

CHAPTER 10

Explosives and Blasting

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SEC. 7-10-1 PURPOSE OF CHAPTER.

The purpose of this Chapter is to regulate the use of explosive materials and to establish uniform limits on permissible levels of blasting resultants to reasonably assure that blasting resultants do not cause injury, damage or unreasonable annoyance to persons or property.

SEC. 7-10-2 DEFINITIONS.

The following definitions shall apply in this Chapter. Terms not herein defined shall be understood to have their usual and ordinary dictionary meaning:

- (a) "Airblast" means an airborne shock wave resulting from the detonation of explosives.
- (b) "Approved" means approval granted by the Town of Caledonia.
- (c) "Blaster" means any individual holding a valid blaster's license issued by the Wisconsin Department of Industry, Labor and Human Relations.
- (d) "Blasting" means any method of loosening, moving or shattering masses of solid matter by use of an explosive.
- (e) "Blasting Operation" means any operation, enterprise or activity involving the use of blasting.
- (f) "Blasting resultants" means the physical manifestations of forces released by blasting, including, but not limited to, projectile matter, vibration and concussion, which might cause injury, damage or unreasonable annoyance to persons or property located outside the controlled blasting site area.
- (g) "Community" means a built-up inhabited area.
- (h) "Permitted explosives use area" means the area that surrounds a blasting site and:
 - (1) Is owned by the operator; or
 - (2) With respect to which, because of property ownership, employment relationship or agreement with the property owner, the operator can take reasonably adequate measures to exclude or to assure the safety of persons and property.
- (i) "Detonator" means any device containing a detonating charge that is used for initiating detonation in an explosive. The term includes, but is not limited to, electric blasting caps

of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord delay connectors, and non-electric instantaneous and delay blasting caps

- (j) "Department" means the Wisconsin Department of Industry, Labor and Human Relations.
- (a) "Electric blasting cap" means a blasting cap designed for, and capable of, initiation by means of an electric current.
- (b) "Explosion" means the substantially instantaneous release of both gas and heat.
- (c) "Explosive" means any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion unless the compound, mixture or device is otherwise classified by the Department by rule.
- (d) "Explosive materials" means explosives, blasting agents and detonators. The term includes, but is not limited to, dynamite and other high explosives, slurries, emulsions, water gels, blasting agents, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord and igniters.
- (e) "Flyrock" means rock that is propelled through the air from a blast.
- (f) "Ground vibration" means a shaking of the ground caused by the elastic wave emanating from a blast.
- (g) "Highway" means any public street, public alley or public road.
- (h) "Inhabited building" means a building regularly occupied in whole or in part as a habitation for human beings, or any church, schoolhouse, railroad station, store or other structure where people are accustomed to assemble, except any building or structure occupied in connection with the manufacture, transportation, storage or use of explosive materials.
- (i) "Particle velocity" means any measure of ground vibration describing the velocity at which a particle of ground vibrates when excited by a seismic wave.
- (j) "Person" means any individual, corporation, company, association, firm, partnership, society or joint stock company.
- (k) "Powder factor" means any ratio between the amount of powder loaded and the amount of rock broken.
- (l) "Primer" means a capped fuse, electric detonator or any other detonating device inserted in or attached to a cartridge of explosive.
- (m) "Stemming" means the inert material, such as drill cutting, used in the collar portion or elsewhere of a blast hole to confine the gaseous products of detonation.
- (n) "Unreasonable annoyance" means an excessive, repeated noise, action or other disturbance that is not justified by reason.

SEC. 7-10-3 REGULATION OF EXPLOSIVE MATERIALS AND BLASTING.

- (a) **General.** No person shall handle or use explosive materials in the Town of Caledonia, unless he:
 - (1) Possesses a valid State of Wisconsin blaster's license with the proper classification or is supervised by a holder of a valid State of Wisconsin blaster's license with the proper classification; and
 - (2) Possesses all necessary state permits and complies with all applicable local, state and federal regulations, including, but not limited to the requirements of this Chapter and Chapter ILHR 7, Explosive Materials, Wisconsin Administrative Code.
- (b) **Permit.** No person shall handle, use or cause explosives to be detonated within the Town

of Caledonia without an explosives use permit issued by the Town of Caledonia, as hereafter set forth, to such person, his supervisor or employer:

- (1) Application. Applications for an explosives use permit shall be in writing upon forms provided by the Town Clerk. Applications shall be accompanied by a Five

Hundred Dollar (\$500.00) permit fee. Permits shall be issued on an annual basis commencing July 1 and ending on June 30 of the succeeding year. All explosives use permits applied for after July 1 shall be prorated from the date of the issuance of the permit to June 30 of the succeeding year. Applications may be made by and permits issued to the owner of a business, provided that the employees doing the blasting or responsible for such blasting shall hold a valid Wisconsin blaster's license with proper classification.

