
CONSTRUCTION AND INSTALLATION OF FREE-STANDING, OPEN-SIDED SHADE STRUCTURE CANOPIES

Disciplines: Structural

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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 structure canopies 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 structure canopies that are often provided to shelter an occupancy.

For applications under this IR, a shade structure is a permanent structure constructed with a noncombustible rigid frame over which a covering is attached that provides weather protection for an occupancy or use underneath. Shade structure canopies regulated under this IR are limited to 4,000 square feet (sq. ft.) in area and shall be designed and constructed in accordance 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 structure canopies.
- Shade structure canopies constructed of combustible materials.
- Shade structure canopies closer than five feet to adjacent buildings or structures.

BACKGROUND

The California Building Code (CBC) Chapter 2 (definitions) does not specifically define the term shade structure, but the term is consistent with that of a canopy. Shade structure canopies have become commonplace on school campuses and are predominately utilized for weather protection of outdoor dining, instructional and environmental spaces. These structures require special considerations for their construction and placement.

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.

All shade structures constructed or installed on campuses located within a designated fire hazard severity zone 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 applicable plan sheets of the PC plan set within the site-specific project plans.

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For additional guidance 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 audible fire alarm notification appliances installed on buildings proximal to shade structures.
- 2.5 Locations of existing and proposed extensions of fire lanes.

3. FIRE DEPARTMENT VEHICLE ACCESS

Shade structures meet the definition for buildings in the CBC. 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 structure locations must not obstruct the required width, vertical clearance, or fire apparatus turning radius of any fire lane.

Where the construction or installation of a new shade structure impacts an existing fire lane, the proposed location must be adjusted, or 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.

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.

4.1 Dining

Shade structures used for outdoor dining purposes are considered Group A-2 occupancies.

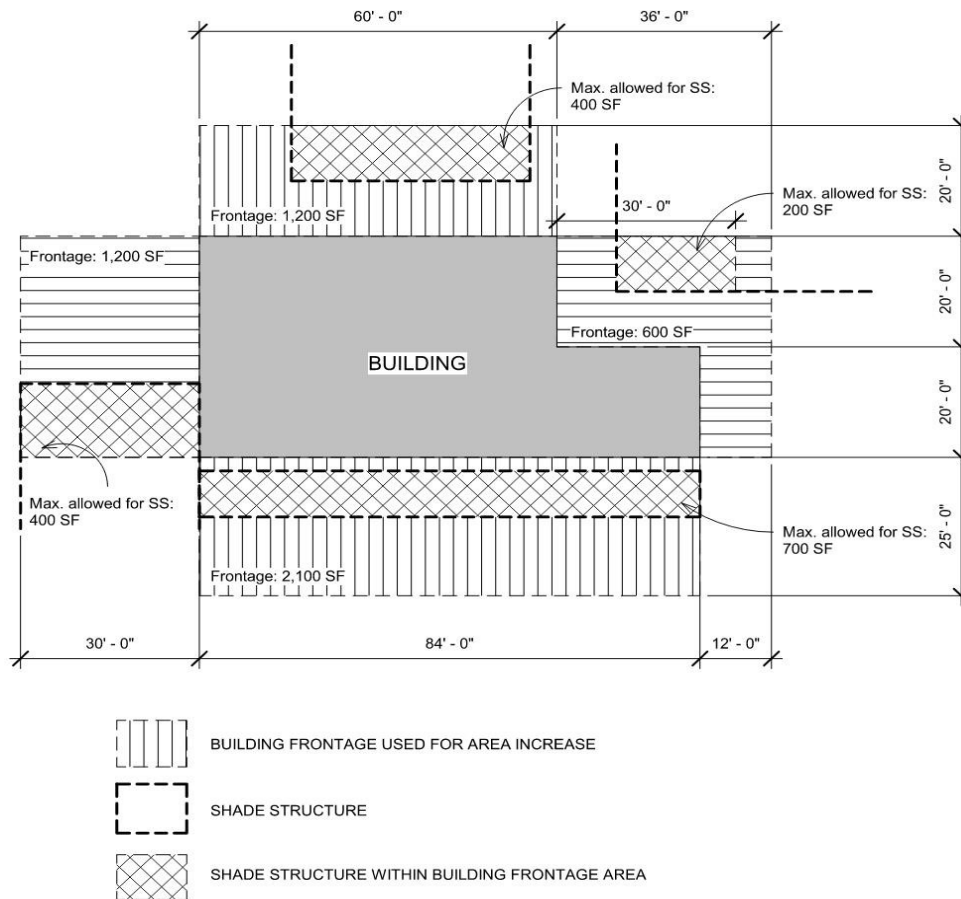
4.2 Instructional Classroom

Shade structures intended as weather protection for outdoor classrooms are classified as a Group E occupancy when located on a K-12 campus, and as a Group B occupancy when located on a community college campus. 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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5. LOCATION

