2016 Cathedral City Fire Code

CITY OF CATHEDRAL CITY FIRE DEPARTMENT
DEVELOPMENT GUIDELINES

CITY OF CATHEDRAL CITY FIRE DEPARTMENT
32100 DESERT VISTA ROAD
CATHEDRAL CITY, CA 92234

EFFECTIVE 01/01/2017

FIRE DEPARTMENT CONTACTS

PAUL WILSON, FIRE CHIEF	**(760)770-8200**	pwilson@cathedralcity.gov

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SCOPE

This guideline has been prepared to assist development applicants, architects and contractors in determining the minimum requirements for fire protection systems, emergency access/gates, and fire apparatus access roads. It outlines the minimum design, installation, testing, and inspection procedures in the City of Cathedral City based on the following:

- City of Cathedral City Municipal Code, Chapter 8.12.
- California Fire Code 2013~~3~~6 Edition – CCR Title 24, Part 9, adopted in its entirety including Appendix Chapter 1 and Appendix Chapter 4, Appendix B, C, D, E, F, G and H.
- International Wildland-Urban Interface code 2015 Edition.
- California Code of Regulations (CCR) - Title 19.
- California Building Code 2013~~3~~6 Edition - CCR Title 24, Part 2. Volumes 1 and 2
- California Mechanical Code 2016 Edition

The Authority Having Jurisdiction, in determining compliance with the above codes and standards, shall be the City of Cathedral City Fire Department. The fire code official may modify or waive these requirements based on unforeseen circumstances or other mitigating factors.

WHAT BUILDING PERMIT PLANS REQUIRE ROUTING FOR FIRE PLAN REVIEW?

- Permits limited to electrical, plumbing, mechanical, foundation or structural work do not require fire plan review, unless they involve the storage of or operations with hazardous materials.
- **All building permit plans, including tenant improvement shall be routed for fire plan review for the following occupancy groups and classifications:**
  - Group A: A-1, A-2, A-3, A-4, A-5
  - Group B
  - Group E
  - Group F: F-1
  - Group H: H-1, H-2, H-3, H-4, H-5
  - Group I: I-1, I-2, I-2.1, I-3, I-4
  - Group M
  - Group R: R-1, R-2, R-3.1, R-4
  - Group S: S-1, S-2

- **Building permit plans, including tenant improvements of more than 500 square feet shall be routed for fire plan review for the following:**
    - Additions to any building where the end result exceeds 3,600 square feet
    - Businesses conducting dry cleaning operations
    - Cannabis businesses including cultivation, dispensary and manufacturing
    - City of Cathedral City buildings
    - High-rise & mid-rise buildings
    - Government owned / occupied buildings
    - Storage occupancy - cold storage buildings or areas that exceed 1,000 square feet

- **Building permit plans for any new buildings that exceed 3,600 square feet in area or two (2) stories in height shall be routed for fire plan review.**

- **Fire Department Access: Building permit plans shall be routed for fire plan review for the following:**
    - New buildings when any portion of the building is situated more than one hundred fifty (150) feet from a public street along an approved fire access road
    - Parking lot layout changes (consult with fire department before routing)
    - Vehicle gate installation (consult with fire department before routing)
    - Planned developments, which include private roadways

- **Hazardous Materials:** Building permit plans, including tenant improvements, shall be routed for fire plan review for projects intended for the use, storage or handling of hazardous materials in any amount.

- **Storage (piles, shelves or racks):** Where the project includes any storage in which the actual storage height may exceed 1~~0~~2 feet for Class 1-4 commodities and 5 feet for hazardous commodities, see Fire Code Chapter 32 High-piled Storage. The project includes storage of ANY height containing: aerosols, cannabis cultivation, manufacturing or storage plastics, idle pallets, plastic pallets, rubber tires, baled cotton, rolled paper, flammable liquids, and similar commodities. Modifications to the fire sprinkler system require a separate fire permit.

Which Projects Require Permits from the Cathedral City Fire Department?

Alarm Systems (fire, emergency, and toxic gas) where the proposed project includes an alarm system installation or modification.

Cannabis Manufacturing

- The processes of extraction and infusion, use of liquefied petroleum gas (LPG) and CO_2 extraction equipment, flammable liquid distillation or evaporative process equipment, vacuum ovens, refrigerated storage and/or processing of flammable liquids.

Battery Systems and Battery Rooms (Stand-by Power, Emergency Power or Uninterrupted Power):

- Stationary battery systems having an electrolyte capacity of more than 50 gallons for flooded lead
- Acid, nickel cadmium (Ni-Cd) and valve-regulated lead acid (VRLA) or 1,000 pounds for lithium ion batteries

Commercial Kitchen Hood System:

- For Type I Hoods (a commercial kitchen hood for collecting and removing grease and smoke) an automatic suppression system is required

Emergency Generators:

- A permit is required by the Fire Department when the capacity of the fuel storage tank exceeds 60 gallons.

Tank Installations for the Storage of Hazardous Materials or Waste:

- The proposed project includes tank installation(s) having capacities greater than 60 gallons. This would include generators with fuel tanks greater than 60 gallons.

Water Supply Systems:

- The proposed project includes an underground water supply for fire protection systems (fire hydrants, sprinkler systems, etc.)

Fire Extinguishing Systems:

- The proposed project includes a fire extinguishing system (clean agent, CO2, dry chemical, foam, etc.) installation or modification.

Temporary Membrane Structures/Tents/Canopies:

- The proposed project involves the installation of a temporary air supported membrane or tent (>200sq.ft.) and/or canopy or tent (>400sq.ft.).

Hazardous Material Tool Installations, Process Piping, Scrubbers:

- Equipment that utilizes material(s) such as tools, wet sinks, scrubbers, process pipe, etc.

Spray Booth:

- The project includes a spray booth. Fire protection plans shall be submitted with spray booth application.

Automatic Fire Sprinklers:

- The proposed project includes a fire sprinkler system installation or modification.

Note: Any building permit project that will be modifying/adding fire sprinklers and/or a fire alarm system shall submit separate plans to the Building Department for Fire Department review.

1.0 WATER AGENCY/DISTRICT CONTACTS SERVICING CATHEDRAL CITY

Service Area	**Service Area**
Cathedral City West of Whitewater River	**Cathedral City East of Whitewater River**
Desert Water Agency 1200 S. Gene Autry Trail Palm Springs, CA 92264 760-323-4971 www.DWA.org	Coachella Valley Water District 85995 Avenue 52 Coachella, CA 92236 760-398-2651 www.CVWD.org

Water Agency/District Requirements

1.1. Contractors or developers will contact the Water Agency/District and request the following information to facilitate designing private fire service mains and fire sprinkler systems:

- Water service size, material type and schedule.
- Length of service, fittings and valves installed.
- Water meter manufacturer, model and size (if fire service is metered)
- Backflow manufacturer, model, size and arrangement.

1.2 The Water Agency/District will assist the fire department in providing flow information for water mains or fire hydrants:

- Static pressures.
- Dynamic/residual pressures.
- Gallons per minute.
- Water main size and configuration.
- Fire Hydrant Identification Numbers used in testing and street address or location description. Indicate Fire Hydrant Identification Number where pressure readings were taken.
- The fire department attempts to conduct water flow capability tests with a Water Agency/District representative. Contractors are required to call 760-770-8200 to request water hydrant flow tests and static pressure readings.

2.0 PLANS AND PERMITS

2.1 When there are significant changes in occupancy, water supply, storage heights, type and quantity of storage, storage configurations, Tenant Improvements or any other changes which may affect the fire sprinkler system design, the owner, tenant or contractor shall submit plans and secure permits.

2.2 Complete plans for private fire service mains or fire sprinkler systems should be submitted for approval as part of the building plans (deferred submittals of fire plans are not permitted). Plan reviews can take up to 20 working days. ***Submit a minimum of two (2) sets of drawings for review***. Upon approval, the Fire Department will retain a set.

2.3 Plans shall be submitted with the City's application to:

City of Cathedral City Building Department
68-700 Avenida Lalo Guerrero
Cathedral City, CA 92234

Counter Hours: Monday – Thursday, 7:00 AM – 6:00 PM

A deposit for Plan Check and Inspection Fees may be required at the time of plan submittal. These fees are established by City Council Resolution of the City of Cathedral City.

2.4 Complete listings and manufacturer's technical data sheets for all system materials shall be included with plan submittals. All system materials shall be UL listed or FM approved for fire protection service and approved by the Fire department prior to installation.

2.5 Plans shall indicate all necessary engineering features, including all hydraulic reference notes, pipe lengths and pipe diameters as required by the appropriate codes and standards. Plans and supportive data (calculations and manufacturer's technical data sheets) shall be submitted with each plan submittal. Complete and accurate legends for all symbols and abbreviations shall be provided on the plans.

The contractor shall submit a copy of their California Contractors License, Workers Compensation Insurance Certificate and Cathedral City Business License with each submittal. Contractors License and Workers Compensation Insurance shall be verified with the Contractor's License Board. The following contractors shall install the appropriate system components:

(A) General Engineering Contractor.
(C-16) Fire Protection Contractor.
(C-34) Pipeline Contractor.
(C-36) Plumbing Contractor.

2.5.1 As Built Drawings and Calculations" will be required when there is a 5% deviation from approved drawings and calculations.

2.5.2 The fire department will determine the fire flow requirements, number of fire hydrants, and hydrant spacing.

3.0 PRIVATE FIRE SERVICE MAIN

3.1 NFPA 24 shall establish the minimum requirements for the installation of private fire service mains and their appurtenances supplying automatic sprinkler systems, open sprinkler systems, water spray fixed systems, foam systems, private hydrants, monitor nozzles or standpipe systems with reference to water supplies, private hydrants and hose houses.

3.2 Private fire service mains shall be not less than eight (8) inches in diameter when serving private fire hydrants and fire sprinkler systems.

3.3 Ductile iron piping with a minimum rating of Class 150 or C900 Class 200 plastic piping, installed to NFPA 24 standards, is required for all private fire service

mains. When fire pumps are installed, a minimum Class 200 ductile iron fire service main ~~may~~ is ~~be~~ required.

3.4 All restrained joints on private fire service mains, private fire hydrant lines and fire sprinkler laterals shall be calculated as required by NFPA 24, or use Water Agency/District Drawings. Calculations shall be submitted and the resulting dimensions/details of restrained joints shall be shown on the plans. Minimum design working pressure shall be 150 PSI. Special design considerations may be required with high static pressures or lines in which fire pumps are installed.

3.5 Private fire service mains when supplying three (3) or more fire hydrants shall be designed with a looped water supply.

3.6 In order to isolate the fire sprinkler underground lateral from any private fire hydrant system, a listed aboveground indicating valve (post indicator valve or outside stem and yoke valve) shall be provided for the fire sprinkler lateral.

3.7 Indicating valves shall be required to sectionalize no more than two commercial buildings, three residential buildings or two private fire hydrants on private fire service mains or when 5 or more fire appliances are on a looped fire service underground system. Any deviation will require the Fire Department approval.

3.8 On-site private fire hydrants and Fire Department Connections located less than three (3) feet behind the face of a curb or when no curb is provided shall be protected by guard posts set in concrete to the following specifications:

- Constructed of steel not less than 4 inches in diameter and concrete filled
- Spaced not more than 4 feet between posts on center
- Set not less than 3 feet deep in a concrete footing of not less than a 15-inch diameter
- Set with the top of the posts not less than 3 feet above ground
- Located not less than 3 feet from the fire hydrants, post indicator valves and Fire Department connections
- All guard posts shall be painted yellow. (Rust-Oleum safety yellow #2149 or equivalent)

3.9 The installing contractor shall provide a completed **"Contractors Material & Test Certificate for Underground Piping"** as required by NFPA 24.

Double Check Detector Assemblies (Private)

3.10 All Double Check Detector Assemblies shall be UL listed/FM approved for fire protection service in compliance with NFPA 24.

3.11 All Double Check Detector Assemblies shall be installed with two tamper switches and electrically monitored at a UL listed central station service, when there are:

- 20 or more fire sprinkler heads.

3.12 All Double Check Detector Assemblies shall be provided with a chain and breakaway security lock. A key shall be kept in the spare sprinkler head box and KNOX key box.

3.13 Reduced pressure zone assemblies or reduced pressure detector assemblies shall not be installed in private fire service mains and fire sprinkler systems.

Fire Department Connections

3.14 Fire Department Connections shall be installed at apparatus access roads in locations approved by the fire department. Check with the fire department prior to plan submittal. The Fire Department Connection shall extend between 30" to 48" above finished grade.

3.15 Fire Department Connections shall be visible, accessible, and installed in approved locations downstream of all Double Check Detector Assemblies. The check valve for the FDC shall be above grade. Fire Department connections shall be located within 100 feet of a fire hydrant. Exceptions may be made by the fire code official.

3.16 Fire Department Connections shall be equipped with protective caps.

3.17 When the total sprinkler system demand, including hose allowance, is less than 499 G.P.M., the Fire Department Connection riser shall be 4" in nominal diameter and shall have a standard 2-way threaded 2 ½" connection.

3.18 When the total sprinkler system demand, including hose allowance, is 500 GPM to 1,199 G.P.M., the Fire Department Connection riser shall be 6" in nominal diameter and shall have a standard 3-way threaded 2 ½" connection.

3.19 When the total sprinkler system demand, including hose allowance, is greater than 1,200 G.P.M., the Fire Department Connection riser shall be 6" in nominal diameter and shall have a standard 4-way threaded 2 ½" connection.

3.20 In a building complex, where two or more buildings are served, or identification of which building is served by separate Fire Department Connections; the Fire department will require signs of substantial construction to be posted at each Fire Department Connection identifying the respective buildings served. The minimum letter size shall be 1" on a contrasting background, white letters on a red background.

3.21 Fire Department Connections shall be painted red (Rust-Oleum Safety Red # 2163 or equivalent).

3.22 Fire Department Connection piping shall be ductile iron from the private fire service main to the Fire Department Connection check valve above ground. The pipe from the Fire Department Connection check valve to the Fire Department Connection shall be ductile iron pipe. The NFPA 13R Fire Department Connection piping shall be copper from the private fire service main.

Fire Hydrants (Private)

3.23 Commercial fire hydrants with a 4", x 2 1/2" x 2 1/2" outlets are required when fire flow demand is 1,500 GPM or greater. Residential fire hydrants with 4" x 2 ½" outlets are required when the fire flow demand is less than 1500 GPM. Existing residential fire hydrants that are located within 150' of a building do not need to be upgraded to commercial fire hydrants if that hydrant(s) can provide the required fire flow.

3.24 Private fire hydrants shall be painted red (Rust-Oleum Safety Red # 2163 or equivalent).

3.25 Blue reflective markers shall be installed to identify location of all fire hydrants. These markers shall be visible from both directions of vehicle travel.

