

# TOWN OF BROOKLINE, NEW HAMPSHIRE

## **BLASTING ORDINANCE**

### **GOVERNING BLASTING AND/OR EXPLOSIVE DEMOLITION**

#### I. PURPOSE

It is declared to be in the best interest of the health, safety and general welfare of the Town of Brookline and its residents to enact the following regulations governing blasting, explosive demolition or other use of explosives within the Town of Brookline.

#### II. AUTHORITY

This Ordinance has been enacted pursuant to the statutory authority granted to the Town of Brookline by RSA 31:39(e) and (n), RSA 154:18, RSA 153:5, and RSA 158:9(f)II.

#### III. DEFINITIONS

For the purpose of this Ordinance, the following words and phrases, when used herein, shall be construed as follows:

- A. "Town" – Town of Brookline, New Hampshire.
- B. "Board" – Selectboard of the Town of Brookline.
- C. "Explosives" – Those materials that are either chemically or otherwise energetically unstable, or produce a sudden expansion of the material usually accompanied by the production of heat and large changes in pressure (and typically also a flash and/or loud noise) upon initiation including but not limited to: dynamite, any explosive compound of which nitroglycerin forms a part, fulminate in bulk or dry condition, blasting caps, detonating fuses, black powder, and ammonium nitrate/fuel oil (ANFO).
- D. "Peak Particle Velocity" or "PPV" – A measurement of maximum ground vibration, in any of the three mutually perpendicular components of particle velocity.
- E. "Seismic Measuring Equipment" – Shall be that equipment utilized to measure ground effects of blasting and or explosive detonation which may include but is not limited to: creepmeters, seismographs, seismometers, strainmeters, or magnetometers.
- F. "Blasting Log" – A detailed written record of the type, amount, depth of explosives and other blasting details submitted to the Town of Brookline. The NHDOT Section 203 Blasting Log or equivalent should be submitted in metric or English.

- G. “Blasting Administrator” – Person(s) appointed by the Selectboard to administer and enforce the Blasting Ordinance. If the Selectboard make no such appointment, then the Blasting Administrator shall be the Town’s Fire Chief and/or his duly appointed designee/agent.
- H. “Structure/Habitable Structure” – A “structure” as used herein shall be anything which is built or constructed on a property (i.e. property improvements) including activity for which a building permit or site permit is required such as foundations, driveways, roadbeds, parking lots, swimming pools, wells, waste disposal systems and utility installations. A “habitable structure” is a structure which persons are occupying or may occupy, including residential dwellings, commercial and industrial buildings, garages, sheds, barns, and storage buildings.

IV. BLASTING PERMITS APPLICABILITY

- A. No person shall engage in blasting or detonation of explosive materials, within the Town of Brookline, without first obtaining a permit in the event the amount of material to be disturbed by blasting exceeds 500 cubic yards over a 30-day period. The permit to conduct such operations shall be obtained from the Blasting Administrator.
- B. Blasting permits may be issued for blasting operations with the following maximum vibration limits as measured outside the nearest habitable structure from the blasting site: PPV of 13mm/s or 0.50 in/s at frequencies below 40 Hz and 25 mm/s or 1.0 in/s at frequencies up to 100 Hz or greater.
- C. Applicants for blasting permits must submit a completed application form containing all the information specified and required within this Ordinance.

V. APPLICATION FORM

- A. A properly executed application form shall be submitted to and approved by the Blasting Administrator for all blasting permits prior to commencement of any blasting or detonation. The application form shall be developed and approved by the Blasting Administrator.
- B. Approval of the blasting permit will not relieve the Applicant of full and complete responsibility for the results of the blasting operations. The Applicant also has full responsibility for the accuracy and adequacy of the blasting plan when implemented in the field.
- C. The application form shall require, at a minimum, the following information:
  - 1. Name, address, and daytime phone number of the Applicant.

