COSUMNES COMMUNITY SERVICES DISTRICT
FIRE DEPARTMENT
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CosumnesCSD.gov/Fire

FIRE PREVENTION CONSTRUCTION STANDARDS
LARGE WAREHOUSE BUILDING STANDARD

Standard Number:	FPCS-1022
Original Effective Date:	3/2/2022
Revision Date:	8/30/2024, 8/22/2025, 9/16/25
Code Section:	California Code of Regulations Title 24

STANDARD

1022.1 Cosumnes Fire Department, Fire Prevention Division ("Division") establishes minimum standards for preparing for, designing, and constructing large warehouses.

PURPOSE AND SCOPE

1022.2 To assist the developing community with minimum requirements concerning large warehouse buildings greater than and including 100,000 square feet.

1022.3 This standard applies in addition to any California statutory regulations, Cosumnes Fire Department fire code ordinance, NFPA standards, and Cosumnes Fire Department policies and standards as enforced by the Cosumnes Fire Department. Where conflicts occur the most restrictive requirement shall apply.

APPLICATION

1022.4 Plans, applications and supporting documents shall be submitted to through our online portal. Separate applications, fees, and plan submittals are required for each plan type (e.g., civil plans, architectural plans, fire sprinkler plans, fire alarm plans, gates, solar, etcetera).

Plan check fees are paid at time of plan submittal. Payment can be made by check, money order, or by credit card (Visa, MasterCard, or Discover) through the online portal.

Plans are reviewed in the order received. Typical turnaround time for first submittal is 15 business days. Some projects may take longer based on size and complexity.

Upon successful review completion, a permit release letter for building permit, approved plans, and a fire permit will be issued through the online portal. This letter along with the fire permit shall be submitted, by the applicant, to the City or County building department as proof of fire department approval. These documents are required prior to City/County building permit issuance.

Once approved, plans and permits shall be readily available on the job site during inspections. Electronic plans shall be printed in large format, with the plan reviewers' electronic signature/stamp along with any noted comments and made available to the field inspector.

For more information, please visit our website.

- https://www.cosumnescsd.gov/303/Plan-Review-and-Inspections
- https://www.cosumnescsd.gov/DocumentCenter/View/18257/Project-Submittal-Information-Sheet-PDF

FIRE SAFETY DURING CONSTRUCTION

1022.5 Projects under construction shall meet the minimum requirements of the California Fire Code for Fire Safety During Construction and Demolition and the following requirements:

a. Required roadways, fire access lanes, street signs, and addresses shall be installed prior to vertical construction or on-site storage of combustible materials. Projects shall provide full fire access in accordance with our access standard and approved improvement plans.

b. Prior to vertical construction, regardless of construction type or phasing, the project shall provide an approved on-site fire hydrant system connected to public water, installed and tested to the satisfaction of the water purveyor and the Cosumnes Fire Department, and installed in accordance with approved improvement plan.

c. Prior to and during construction an approved project address sign that is visible during inclement weather shall be provided at each fire and emergency vehicle access road and project entry points.

d. Construction equipment, including portable restrooms, building materials, work vehicles, delivery vehicles, and the like shall not obstruct fire hydrants or the fire lane at any time.

DESIGN REQUIREMENTS

1022.6 All buildings within the jurisdiction of the Cosumnes Fire Department shall be built to the minimum standards as outlined in the California Code of Regulations Title 24, adopted ordinances, Cosumnes Fire Department standards, and the requirements in this document.

Many of the Cosumnes Fire Department development standards can be found on our website at: https://www.cosumnescsd.gov/946/Fire-Prevention-Standards-and-Forms

FIRE DEPARTMENT TECHNICAL ASSISTANCE

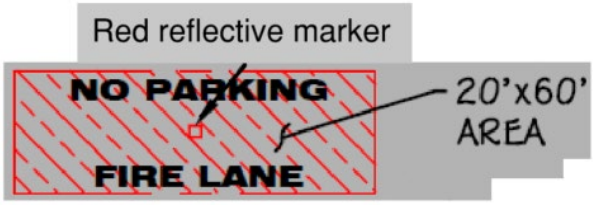
1022.7 Due to the scope and magnitude of these type of projects the Cosumnes Fire Department may require, at the owner's expense, an approved, third-party peer review and the assistance of technical experts to assist in the review and permitting of some projects.

