

February 14, 2020

**SOLICITATION ADDENDUM NO. 3**  
**ITB 19-0037**  
**2020 Auditorium Upgrades**

**THE FOLLOWING CHANGES/ADDITIONS TO THE ABOVE CITED SOLICITATION ARE ANNOUNCED:**

This Addendum modifies the Invitation to Bid (ITB) document(s) only to the extent indicated herein. All other areas not changed or otherwise modified by this Addendum shall remain in full force and effect. This Addendum is hereby made an integral part of the ITB document. Bidder must be responsive to any requirements of this Addendum as if the requirements were set forth in the ITB. Failure to do so may result in Bid rejection. See the ITB regarding requests for clarification or change and protests of this Addendum, and the deadlines for the foregoing.

This addendum is to be acknowledged in the space provided on the Bidder Certification form supplied in the solicitation document. Failure to acknowledge receipt of this addendum may be cause to reject your offer.

**The closing date is UNCHANGED: February 25, 2020 at 2:00 PM Pacific Time**

**CHANGES:**

1. The requested substitutions are either approved or denied, as indicated on the attached Substitution Request Summary.
2. Attachment K Drawings and Attachment L Specifications are changed as indicated on the attached Drawing and Specification Revisions.

**CLARIFICATIONS:**

Question Received

Question: Please see the attached light fixture substitutions for approval

Answer: Please see attached Substitutions Request Summary

Question: I was looking through the spec book and there is a reference to "Division 5 : Metals." I could not find the corresponding division 5. Could you advise on metal specs for the project?

Answer: Please see the attached Drawing and Specification Revisions.

Question: Need to add drawings revised for missing lights, and anything else that you might have needed to revise. Also, I will need to update the reference to "Revised" Drawings.

Answer: Please see the attached Drawing and Specification Revisions.

Question: Has a building permit been submitted by Beaverton School District for this project? If so, who pays for the building permit?

Answer: The necessary building permit(s) have been submitted and are currently in review. The District pays for building permits.

Question: Architectural Woodwork Spec Section 06 40 00 states plastic laminate countertop in control booth, is there a detail available for the countertop for review?

Answer: The Section has been removed or updated per the attached Drawing and Specification Revisions

Question: Specification Table of Contents states Division 5 Metals - Section 05 50 00 Metal Fabrications, no specification is included in the Project Manual, please advise.

Answer: Please see the attached Drawing and Specification Revisions.

Question: Are man lifts accessible into each of the auditoriums?

Answer: Man lifts can be used and access is available in each auditorium, but use of all District equipment is prohibited and Contractor will need to provide lifts as needed.

Question: BHS, where are the electrical panels located in reference to the auditorium? They don't show them on the drawings for the new circuits that are required. Drawings mention a Custodial Room.

Answer: The electrical panels are located on the right hand side of the stage if facing outward toward the audience.

The following Drawing and Specification and Revisions Substitution Request Summary are hereby attached to this Addendum 3 and incorporated by reference.

**-END of Addendum**

Peter Madaus  
Contract Specialist

# Drawing and Specification Revisions

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The following documents are a part of Addendum 3 to ITB 19-0037 2020 Auditorium Upgrades. These documents indicate changes to Attachment K Drawings and Attachment L Specifications.

## **Changes to Drawings:**

### **Southridge High School**

Sheet E2.1 Added sheet keynote 4, to indicate to rewire aisle lighting onto separate dimmer from house lighting.

Added two step lights to existing locations to be replaced below railing.

### **Westview High School**

Sheet E2.1 Revised listed manufacturer/model number for luminaire types 'HD', 'HE', and 'HES' in luminaire schedule.

## **Changes to Specifications:**

Section 01 31 00 Added section missing from bid documents.

Section 05 50 00 Added section missing from bid documents.

Section 06 10 00 Removed section from bid documents.

Section 06 20 00 Removed section from bid documents.

Section 06 40 00 Removed section from bid documents.

Section 26 05 35 Added section missing from bid documents.

**GENERAL SHEET NOTES**

A. WHERE LUMINAIRES ARE REPLACED IN EXISTING LOCATIONS, CONNECT TO EXISTING CIRCUIT FROM ARCHITECTURAL RELAY PANEL.

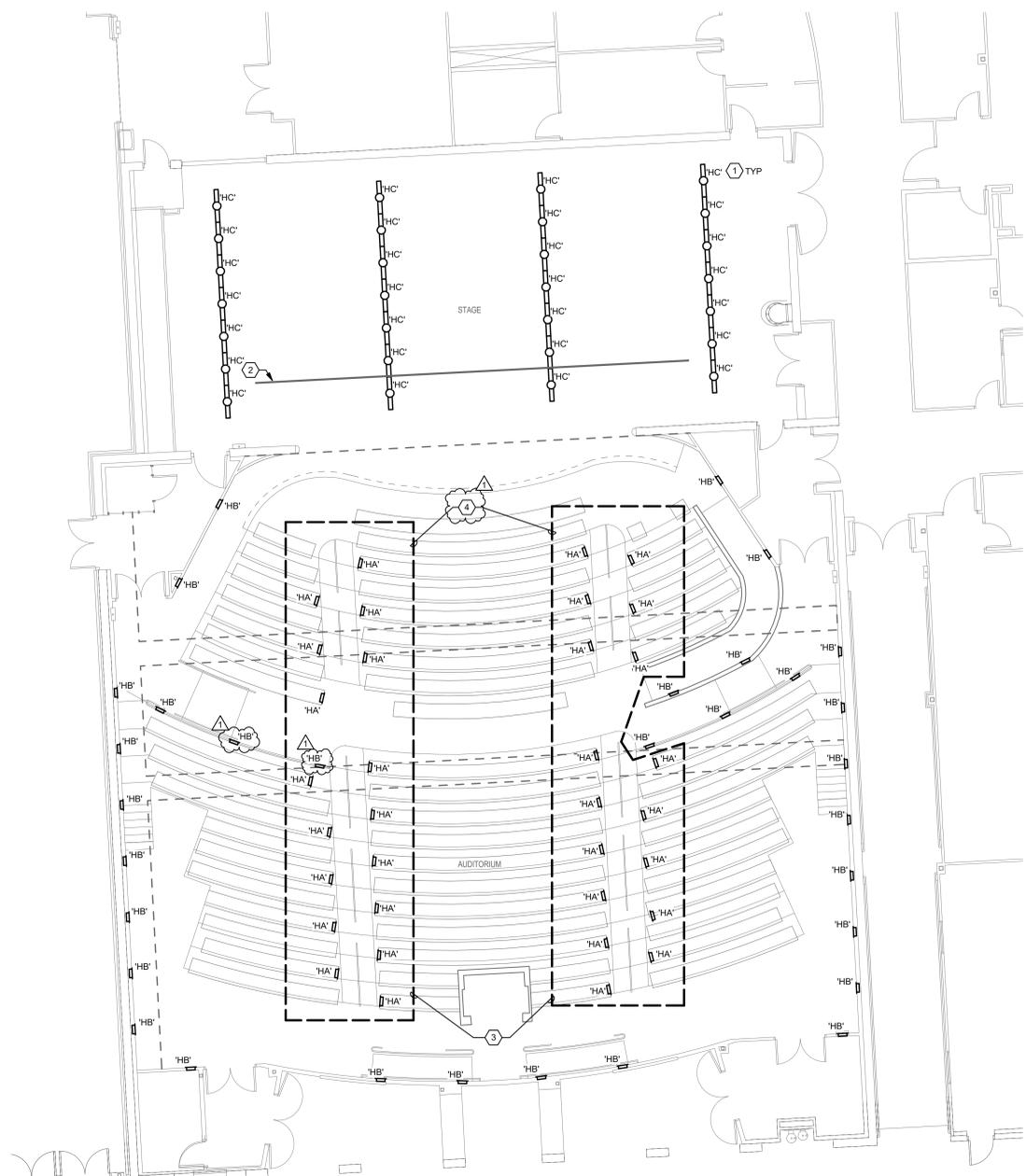


**LUMINAIRE SCHEDULE**

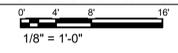
TYPE	DESCRIPTION	HOUSING	SHIELDING	MOUNTING	FINISH	UL/IP RATING	DRIVER/POWER SUPPLY	LIGHT SOURCE	INPUT WATTS	MFG/CATALOG #	NOTES
'HA'	SMALL LED STEPLIGHT FOR THEATRE CHAIR INSTALLATION FOR AISLE LIGHTING; NOMINAL 2.5IN W x 4.5IN H x 2IN D. LUMINAIRE NOT TO EXCEED 2IN DEPTH	ALUMINUM	NA	INSTALLED IN EXISTING THEATRE CHAIRS	BLACK	UL DAMP	INTEGRAL DRIVER; ELV DIMMING	450 NOMINAL LUMENS; 3000K LED; >80CRI	3.0	COLE LIGHTING L111 SERIES; NICOR LED, CLOUDBAY, OR APPROVED	NEW LUMINAIRE TO REPLACE EXISTING LUMINAIRE. SEE LUMINAIRE SCHEDULE NOTE 9.
'HB'	RECESSED LED STEPLIGHT; NOMINAL 12IN W x 7-13/16IN H x 4IN D	DIE FORMED STEEL	LOUVERED FACEPLATE	RECESSED IN WALL	BLACK	UL DAMP	INTEGRAL DRIVER; 0-10V DIMMING	430 NOMINAL LUMENS; >80CRI	7.2	COLE LIGHTING 2153W-HO SERIES; OR APPROVED	NEW LUMINAIRE TO REPLACE EXISTING LUMINAIRE
'HC'	SURFACE MOUNTED LED STRIPLIGHT; NOMINAL 2.5IN W x 2.75IN H x 48IN L	COLD ROLLED STEEL	SQUARE ACRYLIC LENS	SURFACE MOUNTED	BLACK	UL DAMP	REMOTE DRIVER; 0-10V DIMMING	10000 NOMINAL LUMENS; 3000K LED; >80CRI	77.0	FSC LIGHTING L28645 SERIES; OR APPROVED	REMOTE DRIVER TO BE LOCATED ON TOP OF GRID DECK

**LUMINAIRE SCHEDULE NOTES**

- THIS LUMINAIRE SCHEDULE IS NOT COMPLETE WITHOUT A COPY OF THE PROJECT MANUAL CONTAINING THE ELECTRICAL SPECIFICATIONS.
- DIMMING CONTROL PROTOCOL (0-10VDC, LINE VOLTAGE, DALI, ETC.) COMPATIBLE WITH LIGHTING CONTROL SYSTEM AS SPECIFIED AND SHOWN ON DRAWINGS.
- PROVIDE +/- 12 INCH ADJUSTABILITY IN AIRCRAFT CABLE LENGTH WHERE USED.
- COORDINATE ALL CEILING TYPES WITH LUMINAIRE LOCATIONS PRIOR TO ORDERING LUMINAIRES. COORDINATE INSTALLATION WITH REFLECTED CEILING PLAN.
- SPECIFIED MANUFACTURERS ARE APPROVED TO SUBMIT BID. INCLUSION DOES NOT RELIEVE MANUFACTURER FROM SUPPLYING PRODUCT AS DESCRIBED.
- PROVIDE SUBMITTALS THAT INCLUDE THE LUMINAIRE, LAMP AND BALLAST INFORMATION OF EACH LUMINAIRE, WITH APPLICABLE OPTIONS CLEARLY CHECKED OR HIGHLIGHTED. SUBMITTALS NOT INCLUDING THIS INFORMATION WILL BE RETURNED AS REJECTED.
- REMOTE BALLASTS/DRIVERS: UL LISTED FOR THEIR APPLICATION. BALLASTS/DRIVERS MARKED AS UL RECOGNIZED COMPONENT BUT NOT UL LISTED ARE SUBJECT TO REMOVAL AND REPLACEMENT AT NO COST TO OWNER.
- REFER TO FLOOR PLANS FOR LOCATION, CIRCUITING, AND SWITCH LEGS FOR EACH REMOTE DRIVER. LABEL ALL REMOTE DRIVERS TO SHOW LUMINAIRE TYPE IDENTIFICATION AND SOURCE CIRCUIT. PROVIDE WIRING BETWEEN REMOTE DRIVER AND LUMINAIRE AS RECOMMENDED BY MANUFACTURER. DO NOT EXCEED MAXIMUM DISTANCE RECOMMENDED BY MANUFACTURER BETWEEN DRIVER AND FURTHEST LUMINAIRE.
- PROVIDE MOCKUP INSTALLATION OF LUMINAIRE, FOR APPROVAL BY DESIGN TEAM AND OWNER, TO VERIFY COMPATIBILITY WITH EXISTING ARCHITECTURE PRIOR TO SUBMITTAL APPROVAL.



**1 AUDITORIUM PLAN - LEVEL 1 - LIGHTING**



**SHEET KEYNOTES**

- DEMO AND REPLACE EXISTING LUMINAIRES ATTACHED TO UNDERSIDE OF GRIDIRON. INTERCEPT AND EXTEND EXISTING CIRCUIT FROM ARCHITECTURAL RELAY PANEL TO FEED REMOTE DRIVERS FOR NEW LUMINAIRES. LOCATE REMOTE DRIVERS ON TOP SIDE OF GRIDIRON SO AS NOT TO CONFLICT WITH RIGGING.
- INSPECT EXISTING SECOND ELECTRIC RACEWAY WIRING FOR DAMAGE AND REPLACE AS NECESSARY.
- LUMINAIRES AND ASSOCIATED HARDWARE FOR ALTERNATE #1.
- SEPARATE AISLE LIGHTING FIXTURES ONTO DEDICATED DIMMER, SEPARATE FROM HOUSE LIGHTING

920 NW 17th Ave.  
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Stamp



Consultant Logo

**INTERFACE ENGINEERING**  
PROJECT: 2019-0350  
CONTACT: Lauren Krueger  
100 SW Main Street, Suite 1600  
Portland, OR 97204  
TEL: 503.382.2266  
www.interfaceengineering.com

Key Plan

Project Owner:  
**BEAVERTON SCHOOL DISTRICT**

Project Name:  
**SOUTHRIDGE HIGH SCHOOL**  
Project Address:  
**9625 SW 125TH AVE.  
BEAVERTON, OR 97008**

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Revisions to Sheet

No.	Revision	Date

Status: **BID/PERMIT**

Date: **01.13.20**

Sheet Title

**AUDITORIUM FLOOR PLAN  
LEVEL 1  
ELECTRICAL**

Sheet No.

**E2.1**

Job No.

**2019-0350**

**GENERAL SHEET NOTES**



- A. CONTROL ALL THEATER WORK AND STAGE LIGHTING VIA ARCHITECTURAL RELAY PANEL. RELAY DESIGNATIONS INDICATED BY 'TR'. ROUTE EMERGENCY LIGHTING VIA EMERGENCY LIGHTING TRANSFER SYSTEM 'ELTS'. REFER TO THEATRICAL DRAWINGS FOR CONTROL INFORMATION.
- B. FOR EACH 20A, 120V CIRCUIT, PROVIDE 2 #10 CU, 1 #10 CU GND., IN 3/4" CONDUIT.
- C. REFER TO THEATRICAL PL SERIES DRAWINGS FOR LOCATION AND CIRCUIT QUANTITY FOR PRODUCTION LIGHTING POWER CONNECTION POINTS. PROVIDE #10 CU WIRE MINIMUM FOR CIRCUIT HOMERUNS UNLESS OTHERWISE NOTED.

**SHEET KEYNOTES**

- 1. PROVIDE WIRE GUTTER FOR REUSE OF EXISTING DIMMER PANEL FEEDER.
- 2. CONNECT LUMINAIRES TO NEXT AVAILABLE SPARE BREAKER OF EXISTING EMERGENCY LIGHTING TRANSFER SWITCH (ELTS).
- 3. DEMO EXISTING ARCHITECTURAL RELAY PANEL AND PROVIDE CONNECTION TO NEW ARCHITECTURAL RELAY PANEL. REFER TO THEATRICAL DRAWINGS FOR MORE INFORMATION.
- 4. DEMO EXISTING PRODUCTION LIGHTING RELAY PANEL AND PROVIDE CONNECTION TO NEW PRODUCTION LIGHTING RELAY PANEL. REFER TO THEATRICAL DRAWINGS FOR MORE INFORMATION.
- 5. PROVIDE 20A, 208V, 1PH CONNECTION TO CONTROL EQUIPMENT RACK (CER) FROM NEXT AVAILABLE SPARE BREAKER ON PANEL 'B'. REFER TO THEATRICAL DRAWINGS FOR MORE INFORMATION.
- 6. PROVIDE 20A, 208V, 1PH CONNECTION TO EMERGENCY BYPASS CONTROLLER (DEBC) FROM NEXT AVAILABLE SPARE BREAKER ON PANEL 'E2'. REFER TO THEATRICAL DRAWINGS FOR MORE INFORMATION.
- 7. REPLACE EXISTING TWIST-LOCK RECEPTACLE WITH DUPLEX RECEPTACLE AND CONNECT TO EXISTING CIRCUIT.
- 8. LUMINAIRES AND ASSOCIATED HARDWARE FOR ALTERNATE #1.

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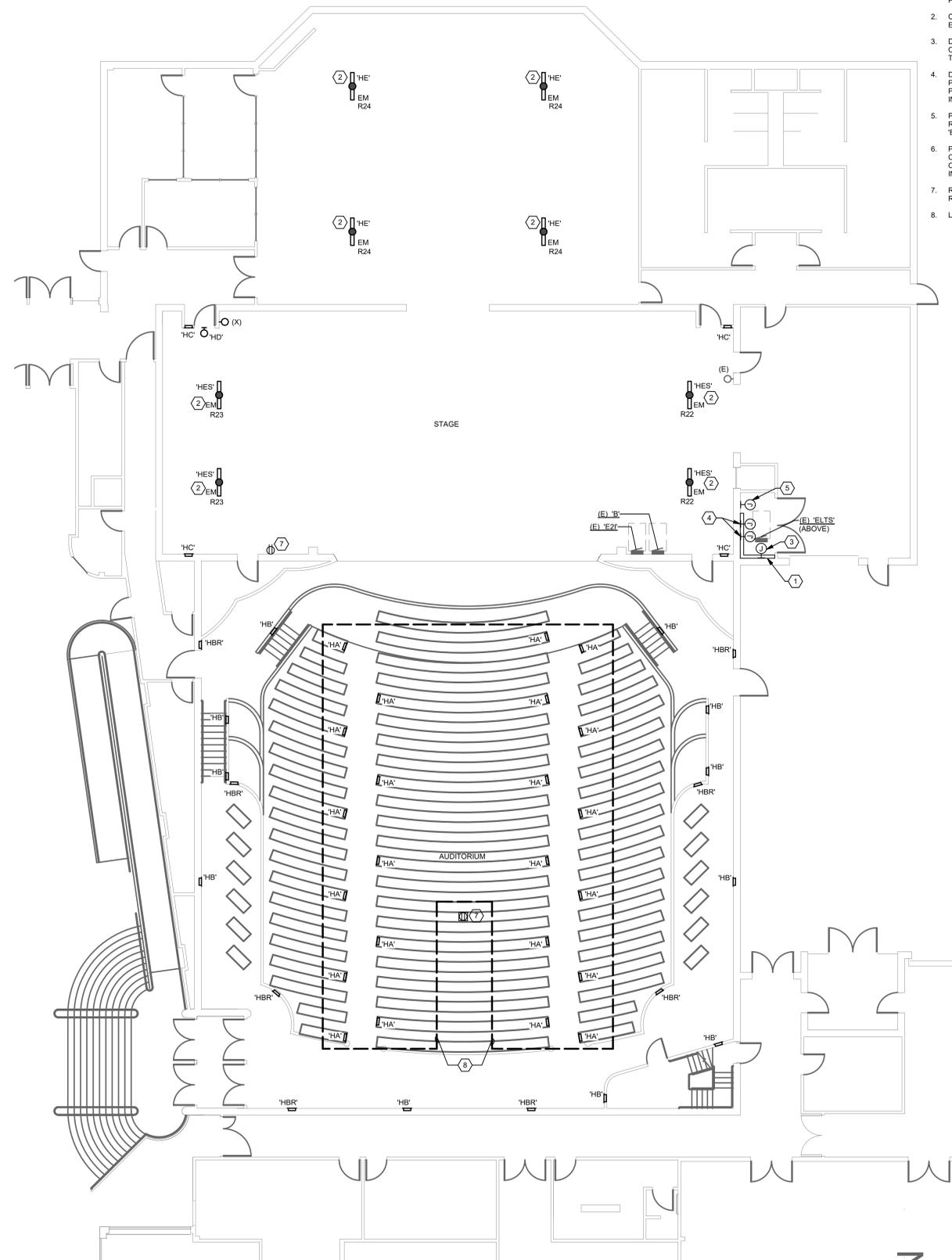


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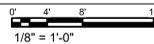


LUMINAIRE SCHEDULE											
TYPE	DESCRIPTION	HOUSING	SHIELDING	MOUNTING	FINISH	UL/IP RATING	DRIVER/POWER SUPPLY	LIGHT SOURCE	INPUT WATTS	MFG/CATALOG #	NOTES
'HA'	SMALL LED STEPLIGHT FOR THEATRE CHAIR INSTALLATION FOR AISLE LIGHTING; NOMINAL 2.5IN W x 4.5IN H x 2.125IN D	ALUMINUM	NA	INSTALLED IN EXISTING THEATRE CHAIRS	BLACK	UL DAMP	INTEGRAL DRIVER; ELV DIMMING	450 NOMINAL LUMENS; 3000K LED; >80CRI	3.0	COLE LIGHTING L111 SERIES; NICOR LED, CLOUDBAY, OR APPROVED	NEW LUMINAIRE TO REPLACE EXISTING LUMINAIRE. SEE LUMINAIRE SCHEDULE NOTE 9.
'HB'	RECESSED LED STEPLIGHT; NOMINAL 12IN W x 7.8125IN H x 4IN D	DIE FORMED STEEL	LOUVERED FACEPLATE	RECESSED IN WALL	BLACK	UL DAMP	INTEGRAL DRIVER; 0-10V DIMMING	430 NOMINAL LUMENS; 3000K LED; >80CRI	7.2	COLE LIGHTING 252 SERIES; OR APPROVED	NEW LUMINAIRE TO REPLACE EXISTING LUMINAIRE
'HBR'	RECESSED LED STEPLIGHT W/ INTEGRAL RECEPTACLE; NOMINAL 12IN W x 7.8125IN H x 4IN D	DIE FORMED STEEL	LOUVERED FACEPLATE	RECESSED IN WALL	BLACK	UL DAMP	INTEGRAL DRIVER; 0-10V DIMMING	430 NOMINAL LUMENS; 3000K LED; >80CRI	7.2	COLE LIGHTING 252 SERIES; OR APPROVED	CONSULT MANUFACTURER FOR FACEPLATE LAYOUT AND INSTALLATION; NEW LUMINAIRE TO REPLACE EXISTING LUMINAIRE
'HC'	RECESSED LED STEPLIGHT W/ INTEGRAL RECEPTACLE; NOMINAL 12IN W x 7.8125IN H x 4IN D	DIE FORMED STEEL	LOUVERED FACEPLATE	RECESSED IN WALL	BLACK	UL DAMP	INTEGRAL DRIVER; 0-10V DIMMING	215 NOMINAL LUMENS; BLUE LED	3.6	COLE LIGHTING 252 SERIES; OR APPROVED	
'HD'	WALL MOUNTED LED FLUSH MOUNT GUARD SCOWCE; NOMINAL 5IN DIA x 9 5/8IN H	ALUMINUM	FROSTED GLOBE	WALL MOUNTED 1'-0" OVER DOOR	BLACK	UL DAMP	INTEGRAL DRIVER; TRIAC DIMMING	1600 NOMINAL LUMENS; 3000K LED; >90CRI	17.0	BARNLIGHT BLE-F-CGG SERIES; BASELITE, OR APPROVED	
'HE'	SURFACE MOUNTED LED STRIPLIGHT; NOMINAL 3.44IN W x 2.29IN H x 48IN L	COLD ROLLED STEEL	FLAT FROSTED ACRYLIC	SURFACE MOUNTED	BLACK	UL DAMP	INTEGRAL DRIVER; 0-10V DIMMING	5000 NOMINAL LUMENS; 3000K LED; >80CRI	36.0	LITHONIA CLX SERIES; DAYBRITE, OR APPROVED	
'HES'	SUSPENDED LED STRIPLIGHT; NOMINAL 3.44IN W x 2.29IN H x 48IN L	COLD ROLLED STEEL	FLAT FROSTED ACRYLIC	SUSPENDED FROM CEILING, ALIGN BOTTOM OF LUMINAIRE TO BOTTOM OF SURROUNDING MEP SYSTEMS	BLACK	UL DAMP	INTEGRAL DRIVER; 0-10V DIMMING	5000 NOMINAL LUMENS; 3000K LED; >80CRI	36.0	LITHONIA CLX SERIES; DAYBRITE, OR APPROVED	
'HF'	SURFACE MOUNTED LED WORKLIGHT W/ ADJUSTABLE YOKE AND PIPE CLAMP; NOMINAL 12IN W x 6IN D x 8.05IN H	ALUMINUM	DIFFUSE LENS	SURFACE MOUNTED TO BATTEN	BLACK	UL DRY	INTEGRAL DRIVER	10000 NOMINAL LUMENS; 3000K LED; >90CRI	130.0	ALTMAN LIGHTING LED WORKLIGHT SERIES; OR APPROVED	PROVIDE LS-20P TWIST-LOCK PLUG TO CONNECT TO BATTEN