3.26 Hydraulic calculations shall be provided for all private fire hydrant systems. Calculations shall be calculated back to the point of the flow test. The fire hydrant system shall meet the fire flow requirements as required by the California Fire

Table 7.1 Private Fire Service Main Inspection, Testing, and Maintenance

Item	Frequency	Reference
Inspection		
Hose houses	Quarterly	7.2.2.7
Hydrants (dry barrel and wall)	Annually and after each operation	7.2.2.4
Monitor nozzles	Semiannually	7.2.2.6
Hydrants (wet barrel)	Annually and after each operation	7.2.2.5
Mainline strainers	Annually and after each significant flow	7.2.2.3
Piping (exposed)	Annually	7.2.2.1
Piping (underground)	See 7.2.2.2	7.2.2.2
Test		
Monitor nozzles	Flow, annually (range and operation)	7.3.3
Hydrants	Flow, annually	7.3.2
Piping (exposed and underground) (flow test)	5 years	7.3.1
Maintenance		
Mainline strainers	Annually and after each operation	7.2.2.3
Hose houses	Annually	7.2.2.7
Hydrants	Annually	7.4.2
Monitor nozzles	Annually	7.4.3

Code (2016 Edition).

3.27 When the private fire service main serves both fire sprinkler system(s) and private fire hydrant(s), the hydraulic calculation shall include the fire hydrant flow rate with associated private fire hydrant(s) and fire sprinkler flow rate for a minimum design of 20 PSI residual pressure for the fire hydrant (s).

3.28 All private fire service hydrants and mains shall be inspected, tested, and maintained in accordance with NFPA 25, Table 7.1 “Private Fire Service Main Inspection, Testing, and Maintenance”.

3.29 Dry barrel and wall hydrants shall be inspected annually and after each operation with the necessary corrective action taken as shown in table 7.2.2.4.

Table 7.2.2.4 Dry Barrel and Wall Hydrants

Condition	Corrective Action
Inaccessible	Make accessible
Barrel contains water or ice (presence of water or ice could indicate a faulty drain, a leaky hydrant valve, or high groundwater table)	Repair and drain; for high groundwater it could be necessary to plug the drain and pump out the barrel after each use
Improper drainage from barrel	Repair drain
Leaks in outlets or at top of hydrant	Repair or replace gaskets, packing, or parts as necessary
Cracks in hydrant barrel	Repair or replace
Tightness of outlet caps	Lubricate if necessary; tighten if necessary
Worn outlet threads	Repair or replace
Worn hydrant operating nut	Repair or replace
Availability of operating wrench	Make sure wrench is available

3.30 Wet barrel shall be inspected annually and after each operation with the necessary corrective action taken as shown in table 7.2.2.5.

Table 7.2.2.5 Wet Barrel Hydrants

Condition	Corrective Action
Inaccessible	Make accessible
Leaks in outlets or at top of hydrant	Repair or replace gaskets, packing, or parts as necessary
Cracks in hydrant barrel	Repair or replace
Tightness of outlet caps	Lubricate if necessary; tighten if necessary
Worn outlet threads	Repair or replace
Worn hydrant operating nut	Repair or replace
Availability of operating wrench	Make sure wrench is available

Water Plans and Water Main Installation (Private)

3.31 Provide the following notes on the private ~~the~~ fire service water main plans:

FIRE DEPARTMENT NOTES:

A. *The installation of the private fire service mains shall comply with:*

- *NFPA 24*
- *California Building Code (2013~~3~~6 Edition).*
- *California Fire Code (2013~~3~~6 Edition)*

B. *No combustibles shall be delivered to building job site prior to the water mains and fire hydrants being operational.*

C. *The following inspections are required:*

- *Restrained pipe joints, trench, and backfill inspection.*
- *Underground hydrostatic test - 200 PSI for two hours.*
- *Underground flush.*
- *Underground final. A completed and signed* ***"Contractors Material & Test Certificate for Underground Piping"*** *form per NFPA 24.*
- *All inspections will be scheduled with the Fire Department. Fire Sprinkler contractors must request inspections through the project Superintendents.*

To schedule inspections, call the fire department at 760-770-8200 at least 24 HOURS prior to the requested inspection date and time.

D. *All Double Check Detector Assemblies shall be installed with two tamper switches and electrically monitored at a UL listed central receiving station service, when there are:*

- *20 or more fire sprinkler heads.*

E. A one piece stainless steel underground piping shall be installed beginning five feet from a building and continue into the building a minimum of 6 inches above finish floor, or finish grade if riser is outside of the building.

F. No piping joints shall be installed under the building.

G. *The civil engineer who designed the water system hereby certifies that this water system is in accordance with the requirements as prescribed by the fire department, the California Fire Code (2016 Edition) and NFPA 24.*

H. Breakaway spools or breakaway bolts are required on all fire hydrants.

Private fire hydrant systems shall be subject to periodic tests and maintenance as required by NFPA 25 and the fire code official. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, alterations and servicing shall comply with the applicable standards.

4.0 AUTOMATIC FIRE SPRINKLER SYSTEMS - NFPA 13

4.0.1 An automatic fire sprinkler system, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system must include a suitable water supply, such as a gravity tank, fire pump, reservoir or pressure tank and/or connection by underground piping to a city or water district water main. The portion of the system aboveground is a network of specifically sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic fire sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharge of the water over the fire area.

4.0.2 The 2016 California Fire Code is locally amended to provide more stringent fire protection requirements, by requiring the installation of approved automatic fire sprinkler systems in every newly constructed buildings in the following group occupancies, where the gross floor area under the roof requires a 1,500 gallons per minute (GPM) or more fire flow regardless of the number of stories.

4.1 Group A-1, A-2, A-3 and A-4 Occupancies

4.1.1 An automatic fire sprinkler system shall be provided for Group A-1, A-2, A-3 and A-4 occupancies where:

4.1.2 The floor area under the roof requires a 1,500 GPM or more fire flow. Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section.

4.2 Group A-5 Occupancies

4.2.1 An automatic fire sprinkler system shall be provided for Group A-5 occupancies in the following areas: concession stands, retail areas, press boxes, and other accessory use areas in excess of 1,000 square feet, or where the floor area under the roof requires a 1,500 GPM or more fire flow.

4.2.2 Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section.

4.3 Group B Occupancies

4.3.1 An automatic fire sprinkler system shall be provided for Group B occupancies where one or more of the following conditions exist:

a. The floor area under the roof requires a 1,500 GPM or more fire flow;
b. Where the fire area has an occupant load or 100 or more persons; or
c. Where the fire area is located on a floor other than the level of exit discharge.

4.3.2 Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section.

4.4 Group E Occupancies

4.4.1 Except as provided for in the 2016 California Fire Code Sections 903.2.3.1 for a new public school campus building(s) and 907.2.3.6 (Automatic Fire Alarm System) for modernization of an existing public school campus building(s), an automatic fire sprinkler system shall be provided for Group E occupancies where one more of the following conditions exist:

a. Throughout all Group E fire areas with greater than a 1,500 GPM fire flow, and;
b. Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section, and;
c. Throughout every portion of an educational building(s) below the level of exit discharge.

Exception: An automatic fire sprinkler system is not required in any fire area or area below the level of exit discharge where every classroom throughout the building has at least one exterior exit door at ground level and the fire area does not exceed a 1,500 GPM fire flow requirement.

4.5 Group F Occupancies

4.5.1 An automatic fire sprinkler system shall be provided for Group F-1 occupancies where one or more of the following conditions exist:

a. Where a Group F-1 fire area exceeds a 1,500 GPM fire flow, regardless of the stories;
b. Where a Group F-1 fire area is located more than three stories above grade plane; or
c. Where the combined area of all Group F-1fire areas on all floors, including any mezzanines, exceeds a 1,500 GPM fire flow requirement.

4.5.2 Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section.

Exception: The Fire Department considers Cannabis Cultivation Sites and Manufacturing Sites to be Group F-1 (Factory Industrial Moderate-Hazard Occupancy). All new construction is required to be fire sprinklered per the amended Fire Code (see above requirements).

4.5.3 For Cannabis Cultivation and Manufacturing Sites that will be sited in an existing structure, an automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

a. Where a Group F-1 fire area exceeds 12,000 square feet;
b. Where a Group F-1 fire area is located more than three stories above grade plane; or
c. Where the combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet.

4.5.4 Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section.

4.6 Group M Occupancies

4.6.1 An automatic fire sprinkler system shall be provided for Group M occupancies where one or more of the following conditions exist:

a. Where a Group M fire area exceeds a 1,500 GPM fire flow, regardless of the stories;

b. Where a Group M fire area is located more than three stories above grade plane; or

c. Where the combined area of all Group M fire areas on all floors, including any mezzanines, exceeds a 1,500 GPM fire flow requirement.

4.6.2 Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section.

4.7 Group S-1 Occupancies

4.7.1 An automatic fire sprinkler system shall be provided for Group S-1 occupancies where one or more of the following conditions exist:

a. Where a Group S-1 fire area exceeds a 1,500 GPM fire flow, regardless of the stories;

b. Where a Group S-1 fire area is located more than three stories above grade plane; or

c. Where the combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds a 1,500 GPM fire flow requirement.

4.7.2 Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section.

4.8 Repair Garages

4.8.1 An automatic fire sprinkler system shall be provided throughout all buildings used as repair garages, in accordance with Section 406 of the California Building Code, where the fire area containing a repair garage exceeds a 1,500 GPM fire flow requirement or where vehicles serviced are parked in the basement.

4.9 Group S-2 Occupancies

4.9.1 An automatic fire sprinkler system shall be provided for Group S-2 occupancies where one or more of the following conditions exist:

a. Where a Group S-2 fire area exceeds a 1,500 GPM fire flow, regardless of the stories;

b. Where a Group S-2 fire area is located more than three stories above grade plane; or

c. Where the combined area of all Group S-2 fire areas on all floors, including any mezzanines, exceeds a 1,500 GPM fire flow requirement.

4.9.2 Fire resistive walls shall not be considered for reducing the fire area of the building for the purposes of this section.

4.9.3 An automatic fire sprinkler system shall be provided throughout all buildings classified as enclosed parking garages, in accordance with

Section 406 of the California Building Code or where located beneath other occupancy groups.

4.10 Commercial Parking Garages

4.10.1 An automatic fire sprinkler system shall be provided throughout all buildings used for storage of commercial trucks or buses where the fire area exceeds a 1,500 GPM fire flow requirement.

4.11 Controls

4.11.1 All control valves shall be UL Listed aboveground indicating valves.

4.11.2 All control valves with tamper switches for private fire service mains/fire sprinkler systems and all water flow switches on fire sprinkler systems shall be electrically monitored at a UL listed central station service when there are:

- 20 or more fire sprinkler heads.

4.11.3 An approved audible sprinkler flow alarm (Wheelock horn/strobe # MT4-115-WH-VFR with WBB back box or equal) shall be provided on the exterior of the building in an approved location. An approved sign shall be provided at or near the outdoor audible device stating the following**: "SPRINKLER FIRE ALARM-WHEN ALARM SOUNDS CALL 9-1-1".**

4.11.4 A dedicated electrical circuit with a circuit breaker lock shall be required for the water flow horn/strobes.

4.12 Fire Sprinkler Risers (NFPA 13)

4.12.1 When more than one fire sprinkler riser is served by a single private fire service main lateral, a separate system riser with a UL Listed aboveground indicating control valve, check valve and water flow indicator is required for each fire sprinkler riser.

4.12.2 In multi-story buildings, each floor shall have a sectional riser with a UL Listed aboveground indicating control valve, and water flow switch indicator.

4.12.3 In order to provide access to the riser for future maintenance and repair, all fire sprinkler system riser locations shall provide with a minimum 18" clearance to each side and to the front of the riser. If a riser is to be concealed by means of a wall or closet, access to the riser shall be provided by means of a door with dimensions of 2'-6" x 6'-8".

4.13 Piping and Hangers (NFPA 13)

4.13.1 Threaded steel pipe shall have a minimum wall thickness of “Dyna-Thread” or Schedule 30 for branch lines less than 2½” and Schedule 40 for all other piping.

4.13.2 Rolled groove steel pipe shall have a minimum wall thickness of Schedule 10.

4.13.3 Where a beam or joist thickness will not accommodate a fastener of a required length, a through bolt with the required diameter of the bolt and washer will be acceptable. All-thread rod is not acceptable for the required bolt.

4.13.4 Lag bolts and screws are not acceptable for seismic bracing.

4.13.5 Seismic sway bracing shall use Schedule 40 pipe as a minimum.

4.14 Design (NFPA 13)

4.14.1 For commercial and industrial “Shell Buildings”, with the potential for high-pile storage and/or wherein no specific end use is identified at the time of plan check, the sprinkler system shall provide a minimum density of 45 GPM/square foot for a 2,000 square foot design area. 175-225 deg. F sprinkler heads shall be used in these buildings. Roof coverage over mezzanine areas may be designed at a density of .25 over 2000 square feet. Any deviation from these densities will require the Fire Department approval.

4.14.2 It is incumbent upon the sprinkler system designer to advise the building owner that the above densities and design areas are minimums for shell buildings; and that increases in sprinkler protection may be required based on future occupancy hazard classification, storage commodity classification, and storage configuration according to NFPA 13 and the California Fire Code (2016 Edition)

4.14.3 When a shell building is built without a hard lid or T-bar ceiling, the upright fire sprinklers shall be designed to the unfinished ceiling height and the density and design area for the required floor area.

4.14.4 Fire sprinkler design shall be limited to 90 percent of the available water supply or, the sprinkler system design shall have a minimum of a 10 percent safety factor designed into the hydraulic calculations for the system.

4.14.5 *Non-combustible construction* shall be as defined by the California Building Code (2016 Edition). Wood frame construction shall be considered combustible construction regardless of materials used for surface covering.

4.14.6 Sprinklers with a temperature rating of not less than an intermediate temperature rating are required in all main electrical panel and meter rooms. No combustible materials shall be stored in these rooms.

4.14.7 Light fixtures, soffits and other potential obstructions shall not interfere with the spray patterns of fire sprinklers. The sprinkler contractor shall insure that the type and location of potential obstructions is considered in the design and installation of the system. The sprinkler contractor is responsible for coordinating and resolving conflicts in coverage patterns.

4.14.8 Fire sprinklers shall not be installed directly below automatic smoke and heat vents.

4.14.9 A dedicated electrical circuit with a circuit breaker lock shall be provided for the water flow horn/strobes.

4.14.10 An Inspector Test Valve is required at the remote area of the system. Access panels and doors to fire sprinkler riser rooms shall have a signs with an appropriate description. The orifice for the Inspectors Test Valve shall be equal to the smallest sprinkler orifice in the system.

