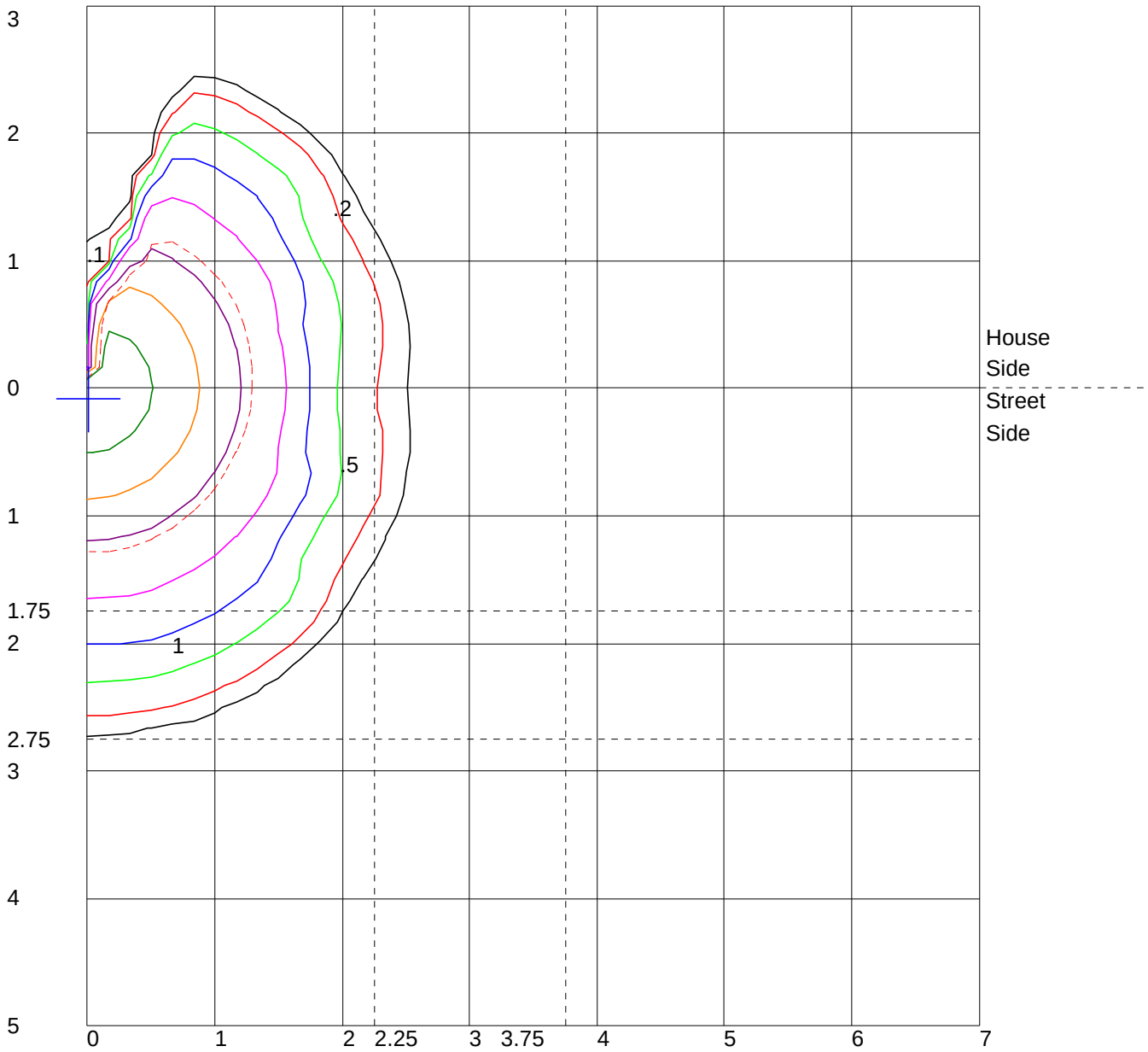
POLAR GRAPH



Maximum Candela = 87.5 Located At Horizontal Angle = 5, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (5 - 185) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L06131608.IES

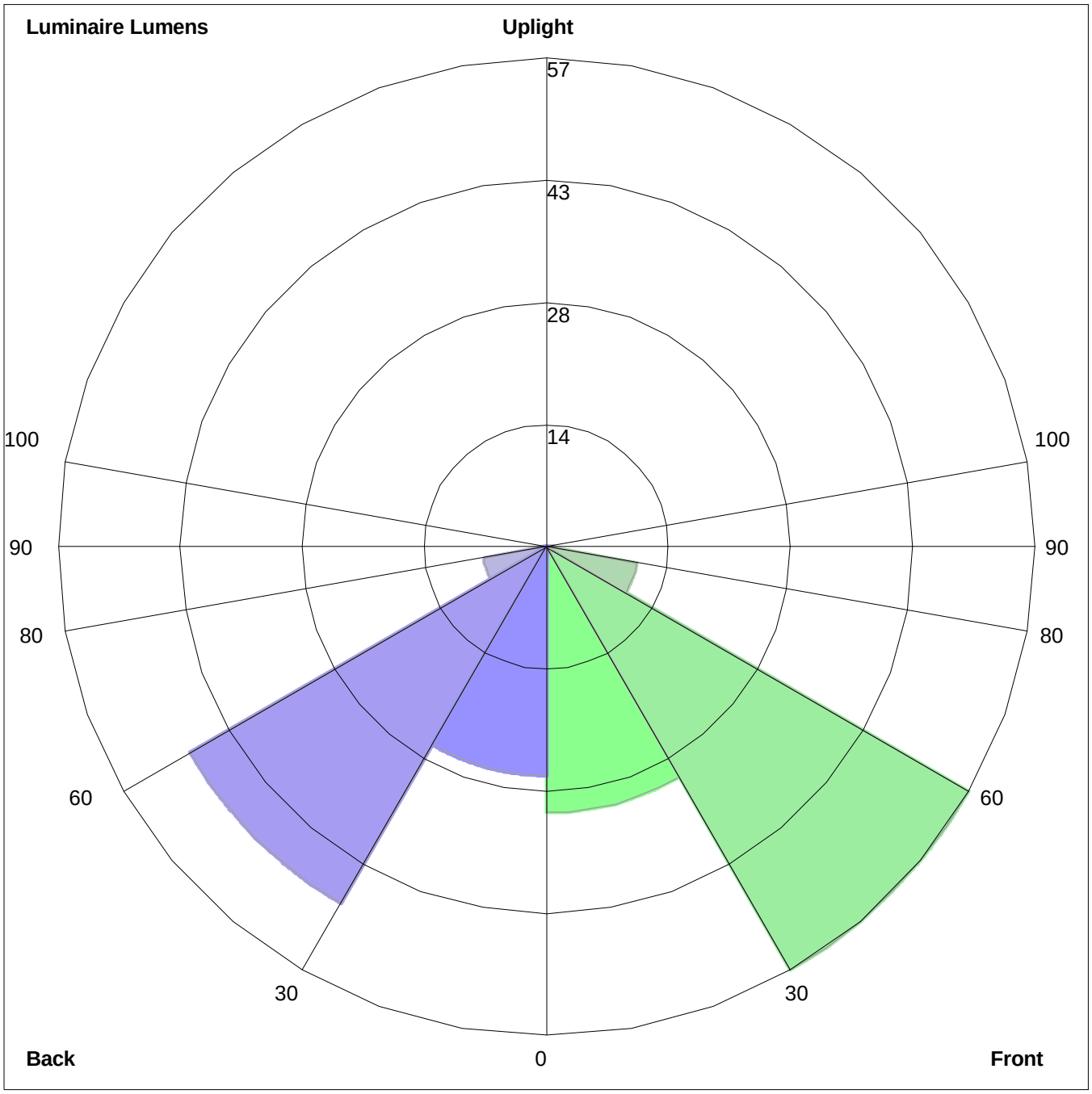
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 1.56 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

IES ROAD REPORT
PHOTOMETRIC FILENAME : L06131608.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=30.9, Medium=56.7, High=10.6, Very High=0.8
Back: Low=26.6, Medium=47.8, High=7.4, Very High=0.3
Uplight: Low=0.0, High=0.0

BUG Rating : B0-U0-G0

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc
2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-M-27 (25° OPTIC, 2700K)

Order Number
12250114
Test Number
12250114.101

Report Date

2018-05-09

Prepared By

Sean Gregory, Project Handler

Approved By

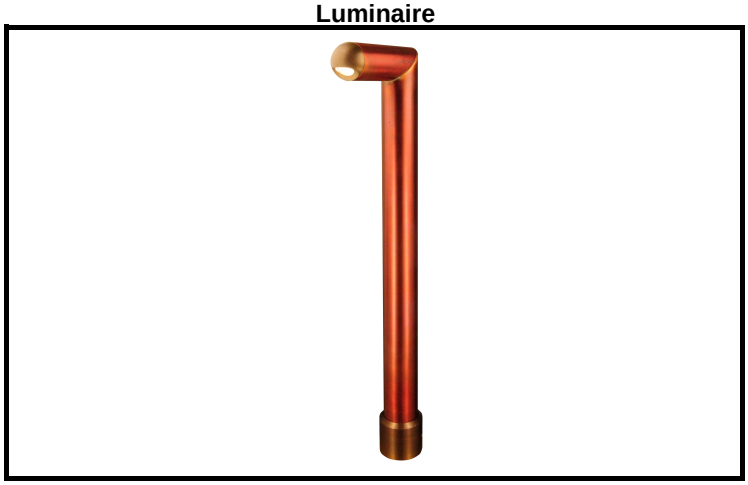
Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 2700K LED with 25° medium optic
Mounting: Step/Wall
Ballast/Driver: Integrated

Note:

This report has been pro-rated using data from report numbers 12250114.100, 12250114.01, 12250114.02, 12250114.03, 12250114.04, 12250114.05, and 12250114.06 to account for differences in color temperature.

Luminaire



Luminaire Characteristics

Luminous Length:	0.50	in.
Luminous Width:	0.5000	in.
Luminous Height:	1.00	in.

Summary of Results

Roadway Classification:	Type II, Very Short
Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.1	°C
Voltage:	12.01	VAC
Current:	0.1680	A
Power:	1.236	W
Power Factor:	0.612	
Frequency:	60	Hz
Current THD:	81.2	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

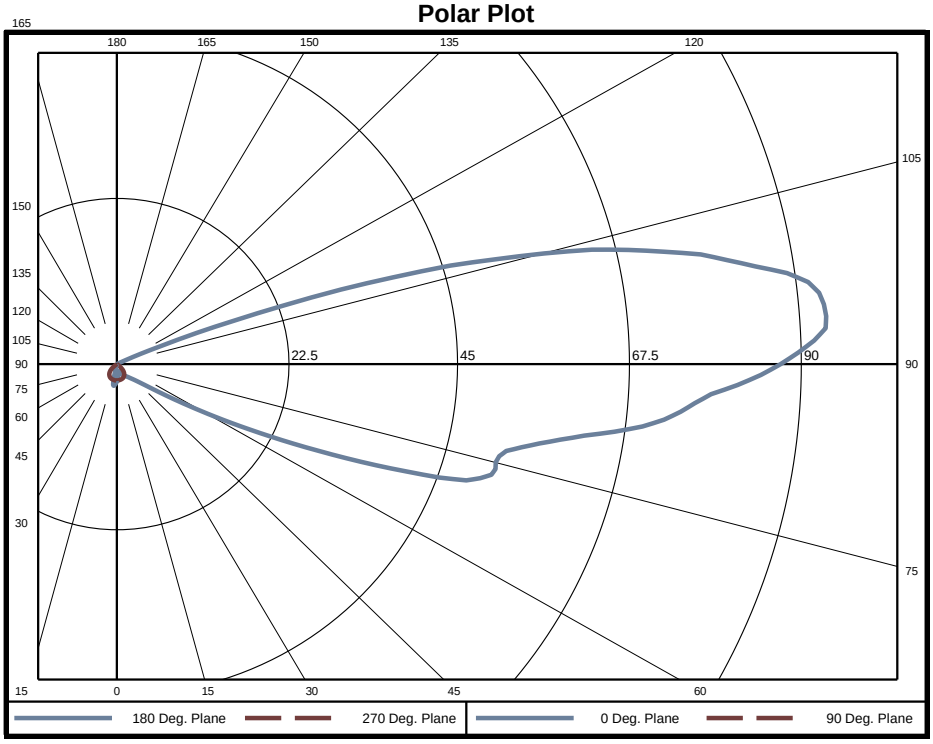
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.1 °C	12.01 VAC	0.1680 A	1.236 W	0.612	60 Hz	81.2 %

Summary of Results

Spacing Criteria
0-180: 0.29
90-270: 1.20

Total Lumen Output: 25.71 Lumens
Luminaire Efficacy: 20.8 lm/w
Maximum Candela: 93 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.054	0.2%	60-65	1.010	3.9%	120-125	0	0.0%
5-10	0.153	0.6%	65-70	1.705	6.6%	125-130	0	0.0%
10-15	0.209	0.8%	70-75	2.131	8.3%	130-135	0	0.0%
15-20	0.208	0.8%	75-80	2.051	8.0%	135-140	0	0.0%
20-25	0.221	0.9%	80-85	2.440	9.5%	140-145	0	0.0%
25-30	0.252	1.0%	85-90	2.866	11.1%	145-150	0	0.0%
30-35	0.264	1.0%	90-95	3.237	12.6%	150-155	0	0.0%
35-40	0.261	1.0%	95-100	3.103	12.1%	155-160	0	0.0%
40-45	0.264	1.0%	100-105	2.400	9.3%	160-165	0	0.0%
45-50	0.289	1.1%	105-110	1.357	5.3%	165-170	0	0.0%
50-55	0.357	1.4%	110-115	0.315	1.2%	170-175	0	0.0%
55-60	0.562	2.2%	115-120	0.004	0.0%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	2	6.3%
0-60	3	12.0%
0-90	15	59.5%
90-180	10	40.5%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26
5	1.74	1.67	1.84	2.03	2.24	2.47	2.63	2.74	2.81	2.74	2.63	2.47	2.24	2.03	1.84	1.67
10	1.00	0.96	1.23	1.75	2.20	2.62	2.84	2.90	2.74	2.90	2.84	2.62	2.20	1.75	1.23	0.96
15	1.04	0.91	0.83	1.40	2.15	2.73	2.50	0.71	0.00	0.71	2.50	2.73	2.15	1.40	0.83	0.91
20	1.31	1.08	0.79	1.05	2.09	2.75	0.47	0.00	0.00	0.00	0.47	2.75	2.09	1.05	0.79	1.08
25	1.58	1.27	0.88	0.78	1.99	2.56	0.00	0.00	0.00	0.00	0.00	2.56	1.99	0.78	0.88	1.27
30	1.75	1.40	0.98	0.62	1.84	1.92	0.00	0.00	0.00	0.00	0.00	1.92	1.84	0.62	0.98	1.40
35	1.99	1.55	1.05	0.49	1.63	1.01	0.00	0.00	0.00	0.00	0.00	1.01	1.63	0.49	1.05	1.55
40	2.30	1.73	1.05	0.36	1.33	0.26	0.00	0.00	0.00	0.00	0.00	0.26	1.33	0.36	1.05	1.73
45	2.84	2.05	1.02	0.20	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.20	1.02	2.05
50	3.84	2.63	0.93	0.05	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.05	0.93	2.63
55	6.30	3.68	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	3.68
60	12.71	5.49	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	5.49
65	25.59	8.35	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	8.35
70	45.08	9.44	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	9.44
75	51.50	5.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.15
80	59.12	2.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64
85	74.30	1.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96
90	87.15	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61
95	93.18	1.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39
100	81.36	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81
105	58.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
110	23.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	#VALUE!	#VALUE!	#VALUE!
45	#VALUE!	#VALUE!	#VALUE!
55	#VALUE!	#VALUE!	#VALUE!
65	#VALUE!	#VALUE!	#VALUE!
75	#VALUE!	#VALUE!	#VALUE!
85	#VALUE!	#VALUE!	#VALUE!

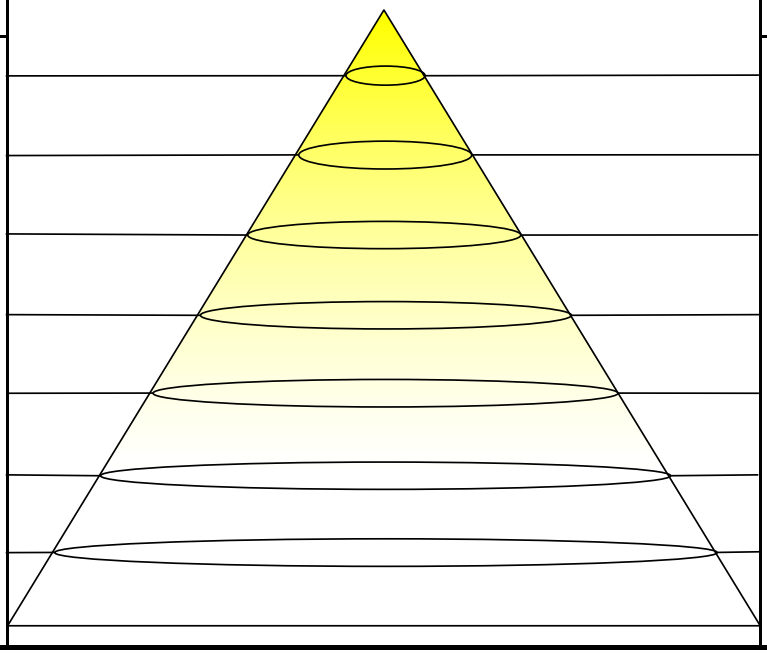
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	28	28	28	28	26	26	26	26	23	23	23	20	20	20	17	17	17	15
1	23	21	19	17	21	19	17	16	16	15	13	13	12	11	11	10	9	8
2	20	17	15	12	18	16	13	11	13	11	9	11	9	8	8	7	6	5
3	18	14	12	9	16	13	11	9	11	9	7	9	7	6	7	5	4	3
4	16	13	10	8	15	11	9	7	9	7	6	8	6	5	6	5	3	2
5	15	11	8	6	14	10	8	6	8	6	5	7	5	4	5	4	3	2
6	14	10	7	5	13	9	7	5	7	6	4	6	4	3	5	3	2	2
7	13	9	6	5	12	8	6	4	7	5	4	6	4	3	4	3	2	1
8	12	8	6	4	11	7	5	4	6	4	3	5	4	2	4	3	2	1
9	11	7	5	4	10	7	5	3	6	4	3	5	3	2	4	3	2	1
10	10	7	5	3	9	6	4	3	5	4	2	4	3	2	3	2	2	1

Beam and Field Information	
CIE Type:	Direct/Indirect
Center Beam Intenisty:	2.26 Candela
Central Cone Intensity:	2 Candela
Beam Flux:	25.0 Lumens
Beam Angle (0-180):	127.7 Degrees
Beam Angle (90-270):	85.8 Degrees
Field Angle (0-180):	129.9 Degrees
Field Angle (90-270):	103.1 Degrees

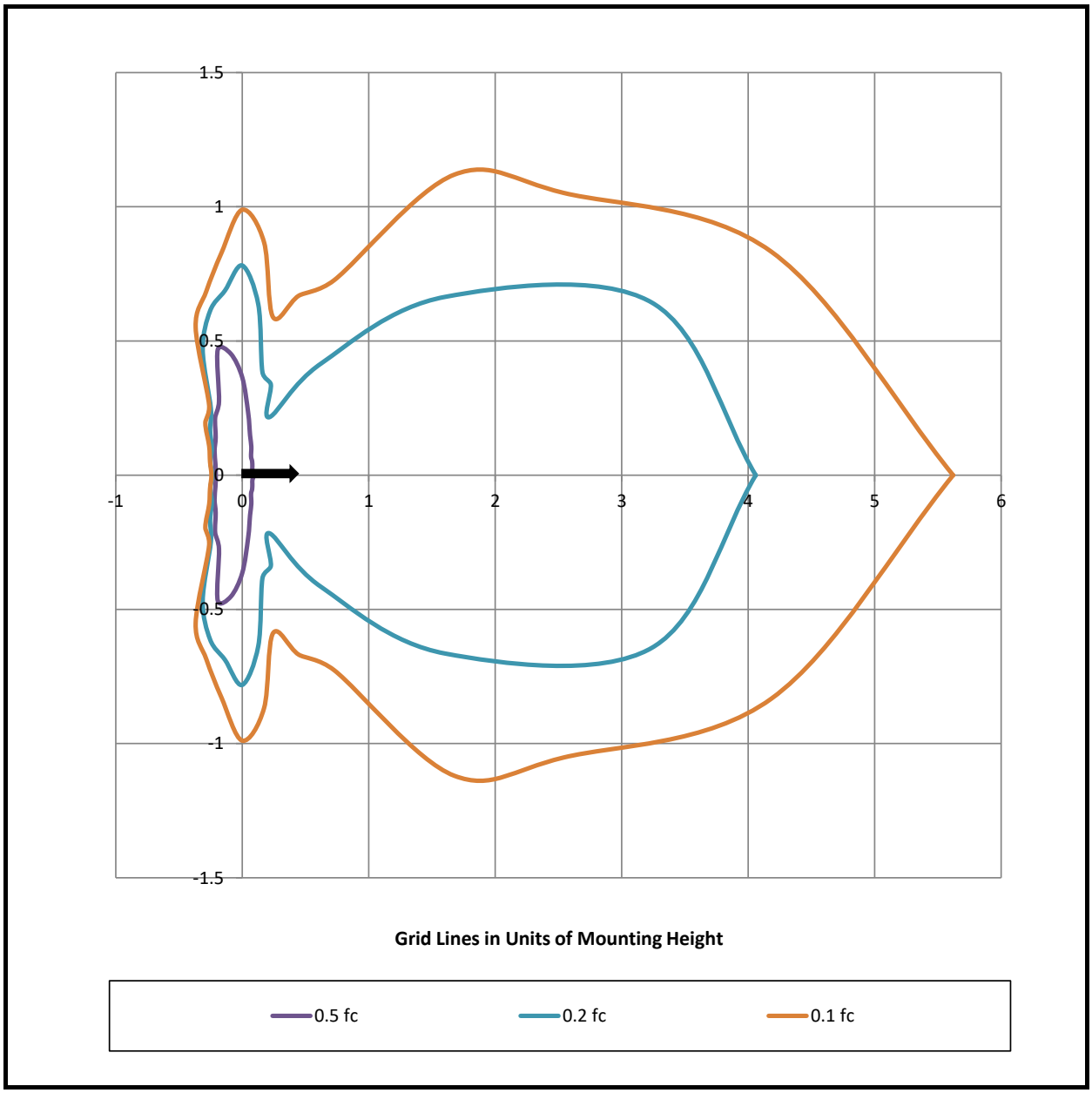
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.141	2.44
6.00	0.0628	3.66
8.00	0.0353	4.88
10.0	0.0226	6.10
12.0	0.0157	7.32
14.0	0.0115	8.54
16.0	0.00883	9.76

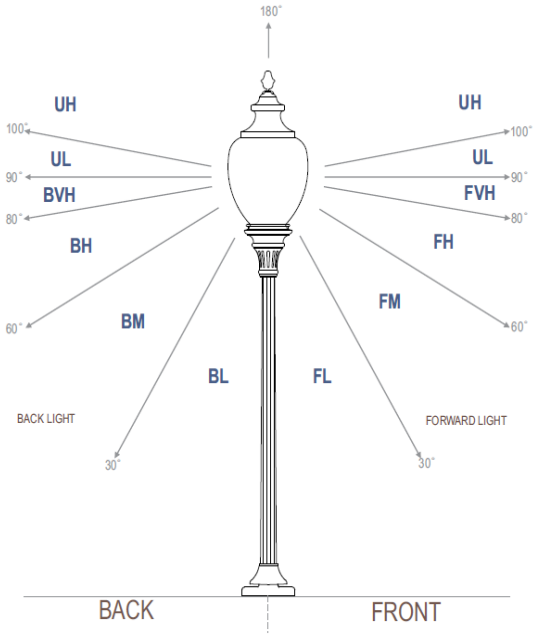


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	0.5	2.3%
FM	(30-60)	1.8	8.0%
FH	(60-80)	6.6	29.3%
FVH	(80-90)	4.5	19.7%
BL	(0-30)	0.6	2.6%
BM	(30-60)	0.3	1.3%
BH	(60-80)	0.0	0.0%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	5.2	23.2%
UH	(100-180)	3.1	13.8%
Total		22.7	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

ACCREDITED
Testing Laboratory

NVLAP LAB CODE 201042-0

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-M-30 (25° OPTIC, 3000K)

Order Number
12250114
Test Number
12250114.100

Test Date

2018-05-04

Prepared By

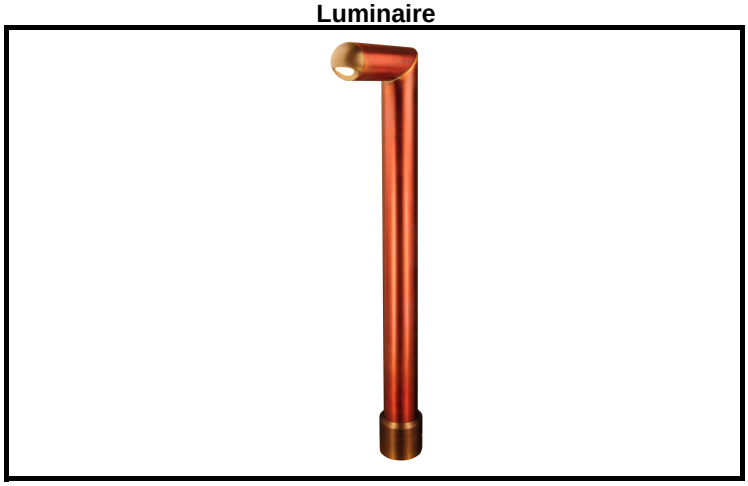
Cordaryl Cousar, Technician

Approved By

Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 3000K LED with 25° medium optic
Mounting: Step/Wall
Ballast/Driver: Integrated

Luminaire



Luminaire Characteristics

Luminous Length:	0.50	in.
Luminous Width:	0.5000	in.
Luminous Height:	1.00	in.

Summary of Results

Roadway Classification:	Type II, Very Short
Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.1	°C
Voltage:	12.01	VAC
Current:	0.1680	A
Power:	1.236	W
Power Factor:	0.612	
Frequency:	60	Hz
Current THD:	81.2	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

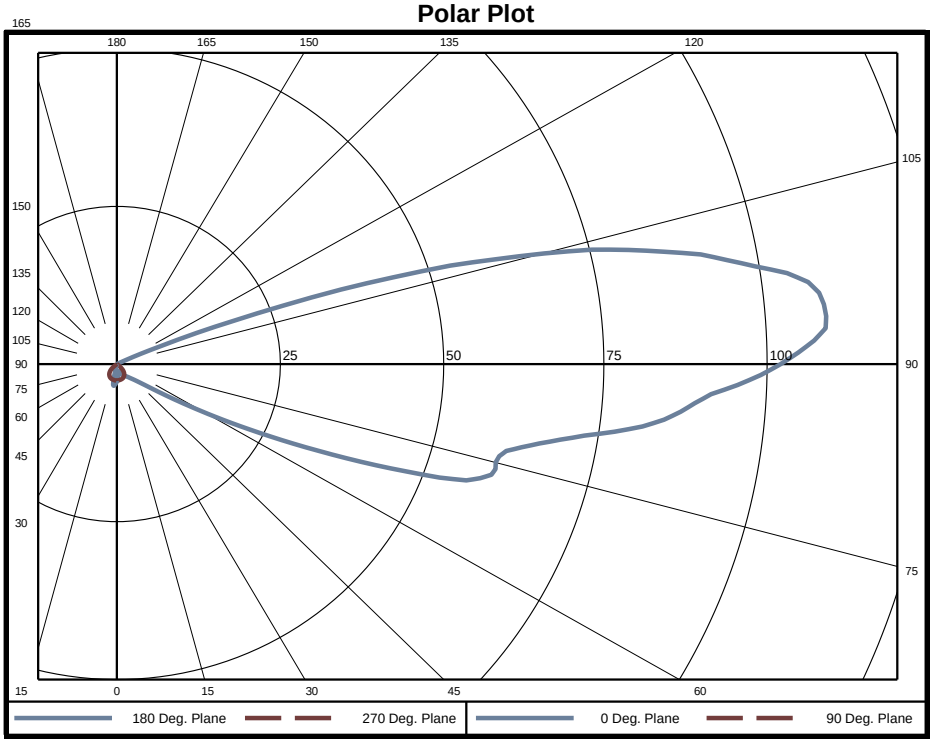
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.1 °C	12.01 VAC	0.1680 A	1.236 W	0.612	60 Hz	81.2 %

Summary of Results

Spacing Criteria
0-180: 0.29
90-270: 1.20

Total Lumen Output: 30.01 Lumens
Luminaire Efficacy: 24.3 lm/w
Maximum Candela: 109 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.063	0.2%	60-65	1.178	3.9%	120-125	0	0.0%
5-10	0.179	0.6%	65-70	1.990	6.6%	125-130	0	0.0%
10-15	0.244	0.8%	70-75	2.487	8.3%	130-135	0	0.0%
15-20	0.242	0.8%	75-80	2.394	8.0%	135-140	0	0.0%
20-25	0.258	0.9%	80-85	2.848	9.5%	140-145	0	0.0%
25-30	0.295	1.0%	85-90	3.345	11.1%	145-150	0	0.0%
30-35	0.308	1.0%	90-95	3.777	12.6%	150-155	0	0.0%
35-40	0.304	1.0%	95-100	3.621	12.1%	155-160	0	0.0%
40-45	0.308	1.0%	100-105	2.800	9.3%	160-165	0	0.0%
45-50	0.337	1.1%	105-110	1.583	5.3%	165-170	0	0.0%
50-55	0.416	1.4%	110-115	0.368	1.2%	170-175	0	0.0%
55-60	0.656	2.2%	115-120	0.004	0.0%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	2	6.3%
0-60	4	12.0%
0-90	18	59.5%
90-180	12	40.5%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
5	2.0	1.9	2.1	2.4	2.6	2.9	3.1	3.2	3.3	3.2	3.1	2.9	2.6	2.4	2.1	1.9
10	1.2	1.1	1.4	2.0	2.6	3.1	3.3	3.4	3.2	3.4	3.3	3.1	2.6	2.0	1.4	1.1
15	1.2	1.1	1.0	1.6	2.5	3.2	2.9	0.8	0.0	0.8	2.9	3.2	2.5	1.6	1.0	1.1
20	1.5	1.3	0.9	1.2	2.4	3.2	0.5	0.0	0.0	0.0	0.5	3.2	2.4	1.2	0.9	1.3
25	1.8	1.5	1.0	0.9	2.3	3.0	0.0	0.0	0.0	0.0	0.0	3.0	2.3	0.9	1.0	1.5
30	2.0	1.6	1.1	0.7	2.1	2.2	0.0	0.0	0.0	0.0	0.0	2.2	2.1	0.7	1.1	1.6
35	2.3	1.8	1.2	0.6	1.9	1.2	0.0	0.0	0.0	0.0	0.0	1.2	1.9	0.6	1.2	1.8
40	2.7	2.0	1.2	0.4	1.6	0.3	0.0	0.0	0.0	0.0	0.0	0.3	1.6	0.4	1.2	2.0
45	3.3	2.4	1.2	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2	1.2	2.4
50	4.5	3.1	1.1	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	1.1	3.1
55	7.4	4.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.3
60	14.8	6.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	6.4
65	29.9	9.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	9.7
70	52.6	11.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	11.0
75	60.1	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
80	69.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1
85	86.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3
90	101.7	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
95	108.7	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
100	94.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
105	67.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
110	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
115	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	16360	16360	16360
45	9700	2717	3214
55	20600	1925	0
65	82840	719	0
75	170100	11	0
85	258500	0	0