- NOTES**
- THIS LUMINAIRE SCHEDULE IS NOT COMPLETE WITHOUT A COPY OF THE PROJECT MANUAL CONTAINING THE ELECTRICAL SPECIFICATIONS.
  - DIMMING CONTROL PROTOCOL (0-10VDC, LINE VOLTAGE, DALI, ETC.) COMPATIBLE WITH LIGHTING CONTROL SYSTEM AS SPECIFIED AND SHOWN ON DRAWINGS.
  - PROVIDE +/- 12 INCH ADJUSTABILITY IN AIRCRAFT CABLE LENGTH WHERE USED.
  - COORDINATE ALL CEILING TYPES WITH LUMINAIRE LOCATIONS PRIOR TO ORDERING LUMINAIRES. COORDINATE INSTALLATION WITH REFLECTED CEILING PLAN.
  - SPECIFIED MANUFACTURERS ARE APPROVED TO SUBMIT BID. INCLUSION DOES NOT RELIEVE MANUFACTURER FROM SUPPLYING PRODUCT AS DESCRIBED.
  - PROVIDE SUBMITTALS THAT INCLUDE THE LUMINAIRE, LAMP AND BALLAST INFORMATION OF EACH LUMINAIRE, WITH APPLICABLE OPTIONS CLEARLY CHECKED OR HIGHLIGHTED. SUBMITTALS NOT INCLUDING THIS INFORMATION WILL BE RETURNED AS REJECTED BY THE ENGINEER OF RECORD.
  - REMOTE BALLASTS/DRIVERS: UL LISTED FOR THEIR APPLICATION. BALLASTS/DRIVERS MARKED AS UL RECOGNIZED COMPONENT BUT NOT UL LISTED ARE SUBJECT TO REMOVAL AND REPLACEMENT AT NO COST TO OWNER.
  - REFER TO FLOOR PLANS FOR LOCATION, CIRCUITING, AND SWITCH LEG FOR EACH REMOTE DRIVER. LABEL ALL REMOTE DRIVERS TO SHOW LUMINAIRE TYPE IDENTIFICATION AND SOURCE CIRCUIT. PROVIDE WIRING BETWEEN REMOTE DRIVER AND LUMINAIRE AS RECOMMENDED BY MANUFACTURER. DO NOT EXCEED MAXIMUM DISTANCE RECOMMENDED BY MANUFACTURER BETWEEN DRIVER AND FURTHEST LUMINAIRE.
  - PROVIDE MOCKUP INSTALLATION OF LUMINAIRE, FOR APPROVAL BY DESIGN TEAM AND OWNER, TO VERIFY COMPATIBILITY WITH EXISTING ARCHITECTURE PRIOR TO SUBMITTAL APPROVAL.



**1 AUDITORIUM PLAN - LEVEL 1 - LIGHTING**



Key Plan

Project Owner:  
**BEAVERTON SCHOOL DISTRICT**

Project Name:  
**WESTVIEW HIGH SCHOOL**  
Project Address:  
**4200 NW 185TH AVE  
PORTLAND, OR 97229**

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Revisions to Sheet		
No.	Revision	Date
1	ADDENDUM 1	02.14.2020

Status: **BID/PERMIT**

Date: **01.13.20**

Sheet Title

**AUDITORIUM FLOOR PLAN  
LEVEL 1  
ELECTRICAL**

Sheet No.

**E.2.1**

Job No.

**2019-0350**

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Project Coordination.
  2. Administrative and Support Personnel.
  3. Safety requirements.
  4. Pre-Construction Conference.
  5. Site Mobilization Conference.
  6. Special Inspection Conference.
  7. Progress meetings.
  8. Pre-Installation Conferences.
  9. Administrative Submittals:
    - a. Shutdown Requests.
    - b. Hot Work Permit.
    - c. Request for Information (RFI).
  10. Layout of Work.
  11. Cleaning and Protection.

1.2 PROJECT COORDINATION

- A. Coordinate scheduling, submittals, and Work of various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

PROJECT MANAGEMENT AND COORDINATION

- E. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 ADMINISTRATIVE AND SUPPORT PERSONNEL

- A. In addition to General Superintendent and other administrative and support personnel required for performance of Work, provide Project Coordinator experienced in administration and supervision of building construction, including mechanical and electrical work. Project Coordinator is required to act as general coordinator of interfaces between units of Work. Both General Superintendent and Project Coordinator shall have a minimum of 5 years experience with projects of similar scope and complexity.
- B. Owner reserves right to review qualifications and experience of general superintendent and project coordinator and to accept or reject Contractor's proposal for staff members filling these positions.
- C. Contractor shall submit to Owner and Architect, within five days of Notice to Proceed, proposed listing of all principal staff members and their assignments, consultants and subcontractors. List shall include business hour phone numbers and addresses as well as emergency phone numbers for off-hour contact on 24-hour basis in event of emergency.

1.4 SAFETY REQUIREMENTS

- A. The following requirements, as applicable, apply to Work specified herein:
  - 1. Associated General Contractors of America, Inc., "Manual of Accident Prevention in Construction."
  - 2. Workmen's Compensation Board "Safety Code for Construction Work."
  - 3. Oregon State Employment Act Safety Requirements.
  - 4. Oregon Occupational Safety and Health Act (OROSHA) requirements, as applicable, apply to Work specified herein.

1.5 PRECONSTRUCTION CONFERENCE

- A. Owner and Architect will arrange, prior to commencement of Work, Preconstruction Conference to cover following agenda:
  - 1. Introduction.
  - 2. Explain:
    - a. Execution of Owner-Contractor agreement.
    - b. Submission of executed bonds and certificates of insurance.

PROJECT MANAGEMENT AND COORDINATION

- c. Distribution of Contract Documents.
  - d. List of subcontractors, products and Schedule of Values.
  - e. Responsibility of each participant.
  - f. Inspection procedures.
  - g. Progress Schedules.
  - h. Progress Payment procedures.
  - i. Submittals and Approvals.
  - j. Routing of correspondence.
  - k. Change Order procedures.
  - l. Final Inspection procedures.
3. Review:
- a. Product identification/temporary signs.
  - b. System for daily collection, recycling, and disposal of waste materials from site.
  - c. Special coordination problems.
  - d. Use of Owner's property.
  - e. Security procedures.
  - f. Ingress and egress to site, traffic and parking rules.
  - g. Demolition procedures.
  - h. Special restrictions, i.e., noise-abatement, etc.
  - i. Special requirements such as BOLI wage rates.
  - j. Certifications.
  - k. Safety, fire and security.
  - l. Insurance responsibilities.
  - m. Hazardous materials.
4. Confirm:
- a. Critical layout situations.

PROJECT MANAGEMENT AND COORDINATION

- b. Existing conditions of Site and adjacent areas.
- c. Points of connection to existing facilities.
- 5. Determine:
  - a. Contractor's plan of operations.
  - b. Line of authority in Contractor's organization.
  - c. Off-hour contacts in case of emergency.
  - d. Safety and security arrangement contemplated by Contractor.
  - e. Address and telephone numbers of Architect, Contractor and subcontractors.

1.6 SITE MOBILIZATION CONFERENCE

- A. Owner will schedule conference at Project Site prior to Contractor occupancy. If deemed appropriate by Owner, Site Mobilization Conference agenda may be combined with Pre-construction Conference.
- B. Attendance required: Owner, Architect, special consultants, Contractor and major subcontractors.
- C. Agenda:
  - 1. Use of premises by Owner and Contractor.
  - 2. Owner's requirements.
  - 3. Temporary utilities provided by Owner.
  - 4. Security and housekeeping procedures.
  - 5. Schedules.
  - 6. Procedures for testing.
  - 7. Procedures for maintaining record documents.
  - 8. Requirements for start-up of equipment.
  - 9. Inspection and acceptance of equipment put into service during construction period.

1.7 SPECIAL INSPECTION CONFERENCE

- A. Within five (5) days of Notice to Proceed, Owner and Architect, together with representative of governing jurisdiction, shall arrange meeting to clarify requirements and conditions for Special Inspections which may be required by governing jurisdiction. The Contractor and Test Lab/Special Inspections firm shall be represented at that meeting.

PROJECT MANAGEMENT AND COORDINATION

1.8 PROGRESS MEETINGS

- A. Contractor shall attend weekly coordination meetings arranged by Owner at regularly scheduled times. Additional specific meetings may also be held for other purposes. Contractor and other persons involved in coordination and planning for Work, such as prime Subcontractors, shall attend as appropriate. Meetings, which will also be attended by Architect, Owner and other appropriate persons, shall be conducted utilizing following agenda:
1. Comments or revisions to previous meeting notes.
  2. Construction schedule review.
  3. Submittals status.
  4. Proposal Request status.
  5. RFI status.
  6. Other quotations.
  7. Design/Construction issues, old and new.
  8. Information.
  9. Site Observations.
- B. Meeting just prior to last meeting of the month:
1. Provide draft payment applications for review at the meeting.
  2. Provide all back up for any COR/Change Order to appear on current month's application.
  3. Correction, revisions or pre-approval of these documents will be made at this meeting, so the final documents will be provided at the last meeting for execution and signing by all necessary parties.
- C. Contractor, who will be responsible for documentation of meetings, will distribute copies of Progress Meeting notes to attendees and appropriate parties, so they are received no later than two business days prior to next regularly scheduled meeting.

1.9 PRE-INSTALLATION CONFERENCES

- A. Contractor shall schedule and hold Pre-Installation Conferences at Site well before installation of each unit of work that requires coordination with other work. Installers and representatives of manufacturers and fabricators who are involved in or affected by each unit of work shall attend. Advise Architect and Owner a minimum of two weeks prior to conference of schedule of meetings, dates, subject, and if consulting engineer is required. At each meeting review progress of other work and preparations of particular work under consideration, including specific requirements for following issues:
1. Contract Documents.

PROJECT MANAGEMENT AND COORDINATION

2. Options.
  3. Related Change Orders.
  4. Purchases.
  5. Deliveries.
  6. Shop Drawings, Product Data and quality controls samples.
  7. Product and Material requirements.
  8. Compatibility and possible conflicts.
  9. Time schedules.
  10. Manufacturer's recommendations.
  11. Acceptability of substrate.
  12. Temporary facilities.
  13. Space and access.
  14. Governing regulations.
  15. Safety.
  16. Inspection, testing and maintenance requirements.
  17. Required performance.
  18. Recording requirements.
  19. Protection.
  20. Warranty requirements.
- B. Record discussions of each conference. Distribute meeting minutes promptly to all involved, including Architect and Owner. When deemed appropriate by the Owner, Pre-installation conferences may be held in conjunction with regularly scheduled Progress Meetings.
- C. Do not proceed with Work if pre-installation is not successfully concluded. Initiate action necessary to resolve issues and re-convene conference as soon as possible. Failure on part of Contractor to resolve issues which may delay project will not be considered as grounds for approval of Change Orders requesting additional Contract Time or compensation.

1.10 CLOSEOUT CONFERENCE

- A. Owner and Architect will arrange, prior to Substantial Completion, Closeout Conference to coer the following agenda:

PROJECT MANAGEMENT AND COORDINATION

1. Procedures for completing and archiving closeout deliverables in eBuilder.
2. Requirements for preparing Record Documents.
3. Requirements for preparing O&Ms
4. Submittal of warranties.
5. Requirements for delivery of Maintenance stock.
6. Requirements for demonstration and training.

1.11 ADMINISTRATIVE SUBMITTALS

- A. Utility Shutdown Requests: Not required.
- B. Hot Work Permits: Work requiring any concrete cutting or brazing, grinding, welding or soldering of metals, or any work producing gases or particulate capable of activating ionization or smoke/heat detectors, shall required five days notice and submittal of Hot Work Permit. Failure to prepare permit and notify Owner of this work that results in Fire Department false alarm will result in pass-through of false alarm fine to Contractor.
- C. Request for Information (RFI): Design Clarifications/Interpretations:
  1. General: When Contractor requires a clarification or information regarding Work, this shall be initiated by submittal of Request for Information. RFI is designed to deal with on-site concerns that, for whatever reason, are not adequately clarified in Contract Documents, and can not be easily resolved at the Site with assistance of the Owner's representative.
  2. Contractor shall submit all RFI's. No RFI's will be accepted from sub-contractors, suppliers, or others, unless first submitted to Contractor.
  3. Contractor shall thoroughly review, date and sign all submitted RFI's. Contractor shall thoroughly review RFI's with respect to Contract Documents prior to submitting RFI's to Architect, and notify affected parties of any potential cost or schedule impact.
  4. Architect will receive only properly prepared and submitted RFI's. Architect will stamp for date received, review with Documents and Owner for decision, and process within 10 working days.
  5. Form: RFI form is to be submitted to Architect, with top section filled out by Contractor. Include required response date to establish when Project may be adversely impacted. This date may be no less than 7 calendar days from initiation date. Incomplete forms may be returned by Architect, resulting in delay in processing. Use additional forms, diagrams or marked-up drawings where necessary. Method of transmittal to Architect should reflect urgency of response.
  6. The RFI process is not intended for Contractor questions when answers are contained in

PROJECT MANAGEMENT AND COORDINATION

the Contract Documents. RFI's whose answers are evident in the Contract Documents will be rejected and returned by the Architect without further action required.

1.12 LAYOUT OF WORK

- A. Verify conditions of project site. Purpose of survey is to record existing conditions prior to construction for comparison with Contract Documents. Report all conflicts to Architect. Architect will provide revisions to Contract Documents or issue instruction to deal with conflicts. Contractor shall be responsible for remedying conflicts which could have been prevented by timely review of existing conditions. All remedies, which vary from Contract Documents shall be approved by Architect and Owner.
- B. Be responsible for properly laying out Work, and for all lines and measurements for all Work executed under Contract Documents. Verify dimensions shown on Shop Drawings and report errors or inaccuracies in writing to Architect before commencing work.
- C. Be responsible for coordination and installation of all architectural and electrical work. Owner will not entertain requests for delays, time expansion or additional costs due to lack of coordination of Work by Contractor.
- D. Electrical trade shall be responsible for layout of conduit based on reference lines shown on Drawings.
  - 1. Because of their small scale, Electrical Drawings are diagrammatic and do not show all offsets and accessories which may be required.
  - 2. Investigate structural and finish conditions affecting Work and arrange Work accordingly.
  - 3. Provide fittings and accessories as required to fit job conditions.
- E. Prepare detail layout drawings to a larger scale than Contract Documents in areas where Work is of sufficient complexity to warrant additional detailing. This shall apply to all Electrical Rooms, wiring at switchboards and motor control centers, and panelboard cabinets in electrical closets. Prepare drawings on tracings of same size as Contract Drawings and submit with each set of Owner's Record Drawings. Submit layout drawings for approval before commencing shop fabrication or field erection, only when so directed by Architect.
- F. Slots, chases and openings through floors, walls, and ceilings as specified in new construction shall be provided by various trades. Trade requiring them shall insure that they are installed and properly located, and shall be responsible for any cutting and patching caused by their omission or improper location.
- G. Anchor bolts, sleeves, inserts and supports that are required shall be furnished and installed under same Section of Specifications as respective items to be anchored, with locations as directed by trade requiring them.
- H. Provide clearance and headroom. Utilize spaces efficiently so that adequate accessibility is retained for future maintenance, repairs, modifications and additions.
- I. Relocate installed work which does not provide adequate accessibility.

PROJECT MANAGEMENT AND COORDINATION

- J. Changes required in Work of Contractor, caused by Contractor's neglect to coordinate Work with others, shall be made at Contractor's own expense.
- K. Do all necessary Work to receive or join with Work of all trades.
- L. Coordinate Work to provide adequate clearances for installation and maintenance of equipment.
- M. Installation and Arrangement: Install Work to permit removal of parts requiring periodic replacement or maintenance.
  - 1. Arrange raceways, wiring and equipment to permit ready access to switches, motors and control components. Doors and access panels shall be kept clear.
  - 2. Offsets, and changes in direction of conduit and raceways shall be made as required to maintain proper headroom and clearances whether or not indicated on Drawings. Provide all fittings, junction boxes, connectors, etc., as required to effect these offsets and change in direction.
- N. Drawings and Specifications are arranged for convenience only and do not necessarily determine which trades perform various portions of Work.
- O. Transmit to trades doing Work of other Divisions all information required for Work to be provided under their respective Sections (such as electric wiring, access door locations, etc.) in ample time for their installation.
- P. Consult with trades doing Work of other Divisions so that:
  - 1. Required related Work and information is received from them in ample time for installation.

1.13 CLEANING AND PROTECTION

- A. During handling and installation of Work at Project Site, clean and protect Work progress and adjoining Work on basis of continuous maintenance. Apply protective covering for stored or installed Work where it is required for proper protection from damage or deterioration, up until Substantial Completion if necessary.

END OF SECTION



METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Examine Drawings for required items and furnish in sizes, number, and kind to complete the Work.
- B. The General Structural Notes shall be used in conjunction with these specifications. The General Structural Notes shall supersede items in this specification when discrepancies exist.
- C. Shop fabricate miscellaneous steel, including brackets, railings, angles, anchors, supports, and other items as detailed for support or connection of other Work.
- D. Furnish items to other trades when setting and installation is part of their Work.
- E. Related Section: Division 9 Section "Painting."

1.2 REFERENCES

- A. American Institute of Steel Construction (AISC).
- B. American Society for Testing and Materials (ASTM).
- C. The Society for Protective Coatings (SSPC).
- D. National Association of Corrosion Engineers International (NACE International).
- E. International Code Council (ICC).
- F. Occupational Safety and Health Administration (OSHA).
- G. International Building Code (IBC).
- H. American Welding Society (AWS).

1.3 SUBMITTALS

- A. Submit the following in accordance with Division 1 Section "Submittal Procedures."
- B. Shop drawings showing dimensioned details of all components. Cross-reference shop drawing details to detail numbers on the Drawings to facilitate checking.
- C. Welding Certificates: Copies of certificates for welding procedures and personnel.
- D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

## METAL FABRICATIONS

### 1.4 QUALITY ASSURANCE

- A. Handrails, guardrails, and ladders shall conform to OSHA standards and IBC requirements.
- B. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Welding: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1, "Structural Welding Code – Steel."
  - 2. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

### 1.5 PROJECT CONDITIONS

- A. Field Measurements:
  - 1. Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 2. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Product manufacturers are listed in Paragraph 2.2, Materials.
- B. Other Manufacturers: Submit Substitution Requests prior to bid date in accordance with Division 1 Section "Product Requirements."

### 2.2 MATERIALS

- A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- B. The following is a list of items needed for the construction of the building as specified and constitutes a description of the type of materials necessary to fabricate such items. However, it does not preclude that each individual item on the job is herein listed. It is the responsibility of this Section to completely furnish all items as detailed.
  - 1. Flat Bar: ASTM A36, standard rolled section of size and weight fabricated as detailed.

METAL FABRICATIONS

2. Steel Tubing: ASTM A500, Grade B, structural steel tubing in size, weight, and wall thickness fabricated as detailed.
3. Plates, Clips, Hangers, and Brackets: ASTM A36, standard rolled shapes and sections fabricated to sizes and dimensions as detailed.
4. Fasteners: Provide zinc-coated fasteners with galvanizing complying with ASTM A 153 as noted on drawings and elsewhere in the specifications. Select fasteners for the type, grade and class required for the installation of miscellaneous metal items. Fasteners to be as follows:
  - a. Nails: ASTM F1667
  - b. Wood Screws: Furnish wood screws as detailed. ASTM D1761
  - c. Tapping Screws: ASTM C1513
  - d. Lag Bolts: ANSI B18.2.1
  - e. Standard Bolts: Steel bolts complying with ASTM A 307, Grade A, with ASTM A 563 hex nuts and flat washers.
  - f. High Strength Bolts: ASTM A325, regular hexagon head
  - g. Nuts: ASTM A563
  - h. Washers: Under head and nut in all wood connections. ASTM F844 with A307 bolts, ASTM F436 with A325 bolts
  - i. Finish: Furnish hot-dip galvanized finish when installed with galvanized items.
5. Threaded Concrete Anchors:
  - a. Description: Zinc plate finish, interior use only.
  - b. Manufacturers: "Titen HD" by Simpson Strong-Tie, Inc., "Kwik HUS-EZ" by Hilti.
6. Expansion Anchors for fastening to concrete:
  - a. ICC approved, zinc plate finish.
  - b. Manufacturers: "Kwik Bolt TZ" by Hilti, "Trubolt+" by ITW Red Head, "Strong-Bolt 2" by Simpson Strong-Tie.
7. Handrails and Guardrails: 1-1/2-inches o.d., ERW or DOM round mechanical tubing, 0.156-inch wall thickness, for general areas fabricated as detailed. Other sizes as noted. All connections penetration welded using back-up sleeve welding connectors, include end returns to wall and closure plates on open ends. All welds ground smooth and flush.

METAL FABRICATIONS

Furnish complete with all fittings, brackets, sleeves and hardware required for installation.