4.14.11 All electrical rooms, upright sprinklers at the roof or in the attic space, non-conditioned rooms or exterior sprinkler heads shall be 200 – 212 degree Fahrenheit heads.

4.15 Plans (NFPA 13)

4.15.1 Complete detailed work sheets and computer hydraulic calculations as required by NFPA 13 shall be included with all submittals for hydraulically designed sprinkler systems. Calculations shall extend to the point at which the water supply data was determined.

4.15.2 Water supply curves and system demand curves, including underground friction loss, hose allowance, and applicable in-rack sprinkler demand, shall be plotted on semi-logarithmic graph paper or computer generated graphs. Sprinkler system design, including hose demand, shall be limited to 90 percent or, the sprinkler system design shall have a minimum of a 10 percent safety factor designed into the hydraulic calculations for the system of the available water supply. Water supply data may be obtained from the Fire department by calling 760-770-8200 if unavailable from the water purveyor.

4.15.3 Unless the requirements of NFPA 13 Section 9.2.1.3.3 apply, structural load calculations will be required for the structural elements/systems supporting the load of the water filled pipe plus a minimum of 250 lbs. applied at the point of hanging, except where permitted by 9.2.1.1.2, 9.2.1.3.3 and 9.2.1.4.1.

4.15.4 Provide separate drawings for the piping plan and reflective ceiling plan.

4.15.5 Provide a fire sprinkler legend including sprinkler symbol, Manufacturer, Sprinkler Identification Number (SIN), model, style, K-factor, degree, finish, escutcheon and quantity.

4.15.6 Provide the occupancy type of each room, ceiling heights and ceiling slopes with direction, slope pitch and ceiling height at the beginning of the slope as applicable.

4.15.7 Provide soffit and ceiling pocket details including widths, depths and heights.

4.15.8 Provide Seismic Bracing Calculations on the drawings per NFPA 13 using **Cp of 0.74 and l/r Ratio of 200**. Separate Seismic Bracing Calculations shall be provided for lateral and longitudinal braces. Show details of the seismic bracing and branch line restraints on the drawings.

4.15.9 Hydraulic Plate information shall be included on the drawings.

4.15.10 Provide calculations of the Number of Sprinklers to Calculate and the Number of Sprinklers on a Branch Line and list Assumed Remote Area Sq. Ft.

4.15.11 Mark on the drawings the Most Hydraulically Demanding Remote Area.

4.15.12 In order to provide access to the riser for future maintenance and repair, all fire sprinkler system riser locations shall provide with a minimum 18" clearance to each side and to the front of the riser. If a riser is to be

concealed by means of a wall or closet, access to the riser shall be provided by means of a door with dimensions of 2'-6" x 6'-8".

4.15.13 The location of the Fire Department Connection shall be within one-hundred (100) feet of a commercial fire hydrant with 4”x2½”x2½” outlets.

4.15.14 All Fire Department Connections shall have protective caps. Locking Knox F.D.C. protective caps shall be installed, at the direction of the fire code official, based on the building location.

4.15.15 Pipe Schedule Design shall not be used in existing systems, extension of existing systems and new systems.

4.15.16 Provide the following notes on fire sprinkler plans:

Fire Department Notes (NFPA 13)

A. ***The installation of the sprinkler systems or modifications to existing sprinkler systems shall comply with:***

- *NFPA 13*
- *California Fire Code (2013~~3~~6 Edition)*
- *California Building Code (2013~~3~~6 Edition).*
- *The City of Cathedral City Municipal Code Chapter 8.12.*
- *Cathedral City Fire Department Development Guidelines*

B. *The Fire department will require the following inspections and tests as a minimum:*

- *Fire sprinkler piping weld inspection.*
- *Overhead installation and hydrostatic test – 200 PSI for two hours.*
- *Fire sprinkler system final inspection. A completed and signed "**Contractors Material and Test Certificate for Aboveground Piping**" form per NFPA 13 is required.*
- *All inspections will be conducted Monday through Thursday. Sprinkler contractors must request inspections through the project Superintendents.*

To schedule inspections, call the Fire department at (760)770-8200 at least 24 HOURS prior to the requested inspection date and time.

C. *A dedicated electrical circuit with a circuit breaker lock shall be required for the water flow horn/strobes.*

D. *All control valves with tamper switches for private fire service mains/fire sprinkler systems and all water flow switches on fire sprinkler systems shall be electrically monitored at a UL listed central station service when there are:*

- *20 or more fire sprinkler heads.*

E. *The fire sprinkler branch lines shall be restrained against excessive vertical and lateral movement by use of a wrap-around U-hook or by other approved means per NFPA 13.*

5.0 FIRE SPRINKLER SYSTEMS (NFPA 13R)

5.1 Design (NFPA 13R)

5.1.1 The sprinkler contractor shall calculate the friction loss for all pipe, meters, valves, fittings and other appurtenances when designing the hydraulic calculations for the NFPA 13R fire sprinkler system.

Fire sprinkler design shall be limited to 90% of the available water supply. Or, the sprinkler system design shall have a minimum of a fifteen (15) percent safety factor designed into the hydraulic calculations for the system.

5.1.2 Fire sprinkler systems shall require a single 2 ½" Fire Department Connection when the building exceeds 2,000 Sq. Ft. or more than one story.

5.1.3 An inspector's test valve shall be provided from a remote portion of the system supplied by a 1 inch pipe with the orifice size to be the same as the smallest sprinkler in the system. This valve shall be a full port ball valve with signed access panel and a copper stub outside the wall. The test valve must be a gate valve enclosed within the inspection test valve compartment with the door at least 60" above grade.

5.1.4 Access panels for fire sprinkler risers and inspector test valves and doors for fire sprinkler riser rooms shall have a signs with an appropriate description.

5.1.5 Fire sprinkler protection is required in entrance foyers.

5.1.6 Garages, attics and outside mechanical and/or electrical rooms shall use commercial Quick Response fire sprinkler heads with a 200 – 212 deg. F temperature rating. Garage fire sprinkler spacing shall be per NFPA 13R Sec. 6.2.2.4 or 7.3 using 130 Sq. Ft. per sprinkler spacing.

Pilot heads shall be installed in attic areas over FAU Units located in attics.

5.1.7 Fire sprinkler protection is required for carports, garages, casitas and similar structures, regardless of construction, unless physically separated by a minimum of 10 feet from fire sprinkler protected dwellings or other fire sprinkler protected structures. Fire sprinklers must be installed in casitas, per CBC.

Piping size ¾" shall provide a fifteen (15) percent safety factor designed into the hydraulic calculations for the system.

5.1.8 Light fixtures, soffits and other potential obstructions shall not interfere with the spray patterns of sprinkler heads. The sprinkler contractor shall insure that the type and location of potential obstructions is considered in the design and installation of the system. The sprinkler contractor is responsible for coordinating and resolving conflicts in coverage patterns.

5.1.9 A dedicated electrical circuit with a circuit breaker lock shall be provided for the water flow horn/strobes.

5.1.10 An approved audible sprinkler flow alarm (Wheelock # MT4-115-WH-VFR with WBB back box or equal) shall be visible from the street. The horn/strobe shall be listed for outdoor installation. An approved sign shall be provided at or near the horn/strobe stating: "SPRINKLER FIRE ALARM-WHEN ALARM SOUNDS CALL 9-1-1".

5.1.11 Contractor shall provide a spare head box with sprinkler wrench based on NFPA13R Section 11.1. The spare head box shall not be located in a garage or other non-conditioned space where the temperature exceeds 100 degrees F.

5.1.12 All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, and water-flow switches on all sprinkler systems shall be electrically supervised by a listed fire alarm control unit and monitored at a UL listed central station service.

5.1.13 Systems shall have a relief valve located on the riser set to a pressure between 150 and 175 psi.

5.2 Plans (NFPA 13R)

5.2.1 Piping shall be detailed on drawing from public water main to riser including pipe sizes, pipe types, pipe lengths, all fittings, all valves, water meter manufacturer and model, back flow device manufacturer, model and size and elevations of house finished floor relative to fire hydrant outlet where pressures were taken.

5.2.2 Provide a riser detail on the drawing, including a flow control valve with a tamper switch and relief valve.

5.2.3 Provide an Inspector Test detail on drawing.

5.2.4 Provide a table on the drawings for piping support spacing and one and two point sprinkler head vertical restraint spacing.

5.2.5 Provide a fire sprinkler legend including sprinkler symbol, Manufacturer, Sprinkler Identification Number (SIN), model, style, K-factor, degree, finish, escutcheon and quantity.

5.2.6 Provide occupancy type of each room, ceiling heights and ceiling slopes with direction, slope pitch and ceiling height at the beginning of the slope as applicable.

5.2.7 Provide soffit and ceiling pocket details including widths, depths and heights.

5.2.8 Provide beam details including widths, heights and spacing.

5.2.9 Design a looped fire sprinkler piping system where practical.

5.2.10 Provide location of required horn/strobes.

5.2.11 Provide the following notes on fire sprinkler plans:

FIRE DEPARTMENT NOTES (NFPA 13R)

A. *The installation of the sprinkler system or modifications to existing sprinkler systems shall comply with:*
- *NFPA 13R (2016 Edition).*
- *California Building Code (2016 Edition).*
- *California Fire Code (2016 Edition)*
- *The City of Cathedral City Municipal Code Chapter 8.12.*
- *Cathedral City Fire Department Development Guidelines*

B. *The fire department will require the following inspections and tests as a minimum:*

- *Overhead installation and hydrostatic test – 200 PSI for two hours.*
- *Fire sprinkler system final inspection. A completed and signed "**Contractors Material and Test Certificate for Aboveground Piping**" form per NFPA 13R is required.*
- *All inspections will be conducted Monday through Thursday. Sprinkler contractors must request inspections through the project superintendent.*

To schedule inspections, call the fire department at (760)770-8200 at least 24 HOURS prior to the requested inspection date and time.

C. *A dedicated electrical circuit with a circuit breaker lock shall be provided for the water flow horn/strobes.*

D. *Water flow switches and control valves on fire sprinkler systems shall be electrically monitored when there are 20 fire sprinkler heads or more.*

6.0 FIRE SPRINKLER SYSTEMS (NFPA 13D)

6.1 Design (NFPA 13D)

6.1.1 A full port ball valve shall be installed at one- and two-family dwelling units as a shut-off valve for both domestic and fire sprinkler water supply. A shut-off valve shall be installed for the domestic water supply after the fire sprinkler system take-off.

6.1.1 Fire sprinkler system design shall be limited to 90 percent of the available water supply. When ¾" pipe is used, the sprinkler system design shall have a minimum of a fifteen (15) percent safety factor designed into the hydraulic calculations for the system.

6.1.2 Fire sprinkler systems shall be combined domestic and fire sprinkler service. Hydraulic calculations shall include 5 GPM domestic water demand at the domestic water take-off.

6.1.3 An inspector's test valve must be provided from a remote portion of the system. Orifice size to be the same as the smallest sprinkler in the system. The test valve shall be a full port ball valve with access panel and copper stub outside the wall enclosed within the exterior inspection test valve compartment with the door at least 60" above grade.

6.1.4 Access panels for fire sprinkler risers shall have signs with an appropriate description.

6.1.5 Garages, attics and outside mechanical rooms shall use commercial Quick Response fire sprinkler heads with a 200 – 212 deg. F temperature rating.

6.1.6 Pilot heads shall be installed in attic areas over FAU Units located in attics.

6.1.7 Fire sprinkler protection is required for carports, garages and similar structures, regardless of construction, unless physically separated by a minimum of 10 feet from dwellings or other structures. Fire sprinklers are required in casitas, per the CBC.

Piping size of ¾" shall provide a fifteen (15) percent safety factor designed into the hydraulic calculations for the system. All systems shall have a relief valve on the riser set between 150 and 175 psi.

6.1.8 Light fixtures, soffits and other potential obstructions shall not interfere with the spray patterns of sprinkler heads. The sprinkler contractor shall insure that the type and location of potential obstructions is considered in the design and installation of the system. The sprinkler contractor is responsible for coordinating and resolving conflicts in coverage patterns.

6.1.9 A dedicated electrical circuit with a circuit breaker lock shall be provided for the water flow horn/strobes.

6.1.10 An approved audible sprinkler flow alarm (Wheelock # MT4-115-WH-VFR with WBB back box or equal) shall be visible from the street. The horn/strobe shall be listed for outdoor installation. An approved sign shall be provided at or near the horn/strobe stating**: "SPRINKLER FIRE ALARM-WHEN ALARM SOUNDS CALL 9-1-1".**

6.1.11 An approved audible sprinkler flow alarm (FIREX # 0498 accessory module connected to multi-station FIREX smoke alarms or equal) to alert the occupants shall be provided.

6.1.12 Contractor shall provide a spare head box with sprinkler wrench and a minimum of two spare sprinkler heads of each type. The spare head box shall not be located in the garage or other non-conditioned space.

6.2 Plans (NFPA13D)

6.2.1 Piping shall be detailed on drawing from public water main to riser including pipe sizes, pipe types, pipe lengths, all fittings, all valves, water meter manufacturer and model, back flow device manufacturer, model

and size and elevations of house finished floor relative to fire hydrant outlet where pressures were taken.

6.2.2 Provide a riser detail on the drawing.

6.2.3 Provide an inspector test detail on drawing. The test valve must be a full port ball valve enclosed within the inspection test valve compartment with the door at least 60" above grade.

6.2.4 Provide a table on the drawings for piping support spacing and one and two point sprinkler head vertical restraint spacing.

6.2.5 Provide a fire sprinkler legend including sprinkler symbol, Manufacturer, Sprinkler Identification Number (SIN), model, style, K-factor, degree, finish, escutcheon and quantity.

6.2.6 Provide occupancy of each room, ceiling heights and ceiling slopes with direction, slope pitch and ceiling height at the beginning of the slope as applicable.

6.2.7 Provide soffit and ceiling pocket details including widths, depths and heights.

6.2.8 Provide beam details including widths, heights and spacing.

6.2.9 Design a looped fire sprinkler piping system where practical.

6.2.10 Provide the following notes on fire sprinkler plans:

FIRE DEPARTMENT NOTES (NFPA 13D)

A. *The installation of fire sprinkler systems or modifications to existing fire sprinkler systems shall comply with:*

- *NFPA 13D.*
- *California Building Code (2016 Edition).*
- *California Fire Code (2016 Edition)*
- *The City of Cathedral City Municipal Code Chapter 8.12.*
- *Cathedral City Fire Department Development Guidelines*

B. *The Fire Department will require the following inspections and tests as a minimum:*

- *Overhead installation and hydrostatic test – minimum 125 PSI Normal operating pressure for two hours.*
- *Final fire sprinkler and underground inspections.*
- *All inspections will be conducted Monday through Thursday. Sprinkler contractors must request inspections through the project Superintendents.*

To schedule inspections, call the fire department at (760)770-8200 at least 24 HOURS prior to the requested inspection date and time.

