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# CONSTRUCTION AND INSTALLATION OF FREE-STANDING, OPEN-SIDED SHADE STRUCTURES ON PUBLIC SCHOOL AND COMMUNITY COLLEGE CAMPUSES

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**Disciplines:** Fire and Life Safety

**History:** Revised 01/11/23  
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Division of the State Architect (DSA) documents referenced within this publication are available on the [DSA Forms](#) or [DSA Publications](#) webpages.

## PURPOSE

This Interpretation of Regulations (IR) clarifies requirements for the construction and installation of shade structures on public school and community college campuses.

## SCOPE

This IR provides direction to design professionals and school districts on the construction and installation of shade structures (SS) that are often provided to shelter an occupancy. For this IR, a shade structure is a permanent structure of rigid construction over which a covering is attached that provides weather protection, and which shelters an occupancy. The scope of this IR is limited to shade structures of 4,000 square feet or less in aggregate area. Refer to *DSA IR A-4: Geohazard Report Requirements* for additional requirements. Shade structures greater than 4,000 square feet in aggregate area shall be reviewed on a case-by-case basis and may not be subject to this IR. Shade structures are permitted to be located within the frontage area of a new or existing building and shall be designed and constructed in compliance with the California Building Code (CBC), California Fire Code (CFC) and the criteria herein.

The following conditions are beyond the scope of this IR:

- Uses presenting special hazards such as vocational programs, wood shops, welding shops, storage, cooking, or similar functions,
- Enclosed or fenced shade structures,
- Shade structures constructed of combustible materials.
- Shade structures closer than 5-feet to adjacent existing buildings or structures.

## BACKGROUND

The California Building Code (CBC) does not specifically define the term Shade Structure or provide clear direction on their design or construction when located on public school campuses. Shade structures, referred to as canopies in CBC, utilized for protection of outdoor dining, instructional and environmental spaces have become commonplace on public school and community college campuses and require special considerations for their construction and placement.

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### **1. PLANS**

Plans for the construction and installation of shade structures shall be fully dimensioned and prepared in accordance with the CBC, CFC, and this IR. Structures shall be designed to withstand wind or other lateral loads and live loads as required by CBC Chapter 16A.

All shade structures constructed or installed on campuses located within a designated hazardous fire area shall be constructed of noncombustible or ignition-resistant materials as required in CBC Chapter 7A.

Where the project utilizes a DSA approved Pre-Checked (PC) structure, include all sheets of the PC plan set within the site-specific project plans.

Where the project scope is for the construction of structures that support photovoltaic arrays, see *IR 16-8: Solar Photovoltaic and Thermal Systems Review and Approval Requirements*.

### **2. SITE PLAN**

Project plans are to include a campus site plan indicating the following:

- 2.1** All buildings on the campus relative to the project area.
- 2.2** Existing shade structures within the project area.
- 2.3** Location(s) for new shade structures including dimensions from adjacent buildings, other shade structures, and existing safe dispersal area(s).
- 2.4** Location(s) of exterior fire alarm notification appliances proximal to proposed shade structures.
- 2.5** Locations of existing and proposed extensions of fire lanes.

### **3. FIRE DEPARTMENT VEHICLE ACCESS**

Campus buildings must be accessible by means of an approved fire department emergency vehicle access roadway (i.e., fire lane) within the distances prescribed in the CFC. Shade structures must not obstruct the required width, vertical clearance, or apparatus turning radius of any fire lane.

Where the construction or installation of a new shade structure impacts an existing fire lane, the fire lane shall be modified as necessary to maintain emergency vehicle access to campus buildings.

### **4. OCCUPANCY/USE**

The proposed occupancy classification shall be clearly reflected on the plans and be consistent with the intended use.

#### **4.1 Dining**

Shade structures constructed over dining areas are considered Group A-2 occupancies.

#### **4.2 Instructional Classroom**

Shade structures used as outdoor classrooms are a Group E occupancy when located on a K–12 campus, and Group B occupancy when located on a community college campus. Those shade structures on a community college campus with a calculated occupant load of 50 or more persons are considered a Group A-3 occupancy.