- (2) Bond. Each application for an explosives use permit as herein stated, or a renewal thereof, shall be accompanied by a surety bond in the sum of Fifty Thousand Dollars (\$50,000.00) executed by the permit applicant and by a bonding company acceptable to the Town Attorney, as surety, being payable to the Town and conditioned upon the payment to the Town for all damages suffered by the Town, including any damages to utilities and property of the Town, and for all costs incurred by the Town to enforce the provisions of this Section and the permit issued under it.

- (3) Explosives Use Plan. Each application for an explosives use permit or a renewal thereof shall include written description of the total area within which explosives are proposed to be used, blasting procedures to be employed, including types of explosives, initiating systems, and an aerial photograph or drawing acceptable to the Town Engineer with a scale of no less than one (1) inch equals one hundred (100) feet and having an overlaying grid of fifty (50) feet by fifty (50) feet which accurately includes all areas and inhabited buildings within five hundred (500) feet of all proposed blasting areas.

- (4) Hours of Operation. Blasting shall only be conducted between 9:00 a.m. and 4:00 p.m. on Monday through Friday and 9:00 a.m. to noon on Saturday, provided, however, that in the event an emergency has delayed a blast beyond 4:00 p.m., a loaded hole may be blown within a reasonable time thereafter. Blasting shall not be conducted at other times or on Sundays or legal holidays without written permission from the Town Engineer or his designee, which shall only be granted upon a showing of extreme need.

- (5) Blasting Log. A blasting log shall be prepared and maintained for each blast fired, and a true and complete copy of said log shall be supplied to the Town Engineer within three (3) working days of the initiation of the blast. The Town may require that the permittee furnish to the Town an analysis of any particular blasting log to be prepared by the permittee. In the event the permittee cannot or will not prepare a reliable analysis, the Town may obtain such analysis from an independent expert. The permittee shall be liable for the cost of such analysis if it is determined after an opportunity to be heard that there was good cause for the Town to require such an analysis. Each blasting log shall include, but not be restricted to, the following information:

- a. Name and license number of blaster in charge of blast;

- b. Blast location with grid coordinate references to the supplied aerial photograph or drawing of the explosives use area;
- c. Date and time of blast;
- d. Weather conditions at time of blast;
- e. Diagram and cross-section of blast hole layout;
- f. Number of blast holes;
- g. Blast hole depth and diameter;
- h. Spacing and burden of blast holes;
- i. Maximum holes per delay;
- j. Maximum pound's of explosives per delay;
- k. Depth and type of stemming used;
- l. Total pounds of explosives used, including primers and initiating cord;
- m. Distance to nearest inhabited building not owned by permittee;
- n. Type of initiation system used;
- o. Seismographic and: airblast information, which shall include:
 - 1. Type of instrument and last calibration date;
 - 2. Exact location of instrument and date, time and distance from the blast;
 - 3. Name and company affiliation of person taking reading;
 - 4. Name of the person and firm analyzing the seismographic and airblast data when required; and
 - 5. Vibrations and airblast levels recorded.

SEC. 7-10-4 TEMPORARY PERMITS.

The Town Clerk, upon receipt of a properly completed temporary permit application form, may issue a temporary permit to allow for special construction or demolition activities requiring the use of explosives. Temporary permits shall be issued for a duration of fourteen (14) consecutive working days. The temporary permit fee shall be Two Hundred Dollars (\$200.00) and shall be submitted with the completed temporary permit application form. Only one (1) temporary permit can be issued for any given site within the year of permit issuance.

SEC. 7-10-5 REGULATION OF BLASTING RESULTANTS.

