

PREPARED FOR: Council
FROM: Andre Boel, Director of Community Building and Planning
MEETING DATE: March 18, 2024
SUBJECT: Blasting Regulation Changes - Consultation Summary and Next Steps

RECOMMENDATION(S)

THAT the report titled Blasting Regulation Changes - Consultation Summary and Next Steps, authored by Andre Boel, Director of Community Building and Planning Services, dated March 18th, 2024 be received.

And that Council consider the following staff recommendation(s):

THAT staff bring forward bylaw amendments for updated blasting regulations and related changes as outlined in the report titled Blasting Regulation Changes - Consultation Summary and Next Steps, authored by Andre Boel, Director of Community Building and Planning Services, dated March 18th, 2024;

Alternatively, staff await another direction from Council.

EXECUTIVE SUMMARY OF REPORT

The District has the authority under the Community Charter legislation to establish regulations to impose requirements related to explosives and protection of the natural environment, buildings, and structures. Currently, Building and Plumbing Bylaw No. 4247 contains a number of blasting permit requirements. In response to resident concerns, Council directed updates to the District's blasting regulations in 2020.

Residents' concerns have been documented over the years and were reviewed as the first part of this bylaw review and update. Following direction from Council in June of 2023, further research and consultation with residents, blasters, and contractors has been conducted. This report summarizes their input and outlines response and mitigation measures responding to five key themes: policy alignment, noise, property, safety, and communication.

Proposed changes include: introducing regulations for rock breaking in addition to blasting, limits on the amounts and timing of rock removal, increased communication and neighbour notification, and a change in the permit fee structure.

BACKGROUND/HISTORIC CONTEXT

Between 2020 and 2023 incremental progress was made with the support of a consultant through a technical review and staff review, resulting in the report provided to Council in June of 2023.

Previously, Council provided direction to review blasting regulations on July 27, 2020 and on June 26, 2023 as follows:

THAT Council direct staff to prepare a report that assesses and recommends short term amendments to the regulation of blasting and longer-term changes to the noise bylaw for rock blasting and hoe ramming in Oak Bay. (2020 - no number)

THAT Council direct staff to prepare changes to the blasting and hoe-ramming regulations and bring amendments to the Building and Plumbing Bylaw No. 4247 and the Anti-Noise Bylaw No. 3210, and that the drafting process include one public meeting, and gathering of input from the building industry and affected contractors. (2023 - 296)

Authority to Regulate Blasting and Rock Breaking

The District has authority to regulate blasting activity in the *Community Charter* (Ch 26 Pt 23 Div 1 Sec 3.) Council can adopt a bylaw to regulate, prohibit and impose requirements related to explosives, protection of the natural environment, buildings and other structures. Section 64 further clarifies that council can act in the well-being of its community respecting nuisance, noise, vibrations, and dust that may disturb the quiet, peace, rest, enjoyment, comfort or convenience of individuals or the public.

Official Community Plan Context

District planning policy, as expressed through the Official Community Plan (OCP) Development Permit Areas guidelines, envision that the existing topography should be respected, minimizing the need for cut and fill, blasting, and retaining walls for infill residential (8.3.1.7), multi-unit residential (8.3.2.7), and commercial and mixed-use developments (8.3.3.7). Heritage policies also direct the retention and conservation of natural vegetation, rock outcrops, existing hydrology, and unique site features, supporting the objective of conserving natural landscapes (4.7.1).

An updated regulation for blasting and rock-breaking activity could discourage unnecessary rock removal, including blasting for the sole purpose of private amenities.

Current Regulations

Building and Plumbing Bylaw No. 4247 outlines the current regulations related to blasting. It requires a blasting permit, proof of insurance and limits the hours for blasting activities.

Resident Concerns

Residents' concerns about blasting have been communicated verbally and in writing at council meetings over the past several years. Subjects included:

- Noise of blasting, drilling, grinding, rock scraping, compressors
- Excessive rock breaking by rock hammering without regulation and a request to provide notification to neighbours of hoe-ramming
- Lack of limits on magnitude of rock removal, allowing "lot line to lot line"
- Dust
- Destruction of nature and natural landscape features, including impact on tree root zones and changes to topography
- Disturbance of urban wildlife
- Disturbance of peace and enjoyment for nearby residents

- Impacts on heritage structures (houses and rock walls)
- Extended time frame of blasting activities (weeks and months)
- Timing of other construction noise (7am-7pm) with request to align with blasting time (8am-4pm)

ANALYSIS

This section covers technical information regarding blasting, discusses the consultation process, explores possible responses and mitigation measures, and outlines the proposed regulatory changes.

Blasting Impacts

Blasting is the most economical technique for rock removal, but it causes three main physical impacts: ground vibrations, air overpressure, and flying rock. Most of the energy from blasting is that which breaks the intended rock, but some creates ground vibrations that can cause ground changes, settlement of foundations, and cracking of weak surfaces like drywall. The airblast (or air overpressure) is a shock wave of energy from blasting that creates some of the sound we hear from a blast. Fly-rock is the rock parts that may be ejected from a blast site. Strict provincial government regulations are in place to minimize the harmful effects of these impacts to humans. Attachment 1 provides a brief primer on other terms related to issues with rock breaking and a summary of rock breaking methods.

Consultation Summary

The Consultation Summary (Attachment 2) details input gathered from the public, blasters, and contractors about proposed updates to the Oak Bay Blasting Bylaw.

In accordance with the June 2023 Council direction regarding scope and budget, consultation was limited to a single open house and interviews with blasting contractors as well as contractors engaging the services of blasting contractors for their projects.

For the public, an Open House was held October 11 from 4pm – 7pm at Windsor Pavillion. About 30 attendees engaged in discussions about blasting changes, including several who had been prompted by discussions about the Quest development at council the evening prior.

This event was promoted through the District's social media. The notice was posted on Facebook and X (formerly Twitter) on September 28, 2023. The Open House information was also included on the Oak Bay events calendar the week prior to the Open Housing, providing links to additional detail on proposed updated regulations.

For blasters and contractors, the consultant team completed in-person interviews with the two primary blasters operating in Oak Bay, sharing potential blasting regulation changes ahead of time to ensure an opportunity for and informed discussion. The two companies that provided input are HHS Drilling and Blasting Ltd. and Western Grater Contracting Ltd.

Likewise, four contractors, active in Oak Bay with projects that required blasting, were interviewed to provide feedback to the proposed changes. The four included: Novus Properties, Citta Construction, Point Break Developments and Hugh Owen Contracting.

All recorded comments from the open house and the interviews with industry stakeholders can be found in Attachment 4.

Response and Mitigation Measures

Matters of blasting and rock breaking in Oak Bay fall into five general areas of concern and consideration of a regulatory response.

Policy alignment

The OCP calls for the District to minimize major blasting to respect the existing topography and retain as much natural vegetation, rock outcrops, existing hydrology, and unique site features as possible.

Potential responses:

- Dissuade blasting and rock breaking in the District through increased limitations on rock breaking, increased permit requirements and scrutiny, increased fees to discourage extensive rock breaking, and limits to volume of rock permitted to be removed
- Protect natural areas and protected species from rock breaking activities including increased owner accountability and transparency about the further alterations of existing topography and submission of an arborist report and wildlife survey

Noise

Noise issues occur due to rock breaking techniques, including blasting itself. The noise disturbance is experienced more pronounced when it is unpredictable, lengthy, and occurring over an extended period of time and/or during quiet days and times of day.

Potential responses are:

- Regulate rock breaking activities in addition to blasting
- Limit the approved number of days for blasting and rock breaking on permits
- Limit the number of permits for one property
- Prohibit onsite rock crushing
- Prohibit or limit noisy rock breaking techniques, like hoe ramming
- Prohibit blasting and rock breaking on weekends and holidays and outside of an eight-hour workday.

Property

The potential impact of blasting and rock breaking on nearby properties is dependent upon the magnitude of ground vibration caused by the rock removal technique used on the particular type of rock to be removed. Air overpressure and flyrock are also possible culprits but most physical property disturbances, though still rare, result from ground alterations and vibrations caused by blasting. This raises concerns about nuisance, damage, liability, and insurance coverage.

Potential responses:

- Owner's Letter of Undertaking
- Owner engagement of independent qualified engineer to monitor and report
- Evidence of blaster certification
- Letters of assurance
- Professional liability insurance

- Prohibit rock removal within a specified setback from the property line

Safety

The more general safety aspects of blasting and explosives is regulated and overseen by the Government of Canada. The Explosives, Regulatory and Business Services Branch (ERBSB) of Natural Resources Canada (NRCan) is responsible for administering the Explosives Act and Regulations and pursuing the advancement of explosives safety and security technology. The Regulations seek to improve the safety and security of the public and all workers involved in the Canadian explosives industry. This is done through measures taken to:

- ensure that explosives are safe to make, transport, store and use;
- prevent explosives from being used in illegal activities;
- assess explosives blast hazards, recommend mitigation measures; and,
- provide an environment that ensures a reliable supply of modern, safe and cost effective explosives for Canadian industry.

Blasters detail their approach to safety in the Control Blasting Plan and are required to include safety as the highest design priority. The safety of workers rests with the blaster and their employer and is overseen by WorkSafeBC. The Plan includes timing, control of flyrock, maximum air overpressure, notifications, identification of conditions in the ground of potential migration of post-blast fumes (carbon monoxide and toxic oxides from nitrogen) and mitigation of risk. The Plan must also include undertaking of pre-blast inspection surveys of nearby properties. WorkSafeBC administers the Occupational Health and Safety Regulation Part 21 for Blasting Operations. Most of the regulation deals with the safety of workers on site.

In addition, Division 14 provides regulations for notification for close proximity blasting which defines the proximity zone (OHS Pt21 sec 21.86) as 300m from the blast site for a school, hospital or medical clinic, and 150m from the blast site for any other potentially occupied structure. (Staff note that currently the District sends an additional notice to properties in a radius of 100 m from the blasting site).

Potential local government responses:

- Require a qualified engineer be retained by the property owner to provide written confirmation to the District:
 - That the Control Blast Plan meets Close Proximity Blasting Guidelines
 - Of any activity in contravention of the bylaw
- Require the Owner to confirm that each inhabited residence in proximity of the blast has an operating carbon monoxide (CO) detector and provide one if they do not have one.

Communication

Those impacted by construction activity have more control over their circumstances when they have information about the potential impact and the roles and responsibilities of those involved if something is amiss with the project. Notifications, for example, are built into the provincial regulation for blasting operations to facilitate communication with potentially affected residents and business operators. The owner (or their contractor) is required to post project information at the blast site before the project begins (OHS Pt21 sec 21.88). The employer conducting the blast must provide written notification at least

48 hours before the blast to all schools, hospitals, and medical clinics as well as occupants of all structures within the proximity zone (OHS Pt21 sec 21.90). Depending on the nature of a concern, the impacted individual may achieve best results contacting the owner, blaster, WorkSafeBC, or the District building official.

Potential local government responses:

- Provide clarity about the local rules for blasting and rock breaking, including more definitions of industry specific terms in the bylaw
- Require the rock removal areas to be marked on the site, at least 7 days prior to the blast or rock removal, including details of blasting or rock breaking dates and volume of rock to be removed.
- Require the blaster to notify residents within the blast site of the planned blast at least 7 days prior to the planned blast
- Post publicly accessible blasting and rock breaking information on a dedicated website landing page.
- Align the practice of sending District initiated notification letters to the wider provincially required notification area .

Proposed regulatory changes

The bylaws requiring amendment include the following:

- Building and Plumbing Bylaw No. 4247
- Anti-Noise Bylaw No. 3210
- Planning, Building and Development Fees and Charges, No. 4845
- Municipal Ticket Information Bylaw No. 4846, 2023

A new blasting specific bylaw would be drafted as per legal advice on the proposed regulations.

A detailed table (attachment 3) compares the current regulations with the proposed regulations, including the rationale for each proposed change. Two key resources that informed the changes are the District of West Vancouver bylaw and the best practices guide from the International Society of Explosives Engineers. The proposed regulation have also been reviewed by the District's legal counsel. An earlier comparison compared blasting regulations in other communities (attachment 5).

Key proposed changes are outlined below.

Building and Plumbing Bylaw

Blasting is currently regulated through Section 24 of the Building and Plumbing Bylaw. Significant changes proposed include the following requirements:

- Several definitions to clarify terms used in the blasting and rock breaking industry.
- Regulations for rock breaking in addition to blasting.
- A pre and post-topographic survey to calculate the amount of rock removed and provide a record of the resultant landscape.
- Owner's engagement of an independent consultant (engineer) to monitor and advise the District on the project's blasting and rock breaking activities, particularly any related issues.
- An arborist report

- A report from a qualified environment professional respecting timing and measures to be taken in nesting season.
- Markings and posting on site respecting the planned blasting area, volume of rock to be removed, and timing of the blasting or rock breaking.
- A maximum volume of rock permitted to be removed in RS and RD zones
- Permit expiring of 10-15 working days for blasting and 15 working days for rock breaking with a limit of one potential permit extension.
- A limit of one blasting or rock breaking permit per year per property.
- Use of a security deposit to ensure the Owner fulfils any obligations under the bylaw.