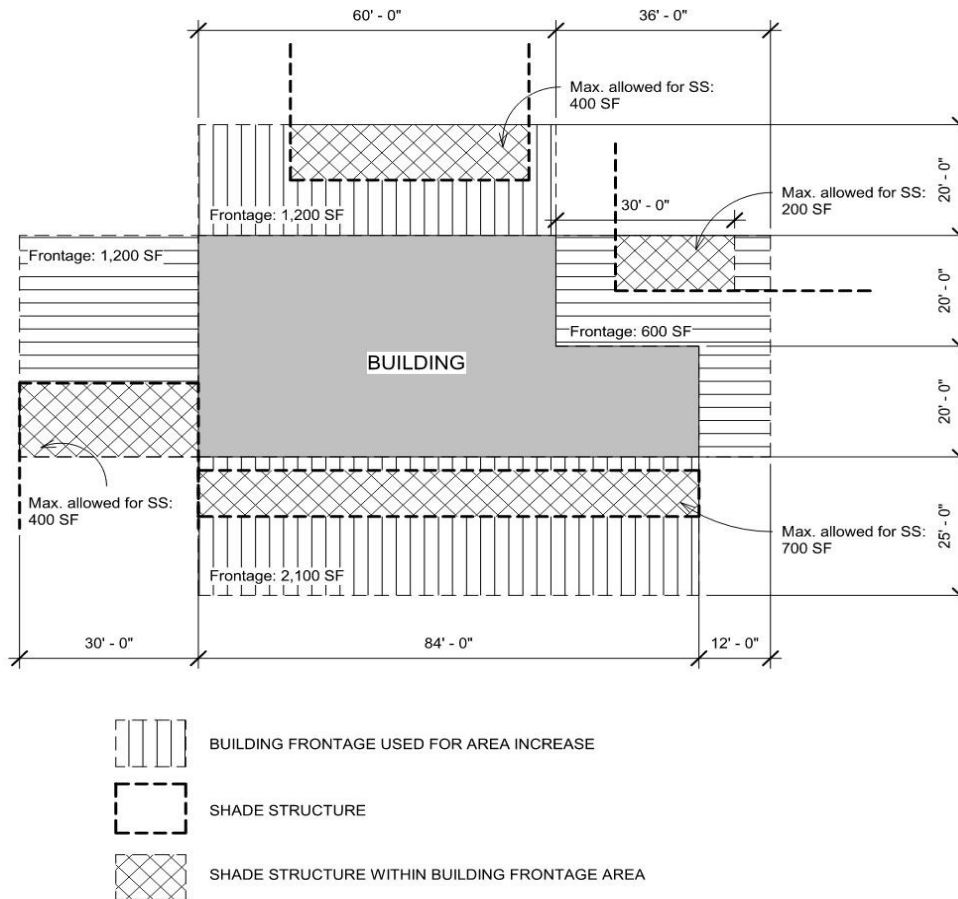
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Shade structures integrated with playground equipment by the manufacturer do not have an occupancy classification. Free-standing open-sided shade structures constructed or installed above playground equipment are considered Group E occupancies.

Shade structures shall not be installed to cover areas used for cooking or storage purposes.

## 5. LOCATION

### 5.1 Location within Dedicated Frontage Areas



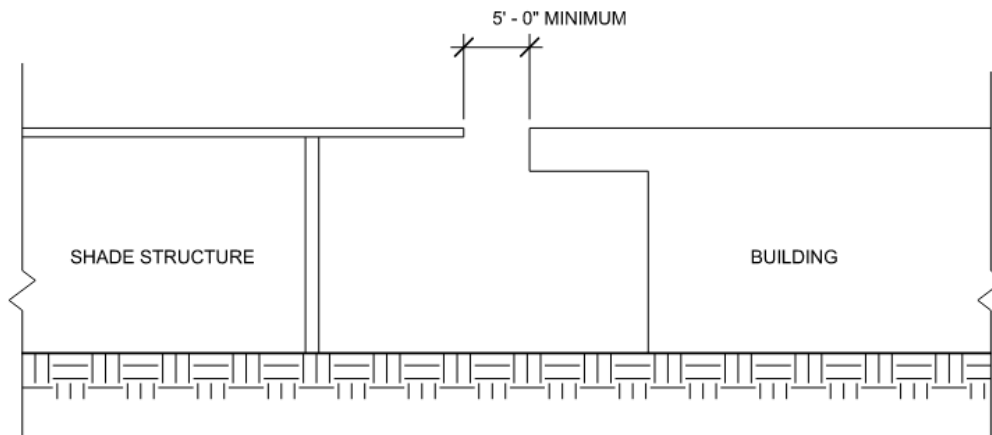
Shade structures (SS) proposed for location within the frontage area of a new or existing building do not increase the floor area of that building. When located within the building frontage area where the frontage has been used for an area factor increase, the SS shall not exceed 1/3 of the projected horizontal area of the frontage area where located.