FIRE DEPARTMENT ACCESS

1022.8 Fire Department Access shall meet the requirements as outlined in the Cosumnes Fire Department Fire Apparatus Access Standard and the Emergency Access Gates and Barriers standard.

In addition to the referenced standards the following shall also apply:

a. Project shall provide pavement markings to indicate the location of designated fire aerial apparatus safe deployment areas. Such markings shall be provided to the satisfaction of the fire department to indicate areas of safe deployment for aerial operations.



b. Designated fire aerial apparatus safe deployment areas shall be marked on center with a red delineator (like a blue fire hydrant reflective marker).

c. Designated fire aerial apparatus safe deployment areas shall be free from vaults.

d. Designated fire aerial apparatus safe deployment areas be sized a minimum of 20 feet wide by 60 feet long.

e. Fire lanes shall be in circumference to the building they serve.

f. Buildings greater than 500,000 square feet may be required to provide ramp(s) of sufficient size and construction to allow fire apparatus and emergency medical vehicles to drive into the building during an emergency response.

g. Project shall provide an approved designated area for parking of emergency medical apparatus. Location and design shall align with occupant emergency standard operating procedures in conjunction with Cosumnes Fire Department response procedures.

h. The installation of traffic calming devices is prohibited without prior approval by the Fire Marshal.

i. All gates across fire access lanes shall be automatic and meet Cosumnes Fire Department emergency gate and access

FIRE DEPARTMENT ROOF ACCESS

1022.9 Fire department roof access requirements:

a. For buildings less than 500,000 square feet a minimum of two remotely located roof access ladders/stairs shall be provided.

b. For building greater than 500,000 square feet, a minimum of four remotely located roof access ladders/stairs shall be provided.

c. Ladders shall be numbered and labeled. For example, WL53 (West Ladder 53).

d. Exterior doors adjacent to roof access ladders/stairs shall be labeled ROOF ACCESS.

e. Ladders shall be of sufficient size for a fully dressed firefighter (with turnout gear, SCBA, and carrying tools and equipment) to traverse the ladder.

f. When stairs are provided, the stairs shall continue to the roof for fighter roof access.

FIRE CONTROL ROOMS AND FIRE COMMAND CENTERS

1022.10 Buildings shall be provided with an approved Fire Control Room and or a Fire Command Center meeting the requirements of the California Fire Code, Cosumnes Fire Department standards and ordinances, the items listed below, and or otherwise to the satisfaction of the Cosumnes Fire Department.

a. Fire Command Center:

1. Fire Command Center shall meet the minimum requirements of the California Fire Code.

2. Size of room and size of warehouse where a command center is needed.

3. Other.

4. S-2 and other occupancies.

5. Fire Command Center shall face the fire lane with direct access from the exterior and be located adjacent to but separate from the fire pump room. *Exception*: Fire pump houses.

6. Fire Command Center shall have direct line of sight to the fire department connection and fire pump house.

7. The exterior door shall be labeled FIRE COMMAND CENTER in minimum 6-inch contrasting letters.

b. Fire Control Room:

1. Fire Control Rooms shall face the fire lane with direct access from the exterior and be located adjacent to the fire pump room. *Exception*: Fire pump houses.

2. Fire Control room shall have direct line of sight to the fire department connection and fire pump house.

3. Size of room and size of warehouse where a standard FCR will work.

4. Fire Control Room shall contain the following:

   a. The fire alarm control panel(s)

   b. Spare fire sprinklers and wrenches in accordance with NFPA 13

   c. A list of installed sprinkler types in accordance with NFPA 13

   d. Document box or boxes

   e. Building floor plan(s)

   f. Fire sprinkler systems plan(s)

   g. Fire sprinkler system color-coded key floorplan mounted to wall

   h. Fire alarm system key floor plan mounted to wall

i. Knox shunt trip box; clearly labeled

j. Any special equipment for fire access/operations (tile remover, special keys, radio equipment)

k. Building emergency contact information for afterhours events

5. Fire Control Rooms shall have a hard-lid ceiling, emergency illumination, and NO STORAGE signs posted.

6. The exterior door shall be labeled FIRE CONTROL ROOM in minimum 6-inch, contrasting letters.

FIRE PUMP ROOM/HOUSE

1022.11 Fire pump rooms and pump houses shall be built to the California fire and building codes and NFPA 20.

In addition to the referenced standards the following shall also apply:

a. Doors shall be labeled FIRE PUMP in minimum 6-inch letters with 1-inch stroke and contrasting in color to the background.

