

<p>July 1, 2010</p>	<p>SANTA ROSA FIRE DEPARTMENT FIRE PREVENTION BUREAU STANDARD</p>
	<p>EXPLOSIVES and BLASTING</p>

PURPOSE

This standard outlines the general requirements for the manufacture, possession, storage, retail or use of explosive materials. Information contained herein applies to typical instances and may not address all circumstances.

CODE REFERENCES

2007 California Fire Code (CFC) Chapter 33
California Code of Regulations (CCR) Title 19 Chapter 10
National Fire Protection Association (NFPA) 495, 2006
Santa Rosa City Code (SRCC) Chapters 18-44

PERMIT(S) REQUIRED

An Explosives/Blasting permit is required. The permit application, plan, and documentation must be submitted to the Fire Department a minimum of ten (10) days prior to the blast date. Categories and fee amounts are found at:

<http://ci.santa-rosa.ca.us/doclib/Documents/IB%20018.pdf>

ATTACHMENTS

- 1) Plan Review Checklist – Explosives/Blasting NFPA 495
- 2) Inspection Checklist – Explosives/Blasting NFPA 495

REQUIRED INSPECTIONS

- 1) Initial Inspection – NFPA 495, Section 10.2 . The initial Fire Department inspection consists of observing pre-blast procedures and verifying safety measures are carried out.
- 2) Post Blast Inspection - NFPA 495, Section 10.4 The Fire Department Inspection consists of observing post blast procedures and verifying compliance with detonation and demobilization.

Inspections shall be scheduled a minimum of 48 hours in advance. Directions for scheduling are found at: <http://ci.santa-rosa.ca.us/news/Pages/AutomatedFireInspectionRequestSystem.aspx>

PERMIT INFORMATION

Working plans shall be submitted for approval to the Santa Rosa Fire Department for any explosive/blasting use. A completed Permit and Plan Review Application Form and fee shall be submitted along with not less than three (3) sets of plans and calculations as required. A Santa Rosa Tax Certificate, current appropriate contractor's license and proof of worker's compensation insurance shall be provided or shall be on file at the time of application. Any deviation from plans, as submitted, requires Fire Department approval. Plans shall include the information specified below, failure to provide all of the required information may result in the plans being rejected. Rejected plans will be returned with a Plan Review Correction Form. Review the form and make the required additions/

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changes which shall be clouded for identification. Provide a legend to describe the addition or change. Allow ten (10) working days for review of submitted plans.

Working plans shall be drawn to an indicated scale, on sheets of uniform size, with a plan of the entire site and shall contain the following data:

- Name of owner and occupant
- Location, including street address
- North arrow
- The purpose for blasting operation(s).
- The date and time of requested blasting operation(s).
- Site specific drawing(s) indicating location(s) of blasting with respect to utility lines, both aboveground and underground, or utility rights-of-way, structures, public rights-of-way, and other hazards. Drawing(s) shall be to scale.
- Notification of neighboring residents and/or occupants is required as further defined herein. Identify the notification locations, including street addresses, and method(s) of notification.
- The depth of hole(s) and drill specifications.
- The type of explosive(s).
- The type of initiating device(s).
- The quantity of explosive for each load and the aggregate quantity of explosives on the job site.
- The detonation specifications relative to series and lapses.
- Safeguard(s) (including seismograph, etc.).

The following documentation shall be provided at the time of permit application to the Fire Department to be retained on file:

- An appropriate and current blasters license issued by the State of California, Department of Industrial Relations, Division of Occupational Safety and Health Administration, Mining and Tunneling Unit.
- An active contractors' license issued by the State of California Contractors' State License Board. (A - General Engineering with or without C-61 / D09 - Specialty Blasting)
- A current Explosive Permit issued by the Sonoma County Sheriffs' Department.
- A Certificate of Eligibility issued by the State of California, Department of Justice, Bureau of Criminal Information and Analysis (CPC 12071).
- A certificate of Workers' Compensation Insurance identifying employers' liability limit at a minimum of (one-million-dollars) \$1,000,000.00 per occurrence.

