

SANTA ROSA FIRE DEPARTMENT

FIRE PREVENTION BUREAU PLAN REVIEW CHECKLIST

July 1, 2010



CARBON DIOXIDE SYSTEM

Address:		Permit #:
Inspector:	Date:	Status:
Inspector:	Date:	Status:
A-Approved; AC-Approved w/comments; I-Incomplete; D-Denied		

This Checklist outlines general requirements. Information contained herein applies to typical instances and may not address all circumstances.

REFERENCES:

- 2007 California Fire Code (CFC) Chapter 3, Chapter 9 (901.5), Appendices B and C and local ordinance requirements
- NFPA 12, 2007 Edition

FILE REVIEW

General

- | | Y | N | |
|----|--------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------|
| 1. | <input type="checkbox"/> | <input type="checkbox"/> | Permit fees entered in Permits Plus. 3 rd or greater checks require an hourly fee for the review. |
| 2. | <input type="checkbox"/> | <input type="checkbox"/> | Three (3) sets of scaled plans and specifications |
| 3. | <input type="checkbox"/> | <input type="checkbox"/> | Contractor shall provide, or have on file, a current Contractor's License. |
| 4. | <input type="checkbox"/> | <input type="checkbox"/> | Worker's Compensation Insurance certificate. |
| 5. | <input type="checkbox"/> | <input type="checkbox"/> | Current Santa Rosa Business Tax Certificate. |
| 6. | <input type="checkbox"/> | <input type="checkbox"/> | Name and address of project |
| 7. | <input type="checkbox"/> | <input type="checkbox"/> | Contractor's name, address, and telephone number. |

Reference numbers following worksheet statements represent an NFPA code section unless otherwise specified.

DETAILS OF THE SYSTEM

CO₂ System Design Information:

- 8. Type of system: flooding or local application; pre-engineered or engineered; high or low pressure.
- 9. Pre-engineered CO₂ system layout meets manufacturer's listing requirements and a design specification manual is provided.

Plan Review Checklist
C02 Extinguishing System

10. **Y** **N** Type of hazard protected and agent quantity, 1-5.2, 1-9.

General

11. Volume of area protected: _____ cu. ft., if area above the ceiling is not included then drop ceilings shall be secured in place.
12. Volume of CO₂ _____ percent, which includes a 20 percent safety factor, is adequate for the hazard, and the concentration level for surface fires is not less than 34 percent, 2-3.2. Concentration level calculations for surface fires, enclosed or unenclosed areas are provided, 2-2.1.1.
13. Concentration level calculations for deep-seat fires, enclosed or unenclosed areas are provided, 2-4.4.
14. Calculations: provide nozzle flow rate and orifice size and coverage area, pipe lengths/type and equivalent pipe lengths, gas storage temperature, reference points, gas quantity, volume of the area protected, 3-4, 3-5.
15. High pressure system design quantity shall be increased by 40 percent, 3-3.1.1.
16. Discharge time for local application is 30 seconds, 3-3.3.
17. Discharge time within 60 seconds for surface fires, 2-5.2.1
18. Discharge time for high pressure system is calculated as required by 3-2.3.
19. Discharge time for deep seated fires shall be within 7 minutes and 30 percent concentration within 2 minutes, 2-5.2.3.
20. Pressure relief venting calculations are provided unless venting is not necessary, 2-6.2.
21. Local Application: Rate by area calculations are provided for flat surfaces or low-level hazards, 3-4.
22. Local Application: Rate by volume calculations are provided for 3-D irregular objects, 3-5.1.

OPERATING DEVICES, CONTROL DEVICES AND ALARMS (1-7, 1-8):

23. Devices are listed for their use and specification sheets are provided.
24. Detail location of emergency release, manual pull device, 1-7.3.5
25. Automatic detection and actuation shall be used, 1-8.1.1.
26. Manual pull device is distinct in appearance and not more than 4 ft. above the floor, note or detail, 1-8.3.4.
27. Automatic fuel or power shutoff is provided, see exception, 1-8.3.8.
28. Predischage alarms or indicators for system operation are provided, 1-8.5
29. Audible and visual pre-discharge alarms are provided, 1-8.5.
30. Abort switches are not permitted, 1-8.3.10.