b. Fire pump rooms and houses shall contain the fire pump and pump controller.

c. Fire pump rooms and houses shall maintain a minimum temperature of at least 40 degrees Fahrenheit and as recommended by the pump manufacturer. This shall be a permanently installed, hardwired heater, with thermostat control.

d. Fire pump room/house shall be equipped with switch overhead lighting and emergency lighting.

e. Fire pump room/house shall be provided with NO STORAGE signs.

WATER SUPPLY AND DESIGN CRITERIA

1022.12 Water mains and fire hydrants designated for a project shall be installed, tested, flushed, inspected, and able to provide the required fire flow from a public water source, prior to vertical construction.

a. Projects are required to provide fire flow from a public water system that meets the fire flow requirements of the California Fire Code, Cosumnes Fire Department, and the water purveyor.

    1. *Exception*: A reduction in required fire flow of up to 50 percent is permitted when the building is provided with an automatic sprinkler system installed in accordance with 903.3.1.1. However, a minimum of 3,000gpm at 20psi must be maintained. Reduction of fire flow does not apply to required fire flow duration nor the number of fire hydrants.

    2. *Exception*: A reduction in required fire flow of up to 75 percent is permitted for warehouse buildings of Type I, Type II, and Type III-A construction and provided with early suppression fast response fire sprinkler systems. However, a minimum of 3,000gpm at 20psi must be maintained. Reduction of fire flow does not apply to required fire flow duration nor the number of fire hydrants.

b. The onsite fire hydrant system shall be designed to a minimum of 50 psi static, 20 psi residual and 3,000 GPM for 4 hours. Building size and type of construction may require an increase of the gallons per minute and duration.

c. The onsite fire hydrant system shall be a public fire hydrant system, maintained by the water purveyor, in lieu of private.

d. Onsite fire hydrant system shall not be pressurized by a fire pump.

e. Buildings without a public water supply shall become connected to the public water supply once public water connectivity becomes available at their property frontage.

f. Onsite fire hydrant water line shall be designed to support the required fire flow but shall be no less than 10 inches in size. Fire hydrant mains shall be looped and connected to the public water system at no less than two, approved, remote points of connection to achieve two flow

directions. Fire flow requirements are determined based on building size, type of construction, and type of fire sprinkler system proposed. Larger mains may be required.

g. For projects needing additional fire flow to meet fire sprinkler demand, a parallel fire sprinkler line, separate from the fire hydrant water line, may be installed and pressurized by the fire pump. Additional design fire flow may be required.

h. When new water mains are extended along streets fire hydrants shall be provided at intersections and at 1000-foot intervals thereafter. Refer to the Cosumnes Fire Department fire code ordinance for additional requirements.

i. Commercial projects located within the jurisdiction of Sacramento County Water Agency Zone 40 may require a fire department flow test. Upon application for a water flow test, the Cosumnes Fire Department will conduct the flow test and submit the results to the water purveyor for confirmation. Test results on water purveyor letterhead shall be included with plan submittal. For more information, please call Cosumnes Fire Department at (916) 405-7100. Fees apply.

j. Commercial projects located within the boundaries of Elk Grove Water District that require a flow test shall be conducted by the Elk Grove Water District. Call Elk Grove Water District directly to schedule. Test results on District letterhead shall be included with plan submittal.

k. Commercial projects located within the boundaries of the City of Galt may require a fire department flow test. Upon application for a water flow test, the Cosumnes Fire Department will conduct the flow test. Test results will be witnessed by the water agency. Test results shall be included with plan submittal. For more information, please call Cosumnes Fire Department at (916) 405-7100. Fees apply.

l. Refer to our website for Standard Commercial Civil Engineering Comments for additional design requirements.