- (a) **Purpose of Sections.** It is the purpose of this Section to provide for the establishment of uniform limits on permissible levels of blasting resultants to reasonably assure that blasting within the Town of Caledonia does not cause injury, damage or unreasonable annoyance to persons or property outside and beyond the permitted explosives use area.
- (b) **Instrumentation.** All blast-monitoring instruments used to produce data to support compliance with this Subsection shall meet the following minimum specifications:
 - (1) Seismic frequency range. 2 to 200 Hz (± 3 Hz).
 - (2) Acoustic frequency range. 2 to 200 Hz (\pm IdB).
 - (3) Velocity range. 0.02 to 4.0 inches per second.
 - (4) Sound range. 100 to 140 dB linear.
 - (5) Transducers. Three (3) mutually perpendicular axes.
 - (6) Recording. Provide time-history of wave form.

- (7) Printout. Direct printout showing time, date, peak air pressure, peak particle velocity and frequency in three (3) directions and a printed waveform graph of the event depicting measured air blast and particle velocity in the three (3) directions.
- (8) Calibration. At least once every twelve 12 months according to manufacturer’s recommendations.

(c) **Control of Adverse Effects.**

- (1) General Requirements. Blasting shall be conducted so as to prevent injury and unreasonable annoyance to persons and damage to public or private property outside the permitted explosives use area.
- (2) Airblast.
 - a. Limits. Airblast shall not exceed the maximum limits listed in Table A-1 at the location of any dwelling, public building, place of employment, school, church or community or institutional building outside and beyond the permitted explosives use area. Notwithstanding this general requirement, an annual permit holder subject to this limitation may exceed the limitation on up to five percent (5%) of the blasts it initiates during the six (6) month period from July 1 to December 31, and during the six (6) month period from January 1 to June 30, without violating this ordinance, provided that the airblast produced by such blasts does not exceed the limitations on airblast imposed by Wisconsin Department of Industry, Labor and Human Relations in Subsection ILHR 7.64(2), Wis. Adm. Code, as amended from time to time.

TABLE A-1

AIRBLAST LIMITS

| <u>Lower Frequency Limit of Measuring System in Hz</u> | <u>Maximum Level in db</u> |
|--|----------------------------|
| 2 Hz or lower -- Flat response | 123 peak |
| 6 Hz or lower -- Flat response | 129 peak |

- b. Monitoring.
 - 1. The permute shall monitor all blasts at the closest location to the blast of any dwelling, public building, place of employment, school, church or community or institutional building outside and beyond the permittee explosives use area, provided, however, that the permittee may monitor, at another location, approximately the same distance from the blast site, if the permittee is unable to obtain permission to conduct the monitoring from the owner of the preferred location. The Town Board or its designee may, at its discretion, require the relocation of monitoring equipment to a more suitable site and/or may conduct independent air-blast monitoring to spot-check data supplied by the permittee. If

the independent monitoring was done after good cause was shown therefor and after the permittee was given notice and an opportunity to be heard on the matter, the permittee shall be liable to the Town of Caledonia for all expenses incurred by the Town of Caledonia as a result of such independent monitoring. Upon receiving and approving billings for such

expenses, the Town shall cause notice of the expenses to be mailed to the permittee, who shall reimburse the Town for such expenses within thirty (30) days after receipt of such notice.

2. The measuring equipment used shall have an upper end flat frequency response of at least two hundred (200) Hz.
- (3) Flyrock. Flyrock produced as a result of explosives use shall be totally contained within the permitted explosives use area.
 - (4) Ground Vibration.
 - a. General.
 1. The maximum ground vibration at the location of any dwelling, public building, place of employment, school, church or community or institutional building outside or beyond the permitted explosives use area shall have a maximum peak-particle-velocity limit as provided by the Department, the scaled-distance equation of paragraph (ii), or the blasting level chart of paragraph (iii), whichever is applicable hereunder. Notwithstanding this general requirement, an annual permit holder who is subject to the limitations of paragraph (iii)a (Figure A, incorporated by herein reference), below, may exceed the limitation of Figure A on up to five percent (5%) of the blasts it initiates during the six (6) month period from July 1 to December 31 and during the six (6) month period from January 1 to June 30 without violating this Section, provided that the ground vibration produced by such blasts does not exceed 0.65 inches per second or the limitations imposed by the Wisconsin Department of Industry, Labor and Human Relations in Section ILHR 7.64(4), Wis. Adm. Code, as amended from time to time, whichever is more stringent. Further, upon a showing by the permittee of particular need (e.g., to deal with difficult physical conditions, such as a "toe" or other uneven burden conditions), the Town Engineer is authorized to approve individual proposed blasts, or specified sequences of proposed blasts, which are anticipated to produce ground vibration in excess of the limitations imposed by Figure A, without violating this Section, provided that such specially approved blasts shall not exceed the limitations of ILHR 7.64(4), Wis. Adm. Code as amended from time to time. [All such specifically approved blasts exceeding the limitations of Figure A, but not exceeding the limitations of Section ILHR 7.64(4), shall be counted as blasts exceeding the limitations of Figure A for purposes