Plan Review Checklist
CO2 Extinguishing System

- | | Y | N | |
|-----|--------------------------|--------------------------|--------------------------------------------------------------------------------------------------|
| 31. | <input type="checkbox"/> | <input type="checkbox"/> | A "lockout valve" for the system is provided, 1-6.1.7 |
| 32. | <input type="checkbox"/> | <input type="checkbox"/> | Alarms indicating failure of supervised devices or equipment are provided and detailed, 1-8.5.3. |

General

- | | | | |
|-----|--------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 33. | <input type="checkbox"/> | <input type="checkbox"/> | Pre-discharge alarm is provided when a hazard to personnel exists, 1-8.5 and sound pressure levels shall be 15 dBA above ambient or 5 dBA above maximum noise level, 90 dBA is minimum. |
|-----|--------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

PIPING, FITTINGS, VALVES AND NOZZLES:

- | | | | |
|-----|--------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 34. | <input type="checkbox"/> | <input type="checkbox"/> | Sizes, type of material, pipe schedule, ASTM specifications, fittings, valves, and nozzle listing data and working pressure ratings are provided, 1-10. |
| 35. | <input type="checkbox"/> | <input type="checkbox"/> | Sections of closed piping are equipped with pressure relief devices, 1-10. 2.2. |
| 36. | <input type="checkbox"/> | <input type="checkbox"/> | Method of securing pipe is detailed, 1-10.2. |

MISCELLANEOUS:

- | | | | |
|-----|--------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------|
| 37. | <input type="checkbox"/> | <input type="checkbox"/> | Detail location of warning and instruction signage at entrances and inside the protected area, 1-6.1.2. |
| 38. | <input type="checkbox"/> | <input type="checkbox"/> | Agent containers are close to or within hazard area and are approved for that use, 1-9.4. |
| 39. | <input type="checkbox"/> | <input type="checkbox"/> | Location of agent storage containers is accessible, 1-9.4 |
| 40. | <input type="checkbox"/> | <input type="checkbox"/> | Storage container securing system is detailed for manifolded systems, 1-9.4. |
| 41. | <input type="checkbox"/> | <input type="checkbox"/> | Nozzle specification sheet for proper application and installation is provided, 1-10.4. |
| 42. | <input type="checkbox"/> | <input type="checkbox"/> | Protected area or room is properly sealed and so noted on plans, 2-2.2 |
| 43. | <input type="checkbox"/> | <input type="checkbox"/> | Forced-air ventilation is designed to be shutoff if its operation may affect the performance of the system, 2-2.2.2. |
| 44. | <input type="checkbox"/> | <input type="checkbox"/> | Nozzle coverage areas are in accordance with the criteria established for the specific hazard, 3-4.3, 3-4.4. |

SIGNS

NFPA12 Section 4.3.2

- | | | | |
|-----|--------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 45. | <input type="checkbox"/> | <input type="checkbox"/> | Warning signs shall be affixed in a conspicuous location in every protected space; at every entrance to protected spaces; in spaces near the protected spaces where it is determined that carbon dioxide could migrate, creating a hazard to personnel; and at each entrance to carbon dioxide storage rooms and where carbon dioxide can migrate or collect in the event of a discharge from a safety device of a storage container. |
| 46. | <input type="checkbox"/> | <input type="checkbox"/> | Safety signs and message wording shall be provided using the three-panel format as required by 4.3.2.3.1 through 4.3.2.3.6. |

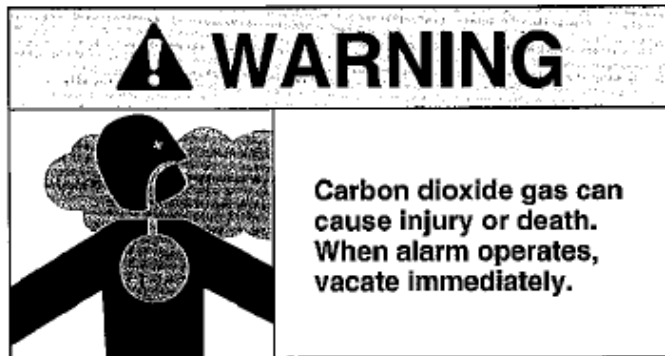


Figure 4.3.2.3.1 Sign on every protected space

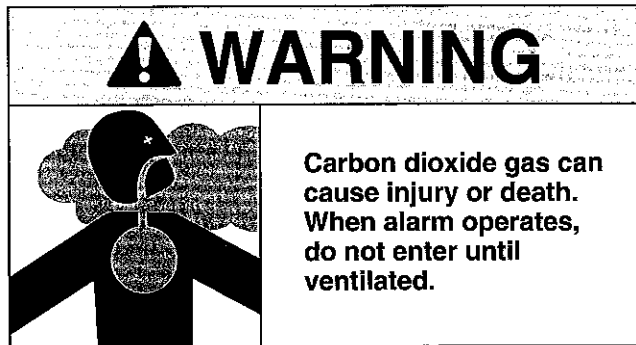


Figure 4.3.2.3.2 Sign in every entrance to protected spaces.