7.0 INSPECTIONS AND TESTS

7.0.1 Buildings must pass all the fire protection systems inspections prior to a certificate of occupancy.

7.0.2 The Inspection, Testing and Maintenance of Water-Based Fire Protection Systems shall comply with California Code of Regulations (CCR) Title 19.

7.0.3 The California State Fire Marshal has adopted NFPA 25 with California Amendments, which will modify Title 19.

7.0.4 The Fire department shall require completed "**Contractors Material and Test Certificate for Underground Piping**" per NFPA 24 (2016 Edition) and "**Contractors Material and Test Certificate for Aboveground Piping**" per NFPA 13 (2016 Edition) and NFPA 13R (2016 Edition) at the time of fire sprinkler final inspection. Aboveground sprinkler system piping and underground piping will not pass final inspection until **the fire department receives all certificates**. NFPA 13D fire sprinkler systems are exempt from the above certificates.

7.0.5 The Fire department will require the following inspections and tests as a minimum:

- OVERHEAD INSTALLATION AND HYDROSTATIC TEST

  Hydro Static test for systems without a fire department connection shall be at normal operating pressure with no evidence of leakage.

The following is required prior to final inspection:

- **Approved drawings and hydraulic calculations available on site**
- **Water service to sprinkler riser shall be installed and live**
- **All HVAC registers shall be installed**
- **All electrical shall be installed <u>for alarm,</u> lights, ceiling fans and smoke detectors**

7.1 FINAL SPRINKLER AND UNDERGROUND INSPECTIONS

7.1.1 **ALL CORRECTIONS FROM PREVIOUS INSPECTIONS MUST BE COMPLETED AND SIGNED OFF**.

7.1.2 A complete approved set of sprinkler system and private fire service main plans stamped approved (wet stamp and signature) by the fire department shall be kept on the job site at all times. **INSPECTIONS WILL NOT BE CONDUCTED WITHOUT THE APPROVED PLANS**.

7.1.3 The permit and inspection record card (Job Card) shall be available with the approved plans at the job site. **INSPECTIONS WILL NOT BE CONDUCTED WITHOUT THE APPROPRIATE INSPECTION RECORD CARD** (Fire Permit).

7.1.4 Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this guideline or of other ordinances of the jurisdiction shall not be valid.

7.1.5 All inspections for systems will be conducted from Monday through Thursday. Sprinkler contractors must request inspections through the project superintendents

7.1.6 All inspections NFPA 13D systems must be requested and scheduled by the project superintendents.

To schedule inspections, call the fire department at (760)770-8200 at least 24 HOURS prior to the requested inspection date and time.

8.0 EMERGENCY ACESS & GATES

8.1 General

8.1.2 This section has been developed to assist development applicants, architects, contractors, and building/business owners in determining the minimum requirements for Knox Key Switches on powered access gates, Knox Boxes for non-powered gates, Knox Box Vaults for residential & commercial facilities, Knox Locks and minimum access gate requirements for fire department access during emergency responses.

8.2 Plans

8.2.1 Plan submittals must identify all access gates and locations of Knox access switches and Knox boxes.

8.3 Gate Access Requirements

8.3.1 The installation of security gates across a fire apparatus access road shall be approved by the fire code official during the plan check review. Where security gates are installed, they shall have an approved means of emergency operation. The security gates and the emergency operation shall be maintained at all times.

8.3.2 A Knox key operated switch shall be installed at every automatic gate. Residential complexes using secured automated vehicle entry gates or entries shall utilize an approved Knox key electric switch and an optical pre-emption device. Secured non-automated vehicle gates or entries shall utilize an approved Knox padlock and chain (maximum link or lock shackle size of ¼ inch).

8.3.3 In the event of a power failure, the gates shall be defaulted or automatically transferred to a fail-safe mode allowing the gate to be pushed open without the use of special knowledge or any equipment. If a two-gate system is used, the override switch must open both gates.

8.3.4 Gate arms securing parking lots and parking structures shall be equipped with a fire department approved dual-keyed Knox key electric switch. When activated, the arm or arms shall open to allow fire access.

8.3.5 If there is no sensing device that will automatically open the gates for exiting, a fire department approved Knox electrical override switch shall be placed on each side of the gate in an approved location.

8.3.6 Approved security gates shall be a minimum of 20 feet in unobstructed drive width on the entrance side with gate in open position and 14 feet minimum on the exit side. An unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm) shall be provided and maintained at all times.

8.3.7 Cathedral City fire apparatus require an unobstructed vertical clearance of not less than 8 feet 6 inches for both subterranean parking structures as well as above ground parking structures.

8.4 Building Access Requirements

8.4.1 Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes a Knox Box Vault will be required.

8.4.2 Knox Box locations shall be mounted at 5 feet above grade in proximity to the main entrance. Show locations of Knox access controls on plan elevation views. Show requirement in plan notes. Knox switches or boxes may be order online at www.knoxbox.com or contact the Fire Department at (760)770-8200 for a Knox application form.

8.4.3 The key box shall be of an approved type and shall contain keys to gain necessary access as required by the fire code official.

8.4.4 Secured emergency access gates serving apartment, town home or condominium complex courtyard must provide a key box in addition to association or facility locks. The nominal height of Knox lock box installations shall be 5 feet above grade. Contact the Fire Department at (760)770-8200 for determination of box location.

8.5 Inspection Requirements

8.5.1 A final field inspection by the fire code official or an authorized representative is required before electronically controlled gates may become operative. Prior to final inspection, electronic gates shall remain in a locked-open position.

8.5.2 A final field inspection by the fire code official or an authorized representative for the installation of Knox Box Vaults is required at time of final inspection.

9.0 FIRE APPARATUS ACCESS ROADS

9.1 General

This section has been developed to assist development applicants, architects, contractors, and building/business owners in determining the minimum requirements for the design of fire apparatus access roads for consistency with the best practices of the fire code in the interest of public safety.

9.2 Plans

Detailed fire apparatus access roads shall be submitted to the Fire Department for review and approval prior to construction. Plans shall include certification from a Registered Professional Engineer stating the roads are of all weather construction and capable of supporting fire apparatus weighing 73,000 lbs. G.V.W.

9.3 Requirements

9.3.1 Private streets shall have a minimum width of at least 20 feet, pursuant to California Fire Code 503.2.1 however, a greater width for private streets may be required by the City engineer to address traffic engineering, parking, and other issues. The Cathedral City Fire Department

requirements for two-way private streets, is a minimum width of 20 feet, unless otherwise allowed by the City engineer and fire code official. No parking shall be allowed on either side of the roadway. The following text, developed in concert with Engineering, Planning, and Fire is adopted as alternative text for the Circulation Element.

- **Designated fire lanes** in private developments shall be not less than 20 feet wide (curb face to curb face) with no parking on either side.
- **Reduced Roadway Width**: Areas with reduced roadway width (such as entry and exit gates, entry and exit approach roads, traffic calming areas) that are under 36 feet wide require red painted curb to maintain minimum 20 foot clear width. Red curb shall be stenciled **"NO PARKING",** ~~and~~ **"FIRE LANE**" and **CVC 22500.1** with white paint.

9.3.2 The grade of the fire apparatus access road shall within the limits established by the fire code official based on the fire department's apparatus. No grade shall exceed 12 percent. Grade transitions shall not exceed maximum angle of approach and angle of departure based on the fire department's apparatus as determined by the fire code official.

9.3.3 A secondary access shall be provided for all developments with 25 or more dwelling units.

9.3.4 Dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus. The City of Cathedral City has two approved turn around provisions. One is a cul-de-sac with an outside turning radius of 35 feet from centerline and 15 feet inside radius from centerline. The other is a hammerhead turnaround extending 65 feet from centerline in each direction.

9.3.5 Fire department access roads/driveways shall be provided so that no portion of the exterior wall of the first floor of any building will be more than 150 feet from such roads.

9.3.6 Mid Rise/High Rise: High-rise and mid-rise buildings shall be accessible on a minimum of two sides. Street access shall not be less than 15 feet or more than 30 feet from the building. Landscaping or other obstructions shall not be placed or maintained around structures in a manner so as to impair or impede accessibility for firefighting and rescue operations.

9.4 Construction Requirements

9.4.1 Access for firefighting equipment shall be provided to the immediate job site at the start of construction and maintained until all construction is complete. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet and an unobstructed vertical clearance of not less than 13'6". Fire Department access roads shall have an all weather driving surface at 90% compaction and support a minimum weight of 73,000 lbs.

10.0 "BLUE DOT" TYPE I MARKER PLACEMENT NOTES

10.0.1 The reflective side shall face the flow of traffic. The "blue dot" shall be in line with

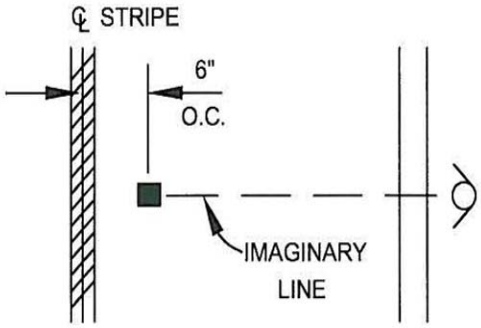
the fire hydrant, except where two (2) dots are used for intersections.

10.0.2 A blue reflective marker will be placed 6" on center from painted lines. If no traffic lines exist, place blue dot 6" from center of the street on the fire hydrant side (see standard placement detail below).

10.0.3 A painted traffic limit line for stop signs exists, place the second "blue dot" 2 feet back from line, 6" on center from painted traffic limit line.

10.0.4 If no traffic limit line for stop signs exists, place "blue dot" in line with sidewalk edge on the side closest to property line, 6" on center from the center of the street line.

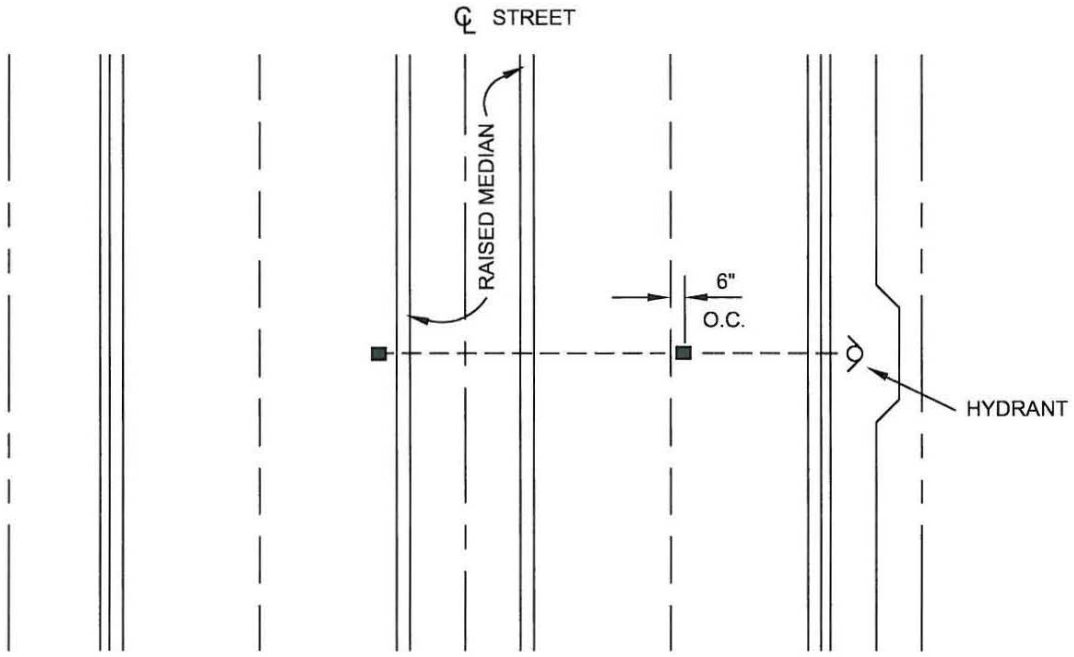
10.0.5 The "blue dot" shall be applied to a dry, dirt free street and enough adhesive shall be applied so that some adhesive oozes out around the edges of the "blue dot".



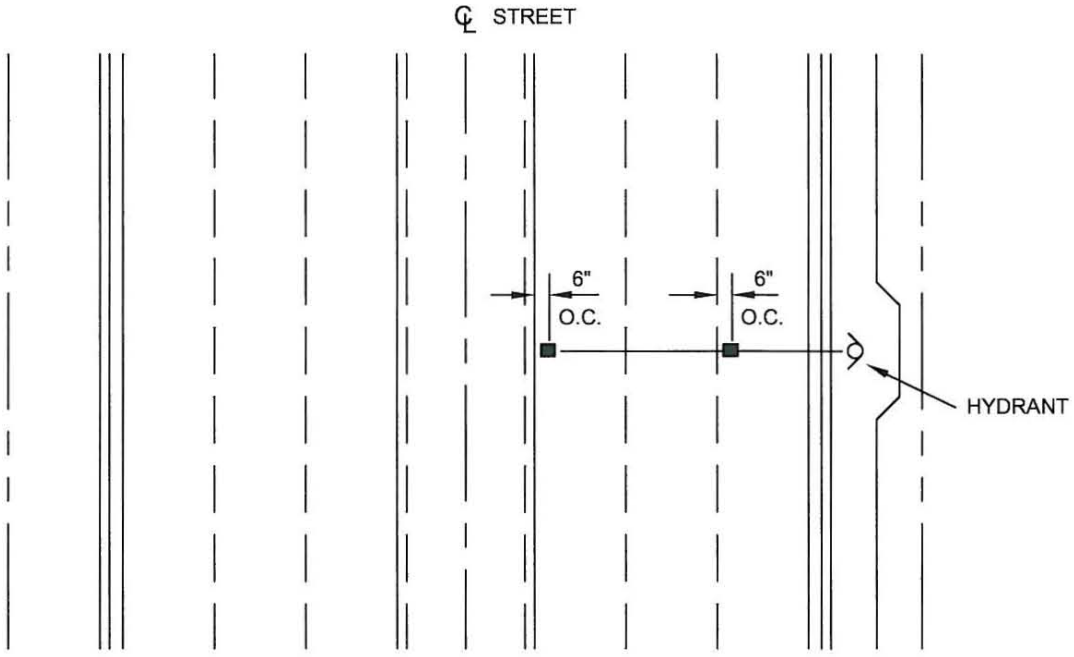
1. Unmarked streets: place marker 6" from edge of imaginary line of street on hydrant side
2. Marked streets: place marker 6" from centerline of painted line to centerline of marker on hydrant side.