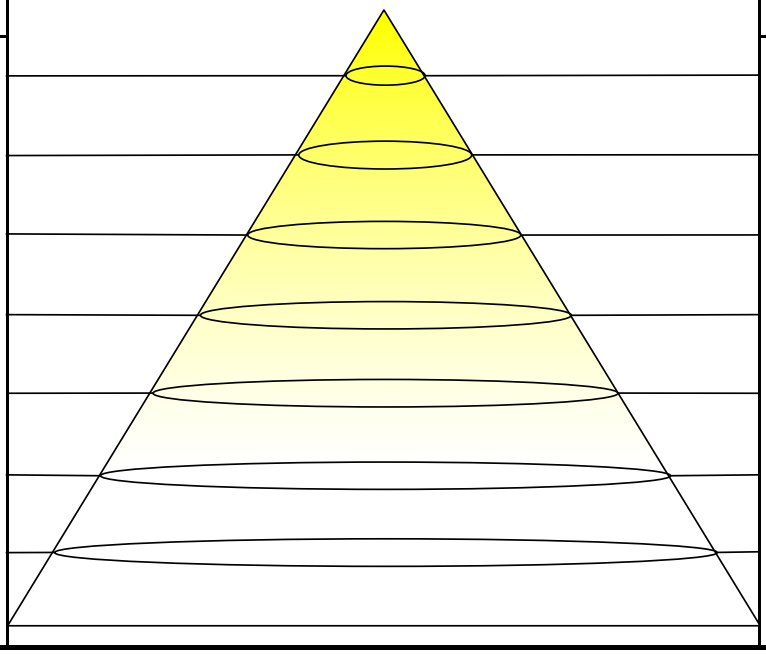
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	33	33	33	33	31	31	31	31	27	27	27	23	23	23	19	19	19	18
1	27	24	22	20	25	22	20	18	19	17	16	16	14	13	12	11	10	9
2	24	20	17	14	22	18	16	13	15	13	11	12	11	9	10	8	7	6
3	21	17	14	11	19	15	13	10	13	10	8	10	8	7	8	6	5	4
4	19	15	11	9	17	13	10	8	11	9	7	9	7	5	7	5	4	3
5	17	13	10	7	16	12	9	7	10	7	6	8	6	4	6	5	3	2
6	16	11	8	6	15	11	8	6	9	6	5	7	5	4	5	4	3	2
7	15	10	7	5	14	10	7	5	8	6	4	6	5	3	5	4	2	2
8	14	9	7	5	13	9	6	4	7	5	4	6	4	3	5	3	2	1
9	13	9	6	4	12	8	6	4	7	5	3	5	4	3	4	3	2	1
10	12	8	5	4	11	7	5	3	6	4	3	5	3	2	4	3	2	1

Beam and Field Information	
CIE Type:	Direct/Indirect
Center Beam Intenisty:	2.6 Candela
Central Cone Intensity:	3 Candela
Beam Flux:	29.2 Lumens
Beam Angle (0-180):	127.7 Degrees
Beam Angle (90-270):	85.8 Degrees
Field Angle (0-180):	129.9 Degrees
Field Angle (90-270):	103.1 Degrees

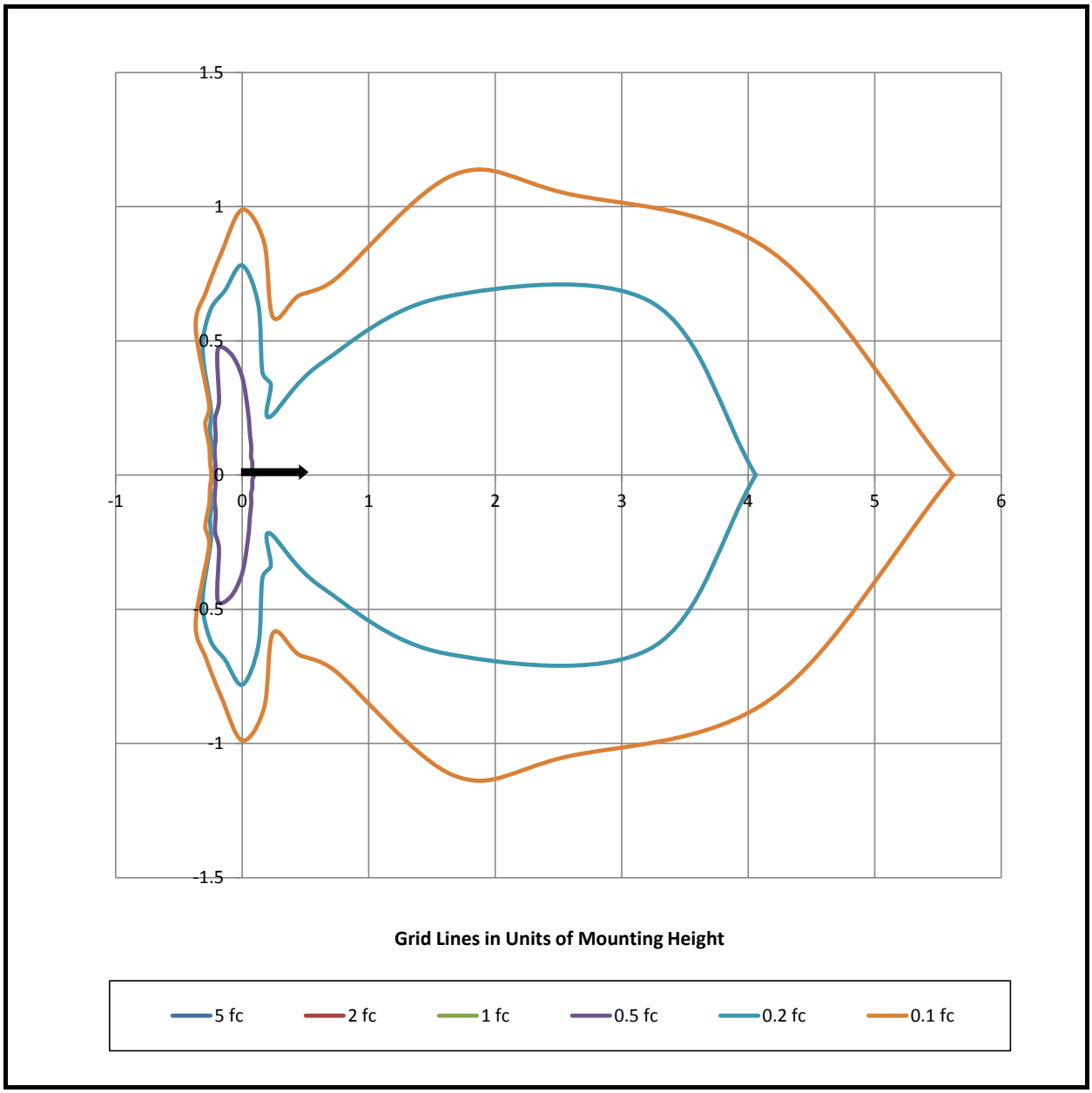
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.165	2.44
6.00	0.0733	3.66
8.00	0.0412	4.88
10.0	0.0264	6.10
12.0	0.0183	7.32
14.0	0.0135	8.54
16.0	0.0103	9.76

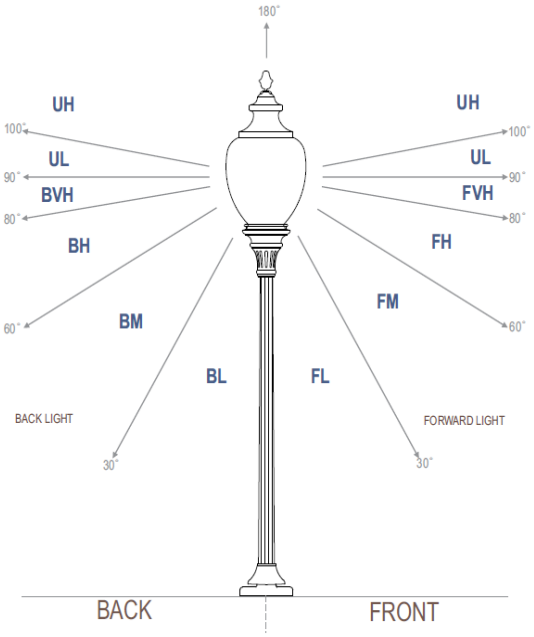


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	0.6	2.3%
FM	(30-60)	2.1	8.0%
FH	(60-80)	7.7	29.3%
FVH	(80-90)	5.2	19.7%
BL	(0-30)	0.7	2.6%
BM	(30-60)	0.3	1.3%
BH	(60-80)	0.0	0.0%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	6.1	23.2%
UH	(100-180)	3.6	13.8%
Total		26.4	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-M-40 (25° OPTIC, 4000K)

Order Number
12250114
Test Number
12250114.102

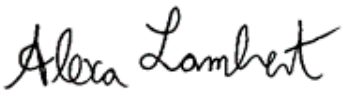
Report Date

2018-05-09

Prepared By

Sean Gregory, Project Handler

Approved By

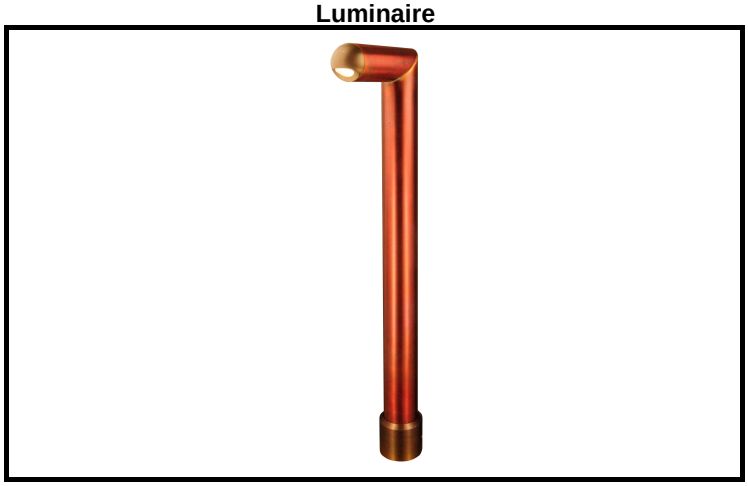


Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 4000K LED with 25° medium optic
Mounting: Step/Wall
Ballast/Driver: Integrated
Note:

This report has been pro-rated using data from report numbers 12250114.100, 12250114.01, 12250114.02, 12250114.03, 12250114.04, 12250114.05, and 12250114.06 to account for differences in color temperature.

Luminaire



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Luminous Length:	0.50	in.
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Luminous Height:	1.00	in.

Summary of Results

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Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

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Voltage:	12.01	VAC
Current:	0.1680	A
Power:	1.236	W
Power Factor:	0.612	
Frequency:	60	Hz
Current THD:	81.2	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

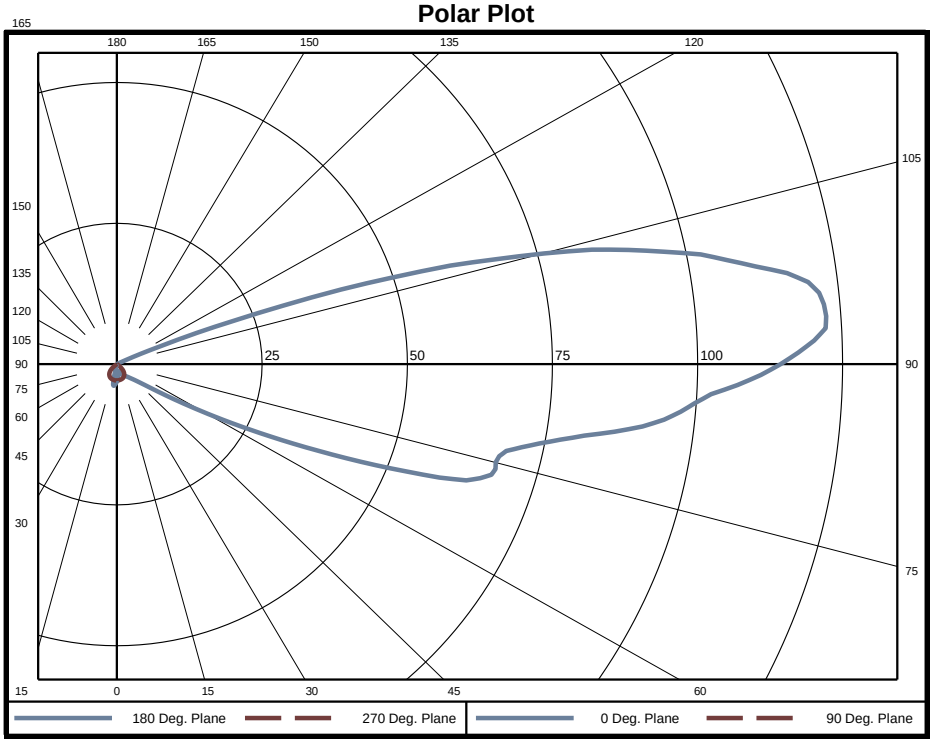
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.1 °C	12.01 VAC	0.1680 A	1.236 W	0.612	60 Hz	81.2 %

Summary of Results

Spacing Criteria
0-180: 0.29
90-270: 1.20

Total Lumen Output: 33.61 Lumens
Luminaire Efficacy: 27.2 lm/w
Maximum Candela: 122 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.070	0.2%	60-65	1.320	3.9%	120-125	0	0.0%
5-10	0.200	0.6%	65-70	2.229	6.6%	125-130	0	0.0%
10-15	0.274	0.8%	70-75	2.786	8.3%	130-135	0	0.0%
15-20	0.271	0.8%	75-80	2.681	8.0%	135-140	0	0.0%
20-25	0.289	0.9%	80-85	3.189	9.5%	140-145	0	0.0%
25-30	0.330	1.0%	85-90	3.747	11.1%	145-150	0	0.0%
30-35	0.345	1.0%	90-95	4.230	12.6%	150-155	0	0.0%
35-40	0.341	1.0%	95-100	4.056	12.1%	155-160	0	0.0%
40-45	0.345	1.0%	100-105	3.137	9.3%	160-165	0	0.0%
45-50	0.377	1.1%	105-110	1.773	5.3%	165-170	0	0.0%
50-55	0.466	1.4%	110-115	0.412	1.2%	170-175	0	0.0%
55-60	0.735	2.2%	115-120	0.005	0.0%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	2	6.3%
0-60	4	12.0%
0-90	20	59.5%
90-180	14	40.5%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5	2.3	2.2	2.4	2.6	2.9	3.2	3.4	3.6	3.7	3.6	3.4	3.2	2.9	2.6	2.4	2.2
10	1.3	1.3	1.6	2.3	2.9	3.4	3.7	3.8	3.6	3.8	3.7	3.4	2.9	2.3	1.6	1.3
15	1.4	1.2	1.1	1.8	2.8	3.6	3.3	0.9	0.0	0.9	3.3	3.6	2.8	1.8	1.1	1.2
20	1.7	1.4	1.0	1.4	2.7	3.6	0.6	0.0	0.0	0.0	0.6	3.6	2.7	1.4	1.0	1.4
25	2.1	1.7	1.1	1.0	2.6	3.3	0.0	0.0	0.0	0.0	0.0	3.3	2.6	1.0	1.1	1.7
30	2.3	1.8	1.3	0.8	2.4	2.5	0.0	0.0	0.0	0.0	0.0	2.5	2.4	0.8	1.3	1.8
35	2.6	2.0	1.4	0.6	2.1	1.3	0.0	0.0	0.0	0.0	0.0	1.3	2.1	0.6	1.4	2.0
40	3.0	2.3	1.4	0.5	1.7	0.3	0.0	0.0	0.0	0.0	0.0	0.3	1.7	0.5	1.4	2.3
45	3.7	2.7	1.3	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.3	1.3	2.7
50	5.0	3.4	1.2	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	1.2	3.4
55	8.2	4.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.8
60	16.6	7.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	7.2
65	33.5	10.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	10.9
70	58.9	12.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	12.3
75	67.3	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7
80	77.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5
85	97.1	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
90	113.9	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
95	121.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
100	106.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
105	75.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
110	30.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
115	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	#VALUE!	#VALUE!	#VALUE!
45	#VALUE!	#VALUE!	#VALUE!
55	#VALUE!	#VALUE!	#VALUE!
65	#VALUE!	#VALUE!	#VALUE!
75	#VALUE!	#VALUE!	#VALUE!
85	#VALUE!	#VALUE!	#VALUE!

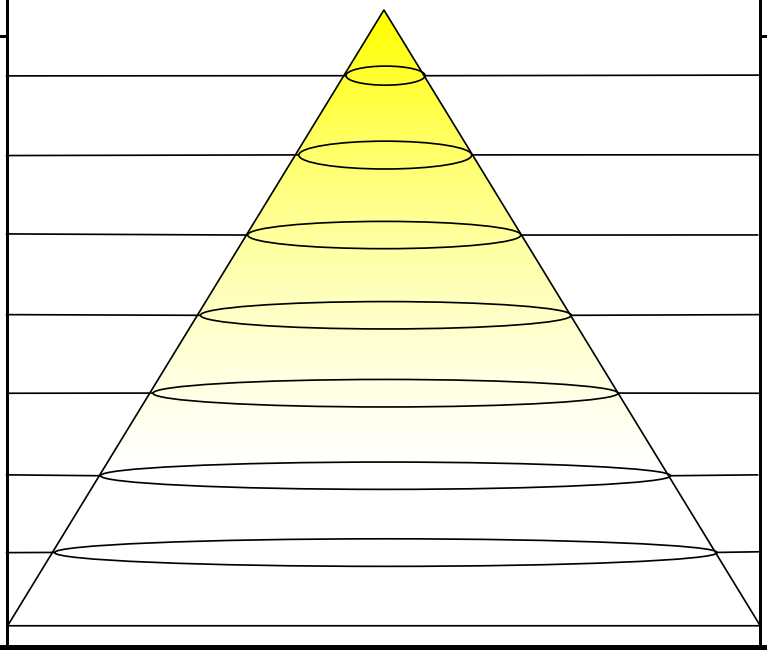
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	37	37	37	37	34	34	34	34	30	30	30	26	26	26	22	22	22	20
1	30	27	25	22	28	25	23	21	21	19	18	17	16	15	14	13	12	10
2	26	22	19	16	24	20	17	15	17	15	12	14	12	10	11	9	8	6
3	24	19	15	12	21	17	14	11	14	12	9	11	9	8	9	7	6	4
4	21	16	13	10	19	15	12	9	12	10	8	10	8	6	8	6	4	3
5	20	14	11	8	18	13	10	8	11	8	6	9	7	5	7	5	4	2
6	18	13	9	7	16	12	9	6	10	7	5	8	6	4	6	4	3	2
7	17	12	8	6	15	11	8	6	9	6	5	7	5	4	6	4	3	2
8	15	11	7	5	14	10	7	5	8	6	4	7	5	3	5	4	2	2
9	14	10	7	5	13	9	6	4	7	5	4	6	4	3	5	3	2	1
10	13	9	6	4	12	8	6	4	7	5	3	6	4	3	5	3	2	1

Beam and Field Information	
CIE Type:	Direct/Indirect
Center Beam Intenisty:	3.0 Candela
Central Cone Intensity:	3 Candela
Beam Flux:	32.7 Lumens
Beam Angle (0-180):	127.7 Degrees
Beam Angle (90-270):	85.8 Degrees
Field Angle (0-180):	129.9 Degrees
Field Angle (90-270):	103.1 Degrees

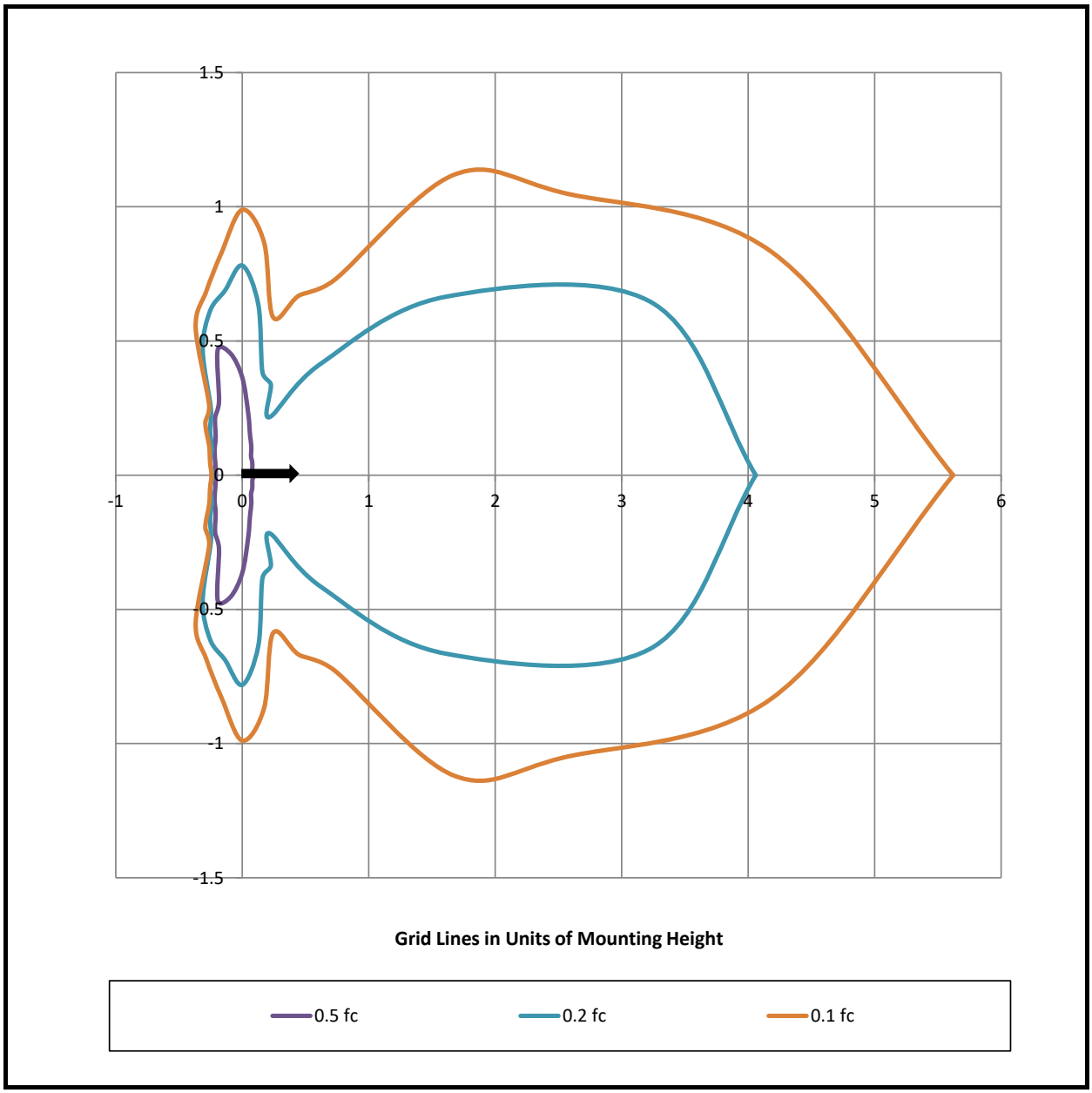
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.185	2.44
6.00	0.0821	3.66
8.00	0.0462	4.88
10.0	0.0295	6.10
12.0	0.0205	7.32
14.0	0.0151	8.54
16.0	0.0115	9.76

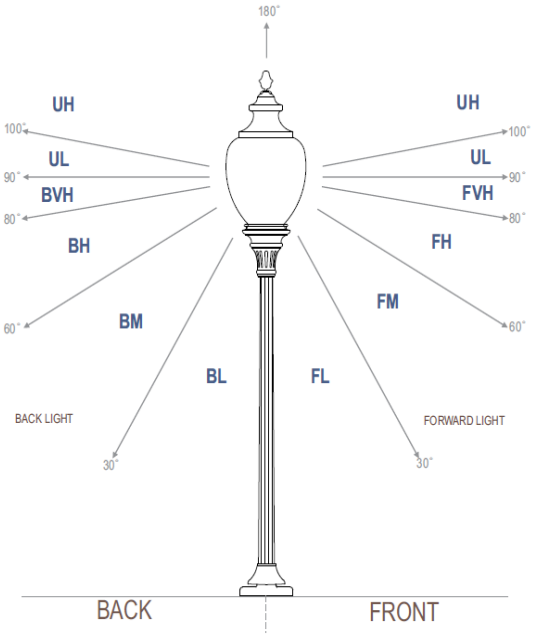


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	0.7	2.3%
FM	(30-60)	2.4	8.0%
FH	(60-80)	8.7	29.3%
FVH	(80-90)	5.8	19.7%
BL	(0-30)	0.8	2.6%
BM	(30-60)	0.4	1.3%
BH	(60-80)	0.0	0.0%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	6.9	23.2%
UH	(100-180)	4.1	13.8%
Total		29.6	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

ACCREDITED

NVLAP LAB CODE 201042-0

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-N-40 (Narrow Optic, 4000K)

Order Number
11912334
Test Number
11912334.01

Test Date

2017-08-16

Prepared By

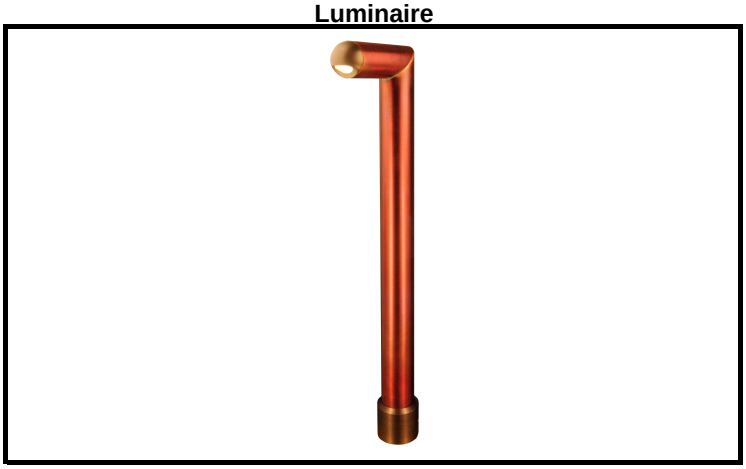
Alexa Lambert, Project Handler

Approved By

Carissa Samonte-cam, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal tapered flush faceplate.
Lamp: One white LED
Mounting: Surface – Wall
Ballast/Driver: Integrated

Luminaire



Luminaire Characteristics

Luminous Length:	0.50	in.
Luminous Width:	0.7500	in.
Luminous Height:	1.00	in.

Summary of Results

Roadway Classification:	Type I, Very Short
Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.3	°C
Voltage:	11.95	VAC
Current:	0.1699	A
Power:	1.239	W
Power Factor:	0.610	
Frequency:	60	Hz
Current THD:	81.0	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

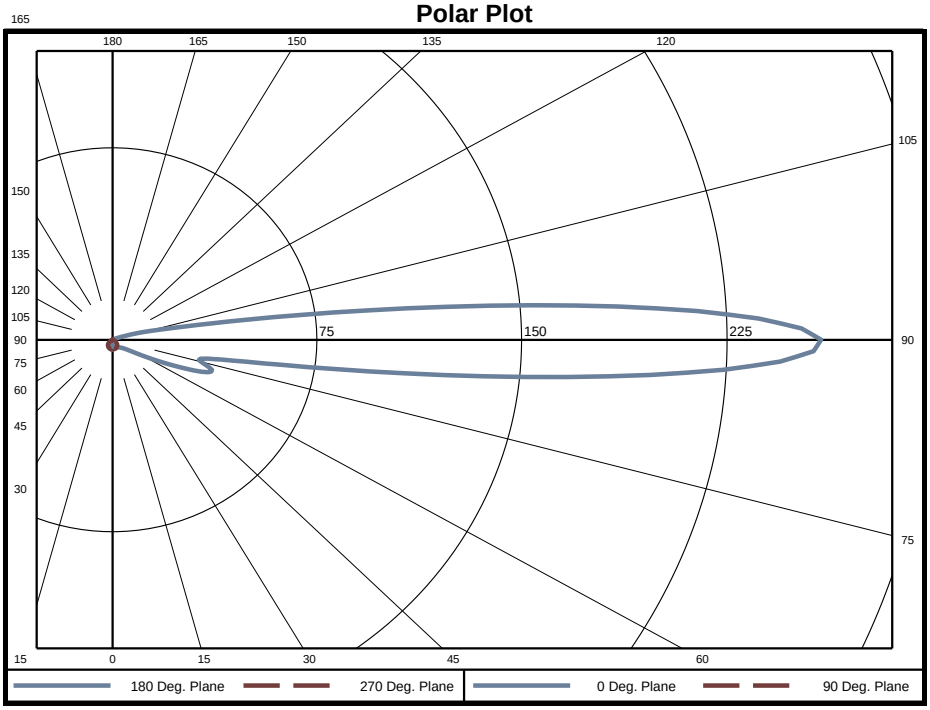
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.3 °C	11.95 VAC	0.1699 A	1.239 W	0.610	60 Hz	81.0 %

Summary of Results

Spacing Criteria
0-180: 1.59
90-270: 0.47

Total Lumen Output: 37.41 Lumens
Luminaire Efficacy: 30.2 lm/w
Maximum Candela: 259 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.089	0.2%	60-65	1.155	3.1%	120-125	0.029	0.1%
5-10	0.262	0.7%	65-70	1.724	4.6%	125-130	0.013	0.0%
10-15	0.389	1.0%	70-75	1.903	5.1%	130-135	0.007	0.0%
15-20	0.442	1.2%	75-80	1.753	4.7%	135-140	0.004	0.0%
20-25	0.478	1.3%	80-85	3.849	10.3%	140-145	0.003	0.0%
25-30	0.526	1.4%	85-90	8.187	21.9%	145-150	0.002	0.0%
30-35	0.572	1.5%	90-95	7.842	21.0%	150-155	0.001	0.0%
35-40	0.619	1.7%	95-100	3.229	8.6%	155-160	0.001	0.0%
40-45	0.654	1.7%	100-105	0.933	2.5%	160-165	0.001	0.0%
45-50	0.679	1.8%	105-110	0.345	0.9%	165-170	0.001	0.0%
50-55	0.715	1.9%	110-115	0.111	0.3%	170-175	0.000	0.0%
55-60	0.832	2.2%	115-120	0.058	0.2%	175-180	0.000	0.0%

Zone	Lumens	% of Luminaire
0-40	3	9.0%
0-60	6	16.7%
0-90	25	66.4%
90-180	13	33.6%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
5	3.5	3.5	3.6	3.7	3.7	3.8	3.9	3.9	3.9	3.9	3.9	3.8	3.7	3.7	3.6	3.5
10	3.1	3.1	3.3	3.5	3.7	4.0	4.0	3.7	3.5	3.7	4.0	4.0	3.7	3.5	3.3	3.1
15	2.8	2.8	2.9	3.3	3.7	4.0	3.4	1.8	1.3	1.8	3.4	4.0	3.7	3.3	2.9	2.8
20	2.8	2.7	2.6	2.9	3.6	4.0	1.7	0.5	0.3	0.5	1.7	4.0	3.6	2.9	2.6	2.7
25	3.1	3.0	2.5	2.5	3.4	3.7	0.7	0.0	0.0	0.0	0.7	3.7	3.4	2.5	2.5	3.0
30	3.3	3.1	2.7	2.2	3.1	3.0	0.1	0.0	0.0	0.0	0.1	3.0	3.1	2.2	2.7	3.1
35	3.6	3.4	2.8	2.1	2.9	2.2	0.0	0.0	0.0	0.0	0.0	2.2	2.9	2.1	2.8	3.4
40	4.0	3.6	2.8	1.9	2.6	1.5	0.0	0.0	0.0	0.0	0.0	1.5	2.6	1.9	2.8	3.6
45	4.4	3.9	2.7	1.8	2.3	0.9	0.0	0.0	0.0	0.0	0.0	0.9	2.3	1.8	2.7	3.9
50	5.3	4.2	2.6	1.5	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.5	1.8	1.5	2.6	4.2
55	7.1	4.7	2.4	1.2	1.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	1.3	1.2	2.4	4.7
60	12.0	5.8	2.1	1.0	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.9	1.0	2.1	5.8
65	22.5	8.0	1.8	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.9	1.8	8.0
70	37.1	9.3	1.7	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	1.7	9.3
75	33.6	6.5	1.4	0.6	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.6	1.4	6.5
80	49.2	5.1	1.3	0.5	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.5	1.3	5.1
85	167.2	4.7	1.1	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4	1.1	4.7
90	259.4	4.1	0.9	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.9	4.1
95	154.4	3.6	0.7	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.7	3.6
100	36.3	3.3	0.6	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.6	3.3
105	11.3	2.5	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.4	2.5
110	2.3	1.0	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.3	1.0
115	0.8	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
120	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
125	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
130	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
135	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	15260	15260	15260
45	8628	4736	5666
55	13360	3879	3201
65	41650	2964	1751
75	63410	2360	966
85	332300	1849	346