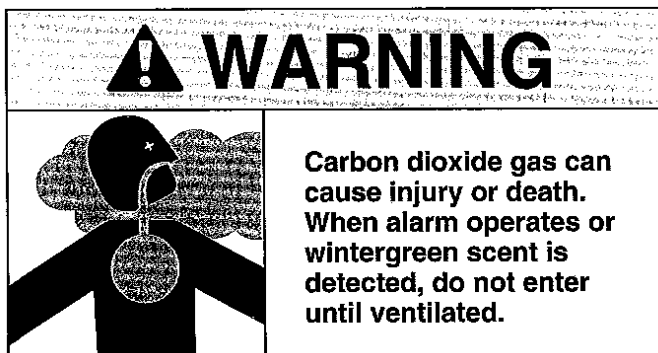


Figure 4.3.2.3.3 Sign at every entrance to protected space for systems provided with a wintergreen odorizer.

Figure 4.3.2.3.4 Sign in every nearby space where carbon dioxide could accumulate to hazardous levels.

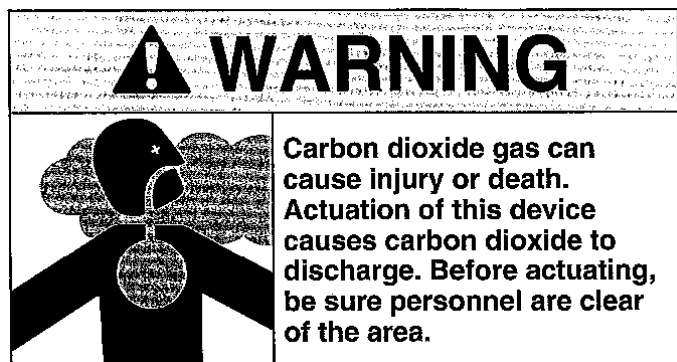
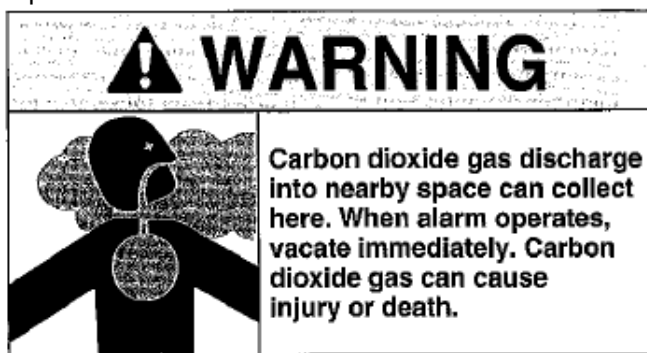


Figure 4.3.2.3.5 Sign outside each entrance to carbon dioxide rooms.

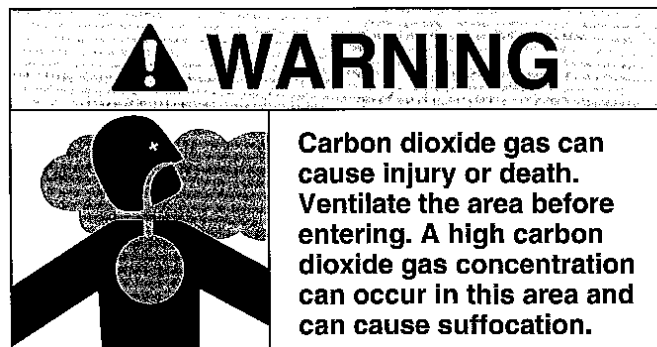


Figure 4.3.2.3.6.2 Sign at each manual dioxide storage actuation station.

EVACUATION PROCEDURES NFPA 12 Section 4.3.3

47. **Y** **N** An established and working evacuation procedure shall be developed and implemented.