— FIRE HYDRANT

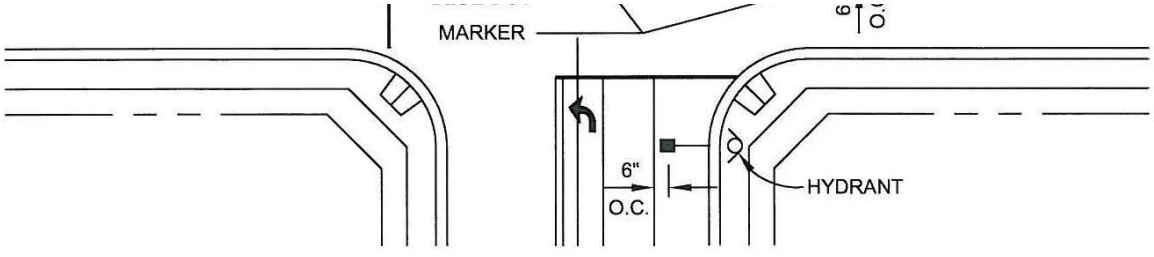
— BLUE MARKER



DIVIDED STREET



STREET WITH TURN LANE



STREET INTERSECTION

11.0 SOLAR PHOTOVOLTAIC INSTALLATION

11.1 General

11.1.1 This section has been developed with safety as the principal objective. The intent of this section is to assist development applicants, architects, contractors, and building/business owners with information that will aid in the designing, building, and installation of solar photovoltaic systems in a manner that meet the objectives of both the solar photovoltaic industry and the Cathedral City Fire Department.

11.2 Plans

11.2.1 Plan submittals for solar photovoltaic systems are to include all necessary markings for emergency responders to isolate the solar electric system. Approved plans are required prior to construction of a solar photovoltaic system.

11.3 Markings

11.3.1 Photovoltaic (PV) systems must be marked. Marking is needed to provide emergency responders with appropriate warning and guidance with respect to working around and isolating the solar electric system. This can facilitate identifying energized electrical lines that connect the solar modules to the inverter, as these should not be cut when venting for smoke removal.

11.3.2 Materials used for marking must be weather resistant. It is recommended that Underwriters Laboratories Marking and Labeling System 969 (UL 969) be used as standard to determine weather rating (UL listing of markings is not required).

11.4 Main Service Disconnect

11.4.1 For residential applications, the marking is to be placed within the main service disconnect. If the main service disconnect is operable with the service panel closed, the marking is to be placed on the outside cover.

For commercial application, the marking is to be per Section 690 of the National Electrical Code.

11.5 Access, Pathways and Smoke Ventilation

11.5.1 Access and spacing requirements are required in order to:

- Ensure access to the roof
- Provide pathways to specific areas of the roof
- Provide for smoke ventilation opportunities area
- Provide emergency egress from the roof

11.5.2 Designation of ridge, hip, and valley does not apply to roofs with 2-in-12 or less pitch. All roof dimensions are measured to centerlines.

11.5.3 Roof access points are to be defined as areas where ladders are not placed over openings (i.e., windows or doors) and are located at strong points of building construction and in locations where they will not conflict with overhead obstructions (i.e., tree limbs, wires, or signs).

11.6 Residential Systems - Single and Two-Unit Residential Dwellings

Plan reviews are required if a system is to be installed on the roof area of a residential building.

11.6.1 Access/Pathways

a. Residential Buildings with hip roof layouts: Modules should be located in a manner that provides one (1) three-foot (3') wide clear access pathway from the eave to the ridge on each roof slope where modules are located. The access pathway should be located at a structurally strong location on the building capable of supporting the firefighters accessing the roof (see example 1).

b. Residential Buildings with a single ridge: Modules should be located in a manner that provides two (2) three-foot (3') wide access pathways from the eave to the ridge on each roof slope where modules are located (see example 2).

c. Hips and Valleys: Modules should be located no closer than one and one half (1.5) feet to a hip or a valley if modules are to be placed on both sides of a hip or valley. If the modules are to be located on only one side of a hip or valley that is of equal length then the modules may be placed directly adjacent to the hip or valley. (See Example 3)

11.6.2 Smoke Ventilation

a. The modules are to be located no higher than three feet (3') below the ridge.

11.7 Commercial Buildings and Residential Housing consisting of Three (3) or More Units

If the roof configuration is similar to residential (such as in the case of townhouses, condominiums, or single family attached buildings), the local fire department may make a determination to apply the residential access and ventilation requirements (see examples 5, 6, 7 and 8).

11.7.1 Access

a. There should be a minimum six foot (6') wide clear perimeter around the edges of the roof. Exception: If either axis of the building is 250 feet or less, there should be a minimum four feet (4') wide clear perimeter around the edges of the roof.

11.7.2 Pathways should be established in the design of the solar installation. Pathways should meet the following requirements:

a. Should be over structural members capable of supporting firefighters accessing the roof.
b. Centerline axis pathways should be provided in both axis of the roof. Centerline axis pathways should run on structural members or over the next closest structural member nearest to the center lines of the roof
c. Should be straight line not less than 4 feet (4') clear to skylights and/or ventilation hatches

d. Should be straight line not less than 4 feet (4') clear to roof standpipes
e. Should provide not less than 4 feet (4') clear around roof access hatch with at least one not less than 4 feet (4') clear pathway to parapet or roof edge

11.7.3 Smoke Ventilation

a. Arrays should be no greater than 150 by 150 feet in distance in either axis
b. Ventilation options between array sections should be either:
   1. A pathway 8 feet (8') or greater in width
   2. 4 feet (4') or greater in width pathway **and** bordering on existing roof skylights or ventilation hatches
   3. 4 feet (4') or greater in width pathway **and** bordering four feet (4') x 8 feet 8' "venting cutouts" every 20 feet (20') on alternating sides of the pathway

11.8 Location of Direct Current (DC) Conductors

11.8.1 Conduit, wiring systems, and raceways for photovoltaic circuits should be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities.

11.8.2 Conduit runs between sub arrays and to DC combiner boxes should use design guidelines that minimize total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes are to be located such that conduit runs are minimized in the pathways between arrays.

11.8.3 To limit the hazard of cutting live conduit in venting operations, DC wiring should be run in metallic conduit or raceways when located within enclosed specs in a building and should be run, to the maximum extent possible, along the bottom of load-bearing members.

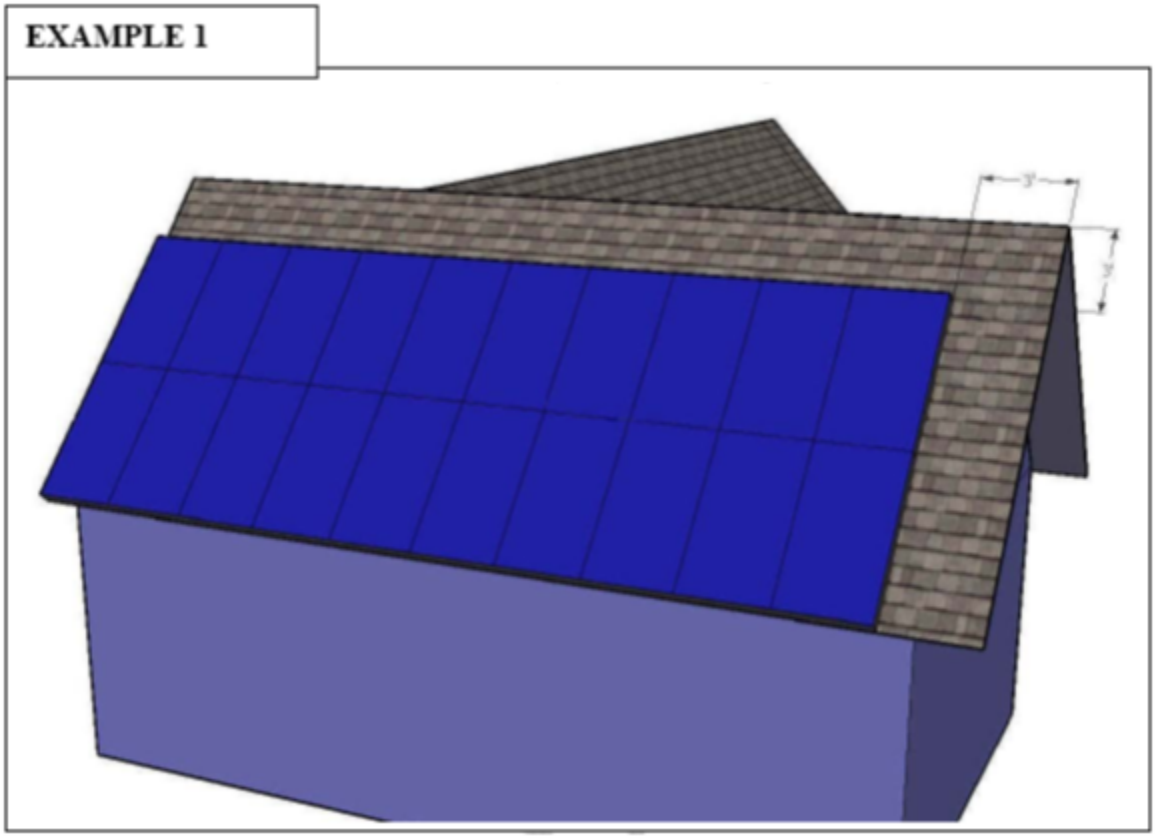
11.9 Non-Habitable Buildings

11.9.1 This guideline does not apply to non-habitable structures. Examples of non-habitable structures include, but are not limited to, parking shade structures, solar trellises, etc.

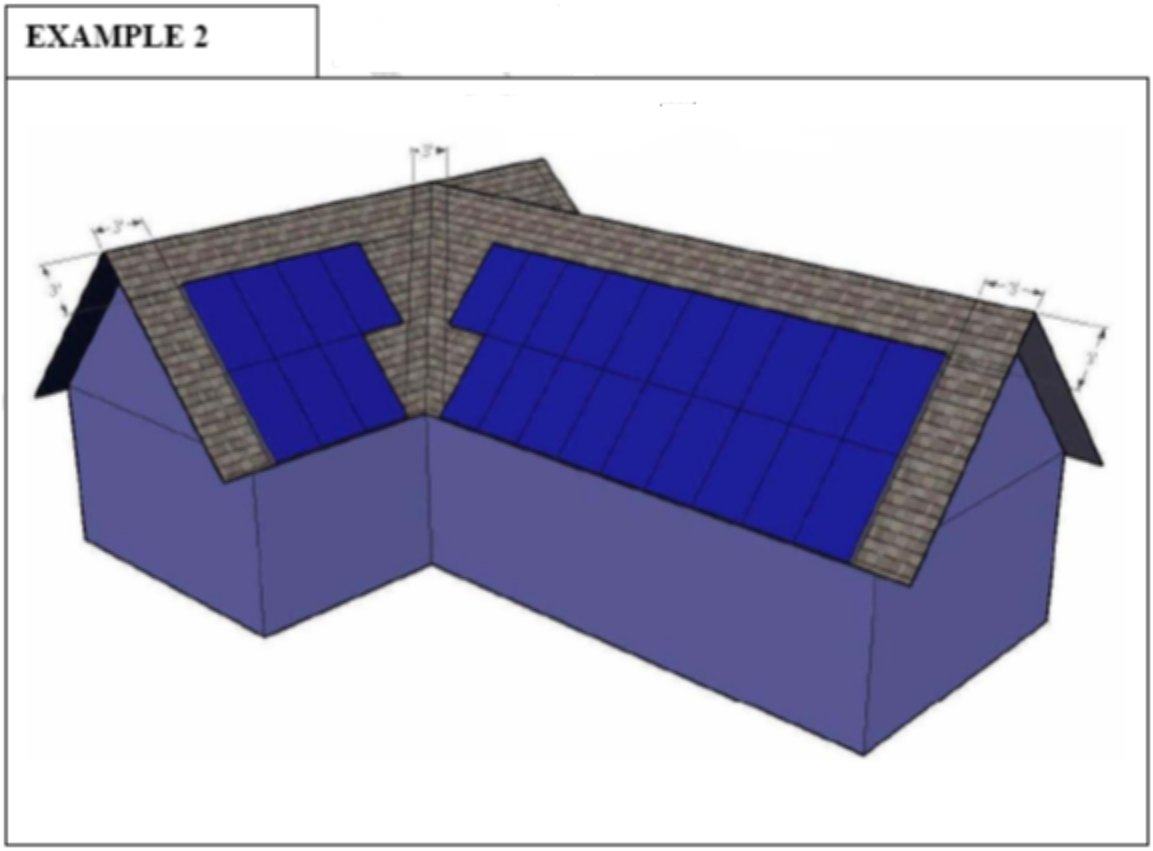
11.10 Ground Mounted Photovoltaic Arrays

11.10.1 Setback requirements do not apply to ground-mounted, freestanding photovoltaic arrays. A clear brush area of ten feet (10') is required for ground mounted photovoltaic arrays.