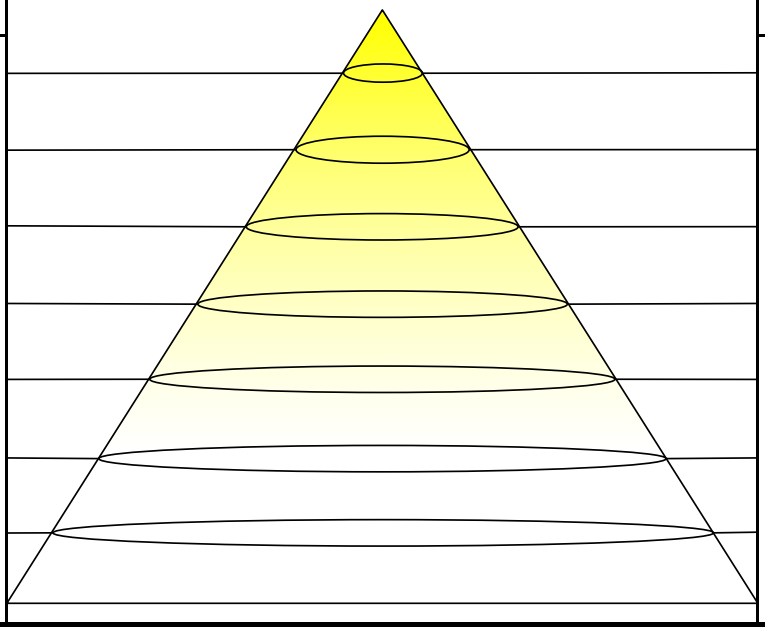
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	42	42	42	42	39	39	39	39	35	35	35	30	30	30	27	27	27	25
1	33	29	26	23	31	27	24	22	23	21	19	19	18	16	16	14	13	11
2	29	24	20	17	27	23	19	16	19	16	13	16	13	11	13	11	9	7
3	26	21	17	13	24	19	15	12	16	13	11	13	11	9	11	9	7	5
4	24	18	14	11	22	17	13	10	14	11	9	12	9	7	10	7	6	4
5	22	16	12	9	20	15	11	9	13	10	7	11	8	6	9	7	5	4
6	20	15	11	8	19	13	10	7	11	8	6	10	7	5	8	6	4	3
7	19	13	9	7	17	12	9	6	10	8	5	9	6	5	7	5	4	3
8	17	12	8	6	16	11	8	6	10	7	5	8	6	4	7	5	3	2
9	16	11	8	5	15	10	7	5	9	6	4	7	5	4	6	4	3	2
10	15	10	7	5	14	9	6	4	8	6	4	7	5	3	6	4	3	2

Beam and Field Information	
CIE Type:	Semi-Direct
Center Beam Intenisty:	3.7 Candela
Central Cone Intensity:	4 Candela
Beam Flux:	35.4 Lumens
Beam Angle (0-180):	124.4 Degrees
Beam Angle (90-270):	98.6 Degrees
Field Angle (0-180):	140.7 Degrees
Field Angle (90-270):	149.4 Degrees

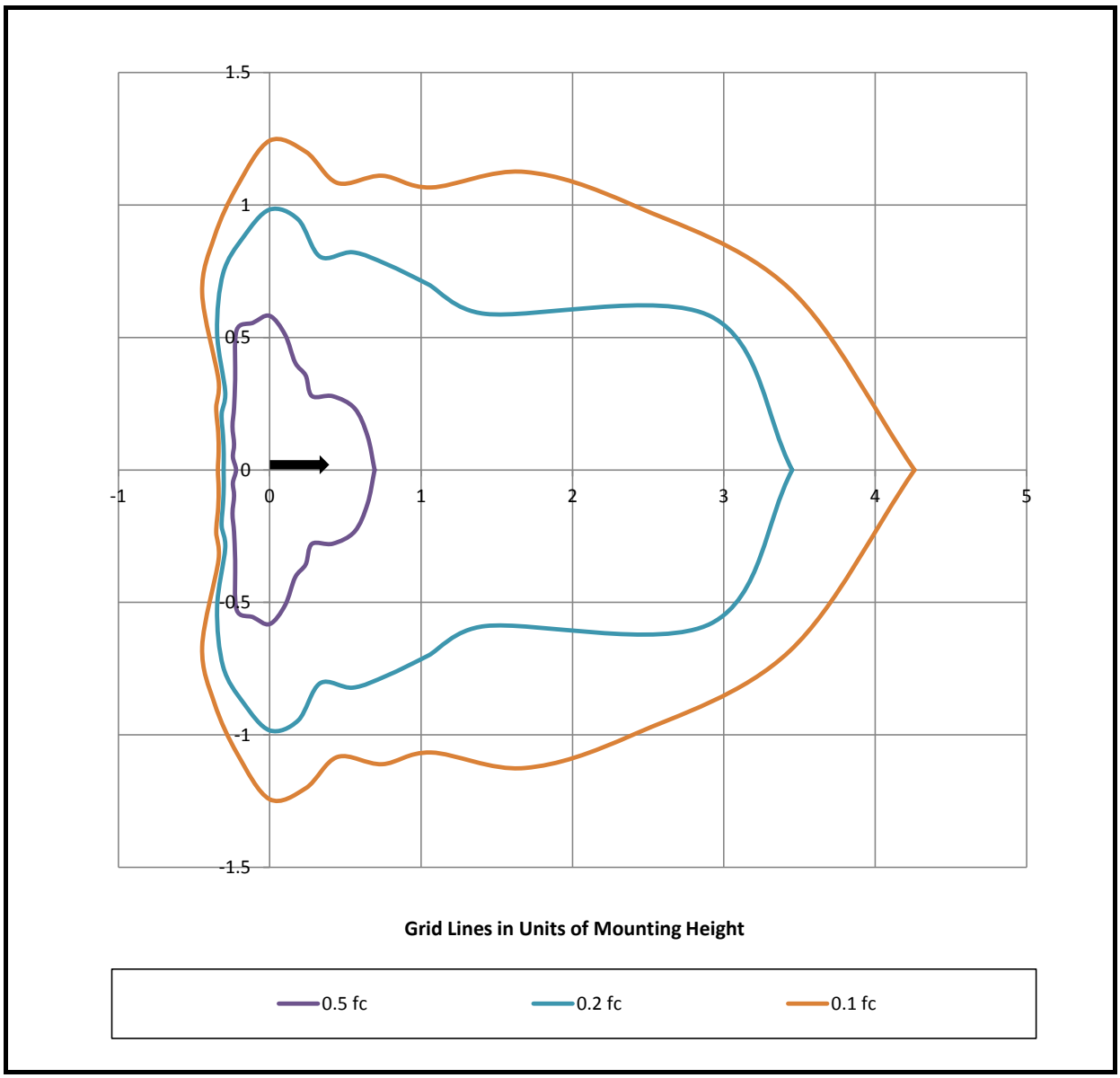
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.231	3.21
6.00	0.103	4.81
8.00	0.0577	6.41
10.0	0.0369	8.02
12.0	0.0256	9.62
14.0	0.0188	11.2
16.0	0.0144	12.8

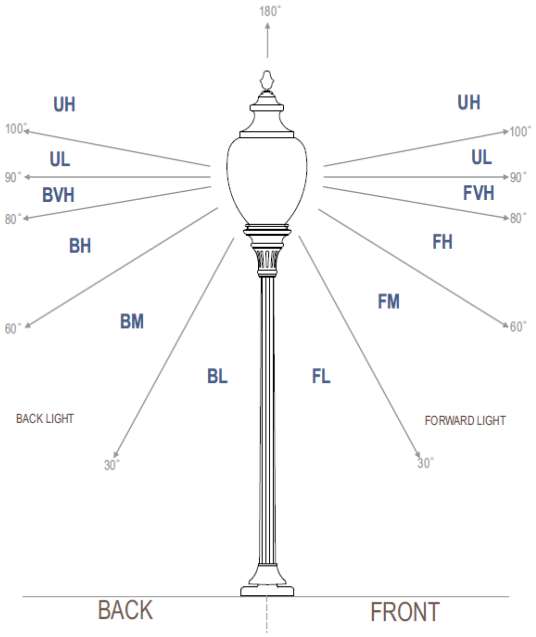


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	1.2	3.8%
FM	(30-60)	3.5	10.5%
FH	(60-80)	6.5	19.5%
FVH	(80-90)	9.6	29.1%
BL	(0-30)	0.9	2.9%
BM	(30-60)	0.7	2.1%
BH	(60-80)	0.1	0.3%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	8.9	27.0%
UH	(100-180)	1.6	4.9%
Total		33.0	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-W-27 (40° OPTIC, 2700K)

Order Number
12250114
Test Number
12250114.106

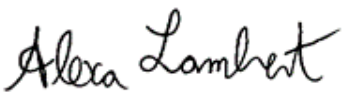
Report Date

2018-05-09

Prepared By

Sean Gregory, Project Handler

Approved By



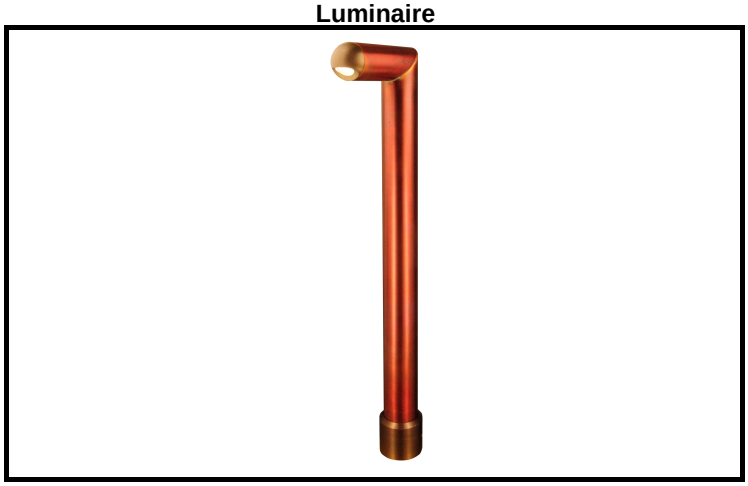
Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 2700K LED with 40° wide optic
Mounting: Step/Wall
Ballast/Driver: Integrated

Note:

This report has been pro-rated using data from report numbers 12250114.105, 12250114.01, 12250114.02, 12250114.03, 12250114.04, 12250114.05, and 12250114.06 to account for differences in color temperature.

Luminaire



Luminaire Characteristics

Luminous Length:	0.50	in.
Luminous Width:	0.5000	in.
Luminous Height:	1.00	in.

Summary of Results

Roadway Classification:	Type II, Very Short
Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.1	°C
Voltage:	12.01	VAC
Current:	0.1679	A
Power:	1.235	W
Power Factor:	0.613	
Frequency:	60	Hz
Current THD:	81.0	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

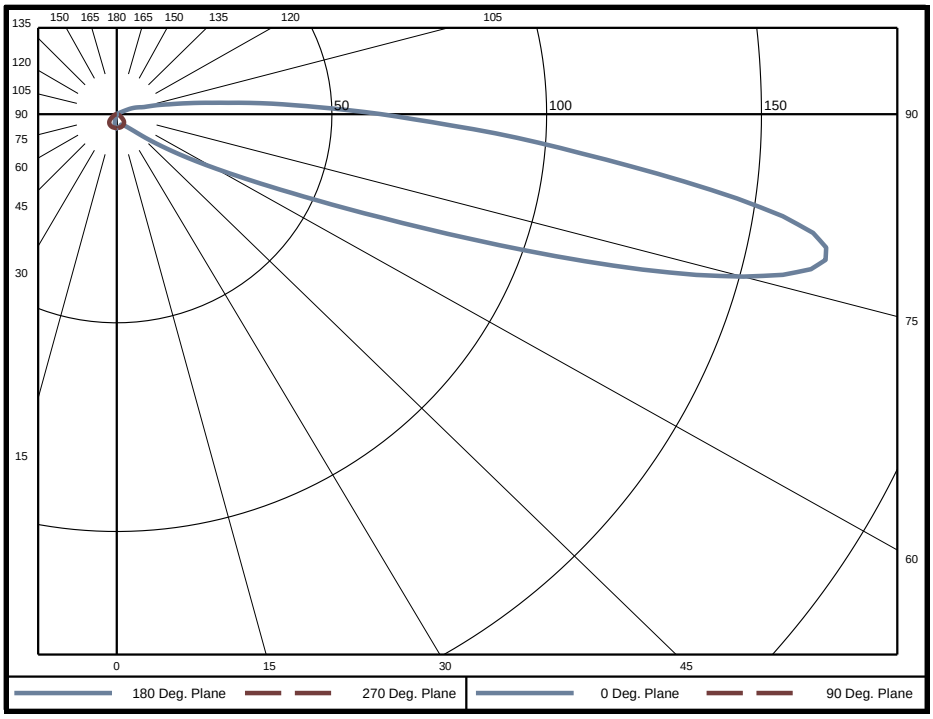
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.1 °C	12.01 VAC	0.1679 A	1.235 W	0.613	60 Hz	81.0 %

Summary of Results

Spacing Criteria
0-180: 9.11
90-270: 1.33

Total Lumen Output: 34.62 Lumens
Luminaire Efficacy: 28.0 lm/w
Maximum Candela: 168 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.079	0.2%	60-65	1.876	5.4%	120-125	0.019	0.1%
5-10	0.227	0.7%	65-70	3.051	8.8%	125-130	0.005	0.0%
10-15	0.342	1.0%	70-75	4.926	14.2%	130-135	0.001	0.0%
15-20	0.402	1.2%	75-80	6.199	17.9%	135-140	0.000	0.0%
20-25	0.432	1.2%	80-85	5.181	15.0%	140-145	0.000	0.0%
25-30	0.475	1.4%	85-90	3.193	9.2%	145-150	0	0.0%
30-35	0.523	1.5%	90-95	1.771	5.1%	150-155	0	0.0%
35-40	0.573	1.7%	95-100	0.899	2.6%	155-160	0	0.0%
40-45	0.635	1.8%	100-105	0.466	1.3%	160-165	0	0.0%
45-50	0.732	2.1%	105-110	0.260	0.8%	165-170	0	0.0%
50-55	0.912	2.6%	110-115	0.149	0.4%	170-175	0	0.0%
55-60	1.250	3.6%	115-120	0.042	0.1%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	3	8.8%
0-60	7	19.0%
0-90	31	89.6%
90-180	4	10.4%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
5	3.2	3.2	3.2	3.2	3.3	3.4	3.4	3.3	3.3	3.3	3.4	3.4	3.3	3.2	3.2	3.2
10	3.1	3.0	3.1	3.2	3.3	3.3	3.0	2.7	2.6	2.7	3.0	3.3	3.3	3.2	3.1	3.0
15	3.0	2.9	3.0	3.1	3.3	3.2	2.5	1.6	1.0	1.6	2.5	3.2	3.3	3.1	3.0	2.9
20	2.8	2.7	2.8	3.0	3.2	2.9	1.5	0.4	0.2	0.4	1.5	2.9	3.2	3.0	2.8	2.7
25	2.8	2.5	2.6	2.8	3.1	2.6	0.5	0.0	0.0	0.0	0.5	2.6	3.1	2.8	2.6	2.5
30	3.1	2.7	2.4	2.7	3.0	2.2	0.1	0.0	0.0	0.0	0.1	2.2	3.0	2.7	2.4	2.7
35	3.5	2.9	2.3	2.4	2.8	1.7	0.0	0.0	0.0	0.0	0.0	1.7	2.8	2.4	2.3	2.9
40	4.3	3.3	2.3	2.2	2.5	1.2	0.0	0.0	0.0	0.0	0.0	1.2	2.5	2.2	2.3	3.3
45	5.9	3.9	2.3	1.9	2.2	0.7	0.0	0.0	0.0	0.0	0.0	0.7	2.2	1.9	2.3	3.9
50	9.1	4.8	2.3	1.6	1.7	0.4	0.0	0.0	0.0	0.0	0.0	0.4	1.7	1.6	2.3	4.8
55	15.0	6.2	2.2	1.3	1.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	1.3	1.3	2.2	6.2
60	25.3	8.5	2.0	1.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.1	2.0	8.5
65	44.6	11.9	1.8	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.0	1.8	11.9
70	87.6	13.9	1.5	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.8	1.5	13.9
75	150.3	10.8	1.3	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	1.3	10.8
80	163.8	7.0	1.2	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	1.2	7.0
85	108.1	4.3	1.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.0	4.3
90	61.2	2.9	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	2.9
95	30.8	2.0	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	2.0
100	14.4	1.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.5
105	6.5	1.1	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.4	1.1
110	4.5	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.7
115	1.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4
120	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
125	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	#VALUE!	#VALUE!	#VALUE!
45	#VALUE!	#VALUE!	#VALUE!
55	#VALUE!	#VALUE!	#VALUE!
65	#VALUE!	#VALUE!	#VALUE!
75	#VALUE!	#VALUE!	#VALUE!
85	#VALUE!	#VALUE!	#VALUE!

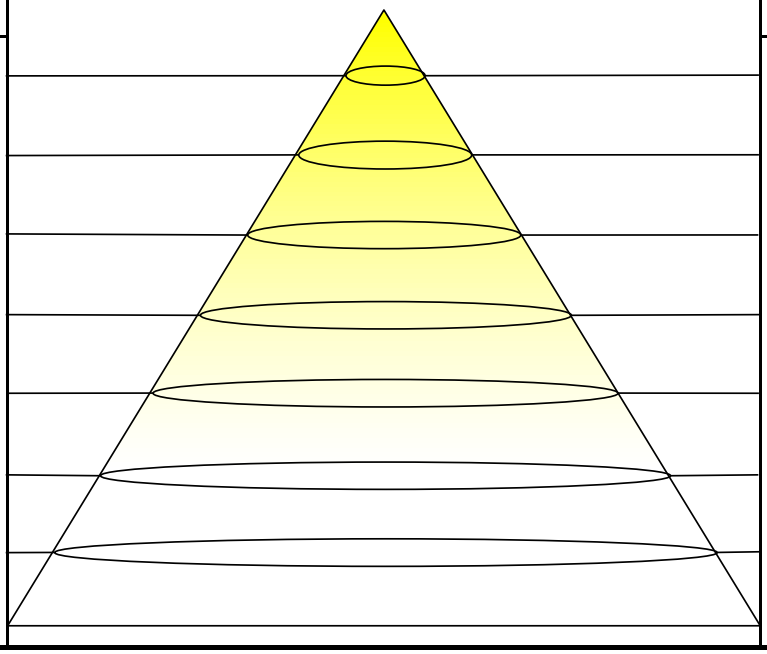
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	40	40	40	40	39	39	39	39	36	36	36	34	34	34	32	32	32	31
1	32	29	25	22	31	27	24	22	25	22	20	23	21	19	21	19	18	16
2	27	22	18	15	26	21	17	14	19	16	13	17	15	12	16	13	11	10
3	24	18	14	10	23	17	13	10	16	12	9	14	11	9	13	10	8	7
4	22	16	11	8	20	15	11	8	13	10	7	12	9	7	11	8	6	5
5	20	14	10	6	19	13	9	6	12	8	6	11	8	5	10	7	5	4
6	18	12	8	5	17	12	8	5	11	7	5	10	7	4	9	6	4	3
7	17	11	7	5	16	11	7	4	10	6	4	9	6	4	8	5	4	3
8	16	10	6	4	15	10	6	4	9	6	4	8	5	3	7	5	3	2
9	15	9	6	4	14	9	6	3	8	5	3	7	5	3	7	4	3	2
10	14	8	5	3	13	8	5	3	8	5	3	7	4	3	6	4	3	2

Beam and Field Information	
CIE Type:	Semi-Direct
Center Beam Intenisty:	3.3 Candela
Central Cone Intensity:	3 Candela
Beam Flux:	32.8 Lumens
Beam Angle (0-180):	127.8 Degrees
Beam Angle (90-270):	101.4 Degrees
Field Angle (0-180):	140.0 Degrees
Field Angle (90-270):	152.9 Degrees

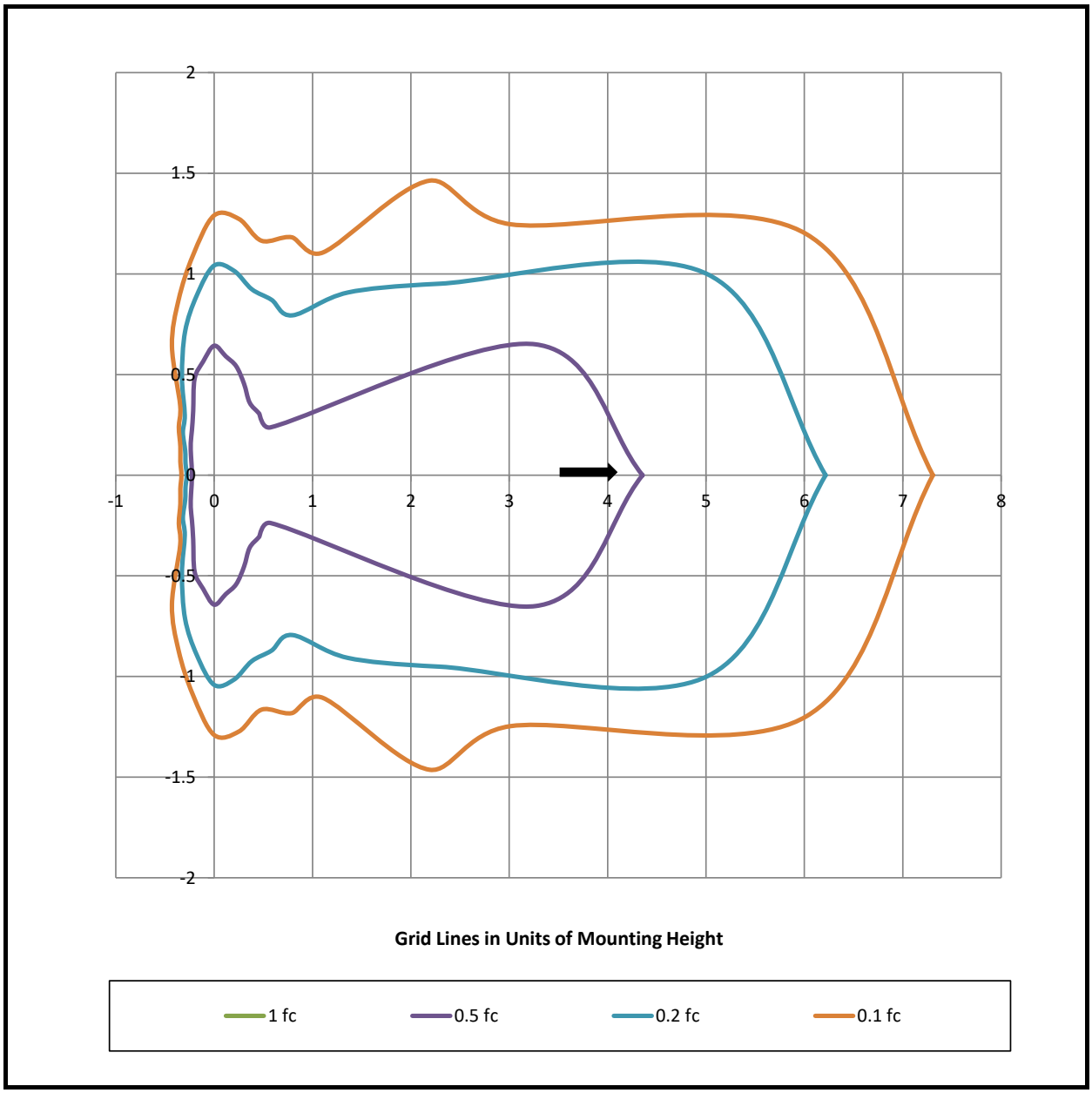
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.205	3.26
6.00	0.0913	4.90
8.00	0.0514	6.53
10.0	0.0329	8.16
12.0	0.0228	9.79
14.0	0.0168	11.4
16.0	0.0128	13.1



ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
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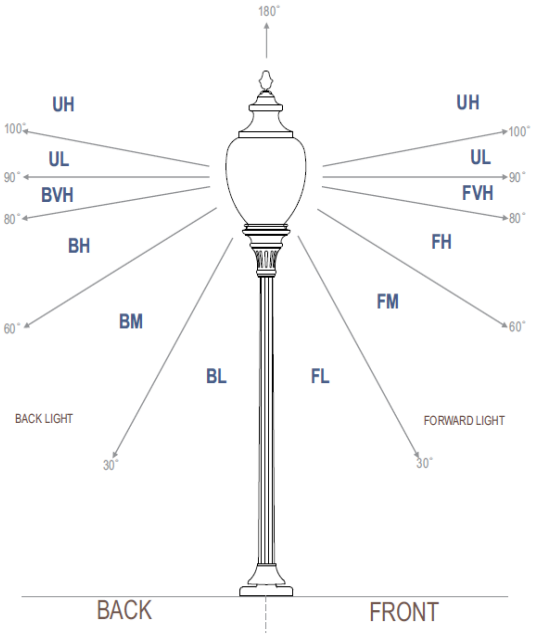
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	1.2	3.7%
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FH	(60-80)	15.3	47.4%
FVH	(80-90)	7.3	22.6%
BL	(0-30)	0.8	2.4%
BM	(30-60)	0.5	1.7%
BH	(60-80)	0.1	0.2%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	2.1	6.5%
UH	(100-180)	0.8	2.6%
Total		32.2	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

ACCREDITED
Testing Laboratory

NVLAP LAB CODE 201042-0

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-W-30 (40° OPTIC, 3000K)

Order Number
12250114
Test Number
12250114.105

Test Date

2018-05-04

Prepared By

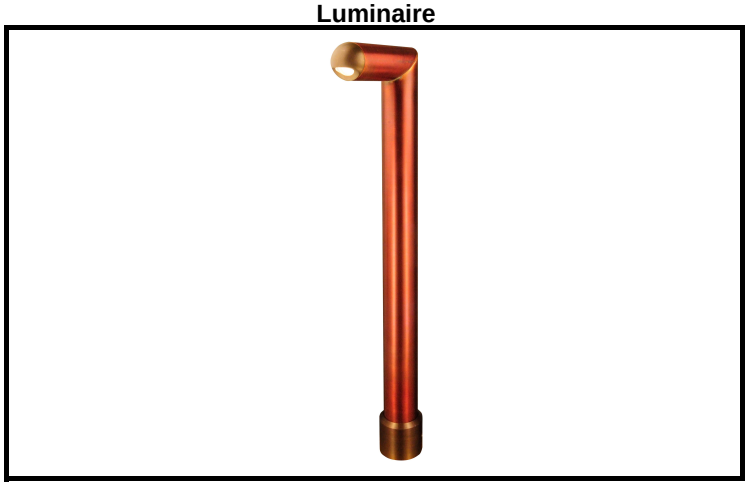
Cordaryl Cousar, Technician

Approved By

Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 3000K LED with 40° wide optic
Mounting: Step/Wall
Ballast/Driver: Integrated

Luminaire



Luminaire Characteristics

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Luminous Height:	1.00 in.