Anti-Noise Bylaw

Proposed amendments to the Anti-Noise Bylaw include:

- Continue to limit blasting to the hours of 8:00am – 4:00pm Monday to Friday providing a reduced time window compared to general construction activities which are allowed between .
- Add a limitation for rock hammering to occur only during the afternoon hours of the hours proposed for blasting activities.
- Prohibit blasting and rock breaking on Saturday, Sunday, holidays, and December 24 through January 2 inclusive to avoid the most impactful construction noise during times when residents are most typically at home.

Planning, Building, and Development Fees and Charges Bylaw

Three options of calculating fees for construction activities were considered:

- Fees based on the value of construction is the current practice and more familiar in the construction industry. They require calculations based on the applicant's estimate of project value. Construction value does not always provide an indication of associated District staff workload and community impact. Also, alternative rock breaking methods should be encouraged but they may be more expensive. Fees based on project value may reflect a disincentive to a higher cost, but more sensitive rock breaking technique.
- Flat fees provide more transparency to users, and they are easier to administer as they would not require rock removal calculations. Flat fees do not distinguish between larger and smaller projects.
- A fee based on rock volume removed aligns with
 - The policy direction to minimize impact on natural landscapes, and
 - The proposed practice of requiring pre- and post- rock removal topographic surveys to calculate rock removed and leave the District with data on topographic changes to the natural environment.

For the benefit of policy alignment and proposed practice, flat fee is proposed. For a Blasting Permit the fee would be \$1,250, for rock breaking \$ 750.

Additional proposed fees for blasting and rock breaking include:

- \$2,500 damage deposit
- \$250 fee for one permit extension
- \$100/m³ for any rock removal over 600m³

Finally, a flat fee of \$ 250 would be added to / included in the application to cover the cost of staff and postage for the continued District notification of properties within an expanded 150 meter area.

Municipal Ticket Information Bylaw

The municipal ticketing bylaw would need to be amended to reflect the bylaw changes and the new blasting regulation bylaw.

OPTIONS

1. That staff be directed to proceed with bringing forward bylaw amendments for updated blasting regulations and related changes as outlined in the report (recommended).
2. That staff be directed to gather additional public input on the proposed changes through Oak Bay Connect.
3. That Council provide alternative direction.

COUNCIL PRIORITY SUPPORTED

Livability

FINANCIAL IMPACT

In June 2023, following Council direction the budget for this project was set at \$14,000 plus the cost of including consultation with the building industry as well. Other additional work was completed due to the complexity of the topic at hand and for responding to the result of a legal review. The total cost to date is approximately \$19,000, funded from the 2023 and 2024 Community Building and Planning consultant budget.

Updating the blasting regulations will change the current permit process. The amount of documentation provided would increase and result in extra staff time to process the applications. On the other hand, the updated regulations may result in fewer blasting permits being applied for. On balance, the proposed regulations are not expected to significantly affect or change existing service levels.

Currently, the cost of a blasting permit typically lies between \$200 and \$400. This covers most but not all of the current staff time needed for permit review and issuance and the District's notification letter.

Under the proposed regulation blasting permits fees would be set at \$1,250 (including the cost of District notification). For rock breaking permits there would be a \$750 fee, plus a charge depending on the volume of rock removed at \$100/m³. The proposed additional fees are intended to cover the cost of expanded review by staff and continuation of the District's notification. This should be monitored and adjusted after the new permit process is implemented.

Additional consultation would require additional funding. Further public input through Connect Oak Bay would be approximately \$ 5,000.

IAP2 FRAMEWORK ENGAGEMENT

☐ **INFORM** ☒ **CONSULT** ☐ **INVOLVE** ☐ **COLLABORATE**

As outlined earlier in this report, community and stakeholder consultation to date included the following:

- September 2023 - Interviews with blasting contractors active in Oak Bay
- October 11, 2023 - Information open house at the Windsor Park Pavilion (Note how event communicated)

- October – November Survey – distributed at the open house and by staff in response to enquiries
- January 2024 – interviews and survey of applicant / contractors involved in recent projects that included blasting

TIMELINE/PROCESS/NEXT STEPS

The following timelines are tentatively proposed for bylaw preparation and implementation:

- Spring 2024 - Council consideration of bylaw amendments
- Summer 2024 - Website and application form updates

If additional consultation is desired, the timing would need to be determined depending on staff and consultant availability.

Respectfully submitted,

Andre Boel, Director of Community Building and Planning

With respect to the Financial Impact described in this report, I concur with the staff recommendation.

Christopher Paine

Christopher Paine, Director of Financial Services

Reviewed and approved by the Director of Corporate Services.

Dianna Plouffe

Dianna Plouffe, Director of Corporate Services

I have read and consider staff's recommendation to be supportable for Council's consideration.

Selina Williams

Selina Williams, Chief Administrative Officer

ATTACHMENTS(S):

[Attachment 1 - Blasting Primer](#)

[Attachment 2 - Consultation Summary](#)

[Attachment 3 - Blasting Regulations Changes](#)

[Attachment 4 - Consultation Comments Received](#)

[Attachment 5 - Blasting Summary - Comparison of Municipalities](#)

ATTACHMENT 1 – BLASTING PRIMER

A Layperson's Background on Blasting and Rock Breaking Terminology

Rock breaking

The removal of boulders or bedrock from land by drilling, blasting, percussive breaking or splitting.

Blasting

Blasting is process of reducing a solid body, such as rock, to fragments by using an [explosive](#). Conventional blasting operations include (1) drilling holes, (2) placing a [charge](#) and [detonator](#) in each hole, (3) detonating the charge, and (4) clearing away the broken material.

Upon detonation, the [chemical energy](#) in the explosive is liberated, and the compact explosive becomes transformed into a glowing gas with an enormous pressure. In a densely packed hole this pressure can exceed 100,000 [atmospheres](#). The high pressure shatters the area [adjacent](#) to the drill hole and exposes the rock beyond to very high stresses and strains that cause cracks to form. Under the influence of the gas pressure, the cracks extend, and the rock in front of the drill hole yields and moves forward. If the distance of the hole to the closest surface is not too great, the rock in front of the hole will break free.

Holes are so placed as to require a minimum quantity of explosive per volume of rock broken (called the powder factor). Most blast-hole patterns are based on the fact that fragmentation is most uniform if the exploding charge is within a particular distance from an exposed face of the rock. To break up a large body of rock, charges are placed in a series of holes drilled so that, as the holes nearest the exposed surface are fired, the blasts create new exposed faces at the proper distances from the next set of holes, in which firing of the charges is slightly [delayed](#). The holes are fired in a predetermined order, at intervals of only thousandths of a second.

Blasting is commonly used to break materials such as coal, ore, stone, or other mined materials, to demolish buildings, and to excavate foundations for civil structures. (Source: Encyclopedia Britannica)

The International Society of Explosive Engineer Western Canadian Chapter's published 3rd Edition of their [Best Practices Guide for Close Proximity Blasting Operations](#) provides a detailed overview of the types of blasting processes that may be experienced in the District of Oak Bay.

Blasting impacts may include ground vibrations, air overpressure, and flyrock.

Vibration

Ground vibrations are typically measured by peak particle velocity (mm/s) and frequency (Hz). Damage due to vibration depends on the magnitude of the vibrations and the quality and type of building construction. Damage can be caused by vibration-caused: pressures that

permanently deform the ground, settlement of a building's foundation, or cracking in the building.

Overpressure

This is the “air blast”, the pressure waves through the air caused by the blast. The higher frequency waves cause the sounds that elicit noise complaints but the lower -frequency waves, that are often not audible, can cause impacts to structures. Leob and Tennant (p.2 2014) report “that noise levels between 120 and 133 dB will not likely cause structural damage but will however generate numerous complaints from affected residents.”

Flyrock

Blasting can propel and scatter rock fragments across and beyond the boundaries of the blast site. Blast design is critical in minimizing risk and avoiding flyrock.

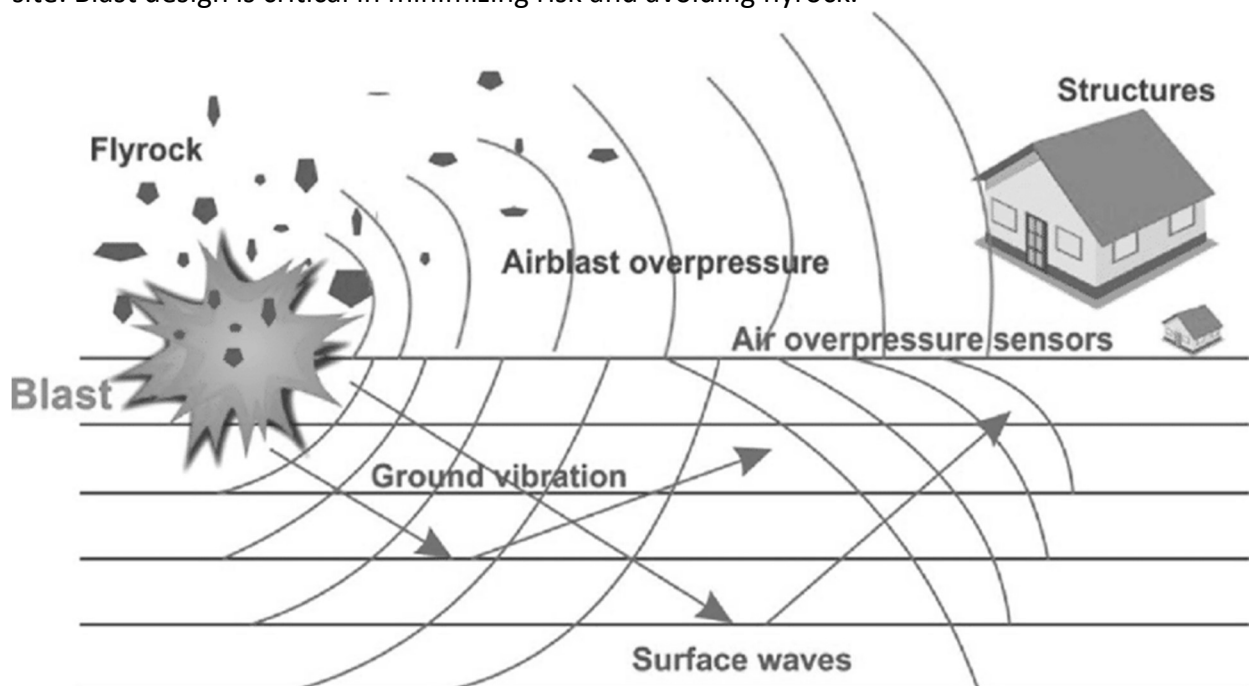


Figure 1. Effects of Blasting Operations, Source: Nguyen et al (2020)

Hoe Rammer

A hydraulic rock breaker. Hoe ramming is a mechanical technique of breaking rock by pounding the rock using a heavy-duty pneumatic hammer installed on an articulated arm of a machine, which produces a persistent and low frequency noise. It provides more precise rock breaking in sensitive areas, like protection of tree roots and adjacent structures.

“A breaker (hydraulic) is a powerful percussion hammer fitted to an excavator for demolishing hard (rock or concrete) structures. It is powered by an [auxiliary hydraulic system](#) from the excavator, which is fitted with a foot-operated valve for this purpose. Additionally, demolition

crews employ the hoe ram for jobs too large for [jackhammering](#) or areas where [blasting](#) is not possible due to safety or environmental issues. Breakers are often referred to as "hammers", "peckers", "hoe rams" or "hoe rammers". These terms are popular and commonly used amongst [construction/demolition](#) workers" (Wikipedia)



Jackhammer

"A jackhammer (pneumatic drill or demolition hammer in [British English](#)) is a [pneumatic](#) or [electro-mechanical](#) tool that combines a [hammer](#) directly with a [chisel](#). It was invented by William McReavy, who then sold the patent to [Charles Brady King](#).^[1] Hand-held jackhammers are generally powered by [compressed air](#), but some are also powered by [electric motors](#). Larger jackhammers, such as rig-mounted hammers used on [construction machinery](#), are usually [hydraulically](#) powered. These tools are typically used to break up [rock](#), [pavement](#), and [concrete](#).

A jackhammer operates by driving an *internal* hammer up and down. The hammer is first driven down to strike the chisel and then back up to return the hammer to the original position to repeat the cycle. The effectiveness of the jackhammer is dependent on how much [force](#) is applied to the tool. It is generally used like a hammer to break the hard surface or rock in construction works and it is not considered under earth-moving equipment, along with its accessories (i.e., pusher leg, lubricator).^[2]

In British English, electromechanical versions are colloquially known as "Kangos". Also the terms **drill** and **breaker** (demolition hammer) are non-interchangeable and refer to two differing distinct types of jackhammer (regardless of their power source). A breaker cannot rotate its **steel** (which for example may be either a chisel or spike) and relies on pure percussion shock to fracture and split material without cutting. Whereas a (pneumatic/hydraulic) drill both impacts and rotates, which enables a **steel** with a tungsten carbide tipped bit to cut into hard rock such as granite, typically to create holes for blasting. Normally only the pneumatic drill

would be used at geological operations such as quarrying or mining and only the breaker at civil operations such as construction and road repair.” (Wikipedia)



Pneumatics provide fluid power by means of pressurised air or gases. Hydraulics provide fluid power by means of pressurised liquids, such as oil or water.