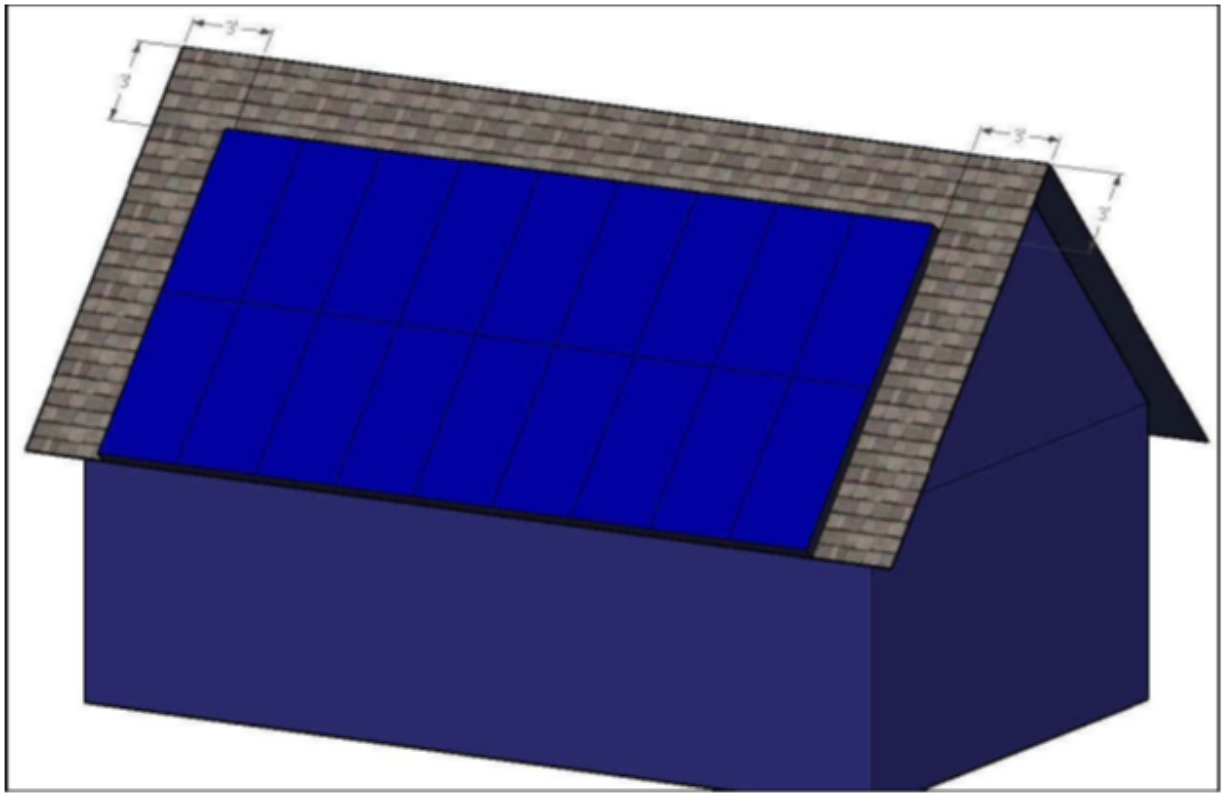
Examples of Photovoltaic Layouts



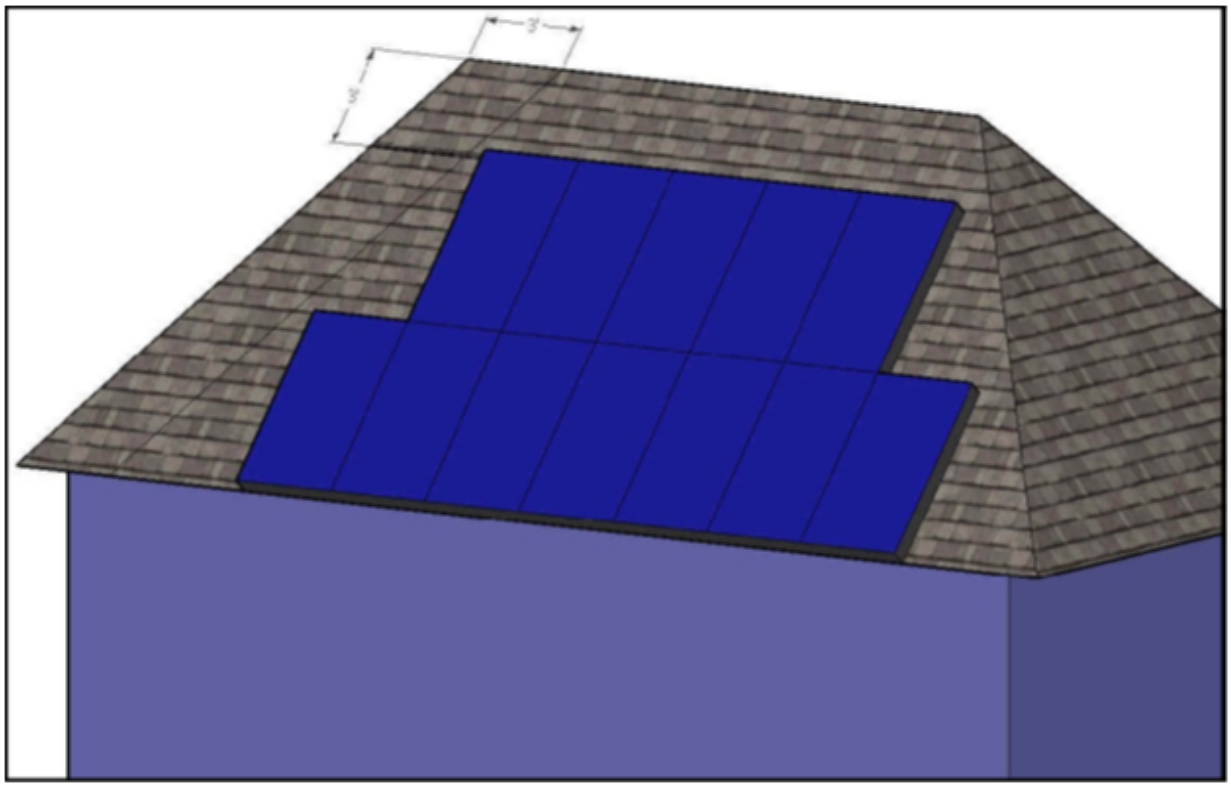
Example #1 Cross Gable Roof



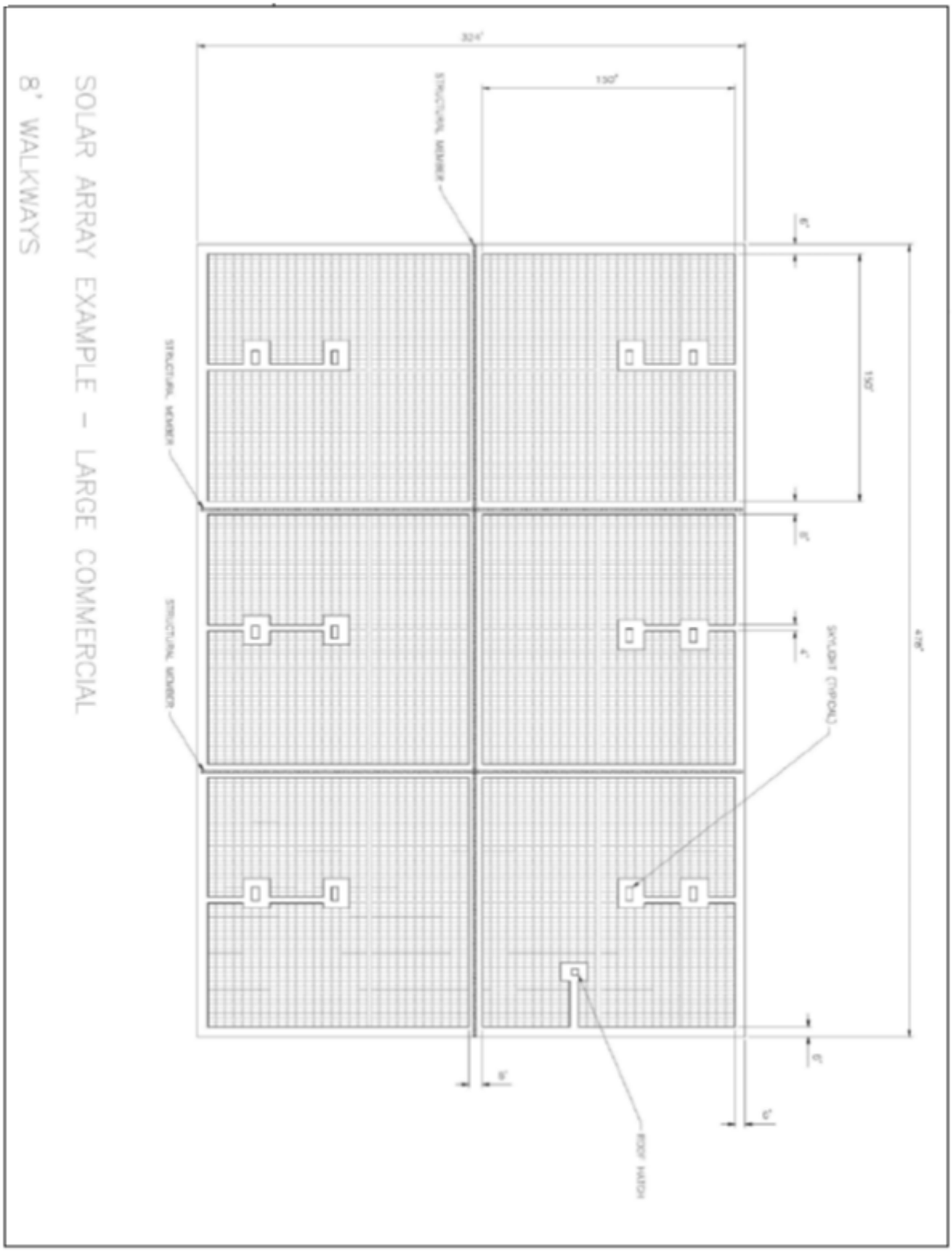
Example #2 Cross Gable with Valley

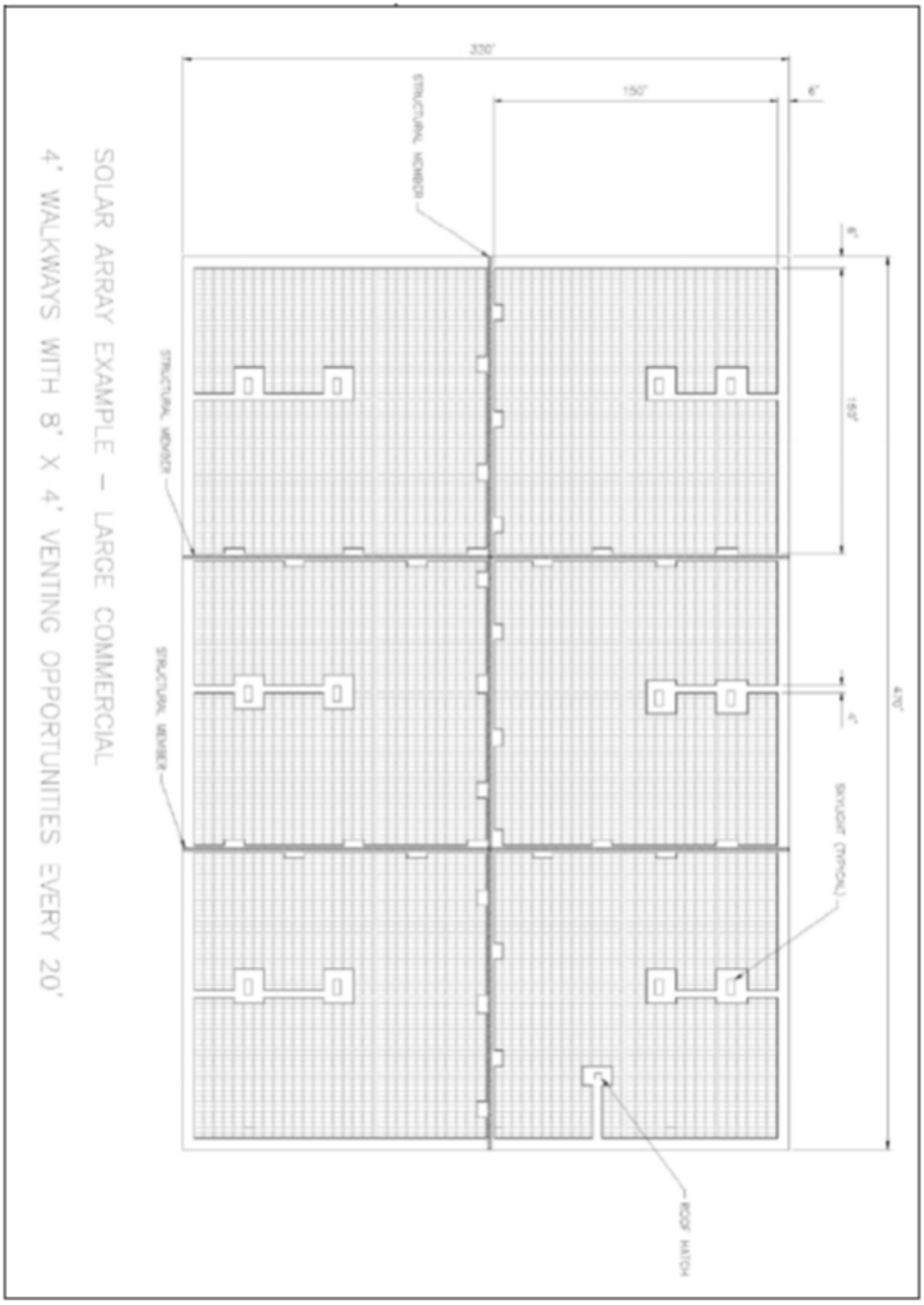


Example #3 Full Gable

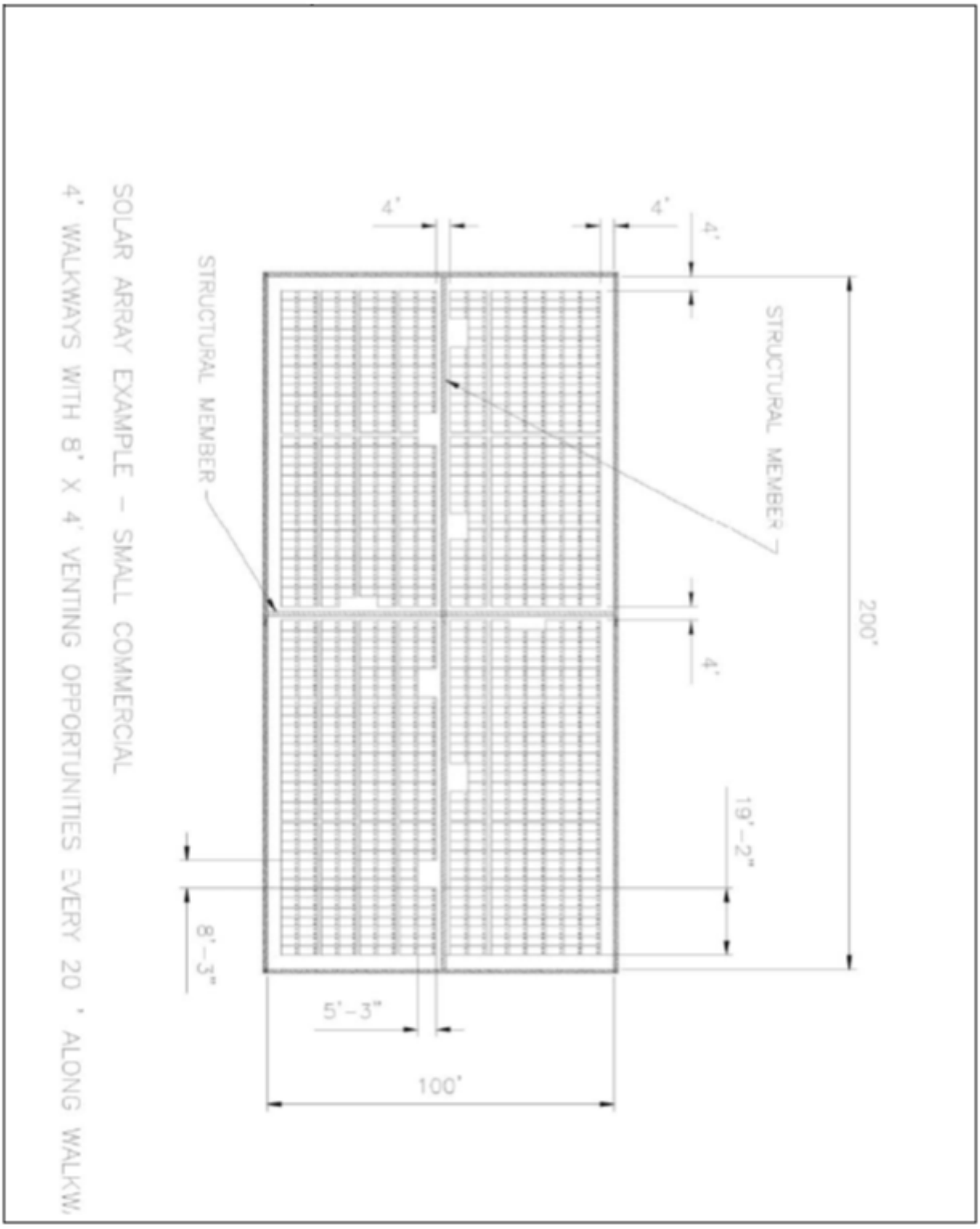


Example #4 Full Hip Roof

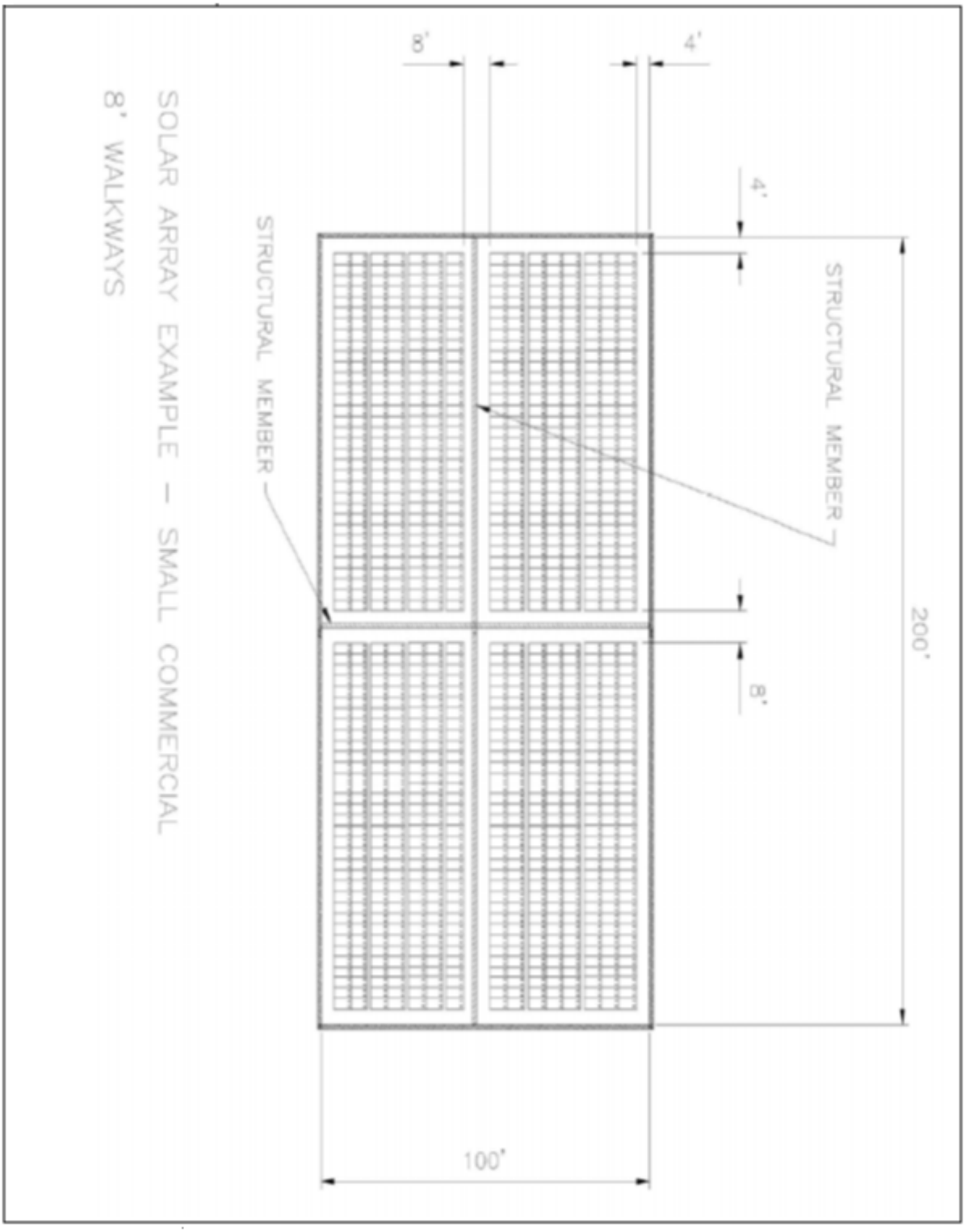

SOLAR ARRAY EXAMPLE – LARGE COMMERCIAL
8' WALKWAYS
324'
150'
STRUCTURAL MEMBER
STRUCTURAL MEMBER
STRUCTURAL MEMBER
SKYLIGHT (TYPICAL)
ROOF HATCH
8'
4'
4'
4


SOLAR ARRAY EXAMPLE – LARGE COMMERCIAL
4' WALKWAYS WITH 8' X 4' VENTING OPPORTUNITIES EVERY 20'
330'
150'
4'
STRUCTURAL MEMBER
8'
STRUCTURAL MEMBER
STRUCTURAL MEMBER
4'
470'
SKYLIGHT (TYPICAL)
ROOF HATCH

Example #6


SOLAR ARRAY EXAMPLE – SMALL COMMERCIAL
4' WALKWAYS WITH 8' X 4' VENTING OPPORTUNITIES EVERY 20 ' ALONG WALKW
STRUCTURAL MEMBER
STRUCTURAL MEMBER
4'
4'
4'
4'
200'
19'-2"
8'-3"
5'-3"
100'

Example #7


SOLAR ARRAY EXAMPLE – SMALL COMMERCIAL
8' WALKWAYS
8'
4'
4'
STRUCTURAL MEMBER
STRUCTURAL MEMBER
200'
8'
100'

Example #8

12.0 CANNABIS EXTRACTION FOR COMMERCIAL MANUFACTURING FACILITIES

The information contained within this guideline is provided to clarify how the Cathedral City Fire Department applies the California Fire Code (CFC) to cannabis extraction processes and equipment at manufacturing facilities licensed by the City of Cathedral City. Because every process and building differs, this guideline is not intended to identify or discuss every code requirement applicable and it is not intended to be a regulatory document; therefore, it is the responsibility of the persons performing these processes and/or otherwise responsible for the design or construction of extraction rooms, equipment, and operations to follow all applicable Codes and Standards as adopted by the City of Cathedral City. This guideline is based upon the 2016 California Fire Code.

12.1 Extraction Process Equipment

Extraction equipment, including equipment used for winterization or other oil refining processes, that use hazardous materials (i.e. flammable / combustible liquids, Carbon Dioxide (CO_2), liquefied petroleum gases (i.e. butane), etc.) are required to be listed or approved per CFC Section 2703.2.3.

12.1.1 Liquefied Petroleum Gas (LPG) and CO2 Extraction Equipment

a. Only closed-loop type LPG extraction equipment is permitted. Open blasting extractions or equipment that releases butane to the atmosphere during the extraction process is strictly prohibited.

b. Because there may not be listings (such as UL, ETL, etc.) available for compressed-gas extraction systems using hazardous materials, extraction equipment approval is required from the Cathedral Fire Department for use in the City of Cathedral City. To obtain equipment approval, an engineering report (signed and sealed by a licensed California engineer) must be submitted for approval. This approval report is required by CFC Section 104.7.2. It is the responsibility of the engineer to justify how the system meets the California Fire Code and any other national standards as a basis of design, including an analysis / description of every component of the system. Thus far, approved LPG (i.e. butane or propane) only closed-loop systems have been designed to applicable sections of NFPA 58. Open-blast LPG extractions are prohibited. In addition to the engineering report, an owners' operation manual must be submitted with specific instructions regarding proper use of the equipment and any safety provisions identified. Equipment may be submitted / approved either by a Master Engineering Report or a Site Specific Engineering report. Engineering reports can be submitted in hard copy, signed and sealed by the licensed design professional to the Cathedral City Fire Department at 32100 Desert Vista Rd. Cathedral City, CA 92234, attention - Fire Chief.

c. In addition to this engineering report approval process, if the extraction equipment uses electrical components, a National Recognized Testing Laboratory (NRTL) listing is also required in

addition to the engineering report certifying that the electrical components are compliant with appropriate electrical standards.

d. Site Specific Engineering Report: Site specific engineering reports can be submitted which approve extraction equipment exclusively to a location and specific equipment. A Plant Extraction Systems Operational Permit will be issued for final approval of the extraction equipment and use. Any modification of the equipment or relocation of equipment to a new address voids the equipment approval.

e. Master Engineering Report – For manufacturers of extraction equipment, a Master Engineering Report can be submittal for approval in lieu of submitting Site Specific reports for every address. Once approved, the report is retained by the Cathedral City Fire Department. Site specific approval letters are then provided by the report Engineer of Record certifying (by location address and serial number) that the equipment on-site meets the approved Master Engineering Report on file. Once this letter is received (and all other extraction room safety provisions are met), a Plant Extraction Systems Operational Permit will be issued for final approval of the extraction equipment and use. Any modification of the equipment or moving addresses voids the equipment approval. Request a Extractor Approval List document from the Cathedral Fire Department at fireinfo@cathedralcity.gov or (760) 770-8200 or for a list of manufacturers with approved Master Engineering reports.

12.1.2 Flammable liquid distillation or evaporative process equipment