Summary of Results

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BUG Rating:	B0 U1 G0

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Power:	1.235 W
Power Factor:	0.613
Frequency:	60 Hz
Current THD:	81.0 %

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

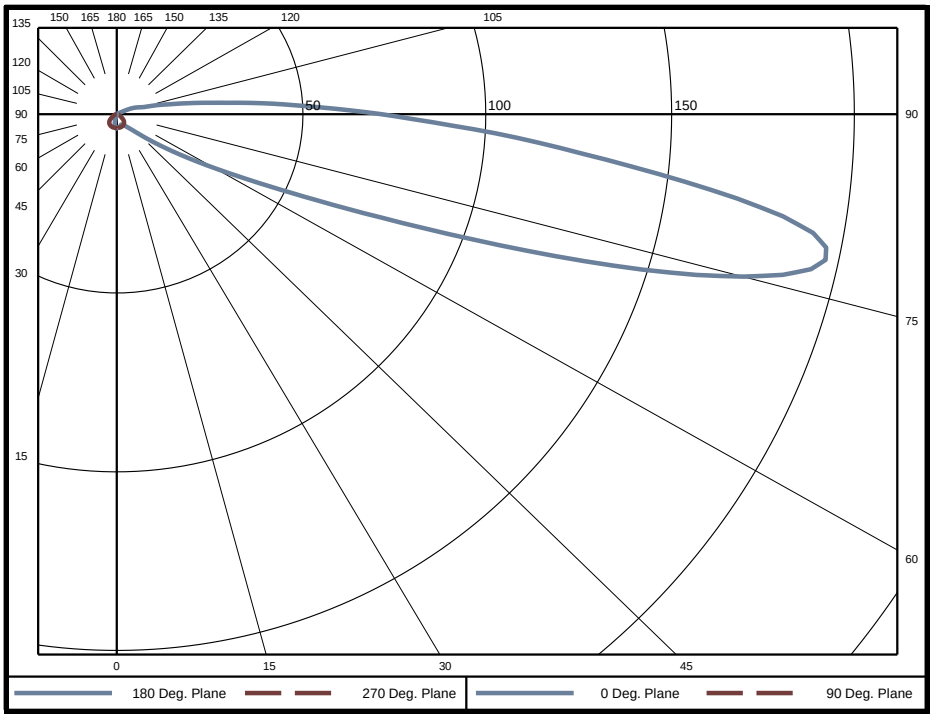
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.1 °C	12.01 VAC	0.1679 A	1.235 W	0.613	60 Hz	81.0 %

Summary of Results

Spacing Criteria
0-180: 9.11
90-270: 1.33

Total Lumen Output: 40.40 Lumens
Luminaire Efficacy: 32.7 lm/w
Maximum Candela: 196 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.092	0.2%	60-65	2.189	5.4%	120-125	0.022	0.1%
5-10	0.265	0.7%	65-70	3.560	8.8%	125-130	0.006	0.0%
10-15	0.399	1.0%	70-75	5.748	14.2%	130-135	0.002	0.0%
15-20	0.469	1.2%	75-80	7.234	17.9%	135-140	0.000	0.0%
20-25	0.504	1.2%	80-85	6.046	15.0%	140-145	0.000	0.0%
25-30	0.554	1.4%	85-90	3.726	9.2%	145-150	0	0.0%
30-35	0.610	1.5%	90-95	2.067	5.1%	150-155	0	0.0%
35-40	0.669	1.7%	95-100	1.049	2.6%	155-160	0	0.0%
40-45	0.741	1.8%	100-105	0.543	1.3%	160-165	0	0.0%
45-50	0.854	2.1%	105-110	0.304	0.8%	165-170	0	0.0%
50-55	1.064	2.6%	110-115	0.174	0.4%	170-175	0	0.0%
55-60	1.459	3.6%	115-120	0.049	0.1%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	4	8.8%
0-60	8	19.0%
0-90	36	89.6%
90-180	4	10.4%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
5	3.8	3.7	3.7	3.8	3.8	4.0	3.9	3.9	3.8	3.9	3.9	4.0	3.8	3.8	3.7	3.7
10	3.6	3.6	3.6	3.7	3.8	3.9	3.5	3.2	3.0	3.2	3.5	3.9	3.8	3.7	3.6	3.6
15	3.5	3.4	3.5	3.6	3.8	3.7	2.9	1.9	1.2	1.9	2.9	3.7	3.8	3.6	3.5	3.4
20	3.2	3.1	3.3	3.5	3.7	3.4	1.7	0.5	0.2	0.5	1.7	3.4	3.7	3.5	3.3	3.1
25	3.3	3.0	3.0	3.3	3.6	3.0	0.6	0.0	0.0	0.0	0.6	3.0	3.6	3.3	3.0	3.0
30	3.6	3.2	2.8	3.1	3.5	2.6	0.1	0.0	0.0	0.0	0.1	2.6	3.5	3.1	2.8	3.2
35	4.1	3.4	2.7	2.8	3.3	2.0	0.0	0.0	0.0	0.0	0.0	2.0	3.3	2.8	2.7	3.4
40	5.0	3.8	2.7	2.5	3.0	1.4	0.0	0.0	0.0	0.0	0.0	1.4	3.0	2.5	2.7	3.8
45	6.8	4.5	2.7	2.2	2.6	0.8	0.0	0.0	0.0	0.0	0.0	0.8	2.6	2.2	2.7	4.5
50	10.6	5.6	2.7	1.8	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	2.0	1.8	2.7	5.6
55	17.4	7.3	2.6	1.5	1.5	0.2	0.0	0.0	0.0	0.0	0.0	0.2	1.5	1.5	2.6	7.3
60	29.5	9.9	2.4	1.3	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.1	1.3	2.4	9.9
65	52.0	13.9	2.1	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.1	2.1	13.9
70	102.2	16.3	1.8	1.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.0	1.8	16.3
75	175.4	12.6	1.6	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	1.6	12.6
80	191.2	8.2	1.4	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.4	8.2
85	126.2	5.1	1.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	1.2	5.1
90	71.4	3.4	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	3.4
95	36.0	2.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	2.3
100	16.8	1.7	0.6	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.6	1.7
105	7.6	1.2	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.4	1.2
110	5.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.8
115	1.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5
120	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2
125	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	23780	23780	23780
45	20000	6258	7494
55	48890	5504	4097
65	144300	4313	2269
75	496500	3225	1214
85	376200	2503	350

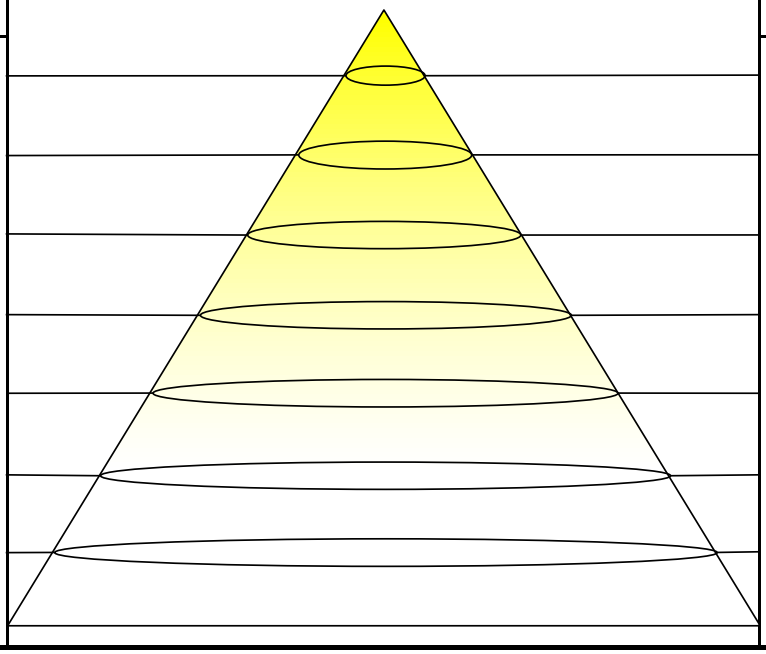
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	47	47	47	47	46	46	46	46	43	43	43	40	40	40	37	37	37	36
1	38	33	30	26	36	32	28	25	29	26	24	27	24	22	24	22	21	19
2	32	26	21	17	30	25	20	16	22	19	15	20	17	14	18	16	13	12
3	28	21	16	12	26	20	16	12	18	14	11	16	13	10	15	12	9	8
4	25	18	13	9	24	17	13	9	16	12	8	14	11	8	13	10	7	6
5	23	16	11	7	22	15	11	7	14	10	7	12	9	6	11	8	6	4
6	21	14	10	6	20	14	9	6	12	8	6	11	8	5	10	7	5	4
7	20	13	8	5	19	12	8	5	11	7	5	10	7	4	9	6	4	3
8	18	12	8	5	17	11	7	5	10	7	4	9	6	4	9	6	4	3
9	17	11	7	4	16	10	7	4	9	6	4	9	6	4	8	5	3	2
10	16	10	6	4	15	10	6	4	9	6	3	8	5	3	7	5	3	2

Beam and Field Information	
CIE Type:	Semi-Direct
Center Beam Intenisty:	3.8 Candela
Central Cone Intensity:	4 Candela
Beam Flux:	38.3 Lumens
Beam Angle (0-180):	127.8 Degrees
Beam Angle (90-270):	101.4 Degrees
Field Angle (0-180):	140.0 Degrees
Field Angle (90-270):	152.9 Degrees

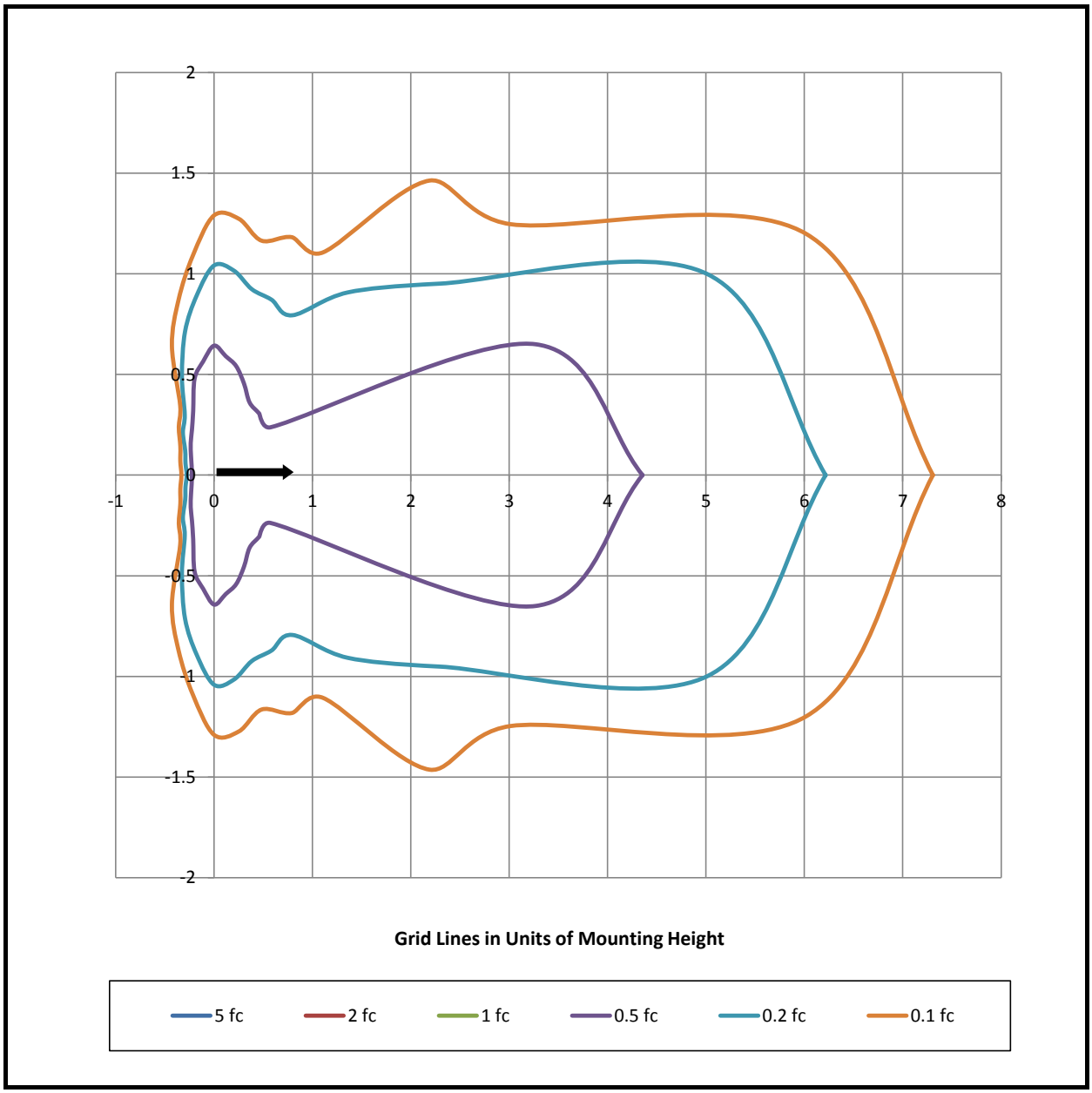
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.240	3.26
6.00	0.107	4.90
8.00	0.0599	6.53
10.0	0.0384	8.16
12.0	0.0266	9.79
14.0	0.0196	11.4
16.0	0.0150	13.1

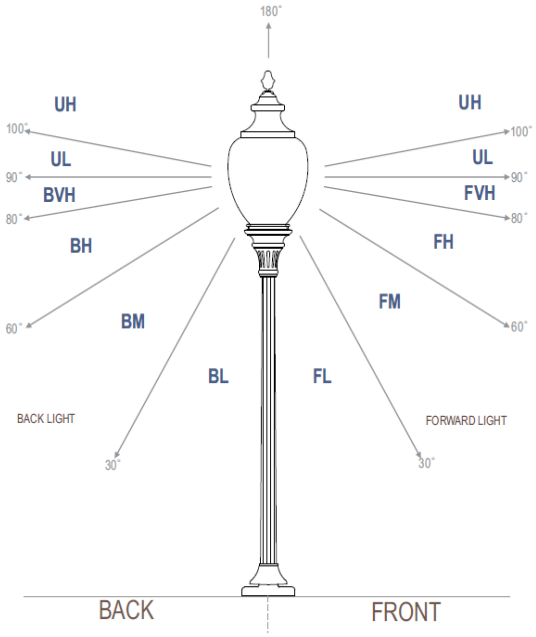


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	1.4	3.7%
FM	(30-60)	4.8	12.9%
FH	(60-80)	17.8	47.4%
FVH	(80-90)	8.5	22.6%
BL	(0-30)	0.9	2.4%
BM	(30-60)	0.6	1.7%
BH	(60-80)	0.1	0.2%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	2.4	6.5%
UH	(100-180)	1.0	2.6%
Total		37.6	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-W-40 (40° OPTIC, 4000K)

Order Number
12250114
Test Number
12250114.107

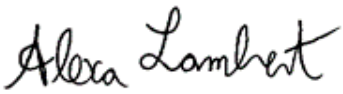
Report Date

2018-05-09

Prepared By

Sean Gregory, Project Handler

Approved By

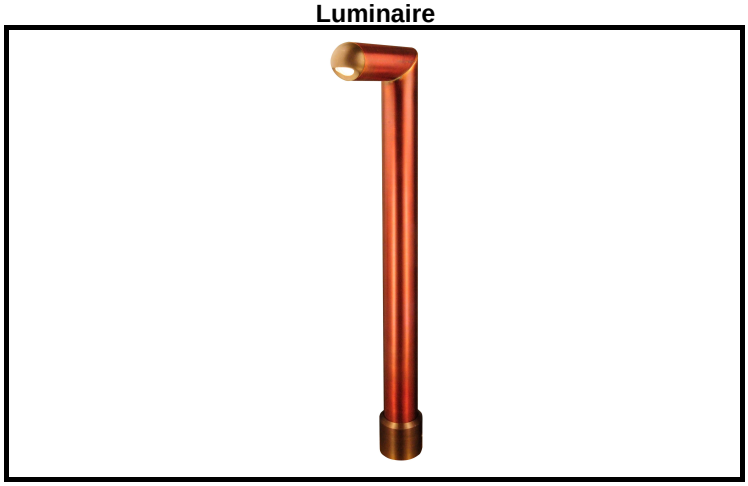


Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 4000K LED with 40° wide optic
Mounting: Step/Wall
Ballast/Driver: Integrated
Note:

This report has been pro-rated using data from report numbers 12250114.105, 12250114.01, 12250114.02, 12250114.03, 12250114.04, 12250114.05, and 12250114.06 to account for differences in color temperature.

Luminaire



Luminaire Characteristics

Luminous Length:	0.50	in.
Luminous Width:	0.5000	in.
Luminous Height:	1.00	in.

Summary of Results

Roadway Classification:	Type II, Very Short
Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.1	°C
Voltage:	12.01	VAC
Current:	0.1679	A
Power:	1.235	W
Power Factor:	0.613	
Frequency:	60	Hz
Current THD:	81.0	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

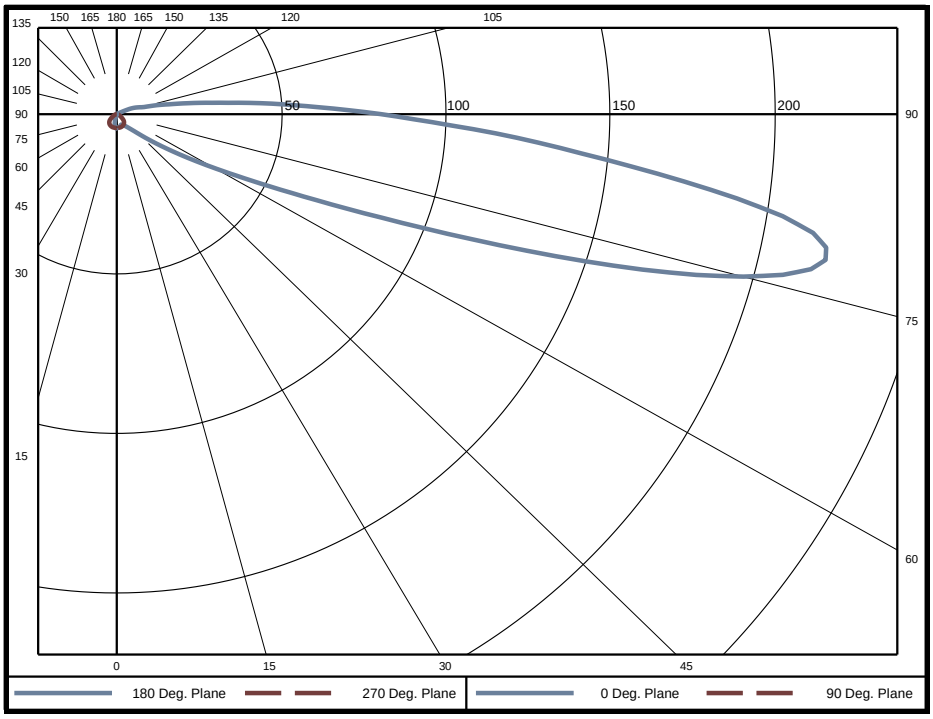
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.1 °C	12.01 VAC	0.1679 A	1.235 W	0.613	60 Hz	81.0 %

Summary of Results

Spacing Criteria
0-180: 9.11
90-270: 1.33

Total Lumen Output: 45.25 Lumens
Luminaire Efficacy: 36.6 lm/w
Maximum Candela: 219 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.103	0.2%	60-65	2.451	5.4%	120-125	0.025	0.1%
5-10	0.296	0.7%	65-70	3.987	8.8%	125-130	0.007	0.0%
10-15	0.447	1.0%	70-75	6.438	14.2%	130-135	0.002	0.0%
15-20	0.526	1.2%	75-80	8.102	17.9%	135-140	0.001	0.0%
20-25	0.565	1.2%	80-85	6.772	15.0%	140-145	0.000	0.0%
25-30	0.621	1.4%	85-90	4.174	9.2%	145-150	0	0.0%
30-35	0.683	1.5%	90-95	2.315	5.1%	150-155	0	0.0%
35-40	0.749	1.7%	95-100	1.175	2.6%	155-160	0	0.0%
40-45	0.830	1.8%	100-105	0.608	1.3%	160-165	0	0.0%
45-50	0.957	2.1%	105-110	0.340	0.8%	165-170	0	0.0%
50-55	1.192	2.6%	110-115	0.195	0.4%	170-175	0	0.0%
55-60	1.634	3.6%	115-120	0.055	0.1%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	4	8.8%
0-60	9	19.0%
0-90	41	89.6%
90-180	5	10.4%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
5	4.2	4.1	4.2	4.2	4.3	4.4	4.4	4.3	4.3	4.3	4.4	4.4	4.3	4.2	4.2	4.1
10	4.1	4.0	4.0	4.1	4.3	4.4	3.9	3.6	3.4	3.6	3.9	4.4	4.3	4.1	4.0	4.0
15	3.9	3.8	3.9	4.0	4.3	4.1	3.2	2.1	1.3	2.1	3.2	4.1	4.3	4.0	3.9	3.8
20	3.6	3.5	3.6	3.9	4.2	3.8	1.9	0.6	0.2	0.6	1.9	3.8	4.2	3.9	3.6	3.5
25	3.7	3.3	3.3	3.7	4.1	3.4	0.7	0.0	0.0	0.0	0.7	3.4	4.1	3.7	3.3	3.3
30	4.0	3.5	3.1	3.5	3.9	2.9	0.2	0.0	0.0	0.0	0.2	2.9	3.9	3.5	3.1	3.5
35	4.6	3.8	3.0	3.2	3.7	2.2	0.0	0.0	0.0	0.0	0.0	2.2	3.7	3.2	3.0	3.8
40	5.6	4.3	3.1	2.8	3.3	1.5	0.0	0.0	0.0	0.0	0.0	1.5	3.3	2.8	3.1	4.3
45	7.7	5.0	3.1	2.4	2.9	0.9	0.0	0.0	0.0	0.0	0.0	0.9	2.9	2.4	3.1	5.0
50	11.9	6.3	3.0	2.0	2.2	0.5	0.0	0.0	0.0	0.0	0.0	0.5	2.2	2.0	3.0	6.3
55	19.5	8.1	2.9	1.7	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.2	1.6	1.7	2.9	8.1
60	33.0	11.1	2.6	1.4	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.2	1.4	2.6	11.1
65	58.3	15.6	2.3	1.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.2	2.3	15.6
70	114.5	18.2	2.0	1.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.1	2.0	18.2
75	196.5	14.1	1.7	0.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	1.7	14.1
80	214.1	9.2	1.5	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.5	9.2
85	141.3	5.7	1.3	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	1.3	5.7
90	80.0	3.8	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	3.8
95	40.3	2.6	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9	2.6
100	18.8	1.9	0.7	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.7	1.9
105	8.5	1.4	0.5	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.5	1.4
110	5.9	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.9
115	1.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5
120	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
125	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	#VALUE!	#VALUE!	#VALUE!
45	#VALUE!	#VALUE!	#VALUE!
55	#VALUE!	#VALUE!	#VALUE!
65	#VALUE!	#VALUE!	#VALUE!
75	#VALUE!	#VALUE!	#VALUE!
85	#VALUE!	#VALUE!	#VALUE!

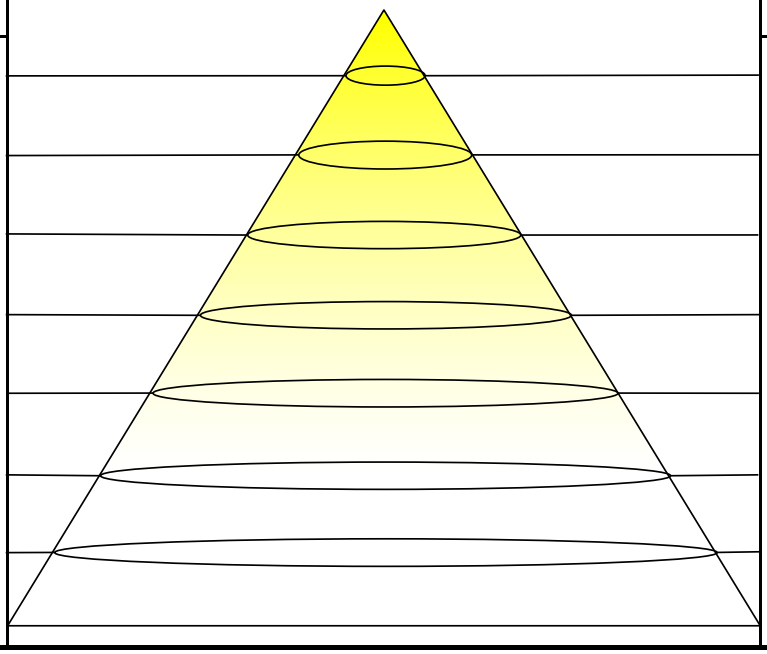
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	53	53	53	53	51	51	51	51	48	48	48	45	45	45	42	42	42	41
1	42	37	33	29	40	36	32	28	33	29	26	30	27	25	27	25	23	21
2	36	29	24	19	34	28	23	18	25	21	17	23	19	16	20	17	15	13
3	32	24	18	14	30	23	17	13	21	16	12	18	15	11	16	13	10	9
4	28	20	15	10	27	19	14	10	18	13	9	16	12	9	14	11	8	6
5	26	18	12	8	24	17	12	8	15	11	7	14	10	7	12	9	6	5
6	24	16	11	7	22	15	10	7	14	9	6	12	9	6	11	8	5	4
7	22	14	9	6	21	14	9	6	13	8	5	11	8	5	10	7	5	3
8	20	13	8	5	19	13	8	5	11	8	5	10	7	4	10	6	4	3
9	19	12	8	5	18	12	7	5	11	7	4	10	6	4	9	6	4	3
10	18	11	7	4	17	11	7	4	10	6	4	9	6	4	8	5	3	2

Beam and Field Information	
CIE Type:	Semi-Direct
Center Beam Intenisty:	4.3 Candela
Central Cone Intensity:	4 Candela
Beam Flux:	42.9 Lumens
Beam Angle (0-180):	127.8 Degrees
Beam Angle (90-270):	101.4 Degrees
Field Angle (0-180):	140.0 Degrees
Field Angle (90-270):	152.9 Degrees

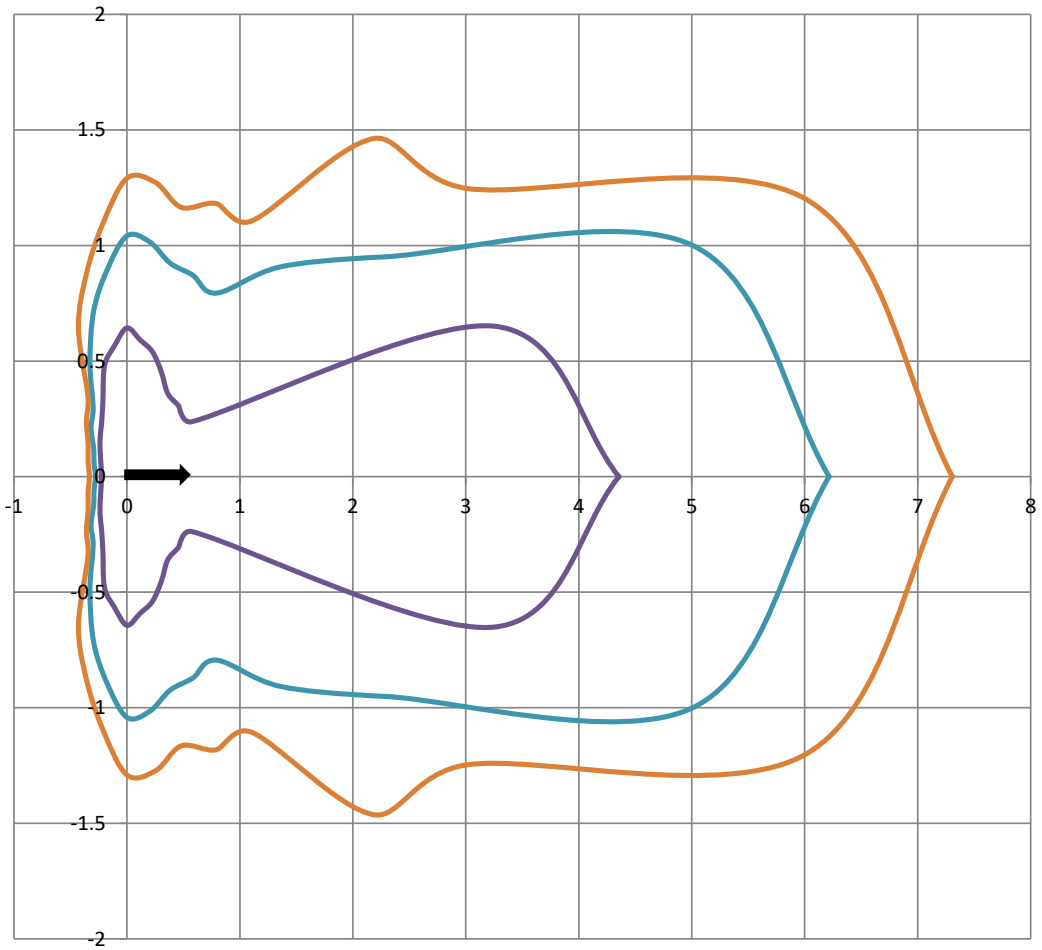
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.269	3.26
6.00	0.119	4.90
8.00	0.0671	6.53
10.0	0.0430	8.16
12.0	0.0298	9.79
14.0	0.0219	11.4
16.0	0.0168	13.1

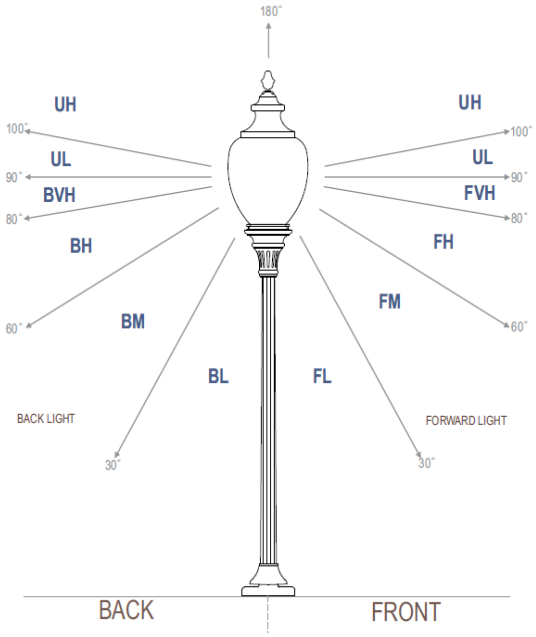


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	1.6	3.7%
FM	(30-60)	5.4	12.9%
FH	(60-80)	20.0	47.4%
FVH	(80-90)	9.5	22.6%
BL	(0-30)	1.0	2.4%
BM	(30-60)	0.7	1.7%
BH	(60-80)	0.1	0.2%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	2.7	6.5%
UH	(100-180)	1.1	2.6%
Total		42.1	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc
2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-WF-27 (60° OPTIC, 2700K)

Order Number
12250114
Test Number
12250114.109

Report Date

2018-05-09

Prepared By

Sean Gregory, Project Handler

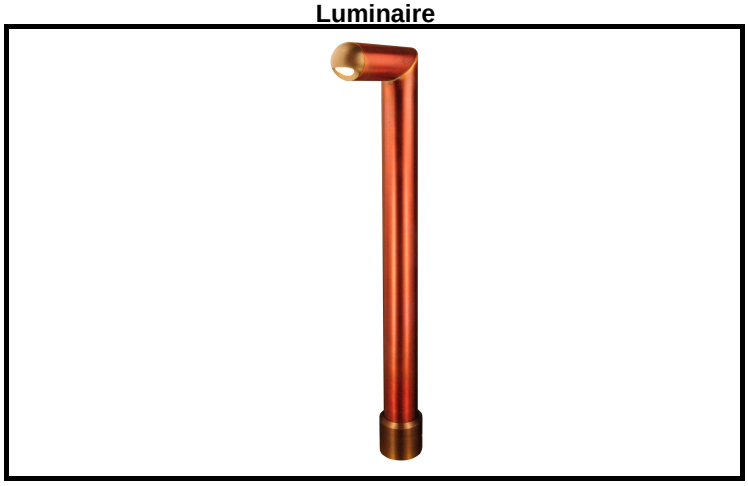
Approved By

Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 2700K LED with 60° wide flood optic
Mounting: Step/Wall
Ballast/Driver: Integrated
Note:

This report has been pro-rated using data from report numbers 12250114.108, 12250114.01, 12250114.02, 12250114.03, 12250114.04, 12250114.05, and 12250114.06 to account for differences in color temperature.

Luminaire



Luminaire Characteristics

Luminous Length:	0.50	in.
Luminous Width:	0.5000	in.
Luminous Height:	1.00	in.

Summary of Results

Roadway Classification:	Type II, Very Short
Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.4	°C
Voltage:	12.01	VAC
Current:	0.1678	A
Power:	1.235	W
Power Factor:	0.613	
Frequency:	60	Hz
Current THD:	81.0	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

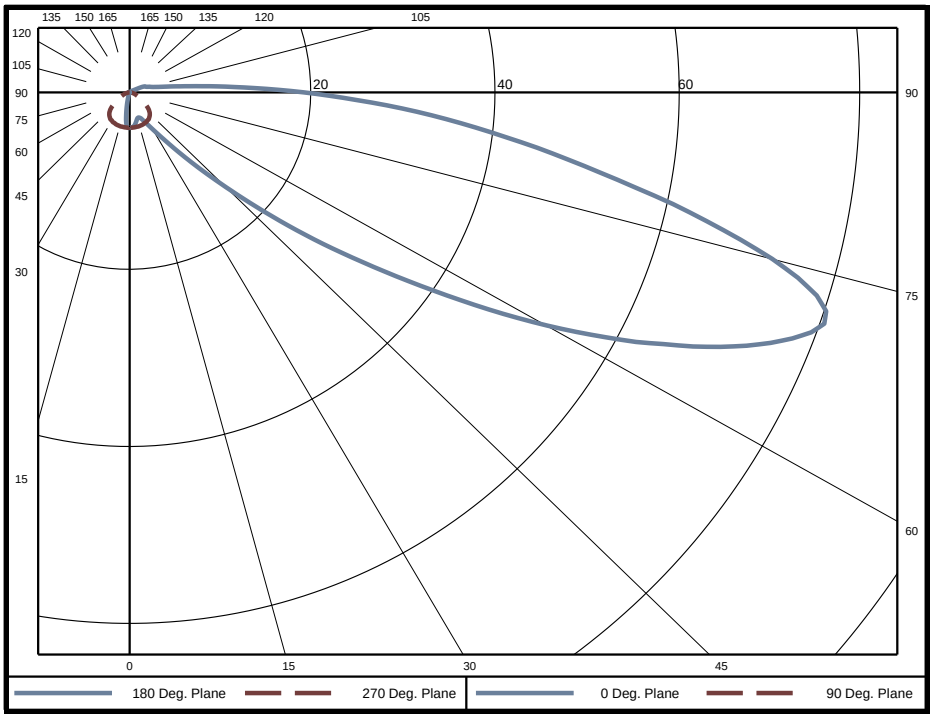
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.4 °C	12.01 VAC	0.1678 A	1.235 W	0.613	60 Hz	81.0 %

Summary of Results

Spacing Criteria
0-180: 6.52
90-270: 1.38

Total Lumen Output: 33.98 Lumens
Luminaire Efficacy: 27.5 lm/w
Maximum Candela: 80 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.095	0.3%	60-65	4.245	12.5%	120-125	0.023	0.1%
5-10	0.263	0.8%	65-70	4.906	14.4%	125-130	0.006	0.0%
10-15	0.365	1.1%	70-75	4.623	13.6%	130-135	0.001	0.0%
15-20	0.422	1.2%	75-80	3.325	9.8%	135-140	0.000	0.0%
20-25	0.470	1.4%	80-85	2.123	6.2%	140-145	0	0.0%
25-30	0.541	1.6%	85-90	1.305	3.8%	145-150	0	0.0%
30-35	0.650	1.9%	90-95	0.693	2.0%	150-155	0	0.0%
35-40	0.826	2.4%	95-100	0.354	1.0%	155-160	0	0.0%
40-45	1.114	3.3%	100-105	0.220	0.6%	160-165	0	0.0%
45-50	1.584	4.7%	105-110	0.157	0.5%	165-170	0	0.0%
50-55	2.284	6.7%	110-115	0.108	0.3%	170-175	0	0.0%
55-60	3.222	9.5%	115-120	0.051	0.2%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	4	10.7%
0-60	12	34.8%
0-90	32	95.2%
90-180	2	4.7%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98
5	3.92	3.86	3.89	3.94	4.00	4.04	3.94	3.85	3.72	3.85	3.94	4.04	4.00	3.94	3.89	3.86
10	3.60	3.55	3.73	3.88	3.97	3.92	3.18	2.36	1.88	2.36	3.18	3.92	3.97	3.88	3.73	3.55
15	3.13	3.08	3.39	3.79	3.95	3.60	1.75	0.96	0.64	0.96	1.75	3.60	3.95	3.79	3.39	3.08
20	3.04	2.87	2.99	3.60	3.90	2.92	0.85	0.29	0.12	0.29	0.85	2.92	3.90	3.60	2.99	2.87
25	3.50	3.10	2.73	3.34	3.80	2.13	0.34	0.00	0.00	0.00	0.34	2.13	3.80	3.34	2.73	3.10
30	4.55	3.79	2.71	3.03	3.70	1.53	0.07	0.00	0.00	0.00	0.07	1.53	3.70	3.03	2.71	3.79
35	6.43	5.02	2.90	2.69	3.56	1.05	0.00	0.00	0.00	0.00	0.00	1.05	3.56	2.69	2.90	5.02
40	9.92	6.99	3.20	2.33	3.30	0.68	0.00	0.00	0.00	0.00	0.00	0.68	3.30	2.33	3.20	6.99
45	15.74	10.30	3.57	2.02	2.89	0.42	0.00	0.00	0.00	0.00	0.00	0.42	2.89	2.02	3.57	10.30
50	25.00	15.42	3.92	1.73	2.29	0.23	0.00	0.00	0.00	0.00	0.00	0.23	2.29	1.73	3.92	15.42
55	37.15	22.44	4.08	1.48	1.65	0.10	0.00	0.00	0.00	0.00	0.00	0.10	1.65	1.48	4.08	22.44
60	52.69	30.60	3.79	1.26	1.18	0.03	0.00	0.00	0.00	0.00	0.00	0.03	1.18	1.26	3.79	30.60
65	67.93	36.37	3.17	1.09	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	1.09	3.17	36.37
70	79.26	33.68	2.39	0.94	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.94	2.39	33.68
75	72.70	21.92	1.75	0.81	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.81	1.75	21.92
80	52.20	10.43	1.41	0.69	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.69	1.41	10.43
85	34.73	5.39	1.16	0.56	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.56	1.16	5.39
90	18.99	3.13	0.96	0.44	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.44	0.96	3.13
95	7.91	1.89	0.78	0.30	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.30	0.78	1.89
100	3.60	1.34	0.60	0.17	0.00	0.00	0.00	0.01	0.04	0.01	0.00	0.00	0.00	0.17	0.60	1.34
105	2.38	1.03	0.43	0.09	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.09	0.43	1.03
110	1.87	0.74	0.27	0.04	0.00	0.00	0.00	0.03	0.06	0.03	0.00	0.00	0.00	0.04	0.27	0.74
115	1.25	0.44	0.14	0.00	0.00	0.00	0.00	0.03	0.06	0.03	0.00	0.00	0.00	0.00	0.14	0.44
120	0.44	0.24	0.06	0.00	0.00	0.00	0.00	0.02	0.06	0.02	0.00	0.00	0.00	0.00	0.06	0.24
125	0.22	0.09	0.01	0.00	0.00	0.00	0.00	0.01	0.05	0.01	0.00	0.00	0.00	0.00	0.01	0.09
130	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
135	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	#VALUE!	#VALUE!	#VALUE!
45	#VALUE!	#VALUE!	#VALUE!
55	#VALUE!	#VALUE!	#VALUE!
65	#VALUE!	#VALUE!	#VALUE!
75	#VALUE!	#VALUE!	#VALUE!
85	#VALUE!	#VALUE!	#VALUE!