Alternative Rock Breaking Methods

Alternative rock breaking methods include hydraulic splitting, expanding grout, and the use of chemical agents. These methods are listed with reliance only on a cursory review of two journal articles. The purpose is to give the reader a general sense of what the alternative rock-breaking methods may involve. The author is not qualified to technically describe, defend or rule out these methods. The use of hydraulic splitting and chemical agents address some impacts experienced with blasting but also have challenges. The use of chemicals, primarily CaO (quicklime), can be inefficient, uses significant amounts of water, and takes many hours to split the rocks (Albaki & Hefni).

Hydraulic splitting. Use of a hydraulic splitting machine to apply pressure into a drilled hole and mechanically break rock.



Figure X. Hydraulic splitting machine. Source: Albakri & Hefni (2021)

Chemical splitting / Expanding Grout. A slurry mixture of chemical agents premixed with water is poured into a predrilled hole. The mixture expands and the rock cracks over hours or days. These techniques are also referred to as *Soundless Chemical Demolition Agents* (SCDA).

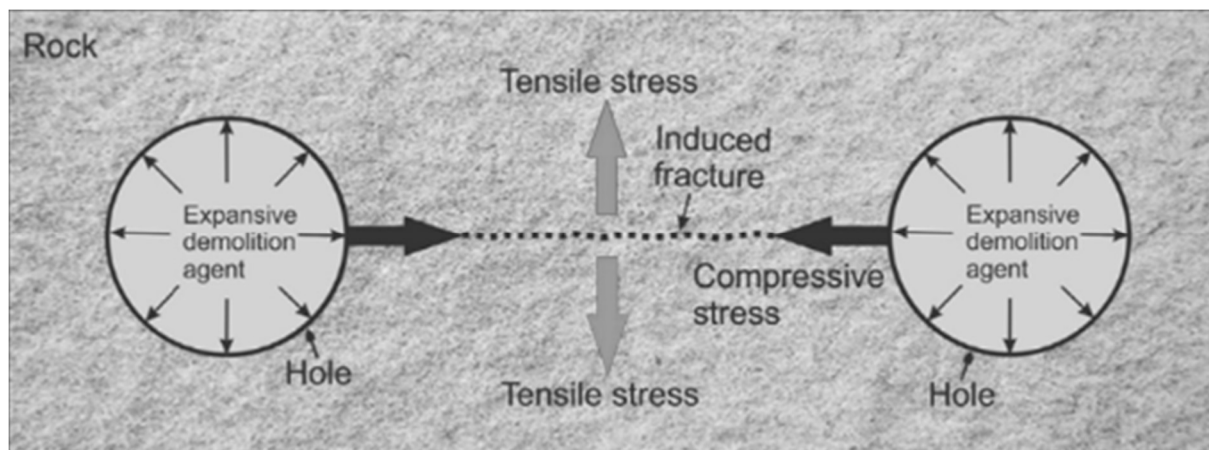


Figure X. Rock breaking with soundless chemical demolition agents (SCDAs). Source: Albakri & Hefni (2021)

	Explosives (dynamite)	Hydraulic splitter	SCDA
Breaking power	◆	O	O
Noise	X	◆	◆
Ground vibration	X	◆	◆
Dust/gas	X	◆	◆
Flyrock	X	◆	◆
Safety	X	◆	◆
Economy	◆	X	O

◆: superior, O: good, X: inferior.

Figure X. Comparing Rock Breaking Methods. Source: Albakri & Hefni (2021) (2021(2021))

References

- Albakri, Ali & Hefni, Mohammed. (2021). [A review of some nonexplosive alternative methods to conventional rock blasting. Open Geosciences](#). 13. 431-442.
- Hustrulid, W. Andrew (2011, October 17). *blasting*. *Encyclopedia Britannica*. <https://www.britannica.com/technology/blasting>
- Nguyen, Hoang & Bui, Xuan-Nam & Hieu, Tran & Hoa, Pham & Nguyen Dinh, An & Thi Thu Hoa, Le & Lê, Quí & Đỗ, Hoàn & Dinh Bao, Tran & Bac, Bui & Moayedi, Hossein. (2020). [A comparative study of empirical and ensemble machine learning algorithms in predicting air over-pressure in open-pit coal mine](#). *Acta Geophysica*. 68.
- Zhou, Huisheng & Xie, Xinghua & Feng, Yuqing. (2018). [Rock breaking methods to replace blasting. IOP Conference Series: Materials Science and Engineering](#). 322.

Attachment 2 - Consultation Summary

Blasting Regulation Changes

Introduction

The District of Oak Bay is a community of approximately 18,000 people located in British Columbia's Capital Regional District, on the south-eastern tip of Vancouver Island. Similar to other communities in the region, Oak Bay is a desirable area with an increasing demand for new construction. Given that the District lacks undeveloped space for new builds and that the terrain is characterised by thin soil and rocky outcroppings, construction activities can require the demolition of an existing structure and sometimes rock removal to accommodate the desired new build. To date, the district has managed rock blasting and rock hammering as an ordinary construction activity and has issued an average of 10 blasting permits each year. A perceived lack of local bylaw controls over these activities regularly prompts complaints from residents.

An update to the blasting regulations for Oak Bay would bring the bylaw more in line with policy to minimize the need for blasting. It may provide the District with additional regulatory tools to manage the impacts of rock blasting and rock breaking within the community. Updated regulations will also provide additional transparency to both the construction industry and members of the community, which would reduce staff time managing complaints and improve trust between the District, blasting operators, contractors, and the broader community.

Therefore, on June 26, 2023, Council directed staff to prepare changes to the blasting and hoe-ramming regulations and bring amendments to the Building and Plumbing Bylaw No. 4247 and the Anti-Noise Bylaw No. 3210. Council desired that the drafting process include one public meeting and gathering of input from the building industry and affected contractors. This report summarizes the discussions at the public meeting and with blasting professionals and contractors active in Oak Bay.

In preparation for community engagement and updating the blasting regulations, a review of letters and previous council submissions from 2020 and 2023 was first carried out. Next, to gain additional feedback from community members and stakeholders, an open house was held for members of the public and stakeholder interviews were conducted with two local blasting professionals. A survey was completed with six local contractors. The open house was held on October 11, 2023, at the Windsor Pavilion (2451 Windsor Road, Victoria BC). The event was attended by roughly 30 people, including District of Oak Bay councillors and staff. The themes identified in the review of previously filed letters and council submissions were similar to those identified in the analysis of feedback from the open house.

Summary of Resident & Stakeholder Feedback

The following summary provides an overview of the comments and feedback collected from residents, blasters, and contractors covering 12 bylaw discussion topics.

1. Definitions

There was no feedback from residents regarding the additional proposed definitions in the bylaw.

Blasters shared their thoughts regarding the definition: “Independent blasting consultant is the blasting plan developed for a site that specifies in what manner blasting operations are to be undertaken”. One professional emphasized that the consultant should be an owner-retained qualified professional engineer. The other professional felt that this would create an undue burden because they believe there are not many qualified engineers who would sign-off on the plan. They would add cost to the project but assume no liability, and that, ultimately, blasting professionals have more experience with the work. The professionals also indicated that they are the “Qualified monitor” and that the definition for this term should indicate as such. They further noted that they are required to monitor for insurance purposes. Two of the responding contractors supported these views cautioning about a professional engineers willingness to act as an Independent Consultant for this purpose. They understand the blaster to be responsible for the work and covered by their insurance.

Contractors expressed uncertainty of the difference between percussive breaking and rock hammering.

- *The proposed definition of “Independent Blasting Consultant” indicates that this is an Owner-retained professional engineer*
- *Proposed change under “Safety and Monitoring” identifies that property owner is responsible to retaining the Independent blasting consultant*

2. Blasting Plan

Residents suggested that blasting plans should prioritize the impact on residents, impacts on older/historical structures, and should include pre- and post-blast measurements of particulate matter levels. One person suggested that the plan should be shared with neighbours within 750 metres of the project site and a time be allotted for plan consultation with neighbours. One resident advocated for a post-blasting survey of neighbours’ homes.

The blasting professionals questioned the value of pre- and post-blast topographic surveys, suggesting it might be a cash grab. Additionally, both blasters believed that topographic surveys, wildlife surveys, and arborist reports should be prerequisites for a Building Permit rather than the Blasting Permit, with the responsibility of procuring these reports falling to the property owner, directly, rather than through a contract with a blaster.

Contractors expressed concern if the topographic surveys were required in addition to the ones they already do (at about \$1,500 each). They currently submit a survey of existing site conditions before site preparation begins. After the building is framed, they have a surveyor confirm the building’s location and height. One contractor is not opposed to taking a few extra measurements during these processes but cautions that some material will have been placed upon the blasted rock at the time the building location pins are recorded.

- *Impact on residents and on older/historical structures are indirectly considered in proposed change under information required for the proposed “Permit Requirements”.*
- *Consultation with Affected Owners about the Blasting Plan is not considered in the bylaw as the Blasting Plan is a technical document defined by WorkSafeBC.*
- *As per proposed “Permit Requirements”, pre- and post-Blast topographic surveys remain a requirement.*

3. Blasting Fees

Residents suggested including a road usage fee and requiring a damage deposit for possible damage incurred by adjoining properties. Another recommendation was made for a fee structure based on truckload as opposed to a flat fee. A few residents expressed support for high fees, in general.

The blasting professionals' comments on fees indicated a preference for flat fees over a percentage model. One blaster suggested tying the permit fee to the blasting plan and not the area and volume of the project.

Contractors noted that they are accustomed to fees based on a percentage of construction value rather than flat fees. One does not see the connection between higher fees as a solution to a perceived problem with blasting. Another contractor could agree with the blasting permit fee of \$1000 and rock breaking fee of \$500 but wondered if it didn't result in a doubling of fees (if the value of blasting was included in the building permit fee). The same contractor thought the fee of \$100/m³ of rock removed beyond the limit was unreasonable, in addition to the limits being unreasonable. There was general curiosity about how a security deposit would be used.

- *A flat fee system is outlined in the amendments to Planning, Building and Development Fees and Charges, No. 4845, 2023*

4. Safety & Best Practice

Neither residents nor the blasting professionals commented on the Safety and Best Practice discussion topic directly though stories were shared about past experiences with a blast resulting in carbon monoxide detection in a nearby home.

Contractors added that WorkSafeBC requires a one metre setback from the foundation of a structure to serve as a safe working space,

- *Safety requirements are outlined in the proposed change under "Safety and Monitoring"*

5. Noise & Permitted Times

Several residents commented on the permitted times for blasting. In general, residents wanted a later morning start time for blasting activities, such as 9am or 10am, with blasting activities ending by 3pm or 4pm. A few people noted that there should be no blasting on holidays or from December 23 to January 2. One resident noted that blasting should not occur during nesting season.

Only one blasting professional commented on this discussion topic, noting that blasting times should align with Public Works staff hours. The blaster also suggested the bylaw consider an exception for emergency reasons, such as a potential "cut-off" scenario at the end of the day (a circumstance where the only safe recourse is to blast again and leaving overnight could be a safety risk).

Contractors advised that any allowable time less than 8am – 4pm would add days to the process. One contractor shared agreement with a restriction on blasting between December 24 – January 2.

- *Proposed changes under "Hours and Conditions" outlines the permitted times in accordance with the Anti-Noise Bylaw, No. 3210, 1977*

- *As per proposed changes to the Anti-Noise Bylaw, No. 3210, 1977, Blasting times and duration are limited to 8am-4pm, Monday to Friday, and excludes the winter holiday season*
- *Further restrictions are proposed for rock hammering, restricting this activity to the afternoon hours of the days on which blasting is allowed.*

6. Notification

Residents highlighted the importance of notifications as they allow neighbouring homeowners to prepare for potential insurance claims. As such, residents emphasized the need for more notification time (e.g., up to 2 months) and wider notification areas (e.g., a 500-metre radius). Residents also recommended sending notifications via email and mail.

The blasting professionals made several comments regarding notification requirements. They indicated that an expanded notification radius was acceptable and that the Oak Bay development tracker would be a good platform to post notification materials. They also believed that any blasting site markers were the owner's responsibility and should be part of the Building Permit. They noted that District staff should process permits as quickly as possible so that insurance can be issued and the most accurate information regarding dates and times can be included in the notification package. Finally, one professional recommended that the notification should conform to the International Society of Explosives Engineers Western Canada Chapter's (ISEE-WEST) [Best Practices](#). A security deposit also provides some incentive for completion and submission of a post-topographic survey (see 24(7) (DVW))

[Guide for Close Proximity Blasting Operations](#)

Contractors were generally concerned that an expanded notification area seemed unreasonable and one asked to confirm if it aligns with provincial regulations. One contractor was concerned that site marking would simply give more voice to those people who want to complain about blasting. Another was concerned that marketing the site was overkill and that site information was provided by the blaster.