### 5.2 Location Adjacent to Buildings

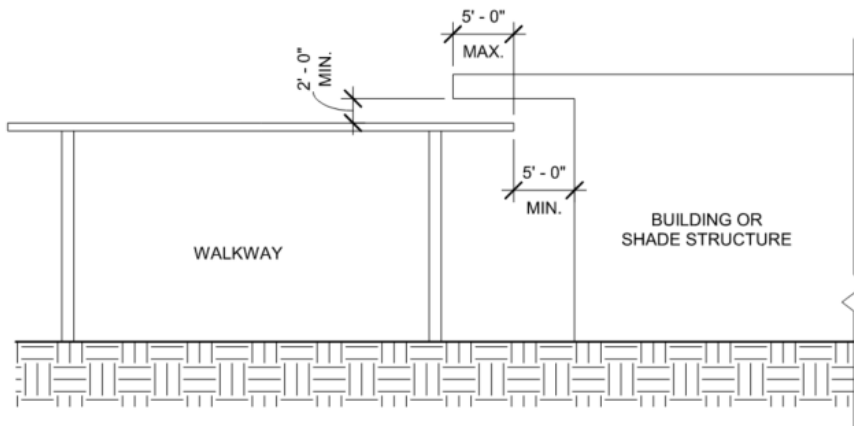
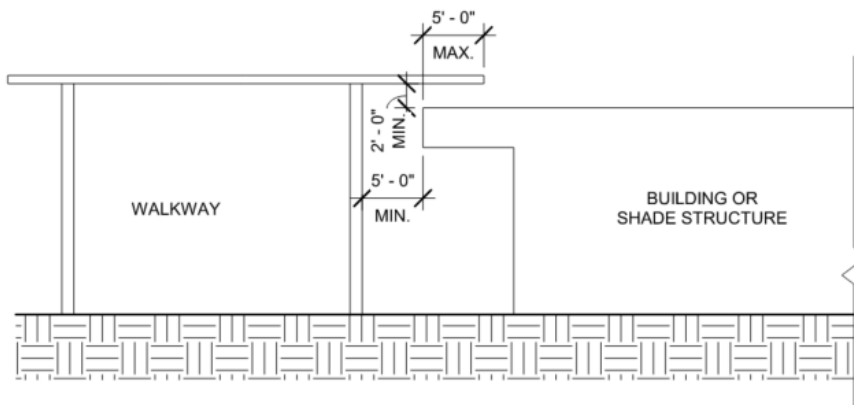
Shade structures under this IR are not permitted less than 5-feet from adjacent buildings. Shade structures shall be located with due consideration to adjacent existing buildings however occupancy separation requirements are not required, nor are protection of openings in relation to property lines.

**5.2.1** Where horizontal elements of shade structures are in-line with, above or below adjacent roof lines, a minimum 5-foot separation shall be provided to allow smoke, heat, and gases to freely vent upward.

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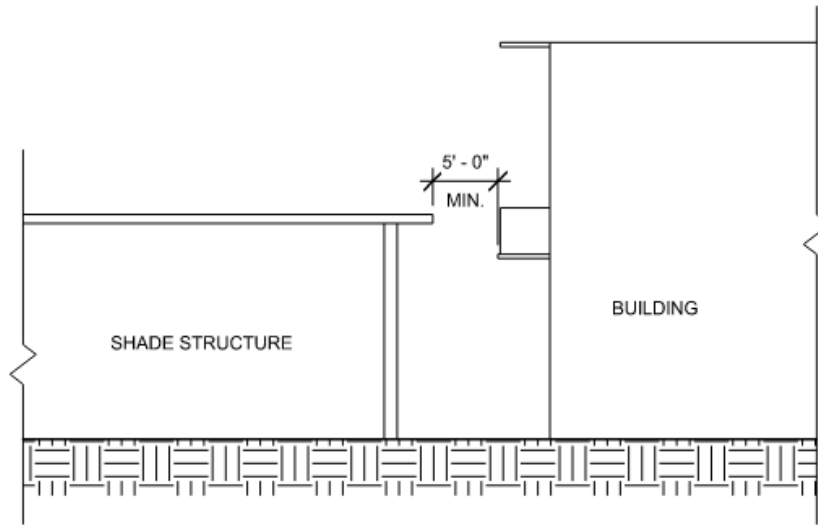
**5.2.2** Where the roof level of a walkway structure is higher or lower than an adjacent building or shade structure, a maximum 10-foot roof overlap is permitted. In such conditions, there shall be a minimum 2-foot vertical clearance between the underside of the projection of the top structure to the roof plane below.