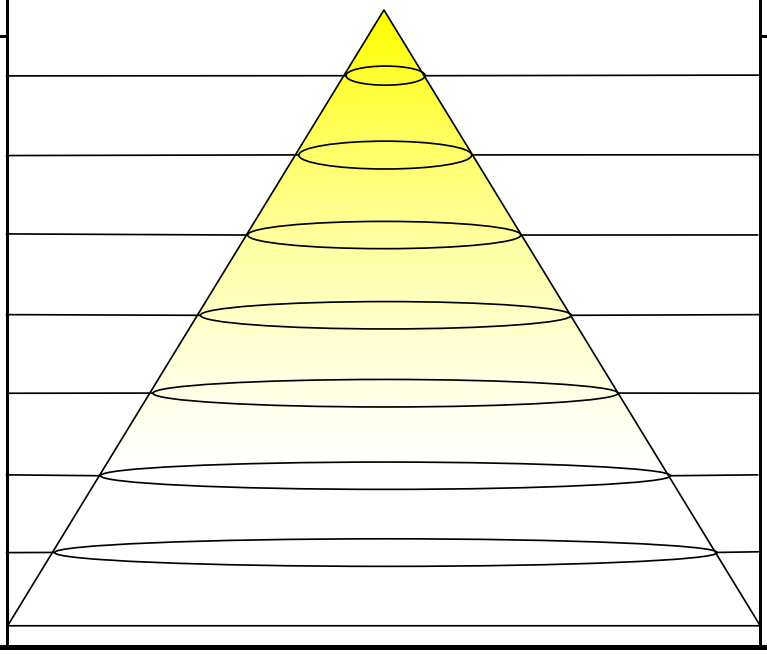
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	40	40	40	40	39	39	39	39	37	37	37	35	35	35	33	33	33	32
1	34	31	29	26	33	30	28	26	28	26	25	27	25	24	25	24	23	22
2	29	25	21	18	28	24	21	18	22	20	17	21	19	17	20	18	16	15
3	26	20	16	13	24	20	16	13	18	15	12	17	14	12	16	13	12	10
4	23	17	13	10	22	17	13	10	15	12	9	14	11	9	13	11	9	8
5	21	15	11	8	20	14	10	8	13	10	7	12	9	7	11	9	7	6
6	19	13	9	6	18	12	9	6	12	8	6	11	8	6	10	8	6	5
7	17	11	8	5	16	11	8	5	10	7	5	10	7	5	9	7	5	4
8	16	10	7	4	15	10	7	4	9	6	4	9	6	4	8	6	4	3
9	15	9	6	4	14	9	6	4	9	6	4	8	5	4	8	5	3	3
10	14	9	5	3	13	8	5	3	8	5	3	7	5	3	7	5	3	2

Beam and Field Information	
CIE Type:	Direct
Center Beam Intenisty:	3.98 Candela
Central Cone Intensity:	4 Candela
Beam Flux:	31.8 Lumens
Beam Angle (0-180):	118.0 Degrees
Beam Angle (90-270):	104.6 Degrees
Field Angle (0-180):	137.9 Degrees
Field Angle (90-270):	152.4 Degrees

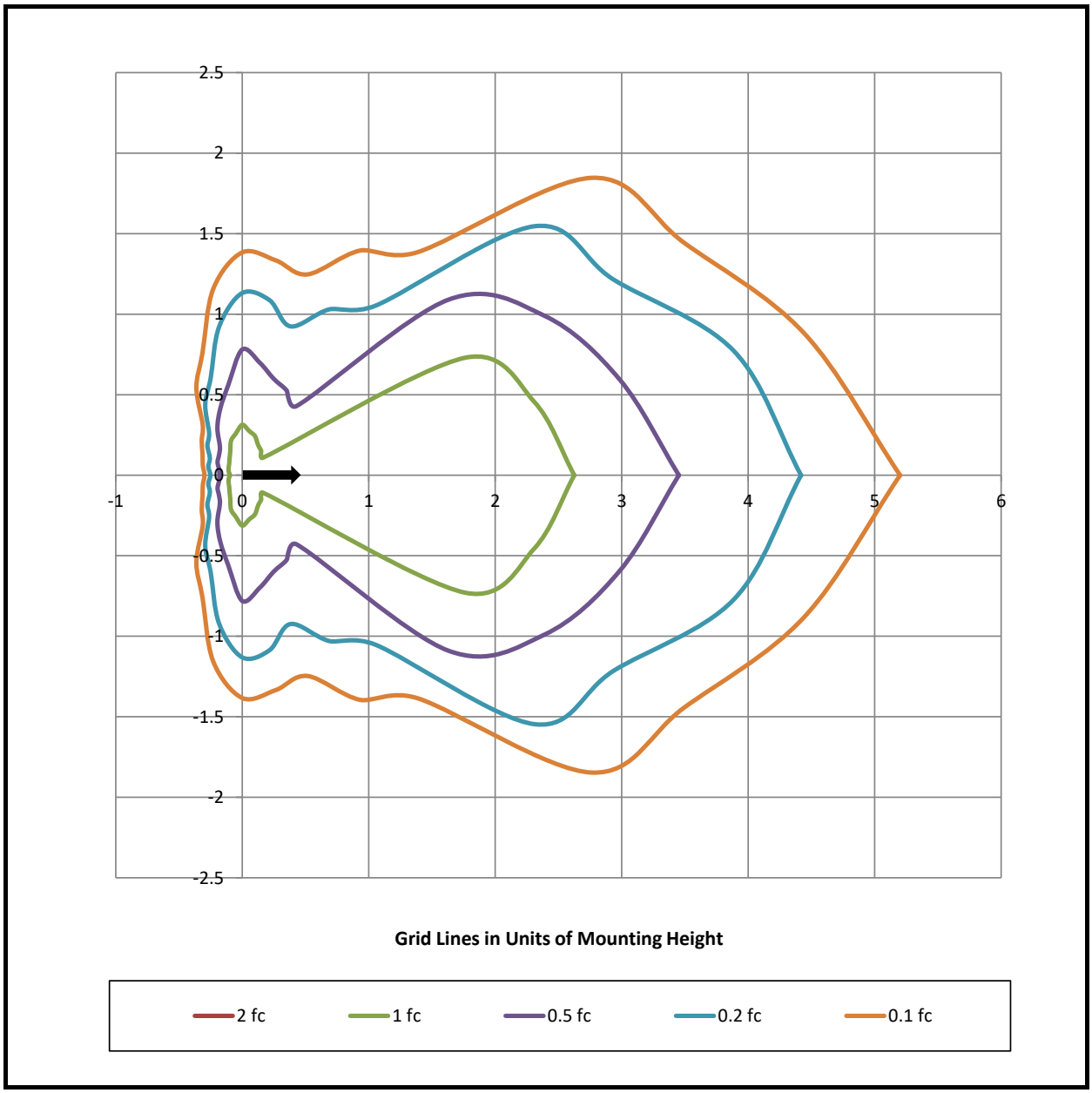
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.248	2.88
6.00	0.110	4.33
8.00	0.0621	5.77
10.0	0.0397	7.21
12.0	0.0276	8.65
14.0	0.0203	10.1
16.0	0.0155	11.5

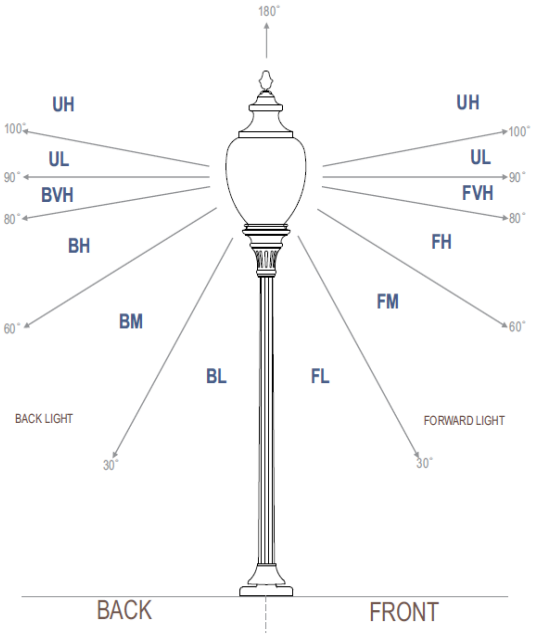


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	1.4	4.3%
FM	(30-60)	9.3	27.6%
FH	(60-80)	16.7	49.9%
FVH	(80-90)	3.2	9.7%
BL	(0-30)	0.7	2.2%
BM	(30-60)	0.5	1.5%
BH	(60-80)	0.1	0.2%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	1.0	2.9%
UH	(100-180)	0.6	1.7%
Total		33.5	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

ACCREDITED
Testing Laboratory

NVLAP LAB CODE 201042-0

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-WF-30 (60° OPTIC, 3000K)

Order Number
12250114
Test Number
12250114.108

Test Date

2018-05-04

Prepared By

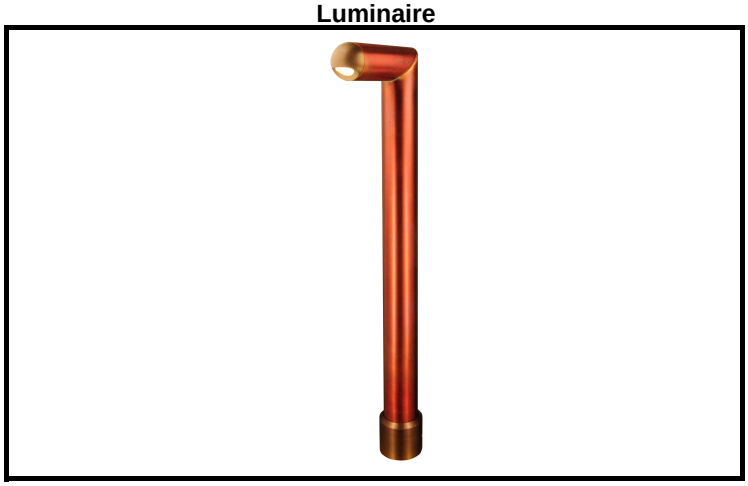
Cordaryl Cousar, Technician

Approved By

Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 3000K LED with 60° wide flood optic
Mounting: Step/Wall
Ballast/Driver: Integrated

Luminaire



Luminaire Characteristics

Luminous Length:	0.50	in.
Luminous Width:	0.5000	in.
Luminous Height:	1.00	in.

Summary of Results

Roadway Classification:	Type II, Very Short
Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.4	°C
Voltage:	12.01	VAC
Current:	0.1678	A
Power:	1.235	W
Power Factor:	0.613	
Frequency:	60	Hz
Current THD:	81.0	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

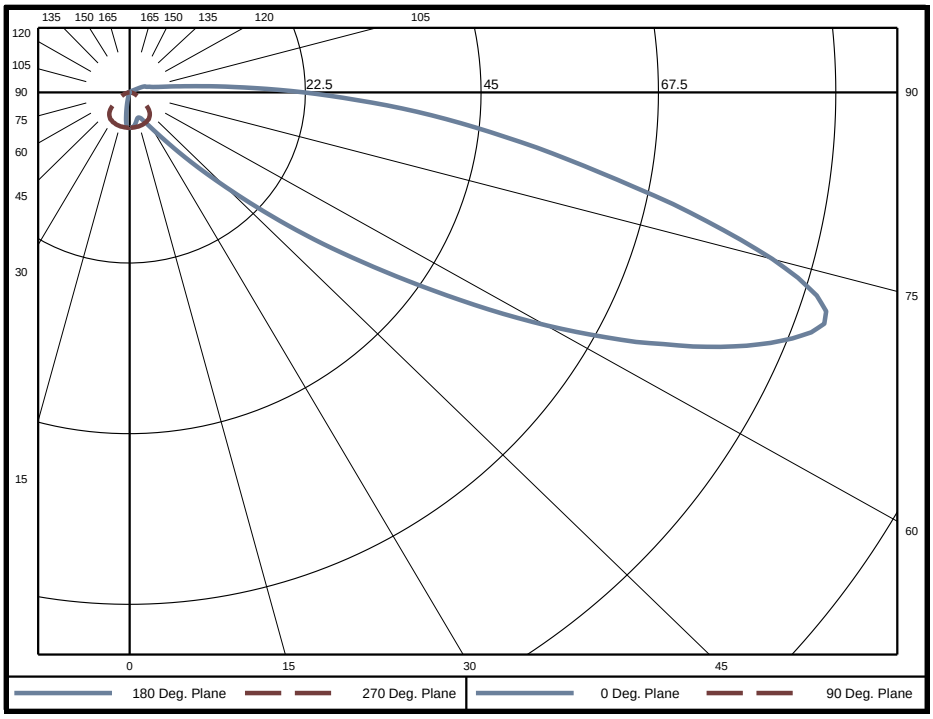
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.4 °C	12.01 VAC	0.1678 A	1.235 W	0.613	60 Hz	81.0 %

Summary of Results

Spacing Criteria
0-180: 6.52
90-270: 1.38

Total Lumen Output: 39.65 Lumens
Luminaire Efficacy: 32.1 lm/w
Maximum Candela: 94 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.111	0.3%	60-65	4.954	12.5%	120-125	0.027	0.1%
5-10	0.307	0.8%	65-70	5.725	14.4%	125-130	0.007	0.0%
10-15	0.426	1.1%	70-75	5.395	13.6%	130-135	0.001	0.0%
15-20	0.493	1.2%	75-80	3.880	9.8%	135-140	0.000	0.0%
20-25	0.549	1.4%	80-85	2.478	6.2%	140-145	0	0.0%
25-30	0.631	1.6%	85-90	1.523	3.8%	145-150	0	0.0%
30-35	0.758	1.9%	90-95	0.809	2.0%	150-155	0	0.0%
35-40	0.964	2.4%	95-100	0.413	1.0%	155-160	0	0.0%
40-45	1.300	3.3%	100-105	0.257	0.6%	160-165	0	0.0%
45-50	1.848	4.7%	105-110	0.184	0.5%	165-170	0	0.0%
50-55	2.666	6.7%	110-115	0.126	0.3%	170-175	0	0.0%
55-60	3.760	9.5%	115-120	0.060	0.2%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	4	10.7%
0-60	14	34.8%
0-90	38	95.3%
90-180	2	4.8%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64
5	4.58	4.51	4.54	4.60	4.66	4.71	4.59	4.50	4.34	4.50	4.59	4.71	4.66	4.60	4.54	4.51
10	4.20	4.15	4.35	4.53	4.64	4.57	3.71	2.76	2.19	2.76	3.71	4.57	4.64	4.53	4.35	4.15
15	3.65	3.60	3.96	4.42	4.61	4.20	2.04	1.12	0.74	1.12	2.04	4.20	4.61	4.42	3.96	3.60
20	3.55	3.35	3.49	4.20	4.56	3.40	0.99	0.33	0.14	0.33	0.99	3.40	4.56	4.20	3.49	3.35
25	4.08	3.62	3.19	3.90	4.44	2.49	0.40	0.00	0.00	0.00	0.40	2.49	4.44	3.90	3.19	3.62
30	5.31	4.42	3.17	3.54	4.31	1.79	0.09	0.00	0.00	0.00	0.09	1.79	4.31	3.54	3.17	4.42
35	7.51	5.85	3.39	3.14	4.15	1.22	0.00	0.00	0.00	0.00	0.00	1.22	4.15	3.14	3.39	5.85
40	11.57	8.16	3.73	2.72	3.85	0.79	0.00	0.00	0.00	0.00	0.00	0.79	3.85	2.72	3.73	8.16
45	18.37	12.02	4.17	2.36	3.37	0.49	0.00	0.00	0.00	0.00	0.00	0.49	3.37	2.36	4.17	12.02
50	29.17	17.99	4.58	2.02	2.67	0.27	0.00	0.00	0.00	0.00	0.00	0.27	2.67	2.02	4.58	17.99
55	43.36	26.19	4.76	1.73	1.93	0.12	0.00	0.00	0.00	0.00	0.00	0.12	1.93	1.73	4.76	26.19
60	61.49	35.71	4.43	1.47	1.37	0.04	0.00	0.00	0.00	0.00	0.00	0.04	1.37	1.47	4.43	35.71
65	79.28	42.44	3.70	1.27	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.27	3.70	42.44
70	92.50	39.30	2.78	1.10	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	1.10	2.78	39.30
75	84.84	25.58	2.05	0.94	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.94	2.05	25.58
80	60.92	12.17	1.65	0.80	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.80	1.65	12.17
85	40.53	6.28	1.36	0.65	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.65	1.36	6.28
90	22.17	3.65	1.12	0.51	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.51	1.12	3.65
95	9.23	2.20	0.91	0.35	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.35	0.91	2.20
100	4.20	1.56	0.70	0.20	0.00	0.00	0.00	0.01	0.04	0.01	0.00	0.00	0.00	0.20	0.70	1.56
105	2.77	1.21	0.50	0.11	0.00	0.00	0.00	0.03	0.06	0.03	0.00	0.00	0.00	0.11	0.50	1.21
110	2.18	0.86	0.31	0.04	0.00	0.00	0.00	0.03	0.08	0.03	0.00	0.00	0.00	0.04	0.31	0.86
115	1.45	0.51	0.17	0.00	0.00	0.00	0.00	0.03	0.07	0.03	0.00	0.00	0.00	0.00	0.17	0.51
120	0.52	0.27	0.07	0.00	0.00	0.00	0.00	0.02	0.07	0.02	0.00	0.00	0.00	0.00	0.07	0.27
125	0.26	0.10	0.01	0.00	0.00	0.00	0.00	0.01	0.06	0.01	0.00	0.00	0.00	0.00	0.01	0.10
130	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
135	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	28760	28760	28760
45	53680	9546	9859
55	121500	10210	5408
65	219900	7686	2764
75	240100	4238	1445
85	120800	2897	418

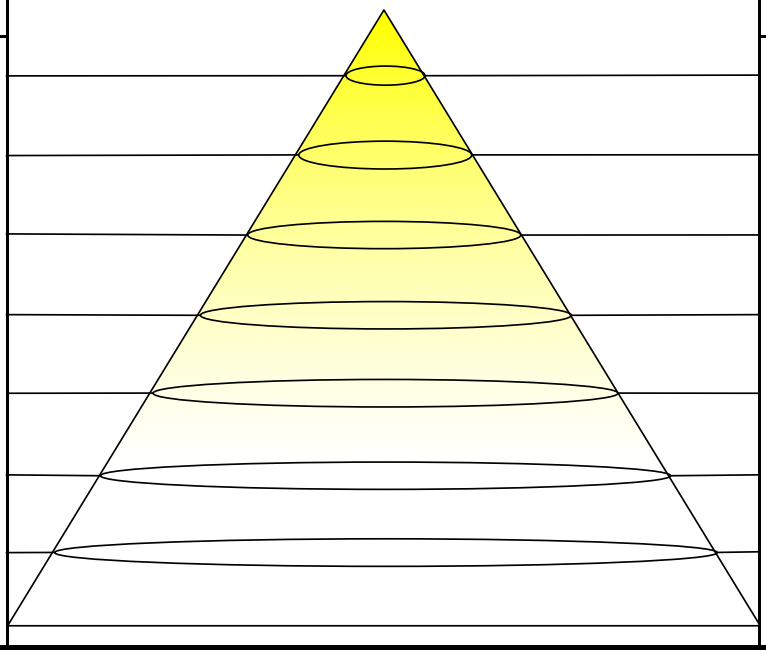
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	47	47	47	47	45	45	45	45	43	43	43	41	41	41	39	39	39	38
1	40	36	33	31	38	35	33	30	33	31	29	31	29	28	29	28	26	25
2	34	29	25	21	33	28	24	21	26	23	20	24	22	19	23	21	18	17
3	30	24	19	15	28	23	19	15	21	18	15	20	17	14	18	16	13	12
4	27	20	15	12	25	19	15	11	18	14	11	17	13	11	15	13	10	9
5	24	17	13	9	23	17	12	9	15	12	9	14	11	8	13	10	8	7
6	22	15	11	7	21	15	10	7	14	10	7	13	9	7	12	9	6	5
7	20	13	9	6	19	13	9	6	12	8	6	11	8	6	11	8	5	4
8	19	12	8	5	18	12	8	5	11	7	5	10	7	5	10	7	5	4
9	17	11	7	5	16	11	7	4	10	7	4	9	6	4	9	6	4	3
10	16	10	6	4	15	10	6	4	9	6	4	9	6	4	8	5	4	3

Beam and Field Information	
CIE Type:	Direct
Center Beam Intenisty:	4.64 Candela
Central Cone Intensity:	5 Candela
Beam Flux:	37.1 Lumens
Beam Angle (0-180):	118.0 Degrees
Beam Angle (90-270):	104.6 Degrees
Field Angle (0-180):	137.9 Degrees
Field Angle (90-270):	152.4 Degrees

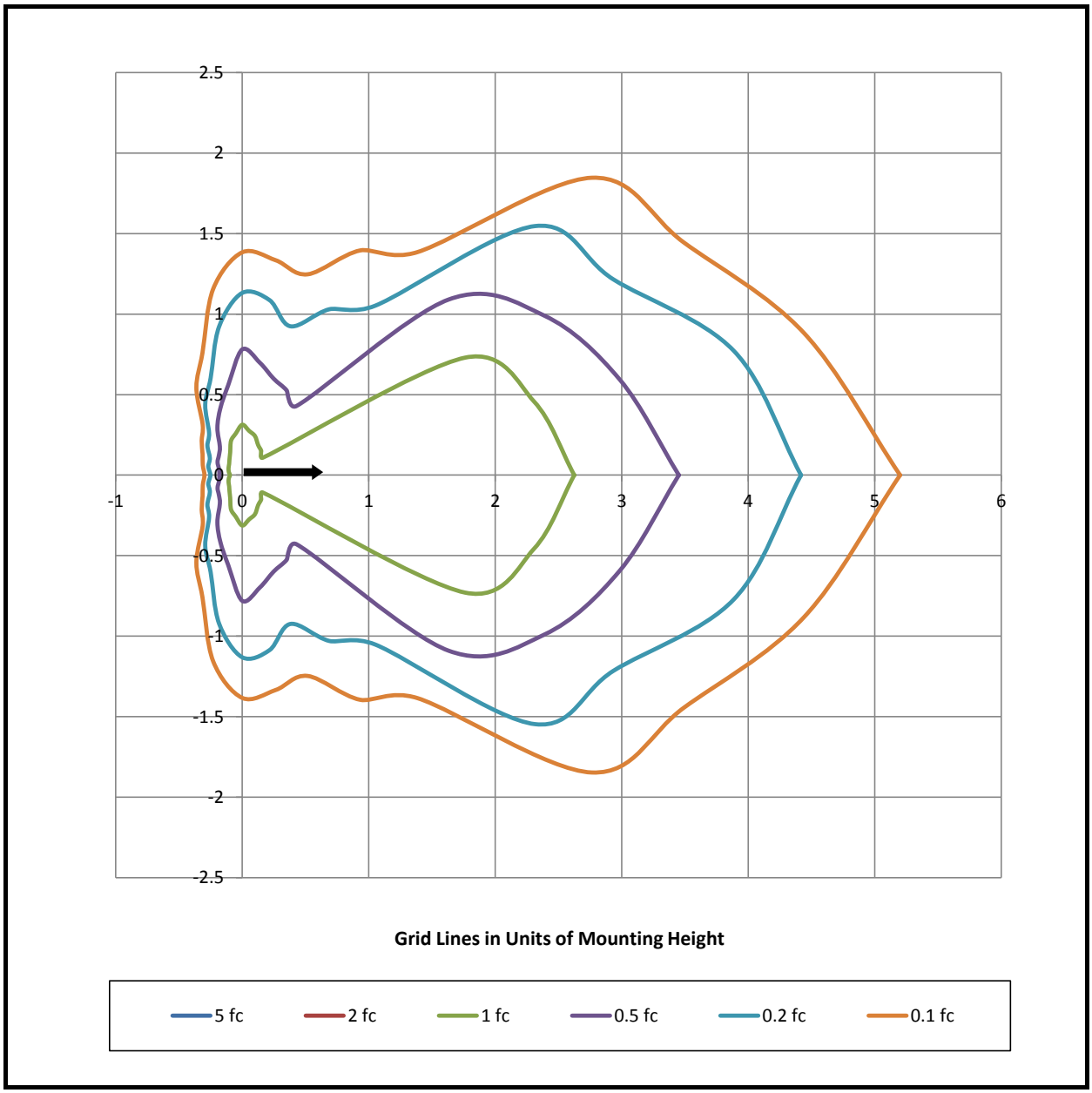
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.290	2.88
6.00	0.129	4.33
8.00	0.0725	5.77
10.0	0.0464	7.21
12.0	0.0322	8.65
14.0	0.0237	10.1
16.0	0.0181	11.5

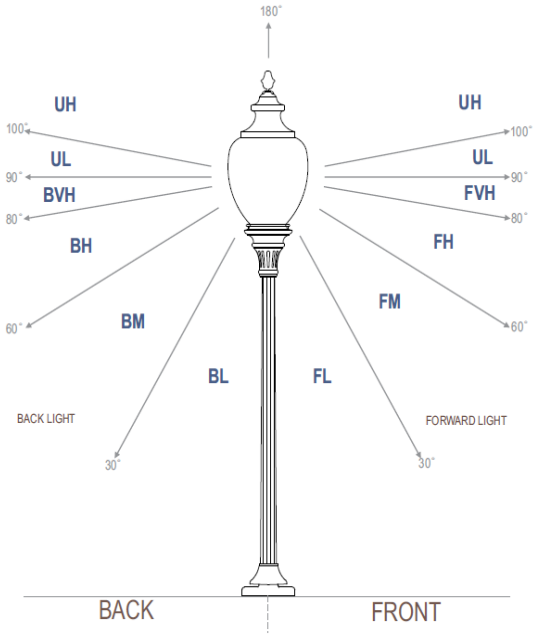


ISOFootcandle Plot

Mounting Height - 2 Feet



IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	1.7	4.3%
FM	(30-60)	10.8	27.6%
FH	(60-80)	19.5	49.9%
FVH	(80-90)	3.8	9.7%
BL	(0-30)	0.9	2.2%
BM	(30-60)	0.6	1.5%
BH	(60-80)	0.1	0.2%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	1.1	2.9%
UH	(100-180)	0.6	1.7%
Total		39.1	100.0%
BUG Rating	**B0 U1 G0**		

UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-2002

Prepared For

Auroralight Inc

2742 Loker Ave W
#100
Carlsbad, CA 92010-6619
United States

Catalog Number

LSW8-PL-WF-40 (60° OPTIC, 4000K)

Order Number
12250114
Test Number
12250114.110

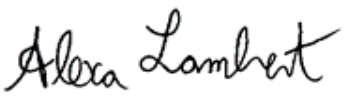
Report Date

2018-05-09

Prepared By

Sean Gregory, Project Handler

Approved By

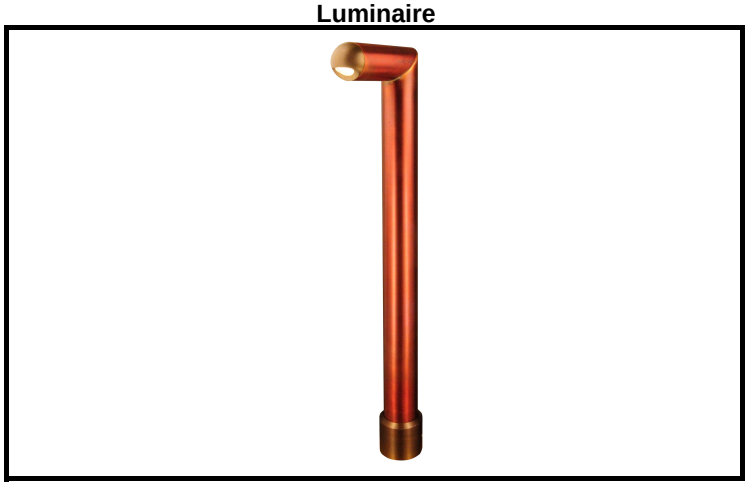


Alexa Lambert, Project Handler

Luminaire Description: Cylindrical copper housing with circular metal domed faceplate
Lamp: One (1) Cree XP-L 4000K LED with 60° wide flood optic
Mounting: Step/Wall
Ballast/Driver: Integrated
Note:

This report has been pro-rated using data from report numbers 12250114.108, 12250114.01, 12250114.02, 12250114.03, 12250114.04, 12250114.05, and 12250114.06 to account for differences in color temperature.

Luminaire



Luminaire Characteristics

Luminous Length:	0.50	in.
Luminous Width:	0.5000	in.
Luminous Height:	1.00	in.