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- A certificate of current liability insurance with a minimum single limit at one-million-dollars (\$1,000,000.00).

MULTIPLE BLASTS AT ONE SITE

For blasting purposes, a permit may be issued for the blast site and not necessarily the blast date as approved by the Fire Department. This eliminates the need for multiple permits and inspections at one location. If this is approved, separate notification and request for subsequent blasts at a currently permitted site must be made in writing and submitted to the Fire Department a minimum of 24 hours in advance of blasting. The written notification and request for blasting must include the site location, the permit number, the contractor and/or blaster's name, telephone number, cellular phone number or pager, the company's name, telephone number, and address, the number of blasts, the amount and type of explosive(s), the type of initiation, and notification procedures for neighboring residents or occupants. A Fire Department inspection may be required.

BASIC REQUIREMENTS

1. Blasting shall be conducted during daylight hours (19 CCR 1568.6). A special permit is required for blasting outside of normal work days (Monday through Friday) and hours (8:00 a.m. to 5:00 p.m.) and is subject to Fire Department approval. A special permit may include an additional charge. Blasting shall not occur on holidays.
2. The Fire Department may cease or delay blasting operations for any reason (e.g., due to an unsafe practice, adverse weather conditions, etc.).
3. Following permit approval, a minimum of two days advance notice, prior to the initial blast date, is required to schedule the required Fire Department inspection. Without the given notice, an inspection is not guaranteed. Blasting may not occur without an inspection by the Fire Department.
4. The initial Fire Department inspection consists of observing pre-blast procedures, a minimum of one blast, and post-blast procedures.
5. The person in charge of the handling and use of explosive materials shall be at least 21 years of age and shall be identified on the permit issued by the Fire Department. (19 CCR 1568)
6. Explosive materials shall not be handled by persons under the influence of intoxicants, narcotics or DEA-controlled substances. (19 CCR 1568.2)
7. Smoking and carrying matches while handling explosive materials or while within fifty (50) feet of where explosive materials are being used are prohibited. (19 CCR 1568.1)
8. When blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph or stream utilities, the blaster shall notify the appropriate representative of such utilities at least twenty-four (24) hours in advance of blasting specifying the location and intended time of such blasting. (19 CCR 1568.7)
9. A minimum of seventy-two (72) hours advance notification is required to all residents and/or occupants within a one thousand (1000) foot radius of the blasting operation. Notification shall be by an acceptable means approved by the Fire Department (e.g., a list identifying resident or occupant addresses where letters were distributed may be submitted to the Fire Department with the date and time of distribution, etc.). Proof of notification must be provided to the satisfaction of the Fire Department.
10. Notifications shall be made by the permittee to the emergency dispatch center prior to blasting and following the last blast of the day. Notifications shall be made by telephone. The telephone number to contact for Santa Rosa is (707) 528-5151.

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11. Blasting operations shall be in accordance with Federal, State, and Local regulations. (19 CCR 1558)
12. Precautions shall be taken to prevent the premature detonation of explosive materials from lightning, radio frequency energy, extraneous electricity or static electricity caused by dust or snow storms, low humidity or mechanical conditions. At a minimum, such precautions shall include (19 CCR 1568.8):
 - a. The suspension of blasting operations and removal of persons from the blasting area during the approach and progress of a thunderstorm,
 - b. The posting of signs prohibiting the use of mobile radio transmitters and cellular phones on roads within one-thousand (1,000) feet of blasting operations where electric detonators are being used, and
 - c. Periodic checks for static electricity or stray currents in areas where these factors could exceed safe operating limits, and
13. Tools used for the opening of containers of explosive materials shall be made of non-sparking materials. (19 CCR 1567.1)
14. When blasting is performed in a congested area or in close proximity to a building, structure, railway, highway or other installation that could be damaged by material being thrown into the air, the blast shall be covered with an adequate blasting mat. (19 CCR 1568.8)
15. Before a blast is fired, the person in charge shall make certain that surplus explosive materials are in a safe place, that persons and vehicles are at a safe distance or under sufficient cover, and that a loud warning signal has been sounded. (19 CCR 1570.8)
16. A blast report must be completed and a copy returned to the Fire Department within forty-eight (48) hours following any blasting. A blank report form can be obtained at the Fire Department or a custom report may be submitted if all elements are reported similar. The submitted report will be maintained at the Fire Department with the blasters permit application and information.