There are numerous methods to perform distillation or evaporative extraction / refinement processes. In general, electrified equipment used in these processes are required to be listed by a National Recognized Testing Laboratory (NRTL) for their intended use and are required to be operated within the manufacturer's guidelines. Equipment such as rotary evaporators are typically listed for distillation processes. Where distillation stills or heated evaporation processes are performed, the heating source shall be listed as explosion-proof (i.e. rated for the electrically classified location) unless it can be shown that the equipment has been tested during its listing to heat flammable liquids without the explosion-proof classification. Approval of the proposed process equipment must be submitted during construction permitting review.

12.1.3 Vacuum Ovens

Vacuum ovens shall not be used to process volatile gases (i.e. alcohol/oil mixtures, oil containing off-gassing LPG, other flammable liquids, etc.) unless the vacuum oven is rated to process these vapors (typically an explosion-proof classification). It is the responsibility of the extraction process operator to ensure the material being introduced into the oven does not contain volatiles. All vacuum ovens shall be listed by a NRTL.

12.1.4 Refrigerators

Refrigerated storage or processing of flammable liquids including oil-laden with flammable liquids must only use refrigerators/freezers rated to store flammable liquids. At minimum, a “Lab-Safe” or “Flammable Safe” rated refrigerator/freezer must be used. Residential type refrigerators are not rated by the manufacturer for flammable liquid storage or processing. See National Fire Protection Association (NFPA) 45 for further information regarding refrigerators used for flammable liquid storage.

12.2 Extraction Room Construction, Gas Detection, Exhaust, & Electrical Systems

12.2.1 Room Construction

a. Extraction rooms are required to be located in a room dedicated to the extraction process. There must be no other equipment within the room (i.e. refrigerators, cooking appliances, electrical panels, computers, cell phones, etc.) that is not associated with the extraction process. Additionally there must be no penetrations into the room that are not essential for the extraction process (i.e. gas lines, HVAC systems, plumbing, etc.).

b. Rooms are to be of continuous, noncombustible, and smooth construction, and room finish should also consider California Department of Public Health requirements for cleaning purposes. Booths constructed in compliance with flammable finish requirements of CFC Chapter 24 will be accepted as meeting these construction requirements. Acoustic-type drop ceilings that could conflict with large LPG extraction exhaust systems will not be permitted. Hand sinks and eye wash stations (if required by other Codes) can be located in the room.

c. Doors to the extraction room using hazardous materials (i.e. CO2, LPG, or flammable liquids) must swing in the direction of egress, be self-closing/latching, and be provided with panic hardware.

d. Post oil processing typically uses small volumes of flammable liquids and may be performed outside of a dedicated extraction room. This process can typically be performed under a bench-top chemical fume hood.

12.2.2 Suppression Systems

a. An LPG extraction room, booth, or hood is required to be provided with an automatic fire suppression system in accordance with CFC Chapter 9. A suppression system is also required in a flammable liquid extraction room, booth, or hood where vapors are released exceeding 25% of the lower flammable limit (LFL). No suppression systems are required in CO2 extraction rooms. Where the building is required to be fire sprinkled, the sprinkler system shall be extended to the room, booth, or hood. Where the building is not required to be fire sprinkled, an alternative suppression system must be provided in accordance with CFC Section 904.

b. These extraction room requirements are not applicable to water extractions, kief production rooms, food-based extractions, or other extraction processes not using hazardous materials.

12.2.3 LPG Extraction Process Gas Detection Systems

a. There are two forms of flammable gas detection required in LPG extraction areas: fixed continuous flammable gas detector serving the room, hood, or booth and a portable flammable gas detector. The intent of these types of flammable gas detection systems within LPG extraction areas is twofold: for alerting the extraction process operator(s) that the area is at or above 10% of the lower flammable limit (LFL) and for the extraction process operator(s) to specifically identify potential leaks during the extraction and additionally to determine when oil and spent plant material is finished off-gassing and is safe to be removed from the extraction area.

b. The fixed detector must be installed in accordance with the manufacturers' guidelines and depending on the size and configuration of the room, booth, or hood, additional detectors may be required. The fixed detection alarm is a local alarm only and does not require off-site monitoring and does not require full occupant notification of the building or extraction room (including ADA visual notification) as a fire alarm system may require. Fixed detection is to alarm at 10% of the lower flammable limit (LFL). The method of alerting the extraction operator (audible / visual notification) is based on the type of the gas detector chosen. Some detectors have integrated visual alarms only that can be accepted when installed within clear view of the extraction operator; i.e. at eye level with the sensor extended to the floor. Otherwise, a remote visual or audible local alarm can be accepted.