FIRE SPRINKLER SYSTEM

1022.13 Fire sprinkler system shall be designed and installed in accordance with the applicable NFPA standards, California fire and building codes, fire code ordinance, Cosumnes Fire Department standards, and the requirements in this document.

a. Whenever possible, fire sprinkler risers shall be located inside the fire pump room. Sprinkler risers located in warehouse areas shall be positioned adjacent to outside walls directly nearest fire department access doors. Sufficient space shall be provided between the fire sprinkler equipment and walls or other equipment to allow for operation and maintenance.

b. Risers on warehouse floors shall be provided with protective bollards spaced three feet from riser equipment.

c. KEEP CLEAR floor markings shall be provided three feet in circumference of risers to prevent storage near system risers.

d. Risers and valves shall be clearly labeled with signs indicating what system the riser serves.

e. A color-coded fire sprinkler system key floor plan shall be permanently posted adjacent to each bank of risers to show system layout. Floor plan shall be a minimum size of 11x17 or larger for legibility.

f. Required hose stations shall be equipped with 2 ½ inch hose connections, in cabinets, without hose. Provide pressure reducers as needed to maintain pressures to below 100psi.

SYSTEM CONTROL VALVES

1022.14 Fire sprinkler system control valves shall be provided in accordance with the applicable NFPA standards, California fire and building codes, and the following requirements:

a. Butterfly valves located on each riser are preferred in lieu of exterior wall post-indicating valves.

b. Each floor in a multi-floor building shall be provided with a floor control valve with tamper switch, a flow switch, and a drain valve. Floor control

valves shall have a permanent sign identifying areas or systems controlled in ½" letters that contrast with their background and shall be permanently banded to the valve or permanently affixed to a wall adjacent to the valve.

c. Sprinkler systems protecting special hazard areas (i.e., spray booths, etc.) shall have a separate locked and monitored indicating control valve.

FIRE DEPARTMENT CONNECTIONS

1022.15 Fire Department Connections (FDC) shall be provided in accordance with NFPA 13, the California fire and building codes, located to the satisfaction of the fire department, and in compliance with the following:

a. FDC shall be located on the project site at least 40 feet from the building that it serves and within 10 to 40 feet of a fire hydrant.

b. Fire hydrant and FDC shall be located on the same side of the fire access route so that fire hoses do not obstruct incoming apparatus.

c. FDC shall serve only one building and shall face the fire lane.

d. FDC's, PIV's, and double-detector check valves (DDCV) shall be painted red and labeled with the building address utilizing a weatherproof, permanent method.

e. FDC hose connections shall be manifolded, one 2 ½ inch hose connection for each 250 gallons of sprinkler demand, using the worst-case fire sprinkler system remote area hydraulic calculation.

FIRE PUMPS

1022.16 Fire pumps shall be installed in accordance with NFPA 20, California fire and building codes, and the following requirements:

a. A fire pump shall serve only one building, except for approved campuses.

b. Fire pump/fire sprinkler systems shall not cross property lines.

c. A fire pump shall have a by-pass line installed.

d. A fire pump shall be connected to a reliable power source as approved by the Cosumnes Fire Department.

e. If a test loop is provided, listed control valves with normally closed tamper switches or other approved tamper switches shall be installed. In addition to the test loop, a method of flowing water every three years in accordance with the adopted California edition of NFPA 25, Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems shall be provided.

FIRE ALARM SYSTEM AND WATER FLOW DEVICES

1022.17 Fire alarm system shall meet the requirements of the California fire and building codes, NFPA 72, adopted ordinances, and the following requirements.

a. Fire Command Centers shall meet the fire alarm requirements of the California Fire Code.

b. Each fire sprinkler riser shall be provided with a weatherproof audible/visual device mounted on the exterior of the building to indicate water flow. This is in lieu of fire sprinkler bells.

c. A fire alarm system with interior horn strobes located along perimeter walls shall be provided.

d. High-piled storage areas shall also meet the minimum requirements of the California Fire Code.

e. Fire alarm systems shall be UL listed or certificated in accordance with NFPA 72.

f. Fire alarm systems shall be monitored by a Type A Central Station.

KNOX REMOTE POWER BOX SHUNT TRIP

1022.18 Buildings shall be provided with a Knox Remote Power Box shunt trip device that will disconnect all power sources including standby and emergency power and automated equipment and shall also meet the following criteria.

a. This shut off shall not interfere with fire pump, fire alarm, emergency lighting, or other fire protection equipment operation or fire and life safety devices.

b. Shunt trip shall be located inside the fire control room or fire command center, as applicable.

c. For more information refer to the KnoxBox website.