5.1 Location within Dedicated Frontage Areas



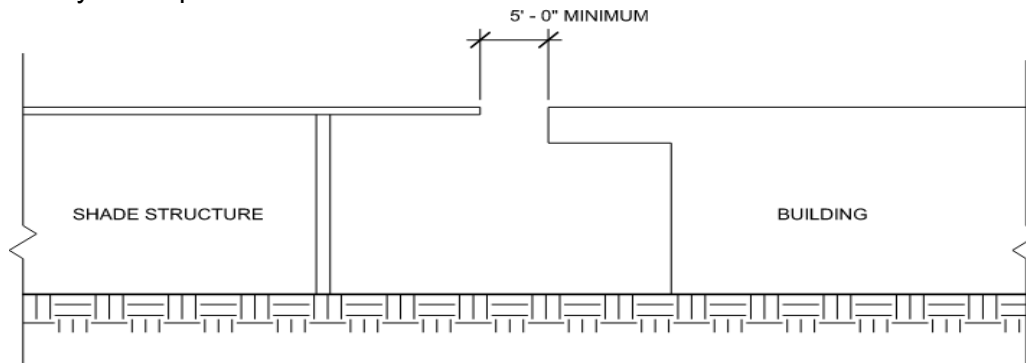
Shade structures proposed for location within the frontage area of a new or existing building do not increase the floor area of that building. When located within the building frontage area where the frontage has been used for an area factor increase, the shade structure shall not exceed 1/3 of the projected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

5.2 Location Adjacent to Buildings

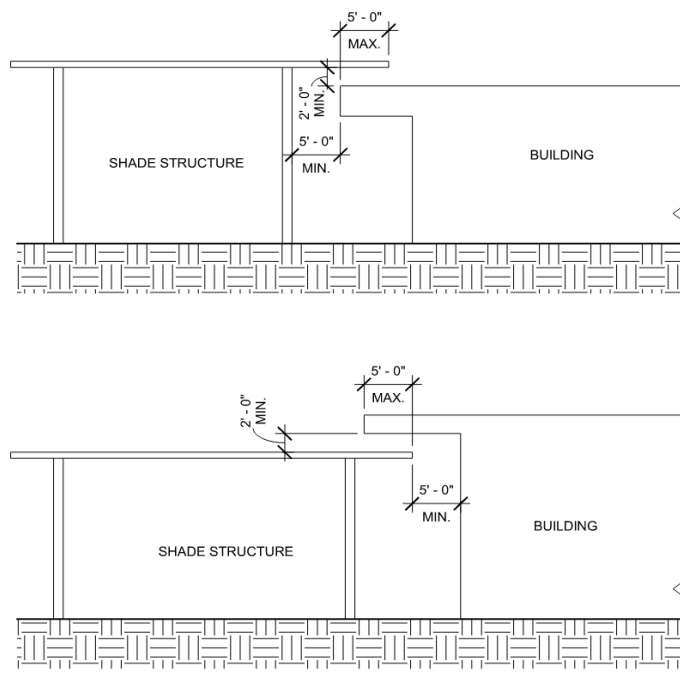
Shade structures under this IR are not permitted less than five feet from adjacent buildings. Shade structures shall be located with due consideration to adjacent existing buildings however occupancy separation requirements are not required, nor are protection of openings in relation to property lines.

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



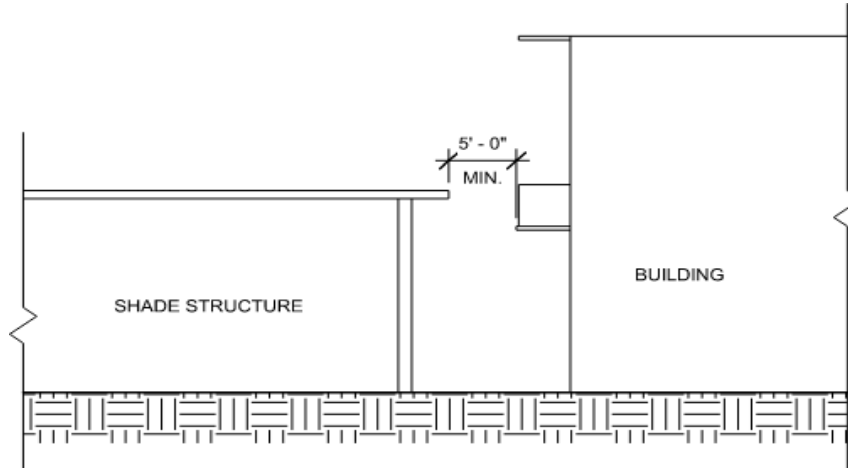
5.2.2 Where the roof level of a walkway structure is higher or lower than an adjacent building or shade structure, a maximum five foot roof overlap is permitted. In such conditions, there shall be a minimum twofoot vertical clearance between the underside of the projection of the top structure to the roof plane below to allow smoke, heat, and gases to freely vent upward.



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 SPRINKLER PROTECTION

Fire flow tests 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 to provide protection for the area as necessary to maintain system design integrity in accordance with the adopted and amended edition of NFPA 13, Standard for the Installation of Sprinkler Systems.

7. FIRE ALARM – OCCUPANT NOTIFICATION

Where a free-standing, open-sided shade structure is located on a playground area, one audible fire alarm notification appliance shall be mounted on the exterior of a building to alert occupants at the shade structure and the playground area.

8. EGRESS

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

The location of shade structures must not impact the egress discharge from adjacent buildings. The minimum egress width as required per CBC Chapter 10 must be maintained from all exits of adjacent buildings through to the 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

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 Shade structures covering dining areas shall be calculated at 15 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 yards containing play structures or covering areas used for

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instructional purposes such as outdoor classrooms or instructional areas shall be calculated at 20 sq. ft. per person. (CBC Table 1004.5).

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

10. ROOF COVERING

Testing documentation for the proposed roof covering material 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).

The roof covering materials for shade structures located in designated fire hazard severity zones shall comply with the requirements in CBC Chapter 7A and Chapter 15.

11. OTHER

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

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

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 at the time of project application submittal to DSA are considered applicable.