8. Caged Vertical Ladder: FS Industries, 800-421-0314, "Fixed Steel Ladders-Series M Modular Fixed Ladders," heavy duty welded sub-assemblies, width and length as detailed. No section is greater than 7-feet in length. Gray factory powder coat paint finish.
  - a. Construction Features:
    - (1) Side members are 1/4"x2"x2" steel angle.
    - (2) Climbing rungs are 3/4" corrugated steel round rungs space on 12" centers.
    - (3) Stand-off brackets are 7".
  - b. Cage Features:
    - (1) OSHA design safety cages have flared bottom opening for easy entry.
    - (2) Cage begins 7-feet (series M) from bottom rung, and is factory welded to the ladder.

2.3 FABRICATION

- A. Examine Drawings for required items and furnish in sizes, number and kind to complete the Work.
- B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- C. Form metal work to required shapes and sizes, with true curves, lines and angles. Provide components in sizes and profiles indicated, but not less than required to comply with requirements indicated for structural performance or, if not indicated, to comply with requirements of authorities having jurisdiction and with structural properties to sustain safety or withstand loads to which normally subjected.
- D. Provide necessary rebates, lugs, and brackets for assembly of units. For Work exposed to view, use concealed fasteners unless indicated as exposed fasteners or welded joints, or unless otherwise indicated on final shop drawings.
- E. Mill all exposed joints to a tight, hairline fit, flush and smooth. Miter exposed corner joints as indicated and machine fit to hairline joint. Joints shall be securely and neatly tenoned, drawn together using concealed fasteners. Locate joints where indicated or accepted on final shop drawings.

METAL FABRICATIONS

- F. Cut shapes to pattern, sizes, and dimensions as detailed and approved. Punch and drill holes accurately, maintaining proper edge and end clearance and proper diameter to fit each fastening. Countersink holes for flat head wood screws.
- G. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- H. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
- I. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- J. Furnish and shop assemble all items true to measurements taken at the job, disassembled and ship to the job, complete with all sleeves, bolts, etc., necessary for erection.
- K. Mark each member or assembly of members with erection marks for identification; furnish an erection diagram with marks as detailed. Ship assembled units in such a manner that they may be transported and unloaded without being excessively stressed, deformed or otherwise damaged. Place fabricated material on skids, off the ground; keep clean and properly drained.
- L. All welding performed by AWS certified welders and in accordance with AWS D1.1. Perform welding, brazing, and soldering such that surface exposed to view in completed Work will be free of pitting, runs, spatter, cracks, warping, dimpling, depressions, distortion, discoloration and other imperfections. Grind exposed welds to match adjacent finish. Welds shall not be visible on finished surface.
- M. Grind exposed ends and cut edge of all items smooth and slightly beveled to remove sharpness, burrs, and cutting marks. Use gas cutting torch in the field to cut holes or correct fabrication errors only after submitting each condition to Architect for review.
- N. Fabrication tolerance for flat surface shall be  $\pm 1/32$ -inch in 2-feet measured in every direction at any location with no evidence of oil canning.
- O. Separate dissimilar metals fabricated under this Section and metals of this Section that contact metals of other construction with separator recommended by fabricator to prevent corrosion and galvanic action. Do not extend coating onto exposed surfaces.

2.4 STEEL FINISHES

- A. One shop coat rust inhibiting primer paint on all items whether concealed or exposed, except do not prime surfaces within 2-inches of welds.

METAL FABRICATIONS

PART 3 EXECUTION

3.1 ERECTION

- A. Furnish items to other trades when setting and installation is part of their Work.
- B. Do not set permanent bolting or welding until as much of the assembly as will be stiffened thereby has been properly aligned and within tolerances.
- C. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- D. Set steel elements accurately to the lines and elevations indicated. Align and adjust the various members before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
- E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- F. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- G. At completion of erection, grind exposed welds smooth, touch-up paint field bolts and welds and abrasions with the same paint used for shop painting or galvanized repair paint on galvanized items.

END OF SECTION



PRODUCTION SYSTEMS ELECTRICAL INSTALLATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provision of services as listed within Div. 26 related to the installation of production systems and electrical infrastructure including:
  - a. Production lighting power and control system
  - b. Production rigging power and control system

B. It shall be under the work in this section to provide electrical infrastructure, accommodations and connections to systems in other Sections.

1. It shall be under the work of a specialty sub contractor for Section 11 61 33 – Production Rigging to furnish devices related to motors, limit switches and sensors. It shall be under the work in this Div. 26 Section to coordinate and provide electrical service, connection and testing for related power and control. Reference PR Documents and shop drawings for electrical requirements.

C. Coordination with all related sections doing adjacent or integrated work.

1.2 RELATED SECTIONS

A. Coordinate with the following sections in carrying out this work:

1. Division 1 General Conditions
2. Section 11 61 33 – Production Rigging
3. Section 11 61 83 – Production Lighting Control
4. Other Division 26 Sections

1.3 REFERENCES

- A. Comply with all national, state and local regulations. In the event of conflict between these specifications and the applicable regulations, the more stringent shall govern.

1.4 DEFINITIONS

- A. Refer to Div. 1 for definitions.
- B. Owner's Representative: For the scope in this Section, authorized personnel representing The Beaverton School District and The Shalleck Collaborative, Inc., Theatre Consultants.

1.5 SYSTEM DESCRIPTION

- A. Production Rigging systems

### PRODUCTION SYSTEMS ELECTRICAL INSTALLATION

1. It shall be under the work of a specialty sub contractor for Section 11 61 33 – Production Rigging to furnish devices related to motors, limit switches and sensors.
2. It shall be under the work in this Div. 26 Section to coordinate and provide electrical service, connection and testing for related power and control. Reference PR Documents and shop drawings for electrical requirements.
  - a. Motorized Cyc Line-set motor and control systems.
  - b. Termination of “electrics” lighting batten flexible electrical cables on both ends. (cable supplied installed by 11 61 33, termination by Div 26).

#### A. Production Lighting Control System

1. The system shall be designed for the control of production lighting and shall consist of factory pre-wired dimming, switching and processing rack enclosures containing relays, dimmers, power supplies, breakers, terminals and/or control electronics.
2. Switched circuits shall be connected to factory pre-wired wiring devices.
3. System shall work in conjunction with specified low-voltage control and receptacle stations.
4. All equipment is furnished as equipment only and must be installed and circuited by the electrical contractor.

## 1.6 DESIGN CRITERIA

#### A. Production Lighting System

1. Branch production lighting wiring and infrastructure shall provide 115VAC +/-3% at all wiring devices under a 575w lighting load.
2. Production circuits shall be rated for 100% continuous operation. Branch wire size and conduit/raceway shall be sized for the full rated loads of the dimmers and/or relays and 100% continuous operation of every circuit without deration on any part of the circuit or system, subject to the maximum overall feeder and protection devices as listed in Drawings. For 20A loads, assume 10AWG wire unless otherwise noted.
3. Control wiring shall be installed per the related trade and regulatory guidelines including but not limited to UL, NEC, IEEE, and all manufacturer’s recommendations and requirements. Contractor shall be responsible in the event that work under their control voids or jeopardizes manufacturers’ warranties.

- B. Control wiring shall be installed per the related trade and regulatory guidelines including but not limited to UL, NEC, IEEE, and all manufacturer’s recommendations and requirements. Contractor shall be responsible in the event that work under their control voids or jeopardizes manufacturers’ warranties.

## 1.7 SUBSTITUTIONS

- A. All requests for substitutions from the specified materials, assemblies or related services

## PRODUCTION SYSTEMS ELECTRICAL INSTALLATION

shall be submitted for review by the Owner's Representative prior to bid. Substitution requests made after bid shall be neither reviewed nor accepted. Requests shall be made in accordance with Division 1 of the specifications, and in a timely fashion so as to not affect the project schedule in either case of the substitution being accepted or rejected.

- B. Documentation for the substitution shall be submitted with supporting material and shall include the related information for the item as specified so that equivalence can be demonstrated. The burden of proof rests solely upon the Contractor. The Owner's Representative shall be the sole evaluator of the fitness of the substitution.
- C. All expenses related to the substitution including, but not limited to, all fees and expenses incurred in the evaluation of the substitution, and any effect on the costs and schedule of other trades whether or not the substitution is accepted, shall be borne by the Contractor.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Components and types per referenced specification sections except where manufacturer's recommendations and requirements vary.
  - 1. Refer to final, approved production systems manufacturers or specialty sub contractor's shop drawings for final control wiring types, counts and routes, which shall govern over Drawings. Coordinate with manufacturer or specialty sub contractor for alternate routes and wire counts in case of field limitations.

### 2.2 PRODUCTION LIGHTING

- A. All power and control wiring shall be labeled at each end and connected per circuit assignments as shown on the PL drawings and approved shop drawings, as applicable.
- B. Provide excess tails at ends as recommended by the manufacturer.
- C. Control wiring shall be continuous with no splices per the applicable industry standards.
- D. Wiring device wiring:
  - 1. Branch load wiring shall include a dedicated neutral for each circuit, sized as a current carrying conductor. No common neutrals will be accepted.
  - 2. Provide one ground wire minimum per wiring device, homerun to and terminated at the Relay Panel, sized per applicable regulatory requirements.
  - 3. Coordinate circuit management for proper landing on device lugs. Coordination shall include, but not be limited to, verifying with the manufacturer, during the submittal process and prior to manufacturing, provision of the appropriate lug sizes within the devices.
  - 4. Branch circuit load wiring shall be continuous. No splices will be acceptable between relay lugs and wiring device terminal strip.
  - 5. Coordinate with manufacturer for the provision of properly sized terminals and lugs,

### PRODUCTION SYSTEMS ELECTRICAL INSTALLATION

as appropriate for compliant wiring. Wire size reductions or spliced leaders used for stepping down wire size to fit manufactures' terminals is not acceptable.

6. All power and control wiring for production systems shall be pulled in metal raceway. This shall include empty raceway provided for future production systems wiring.
  - a. Raceway placed in grade or poured in concrete shall be epoxy covered, rigid metal conduit/raceway.
7. Production lighting conduit shall be no smaller than 1" diameter, or the greater of what is required by either the applicable code, Drawings or the final, approved equipment shop drawings.

#### E. Floor Pockets

1. Reuse existing floor pockets at locations as shown on the drawings. New faceplates for the floor boxes will be provided by the production lighting control section.
  - a. Floor pocket backbox shall be placed in flooring material to yield a finished product that is flush with the finish floor, including floor box cover.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

##### A. Production Lighting Control System

1. It is under the work in this Div. 26 Section to receive and store the necessary materials and equipment for installation of the system. It is the intent of these specifications and plans to include everything required for proper and complete installation and operation of the production lighting system, even though every item may not be specifically mentioned. The contractor shall deliver on a timely basis to other trades any equipment that must be installed during construction.
2. It is under the work in this Div. 26 Section to be responsible for field measurements and coordinating physical size of all equipment with the architectural requirements of the spaces into which they are to be installed.
3. It is under the work in this Div. 26 Section to install all lighting control and production lighting equipment in accordance with final, approved manufacturer's approved shop drawings.

#### 3.2 CONDUIT/RACEWAY INSTALLATION

- ##### A. Conduit/raceway shall not be placed where it obstructs production functions or the proper installation of other production systems.
1. No conduit/raceway is permitted on lighting pipes. Crossing pipes or grids used for lighting shall only be allowed where authorized by the Owner's Representative. Vertical conduit/raceway shall be placed on vertical structural hangers or where otherwise permitted by the Owner's Representative.

PRODUCTION SYSTEMS ELECTRICAL INSTALLATION

2. No conduit or raceway shall be in a rigging clear zone or shall obstruct the operations of the rigging systems or shall be within 6" of a moving rigging component, including lift lines.

3.3 COMMISSIONING

A. Production Lighting Control System

1. All branch load circuits shall be live tested before connecting the loads to the system load terminals.
2. All branch load circuits shall be live tested after termination for proper wiring, continuity and polarity. Irregularities shall be corrected before arrival of manufacturer's factory-trained personnel and Owner's Representative checkout.
3. Upon completion of the installation, including testing of load circuits, the contractor shall notify the dimming system manufacturer that the system is available for formal checkout.
4. Notification shall be provided in writing, two weeks prior to the time factory-trained personnel are needed on the job site.
5. No power is to be applied to the dimming system unless specifically authorized by written instructions from the manufacturer.

**END OF SECTION**

# Substitution Request Summary



**Northern Illumination Company, LLC**  
17400 SW Upper Boones Ferry Road, Suite 270  
Portland, OR 97224

503-226-3633 503-226-3733 fax

To: Opsis Architecture 920 NW 17th Avenue Portland, OR 97209	<h2 style="margin: 0;">Submittal</h2> <p>Source Quote: 20-0047                  Entry Date: 2/10/2020                  Project: BSD 2020 AUDITORIUM UPGRADES</p>
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Original Submittal for Prior Approval  
1 Copy of Submittals is Attached

Qty	Type	Mfg	Description
	HA	MP Lgt	L47-3W30S-BK LED STEP LIGHT
	HB	MP Lgt	L49-6W30SF02-BK LED STEP LIGHT
	HD	Baselite Corporation	SFM2-41-LED25W-FRE-CG FLUSH MOUNT LED GUARD SCONCE
	HE	Day-Brite	FSS444L830-UNV-DIM-BK 4' LED STRIP BLACK FIN
	HES	Day-Brite	FSS444L830-UNV-DIM-BK 4' LED STRIP BLACK FIN

Remarks:

**SUBSTITUTION REQUEST**

*The Construction Specifications Institute  
Northwest Region*

TO: Opsis Architecture / Interface Engineering / The Shalleck Collaborative

PROJECT: BSD 2020 AUDITORIUM UPGRADES

SPECIFIED ITEM:

<u>PLANS</u> Section No.	<u>E2.1</u> Page	<u>LUME SCHED</u> Paragraph	<u>TYPE HA, Cole, L111 Series</u> Description
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**PROPOSED SUBSTITUTION:** MP Lgt, L47-3W30S-BK

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identifying applicable portions.

Attached data also includes description of changes to Contract Documents that proposed substitution requires for proper installation.

**Undersigned certifies that the following items, unless modified by attachments, are correct:**

1. Proposed substitution does not affect dimensions shown on Drawings.
2. Undersigned pays for changes to building design, including engineering design, detailing and construction costs caused by proposed substitution.
3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
4. Maintenance and service parts are available locally or are readily obtainable for proposed substitution.

**Undersigned further certifies that function, appearance, and quality of proposed substitution are equivalent or superior to specified item.**

**Undersigned agrees that, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.**

**Submitted by**

David Wray  
Name (Print) David Wray

Signature  
Northern Illumination Co.  
Firm Name  
17400 SW Upper Boones Ferry Rd. #270  
Address  
Portland, OR 97224  
City, State, Zip  
2/10/2020  
Date  
(503) 226-3633 (503) 226-3733  
Telephone Fax

**Attachments**

General Contractor (if after award of Contract)

For use by A/E:	
<input type="checkbox"/> Approved	<input type="checkbox"/> Approved as Noted
<input checked="" type="checkbox"/> Not Approved	<input type="checkbox"/> Received Too Late
By <u>Chris Roybal</u>	
Date <u>02/12/2020</u>	
Remarks <u>Not approved due to HB not approved, see HB for comments</u>	

	<b>Description :</b> <h1>L47-3W30S-BK</h1> <b>Project Name:</b> BSD 2020 AUDITORIUM UPGRADES <b>Notes:</b>	<b>TYPE:</b> <h1>HA</h1>
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Specification Sheet / Wall Mount / L47



## L47

**Application** Exterior/interior wall, stair and walkway.  
 Recommended Projects - Commercial, Institutional, Retail, Clinic, Hospitality, Religious, Educational, Architecture

**IP Rating** 66

**Mounting** Mounts to vertical orientated single gang box only. Box opening must be 2 3/8" wide by 2" tall minimum. Suggested boxes include MP Lighting single gang box (SGB1) and Scepter F.D. Blank (*Junction box not included, non dimmable integral driver included*).  
*\*Refer to page 02-03*

**Electrical** Integral Non Dimmable Driver 120V - 3W (350mA) and or 120V - 6W (700mA)  
*\*Consult Factory for Integral Driver 120V / 277V - 6W option with Phase Dimmer and or 0-10V*  
*\*For other inquires please consult factory for remote driver options*

**Power Consumption** 4.0 Watt (at 350 mA, 3.0 Watt)  
 8.0 Watt (at 700mA, 6.0 Watt)

**Light Output** 3.0 Watt , 29 lm  
 6.0 Watt, 53 lm  
*\*For photmetric data, see page 03*

**Warranty** 5 years limited warranty  
 Estimated useful life of LED is 50,000 hours.

**Material** Solid anodized aluminum or marine grade stainless steel (316) . RoHS compliant.

**Weight** 1.5lbs (0.68kg).

**Approval**

**Type:**  
**Project:**  
**Modified:**  
**Quantity:**  
**Notes:**

**DISCLAIMER** - When using a control system, consult dimming system manufacturer with minimum load before installing. Malfunction and damage to product due to improper dimming system installation or misuse will not be covered under warranty. Only DC Drivers are recommended for dimming systems. Consult MP Lighting for recommended drivers.

\*MP Lighting reserves the right, at its sole discretion, at any time and without notice, to make design changes to any of our products.

### Order Guide

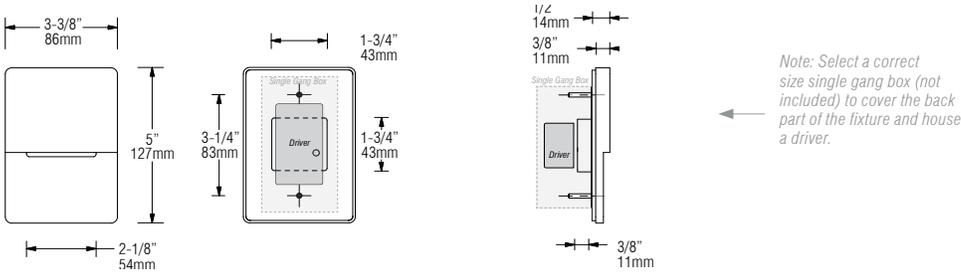
Example: L47-3-W27S-MA

Code	Wattage	Color	Finish
<b>L47</b>	-	-	-
	<b>3 = 3W</b> <b>6 = 6W</b> <i>*Available 120V. For other voltage options available, please consult factory</i>	<b>W22S = 2200K, 80+ CRI</b> <b>W27S = 2700K, 80+ CRI</b> <b>W30S = 3000K, 80+ CRI</b> <b>W35S = 3500K, 80+ CRI</b> <b>W41S = 4100K, 80+ CRI</b> <b>W27H = 2700K, 90+ CRI</b> <b>W30H = 3000K, 90+ CRI</b> <b>W35H = 3500K, 90+ CRI</b>	<b>MA = matte clear anodized</b> <b>BK = black powder coating</b> <b>BZ = bronze powder coating</b> <b>WH = white powder coating</b> <b>S6 = stainless steel 316</b>

	<b>Description :</b> <h1>L47-3W30S-BK</h1> <b>Project Name:</b> BSD 2020 AUDITORIUM UPGRADES <b>Notes:</b>	<b>TYPE:</b> <h1>HA</h1>
--	--	-----------------------------

Specification Sheet / Wall Mount / L47

**DIMENSION:**



**SEPARATE CUSTOM RECTANGULAR BOXES ORDER GUIDE:**

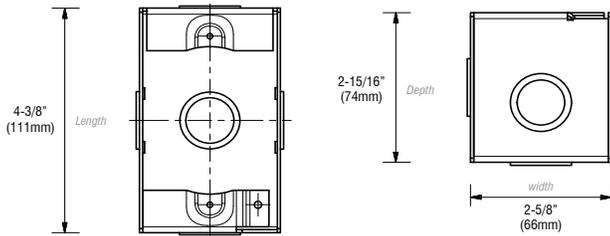
Box Type

**EBX -**

- SGB1 = MPLIGHTING Single gang box, 4-1/4" (107mm)
- SFD = Scepter FD, 4-1/4" (107mm)

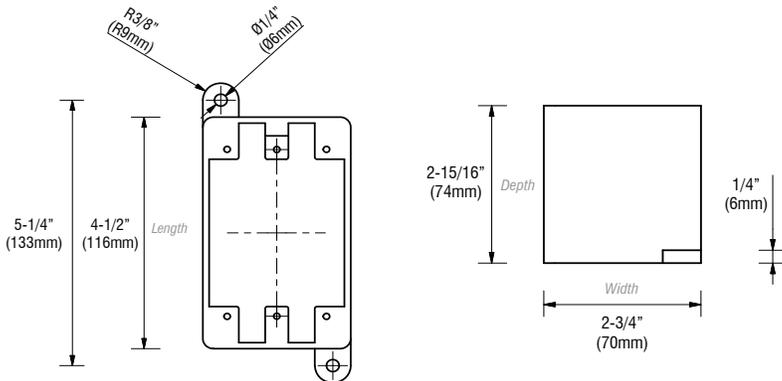
**MP Lighting Single Gang Back Box | Order Code: EBX-SGB1**

*\*Not included, for inquiry or purchase please consult with MP Factory*



**Scepter FD Back box | Order Code: EBX-SFD**

*\*Not included, for inquiry or purchase please consult with MP Factory*



Description :

# L47-3W30S-BK

TYPE:

# HA

Project Name:

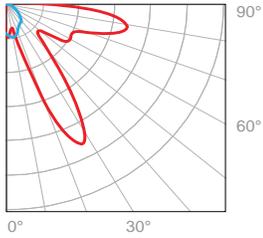
## BSD 2020 AUDITORIUM UPGRADES

Notes:

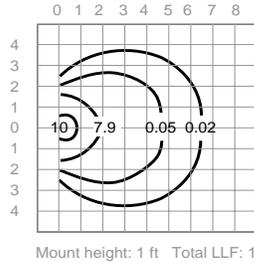
Specification Sheet / Wall Mount / L47

3W, 3000K, 90+ CRI

### Polar Candela Distribution



### Isofootcandle Plot



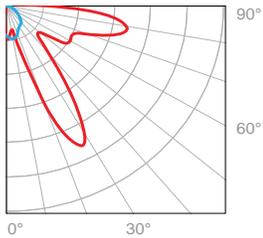
### Illuminance at a Distance

Distance		Center Beam fc	Beam Width			
0ft	0m	10fc	2.9ft	0.88m	0.5ft	0.15m
2.0ft	0.61m	7.9fc	5.8ft	1.77m	1.0ft	0.30m
5.0ft	1.52m	0.05fc	8.7ft	2.65m	1.5ft	0.46m
7.0ft	2.13m	0.02fc	11.7ft	3.57m	2.0ft	0.60m

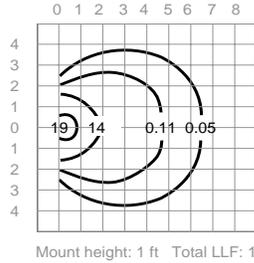
■ Vertical Beam Spread: 88.3°  
■ Horizontal Beam Spread: 19.3°

6W, 3000K, 90+ CRI

### Polar Candela Distribution



### Isofootcandle Plot



### Illuminance at a Distance

Distance		Center Beam fc	Beam Width			
0ft	0m	19fc	2.9ft	0.88m	0.5ft	0.15m
2.0ft	0.61m	14fc	5.8ft	1.77m	1.0ft	0.30m
5.0ft	1.52m	0.11fc	8.7ft	2.65m	1.5ft	0.46m
7.0ft	2.13m	0.05fc	11.7ft	3.57m	2.0ft	0.60m

■ Vertical Beam Spread: 88.3°  
■ Horizontal Beam Spread: 19.3°

**SUBSTITUTION REQUEST**

*The Construction Specifications Institute  
Northwest Region*

TO: Opsis Architecture / Interface Engineering / The Shalleck Collaborative

PROJECT: BSD 2020 AUDITORIUM UPGRADES

SPECIFIED ITEM:

<u>PLANS</u> Section No.	<u>E2.1</u> Page	<u>LUME SCHED</u> Paragraph	<u>TYPE HB, Cole, 252 Series</u> Description
-----------------------------	---------------------	--------------------------------	---

**PROPOSED SUBSTITUTION:** MP Lgt, L49-6W30SF02-BK

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identifying applicable portions.