PRE-BLAST OPERATIONS

1. During the time that holes are being loaded or are loaded with explosive materials, blasting agents, or detonators, the blast site shall be off limits to all but those persons authorized to engage in the drilling and loading operations or who are otherwise authorized to enter the site. The blast site shall be guarded or barricaded and posted. (NFPA 495 10.2.1.1)
2. The permit holder/blaster shall ensure the following:
 - a. Drill holes are large enough to allow free insertion of cartridges of explosive materials,
 - b. Drill holes are not collared in bootlegs or in holes that previously contained explosive materials, and
 - c. Holes are not drilled where there is a danger of intersecting another hole containing explosive material. (NFPA 495 10.2.2 – 10.2.2.2)
3. The permit holder/blaster shall inspect and clear any obstruction before loading. (NFPA 495 10.2.3)
4. Pneumatic loading of blasting agents into blast holes primed with electric detonators or other static-sensitive initiation systems shall comply with the following requirements:
 - a. A positive grounding device shall be used for the equipment to prevent the accumulation of static electricity.

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- b. A semi conductive discharge hose shall be used.
- c. A qualified person shall evaluate all systems to ensure that they adequately dissipate static charges under field conditions. (NFPA 495 10.2.4)
5. Tamping shall only be performed with wooden rods or approved plastic pole having no exposed metal parts. (NFPA 495 10.2.5)
6. Violent tamping shall be avoided. (NFPA 495 10.2.5.2)
7. The primer shall not be tamped at any time. (NFPA 495 10.2.5.3)
8. After the loading for a blast is completed and before firing, all excess explosive materials shall be removed from the area and returned to the proper storage facilities. (NFPA 495 10.2.6)
9. As soon as practicable after all blast holes are connected, prior to connecting to a source of initiation such as a blasting machine, and continuing until the shot has been fired and subjected to post-blast examination, the blast area shall be guarded or barricaded and posted. (NFPA 495 10.2.7)

INITIATING BLASTS

1. Cap and fuse shall not be used to initiate blasts in congested areas or adjacent to highways open to traffic. (NFPA 495 10.3.1)
2. Where a safety fuse is used, the burning rate shall be determined by the permit holder or blaster and in no case shall fuse lengths of less than one-hundred-twenty (120) seconds be used. The detonator shall be attached securely to the fuse with a standard ring-type cap crimper. (NFPA 495 10.3.2.1)
3. Where electric detonators are used, stray current tests shall be made as frequently as necessary. Maximum stray current shall not exceed 0.05 amperes through a 1-ohm resistor, measured at the blast site. Non-electric initiating systems shall be used unless corrective action is taken to reduce the stray current below the limits indicated in this paragraph. (NFPA 495 10.3.3.1 – 10.3.3.3)
4. Electric detonators of different brands shall not be used in the same firing circuit. Original containers and/or wrappers shall be available on site for Fire Department inspection. (NFPA 495 10.3.4)
5. All electric blasting circuits and other initiating systems whose continuity can be tested (such as gas detonator initiating systems) shall be tested with a blasting galvanometer or other blast continuity test instrument, as appropriate, that has been designed and approved for the purpose. All electrically initiated blasts shall be made by using blasting machines suitable for the circuitry being fired. (NFPA 495 10.3.5)
6. No detonator shall be inserted in explosive materials that do not have a cap well without first making a hole in the cartridge with a proper size non-sparking tool or the appropriate pointed handle of an approved cap crimper. (NFPA 495 10.3.7)
7. Primers shall not be assembled closer than fifty (50) feet from any magazine or other means of explosives storage. Primers shall be assembled only when and as necessary for immediate needs. (NFPA 495 10.3.7.1 – 10.3.7.2)
8. The permit holder or blaster shall ensure that adequate priming is being used. If any uncertainty exists regarding the amount of priming necessary, the manufacturer shall be consulted. (NFPA 495 10.3.7.3 – 10.3.7.4)
9. Primers shall be assembled only at the time of use and as close to the blast site as conditions allow. (NFPA