- *Information about requirements for notification are outlined in proposed changes under "Notifications". Notification requirements align with elements of the (ISEE-WEST) guidelines and the Occupational Health & Safety Regulation for Blasting*
- *Notification radius is proposed to be set at 150 meter aligned with provincial requirements.*

7. Dust Control

One resident suggested that the owner/developer should provide neighbours with exterior cleaning products and air filters. There was no comment on this section from the blasters or contractors.

- *Proposed change under "Hours and Conditions" outlines that any dust resulting from rock breaking activities, including removal, shall not cause any nuisance or affect the right of way.*

8. Blasting & Rock-Breaking Techniques

There was strong agreement among residents that rock hammering (also known as "hoe ramming") not be permitted. Residents also agreed that there should be a limit on the amount of material that can be removed from a site, with one resident suggesting it should be capped at 400m³.

Blasting professionals were generally indifferent in regard to the amount of material permitted to be extracted from a site but mentioned that the limit should be high enough to make the project viable. They did have reservations, however, about using alternative methods for rock breaking, citing concerns about their higher costs, safety risks like fly rock with chemical methods, and potential unsuitability of some alternative methods for Oak Bay's granite and basalt rock. One blaster recommended the use of electronic detonators to help reduce vibration but the other expressed opposition to this idea. Finally, neither blaster took issue with banning rock hammering, with the exception of a "rock backline" remediation, which may be needed in some instances.

Contractors did not see the value in rock volume limits as it could reduce an owner's ability to design and occupy space. One questioned whether a full basement could be built on an average lot. Contractor views on hoe-ramming varied. One considered prohibition of the technique unreasonable and another explained that hoe-ramming can be much faster and less costly compared to drilling and blasting. On the other hand, a third contractor suggested there be no permit for hoe-ramming less than 10m³, aligned with the exemption clause in the bylaw. The fourth contractor mentioned that hoe rams and expanding grout are destructive enough that they should require a permit, but it could simply be part of the building permit where the applicant would describe the means of excavation as part of the application.

- *Proposed change under "Hours and Conditions" outlines that rock hammering is prohibited except for rock removal under 10m³ within restricted weekday afternoons, which would require a permit.*
- *Proposed change under "Limitations" outlines a maximum of 400m³-600m³ of rock can be removed from a site, depending on lot size.*

9. Permitting

Residents had various suggestions regarding permitting, including the requirement that no blasting permits be issued without a building permit, that the permit be time-limited scope (for both daily activity and overall duration of blasting), and that the permit include prohibited and/or permitted activities. One resident suggested issuing blasting permits for Multi Dwelling Unit projects only, and the recommendation to include blasting time limitations as permit conditions.

The blasting professionals indicated that a typical blasting and excavation project lasts approximately 3-4 business days but that the permit should be valid for a period of 20 working days from the time blasting is proposed to start. Both blasters emphasised the importance of a speedy permit renewal process, as it would involve stopping work until a new permit is obtained. They also expressed concerns about potential time delays in re-applying for extensions, emphasizing that such applications should be processed immediately due to site safety issues if blasting is left partially complete while waiting for the permit extension. They raised questions about the procedure for notifying neighbours when there are permit extensions.

Contractors viewed time constraints as problematic in consideration of labour and equipment issues and wondered why the time needed to be constrained when the volume of rock to be removed was already proposed to be limited. One contractor expressed concern about time

limits putting deadlines on the environmentally sensitive process of planning and executing a blast. Another contractor suggested timing should begin from the day the work being as sometimes it can take days or weeks to get machinery moved to the site. An additional 5-10 days in addition to what it proposed would be more reasonable. There must be consideration of unforeseen delays like weather and road closures. In most cases 10-15 days is not enough to do a clean and safe job. A large number of accidents and injuries occur when people are rushed and life safety should be a priority over appeasing neighbours who forget they live in a house that was once constructed in a similar manner. One permit per year would not accommodate large sites with several construction phases.

- *Proposed change under “Permit Requirements” outlines that a blasting or rock breaking permit shall not be issued unless a building permit has been issued.*
- *Blasting times and duration are limited. Please see Noise and Permitting Section of this report for more information.*
- *Change under “Permit Expiry” outlines that permits will expire after 10-15 days, depending on the lot size.*
- *The time it takes for the District to issue a permit is not considered in the bylaw*

10. Liability Insurance

One resident suggested an increase in coverage from the proposed \$5,000,000 to \$15,000,000, while others proposed that neighbours should be insured by the owner/developer and/or the District.

The blasting professionals noted that the minimum \$5,000,000 liability insurance is standard.

- *Liability insurance is set at \$5,000,000 in proposed change under “Insurance, Indemnity, and Deposit”*

11. Security

Neither residents nor the professionals commented on the Security discussion topic. Contractors questioned how the security deposit would be used, if it was? One contractor recommended this be left to the blasters and their insurance providers. Another explained that whenever they do any blasting, they stop both vehicle and pedestrian traffic from crossing in front of the site from the sound of the 3 beeps, to after each blast. (30 seconds +/-). This is reasonable to be done with site workers in a high-viz vest, one for each lane of traffic. It is not necessary to hire out to a third party and for 30 seconds of work a few times in a day. If that is what is proposed, it is another very large expense that is not reasonable or necessary

- *Proposed change under “Insurance, Indemnity, and Deposit” stipulates that the security deposit will not be released until the Director has reviewed and signs off on the post-Blast topographic survey.*

12. Other Recommendations, Comments, or Suggestions

Setbacks - Many residents suggested a blasting area setback from the property. Contractors caution the WorkSafeBC one metre setback from a foundation for working space should be taken into consideration. Two contractors also advocate that setbacks should be set by what an engineer is prepared to sign-off on.

- *No specific setback for rock removal from the property line is proposed.*

Community Monitoring - Some residents suggested that there be a phone number to call and report permit violations

Guidelines - Residents suggested that the District encourage other forms of development that do not require blasting, possibly through guidelines.

- *This is not explicitly considered in the bylaw, however a more robust permitting process for blasting, as outlined in the proposed changes, may encourage some people to consider other construction methods.*

Community Engagement and Involvement - A few residents mentioned they would like to see greater community engagement on projects that involve blasting, and that District staff empathize more with neighbouring property owners, given that some neighbours have had damage to their properties while others feel that the blasting affected their mental wellbeing. Others saw an opportunity to get local post-secondary students involved in impact assessment or monitoring activities.

Pre-Qualified Blasting Professionals - One blasting professional recommended that the District maintain a list of prequalified professionals for smaller projects.

Burden - The blasting professionals both felt that the bylaw was potentially burdensome, especially if a pre- and post-blasting topographic study is required.

- *It is the view of staff that the requirement set out in the proposed changes to the bylaw are not burdensome as they align strongly with similar bylaws in other BC jurisdictions and provide for careful deliberation when Blasting activities are considered.*

Housing Cost – Contractors feel that every extra regulatory requirement makes housing more expensive which is contrary to the goal of making housing more affordable.

Attachment 3 - Blasting Regulation Changes

Building and Plumbing Bylaw No. 4247, 2005			
Sec.	Current	Proposed	Rationale
	DEFINITIONS		"DWV" is the District of West Vancouver Soil Removal, Deposit, Blasting and Rock Breaking Bylaw No. 5130, 2021 "ISEEW" is the Best Practices Guide for Close Proximity Blasting Operations 3rd Edition, International Society of Explosives Engineers Western Canada Chapter
1	N/A	"Affected Owner(s)" means the owners or occupiers of parcels of land to be inspected before a Blasting Permit is issued pursuant to Section 24 (2)(h) (Pre-Blast Inspection and Post-Blast Inspection);	Differentiates between the Owner who is initiating the Blasting or Rock breaking and those properties within a certain radius who may be impacted (DWV) 
	N/A	" Blast " or " Blasting " means the use of explosives, or chemicals, for the purpose of moving, displacing, or breaking rock or other material;	Reference to Bylaw regulations (DWV) 
	N/A	" Blaster " means the person, firm or corporation engaged by the Owner to conduct Blasting and includes an agent, contractor, or employee of the Blaster;	Reference to Bylaw regulations (DWV) 
	N/A	" Control Measures / Blasting Plan " is the Blasting plan developed for a site that specifies in what manner Blasting operations are to be undertaken;	This definition explains how the Blasting Plan is a technical document about the activity (ISEEW) 
	N/A	" Independent Blasting Consultant " is an Owner -retained qualified professional engineer with specific knowledge and expertise in rock mechanics and close proximity Blast design to meet specific objectives as well as the control of vibration and air over pressure, who is independent of the Blaster ;	The definition is different from the industry definition in that it specifies the consultant must be a qualified professional engineer (ISEEW and DWV)  

		“Nesting Season” means the nesting season for a raptor, as set out in the <i>Provincial Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia</i> (2013);	Recommended cross reference by legal. 
	N/A	“Pre-Blast Inspection” is a detailed record in written form, accompanied by photos/video, of the condition of private or public property, prior to the commencement of Blasting operations; “Post-Blast Inspection” is a detailed record in written form, accompanied by photos/video, of the condition of private or public property, following the completion of Blasting operations;	For increased clarity and improved communication in reference to Bylaw regulations. It differs from the industry term with the use of <i>inspection</i> rather than <i>survey</i> to avoid confusion with other required surveys. Post-blast inspection is added. (ISEEW)  
	N/A	“Rock breaking” means the removal of boulders or bedrock from land by drilling, percussive breaking (other than rock hammering), or splitting, but excluding Blasting;	Reference to Bylaw regulation scope (DWV)  
	N/A	“Rock hammering” means the use of a sharp-tipped hydraulic hammer that is fitted on a piece of mobile machinery to break concrete or rock surfaces;	Reference to Bylaw regulations. Also known as hoe ramming  
4(1)	(d) Blasting.	(d) subject to section 4(2)(d), the removal of rock by Blasting and other acceptable Rock breaking.	The broader definition allows the District to regulate all Rock breaking activities.  

4(2)	N/A	(d) Blasting or Rock breaking in any of the following circumstances: (i) Rock breaking that involves the removal of less than 10 cubic metres of rock; (ii) The rock to be removed consists entirely of boulders separate from bedrock; (iii) If the rock removal is specifically authorized by a statute or regulation other than the Community Charter or Local Government Act; or (iv) If the work is, in the Director's opinion, required on an urgent basis to lessen or eliminate an imminent threat to life, safety, property damage or public transportation routes and communication systems.	Exemptions avoid unnecessary steps in the right circumstances They are reasonable consideration (DWV)  
5(4)	No person shall carry out Blasting unless a building official has issued a permit for the work.	No person shall carry out Blasting or Rock breaking unless a building official has issued a permit for the work.	Typical bylaw clause to confirm permit requirement
24	BLASTING	BLASTING AND ROCK BREAKING The following regulations apply to Blasting and Rock breaking with the purpose of regulating the removal from and deposit of rock on lands within the Municipality, to regulate and prohibit the use of explosive agents for Blasting, to require the holding of a permit for such purposes, and to fix a fee and security for such permit.	Provides an introduction to Section 24 of the Building Bylaw to make clear that Blasting and Rock breaking are regulated subject to this section 
PERMIT REQUIREMENTS			
24	(1) No person shall Blast, carry on Blasting operations, or use any explosive agent without first obtaining a permit and paying the fees set out in Schedule "A" of this Bylaw.	1) No person shall remove or cause to be removed rock unless the person has obtained a Blasting or Rock breaking permit for such removal under this bylaw, and every such removal shall conform in all respects to the regulations and requirements of this bylaw and the terms and conditions of the permit;	Permit required for Blasting or Rock breaking provides the District the opportunity to manage neighbourhood disturbances of these construction activities (DWV) 
		2) When an Owner proposes to remove rock through means of Blasting , the Owner shall first apply to the Director of Building and Planning for a Blasting Permit by providing each of the following:	List of information required to facilitate communication and transparency. 
		a) The permit fee and security deposit as set out in the <i>Planning and Development Fees and Charges Bylaw No. 4845, 2023</i> as amended from time to time. The damage deposit shall be security for the completion of all requirements under this Bylaw and may be used at any time by the District to secure completion of any of these requirements;	Permit fees in accordance with fees bylaw. Noting potential for permit extension fee. Some minimal assurance of compliance with the regulation. (DVW)  