Summary of Results

Roadway Classification:	Type II, Very Short
Cutoff Classification:	Noncutoff
BUG Rating:	B0 U1 G0

Test Conditions

Test Temperature:	24.4	°C
Voltage:	12.01	VAC
Current:	0.1678	A
Power:	1.235	W
Power Factor:	0.613	
Frequency:	60	Hz
Current THD:	81.0	%

Tested in 30 planes left side, 30 planes right side, left and right averaged
Vertical test increments are 2.5 degrees
Test distance exceeds five times the greatest luminous opening of luminaire

Laboratory results may not be representative of field performance
Ballast factors have not been applied

Distribution - Goniophotometer

Distribution Test Conditions

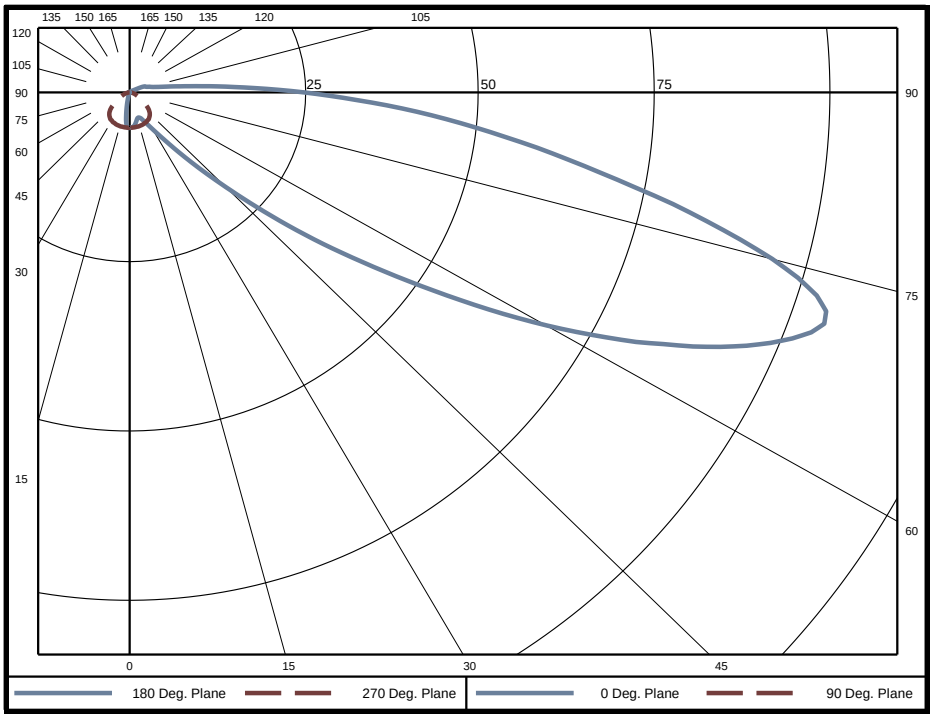
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.4 °C	12.01 VAC	0.1678 A	1.235 W	0.613	60 Hz	81.0 %

Summary of Results

Spacing Criteria
0-180: 6.52
90-270: 1.38

Total Lumen Output: 44.41 Lumens
Luminaire Efficacy: 36.0 lm/w
Maximum Candela: 105 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	0.124	0.3%	60-65	5.548	12.5%	120-125	0.031	0.1%
5-10	0.344	0.8%	65-70	6.412	14.4%	125-130	0.008	0.0%
10-15	0.477	1.1%	70-75	6.043	13.6%	130-135	0.001	0.0%
15-20	0.552	1.2%	75-80	4.346	9.8%	135-140	0.000	0.0%
20-25	0.614	1.4%	80-85	2.775	6.2%	140-145	0	0.0%
25-30	0.707	1.6%	85-90	1.706	3.8%	145-150	0	0.0%
30-35	0.849	1.9%	90-95	0.906	2.0%	150-155	0	0.0%
35-40	1.080	2.4%	95-100	0.463	1.0%	155-160	0	0.0%
40-45	1.456	3.3%	100-105	0.288	0.6%	160-165	0	0.0%
45-50	2.070	4.7%	105-110	0.206	0.5%	165-170	0	0.0%
50-55	2.986	6.7%	110-115	0.141	0.3%	170-175	0	0.0%
55-60	4.211	9.5%	115-120	0.067	0.2%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	5	10.7%
0-60	15	34.8%
0-90	42	95.2%
90-180	2	4.8%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
5	5.1	5.1	5.1	5.2	5.2	5.3	5.1	5.0	4.9	5.0	5.1	5.3	5.2	5.2	5.1	5.1
10	4.7	4.6	4.9	5.1	5.2	5.1	4.2	3.1	2.5	3.1	4.2	5.1	5.2	5.1	4.9	4.6
15	4.1	4.0	4.4	4.9	5.2	4.7	2.3	1.3	0.8	1.3	2.3	4.7	5.2	4.9	4.4	4.0
20	4.0	3.8	3.9	4.7	5.1	3.8	1.1	0.4	0.2	0.4	1.1	3.8	5.1	4.7	3.9	3.8
25	4.6	4.1	3.6	4.4	5.0	2.8	0.4	0.0	0.0	0.0	0.4	2.8	5.0	4.4	3.6	4.1
30	5.9	5.0	3.5	4.0	4.8	2.0	0.1	0.0	0.0	0.0	0.1	2.0	4.8	4.0	3.5	5.0
35	8.4	6.6	3.8	3.5	4.7	1.4	0.0	0.0	0.0	0.0	0.0	1.4	4.7	3.5	3.8	6.6
40	13.0	9.1	4.2	3.1	4.3	0.9	0.0	0.0	0.0	0.0	0.0	0.9	4.3	3.1	4.2	9.1
45	20.6	13.5	4.7	2.6	3.8	0.5	0.0	0.0	0.0	0.0	0.0	0.5	3.8	2.6	4.7	13.5
50	32.7	20.2	5.1	2.3	3.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	3.0	2.3	5.1	20.2
55	48.6	29.3	5.3	1.9	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	2.2	1.9	5.3	29.3
60	68.9	40.0	5.0	1.6	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.6	5.0	40.0
65	88.8	47.5	4.1	1.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.4	4.1	47.5
70	103.6	44.0	3.1	1.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.2	3.1	44.0
75	95.0	28.7	2.3	1.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.1	2.3	28.7
80	68.2	13.6	1.8	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.9	1.8	13.6
85	45.4	7.0	1.5	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.5	7.0
90	24.8	4.1	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.3	4.1
95	10.3	2.5	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	2.5
100	4.7	1.7	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	1.7
105	3.1	1.4	0.6	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.6	1.4
110	2.4	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	1.0
115	1.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6
120	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
125	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average Luminance (cd/m^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	#VALUE!	#VALUE!	#VALUE!
45	#VALUE!	#VALUE!	#VALUE!
55	#VALUE!	#VALUE!	#VALUE!
65	#VALUE!	#VALUE!	#VALUE!
75	#VALUE!	#VALUE!	#VALUE!
85	#VALUE!	#VALUE!	#VALUE!

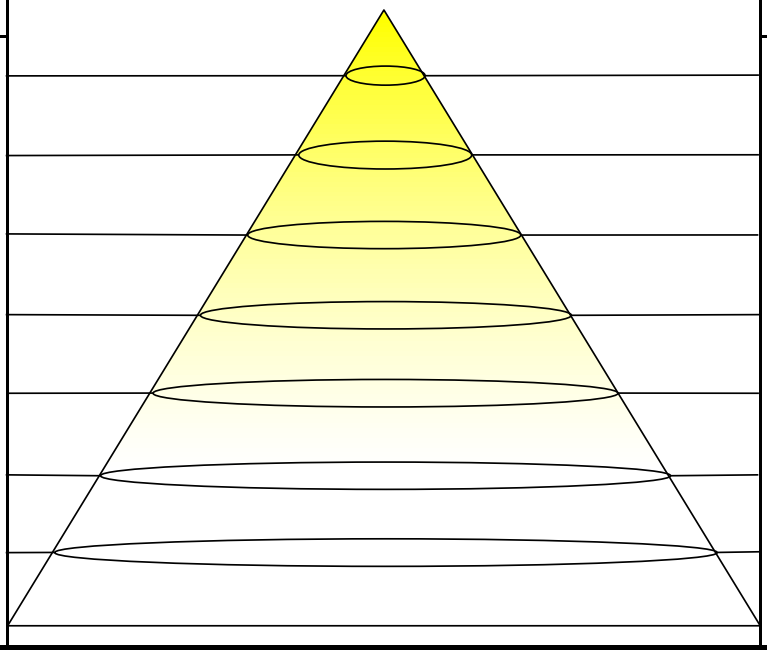
Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	52	52	52	52	51	51	51	51	48	48	48	46	46	46	43	43	43	42
1	44	41	38	35	43	39	36	34	37	35	32	35	33	31	33	31	30	28
2	38	33	28	24	37	31	27	23	29	26	22	27	24	22	26	23	21	19
3	33	27	21	17	32	26	21	17	24	20	16	22	19	16	21	18	15	14
4	30	22	17	13	28	22	17	13	20	16	12	19	15	12	17	14	11	10
5	27	19	14	10	26	19	14	10	17	13	10	16	12	9	15	12	9	8
6	24	17	12	8	23	16	12	8	15	11	8	14	10	8	13	10	7	6
7	22	15	10	7	21	15	10	7	14	9	7	13	9	6	12	9	6	5
8	21	14	9	6	20	13	9	6	12	8	6	11	8	5	11	8	5	4
9	19	12	8	5	18	12	8	5	11	7	5	10	7	5	10	7	4	4
10	18	11	7	4	17	11	7	4	10	7	4	10	6	4	9	6	4	3

Beam and Field Information	
CIE Type:	Direct
Center Beam Intenisty:	5.2 Candela
Central Cone Intensity:	5 Candela
Beam Flux:	41.6 Lumens
Beam Angle (0-180):	118.0 Degrees
Beam Angle (90-270):	104.6 Degrees
Field Angle (0-180):	137.9 Degrees
Field Angle (90-270):	152.4 Degrees

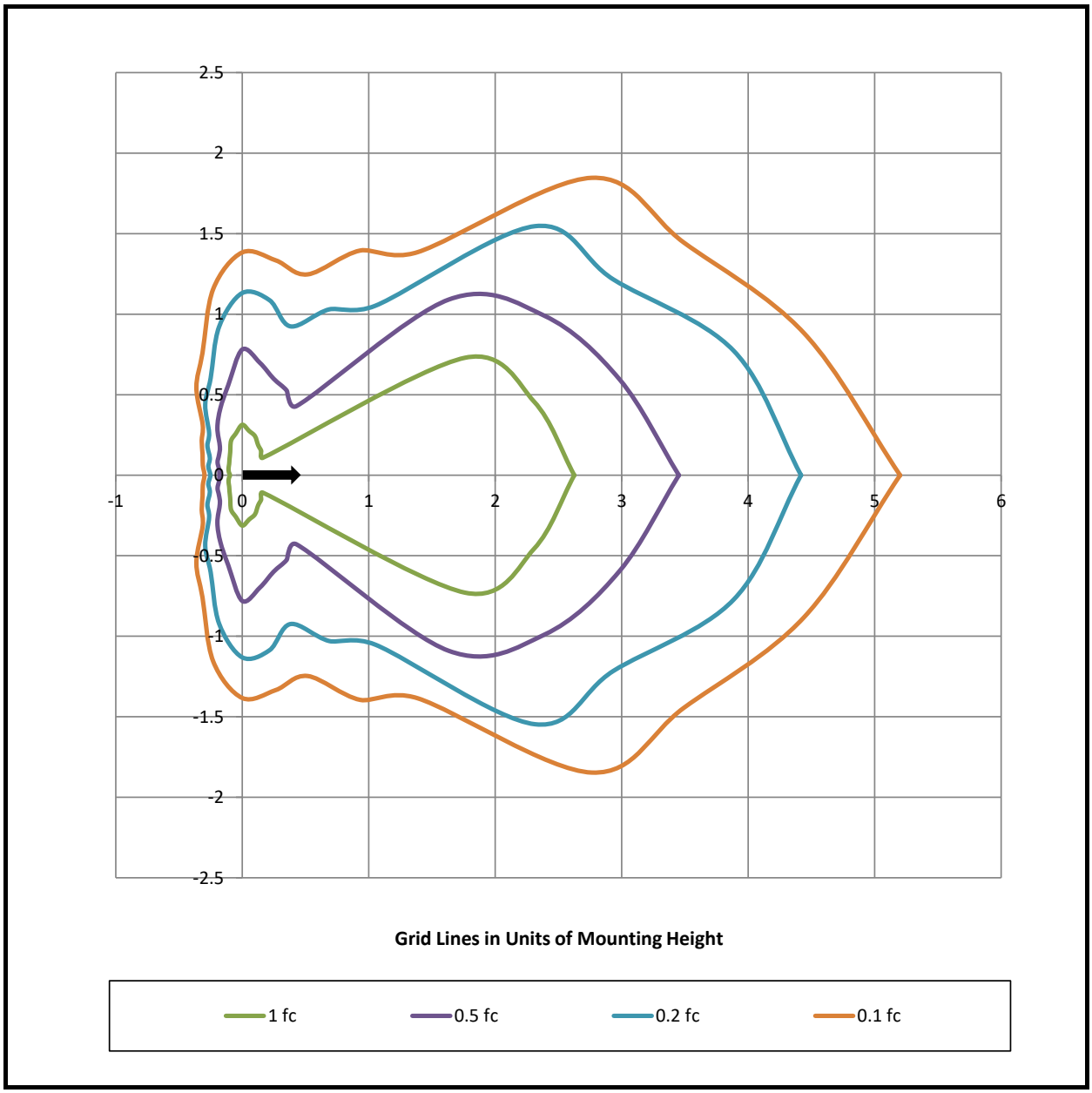
Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	0.325	2.88
6.00	0.144	4.33
8.00	0.0812	5.77
10.0	0.0519	7.21
12.0	0.0361	8.65
14.0	0.0265	10.1
16.0	0.0203	11.5

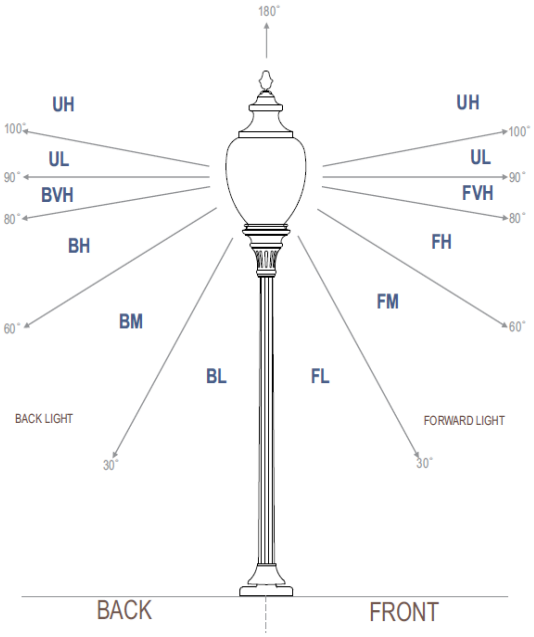


ISOFootcandle Plot

Mounting Height - 2 Feet

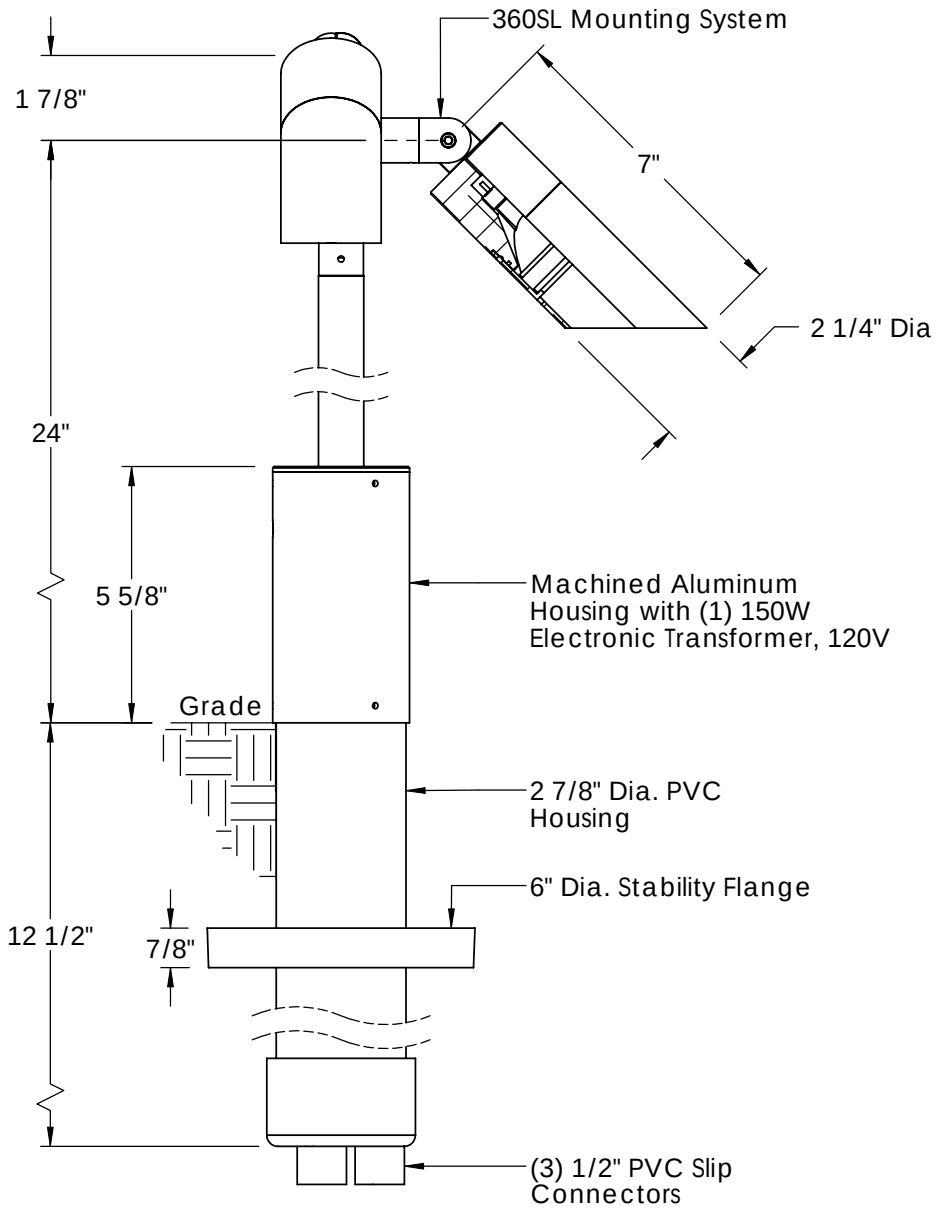


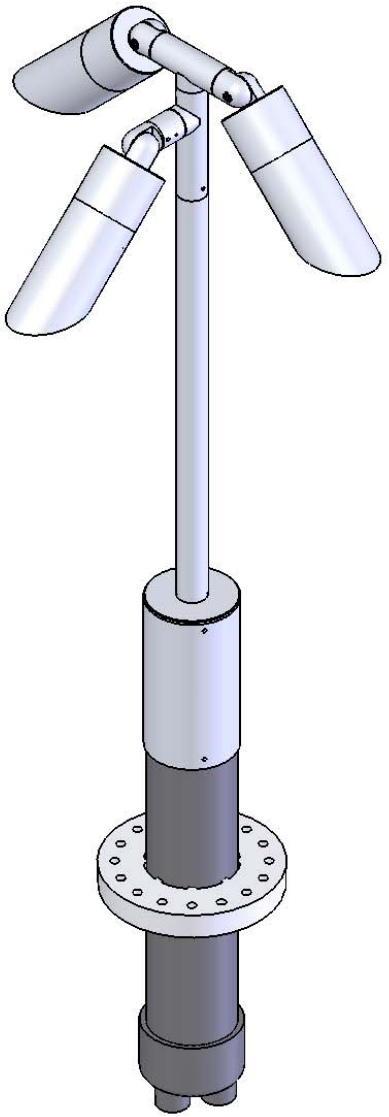
IES "BUG" Rating
(Back Light, Uplight, Glare)
Per IES TM-15-11



Luminaire Classification System (LCS)

LCS	Zone	Lumens	Luminaire %
FL	(0-30)	1.9	4.3%
FM	(30-60)	12.1	27.6%
FH	(60-80)	21.8	49.9%
FVH	(80-90)	4.2	9.7%
BL	(0-30)	1.0	2.2%
BM	(30-60)	0.7	1.5%
BH	(60-80)	0.1	0.2%
BVH	(80-90)	0.0	0.0%
UL	(90-100)	1.3	2.9%
UH	(100-180)	0.7	1.7%
Total		43.8	100.0%
BUG Rating	**B0 U1 G0**		





(3) DELTA STAR "A" FIXTURES ON STAFF STAR "C" ON PPII-L150E

07/29/10 | **B-K LIGHTING, INC.** | DRAWING NUMBER CUS-1334-88

ROGER PRADIER

Factory - Headquarters
46 avenue d'Occitanie
36250 Saint-Maur - France

Trade office Paris
12 rue Lamartine
75009 Paris - France

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France +33(0)2 54 53 56 54
Fax +33(0)2 54 34 78 45

info@roger-pradier.com
roger-pradier.com

Distributor

DESIGNED & MANUFACTURED IN FRANCE · ROGER PRADIER · CHÂTEAUROUX ·
WARRANTY 25 YEARS ALUMINIUM ANTI-CORROSION

Made in France

Lampiok 4

Design by Stéphane Joyeux

OUTDOOR LIGHTING · FRANCE · ROGER PRADIER

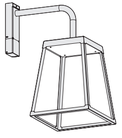
Inspired by the emblematic four-sided lantern, the Lampiok collection is on the rise with Lampiok 4.
This massive bracket – monochrone or two-tone – is available in a wide range of colours.

Its mighty and open-air design is delicately hemmed with aluminium. The material is cut-out, folded and adjusted with precision as is Roger Pradier®'s know-how.

OUTDOOR LIGHTING
Estd. 1910
CHATEAUROUX • FRANCE

LAMPIOK 4 COLLECTION

height / width / depth



883 / 452 / 721
1

883 / 452 / 721
2

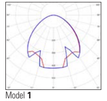
TECHNICAL DATA

IP 65
Class 1

LED 35W - 3000K warm white
LED 35W - 4000K neutral white
LED 70W - 3000K warm white (model 1)
LED 70W - 4000K neutral white (model 1)

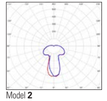
Aluminium

For two coloured version, bracket and mounting plate remains black grey 107 (RAL 7021)
Opal or satin-finish PMMA diffuser (model 1)
Satin-finish PMMA tube diffuser (model 2)



Model **1**

LED 70W - IP65
Real light output / opal - 5440 lm
Real light output / satin-finish - 5885 lm
CRI > 80



Model **2**

LED 35W - IP65
Real light output / satin-finish - 3007 lm
CRI > 80

REFERENCES

Monochrome version

Replace ••• with the colour code

MODELS	DIFFUSERS	LED 35W 3000K warm white	LED 35W 4000K neutral white	LED 70W 3000K warm white	LED 70W 4000K neutral white	SPARE DIFFUSERS
1	OPAL PMMA	175 001 •••	175 004 •••	175 007 •••	175 009 •••	165 091 615
	SATIN-FINISH PMMA	175 002 •••	175 005 •••	175 008 •••	175 010 •••	165 091 616
2	SATIN-FINISH PMMA TUBE	175 003 •••	175 006 •••			165 092 612

COLOURS CODES

Replace ••• with the colour code

RAL 9005 JET BLACK 000
RAL 7021 BLACK GREY 107
RAL 7044 SILK GREY 105
RAL 9010 PURE WHITE 101
RAL 6009 FIR GREEN 067
RAL 3013 TOMATO RED 110
OLD RUSTIC 046

24 standard colours
Others colours on request

REFERENCES

Two coloured version with black grey 107 (RAL 7021) bracket and mounting plate

Replace ••• with the colour code

MODELS	DIFFUSERS	LED 35W 3000K warm white	LED 35W 4000K neutral white	LED 70W 3000K warm white	LED 70W 4000K neutral white	SPARE DIFFUSERS
1	OPAL PMMA	175 201 •••	175 204 •••	175 207 •••	175 209 •••	165 091 615
	SATIN-FINISH PMMA	175 202 •••	175 205 •••	175 208 •••	175 210 •••	165 091 616
2	SATIN-FINISH PMMA TUBE	175 203 •••	175 206 •••			165 092 612

COLOURS CODES

Replace ••• with the colour code

RAL 7044 SILK GREY 105
RAL 9010 PURE WHITE 101
RAL 6009 FIR GREEN 067
RAL 3013 TOMATO RED 110

24 standard colours
Others colours on request

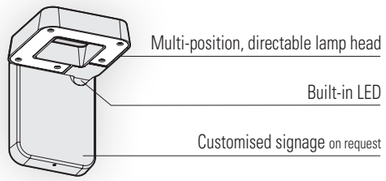
Square

Design by Patrick Norguet

Square

IP65
IK09
Class 1

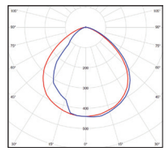
Aluminium
Satin-finish polycarbonate diffuser



H 259 mm
W 226 mm
D 271 mm

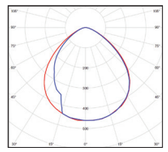
SOURCES

LED 30W - 2700K warm white
LED 30W - 4000K neutral white



Model **1**

LED 30W
Real light output - 2716 lm
CRI > 80

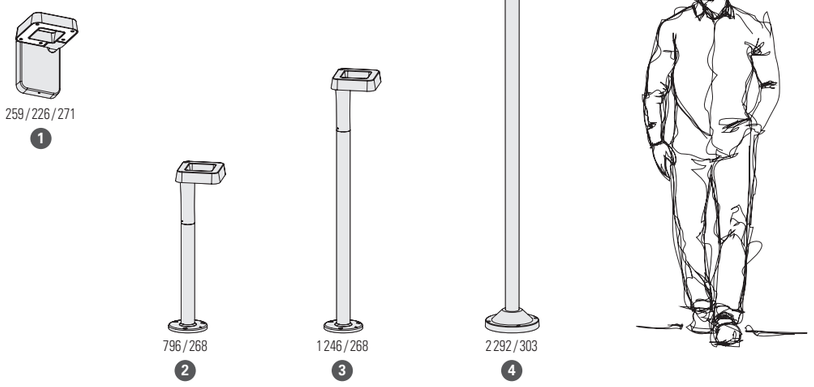


Models **2** to **4**

LED 30W
Real light output - 2691 lm
CRI > 80

MODELS

height / width / depth



REFERENCES

Replace ••• with the colour code

MODELS	LED 30W 2700K warm white	LED 30W 4000K neutral white
1	156 002 •••	156 001 •••
2	156 004 •••	156 003 •••
3	156 006 •••	156 005 •••
4	156 008 •••	156 007 •••

COLOURS CODES

Replace ••• with the colour code

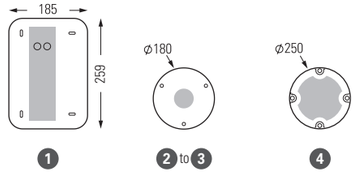
RAL 7021 BLACK GREY 107
DARK GREY 006
RAL 7044 SILK GREY 105

WHITE 001
RAL 3013 TOMATO RED 110
LIMESTONE 053

Other colours on request

MOUNTING

Wiring entry points in grey
Fixing kit included



Type:
BEGA Product:
Project:
Modified:

Application
Designed for down lighting atriums, canopies, passages, and other interior and exterior locations featuring a symmetrical wide beam light distribution.

Materials
Luminaire housing constructed of die-cast marine grade, copper free (≤0.3% copper content) A360.0 aluminum alloy
Faceplate constructed of 316 grade machined stainless steel
Clear safety glass
Reflector made of pure anodized aluminum
High temperature silicone gasket
Stainless steel screw clamps
Ceiling mounted driver enclosure constructed of aluminum

NRTL listed to North American Standards, suitable for wet locations
Protection class IP65
Weight: 0.5 lbs

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-30° C
LED module wattage	4.2 W
System wattage	6 W
Controllability	0-10V dimmable
Color rendering index	Ra > 90
Luminaire lumens	299 lumens (3000K)
Lifetime at Ta = 15° C	>500,000 h (L70)
Lifetime at Ta = 25° C	159,000 h (L70)

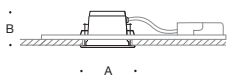
LED color temperature

☐ 4000K - Product number + **K4**
☐ 3500K - Product number + **K35**
☐ 3000K - Product number + **K3**
☐ 2700K - Product number + **K27**

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
#4 brushed stainless steel.
Custom colors are not available.
Stainless steel requires regular cleaning and maintenance, much like household appliances to maintain its luster and prevent tarnishing or the appearance of rust like stains.

Mounting options
☐ **CP** Ceiling pan



LED recessed ceiling downlight · wide beam

	LED	β	A	B
55822	4.2 W	81°	3 1/8	2 1/2

β = Beam angle

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Type:
BEGA Product:
Project:
Modified:

Application
LED recessed wall luminaire with asymmetrical forward throw distribution for superior illumination of ground surfaces from an extremely low mounting height. The optimal mounting height between 1' and 1.5' above finished grade.

Materials
Luminaire housing constructed of die-cast aluminum marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy
Clear safety glass with optical texture
Reflector made of pure anodized aluminum
Silicone applied robotically to casting, plasma treated for increased adhesion
High temperature silicone gasket
Mechanically captive stainless steel fasteners
Stainless steel screw clamps
Composite installation housing

NRTL listed to North American Standards, suitable for wet locations
Protection class IP65
Weight: 1.2 lbs

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-40° C
LED module wattage	5.1 W
System wattage	8.0 W
Controlability	0-10V dimmable
Color rendering index	Ra > 80
Luminaire lumens	301 lumens (3000K)
Lifetime at Ta=15°C	> 500,000 h (L70)
Lifetime at Ta=25°C	470,000 h (L70)

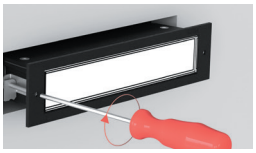
LED color temperature

2700K - Product number + **K27**
3000K - Product number + **K3**
3500K - Product number + **K35**
4000K - Product number + **K4**

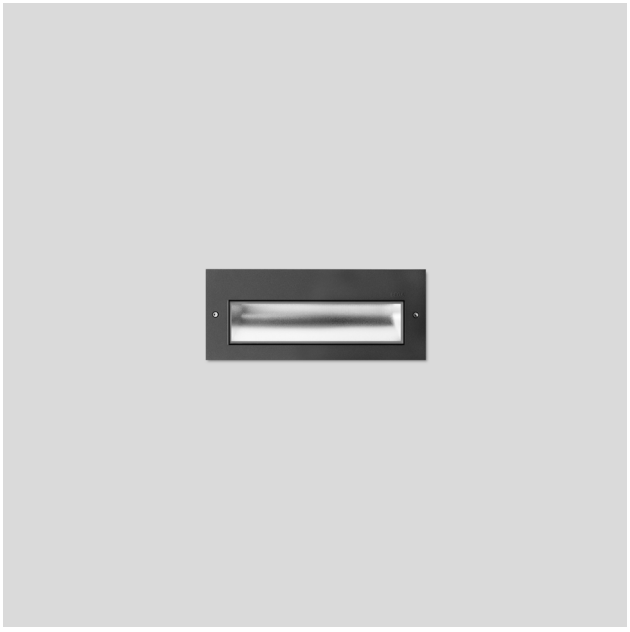
BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors	Black (BLK)	White (WHT)	RAL:
	Bronze (BRZ)	Silver (SLV)	CUS:



Fully enclosed luminaire with installation housing ensures seamless integration and weathertight operation.