of determining whether an annual permit holder has exceeded such limitations with respect to more than five percent (5%) of its blasts during a six (6) month period hereunder.] Any denial of such special approval by the Town Engineer may be appealed to the Town Board.

2. All structures in the vicinity of the permitted explosives use area, not listed in Subsection (a), such as water towers, pipelines and other utilities, tunnels, dams, impoundments and underground mines shall

be protected from damage by establishment by the permit holder of a maximum allowable limit on the ground vibration. The permit holder shall establish the limit after consulting with the owner of the structure.

b. Seismic monitoring.

1. The Town Board, in its discretion, may conduct independent seismic blast monitoring to spot-check data supplied by the permit holder. If the independent monitoring was done after good cause was shown therefor and after the permittee was given notice and an opportunity to be heard on the matter, the permittee shall be liable to the Town of Caledonia for all expenses incurred by the Town of Caledonia as a result of such independent monitoring. Upon receiving and approving billings for such expenses, the Town shall cause notice of the expenses to be mailed to the permittee, who shall reimburse the Town for such expenses within thirty (30) days after receipt of such notice.
2. The Town Board, upon good cause shown and after giving the permittee notice and an opportunity to be heard, may request analysis, by a method approved by the Town Engineer, of records and data for any or all blasts which occurred within the permitted explosives use area.

c. Preblasting notification.

1. Each explosives use permit application and all reapplications shall include the names and addressees of all residents or owners of dwellings or other structures located within an area affected by the permitted explosives use. The affected area shall be determined based on the scaled-distance equation using a scaled-distance factor (D_s) of one hundred (100) affected dwellings or other structures shall be those located within the distance (D) of the permitted explosives use area for the weight per delay (W) of explosives to be used. All calculations shall be included in the permit application.

2. At the time of permit application, the applicant shall have notified, in writing, all residents or owners of dwellings or other structures located within the previously defined area, affected by the permitted explosives use, may request a preblast survey. This request shall be in writing to the Town Engineer, who shall promptly notify the applicant/permittee. The applicant shall cause a preblast survey to be conducted as to such dwelling or structures, provided,

however, that the applicant shall not be required to conduct a preblast survey more than once every six (6) years as to any dwelling or structure, unless the dwelling or structure has been substantially modified or improved. The preblast survey shall be promptly conducted in a manner and form and by an independent survey company or organization selected by the applicant and acceptable to the owner or resident and the Town Engineer. The survey shall determine the condition of the dwelling or structure and shall document any preblasting damage or other physical factors that could reasonably be expected to be affected by the use of explosives.

3. The survey shall include a written report signed by the person who conducted the survey. Copies of the survey report shall be promptly provided to the Town of Caledonia, the owner or resident, and the applicant/permittee. The owner, resident or applicant/permittee shall promptly submit in writing to the Town of Caledonia any objections to the survey report, setting forth in detail such objections.
4. An updated survey may be requested by the owner or resident of any additions, modifications or renovations which occur to the previously surveyed dwelling or structure. The request shall be in writing to the Town Engineer, who shall promptly notify the permittee. The updated survey shall be performed in the same manner and form as the original survey. All expenses incurred as a result of such independent surveys shall be the responsibility of the applicant/permittee. Upon receiving and approving billings for such expenses, the Town shall cause notice of the expenses to be mailed to the applicant/permittee, who shall reimburse the Town for such expenses within thirty (30) days after receipt of such notice.
5. All expenses incurred as a result of such independent surveys shall be the responsibility of the applicant/permittee. Upon receiving and approving billings for such expenses, the Town shall cause notice of the expenses to be mailed to the applicant/permittee, who shall reimburse the Town for such expenses within thirty (30) days after receipt of such notice.