24	(2) No person shall Blast, carry on Blasting operations, or use any explosive agent or obtain a Blasting permit unless he holds a valid Blasting Certificate issued by the Workers Compensation Board of British Columbia.	b) A copy of a valid Blasting certificate issued to the Blaster by WorkSafe BC for all persons completing the Blast ;	Confirmation of technical blasting qualifications on file. (DVW)  
24	(3) An applicant for a Blasting permit shall provide proof of comprehensive general liability insurance coverage for Blasting operations with a minimum coverage of Two Million Dollars (\$2,000,000.00) inclusive per occurrence.	c) A certificate of insurance to insure damage to persons or property that may be injured by the Blasting or Rock breaking . This insurance shall be public liability and property damage insurance in a form satisfactory to the Municipal Solicitor, with Five Million Dollars (\$5,000,000) coverage inclusive for loss or damage in respect of injury or death of any person or person and/or damage to property from any one accident or occurrence. There shall be no third-party deductible for bodily injury or property damage loss and no space warranty clause. The District and the company employing the holder of the Blasting certificate shall be named insureds. Notification will be given by the insurer to the Director of Building and Planning by registered mail not less than 30 days prior to material change, cancellation or termination of the insurance.	Required regulation in building bylaw but increases value to \$5million   
24	(4) An applicant for a Blasting permit shall execute a contractual Letter of Undertaking releasing, indemnifying and saving harmless the Municipality from and against any and all losses, claims, demands, suits, actions, recoveries and judgements of every kind brought or recovered against the Municipality arising out of or in any way connected with the work done under the Blasting permit.	d) A contractual Letter of Undertaking from the Owner releasing, indemnifying, and saving harmless the Municipality from and against any and all losses, claims, demands, suits, actions, recoveries, and judgements of every kind brought or recovered against the Municipality arising out of or in any way connected with the work done under the permit, in a form satisfactory to the Director;	Requirement transfers from current building bylaw (DVW)  
		e) A context map of the area within 300 metres of where the rock removal will occur;	Provides neighbourhood context of the Blast site including any potential affected properties.   

		f) A comprehensive topographic survey of the parcel (or the portion thereof) where the rock removal is to be carried out, prepared by a B.C.L.S. or a professional engineer; The topographic survey shall have the dimensioned exterior walls of the principal building and garage, and edge of driveway, overlaid as shown on the building permit plans. The Owner shall ensure that the survey is completed after removal of organics and other overburden so that the bedrock proposed to be removed is exposed;	This requirement is the first part of enabling: (1) the calculation of rock removed, and (2) a record of the resulting landscape that may affect drainage, natural areas, and aesthetics. (DVW)   
24(5)	No person shall Blast, carry on Blasting or operate or use an explosive agent in dangerous proximity to any person, building or property, or the works of any underground utility liable to suffer injury from Blasting unless and until precautions have been taken to prevent injury to any person, building, property or utility.	g) A Control Measures / Blasting Plan , prepared by the Blaster and accepted in writing by an Independent Blasting Consultant , which shall consist of a sketch of the Blasting pattern and include the sequence of detonation and the maximum weight of explosives to be detonated per delay, and shall specify measures designed to minimize potential injury to any person and avoid, control, or minimize the impact of the Blasting .	This is the technical plan that specifies the methods to be used to ensure safety of people and property. The clause provides increased clarity and direction to achieve the current Blasting regulation that references “precautions” (current Sec 24(5)) Staff are not qualified to judge the competence of the plan so the plan is subject to review and endorsement by a qualified engineer (Independent Blasting Consultant by definition in the bylaw) (DWV and ISEEW)  
		h) A copy of the Pre-Blast Inspection Report ;	This information provides the District with insight regarding the extent of the Pre-Blast Inspection conducted for insurance purposes by the blaster.  
		i) A letter to the District from a qualified Independent Blasting Consultant confirming they have reviewed and approved the Control Measures / Blasting Plan and acknowledging that the District is relying on their approval in issuing the permit.	As referenced above, the owner-retained qualified engineer provides professional assurance to the District that the plan is acceptable.     

		j) An arborist report that describes the plan to protect trees, including that Blasting and Rock breaking: i) near tree roots will only be performed using explosives of low phytotoxicity and techniques that minimize tree damage, like expanding foam and hydraulic rock breakers; ii) will only use small low-concussion charges, and multiple small charges designed to pre-shear the rock face, to reduce fracturing, ground vibration, and minimize the impact on the surrounding environment; iii) materials, including blast rock and other construction materials and debris, are stored away from critical tree root zone.	The District arborist often adds these conditions to Blasting permit so they are included in the bylaw for consistency, communication, and transparency. The examples are recommendations from local professional tree service providers. 
		k) A QEP recommendation about timing and measures required to comply with provincial regulations and guidelines during Nesting Season, for Blasting or Rock breaking, between March 30 and August 16;	Raptor Conservation Guidelines "Blasting is of particular concern, especially during courtship and egg-laying periods. If blasting must occur at this time, a minimum 1,000 m (1 km) buffer from the nest site should be maintained." (p.35 Sec 8.4) Environment Canada Nesting Calendar for Region A1 This requirement provides required information to enable the Director to withhold a permit in nesting season within the buffer area of a nest of a protected wildlife species, if required. This is in accordance with BC's Wildlife Act Section 34, federal Migratory Birds Regulations Section 6, and the federal Migratory Birds Convention Act Section 5.1(1)(2) 
		l) Information of any proposed road and sidewalk closures, detours, or other temporary accessibility changes;	This information is information required by Public Works that can be communicated as part of the rock removal permit notification process.  
		3) When an Owner proposes to remove rock through means of Rock breaking, the Owner shall first apply to the Director of Building and Planning for a Rock breaking Permit by fulfilling each of the requirements outlined in 24(2), except for 24(2)(b) Blasting Certificate, 24(2)(g) and 24(2)(i) respecting Control Measures / Blasting Plan, and 24(2)(h) report on the results of a Pre-Blast Inspection.	List of information required to facilitate communication and transparency. Rock breaking does not require the technical detail of Blasting. (DWV) 

		4) For Blasting or Rock breaking on land owned by the municipality or another government, the persons seeking permission to Blast or Rock break shall sign all forms, complete all requirements, and bear all responsibilities, liabilities, and costs under the Bylaw and otherwise, as if they were the Owner.	Provides clarification about how the bylaw applies to public lands (DVW)   
24	(10) Where a Blasting permit is for an excavation required for the construction of a building, no Blasting permit shall be issued unless the applicant has first obtained a building permit for the proposed building	5) Where a Blasting or Rock breaking permit is for an excavation required for the construction of a building or structure, no Blasting or Rock breaking permit shall be issued unless the applicant has first obtained a building permit for the proposed building or structure.	Ensures the site plans are completed and filed with a building permit to justify the need for blasting or rock breaking.   
		6) The rock removal areas will be clearly marked on the site prior to issuance of a permit, readable from the outside the property line, and posted at least one week prior to the planned rock removal. Information will include the planned date and duration of rock removal, the intended depth of rock removal, and the volume of rock to be removed. The method of marking should not be removed by inclement weather;	This provision supplements the OHS blasting regulation 21.88(2) that requires the project notice be posted at the blast site. Site marking provides additional information to neighbours. And confirms owner's intention for department staff inspection and response to enquiries (DVW)    
		7) An Owner shall provide a post rock removal topographic survey in accordance with the requirements for a topographic survey in 24(2)(f) once any Blasting and/or Rock breaking ;	The post rock removal topographic survey will provide measures to calculate the net rock removal from the site and the rock base of the resultant landscape for future site and infrastructure planning purposes. (DVW)    
		LIMITATIONS	

		8) On land zoned Residential Use (RS or RD) in the zoning bylaw, Blasting and Rock breaking are prohibited except: a) For the construction of one or more of a primary dwelling, garage, coach house, access driveways, or parking area as shown on plans for which a building permit has been issued and is in good standing, and for such purposes the allowable rock volume to be broken, blasted and removed, shall not exceed: i) a total volume of 400m³ on lots less than 885m², and ii) a total volume of 600m³ on lots over and equal to 885m²; For certainty, the totals above are the cumulative amount of rock that is permitted to be broken, blasted and removed for the construction of any and all primary dwellings, garages, coach houses, access driveways and parking areas on a lot. If the District has records of a volume of rock that was previously removed on a lot for any of these purposes, then this volume will be deducted from the allowable volume specified under this section. If the District has no records of a volume of rock that was previously removed on a lot, then no adjustments are made to the allowable volume specified under this section.	Provides limits to rock removal in accordance with OCP Policies guiding natural landscapes and outcrops with minimal blasting Provides an opportunity for the district to manage rock removal and related topographic change over time. (DVW)   
		b) For the installation of utilities and utility connections; and	Facilitates required utility connections (DVW) 
		c) Blasting or Rock breaking certified by a geotechnical engineer as being necessary for the safe use of the site.	Provides for safety-related intervention (DVW) 
		9) Despite the provisions of Section 24 (8)(a) for RS and RD zones, the Owner of the land may apply to the Director for a Blasting or Rock breaking permit to remove a volume of rock specified in the permit in order to:	Provides minor opportunities for rock removal when a broader policy objective may be achieved. (DVW)   
		a) Facilitate the construction of a swimming pool if the Director is satisfied that the Blasting or Rock breaking will reduce the visual and auditory impact of the pool and associated mechanical equipment on surrounding properties;	Supports urban design objectives (DVW)  

		b) Enable any accessory building or structure to be located on the site in a manner which in the opinion of the Director will: (1) Accommodate the design and spatial relationship of the buildings so the floor levels conform to the natural contours of the site; (2) Eliminate or reduce the use of exposed foundation walls and structural support elements, or; (3) Minimize the visible mass of all structures as viewed from adjacent roads and properties;	Supports urban design objectives (DVW)   
		c) Enable minor terrain alteration, in the opinion of the Director, to accommodate landscaping work or property amenity; but excluding in all cases, the removal of rock which substantially alters the natural grade of the site.	Enables landscaping projects (DVW)   
		10) For certainty, an Owner may not remove an aggregate volume of rock removed pursuant to one or both of Sections 24(8)(a) and 24(9) exceeding the allowable rock volume in Section 24(8)(a);	Further regulations of volume of rock removed to limit impact on natural landscape. (DVW)  
		11) (removed)	
		12) The aggregate volume limitations in 24(8)(a) do not apply to rock removal required for the construction of roads or the installation of utilities and services in accordance with approved subdivision drawings;	Exempts required infrastructure projects from aggregate volumes for new subdivision development. (DVW)  
HOURS and CONDITIONS			
24	(6)The holder of a Blasting permit may only Blast, carry on Blasting operations, use an explosive agent, or operate drills, compressors or other equipment used to prepare land for Blasting from Monday to Friday, exclusive of statutory holidays, between the hours of 8:00 a.m. and 4:00 p.m.	13) An Owner shall ensure that Rock breaking or Blasting only occurs within the times permitted under <i>Anti-Noise Bylaw, No. 3210, 1977</i>, as amended from time to time.	Limiting the hours of nuisance while maintaining a reasonable window of time to safety complete the work. This represents status quo for Oak Bay respecting time of day – see Noise bylaw proposal. Note that this allows blasting for 30 minutes beyond the end of the normal workday of Public Works. (DVW)  

		14) The Director may withhold issuing a Rock breaking or Blasting permit until the end of the Nesting Season , if the Director is satisfied that the subject property is within the buffer area of a nest of a protected wildlife species, as defined by the <i>Provincial Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia</i> (2013) or may specify as a condition of a Permit that the Rock breaking or Blasting must not occur except on or after a date specified in the permit.	Protection of wildlife as regulated in the Wildlife Act (DVW) 
		15) No person shall engage in Rock hammering except for minor Rock breaking under 10m ³	Addresses the excessive annoyance of hoe ramming. See also accompanying provision in Noise Bylaw. DVW  
		16) Onsite rock crushing or grinding is prohibited, except for in the case of a new subdivision of land.	 
24(9)	No person shall Blast, carry on Blasting operations, use an explosive agent, or operate drills, compressors or other equipment used to prepare land for Blasting unless and until steps have been taken to suppress dust which may occur as a result of the said activity.	17) No person shall remove or deposit rock in a manner that causes a dust or dirt nuisance to any neighbouring property or right of way.	Provides clear instruction to contractors to manage operations to avoid impacting neighbours (DVW) 
		PERMIT EXPIRY	

13(4)	Every permit is issued upon the condition that the permit shall expire and the rights of the owner under the permit shall terminate if: (c) the work authorized by the permit is not completed, or any inspections and occupancy permits related to the permit and required pursuant to this Bylaw are not obtained: (ii) within twelve (12) months from the date of issuance of a permit that is not in respect of the construction of a complex building and that is not a renewal permit	18) Authority for Blasting under a Blasting permit expires 10 working days for lots less than 885 m² 15 working days for lots equal to or greater than 885 m² 19) A Rock Breaking permit expires 15 working days after issuance of the permit for Rock Breaking;	Blasting expirations are intended to balance enough time to complete the required blasting but limited to avoid ongoing blasting. Rock breaking permit expiration is reasonable to limit the nuisance of noise in the vicinity. (DWV)  
		20) The Director may, at the request of the Owner, may extend the authority for rock removal under a Blasting or Rock breaking permit provided that - The Owner provides evidence of the need for an extension of time due to: - Unforeseen environmental conditions such as extreme weather or a natural disaster - Labour shortage due to loss of staff or illness - Inability to proceed due to supply chain matters causing an equipment delay or unavailability; - Only one permit extension is granted; - The extension of time is no more than the time authorized with the original permit; - The Owner pays an Extension Fee as established in the <i>Planning, Building and Development Fees and Charges, No. 4845, 2023</i>; - The Owner notifies all Affected Owners of the permit extension and updates the project information posted on the site; - The Director is satisfied that any policy of insurance or security provided under Section 24(2)(c) will remain in effect;	This provision allows for permit extensions, subject to an additional fee to cover administrative costs, to better manage the impacts of larger blasting or rock breaking projects or those impacted by unforeseen circumstances like weather. (DVW)    