12.2.4 LPG Extraction Exhaust Systems

a. A hazardous exhaust system is required to be installed in accordance with the Mechanical Code for extraction processes using LPG. There are many different ways to design a hazardous exhaust system including fume hoods, walk-in hoods, booths, and exhausted rooms. There are manufacturers of booths and hoods that meet this requirement in a complete off-the-shelf package. Exhaust systems can also be built specifically to suit the needs of a location or process; however, no one system is dictated by the Fire Code. The engineer of record must design and/or specify a system to meet the minimum requirements of a hazardous exhaust system.

b. The intent of the exhaust system provided is to be designed with capture and containment velocities across the work area (International Mechanical Code 510.5.4) as typically seen with other industrial or laboratory processes using hazardous materials. There are several work areas that must be considered in this design and may be different for each extraction equipment

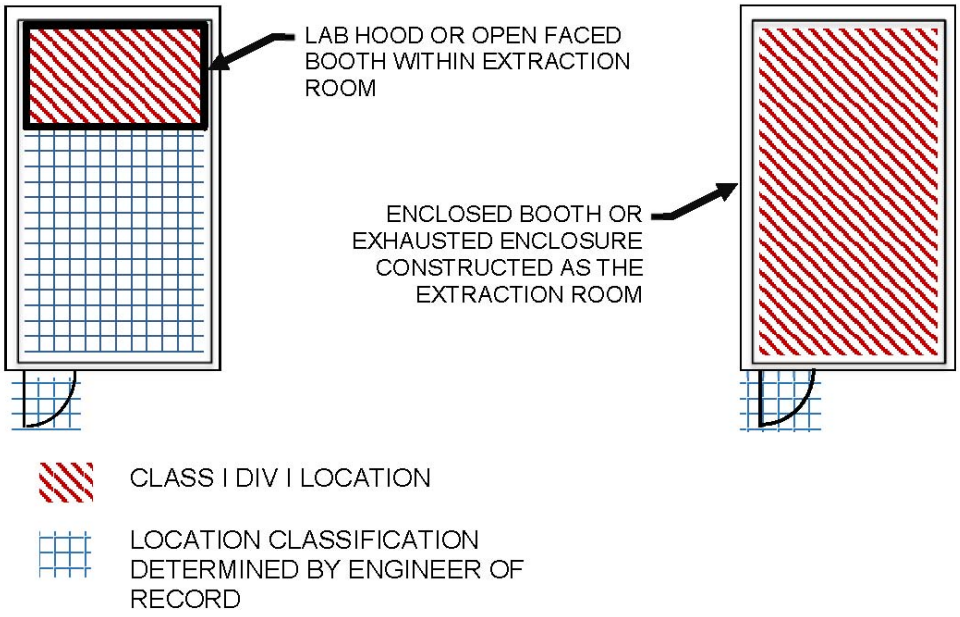
manufacturer. The extraction process equipment location, the location of oil retrieval, and the location of LPG-laden plant material removed from the extraction equipment for degassing are all work areas that are intended to be provided with exhaust system capture and containment velocities. The assumption that a "closed-loop" system does not release LPG into the atmosphere will not be accepted as a basis in the design of these exhaust systems, since all extraction systems must be opened at some point in the process with vapor released. It is recommended that the **American Conference of Governmental Industrial Hygienists (**ACGIH) Industrial Ventilation Handbook be consulted for exhaust system and capture and containment velocity design.

12.2.4 LPG Extraction Electrical Systems

a. The location of the LPG extraction process must be considered a Class I Division I location in accordance with the National Electric Code (NEC); depending on the type of exhaust system provided, this could be the entire room or the area inside of a hood or booth. This Class I Division I requirement was based on flammable gas metering of several extraction processes, all of which exceeded minimum LFLs during equipment opening for oil retrieval and removal of LPG-laden plant material in addition to other known equipment and accidental process failures releasing LPG. Flammable gasses are present during normal extraction operations, therefore this location meets the definition of a Class I Division I location per the NEC.

b. The location adjacent to the Class I Division I location must be classified by the design engineer (i.e. doors to the extraction room, hoods opening into the extraction room, etc.). This is dependent on the type of exhaust system provided and the room configuration. Normally, adjacent locations are Class I Division II; however, the NEC does not define a required distance that an "adjacent location" must be from the Class I Division I location in order to be classified as a Class I Division II location. The NEC defines Class I Division II as a location where flammable vapors could be present from accidental rupture or breakdown of containers. Therefore, this location classification should be established on a total extraction equipment failure. This classification has been intentionally left to the determination of the responsible engineer since many factors can influence this area, such as mechanical exhaust sizing, total LPG within the extraction equipment, etc.

Typical LPG exhaust types and the associated NEC location classification is illustrated below:



c. Based on the Class I Division I location, all equipment in the extraction room must be rated for use in Class I Division I locations. This includes lighting, power receptacles, vacuum pumps, recovery pumps, and any other electrical equipment in the room. The need for explosion-proof rated equipment can be minimized. Lighting located behind a vapor-tight glazing panel outside of the extraction room/booth is not required to be classified as Class I Division I; this concept is similar to flammable finish spray booth lighting systems. Other extraction process support systems such as air compressors to drive recovery pumps, heated / chilled water circulation pumps, vacuum air systems, etc. can all be located outside of the Class I location and piped into the process area. Where electrical equipment is needed, it must be rated for the Class I location in which it is installed in.

d. To reduce the possibility of spark from static discharge, all metal objects including ductwork, hand sinks, water piping, etc. must be grounded / bonded in accordance with the NEC. This will also require the extraction equipment to be grounded / bonded.

e. The room lighting and room power receptacles (where provided) are required to be interlocked with the exhaust system such that the room power and lighting will not operate without the exhaust system running. Power serving room flammable gas detectors is not required to be part of this interlock requirement.

12.2.5 Flammable Liquid Extraction & Post Oil Processing Gas Detection Systems

None Required.

12.2.6 Flammable Liquid Extraction & Post Oil Processing Exhaust Systems

For the purposes of this section, exhaust system requirements for extraction processes using flammable liquids are also required for post oil processing using flammable liquids. Post oil processing is an oil refining or winterization process occurring after the initial extraction is completed.

There are many different methods available to perform flammable liquid extractions as well as a variety of equipment available; therefore, all processes cannot be described in detail within this guideline. Generally, these processes can be grouped into two categories; distillation extractions where most of the flammable solvent is recollected OR a heated boil-off (evaporative) process where flammable liquid is evaporated to the atmosphere without recollection.

a. A hazardous exhaust system is required complying with International Mechanical Code (IMC) Section 510 for flammable liquid processes exceeding 5 gallons. These typically include boil/evaporative processes, distillation processes, and flammable liquid plant wash processes. This exhaust system is intended for larger processes where dispensing of flammable liquids also occurs in greater volumes, flammable liquid laden plant material is removed from equipment and/or vapors are present from heated extraction processes. The exhaust system must provide capture and containment velocity across the work area per IMC Section 510.5.4 and is typically provided in the form of a standard lab-type exhaust hood. It is suggested that the ACGIH Industrial Ventilation Handbook be consulted for exhaust system and capture velocity design.

b. Distillation process using less than 5 gallons are to be performed under a chemical fume hood designed to contain fumes within the hood and exhaust them to the exterior. This system does not have the duct gauge thickness and other requirements of a full hazardous exhaust system. This exhaust system is typically for smaller bench-top type of distillations and also small flammable liquid dispensing volumes.

c. Listed solvent distillation units complying with CFC 5705.4 are not subject to these exhaust system requirements.

12.2.7 Flammable Liquid Extraction & Post Oil Processing Electrical Systems:

For rooms, booths, or hoods containing flammable liquid extraction or post oil processes, the electrical location classification must be specified by the responsible licensed design professional. It is expected that this classification is included on building permit drawings and that supporting information is submitted justifying how the location classification was determined. Because there are numerous methods of performing flammable liquid extractions, the process must be evaluated and the classification determination must be established by the licensed design professional. Note that the licensed design professional must consider

not only the process equipment, but also the dispensing (i.e. filling and removal) of flammable liquids, soaking (i.e. plant wash) material in open containers, and the removal of plant material saturated with flammable liquids, because these operations may have an impact on the location classification.

Also see section I.B of this guideline for further information.

12.2.8 CO2 Extraction Process Gas Detection Systems

A fixed continuous CO2 detection system is required within CO2 extraction rooms set to alarm at 5000 ppm. This system is a local alarm only and is not required to be monitored off site. The system is intended to alert the extraction operator of a potential asphyxiation hazard. There is no requirement to alarm the building nor to have ADA compliant visual notification as typically required for fire alarm systems.

12.2.9 CO2 Extraction Exhaust Systems & Electrical Systems

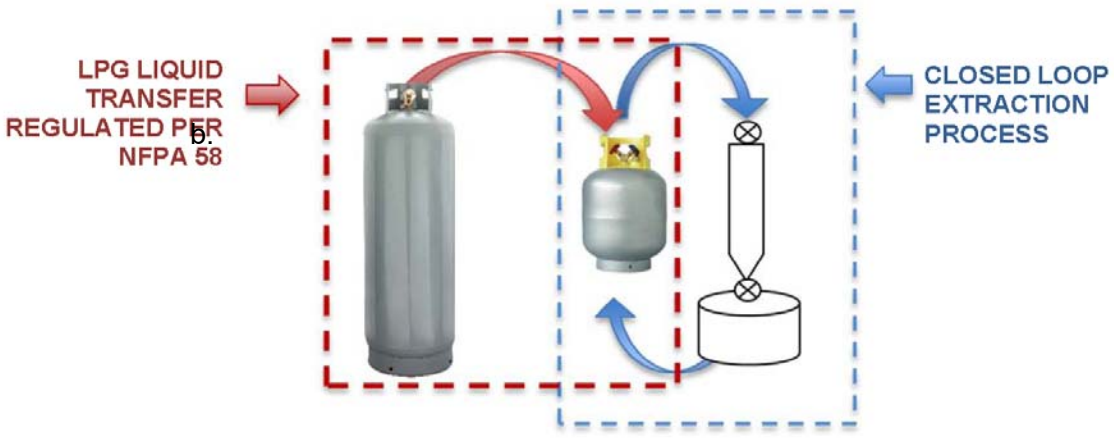
a. CO2 extraction equipment is required to have releases of CO2 piped to the exterior. Stored cylinders shall be secured to a fixed object to prevent falling. See CFC Chapter 53 for compressed gas storage requirements.

b. There are no further exhaust system or electrical requirements above ordinary requirements of the California Building Code.

12.3 Filling LPG Extraction Equipment

12.3.1 Filling LPG Extraction Equipment

a. Although manufacturers may use different terminology, extraction equipment includes an LPG solvent tank (i.e. a local system supply tank) which is filled with LPG and supplies the extraction equipment and this same tank is also used to reclaim LPG after the extraction. The approval for closed loop LPG extraction equipment discussed in Part I of this document approves only the closed loop system. Filling the LPG solvent tank from a bulk tank (i.e. typically a 100# tank) is not included in the extraction equipment approval and is regulated per NFPA 58 as LPG liquid transfer. This delineation is depicted below:



b.

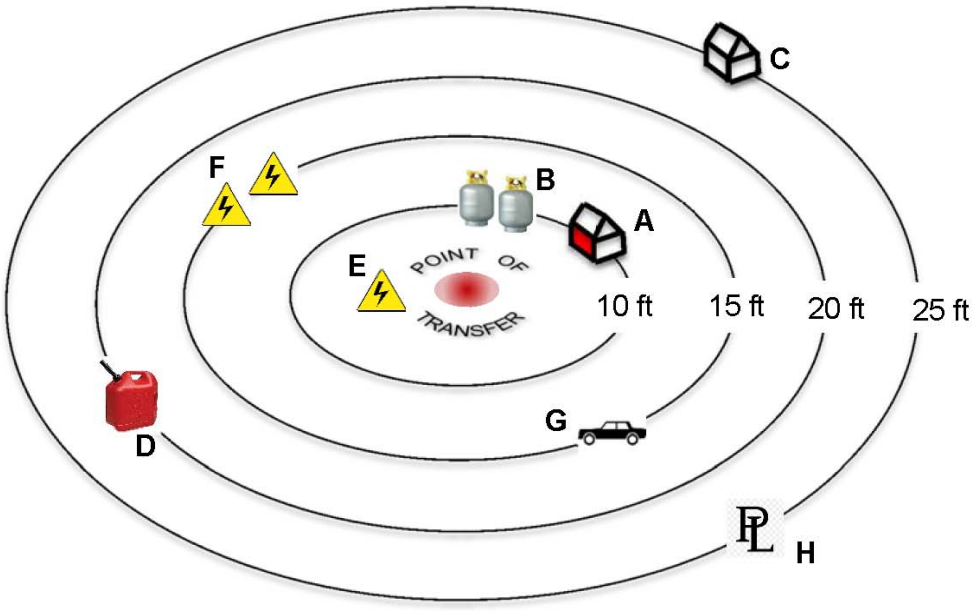
b. Filling the solvent tank is regulated as LPG liquid transfer under NFPA 58 and must be conducted outdoors. Indoor filling and/or indoor filling from piped LPG liquid systems may be conducted indoors where the room and process has been designed in accordance with NFPA 58, notably Chapter 10; the requirements of this chapter are stringent and will not be discussed herein due to their complexity. Where performed, this process is included in the Plant Extraction Systems operational permit issued; information on LPG liquid transfer must be included at this time of permit application.

c. LPG liquid transfers using lighter refill-type containers using can taps or other puncture equipment is prohibited.

d. The following is a summary of requirements from NFPA 58:

   i. Personnel conducting liquid transfer operation shall be trained in LPG filling (recertified every 3 year). Documentation of training shall be available (NFPA 58-7.2.1)
   ii. Public access to the filling location must be restricted (i.e. fenced area)
   iii. The filling location must be located 15’ from combustion engine use; i.e. vehicle parking. All ignition sources shall be shut off. The location may be located against a noncombustible building wall without openings
   iv. Electrical equipment is required to be Class I Division I within 5’ and Class I Division II within 15’ of filling operations.
   v. Where heating blankets are used, they must be listed for use in explosive environments. An electrical permit is required for any circuits being extended to the filling location.
   vi. Where scales are used for weighing containers, they shall be Class I Division I listed or be of the mechanical type.
   vii. Smoking, portable lighting, portable electric tools, etc. shall not be in use within 25’ of the filling operation.
   viii. Purging of tanks may be performed at the tank filling location in accordance with NFPA 58. The tank must be rapidly dispersed in the atmosphere, where environmental conditions do not allow rapid dispersal (i.e. wind conditions, site conditions such as neighboring buildings on lot lines not allowing adequate natural ventilation, etc.). LPG must be flared using a method in compliance with NFPA 58.

ix. The NFPA 58 separation distances from the trans-filling location are illustrated below:



A. Buildings with 1HR fire rated exterior wall
B. LPG Containers in Storage
C. Buildings with non-fire rated exterior wall or building openings
D. Flammable / combustible liquid storage
E. Class I Division I electrically classified area within 5’ of transfer
F. Class I Division II electrically classified area
G. Vehicle traffic
H. Property Line that can be built upon