LED recessed wall luminaires · asym. forward throw

	LED	A	B	C
24 063	5.1 W	6 5/8	2 3/4	5

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Outdoor Lamp

By Coe Studios

LUMENS
LIGHT AND LIVING

Call Us 877.445.4486

Product Options

Glass Color: Clear, Frosted
Size: Entryway, Garden, Estate

Details

- Hand-blown, slightly textured glass shade
- Solid bronze construction
- Adaptable for either low-voltage or line-voltage installation
- UL Listed for wet locations
- Designed by Jerry Coe
- Finish: Bronze
- UL Listed Wet
- Made In USA

Dimensions

Entryway Option Fixture: Height 10"
Estate Option Fixture: Height 11"
Garden Option Fixture: Height 8"
Entryway Option Fixture: Width 12"
Estate Option Fixture: Width 18"
Garden Option Fixture: Width 8"
Entryway Option Fixture: Diameter 5.38"
Estate Option Fixture: Diameter 7.25"
Garden Option Fixture: Diameter 3.5"
Entryway Option Fixture: Depth 12"
Estate Option Fixture: Depth 18"
Garden Option Fixture: Depth 8"

Notes:

Lighting

- Entryway option utilizes one 60 Watt 120 Volt Incandescent lamp (included).
- Estate option utilizes one 60 Watt 120 Volt Incandescent lamp (included).
- Garden option utilizes one 18 Watt 12 Volt bayonet Incandescent lamp (two included), or one 15 Watt 120 Volt bayonet Incandescent lamp (two included)

Additional Details

Product URL: https://www.lumens.com/outdoor-lamp-by-coe-studios-uu15833.html
Rating: UL Listed Wet

Product ID: uu15833

Prepared by:

Prepared for:
Project:
Room:
Placement:
Approval:

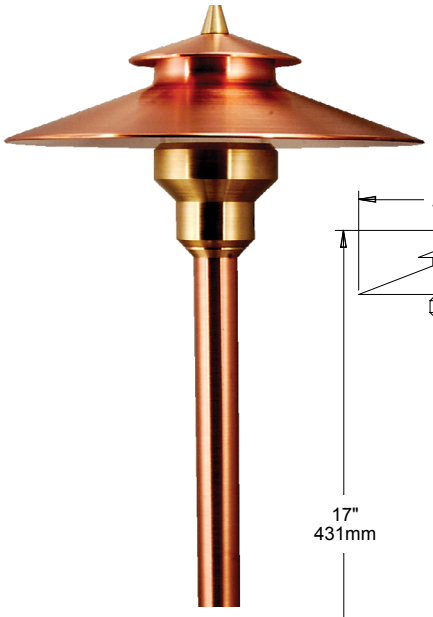
Created December 23rd, 2019

auroralight

auroralight lifetime WARRANTY

TYPE:
CAT. #: HPL6-

HPL6 LA JOLLA



NAT

The compact size of the **HPL6** allows for it to be installed discretely into planters and is ideal for illuminating pathways and intimate garden areas. Use anywhere a less obvious light source is desired. With a timeless design, precision manufacturing and the highest quality materials, our HPL luminaires are the clear choice.

Every HPL series path light gives you a choice of a Thermally Integrated® Field Serviceable LED Module or traditional Halogen lamp. Using Copper Core™ Technology, the HPL module is specifically engineered to transfer heat away from the LED driver/circuit and dissipate throughout the luminaire, ensuring optimal performance, color consistency and long life!

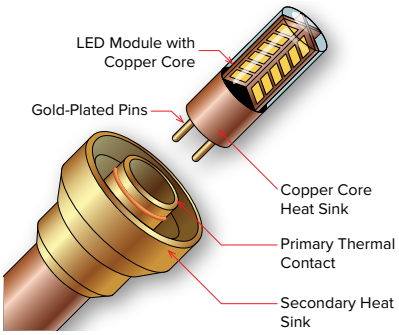
Features include:

- Interchangeable LED Module in 2.5 or 3.5 Watts
- 2700 or 3000K (CRI 80 typ.)
- Thermally Integrated® Field Serviceable LED Module
- TRIAC Dimming to <10% typ.
- 12 VAC Electronic or Magnetic Source Compatible
- Solid Copper and Brass Construction
- Patent Pending

LED hybrid HALOGEN

12V

COPPER CORE TECHNOLOGY™



ORDERING GUIDE: HPL6 H (HYBRID) PL (PATH LIGHT) 6 (INCHES)

Prefix

INDICATES REQUIRED FIELD *INDICATES OPTIONAL FIELD*

Auroralight LED Module
[227] 2.5 Watts, 2700K
[230] 2.5 Watts, 3000K
[327] 3.5 Watts, 2700K
[330] 3.5 Watts, 3000K

ACCESSORIES
(Select One)
[180] 180˚ Directional Reflector™ *
[270] 270˚ Directional Reflector™ *
[ID] Internal Diffuser (Frosted)

* Visible light

MOUNT
[1/2] 1/2" Male Thread
[G/S] Ground Stake
[D/S] Deluxe Stake 9"
[T/R-X] Trident Spike (**9**" or **12**")
[P/B-S] Power Box w/ Stake (Inc. 60W 120-12V transformer)
[P/M] 4" Pedestal Mount
[SM3] 3 1/4" Surface Mount
[SM2] 2 1/4" Surface Mount

[X] = Specify Length
NOTE: See Mount Guide for more options

FINISH
[NAT] Natural
[BLP] Bronze Living Patina
[BLP-XD] BLP Extra Dark
[NI] Nickel PVD

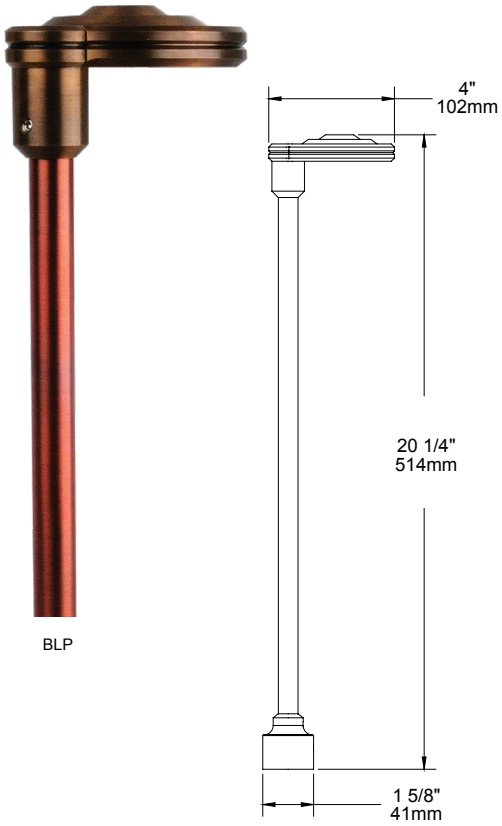
ACCESSORIES

MOUNTS

MADE IN THE USA
CARLSBAD, CA | PHONE 877 942 1179 | FAX 760 931 2916 | E-MAIL SALES@AURORALIGHT.COM | AURORALIGHT.COM

TYPE:
CAT. #: LPL1-

LPL1 CENTINELA



The **LPL1** is a stylish, low energy LED path light. Its contemporary design and slim profile allow it to blend seamlessly into the surrounding landscape.

Features include:

- 2.5 Watts
- Cree XLAMP® (XP-G) LED
- 2700, 3000 or 4500K (CRI 80 typ.)
- Fully Integrated LED
- TRIAC Dimming to <10% typ.
- 12 VAC Electronic or Magnetic Source Compatible
- Recommended Spacing 10–18' O.C.
- Solid Copper and Brass Construction

Powered by CREE LEDs

12V

ida APPROVED Dark-Sky Friendly Fixture www.darksky.org

ORDERING GUIDE: Prefix **LPL1** L (LED) PL (PATH LIGHT) 1 (SERIES)

INDICATES REQUIRED FIELD *INDICATES OPTIONAL FIELD*

LED COLOR
[27] 2700K
[30] 3000K
[45] 4500K
[27D] 2700K
[30D] 3000K
[45D] 4500K

[D] = Dimmable

PL MOUNT
[1/2] 1/2" Male Thread
[G/S] Ground Stake
[D/S] Deluxe Stake 9"
[T/R-X] Trident Spike (**9**" or **12**")
[P/B-S] Power Box w/ Stake (Inc. 60W 120-12V trans.)
[P/M] 4" Pedestal Mount
[SM3] 3 1/4" Surface Mount
[SM2] 2 1/4" Surface Mount

[X] = Specify Length
NOTE: See Mount Guide for more options

FINISH
[NAT] Natural
[BLP] Bronze Living Patina
[BLP-XD] BLP Extra Dark
[NI] Nickel PVD

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c UL us LISTED

auroralight

auroralight lifetime WARRANTY

TYPE:
CAT. #: LSW8-PL-

LSW8-PL MERIDIAN

BR-BLP

The LSW8-PL is an ideal solution for uniform spacing and light levels in the absence of a structure. Its small aperture effectively shields against glare while allowing for excellent forward projection with even illumination side to side. Pair with our LSW8 step/wall light for design continuity throughout your project.

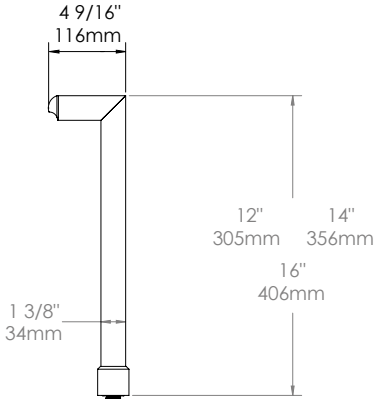
Features include:

- 1.25 Watts and up to 45 lumens
- Cree XP-L® High Density LED
- 2700, 3000 or 4000K (CRI 80 typ.)
- Interchangeable UV & Shock Resistant Silicone Optic
- Thermally Integrated®, Field Serviceable LED Module
- TRIAC Dimming to <10% typ.
- 12 VAC Electronic or Magnetic
- Copper and Brass Body w/ Brass or Copper Faceplate

Powered by CREE LEDs

12V

COPPER CORE TECHNOLOGY®



FACEPLATE OPTIONS

CU-NAT CU-BLP BR-NI

Prefix

ORDERING GUIDE: **LSW8-PL** L (LED) SW (STEP/WALL) 8 (8 X 1/8 INCHES) PL (PATH LIGHT)

INDICATES REQUIRED FIELD *INDICATES OPTIONAL FIELD*

FACEPLATE
[BR] Brass
[CU] Copper

OPTIC
[N] 15° Narrow
[M] 25° Medium
[W] 40° Wide
[WF] 60° Wide Flood
[A] All Optics

LED COLOR
[27D] 2700K
[30D] 3000K
[40D] 4000K
[AMBD] Amber (XP-E) (585-595 nm)

[D] = Dimmable

HEIGHT
[12] 12"
[14] 14"
[16] 16"
[XX] Specify

MOUNT
[1/2] 1/2" Male Thread
[G/S] Ground Stake
[T/R-X] Trident Spike (**9**" or **12**")
[P/B-S] Power Box w/ Stake (Inc. 60W 120-12V transformer)
[P/M] 4" Pedestal Mount
[SM3] 3 1/4" Surface Mount
[SM2] 2 1/4" Surface Mount

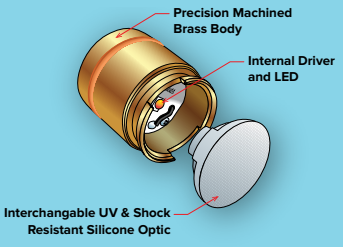
[X] = Specify Length

NOTE: See Mount Guide for more options

FINISH
[NAT] Natural
[BLP] Bronze Living Patina
[BLP-XD] BLP Extra Dark
[NI] Nickel PVD (Faceplate only)

Highly Configurable Machined Brass LED Module

IP67 sealed module with encapsulated electronics, Copper PCB and interchangeable silicone optics.



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MADE IN THE USA

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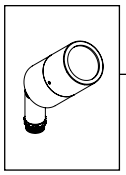


BK SSL SOLID STATE LIGHTING

the power of dimming with adjust-e-lume® TECHNOLOGY

NITE STAR II™

PROJECT:	
TYPE:	
CATALOG NUMBER:	
SOURCE:	
NOTES:	

CATALOG NUMBER LOGIC

	NSII	LED								
Example	- NSII	- LED	- e64	- SP	- A5	- BZW	- 12	- 11	- 360SL	

Material
Blank - Aluminum
B - Brass
S - Stainless Steel

Series
NSII - Nite Star II™

Source
LED - **'e'** Technology with Integral Dimming Driver (See Specifications for Dimming)
Designed for use with remote 12VAC BKSSL® transformers. Requires magnetic Low Voltage dimmer

LED Type
e64 - 7WLED/2.7K
e65 - 7WLED/3K
e66 - 7WLED/4K
e74 - 7WLED/Amber

Optics*
NSP - Narrow Spot (Red Indicator)
SP - Spot (Green Indicator)
MFL - Medium Flood (Yellow Indicator)
WFL - Wide Flood (Blue Indicator)

Adjust-e-Lume® Output Intensity** *(Choose factory setting)*
A9 (Standard)**, A8, A7, A6, A5, A4, A3, A2, A1**
***Please see Adjust-e-Lume® photometry to determine desired intensity.*

Finish

Aluminum Finish

Powder Coat Color	Satin	Wrinkle
Bronze	**BZP**	**BZW**
Black	**BLP**	**BLW**
White (Gloss)	**WHP**	**WHW**
Aluminum	**SAP**	—
Verde	—	**VER**

Brass Finish

Machined	**MAC**
Polished	**POL**
Mitique™	**MIT**

Stainless Finish

Machined	**MAC**
Polished	**POL**
Brushed	**BRU** *Interior use only.*

Premium Finish

ABP	Antique Brass Powder	**CMG**	Cascade Mountain Granite	**RMG**	Rocky Mountain Granite
AMG	Aleutian Mountain Granite	**CRI**	Cracked Ice	**SDS**	Sonoran Desert Sandstone
AQW	Antique White	**CRM**	Cream	**SMG**	Sierra Mountain Granite
BCM	Black Chrome	**HUG**	Hunter Green	**TXF**	Textured Forest
BGE	Beige	**MDS**	Mojave Desert Sandstone	**WCP**	Weathered Copper
BPP	Brown Patina Powder	**NBP**	Natural Brass Powder	**WIR**	Weathered Iron
CAP	Clear Anodized Powder	**OCP**	Old Copper	*Also available in RAL Finishes See submittal SUB-1439-00*	

Lens Type
12 - Soft Focus Lens
13 - Rectilinear Lens

Shielding
11 - Honeycomb Baffle

Option
360SL - 360SL™ Rotational Knuckle Mounting System

DRIVER DATA

Input Volts	InRush Current	Operating Current	Dimmable	Operation Ambient Temperature
12VAC/DC 50/60Hz	250mA (non-dimmed)	700mA	Magnetic Low Voltage Dimmer	-10°F-130°F

LM79 DATA

BK No.	CCT (Typ.)	Input Watts (Typ.)	CRI (Typ.)
e64	2700K	7.0	80
e65	3000K	7.0	80
e66	4000K	7.0	80
e74	Amber (590nm)	7.0	~

L70 DATA

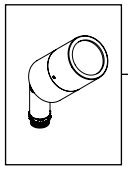
Minimum Rated Life (hrs.) 70% of initial lumens(L70)
50,000
50,000
50,000
50,000

*OPTICAL DATA

Beam Type	Angle	e66 CBCP	Visual Indicator
Narrow Spot	13°	6889	Red Dot
Spot	15°	5225	Green Dot
Medium Flood	23°	1984	Yellow Dot
Wide Flood	31°	1300	Blue Dot

B-K LIGHTING
40429 Brickyard Drive • Madera, CA 93636 • USA
559.438.5800 • FAX 559.438.5900
www.bklighting.com • info@bklighting.com

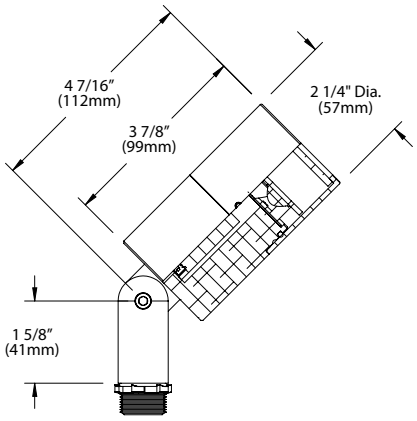
RELEASED 10-24-18
DRAWING NUMBER SUB-2192-00



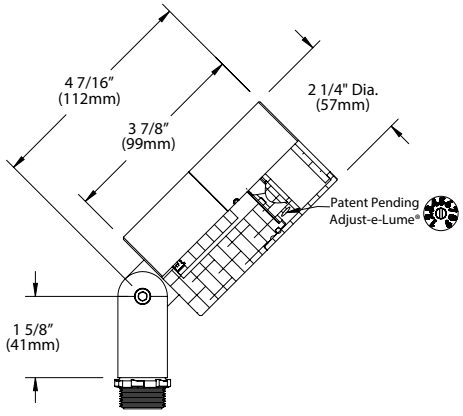
NITE STAR II™

PROJECT:	
TYPE:	

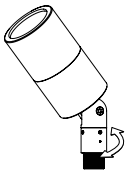
SIDE VIEW



SIDE VIEW adjust-e-lume® TECHNOLOGY



360SL™

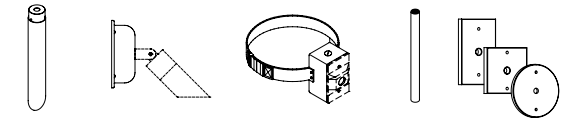


Horizontal Rotation
(Optional 360SL™ Knuckle)

Accessories *(Configure separately)*

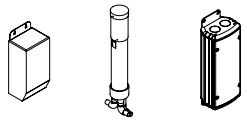
All dimensions indicated on this submittal are nominal.
Contact Technical Sales if you require more stringent specifications.

Mounting:



Power Pipe™ | Power Canopy™ | Tree Strap™ | Stems | Canopies | UPM™

Remote Transformers:



TR Series | Power Pipe ™ | UPMRM™

SPECIFICATIONS

GreenSource Initiative™
Metal and packaging components are made from recycled materials. Manufactured using renewable solar energy, produced on site. Returnable to manufacturer at end of life to ensure cradle-to-cradle handling. Packaging contains no chlorofluorocarbons (CFC's). Use of this product may qualify for GreenSource efficacy and recycling rebate(s). Consult www.bklighting.com/greensource for program requirements.

Materials
Furnished in Copper-Free Aluminum (Type 6061-T6), Brass (Type 360) or Stainless Steel (Type 304).

Body
Fully machined from solid billet. Unibody design provides enclosed, water-proof wireway and integral heat sink for maximum component life. Integral knuckle for maximum mechanical strength. High temperature, silicone 'O' Ring provides water-tight seal.

Knuckle
The LOCK™ (Locking 'O' Ring Compression Knuckle) is comprised of two components. The first is integral to the body and features an interior, machined taper. The second is machined from solid billet and features a second, reverse angle taper. The resultant mechanical taper-lock allows a full 180° vertical adjustment without the use of serrated teeth, which inherently limit aiming. High temperature, silicone 'O' Ring provides water-tight seal and compressive resistance to maintain fixture position. Design withstands 73 lb. static load prior to movement to ensure decades of optical alignment. ½" pipe thread for mounting.

Optional 360SL™ additionally provides biaxial source control with 360° horizontal rotation in addition to vertical adjustment.

Cap
Fully machined. 1" deep cutoff with flush mounted lens. Accommodates up to (2) lens or louver media.

Lens
Shock resistant, tempered, glass lens is factory adhered to fixture cap and provides hermetically sealed optical compartment. Specify soft focus (#12) or rectilinear (#13) lens.

BKSSL®
Integrated solid state system with 'e' technology is scalable for field upgrade. Modular design with electrical quick disconnects permit field maintenance. High power, forward throw source complies with ANSI C78.377 binning requirements. Exceeds ENERGY STAR® lumen maintenance requirements. LM-80 certified components.

Integral, constant current driver. 12VAC/VDC input. 50/60Hz. Proprietary input control scheme achieves power factor correction and eliminates inrush current. Output, over-voltage, open-circuit, and short circuit protected. Inrush current limited to <1A (non-dimming). Conforms to Safety Std. C22.2 No. 250.13-12.

Dimming
Line voltage dimmable via magnetic low voltage dimmer. For use with low voltage dimmer with dedicated neutral conductor. For purposes of dimming: Remote magnetic transformer with BKSSL® Power of 'e' technology loads should be loaded to 25% of the transformer VA (watts) rated value.

Adjust-e-Lume®
Integral electronics allows dynamic lumen response at the individual fixture. Indexed (100% to 25% nom.) lumen output. Maintains output at desired level or may be changed as conditions require. Specify factory preset output intensity.

Optics
Interchangeable OPTIKIT™ modules permit field changes to optical distribution. Color-coded for easy reference: Narrow Spot (NSP) = Red. Spot (SP) = Green.
Medium Flood (MFL) = Yellow. Wide Flood (WFL) = Blue.

Remote Transformer
For use with 12VAC BKSSL remote transformer or magnetic transformers only. B-K Lighting cannot guarantee performance with third party manufacturers' transformers.

Wiring
XLPE, 18GA,150C, 600V, rated and certified to UL3321.

Hardware
Tamper-resistant, stainless steel hardware. LOCK™ aiming screw is additionally black oxide treated for additional corrosion resistance.

Finish
StarGuard®, our exclusive RoHs compliant, 15 stage chromate-free process cleans and conversion coats aluminum components prior to application of Class 'A' TGIC polyester powder coating. Brass components are available in powder coat or handcrafted metal finish. Stainless steel components are available in handcrafted metal finish. (Brushed finish for interior use only).

Warranty
5 year limited warranty.

Certification and Listing
ITL tested to IESNA LM-79. UL Listed. Certified to CAN/CSA /ANSI Standards. RoHs compliant. Suitable for indoor or outdoor use. Suitable for use in wet locations. Suitable for installation within 4' of the ground. IP66 Rated. Made in USA.

c UL us LISTED RoHS MADE IN THE USA

®Energy Star is a registered trademark of the United States Environmental Protection Agency.

dweLED

Fixture Type:

Catalog Number:

Project:

Location:

Sodor

Outdoor Wall Sconce 3000K

Model & Size	*Color Temp & CRI*	*Finish*	*Watt*	*LED Lumens*	*Delivered Lumens*	*Title 24*
❍ WS-W15708 8"	3000K 90	❍ BK Black	12W	1000	314	Yes
	3000K 90	❍ BZ Bronze	9W	750	315	No
	3000K 90	❍ GH Graphite	9W	750	315	No

Example: **WS-W15708-BK**

DESCRIPTION

A Steam work inspired approach to a traditional lantern design. Sodor is constructed with a solid die-cast aluminum shade that provides fantastic glare cutoff and a weather resistant powder coated finish. The light engine is factory sealed for maximum protection against the harshest elements.

FEATURES

- Weather resistant powder coated finishes
- Light engine is factory sealed for maximum protection from the elements
- Heavy aluminum shade provides great glare cutoff
- Title 24 may not be available for all finishes, check for availability
- ACLED driverless technology
- 5 year warranty

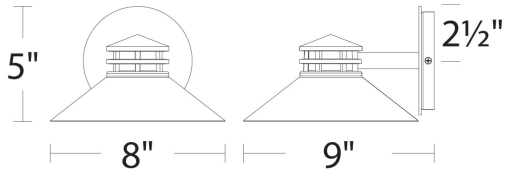
SPECIFICATIONS

Color Temp:	3000K
Input:	120 VAC, 50/60Hz
CRI:	90
Dimming:	ELV: 100 - 10%
Rated Life:	54000 Hours
Standards:	ETL, cETL, IP65, Title 24 JA8-2016 Compliant, Dark Sky Friendly Wet Location Listed
Construction:	Aluminum hardware with glass diffuser

FINISHES

Black Bronze Graphite

LINE DRAWING



WS-W15708

dweLED

Fixture Type:

Catalog Number:

Project:

Location:

Sodor

Outdoor Wall Sconce 3000K

Model & Size	*Color Temp & CRI*	*Finish*	*Watt*	*LED Lumens*	*Delivered Lumens*	*Title 24*
❍ WS-W15710 10"	3000K 90	❍ BK Black	15W	1200	484	Yes
	3000K 90	❍ BZ Bronze	11.5W	1200	560	No
	3000K 90	❍ GH Graphite	11.5W	1200	560	No

Example: **WS-W15710-BK**

DESCRIPTION

A Steam work inspired approach to a traditional lantern design. Sodor is constructed with a solid die-cast aluminum shade that provides fantastic glare cutoff and a weather resistant powder coated finish. The light engine is factory sealed for maximum protection against the harshest elements.

FEATURES

- Weather resistant powder coated finishes
- Light engine is factory sealed for maximum protection from the elements
- Heavy aluminum shade provides great glare cutoff
- Title 24 may not be available for all finishes, check for availability
- ACLED driverless technology
- 5 year warranty

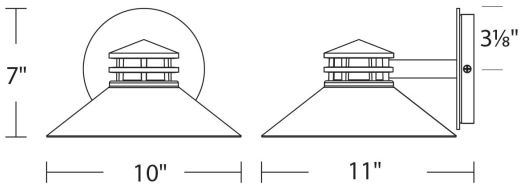
SPECIFICATIONS

Color Temp:	3000K
Input:	120 VAC, 50/60Hz
CRI:	90
Dimming:	ELV: 100 - 10%
Rated Life:	54000 Hours
Standards:	ETL, cETL, IP65, Title 24 JA8-2016 Compliant, Dark Sky Friendly Wet Location Listed
Construction:	Aluminum hardware with glass diffuser

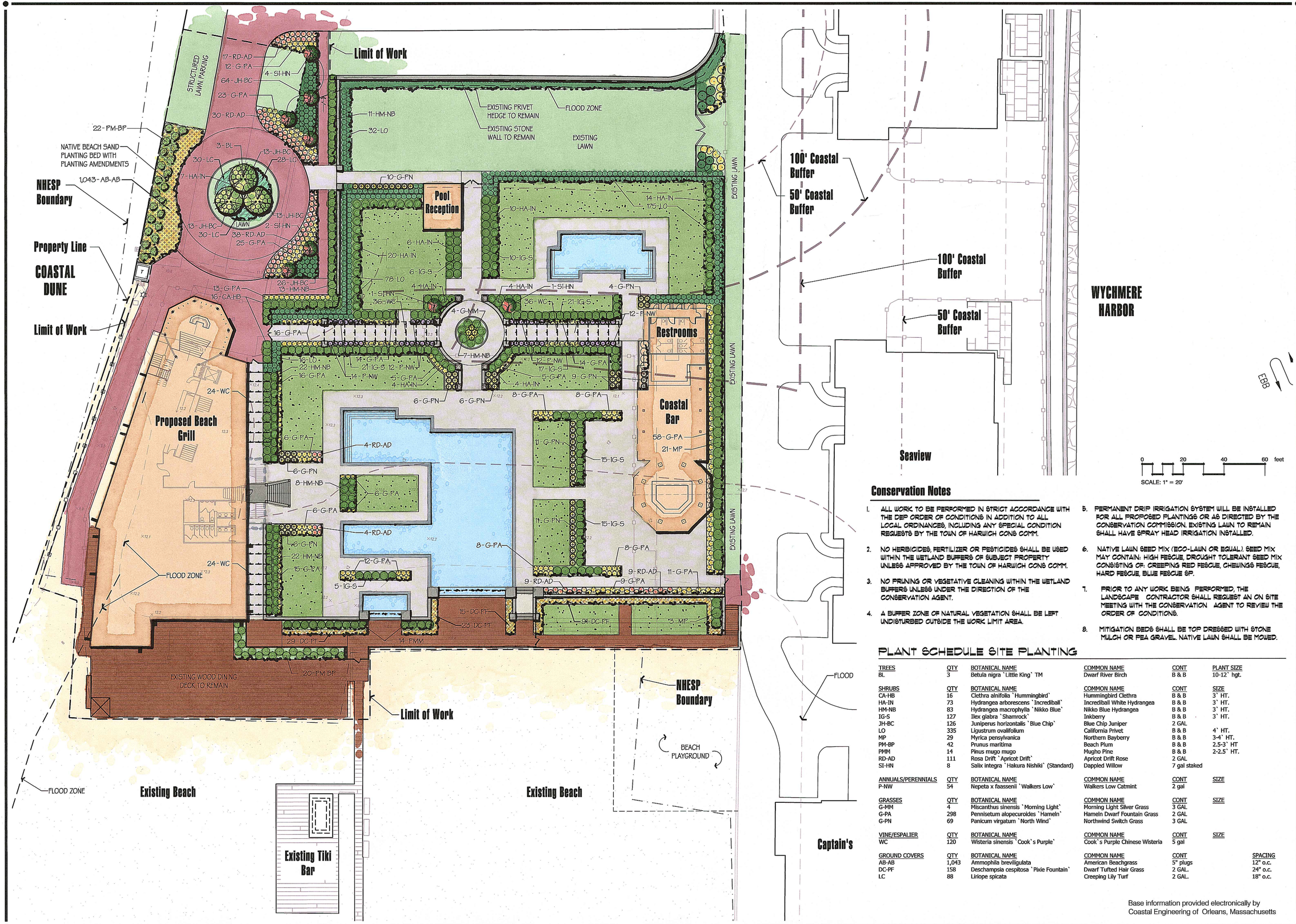
FINISHES

Black Bronze Graphite

LINE DRAWING



WS-W15710



Conservation Notes

1. ALL WORK TO BE PERFORMED IN STRICT ACCORDANCE WITH THE DEP ORDER OF CONDITIONS IN ADDITION TO ALL LOCAL ORDINANCES, INCLUDING ANY SPECIAL CONDITION REQUESTS BY THE TOWN OF HARWICH CONS COMM.
2. NO HERBICIDES, FERTILIZER OR PESTICIDES SHALL BE USED WITHIN THE WETLAND BUFFERS OF SUBJECT PROPERTY UNLESS APPROVED BY THE TOWN OF HARWICH CONS COMM.
3. NO PRUNING OR VEGETATIVE CLEANING WITHIN THE WETLAND BUFFERS UNLESS UNDER THE DIRECTION OF THE CONSERVATION AGENT.
4. A BUFFER ZONE OF NATURAL VEGETATION SHALL BE LEFT UNDISTURBED OUTSIDE THE WORK LIMIT AREA.
5. PERMANENT DRIP IRRIGATION SYSTEM WILL BE INSTALLED FOR ALL PROPOSED PLANTINGS OR AS DIRECTED BY THE CONSERVATION COMMISSION. EXISTING LAWN TO REMAIN SHALL HAVE SPRAY HEAD IRRIGATION INSTALLED.
6. NATIVE LAWN SEED MIX (ECO-LAWN OR EQUAL). SEED MIX MAY CONTAIN: HIGH FESCUE, DROUGHT TOLERANT SEED MIX CONSISTING OF: CREEPING RED FESCUE, CHEWINGS FESCUE, HARD FESCUE, BLUE FESCUE SP.
7. PRIOR TO ANY WORK BEING PERFORMED, THE LANDSCAPE CONTRACTOR SHALL REQUEST AN ON SITE MEETING WITH THE CONSERVATION AGENT TO REVIEW THE ORDER OF CONDITIONS.
8. MITIGATION BEDS SHALL BE TOP DRESSED WITH STONE MULCH OR PEA GRAVEL. NATIVE LAWN SHALL BE MOWED.