KNOX RAPID ENTRY DEVICES

1022.19 Knox key boxes, in sufficient quantity, shall be provided on all four sides of the building, including at the main entry door, fire control room/pump room, fire command center, fire pump house, elevators, and to the satisfaction of the Cosumnes Fire Department, and shall include the following items:

a. Multiple sets of building master access keys with labels and wrist straps shall be provided in each box.

b. Each box shall contain fire alarm system operation and reset keys, breakaway padlock keys, etc.

c. Each box shall contain emergency contact names and phone numbers for afterhours emergency notification.

d. Key boxes shall be mounted on the building at 6 feet on center above finished floor.

e. A Knox key box shall be located at the base of each elevator mounted approximately 18 inches above finished floor. Elevator key boxes shall contain elevator operation keys.

f. To order Knox products refer to our website for ordering instructions:

1. http://www.cosumnescsd.gov/DocumentCenter/View/18256/2005---Knox-Product-Ordering-Instructions-PDF

EMERGENCY RESPONDER RADIO COVERAGE

1022.20 Shall be designed and tested to meet the minimum requirements of the California fire and building codes, fire code ordinance, Cosumnes Fire Department standards, and the following requirements:

a. A test conducted at project completion by a Sacramento County Radio Shop approved FCC licensed third party shall be conducted and the test results forwarded to the Cosumnes Fire Department. This test is usually conducted once all furniture, equipment, low voltage equipment, equipment automation, other building equipment, and elements that may disrupt radio transmission. Projects are also encouraged to conduct a test at project start. A failed test at project start will provide early notification of radio requirements.

b. Buildings failing the radio test will be required to submit plans for emergency responder radio enhancement equipment to both the Sacramento County Radio Shop and the Cosumnes Fire Department. A temporary certificate of occupancy may be obtained, providing all other requirements are met, until such radio system is designed, approved, installed, and tested by the Cosumnes Fire Department and the third party specialist.

c. For more information, refer to the radio standard, FPCS-1021.

TRASH COMPACTORS AND RECEPTACLES

1022.21 Trash compactors and bins shall be provided with the following:

a. Compactor doors mounted on walls with access from the interior to a trash chute shall be equipped with the following:

1. Shall be fire rated to 1 ½ hours.

2. Shall be self-closing.

3. Shall be equipped with a heat or smoke detector above the door/

4. Shall be provided with fire sprinkler protection in the chute equipped with a fire sprinkler head guard.

b. Each fully-enclosed trash bin shall be provided with firefighting portholes on all four sides of the bin.

   1. The portholes shall be a minimum size of 4 inches in diameter.

   2. Clearly labeled FIRE PORT.

   3. Each porthole shall be provided with a threaded cap and wrench nut.

INTERIOR AND EXTERIOR SIGNAGE

1022.22 Provide exterior door labels in accordance with the California fire and building codes, as indicated below, and to the satisfaction of the fire department. Exterior door labels are to be a minimum of 6-inches in height with a 1-inch stroke and contrasting in color to the background. All signage shall be durable and weather resistant.

a. Provide EMERGENCY EXIT DO NOT BLOCK signs on all emergency exit doors.

b. Provide approved exterior door number scheme such as W053 (West Door 53).

c. Provide approved interior door number scheme such as W053 (West Door 53) to match the exterior number.

d. Provide FIRE PUMP ROOM sign mounted on fire pump room/house door.

e. Provide FIRE CONTROL ROOM sign mounted on fire control room door.

f. Provide NO STORAGE signs inside fire pump room, fire pump house, and fire control room.

g. Exterior doors adjacent to roof access ladders/stairs shall be labeled ROOF ACCESS.

h. Fire pump test header shall be labeled FIRE PUMP TEST HEADER.

i. Fire water access port on enclosed dumpsters shall be labeled FIRE PORT.

j. Each fire sprinkler riser shall be numbered to correspond with the color-coded system map.

k. Each entry/exit door adjacent to the fire sprinkler risers shall also be labeled RISERS 1-4, for example.

REFERENCES

1022.23 California Code of Regulations Title 24

1022.24 National Fire Protection Association Standards

1022.25 Cosumnes Fire Department Fire Code Ordinance

1022.26 Cosumnes Fire Department Standards