ROOFS AT DIFFERENT ELEVATIONS

**5.2.3** Where adjacent buildings include projections such as awnings or exterior balconies, dimensions shall be determined from a vertical plane at the furthest horizontal point of the projection.

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### 6. FIRE FLOW AND FIRE PROTECTION

Fire flow tests as required by the California Fire Code (CFC) are not required for shade structures within the scope of this IR.

Automatic fire sprinkler systems (AFSS) are not required for free-standing open-sided shade structures. Where shade structures are designed as awnings attached to a building that is protected by AFSS, the building fire sprinkler system design shall be modified as necessary to maintain system design integrity per the adopted and amended edition of NFPA 13, Standard for the Installation of Sprinkler Systems.

### 7. AUTOMATIC FIRE ALARM

Occupants of shade structures shall be capable of hearing the campus fire alarm signal. Where obstructions or structure location are such that the fire alarm signal cannot be heard, additional exterior notification appliances shall be installed on adjacent building(s).

### 8. EGRESS

Shade structures shall be provided with complying egress. Required path(s) of egress travel shall not be blocked by fencing, planters, tie downs, guy wires, grade changes, etc.

The location of shade structures must not impact egress from adjacent buildings. The minimum egress width as required per CBC Chapter 10 must be maintained from all exits of adjacent buildings through to a public way or approved safe dispersal area (SDA).

Where an SDA is utilized on a campus for egress purposes, plans for shade structures must reflect a compliant, accessible path of egress travel connecting to the existing egress path to the SDA.

### 9. OCCUPANT LOAD DETERMINATION

For the purposes of this IR the occupant load of a shade structure does not contribute to the overall campus occupant load or the exit discharge element of the egress system design.

**9.1** For verifying the applicable structural risk category per CBC Table 1604A.5, the calculated occupant load of the shade structure shall be reflected on the plans. Shade structures covering

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dining areas shall be calculated at 15 square feet (sq. ft) per person. Where combination table/bench type seating is provided, the calculation shall be based on one person for each 18 inches of linear bench (seat) length. (CBC 1004.6).

**9.2** Shade structures installed over play structures or covering areas used for instructional purposes such as outdoor classrooms shall be calculated at 20 sq. ft. per person. (CBC Table 1004.5).

**9.3** Shade features installed as a component of manufactured play structures do not require an occupant load calculation.

### **10. ROOF COVERING**

Testing documentation for the proposed roof covering shall be included in the project submittal package. Fabric materials must be fire-retardant treated in accordance with California Code of Regulations (CCR) Title 19, Section 315(a).

### **11. OTHER**

Fire extinguishers, exit signs, and egress illumination may be omitted for shade structures.

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#### **REFERENCES:**

2022 California Code of Regulations (CCR), Title 24, Part 2, Section 3111

2022 California Code of Regulations (CCR) Title 24, Part 9, Section 503 CCR Title 19, Public Safety, California Code of Regulations

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This IR is intended for use by DSA staff and by design professionals to promote statewide consistency for review and approval of plans and specifications as well as construction oversight of projects within the jurisdiction of DSA, which includes State of California public schools (K–12), community colleges and state-owned or state-leased essential services buildings. This IR indicates an acceptable method for achieving compliance with applicable codes and regulations, although other methods proposed by design professionals may be considered by DSA.

This IR is subject to revision at any time. Please check DSA's website for currently effective IRs. Only IRs listed on the webpage at [www.dgs.ca.gov/dsa/publications](http://www.dgs.ca.gov/dsa/publications) at the time of project application submittal to DSA are considered applicable.