Attached data also includes description of changes to Contract Documents that proposed substitution requires for proper installation.

**Undersigned certifies that the following items, unless modified by attachments, are correct:**

1. Proposed substitution does not affect dimensions shown on Drawings.
2. Undersigned pays for changes to building design, including engineering design, detailing and construction costs caused by proposed substitution.
3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
4. Maintenance and service parts are available locally or are readily obtainable for proposed substitution.

**Undersigned further certifies that function, appearance, and quality of proposed substitution are equivalent or superior to specified item.**

**Undersigned agrees that, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.**

**Submitted by**

David Wray  
Name (Print) David Wray

Signature  
Northern Illumination Co.  
Firm Name  
17400 SW Upper Boones Ferry Rd. #270  
Address  
Portland, OR 97224  
City, State, Zip  
2/10/2020  
Date

(503) 226-3633 (503) 226-3733  
Telephone Fax

**Attachments**

General Contractor (if after award of Contract)

For use by A/E:	
<input type="checkbox"/> Approved	<input type="checkbox"/> Approved as Noted
<input checked="" type="checkbox"/> Not Approved	<input type="checkbox"/> Received Too Late
By <u>Chris Roybal</u>	
Date <u>02/12/2020</u>	
Remarks <u>No option for HBR, all steplights to be from same manufacturer</u>	

1999 Edition

	<b>Description :</b> <b>L49-6W30SF02-BK</b> <b>Project Name:</b> BSD 2020 AUDITORIUM UPGRADES <b>Notes:</b>	<b>TYPE:</b> <b>HB</b>
--	---	---------------------------

Specification Sheet / Wall Mount / L49



**Type:**  
**Project:**  
**Modified:**  
**Quantity:**  
**Notes:**

## L49

**Application** Exterior/interior wall, stair, and walkway illumination. Adjustable with 0° to 45° tilt  
Recommended Projects - Commercial, Institutional, Retail, Clinic, Hospitality, Religious, Educational, Architecture

**IP Rating** 66

**Mounting** Surface or recessed mount to 3-1/2" deep x 7-3/8" wide x 3-3/4" high, 4 gang masonry box (Included). Mounting box is made of stainless steel. Can also be used with standard box (ex. Iberville, CIMBD-4-K).  
*\*Refer to page 02*

**Electrical** 6 x 1W, 350mA LEDs  
Integral Non Dimmable Driver 120V - 3W (350mA) and or 120V - 6W (700mA)  
\*Consult Factory for Integral Driver 120V / 277V – 6W option with Phase Dimmer and or 0-10V  
*\*For other inquires please consult factory for remote driver options*

**Power Consumption** 8.0 Watt

**Light Output** 6.0 Watt, 70~170 lm  
*\*For photometric data, see page 03*

**Warranty** 5 years limited warranty  
Estimated useful life of LED is 50,000 hours.

**Material** Solid machined anodized aluminum with polycarbonate lens

**Weight** -

**Approval**  

**DISCLAIMER** - When using a control system, consult dimming system manufacturer with minimum load before installing. Malfunction and damage to product due to improper dimming system installation or misuse will not be covered under warranty. Only DC Drivers are recommended for dimming systems. Consult MP Lighting for recommended drivers.

\*MP Lighting reserves the right, at its sole discretion, at any time and without notice, to make design changes to any of our products.

### Order Guide

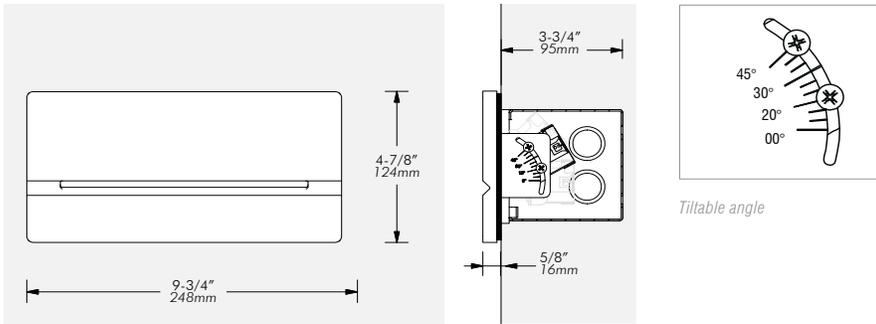
Example: L49-6-W20S-S-0-1-MA

Code	Wattage	Color	Beam	Tilt (Option)**	Input Voltage	Finish
<b>L49</b>	-	<b>6</b>				
	<b>6 = 6W</b>	<b>W22S</b> = 2200K, 80+ CRI <b>W27S</b> = 2700K, 80+ CRI <b>W30S</b> = 3000K, 80+ CRI <b>W35S</b> = 3500K, 80+ CRI <b>W41S</b> = 4100K, 80+ CRI <b>W27H</b> = 2700K, 90+ CRI <b>W30H</b> = 3000K, 90+ CRI <b>W35H</b> = 3500K, 90+ CRI	<b>S</b> = spot (12°) <b>N</b> = narrow flood (30°) <b>F</b> = flood (60°) <b>W</b> = wide flood (120°) <b>E</b> = elliptical (17°+46°)	<b>0</b> = 0° <b>15</b> = 15° <b>30</b> = 30° <b>45</b> = 45°	<b>1</b> = 120V <b>2</b> = 277V ** Input Voltage 1 = 120V Input integral driver. Phase dimmable. 2 = 120-277V Universal input voltage. 0-10V dimmable.	<b>MA</b> = matte clear anodized <b>BK</b> = black powder coating <b>BZ</b> = bronze powder coating <b>WH</b> = white powder coating

	<b>Description :</b> <b>L49-6W30SF02-BK</b> <b>Project Name:</b> <b>BSD 2020 AUDITORIUM UPGRADES</b> <b>Notes:</b>	<b>TYPE:</b> <b>HB</b>
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Specification Sheet / Wall Mount / L49

**Dimension:**



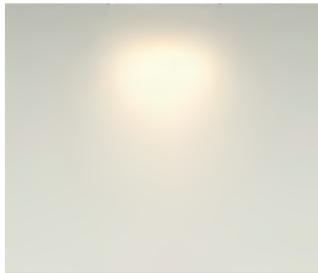
Mounting Box in stainless steel

**Light Distribution:**

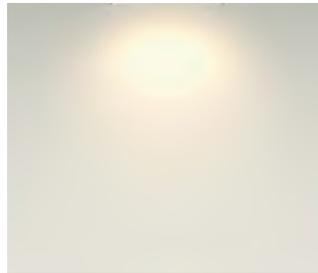
**6 Watt (top view)**



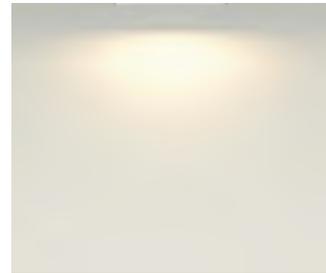
12° (Spot Beam), 30° tilted, Matte clear anodized



30° (Narrow Flood Beam), 30° tilted, Matte clear anodized



60° (Flood Beam), 30° tilted, Matte clear anodized



120° (Wide Flood Beam), 30° tilted, Matte clear anodized



17°+46° (Elliptical Beam), 30° tilted, Matte clear anodized

Description :

# L49-6W30SF02-BK

TYPE:

Project Name:

## BSD 2020 AUDITORIUM UPGRADES

# HB

Notes:

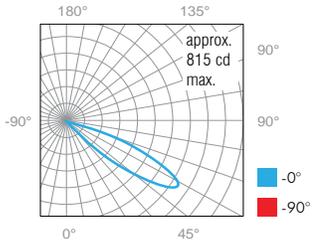
Specification Sheet / Wall Mount / L49

### Photometric Data:

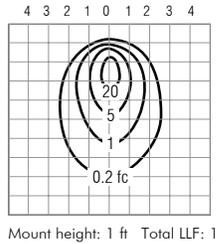
6W, 3000K, 30° tilted

#### Polar Candela Distribution

170lm, Spot Beam (12°)

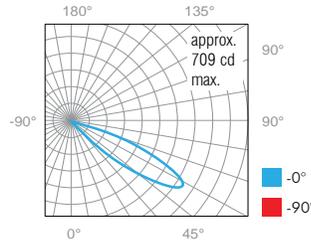


#### Isofootcandle Plot

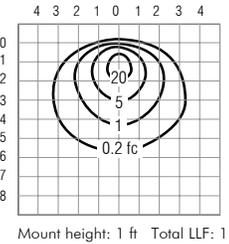


#### Polar Candela Distribution

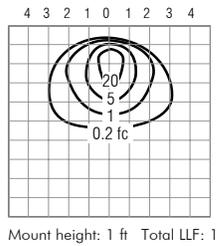
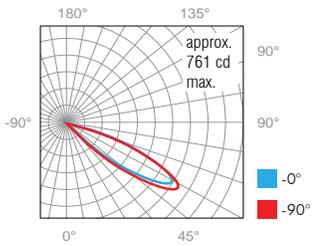
141lm, Narrow Flood Beam (30°)



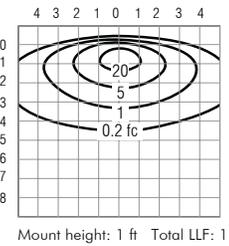
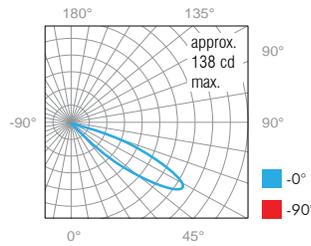
#### Isofootcandle Plot



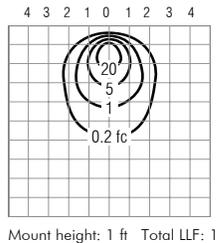
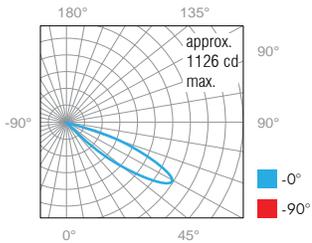
118lm, Flood Beam (60°)



70lm, Wide Beam (120°)



181lm, Elliptical (17°+46°)



**SUBSTITUTION REQUEST**

*The Construction Specifications Institute  
Northwest Region*

TO: Opsis Architecture / Interface Engineering / The Shalleck Collaborative

PROJECT: BSD 2020 AUDITORIUM UPGRADES

SPECIFIED ITEM:

<u>PLANS</u> Section No.	<u>E2.1</u> Page	<u>LUME SCHED</u> Paragraph	<u>TYPE HD, Barnlight, BLE Series</u> Description
-----------------------------	---------------------	--------------------------------	--

**PROPOSED SUBSTITUTION:** Baselite, SFM2-41-LED25W-FRE-CG

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identifying applicable portions.

Attached data also includes description of changes to Contract Documents that proposed substitution requires for proper installation.

**Undersigned certifies that the following items, unless modified by attachments, are correct:**

1. Proposed substitution does not affect dimensions shown on Drawings.
2. Undersigned pays for changes to building design, including engineering design, detailing and construction costs caused by proposed substitution.
3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
4. Maintenance and service parts are available locally or are readily obtainable for proposed substitution.

**Undersigned further certifies that function, appearance, and quality of proposed substitution are equivalent or superior to specified item.**

**Undersigned agrees that, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.**

**Submitted by**

David Wray  
Name (Print) David Wray

Signature  
Northern Illumination Co.  
Firm Name  
17400 SW Upper Boones Ferry Rd. #270  
Address  
Portland, OR 97224  
City, State, Zip  
2/10/2020  
Date  
(503) 226-3633 (503) 226-3733  
Telephone Fax

**Attachments**

General Contractor (if after award of Contract)

For use by A/E:	
<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Approved as Noted
<input type="checkbox"/> Not Approved	<input type="checkbox"/> Received Too Late
By <u>Chris Roybal</u>	
Date <u>02/12/2020</u>	
Remarks _____	

1999 Edition

Description :

**SFM2-41-LED25W-FRE-CG**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES**

**HD**

Notes:

SPECIFICATION SHEET  

**BASELITE VAPOR JAR CATALOG**

PROJECT NAME: \_\_\_\_\_

PROJECT TYPE: \_\_\_\_\_

NOTES:

\*SKIP SECTION IF OPTION DOES NOT APPLY

MODEL #	/	/	/	/	/	/	/	/	/	/
EXAMPLE:	GH16	41	ST18	SLC	43	12LEDW	AH	WG	44	LDM120

**A - SHADES**

- 4PE1 SERIES
- 4PE1
- 4HPE1 SERIES
- 4HPE1
- 4DPE1 SERIES
- 4DPE1
- 4PE3 SERIES
- 4PE3
- 4HPE3 SERIES
- 4HPE3
- 4DPE3 SERIES
- 4DPE3
- P4S1 SERIES
- P4S1
- P5S1 SERIES
- P5S1
- PS4E1 SERIES
- PS4E1
- WCG SERIES
- WCG12
- WCG14
- WCG16
- WCG20
- WCG24
- RCG SERIES
- RCG12
- RCG16
- RCG18
- RCG20
- MG SERIES
- MG12
- CH SERIES
- CH1
- CH2
- DB SERIES
- DB1
- DB2
- SL SERIES
- SL1
- SL2
- SFM SERIES
- SFM1
- SFM2**
- HZ SERIES
- HZ1
- HZ2
- VA SERIES
- VA1
- VA2
- VE SERIES
- VE1
- VE2

**B - FINISH OPTIONS**

- 20-RAW BRASS
- 21-OIL RUBBED BRONZE
- 22-OLD PEWTER
- 23-OLD COPPER PATINA
- 40-COPPER w/ CLEAR COAT
- 41-GLOSS BLACK**
- 42-DARK GREEN
- 43-RED
- 44-WHITE
- 45-MEDIUM BLUE
- 46-YELLOW
- 48-POLISHED ALUMINUM
- 49-GALVANIZED
- 50-NAVY BLUE
- 51-ARCHITECTURAL BRONZE
- 52-PATINA
- 53-RUST
- 54-STUCCO
- 55- SAGE
- 59-COPPER TONE
- 60- CANAL GREEN
- 61-ANODIZED CHARCOAL
- 62-ANODIZED BRONZE
- 63-IRON RUST
- 70-TRANSPARENT RED
- 71-TRANSPARENT GREEN
- 72-TRANSPARENT WINE
- 73-TRANSPARENT NAVY BLUE

**C - MOUNTING**

- CORD MOUNT
- BLC RCHB CHB
- WHC RCHW CHW
- COLOR CORD
- BKCC MCC BHCC
- WCC NCC YHCC
- RCC SCC BLCC
- BCC TCC PCCC
- OCC NTCC TSCC
- PCC BZCC NTCC
- STEM MOUNT
- ST18
- ST24
- ST36
- ST48

**C – MOUNTING (CONTINUED)**

- ½" ARM EXTENSIONS
- B1 E1
- E3 E4
- ¾" ARM EXTENSIONS
- E3A E9 E17
- E4A E10 E18
- E5 E11 E19
- E6 E12 E21
- E7 E13 B15
- E8 E16 B15S
- E14- CREATE YOUR OWN  
(BASELITE WILL TAKE YOUR SKETCH AND FABRICATE A CUSTOM ARM EXTENSION TO MEET YOUR NEEDS).

**D – MOUNTING ADD-ONS**

- STC
- SLC
- CNK-3

**E – MOUNTING COLOR**

SEE SECTION "B" FOR COLOR OPTIONS.

**F – LIGHT SOURCE**

- \*SEE SECTION "F" FOR FIXTURE AVAILABILITY INCANDESCENT (INC)
- 100W
- 150W
- 200W
- COMPACT FLOURESCENT (CF)
- 26W
- 32W
- 42W
- HIGH INTENSITY DISCHARGE (HID)
- 50W 150W
- 70W 175W
- 100W
- LIGHT EMITTED DIODE (LED)**
- 12W
- 25W**

**G – GLASS OPTION**

- CL3 RE4 BL3
- CL4 AH3 BL4
- FR3 AH4 GR3
- FR4** PR3 GR4
- RE3 PR4

**H - ACCESSORIES**

- GR7 GR16 WJB4½"
- GR8 GR18 WJB4¾"
- GR10 **CG**
- GR12 WG
- GR14 PERF

**I – ACCESSORY COLOR**

SEE SECTION "B" FOR COLOR OPTIONS.

**J – ELECTRICAL OPTION**

- CDM7-120/277
- CDM10-120
- CDM10-277
- LDM120
- LDM277
- LDM0-10V
- EM

**NOTES**

- \* ALL ARMS COME WITH A CAST BACKPLATE (CB ½", CB ¾", LWTM, CFWTM, ECT.)
- \*ACCORDING TO THE LIGHT SOURCE, BACKPLATE MAY VARY IN SIZE.
- \*FIXTURE DIMENSIONS MAY VARY ± 0.25"
- \*FINISH OPTIONS 20,21,22,23 ARE FOR SOLID BRASS FIXTURES ONLY.
- \*COLOR CORDS NOT APPLICABLE FOR LED.

Description :

**SFM2-41-LED25W-FRE-CG**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES**

**HD**

Notes:



**BASELITE VAPOR JAR CATALOG**

PROJECT NAME: \_\_\_\_\_

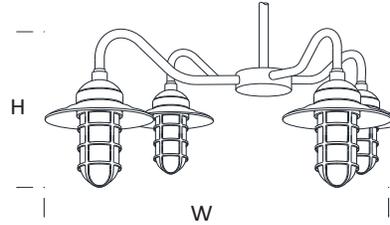
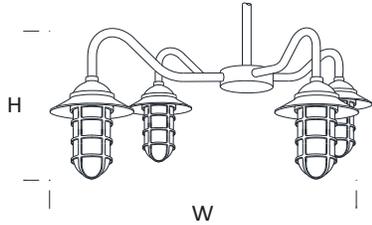
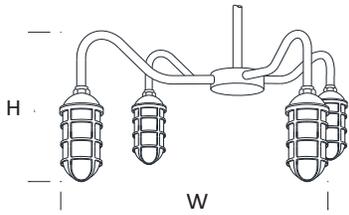
PROJECT TYPE: \_\_\_\_\_

**A- SHADES (CONTINUED)**

**4PE1 SERIES**

**4HPE1 SERIES**

**4DPE1 SERIES**

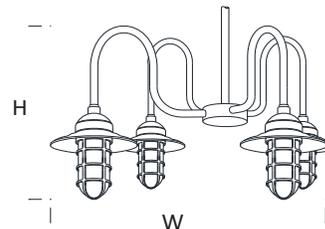
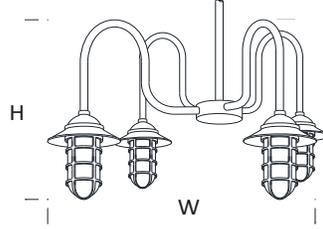
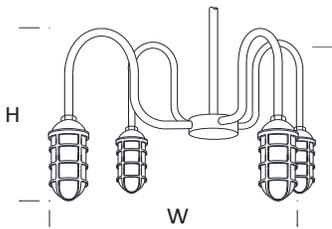


	HEIGHT	WIDTH
<b>4PE1</b>	17.5"	30.5"
<b>4HPE1</b>	17.5"	34.5"
<b>4DPE1</b>	17.5"	36.5"

**4PE3 SERIES**

**4HPE3 SERIES**

**4DPE3 SERIES**

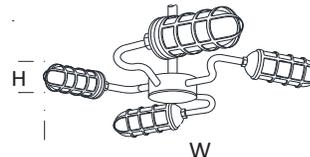
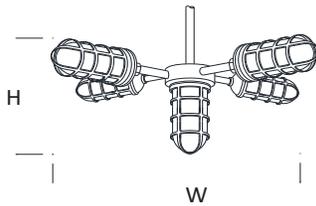
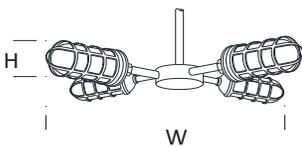


	HEIGHT	WIDTH
<b>4PE3</b>	18"	40"
<b>4HPE3</b>	18"	44"
<b>4DPE3</b>	18"	46"

**P4S1 SERIES**

**P5S1 SERIES**

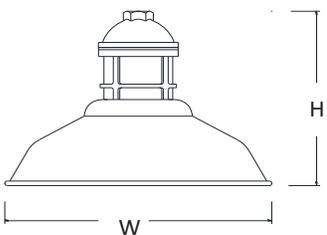
**PS4E1 SERIES**



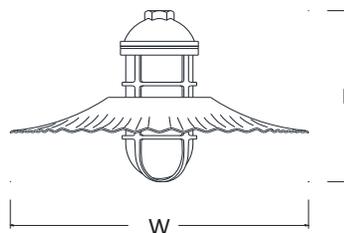
	HEIGHT	WIDTH
<b>P4S1</b>	4"	37.75"
<b>P5S1</b>	10.5"	37.5"
<b>PS4E1</b>	4"	41.5"

**WCG SERIES**

**RCG SERIES**



	HEIGHT	WIDTH
<b>WCG12</b>	9.5"	12"
<b>WCG14</b>	10"	14"
<b>WCG16</b>	10.5"	16"
<b>WCG20</b>	12.5"	20"
<b>WCG24</b>	16"	24"



	HEIGHT	WIDTH
<b>RCG12</b>	9.5"	12"
<b>RCG16</b>	9.5"	16"
<b>RCG18</b>	9.5"	18"
<b>RCG20</b>	9.5"	20"

Description :

**SFM2-41-LED25W-FRE-CG**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES****HD**

Notes:



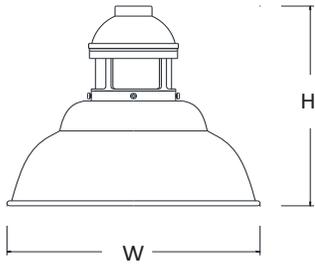
## BASELITE VAPOR JAR CATALOG

PROJECT NAME: \_\_\_\_\_

PROJECT TYPE: \_\_\_\_\_

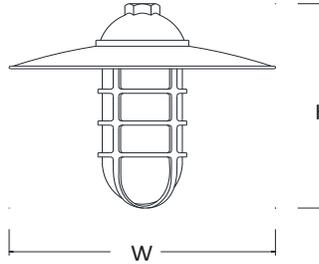
### A- SHADES (CONTINUED)

#### MG SERIES



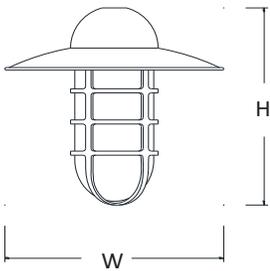
	HEIGHT	WIDTH
<b>MG12</b>	10"	12"

#### CH SERIES



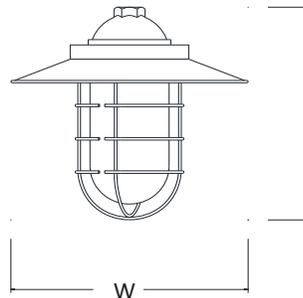
	HEIGHT	WIDTH
<b>CH1</b>	9.5"	12"
<b>CH2</b>	12"	14"

#### DB SERIES



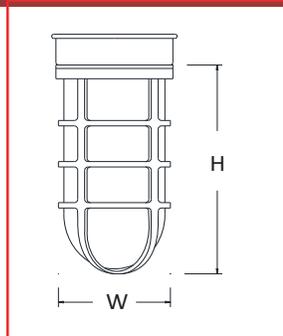
	HEIGHT	WIDTH
<b>DB1</b>	9.5"	10"
<b>DB2</b>	9.5"	12"

#### SL SERIES



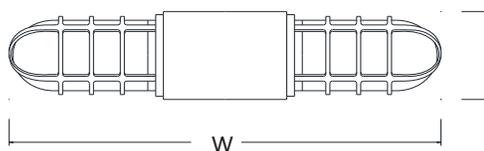
	HEIGHT	WIDTH
<b>SL1</b>	11.25"	12"
<b>SL2</b>	11.25"	18"

#### SFM SERIES



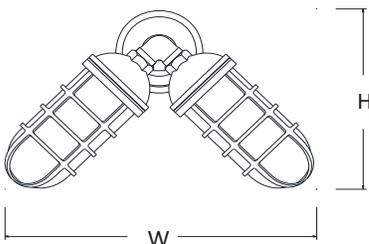
	HEIGHT	WIDTH
<b>SFM1</b>	7.5"	4"
<b>SFM2</b>	9.75"	5.5"

#### HZ SERIES



	HEIGHT	WIDTH
<b>HZ1</b>	4.5"	21"
<b>HZ2</b>	5.5"	45.75"

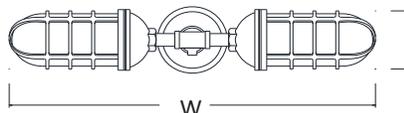
#### VA SERIES



	HEIGHT	WIDTH	PROJ.
<b>VA1</b>	10"	16.25"	6"
<b>VA2</b>	12"	20"	7"

\*FOR LED AND CF LIGHT SOURCE THE BACKPLATE INCREASES IN SIZE. ADD 1.75" TO PROJECTION.