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495 10.3.7.5)

10. Where using non-electric initiation systems:

- a. The selection of the initiation system and the design of the blast shall be under the supervision of the blaster in charge;
- b. The initiation system shall be used in accordance with the manufacturers instructions;
- c. The blaster in charge shall conduct a visual check after blast hookup;
- d. The blast layout shall be tested for continuity as recommended by the manufacturer where using a system that can be tested for continuity; and
- e. A double trunk line or closed-loop hookup shall be used where judged to be necessary by the blaster in charge. (NFPA 495 10.3.7.6 (1-5))

11. Only the person making the lead line connections or the blaster in charge shall fire the blast. All connections shall be made progressively from the borehole back to the initiation point. Blasting lead lines shall remain shunted (shorted) and shall not be connected to the blasting machine or other source of current until the blast is to be fired. (NFPA 495 10.3.8 – 10.3.8.2)

12. No blast shall be fired until the blaster in charge has made certain that all surplus explosive materials are in a safe place, all persons and equipment are at a safe distance or under sufficient cover, and an adequate warning signal has been given. (NFPA 495 10.3.9)

PROCEDURES AFTER BLASTING

1. No person shall return to the blast area until permitted to do so by the blaster. (NFPA 495 10.4.1)
2. The blaster shall allow sufficient time for smoke and fumes to dissipate and for dust to settle before returning to the blast site. (NFPA 495 10.4.2)
3. The blaster shall inspect the entire blast site for misfires before allowing other personnel to return to the blast area. (NFPA 495 10.4.3)

MISFIRES

1. Where a misfire is found, the blaster shall provide the proper safeguards for excluding all personnel from the blast area. Misfires shall be reported to the supervisor immediately. (NFPA 495 10.5.1 – 10.5.2)
2. No additional work, other than that necessary to remove the hazard, shall be performed. Only those persons needed to do such work shall remain at the blast site. (NFPA 495 10.5.3)
3. No attempt shall be made to extract explosive materials from a misfired hole. A new primer shall be inserted and the hole shall be re-blasted. (NFPA 495 10.5.4 – 10.5.4.1)

Exception: Where re-blasting presents a hazard, the explosive materials shall be permitted to be washed out with water, or, where the misfire is under water, blown out with air.

4. Whenever there is a misfire, all personnel shall remain at a safe distance for at least 15 minutes (30 minutes if electronic or cap and fuse initiation is used). (NFPA 495 10.5.5)
5. Misfires shall be the responsibility of the person in charge of the blasting operation. (NFPA 495 10.5.6)

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6. Where a misfire is suspected, all initiating circuits (electric or non-electric) shall be traced carefully and a search made for unexploded charges. (NFPA 495 10.5.7)
7. No drilling, digging, or picking shall be permitted until all misfires have been detonated or until the authority having jurisdiction approved the resumption of work. (NFPA 495 10.5.8)

GROUND VIBRATION, AIRBLAST, FLYROCK

1. At all blasting operations, the maximum ground vibration at any dwelling, public building, school, church, or commercial or institutional building adjacent to the blasting site shall not exceed the limitations specified in Table 8-1.1.
(NFPA 495 11.1.1)
2. A recently calibrated seismograph is required to be on site at an approved location during all blasting operations.