		21) The Director may cancel or suspend the authority for rock removal under a Blasting or Rock breaking Permit if there are reasonable grounds to believe that the Owner or Blaster has done anything in violation of this Bylaw or the permit, or in violation of any agreement made pursuant to Section 24(2)(d) or (g). No person who has had their authority for rock removal under a permit cancelled or suspended shall engage in or carry-on rock removal in the District unless special written permission to do so is given by the Director;	This regulation provides the Director discretion to respond to a problematic project. The agreements reference the Owner's Letter of Understanding and the Blaster's Control Measures / Blasting Plan (DVW)  
		22) The District will not issue more than one Blasting permit for the same property within any 12-month period, exclusive of the dates of an active Blasting or Rock breaking permit.	Provides motivation for the Owner to communicate longer term development plans up front and limit multiple blasting projects over time at one location. 
		NOTIFICATION	

24	(7) No person shall Blast, carry on a Blasting, or use an explosive agent within a radius of 100 metres of any building without first notifying in writing the owners or occupants of such building, with such notice to include the anticipated duration of the Blasting program.	23) The holder of a Blasting or Rock breaking Permit shall not commence or allow Blasting, Rock breaking until such time as the holder of the Blasting Permit has given written notice to the Director and all property owners within 150-meter radius of the blast location. The notice shall include the: a) Description of the work to be done, including the volume of rock being removed; b) Dates on which the Blasting or Rock breaking will occur; c) Times when Blasting or Rock breaking will occur; d) Methods intended to safeguard persons and property, including plan of vibration and air over pressure monitoring; e) Signals and other warning methods to be used to inform those nearby of an impending Blast; f) Name, telephone number, cellular telephone number and email address of the Blaster or Owner who will provide additional information, and; g) Name, address, and telephone number of the Blaster's insurer.	This is required notification and the listed details provide improved communication and transparency for the Owner, Blaster , property owners, and District. (DWV) It supports provincial notification requirements and provides the District an opportunity to require additional communication in certain circumstances Occupational Health and Safety Regulation Part 21 defines the proximity zone for blasting as 300m from the blast site for a school, hospital or medical clinic, and 150m from the blast site for any other potentially occupied structure. Additional operational practice, with cost covered by the blasting fee. The District will: – Continue general notification to all property owners and residents within an increased 150 meters by the municipality with cost covered by the blasting fees - include blasting applications on the Development Tracker with information about who to contact for specific resident concerns.
		24) The holder of a Blasting or Rock breaking permit shall provide at least 48 hours' notice shall be given of the commencement of any Blasting or Rock breaking , and at least one week's (7 days) notice shall be given of any project expected to continue for more than two (2) days.	In addition, the District will continue to provide notice to properties within 150 meter of the blast site at least one-week in advance of blasting.
24(8)	No person shall Blast, carry on Blasting operations, or use an explosive agent within a radius of 300 metres of any school building during school hours without first notifying in writing the School District, Principal or person in charge thereof, with such notice to include the anticipated duration of the Blasting program.	25) The holder of a Blasting or Rock breaking permit shall not commence or allow Blasting or Rock breaking within 300 metres of a School or Health Facility until notice as required in Sections 24(23), and 24(24) has also been given to the senior administrator of the School or Health Facility and has been provided to the Director . Further notice must be given to the senior administrator, or his or her designate, at least two (2) hours prior to each actual blast, stating the approximate time of the blast.	Provides specific notification requirements for schools and health facilities, so Blasts can be planned to avoid more sensitive school or health centre times and that the planned Blasting is well known to nearby institutions.

		26) The Owner shall notify or cause to be notified the Director and each Affected Owner , in writing, when the rock removal to be carried out under the permit that has been completed.	Notice of blasting completion triggers a 60-day period for affected to communicate concerns to the Blaster's (or contractor's, in the case of Rock breaking) insurance company.
		SAFETY AND MONITORING	
		27) The Blaster shall ensure that a security person (equipped with and trained in the use of warning and signalling devices approved by WorkSafeBC BC) is posted at every location where vehicles or pedestrians might be affected by a Blast . Prior to any Blast , the Blaster shall ensure that the security person signals vehicles and pedestrians to prevent them from entering an area which may be affected by the Blast . The Blaster shall ensure that no Blasting occurs until all persons and vehicles vacate the area affected by the Blast .	OHS requires blaster to secure access to the site but there is no mention of nearby  and pedestrian intersections and access in the vicinity. Manages traffic and proximity access during a blast. (DVW)  
		28) The Owner will, at the Owner's cost, retain an Independent Blasting Consultant to act on the Owner's behalf to: a) complete the requirements of Section 24 that relate to the Independent Blasting Consultant ; b) monitor the Blasting to ensure that the Blasting complies with the Control Measures / Blasting Plan , the Blasting Permit , and the requirements of this bylaw.	An owner-retained qualified engineer supports technical reviews required by the Director This will be an additional expense to the Owner and a disincentive to undertake blasting and an incentive to find site development options that respect the natural topography of the land. (DVW) 
		29) During the course of Blasting , the Blaster shall forward to the Independent Blasting Consultant all Blast records and the Independent Blasting Consultant shall review the Blast records and confirm to the Director , if requested, that Blasting is being carried out in accordance with the Control Measures / Blasting Plan , and shall immediately report any problems, unusual circumstances, or inconsistencies to the Director	An owner-retained P.Eng has a professional responsibility to communicate with the District. (DVW) 
		30) The Independent Blasting Consultant shall immediately notify the Director if they have direct or indirect knowledge of a contravention of the Control Measures / Blasting Plan , the Blasting Permit , or the provisions of this Bylaw.	Designates responsibility to a qualified P.Eng to notify the District of any issues. (DVW)   
		31) Upon completion of the Blasting and upon submission of a post- Blast topographic survey confirming the quantity of rock removed, satisfactory the Director, the Municipality shall return the security deposit to the applicant.	A security deposit also provides some incentive for completion and submission of a post-topographic survey (see 24(7) (DVW)  
		32) The holder of a Blasting permit must ensure that all Provincial and Federal Blasting standards are met.	Stating what is understood for clarity 

Anti-Noise Bylaw, No. 3210, 1977			
Sec	Current	Proposed	Rationale
4		Prohibited Conduct: (6) Blasting or Rock breaking outside the hours of 8am-4pm Monday to Friday Blasting or Rock breaking on Saturday, Sunday, or holidays Blasting or Rock breaking from December 24 - January 2, inclusive	Limited times and seasons for blasting and rock breaking balances the need for construction activity with the comfort of living in the community
4		Notwithstanding (6) above, rock hammering is prohibited outside the window of 12 pm – 4 pm of the allowed days for Blasting and Rock breaking.	Rock hammering is the most impactful type of rock breaking in terms of noise. For this reason, extended day long noise exposure to residents could be limited to afternoons only.

	Planning, Building and Development Fees and Charges, No. 4845, 2023																
Sec	Current		Proposed		Rationale												
	Initial fee based on construction value: <table><tr><td>≤ \$100K</td><td>\$100 + 1.3% project value</td></tr><tr><td>> \$100K ≤ \$500K</td><td>\$1,500 + 1.3% project value >\$100K</td></tr><tr><td>> \$500K</td><td>\$5,000 + 1.3% project value >\$500K</td></tr></table>		≤ \$100K	\$100 + 1.3% project value	> \$100K ≤ \$500K	\$1,500 + 1.3% project value >\$100K	> \$500K	\$5,000 + 1.3% project value >\$500K	Schedule 2, Table 1 <table><tr><td>Blasting permit fee</td><td>\$1,250</td></tr><tr><td>Rock breaking permit fee</td><td>\$750</td></tr><tr><td>Blasting & Rock breaking security deposit</td><td>\$2,500</td></tr></table>		Blasting permit fee	\$1,250	Rock breaking permit fee	\$750	Blasting & Rock breaking security deposit	\$2,500	Set fees do not rely on construction value estimates. The cost of notifications (an estimated \$250 dollars typically) has been included in the proposed base fees.
≤ \$100K	\$100 + 1.3% project value																
> \$100K ≤ \$500K	\$1,500 + 1.3% project value >\$100K																
> \$500K	\$5,000 + 1.3% project value >\$500K																
Blasting permit fee	\$1,250																
Rock breaking permit fee	\$750																
Blasting & Rock breaking security deposit	\$2,500																
	Extension fee based on original permit fee: <table><tr><td>≤ \$500</td><td>10% of original fee</td></tr><tr><td>> \$500</td><td>\$50</td></tr></table>		≤ \$500	10% of original fee	> \$500	\$50	<table><tr><td>Blasting or Rock breaking fee for extension of time</td><td>\$250</td></tr><tr><td>Blasting or Rock breaking fee for rock removal over the maximum permitted</td><td>\$100/m3</td></tr></table>		Blasting or Rock breaking fee for extension of time	\$250	Blasting or Rock breaking fee for rock removal over the maximum permitted	\$100/m3	Extension fees motivate completion of rock removal within a reasonable time frame. Note that this will require seamless turn-around of extensions at the District.				
≤ \$500	10% of original fee																
> \$500	\$50																
Blasting or Rock breaking fee for extension of time	\$250																
Blasting or Rock breaking fee for rock removal over the maximum permitted	\$100/m3																

Attachment 4 – Consultation Comments Received

Discussion Topics - Potential Amendments to Oak Bay Blasting Regulations		
1. DEFINITIONS	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Include rock-breaking within the blasting regulations in the Building Bylaw (Bylaw No. 4247, Section 24) and provide definitions:		-
"Blast" or "Blasting" means the use of explosives, or chemicals, for the purpose of moving, displacing or breaking rock or other material		
"Rock-breaking" means the removal of boulders or bedrock from land by drilling, percussive breaking (not hammering), or splitting, but excluding blasting		Difference between percussive breaking and hammering is not clear (CO1)
"Control blasting plan" is the blasting plan developed for a site that specifies in what manner blasting operations are to be undertaken		
"Blaster" is a person who is the holder of a valid, applicable Blaster's Certificate issued by a municipal, provincial, state, federal or recognized regulatory agency		
"Independent blasting consultant" is a blasting professional with a minimum of five cumulative years of experience working in a consulting role in the blasting field in a Close Proximity blasting environment, a professional engineer with specific knowledge and expertise in blast design to meet specific objectives as well as the control of vibration and air over pressure, and whose experience is acceptable to the Director		- The "independent blasting consultant" should be an <u>owner-retained qualified professional engineer</u> hired to review the blasting plan provided by the blaster (BP1) - Not many qualified engineers around, few will sign-off on the plan, they will add cost but assume no liability, and BPs have more experience. (BP2) - My assumption was that most of this work already occurred as part of a blaster's obligation to their insurance provider so maybe that info can just get repackaged and submitted instead of layering on another requirement. (CO3) - These requirements are all captured by the blasting contractor. Also, for any requirements, I think it's very important to add "or owner representative" to the wording. Very few residents (clients of mine) would have the patience or understanding of how to go

		about any kind of building related application. (CO4)
“Pre-blast survey” is a detailed record in written form, accompanied by photos/video, of the condition of private or public property, prior to the commencement of blasting operations.		
“Qualified monitor” A vibration consultant or person working under the supervision of a blasting consultant trained and/or certified on the use of vibration and air overpressure monitoring equipment.		- The “qualified monitor” is the blaster. Their insurer requires the monitoring and logs, all regulated by WorkSafe BC. - Caution the availability and/or willingness of a P.Eng with blasting experience to service in the role of independent blasting consultant (CO1) - My assumption was that most of this work already occurred as part of a blasters obligation to their insurance provider so maybe that info can just get repackaged and submitted instead of layering on another requirement (CO3)
2. BLASTING PLAN	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Require the owner provide, as part of the Building Permit: • a pre-blast topographic survey that includes planned volume of rock to be removed (used to determine impact and calculate fees) • a post-blast topographic survey to confirm volume of rock removed and provide new baseline information • a wildlife survey for blasting between March 15 and August 15 • an arborist report Require a Blasting Plan, developed and managed by the Blaster, monitored by a Qualified monitor, and reviewed by an owner-retained Independent blasting consultant, to be submitted and approved by the Director. • The Blasting Plan must include a pre-blast survey • Changes to the submitted Blasting Plan are subject to review and approval by the Director, including a change fee	- Blasting review done on the basis of the impact on the residents and then design guidelines (R3) - Plan should be shared with neighbours w/in 750m and time for consultation - Post-blasting survey for neighbours (R7) - Include third-party testing to measure particulates levels of “granite dust” (R#) - Consideration for nearby older structures (R4)	- No value in the pre-/post-blast topographic survey (cash grab?) (BP1, BP2) - Risk and Hazard Assessment = Job Hazard Analysis. (BP1, BP2) - Topographic surveys, wildlife surveys, and arborist reports should be requirements for Building Permit, not for the blasting permit, and the responsibility of the owner. (BP1, BP2) - The pre-blast topographic survey should be the same as the topographic survey already required as part of the building permit (CO1) - The post-blast topographic survey should only be required (1) if blasting occurs beyond one metre of the building footprint and/or (2) if the general grade lines varied more than one metre. The additional work of this survey would cost in the order of \$1,500.(CO1) - Plans will indicate post-blast topography. Note the need to blast three feet (one metre) beyond the walls of the house to allow safe work space (WorkSafe).(CO2) - I don't see a value in this idea. There are topographic surveys done for the build design as well as average grade calcs provided. I think that should be enough info to answer any additional questions that might come up. If it was rural farmland