PLANT SCHEDULE SITE PLANTING

TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	PLANT SIZE
BL	3	Betula nigra `Little King` TM	Dwarf River Birch	B & B	10-12` hgt.
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**
CA-HB	16	Clethra alnifolia `Hummingbird`	Hummingbird Clethra	B & B	3` HT.
HA-IN	73	Hydrangea arborescens `Incrediball`	Incrediball White Hydrangea	B & B	3` HT.
HM-NB	83	Hydrangea macrophylla `Nikko Blue`	Nikko Blue Hydrangea	B & B	3` HT.
IG-S	127	Ilex glabra `Shamrock`	Inkberry	B & B	3` HT.
JH-BC	126	Juniperus horizontalis `Blue Chip`	Blue Chip Juniper	2 GAL	
LO	335	Ligustrum ovalifolium	California Privet	B & B	4` HT.
MP	29	Myrica pensylvanica	Northern Bayberry	B & B	3-4` HT.
PM-BP	42	Prunus maritima	Beach Plum	B & B	2.5-3` HT
PMM	14	Pinus mugo mugo	Mugho Pine	B & B	2-2.5` HT.
RD-AD	111	Rosa Drift `Apricot Drift`	Apricot Drift Rose	2 GAL	
SI-HN	8	Salix integra `Hakura Nishiki` (Standard)	Dappled Willow	7 gal staked	
ANNUALS/PERENNIALS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**
P-NW	54	Nepeta x faassenii `Walkers Low`	Walkers Low Catmint	2 gal	
GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**
G-MM	4	Miscanthus sinensis `Morning Light`	Morning Light Silver Grass	3 GAL	
G-PA	298	Pennisetum alopecuroides `Hameln`	Hameln Dwarf Fountain Grass	2 GAL	
G-PN	69	Panicum virgatum `North Wind`	Northwind Switch Grass	3 GAL	
VINE/ESPALIER	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**
WC	120	Wisteria sinensis `Cook`s Purple`	Cook`s Purple Chinese Wisteria	5 gal	
GROUND COVERS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SPACING**
AB-AB	1,043	Ammophila brevilgulata	American Beachgrass	5" plugs	12" o.c.
DC-PF	158	Deschampsia cespitosa `Pixie Fountain`	Dwarf Tufted Hair Grass	2 GAL.	24" o.c.
LC	88	Liriope spicata	Creeping Lily Turf	2 GAL.	18" o.c.

Base information provided electronically by Coastal Engineering of Orleans, Massachusetts

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
info@hawkdesigninc.com
www.hawkdesigninc.com

Date: 12/18/19

Revisions:
Num. Date Description

Wychmere Beach Club

22 Snow Inn Rd., Harwich Port, MA

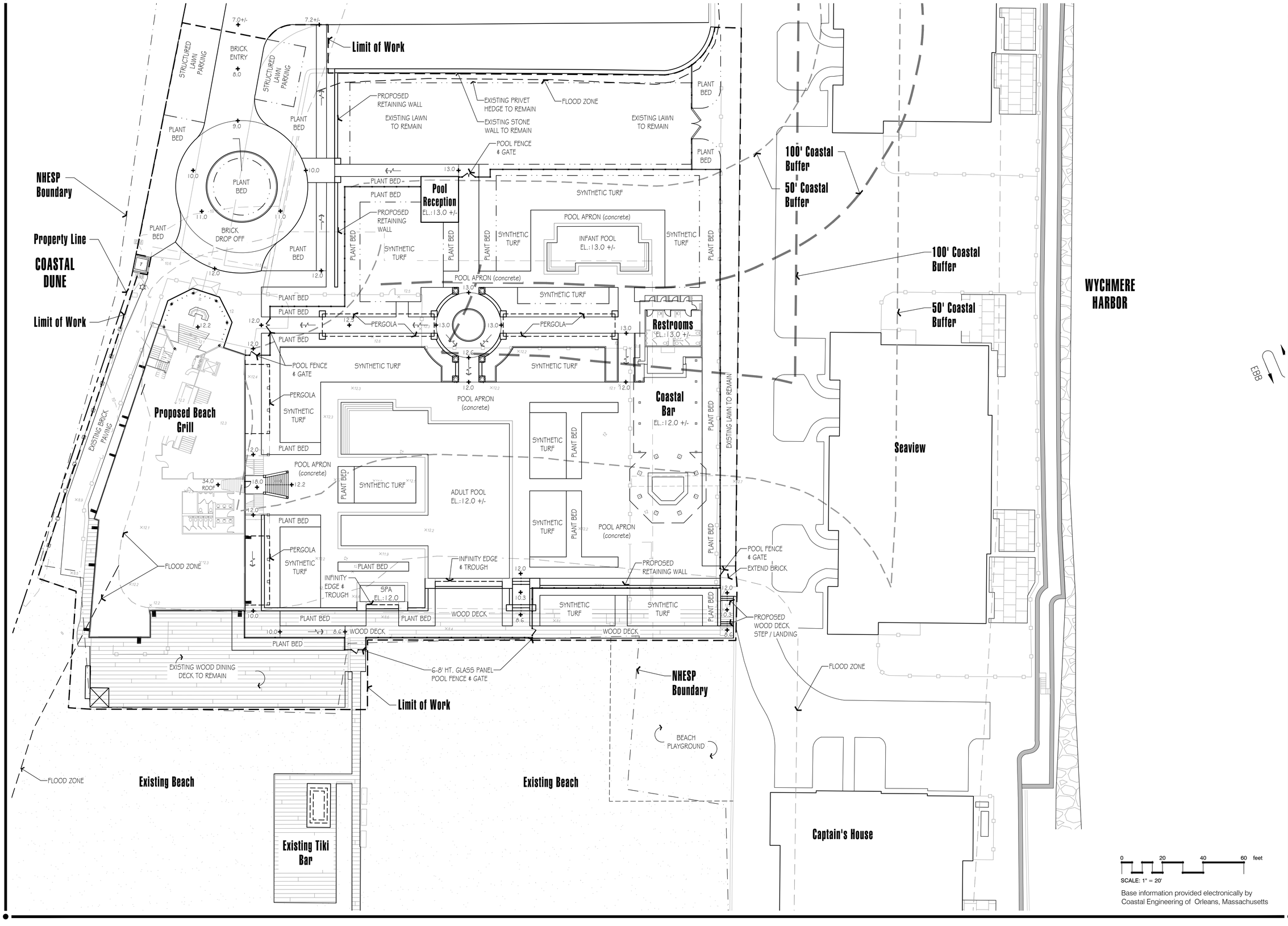
Longwood Venues / Atlas Development

Drawn By: TM | Checked By: DH

Landscape Submission Plan

Scale: 1"=20'-0"

Sheet: L2.0



Base information provided electronically by Coastal Engineering of Orleans, Massachusetts

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
info@hawkdesigninc.com
www.hawkdesigninc.com

Date: 12/18/19

Revisions:

Num.	Date	Description

Wychmere Beach Club

23 Snow Inn Rd, Harwich Port, MA

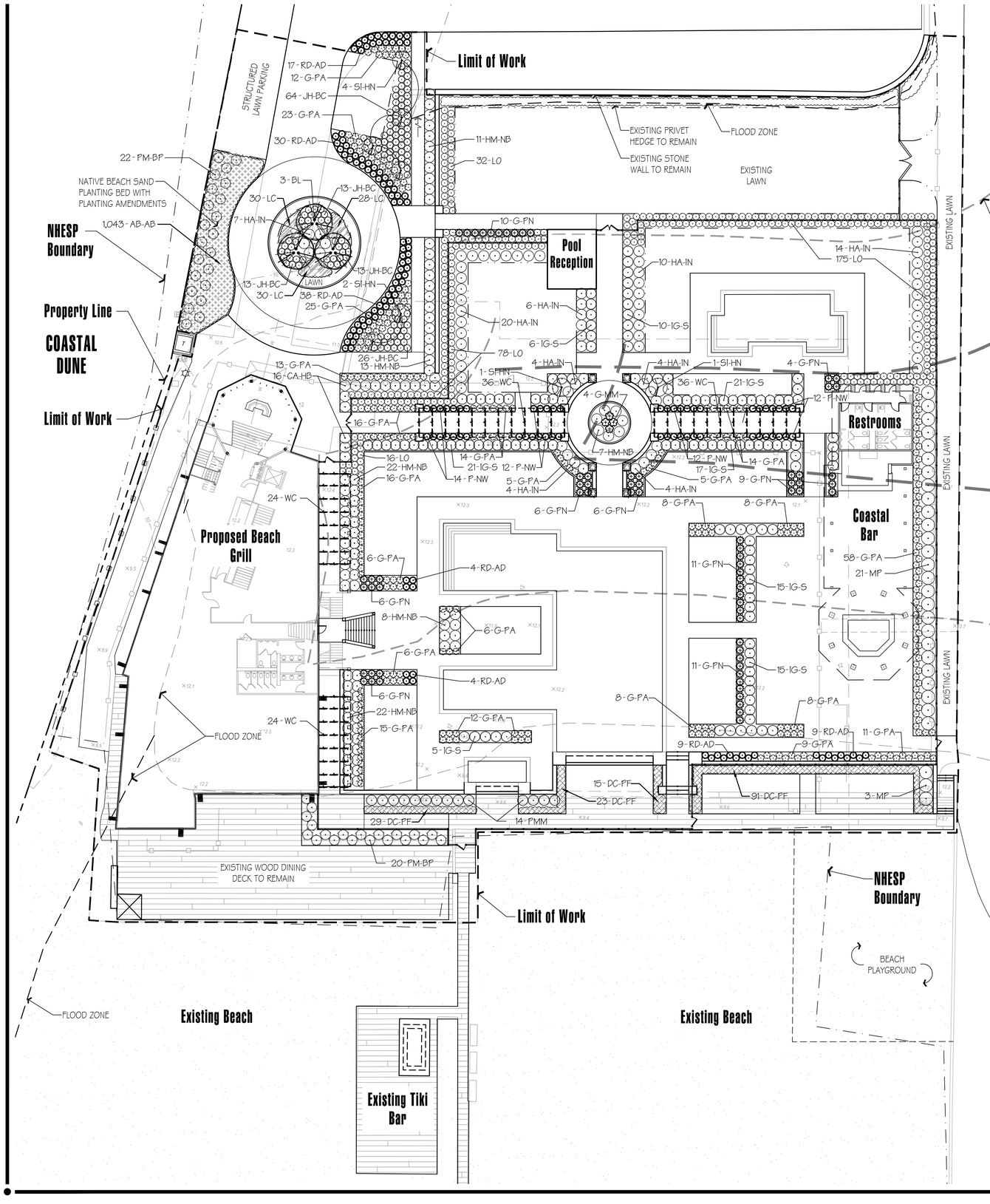
Longwood Venues / Atlas Development

Drawn By: TM | Checked By: DH

Landscape Submission Plan

Scale: 1"=20'-0"

Sheet: L1.0



Conservation Notes

1. ALL WORK TO BE PERFORMED IN STRICT ACCORDANCE WITH THE DEP ORDER OF CONDITIONS IN ADDITION TO ALL LOCAL ORDINANCES, INCLUDING ANY SPECIAL CONDITION REQUESTS BY THE TOWN OF HARWICH CONS COMM.
2. NO HERBICIDES, FERTILIZER OR PESTICIDES SHALL BE USED WITHIN THE WETLAND BUFFERS OR SUBJECT PROPERTY UNLESS APPROVED BY THE TOWN OF HARWICH CONS COMM.
3. NO PRUNING OR VEGETATIVE CLEANING WITHIN THE WETLAND BUFFERS UNLESS UNDER THE DIRECTION OF THE CONSERVATION AGENT.
4. A BUFFER ZONE OF NATURAL VEGETATION SHALL BE LEFT UNDISTURBED OUTSIDE THE WORK LIMIT AREA.
5. PERMANENT DRIP IRRIGATION SYSTEM WILL BE INSTALLED FOR ALL PROPOSED PLANTINGS OR AS DIRECTED BY THE CONSERVATION COMMISSION. EXISTING LAWN TO REMAIN SHALL HAVE SPRAY HEAD IRRIGATION INSTALLED.
6. NATIVE LAWN SEED MIX (ECO-LAWN OR EQUAL) SEED MIX MAY CONTAIN: HIGH FESCUE, DROUGHT TOLERANT SEED MIX CONSISTING OF: CREEPING RED FESCUE, CHEWINGS FESCUE, HARD FESCUE, BLUE FESCUE SP.
7. PRIOR TO ANY WORK BEING PERFORMED, THE LANDSCAPE CONTRACTOR SHALL REQUEST AN ON SITE MEETING WITH THE CONSERVATION AGENT TO REVIEW THE ORDER OF CONDITIONS.
8. MITIGATION BEDS SHALL BE TOP DRESSED WITH STONE MULCH OR PEA GRAVEL. NATIVE LAWN SHALL BE MOWED.

PLANT SCHEDULE SITE PLANTING

TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	PLANT SIZE
BL	3	Betula nigra `Little King` TM	Dwarf River Birch	B & B	10-12` hgt.
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**
CA-HB	16	Clethra alnifolia `Hummingbird`	Hummingbird Clethra	B & B	3` HT.
HA-IN	73	Hydrangea arborescens `Incrediball`	Incrediball White Hydrangea	B & B	3` HT.
HM-NB	83	Hydrangea macrophylla `Nikko Blue`	Nikko Blue Hydrangea	B & B	3` HT.
IG-S	127	Ilex glabra `Shamrock`	Inkberry	B & B	3` HT.
JH-BC	126	Juniperus horizontalis `Blue Chip`	Blue Chip Juniper	2 GAL	
LO	335	Ligustrum ovalifolium	California Privet	B & B	4` HT.
MP	29	Myrica pensylvanica	Northern Bayberry	B & B	3-4` HT.
PM-BP	42	Prunus maritima	Beach Plum	B & B	2.5-3` HT
PMM	14	Pinus mugo mugo	Mugho Pine	B & B	2-2.5` HT.
RD-AD	111	Rosa Drift `Apricot Drift`	Apricot Drift Rose	2 GAL	
SI-HN	8	Salix integra `Hakura Nishiki` (Standard)	Dappled Willow	7 gal staked	
ANNUALS/PERENNIALS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**
P-NW	54	Nepeta x faassenii `Walkers Low`	Walkers Low Catmint	2 gal	
GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**
G-MM	4	Miscanthus sinensis `Morning Light`	Morning Light Silver Grass	3 GAL	
G-PA	298	Pennisetum alopecuroides `Hameln`	Hameln Dwarf Fountain Grass	2 GAL	
G-PN	69	Panicum virgatum `North Wind`	Northwind Switch Grass	3 GAL	
VINE/ESPALIER	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**
WC	120	Wisteria sinensis `Cook`s Purple`	Cook`s Purple Chinese Wisteria	5 gal	
GROUND COVERS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SPACING**
AB-AB	1,043	Ammophila breviligulata	American Beachgrass	5" plugs	12" o.c.
DC-PF	158	Deschampsia cespitosa `Pixie Fountain`	Dwarf Tufted Hair Grass	2 GAL.	24" o.c.
LC	88	Liriope spicata	Creeping Lily Turf	2 GAL.	18" o.c.

Base information provided electronically by Coastal Engineering of Orleans, Massachusetts

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
info@hawkdesigninc.com
www.hawkdesigninc.com

Date: 12/18/19

Revisions:
Num. Date Description

Wychmere Beach Club

23 Snow Inn Rd, Harwich Port, MA

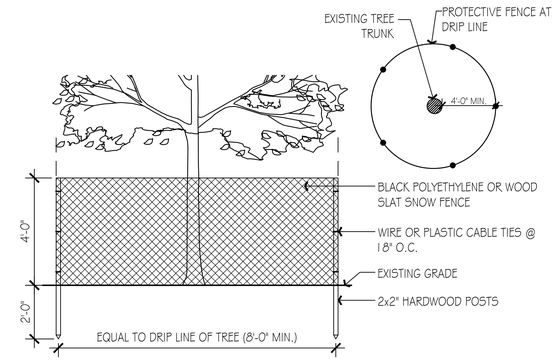
Longwood Venues / Atlas Development

Drawn By: TM | Checked By: DH

Landscape Submission Plan

Scale: 1" = 20'-0"

Sheet: L2.0



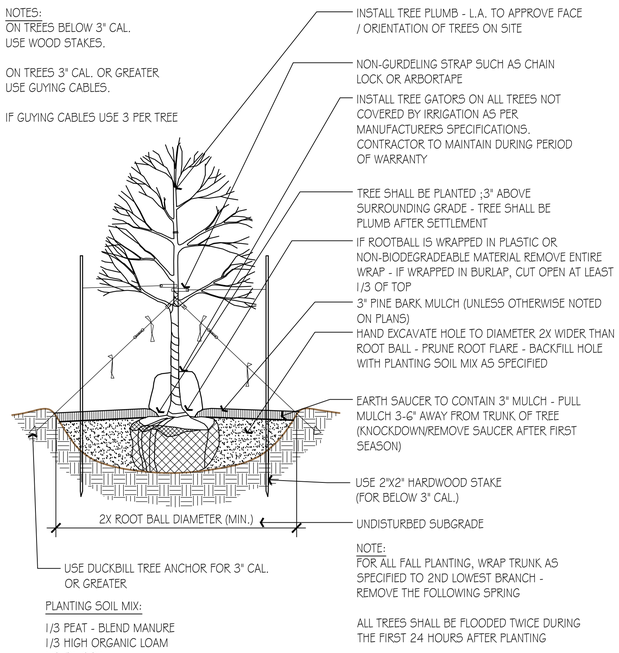
NOTES:
1. PROTECTIVE FENCE TO REMAIN UNTIL CONSTRUCTION IS COMPLETE.
2. NO TREE SHALL BE REMOVED UNLESS SPECIFICALLY TAGGED FOR REMOVAL BY THE LANDSCAPE ARCHITECT.
3. CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE TREES THAT ARE TO REMAIN.
4. DO NOT NAIL BOARDS OR FENCING TO TREES DURING CONSTRUCTION.
5. ANY EXCAVATING WITHIN DRIPLINE MUST BE APPROVED BY LANDSCAPE ARCHITECT AND MUST BE HAND-DUG. CONTRACTOR SHALL NOT CUT ANY ROOTS AND/OR BRANCHES UNLESS APPROVED BY LANDSCAPE ARCHITECT.
6. ROOTS EXPOSED AND/OR DAMAGED DURING GRADING & CONSTRUCTION OPERATIONS SHALL BE CUT OFF CLEANLY INSIDE THE EXPOSED OR DAMAGED AREA AND TOPSOIL BE PLACED OVER THE ROOTS IMMEDIATELY. FEEDER ROOTS SHALL NOT BE CUT IN AN AREA INSIDE DRIP LINE OF THE TREE BRANCHES.
7. ROOTS GREATER THAN 1" DIAMETER SHALL NOT BE CUT UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT.
8. STOCKPILED MATERIALS OR UNNECESSARY VEHICULAR TRAFFIC SHALL NOT BE ALLOWED OVER ANY TREE ROOT SYSTEM.
9. INSPECT FENCE ON WEEKLY BASIS AND REPAIR DAMAGE IMMEDIATELY.

1 Tree Protection
Scale: N.T.S.

NOTES:
ON TREES BELOW 3" CAL.
USE WOOD STAKES.

ON TREES 3" CAL. OR GREATER
USE GUYING CABLES.

IF GUYING CABLES USE 3 PER TREE



NOTE:
FOR ALL FALL PLANTING, WRAP TRUNK AS SPECIFIED TO 2ND LOWEST BRANCH - REMOVE THE FOLLOWING SPRING

ALL TREES SHALL BE FLOODED TWICE DURING THE FIRST 24 HOURS AFTER PLANTING

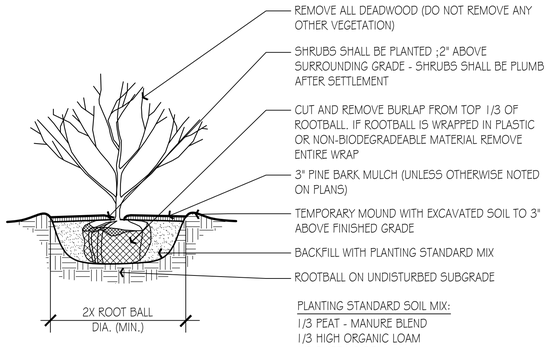
PLANTING SOIL MIX:

1/3 PEAT - BLEND MANURE
1/3 HIGH ORGANIC LOAM
1/3 EX. SOIL

2 Deciduous Tree Planting
Scale: N.T.S.

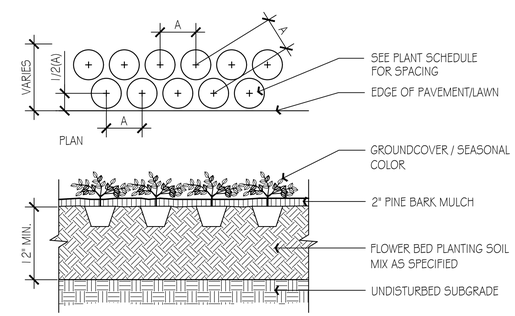
SCHEDULE OF TOPSOILS & ADDITIVES

LOCATION	DEPTH	DESCRIPTION
GENERAL PLANTING BEDS	12"	1/3 PEAT - MANURE BLEND 1/3 HIGH ORGANIC LOAM 1/3 EXISTING SOIL
FLOWER BEDS	12"	SCREENED LOAM 1/3 PEAT - MANURE BLEND LIME - PELATIZED OR GROUND (50 LB. PER 100 SF.) GROUND BONE MEAL (50 LB. PER 100 SF.) 10-10-10 INORGANIC FERTILIZER (50 LB. PER 5000 SF.)
LAWNS - SOD & SEED	6"	6" SCREENED LOAM
PITS/TREE WELLS "STANDARD MIX" FOR BACKFILL	12"	1/3 PEAT - MANURE BLEND 1/3 HIGH ORGANIC LOAM 1/3 EXISTING SOIL



PLANTING STANDARD SOIL MIX:
1/3 PEAT - MANURE BLEND
1/3 HIGH ORGANIC LOAM
1/3 EXISTING SOIL

3 Shrub Planting
Scale: N.T.S.



4 Seasonal Color / Perennial / Groundcover
Scale: N.T.S.

Base information provided electronically by
Coastal Engineering of Orleans, Massachusetts

Hawk Design, Inc.
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Sagamore, MA
508-833-8800
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Date: 12/18/19

Revisions:
Num. Date Description

Wychmere Beach Club
23 Snow Inn Rd, Harwich Port, MA
Longwood Venues / Atlas Development

Drawn By: TM | Checked By: DH

Landscape Submission Plan

Scale: 1" = 20'-0"

Sheet: L2.1

Charleen Greenhalgh

From: Jack Welch <welchjf@bc.edu>
Sent: January 12, 2020 7:41 PM
To: Charleen Greenhalgh
Subject: Comments on proposed Wychmere beach grill

Dear Ms. Greenhalgh,

Neigforbors forwarded elevations of the Beach Grill proposed by the Wychmere Beach Club. I live on Snow Inn Road, and thought I would offer comments to the Planning Board as you decide how to move forward.

The current owners of Wychmere have been good for the Club and the improvements to the property they have made over the years have been tastefully done. However, my opinion is the proposed new structure is too large for the Merkel Beach area. In particular, a ~50ft tall structure is completely out of place on the Beach. My recommendation is for the Planning Board to limit the size and especially the height of the new structure.

One other issue. On summer weekends, there are hundreds of cars that travel down Snow Inn Road and this new facility should add considerably to that. Many of the Wychmere guests drive way too fast for a residential neighborhood, and this is especially true at the end of the night after drinking at a wedding. I ask the Town to consider seasonal placement of speed bumps outside the Club to discourage speeding, similar to what you would find on the way to Stonehorse Yacht Club.

Thank you for your consideration,

John Welch
42 and 45 Snow Inn Road

VIA CERTIFIED MAIL & Email

January 22, 2020

Thomas A. Cosmer
Lonnie A. Cosmer
299 West 12th Street
New York, NY 10014

Ms. Charlene Greenhalgh
Town Planner
Town of Harwich
732 Main Street
Harwich, MA 02645

Re: PB2019-27 Wychmere Harbor Real Estate LLC

Dear Charlene;

Thank you for receiving this letter, and sharing it with members of the Town Planning Board. We write to oppose certain facets of the applicant's plan to modify and further expand the subject property known as Wychmere Beach Club – an expansion coming only several years after the last expansion. We hope concerns expressed herein will help inform the deliberations and decisions made by the Planning Board regarding plans proposed by Wychmere Harbor Real Estate LLC.

We have owned property in Harwich for almost thirty years, and currently own 19 Davis Lane and 23 Davis Lane, two homes located near Wychmere Beach Club. We are familiar with Wychmere Beach Club, were members years ago, and have friends and neighbors who are current members. In recent years, we (and others) have been negatively impacted by heightened levels of activity associated with Wychmere Beach Club, and for increasingly longer periods of time each year – no longer limited to the months of July and August. These negative impacts include noise pollution, traffic congestion/safety, pedestrian safety, and parking. As a result, the character and charm of our cherished neighborhood has deteriorated, and done so in direct proportion to increased activity levels at Wychmere Beach Club.

The latest expansion proposal before the Planning Board, if approved, will result in higher activity levels at Wychmere Beach Club, and make an already untenable and unsafe situation for many even worse – in several areas:

1. **Expansion of Club Facilities – Beach Grill and Coastal Bar Pavilion** – The application before the Planning Board indicates Wychmere Beach Club intends to replace the existing small Beach House and to replace it with a much larger and taller structure called a "Beach Grill" running on the far west side of the property – immediately adjacent to Merkel Beach. This building will be significantly higher (above 50 feet), larger and much more impactful than what is currently there, will sit on pile foundation, and will feature:
    a. ground level "pool deck" space
    b. a 3,400 SF restaurant, and a 1,854 SF kitchen on the "first floor" which is up one level (first floor set at 18 feet elevation)
    c. a sizable **open-air lounge and bar** on the "Roof Deck" above the restaurant (the floor of roof deck set at 34 feet elevation)

The applicant promotes the fact that the number of "restaurant seats" on the property will remain constant at 650, yet fails to account for what will be a growing number of people standing. Unseated individuals will utilize the proposed open-air lounge and roof deck planned for the level above the expanded restaurant - typical for any lounge or bar (think Ember restaurant patio). Also, one must consider the shifting location of these 650 seats – as plans suggest many more seats will now be on the property perimeter. The proposed use of the Beach Grill will be something quite different than what the much smaller Beach House is being used for today – a change of use that deserves your close examination and scrutiny.

Consider that this new "Beach Grill" (alone) will be bigger and larger in every way than the Ember restaurant. It is hard to comprehend the logic of placing an additional restaurant/bar/lounge of that size and scale anywhere on Wychmere Beach Club property – let alone on the very edge of the twenty (20) acre property immediately adjacent to Merkel Beach. This proposed location is the exact spot where the negative impact to others will be the greatest. Further, the drastic expansion of the current Beach House into this much larger "Beach Grill" should be considered in light of the proposed significant expansion/relocation of the existing "Coastal Bar Pavilion", and importantly in light of the several rounds of expansion the Town has granted Wychmere Beach Club in recent years. At what point will the size, scope and impact of the physical structures on Wychmere Beach Club property be contained?

We believe the proposed drastic increase in size, scale, purpose and use of the Beach Grill and Coastal Bar Pavilion will inevitably lead to more activity on Wychmere Beach Club property, and will translate into a worsening of existing problems associated with traffic, pedestrian safety, noise pollution and light pollution.

2. **<u>Traffic and Pedestrian Safety</u>** - Wychmere Beach Club abuts sensitive coastal areas on three (3) sides, and sits at the end of Snow Inn Road - a narrow winding road with no sidewalk. Public parking in the neighborhood is non-existent. As such, Snow Inn Road has become the main route for pedestrians and bicyclists seeking access to Wychmere Harbor and Merkel Beach. These pedestrians, including families with young children in strollers and wagons full of beach gear, are now forced to dodge a steady stream of vehicles – including large commercial trucks - driving to/from Wychmere Beach Club. It is now common for traffic jams/backups to build at the intersection of Snow Inn Road and Route #28. As a result, vehicles going to or coming from Wychmere Beach Club now frequently bypass the congestion on Snow Inn Road by cutting across Davis Lane to access Bayview Road. This has become an extremely dangerous situation as Davis Lane is a very narrow one direction unpaved unlit private way. During the summer - it is now virtually impossible for area residents to access Bayview Road or Snow Inn Road without backing up and pulling onto private property to yield to oncoming traffic or pedestrians. Davis Lane is not able to accommodate any volume of two-way traffic, let alone to absorb the increasing flow of Wychmere Beach Club traffic at all hours of the day. With no street lights of any kind, Davis Lane has become especially dangerous for pedestrians and residents in the evening. Neighborhood traffic issues and pedestrian safety concerns are a direct result of increased traffic associated with Wychmere Beach Club.

We believe the expansion plans submitted by Wychmere Beach Club will lead to additional traffic congestion in the area, will further compromise pedestrian and vehicular safety, and further inconvenience neighborhood residents.

3. <u>Noise Pollution</u>

Much debate is ongoing within the Town on matters of noise pollution, specifically as it relates to noise levels beyond a 150 foot perimeter, and on what days and at what time amplified music is permitted. This debate, driven by The Town of Harwich Ad Hoc Noise Committee is not limited to Ember, The Port, and Perks, but rather any establishment that prevents a resident from peacefully enjoying their home. We reside over 150 feet from Wychmere Beach Club and hear clearly their amplified music on many days and most evenings. Like many, we avoid calling the Police as doing so could deplete precious resources available for more critical or urgent matters. As a result, we now limit our time outdoors, and resist the temptation to open our windows. Tenants using our rental property next door frequently complain about the noise – and have refused to return specifically because of the disruption coming from Wychmere Beach Club. Our ability to enjoy our home, and to attract tenants to our rental property has been compromised by the loud and disruptive noise emanating from Wychmere Beach Club. Please consider that Wychmere Beach Club presents many unique noise challenges, including:

a) Use of the Wychmere Beach Club property goes well beyond the 12 week summer season, and typically runs from April through November.
b) The number of people on Wychmere Beach Club property can include hundreds of club members & guests at the same time hundreds of others attend weddings & celebratory events. 650 seats at the property is a large number.
c) Many Club entertainment/food spaces are outdoors, and other "indoor" spaces are frequently transformed to open air spaces via removable doors/windows. Wychmere Beach Club's website notes the capacity of their separate entertainment spaces as follows:
    - Private Beach or Beach Tent event – up to 500 guests.
    - Grand Lawn Tent - up to 500 guests.
    - Hydrangea Room - up to 280 guests.
    - Harbour Room - up to 450 guests.
    - Ocean Room – up to 300 guests.

    (all of these spaces exclude the proposed Beach Grill and Coastal Bar Pavilion)
d) Wychmere Beach Club entertainment/food spaces abut sensitive coastal resources such as Wychmere Harbor, Merkel Beach or open dune areas that serve to exacerbate noise levels.
e) Wychmere Beach Club typically has loud amplified music throughout both the day and evening. This negatively impacts area residents as well as all in Harwich who utilize Merkel Beach for sunbathing and recreation during the day. This amplified music is clearly audible hundreds of feet beyond the perimeter of Club property.
f) Given the sheer size of the various Wychmere Beach Club entertainment spaces and the number of individuals present – music is always amplified and typically loud. Multiple events across multiple venues take place at the same time.
g) The proposed "Beach Grill" includes an elevated open-air lounge and roof deck bar, and is to be located immediately adjacent to Merkel Beach. This is flawed – in scale, use and location, and will certainly add to the already unacceptable levels of noise pollution. Further, we understand Wychmere Beach Club is anxious to extend beyond 10:00 pm the time for playing amplified music across their multiple property venues – which would be accretive to their profits – but come at a great cost to local residents.

Proposed building plans – specifically with regard to the "Beach Grill" - are not compatible with area residents peacefully enjoying their homes during the day and/or evening, and are not compatible with residents/visitors seeking to enjoy leisurely time on Merkel Beach.

Conclusion

The size of the relevant land mass associated with Wychmere Beach Club has not grown over time. What has grown at Wychmere Beach Club, time and time again, is the size and number of buildings on the property – and as a result - the flow of club members, residents, guests, workers, suppliers, vendors and those celebrating special events and weddings throughout the year. In simple terms, heightened use of the Wychmere Beach Club property brings with it heightened use of the surrounding neighborhood infrastructure. We believe an important and delicate balance must exist at all times between these two forces. We also believe this delicate balance has already been compromised - as the Town has allowed Wychmere Beach Club to become "a quart in a pint container."

The latest expansion plans submitted by the applicant promise to create a further imbalance – to do further harm to many Harwich residents and visitors - especially as it relates to noise pollution, traffic woes, pedestrian safety and light pollution. For these and other reasons, we urge members of the Town Planning Board to deny the application. We also urge Town officials to take immediate action to address an already dangerous public safety matter – namely the competition among vehicles, bicyclists and pedestrians on the narrow, windy and sidewalk free public roads and private ways leading to and from Wychmere Beach Club, Merkel Beach, Wychmere Harbor and Nantucket Sound.

Respectfully submitted,

Tom & Lonnie Cosmer

19 Davis Lane
23 Davis Lane