#### VE SERIES



	HEIGHT	WIDTH	PROJ.
<b>VE1</b>	4"	24"	9"
<b>VE2</b>	5.5"	28.75"	10"

\*FOR LED AND CF LIGHT SOURCE THE BACKPLATE INCREASES IN SIZE. ADD 1.75" TO PROJECTION.

\*ARM INCLUDED WITH VA AND VE SERIES. (NO OTHER ARMS APPLY)

Description :

**SFM2-41-LED25W-FRE-CG**  
**BSD 2020 AUDITORIUM UPGRADES**

TYPE:

**HD**

Project Name:

Notes:



**BASELITE VAPOR JAR CATALOG**

PROJECT NAME: \_\_\_\_\_

PROJECT TYPE: \_\_\_\_\_

**B- FINISHES**

BASELITE USES A DURABLE POWDER COATING TO FINISH THEIR SHADES. THE POWDER COATING PROCESS ALLOWS THE SHADES TO HAVE A THICKER COATING OF PAINT, WHICH ENSURES A HIGHER QUALITY PROTECTIVE COATING. BASELITE OFFERS A WIDE RANGE OF COLORS TO CHOOSE FROM. CALL FOR CUSTOM COLOR OPTIONS.



20-RAW BRASS



21-OIL RUBBED BRONZE



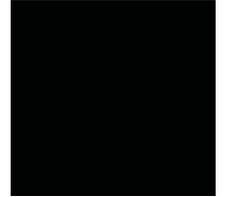
22-OLD PEWTER



23-OLD COPPER PATINA



40- COPPER W/  
CLEAR COAT



41-GLOSS BLACK



42-DARK GREEN



43-RED



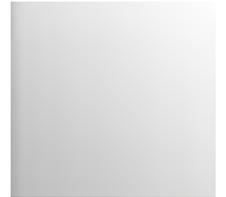
44-WHITE



45-MEDIUM BLUE



46-YELLOW



48-POLISHED ALUMINUM



49-GALVANIZED



50-NAVY BLUE



51-ARCHITECTURAL BRONZE



52-PATINA



53-RUST



54-STUCCO



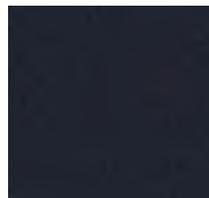
55-SAGE



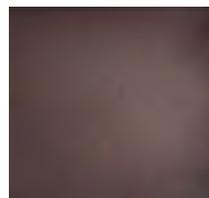
59-COPPER TONE



60-CANAL GREEN



61-ANODIZED CHARCOAL



62-ANODIZED BRONZE



63-IRON RUST



70-TRANSPARENT RED



71-TRANSPARENT GREEN



72-TRANSPARENT WINE



73-TRANSPARENT NAVY

**B – FINISH OPTIONS NOTES**

\*ALL FINISH COLORS FEATURE A WHITE INTERIOR, EXCLUDING FINISH COLORS 61 AND 62. THESE COLORS ARE PAINTED THE SAME COLOR INSIDE AND OUT OF THE SHADE.

\*FINISH OPTIONS 20,21,22,23 ARE FOR SOLID BRASS FIXTURES ONLY.

Description :

**SFM2-41-LED25W-FRE-CG**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES**

**HD**

Notes:



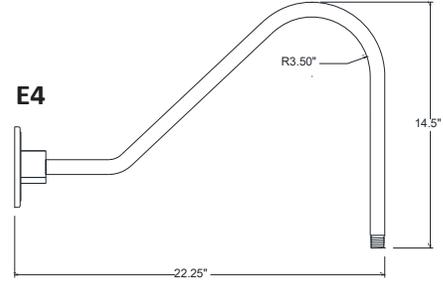
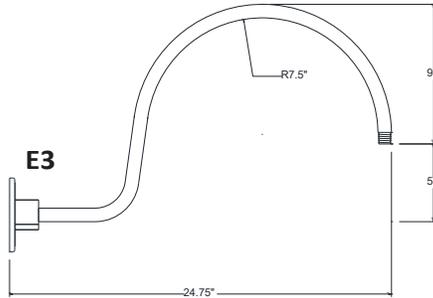
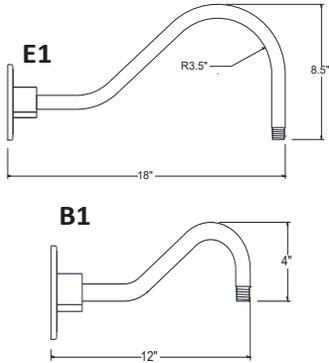
**BASELITE VAPOR JAR CATALOG**

PROJECT NAME: \_\_\_\_\_

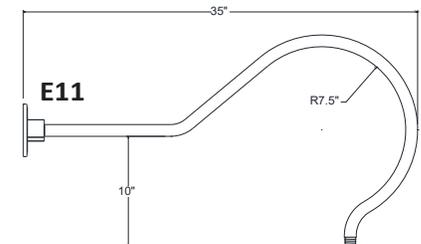
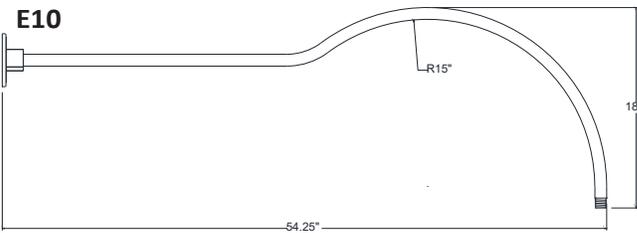
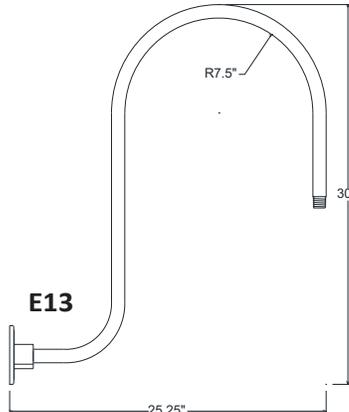
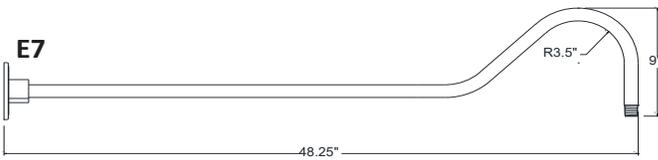
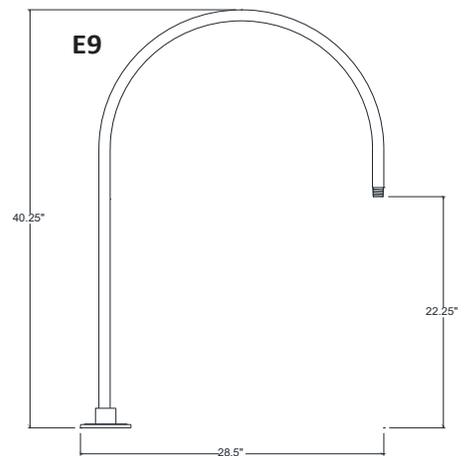
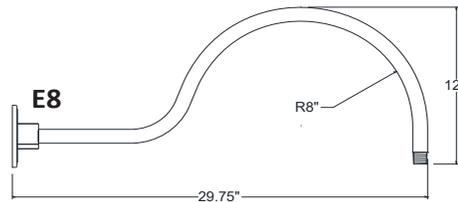
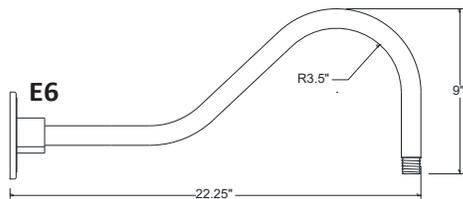
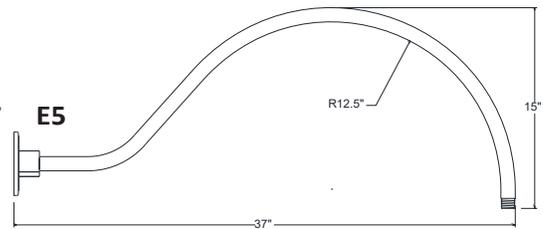
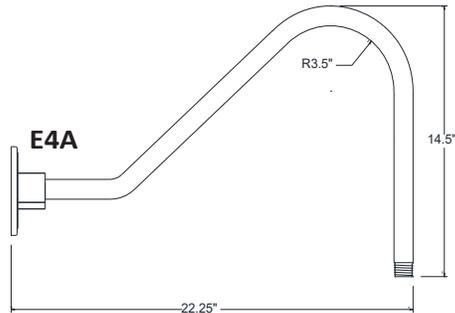
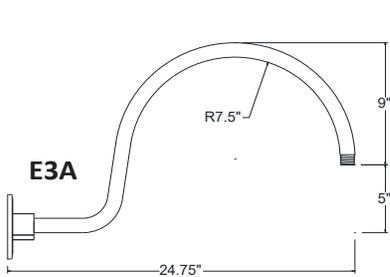
PROJECT TYPE: \_\_\_\_\_

**C - MOUNTING OPTIONS**

**1/2" ARM EXTENSIONS**



**3/4" ARM EXTENSIONS**



Description :

**SFM2-41-LED25W-FRE-CG**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES**

**HD**

Notes:

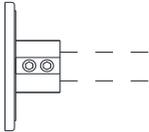


**BASELITE VAPOR JAR CATALOG**

PROJECT NAME: \_\_\_\_\_  
PROJECT TYPE: \_\_\_\_\_

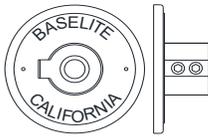
**C - MOUNTING OPTIONS (CONTINUED)**

**E14**

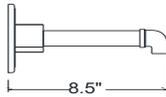


Baselite will take your sketch and fabricate a custom arm extension to meet your needs

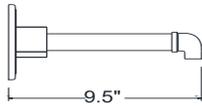
All arms sold with Cast Backplate (CB)



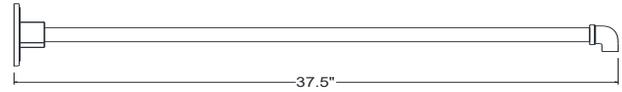
**E16**



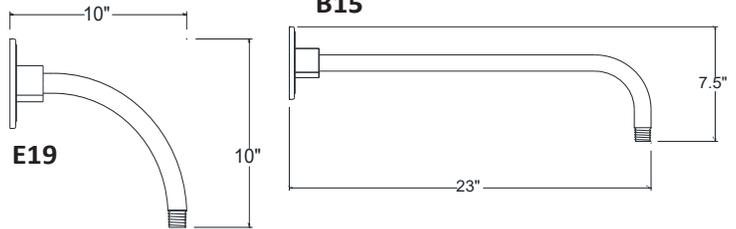
**E17**



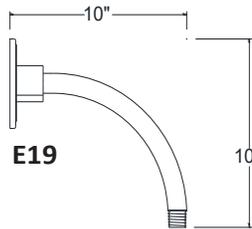
**E12**



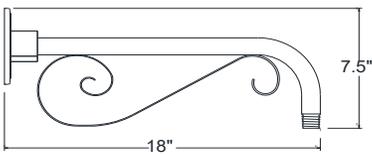
**B15**



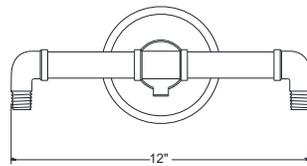
**E19**



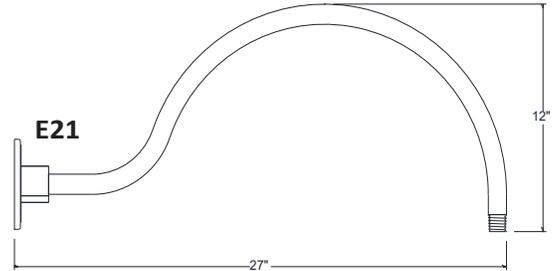
**B15S**



**E18**



**E21**

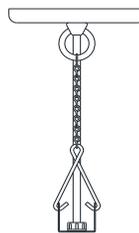


**CORD MOUNTS**



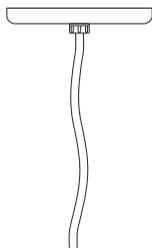
**ST(XX)** STEM- 1/2" NPT

XX = LENGTH OF STEM  
(EXAMPLE - "ST18" = STEM MOUNT 18" LENGTH)  
\*CANOPY NOT INCLUDED, ADD IN SECTION D



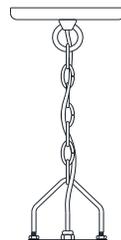
**RCHB** 8' BLACK CORD, CHAIN, and LOOP

**RCHW** 8' WHITE CORD, CHAIN, and LOOP



**BLC** 8' BLACK CORD (INCLUDES CANOPY) INC

**WHC** 8' WHITE CORD (INCLUDES CANOPY) INC



**CHB** 8' BLACK CORD, CHAIN, and LOOP

**CHW** 8' WHITE CORD, CHAIN, and LOOP

Available for BN fixture only

Description :

**SFM2-41-LED25W-FRE-CG**  
**BSD 2020 AUDITORIUM UPGRADES**

TYPE:

**HD**

Project Name:

Notes:

**BASELITE VAPOR JAR CATALOG**

PROJECT NAME: \_\_\_\_\_  
PROJECT TYPE: \_\_\_\_\_

**C - MOUNTING OPTIONS (CONTINUED)**

**COLOR CORD CODES**

\*COLOR CORDS NOT APPLICABLE FOR LED.



**BKCC** BLACK CLOTH CORD



**MCC** MINT CLOTH CORD



**BHCC** BLACK WHITE HOUNDSTOOTH CLOTH CORD



**WCC** WHITE CLOTH CORD



**NCC** NATURAL CLOTH CORD



**YHCC** YELLOW BLACK HOUNDSTOOTH CLOTH CORD



**RCC** RED CLOTH CORD



**SCC** SILVER CLOTH CORD



**BLCC** BLACK LINEN CLOTH CORD



**BCC** BLUE CLOTH CORD



**TCC** TURQUOISE CLOTH CORD



**PCCC** PINK CRISS CROSS CLOTH CORD



**OCC** ORANGE CLOTH CORD



**NYCC** NEON YELLOW CLOTH CORD



**TSSC** TURQUOISE BROWN STRIPE CLOTH CORD



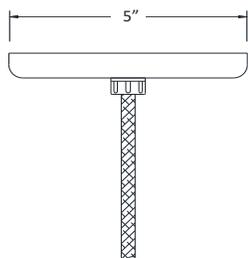
**PCC** PURPLE CLOTH CORD



**BZCC** BLACK WHITE ZIG ZAG CLOTH CORD



**NTCC** NATURAL TWEED CLOTH CORD

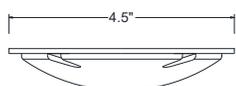


CANOPY INCLUDED WITH CHOICE OF COLOR CORD.

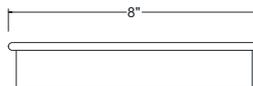


**D - MOUNTING ADD-ONS**

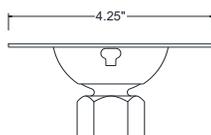
FOR LED & COMPACT FLUORESCENT OPTIONS, CANOPIES WILL VARY IN SIZE DUE TO SIZE OF THE DRIVER/BALLAST THAT WILL BE LOCATED INSIDE OF THE CANOPY.



**STC - STEM CANOPY**



**CNK-3 - MULTIPLE CORD CANOPY**  
(SIZE MAY VARY DEPENDING ON AMOUNT OF FIXTURES USED)



**SLC - SLOPE CEILING CANOPY**  
(SLOPES TO 20 DEGREES)

Description :

**SFM2-41-LED25W-FRE-CG**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES****HD**

Notes:

## BASELITE VAPOR JAR CATALOG

PROJECT NAME: \_\_\_\_\_

PROJECT TYPE: \_\_\_\_\_

## F – LIGHT SOURCE

BASELITE'S PUBLISHED LUMINAIRE PHOTOMETRIC TESTING WAS PERFORMED IN A 3-METER INTEGRATING SPHERE USING THE 4TT GEOMETRY METHOD. DATA IS CONSIDERED TO BE REPRESENTATIVE OF THE CONFIGURATIONS SHOWN, WITHIN THE TOLERANCES ALLOWED BY LIGHTING FACTS. TO OBTAIN AN IES FILE SPECIFIC TO YOUR PROJECT, PLEASE CONTACT THE FACTORY.

OPTION	WATTAGE	LUMENS		CRI	VOLTAGE	DIMMING
<b>LIGHT-EMITTING DIODE (LED)</b>						
LED12W	12W	1019	1114	>90	120-277 VAC	0-10V
LED25W	25W	1820	1957	>90	120-277 VAC	0-10V
		@3000K	@5000K			
*IMPORTANT – FOR LIGHT-EMITTING DIODE (LED) LIGHT SOURCE OPTION FIXTURES ARE LIMITED DUE TO SIZE OF THE FIXTURE AND THE CORD WATTAGE RESTRICTIONS. PLEASE SEE AVAILABILITY CHART TO THE RIGHT.		<b>LED 12W (MAX)</b> – A1, AH1, W1, HW1, E1, HE1, P1, HP1, DE1, DP1, DHE1, DHP1, DPV1, WCG12, WCG14, WCG16, WCG20, MG12, RCG12, RCG16, RCG18, RCG20, CH1, DB1, SL1, SFM1, HZ1, VA1, VE1, GH12, GH14, GH16, GH18, GH20, PW1, BW1, BSW1, BE1, BHE1, BAH1, BHW1, BSF1, BP1, BHP1, BN1, LP1, LH1, LF1, BSM(1,2,3,4,5,6), PR(1,2,4,5), PRH1, PRD1, BLH1, BLH2, BLH3, BLH4 <b>LED 25W (MAX)</b> – A2, AH2, W2, HW2, E2, HE2, P2, HP2, DE2, DP2, DHE2, DHP2, DPV2, WCG24, CH2, DB2, SL2, SFM2, HZ2, VA2, VE2, PW2, LP2, LH2, LF2, HA14, HA16, BSM(11,12,13,14,15,16), PR(11,12,14,15), BLH1, BLH2, BLH3, BLH4				
EXAMPLE: / LED25W /						

OPTION	WATTAGE	LUMENS		CRI	VOLTAGE	DIMMING
<b>INCANDESCENT (INC) MED E26</b>						
INC100W	100W	PER BULB SPECS		>90	120-277 VAC	N/A
INC150W	150W	PER BULB SPECS		>90	120-277 VAC	N/A
INC200W	200W	PER BULB SPECS		>90	120-277 VAC	N/A
*IMPORTANT – FOR INCANDESCENT (INC) LIGHT SOURCE OPTION, FIXTURES ARE LIMITED DUE TO SIZE OF THE FIXTURE AND THE CORD WATTAGE RESTRICTIONS. PLEASE SEE AVAILABILITY CHART TO THE RIGHT.		<b>INC100W</b> – A1, AH1, W1, HW1, E1, HE1, P1, HP1, DE1, DP1, DHE1, DHP1, DPV1, TP1, THP1, HJ1, PJ1, PLS1, PLD1, HL1, HPLD1, PLE1, PLEX1, 4PE1, 4HPE1, 4DPE1, 4PE3, 4HPE3, 4DPE3, P4S1, P5S1, P54E1, WCG12, WCG14, WCG16, WCG20, MG12, RCG12, RCG16, RCG18, RCG20, CH1, DB1, SL1, SFM1, HZ1, VA1, VE1, GH12, GH14, GH16, GH18, GH20, PW1, BW1, BSW1, BE1, BHE1, BAH1, BHW1, BSF1, BP1, BHP1, BN1, LP1, LH1, LF1, BSM(1,2,3,4,5,6), PR(1,2,4,5), PRH1, PRD1, BLH1, BLH2, BLH3, BLH4 <b>INC150W</b> – BOL(1,4,5,6,7,8,12,14,15) <b>INC200W</b> – A2, AH2, W2, HW2, E2, HE2, P2, HP2, DE2, DP2, DHE2, DHP2, DPV2, T[2], THP2, HJ2, PJ2, PLS2, PLD2, HL2, HPLD2, PLE2, PLEX2, WCG24, CH2, DB2, SL2, SFM2, HZ2, VA2, VE2, PW2, LP2, LH2, LF2, HA14, HA16, BSM(11,12,13,14,15,16), PR(11,12,14,15)				
EXAMPLE: / INC150W /						