2. A copy of license issued by the State Police to the Applicant along with proof of identification, under RSA 158:9-b.
3. Name, address, experience, qualifications, and daytime phone number of blasting supervisor.
4. A copy of blasting supervisor's Certificate of Competency issued by the State Police pursuant to RSA158:9-h.
5. The tax map number and physical location where blasting is to be conducted, as well as the date(s) of detonation.
6. A map or plan at a scale not greater than 1" = 200' depicting the approximate location of the proposed blasting/detonation, and all properties within 500 feet.
7. A list of the owners of all such properties identified, together with a notation as to whether such properties are improved by a structure and the type of occupancy (i.e., residential, commercial, industrial).
8. A letter of permission from the property owner of the blasting site.
9. Evidence of general liability and property damage insurance issued by a carrier authorized by the New Hampshire Insurance Commissioner to do business in New Hampshire in amounts not less than two million dollars (\$2,000,000) combined single limit per occurrence. All liability insurance companies supplying policies per this Ordinance shall have at least a double A (AA) Moody Bond rating.
10. The Applicant shall submit the following information to the Blasting Administrator or his/her authorized representative, at least five (5) days prior to commencing drilling and/or blasting operations:
  - a. Sequence and schedule of production blast rounds, including the general method of developing the excavation, lift heights, starting locations, estimated starting dates, estimated rates of progress, etc.
  - b. Written evidence of the licensing, experience, and qualifications of the blaster who shall be directly responsible for the loading and firing of each shot.
  - c. Name, experience, and qualifications of the person responsible for designing and directing the Applicant's blasting operation.
  - d. Name, experience, and qualifications of the person to be used to conduct pre-blast condition surveys.

e. Name, experience, and qualifications of the person to be used in monitoring blast vibration.

VI. FEE

All permit applications shall be accompanied by the proper application fee as established by the Selectboard in accordance with RSA 41:9-a.

VII. PERMIT DURATION

- A. All permits are good for a period of 30 days.
- B. Successive or renewed permits are permitted, provided application information is updated and a new application fee is paid.
- D. A permanent record of all permits issued under this Ordinance will be kept at the Blasting Administrator's office.

VIII. MINIMUM STANDARDS OF CONDUCT

Unless more stringent provisions are contained herein, the conduct of all blasting or explosive detonations shall be governed by the standards in New Hampshire Code of Administrative Rules, Saf-C Section 1600, et seq.

IX. LOCAL REQUIREMENTS

In addition to any other requirements of New Hampshire law, the following additional requirements shall apply to blasting activity within the Town of Brookline:

- A. General: All blasting operations, including the storage and handling of explosives and blasting agents, shall be performed in accordance with the applicable provisions of this Ordinance and all other pertinent federal, state, and local regulations. Whenever explosives are used, they shall be of such character and in such amounts as are permitted by the State and local laws and ordinances, and all respective agencies having jurisdiction over them.
- B. Pre-blast Condition Survey: Prior to conducting any blasting, the Applicant or their agent shall conduct a pre-blast condition survey of all existing structures and conditions on the site, adjacent to the site, and within 500 feet.

This survey shall extend to such structures or conditions as may be affected by the Applicant's construction operations. At a minimum, pre-blast condition surveys shall be performed on all structures, including homes, foundations, driveways, roadbeds, swimming pools, wells, and mobile homes, within the areas described above. The Applicant, as well as the owner of the property being surveyed, shall sign all such surveys once completed. If a property owner, for whatever reason, refuses to allow for

the conducting of a pre-blast survey or to sign a pre-blast survey form, then the Applicant shall note this on the form. The Applicant shall make at least two (2) in-person attempts and at least one certified mail notice over a 14 day time period to contact an owner to explain the need for such surveys.

1. The individual person conducting the survey shall give written notice to the owner of the property concerned, as well as to any tenants of the property. The notice shall state the dates on which surveys are to be made. Copies of all notices shall be provided to the Blasting Administrator.
  2. The pre-blast structural inspection condition survey shall consist of a written description of the interior and exterior condition of each of the structures examined. Descriptions shall locate any existing cracks, damage, or other defects, and shall include such information so as to make it possible to determine the effect, if any, of the construction operations on the defect. Where significant cracks or damage exist, or for defects too complicated to describe in words, photographs shall be taken. A good quality video survey with appropriate audio description of locations, conditions, and defects can be used in lieu of a written form. This survey shall be kept for a minimum of seven (7) years and be made available to the Blasting Administrator upon request. In addition, copies of the completed survey and videos shall be delivered to each property owner free of charge within 14 days.
  3. Upon completion of all earth/rock excavation and blasting work, the Applicant shall conduct a post-blast survey of any properties, structures, and conditions for which complaints of damage have been received or damage claims have been filed. Notice shall be given to all interested parties so that they may be present during the final examination. Records of the final examination shall be distributed the same as the original pre-blast condition survey.
  4. All costs associated with condition surveys shall be borne by the Applicant.
- C. Seismic Measuring Devices: Prior to conducting any blasting, the Applicant or their agent shall identify the two closest structures to the blasting site not owned by the owner of the blast site and request written permission from the Owner(s) thereof to install and monitor seismic measuring equipment. The Applicant shall make four (4) attempts to obtain such permission. The fourth and final attempt shall be made in writing via certified mail and, if unsuccessful, the seismic measuring equipment shall be installed between the structure and the blast location as close as reasonable to the structure. An explanation of the reason for such location shall be made on the vibration monitoring report for such structure and the PPV shall be extrapolated to the structure using standard relations. Prior to conducting any blasting, seismic measuring equipment

shall be installed as described above. The Blasting Administrator may require additional measuring devices when necessary to protect property. If an owner refuses to allow for or waives the placement of seismic measuring equipment, the Applicant shall note this on the vibration monitoring report.