		with a history of mining/extraction/landfill activities then I could understand it, but this is Oak Bay so not an issue in my mind. (CO3) - From a custom home building perspective, and trying to control costs for clients, fewer surveys are better. As of now, we submit a survey that represent the site conditions before building prep begins. After the building is framed, we have the surveyor confirm the building's location and height, submitted with the framing inspections. I'm not totally opposed to having the surveyor take a few additional heights post blasting when they are there to give us building location pins, as those could be easily recorded and included with building location/height survey. But, the stage at which the surveyor pins the building location, there is typically already some amount of engineered material placed on top of the blasted rock in order to level the cut, or cover and compact fractured rock as requested by the Geotechnical engineer. So, if that "post-blast" survey could be taken as more of a reasonable estimation or an average then no additional costs would be passed to the client. Or even simpler, an elevation of the underside of footing would be more accurate of the new "hard pan/bearing material" it would be one additional trip for the surveyor avoided, which isn't a terrible expense, but in a world of climbing costs, it's worth noting. (CO4)
3. BLASTING FEES	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Include a blasting-specific fee schedule to the Fees Bylaw which better captures the fiscal impact of blasting, including restrictions/fees on the allowable volume of removed materials, excess rock removal, permit extensions, security deposit, etc.	- include road usage fee (R3) - Require a damage deposit for adjoining properties that can be recovered by those property owners if they are having problems with insurance claims (R5) - Fee per truck-load (R2) - Fees should be high enough to discourage blasting/encourage other approaches (R7) - In favour of higher fees (R1)	- Flat fees are better/more predictable than a percentage model (BP2) - Fee for extension was not as problematic as any potential time delay required for re-application of an extension. It should be processed immediately if required as it is likely a safety issue. Also, how do permit extensions align with notification requirements? - Fee for extension was not as problematic but the app should be processed immediately as it is likely a safety issue. - What is the procedure for notification re extensions? - Construction is accustomed to fees based on percentages rather than flat fees. Cost per m3 (volume) can't be rationalized based on District effort as permit processing

		would take the same effort for a small amount versus a larger amount of rock removal. (CO1) - I don't understand why higher fees are a solution to anything being proposed. (CO3) - I can agree with the first two (<i>blasting permit fee \$1000 and rock breaking fee \$500</i>), however overall blasting costs are included in construction budgets. So there is a doubling of fees there. But it is what it is. The permit extension I don't agree with at all. \$100/m3 is very unreasonable. I think the restriction on volume is very unreasonable as well. Those two proposals, especially this one could and would add tens of thousands of cost to a client. Not to mention, how could you monitor the additional volumes? There would need to be another consultant on site at all times. I hate to say it, but this would promote dishonesty. Not from me, as I value my relationship with Oak Bay, but I can't speak for anyone else. Is this security deposit not already captured by the building permit security deposit? I've never had my security deposit held back and will continue to make efforts to make sure it's not required, so am less bothered by this proposal. but I'm just not sure I understand what it is for. (CO4)
4. SAFETY BEST PRACTICE	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Change language regarding safety best practices: "The holder of a blasting permit shall ensure that all Provincial and Federal blasting standards are met."		- WorkSafe BC requires a three foot (one metre) setback from a foundation to serve as a safe working working space so any setback measures for blasting must take this into consideration. (CO1) - The blaster and their insurer should be relied on to set the parameters of distance from property lines/structures/trees etc. (CO3)
5. NOISE AND PERMITTED TIMES	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
• Align all construction time restrictions from the anti-noise bylaw for ease of communication and reference; • Remove any noise restrictions from the building bylaw • Limit times allowed for blasting and rock-breaking activities:	- 10am-4pm (R6) - 10am-3pm (R2) - NO blasting during holidays and nesting season (R2) - This is very important. Blasting going on for too	- Align blasting times to Public Works staff hours. (BP1) - Holiday shut-down = good (BP1) - Concerns about potential a "cut-off" at the end of the day (a circumstance where the only safe recourse is to blast again and leaving overnight could be a safety risk) and public notifications.

- Monday to Friday, except statutory holidays, between the hours of 8:00am and 4:00pm (Public Works Office Hours) - Dec 24 - Jan 2 - During nesting season of protected wildlife as regulated in the Wildlife Act Sec 34	long (R7) 8am-3pm (R7) - Start at 9am (R#) 9am-4pm, no blasting from Dec 23-Jan 2 (R1) - M-F, 9am-5pm (R4)	(BP1) - They suggest a clause that permits an exception for emergency reasons. (BP1) - Any allowable working time less than 8am - 4pm will add days to the process. (CO1) - Limit holiday ban on blasting to Dec 24 (not Dec 17) - Jan 2, otherwise it is the loss of a whole week of work. (CO2)
6. NOTIFICATIONS	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Bolster the Notification requirements to include: - Expected start date of work - Anticipated duration of blasting - Work to be done/volume of rock being removed - Contact information for Blaster/Owner - Oak Bay sends notification at least 7 days in advance shall be given of the commencement of any Blasting or Rock-breaking. - Require that removal areas be clearly marked on site, including the intended depth of removal and volume of rock to be removed. - Include blasting permits on Development Tracker - Include schools, hospitals, and clinics within the 300m radius notification requirements (currently only applicable to school buildings) - Require blaster coordinates Blasting Plan with schools and medical facilities	- more notification time (R3) - wider notification areas (R3) - Ample notification time so adjoining properties can document their homes for insurance purposes prior to blasting - More time should be provided for notification, e.g., 2mo (R7) - Notifications should be emailed and mailed to neighbouring residents (R7) - Notification radius should 500m and include all neighbours (R7) - Homeowners are not getting notifications (R#) - Notification is important in order to prepare for possible insurance claims (R1)	Notification list from ISEE-WEST Best Practices Guide: 1. Project description, location and purpose. 2. Anticipated start and completion dates. 3. Anticipated blasting times and number of daily blasts. 4. How or if they will be notified for each blast. 5. Blasting Contractor's name and contact information. 6. Name of the person conducting the Pre-Blast survey (if suggested). - Owner is to file a 'notice of project' (over \$100k, more than 3 days) to WorkSafe BC. (BP1) - Clearly marking blasting sites will not work. A sign tied to the topographic survey (BP1) - Blasting site markers is the responsibility of the owner in the initial Building Permit. (BP1, BP2) - Owner requires by regulation to give 48 hours' notice and Oak Bay gives 7 days' notice. Is this to change? - Okay with development tracker (BP1, BP2) - Oak Bay notification doesn't state time as blaster hasn't yet confirmed insurance; however, Oak Bay notification happens prior to confirmation of permit issuance. These dates need to align. - a 2 notifications system will confuse homeowner (BP2) - WorkSafe BC requires 150m notification (note: Colwood is 300m) 300m = okay (BP1) Site Marking - This would simply give more voice to those people who want to complain about blasting (CO1) - Would this require an additional inspection? (CO2)

		- If the zoning allows a particular use and the permit process creates the guardrails on heights, grades etc, then this seems like overkill (CO3) - These requirements are all captured by the blasting contractor. Also, for any requirements, I think it's very important to add "or owner representative" to the wording. Very few residents (clients of mine) would have the patience or understanding of how to go about any kind of building related application. (CO4) Notification Area - 300 metre notification seems unreasonable. - 300 metre notification (600 metre diameter circle) includes a lot of houses and would be onerous. What is achieved by this magnitude of notice? (if the application is also posted on the website) (CO1) - Confirm notification distance aligns with provincial regulations (CO2) - I agree with needing to notify all stakeholders once blasting is done but would expect it could be done similar to the lien act where you post a notice on site in a conspicuous location. 95% of the time it won't matter to "affected" owners so a public notice for all to see is adequate and any concerned "affected" owners will be able to watch for notices. (CO3)
7. DUST CONTROL	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Change language regarding dust control: "No operation by which soil or rock is removed or deposited shall cause a dust or dirt nuisance affecting any neighbouring property, highway or right of way."	- Window-cleaning, house spray, and filters for neighbours (R7)	
8. BLASTING AND ROCK-BREAKING TECHNIQUES	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Limit Blasting or Rock-Breaking Techniques: • Allowable rock volume • 400m3 (lots <885m2) • 600m3 (lots >=885m2)	- Prohibit hoe ramming (R5) - Strong agreement re no rock hammering (R2) - Max amount should be 400m3 and no on-site crushing, even for subdivisions (R7) - There needs to be a limit (R1)	Rock volume: - indifferent but cautions about private property rights (BP1) - Concerns re feasible for blasting companies (BP1) - very few residential lots have more than 600 m3 (BP2) - example Highland's fees: < 10m3 = \$25, >10m3 = \$50 - Calculate how big of a house could be built on these lots with

• No on-site rock crushing and grinding other than in instances of subdivision • Prohibit rock hammering and require use of alternative rock-breaking methods (chemical grouting/hydraulic pressure/etc.) with provision for Director-discretion when the use of rock hammering will not create a noise disturbance as employed in the Blasting Plan.		this limit on rock removal given a standard basement depth of about 10 feet. (CO1) - I think the removal should be tied to another permit that would set the terms of the removal without needing all this additional application/process time. (CO3) - I'm not sure to what advantage this is? Blasting can be done safely and accurately. These volume limits reduce a person's ability in design and occupiable space. My math on those volumes doesn't even allow for a full basement on an average lot Also, building permits are based on construction value. This would reduce Oak Bay's potential permit fee on a project. I don't mean to imply anything there; I'm just not seeing the value in this proposal. (CO4) Alternative methods (AM): - Costs associated with AMs. e.g., expanding grout is 10X more per foot than dynamite (BP1) - Dangers associated with AMs: chemical grout has risk of fly rock (BP1) - AMs problematic in Oak Bay's granite and basalt rock (BP1) - blasting requires minimum 1.2 m depth – for example, to remove 6" requires 1.2m (BP1) - Everyone should use electronic detonators. They reduce vibrations, increase frequency, and reduce air overpressure (BP1) - BP2 not a fan - A notable comment: that excavation cost of blasting compared to digging clay can be comparable as the blasted rock has no cost for additional use but the cost of hauling and disposing the removed clay is significant. (CO1) Prohibit hoe ramming - ordinary construction activity, there should be exception for "rock backline" remediation (BP1) - blanket rules or no discretion (BP2) - Align hoe ramming with the quantity of rock to be removed that requires a permit, i.e. no permit required for less than 10m3 of rock to be removed (4(2)). Prohibit hoe ramming for any rock amount removed 10m3 or greater. (CO1)
--	--	---