OPTION	WATTAGE	LUMENS		CRI	VOLTAGE	DIMMING
<b>COMPACT FLOURESCENT (CF)</b>						
CF26W	26W	PER BULB SPECS		>90	120-277 VAC	0-10V
CF32W	32W	PER BULB SPECS		>90	120-277 VAC	0-10V
CF42W	42W	PER BULB SPECS		>90	120-277 VAC	0-10V
*IMPORTANT – FOR COMPACT FLOURESCENT (CF) LIGHT SOURCE, FIXTURES ARE LIMITED DUE TO THE SIZE OF THE SHADE. PLEASE SEE THE CHART TO THE RIGHT TO SEE WHAT WATTAGE IS COMPATIBLE FOR EACH FIXTURE WHEN ORDERING.		<b>26W, 32W</b> – A1, AH1, W1, HW1, E1, HE1, P1, HP1, DE1, DP1, DHE1, DHP1, DPV1, SFM1, HZ1, VA1, VE1, PW1, BW1, BSW1, BE1, BHE1, BAH1, BHW1, BSF1, BP1, BN1, LP1, LH1, LF1, BSM(1,2,3,4,5,6) <b>42W</b> – A2, AH2, W2, HW2, E2, HE2, P2, HP2, DE2, DP2, DHE2, DHP2, DPV2, SFM2, HZ2, VA2, VE2, PW2, LP2, LH2, LF2, BSM(11,12,13, 14, 15,16) <b>26W, 32W, 42W</b> – WCG12, WCG14, WCG16, WCG18, WCG20, WCG24, MG12, RCG12, RCG16, RCG18, RCG20, CH1, CH2, DB1, DB2, SL1, SL2, GH12, GH14, GH16, GH18, GH20, HA14, HA16, PR(1,2,4,5,11,12,14,15), PRH1, PRD1, BLH1, BLH2, BLH3, BLH4, BOL(1,4,5,6,7,8,12,14,15) <b>GU24</b> – TP1, TP2, THP1, THP2, HJ1, HJ2, PJ1, PJ2, PLS1, PLS2, PLD1, PLD2, HL1, HL2, HPLD1, HPLD2, PLE1, PLE2, PLEX1, PLEX2, 4PE1, 4HPE1,				
EXAMPLE: / CF42W /						

OPTION	WATTAGE	LUMENS		CRI	VOLTAGE	DIMMING
<b>HIGH INTENSITY DISCHARGE (HID)</b>						
HID50W	50W	PER BULB SPECS		>90	120-277 VAC	0-10V
HID70W	70W	PER BULB SPECS		>90	120-277 VAC	0-10V
HID100W	1000W	PER BULB SPECS		>90	120-277 VAC	0-10V
*IMPORTANT – FOR HIGH INTENSITY DISCHARGE (H.I.D) LIGHT SOURCE, FIXTURES ARE LIMITED DUE TO THE SIZE OF THE SHADE. PLEASE SEE THE CHART TO THE RIGHT TO SEE WHAT WATTAGE IS COMPATIBLE FOR EACH FIXTURE WHEN ORDERING.		<b>50W, 70W</b> – BOL(1,4,5,6,7,8,12,14,15) <b>70W, 100W, 150W, 175W</b> – BLH1, BLH2, BLH3, BLH4				
EXAMPLE: / HID50W /						

	Description : <b>SFM2-41-LED25W-FRE-CG</b> Project Name: <b>BSD 2020 AUDITORIUM UPGRADES</b> Notes:	TYPE: <b>HD</b>
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**BASELITE COMMERCIAL CATALOG** PROJECT NAME: \_\_\_\_\_  
 PROJECT TYPE: \_\_\_\_\_

**J – ELECTRICAL OPTION**

FOR DIMMING OPTONS AND ALL OTHER ELECTRICAL OPTIONS PLEASE SEE CHART BELOW. FOR FURTHER INFROMATION CONTACT THE FACTORY.

COMPACT FLUORESCENT DIMMING OPTIONS  
 PROVIDED WITH ADVANCE TRANSFORMER, PLEASE CHOOSE MARK 10 OR MARK 7 WITH SPECIFIED VOLTAGE FROM THE LIST BELOW. CONTACT BALLAST MANUFACTURER FOR SPECIFICATIONS.  
**CDM7-120/277** - ADVANCE MARK 7 0-10v ELECTRICAL BALLST – 120/277 VOLT  
**CDM10-120** - ADVANCE MARK 10 ELECTRICAL BALLST – 120 VOLT  
**CDM10-277** - ADVANCE MARK 10 ELECTRICAL BALLST – 277 VOLT

LED DIMMING OPTIONS  
 FOR TRIAC OR 0-10V OPTOIN CHOOSE FROM THE LIST BELOW. CONTACT DRIVER MANUFACTURER FOR SPECIFICATIONS.  
**LDM120** - TRIAC DIMMING AT 120 VOLT  
**LDM277** - TRIAC DIMMING AT 277 VOLT  
**LDM0-10V** – 0 – 10v

EMERGENCY OPTION  
**EM** – EMERGENCY BALLAST (ONLY AVAILABLE FOR COMPACT FLOURESCENT)

**NOTES:**  
 FOR COMPACT FLUORESCENT DIMMING OPTION:  
MARK 7 – 120 THROUGH 277V. BALLASTS MAY BE REMOTE MOUNTED UP TO 6 IN. AWAY FROM LAMPS. 100% - 3% FULL RANGE CONTINUOUS DIMMING. SOME LIGHT MANUFACTURERS RECOMMEND BURNING IN NEW LAMPS 100 HOURS AT FULL LIGHT OUTPUT BEFORE DIMMING. CONSULT LIGHT MANUFACTURER.

MARK 10 – 120V ONLY. ONE AND TWO-LAMP BALLASTS MAY BE REMOTE MOUNTED UP TO 6 FT. AWAY FROM LAMPS. THREE LAMP BALLASTS MAY NOT BE REMOTE MOUNTED. 100% - 5% FULL RANGE CONTINUOUS DIMMING. SOME LIGHT MANUFACTURERS RECOMMEND BURNING IN NEW LAMPS 100 HOURS AT FULL LIGHT OUTPUT BEFORE DIMMING. CONSULT LIGHT MANUFACTURER.

FOR **EM** (EMERGENCY BALLAST) OPTION: STANDARD LUMEN OUTPUT IS 700. CALL FACTORY FOR REQUEST OF A HIGHER LUMEN OUTPUT. \*IF EMERGENCY OPTION IS USED WITH DIMMING, THE BALLAST MUST BE LOCATED HALF THE DISTANCE OF THE DIMMING REQUIREMENTS.

Description :

**SFM2-41-LED25W-FRE-CG**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES**

**HD**

Notes:



**BASELITE VAPOR JAR CATALOG**

PROJECT NAME: \_\_\_\_\_

PROJECT TYPE: \_\_\_\_\_

**G- GLASS OPTIONS**



**CL3** 3" CLEAR GLASS

**CL4** 4" CLEAR GLASS



**PR3** 3" PRISMATIC GLASS

**PR4** 4" PRISMATIC GLASS



**FR3** 3" FROSTED GLASS

**FR4** 4" FROSTED GLASS



**AH3** 3" AMBER HYDE GLASS

**AH4** 4" AMBER HYDE GLASS



**RE3** 3" RED GLASS

**RE4** 4" RED GLASS



**GR3** 3" GREEN GLASS

**GR4** 4" GREEN GLASS



**BL3** 3" BLUE GLASS

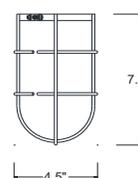
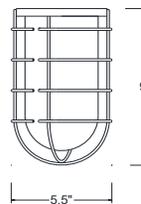
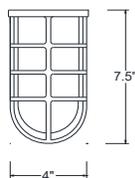
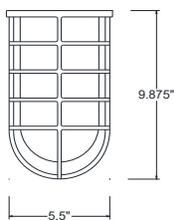
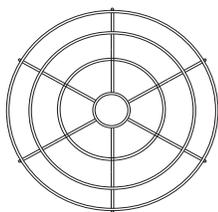
**BL4** 4" BLUE GLASS

GLASS – MAX WATTAGE

3" GLASS – 100W INC

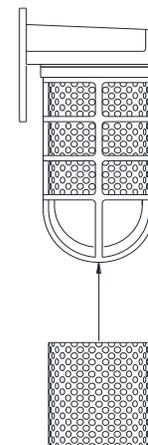
4" GLASS – 200W INC

**H- ACCESSORIES**



**CG** CAST ALUMINUM GUARD

**WG** WIRE GUARD



**PERF** PERFORATED

**GR7** 7" WIRE GRILL

**GR8** 8" WIRE GRILL

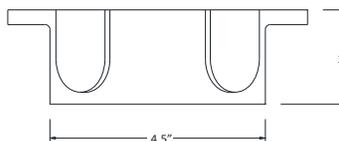
**GR10** 10" WIRE GRILL

**GR12** 12" WIRE GRILL

**GR14** 14" WIRE GRILL

**GR16** 16" WIRE GRILL

**GR18** 18" WIRE GRILL



**WJB4 1/2"** JUNCTION BOX 4-0 w/ 1/2" KNOCKOUT

**WJB4 3/4"** JUNCTION BOX 4-0 w/ 3/4" KNOCKOUT

**SUBSTITUTION REQUEST**

*The Construction Specifications Institute  
Northwest Region*

TO: Opsis Architecture / Interface Engineering / The Shalleck Collaborative

PROJECT: BSD 2020 AUDITORIUM UPGRADES

SPECIFIED ITEM:

<u>PLANS</u> Section No.	<u>E2.1</u> Page	<u>LUME SCHED</u> Paragraph	<u>TYPE HE, Lithonia, CLX Series</u> Description
-----------------------------	---------------------	--------------------------------	---

**PROPOSED SUBSTITUTION:** Day-Brite, FSS444L830-UNV-DIM-BK

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identifying applicable portions.

Attached data also includes description of changes to Contract Documents that proposed substitution requires for proper installation.

**Undersigned certifies that the following items, unless modified by attachments, are correct:**

1. Proposed substitution does not affect dimensions shown on Drawings.
2. Undersigned pays for changes to building design, including engineering design, detailing and construction costs caused by proposed substitution.
3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
4. Maintenance and service parts are available locally or are readily obtainable for proposed substitution.

**Undersigned further certifies that function, appearance, and quality of proposed substitution are equivalent or superior to specified item.**

**Undersigned agrees that, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.**

**Submitted by**

David Wray  
Name (Print) David Wray

Signature  
Northern Illumination Co.  
Firm Name  
17400 SW Upper Boones Ferry Rd. #270  
Address  
Portland, OR 97224  
City, State, Zip  
2/10/2020  
Date  
(503) 226-3633 (503) 226-3733  
Telephone Fax

**Attachments**

General Contractor (if after award of Contract)

For use by A/E:	
<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Approved as Noted
<input type="checkbox"/> Not Approved	<input type="checkbox"/> Received Too Late
By <u>Chris Roybal</u>	
Date <u>02/12/2020</u>	
Remarks _____	

	Description :	<b>FSS444L830-UNV-DIM-BK</b>	TYPE:
	Project Name:	<b>BSD 2020 AUDITORIUM UPGRADES</b>	<b>HE</b>
	Notes:		

**Day-Brite**  
**CFI**  
by @ignify

Linear

FluxStream strip

FSS 2', 3', 4', & 8'



Day-Brite / CFI FluxStream LED strip is a high performing luminaire delivering smooth diffuse light ideal for light industrial, commercial and residential applications with unparalleled energy efficiency.

Project: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Cat.No: \_\_\_\_\_  
 Type: \_\_\_\_\_  
 Lumens: \_\_\_\_\_ Qty: \_\_\_\_\_  
 Notes: \_\_\_\_\_

Ordering guide - standard & wireless controls

example: FSS440L840-UNV-DIM

Series	Length (nominal)	Lumens <sup>2</sup> (nominal)	Color temp. (K)	Voltage	Driver	Options
FSS						
FSS FluxStream strip	2' 2' length	20L 2000 lumens 30L 3000 lumens	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 <sup>1</sup> 80 CRI, 5000K	UNV Universal voltage 120-277V 120 <sup>4</sup> 120V 277 <sup>4</sup> 277V 347 <sup>5</sup> 347V	DIM <sup>12</sup> Dimming SDIM <sup>5,7</sup> Step dimming to 40% input power XDIM <sup>4,6,7</sup> MarkX phase dimming DALI <sup>8</sup> DALI	EMLED <sup>5,6,9</sup> Factory wired Bodine BSL310LP integral emergency pack. Nominal 1100lm LSXR10 120-347V motion sensor, factory installed on end cap LSXR10ADC <sup>10</sup> 120-347V motion sensor with photocell and hi/lo trim dimming, factory installed on end cap GTD/E <sup>13</sup> UL924 listed Bodine GTD factory installed on driver input GTD/SNSR <sup>13,14</sup> UL924 listed Bodine GTD factory installed between driver & sensor IAP <sup>10,11</sup> Integral Interact Pro RF sensor, enables wireless connected lighting control IAO <sup>10</sup> Integral Interact Office daylighting and occupancy sensor, enables wireless connected lighting control SWZDT <sup>10</sup> Integral sensor, daylighting and occupancy, advanced grouping, with dwell time PAF Paint after fabrication for extra corrosion resistance (white) BK Matte black paint color ST Satin aluminum paint color
	3' 3' length	30L 3000 lumens				
	4' 4' length	30L 3000 lumens 40L 4000 lumens 55L 5500 lumens 70L 7000 lumens				
	8' 8' length	60L 6000 lumens 80L 8000 lumens 110L 11000 lumens 140L 14000 lumens				

- 8' is tandem (2) 4' lenses with single piece 8' body.
- Nominal delivered lumens at 25°C ambient.
- Not available in 3' model.
- XDIM option must be specified with 120V or 277V option only.
- 347V with EMLED only available in 8' models.
- Not available in 2' or 3' model.
- Not available in 4' 70L model or 8' 140L model.
- DALI available up to 80L models only, consult factory for other options.
- EMLED on 8' models illuminates 4' section in emergency mode.
- Available with DIM driver option only.
- Not available in 8' 110L or 140L models.
- Integral controls options dimmable to 5% via wireless wall switch (see p.2). Non-integral controls configurations are 0-10V dimmable to 1%.
- Must be installed in conjunction with a UL1008 device.
- Must be ordered with an integral sensing option.

Ordering guide - PoE controls

example: FSS440L840-LV-POE-IAO

Series	Length (nominal)	Lumens <sup>16</sup> (nominal)	Color temp. (K)	Voltage	Driver	Options
FSS				LV	POE	
FSS FluxStream Strip	4' 4' length	30L 3000 lumens 40L 4000 lumens 60L 6000 lumens	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 80 CRI, 5000K	LV Low voltage	POE Power over ethernet	IAO Integral Interact Office daylighting and occupancy sensor, enables wired connected lighting control EMPOE <sup>17</sup> 600lm integral emergency driver and battery pack. PAF Paint after fabrication for extra corrosion resistance (white) BK Matte black paint color ST Satin aluminum paint color
	8' 8' length <sup>15</sup>	60L 6000 lumens				

- 8' is tandem (2) 4' lenses with single piece 8' body.
- Nominal delivered lumens at 25°C ambient.
- EMLED on 8' models illuminates 4' section in emergency mode.

Accessories (order separately)

- FSSD2L - 2' Diffuse replacement lens
- FSSD3L - 3' Diffuse replacement lens
- FSSD4L - 4' Diffuse replacement lens (order two for 8' models)
- FSSWG4 - 4' wire guard (order two for 8' models)
- FSTH - Sliding hanger bracket (set of two)
- LSXR10 - Low bay PIR motion sensor, 120-277V (not available with PoE)
- LSXR10ADC - Low bay PIR motion sensor with photocell and hi/lo trim dimming, 120-277V (not available with PoE)
- FSSDEK - Decorative plastic end cap (set of two) (See last page for details and more options)

General notes

Many luminaire components, such as reflectors, refractors, lenses, sockets, lampholders, and LEDs are made from various types of plastics which can be adversely affected by airborne contaminants. If sulfur based chemicals, petroleum based products, cleaning solutions, or other contaminants are expected in the intended area of use, consult factory for compatibility.  
 PAF (Paint after fabrication) option is required for all products that will be used in a damp or humid location, such as under a canopy or covered parking area.



interact ready.

Description :

**FSS444L830-UNV-DIM-BK**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES**

**HE**

Notes:

# FSS FluxStream LED strip

2', 3', 4' and 8'

## Features

- Compact design for installation in tight spaces.
- Frosted acrylic diffuser provides wide light distribution and superior glare control.
- Diffuser and LED plate snap into place allowing tool-free access to LED boards and driver.
- 2', 3', 4' and 8' tandem lengths available to accommodate many field applications.
- Up to 100,000 hour predicted L70 LED lumen maintenance provides long service life to reduce maintenance costs.
- Can be surface mounted on ceilings or walls, or suspended via chain, pendants or cables.
- Wall mountable - ADA compliant.
- Ideal for cold applications (-20°C).
- Continuous row mounting using standard end caps. No extra parts needed.
- 7/8" knock out provided at each end and on base of luminaire. Note: Center knockout is covered and not useable in 4' version with EMLED option.
- Multiple driver options available with 0-10V as standard.
- Enclosed lens minimizes penetration of dust, insects, and other debris into the LED compartment.

- 8' tandem unit is two 4' optical assemblies with a center mullion on a single full length chassis.
- Integral controls options include sensor mounted in control module extension mounted on fixture end (see dimension drawing).
- Fluxstream luminaires are Designlights Consortium® qualified. Please see the DLC QPL list for exact catalog numbers [www.designlights.org/QPL](http://www.designlights.org/QPL).
- 5 year manufacturer's limited warranty. Visit [signify.com/warranties](http://signify.com/warranties) for complete warranty information.

## Finish

- Baked white acrylic matte high reflectance paint finish.
- PAF (Paint after fabrication) option, which is required for all products that will be used in damp or humid locations, such as a canopy or covered parking area, provides extra corrosion resistance.

## Shielding

- Contoured frosted acrylic lens.

## Electrical

- LED boards and drivers are RoHS (Restriction of Hazardous Substances) compliant. Total system life rated at 50,000 hours. Predicted L70 lifetime based on LED manufacturer's supplied LM-80 data and in-situ laboratory testing.
- Integral emergency driver with EMLED option. To estimate lumen output in emergency mode, multiply emergency pack wattage by efficacy, then by 1.10.
- The GTD/E option is used to bypass wall switches and allow luminaire operation on auxiliary power. Generator transfer requires installation in conjunction with a UL1008 listed device.
- The GTD/SNSR option is used to bypass integrated sensor control in the event of utility power loss. Generator transfer requires installation in conjunction with a UL1008 listed device.

## Materials

- Heavy gauge cold rolled steel housing, LED plate, and end caps.

## Labels

- cETLus listed.
- Suitable for damp locations.

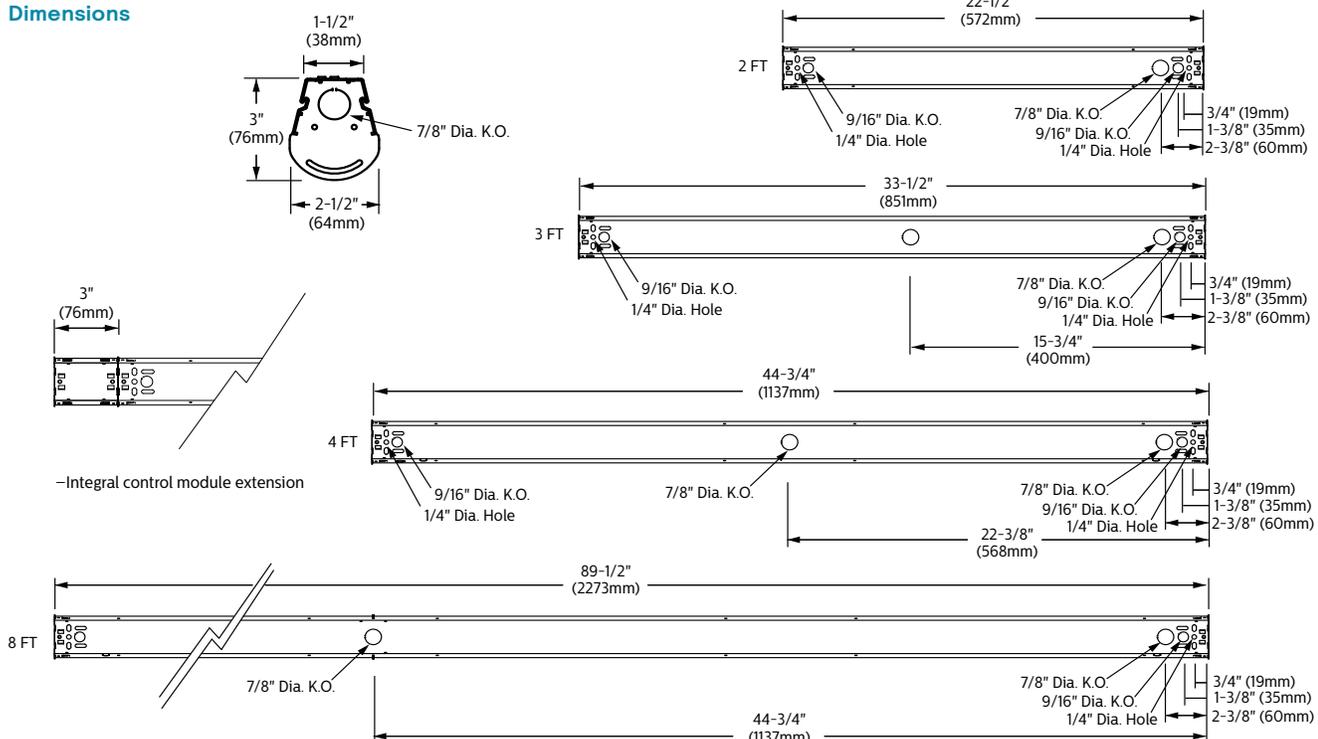
## Performance data

Fixture	Lumens	Wattage	Efficacy
FSS220L	2000lm	17W	123lm/w
FSS330L	3000lm	26W	119lm/w
FSS440L	4000lm	31W	133lm/w
FSS455L	5500lm	45W	129lm/w
FSS470L	7000lm	58W	126lm/w

## Ambient temperature data

Configuration	Ambient
FSS470L	-20°C to 30°C
FSS8110L	-20°C to 35°C
FSS8140L	-20°C to 25°C
EMLED option	Minimum 0°C
All others	-20°C to 40°C

## Dimensions



	<b>Description :</b> <b>FSS444L830-UNV-DIM-BK</b> <b>Project Name:</b> <b>BSD 2020 AUDITORIUM UPGRADES</b> <b>Notes:</b>	<b>TYPE:</b> <b>HE</b>
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# FSS FluxStream LED strip

2', 3', 4' and 8'

## Wireless Controls Options

### SpaceWise DT (SWZDT)

- Standalone daylight and occupancy sensing with advanced grouping and dwell time
- Commissioning via compatible Android phone and Philips Field App
- Dimming via compatible Zigbee wireless wall switch only (see link below for details)
- Register for the commissioning app at <http://registration.componentcloud.philips.com/appregistration/>
- Integral sensing options may not be combined
- For more information including recommended switches, refer to the following: -  
**SWZDT** - [www.usa.lighting.philips.com/systems/lighting-systems/spacewise](http://www.usa.lighting.philips.com/systems/lighting-systems/spacewise)