All costs associated with analysis and monitoring shall be borne by the Applicant.

- D. Map of Operations: The Applicant shall provide a vicinity map and plan, locating the blast site, blast area, and the locations of all measuring devices required hereunder.
- E. Additional Surveys / Seismic Devices: The Town, through its Blasting Administrator or Selectboard, reserves the right to require additional condition surveys and/or placement of seismic measuring equipment on properties farther than specified should the need arise due to complaints or other causes. Further, the Town reserves the right to require geological surveys of the area around the blasting location should conditions warrant such analysis. Such additional requirements may be prerequisites to obtaining any permit renewals.
- F. Timing of Blasting Operations: Blasting and/or detonation shall be conducted only between the hours of 9:00 am and 4:00 pm, and shall not be permitted on Saturdays, Sundays or town observed holidays.
- G. Blast Vibration Control and Monitoring: The Applicant shall be required to comply with the blasting vibration limits established by the applicable New Hampshire rules and regulations. The Town reserves the right to impose lower maximum vibration limits. See Section IV (B).
- H. Vibration Monitoring Instrumentation: All vibration monitoring instrumentation proposed for use on the project by the Applicant shall comply with the following requirements:

- 1. Measure, display, record, analyze, and print three-component ground motion and measure, display, record and print air pressure with specification equal to or better than the following:

Range:	0.01-10 in/s
Resolution:	seismic, 0.005 in/s acoustic, 1 db
Sample Rate:	1024 Samples/s
Frequency Response:	0-250 Hz, flat within 3 db
Trigger	

Source: seismic and/or acoustic

Trigger

Level: seismic, programmable, 0.02-2.00 in/s  
acoustic, programmable, 100-129 db, Linear  
weighting scale

Record

Time: 1-10 s plus 0.5 s pre-trigger

Storage

Capacity: 100 1-sec events at 1024 samples/s

2. Measure the three (3) mutually perpendicular components of particle velocity in directions vertical, radial, and perpendicular to the vibration source. Full wave forms must be recorded.
  3. All seismographs used on the project shall display the date of the most recent calibration. Said calibration must have occurred within the last twelve (12) months and been performed to a standard traceable to the National Institute of Standards and Technology.
- I. Report of Monitoring Results: Within forty-eight (48) hours excluding weekends or town observed holidays of each blast, the Applicant, or their authorized representative, shall submit to the Blasting Administrator in writing the following items:
1. Details of the round as shot to include the information shown on the sample blasting log (see, Section III (F)).
  2. Results of the blast monitoring at each instrument location, including the following:
    - a. Date and time of blast.
    - b. Location of blast.
    - c. Operator name and signature.
    - d. Distance of seismograph from blast in feet.
    - e. Listing of the maximum values of the three components of peak particle velocity, PPV (in/s), acceleration, PPA (g), displacement, PPD (in), time on the record at which the PPV occurs (ms), peak vector sum, PVS (in/s) and time on record at which the PVS occurs, peak sound pressure level, PSPL (psi) and time on record at which the PSPL occurs (ms), and the PSPL frequency (Hz).
    - f. Seismograph manufacturer, model, serial number, calibration date.

g. Trigger settings.

h. Software manufacturer, name, version used for download and/or analysis.

i. Full waveform plots of three seismic components and acoustic component.

j. Plot displaying OSM and USBM RI8507 analysis.

k. If the seismic ground vibration or air overpressure, or both ground vibration and air overpressure caused by the Applicant's blasting operation equals or exceeds either the limits established by the State of New Hampshire or the maximum limits imposed by the Town, which ever being more restrictive, the operations shall cease and the permit may be revoked by the Blasting Administrator.

J. Notice and Warning Signals: Adequate warnings shall be given to all personnel in proximity to the blast site at least three minutes in advance of each blast. The Applicant shall use sirens or horns or both sirens and horns with sufficient intensity such that they can be heard for a minimum distance of 1,000 feet. Immediately following any detonation of explosives within the Town, the responsible party shall ensure that all charges have been properly detonated and then shall sound an appropriate and audible "all clear" signal.