		- Prohibiting hoe-ramming is unreasonable. It is a useful and efficient tool for removal of small amounts of rock. (CO2) - Hoe rams and expanding grout are destructive enough that they should also require a permit. It could just be a condition of the building permit though, where the applicant has to describe the means of excavation as part of the build permit application. (CO3) - In some cases hoe-ramming can be much faster, and far less costly over blasting. if this is due to noise concerns, then again, a few hours of hoe-ramming can often times be much quicker than drilling and blasting. (CO4) -
9. PERMITS	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Include Permit Expiry: • Blasting = 10 working days (<885m2) • Blasting = 15 working days (>885m2) • Rock-breaking = 15 working days • Extensions only per Director approval & receipt of Extension Fee • One Blasting Permit allowed on a single property over one year, with extensions subject to Director's approval	- No blasting permits issued without a building permit. (R3) - Time limited scope (R5) - 10 days for rock-breaking, unless low-impact technique used (R7) - Only issue blasting permits for MDUs (R#) - Include blasting time limitation in permit conditions (R4)	- typical is 3-4 days for blast and 3-4 days for excavation (BP2) - Saanich (30 days), Colwood (\$50 for 10 working days, renewable), Victoria (\$150/month) (BP2) - Recommend one month – 20 working days for permit (BP1) - don't tie permit time to volume and area, make it as per blasting plan (BP1) - Colwood has a 2-week expiry (BP1) - renewal process is a problem (stop work, reapply, wait for response and new permit) (BP1) - Consider labour and equipment issues. The duration is already limited by volume. Could there be a possible leniency with permit time give the volume restriction? (CO1) - Define working days as Monday to Friday or it may be interpreted to include weekends.(CO2) - I understand and am OK with putting time restrictions on the blasting permit but 15 days isn't enough considering the pace of construction these days. You would also potentially face unintended consequences if you force a person to blast in less than ideal conditions (winter storm, rain) because they had a time deadline.(CO3) - Expiration days - they should begin from the day the work begins, as sometimes it can take a few days/weeks to get machinery moved to site. Also, you could add at least 5-10 days to each of those to be more flexible/reasonable with site conditions and logistics of working people, weather, equipment

		availability etc. Also, there should be some ability for a builder to appeal this in the case of unforeseen delays such as weather, road closures, access, etc. (CO4) - One permit extension - I don't like this either and wouldn't even be an issue if 10 and 15 day open permit times weren't proposed. In most cases, it's simply just not enough time to do a clean and safe job. These time restrictions only add pressure and complications to a working site. It is commonly understood that a large majority of accidents and site injuries happen when people are rushed. We should always choose life safety over appeasing neighbours whom always seem to forget that they live in a house that was once constructed as well. (CO4) - One permit per year - some sites are quite large and have several construction phases planned. I don't see the advantage of this. it only adds pressure for a builder to do more at one time, which adds cost, time, noise, and potentially less than safe working conditions. Site logistics can be a major driver in staging a project's phase. This seems like a blanket restriction that could make some sites unreasonable to build on.(CO4)
10. LIABILITY INSURANCE	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Increase the required Liability Insurance coverage to \$5,000,000	- Increase to 15,000,000 (R6) - Resident within 500-750m should be insured by City and developer (R2) - Can the Municipality act as the insurer (R#)	- this amount or more is standard (BP1, BP2)
11. SECURITY	RESIDENTS (R)	BLASTERS (BP) & CONTRACTORS (CO)
Link the release of the Owner's security deposit to the successful acceptance of the post-blasting topographic survey/rock-removal report by the Director		- How would the security deposit be used, if it was?(CO2) - I would leave this up to the blasters and their insurance providers. (On security personnel at nearby pedestrian and vehicular intersections near the blast) (CO3) - I'm not sure I understand what this additional security would look like. As it is, whenever we do any blasting. we stop both vehicle and pedestrian traffic from crossing in front of the site from the sound of the 3 beeps, to after each blast. (30 seconds +/-) I think that this is reasonable to be done with site workers in a high-viz vest, one for each lane of traffic. This is not something I feel necessary to hire out to a third party and wouldn't support that if it was proposed for 30 seconds of work a few times in a day. If

		that is what is proposed, that is another very large expense that I don't think is reasonable or necessary. (C04)
--	--	---

12. OTHER RECOMMENDATIONS, COMMENTS, SUGGESTIONS

RESIDENTS (R)

Permitted Activities

- No blasting to lot line (R3)
- No rock removal to the property line (R5)
- No rock removal to the property line (R2)
- Limit the number of truckloads/day and number of times a truck can travel on a road (route planning) (R7)
- No rock removal to the property line (R1)

Monitoring

- Create a snitch/complaints line for monitoring (R7)
- CO emissions monitoring (R#)

Guidelines

- promote other forms of construction/built form that do not require blasting (R7)
- No super-basements (R1)

Community Engagement and Involvement

- Councillors should attend public engagement (R6)
- UVic / Camosun students could do a study (R#)
- Engage and empathize with the residents (R#)

Other

- Blasting has an effect on mental wellbeing (R1)
- Blasting has damaged my or my neighbour's home (R4, R8)
- Feels like daily earthquakes (R1)
- Amend (Noise) Bylaw, section 5(7)9a) to confine excavation to M-F, 9am-5pm (R4)

BLASTING PROFESSIONALS (PB)

Blasting Professional Qualifications

- Consider pre-qualifying blasting contractors for smaller projects (i.e. COR Certification, SAFE) (BP1)

Possible Burden

- The amount of work is not reasonable: pre- and post- topographic surveys; listing the amount of rock; focusing on scale of work (BP1)
- Put the onus on the owner (BP2)
- West Van bylaw is too much (BP2)

CONTRACTORS (CO)**Setbacks**

- WorkSafe BC requires a three-foot (one metre) setback from a foundation to serve as a safe working space so any setback measures for blasting must take this into consideration. (CO1)
- The blaster and their insurer should be relied on to set the parameters of distance from property lines/structures/trees etc. (CO3)
- If an engineer can sign off on the stability of a blast right to the property line, then I think this isn't a necessary precaution and limits access, design and construction ability. (CO4)

Housing Cost

- There is a strong general theme in the industry that every extra regulatory requirement makes housing more expensive, which is contrary to the goal of making housing more affordable. (CO1)
- Maximizing density requires development of lower level (basements) but then blasting becomes a disincentive. (CO1)
- Municipalities are making development more onerous. (CO2)

Bylaw Check

- Run the proposed regulations through several scenarios to determine whether the bylaw is achieving what is intended. For example, basement depth, basement size, sloping lots

Attachment 5 – Blasting Summary – Comparison of Municipalities (page 1 of 2)

Bylaw Research – Blasting

Municipality	Blasting Permitted - Weekdays	Blasting Permitted - Weekends	Blasting Not Permitted Days	Bylaw
Oak Bay	Mon to Fri (non holidays) - 8am to 4pm	Saturdays - 8am to 4pm	Sundays/holidays	Building Bylaw (specific to blasting)
West Vancouver ¹	Mon to Fri (non holidays) - 7:30am to 5:30pm	Saturdays - 8am to 5pm	Sundays/holidays	Noise Bylaw (construction noise)
Regional Comparables:				
Victoria	Mon to Fri (non holidays) - 7am to 7pm	Saturdays - 10am to 7pm	Sundays/holidays	Noise Bylaw (construction noise)
Esquimalt ²	Mon to Fri - 7am to 10pm	Saturdays/Sundays - 9am to 10pm	N/A	Maintenance of Property and Nuisance Regulation Bylaw (noise control)
Saanich	Mon to Fri (non holidays) - 8am to 5pm	Saturdays - 8am to 5pm	Sundays/holidays	Blasting Bylaw
Central Saanich	Mon to Fri - 7am to 9pm	Saturdays - 7am to 9pm	Sundays ²	Noise Bylaw (construction noise)
North Saanich	Mon to Fri (non holidays) - 8am to 5pm	Saturdays - 8am to 5pm	Sundays/holidays	Blasting Bylaw
Sidney	Mon to Fri (non holidays) - 7am to 4:30pm	None	Weekends/holidays	Building Regulations Bylaw (construction noise)
View Royal	Mon to Fri (non holidays) - 7am to 7pm	Saturdays - 7am to 7pm	Sundays/holidays	Noise Bylaw (construction noise)
Colwood	Mon to Fri (non holidays) - 8am to 5pm	Saturdays - 8am to 5pm	Sundays/holidays	Noise bylaw (specific to blasting)
Highlands	Mon to Fri (non holidays) 8am to 4pm	Saturdays - 8am to 4pm	Sundays/holidays	Blasting Bylaw
Metchosin	Mon to Fri (non holidays) 8am to 4pm	Saturdays - 8am to 4pm	Sundays/holidays	Blasting Bylaw
Langford	Mon to Fri (non holidays) 8am to 4:30pm	None	Weekends/holidays ³	Noise bylaw (specific to blasting / rock removal)
Population Comparables:				
Pitt Meadows	Mon to Fri (non holidays) - 7am to 9pm	Saturdays - 7am to 9pm	Sundays/holidays ³	Noise Bylaw (construction noise)
Port Alberni	Mon to Fri - 7am to 6pm ⁴	Saturdays - 7am to 6pm ⁴	Sundays	Blasting Bylaw
Nelson	Mon to Fri (non holidays) - 7am to 10pm	Saturdays - 7am to 10pm	Sundays/holidays	Noise Bylaw (construction noise)
Salmon Arm	Mon to Fri - 7am to 10pm	Saturdays/Sundays - 7am to 10pm	N/A	Noise Bylaw (construction noise)
Squamish	Mon to Fri - 7am to 8pm	Saturdays - 8am to 7pm; Sundays and holidays - 10am to 4pm	N/A	Noise Bylaw (construction noise)
Lake Country	Mon to Fri (non holidays) - 8:30am to 4:30pm	None	Weekends/holidays	Blasting Bylaw

¹ Municipality has a Blasting Bylaw; refers to Noise Bylaw for noise regulations.

² Also permitted, in the case of urgent necessity, at any other time during the week if such work is essential to the health, safety or protection of the public.

³ Unless a person is working on their own residence, not for profit or gain. Hours are then 9am to 6pm.

⁴ Subject to defined atmospheric conditions/visibility

⁵ Applies to Rural Residential Zones; Residential Zones or Multiple Residential Zones; no blasting allowed anywhere in Langford on Sundays & holidays.

⁶ Hoe ramming would be included in general construction noise for all communities listed except Langford, which expressly includes rock crushing and mechanical breaking of rock in noise regulations specific to blasting.

Attachment 5 – Blasting Summary - Comparison of Municipalities (page 2 of 2)

Bylaw Research - Construction / Hoe Ramming

Municipality	Construction (incl. hoe ramming) ¹ Permitted - Weekdays	Construction Permitted - Weekends	Construction Not Permitted Days	Bylaw
Oak Bay	Mon to Fri (non holidays) - 7am to 7pm	Saturdays - 7am to 7pm	Sundays/holidays	Noise Bylaw (construction noise)
West Vancouver ³	Mon to Fri (non holidays) - 7:30am to 5:30pm	Saturdays - 8am to 5pm	Sundays/holidays	Noise Bylaw (construction noise)
Regional Comparables:				
Victoria	Mon to Fri (non holidays) - 7am to 7pm	Saturdays - 10am to 7pm	Sundays/holidays	Noise Bylaw (construction noise)
Esquimalt ²	Mon to Fri - 7am to 10pm	Saturdays/Sundays - 9am to 10pm	N/A	Maintenance of Property and Nuisance Regulation Bylaw (noise control)
Saanich	Mon to Fri - 7am to 9pm	Saturdays - 7am to 9pm	Sundays ²	Noise Bylaw (construction noise)
Central Saanich	Mon to Fri - 7am to 9pm	Saturdays - 7am to 9pm	Sundays ²	Noise Bylaw (construction noise)
North Saanich	Mon to Fri (non holidays) - 7am to 7pm	Saturdays - 8am to 4pm	Sundays/holidays	Noise Bylaw (construction noise)
Sidney	Mon to Fri - 7am to 7pm	Saturdays - 8am to 7pm	Sundays	Noise Bylaw (construction noise)
View Royal	Mon to Fri (non holidays) - 7am to 7pm	Saturdays - 7am to 7pm	Sundays/holidays	Noise Bylaw (construction noise)
Colwood	Mon to Fri (non holidays) - 7am to 7pm	Saturdays - 7am to 7pm	Sundays/holidays	Noise Bylaw (construction noise)
Highlands	Mon to Fri - 7am to 7pm	Saturdays/Sundays - 7am to 7pm	N/A	Noise Bylaw (construction noise)
Metochosin	Mon to Fri - 7am to 10pm unless a holiday, then 9am to 6pm	Saturdays - 7am to 10pm	Sundays	Noise Bylaw (construction noise)
Langford	Mon to Fri (non holidays) 8am to 4:30pm	None	Weekends/holidays ²	Noise Bylaw (specific to blasting / rock removal) ⁴
Population Comparables:				
Pitt Meadows	Mon to Fri (non holidays) - 7am to 9pm	Saturdays - 7am to 9pm	Sundays/holidays ³	Noise Bylaw (construction noise)
Port Alberni	Mon to Fri - 7am to 10pm	Saturdays & Sundays - 7am to 10pm	N/A	Noise Bylaw (construction noise)
Nelson	Mon to Fri (non holidays) - 7am to 10pm	Saturdays - 7am to 10pm	Sundays/holidays	Noise Bylaw (construction noise)
Salmon Arm	Mon to Fri - 7am to 10pm	Saturdays/Sundays - 7am to 10pm	N/A	Noise Bylaw (construction noise)
		Saturdays - 8am to 7pm; Sundays and holidays - 10am to 4pm		
Squamish	Mon to Fri - 7am to 8pm	Saturdays/Sundays - 7am to 9pm	N/A	Noise Bylaw (construction noise)
Lake Country	Mon to Fri 7am to 9pm	Saturdays/Sundays - 7am to 9pm	N/A	Nuisance Bylaw (noise regulations)

¹ Municipality has a Blasting Bylaw; refers to Noise Bylaw for noise regulations.

² Also permitted, in the case of urgent necessity, at any other time during the week if such work is essential to the health, safety or protection of the public.

³ Unless a person is working on their own residence, not for profit or gain. Hours are then 9am to 6pm.

⁴ Subject to defined atmospheric conditions/visibility

⁵ Applies to Rural Residential Zones; Residential Zones or Multiple Residential Zones; no blasting allowed anywhere in Langford on Sundays & holidays.

⁶ Hoe ramming would be included in general construction noise for all communities listed except Langford, which expressly includes rock crushing and mechanical breaking of rock in noise regulations specific to blasting.