### Interact Pro (IAP)

- Interact Pro brings the power of connected lighting to **small and medium businesses** without the complexity usually associated with connected lighting.
- Interact Pro includes an app, a portal and a broad portfolio of wireless Luminaires, lamps and retrofit kits all working on the same system.
- Commissioning via Interact Pro App (Android or iPhone)
- Prepare commissioning remotely via Interact Pro portal
- Requires compatible Interact Pro Gateway and internet connectivity for commissioning
- Compatible with UID8451/10 ZigBee Greenpower wireless dimmer switch
- Compatible with wireless Occ sensor (OCC SENSOR IA CM IP42 WH 10/1) or wireless Day/Occ sensor (OCC MULTI SENSOR IA CM WH 10/1)
- For more information on Interact Pro visit: [www.interact-lighting.com/pro](http://www.interact-lighting.com/pro)
- For more information on Interact Ready visit: [www.philips.com/interact-ready](http://www.philips.com/interact-ready)

### Interact Office (IAO)

- A wireless IoT connected lighting solution for **large enterprises** that span across multiple floors, buildings and require multiple gateways.
- View all your projects under one dashboard and easily compare insights from multiple projects in one view.
- Compatible Zigbee Green Power wall dimmer and wireless Occupancy or Daylight & Occupancy sensors available.
- Use Interact Office software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
- Supports advanced IoT Apps on wayfinding, room/desk reservation and offers open APIs
- Requires compatible Interact Office Gateway and internet connectivity for commissioning.
- For more information on Interact Office Wireless, visit: [www.interact-lighting.com/office](http://www.interact-lighting.com/office) or [www.usa.lighting.philips.com/systems/system-areas/offices](http://www.usa.lighting.philips.com/systems/system-areas/offices)

FluxStream strip shown with integral sensor



## Wired Controls Options

### Interact Office Wired (PoE)

- PoE based IoT connected lighting solution for large enterprises that span across multiple floors, buildings and require multiple gateways.
- Use Interact Office software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
- Supports advanced IoT Apps on Personal Control, Space Management, wayfinding, room/desk reservation and offers open APIs for light control and data exchange.
- PoE lighting controller is accessible from below.
- Integral sensor option for occupancy sensing (PIR) and/or daylight harvesting available for additional energy savings.
- Optional integral emergency controller and battery pack provides 600lm nominal output. Test switch and indicator light mounted on side of chassis on one end.
- Emergency battery has a 3 month pre-installed shelf life, and must be stored and installed in environments of 20C to 30C (-4F to 86F) ambient, and 45-85% relative humidity.
- For more information on Interact Office Wired, visit: [www.interact-lighting.com/office](http://www.interact-lighting.com/office) or [www.usa.lighting.philips.com/systems/system-areas/offices](http://www.usa.lighting.philips.com/systems/system-areas/offices)

	Description :	<b>FSS444L830-UNV-DIM-BK</b>	TYPE:
	Project Name:	<b>BSD 2020 AUDITORIUM UPGRADES</b>	<b>HE</b>
	Notes:		

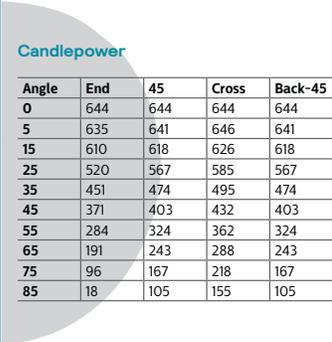
# FSS FluxStream LED strip

2', 3', 4' and 8'

## Photometry

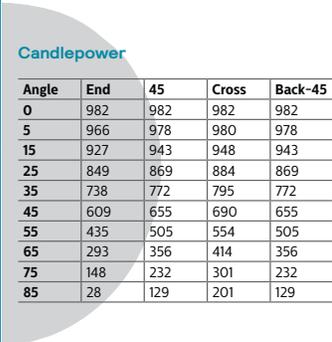
2' FluxStream LED strip, 2000 nominal delivered lumens

LER - 123

<b>Catalog No.</b> FSS220L840-UNV-DIM <b>Test No.</b> 37164 <b>S/MH</b> 1.2 <b>Lamp Type</b> LED <b>Lumens</b> 2034 <b>Input Watts</b> 17  Comparative yearly lighting energy cost per 1000 lumens – <b>\$1.95</b> based on 3000 hrs. and \$.08 pwr KWH.  The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.  Photometric values based on test performed in compliance with LM-79.		<b>Light Distribution</b> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>493</td><td>24.2</td></tr> <tr><td>0-40</td><td>790</td><td>38.9</td></tr> <tr><td>0-60</td><td>1391</td><td>68.4</td></tr> <tr><td>0-90</td><td>1910</td><td>93.9</td></tr> <tr><td>90-180</td><td>124</td><td>6.1</td></tr> <tr><td>0-180</td><td>2034</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	493	24.2	0-40	790	38.9	0-60	1391	68.4	0-90	1910	93.9	90-180	124	6.1	0-180	2034	100	<b>Average Luminance</b> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45°</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>15155</td><td>12916</td><td>12955</td></tr> <tr><td>55</td><td>14048</td><td>11583</td><td>11859</td></tr> <tr><td>65</td><td>12449</td><td>10173</td><td>10781</td></tr> <tr><td>75</td><td>9646</td><td>8758</td><td>9839</td></tr> <tr><td>85</td><td>4206</td><td>7611</td><td>9181</td></tr> </tbody> </table>	Zone	End	45°	Cross	45	15155	12916	12955	55	14048	11583	11859	65	12449	10173	10781	75	9646	8758	9839	85	4206	7611	9181																																																																																																																																																																																																												
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3' FluxStream LED strip, 3000 nominal delivered lumens

LER - 119

<b>Catalog No.</b> FSS330L840-UNV-DIM <b>Test No.</b> 37132 <b>S/MH</b> 1.3 <b>Lamp Type</b> LED <b>Lumens</b> 3045 <b>Input Watts</b> 26  Comparative yearly lighting energy cost per 1000 lumens – <b>\$2.02</b> based on 3000 hrs. and \$.08 pwr KWH.  The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.  Photometric values based on test performed in compliance with LM-79.		<b>Light Distribution</b> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>759</td><td>24.9</td></tr> <tr><td>0-40</td><td>1241</td><td>40.8</td></tr> <tr><td>0-60</td><td>2187</td><td>71.8</td></tr> <tr><td>0-90</td><td>2918</td><td>95.8</td></tr> <tr><td>90-180</td><td>127</td><td>4.2</td></tr> <tr><td>0-180</td><td>3045</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	759	24.9	0-40	1241	40.8	0-60	2187	71.8	0-90	2918	95.8	90-180	127	4.2	0-180	3045	100	<b>Average Luminance</b> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45°</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>16859</td><td>14162</td><td>13823</td></tr> <tr><td>55</td><td>14686</td><td>12197</td><td>12138</td></tr> <tr><td>65</td><td>13174</td><td>10098</td><td>10376</td></tr> <tr><td>75</td><td>10412</td><td>8269</td><td>9110</td></tr> <tr><td>85</td><td>4882</td><td>6455</td><td>7980</td></tr> </tbody> </table>	Zone	End	45°	Cross	45	16859	14162	13823	55	14686	12197	12138	65	13174	10098	10376	75	10412	8269	9110	85	4882	6455	7980																																																																																																																																																																																																												
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	Description :	<b>FSS444L830-UNV-DIM-BK</b>	TYPE:
	Project Name:	<b>BSD 2020 AUDITORIUM UPGRADES</b>	<b>HE</b>
	Notes:		

# FSS FluxStream LED strip

2', 3', 4' and 8'

## Photometry

### 4' FluxStream LED strip, 4000 nominal delivered lumens

LER - 133

Catalog No.	FSS440L840-UNV-DIM
Test No.	37259
S/MH	1.3
Lamp Type	LED
Lumens	4130
Input Watts	31

#### Candlepower

Angle	End	45	Cross	Back-45
0	1272	1272	1272	1272
5	1250	1265	1277	1265
15	1199	1221	1237	1221
25	1098	1130	1157	1130
35	957	1005	1044	1005
45	791	860	910	860
55	606	690	758	690
65	382	481	598	481
75	194	326	416	326
85	36	196	289	196

Comparative yearly lighting energy cost per 1000 lumens – **\$1.80** based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	986	23.9
0-40	1614	39.1
0-60	2886	69.9
0-90	3905	94.6
90-180	225	5.4
0-180	4130	100

#### Average Luminance

Zone	End	45°	Cross
45	16754	14171	13847
55	15678	12712	12618
65	13207	10415	11375
75	10615	8873	9550
85	5052	7511	8720

#### Coefficients of Utilization

EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)									
pfc =	20		80		70		50		50
Ceil									
Wall	70	50	30	70	50	30	50	30	
RCR									
0	118	118	118	114	114	114	108	108	
1	106	101	95	103	97	93	92	89	
2	95	86	80	93	84	78	80	75	
3	86	76	67	83	73	66	69	64	
4	80	67	57	77	65	56	61	55	
5	72	59	51	70	57	50	56	47	
6	68	54	45	65	53	44	50	42	
7	63	48	40	59	47	39	46	38	
8	57	44	35	56	44	34	41	34	
9	54	40	32	53	40	32	38	30	
10	51	38	30	49	37	29	35	28	

### 4' FluxStream LED strip, 5500 nominal delivered lumens

LER - 129

Catalog No.	FSS455L840-UNV-DIM
Test No.	37262
S/MH	1.3
Lamp Type	LED
Lumens	5759
Input Watts	45

#### Candlepower

Angle	End	45	Cross	Back-45
0	1788	1788	1788	1788
5	1757	1777	1792	1777
15	1685	1715	1736	1715
25	1544	1585	1623	1585
35	1346	1408	1462	1408
45	1113	1202	1271	1202
55	852	960	1055	960
65	575	712	828	712
75	272	443	610	443
85	50	259	389	259

Comparative yearly lighting energy cost per 1000 lumens – **\$1.86** based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	1384	24
0-40	2264	39.3
0-60	4043	70.2
0-90	5478	95.1
90-180	281	4.9
0-180	5759	100

#### Average Luminance

Zone	End	45°	Cross
45	23558	19796	19347
55	22047	17697	17574
65	19887	15425	15749
75	14898	12084	14023
85	7023	9926	11749

#### Coefficients of Utilization

EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)									
pfc =	20		80		70		50		50
Ceil									
Wall	70	50	30	70	50	30	50	30	
RCR									
0	118	118	118	115	115	115	108	108	
1	106	101	95	103	97	93	92	89	
2	95	86	80	93	84	78	80	75	
3	86	76	68	83	73	66	69	64	
4	80	67	57	77	66	56	61	55	
5	72	59	51	70	58	50	56	47	
6	68	54	45	65	53	44	50	42	
7	63	48	40	60	47	39	46	38	
8	57	44	35	56	44	34	41	34	
9	54	40	32	53	40	32	38	30	
10	51	38	30	49	37	29	36	29	

### 4' FluxStream LED strip, 7000 nominal delivered lumens

LER - 126

Catalog No.	FSS470L840-UNV-DIM
Test No.	37265
S/MH	1.3
Lamp Type	LED
Lumens	7275
Input Watts	58

#### Candlepower

Angle	End	45	Cross	Back-45
0	2211	2211	2211	2211
5	2176	2199	2217	2199
15	2088	2124	2148	2124
25	1914	1966	2010	1966
35	1672	1750	1813	1750
45	1379	1502	1580	1502
55	1058	1204	1317	1204
65	714	898	1041	898
75	339	592	776	592
85	63	344	524	344

Comparative yearly lighting energy cost per 1000 lumens – **\$1.90** based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	1714	23.6
0-40	2809	38.6
0-60	5028	69.1
0-90	6879	94.6
90-180	396	5.4
0-180	7275	100

#### Average Luminance

Zone	End	45°	Cross
45	29203	24745	24050
55	27371	22192	21938
65	24688	19451	19793
75	18540	16135	17825
85	8824	13174	15831

#### Coefficients of Utilization

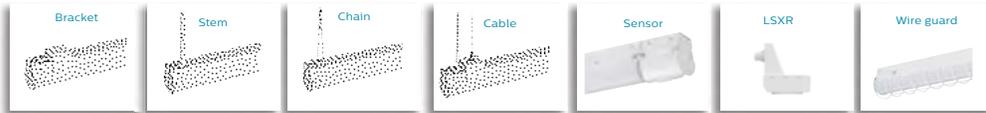
EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)									
pfc =	20		80		70		50		50
Ceil									
Wall	70	50	30	70	50	30	50	30	
RCR									
0	118	118	118	114	114	114	108	108	
1	106	100	95	103	97	93	92	89	
2	95	86	79	92	83	78	80	73	
3	86	76	67	83	73	66	69	63	
4	79	67	57	77	65	56	61	55	
5	72	59	50	69	57	48	55	47	
6	67	54	44	65	52	44	50	41	
7	61	47	40	59	46	39	45	38	
8	57	44	35	56	42	34	40	34	
9	54	40	32	52	40	32	38	30	
10	51	37	29	49	37	29	35	28	

	<b>Description :</b> <b>FSS444L830-UNV-DIM-BK</b>	<b>TYPE:</b>  <b>HE</b>
	<b>Project Name:</b> <b>BSD 2020 AUDITORIUM UPGRADES</b>	
	<b>Notes:</b>	

## FSS FluxStream LED strip

2', 3', 4' and 8'

### Accessories



Accessory Catalog Code	Description
<b>FSTH</b>	Sliding hanger bracket (pair)
<b>SV5F12</b>	12" Stem and canopy kit
<b>SV5F18</b>	18" Stem and canopy kit
<b>SV5F24</b>	24" Stem and canopy kit
<b>SV5F36</b>	36" Stem and canopy kit
<b>SV5F48</b>	48" Stem and canopy kit
<b>FKR-126</b>	Chain hanger set (pair)
<b>DACHxx</b>	Adjustable cable hanger kit (single)
<b>DACHxx-1-SC</b>	Adjustable cable hanger kit with white straight 18/3 cord (single)
<b>DACHxx-1-CC</b>	Adjustable cable hanger kit with white coiled 18/3 cord (single)
<b>DACHxx-2-SC</b>	Adjustable cable hanger kit with white straight 18/4 cord (single)
<b>DACHxx-2-CC</b>	Adjustable cable hanger kit with white coiled 18/4 cord (single)
<b>DACHxx-1D-SC</b>	Adjustable cable hanger kit with white straight 18/5 cord with dimming leads (single)
<b>LSXR10</b>	Low bay pir motion sensor (120-277v)
<b>LSXR10ADC</b>	Low bay pir motion sensor with photocell and hi/lo trim dimming (120-277v)
<b>FSSWG4</b>	4' Wire guard (order two for 8' models)
<b>FSSD2L</b>	2' Diffuse replacement lens
<b>FSSD3L</b>	3' Diffuse replacement lens
<b>FSSD4L</b>	4' Diffuse replacement lens (order two for 8' models)
<b>FSSDEK</b>	Decorative plastic end cap (set of two)

White stem and canopy kit, 1/4" trade size (1/2" O.D.) locknuts included. Works with 9/16" k.O. on base of housing.

Includes two 5' heavy duty link chains with "V" hooks. Attaches to base of housing.

Works with 1/4" hole on base of housing or FSTH hanger bracket.

xx=cable length in inches, enter 48" to 180" lengths in 12" increments

The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract.



**SUBSTITUTION REQUEST**

*The Construction Specifications Institute  
Northwest Region*

TO: Opsis Architecture / Interface Engineering / The Shalleck Collaborative

PROJECT: BSD 2020 AUDITORIUM UPGRADES

SPECIFIED ITEM:

<u>PLANS</u> Section No.	<u>E2.1</u> Page	<u>LUME SCHED</u> Paragraph	<u>TYPE HES, Lithonia, CLX Series</u> Description
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**PROPOSED SUBSTITUTION:** Day-Brite, FSS444L830-UNV-DIM-BK

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identifying applicable portions.

Attached data also includes description of changes to Contract Documents that proposed substitution requires for proper installation.

**Undersigned certifies that the following items, unless modified by attachments, are correct:**

1. Proposed substitution does not affect dimensions shown on Drawings.
2. Undersigned pays for changes to building design, including engineering design, detailing and construction costs caused by proposed substitution.
3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
4. Maintenance and service parts are available locally or are readily obtainable for proposed substitution.

**Undersigned further certifies that function, appearance, and quality of proposed substitution are equivalent or superior to specified item.**

**Undersigned agrees that, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.**

**Submitted by**

David Wray  
Name (Print) David Wray

Signature  
Northern Illumination Co.  
Firm Name  
17400 SW Upper Boones Ferry Rd. #270  
Address  
Portland, OR 97224  
City, State, Zip  
2/10/2020  
Date  
(503) 226-3633 (503) 226-3733  
Telephone Fax

**Attachments**

General Contractor (if after award of Contract)

For use by A/E:	
<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Approved as Noted
<input type="checkbox"/> Not Approved	<input type="checkbox"/> Received Too Late
By <u>Chris Roybal</u>	
Date <u>02/12/2020</u>	
Remarks _____	

	Description :	<b>FSS444L830-UNV-DIM-BK</b>	TYPE:
	Project Name:	<b>BSD 2020 AUDITORIUM UPGRADES</b>	<b>HES</b>
	Notes:		

**Day-Brite**  
**CFI**  
by @ignify

Linear

FluxStream strip

FSS 2', 3', 4', & 8'



Day-Brite / CFI FluxStream LED strip is a high performing luminaire delivering smooth diffuse light ideal for light industrial, commercial and residential applications with unparalleled energy efficiency.

Project: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Cat.No: \_\_\_\_\_  
 Type: \_\_\_\_\_  
 Lumens: \_\_\_\_\_ Qty: \_\_\_\_\_  
 Notes: \_\_\_\_\_

**Ordering guide - standard & wireless controls**

example: FSS440L840-UNV-DIM

Series	Length (nominal)	Lumens <sup>2</sup> (nominal)	Color temp. (K)	Voltage	Driver	Options
FSS						
FSS FluxStream strip	2' 2' length	20L 2000 lumens 30L 3000 lumens	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 <sup>1</sup> 80 CRI, 5000K	UNV Universal voltage 120-277V 120 <sup>4</sup> 120V 277 <sup>4</sup> 277V 347 <sup>5</sup> 347V	DIM <sup>12</sup> Dimming SDIM <sup>5,7</sup> Step dimming to 40% input power XDIM <sup>4,6,7</sup> MarkX phase dimming DALI <sup>8</sup> DALI	EMLED <sup>5,6,9</sup> Factory wired Bodine BSL310LP integral emergency pack. Nominal 1100lm LSXR10 120-347V motion sensor, factory installed on end cap LSXR10ADC <sup>10</sup> 120-347V motion sensor with photocell and hi/lo trim dimming, factory installed on end cap GTD/E <sup>13</sup> UL924 listed Bodine GTD factory installed on driver input GTD/SNSR <sup>13,14</sup> UL924 listed Bodine GTD factory installed between driver & sensor IAP <sup>10,11</sup> Integral Interact Pro RF sensor, enables wireless connected lighting control IAO <sup>10</sup> Integral Interact Office daylighting and occupancy sensor, enables wireless connected lighting control SWZDT <sup>10</sup> Integral sensor, daylighting and occupancy, advanced grouping, with dwell time PAF Paint after fabrication for extra corrosion resistance (white) BK Matte black paint color ST Satin aluminum paint color
	3' 3' length	30L 3000 lumens				
	4' 4' length	30L 3000 lumens 40L 4000 lumens 55L 5500 lumens 70L 7000 lumens				
	8' 8' length	60L 6000 lumens 80L 8000 lumens 110L 11000 lumens 140L 14000 lumens				

- 8' is tandem (2) 4' lenses with single piece 8' body.
- Nominal delivered lumens at 25°C ambient.
- Not available in 3' model.
- XDIM option must be specified with 120V or 277V option only.
- 347V with EMLED only available in 8' models.
- Not available in 2' or 3' model.
- Not available in 4' 70L model or 8' 140L model.
- DALI available up to 80L models only, consult factory for other options.
- EMLED on 8' models illuminates 4' section in emergency mode.
- Available with DIM driver option only.
- Not available in 8' 110L or 140L models.
- Integral controls options dimmable to 5% via wireless wall switch (see p.2). Non-integral controls configurations are 0-10V dimmable to 1%.
- Must be installed in conjunction with a UL1008 device.
- Must be ordered with an integral sensing option.

**Ordering guide - PoE controls**

example: FSS440L840-LV-POE-IAO

Series	Length (nominal)	Lumens <sup>16</sup> (nominal)	Color temp. (K)	Voltage	Driver	Options
FSS				LV	POE	
FSS FluxStream Strip	4' 4' length	30L 3000 lumens 40L 4000 lumens 60L 6000 lumens	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 80 CRI, 5000K	LV Low voltage	POE Power over ethernet	IAO Integral Interact Office daylighting and occupancy sensor, enables wired connected lighting control EMPOE <sup>17</sup> 600lm integral emergency driver and battery pack. PAF Paint after fabrication for extra corrosion resistance (white) BK Matte black paint color ST Satin aluminum paint color
	8' 8' length <sup>15</sup>	60L 6000 lumens				

- 8' is tandem (2) 4' lenses with single piece 8' body.
- Nominal delivered lumens at 25°C ambient.
- EMLED on 8' models illuminates 4' section in emergency mode.

**Accessories (order separately)**

- FSSD2L - 2' Diffuse replacement lens
- FSSD3L - 3' Diffuse replacement lens
- FSSD4L - 4' Diffuse replacement lens (order two for 8' models)
- FSSWG4 - 4' wire guard (order two for 8' models)
- FSTH - Sliding hanger bracket (set of two)
- LSXR10 - Low bay PIR motion sensor, 120-277V (not available with PoE)
- LSXR10ADC - Low bay PIR motion sensor with photocell and hi/lo trim dimming, 120-277V (not available with PoE)
- FSSDEK - Decorative plastic end cap (set of two) (See last page for details and more options)

**General notes**

Many luminaire components, such as reflectors, refractors, lenses, sockets, lampholders, and LEDs are made from various types of plastics which can be adversely affected by airborne contaminants. If sulfur based chemicals, petroleum based products, cleaning solutions, or other contaminants are expected in the intended area of use, consult factory for compatibility. PAF (Paint after fabrication) option is required for all products that will be used in a damp or humid location, such as under a canopy or covered parking area.



interact ready.

Description :

**FSS444L830-UNV-DIM-BK**

TYPE:

Project Name:

**BSD 2020 AUDITORIUM UPGRADES**

**HES**

Notes:

# FSS FluxStream LED strip

2', 3', 4' and 8'

## Features

- Compact design for installation in tight spaces.
- Frosted acrylic diffuser provides wide light distribution and superior glare control.
- Diffuser and LED plate snap into place allowing tool-free access to LED boards and driver.
- 2', 3', 4' and 8' tandem lengths available to accommodate many field applications.
- Up to 100,000 hour predicted L70 LED lumen maintenance provides long service life to reduce maintenance costs.
- Can be surface mounted on ceilings or walls, or suspended via chain, pendants or cables.
- Wall mountable - ADA compliant.
- Ideal for cold applications (-20°C).
- Continuous row mounting using standard end caps. No extra parts needed.
- 7/8" knock out provided at each end and on base of luminaire. Note: Center knockout is covered and not useable in 4' version with EMLED option.
- Multiple driver options available with 0-10V as standard.
- Enclosed lens minimizes penetration of dust, insects, and other debris into the LED compartment.