1. The Applicant shall notify Dispatch (603) 465-3636 one (1) hour prior to the time of the blast.
2. The Applicant shall notify all property owners within the required areas by certified US Mail, three (3) days prior to blast, of the following information: the place, date and duration of the blasting operation.

K. Flyrock Control: Before the firing of any blast in areas where flying rock or debris may result in personal injury or damage to property, the rock to be blasted shall be covered with approved blasting mats, soil, or other equally serviceable material to prevent flyrock.

L. Responsibility for Blasting Operations: Review of the Applicant's blasting submittals by the Town of Brookline, the Blasting Administrator or their authorized representative will not relieve the Applicant of his/her responsibility for the accuracy, adequacy, and safety of the blasting; for exercising proper supervision and field judgment; for preventing damage to structures; and for producing results in accordance with New Hampshire regulations and NHDOT Specifications. The Applicant shall be solely and completely responsible for the safety of all persons and properties during the performance of his/her work. The Applicant shall



take whatever measures it deems necessary, in addition to the requirements herein, to protect the safety of persons and property, both at the construction site and away from the site. The Applicant shall have full and complete responsibility for the handling, discharging, or settling of any and all damage or annoyance claims resulting from the blasting activities on the project. Any monitoring and/or review of the Applicant's procedures and performance conducted by the Town of Brookline, the Blasting Administrator's Office or their authorized representative shall not relieve the Applicant of his/her responsibility for safety at and away from the site, or for preventing damage to adjacent structures or property.

- M. **Blasting Monitoring:** All blasting in the Town of Brookline shall be directly monitored by the Blasting Administrator or his representative unless otherwise directed by the Blasting Administrator. The blasting company shall notify the Blasting Administrator or his designee at least 1 hour before the time of the blast. If three or more blasts are scheduled within a 4 hour time period then the Blasting Administrator may require a Fire Department work detail to standby a site for safety and monitoring duties. The cost of a Fire Department work detail or any other private consultants necessary for enforcement of these regulations will be at the Applicant's expense.
- N. **Dust Control:** During and after the firing of any blast, dust control shall be in place to control the dust from the blast and the removal of the blasted rock and dirt. Dust migration from blasting operations, including rock removal and rock processing, to adjacent properties shall be controlled and kept to a minimum. Dust control plans and procedures shall be submitted with all blasting permit applications and approved by the Blasting Administrator.
- O. **Waste Disposal:** The Blasting Administrator shall prescribe the acceptable form and manner for the disposal of any blasting packaging materials, and any other waste or rubbish generated in the course of the blasting activities, the costs of such waste disposal to be borne by the Applicant.

#### X. REVOCATION OF PERMIT

A permit issued hereunder may be revoked by the Blasting Administrator for just cause including but not limited to: failure to conduct operations in accordance with the standards herein resulting in property damage that does or has the potential to exceed the amount of liability insurance held by the Applicant; lapse or revocation of the state license, or the institution of proceedings (civil, criminal, or administrative) by the state for violation of applicable state law or regulations. Revocation of permission to perform blasting operations in Brookline may result in the loss of all blasting permits for one year. An Applicant who has had a permit revoked may apply for a re-issuance to the Selectboard who shall hold a public hearing on said request and, following same, determine whether or not a permit shall be reissued. The Applicant requesting the permit shall provide a detailed report to the Blasting Administrator outlining why they believe said permit should be issued along with any other information requested by the Blasting Administrator.

XI. FINES AND PENALTIES

Violations of this Ordinance and/or any permits issued per the Ordinance shall be subject to a \$1,000 maximum fine for each separate offense.

XII. NO WAIVER

There shall be no waiver of any of the herein regulations and standards unless the Applicant can demonstrate to the Blasting Administration that compliance with same would impose a manifest hardship and that there are reasonable, alternative means of ensuring safety.

XIII. SEVERABILITY

Severability is intended throughout and within the provisions of the Ordinance. If any section, subsection, sentence, clause, phrase or portion of this Ordinance is held to be invalid or unconstitutional by a court of competent jurisdiction, then that decision shall not affect the validity of the remaining portions of this Ordinance.

XIV. CONFLICT

If any provision of this Section is in conflict with the provisions of any other provisions of the Brookline Non-Residential Site Plan Regulations, the Brookline Subdivision Regulations, the Brookline Town Ordinances, the Brookline Zoning & Land Use Ordinance, and New Hampshire State requirements, the more restrictive provision shall apply.

END