- 8' tandem unit is two 4' optical assemblies with a center mullion on a single full length chassis.
- Integral controls options include sensor mounted in control module extension mounted on fixture end (see dimension drawing).
- Fluxstream luminaires are Designlights Consortium® qualified. Please see the DLC QPL list for exact catalog numbers [www.designlights.org/QPL](http://www.designlights.org/QPL).
- 5 year manufacturer's limited warranty. Visit [signify.com/warranties](http://signify.com/warranties) for complete warranty information.

## Finish

- Baked white acrylic matte high reflectance paint finish.
- PAF (Paint after fabrication) option, which is required for all products that will be used in damp or humid locations, such as a canopy or covered parking area, provides extra corrosion resistance.

## Shielding

- Contoured frosted acrylic lens.

## Electrical

- LED boards and drivers are RoHS (Restriction of Hazardous Substances) compliant. Total system life rated at 50,000 hours. Predicted L70 lifetime based on LED manufacturer's supplied LM-80 data and in-situ laboratory testing.
- Integral emergency driver with EMLED option. To estimate lumen output in emergency mode, multiply emergency pack wattage by efficacy, then by 1.10.
- The GTD/E option is used to bypass wall switches and allow luminaire operation on auxiliary power. Generator transfer requires installation in conjunction with a UL1008 listed device.
- The GTD/SNSR option is used to bypass integrated sensor control in the event of utility power loss. Generator transfer requires installation in conjunction with a UL1008 listed device.

## Materials

- Heavy gauge cold rolled steel housing, LED plate, and end caps.

## Labels

- cETLus listed.
- Suitable for damp locations.

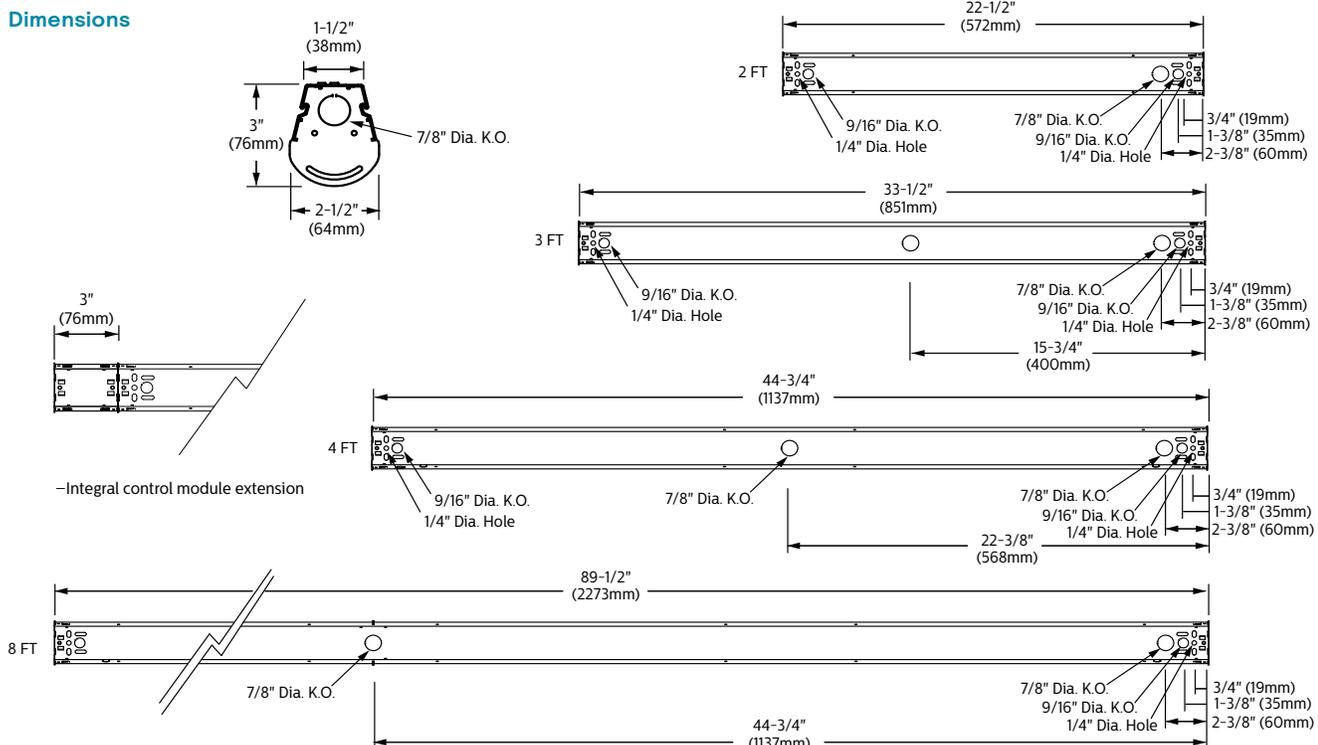
## Performance data

Fixture	Lumens	Wattage	Efficacy
FSS220L	2000lm	17W	123lm/w
FSS330L	3000lm	26W	119lm/w
FSS440L	4000lm	31W	133lm/w
FSS455L	5500lm	45W	129lm/w
FSS470L	7000lm	58W	126lm/w

## Ambient temperature data

Configuration	Ambient
FSS470L	-20°C to 30°C
FSS8110L	-20°C to 35°C
FSS8140L	-20°C to 25°C
EMLED option	Minimum 0°C
All others	-20°C to 40°C

## Dimensions



	<b>Description :</b> <b>FSS444L830-UNV-DIM-BK</b> <b>Project Name:</b> <b>BSD 2020 AUDITORIUM UPGRADES</b> <b>Notes:</b>	<b>TYPE:</b> <b>HES</b>
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# FSS FluxStream LED strip

2', 3', 4' and 8'

## Wireless Controls Options

### SpaceWise DT (SWZDT)

- Standalone daylight and occupancy sensing with advanced grouping and dwell time
- Commissioning via compatible Android phone and Philips Field App
- Dimming via compatible Zigbee wireless wall switch only (see link below for details)
- Register for the commissioning app at <http://registration.componentcloud.philips.com/appregistration/>
- Integral sensing options may not be combined
- For more information including recommended switches, refer to the following: -  
**SWZDT** - [www.usa.lighting.philips.com/systems/lighting-systems/spacewise](http://www.usa.lighting.philips.com/systems/lighting-systems/spacewise)

### Interact Pro (IAP)

- Interact Pro brings the power of connected lighting to **small and medium businesses** without the complexity usually associated with connected lighting.
- Interact Pro includes an app, a portal and a broad portfolio of wireless Luminaires, lamps and retrofit kits all working on the same system.
- Commissioning via Interact Pro App (Android or iPhone)
- Prepare commissioning remotely via Interact Pro portal
- Requires compatible Interact Pro Gateway and internet connectivity for commissioning
- Compatible with UID8451/10 ZigBee Greenpower wireless dimmer switch
- Compatible with wireless Occ sensor (OCC SENSOR IA CM IP42 WH 10/1) or wireless Day/Occ sensor (OCC MULTI SENSOR IA CM WH 10/1)
- For more information on Interact Pro visit: [www.interact-lighting.com/pro](http://www.interact-lighting.com/pro)
- For more information on Interact Ready visit: [www.philips.com/interact-ready](http://www.philips.com/interact-ready)

### Interact Office (IAO)

- A wireless IoT connected lighting solution for **large enterprises** that span across multiple floors, buildings and require multiple gateways.
- View all your projects under one dashboard and easily compare insights from multiple projects in one view.
- Compatible Zigbee Green Power wall dimmer and wireless Occupancy or Daylight & Occupancy sensors available.
- Use Interact Office software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
- Supports advanced IoT Apps on wayfinding, room/desk reservation and offers open APIs
- Requires compatible Interact Office Gateway and internet connectivity for commissioning.
- For more information on Interact Office Wireless, visit: [www.interact-lighting.com/office](http://www.interact-lighting.com/office) or [www.usa.lighting.philips.com/systems/system-areas/offices](http://www.usa.lighting.philips.com/systems/system-areas/offices)

FluxStream strip shown with integral sensor



## Wired Controls Options

### Interact Office Wired (PoE)

- PoE based IoT connected lighting solution for large enterprises that span across multiple floors, buildings and require multiple gateways.
- Use Interact Office software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
- Supports advanced IoT Apps on Personal Control, Space Management, wayfinding, room/desk reservation and offers open APIs for light control and data exchange.
- PoE lighting controller is accessible from below.
- Integral sensor option for occupancy sensing (PIR) and/or daylight harvesting available for additional energy savings.
- Optional integral emergency controller and battery pack provides 600lm nominal output. Test switch and indicator light mounted on side of chassis on one end.
- Emergency battery has a 3 month pre-installed shelf life, and must be stored and installed in environments of 20C to 30C (-4F to 86F) ambient, and 45-85% relative humidity.
- For more information on Interact Office Wired, visit: [www.interact-lighting.com/office](http://www.interact-lighting.com/office) or [www.usa.lighting.philips.com/systems/system-areas/offices](http://www.usa.lighting.philips.com/systems/system-areas/offices)

	Description :	<b>FSS444L830-UNV-DIM-BK</b>	TYPE:
	Project Name:	<b>BSD 2020 AUDITORIUM UPGRADES</b>	<b>HES</b>
	Notes:		

# FSS FluxStream LED strip

2', 3', 4' and 8'

## Photometry

2' FluxStream LED strip, 2000 nominal delivered lumens

LER - 123

<b>Catalog No.</b> FSS220L840-UNV-DIM <b>Test No.</b> 37164 <b>S/MH</b> 1.2 <b>Lamp Type</b> LED <b>Lumens</b> 2034 <b>Input Watts</b> 17  Comparative yearly lighting energy cost per 1000 lumens – <b>\$1.95</b> based on 3000 hrs. and \$.08 pwr KWH.  The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.  Photometric values based on test performed in compliance with LM-79.		<table border="1"> <thead> <tr> <th>Angle</th> <th>End</th> <th>45</th> <th>Cross</th> <th>Back-45</th> </tr> </thead> <tbody> <tr><td>0</td><td>644</td><td>644</td><td>644</td><td>644</td></tr> <tr><td>5</td><td>635</td><td>641</td><td>646</td><td>641</td></tr> <tr><td>15</td><td>610</td><td>618</td><td>626</td><td>618</td></tr> <tr><td>25</td><td>520</td><td>567</td><td>585</td><td>567</td></tr> <tr><td>35</td><td>451</td><td>474</td><td>495</td><td>474</td></tr> <tr><td>45</td><td>371</td><td>403</td><td>432</td><td>403</td></tr> <tr><td>55</td><td>284</td><td>324</td><td>362</td><td>324</td></tr> <tr><td>65</td><td>191</td><td>243</td><td>288</td><td>243</td></tr> <tr><td>75</td><td>96</td><td>167</td><td>218</td><td>167</td></tr> <tr><td>85</td><td>18</td><td>105</td><td>155</td><td>105</td></tr> </tbody> </table>	Angle	End	45	Cross	Back-45	0	644	644	644	644	5	635	641	646	641	15	610	618	626	618	25	520	567	585	567	35	451	474	495	474	45	371	403	432	403	55	284	324	362	324	65	191	243	288	243	75	96	167	218	167	85	18	105	155	105	<b>Light Distribution</b> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>493</td><td>24.2</td></tr> <tr><td>0-40</td><td>790</td><td>38.9</td></tr> <tr><td>0-60</td><td>1391</td><td>68.4</td></tr> <tr><td>0-90</td><td>1910</td><td>93.9</td></tr> <tr><td>90-180</td><td>124</td><td>6.1</td></tr> <tr><td>0-180</td><td>2034</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	493	24.2	0-40	790	38.9	0-60	1391	68.4	0-90	1910	93.9	90-180	124	6.1	0-180	2034	100	<b>Average Luminance</b> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45°</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>15155</td><td>12916</td><td>12955</td></tr> <tr><td>55</td><td>14048</td><td>11583</td><td>11859</td></tr> <tr><td>65</td><td>12449</td><td>10173</td><td>10781</td></tr> <tr><td>75</td><td>9646</td><td>8758</td><td>9839</td></tr> <tr><td>85</td><td>4206</td><td>7611</td><td>9181</td></tr> </tbody> </table>	Zone	End	45°	Cross	45	15155	12916	12955	55	14048	11583	11859	65	12449	10173	10781	75	9646	8758	9839	85	4206	7611	9181																																																																																		
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3' FluxStream LED strip, 3000 nominal delivered lumens

LER - 119

<b>Catalog No.</b> FSS330L840-UNV-DIM <b>Test No.</b> 37132 <b>S/MH</b> 1.3 <b>Lamp Type</b> LED <b>Lumens</b> 3045 <b>Input Watts</b> 26  Comparative yearly lighting energy cost per 1000 lumens – <b>\$2.02</b> based on 3000 hrs. and \$.08 pwr KWH.  The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.  Photometric values based on test performed in compliance with LM-79.		<table border="1"> <thead> <tr> <th>Angle</th> <th>End</th> <th>45</th> <th>Cross</th> <th>Back-45</th> </tr> </thead> <tbody> <tr><td>0</td><td>982</td><td>982</td><td>982</td><td>982</td></tr> <tr><td>5</td><td>966</td><td>978</td><td>980</td><td>978</td></tr> <tr><td>15</td><td>927</td><td>943</td><td>948</td><td>943</td></tr> <tr><td>25</td><td>849</td><td>869</td><td>884</td><td>869</td></tr> <tr><td>35</td><td>738</td><td>772</td><td>795</td><td>772</td></tr> <tr><td>45</td><td>609</td><td>655</td><td>690</td><td>655</td></tr> <tr><td>55</td><td>435</td><td>505</td><td>554</td><td>505</td></tr> <tr><td>65</td><td>293</td><td>356</td><td>414</td><td>356</td></tr> <tr><td>75</td><td>148</td><td>232</td><td>301</td><td>232</td></tr> <tr><td>85</td><td>28</td><td>129</td><td>201</td><td>129</td></tr> </tbody> </table>	Angle	End	45	Cross	Back-45	0	982	982	982	982	5	966	978	980	978	15	927	943	948	943	25	849	869	884	869	35	738	772	795	772	45	609	655	690	655	55	435	505	554	505	65	293	356	414	356	75	148	232	301	232	85	28	129	201	129	<b>Light Distribution</b> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>759</td><td>24.9</td></tr> <tr><td>0-40</td><td>1241</td><td>40.8</td></tr> <tr><td>0-60</td><td>2187</td><td>71.8</td></tr> <tr><td>0-90</td><td>2918</td><td>95.8</td></tr> <tr><td>90-180</td><td>127</td><td>4.2</td></tr> <tr><td>0-180</td><td>3045</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	759	24.9	0-40	1241	40.8	0-60	2187	71.8	0-90	2918	95.8	90-180	127	4.2	0-180	3045	100	<b>Average Luminance</b> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45°</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>16859</td><td>14162</td><td>13823</td></tr> <tr><td>55</td><td>14686</td><td>12197</td><td>12138</td></tr> <tr><td>65</td><td>13174</td><td>10098</td><td>10376</td></tr> <tr><td>75</td><td>10412</td><td>8269</td><td>9110</td></tr> <tr><td>85</td><td>4882</td><td>6455</td><td>7980</td></tr> </tbody> </table>	Zone	End	45°	Cross	45	16859	14162	13823	55	14686	12197	12138	65	13174	10098	10376	75	10412	8269	9110	85	4882	6455	7980																																																																																		
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	Description :	<b>FSS444L830-UNV-DIM-BK</b>	TYPE:
	Project Name:	<b>BSD 2020 AUDITORIUM UPGRADES</b>	<b>HES</b>
	Notes:		

# FSS FluxStream LED strip

2', 3', 4' and 8'

## Photometry

### 4' FluxStream LED strip, 4000 nominal delivered lumens

LER - 133

Catalog No.	FSS440L840-UNV-DIM
Test No.	37259
S/MH	1.3
Lamp Type	LED
Lumens	4130
Input Watts	31

#### Candlepower

Angle	End	45	Cross	Back-45
0	1272	1272	1272	1272
5	1250	1265	1277	1265
15	1199	1221	1237	1221
25	1098	1130	1157	1130
35	957	1005	1044	1005
45	791	860	910	860
55	606	690	758	690
65	382	481	598	481
75	194	326	416	326
85	36	196	289	196

Comparative yearly lighting energy cost per 1000 lumens – **\$1.80** based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	986	23.9
0-40	1614	39.1
0-60	2886	69.9
0-90	3905	94.6
90-180	225	5.4
0-180	4130	100

#### Average Luminance

Zone	End	45°	Cross
45	16754	14171	13847
55	15678	12712	12618
65	13207	10415	11375
75	10615	8873	9550
85	5052	7511	8720

#### Coefficients of Utilization

EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)									
pfc =	20		80		70		50		50
Ceil									
Wall	70	50	30	70	50	30	50	30	
RCR									
0	118	118	118	114	114	114	108	108	
1	106	101	95	103	97	93	92	89	
2	95	86	80	93	84	78	80	75	
3	86	76	67	83	73	66	69	64	
4	80	67	57	77	65	56	61	55	
5	72	59	51	70	57	50	56	47	
6	68	54	45	65	53	44	50	42	
7	63	48	40	59	47	39	46	38	
8	57	44	35	56	44	34	41	34	
9	54	40	32	53	40	32	38	30	
10	51	38	30	49	37	29	35	28	

### 4' FluxStream LED strip, 5500 nominal delivered lumens

LER - 129

Catalog No.	FSS455L840-UNV-DIM
Test No.	37262
S/MH	1.3
Lamp Type	LED
Lumens	5759
Input Watts	45

#### Candlepower

Angle	End	45	Cross	Back-45
0	1788	1788	1788	1788
5	1757	1777	1792	1777
15	1685	1715	1736	1715
25	1544	1585	1623	1585
35	1346	1408	1462	1408
45	1113	1202	1271	1202
55	852	960	1055	960
65	575	712	828	712
75	272	443	610	443
85	50	259	389	259

Comparative yearly lighting energy cost per 1000 lumens – **\$1.86** based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	1384	24
0-40	2264	39.3
0-60	4043	70.2
0-90	5478	95.1
90-180	281	4.9
0-180	5759	100

#### Average Luminance

Zone	End	45°	Cross
45	23558	19796	19347
55	22047	17697	17574
65	19887	15425	15749
75	14898	12084	14023
85	7023	9926	11749

#### Coefficients of Utilization

EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)									
pfc =	20		80		70		50		50
Ceil									
Wall	70	50	30	70	50	30	50	30	
RCR									
0	118	118	118	115	115	115	108	108	
1	106	101	95	103	97	93	93	89	
2	95	86	80	93	84	78	80	75	
3	86	76	68	83	73	66	69	64	
4	80	67	57	77	66	56	61	55	
5	72	59	51	70	58	50	56	47	
6	68	54	45	65	53	44	50	42	
7	63	48	40	60	47	39	46	38	
8	57	44	35	56	44	34	41	34	
9	54	40	32	53	40	32	38	30	
10	51	38	30	49	37	29	36	29	

### 4' FluxStream LED strip, 7000 nominal delivered lumens

LER - 126

Catalog No.	FSS470L840-UNV-DIM
Test No.	37265
S/MH	1.3
Lamp Type	LED
Lumens	7275
Input Watts	58

#### Candlepower

Angle	End	45	Cross	Back-45
0	2211	2211	2211	2211
5	2176	2199	2217	2199
15	2088	2124	2148	2124
25	1914	1966	2010	1966
35	1672	1750	1813	1750
45	1379	1502	1580	1502
55	1058	1204	1317	1204
65	714	898	1041	898
75	339	592	776	592
85	63	344	524	344

Comparative yearly lighting energy cost per 1000 lumens – **\$1.90** based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	1714	23.6
0-40	2809	38.6
0-60	5028	69.1
0-90	6879	94.6
90-180	396	5.4
0-180	7275	100

#### Average Luminance

Zone	End	45°	Cross
45	29203	24745	24050
55	27371	22192	21938
65	24688	19451	19793
75	18540	16135	17825
85	8824	13174	15831

#### Coefficients of Utilization

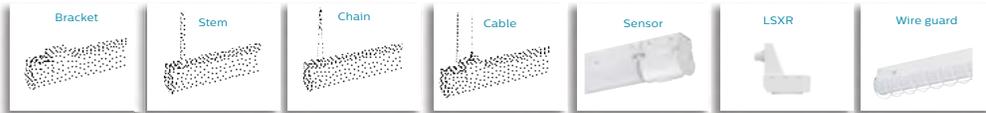
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pfc =	20		80		70		50		50
Ceil									
Wall	70	50	30	70	50	30	50	30	
RCR									
0	118	118	118	114	114	114	108	108	
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	<b>Description :</b> <b>FSS444L830-UNV-DIM-BK</b> <b>Project Name:</b> <b>BSD 2020 AUDITORIUM UPGRADES</b> <b>Notes:</b>	<b>TYPE:</b> <h1 style="text-align: center;">HES</h1>
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## FSS FluxStream LED strip

2', 3', 4' and 8'

### Accessories



Accessory Catalog Code	Description
FSTH	Sliding hanger bracket (pair)
SV5F12	12" Stem and canopy kit
SV5F18	18" Stem and canopy kit
SV5F24	24" Stem and canopy kit
SV5F36	36" Stem and canopy kit
SV5F48	48" Stem and canopy kit
FKR-126	Chain hanger set (pair)
DACHxx	Adjustable cable hanger kit (single)
DACHxx-1-SC	Adjustable cable hanger kit with white straight 18/3 cord (single)
DACHxx-1-CC	Adjustable cable hanger kit with white coiled 18/3 cord (single)
DACHxx-2-SC	Adjustable cable hanger kit with white straight 18/4 cord (single)
DACHxx-2-CC	Adjustable cable hanger kit with white coiled 18/4 cord (single)
DACHxx-1D-SC	Adjustable cable hanger kit with white straight 18/5 cord with dimming leads (single)
LSXR10	Low bay pir motion sensor (120-277v)
LSXR10ADC	Low bay pir motion sensor with photocell and hi/lo trim dimming (120-277v)
FSSWG4	4' Wire guard (order two for 8' models)
FSSD2L	2' Diffuse replacement lens
FSSD3L	3' Diffuse replacement lens
FSSD4L	4' Diffuse replacement lens (order two for 8' models)
FSSDEK	Decorative plastic end cap (set of two)

White stem and canopy kit, 1/4" trade size (1/2" O.D.) locknuts included. Works with 9/16" k.O. on base of housing.

Includes two 5' heavy duty link chains with "V" hooks. Attaches to base of housing.

Works with 1/4" hole on base of housing or FSTH hanger bracket.

xx=cable length in inches, enter 48" to 180" lengths in 12" increments

The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract.

